LilyPond

Il compositore tipografico per la musica

Guida alla Notazione

Il team di sviluppo di LilyPond

Questo manuale costituisce la guida di riferimento per tutti gli aspetti relativi alla notazione musicale in LilyPond versione 2.17.26. Si presuppone che il lettore conosca il materiale esposto nel Sezione "Manuale di Apprendimento" in *Manuale di Apprendimento*.

Per maggiori informazioni su come questo manuale si integra col resto della documentazione, o per leggere questo manuale in altri formati, si veda Sezione "Manuali" in *Informazioni generali*.

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Per la versione di LilyPond 2.17.26

Sommario

1 Notazione musicale . . . 1
1.1 Altezze . . . 1
1.1.1 Inserimento delle altezze . . . 1
Ottava assoluta . . . 1
Ottava relativa . . . 2
Alterazioni . . . 5
Nomi delle note in altre lingue . . . 7
1.1.2 Modifica di più altezze . . . 9
Controlli di ottava . . . 9
Trasposizione . . . 10
Inversione . . . 13
Retrogradazione . . . 14
Trasposizioni modali . . . 14
1.1.3 Aspetto delle altezze . . . 16
Chiave . . . 17
Armatura di chiave . . . 20
Segni di ottavazione . . . 23
Trasporto strumentale . . . 24
Alterazioni automatiche . . . 26
Ambitus . . . 33
1.1.4 Teste di nota . . . 35
Teste di nota speciali . . . 35
Testa di nota con nome della nota . . . 37
Teste di nota a forma variabile . . . 39
Improvvisazione . . . 41
1.2 Ritmi . . . 42
1.2.1 Scrittura delle durate . . . 43
Durata . . . 43
Gruppi irregolari . . . 45
Scalare le durate . . . 49
Legature di valore . . . 50
1.2.2 Scrittura delle pause . . . 54
Pause . . . 54
Pause invisibili . . . 56
Pause d'intero . . . 57
1.2.3 Aspetto dei ritmi . . . 61
Indicazione di tempo . . . 61
Indicazioni metronomiche . . . 66
Anacrusi . . . 70
Musica in tempo libero . . . 71
Notazione polimetrica . . . 73
Divisione automatica delle note . . . 76
Mostrare i ritmi della melodia . . . 77
1.2.4 Travature . . . 79
Travature automatiche . . . 79
Impostare il comportamento della travatura automatica . . . 82
Travature manuali . . . 90
Travature convergenti/divergenti . . . 93

1.2.5 Battute . . . 94
Stanghette . . . 94
Numeri di battuta . . . 101
Controlli di battuta e del numero di battuta . . . 105
Segni di chiamata . . . 106
1.2.6 Questioni ritmiche particolari . . . 108
Abbellimenti . . . 108
Allineamento sulle cadenze . . . 113
Gestione del tempo . . . 114
1.3 Segni di espressione . . . 115
1.3.1 Segni di espressione collegati alle note . . . 116
Articolazioni e abbellimenti . . . 116
Dinamiche . . . 118
Nuovi segni di dinamica . . . 124
1.3.2 Segni di espressione in forma di curva . . . 126
Legature di portamento . . . 126
Legature di frase . . . 129
Respiri . . . 130
Portamenti indeterminati verso il basso e verso l'alto . . . 132
1.3.3 Segni di espressione in forma di linea . . . 133
Glissando . . . 133
Arpeggio . . . 137
Trilli . . . 140
1.4 Ripetizioni . . . 142
1.4.1 Ripetizioni lunghe . . . 143
Ripetizioni normali . . . 143
Segni di ripetizione manuali . . . 150
Ripetizioni ricopiate . . . 152
1.4.2 Ripetizioni brevi . . . 154
Ripetizioni con percentuale . . . 154
Ripetizioni con tremolo . . . 156
1.5 Note simultanee . . . 158
1.5.1 Una voce . . . 158
Note in un accordo . . . 158
Ripetizione di un accordo . . . 160
Espressioni simultanee . . . 162
Cluster . . . 163
1.5.2 Più voci . . . 163
Polifonia su un solo rigo . . . 163
Stili di voce . . . 167
Risoluzione delle collisioni . . . 167
Combinazione automatica delle parti . . . 172
Scrivere la musica in parallelo . . . 177
1.6 Staff notation . . . 179
1.6.1 Displaying staves . . . 180
Instantiating new staves . . . 180
Grouping staves . . . 181
Nested staff groups . . . 184
Separating systems . . . 186
1.6.2 Modifying single staves . . . 187
Staff symbol . . . 187
Ossia staves . . . 190
Hiding staves . . . 194
1.6.3 Writing parts . . . 197

Instrument names . . . 197
Quoting other voices . . . 201
Formatting cue notes . . . 203
1.7 Editorial annotations . . . 209
1.7.1 Inside the staff . . . 209
Selecting notation font size . . . 209
Fingering instructions . . . 210
Hidden notes . . . 212
Coloring objects . . . 213
Parentheses . . . 214
Stems . . . 215
1.7.2 Outside the staff . . . 216
Balloon help . . . 216
Grid lines . . . 217
Analysis brackets . . . 219
1.8 Text . . . 220
1.8.1 Writing text . . . 221
Text scripts . . . 221
Text spanners . . . 222
Text marks . . . 224
Separate text . . . 227
1.8.2 Formatting text . . . 229
Text markup introduction . . . 229
Selecting font and font size . . . 230
Text alignment . . . 233
Graphic notation inside markup . . . 236
Music notation inside markup . . . 239
Multi-page markup . . . 241
1.8.3 Fonts . . . 242
Fonts explained . . . 242
Single entry fonts . . . 244
Entire document fonts . . . 244

2 Specialist notation . . . 246

2.1 Vocal music . . . 246
2.1.1 Common notation for vocal music . . . 246
References for vocal music . . . 246
Entering lyrics . . . 247
Aligning lyrics to a melody . . . 248
Automatic syllable durations . . . 250
Manual syllable durations . . . 252
Multiple syllables to one note . . . 254
Multiple notes to one syllable . . . 254
Extenders and hyphens . . . 258
2.1.2 Techniques specific to lyrics . . . 258
Working with lyrics and variables . . . 258
Placing lyrics vertically . . . 260
Placing syllables horizontally . . . 264
Lyrics and repeats . . . 266
Divisi lyrics . . . 274
Polyphony with shared lyrics . . . 275
2.1.3 Stanzas . . . 277
Adding stanza numbers . . . 277
Adding dynamics marks to stanzas . . . 277

Adding singers' names to stanzas . . . 278
Stanzas with different rhythms . . . 278
Printing stanzas at the end . . . 281
Printing stanzas at the end in multiple columns . . . 282
2.1.4 Songs . . . 284
References for songs . . . 284
Lead sheets . . . 284
2.1.5 Choral . . . 285
References for choral . . . 285
Score layouts for choral . . . 286
Divided voices . . . 287
2.1.6 Opera and stage musicals . . . 288
References for opera and stage musicals . . . 288
Character names . . . 289
Musical cues . . . 291
Spoken music . . . 295
Dialogue over music . . . 295
2.1.7 Chants psalms and hymns . . . 296
References for chants and psalms . . . 296
Setting a chant . . . 296
Pointing a psalm . . . 303
Partial measures in hymn tunes . . . 306
2.1.8 Ancient vocal music . . . 308
2.2 Keyboard and other multi-staff instruments . . . 309
2.2.1 Common notation for keyboards . . . 310
References for keyboards . . . 310
Changing staff manually . . . 311
Changing staff automatically . . . 312
Staff-change lines . . . 314
Cross-staff stems . . . 314
2.2.2 Piano . . . 316
Piano pedals . . . 316
2.2.3 Accordion . . . 317
Discant symbols . . . 317
2.2.4 Harp . . . 321
References for harps . . . 321
Harp pedals . . . 321
2.3 Unfretted string instruments . . . 322
2.3.1 Common notation for unfretted strings . . . 322
References for unfretted strings . . . 322
Bowing indications . . . 323
Harmonics . . . 323
Snap (Bartók) pizzicato . . . 324
2.4 Fretted string instruments . . . 325
2.4.1 Common notation for fretted strings . . . 326
References for fretted strings . . . 326
String number indications . . . 326
Default tablatures . . . 328
Custom tablatures . . . 340
Fret diagram markups . . . 343
Predefined fret diagrams . . . 352
Automatic fret diagrams . . . 362
Right-hand fingerings . . . 365
2.4.2 Guitar . . . 366

Indicating position and barring . . . 367
Indicating harmonics and dampened notes . . . 367
Indicating power chords . . . 368
2.4.3 Banjo . . . 370
Banjo tablatures . . . 370
2.5 Percussion . . . 371
2.5.1 Common notation for percussion . . . 371
References for percussion . . . 371
Basic percussion notation . . . 371
Drum rolls . . . 372
Pitched percussion . . . 373
Percussion staves . . . 373
Custom percussion staves . . . 375
Ghost notes . . . 379
2.6 Wind instruments . . . 379
2.6.1 Common notation for wind instruments . . . 380
References for wind instruments . . . 380
Fingerings . . . 381
2.6.2 Bagpipes . . . 383
Bagpipe definitions . . . 383
Bagpipe example . . . 383
2.6.3 Woodwinds . . . 385
2.6.3.1 Woodwind diagrams . . . 385
2.7 Chord notation . . . 393
2.7.1 Chord mode . . . 393
Chord mode overview . . . 393
Common chords . . . 395
Extended and altered chords . . . 396
2.7.2 Displaying chords . . . 399
Printing chord names . . . 399
Customizing chord names . . . 401
2.7.3 Figured bass . . . 406
Introduction to figured bass . . . 407
Entering figured bass . . . 408
Displaying figured bass . . . 410
2.8 Contemporary music . . . 413
2.8.1 Pitch and harmony in contemporary music . . . 413
References for pitch and harmony in contemporary music . . . 413
Microtonal notation . . . 413
Contemporary key signatures and harmony . . . 413
2.8.2 Contemporary approaches to rhythm . . . 413
References for contemporary approaches to rhythm . . . 413
Tuplets in contemporary music . . . 413
Contemporary time signatures . . . 413
Extended polymetric notation . . . 413
Beams in contemporary music . . . 413
Bar lines in contemporary music . . . 413
2.8.3 Graphical notation . . . 413
2.8.4 Contemporary scoring techniques . . . 413
2.8.5 New instrumental techniques . . . 414
2.8.6 Further reading and scores of interest . . . 414
Books and articles on contemporary musical notation . . . 414
Scores and musical examples . . . 414
2.9 Ancient notation . . . 414

2.9.1 Overview of the supported styles . . . 415
2.9.2 Ancient notation—common features . . . 416
Pre-defined contexts . . . 416
Ligatures . . . 416
Custodes . . . 417
2.9.3 Typesetting mensural music . . . 418
Mensural contexts . . . 418
Mensural clefs . . . 418
Mensural time signatures . . . 420
Mensural note heads . . . 421
Mensural flags . . . 421
Mensural rests . . . 422
Mensural accidentals and key signatures . . . 423
Annotational accidentals (*musica ficta*) . . . 423
White mensural ligatures . . . 424
2.9.4 Typesetting Gregorian chant . . . 425
Gregorian chant contexts . . . 425
Gregorian clefs . . . 426
Gregorian accidentals and key signatures . . . 427
Divisiones . . . 427
Gregorian articulation signs . . . 428
Augmentum dots (*morae*) . . . 429
Gregorian square neume ligatures . . . 429
2.9.5 Typesetting Kievan square notation . . . 436
Kievan contexts . . . 436
Kievan clefs . . . 437
Kievan notes . . . 437
Kievan accidentals . . . 438
Kievan bar line . . . 438
Kievan melismata . . . 439
2.9.6 Working with ancient music—scenarios and solutions . . . 440
Incipits . . . 440
Mensurstriche layout . . . 440
Transcribing Gregorian chant . . . 440
Ancient and modern from one source . . . 443
Editorial markings . . . 443
2.10 World music . . . 444
2.10.1 Common notation for non-Western music . . . 444
Extending notation and tuning systems . . . 444
2.10.2 Arabic music . . . 445
References for Arabic music . . . 445
Arabic note names . . . 445
Arabic key signatures . . . 446
Arabic time signatures . . . 448
Arabic music example . . . 448
Further reading for Arabic music . . . 449
2.10.3 Turkish classical music . . . 450
References for Turkish classical music . . . 450
Turkish note names . . . 450

3 General input and output . . . 451

3.1 Input structure . . . 451
3.1.1 Structure of a score . . . 451
3.1.2 Multiple scores in a book . . . 452
3.1.3 Multiple output files from one input file . . . 453
3.1.4 Output file names . . . 454
3.1.5 File structure . . . 455
3.2 Titles and headers . . . 457
3.2.1 Creating titles headers and footers . . . 457
Titles explained . . . 457
Default layout of bookpart and score titles . . . 460
Default layout of headers and footers . . . 463
3.2.2 Custom titles headers and footers . . . 464
Custom text formatting for titles . . . 464
Custom layout for titles . . . 465
Custom layout for headers and footers . . . 468
3.2.3 Creating footnotes . . . 469
Footnotes in music expressions . . . 469
Footnotes in stand-alone text . . . 475
3.2.4 Reference to page numbers . . . 478
3.2.5 Table of contents . . . 479
3.3 Working with input files . . . 481
3.3.1 Including LilyPond files . . . 481
3.3.2 Different editions from one source . . . 482
Using variables . . . 483
Using tags . . . 484
Using global settings . . . 487
3.3.3 Special characters . . . 487
Text encoding . . . 487
Unicode . . . 488
ASCII aliases . . . 489
3.4 Controlling output . . . 490
3.4.1 Extracting fragments of music . . . 490
3.4.2 Skipping corrected music . . . 490
3.4.3 Alternative output formats . . . 491
3.4.4 Replacing the notation font . . . 491
3.5 MIDI output . . . 492
3.5.1 Creating MIDI files . . . 492
3.5.2 MIDI Instruments . . . 494
3.5.3 MIDI block . . . 494
3.5.4 What goes into the MIDI output? . . . 495
Supported in MIDI . . . 495
Unsupported in MIDI . . . 496
3.5.5 Repeats in MIDI . . . 496
3.5.6 Controlling MIDI dynamics . . . 497
Dynamic marks . . . 497
Overall MIDI volume . . . 498
Equalizing different instruments (i) . . . 499
Equalizing different instruments (ii) . . . 499
3.5.7 Percussion in MIDI . . . 501
3.5.8 The Articulate script . . . 501
3.6 Extracting musical information . . . 501
3.6.1 Displaying LilyPond notation . . . 502
3.6.2 Displaying scheme music expressions . . . 502

3.6.3 Saving music events to a file . . . 502

4 Spacing issues . . . 504
4.1 Page layout . . . 504
4.1.1 The \paper block . . . 504
4.1.2 Paper size and automatic scaling . . . 505
Setting the paper size . . . 505
Automatic scaling to paper size . . . 506
4.1.3 Fixed vertical spacing \paper variables . . . 506
4.1.4 Flexible vertical spacing \paper variables . . . 507
Structure of flexible vertical spacing alists . . . 507
List of flexible vertical spacing \paper variables . . . 508
4.1.5 Horizontal spacing \paper variables . . . 509
\paper variables for widths and margins . . . 509
\paper variables for two-sided mode . . . 510
\paper variables for shifts and indents . . . 511
4.1.6 Other \paper variables . . . 511
\paper variables for line breaking . . . 511
\paper variables for page breaking . . . 512
\paper variables for page numbering . . . 513
Miscellaneous \paper variables . . . 513
4.2 Score layout . . . 514
4.2.1 The \layout block . . . 514
4.2.2 Setting the staff size . . . 516
4.3 Breaks . . . 517
4.3.1 Line breaking . . . 517
4.3.2 Page breaking . . . 519
4.3.3 Optimal page breaking . . . 520
4.3.4 Optimal page turning . . . 520
4.3.5 Minimal page breaking . . . 521
4.3.6 One-line page breaking . . . 521
4.3.7 Explicit breaks . . . 521
4.3.8 Using an extra voice for breaks . . . 523
4.4 Vertical spacing . . . 525
4.4.1 Flexible vertical spacing within systems . . . 525
Within-system spacing properties . . . 525
Spacing of ungrouped staves . . . 528
Spacing of grouped staves . . . 529
Spacing of non-staff lines . . . 531
4.4.2 Explicit staff and system positioning . . . 532
4.4.3 Vertical collision avoidance . . . 539
4.5 Horizontal spacing . . . 540
4.5.1 Horizontal spacing overview . . . 540
4.5.2 New spacing area . . . 542
4.5.3 Changing horizontal spacing . . . 542
4.5.4 Line length . . . 544
4.5.5 Proportional notation . . . 545
4.6 Fitting music onto fewer pages . . . 551
4.6.1 Displaying spacing . . . 551
4.6.2 Changing spacing . . . 552

5 Changing defaults . . . 555
5.1 Interpretation contexts . . . 555
5.1.1 Contexts explained . . . 555
Score - the master of all contexts . . . 555
Top-level contexts - staff containers . . . 555
Intermediate-level contexts - staves . . . 556
Bottom-level contexts - voices . . . 556
5.1.2 Creating and referencing contexts . . . 557
5.1.3 Keeping contexts alive . . . 560
5.1.4 Modifying context plug-ins . . . 562
5.1.5 Changing context default settings . . . 564
Changing all contexts of the same type . . . 564
Changing just one specific context . . . 567
Order of precedence . . . 569
5.1.6 Defining new contexts . . . 569
5.1.7 Context layout order . . . 571
5.2 Explaining the Internals Reference . . . 572
5.2.1 Navigating the program reference . . . 572
5.2.2 Layout interfaces . . . 573
5.2.3 Determining the grob property . . . 574
5.2.4 Naming conventions . . . 575
5.3 Modifying properties . . . 575
5.3.1 Overview of modifying properties . . . 576
5.3.2 The `\set` command . . . 576
5.3.3 The `\override` command . . . 578
5.3.4 The `\tweak` command . . . 580
5.3.5 `\set` vs. `\override` . . . 582
5.3.6 Modifying alists . . . 582
5.4 Useful concepts and properties . . . 583
5.4.1 Input modes . . . 584
5.4.2 Direction and placement . . . 585
Articulation direction indicators . . . 585
The direction property . . . 586
5.4.3 Distances and measurements . . . 586
5.4.4 Staff symbol properties . . . 587
5.4.5 Spanners . . . 587
Using the `spanner-interface` . . . 587
Using the `line-spanner-interface` . . . 590
5.4.6 Visibility of objects . . . 592
Removing the stencil . . . 592
Making objects transparent . . . 592
Painting objects white . . . 593
Using break-visibility . . . 593
Special considerations . . . 595
5.4.7 Line styles . . . 597
5.4.8 Rotating objects . . . 598
Rotating layout objects . . . 598
Rotating markup . . . 599
5.5 Advanced tweaks . . . 599
5.5.1 Aligning objects . . . 599
Setting `X-offset` and `Y-offset` directly . . . 600
Using the `side-position-interface` . . . 600
Using the `self-alignment-interface` . . . 601
Using the `break-alignable-interface` . . . 602

5.5.2 Vertical grouping of grobs . . . 604
5.5.3 Modifying stencils . . . 604
5.5.4 Modifying shapes . . . 605
Modifying ties and slurs . . . 605
5.5.5 Unpure-pure containers . . . 609
5.6 Using music functions . . . 610
5.6.1 Substitution function syntax . . . 610
5.6.2 Substitution function examples . . . 611

Appendice A Notation manual tables . . . 613

A.1 Chord name chart . . . 613
A.2 Common chord modifiers . . . 614
A.3 Predefined string tunings . . . 617
A.4 Predefined fretboard diagrams . . . 618
A.5 Predefined paper sizes . . . 632
A.6 MIDI instruments . . . 635
A.7 List of colors . . . 636
A.8 The Feta font . . . 637
Clef glyphs . . . 638
Time Signature glyphs . . . 638
Number glyphs . . . 638
Accidental glyphs . . . 639
Default Notehead glyphs . . . 640
Special Notehead glyphs . . . 640
Shape-note Notehead glyphs . . . 641
Rest glyphs . . . 645
Flag glyphs . . . 645
Dot glyphs . . . 646
Dynamic glyphs . . . 646
Script glyphs . . . 646
Arrowhead glyphs . . . 648
Bracket-tip glyphs . . . 649
Pedal glyphs . . . 649
Accordion glyphs . . . 649
Tie glyphs . . . 649
Vaticana glyphs . . . 650
Medicaea glyphs . . . 651
Hufnagel glyphs . . . 651
Mensural glyphs . . . 652
Neomensural glyphs . . . 655
Petrucci glyphs . . . 656
Solesmes glyphs . . . 657
Kievan Notation glyphs . . . 657
A.9 Note head styles . . . 658
A.10 Text markup commands . . . 659
A.10.1 Font . . . 659
A.10.2 Align . . . 667
A.10.3 Graphic . . . 682
A.10.4 Music . . . 690
A.10.5 Instrument Specific Markup . . . 695
A.10.6 Accordion Registers . . . 698
A.10.7 Other . . . 703
A.11 Text markup list commands . . . 709
A.12 List of special characters . . . 710

A.13 List of articulations . . . 712
Articulation scripts . . . 712
Ornament scripts . . . 712
Fermata scripts . . . 712
Instrument-specific scripts . . . 713
Repeat sign scripts . . . 713
Ancient scripts . . . 713
A.14 Percussion notes . . . 713
A.15 Technical glossary . . . 715
alist . . . 715
callback . . . 715
closure . . . 715
glyph . . . 715
grob . . . 715
immutable . . . 716
interface . . . 716
lexer . . . 716
mutable . . . 716
output-def . . . 716
parser . . . 716
parser variable . . . 717
prob . . . 717
simple closure . . . 717
smob . . . 717
stencil . . . 717
A.16 All context properties . . . 718
A.17 Layout properties . . . 730
A.18 Available music functions . . . 748
A.19 Context modification identifiers . . . 756
A.20 Predefined type predicates . . . 757
R5RS primary predicates . . . 757
R5RS secondary predicates . . . 757
Guile predicates . . . 757
LilyPond scheme predicates . . . 758
LilyPond exported predicates . . . 758
A.21 Scheme functions . . . 759

Appendice B Cheat sheet . . . 783

Appendice C GNU Free Documentation License . . . 787

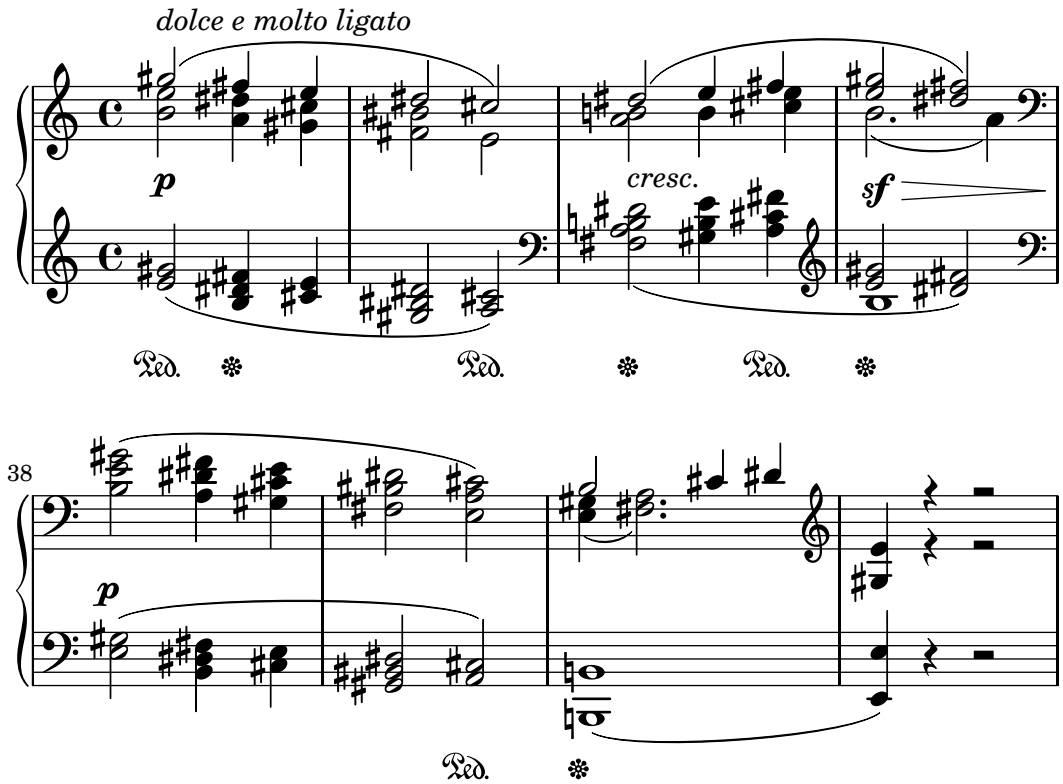
Appendice D Indice dei comandi di LilyPond . . . 794

Appendice E Indice di LilyPond . . . 804

1 Notazione musicale

Questo capitolo spiega come creare la notazione musicale.

1.1 Altezze



Questa sezione tratta il modo in cui si determina l'altezza delle note. Occorre considerare tre aspetti: input, modifica e output.

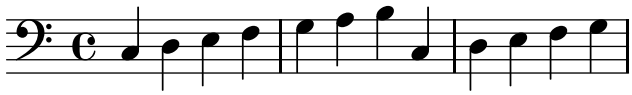
1.1.1 Inserimento delle altezze

Questa sezione spiega come indicare l'altezza delle note. Ci sono due modi di collocare le note in una determinata ottava: il modo assoluto e il modo relativo. Nella maggioranza dei casi il modo relativo è più funzionale.

Ottava assoluta

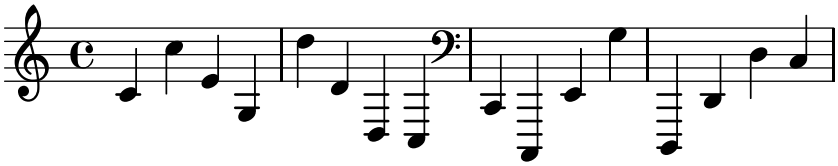
Le altezze, se non si adotta una lingua diversa, sono scritte in notazione olandese, che usa le lettere minuscole dalla `a` (La) alla `g` (Sol). Le note `c` (Do) e `b` (Si) vengono scritte un'ottava sotto il Do centrale.

```
{
  \clef bass
  c4 d e f
  g4 a b c
  d4 e f g
}
```



Si possono indicare altre ottave con l'apice singolo (`'`) o la virgola (`,`). Ogni `'` alza l'altezza di un'ottava; ogni `,` abbassa l'altezza di un'ottava.

```
{
  \clef treble
  c'4 c'' e' g
  d''4 d' d c
  \clef bass
  c,4 c,, e, g
  d,,4 d, d c
}
```



Si può indicare in modo esplicito che la musica viene inserita con l'ottava assoluta facendola precedere da `\absolute`:

`\absolute` *`espressione-musicale`*

verrà interpretata nella modalità assoluta indipendentemente dal contesto in cui si trova.

Vedi anche

Glossario musicale: Sezione "Nomi delle altezze" in *Glossario Musicale*.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Ottava relativa

L'inserimento delle note con l'ottava assoluta costringe a specificare l'ottava di ogni singola nota. Al contrario, se si usa l'ottava relativa, ogni ottava è determinata dall'ultima nota: se si cambia l'ottava di una nota, cambieranno anche le ottave di tutte le ote successive.

La modalità relativa deve essere impostata in modo esplicito col comando `\relative`:

`\relative` *`altezza_di_riferimento espressione_musicale`*

In modalità relativa ogni nota è collocata il più vicino possibile a quella precedente. Questo significa che l'ottava di ogni altezza all'interno di *`espressione_musicale`* viene calcolata nel modo seguente:

- In assenza di segni di cambiamento d'ottava, l'ottava di un'altezza viene calcolata in modo che l'intervallo con la nota precedente sia inferiore a una quinta. Tale intervallo è determinato senza considerare gli accidenti.
- Si può aggiungere un segno di cambiamento d'ottava `'` o `,` per collocare l'altezza di una nota all'ottava superiore o inferiore a quella di riferimento.
- È possibile usare più di un segno di cambiamento d'ottava. Per esempio, `''` e `,,` modificano l'altezza di due ottave.
- L'altezza della prima nota è relativa a *`altezza_di_riferimento`*. *`altezza_di_riferimento`* è specificato nel modo di ottava assoluta. Quale di queste opzioni è la più conveniente?

  un'ottava del `c`
  : Identificare il Do centrale con `c'` è molto semplice, quindi trovare le ottave del `c` (Do) sarà altrettanto semplice. Se la musica inizia con `gis` sopra `c'''`, si scriverà qualcosa simile a `\relative c''' { gis' ... }`

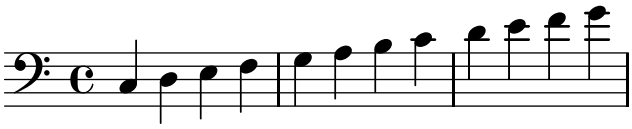
un'ottava della prima nota
: Scrivere `\relative gis''' { gis ... }` è un modo semplice per determinare l'altezza assoluta della prima nota dell'espressione musicale.

nessuna altezza di riferimento esplicita
: Questa (ovvero `\relative { gis''' ... }`) può essere considerata una versione compatta dell'opzione precedente: la prima nota dentro l'espressione musicale è scritta come altezza assoluta. In questo caso equivale a scegliere `f` come altezza di riferimento.

La documentazione di solito usa la prima opzione.

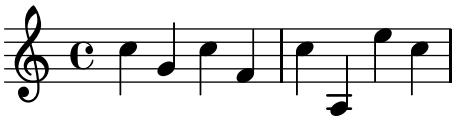
Ecco il modo relativo in azione:

```
\relative c {
  \clef bass
  c d e f
  g a b c
  d e f g
}
```



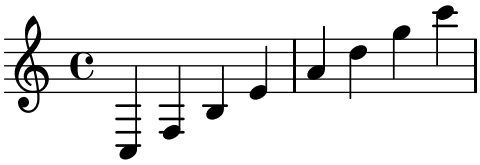
I segni di cambiamento d'ottava si impiegano per gli intervalli più ampi di quello di quarta:

```
\relative c'' {
  c g c f,
  c' a, e'' c
}
```



Una sequenza di note senza segni di ottava può tuttavia comprendere intervalli di grande estensione:

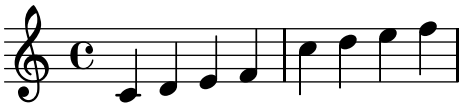
```
\relative c {
  c f b e
  a d g c
}
```



Nel caso di blocchi `\relative` annidati, si considera il blocco `\relative` più interno.

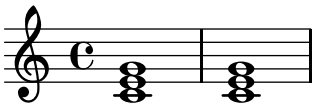
```
\relative c' {
  c d e f
  \relative c'' {
    c d e f
  }
```

```
}
```



`\relative` non ha effetto sui blocchi `\chordmode`.

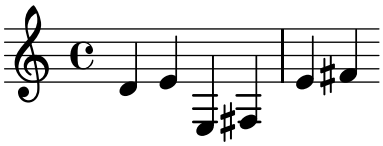
```
\new Staff {
  \relative c''' {
    \chordmode { c1 }
  }
  \chordmode { c1 }
}
```



`\relative` non può essere inserito all'interno dei blocchi `\chordmode`.

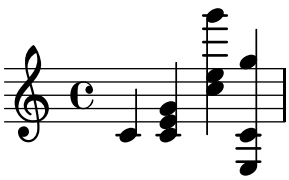
La musica all'interno di un blocco `\transpose` è considerata in notazione d'ottava assoluta, a meno che non sia incluso il blocco `\relative`.

```
\relative c' {
  d e
  \transpose f g {
    d e
    \relative c' {
      d e
    }
  }
}
```



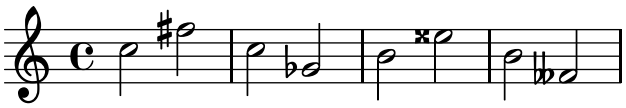
Se l'elemento precedente è un accordo, il posizionamento dell'ottava della nota o dell'accordo che segue è riferito alla prima nota dell'accordo stesso. All'interno degli accordi la nota successiva è sempre relativa a quella precedente. Esaminate con attenzione l'esempio seguente, e in particolare le note `c`.

```
\relative c' {
  c
  <c e g>
  <c' e g'>
  <c, e, g''>
}
```



Come spiegato sopra, il riferimento delle altezze a un'ottava è calcolato in base ai soli nomi delle note, senza considerare le alterazioni. Dunque un Mi doppio diesis che segue un Si verrà posizionato sopra, mentre un Fa doppio bemolle sarà posizionato sotto. In altre parole, un intervallo di quarta aumentata due volte viene considerato più piccolo di una quinta diminuita due volte, indipendentemente dal numero di semitoni contenuto in ogni intervallo.

```
\relative c'' {
  c2 fis
  c2 ges
  b2 eisis
  b2 feses
}
```



Ne consegue che la prima nota di un blocco `\relative f` venga interpretata come se fosse scritta nel modo di ottava assoluta.

Vedi anche

Glossario musicale: Sezione "quinta" in *Glossario Musicale*, Sezione "intervallo" in *Glossario Musicale*, Sezione "Nomi delle altezze" in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Octave checks], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

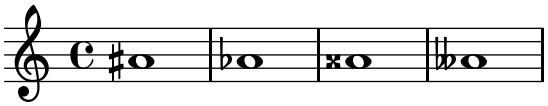
Guida al funzionamento interno: Sezione "RelativeOctaveMusic" in *Guida al Funzionamento Interno*.

Alterazioni

Nota: I nuovi utenti sono talvolta confusi dalla gestione delle alterazioni e delle armature di chiave. In LilyPond i nomi delle note costituiscono l'input grezzo; le armature e le chiavi determinano come questo input grezzo venga mostrato. Una nota non alterata come `c` significa 'Do naturale', indipendentemente dall'armatura o dalla chiave. Per maggiori informazioni si veda Sezione "Alterazioni e armature di chiave" in *Manuale di Apprendimento*.

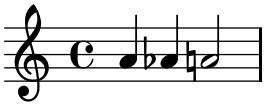
Nella modalità di notazione predefinita un *diesis* si ottiene aggiungendo `is` al nome della nota, un *bemolle* aggiungendo `es`. Come potete immaginare, un *doppio diesis* o *doppio bemolle* si ottengono aggiungendo `isis` o `eses`. Questa sintassi è desunta dalla notazione olandese. Per usare altri nomi per le alterazioni, si veda ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩.

```
ais1 aes aisis aeses
```



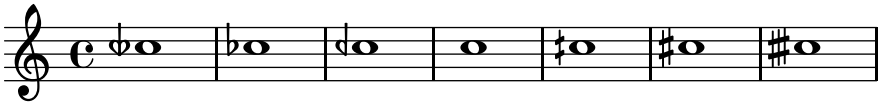
Un bequadro cancella l'effetto di un'alterazione o di un'armatura di chiave. Tuttavia, nella sintassi di Lilypond, non occorre specificare i bequadri mediante l'aggiunta di un particolare suffisso: un'altezza naturale è indicata con il semplice nome della nota:

```
a4 aes a2
```



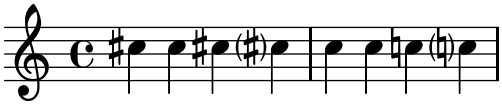
È possibile indicare alterazioni di quarti di tono. Ecco una serie di Do con altezza crescente:

```
ceseh1 ces ceh c cih cis cisih
```



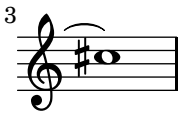
Di norma le alterazioni vengono mostrate automaticamente, ma è possibile anche inserirle manualmente. Si può forzare l'inserimento di un'alterazione di sicurezza aggiungendo il punto esclamativo `!` dopo l'altezza. Un'alterazione di cortesia (ovvero un'alterazione compresa tra parentesi) si ottiene aggiungendo il punto interrogativo `?` dopo l'altezza. Questi segni possono essere usati anche per produrre dei bequadri.

```
cis cis cis! cis? c c c! c?
```



Se una nota è prolungata attraverso una legatura di valore, l'alterazione viene ripetuta solo all'inizio di un nuovo sistema:

```
cis1~ cis~
\break
cis
```



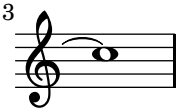
Frammenti di codice selezionati

*Nascondere le alterazioni delle note con legatura di valore*all'inizio di un nuovo sistema

Questo frammento mostra come nascondere le alterazioni delle note con legatura di valore all'inizio di un nuovo sistema

```
\relative c'' {
  \override Accidental.hide-tied-accidental-after-break = ##t
  cis1~ cis~
  \break
  cis
}
```

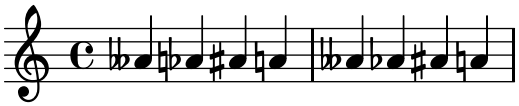
3



Impedire l'inserimento automatico dei bequadri supplementari

Secondo le norme tipografiche tradizionali, un segno di bequadro viene inserito prima di un diesis o di un bemolle se un precedente doppio diesis o bemolle sulla stessa nota è cancellato. Per cambiare questo comportamento e seguire la pratica contemporanea, si imposta la proprietà `extraNatural` su `f` (falso) nel contesto `Staff`.

```
\relative c'' {
  aeses4 aes ais a
  \set Staff.extraNatural = ##f
  aeses4 aes ais a
}
```



Vedi anche

Glossario musicale: Sezione "diesis" in *Glossario Musicale*, Sezione "bemolle" in *Glossario Musicale*, Sezione "doppio diesis" in *Glossario Musicale*, Sezione "doppio bemolle" in *Glossario Musicale*, Sezione "Nomi delle altezze" in *Glossario Musicale*, Sezione "quarto di tono" in *Glossario Musicale*.

Manuale di apprendimento: Sezione "Alterazioni e armature di chiave" in *Manuale di Apprendimento*.

Guida alla notazione: ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩, [Annotational accidentals (musica ficta)], pagina 423, ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Accidental_engraver" in *Guida al Funzionamento Interno*, Sezione "Accidental" in *Guida al Funzionamento Interno*, Sezione "AccidentalCautionary" in *Guida al Funzionamento Interno*, Sezione "accidental-interface" in *Guida al Funzionamento Interno*.

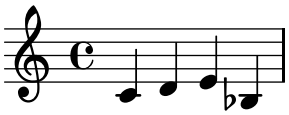
Problemi noti e avvertimenti

Poiché non esistono standard universalmente accettati per indicare le alterazioni di quarto di tono, il simbolo impiegato da LilyPond non si riferisce ad alcuno standard.

Nomi delle note in altre lingue

Lilypond comprende insiemi predefiniti di nomi di note e alterazioni in altre lingue. La scelta della lingua si fa solitamente all'inizio del file; l'esempio seguente è scritto in notazione italiana:

```
\language "italiano"

\relative do' {
  do re mi sib
}
```



Le lingue disponibili e i tipi di notazione che definiscono sono:

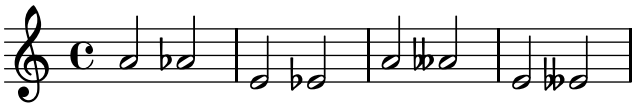
Lingua	**Nomi delle note**
`nederlands`	c d e f g a bes b
`catalan`	do re mi fa sol la sib si
`deutsch`	c d e f g a b h
`english`	c d e f g a bf b
`espanol` o `español`	do re mi fa sol la sib si
`italiano` o `français`	do re mi fa sol la sib si
`norsk`	c d e f g a b h
`portugues`	do re mi fa sol la sib si
`suomi`	c d e f g a b h
`svenska`	c d e f g a b h
`vlaams`	do re mi fa sol la sib si

Oltre ai nomi delle note, anche i suffissi per le alterazioni possono variare a seconda della lingua adottata:

Lingua	**diesis**	**bemolle**	**doppio diesis**	**doppio bemolle**
`nederlands`	-is	-es	-isis	-eses
`catalan`	-d/-s	-b	-dd/-ss	-bb
`deutsch`	-is	-es	-isis	-eses
`english`	-s/-sharp	-f/-flat	-ss/-x/-sharpsharp	-ff/-flatflat
`espanol` o `español`	-s	-b	-ss/-x	-bb
`italiano` o `français`	-d	-b	-dd	-bb
`norsk`	-iss/-is	-ess/-es	-ississ/-isis	-essess/-eses
`portugues`	-s	-b	-ss	-bb
`suomi`	-is	-es	-isis	-eses
`svenska`	-iss	-ess	-ississ	-essess
`vlaams`	-k	-b	-kk	-bb

In olandese, `aes` viene contratto in `as`, ma entrambe le forme sono accettate in LilyPond. Analogalmente, sia `es` che `ees` sono accettati. Lo stesso vale per `aeses` / `ases` e `eeses` / `eses`. Talvolta solo questi nomi contratti sono definiti nei corrispondenti file della lingua.

```
a2 as e es a ases e eses
```



In alcune forme musicali vengono usati i microtoni, le cui alterazioni sono frazioni di un 'normale' diesis o bemolle. La seguente tabella elenca i nomi delle note per le alterazioni di un quarto di tono in varie lingue; i prefissi *semi-* e *sesqui-* significano rispettivamente 'metà' e 'uno e mezzo'. Le lingue che non compaiono in questa tabella non hanno ancora dei nomi per le note speciali.

Lingua	semi-diesis	semi-bemolle	sesqui-diesis	sesqui-bemolle
nederlands	-ih	-eh	-isih	-eseh
deutsch	-ih	-eh	-isih	-eseh
english	-qs	-qf	-tqs	-tqf
espanol o español	-cs	-cb	-tcs	-tcb
italiano o français	-sd	-sb	-dsd	-bsb
portugues	-sqt	-bqt	-stqt	-btqt

Gran parte delle lingue presentate qui sono comunemente associate alla musica classica occidentale, nota anche come *Common Practice Period*. Sono tuttavia supportati anche altezze e sistemi di accordatura alternativi: si veda Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

Vedi anche

Glossario musicale: Sezione "Nomi delle altezze" in *Glossario Musicale*, Sezione "Periodo di pratica comune" in *Glossario Musicale*.

Guida alla notazione: Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

File installati: '`scm/define-note-names.scm`'.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

1.1.2 Modifica di più altezze

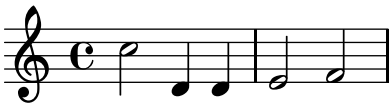
Questa sezione tratta il modo di modificare le altezze delle note.

Controlli di ottava

In modalità relativa è facile dimenticare un segno di cambiamento d'ottava. I controlli di ottava permettono di rilevare questi errori più facilmente: infatti, generano un avviso e correggono l'ottava se una nota si trova in un'ottava diversa dal previsto.

Per controllare l'ottava di una nota, occorre specificare l'ottava assoluta dopo il simbolo `=`. Questo esempio genererà un avviso (e cambierà l'altezza) perché la seconda nota è l'ottava assoluta `d''` invece di `d'`, come indicato dalla correzione di ottava.

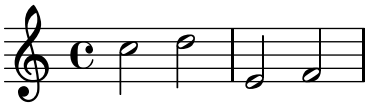
```
\relative c'' {
  c2 d='4 d
  e2 f
}
```



L'ottava in cui si trovano le note può essere controllata anche col comando `\octaveCheck` *`altezza_di_controllo`*. L'*`altezza_di_controllo`* è specificata in modo assoluto. Questo comando controlla che l'intervallo tra la nota precedente e l'*`altezza_di_controllo`* sia compresa in una quinta (ovvero secondo il normale calcolo della modalità relativo). Se il controllo fallisce, compare un avviso, ma la nota precedente non viene modificata. Le note successive sono relative all'*`altezza_di_controllo`*.

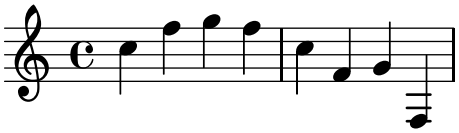
```
\relative c'' {
  c2 d
```

```
  \octaveCheck c'
  e2 f
}
```



Nelle due battute che seguono, il primo e il terzo `\octaveCheck` falliscono, mentre il secondo non fallisce.

```
\relative c'' {
  c4 f g f

  c4
  \octaveCheck c'
  f
  \octaveCheck c'
  g
  \octaveCheck c'
  f
}
```



Vedi anche

Frammenti di codice: Sezione "Pitches, Altezze" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "RelativeOctaveCheck" in *Guida al Funzionamento Interno*.

Trasposizione

Un'espressione musicale può essere trasposta con `\transpose`. La sintassi è

`\transpose` *`altezza_di_partenza altezza_di_arrivo espressione_musicale`*

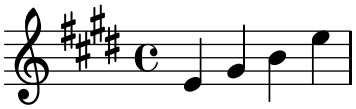
Significa che *`espressione_musicale`* viene trasposto dell'intervallo compreso tra le altezze *`altezza_di_partenza`* e *`altezza_di_arrivo`*: qualsiasi nota che presenti un'altezza corrispondente all'*`altezza_di_partenza`* viene modificata in *`altezza_di_arrivo`*, e qualsiasi altra nota viene trasposta dello stesso intervallo. Entrambe le altezze sono inserite in modalità assoluta.

> **Nota:** La musica all'interno di un blocco `\transpose` è assoluta a meno che il blocco non includa un `\relative`.

Prendiamo come esempio un brano scritto in Re maggiore. Possiamo trasportarlo in Mi maggiore; si noti come anche l'armatura di chiave venga trasposta automaticamente.

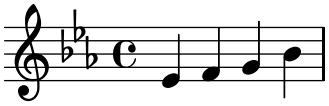
```
\transpose d e {
  \relative c' {
    \key d \major
    d4 fis a d
  }
```

```
}
```



Se una parte scritta in Do (l'*intonazione reale* abituale) deve essere suonata su un clarinetto in La (per il quale un La viene rappresentato da un Do e dunque suona una terza minore più basso), la trasposizione sarà ottenuta con:

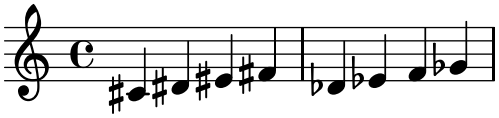
```
\transpose a c' {
  \relative c' {
    \key c \major
    c4 d e g
  }
}
```



Si noti che `\key c \major` è specificato esplicitamente. Se non si specifica un'armatura di chiave, le note verranno trasposte ma non apparirà alcuna armatura.

`\transpose` fa distinzione tra altezze enarmoniche: sia `\transpose c cis` che `\transpose c des` traspongono un brano di un semitono più alto. La prima versione mostrerà i diesis e le note rimarranno sullo stesso grado della scala, mentre la seconda versione mostrerà i bemolle sul grado superiore della scala.

```
music = \relative c' { c d e f }
\new Staff {
  \transpose c cis { \music }
  \transpose c des { \music }
}
```



`\transpose` può essere usato anche in un altro modo, ovvero per inserire note scritte per uno strumento traspositore. Gli esempi precedenti mostrano come inserire altezze in Do (o *intonazione reale*) e mostrare le note di uno strumento traspositore, ma è possibile anche il contrario: per esempio, se da un insieme di parti strumentali si volesse ricavare una partitura per il direttore. Così, per inserire la parte per una tromba in Si bemolle che inizia con un Mi (intonazione reale Re), si può scrivere:

```
musicInBflat = { e4 ... }
\transpose c bes, \musicInBflat
```

Per stampare questa musica in Fa (ad esempio per riarrangiarla per corno) si può avvolgere la musica esistente in un altro `\transpose`:

```
musicInBflat = { e4 ... }
\transpose f c' { \transpose c bes, \musicInBflat }
```

Per maggiori informazioni sugli strumenti traspositori, si veda ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩.

Frammenti di codice selezionati

Trasposizione delle altezze con numero minimo di alterazioni

Questo esempio usa del codice Scheme per imporre delle modifiche enarmoniche alle note che permettano di avere il numero minimo di alterazioni. In questo caso si applica la seguente regola:

Le doppie alterazioni devono essere eliminate

Si diesis -> Do

Mi diesis -> Fa

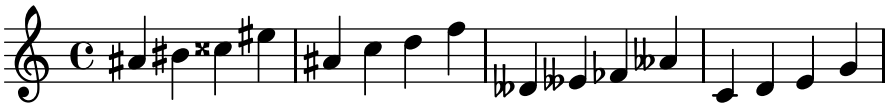
Do bemolle -> Si

Fa bemolle -> Mi

In questo modo vengono scelti i suoni enarmonici più semplici.

```
#(define (naturalize-pitch p)
   (let ((o (ly:pitch-octave p))
         (a (* 4 (ly:pitch-alteration p)))
         ;; alteration, a, in quarter tone steps,
         ;; for historical reasons
         (n (ly:pitch-notename p)))
     (cond
      ((and (> a 1) (or (eq? n 6) (eq? n 2)))
       (set! a (- a 2))
       (set! n (+ n 1)))
      ((and (< a -1) (or (eq? n 0) (eq? n 3)))
       (set! a (+ a 2))
       (set! n (- n 1))))
     (cond
      ((> a 2) (set! a (- a 4)) (set! n (+ n 1)))
      ((< a -2) (set! a (+ a 4)) (set! n (- n 1))))
     (if (< n 0) (begin (set! o (- o 1)) (set! n (+ n 7))))
     (if (> n 6) (begin (set! o (+ o 1)) (set! n (- n 7))))
     (ly:make-pitch o n (/ a 4))))

#(define (naturalize music)
   (let ((es (ly:music-property music 'elements))
         (e (ly:music-property music 'element))
         (p (ly:music-property music 'pitch)))
     (if (pair? es)
         (ly:music-set-property!
          music 'elements
          (map (lambda (x) (naturalize x)) es)))
     (if (ly:music? e)
         (ly:music-set-property!
          music 'element
          (naturalize e)))
     (if (ly:pitch? p)
         (begin
           (set! p (naturalize-pitch p))
           (ly:music-set-property! music 'pitch p)))
     music))

naturalizeMusic =
```

```
#(define-music-function (parser location m)
   (ly:music?)
   (naturalize m))

music = \relative c' { c4 d e g }

\score {
  \new Staff {
    \transpose c ais { \music }
    \naturalizeMusic \transpose c ais { \music }
    \transpose c deses { \music }
    \naturalizeMusic \transpose c deses { \music }
  }
  \layout { }
}
```



Vedi anche

Guida alla notazione: ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩, ⟨undefined⟩ [Inversion], pagina ⟨undefined⟩, ⟨undefined⟩ [Modal transformations], pagina ⟨undefined⟩, ⟨undefined⟩ [Relative octave entry], pagina ⟨undefined⟩, ⟨undefined⟩ [Retrograde], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "TransposedMusic" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

La conversione relativa non avrà effetto sulle sezioni `\transpose`, `\chordmode` e `\relative` comprese all'interno di un blocco `\relative`. Per usare la modalità relativa all'interno di musica trasposta, occorre inserire un ulteriore blocco `\relative` all'interno di `\transpose`.

Il comando `\transpose` impedisce di stampare le alterazioni triple. Le sostituisce con un'altezza 'enarmonicamente equivalente' (per esempio, Re bemolle al posto di Mi triplo bemolle).

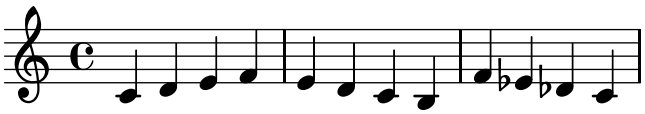
Inversione

Un'espressione musicale può essere invertita e trasposta in una singola operazione con:

`\inversion` *`altezza-di-riferimento altezza-di-arrivo espressione_musicale`*

L'*`espressione_musicale`* viene invertita intervallo per intervallo intorno all'*`altezza-di-riferimento`* e poi trasposta in modo che ci sia una corrispondenza tra *`altezza-di-riferimento`* e *`altezza-di-arrivo`*.

```
music = \relative c' { c d e f }
\new Staff {
  \music
  \inversion d' d' \music
  \inversion d' ees' \music
}
```



Nota: I motivi da invertire devono essere scritti in forma assoluta oppure devono essere prima convertiti in forma assoluta racchiudendoli in un blocco `\relative`.

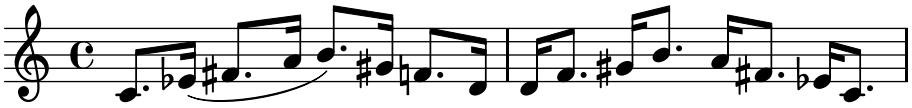
Vedi anche

Guida alla notazione: ⟨undefined⟩ [Modal transformations], pagina ⟨undefined⟩, ⟨undefined⟩ [Retrograde], pagina ⟨undefined⟩, ⟨undefined⟩ [Transpose], pagina ⟨undefined⟩.

Retrogradazione

Un'espressione musicale può essere invertita in modo da produrre il proprio retrogrado:

```
music = \relative c' { c8. ees16( fis8. a16 b8.) gis16 f8. d16 }

\new Staff {
  \music
  \retrograde \music
}
```



Problemi noti e avvertimenti

Le legature di valore manuali in `\retrograde` saranno spezzate e genereranno degli avvisi. Alcune legature di valore possono essere generate automaticamente abilitando ⟨undefined⟩ [Automatic note splitting], pagina ⟨undefined⟩.

Vedi anche

Guida alla notazione: ⟨undefined⟩ [Inversion], pagina ⟨undefined⟩, ⟨undefined⟩ [Modal transformations], pagina ⟨undefined⟩, ⟨undefined⟩ [Transpose], pagina ⟨undefined⟩.

Trasposizioni modali

In una composizione musicale basata su una scala, un motivo viene frequentemente trasportato in differenti modi. Può essere *trasposto* per iniziare in punti diversi della scala o può essere *invertito* rispetto a un punto cardine della scala. Può anche essere rovesciato per produrre il *retrogrado*, si veda ⟨undefined⟩ [Retrograde], pagina ⟨undefined⟩.

Nota: Le note che non si trovano all'interno della scala definita non vengono trasformate.

Trasposizione modale

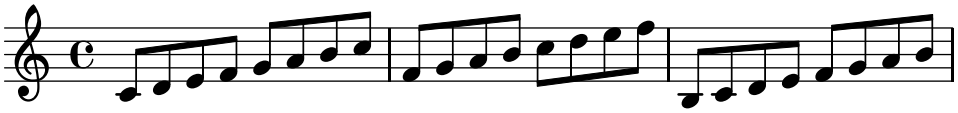
Un motivo può essere trasposto entro una certa scala con:

`\modalTranspose` *`altezza-di-partenza altezza-di-arrivo scala motif`*

Le note di *motif* vengono spostate, se all'interno della *scala*, del numero di gradi della scala dati dall'intervallo tra *altezza-di-arrivo* e *altezza-di-partenza*:

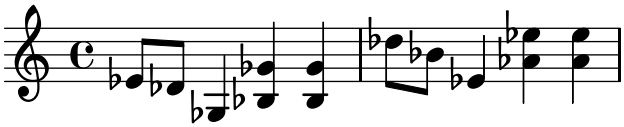
```
diatonicScale = \relative c' { c d e f g a b }
motif = \relative c' { c8 d e f g a b c }
```

```
\new Staff {
  \motif
  \modalTranspose c f \diatonicScale \motif
  \modalTranspose c b, \diatonicScale \motif
}
```



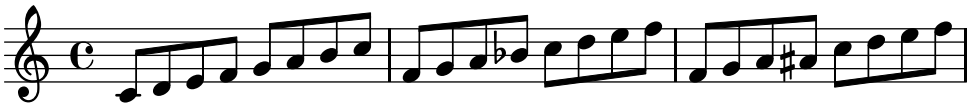
È possibile indicare una scala ascendente di qualsiasi lunghezza e con qualsiasi intervallo:

```
pentatonicScale = \relative c' { ges aes bes des ees }
motif = \relative c' { ees8 des ges,4 <ges' bes,> <ges bes,> }

\new Staff {
  \motif
  \modalTranspose ges ees' \pentatonicScale \motif
}
```



Se usato con una scala cromatica, `\modalTranspose` ha un effetto simile a `\transpose`, con in più la possibilità di specificare i nomi delle note da usare:

```
chromaticScale = \relative c' { c cis d dis e f fis g gis a ais b }
motif = \relative c' { c8 d e f g a b c }

\new Staff {
  \motif
  \transpose c f \motif
  \modalTranspose c f \chromaticScale \motif
}
```



Inversione modale

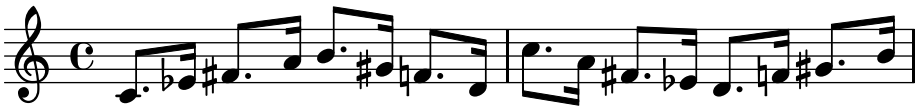
Una sequenza di note può essere invertita all'interno di una data scala intorno a una determinata nota cardine e quindi trasposto, in un'unica operazione, con:

`\modalInversion` *`altezza-cardine altezza-di-arrivo scala motif`*

Le note di *motif* vengono spostate dello stesso numero di gradi dalla nota dell'*altezza-cardine* all'interno della *scala*, ma nella direzione opposta, e il risultato viene poi spostato all'interno della *scala* per il numero di gradi dato dall'intervallo tra *altezza-di-arrivo* e *altezza-cardine*.

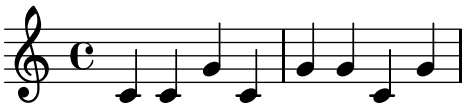
Dunque, per invertire intorno a una particolare nota della scala, è necessario usare il medesimo valore per *altezza-cardine* e *altezza-di-arrivo*:

```
octatonicScale = \relative c' { ees f fis gis a b c d }
motif = \relative c' { c8. ees16 fis8. a16 b8. gis16 f8. d16 }

\new Staff {
  \motif
  \modalInversion fis' fis' \octatonicScale \motif
}
```



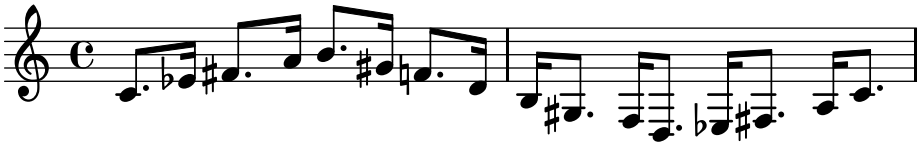
Per invertire intorno a una nota cardine posta tra altre due note, si inverte intorno a una della note e poi si traspone di un grado della scala. Le due note specificate possono essere interpretate come parentesi del punto cardine:

```
scale = \relative c' { c g' }
motive = \relative c' { c c g' c, }

\new Staff {
  \motive
  \modalInversion c' g' \scale \motive
}
```



L'operazione combinata di inversione e retrogradazione produce la retrogradazione inversa:

```
octatonicScale = \relative c' { ees f fis gis a b c d }
motif = \relative c' { c8. ees16 fis8. a16 b8. gis16 f8. d16 }

\new Staff {
  \motif
  \retrograde \modalInversion c' c' \octatonicScale \motif
}
```



Vedi anche

Guida alla notazione: ⟨undefined⟩ [Inversion], pagina ⟨undefined⟩, ⟨undefined⟩ [Retrograde], pagina ⟨undefined⟩, ⟨undefined⟩ [Transpose], pagina ⟨undefined⟩.

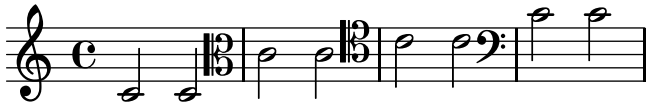
1.1.3 Aspetto delle altezze

Questa sezione tratta il modo di modificare l'aspetto delle altezze delle note.

Chiave

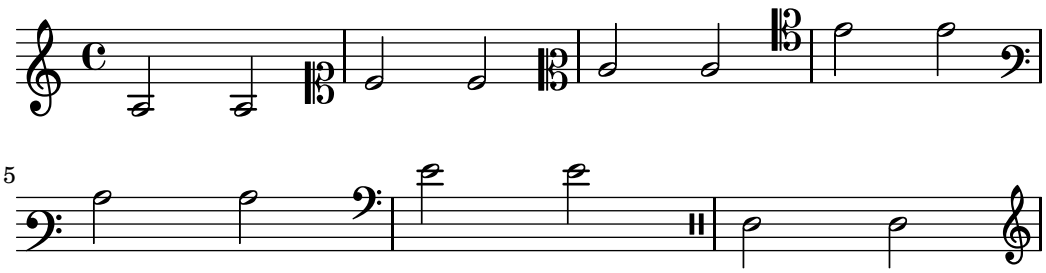
È possibile cambiare la chiave impiegata. Negli esempi seguenti mostriamo il Do centrale. I seguenti nomi di chiave possono (ma non devono) essere racchiusi tra virgolette.

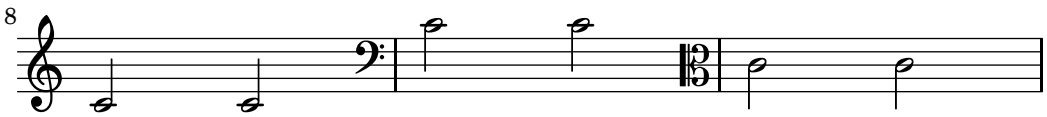
```
\clef treble
c2 c
\clef alto
c2 c
\clef tenor
c2 c
\clef bass
c2 c
```



Altre chiavi:

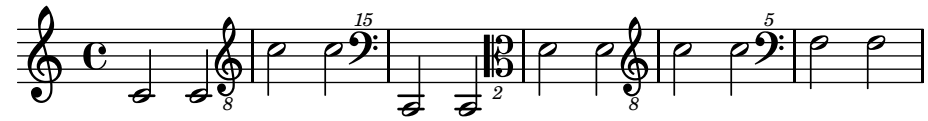
```
\clef french
c2 c
\clef soprano
c2 c
\clef mezzosoprano
c2 c
\clef baritone
c2 c

\break

\clef varbaritone
c2 c
\clef subbass
c2 c
\clef percussion
c2 c

\break

\clef G   % synonym for treble
c2 c
\clef F   % synonym for bass
c2 c
\clef C   % synonym for alto
c2 c
```





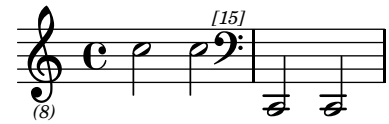
Aggiungendo `_8` o `^8` al nome della chiave, la sua adozione comporta il trasporto all'ottava rispettivamente inferiore o superiore, mentre `_15` e `^15` traspongono di due ottave. È possibile usare altri numeri interi, se necessario. I nomi di chiave contenenti caratteri non alfabetici devono essere racchiusi tra virgolette

```
\clef treble
c2 c
\clef "treble_8"
c2 c
\clef "bass^15"
c2 c
\clef "alto_2"
c2 c
\clef "G_8"
c2 c
\clef "F^5"
c2 c
```



L'ottavazione opzionale si può ottenere racchiudendo l'argomento numerico tra parentesi tonde o quadre:

```
\clef "treble_(8)"
c2 c
\clef "bass^[15]"
c2 c
```



Le altezze vengono mostrate come se l'argomento numerico fosse inserito senza parentesi.

Alcune chiavi particolari sono descritte in [Mensural clefs], pagina 418, [Gregorian clefs], pagina 426, [Default tablatures], pagina 328 e [Custom tablatures], pagina 340. Per alternare chiavi diverse nelle citazioni in corpo più piccolo all'interno di una partitura, si vedano le funzioni `\cueClef` e `\cueDuringWithClef` in [Formatting cue notes], pagina 203.

Frammenti di codice selezionati

Modifiche manuali della proprietà della chiave

Il comando `\clef "treble_8"` equivale a impostare `clefGlyph`, `clefPosition` (che regola la posizione verticale della chiave), `middleCPosition` e `clefTransposition`. Viene stampata una chiave quando cambia una di queste proprietà, eccetto `middleCPosition`.

La modifica del glifo, della posizione della chiave o dell'ottavazione non è sufficiente per cambiare la posizione delle note che seguono sul rigo: bisogna anche specificare la posizione del Do centrale (middle C). Per far sì che le armature di chiave si trovino sulle linee corrette del rigo, occorre impostare anche `middleCClefPosition`. I parametri di posizione sono relativi alla linea centrale del rigo, con i numeri positivi che indicano la parte superiore: ogni linea e spazio

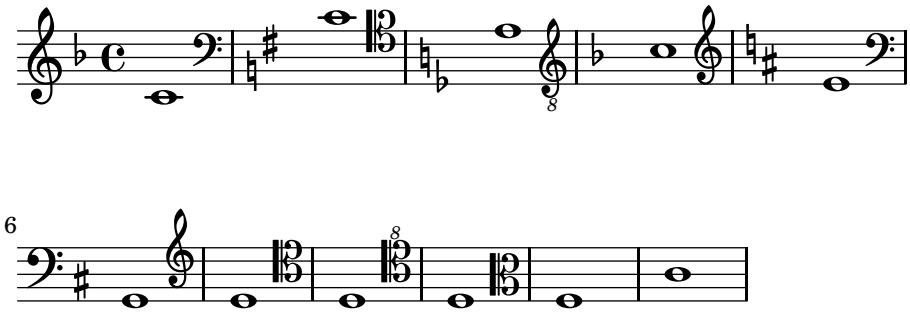
valgono uno. Il valore `clefTransposition` di norma è impostato su 7, -7, 15 o -15, ma altri valori sono considerati validi.

Quando un cambio di chiave avviene in corrispondenza di un'interruzione di linea, di norma il simbolo della nuova chiave viene inserito sia alla fine del rigo precedente sia all'inizio di quello successivo. Se la chiave di avvertimento a fine rigo non fosse necessaria, può essere nascosta impostando la proprietà `explicitClefVisibility` del contesto `Staff` su `end-of-line-invisible`. Il comportamento predefinito può essere ripristinato con `\unset Staff.explicitClefVisibility`.

Gli esempi seguenti mostrano le possibilità date dall'impostazione manuale di tali proprietà. Sulla prima linea le modifiche manuali preservano il posizionamento relativo standard di chiavi e note, mentre sulla seconda linea non lo fanno.

```
\layout { ragged-right = ##t }
{
  % The default treble clef
  \key f \major
  c'1
  % The standard bass clef
  \set Staff.clefGlyph = #"clefs.F"
  \set Staff.clefPosition = #2
  \set Staff.middleCPosition = #6
  \set Staff.middleCClefPosition = #6
  \key g \major
  c'1
  % The baritone clef
  \set Staff.clefGlyph = #"clefs.C"
  \set Staff.clefPosition = #4
  \set Staff.middleCPosition = #4
  \set Staff.middleCClefPosition = #4
  \key f \major
  c'1
  % The standard choral tenor clef
  \set Staff.clefGlyph = #"clefs.G"
  \set Staff.clefPosition = #-2
  \set Staff.clefTransposition = #-7
  \set Staff.middleCPosition = #1
  \set Staff.middleCClefPosition = #1
  \key f \major
  c'1
  % A non-standard clef
  \set Staff.clefPosition = #0
  \set Staff.clefTransposition = #0
  \set Staff.middleCPosition = #-4
  \set Staff.middleCClefPosition = #-4
  \key g \major
  c'1 \break

  % The following clef changes do not preserve
  % the normal relationship between notes, key signatures
  % and clefs:

  \set Staff.clefGlyph = #"clefs.F"
```

```
  \set Staff.clefPosition = #2
  c'1
  \set Staff.clefGlyph = #"clefs.G"
  c'1
  \set Staff.clefGlyph = #"clefs.C"
  c'1
  \set Staff.clefTransposition = #7
  c'1
  \set Staff.clefTransposition = #0
  \set Staff.clefPosition = #0
  c'1

  % Return to the normal clef:

  \set Staff.middleCPosition = #0
  c'1
}
```



Vedi anche

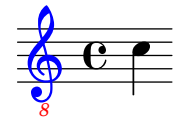
Guida alla notazione: [Mensural clefs], pagina 418, [Gregorian clefs], pagina 426, [Default tablatures], pagina 328, [Custom tablatures], pagina 340, [Formatting cue notes], pagina 203.

Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Clef_engraver” in *Guida al Funzionamento Interno*, Sezione “Clef” in *Guida al Funzionamento Interno*, Sezione “ClefModifier” in *Guida al Funzionamento Interno*, Sezione “clef-interface” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

I numeri di ottavazione assegnati alle chiavi sono trattati come oggetti grafici separati. Quindi qualsiasi `\override` all’oggetto *Clef* dovrà essere applicato, con un altro `\override`, all’oggetto *ClefModifier*.



Armatura di chiave

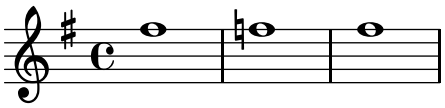
Nota: I nuovi utenti sono talvolta confusi dalla gestione delle alterazioni e delle armature di chiave. In LilyPond i nomi delle note costituiscono l'input grezzo; le armature e le chiavi determinano come questo venga mostrato. Una nota non alterata come `c` significa 'Do naturale', indipendentemente dall'armatura o dalla chiave. Per maggiori informazioni si veda Sezione "Alterazioni e armature di chiave" in *Manuale di Apprendimento*.

L'armatura di chiave indica la tonalità di un brano. È costituita da un insieme di alterazioni (bemolle o diesis) all'inizio del rigo. L'armatura di chiave può essere modificata:

```
\key altezza modo
```

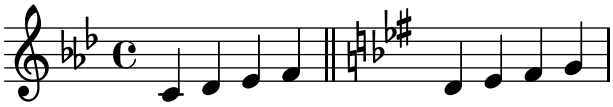
modo deve essere `\major` o `\minor` per ottenere rispettivamente un'armatura di *altezza*-maggiore o *altezza*-minore. È anche possibile usare i nomi tradizionali dei modi, chiamati anche *modi ecclesiastici*: `\ionian`, `\dorian`, `\phrygian`, `\lydian`, `\mixolydian`, `\aeolian` e `\locrian`.

```
\key g \major
fis1
f
fis
```



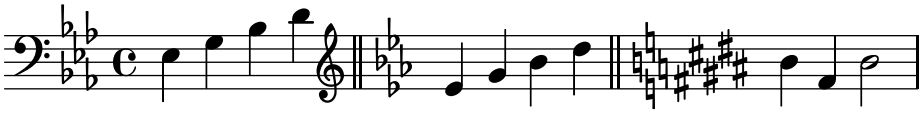
Si possono definire ulteriori modi elencando le alterazioni per ogni grado della scala quando il modo inizia col Do.

```
freygish = #`((0 . ,NATURAL) (1 . ,FLAT) (2 . ,NATURAL)
    (3 . ,NATURAL) (4 . ,NATURAL) (5 . ,FLAT) (6 . ,FLAT))

\relative c' {
  \key c \freygish c4 des e f
  \bar "||" \key d \freygish d es fis g
}
```



Le alterazioni dell'armatura di chiave possono essere collocate in posizioni diverse da quelle tradizionali o anche in più di un'ottava, usando le proprietà `flat-positions` e `sharp-positions` di `KeySignature`. I valori di queste proprietà specificano l'estensione delle posizioni del rigo in cui potranno comparire le alterazioni. Se viene specificata una sola posizione, le alterazioni vengono collocate entro l'ottava che finisce in quella posizione del rigo.

```
\override Staff.KeySignature.flat-positions = #'((-5 . 5))
\override Staff.KeyCancellation.flat-positions = #'((-5 . 5))
\clef bass \key es \major es g bes d
\clef treble \bar "||" \key es \major es g bes d

\override Staff.KeySignature.sharp-positions = #'(2)
\bar "||" \key b \major b fis b2
```

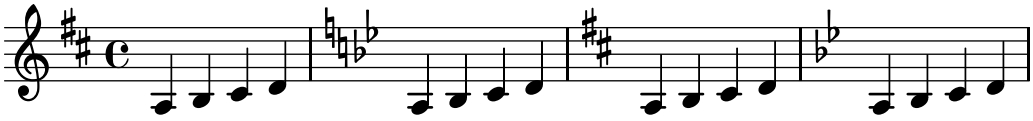


Frammenti di codice selezionati

Impedire l'inserimento dei segni di bequadro quando cambia l'armatura di chiave

Quando l'armatura di chiave cambia, vengono inseriti automaticamente i segni di bequadro per annulare le alterazioni di precedenti armature. Si può evitare questo comportamento impostando su `f` (falso) la proprietà `printKeyCancellation` nel contesto `Staff`.

```
\relative c' {
  \key d \major
  a4 b cis d
  \key g \minor
  a4 bes c d
  \set Staff.printKeyCancellation = ##f
  \key d \major
  a4 b cis d
  \key g \minor
  a4 bes c d
}
```



Armature di chiave non tradizionali

Il comando `\key` comunemente usato imposta la proprietà `keySignature`, che fa parte del contesto `Staff`.

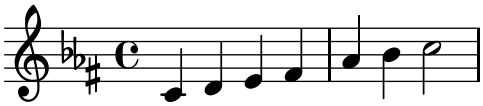
Per creare armature di chiave non standard, tale proprietà va impostata esplicitamente. Il formato di questo comando è una lista:

`\set Staff.keySignature = #`(((ottava . grado) . alterazione) ((ottava . grado) . alterazione) ...)` dove, per ogni elemento della lista, `ottava` indica l'ottava (0 è l'ottava dal Do centrale al Si precedente), `grado` indica la nota all'interno dell'ottava (0 significa Do e 6 significa Si) e `alterazione` può essere `,SHARP` `,FLAT` `,DOUBLE-SHARP` etc. (Si noti la virgola iniziale.)

Altrimenti, usando, per ogni elemento della lista, il formato breve `(grado . alterazione)`, ciò indica che la stessa alterazione deve essere presente in tutte le ottave.

Ecco un esempio di una possibile armatura per generare una scala a tono intero:

```
\relative c' {
  \set Staff.keySignature = #`(((0 . 6) . ,FLAT)
                              ((0 . 5) . ,FLAT)
                              ((0 . 3) . ,SHARP))
  c4 d e fis
  aes4 bes c2
}
```



Vedi anche

Glossario musicale: Sezione “church mode” in *Glossario Musicale*, Sezione “scordatura” in *Glossario Musicale*.

Manuale di apprendimento: Sezione “Alterazioni e armature di chiave” in *Manuale di Apprendimento*.

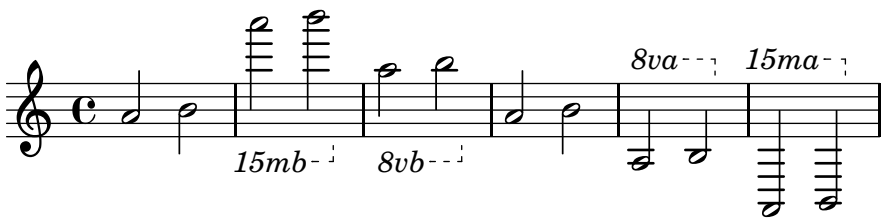
Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “KeyChangeEvent” in *Guida al Funzionamento Interno*, Sezione “Key_engraver” in *Guida al Funzionamento Interno*, Sezione “Key_performer” in *Guida al Funzionamento Interno*, Sezione “KeyCancellation” in *Guida al Funzionamento Interno*, Sezione “KeySignature” in *Guida al Funzionamento Interno*, Sezione “key-signature-interface” in *Guida al Funzionamento Interno*.

Segni di ottavazione

I *segni di ottavazione* introducono un’ulteriore trasposizione di ottava nel rigo:

```
a2 b
\ottava #-2
a2 b
\ottava #-1
a2 b
\ottava #0
a2 b
\ottava #1
a2 b
\ottava #2
a2 b
```

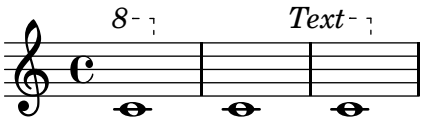


Frammenti di codice selezionati

Testo dell’ottava

Internamente, `\ottava` imposta le proprietà `ottavation` (ad esempio, su `8va` o `8vb`) e `middleCPosition`. Per sovrascrivere il testo della parentesi, occorre specificare `ottavation` dopo il comando `\ottava`.

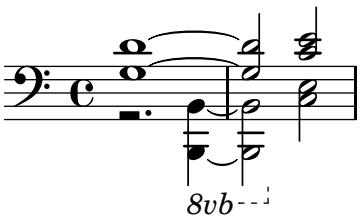
```
{
  \ottava #1
  \set Staff.ottavation = #"8"
  c''1
  \ottava #0
  c'1
  \ottava #1
  \set Staff.ottavation = #"Text"
  c''1
}
```



Aggiungere un segno di ottava a una sola voce

Se il rigo ha più di una voce, l'ottavazione in una voce trasporrà la posizione delle note in tutte le voci per la durata della parentesi dell'ottava. Se si intende applicare l'ottavazione a una sola voce, si possono impostare esplicitamente middleCPosition e la parentesi di ottava. In questo frammento, la chiave di basso ha di norma il MiddleCPosition impostato su 6, ovvero sei posizioni sopra la linea centrale, dunque nella porzione con l'ottava il MiddleCPosition è più alto di sette posizioni (un'ottava).

```
{
  \clef bass
  << { <g d'>1~ q2 <c' e'> }
  \\
    {
      r2.
      \set Staff.ottavation = #"8vb"
      \once \override Staff.OttavaBracket.direction = #DOWN
      \set Voice.middleCPosition = #(+ 6 7)
      <b,,, b,,>4 ~ |
      q2
      \unset Staff.ottavation
      \unset Voice.middleCPosition
      <c e>2
    }
  >>
}
```



Vedi anche

Glossario musicale: Sezione "ottavazione" in *Glossario Musicale*.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Ottava_spanner_engraver" in *Guida al Funzionamento Interno*, Sezione "OttavaBracket" in *Guida al Funzionamento Interno*, Sezione "ottava-bracket-interface" in *Guida al Funzionamento Interno*.

Trasporto strumentale

Quando si scrivono partiture che comprendono strumenti traspositori, alcune parti possono essere scritte a un'altezza diversa dall'*intonazione reale*. In questi casi, è necessario specificare la chiave dello *strumento traspositore*, altrimenti l'output MIDI e le citazioni in altre parti produrranno altezze errate. Per maggiori informazioni sulle citazioni, si veda [Quoting other voices], pagina 201.

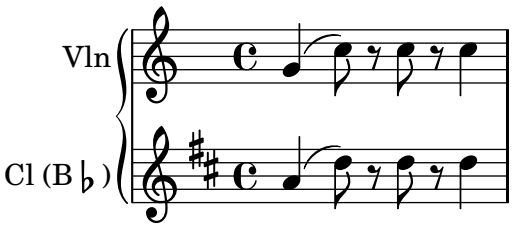
`\transposition` *altezza*

L'altezza da usare per `\transposition` deve corrispondere al suono effettivamente prodotto quando un `c'` scritto sul rigo viene suonato dallo strumento traspositore. Tale altezza viene

inserita in modalità assoluta; dunque, uno strumento che produce un suono reale un tono sopra la notazione deve usare `\transposition d'`. `\transposition` va usato *soltanto* se le altezze *non* sono scritte in intonazione reale.

Ecco un frammento per violino e clarinetto in Si bemolle, le cui parti sono inserite usando le note e l'armatura di chiave che appaiono nei rispettivi righi sulla partitura del direttore. I due strumenti suonano all'unisono.

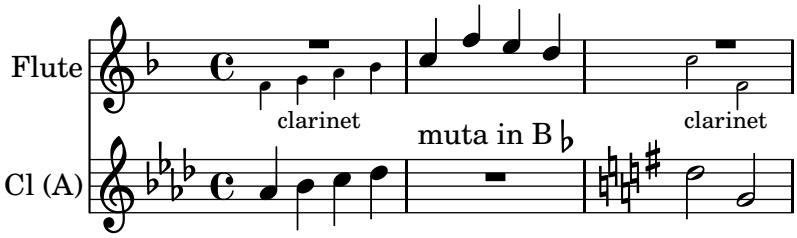
```
\new GrandStaff <<
  \new Staff = "violin" {
    \relative c'' {
      \set Staff.instrumentName = #"Vln"
      \set Staff.midiInstrument = #"violin"
      % not strictly necessary, but a good reminder
      \transposition c'

      \key c \major
      g4( c8) r c r c4
    }
  }
  \new Staff = "clarinet" {
    \relative c'' {
      \set Staff.instrumentName = \markup { Cl (B\flat) }
      \set Staff.midiInstrument = #"clarinet"
      \transposition bes

      \key d \major
      a4( d8) r d r d4
    }
  }
>>
```



`\transposition` può essere modificato nel corso di un brano. Ad esempio, un clarinettista potrebbe essere costretto a passare da un clarinetto in La a uno in Si bemolle.

```
flute = \relative c'' {
  \key f \major
  \cueDuring #"clarinet" #DOWN {
    R1 _\markup\tiny "clarinet"
    c4 f e d
    R1 _\markup\tiny "clarinet"
  }
}
clarinet = \relative c'' {
  \key aes \major
  \transposition a
  aes4 bes c des
```

```
  R1^\markup { muta in B\flat }
  \key g \major
  \transposition bes
  d2 g,
}
\addQuote "clarinet" \clarinet
<<
  \new Staff \with { instrumentName = #"Flute" }
    \flute
  \new Staff \with { instrumentName = #"Cl (A)" }
    \clarinet
>>
```



Vedi anche

Glossario musicale: Sezione "intonazione reale" in *Glossario Musicale*, Sezione "strumento traspositore" in *Glossario Musicale*.

Guida alla notazione: [Quoting other voices], pagina 201, ⟨undefined⟩ [Transpose], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Alterazioni automatiche

Esistono diverse convenzioni sul modo di scrivere le alterazioni. LilyPond ha una funzione per specificare lo stile di gestione delle alterazioni adottato. Questa funzione viene richiamata nel modo seguente:

```
\new Staff <<
  \accidentalStyle voice
  { ... }
>>
```

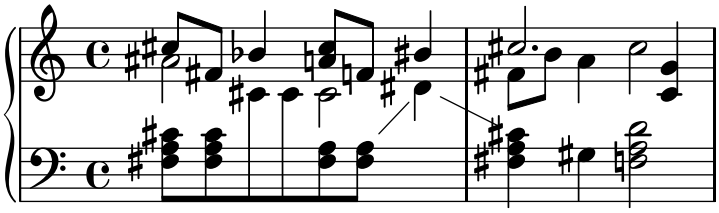
La gestione delle alterazioni si applica di norma all'attuale `Staff` (con l'eccezione degli stili `piano` e `piano-cautionary`, che sono spiegati dopo). Questa funzione accetta un secondo argomento opzionale che determina in quale ambito debba essere cambiato lo stile. Ad esempio, per usare lo stesso stile in tutti i righi dell'attuale `StaffGroup`, si usa:

```
\accidentalStyle StaffGroup.voice
```

Sono supportati i seguenti modi di gestire le alterazioni. Il seguente esempio mostra tutti gli stili:

```
musicA = {
  <<
    \relative c' {
      cis'8 fis, bes4 <a cis>8 f bis4 |
      cis2. <c, g'>4 |
    }
    \\
```

```
    \relative c' {
      ais'2 cis, |
      fis8 b a4 cis2 |
    }
  >>
}

musicB = {
  \clef bass
  \new Voice {
    \voiceTwo \relative c' {
      <fis, a cis>8[ <fis a cis>
      \change Staff = up
      cis' cis
      \change Staff = down
      <fis, a> <fis a>]
      \showStaffSwitch
      \change Staff = up
      dis'4 |
      \change Staff = down
      <fis, a cis>4 gis <f a d>2 |
    }
  }
}

\new PianoStaff {
  <<
    \context Staff = "up" {
      \accidentalStyle default
      \musicA
    }
    \context Staff = "down" {
      \accidentalStyle default
      \musicB
    }
  >>
}
```



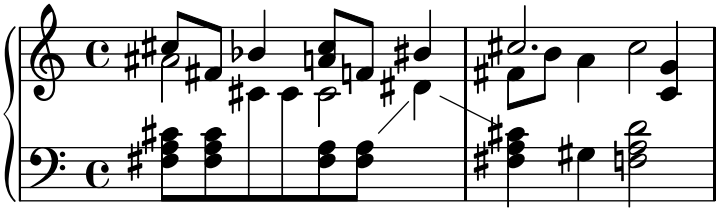
Si noti che le ultime linee di questo esempio possono essere sostituite dal seguente frammento, se si vuole usare lo stesso stile in entrambi i righi.

```
\new PianoStaff {
  <<
    \context Staff = "up" {
      %%% change the next line as desired:
      \accidentalStyle Score.default
```

```
        \musicA
      }
      \context Staff = "down" {
        \musicB
      }
    >>
  }
```

`default`

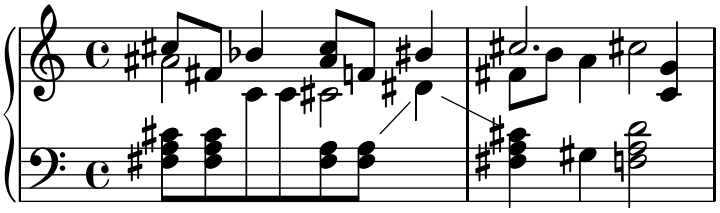
Questo è il comportamento predefinito del compositore tipografico. Corrisponde alla pratica comunemente impiegata dal diciottesimo secolo: le alterazioni vengono ricordate fino alla fine della misura in cui si trovano, limitatamente all'ottava di appartenenza. Quindi, nell'esempio seguente non compare alcun segno di bequadro prima del `b` nella seconda misura o prima dell'ultimo `c`:



`voice`

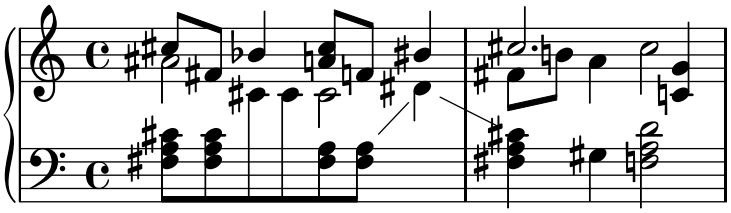
Normalmente le alterazioni mantengono la propria validità a livello di `Staff`. Tuttavia in questo stile le alterazioni vengono gestite individualmente per ogni voce. Al di fuori di quest'aspetto, lo stile è analogo a `default`.

Di conseguenza, le alterazioni relative a una voce non vengono cancellate nelle altre voci. Un risultato spesso non desiderabile: nell'esempio seguente è difficile capire se il secondo `a` sia naturale o diesis. L'opzione `voice` deve essere quindi usata solo se ogni voce è destinata a un esecutore diverso. Se la partitura deve essere letta da un unico musicista (come nel caso della partitura del direttore, o di uno spartito per pianoforte), allora è preferibile usare `modern` o `modern-cautionary`.



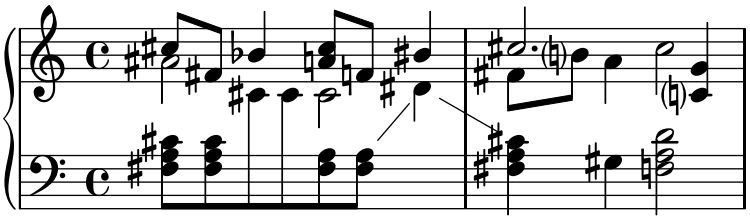
`modern`

Questa regola corrisponde alla pratica comune del ventesimo secolo. Omette i segni di bequadro supplementari che in passato erano di norma anteposti al diesis che segue un doppio diesis o a un bemolle che segue un doppio bemolle. La regola `modern` presenta le stesse alterazioni di `default`, con due aggiunte che servono a evitare ambiguità: i segni di annullamento delle alterazioni temporanee sono anteposti alle note sulla stessa ottava della misura successiva e alle note in ottave diverse nella stessa misura. In questo esempio, dunque, i bequadri del `b` e del `c` nella seconda misura del rigo superiore:



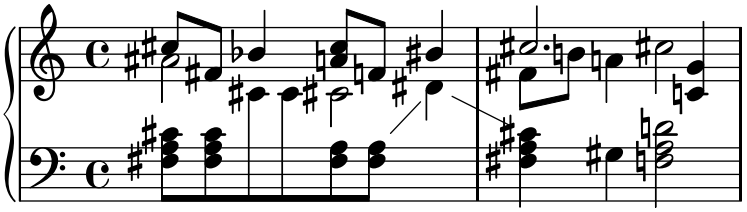
`modern-cautionary`

Questa regola è simile a `modern`, ma le alterazioni 'supplementari' (quelle non mostrate da `default`) sono segnate come alterazioni di precauzione. Di norma, sono poste tra parentesi; altrimenti, possono essere ridotte in corpo più piccolo definendo la proprietà `cautionary-style` di `AccidentalSuggestion`.



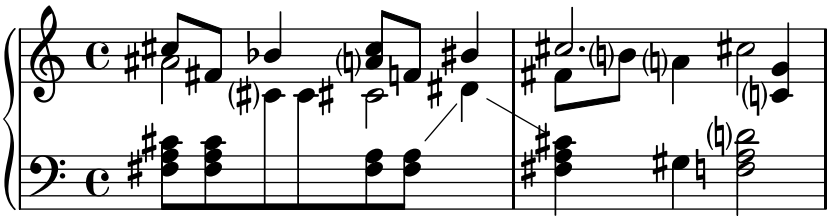
`modern-voice`

Questa regola viene usata per le alterazioni su più voci destinate sia agli esecutori che suonano una singola voce sia a quelli che suonano tutte le voci. Le alterazioni sono mostrate su tutte le voci, ma *sono annullate* su ogni voce dello stesso rigo (`Staff`). Quindi, l'alterazione dell' `a` nell'ultima misura viene annullata perché l'annullamento precedente si trovava in una voce diversa, mentre quella del `d` nel rigo inferiore viene annullata a causa dell'alterazione in un'altra voce della misura precedente:



`modern-voice-cautionary`

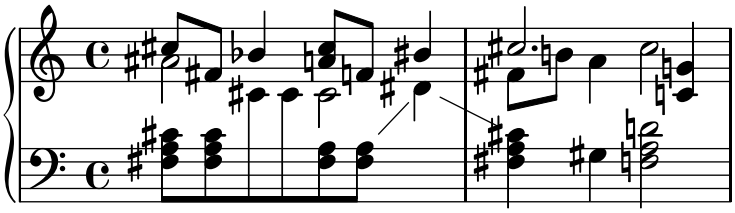
Questa regola è analoga a `modern-voice`, ma con le alterazioni supplementari (quelle non mostrate da `voice`) segnate come alterazioni di precauzione. Tutte le alterazioni mostrate da `default` *sono* mostrate con questa regola, ma alcune di esse sono indicate come alterazioni di precauzione.



`piano`

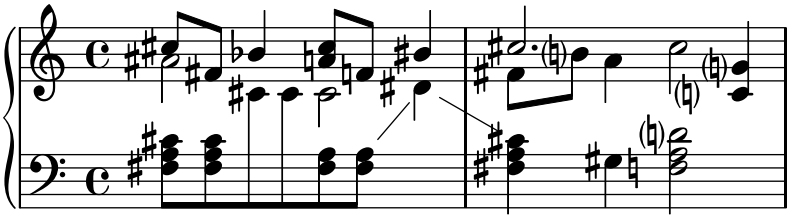
Questa regola riflette la pratica del ventesimo secolo per la notazione per pianoforte. Il suo comportamento è molto simile allo stile `modern`, ma in questo caso le alterazioni vengono annullate in tutti i righi che si trovano nello stesso `GrandStaff` o `PianoStaff`, dunque tutte gli annullamenti delle note finali.

È lo stile predefinito per gli attuali `GrandStaff` e `PianoStaff`.



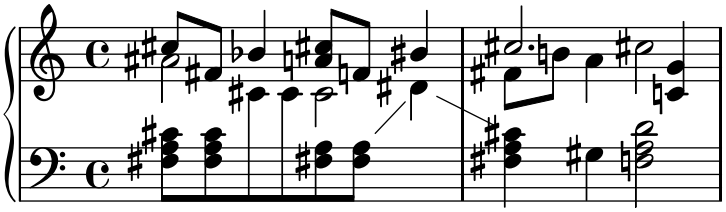
`piano-cautionary`

È uguale a `piano` ma con le alterazioni supplementari mostrate come alterazioni di precauzione.



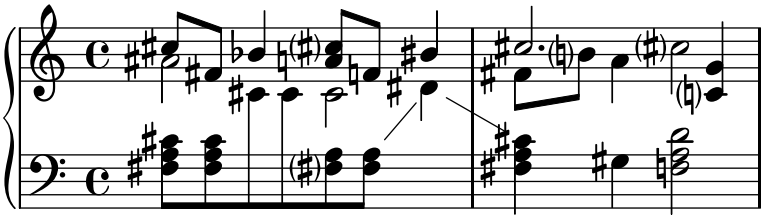
`neo-modern`

Questa regola si riferisce a una pratica tipica della musica contemporanea: le alterazioni sono mostrate come in `modern`, ma vengono ripetute se la stessa nota appare in seguito nella stessa misura – a meno che la seconda occorrenza non segua direttamente la prima.



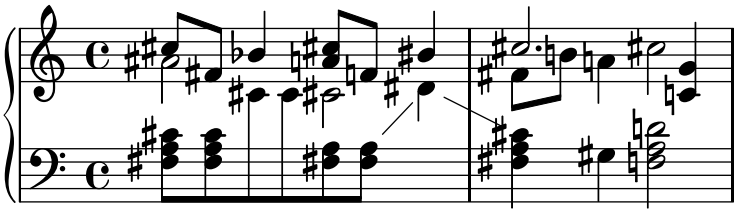
`neo-modern-cautionary`

Questa regola è simile a `neo-modern`, ma le alterazioni supplementari sono mostrate come alterazioni di precauzione.



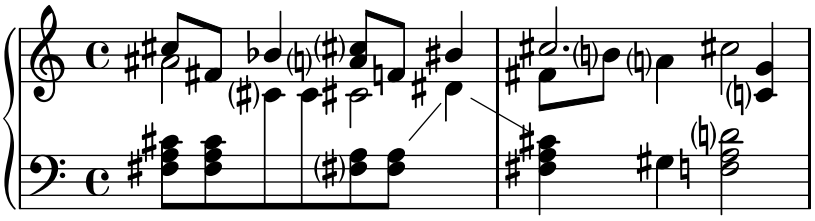
`neo-modern-voice`

Questa regola viene usata per le alterazioni su più di una voce che devono essere lette sia da musicisti che suonano una singola voce sia da musicisti che suonano tutte le voci. Le alterazioni per ogni voce sono mostrate come nello stile `neo-modern`, ma vengono annullate attraverso le voci nello stesso rigo (`Staff`).



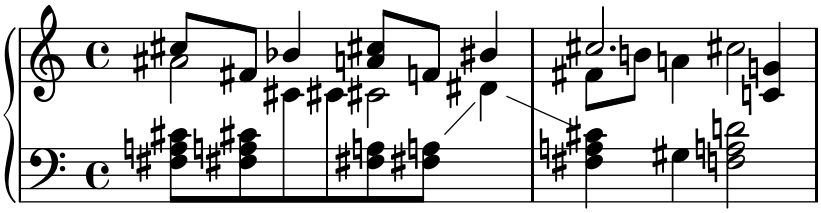
`neo-modern-voice-cautionary`

Questa regola è simile a `neo-modern-voice`, ma le alterazioni supplementari sono indicate come alterazioni di precauzione.



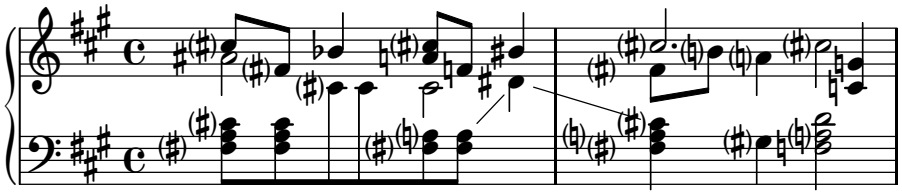
`dodecaphonic`

Questa regola riflette una regola introdotta dai compositori all'inizio del ventesimo secolo nel tentativo di abolire la gerarchia tra suoni naturali e non naturali. Con questo stile, *ogni* nota presenta un segno di alterazione, anche i suoni naturali.



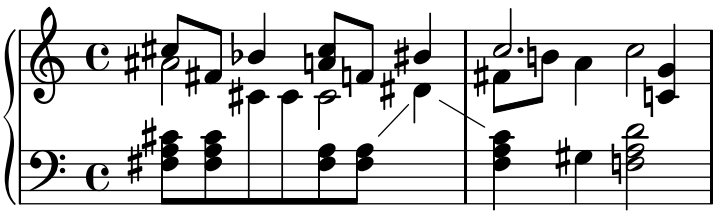
`teaching`

Questa regola è pensata per gli studenti: permette di generare facilmente degli spartiti di scale con le alterazioni di precauzione inserite in modo automatico. Alle alterazioni, indicate come nello stile `modern`, vengono aggiunte ulteriori segni di precauzione per tutti i diesis e bemolle specificati dall'armatura di chiave, fuorché nel caso di ripetizioni immediatamente successive di una stessa nota.



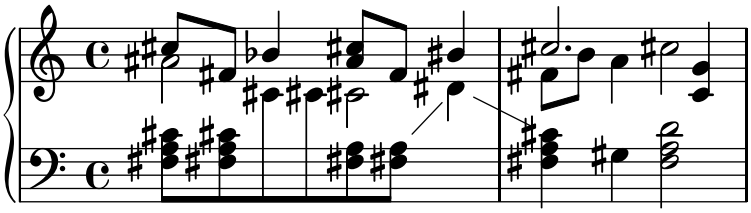
`no-reset`

È identico a `default`, ma le alterazioni mantengono la propria validità 'per sempre', non solo all'interno della singola misura:



`forget`

È il contrario di `no-reset`: le alterazioni non vengono ricordate affatto – pertanto, tutte le alterazioni si riferiscono all'armatura di chiave, indipendentemente dal materiale musicale precedente.



Vedi anche

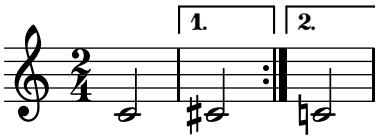
Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Accidental” in *Guida al Funzionamento Interno*, Sezione “Accidental_engraver” in *Guida al Funzionamento Interno*, Sezione “GrandStaff” in *Guida al Funzionamento Interno*, Sezione “PianoStaff” in *Guida al Funzionamento Interno*, Sezione “Staff” in *Guida al Funzionamento Interno*, Sezione “AccidentalSuggestion” in *Guida al Funzionamento Interno*, Sezione “AccidentalPlacement” in *Guida al Funzionamento Interno*, Sezione “accidental-suggestion-interface” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

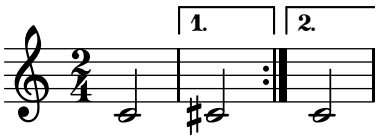
Le note simultanee non vengono considerate nell’individuazione automatica delle alterazioni; vengono prese come riferimento solo le note precedenti e l’armatura di chiave. Se la stessa nota occorre simultaneamente con alterazioni diverse, può essere necessario forzare le alterazioni con `!` o `?`: ‘`<f! fis!>`’.

L’annullamento di precauzione delle alterazioni avviene in relazione alla misura precedente. Tuttavia, nel blocco `\alternative` che segue una sezione `\repeat volta N`, è auspicabile che l’annullamento sia calcolato in base alla precedente misura *eseguita*, non alla precedente misura *stampata*. Nell’esempio seguente il Do naturale della seconda volta non richiede il segno di bequadro:



Si può usare il seguente espediente: si definisce una funzione che imposti localmente lo stile delle alterazioni su `forget`:

```
forget = #(define-music-function (parser location music) (ly:music?) #{
  \accidentalStyle forget
  #music
  \accidentalStyle modern
#})
{
  \accidentalStyle modern
  \time 2/4
  \repeat volta 2 {
    c'2
  }
  \alternative {
     cis'
     \forget c'
  }
}
```

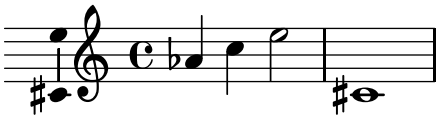


Ambitus

Il termine *ambitus* (pl. ambitus) indica l'ambito di altezze di una determinata voce all'interno di una composizione musicale. Può indicare anche l'estensione di uno strumento musicale, ovvero l'intera gamma di suoni che può produrre. L'ambitus viene usato nelle parti vocali in modo che gli esecutori possano capire facilmente se siano adeguate alle loro possibilità.

L'ambitus viene indicato all'inizio del brano, prima della chiave iniziale. L'intervallo è individuato graficamente da due teste di nota che rappresentano l'altezza più bassa e più alta. Le alterazioni sono mostrate solo se non fanno parte dell'armatura di chiave.

```
\layout {
  \context {
    \Voice
    \consists "Ambitus_engraver"
  }
}

\relative c'' {
  aes c e2
  cis,1
}
```

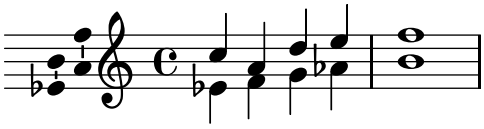


Frammenti di codice selezionati

Un ambitus per voce

L'ambitus può essere specificato per voce. In tal caso occorre spostarlo manualmente per evitare collisioni.

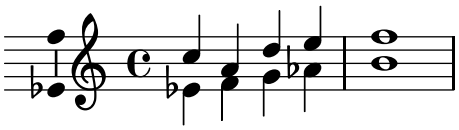
```
\new Staff <<
  \new Voice \with {
    \consists "Ambitus_engraver"
  } \relative c'' {
    \override Ambitus.X-offset = #2.0
    \voiceOne
    c4 a d e
    f1
  }
  \new Voice \with {
    \consists "Ambitus_engraver"
  } \relative c' {
    \voiceTwo
    es4 f g as
    b1
  }
>>
```



Ambitus su più voci

Se si aggiunge l'incisore `Ambitus_engraver` al contesto `Staff` viene creato un solo ambitus per il rigo, anche nel caso di righi che hanno più voci.

```
\new Staff \with {
  \consists "Ambitus_engraver"
  }
<<
  \new Voice \relative c'' {
    \voiceOne
    c4 a d e
    f1
  }
  \new Voice \relative c' {
    \voiceTwo
    es4 f g as
    b1
  }
>>
```

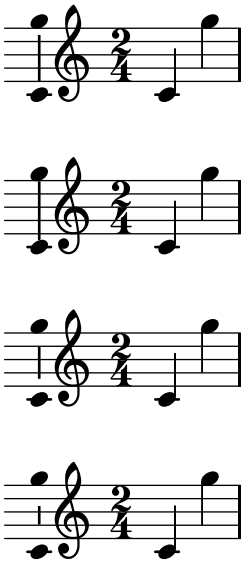


Modifica dell'intervallo dell'ambitus

È possibile cambiare le impostazioni predefinite dell'intervallo tra le teste di nota dell'ambitus e la linea che le collega.

```
\layout {
  \context {
    \Voice
    \consists "Ambitus_engraver"
  }
}

\new Staff {
  \time 2/4
  % Default setting
  c'4 g''
}

\new Staff {
  \time 2/4
  \override AmbitusLine.gap = #0
  c'4 g''
}

\new Staff {
  \time 2/4
  \override AmbitusLine.gap = #1
  c'4 g''
```

```
}

\new Staff {
  \time 2/4
  \override AmbitusLine.gap = #1.5
  c'4 g''
}
```



Vedi anche

Glossario musicale: Sezione “ambitus” in *Glossario Musicale*.

Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Ambitus_engraver” in *Guida al Funzionamento Interno*, Sezione “Voice” in *Guida al Funzionamento Interno*, Sezione “Staff” in *Guida al Funzionamento Interno*, Sezione “Ambitus” in *Guida al Funzionamento Interno*, Sezione “AmbitusAccidental” in *Guida al Funzionamento Interno*, Sezione “AmbitusLine” in *Guida al Funzionamento Interno*, Sezione “AmbitusNoteHead” in *Guida al Funzionamento Interno*, Sezione “ambitus-interface” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Le collisioni non vengono gestite in presenza di un ambitus multiplo su più di una voce.

1.1.4 Teste di nota

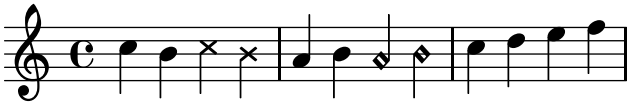
Questa sezione suggerisce i modi in cui modificare la testa di una nota.

Teste di nota speciali

L’aspetto delle teste delle note può essere modificato:

```
c4 b
\override NoteHead.style = #'cross
c4 b
\revert NoteHead.style
a b
\override NoteHead.style = #'harmonic
a b
```

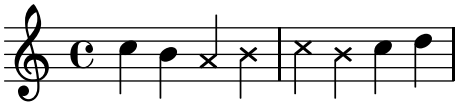
```
\revert NoteHead.style
c4 d e f
```



L'elenco di tutti gli stili per le teste di nota è in Sezione A.9 [Note head styles], pagina 658.

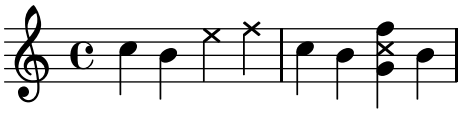
Lo stile barrato (`cross`) viene usato per rappresentare varie intenzioni musicali. I seguenti comandi generici predefiniti modificano la testa della nota nei contesti del rigo e dell'intavolatura e possono essere usati per rappresentare qualsiasi significato musicale:

```
c4 b
\xNotesOn
 a b c4 b
\xNotesOff
c4 d
```



Questo comando può essere usato all'interno e all'esterno degli accordi per generare teste barrate sia nel contesto del rigo che in quello dell'intavolatura:

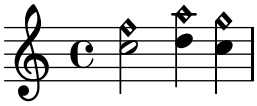
```
c4 b
\xNote { e f }
c b < g \xNote c f > b
```



Potete utilizzare, al posto di `\xNote`, `\xNotesOn` e `\xNotesOff`, i comandi `\deadNote`, `\deadNotesOn` e `\deadNotesOff`. Il termine *dead note* è di uso comune tra i chitarristi.

Esiste anche una scorciatoia per le forme a diamante. Può essere usata solo all'interno di un accordo:

```
<c f\harmonic>2 <d a'\harmonic>4 <c g'\harmonic>
```



Comandi predefiniti

`\harmonic`, `\xNotesOn`, `\xNotesOff`, `\xNote`.

Vedi anche

Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

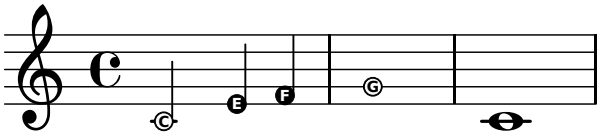
Guida alla notazione: Sezione A.9 [Note head styles], pagina 658, ⟨undefined⟩ [Chorded notes], pagina ⟨undefined⟩, [Indicating harmonics and dampened notes], pagina 367.

Guida al funzionamento interno: Sezione “note-event” in *Guida al Funzionamento Interno*, Sezione “Note_heads_engraver” in *Guida al Funzionamento Interno*, Sezione “Ledger_line_engraver” in *Guida al Funzionamento Interno*, Sezione “NoteHead” in *Guida al Funzionamento Interno*, Sezione “LedgerLineSpanner” in *Guida al Funzionamento Interno*, Sezione “note-head-interface” in *Guida al Funzionamento Interno*, Sezione “ledger-line-spanner-interface” in *Guida al Funzionamento Interno*.

Testa di nota con nome della nota

La nota ‘easy play’ inserisce il nome della nota dentro la testa. Viene usata nella musica per principianti. Per rendere le lettere leggibili, occorrerebbe usare un carattere più grande. A questo proposito si veda Sezione 4.2.2 [Setting the staff size], pagina 516.

```
#(set-global-staff-size 26)
\relative c' {
  \easyHeadsOn
  c2 e4 f
  g1
  \easyHeadsOff
  c,1
}
```



Comandi predefiniti

`\easyHeadsOn`, `\easyHeadsOff`.

Frammenti di codice selezionati

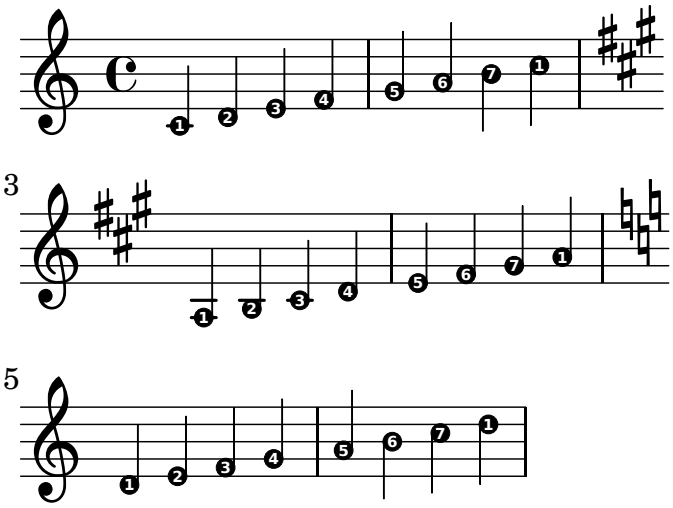
Numeri dentro le teste di nota

Le teste di nota con nome della nota usano la proprietà `note-names` dell’oggetto `NoteHead` per determinare cosa appaia all’interno della testa. È possibile sovrascrivere questa proprietà e mostrare numeri che corrispondano ai gradi della scala.

Si può creare un semplice incisore che faccia questo per oggni oggetto testa di nota che incontra.

```
#(define Ez_numbers_engraver
   (make-engraver
    (acknowledgers
     ((note-head-interface engraver grob source-engraver)
      (let* ((context (ly:translator-context engraver))
             (tonic-pitch (ly:context-property context 'tonic))
             (tonic-name (ly:pitch-notename tonic-pitch))
             (grob-pitch
              (ly:event-property (event-cause grob) 'pitch))
             (grob-name (ly:pitch-notename grob-pitch))
```

```
                (delta (modulo (- grob-name tonic-name) 7))
                (note-names
                 (make-vector 7 (number->string (1+ delta)))))
          (ly:grob-set-property! grob 'note-names note-names))))))

#(set-global-staff-size 26)

\layout {
  ragged-right = ##t
  \context {
    \Voice
    \consists \Ez_numbers_engraver
  }
}

\relative c' {
  \easyHeadsOn
  c4 d e f
  g4 a b c \break

  \key a \major
  a,4 b cis d
  e4 fis gis a \break

  \key d \dorian
  d,4 e f g
  a4 b c d
}
```



Vedi anche

Guida alla notazione: Sezione 4.2.2 [Setting the staff size], pagina 516.

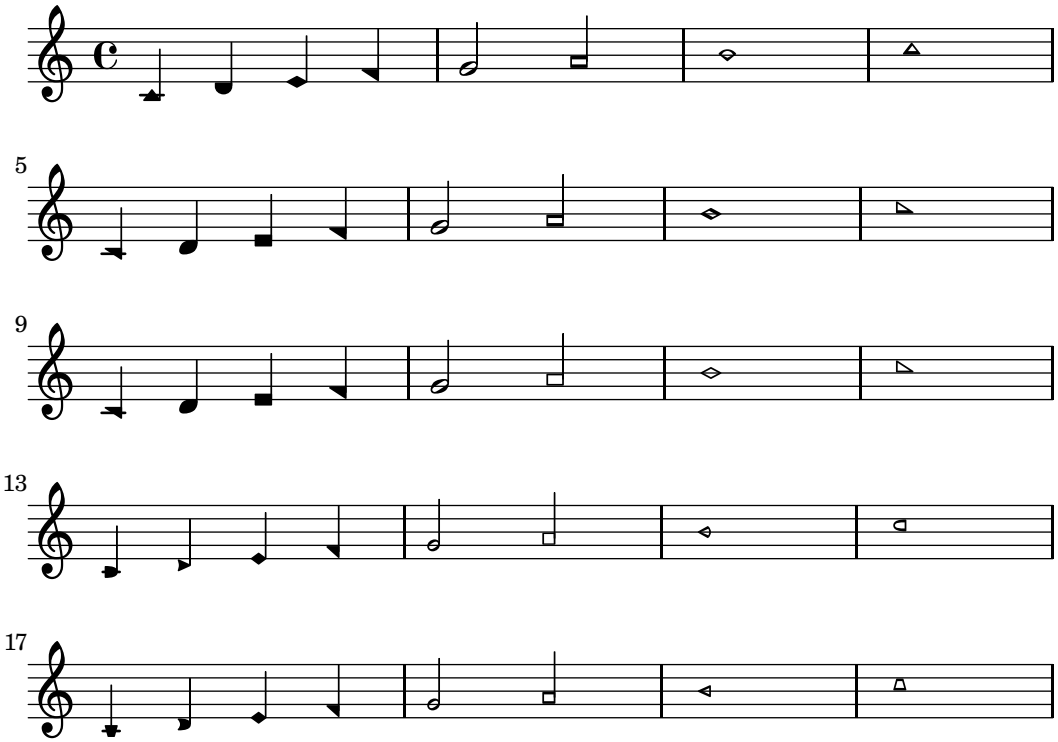
Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “note-event” in *Guida al Funzionamento Interno*, Sezione “Note_heads_engraver” in *Guida al Funzionamento Interno*, Sezione “NoteHead” in *Guida al Funzionamento Interno*, Sezione “note-head-interface” in *Guida al Funzionamento Interno*.

Teste di nota a forma variabile

In alcune notazioni, la forma della testa della nota corrisponde alla funzione armonica di una nota nella scala. Questa notazione era comune nei canzonieri americani del diciannovesimo secolo. Gli stili possibili sono Sacred Harp, Southern Harmony, Funk (Harmonica Sacra), Walker e Aiken (Christian Harmony):

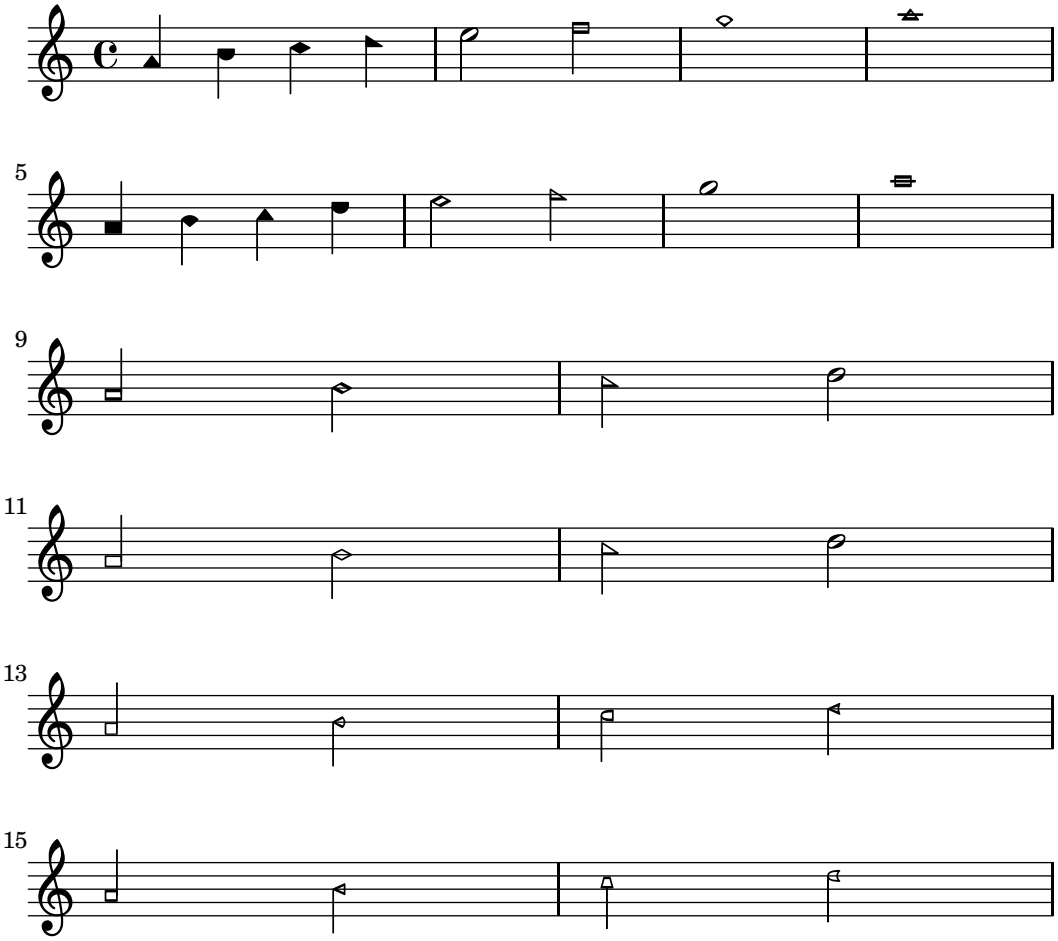
```
\aikenHeads
c, d e f g2 a b1 c \break
\sacredHarpHeads
c,4 d e f g2 a b1 c \break
\southernHarmonyHeads
c,4 d e f g2 a b1 c \break
\funkHeads
c,4 d e f g2 a b1 c \break
\walkerHeads
c,4 d e f g2 a b1 c \break
```



Le forme variano in base al grado della scala; la scala è determinata dal comando `\key`. Se si scrive in tonalità minore, il grado della scala può essere determinato in base alla relativa maggiore:

```
\key a \minor
\aikenHeads
a b c d e2 f g1 a \break
\aikenHeadsMinor
a,4 b c d e2 f g1 a \break
\sacredHarpHeadsMinor
a,2 b c d \break
\southernHarmonyHeadsMinor
a2 b c d \break
\funkHeadsMinor
```

```
a2 b c d \break
\walkerHeadsMinor
a2 b c d \break
```



Comandi predefiniti

`\aikenHeads`, `\aikenHeadsMinor`, `\funkHeads`, `\funkHeadsMinor`, `\sacredHarpHeads`, `\sacredHarpHeadsMinor`, `\southernHarmonyHeads`, `\southernHarmonyHeadsMinor`, `\walkerHeads`, `\walkerHeadsMinor`.

Frammenti di codice selezionati

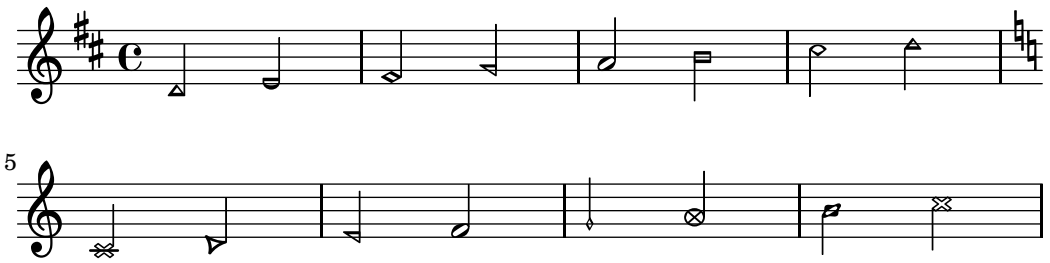
Applicazione degli stili delle teste di nota in base al grado della scala

La proprietà `shapeNoteStyles` può essere usata per definire vari stili di teste di nota per ogni grado della scala (definita dall'armatura di chiave o dalla proprietà `tonic`). Questa proprietà richiede un insieme di simboli, che può essere puramente arbitrario (sono permesse espressioni geometriche come `triangle`, `cross` e `xcircle`) o basato sull'antica tradizione tipografica americana (sono consentiti anche alcuni nomi di nota latini).

Detto questo, per imitare gli antichi canzionieri americani, ci sono vari stili predefiniti disponibili attraverso dei comodi comandi come `\aikenHeads` o `\sacredHarpHeads`.

Questo esempio mostra modi diversi di ottenere teste di nota di varie forme e illustra la possibilità di trasporre una melodia senza perdere la corrispondenza tra le funzioni armoniche e gli stili delle teste.

```
fragment = {
  \key c \major
  c2 d
  e2 f
  g2 a
  b2 c
}

\new Staff {
  \transpose c d
  \relative c' {
    \set shapeNoteStyles = ##(do re mi fa
                              #f la ti)
    \fragment
  }

  \break

  \relative c' {
    \set shapeNoteStyles = ##(cross triangle fa #f
                              mensural xcircle diamond)
    \fragment
  }
}
```



La lista completa di tutti gli stili delle teste si trova in Sezione A.9 [Note head styles], pagina 658.

Vedi anche

Frammenti di codice: Sezione “Altezze” in *Frammenti di codice*.

Guida alla notazione: Sezione A.9 [Note head styles], pagina 658.

Guida al funzionamento interno: Sezione “note-event” in *Guida al Funzionamento Interno*, Sezione “Note_heads_engraver” in *Guida al Funzionamento Interno*, Sezione “NoteHead” in *Guida al Funzionamento Interno*, Sezione “note-head-interface” in *Guida al Funzionamento Interno*.

Improvvisazione

L’improvvisazione viene talvolta indicata con teste tagliate: l’esecutore può scegliere qualsiasi nota ma deve seguire il ritmo indicato. Si possono creare queste teste:

```
\new Voice \with {
  \consists "Pitch_squash_engraver"
} {
  e8 e g a a16( bes) a8 g
```

```
  \improvisationOn
  e8 ~
  e2 ~ e8 f4 f8 ~
  f2
  \improvisationOff
  a16( bes) a8 g e
}
```

Comandi predefiniti

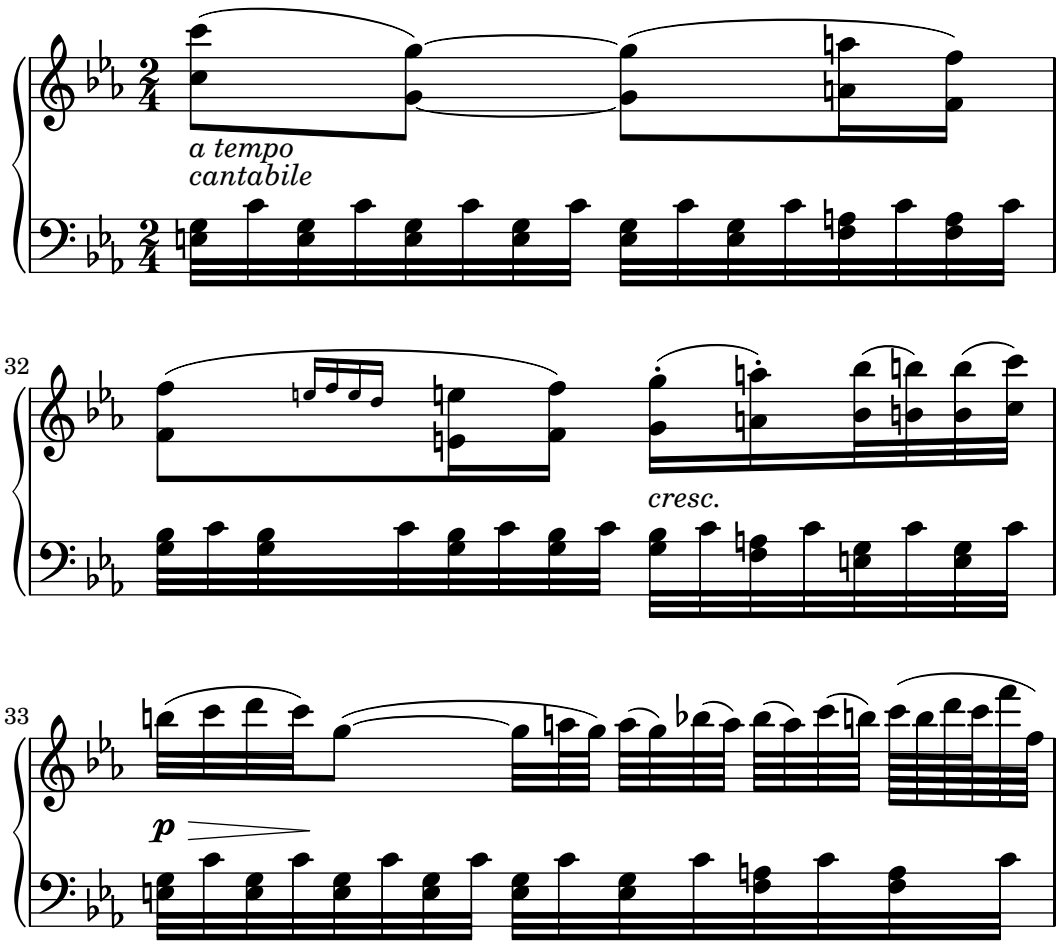
`\improvisationOn`, `\improvisationOff`.

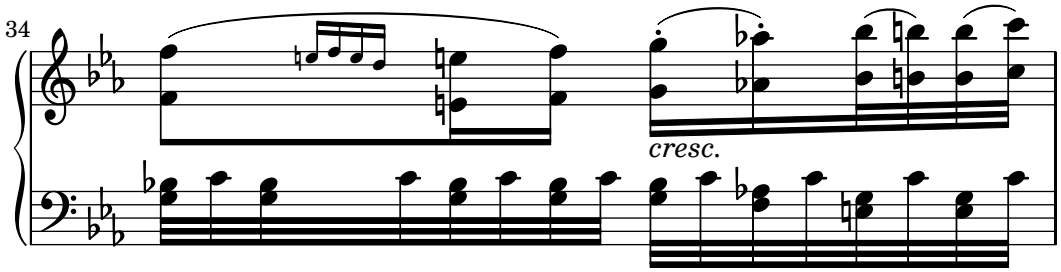
Vedi anche

Frammenti di codice: Sezione "Altezze" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Pitch_squash_engraver" in *Guida al Funzionamento Interno*, Sezione "Voice" in *Guida al Funzionamento Interno*, Sezione "RhythmicStaff" in *Guida al Funzionamento Interno*.

1.2 Ritmi





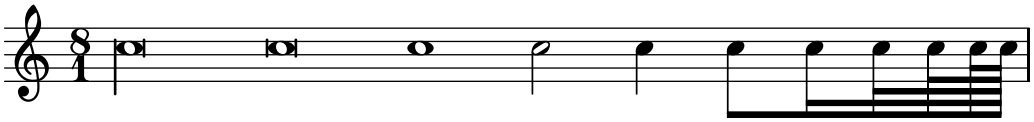
Questa sezione tratta i ritmi, le pause, le durate, la disposizione delle travature e le battute.

1.2.1 Scrittura delle durate

Durata

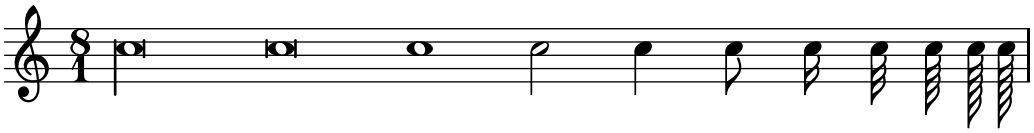
Le durate, indicate con numeri e punti, vengono inserite con i loro valori reciproci. Ad esempio, una nota di un quarto si indica con un `4` (dato che il suo valore è un 1/4), mentre una minima si indica col `2` (dato che il suo valore è 1/2). Per le note più lunghe di un intero bisogna usare i comandi `\longa` (due volte una breve) e `\breve`. Valori minori sono possibili, ma appaiono con delle travature. La nota più breve ha un valore di 128.

```
\time 8/1
c\longa c\breve c1 c2
c4 c8 c16 c32 c64 c128 c128
```



Ecco le stesse durate con la disposizione automatica delle travature disabilitata.

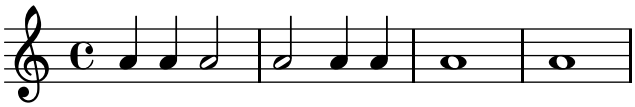
```
\time 8/1
\autoBeamOff
c\longa c\breve c1 c2
c4 c8 c16 c32 c64 c128 c128
```



Solo nella notazione per musica antica è possibile specificare una nota che dura quattro volte una breve, attraverso il comando `\maxima`. Per maggiori informazioni si veda Sezione 2.9 [Ancient notation], pagina 414.

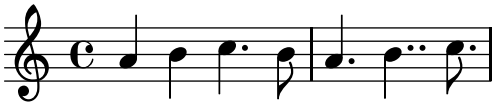
Se la durata viene omessa, viene impostata sulla durata precedente. Il valore predefinito della prima nota è un quarto.

```
a a a2 a a4 a a1 a
```



Per ottenere note puntate, si inserisce un punto (`.`) dopo la durata. Le note doppiamente puntate si specificano aggiungendo due punti, e così via.

```
a4 b c4. b8 a4. b4.. c8.
```



Alcune durate non possono essere rappresentate soltanto con durate e punti; occorre utilizzare una legatura di valore tra due o più note. I dettagli sono spiegati in ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.

Per sapere come specificare le durate delle sillabe del testo e come allineare il testo alle note, si veda Sezione 2.1 [Vocal music], pagina 246.

Le note possono essere distanziate in modo strettamente proporzionale alla loro durata. I dettagli relativi a questo e a altre impostazioni che controllano la notazione proporzionale si trovano in Sezione 4.5.5 [Proportional notation], pagina 545.

Di norma i punti sono spostati in su per evitare le linee del rigo, con l'eccezione dei passaggi polifonici. I punti possono essere posizionati manualmente sopra o sotto il rigo; si veda Sezione 5.4.2 [Direction and placement], pagina 585.

Comandi predefiniti

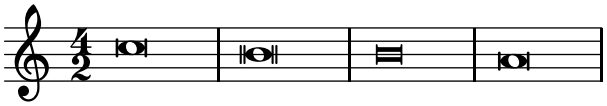
`\autoBeamOn`, `\autoBeamOff`, `\dotsUp`, `\dotsDown`, `\dotsNeutral`.

Frammenti di codice selezionati

Nota breve alternativa

Questo frammento mostra come usare la nota breve alternativa che ha due lineette verticali su ciascun lato della testa invece di una sola.

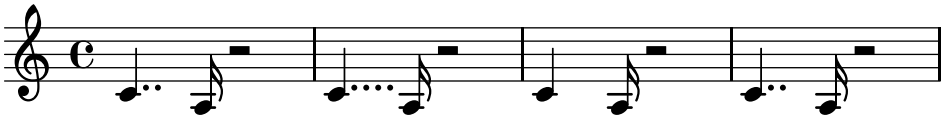
```
\relative c'' {
  \time 4/2
  c\breve |
  \override Staff.NoteHead.style = #'altdefault
  b\breve
  \override Staff.NoteHead.style = #'baroque
  b\breve
  \revert Staff.NoteHead.style
  a\breve
}
```



Modifica del numero di punti di aumentazione per nota

Il numero di punti di aumentazione su una singola nota può essere modificato in modo indipendente dai punti posizionati dopo la nota.

```
\relative c' {
  c4.. a16 r2 |
  \override Dots.dot-count = #4
  c4.. a16 r2 |
  \override Dots.dot-count = #0
  c4.. a16 r2 |
  \revert Dots.dot-count
  c4.. a16 r2 |
}
```



Vedi anche

Glossario musicale: Sezione “breve” in *Glossario Musicale*, Sezione “longa” in *Glossario Musicale*, Sezione “maxima” in *Glossario Musicale*, Sezione “durata” in *Glossario Musicale*, Sezione “Nomi di durata delle note e delle pause” in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Automatic beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Ties], pagina ⟨undefined⟩, [Stems], pagina 215, ⟨undefined⟩ [Writing rhythms], pagina ⟨undefined⟩, ⟨undefined⟩ [Writing rests], pagina ⟨undefined⟩, Sezione 2.1 [Vocal music], pagina 246, Sezione 2.9 [Ancient notation], pagina 414, Sezione 4.5.5 [Proportional notation], pagina 545.

Frammenti di codice: Sezione “Rhythms” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Dots” in *Guida al Funzionamento Interno*, Sezione “DotColumn” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Non c’è un limite massimo o minimo alle durate di una pausa, è il numero dei glifi ad essere limitato: si possono indicare pause da un centoventottesimo fino alla maxima (otto volte una semibreve).

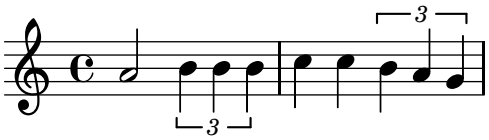
Gruppi irregolari

I gruppi irregolari sono costituiti da un’espressione musicale introdotta dal comando `\tuplet`, che moltiplica la velocità dell’espressione musicale per una frazione:

```
\tuplet frazione { musica }
```

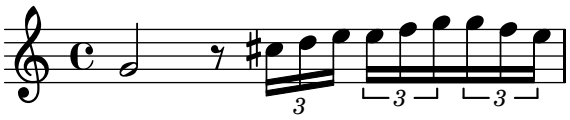
Il numeratore della frazione apparirà sopra o sotto le note, eventualmente con una parentesi quadra. Il gruppo irregolare più comune è la terzina, in cui 3 note hanno la durata di 2:

```
a2 \tuplet 3/2 { b4 b b }
c4 c \tuplet 3/2 { b4 a g }
```



In caso di lunghi passaggi di gruppi irregolari, dover scrivere un comando `\tuplet` per ogni gruppo è scomodo. È possibile specificare direttamente la durata di un gruppo irregolare prima della musica per far sì che i gruppi siano suddivisi automaticamente:

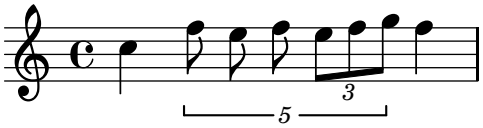
```
g2 r8 \tuplet 3/2 8 { cis16 d e e f g g f e }
```



Le parentesi dei gruppi irregolari si possono posizionare manualmente sopra o sotto il rigo, come spiegato dettagliatamente in Sezione 5.4.2 [Direction and placement], pagina 585.

È possibile annidare i gruppi irregolari:

```
\autoBeamOff
c4 \tuplet 5/4 { f8 e f \tuplet 3/2 { e[ f g] } } f4
```



La modifica di gruppi irregolari annidati che iniziano nello stesso momento musicale richiede l'uso di `\tweak`.

Per modificare la durata delle note senza che appaia la parentesi del gruppo irregolare, si veda ⟨undefined⟩ [Scaling durations], pagina ⟨undefined⟩.

Comandi predefiniti

`\tupletUp`, `\tupletDown`, `\tupletNeutral`.

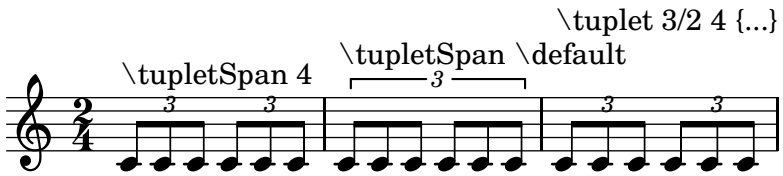
Frammenti di codice selezionati

Inserire vari gruppi irregolari usando una sola volta il comando `\tuplet`

La proprietà `tupletSpannerDuration` imposta la durata di ognuno dei gruppi irregolari compresi tra parentesi dopo il comando `\tuplet`. In questo modo si possono inserire molti gruppi irregolari consecutivi all'interno di una singola espressione `\tuplet`, risparmiando così tempo e spazio.

Ci sono vari modi per impostare `tupletSpannerDuration`. Il comando `\tupletSpan` la imposta su una certa durata e poi la annulla quando invece di una durata viene specificato `\default`. Altrimenti si può usare un argomento opzionale con `\tuplet`.

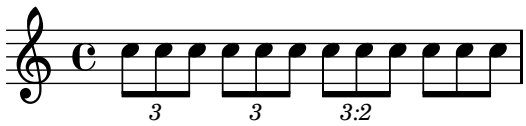
```
\relative c' {
  \time 2/4
  \tupletSpan 4
  \tuplet 3/2 { c8^"\\tupletSpan 4" c c c c c }
  \tupletSpan \default
  \tuplet 3/2 { c8^"\\tupletSpan \\default" c c c c c }
  \tuplet 3/2 4 { c8^"\\tuplet 3/2 4 {...}" c c c c c }
}
```



Modifica del numero del gruppo irregolare

Di norma compare sulla parentesi del gruppo irregolare solo il numeratore del numero del gruppo irregolare. Ma è possibile mostrare la frazione num:den del numero del gruppo irregolare oppure nascondere del tutto il numero.

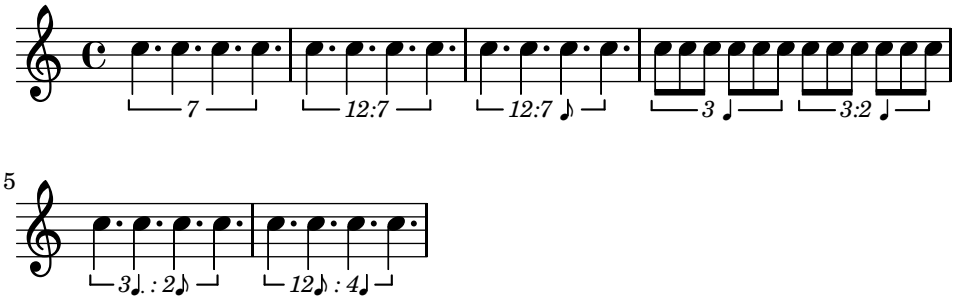
```
\relative c'' {
  \tuplet 3/2 { c8 c c }
  \tuplet 3/2 { c8 c c }
  \override TupletNumber.text = #tuplet-number::calc-fraction-text
  \tuplet 3/2 { c8 c c }
  \override TupletNumber.stencil = ##f
  \tuplet 3/2 { c8 c c }
}
```



Numeri non predefiniti per i gruppi irregolari

LilyPond fornisce anche funzioni di formattazione che permettono di creare numeri di gruppi irregolari diversi dalla frazione vera e propria, così come di aggiungere un valore di nota al numero o alla frazione di un gruppo irregolare.

```
\relative c'' {
  \once \override TupletNumber.text =
    #(tuplet-number::non-default-tuplet-denominator-text 7)
  \tuplet 3/2  { c4. c4. c4. c4. }
  \once \override TupletNumber.text =
    #(tuplet-number::non-default-tuplet-fraction-text 12 7)
  \tuplet 3/2  { c4. c4. c4. c4. }
  \once \override TupletNumber.text =
    #(tuplet-number::append-note-wrapper
      (tuplet-number::non-default-tuplet-fraction-text 12 7) "8")
  \tuplet 3/2  { c4. c4. c4. c4. }

  \once \override TupletNumber.text =
    #(tuplet-number::append-note-wrapper
      tuplet-number::calc-denominator-text "4")
  \tuplet 3/2  { c8 c8 c8 c8 c8 c8 }
  \once \override TupletNumber.text =
    #(tuplet-number::append-note-wrapper
      tuplet-number::calc-fraction-text "4")
  \tuplet 3/2  { c8 c8 c8 c8 c8 c8 }

  \once \override TupletNumber.text =
    #(tuplet-number::fraction-with-notes "4." "8")
  \tuplet 3/2  { c4. c4. c4. c4. }
  \once \override TupletNumber.text =
    #(tuplet-number::non-default-fraction-with-notes 12 "8" 4 "4")
  \tuplet 3/2  { c4. c4. c4. c4. }
}
```

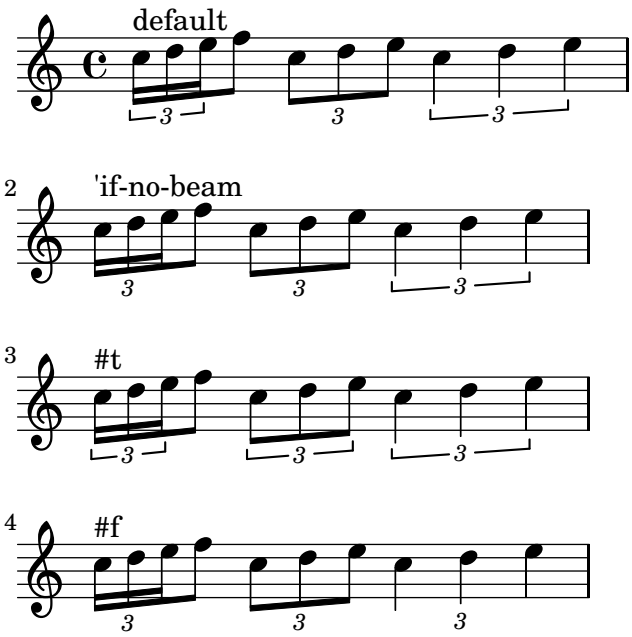


Controllare la visibilità della parentesi del gruppo irregolare

Il comportamento predefinito relativo alla visibilità della parentesi quadra del gruppo irregolare è di mostrare una parentesi a meno che non ci sia una travatura della stessa lunghezza del gruppo. Per controllare la visibilità di tale parentesi, si imposta la proprietà `'bracket-visibility` su `#t` (mostra sempre la parentesi), `#f` (non mostrare mai la parentesi) o `#'if-no-beam` (mostra la parentesi solo se non c'è una travatura).

```
music = \relative c'' {
  \tuplet 3/2 { c16[ d e } f8]
  \tuplet 3/2 { c8 d e }
  \tuplet 3/2 { c4 d e }
```

```
}

\new Voice {
  \relative c' {
    << \music s4^"default" >>
    \override TupletBracket.bracket-visibility = #'if-no-beam
    << \music s4^"'if-no-beam" >>
    \override TupletBracket.bracket-visibility = ##t
    << \music s4^"#t" >>
    \override TupletBracket.bracket-visibility = ##f
    << \music s4^"#f" >>
  }
}
```

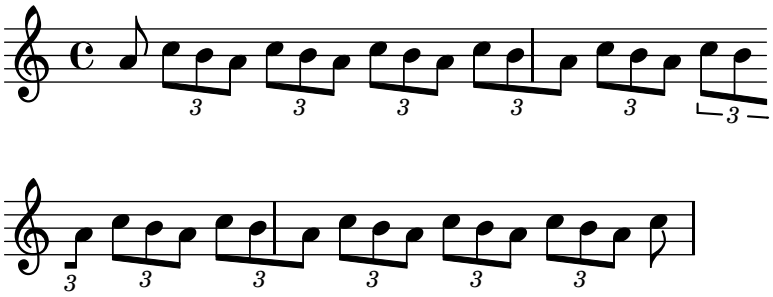


Consentire l'interruzione del rigo all'interno di gruppi irregolari con travature

Questo esempio artificioso mostra come permettere interruzioni del rigo sia manuali che automatiche all'interno di un gruppo irregolare con travature. Si noti che le travature di questi gruppi irregolari fuori dal ritmo devono essere disposte manualmente.

```
\layout {
  \context {
    \Voice
    % Permit line breaks within tuplets
    \remove "Forbid_line_break_engraver"
    % Allow beams to be broken at line breaks
    \override Beam.breakable = ##t
  }
}
\relative c'' {
  a8
  \repeat unfold 5 { \tuplet 3/2 { c[ b a] } }
  % Insert a manual line break within a tuplet
  \tuplet 3/2 { c[ b \bar "" \break a] }
  \repeat unfold 5 { \tuplet 3/2 { c[ b a] } }
```

```
  c8
}
```



Vedi anche

Glossario musicale: Sezione “terzina” in *Glossario Musicale*, Sezione “gruppo irregolare” in *Glossario Musicale*, Sezione “polimetrico” in *Glossario Musicale*.

Manuale di apprendimento: Sezione “Tweaking methods” in *Manuale di Apprendimento*.

Guida alla notazione: ⟨undefined⟩ [Time administration], pagina ⟨undefined⟩, ⟨undefined⟩ [Scaling durations], pagina ⟨undefined⟩, Sezione 5.3.4 [The tweak command], pagina 580, ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩.

Frammenti di codice: Sezione “Rhythms” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “TupletBracket” in *Guida al Funzionamento Interno*, Sezione “TupletNumber” in *Guida al Funzionamento Interno*, Sezione “TimeScaledMusic” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Gli abbellimenti si possono inserire dentro le parentesi del gruppo irregolare, *eccetto* quando un rigo inizia con un abbellimento seguito da un gruppo irregolare. In questo caso particolare, l’abbellimento deve essere inserito prima del comando `\tuplet` per evitare errori.

Quando si usa un gruppo irregolare all’inizio di un brano che ha un segno di `\tempo`, la musica deve essere inserita esplicitamente in un blocco `\new Voice`, come è spiegato in Sezione “Voices contain music” in *Manuale di Apprendimento*.

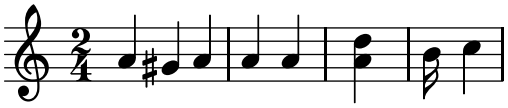
Scalare le durate

La durata di singole note, pause o accordi può essere moltiplicata per una frazione `N/M` aggiungendo `*N/M` (o `*N` se `M` è 1). Questo non cambierà l’aspetto delle note o delle pause, ma la durata così alterata verrà utilizzata per calcolare la posizione all’interno della misura e per impostare la durata nel file MIDI. Si possono combinare molteplici fattori, come `*L*M/N`. I fattori fanno parte della durata: quindi se non si specifica una durata per le note successive, la durata predefinita presa dalla nota precedente includerà il fattore di scalatura.

Nell’esempio seguente le prime tre note occupano esattamente due battiti, ma non sono indicate come gruppo irregolare.

```
\time 2/4
% Trasforma le durate in terzine
a4*2/3 gis a
% Durate normali
a4 a
% Raddoppia la durata dell'accordo
<a d>4*2
% Durata di un quarto, ma appare come un sedicesimo
```

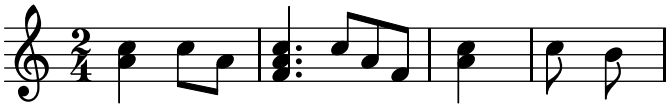
```
b16*4 c4
```



Anche la durata delle pause spaziatrici può essere modificata con un moltiplicatore. Può essere utile per saltare molte misure, ad esempio `s1*23`.

Si possono comprimere allo stesso modo tratti musicali più lunghi, come se ogni nota, accordo o pausa avesse la frazione come moltiplicatore. Così l'aspetto della musica non cambia ma la durata interna delle note viene moltiplicata per la frazione *num*/*den*. Ecco un esempio che mostra come la musica possa essere compressa e espansa:

```
\time 2/4
% Durate normali
<c a>4 c8 a
% Scala la musica di *2/3
\scaleDurations 2/3 {
  <c a f>4. c8 a f
}
% Scala la musica di *2
\scaleDurations 2/1 {
  <c' a>4 c8 b
}
```



Questo comando torna utile nella notazione polimetrica, si veda ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩.

Vedi anche

Guida alla notazione: ⟨undefined⟩ [Tuplets], pagina ⟨undefined⟩, ⟨undefined⟩ [Invisible rests], pagina ⟨undefined⟩, ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Problemi noti e avvertimenti

Il calcolo della posizione in una misura deve considerare tutti i fattori di dimensionamento applicati alle note di quella misura e gli esigui residui delle misure precedenti. Questo calcolo viene fatto con numeri razionali. Se un numeratore o un denominatore intermedi in quel calcolo eccedono di 2^30, l'esecuzione e la composizione tipografica si arresteranno in quel punto senza indicare un errore.

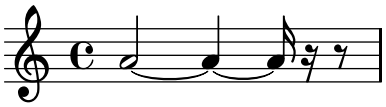
Legature di valore

Una legatura di valore connette due teste di nota adiacenti della stessa altezza. La legatura di valore estende la durata di una nota.

> **Nota:** Le legature di valore non devono essere confuse con le *legature di portamento*, che indicano un'articolazione, o con le *legature di frase*, che indicano una frase musicale. Una legatura di valore serve semplicemente a estendere la durata di una nota, in modo analogo al punto di aumentazione.

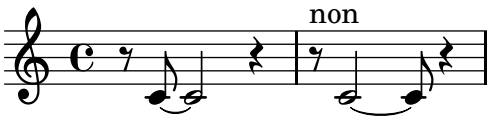
La legatura di valore si inserisce aggiungendo il simbolo tilde (~) alla prima di ogni coppia di note legate. Esso indica che la nota deve essere legata alla nota successiva, che deve essere della stessa altezza.

```
a2~ a4~ a16 r r8
```



Le legature di valore si usano quando una nota attraversa una stanghetta o quando non si possono usare i punti per indicare la durata. Le legature si dovrebbero usare anche quando i valori della nota superano le suddivisioni della misura:

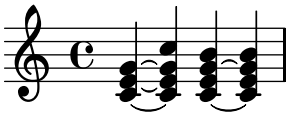
```
\relative c' {
  r8 c~ c2 r4 |
  r8^"non" c2~ c8 r4
}
```



Se si devono creare legature di valore tra molte note che attraversano le misure, è più semplice usare la suddivisione automatica delle note, come è spiegato in ⟨undefined⟩ [Automatic note splitting], pagina ⟨undefined⟩. Questo sistema divide automaticamente le note lunghe e le connette da misura a misura.

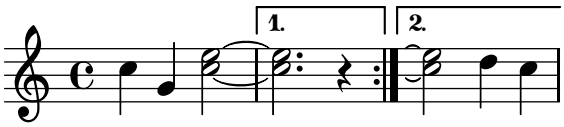
Quando si applica una legatura di valore a un accordo, vengono legate tutte le teste di nota con la stessa altezza. Se le teste non corrispondono, non verrà creata alcuna legatura. Gli accordi possono essere parzialmente legati inserendo le legature dentro l'accordo.

```
<c e g>~ <c e g c>
<c~ e g~ b> <c e g b>
```



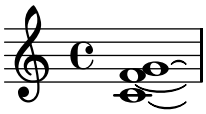
Quando la seconda alternativa di una ripetizione inizia con una nota legata, occorre specificarla nel modo seguente:

```
\repeat volta 2 { c g <c e>2~ }
\alternative {
  % Prima alternativa: la nota seguente viene legata in modo normale
  { <c e>2. r4 }
  % Seconda alternativa: la nota seguente ha una legatura ripetuta
  { <c e>2\repeatTie d4 c } }
```



Le legature di valore *L.v.* (*laissez vibrer*) indicano che le note non devono essere smorzate alla fine. Si usa nella notazione per pianoforte, arpa e altri strumenti a corda e a percussione. Si inseriscono così:

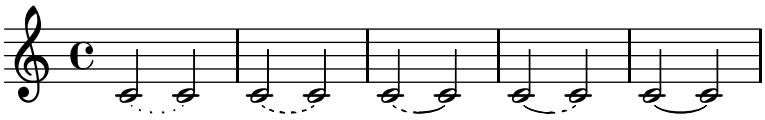
```
<c f g>1\laissezVibrer
```



Le legature di valore possono essere impostate manualmente per avere la curva in su o in giù, come è spiegato in Sezione 5.4.2 [Direction and placement], pagina 585.

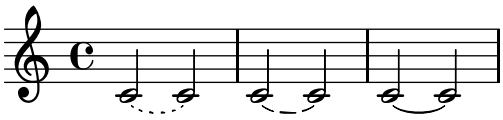
Le legature di valore possono essere tratteggiate, punteggiate oppure in una combinazione di tratti continui e tratti interrotti.

```
\tieDotted
c2~ c
\tieDashed
c2~ c
\tieHalfDashed
c2~ c
\tieHalfSolid
c2~ c
\tieSolid
c2~ c
```



Si possono specificare modelli di tratteggiatura personalizzati:

```
\tieDashPattern #0.3 #0.75
c2~ c
\tieDashPattern #0.7 #1.5
c2~ c
\tieSolid
c2~ c
```

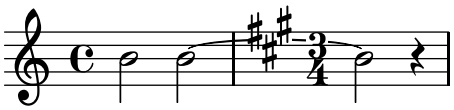


Le definizioni dei modelli di tratteggiatura delle legature di valore hanno la stessa struttura di quelle per le legature di portamento. I dettagli relativi ai modelli complessi di tratteggiatura sono trattati in ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.

Se le legature collidono con altri oggetti del rigo, si possono sovrascrivere le proprietà di formattazione *whiteout* e *layer*.

```
\override Tie.layer = #-2
\override Staff.TimeSignature.layer = #-1
\override Staff.KeySignature.layer = #-1
\override Staff.TimeSignature.whiteout = ##t
\override Staff.KeySignature.whiteout = ##t
b2 b~
\time 3/4
\key a \major
```

```
b r4
```



Comandi predefiniti

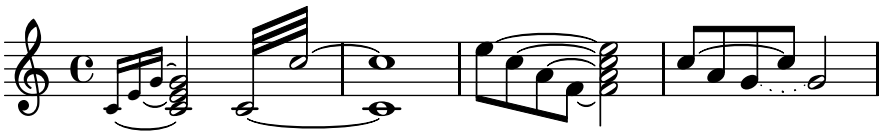
`\tieUp`, `\tieDown`, `\tieNeutral`, `\tieDotted`, `\tieDashed`, `\tieDashPattern`, `\tieHalfDashed`, `\tieHalfSolid`, `\tieSolid`.

Frammenti di codice selezionati

Usare le legature di valore con un arpeggio

Le legature di valore vengono usate talvolta per scrivere un arpeggio. In questo caso, le due note da legare devono non essere consecutive. Per riuscirci occorre impostare la proprietà `tieWaitForNote` su `#t`. Questa funzionalità serve anche a legare un tremolo a un accordo e in generale qualsiasi note consecutive.

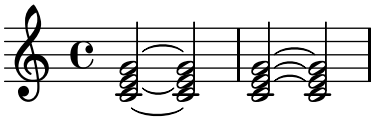
```
\relative c' {
  \set tieWaitForNote = ##t
  \grace { c16[ ~ e ~ g] ~ } <c, e g>2
  \repeat tremolo 8 { c32 ~ c' ~ } <c c,>1
  e8 ~ c ~ a ~ f ~ <e' c a f>2
  \tieUp
  c8 ~ a
  \tieDown
  \tieDotted
  g8 ~ c g2
}
```



Disegnare manualmente le legature di valore

Le legature di valore possono essere disegnate a mano cambiando la proprietà `tie-configuration` dell'oggetto `TieColumn`. Il primo numero indica la distanza dal centro del rigo nell'unità di metà spazio rigo, mentre il secondo numero indica la direzione (1 = su, -1 = giù).

```
\relative c' {
  <c e g>2~ <c e g>
  \override TieColumn.tie-configuration =
    #'((0.0 . 1) (-2.0 . 1) (-4.0 . 1))
  <c e g>2~ <c e g>
}
```



Vedi anche

Glossario musicale: Sezione “legatura di valore” in *Glossario Musicale*, Sezione “laissez vibrer” in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic note splitting], pagina ⟨undefined⟩.

Frammenti di codice: Sezione “Expressive marks” in *Frammenti di codice*, Sezione “Rhythms” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “LaissezVibrerTie” in *Guida al Funzionamento Interno*, Sezione “LaissezVibrerTieColumn” in *Guida al Funzionamento Interno*, Sezione “TieColumn” in *Guida al Funzionamento Interno*, Sezione “Tie” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Cambiare righi mentre una legatura di valore è attiva non produce una legatura obliqua.

Il cambio di chiave o di ottava durante una legatura di valore non è una situazione ben definita. In questi casi è preferibile usare una legatura di portamento.

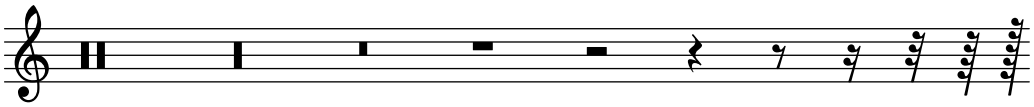
1.2.2 Scrittura delle pause

Le pause si inseriscono insieme alla musica contenuta nelle espressioni musicali.

Pause

Le pause si inseriscono allo stesso modo delle note ma col nome `r`. Le durate più lunghe di un intero usano i seguenti comandi predefiniti:

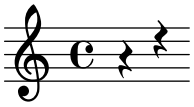
```
\new Staff {
  % Queste due linee servono solo ad abbellire questo esempio
  \time 16/1
  \override Staff.TimeSignature.stencil = ##f
  % Mostra una pausa di maxima, equivalente a quattro brevi
  r\maxima
  % Mostra una pausa di longa, equivalente a due brevi
  r\longa
  % Mostra una pausa di breve
  r\breve
  r1 r2 r4 r8 r16 r32 r64 r128
}
```



Le pause d’intero, centrate sulla misura, devono essere inserite come pausa multipla. Si possono usare per una sola misura così come su molte misure, come è spiegato in ⟨undefined⟩ [Full measure rests], pagina ⟨undefined⟩.

Per specificare esplicitamente la posizione verticale di una pausa, si scrive il nome di una nota seguito da `\rest`. Una pausa della durata della nota verrà posizionata sul punto del rigo in cui apparirebbe la nota. Questo permette una precisa formattazione mauale della musica polifonica, dato che il formattatore automatico che gestisce le collisioni tra pause non sposterà queste pause.

```
a4\rest d4\rest
```

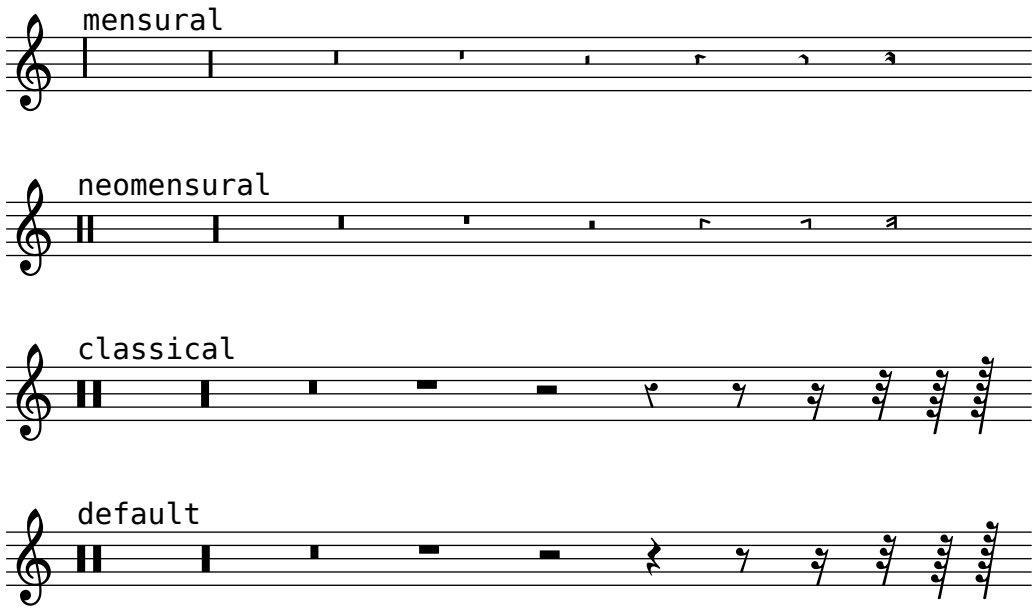


Frammenti di codice selezionati

Stili di pausa

Esistono vari stili di pausa.

```
\layout {
  indent = 0
  \context {
    \Staff
    \remove "Time_signature_engraver"
  }
}

\new Staff \relative c {
  \cadenzaOn
  \override Staff.Rest.style = #'mensural
  r\maxima^\markup \typewriter { mensural }
  r\longa r\breve r1 r2 r4 r8 r16 s32 s64 s128 s128
  \bar ""

  \override Staff.Rest.style = #'neomensural
  r\maxima^\markup \typewriter { neomensural }
  r\longa r\breve r1 r2 r4 r8 r16 s32 s64 s128 s128
  \bar ""

  \override Staff.Rest.style = #'classical
  r\maxima^\markup \typewriter { classical }
  r\longa r\breve r1 r2 r4 r8 r16 r32 r64 r128 s128
  \bar ""

  \override Staff.Rest.style = #'default
  r\maxima^\markup \typewriter { default }
  r\longa r\breve r1 r2 r4 r8 r16 r32 r64 r128 s128
}
```



Vedi anche

Glossario musicale: Sezione “breve” in *Glossario Musicale*, Sezione “longa” in *Glossario Musicale*, Sezione “maxima” in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Full measure rests], pagina ⟨undefined⟩.

Frammenti di codice: Sezione “Rhythms” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Rest” in *Guida al Funzionamento Interno*.

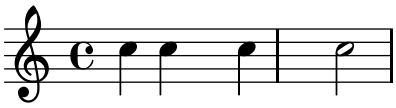
Problemi noti e avvertimenti

Non c’è un limite massimo o minimo alle durate di una pausa, è il numero dei glifi ad essere limitato: si possono indicare pause da un centoventottesimo fino alla maxima (otto volte una semibreve).

Pause invisibili

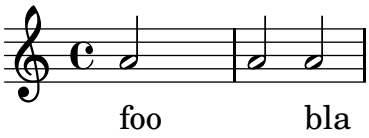
Una pausa invisibile (chiamata anche ‘pausa spaziatrice’) si inserisce come come una nota col nome `s`:

```
c4 c s c
s2 c
```



Le pause spaziatrici possono essere utilizzate soltanto nella modalità note e nella modalità accordi. In altre situazioni, ad esempio quando si inserisce il testo vocale, si usa il comando `\skip` per saltare un momento musicale. `\skip` richiede una durata esplicita, ma questo requisito viene ignorato se il testo deriva le propriet durate dalle note presenti in una melodia ad esso associata attraverso `\addlyrics` o `\lyricsto`.

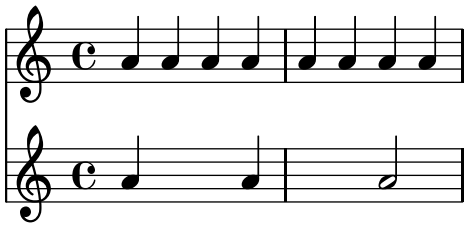
```
<<
  {
    a2 \skip2 a2 a2
  }
  \new Lyrics {
    \lyricmode {
      foo2 \skip 1 bla2
    }
  }
>>
```



Dato che `\skip` è un comando, non modifica la durata predefinita delle note che seguono, diversamente da `s`.

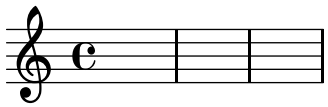
```
<<
  {
    \repeat unfold 8 { a4 }
  }
  {
    a4 \skip 2 a |
```

```
    s2 a
  }
>>
```



Una pausa spaziatrice crea implicitamente i contesti `Staff` e `Voice` se non esistono già, proprio come accade per le note e le pause:

```
s1 s s
```



`\skip` si limita a saltare un momento musicale, non crea nessun tipo di output.

```
% Questo input è corretto, ma non produce niente
\skip 1 \skip1 \skip 1
```

Vedi anche

Manuale di apprendimento: Sezione "Visibility and color of objects" in *Manuale di Apprendimento*.

Guida alla notazione: [Hidden notes], pagina 212, Sezione 5.4.6 [Visibility of objects], pagina 592.

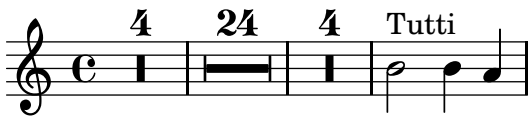
Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "SkipMusic" in *Guida al Funzionamento Interno*.

Pause d'intero

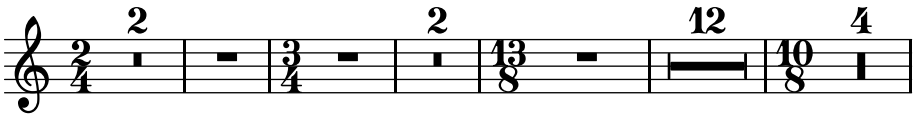
Le pause per una o più misure intere si inseriscono come le note col nome di nota maiuscolo `R`:

```
% Le misure di ciascuna pausa vengono contratte in una sola misura
\compressFullBarRests
R1*4
R1*24
R1*4
b2^"Tutti" b4 a4
```



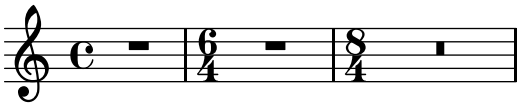
La durata delle pause multiple è identica alla notazione di durata usata per le note e deve essere sempre un numero intero di misure/lunghezze, quindi occorre spesso usare dei punti di aumentazione o delle frazioni:

```
\compressFullBarRests
\time 2/4
R1 | R2 |
\time 3/4
R2. | R2.*2 |
\time 13/8
R1*13/8 | R1*13/8*12 |
\time 10/8
R4*5*4 |
```



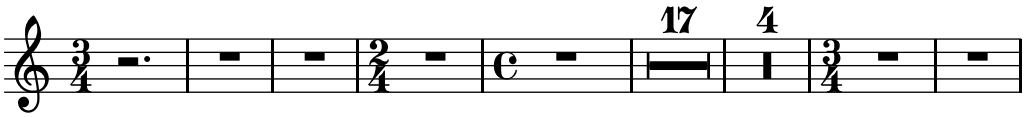
Una pausa d'intero appare al centro della misura come una pausa di semibreve o una pausa di breve, a seconda del segno di tempo.

```
\time 4/4
R1 |
\time 6/4
R1*3/2 |
\time 8/4
R1*2 |
```



Di norma una pausa multipla viene espansa nel pentagramma in modo da mostrare esplicitamente tutte le misure in cui quella pausa appare. Altrimenti è possibile mostrare una pausa multipla come una singola misura che contiene un simbolo di pausa multipla, col numero di misure in cui la pausa si ripete indicato sopra la misura:

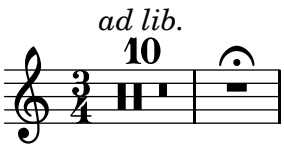
```
% Default behavior
\time 3/4 r2. | R2.*2 |
\time 2/4 R2 |
\time 4/4
% Le misure di ciascuna pausa multipla vengono contratte in una singola misura
\compressFullBarRests
r1 | R1*17 | R1*4 |
% Le misure della pausa multipla vengono espanse
\expandFullBarRests
\time 3/4
R2.*2 |
```



Si possono aggiungere delle annotazioni alle pause multiple. Il comando predefinito `\fermataMarkup` permette di aggiungere il segno di corona.

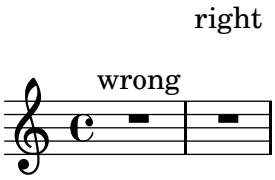
```
\compressFullBarRests
\time 3/4
```

```
R2.*10^\markup { \italic "ad lib." }
R2.^\fermataMarkup
```



Nota: Il testo connesso a una pausa multipla è un oggetto di tipo `MultiMeasureRestText`, non `TextScript`. Le sovrascritture devono specificare l'oggetto corretto o saranno ignorate. Si veda l'esempio seguente:

```
% Questo non funziona, perché è specificato il nome dell'oggetto sbagliato
\override TextScript.padding = #5
R1^"wrong"
% Questo è il nome dell'oggetto corretto da specificare
\override MultiMeasureRestText.padding = #5
R1^"right"
```



Quando una pausa multipla segue immediatamente un comando `\partial`, potrebbero non apparire i relativi avvertimenti del controllo battuta.

Comandi predefiniti

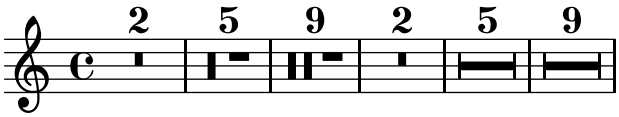
`\textLengthOn`, `\textLengthOff`, `\fermataMarkup`, `\compressFullBarRests`, `\expandFullBarRests`.

Frammenti di codice selezionati

Modificare la forma delle pause multiple

Se la pausa multipla dura dieci misure o un numero inferiore a dieci, nel rigo apparirà una serie di pause di longa e di breve (chiamate in tedesco "Kirchenpausen" - pause ecclesiastiche); altrimenti apparirà una semplice linea. Il numero predefinito di dieci può essere cambiato sovrascrivendo la proprietà `expand-limit`..

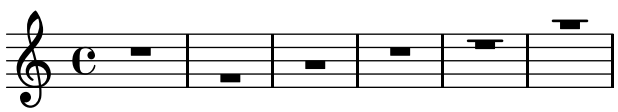
```
\relative c'' {
  \compressFullBarRests
  R1*2 | R1*5 | R1*9
  \override MultiMeasureRest.expand-limit = #3
  R1*2 | R1*5 | R1*9
}
```

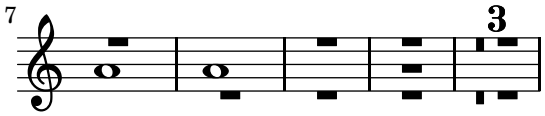


Posizionamento delle pause multiple

Diversamente dalle pause normali, non esiste un comando predefinito per cambiare la posizione sul rigo di un simbolo di pausa multipla di qualsiasi tipo connettendolo a una nota. Tuttavia, nella musica polifonica le pause multiple nelle voci dispari e pari sono separate verticalmente. Il posizionamento delle pause multiple si controlla nel modo seguente:

```
\relative c'' {
  % Multi-measure rests by default are set under the fourth line
  R1
  % They can be moved using an override
  \override MultiMeasureRest.staff-position = #-2
  R1
  \override MultiMeasureRest.staff-position = #0
  R1
  \override MultiMeasureRest.staff-position = #2
  R1
  \override MultiMeasureRest.staff-position = #3
  R1
  \override MultiMeasureRest.staff-position = #6
  R1
  \revert MultiMeasureRest.staff-position
  \break

  % In two Voices, odd-numbered voices are under the top line
  << { R1 } \\ { a1 } >>
  % Even-numbered voices are under the bottom line
  << { a1 } \\ { R1 } >>
  % Multi-measure rests in both voices remain separate
  << { R1 } \\ { R1 } >>

  % Separating multi-measure rests in more than two voices
  % requires an override
  << { R1 } \\ { R1 } \\
     \once \override MultiMeasureRest.staff-position = #0
     { R1 }
  >>

  % Using compressed bars in multiple voices requires another override
  % in all voices to avoid multiple instances being printed
  \compressFullBarRests
  <<
   \revert MultiMeasureRest.staff-position
    { R1*3 }
    \\
   \revert MultiMeasureRest.staff-position
    { R1*3 }
  >>
}
```



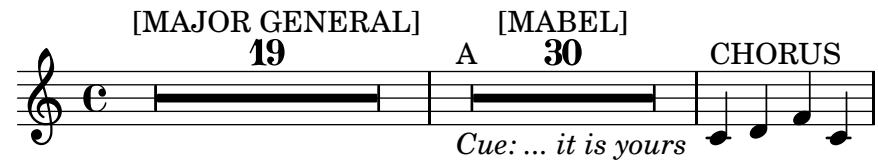


Testo a margine delle pause multiple

Il testo a margine di una pausa multipla viene centrato sopra o sotto di essa. Se il testo è lungo, la misura non si espanderà. Per espandere la pausa multipla in modo che si allinei col testo, conviene usare un accordo vuoto con del testo attaccato prima della pausa multipla.

Il testo così attaccato a una nota spaziatrice viene allineato a sinistra della posizione in cui la nota sarebbe posta nella misura, ma se la lunghezza della misura è determinata dalla lunghezza del testo, il testo verrà centrato.

```
\relative c' {
  \compressFullBarRests
  \textLengthOn
  <>^\markup { [MAJOR GENERAL] }
  R1*19
  <>_\markup { \italic { Cue: ... it is yours } }
  <>^\markup { A }
  R1*30^\markup { [MABEL] }
  \textLengthOff
  c4^\markup { CHORUS } d f c
}
```



Vedi anche

Glossario musicale: Sezione “pausa multipla” in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Durations], pagina ⟨undefined⟩, Sezione 1.8 [Text], pagina 220, Sezione 1.8.2 [Formatting text], pagina 229, [Text scripts], pagina 221.

Frammenti di codice: Sezione “Rhythms” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “MultiMeasureRest” in *Guida al Funzionamento Interno*, Sezione “MultiMeasureRestNumber” in *Guida al Funzionamento Interno*, Sezione “MultiMeasureRestText” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Se una diteggiatura viene attaccata a una pausa multipla (ad esempio `R1*10-4`), il numero della diteggiatura può collidere col numero del contatore delle battute.

Non è possibile condensare automaticamente molteplici pause normali in in una singola pausa multipla.

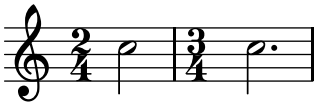
Le pause multiple non prendono parte alle collisioni di pausa.

1.2.3 Aspetto dei ritmi

Indicazione di tempo

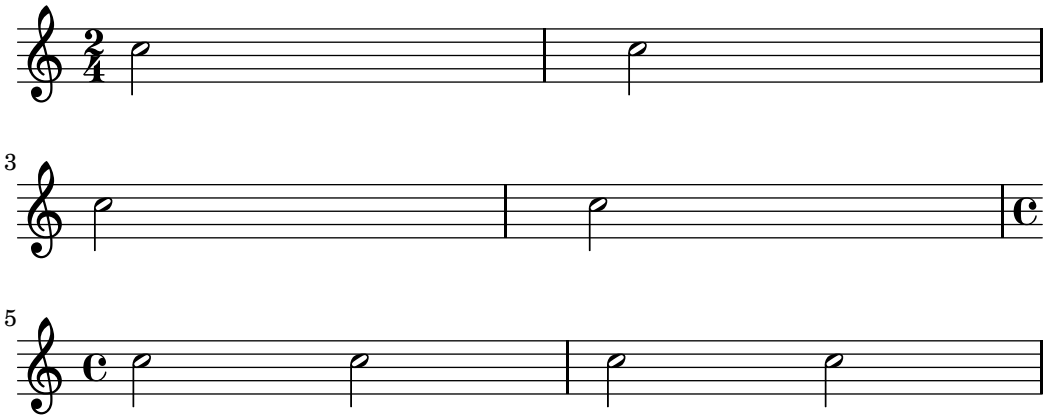
L’indicazione di tempo si imposta così:

```
\time 2/4 c2
\time 3/4 c2.
```



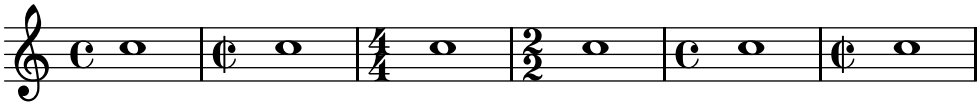
Le indicazioni di tempo appaiono all'inizio di un brano e ogni volta che l'indicazione cambia. Se il cambio ha luogo alla fine di un rigo, appare un'indicazione di tempo di avvertimento. Si può modificare questo comportamento predefinito, come è spiegato in Sezione 5.4.6 [Visibility of objects], pagina 592.

```
\time 2/4
c2 c
\break
c c
\break
\time 4/4
c c c c
```



Il simbolo di indicazione di tempo usato nei tempi 2/2 e 4/4 può essere sostituito da un numero:

```
% Stile predefinito
\time 4/4 c1
\time 2/2 c1
% Passaggio allo stile numerico
\numericTimeSignature
\time 4/4 c1
\time 2/2 c1
% Ritorno allo stile predefinito
\defaultTimeSignature
\time 4/4 c1
\time 2/2 c1
```

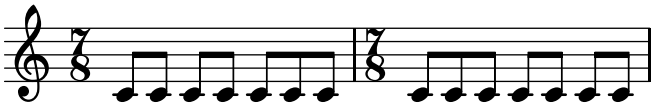


Le indicazioni di tempo mensurali sono trattate in [Mensural time signatures], pagina 420.

Oltre a impostare l'indicazione di tempo che appare nel pentagramma, il comando `\time` imposta anche i valori delle proprietà basate sull'indicazione di tempo, ovvero `baseMoment`, `beatStructure` e `beamExceptions`. I valori predefiniti di queste proprietà si trovano in '`scm/time-signature-settings.scm`'.

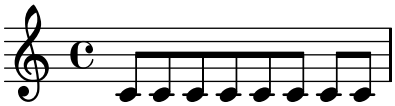
Si può sovrascrivere il valore predefinito di `beatStructure` nel comando `\time` stesso specificandolo come primo argomento opzionale:

```
\score {
  \new Staff {
    \relative c' {
      \time #'(2 2 3) 7/8
      \repeat unfold 7 { c8 } |
      \time #'(3 2 2) 7/8
      \repeat unfold 7 { c8 } |
    }
  }
}
```



Oppure si possono impostare tutti i valori predefiniti di queste variabili legate all'indicazione di tempo, incluse `baseMoment` e `beamExceptions`. I valori possono essere impostati in modo indipendente per diverse indicazioni di tempo. I nuovi valori hanno effetto appena viene eseguito un nuovo comando `\time` che abbia lo stesso valore dell'indicazione di tempo specificata nelle nuove impostazioni:

```
\score {
  \new Staff {
    \relative c' {
      \overrideTimeSignatureSettings
        4/4        % timeSignatureFraction
        1/4        % baseMomentFraction
        #'(3 1)    % beatStructure
        #'()       % beamExceptions
      \time 4/4
      \repeat unfold 8 { c8 } |
    }
  }
}
```

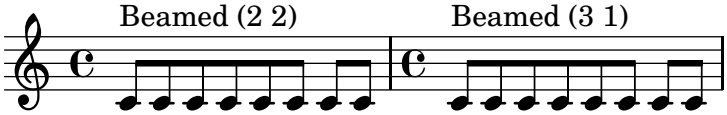


`\overrideTimeSignatureSettings` prende quattro argomenti:

1. *`timeSignatureFraction`*, una frazione che indica l'indicazione di tempo a cui questi valori si riferiscono.
2. *`baseMomentFraction`*, una frazione che contiene il numeratore e il denominatore dell'unità di tempo.
3. *`beatStructure`*, una lista Scheme che indica la struttura dei battiti nella misura, nell'unità di *`baseMomentFraction`*.
4. *`beamExceptions`*, una lista di associazione (*alist*) che contiene regole di disposizione delle travature che vanno oltre la fine ad ogni battito, come descritto in ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩.

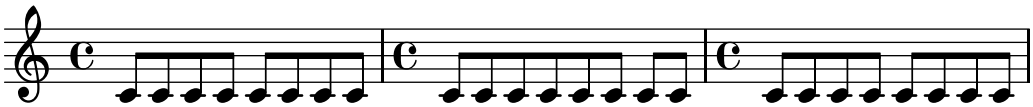
Il contesto che contiene `\overrideTimeSignatureSettings` deve essere istanziato prima dell'esecuzione di `\overrideTimeSignatureSettings`. Ciò significa che deve essere istanziato esplicitamente oppure ci deve essere della musica nel contesto prima che venga chiamato `\overrideTimeSignatureSettings`:

```
\score {
  \relative c' {
    % Questa chiamata non funzionerà perché il contesto non è ancora istanziato
    \overrideTimeSignatureSettings
      4/4        % timeSignatureFraction
      1/4        % baseMomentFraction
      #'(3 1)    % beatStructure
      #'()       % beamExceptions
    \time 4/4
    c8^\markup {"Beamed (2 2)"}
    \repeat unfold 7 { c8 } |
    % Questa chiamata funzionerà
    \overrideTimeSignatureSettings
      4/4        % timeSignatureFraction
      1/4        % baseMomentFraction
      #'(3 1)    % beatStructure
      #'()       % beamExceptions
    \time 4/4
    c8^\markup {"Beamed (3 1)"}
    \repeat unfold 7 { c8 } |
  }
}
```



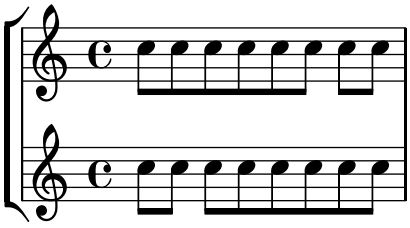
I valori modificati delle proprietà predefinite dell'indicazione di tempo possono essere ripristinati ai valori originali:

```
\score{
  \relative c' {
    \repeat unfold 8 { c8 } |
    \overrideTimeSignatureSettings
      4/4        % timeSignatureFraction
      1/4        % baseMomentFraction
      #'(3 1)    % beatStructure
      #'()       % beamExceptions
    \time 4/4
    \repeat unfold 8 { c8 } |
    \revertTimeSignatureSettings 4/4
    \time 4/4
    \repeat unfold 8 { c8 } |
  }
}
```



Si possono stabilire valori diversi delle proprietà predefinite dell'indicazione di tempo per righi diversi spostando `Timing_translator` e `Default_bar_line_engraver` dal contesto `Score` al contesto `Staff`.

```
\score {
  \new StaffGroup <<
     \new Staff {
        \overrideTimeSignatureSettings
          4/4        % timeSignatureFraction
          1/4        % baseMomentFraction
          #'(3 1)    % beatStructure
          #'()       % beamExceptions
        \time 4/4
        \repeat unfold 8 {c''8}
     }
     \new Staff {
        \overrideTimeSignatureSettings
          4/4        % timeSignatureFraction
          1/4        % baseMomentFraction
          #'(1 3)    % beatStructure
          #'()       % beamExceptions
        \time 4/4
        \repeat unfold 8 {c''8}
     }
  >>
  \layout {
    \context {
      \Score
      \remove "Timing_translator"
      \remove "Default_bar_line_engraver"
    }
    \context {
      \Staff
      \consists "Timing_translator"
      \consists "Default_bar_line_engraver"
    }
  }
}
```



Un ulteriore metodo per modificare queste variabili relative all'indicazione di tempo, che evita di mostrare di nuovo l'indicazione di tempo al momento del cambio, è mostrato in ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩.

Comandi predefiniti

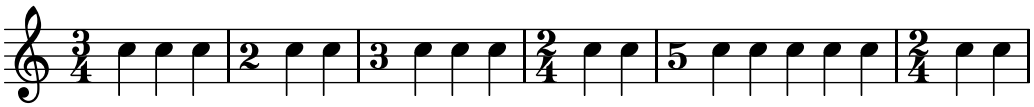
`\numericTimeSignature`, `\defaultTimeSignature`.

Frammenti di codice selezionati

Indicazione di tempo che mostra solo il numeratore (invece della frazione)

Talvolta un'indicazione di tempo non deve mostrare la frazione intera (ad esempio 7/4), ma solo il numeratore (7 in questo caso). Si può fare facilmente con `\override Staff.TimeSignature.style = #'single-digit`, che cambia lo stile in modo permanente. Con `\revert Staff.TimeSignature.style`, questa impostazione può essere annullata. Per applicare lo stile a cifra singola (`single-digit`) a una sola indicazione di tempo, si usa il comando `\override` preceduto da `\once`.

```
\relative c'' {
  \time 3/4
  c4 c c
  % Change the style permanently
  \override Staff.TimeSignature.style = #'single-digit
  \time 2/4
  c4 c
  \time 3/4
  c4 c c
  % Revert to default style:
  \revert Staff.TimeSignature.style
  \time 2/4
  c4 c
  % single-digit style only for the next time signature
  \once \override Staff.TimeSignature.style = #'single-digit
  \time 5/4
  c4 c c c c
  \time 2/4
  c4 c
}
```



Vedi anche

Glossario musicale: Sezione "indicazione di tempo" in *Glossario Musicale*

Guida alla notazione: [Mensural time signatures], pagina 420, ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩, ⟨undefined⟩ [Time administration], pagina ⟨undefined⟩.

File installati: '`scm/time-signature-settings.scm`'.

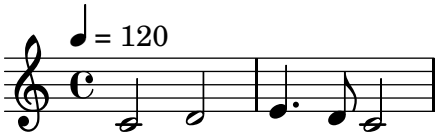
Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "TimeSignature" in *Guida al Funzionamento Interno*, Sezione "Timing_translator" in *Guida al Funzionamento Interno*.

Indicazioni metronomiche

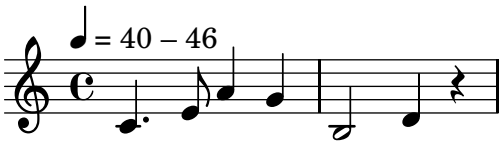
Un'indicazione metronomica è semplice da scrivere:

```
\tempo 4 = 120
c2 d
e4. d8 c2
```



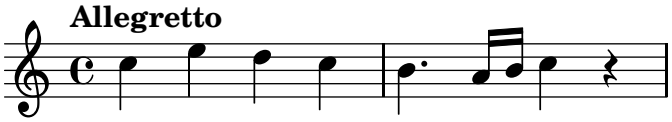
Le indicazioni metronomiche si possono rappresentare anche come una gamma di due numeri:

```
\tempo 4 = 40 - 46
c4. e8 a4 g
b,2 d4 r
```



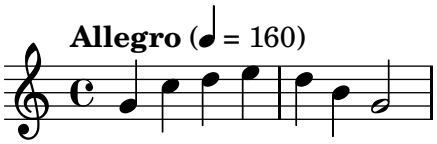
Al loro posto si possono usare delle indicazioni di tempo testuali:

```
\tempo "Allegretto"
c4 e d c
b4. a16 b c4 r4
```



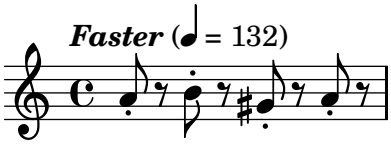
Un'indicazione metronomica, se combinata con del testo, viene messa automaticamente tra parentesi:

```
\tempo "Allegro" 4 = 160
g4 c d e
d4 b g2
```



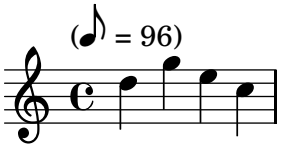
In generale, il testo può essere qualsiasi oggetto di tipo testuale:

```
\tempo \markup { \italic Faster } 4 = 132
a8-. r8 b-. r gis-. r a-. r
```



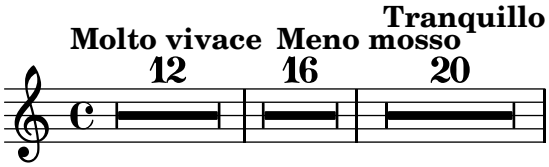
Si può scrivere un'indicazione metronomica tra parentesi e senza testo se si include una stringa vuota nell'input:

```
\tempo "" 8 = 96
d4 g e c
```



In una parte per uno strumento che ha lunghi periodi pieni di pause, le indicazioni di tempo sono talvolta molto ravvicinate. Il comando `\markLengthOn` aggiunge dello spazio orizzontale per impedire che le indicazioni di tempo si sovrappongano; `\markLengthOff` ripristina il comportamento predefinito, per cui le indicazioni di tempo non sono tenute in considerazione ai fini della spaziatura orizzontale.

```
\compressFullBarRests
\markLengthOn
\tempo "Molto vivace"
R1*12
\tempo "Meno mosso"
R1*16
\markLengthOff
\tempo "Tranquillo"
R1*20
```

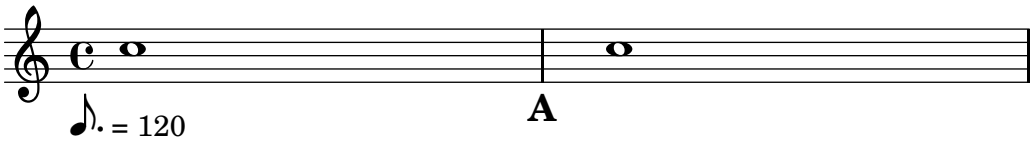


Frammenti di codice selezionati

Posizionare il metronomo e i numeri di chiamata sotto il rigo

Di norma, il metronomo e i numeri di chiamata vengono posizionati sopra il rigo. Per metterli sotto il rigo basta impostare correttamente la proprietà `direction` di `MetronomeMark` o `RehearsalMark`.

```
\layout { ragged-right = ##f }

{
  % Metronome marks below the staff
  \override Score.MetronomeMark.direction = #DOWN
  \tempo 8. = 120
  c''1

  % Rehearsal marks below the staff
  \override Score.RehearsalMark.direction = #DOWN
  \mark \default
  c''1
}
```

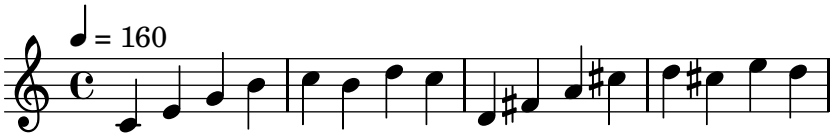


Modificare il tempo senza mostrare l'indicazione metronomica

Per cambiare il tempo del file MIDI senza che l'indicazione metronomica appaia, basta renderla invisibile.

```
\score {
  \new Staff \relative c' {
    \tempo 4 = 160
```

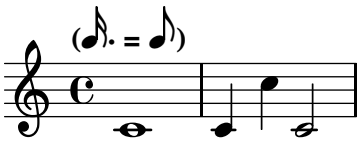
```
    c4 e g b
    c4 b d c
    \set Score.tempoHideNote = ##t
    \tempo 4 = 96
    d,4 fis a cis
    d4 cis e d
  }
  \layout { }
  \midi { }
}
```



Creare indicazioni metronomiche in modalità testuale

Si possono creare nuove indicazioni metronomiche in modalità testuale, ma non modificheranno il tempo del file MIDI.

```
\relative c' {
  \tempo \markup {
    \concat {
      (
      \smaller \general-align #Y #DOWN \note #"16." #1
      " = "
      \smaller \general-align #Y #DOWN \note #"8" #1
      )
    }
  }
  c1
  c4 c' c,2
}
```



I dettagli si trovano in Sezione 1.8.2 [Formatting text], pagina 229.

Vedi anche

Glossario musicale: Sezione “metronomo” in *Glossario Musicale*, Sezione “indicazione di tempo” in *Glossario Musicale*, Sezione “indicazione metronomica” in *Glossario Musicale*.

Guida alla notazione: Sezione 1.8.2 [Formatting text], pagina 229, Sezione 3.5 [MIDI output], pagina 492.

Frammenti di codice: Sezione “Staff notation” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “MetronomeMark” in *Guida al Funzionamento Interno*.

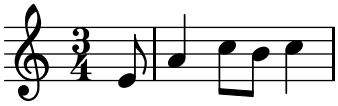
Anacrusi

Le misure parziali, come un *anacrusi* o una battuta in levare, si inseriscono col comando `\partial`,

```
\partial durata
```

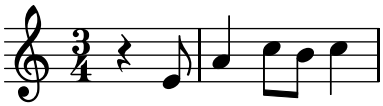
dove *durata* è la lunghezza *rimanente* della misura parziale *prima* dell'inizio della nuova misura completa.

```
\time 3/4
\partial 8
e8 | a4 c8 b c4 |
```



La *durata* può avere qualsiasi valore inferiore a quello di una misura intera:

```
\time 3/4
\partial 4.
r4 e8 | a4 c8 b c4 |
```

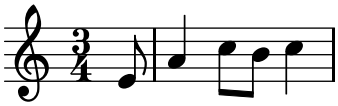


L'espressione `\partial durata` si può scrivere anche così:

```
\set Timing.measurePosition -durata
```

Quindi l'esempio precedente può essere scritto così:

```
\time 3/4
\set Timing.measurePosition = #(ly:make-moment -1/8)
e8 | a4 c8 b c4 |
```



La proprietà `measurePosition` contiene un numero razionale, solitamente positivo, che indica quanto della misura è già passato in quel momento. Il comando `\partial durata` lo imposta su un numero negativo quando ha un senso diverso: in quel caso significa che la battuta corrente (la prima) sarà *preceduta* da una battuta 0 (la battuta parziale) della durata indicata da *durata*.

Vedi anche

Glossario musicale: Sezione "anacrusi" in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩.

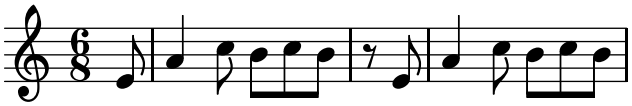
Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Timing_translator" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Il comando `\partial` deve essere usato solo all'inizio di un brano. Se si usa dopo l'inizio, il programma potrebbe emettere degli avvisi o si potrebbero verificare problemi, dunque si consiglia di usare `\set Timing.measurePosition` al suo posto.

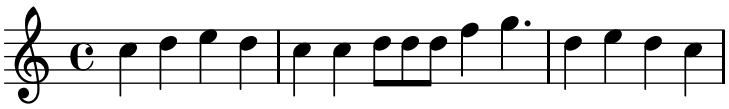
```
\time 6/8
\partial 8
e8 | a4 c8 b[ c b] |
\set Timing.measurePosition = #(ly:make-moment -1/4)
r8 e,8 | a4 c8 b[ c b] |
```



Musica in tempo libero

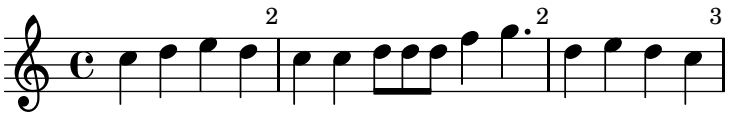
Nella musica in tempo determinato le stanghette vengono inserite e i numeri di battuta sono calcolati automaticamente. Nella musica in tempo libero (ad esempio, la cadenza), questo comportamento non è desiderabile e può essere 'disabilitato' col comando `\cadenzaOn` e poi 'riabilitato' al momento giusto con `\cadenzaOff`.

```
c4 d e d
\cadenzaOn
c4 c d8[ d d] f4 g4.
\cadenzaOff
\bar "|"
d4 e d c
```



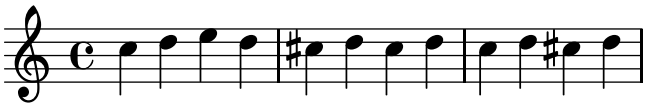
La numerazione delle battute ricomincia alla fine della cadenza.

```
% Mostra tutti i numeri di battuta
\override Score.BarNumber.break-visibility = #all-visible
c4 d e d
\cadenzaOn
c4 c d8[ d d] f4 g4.
\cadenzaOff
\bar "|"
d4 e d c
```



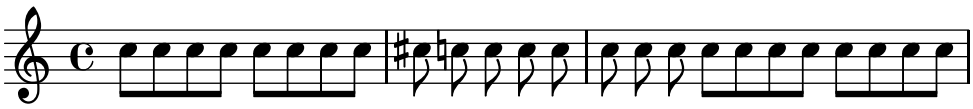
Se si inserisce un comando `\bar` dentro una cadenza non viene iniziata una nuova misura, anche se appare una stanghetta nell'output. Quindi qualsiasi alterazione, che di solito si considera sempre attiva fino alla fine della misura, sarà ancora valida dopo la stanghetta stampata da `\bar`. Se si desidera che le alterazioni successive appaiano, si dovranno inserire manualmente delle alterazioni forzate o di sicurezza, come è spiegato in ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩.

```
c4 d e d
\cadenzaOn
cis4 d cis d
\bar "|"
% Il primo cis viene stampato senza alterazione anche se si trova dopo \bar
cis4 d cis! d
\cadenzaOff
\bar "|"
```



La disposizione automatica delle travature viene disabilitata da `\cadenzaOn`. Quindi tutte le travature nelle cadenze devono essere inserite manualmente. Si veda ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩.

```
\repeat unfold 8 { c8 }
\cadenzaOn
cis8 c c c c
\bar"|"
c8 c c
\cadenzaOff
\repeat unfold 8 { c8 }
```



Questi comandi predefiniti hanno effetto su tutti i righi di una partitura, anche quando inseriti in un solo contesto `Voice`. Per modificare questo comportamento, si sposta `Timing_translator` dal contesto `Score` al contesto `Staff`. Si veda ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩.

Comandi predefiniti

`\cadenzaOn`, `\cadenzaOff`.

Vedi anche

Glossario musicale: Sezione "cadenza" in *Glossario Musicale*.

Guida alla notazione: Sezione 5.4.6 [Visibility of objects], pagina 592, ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩, ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Problemi noti e avvertimenti

Le interruzioni automatiche di linea e di pagina sono possibili solo dopo una stanghetta, quindi per consentire delle interruzioni nei lunghi passaggi di musica in tempo libero è necessario inserire manualmente delle stanghette 'invisibili':

```
\bar ""
```

Bisogna creare esplicitamente un contesto `Voice` quando si inizia un brano con `\cadenzaOn`, altrimenti potrebbero verificarsi errori inattesi.

```
\new Voice {
  \relative c' {
    \cadenzaOn
    c16[^"Solo Free Time" d e f] g2.
    \bar "||"
    \cadenzaOff
  }
}
```

Notazione polimetrica

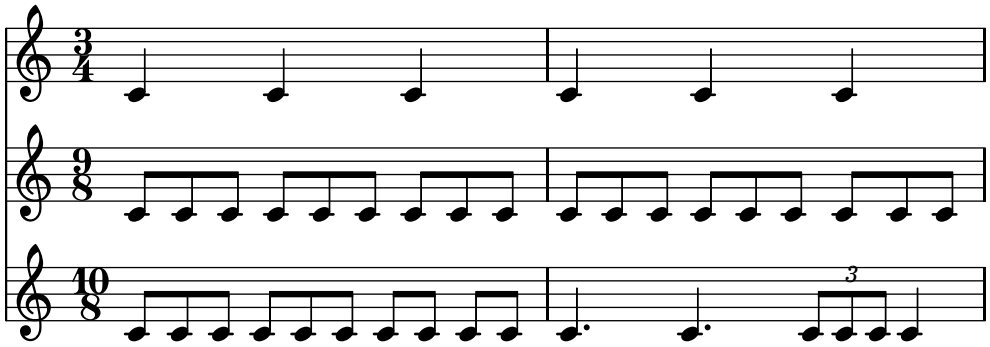
La notazione polimetrica è supportata esplicitamente o tramite la modifica manuale del simbolo d'indicazione di tempo (e la trasformazione della durata delle note).

Diverse indicazioni di tempo con misure di uguale lunghezza

Si sceglie una normale indicazione di tempo per ogni rigo e si imposta `timeSignatureFraction` sulla frazione desiderata. Quindi si usa la funzione `\scaleDurations` per scalare la durata delle note di ogni rigo in modo che rientrino nella comune indicazione di tempo.

Nell'esempio seguente viene messa in parallelo della musica con indicazioni di tempo di 3/4, 9/8 e 10/8. Nel secondo rigo le durate appaiono come moltiplicate per 2/3 (perché 2/3 * 9/8 = 3/4), mentre nel terzo rigo le durate appaiono come moltiplicate per 3/5 (perché 3/5 * 10/8 = 3/4). È possibile che si debbano inserire a mano le travature, perché la scalatura delle durate influenzerà le regole della disposizione automatica delle travature.

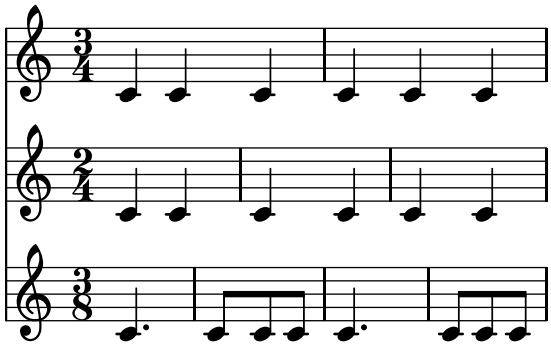
```
\relative c' <<
  \new Staff {
    \time 3/4
    c4 c c |
    c4 c c |
  }
  \new Staff {
    \time 3/4
    \set Staff.timeSignatureFraction = 9/8
    \scaleDurations 2/3
      \repeat unfold 6 { c8[ c c] }
  }
  \new Staff {
    \time 3/4
    \set Staff.timeSignatureFraction = 10/8
    \scaleDurations 3/5 {
      \repeat unfold 2 { c8[ c c] }
      \repeat unfold 2 { c8[ c] } |
      c4. c \tuplet 3/2 { c8[ c c] } c4
    }
  }
>>
```



Diverse indicazioni di tempo con misure di lunghezza non uguale

Si può dare a ogni rigo la sua indicazione di tempo indipendente spostando `Timing_translator` e `Default_bar_line_engraver` nel contesto `Staff`.

```
\layout {
  \context {
    \Score
    \remove "Timing_translator"
    \remove "Default_bar_line_engraver"
  }
  \context {
    \Staff
    \consists "Timing_translator"
    \consists "Default_bar_line_engraver"
  }
}

% Ora ogni rigo ha la sua indicazione di tempo.

\relative c' <<
  \new Staff {
    \time 3/4
    c4 c c |
    c4 c c |
  }
  \new Staff {
    \time 2/4
    c4 c |
    c4 c |
    c4 c |
  }
  \new Staff {
    \time 3/8
    c4. |
    c8 c c |
    c4. |
    c8 c c |
  }
>>
```



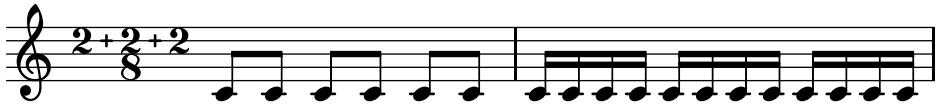
Indicazioni di tempo composto

Si creano con la funzione `\compoundMeter`. La sintassi è:

```
\compoundMeter #'(lista di liste)
```

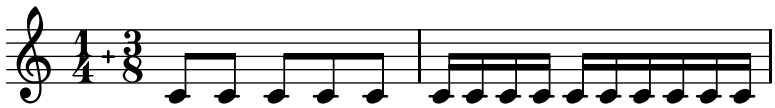
La struttura più semplice è una singola lista, dove l'*ultimo* numero indica il numero inferiore dell'indicazione di tempo e i numeri precedenti indicano i numeri superiori del segno di tempo.

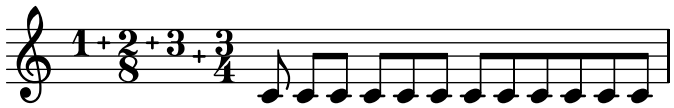
```
\relative c' {
  \compoundMeter #'((2 2 2 8))
  \repeat unfold 6 c8 \repeat unfold 12 c16
}
```



Si possono costruire tempi più complessi tramite ulteriori liste. Le impostazioni della disposizione automatica delle travature varieranno a seconda di questi valori.

```
\relative c' {
  \compoundMeter #'((1 4) (3 8))
  \repeat unfold 5 c8 \repeat unfold 10 c16
}

\relative c' {
  \compoundMeter #'((1 2 3 8) (3 4))
  \repeat unfold 12 c8
}
```





Vedi anche

Glossario musicale: Sezione "polimetrico" in *Glossario Musicale*, Sezione "indicazione di tempo polimetrico" in *Glossario Musicale*, Sezione "tempo" in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Automatic beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩, ⟨undefined⟩ [Scaling durations], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "TimeSignature" in *Guida al Funzionamento Interno*, Sezione "Timing_translator" in *Guida al Funzionamento Interno*, Sezione "Default_bar_line_engraver" in *Guida al Funzionamento Interno*, Sezione "Staff" in *Guida al Funzionamento Interno*.

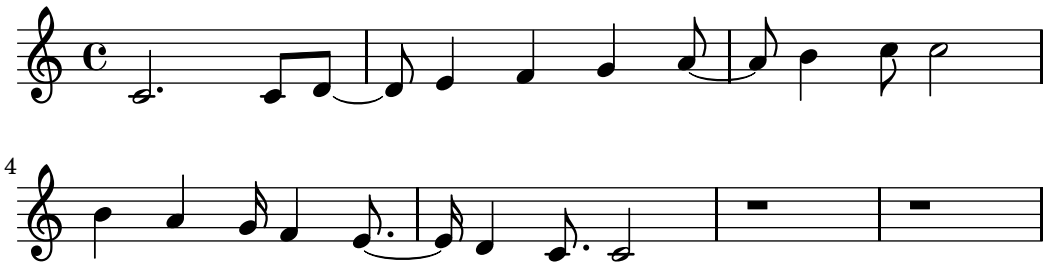
Problemi noti e avvertimenti

Quando si usano indicazioni di tempo diverse in parallelo, le note che si trovano nello stesso momento saranno poste nella stessa posizione sull'asse orizzontale. Tuttavia le stanghette dei vari righi faranno sì che la spaziatura delle note sia meno regolare in ciascun rigo di quanto accadrebbe normalmente senza le diverse indicazioni di tempo.

Divisione automatica delle note

Le note lunghe che oltrepassano le stanghette possono essere convertite automaticamente in note con legature di valore sostituendo l'incisore `Note_heads_engraver` con `Completion_heads_engraver`. Analogalmente, le pause lunghe che oltrepassano le stanghette possono essere divise automaticamente sostituendo `Rest_engraver` con `Completion_rest_engraver`. Nell'esempio seguente, le note e le pause che attraversano le stanghette vengono divise e le note sono anche connesse con legature di valore.

```
\new Voice \with {
  \remove "Note_heads_engraver"
  \consists "Completion_heads_engraver"
  \remove "Rest_engraver"
  \consists "Completion_rest_engraver"
}

{ c2. c8 d4 e f g a b c8 c2 b4 a g16 f4 e d c8. c2 r1*2 }
```



Questi incisori dividono tutte le note e le pause nel punto in cui si trova la stanghetta e inseriscono le legature di valore. Uno dei suoi usi possibili è la verifica di partiture complesse: se le misure non sono riempite interamente, le legature di valore mostrano esattamente di quanto è spostata ogni misura.

Vedi anche

Glossario musicale: Sezione "legatura di valore" in *Glossario Musicale*

Manuale di apprendimento: Sezione "Engravers explained" in *Manuale di Apprendimento*, Sezione "Adding and removing engravers" in *Manuale di Apprendimento*.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Note_heads_engraver" in *Guida al Funzionamento Interno*, Sezione "Completion_heads_engraver" in *Guida al Funzionamento Interno*, Sezione "Rest_engraver" in *Guida al Funzionamento Interno*, Sezione "Completion_rest_engraver" in *Guida al Funzionamento Interno*, Sezione "Forbid_line_break_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

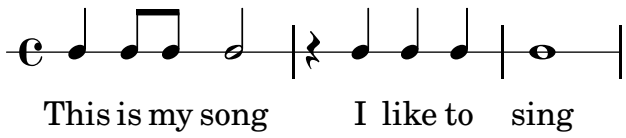
Non tutte le durate (specialmente quelle che contengono gruppi irregolari) possono essere rappresentate esattamente con normali note e punti, ma l'incisore `Completion_heads_engraver` non inserirà gruppi irregolari.

L'incisore `Completion_heads_engraver` ha effetto solo sulle note, non divide le pause.

Mostrare i ritmi della melodia

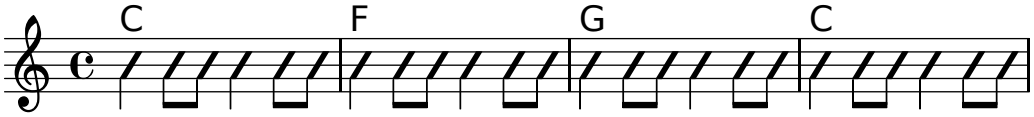
È possibile mostrare soltanto il ritmo di una melodia usando il rigo ritmico. Tutte le altezze delle note su tale rigo sono schiacciate e il rigo stesso ha una sola linea

```
<<
  \new RhythmicStaff {
    \new Voice = "myRhythm" {
      \time 4/4
      c4 e8 f g2
      r4 g g f
      g1
    }
  }
  \new Lyrics {
    \lyricsto "myRhythm" {
      This is my song
      I like to sing
    }
  }
>>
```



I diagrammi degli accordi per chitarra di solito mostrano i ritmi di accompagnamento. Si possono visualizzare usando l'incisore `Pitch_squash_engraver` e il comando `\improvisationOn`.

```
<<
  \new ChordNames {
    \chordmode {
      c1 f g c
    }
  }
  \new Voice \with {
    \consists "Pitch_squash_engraver"
  } \relative c'' {
    \improvisationOn
    c4 c8 c c4 c8 c
    f4 f8 f f4 f8 f
    g4 g8 g g4 g8 g
    c4 c8 c c4 c8 c
  }
>>
```



Comandi predefiniti

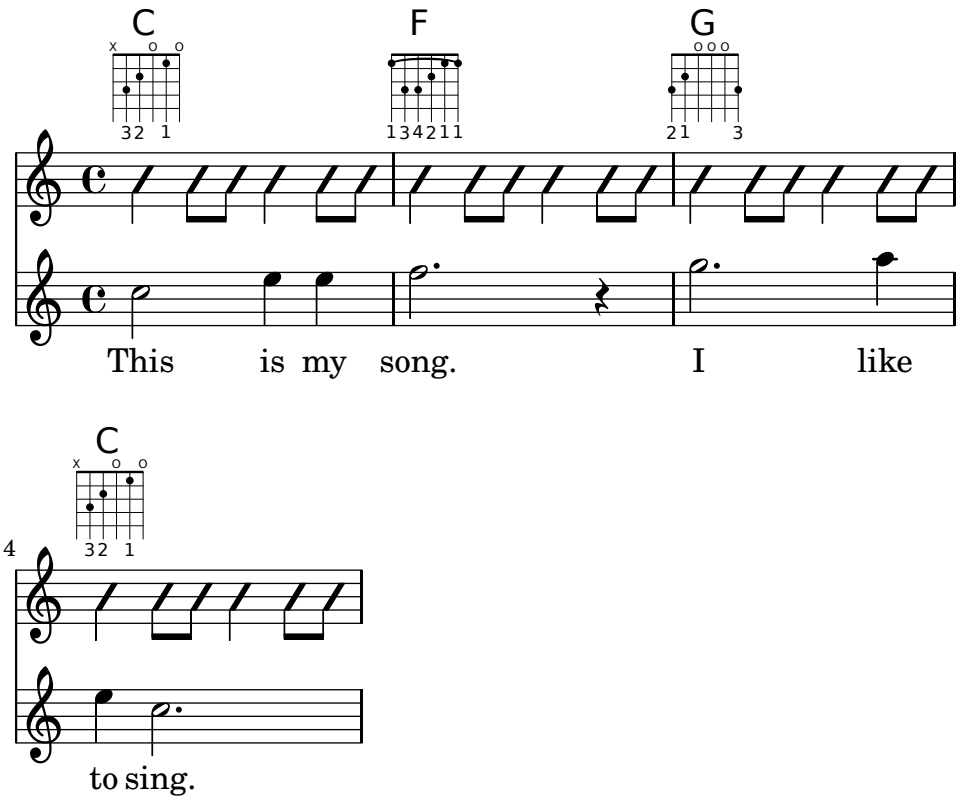
`\improvisationOn`, `\improvisationOff`.

Frammenti di codice selezionati

Ritmi di accompagnamento per chitarra

Per la musica per chitarra, è possibile mostrare i ritmi di accompagnamento, insieme alle note della melodia e ai nomi e ai diagrammi degli accordi.

```
\include "predefined-guitar-fretboards.ly"
<<
  \new ChordNames {
    \chordmode {
      c1 | f | g | c
    }
  }
  \new FretBoards {
    \chordmode {
      c1 | f | g | c
    }
  }
  \new Voice \with {
    \consists "Pitch_squash_engraver"
  } {
    \relative c'' {
      \improvisationOn
      c4 c8 c c4 c8 c
      f4 f8 f f4 f8 f
      g4 g8 g g4 g8 g
      c4 c8 c c4 c8 c
    }
  }
  \new Voice = "melody" {
    \relative c'' {
      c2 e4 e4
      f2. r4
      g2. a4
      e4 c2.
    }
  }
  \new Lyrics {
    \lyricsto "melody" {
      This is my song.
      I like to sing.
    }
  }
>>
```



Vedi anche

Frammenti di codice: Sezione “Rhythms” in *Frammenti di codice*.

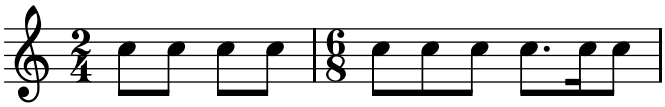
Guida al funzionamento interno: Sezione “RhythmicStaff” in *Guida al Funzionamento Interno*, Sezione “Pitch_squash_engraver” in *Guida al Funzionamento Interno*.

1.2.4 Travature

Travature automatiche

Le travature sono inserite automaticamente:

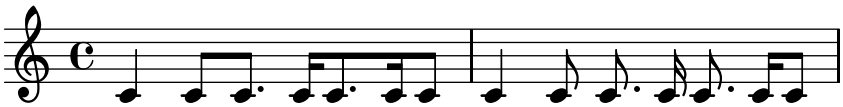
```
\time 2/4 c8 c c c
\time 6/8 c8 c c c8. c16 c8
```



Se queste decisioni automatiche non sono soddisfacenti, si può definire esplicitamente la disposizione delle travature, come è spiegato in ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩. Le travature *devono* essere inserite manualmente se devono estendersi oltre le pause.

La disposizione automatica delle travature, se non necessaria, può essere disabilitata con `\autoBeamOff` e riabilitata con `\autoBeamOn`:

```
c4 c8 c8. c16 c8. c16 c8
\autoBeamOff
c4 c8 c8. c16 c8.
\autoBeamOn
c16 c8
```



Nota: Se si usano le travature per indicare i melismi nelle canzoni, occorre disabilitare la disposizione automatica delle travature con `\\autoBeamOff` e le travature devono essere indicate manualmente. L'uso di `\partcombine` insieme a `\autoBeamOff` può produrre risultati inattesi. Si vedano i frammenti di codice per avere maggiori informazioni.

Si possono creare dei modelli di disposizione delle travature diversi da quelli automatici predefiniti, come è spiegato in ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩.

Comandi predefiniti

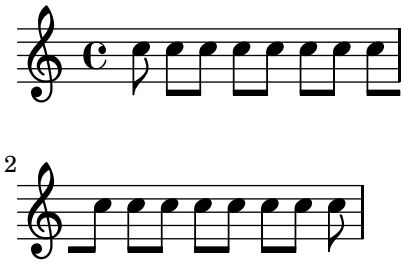
`\autoBeamOff`, `\autoBeamOn`.

Frammenti di codice selezionati

Travature che attraversano le interruzioni di linea

Le interruzioni di linea sono di norma proibite quando le travature attraversano la stanghetta di una battuta. Si può cambiare questo comportamento nel modo seguente:

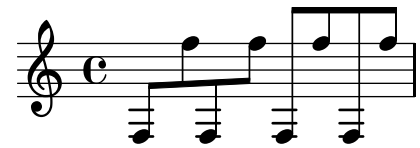
```
\relative c'' {
  \override Beam.breakable = ##t
  c8 c[ c] c[ c] c[ c] c[ \break
  c8] c[ c] c[ c] c[ c] c
}
```



Modificare la distanza delle travature angolari

Le travature angolari vengono inserite automaticamente quando viene rilevata un'ampia distanza tra le teste di nota. Questo comportamento può essere regolato attraverso la proprietà `auto-knee-gap`. Viene disegnata una travatura angolare se la distanza è più grande del valore di `auto-knee-gap` più la larghezza della travatura (che dipende dalla durata delle note e dall'inclinazione della travatura). Il valore predefinito di `auto-knee-gap` è 5.5 spazi rigo.

```
{
  f8 f''8 f8 f''8
  \override Beam.auto-knee-gap = #6
  f8 f''8 f8 f''8
}
```



Partcombine e autoBeamOff

La funzione `\autoBeamOff`, se usata insieme a `\partcombine`, può essere difficile da comprendere.

È preferibile usare invece

`\set Staff.autoBeaming = ##f`

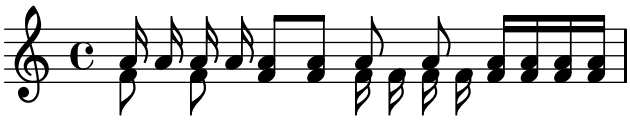
per assicurarsi che la disposizione delle travature sia disabilitata per tutto il rigo.

`\partcombine` funziona con 3 voci – gambo in su singolo, gambo in giù singolo, gambo in su unito.

L'uso di `\autoBeamOff` all'interno del primo argomento di partcombine ha effetto sulla voce che è attiva al momento in cui la funzione viene elaborata, ovvero sul gambo in su singolo o sul gambo in giù unito. L'uso di `\autoBeamOff` nel secondo argomento avrà effetto sulla voce che ha il gambo in giù singolo.

Per poter usare `\autoBeamOff` per impedire tutte le disposizioni automatiche delle travature, se usato con `\partcombine`, è necessario richiamare tre volte la funzione `\autoBeamOff`.

```
{
  %\set Staff.autoBeaming = ##f % turns off all autobeaming
  \partcombine
  {
    \autoBeamOff % applies to split up stems
    \repeat unfold 4 a'16
    %\autoBeamOff % applies to combined up stems
    \repeat unfold 4 a'8
    \repeat unfold 4 a'16
  }
  {
    \autoBeamOff % applies to down stems
    \repeat unfold 4 f'8
    \repeat unfold 8 f'16 |
  }
}
```



Vedi anche

Guida alla notazione: ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩.

File installati: '`scm/auto-beam.scm`'.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Auto_beam_engraver" in *Guida al Funzionamento Interno*, Sezione "Beam_engraver" in *Guida al Funzionamento Interno*, Sezione "Beam" in *Guida al Funzionamento Interno*, Sezione "BeamEvent" in *Guida al Funzionamento Interno*, Sezione "BeamForbidEvent" in *Guida al Funzionamento Interno*, Sezione "beam-interface" in *Guida al Funzionamento Interno*, Sezione "unbreakable-spanner-interface" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Le proprietà di una travatura sono determinate all'*inizio* della sua costruzione e qualsiasi ulteriore modifica alle sue proprietà che venga fatta prima che la travatura sia stata completata non avrà effetto finché non inizia la *successiva*, nuova travatura.

Impostare il comportamento della travatura automatica

Quando la disposizione automatica delle travature è abilitata, la disposizione delle travature è determinata da tre proprietà di contesto: `baseMoment`, `beatStructure` e `beamExceptions`. I valori predefiniti di queste variabili possono essere sovrascritti, come vedremo tra breve, oppure si possono cambiare i valori predefiniti stessi, come è spiegato in ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

Se è definita una regola `beamExceptions` per l'indicazione di tempo corrente, è quella regola soltanto a determinare la disposizione delle travature; i valori di `baseMoment` e `beatStructure` vengono ignorati. Se non è definita alcuna regola `beamExceptions` per l'indicazione di tempo corrente, la disposizione delle travature è determinata dai valori di `baseMoment` e `beatStructure`.

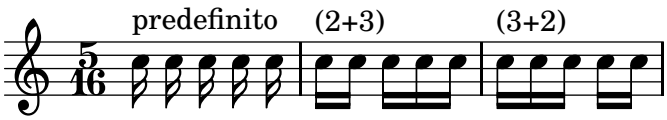
Disposizione delle travature basata su `baseMoment` *e* `beatStructure`

Dato che le indicazioni di tempo più comuni hanno delle regole `beamExceptions` già definite, occorre disabilitarle se la disposizione automatica deve basarsi su `baseMoment` e `beatStructure`. Le regole `beamExceptions` si disabilitano con questo comando

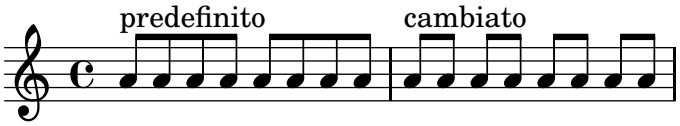
```
\set Timing.beamExceptions = #'()
```

Quando `beamExceptions` è impostato su `#'()`, o per impostazione esplicita o perché non sono state definite internamente le `beamExceptions` per l'indicazione di tempo corrente, le estremità delle travature si trovano sui battiti come specificato dalle proprietà di contesto `baseMoment` e `beatStructure`. `beatStructure` è una lista *scheme* che definisce la lunghezza di ogni battito nella misura in unità di `baseMoment`. Per impostazione predefinita, `baseMoment` è uno fratto il denominatore dell'indicazione di tempo e ogni unità di `baseMoment` corrisponde a un singolo battito.

```
\time 5/16
c16^"predefinito" c c c c |
% È improbabile che per un tempo di 5/16 sia stata definita beamExceptions,
% ma disabilitiamola lo stesso per sicurezza
\set Timing.beamExceptions = #'()
\set Timing.beatStructure = #'(2 3)
c16^"(2+3)" c c c c |
\set Timing.beatStructure = #'(3 2)
c16^"(3+2)" c c c c |
```

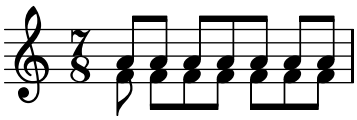



```
\time 4/4
a8^"predefinito" a a a a a a
% Disabilita beamExceptions perché è senz'altro definita
% per il tempo 4/4
\set Timing.beamExceptions = #'()
\set Timing.baseMoment = #(ly:make-moment 1/4)
\set Timing.beatStructure = #'(1 1 1 1)
a8^"cambiato" a a a a a a
```



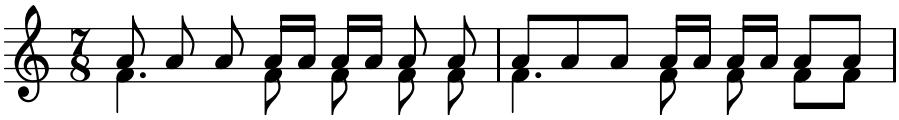
Le modifiche alle impostazioni delle travature possono essere limitate a contesti specifici. Se non si specifica alcuna impostazione in un contesto di livello più basso, verrà applicata l'impostazione del contesto che lo contiene.

```
\new Staff {
  \time 7/8
  % Nessun bisogno di disabilitare beamExceptions perché non è definita per il tempo 7/

  \set Staff.beatStructure = #'(2 3 2)
  <<
    \new Voice = one {
      \relative c'' {
        a8 a a a a a a
      }
    }
    \new Voice = two {
      \relative c' {
        \voiceTwo
        \set Voice.beatStructure = #'(1 3 3)
        f8 f f f f f f
      }
    }
  >>
}
```



Quando si usano varie voci, occorre specificare il contesto `Staff` se si vuole applicare la disposizione delle travature a tutte le voci del rigo:

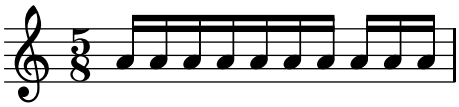
```
\time 7/8
% ritmo 3-1-1-2
% Se non si specifica il contesto, la modifica viene applicata a Voice e quindi non fun
% Dato che le voci sono autogenerate, tutto il ritmo avrà come baseMoment (1 . 8)
\set beatStructure = #'(3 1 1 2)
<< {a8 a a a16 a a a a8 a} \\ {f4. f8 f f f} >>

% Funziona correttamente se si specifica il contesto Staff
\set Staff.beatStructure = #'(3 1 1 2)
<< {a8 a a a16 a a a a8 a} \\ {f4. f8 f f f} >>
```



Il valore di `baseMoment` può essere regolato in modo da cambiare il comportamento delle travature, se si vuole. In questo caso occorre cambiare anche il valore di `beatStructure` così che sia compatibile col nuovo valore di `baseMoment`.

```
\time 5/8
% Nessun bisogno di disabilitare beamExceptions perché non è definita per il tempo 5/8
\set Timing.baseMoment = #(ly:make-moment 1/16)
```

```
\set Timing.beatStructure = #'(7 3)
\repeat unfold 10 { a16 }
```



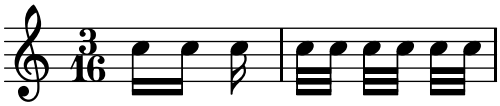
`baseMoment` è un *momento*, ovvero un'unità della durata musicale. Una quantità di tipo *moment* viene creata dalla funzione scheme `ly:make-moment`. Per maggiori informazioni su questa funzione, si veda ⟨undefined⟩ [Time administration], pagina ⟨undefined⟩.

Per impostazione predefinita, `baseMoment` ha un valore di uno fratto il denominatore dell'indicazione di tempo. Le eccezioni a questa regola si trovano in '`scm/time-signature-settings.scm`'.

Disposizione delle travature con `beamExceptions`

Le regole speciali di disposizione automatica delle travature (diverse da quelle che determinano dove terminare una travatura su un battito) sono definite nella proprietà `beamExceptions`.

```
\time 3/16
\set Timing.beatStructure = #'(2 1)
\set Timing.beamExceptions =
  #'(                          ;inizio della lista di associazioni (alist)
     (end .                    ;estremità delle travature
      (                        ;inizio della lista che indica le estremità
       ((1 . 32) . (2 2 2))    ;regola per le travature da 1/32 -- termina ognuna a 1/16
      )))                      %chiude tutti gli elementi
c16 c c |
\repeat unfold 6 { c32 } |
```



`beamExceptions` è una lista di associazioni (*alist*) che ha una chiave che indica il tipo di regola e un valore che esprime le regole di disposizione delle travature.

Al momento l'unico tipo di regola disponibile è `'end`, che specifica il termine della travatura.

Le regole di disposizione delle travature sono una lista di associazione scheme (o lista di coppie) che indica il tipo di travatura e la modalità di raggruppamento da applicare alle travature contenenti note dalla durata più breve del tipo di travatura a loro assegnato.

```
#'((travatura-1 . raggruppamento-1)
   (travatura-2 . raggruppamento-2)
   (travatura-3 . raggruppamento-3))
```

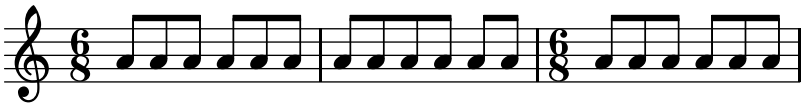
Il tipo di travatura è una coppia scheme che indica la durata della travatura, ad esempio `(1 . 16)`.

Il raggruppamento è una lista scheme che indica il raggruppamento da usare per la travatura; ha come unità la durata specificata nel tipo di travatura.

Nota: Il valore di `beamExceptions` deve essere una lista *completa* di eccezioni, ovvero bisogna includere tutte le eccezioni che si vogliono applicare. Non è possibile aggiungere, rimuovere o modificare soltanto una eccezione. Anche se questo può sembrare scomodo, significa anche che non c'è bisogno di conoscere le attuali impostazioni delle travature per poter specificare un nuovo modello di disposizione delle travature.

Quando cambia l'indicazione di tempo, vengono impostati i valori predefiniti di `Timing.baseMoment`, `Timing.beatStructure` e `Timing.beamExceptions`. L'impostazione dell'indicazione di tempo ripristina le impostazioni automatiche delle travature del contesto `Timing` ai valori predefiniti.

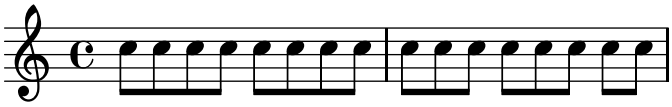
```
\time 6/8
\repeat unfold 6 { a8 }
% raggruppamento (4 + 2)
\set Timing.beatStructure = #'(4 2)
\repeat unfold 6 { a8 }
% ritorno al comportamento predefinito
\time 6/8
\repeat unfold 6 { a8 }
```



Le impostazioni predefinite della disposizione automatica delle travature per ogni tempo sono definite in '`scm/time-signature-settings.scm`'. La loro modifica è descritta in ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

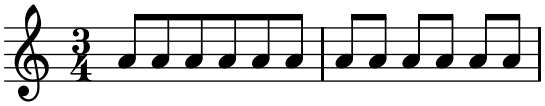
Molte impostazioni di travature automatiche per le indicazioni di tempo hanno un elemento `beamExceptions`. Ad esempio, il tempo 4/4 cerca di creare due travature nella misura se ci sono solo note di un ottavo. La regola `beamExceptions` può sovrascrivere l'impostazione di `beatStructure` se `beamExceptions` non viene annullato.

```
\time 4/4
\set Timing.baseMoment = #(ly:make-moment 1/8)
\set Timing.beatStructure = #'(3 3 2)
% Le travature non saranno raggruppate in (3 3 2) a causa di beamExceptions
\repeat unfold 8 {c8} |
% Il raggruppamento delle travature è (3 3 2) perché abbiamo tolto le impostazioni prec
\set Timing.beamExceptions = #'()
\repeat unfold 8 {c8}
```



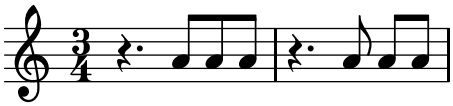
Analogalmente, le note di un ottavo in un tempo 3/4 sono raggruppate in un'unica travatura. Per raggrupparle sul battito, azzera `beamExceptions`.

```
\time 3/4
% il comportamento predefinito è un gruppo di (6) a causa di beamExceptions
\repeat unfold 6 {a8} |
% Le travature saranno raggruppate in (1 1 1) a causa dei valori predefiniti di baseMor
\set Timing.beamExceptions = #'()
\repeat unfold 6 {a8}
```



Nelle partiture del periodo Romantico fino a quello Classico, le travature spesso iniziano a metà della misura in un tempo 3/4; ma la pratica moderna preferisce evitare la falsa impressione di un tempo 6/8 (vedi Gould, p. 153). Si presentano situazioni simili nel tempo 3/8. Questo comportamento è controllato dalla proprietà di contesto `beamHalfMeasure`, che ha effetto soltanto sulle indicazioni di tempo che hanno 3 come numeratore:

```
\time 3/4
r4. a8 a a |
\set Timing.beamHalfMeasure = ##f
r4. a8 a a |
```



Come funziona la disposizione automatica delle travature

Quando la disposizione automatica delle travature è abilitata, la disposizione delle travature è determinata dalle proprietà di contesto `baseMoment`, `beatStructure` e `beamExceptions`.

Nel determinare l'aspetto delle travature vengono applicate le seguenti regole, in ordine di priorità:

- Se si specifica una travatura manuale con `[...]` imposta la travatura in quel modo, altrimenti
- se è definita una regola di fine della travatura in `beamExceptions` per il tipo di travatura in questione, la usa per determinare i punti corretti in cui le travature possono terminare, altrimenti
- se è definita una regola di fine della travatura in `beamExceptions` per un tipo di travatura più lunga, la usa per determinare i punti corretti in cui le travature possono terminare, altrimenti
- usa i valori di `baseMoment` e `beatStructure` per determinare le estremità dei battiti nella misura e terminare le travature alla fine dei battiti.

Nelle regole precedenti, il *tipo di travatura* è la durata della nota più corta nel gruppo della travatura.

Le regole predefinite per le travature si trovano in '`scm/time-signature-settings.scm`'.

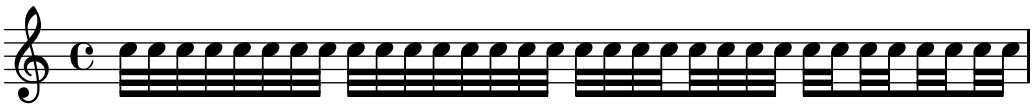
Frammenti di codice selezionati

Suddividere le travature

Le travature di note consecutive di un sedicesimo (o più brevi) non vengono suddivise, ovvero le tre (o più) travature si allungano, senza spezzarsi, su interi gruppi di note. Questo comportamento può essere modificato in modo da suddividere le travature in sottogruppi attraverso la proprietà `subdivideBeams`. Se impostata, le travature multiple verranno suddivise a intervalli definiti dal valore attuale di `baseMoment`, riducendo le travature multiple a una sola travatura che collega i sottogruppi. Si noti che `baseMoment`, se non impostata esplicitamente, equivale a uno fratto il denominatore dell'attuale indicazione di tempo. Deve quindi essere impostata su una frazione che stabilisca la durata del sottogruppo di travature; lo si può fare usando la funzione `ly:make-moment`, come è mostrato in questo frammento di codice. Inoltre quando `baseMoment` cambia, anche `beatStructure` deve essere modificato per accordarsi con `baseMoment`:

```
\relative c'' {
  c32[ c c c c c c c]
```

```
  \set subdivideBeams = ##t
  c32[ c c c c c c c]

  % Set beam sub-group length to an eighth note
  \set baseMoment = #(ly:make-moment 1/8)
  \set beatStructure = #'(2 2 2 2)
  c32[ c c c c c c c]

  % Set beam sub-group length to a sixteenth note
  \set baseMoment = #(ly:make-moment 1/16)
  \set beatStructure = #'(4 4 4 4)
  c32[ c c c c c c c]
}
```



Travatura che segue strettamente il battito

Si possono impostare le lineette della travatura in modo che siano rivolte verso il battito cui appartengono. La prima travatura fa sì che non spuntino le code (comportamento predefinito); la seconda travatura segue esattamente il battito.

```
\relative c'' {
  \time 6/8
  a8. a16 a a
  \set strictBeatBeaming = ##t
  a8. a16 a a
}
```

Segni per la conduzione, segni di raggruppamento della misura

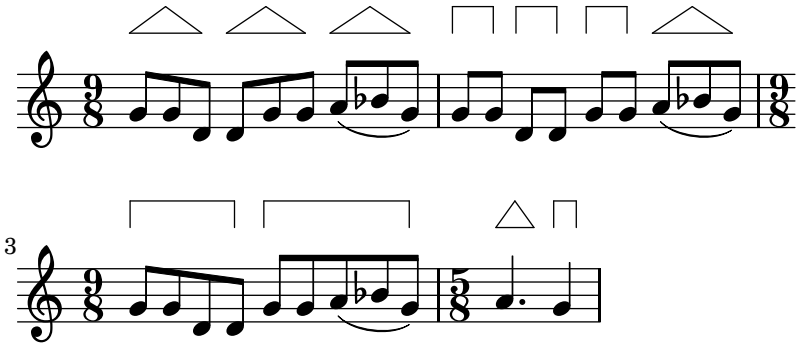
Il raggruppamento dei battiti all'interno della misura è regolato dalla proprietà di contesto `beatStructure`. I valori di `beatStructure` per varie indicazioni di tempo vengono stabiliti in '`scm/time-signature-settings.scm`'. Questi valori possono essere impostati o modificati con `\set`. Altrimenti, si può usare `\time` per impostare sia l'indicazione di tempo che la struttura dei battiti. Per farlo si specifica il raggruppamento interno dei battiti in una misura in una lista di numeri (nella sintassi di Scheme) prima dell'indicazione di tempo.

`\time` agisce nel contesto `Timing`, dunque non reimposterà i i valori di `beatStructure` e `baseMoment` che sono impostati in altri contesti di più basso livello, come `Voice`.

Se si include l'incisore `Measure_grouping_engraver` in uno dei contesti che regolano l'aspetto, appariranno i segni di raggruppamento della misura. Tali segni facilitano la lettura di musica moderna ritmicamente complessa. Nell'esempio la misura di 9/8 è raggruppata in due diversi schemi usando due metodi differenti, mentre la misura di 5/8 è raggruppata in base alle impostazioni predefinite in '`scm/time-signature-settings.scm`':

```
\score {
  \new Voice \relative c'' {
    \time 9/8
    g8 g d d g g a( bes g) |
```

```
    \set Timing.beatStructure = #'(2 2 2 3)
    g8 g d d g g a( bes g) |
    \time #'(4 5) 9/8
    g8 g d d g g a( bes g) |
    \time 5/8
    a4. g4 |
  }
  \layout {
    \context {
      \Staff
      \consists "Measure_grouping_engraver"
    }
  }
}
```

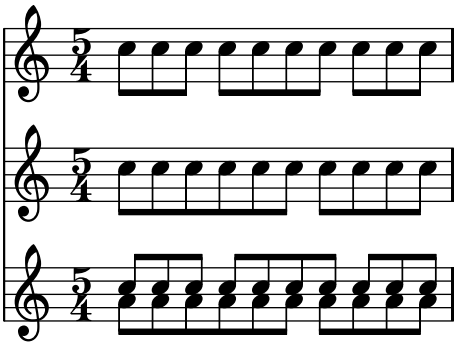


Estremità delle travature nel contesto Score

Le regole relative alle estremità delle travature definite nel contesto `Score` si applicano a tutti i righi, ma possono essere modificate anche ai livelli `Staff` e `Voice`:

```
\relative c'' {
  \time 5/4
  % Set default beaming for all staves
  \set Score.baseMoment = #(ly:make-moment 1/8)
  \set Score.beatStructure = #'(3 4 3)
  <<
    \new Staff {
      c8 c c c c c c c c c
    }
    \new Staff {
      % Modify beaming for just this staff
      \set Staff.beatStructure = #'(6 4)
      c8 c c c c c c c c c
    }
    \new Staff {
      % Inherit beaming from Score context
      <<
        {
          \voiceOne
          c8 c c c c c c c c c
        }
        % Modify beaming for this voice only
        \new Voice {
```

```
            \voiceTwo
            \set Voice.beatStructure = #'(6 4)
            a8 a a a a a a a a
          }
        >>
      }
    >>
  }
```



Vedi anche

Guida alla notazione: ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

File installati: '`scm/time-signature-settings.scm`'.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

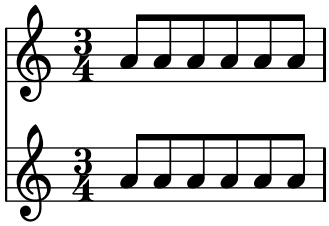
Guida al funzionamento interno: Sezione "Auto_beam_engraver" in *Guida al Funzionamento Interno*, Sezione "Beam" in *Guida al Funzionamento Interno*, Sezione "BeamForbidEvent" in *Guida al Funzionamento Interno*, Sezione "beam-interface" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Se una partitura finisce quando una travatura automatica non è stata terminata e si sta ancora aspettando delle note, quest'ultima travatura non apparirà. Lo stesso vale per le voci polifoniche, inserite con `<< ... \\ ... >>`. Una voce polifonica non apparirà se termina quando una travatura automatica è ancora in attesa di note. Per aggirare questi problemi occorre impostare manualmente l'ultima travatura della voce o della partitura.

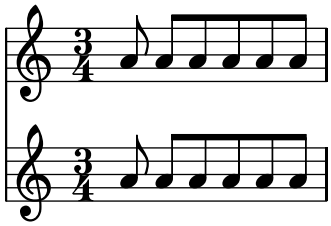
`Timing` è un alias del contesto `Score`. Questo significa che la modifica della disposizione delle travature in un rigo avrà effetto anche sugli altri righi. Quindi un'impostazione di tempo in un rigo successivo reimposterà la disposizione personalizzata delle travature definita in un rigo precedente. Per evitare questo problema si può impostare l'indicazione di tempo su un solo rigo.

```
<<
  \new Staff {
    \time 3/4
    \set Timing.baseMoment = #(ly:make-moment 1/8)
    \set Timing.beatStructure = #'(1 5)
    \repeat unfold 6 { a8 }
  }
  \new Staff {
    \repeat unfold 6 { a8 }
  }
>>
```



Si possono cambiare anche le impostazioni predefinite delle travature, in modo che sia usata sempre la disposizione delle travature desiderata. Le modifiche nelle impostazioni della travatura automatica per le indicazioni di tempo sono descritte in ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

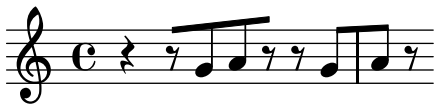
```
<<
  \new Staff {
    \overrideTimeSignatureSettings
      3/4       % timeSignatureFraction
      1/8       % baseMomentFraction
      #'(1 5)   % beatStructure
      #'()              % beamExceptions
    \time 3/4
    \repeat unfold 6 { a8 }
  }
  \new Staff {
    \time 3/4
    \repeat unfold 6 { a8 }
  }
>>
```



Travature manuali

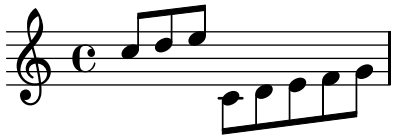
In alcuni casi potrebbe essere necessario scavalcare l'algoritmo di disposizione automatica delle travature. Ad esempio, questo algoritmo non inserirà delle travature tra le pause o tra le stanghette; e nelle partiture corali la disposizione delle travature segue spesso il tempo del testo piuttosto che quello delle note. Tali travature possono essere specificate manualmente contrassegnando i punti iniziali e finali con `[` e `]`.

```
r4 r8[ g' a r] r g[ | a] r
```



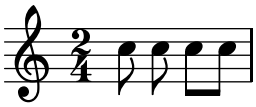
La direzione delle travature può essere impostata manualmente attraverso gli indicatori di direzione:

```
c8^[ d e] c,_[ d e f g]
```



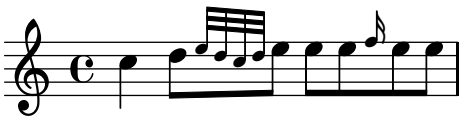
Le note individuali possono essere contrassegnate con `\noBeam` per impedire che vengano inserite in una travatura:

```
\time 2/4
c8 c\noBeam c c
```



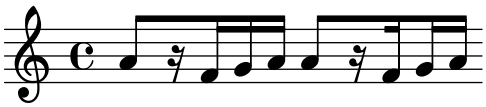
Le travature degli abbellimenti e quelle delle note normali possono verificarsi simultaneamente. Gli abbellimenti privi di travatura non vengono inseriti nella travatura delle note normali.

```
c4 d8[
\grace { e32[ d c d] }
e8] e[ e
\grace { f16 }
e8 e]
```



Si può avere un controllo manuale delle travature ancora più preciso attraverso le proprietà `stemLeftBeamCount` e `stemRightBeamCount`, che specificano il numero di travature da creare a sinistra e a destra della nota successiva. Se una di queste proprietà viene impostata, il suo valore verrà usato una volta sola e poi viene cancellato. In questo esempio, l'ultima nota `f` ha una sola travatura a sinistra, ovvero la travatura di una nota di un ottavo dell'intero gruppo.

```
a8[ r16 f g a]
a8[ r16
\set stemLeftBeamCount = #2
\set stemRightBeamCount = #1
f16
\set stemLeftBeamCount = #1
g16 a]
```



Comandi predefiniti

`\noBeam`.

Frammenti di codice selezionati

Code e punte delle travature

È possibile ottenere delle code su note sole e delle punte all'estremità della travatura con una combinazione di `stemLeftBeamCount`, `stemRightBeamCount` e una coppia di indicatori della travatura `[]`.

Per ottenere delle code che siano rivolte a destra, si usano la coppia di indicatori `[]` e si imposta `stemLeftBeamCount` a zero (vedi Example 1).

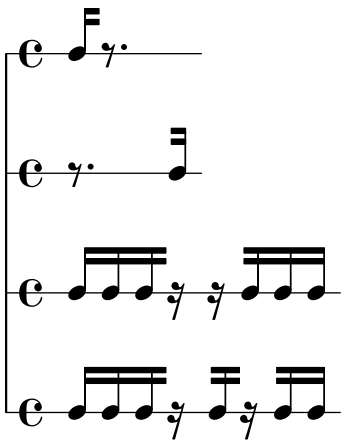
Per ottenere delle code che siano rivolte a sinistra, si imposta invece `stemRightBeamCount` (Example 2).

Perché le punte alla fine di un gruppo di note unite da travatura siano rivolte a destra, si imposta `stemRightBeamCount` su un valore positivo. Perché le punte all'inizio di un gruppo di note unite da travatura siano rivolte a sinistra, si imposta invece `stemLeftBeamCount` (Example 3).

Talvolta, ad esempio per una nota solitaria circondata da pause, ha senso avere una coda che punti sia a destra che a sinistra. Lo si può fare con una coppia di indicatori di travatura `[]` da soli (Example 4).

(Nota che `\set stemLeftBeamCount` è sempre equivalente a `\once \set`. In altre parole, le impostazioni che definiscono il conteggio delle travature non "permangono", quindi la coppia di code attaccate al `c'16[]` solitario nell'ultimo esempio non hanno nulla a che fare con l'impostazione `\set` di due note prima.)

```
\score {
  <<
    % Example 1
    \new RhythmicStaff {
      \set stemLeftBeamCount = #0
      c16[]
      r8.
    }
    % Example 2
    \new RhythmicStaff {
      r8.
      \set stemRightBeamCount = #0
      c16[]
    }
    % Example 3
    \new RhythmicStaff {
      c16 c
      \set stemRightBeamCount = #2
      c16 r r
      \set stemLeftBeamCount = #2
      c16 c c
    }
    % Example 4
    \new RhythmicStaff {
      c16 c
      \set stemRightBeamCount = #2
      c16 r
      c16[]
      r16
      \set stemLeftBeamCount = #2
      c16 c
    }
  >>
}
```



Vedi anche

Guida alla notazione: Sezione 5.4.2 [Direction and placement], pagina 585, ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Beam" in *Guida al Funzionamento Interno*, Sezione "BeamEvent" in *Guida al Funzionamento Interno*, Sezione "Beam_engraver" in *Guida al Funzionamento Interno*, Sezione "beam-interface" in *Guida al Funzionamento Interno*, Sezione "Stem_engraver" in *Guida al Funzionamento Interno*.

Travature convergenti/divergenti

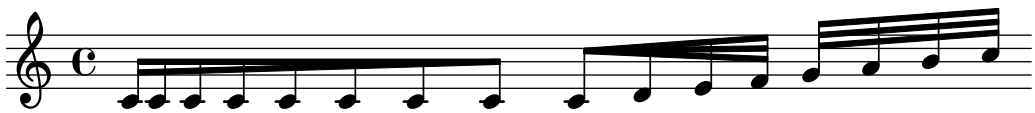
Le travature convergenti o divergenti servono a indicare che un piccolo gruppo di note deve essere suonato a un tempo crescente (o decrescente), senza cambiare il tempo complessivo del brano. L'estensione della travatura convergente o divergente deve essere indicato a mano con `[` e `]`; questo tipo di travatura si attiva specificando la direzione della proprietà `Beam` di `grow-direction`.

Se la disposizione delle note e il suono del file MIDI devono riflettere il *ritardando* o l'*accelerando* indicati dalla travatura convergente/divergente, le note devono essere raggruppate in un'espressione musicale delimitata da parentesi graffe e preceduta dal comando `featherDurations`, che specifica il rapporto tra le durate delle prime e delle ultime note del gruppo.

Le parentesi quadre indicano l'estensione della travatura, mentre quelle graffe indicano quali note devono avere una durata modificata. Di norma queste parentesi delimitano lo stesso gruppo di note, ma questo non è un requisito: i due comandi sono indipendenti.

Nell'esempio seguente le otto note da un sedicesimo occupano esattamente lo stesso tempo di una nota di due quarti, ma la prima nota dura la metà dell'ultima e le note intermedie si allungano gradualmente. Le prime quattro note da un trentaduesimo diventano gradualmente più veloci, mentre le ultime quattro hanno un tempo costante.

```
\override Beam.grow-direction = #LEFT
\featherDurations #(ly:make-moment 2/1)
{ c16[ c c c c c c c] }
\override Beam.grow-direction = #RIGHT
\featherDurations #(ly:make-moment 2/3)
{ c32[ d e f] }
% ripristina le travature normali
\override Beam.grow-direction = #'()
{ g32[ a b c] }
```



La spaziatura rappresenta la durata effettiva delle note solo in modo approssimato, mentre il tempo nel file MIDI è esatto.

Comandi predefiniti

`\featherDurations`.

Vedi anche

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Problemi noti e avvertimenti

Il comando `\featherDurations` funziona solamente con frammenti di musica molto brevi e quando i numeri della frazione sono piccoli.

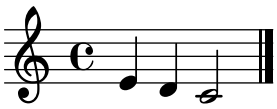
1.2.5 Battute

Stanghette

Le stanghette delimitano le misure e sono usate anche per indicare le ripetizioni. Di norma le stanghette semplici sono inserite automaticamente in base all'indicazione di tempo.

Si possono inserire altri tipi di stanghette col comando `\bar`. Ad esempio, di solito si usa una stanghetta doppia alla fine di un brano:

```
e4 d c2 \bar "|."
```



Se la nota finale in una misura non termina entro la stanghetta inserita automaticamente, non viene segnalato un errore: si presuppone che la nota continui nella misura successiva. Ma se ci sono tante misure simili in sequenza, la musica potrebbe apparire compressa oppure scorrere fuori dalla pagina. Questo accade perché le interruzioni di linea automatiche si verificano solo al termine di misure complete, ovvero quando tutte le note terminano prima dell'inizio di una misura.

> **Nota:** Una durata sbagliata può impedire un'interruzione di linea, causando una linea di musica altamente compressa oppure a musica che prosegue fuori dalla pagina.

Le interruzioni di linea sono permesse anche in caso si stanghette inserite a mano anche all'interno di misure incomplete. Per permettere un'interruzione di linea senza che appaia una stanghetta si usa:

```
\bar ""
```

Questo comando inserirà una stanghetta invisibile e permetterà (senza forzarla) un'interruzione di linea in questo punto. Il contatore dei numeri di battuta non aumenta. Per forzare un'interruzione di linea si veda Sezione 4.3.1 [Line breaking], pagina 517.

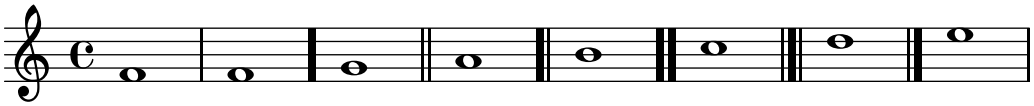
Si possono inserire questa e altre stanghette speciali in qualsiasi punto. Quando coincidono con la fine di una misura, sostituiscono la stanghetta semplice che sarebbe stata inserita lì automaticamente. Quando non coincidono con la fine di una misura, la stanghetta specificata viene inserita in quel punto.

Si noti che le stanghette manuali hanno una funzione puramente visiva. Non hanno alcun effetto sulle proprietà di una normale stanghetta, come i numeri della misura, le alterazioni, le

interruzioni di linea, etc. Non influiscono nemmeno sul conteggio e sulla posizione delle stanghette automatiche successive. Quando una stanghetta manuale è posta nel punto in cui si trova già una normale stanghetta, le caratteristiche della stanghetta originale non sono alterate.

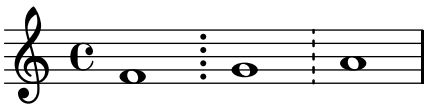
Sono disponibili per l'inserimento manuale due tipi di stanghette semplici e cinque tipi di stanghette doppie:

```
f1 \bar "|"
f1 \bar "."
g1 \bar "||"
a1 \bar ".|"
b1 \bar ".."
c1 \bar "|.|"
d1 \bar "|."
e1
```



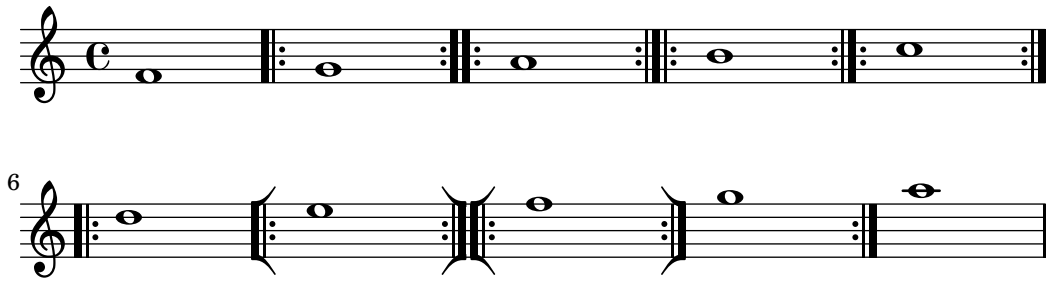
oltre alle stanghette puntate e tratteggiate:

```
f1 \bar ";"
g1 \bar "!"
a1
```



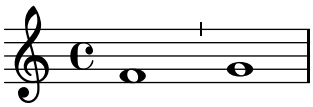
e a nove tipi di stanghette per le ripetizioni:

```
f1 \bar ".|:"
g1 \bar ":..:"
a1 \bar ":|.|:"
b1 \bar ":|.:"
c1 \bar ":.|.:"
d1 \bar "[|:"
e1 \bar ":|][|:"
f1 \bar ":|]"
g1 \bar ":|."
a1
```



Inoltre, una stanghetta può apparire come un semplice segno di spunta:

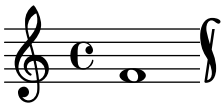
```
f1 \bar "'" g1
```



Tuttavia,dato che questi segni di spunta sono tipicamente usati nel canto gregoriano, è preferibile usare `\divisioMinima`, come è descritto nella sezione [Divisiones], pagina 427 della parte dedicata al canto gregoriano.

Lilypond supporta la notazione russa e fornisce una stanghetta speciale per questo tipo di notazione:

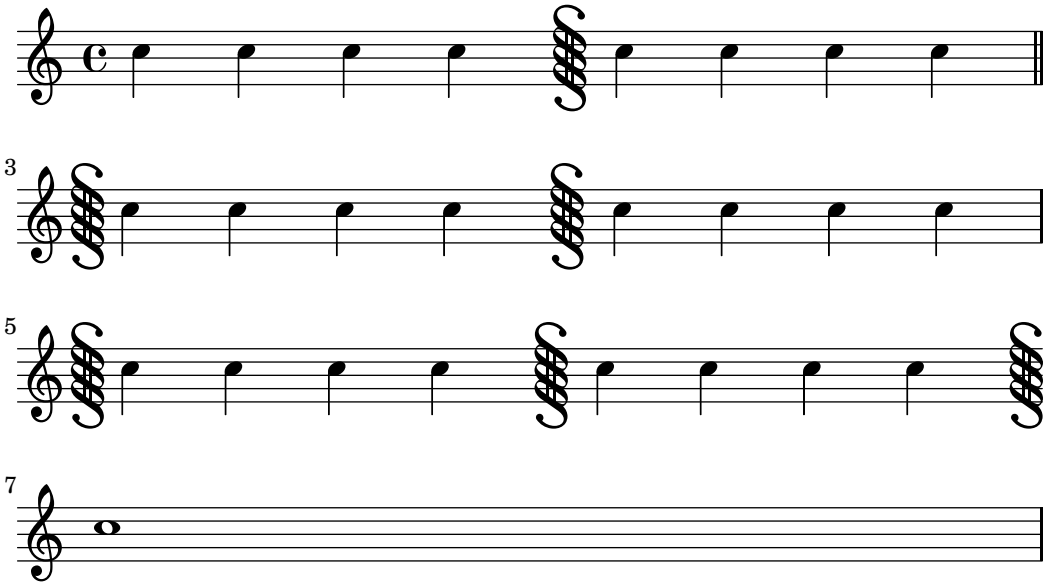
```
f1 \bar "k"
```



I dettagli di questo tipo di notazione sono spiegati in Sezione 2.9.5 [Typesetting Kievan square notation], pagina 436.

Per i segni di tipo segno interni al rigo, ci sono tre tipi di stanghette che differiscono nel comportamento quando incontrano un'interruzione di linea:

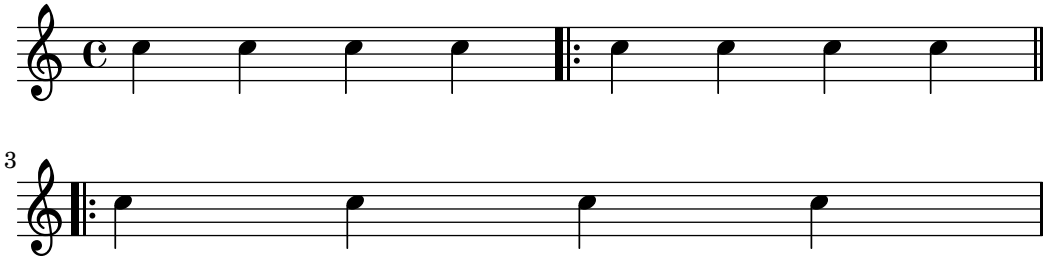
```
c4 c c c
\bar "S"
c4 c c c \break
\bar "S"
c4 c c c
\bar "S-|"
c4 c c c \break
\bar "S-|"
c4 c c c
\bar "S-S"
c4 c c c \break
\bar "S-S"
c1
```



Sebbene le stanghette che indicano le ripetizioni possano essere inserite a mano, non fanno sì che LilyPond riconosca la musica come una sezione da ripetere. Tali sezioni devono essere inserite con i vari comandi di ripetizione (vedi ⟨undefined⟩ [Repeats], pagina ⟨undefined⟩), che creano automaticamente le stanghette appropriate.

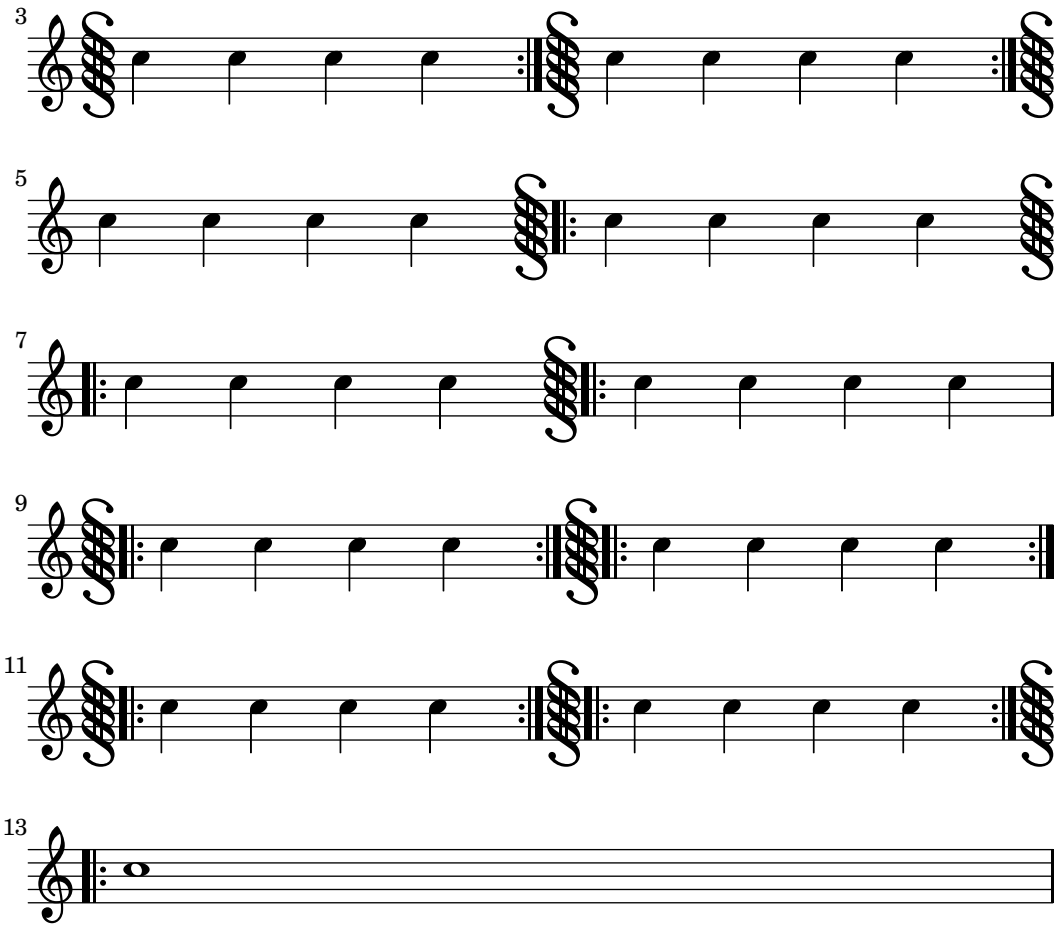
Inoltre si può specificare `".|:-||"`, che è equivalente a `".|:"` tranne in presenza di un'interruzione di linea, dove crea una doppia stanghetta alla fine della linea e una stanghetta di inizio ripetizione all'inizio della linea successiva.

```
c4 c c c
\bar ".|:-||"
c4 c c c \break
\bar ".|:-||"
c4 c c c
```



Per combinare le ripetizioni con i segni di tipo segno, ci sono sei diverse varianti:

```
c4 c c c
\bar ":|.S"
c4 c c c \break
\bar ":|.S"
c4 c c c
\bar ":|.S-S"
c4 c c c \break
\bar ":|.S-S"
c4 c c c
\bar "S.|:-S"
c4 c c c \break
\bar "S.|:-S"
c4 c c c
\bar "S.|:"
c4 c c c \break
\bar "S.|:"
c4 c c c
\bar ":|.S.|:"
c4 c c c \break
\bar ":|.S.|:"
c4 c c c
\bar ":|.S.|:-S"
c4 c c c \break
\bar ":|.S.|:-S"
c1
```



Inoltre esiste un comando `\inStaffSegno` che crea una battuta di tipo segno, posta in cooperazione col comando`\repeat volta`.

Si possono definire nuovi tipi di stanghette con `\defineBarLine`:

`\defineBarLine` *`tipo-stanghetta`* `#'(`*`fine inizio span`*`)`

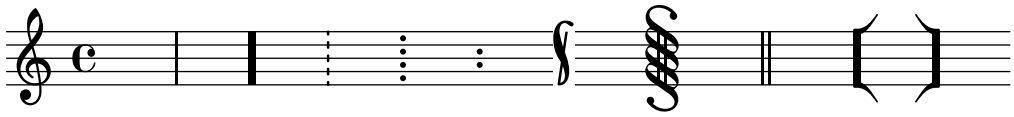
Le variabili di `\defineBarline` possono includere la stringa 'vuota' `""`,che è equivalente a una stanghetta invisibile. Oppure possono essere impostate su `#f`, che fa sì che non appaia alcuna stanghetta.

Dopo averla definita, si può richiamare la nuova stanghetta col comando `\bar` *tipo-stanghetta*.

Attualmente sono disponibile dieci tipi di stanghetta:

```
\defineBarLine ":" #'("" ":" "")
\defineBarLine "=" #'("=" "" "")
\defineBarLine "[" #'("" "[" "")
\defineBarLine "]" #'("]" "" "")

\new Staff {
  s1 \bar "|"
  s1 \bar "."
  s1 \bar "!"
  s1 \bar ";"
  s1 \bar ":"
  s1 \bar "k"
  s1 \bar "S"
  s1 \bar "="
  s1 \bar "["
  s1 \bar "]"
  s1 \bar ""
```

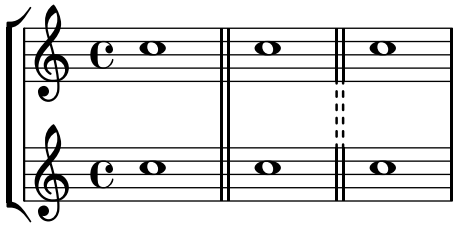
```
}
```



La stanghetta "=" crea la stanghetta doppia, usata insieme al segno. Non deve essere usata per creare una sottile stanghetta doppia che sta per conto suo; in questo caso è preferibile usare \bar "||".

Il segno "-" introduce le annotazioni alle stanghette che servono a distinguere quelle che hanno aspetto identico ma un diverso comportamento in occasione delle interruzioni di linea e/o un diverso modo di connettere le stanghette tra i righi. La parte che segue il segno "-" non viene usato per costruire la stanghetta.

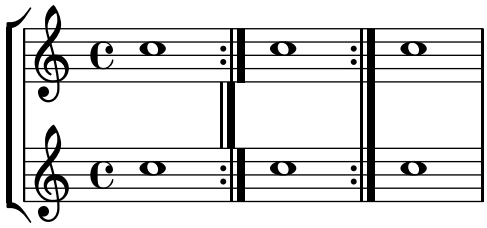
```
\defineBarLine "||-dashedSpan" #'("||" "" "!!")

\new StaffGroup <<
  \new Staff {
    c1 \bar "||"
    c1 \bar "||-dashedSpan"
    c1
  }
  \new Staff {
    c1
    c1
    c1
  }
>>
```



Lo spazio " " fa da segnaposto e fa sì che le stanghette tra i righi siano allineate correttamente alle stanghette principali:

```
\defineBarLine ":|.-sbagliata" #'(":|." "" "|.")
\defineBarLine ":|.-giusta" #'(":|." "" " |.")

\new StaffGroup <<
  \new Staff {
    c1 \bar ":|.-sbagliata"
    c1 \bar ":|.-giusta"
    c1
  }
  \new Staff {
    c1
    c1
    c1
  }
```

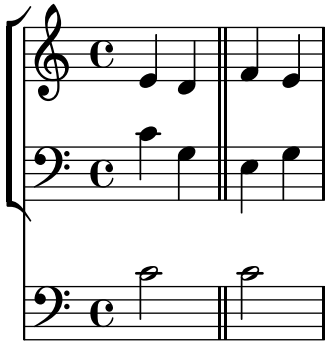
```
>>
```



Se servono ulteriori elementi, LilyPond fornisce un modo semplice per definirli. Maggiori informazioni sulla modifica e l'aggiunta delle stanghette sono presenti nel file '`scm/bar-line.scm`'.

Nelle partiture con molti righi, un comando `\bar` inserito in un rigo viene applicato automaticamente a tutti i righi. Le stanghette risultanti sono connesse tra i diversi righi di un `StaffGroup`, `PianoStaff` o `GrandStaff`.

```
<<
  \new StaffGroup <<
    \new Staff {
      e4 d
      \bar "||"
      f4 e
    }
    \new Staff { \clef bass c4 g e g }
  >>
  \new Staff { \clef bass c2 c2 }
>>
```



Il comando '`\bar` *`tipo-stanghetta`*' è una scorciatoia di '`\set Timing.whichBar =` *`tipo-stanghetta`*'. Una stanghetta viene creata ogni volta che si imposta la proprietà `whichBar`.

Il tipo di stanghetta predefinita per le stanghette inserite automaticamente è `"|"`. Si può modificare in qualsiasi momento con '`\set Timing.defaultBarType =` *`tipo-stanghetta`*'.

Vedi anche

Guida alla notazione: Sezione 4.3.1 [Line breaking], pagina 517, ⟨undefined⟩ [Repeats], pagina ⟨undefined⟩, [Grouping staves], pagina 181.

File installati: '`scm/bar-line.scm`'.

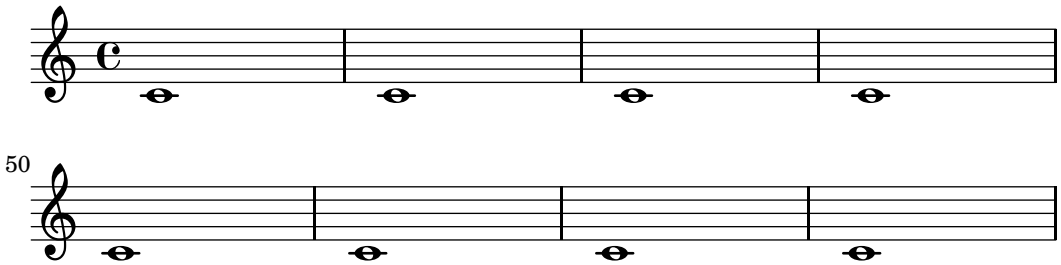
Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "BarLine" in *Guida al Funzionamento Interno* (creata al livello `Staff`), Sezione "SpanBar" in *Guida al Funzionamento Interno* (tra i righi), Sezione "Timing_translator" in *Guida al Funzionamento Interno* (per le proprietà di Timing).

Numeri di battuta

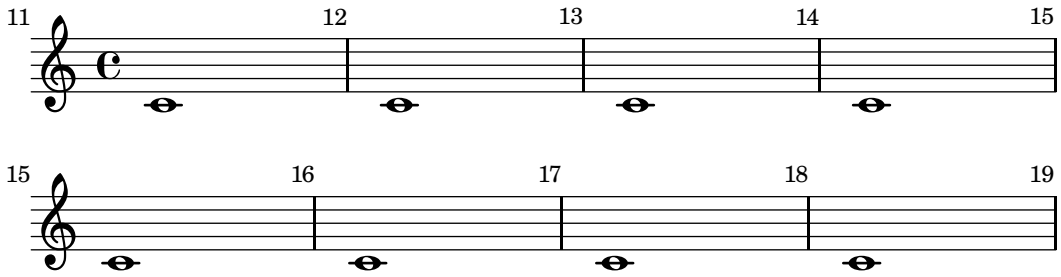
I numeri di battuta appaiono all'inizio di ogni linea eccetto la prima. Il numero viene salvato nella proprietà `currentBarNumber`, che viene aggiornata automaticamente per ogni misura. Può anche essere impostata a mano:

```
c1 c c c
\break
\set Score.currentBarNumber = #50
c1 c c c
```



I numeri di battuta possono essere mostrati a intervalli regolari invece che solo all'inizio di ogni linea. Per farlo occorre sovrascrivere il comportamento predefinito e permettere ai numeri di battuta di apparire anche in punti diversi dall'inizio della linea. Questo comportamento è regolato dalla proprietà `break-visibility` di `BarNumber`, che prende tre valori impostabili su `#t` o `#f` che indicano se il numero di battuta corrispondente debba essere visibile o no. L'ordine dei tre valori è `end of line visible`, `middle of line visible`, `beginning of line visible`. Nell'esempio seguente i numeri di battuta appaiono in tutti i punti possibili:

```
\override Score.BarNumber.break-visibility = ##(#t #t #t)
\set Score.currentBarNumber = #11
% Permette la visualizzazione del primo numero di battuta
\bar ""
c1 | c | c | c
\break
c1 | c | c | c
```



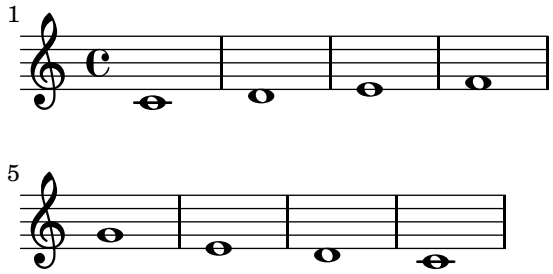
Frammenti di codice selezionati

Mostrare il numero di battuta nella prima misura

Il primo numero di battuta di una partitura viene soppresso se è inferiore o uguale a '1'. Se si imposta `barNumberVisibility` su `all-bar-numbers-visible`, verrà mostrato il numero di battuta della prima misura e di tutte quelle successive. Si noti che perché funzioni è necessario inserire una stanghetta vuota prima della prima nota.

```
\relative c' {
  \set Score.barNumberVisibility = #all-bar-numbers-visible
  \bar ""
```

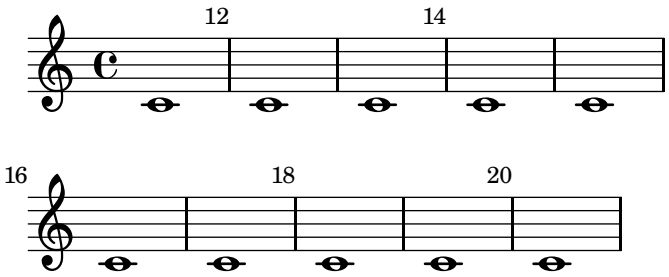
```
  c1 | d | e | f \break
  g1 | e | d | c
}
```



Mostrare i numeri di battuta a intervalli regolari

I numeri di battuta possono essere resi visbili a intervalli regolari attraverso la proprietà `barNumberVisibility`. In questo esempio vengono mostrati ogni due misure eccetto alla fine della linea.

```
\relative c' {
  \override Score.BarNumber.break-visibility = #end-of-line-invisible
  \set Score.currentBarNumber = #11
  % Permit first bar number to be printed
  \bar ""
  % Print a bar number every second measure
  \set Score.barNumberVisibility = #(every-nth-bar-number-visible 2)
  c1 | c | c | c | c
  \break
  c1 | c | c | c | c
}
```

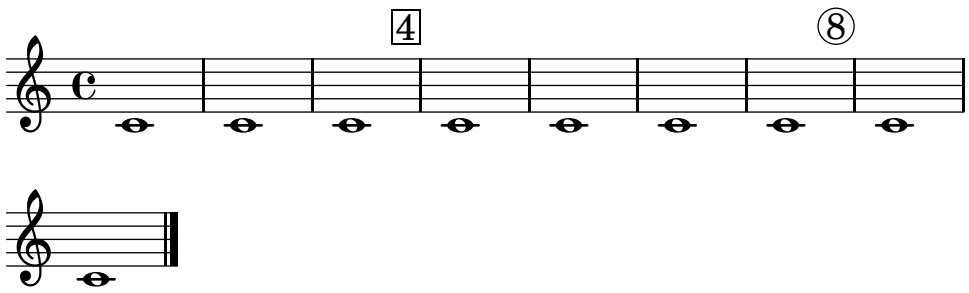


Numeri di battuta racchiusi in rettangoli o cerchi

I numeri di battuta possono apparire anche all'interno di rettangoli o cerchi.

```
\relative c' {
  % Prevent bar numbers at the end of a line and permit them elsewhere
  \override Score.BarNumber.break-visibility = #end-of-line-invisible
  \set Score.barNumberVisibility = #(every-nth-bar-number-visible 4)

  % Increase the size of the bar number by 2
  \override Score.BarNumber.font-size = #2

  % Draw a box round the following bar number(s)
  \override Score.BarNumber.stencil
    = #(make-stencil-boxer 0.1 0.25 ly:text-interface::print)
  \repeat unfold 5 { c1 }
```

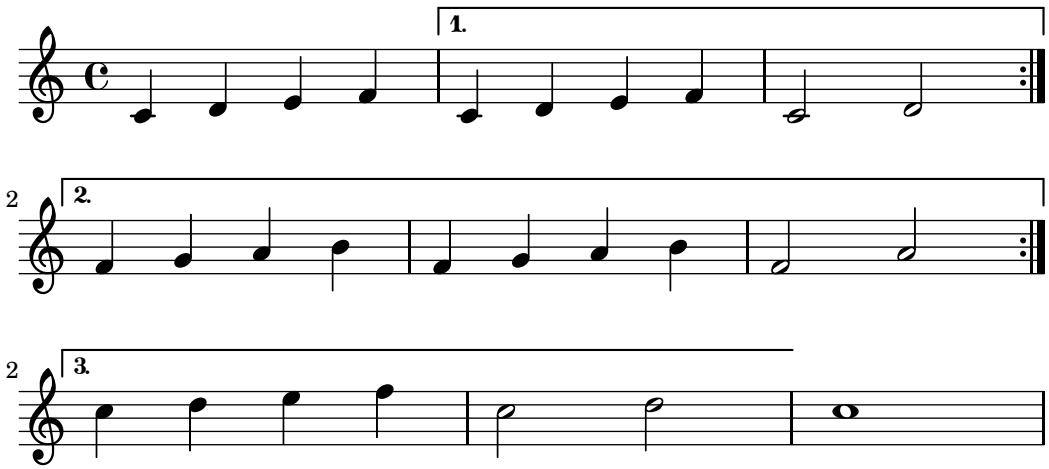
```
  % Draw a circle round the following bar number(s)
  \override Score.BarNumber.stencil
    = #(make-stencil-circler 0.1 0.25 ly:text-interface::print)
  \repeat unfold 4 { c1 } \bar "|."
}
```

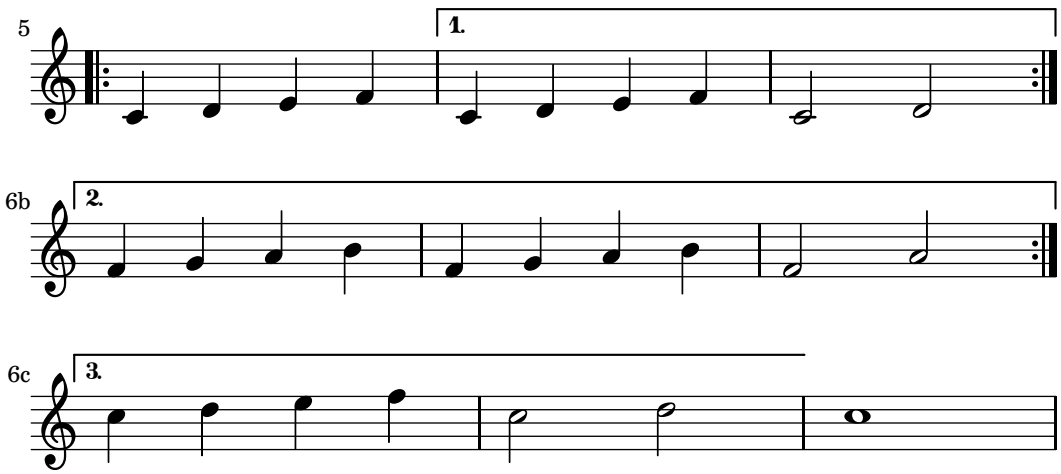


Numeri di battuta alternativi

Si possono impostare due metodi alternativi di numerazione della battuta, utili specialmente per le ripetizioni.

```
\relative c'{
  \set Score.alternativeNumberingStyle = #'numbers
  \repeat volta 3 { c4 d e f | }
    \alternative {
      { c4 d e f | c2 d \break }
      { f4 g a b | f4 g a b | f2 a | \break }
      { c4 d e f | c2 d }
    }
  c1 \break
  \set Score.alternativeNumberingStyle = #'numbers-with-letters
  \repeat volta 3 { c,4 d e f | }
    \alternative {
      { c4 d e f | c2 d \break }
      { f4 g a b | f4 g a b | f2 a | \break }
      { c4 d e f | c2 d }
    }
  c1
}
```

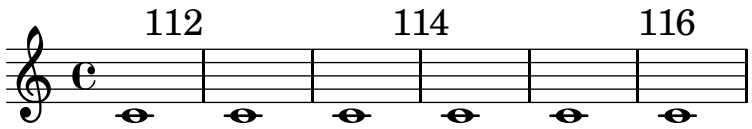




Allineare i numeri di battuta

Per impostazione predefinita i numeri di battuta sono allineati a destra rispetto al loro oggetto genitore. Di solito si tratta del margine sinistro della linea oppure, se i numeri appaiono all'interno della linea, del lato sinistro della stanghetta. I numeri possono essere posizionati anche direttamente sopra la stanghetta oppure allineati a sinistra della stanghetta.

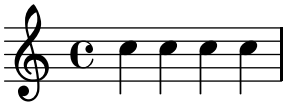
```
\relative c' {
  \set Score.currentBarNumber = #111
  \override Score.BarNumber.break-visibility = #all-visible
  % Increase the size of the bar number by 2
  \override Score.BarNumber.font-size = #2
  % Print a bar number every second measure
  \set Score.barNumberVisibility = #(every-nth-bar-number-visible 2)
  c1 | c1
  % Center-align bar numbers
  \override Score.BarNumber.self-alignment-X = #CENTER
  c1 | c1
  % Left-align bar numbers
  \override Score.BarNumber.self-alignment-X = #LEFT
  c1 | c1
}
```

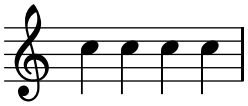


Togliere i numeri di battuta da uno spartito

I numeri di battuta possono essere tolti rimuovendo l'incisore `Bar_number_engraver` dal contesto `Score`.

```
\layout {
  \context {
    \Score
    \remove "Bar_number_engraver"
  }
}

\relative c'' {
  c4 c c c \break
  c4 c c c
}
```





Vedi anche

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "BarNumber" in *Guida al Funzionamento Interno*, Sezione "Bar_number_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

I numeri di battuta possono collidere con la cima della parentesi quadra di `StaffGroup`, se presente. Per evitare la collisione, si può usare la proprietà `padding` di `BarNumber` per posizionare correttamente il numero. Si veda Sezione "StaffGroup" in *Guida al Funzionamento Interno* e Sezione "BarNumber" in *Guida al Funzionamento Interno* per maggiori informazioni.

Controlli di battuta e del numero di battuta

I controlli di battuta aiutano a rilevare gli errori nelle durate. Il controllo di battuta si inserisce col simbolo della barra verticale, `|`, in un qualsiasi punto in cui si prevede che cada la stanghetta. Se vengono trovati controlli di battuta in punti diversi, viene creata una lista di avvisi nel file di log che mostra i numeri di linea e le linee in cui il controllo è fallito. Nell'esempio seguente il secondo controllo di battuta segnalerà un errore.

```
\time 3/4 c2 e4 | g2 |
```

I controlli di battuta possono essere usati anche nel testo vocale:

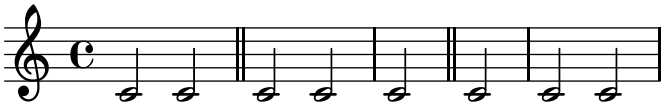
```
\lyricmode {
  \time 2/4
  Twin -- kle | Twin -- kle |
}
```

Una durata non corretta può generare uno spartito completamente alterato, specialmente se il brano è polifonico. Quindi il primo passo da compiere per correggere l'input è la verifica dei controlli di battuta e delle durate sbagliate.

Se i controlli di battuta successivi sono spostati dello stesso intervallo musicale, viene mostrato solo il primo messaggio di avviso. Così l'avvertimento si concentra sulla causa dell'errore di tempo.

È anche possibile ridefinire l'azione da prendere quando si incontra un controllo di battuta o simbolo di barra verticale, `|`, nell'input, in modo che faccuia qualcosa di diverso dal controllo di battuta. Si può fare assegnando un'espressione musicale a `"|"`. Nell'esempio seguente `|`, invece di controllare la fine di una battuta, viene usato per inserire una stanghetta doppia ovunque appaia nell'input.

```
"|" = \bar "||"
{
  c'2 c' |
  c'2 c'
  c'2 | c'
  c'2 c'
}
```



Quando si copiano brani ampi, può essere d'aiuto verificare che i numeri di battuta di LilyPond corrispondano all'originale da cui si sta inserendo il brano. Si può abilitare con `\barNumberCheck`, ad esempio,

```
\barNumberCheck #123
```

genererà un avvertimento se `currentBarNumber` non è 123 nel momento in cui viene elaborato.

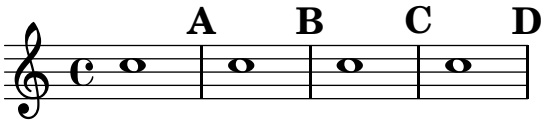
Vedi anche

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Segni di chiamata

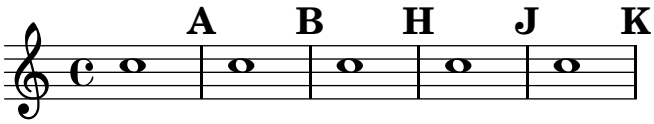
Per creare un segno di chiamata si usa il comando `\mark`.

```
c1 \mark \default
c1 \mark \default
c1 \mark \default
c1 \mark \default
```



Il segno viene incrementato automaticamente se si usa `\mark \default`, ma è possibile usare anche un numero intero come argomento in modo da impostare il segno manualmente. Il valore da usare viene salvato nella proprietà `rehearsalMark`.

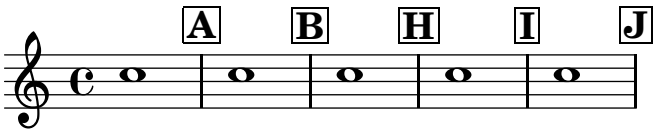
```
c1 \mark \default
c1 \mark \default
c1 \mark #8
c1 \mark \default
c1 \mark \default
```



La lettera 'I' viene saltata, come vuole la tradizione tipografica. Se si desidera includere la lettera 'I', si può usare uno dei seguenti comandi, a seconda dello stile che si vuole (solo lettere, lettere in un quadrato o lettere in un cerchio).

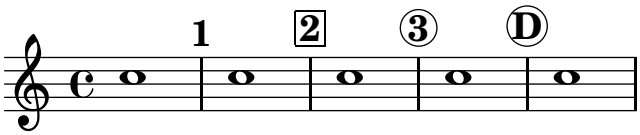
```
\set Score.markFormatter = #format-mark-alphabet
\set Score.markFormatter = #format-mark-box-alphabet
\set Score.markFormatter = #format-mark-circle-alphabet
```

```
\set Score.markFormatter = #format-mark-box-alphabet
c1 \mark \default
c1 \mark \default
c1 \mark #8
c1 \mark \default
c1 \mark \default
```



Lo stile viene definito dalla proprietà `markFormatter`. È una funzione che prende come argomenti il segno corrente (un numero intero) e il contesto corrente. Dovrebbe restituire un oggetto testuale. Nell'esempio seguente, `markFormatter` viene prima impostato su una procedura predefinita e dopo alcune misure su una procedura che produce un numero racchiuso in un quadrato.

```
\set Score.markFormatter = #format-mark-numbers
c1 \mark \default
c1 \mark \default
\set Score.markFormatter = #format-mark-box-numbers
c1 \mark \default
\set Score.markFormatter = #format-mark-circle-numbers
c1 \mark \default
\set Score.markFormatter = #format-mark-circle-letters
c1
```



Il file '`scm/translation-functions.scm`' contiene le definizioni di `format-mark-numbers` (il formato predefinito), `format-mark-box-numbers`, `format-mark-letters` e `format-mark-box-letters`. Possono essere usate come fonte di ispirazione per creare altre funzioni di formattazione.

Si possono usare `format-mark-barnumbers`, `format-mark-box-barnumbers` e `format-mark-circle-barnumbers` per ottenere i numeri di battuta invece di numeri o lettere crescenti.

Si possono specificare manualmente altri stili di segni di chiamata:

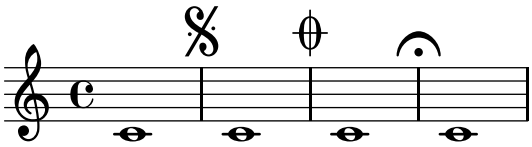
```
\mark "A1"
```

Si noti che `Score.markFormatter` non ha effetto sui segni specificati in questo modo. Tuttavia, è possibile applicare un `\markup` alla stringa.

```
\mark \markup{ \box A1 }
```

I glifi musicali (come il Segno) possono essere posti dentro il comando `\mark`

```
c1 \mark \markup { \musicglyph #"scripts.segno" }
c1 \mark \markup { \musicglyph #"scripts.coda" }
c1 \mark \markup { \musicglyph #"scripts.ufermata" }
c1
```



L'elenco dei simboli che possono essere prodotti con `\musicglyph` si trova in Sezione A.8 [The Feta font], pagina 637.

Per le più comuni modifiche relative al posizionamento dei segni di chiamata, si veda Sezione 1.8.2 [Formatting text], pagina 229. Per ottenere un controllo più preciso si consiglia di studiare il funzionamento della proprietà `break-alignable-interface` descritta in Sezione 5.5.1 [Aligning objects], pagina 599.

Il file '`scm/translation-functions.scm`' contiene le definizioni di `format-mark-numbers` e `format-mark-letters`, che possono essere usate come fonte di ispirazione per creare altre funzioni di formattazione.

Vedi anche

Guida alla notazione: Sezione A.8 [The Feta font], pagina 637, Sezione 1.8.2 [Formatting text], pagina 229, Sezione 5.5.1 [Aligning objects], pagina 599.

File installati: '`scm/translation-functions.scm`'.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

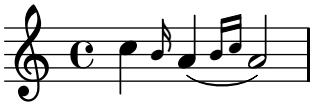
Guida al funzionamento interno: Sezione "MarkEvent" in *Guida al Funzionamento Interno*, Sezione "Mark_engraver" in *Guida al Funzionamento Interno*, Sezione "RehearsalMark" in *Guida al Funzionamento Interno*.

1.2.6 Questioni ritmiche particolari

Abbellimenti

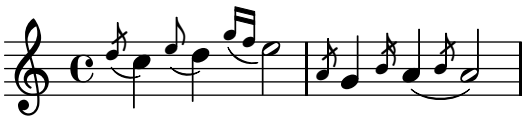
Gli abbellimenti sono degli ornamenti musicali che hanno un tipo di carattere più piccolo e non occupano alcuno spazio temporale in una misura.

```
c4 \grace b16 a4(
\grace { b16[ c16] } a2)
```



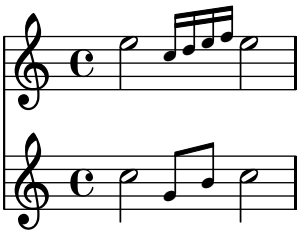
Esistono altri tre tipi di abbellimenti possibili; l'*acciaccatura* – un abbellimento a tempo libero indicato da una nota con legatura di portamento e un gambo barrato – e l'*appoggiatura*, che prende una frazione fissa della nota principale a cui è attaccata e ha un gambo non barrato. È anche possibile creare un abbellimento con gambo barrato, come l'acciaccatura ma senza la legatura di portamento, in modo da posizionarla tra note che sono già legate tra loro: si usa il comando `\slashedGrace`.

```
\acciaccatura d8 c4
\appoggiatura e8 d4
\acciaccatura { g16[ f] } e2
\slashedGrace a,8 g4
\slashedGrace b16 a4(
\slashedGrace b8 a2)
```



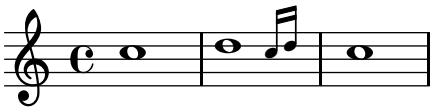
Il posizionamento degli abbellimenti è sincronizzato tra righi diversi. Nell'esempio seguente, ci sono due abbellimenti da un sedicesimo ogni abbellimento da un ottavo

```
<<
  \new Staff { e2 \grace { c16[ d e f] } e2 }
  \new Staff { c2 \grace { g8[ b] } c2 }
>>
```



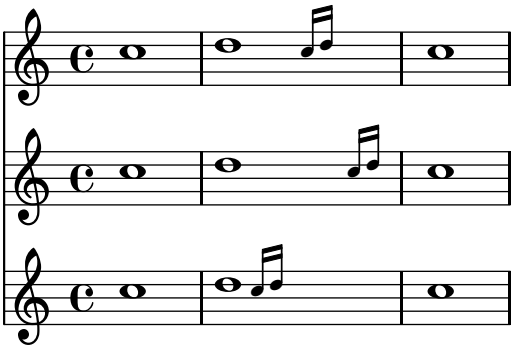
Se si desidera terminare una nota con un abbellimento, si usa il comando `\afterGrace`. Prende due argomenti: la nota principale e gli abbellimenti che la seguono.

```
c1 \afterGrace d1 { c16[ d] } c1
```



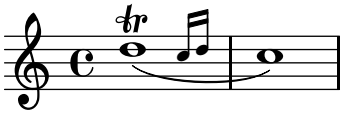
In questo modo gli abbellimenti vengono posizionati dopo uno spazio che dura 3/4 della durata della nota principale. La frazione predefinita 3/4 può essere modificata attraverso `afterGraceFraction`. L'esempio seguente mostra le diverse spaziature che si ottengono con la frazione predefinita, con 15/16 e infine con 1/2 della nota principale.

```
<<
  \new Staff {
    c1 \afterGrace d1 { c16[ d] } c1
  }
  \new Staff {
    #(define afterGraceFraction (cons 15 16))
    c1 \afterGrace d1 { c16[ d] } c1
  }
  \new Staff {
    #(define afterGraceFraction (cons 1 2))
    c1 \afterGrace d1 { c16[ d] } c1
  }
>>
```



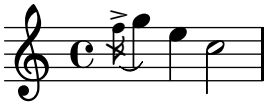
The space between the main note and the grace note may also be specified using spacers. The following example places the grace note after a space lasting 7/8 of the main note.

```
\new Voice {
  <<
    { d1^\trill_( }
    { s2 s4. \grace { c16[ d] } }
  >>
  c1)
}
```



L'espressione musicale introdotta dal comando `\grace` avrà delle impostazioni tipografiche speciali, ad esempio per rimpicciolire il tipo di carattere e impostare le direzioni. Dunque le modifiche che sovrascrivono tali impostazioni speciali devono essere poste all'interno del blocco `\grace`. Lo stesso vale per le modifiche che ripristinano i valori predefiniti. Nell'esempio seguente la direzione predefinita del gambo viene prima sovrascritta e poi ripristinata.

```
\new Voice {
  \acciaccatura {
    \stemDown
    f16->
    \stemNeutral
  }
  g4 e c2
}
```

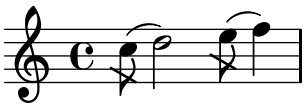


Frammenti di codice selezionati

Usare il gambo barrato degli abbellimenti con le teste normali

Il gambo barrato presente nelle acciaccature può essere applicato in altre situazioni.

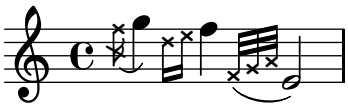
```
\relative c'' {
  \override Flag.stroke-style = #"grace"
  c8( d2) e8( f4)
}
```



Modificare l'aspetto degli abbellimenti di un intero brano

L'aspetto di tutte le espressioni contenute nei blocchi `\grace` di un brano può essere modificato con le funzioni `add-grace-property` e `remove-grace-property`. L'esempio seguente toglie la definizione della direzione di `Stem` nell'abbellimento, in modo che gli abbellimenti non siano sempre rivolti in su, e rende barrate le teste di nota.

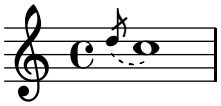
```
\relative c'' {
  \new Staff {
    $(remove-grace-property 'Voice 'Stem 'direction)
    $(add-grace-property 'Voice 'NoteHead 'style 'cross)
    \new Voice {
       \acciaccatura { f16 } g4
       \grace { d16[ e] } f4
       \appoggiatura { f,32[ g a] } e2
    }
  }
}
```



Ridefinire le impostazioni predefinite globali degli abbellimenti

Le impostazioni predefinite globali degli abbellimenti sono salvate negli identificatori `startGraceMusic`, `stopGraceMusic`, `startAcciaccaturaMusic`, `stopAcciaccaturaMusic`, `startAppoggiaturaMusic` e `stopAppoggiaturaMusic`, che sono definiti nel file `ly/grace-init.ly`. Ridefinendoli si possono ottenere altri effetti.

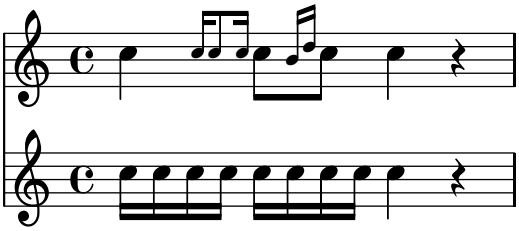
```
startAcciaccaturaMusic = {
  <>(
  \override Flag.stroke-style = #"grace"
  \slurDashed
}

stopAcciaccaturaMusic = {
  \revert Flag.stroke-style
  \slurSolid
  <>)
}

\relative c'' {
  \acciaccatura d8 c1
}
```



Posizionare gli abbellimenti con dello spazio fluttuante

Se si imposta la proprietà `'strict-grace-spacing`, le colonne musicali degli abbellimenti 'fluttuano', ovvero si scollegano dalle note normali: prima vengono spaziate le note normali, poi le colonne musicali degli abbellimenti vengono messe a sinistra delle colonne delle note principali.

```
\relative c'' {
  <<
    \override Score.SpacingSpanner.strict-grace-spacing = ##t
    \new Staff \new Voice {
      \afterGrace c4 { c16[ c8 c16] }
      c8[ \grace { b16[ d] } c8]
      c4 r
    }
    \new Staff {
      c16 c c c c c c c c4 r
    }
  >>
}
```



Vedi anche

Glossario musicale: Sezione "acciaccatura" in *Glossario Musicale*, Sezione "acciaccatura" in *Glossario Musicale*, Sezione "appoggiatura" in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Scaling durations], pagina ⟨undefined⟩, ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩.

File installati: '`ly/grace-init.ly`'.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

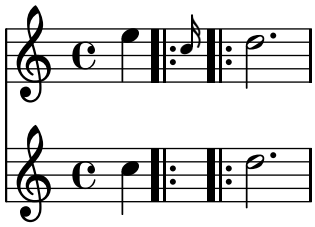
Guida al funzionamento interno: Sezione "GraceMusic" in *Guida al Funzionamento Interno*, Sezione "Grace_beam_engraver" in *Guida al Funzionamento Interno*, Sezione "Grace_engraver" in *Guida al Funzionamento Interno*, Sezione "Grace_spacing_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Una *acciaccatura* con molte note legate da travatura è priva della barratura e ha lo stesso identico aspetto di una *appoggiatura* composta da varie note legate da travatura.

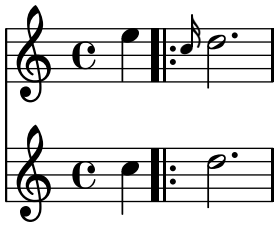
La sincronizzazione degli abbellimenti può nascondere delle sorprese, perché vengono sincronizzati anche altri elementi della notazione del rigo, come le armature di chiave, le stanghette, etc. Fai attenzione quando metti insieme righi che hanno degli abbellimenti con righi che non ne hanno. Ad esmepio

```
<<
  \new Staff { e4 \bar ".|:" \grace c16 d2. }
  \new Staff { c4 \bar ".|:" d2. }
>>
```



Si può ovviare a questo problema inserendo degli abbellimenti della durata corrispondente negli altri righi. Riprendendo l'esempio precedente

```
<<
  \new Staff { e4 \bar ".|:" \grace c16 d2. }
  \new Staff { c4 \bar ".|:" \grace s16 d2. }
>>
```



L'uso degli abbellimenti all'interno dei contesti della voce confonde il modo in cui la voce viene rappresentata. Si può evitare il problema inserendo una pausa o una nota tra il comando della voce e l'abbellimento.

```
accMusic = {
  \acciaccatura { f8 } e8 r8 \acciaccatura { f8 } e8 r4
}

\new Staff {
  <<
    \new Voice {
      \relative c'' {
        r8 r8 \voiceOne \accMusic \oneVoice r8 |
        r8 \voiceOne r8 \accMusic \oneVoice r8 |
      }
    }
    \new Voice {
      \relative c' {
        s8 s8 \voiceTwo \accMusic \oneVoice s8 |
        s8 \voiceTwo r8 \accMusic \oneVoice s8 |
      }
    }
  >>
}
```

Le sezioni con abbellimenti devono essere usate solamente all'interno di espressioni musicali sequenziali. Non è permesso annidare o affiancare gruppi di abbellimenti; potrebbero verificarsi blocchi del programma o altri errori se non si rispetta questa limitazione.

Ogni abbellimento generato nell'output MIDI ha una durata di 1/4 della sua vera durata. Se la durata complessiva degli abbellimenti è maggiore della durata della nota che li precede, verrà generato l'errore "`Going back in MIDI time`". O si diminuisce la durata degli abbellimenti, ad esempio:

```
c'8 \acciaccatura { c'8[ d' e' f' g'] }
```

diventa:

```
c'8 \acciaccatura { c'16[ d' e' f' g'] }
```

Oppure si cambia esplicitamente la durata musicale:

```
c'8 \acciaccatura { \scaleDurations 1/2 { c'8[ d' e' f' g'] } }
```

Vedi ⟨undefined⟩ [Scaling durations], pagina ⟨undefined⟩.

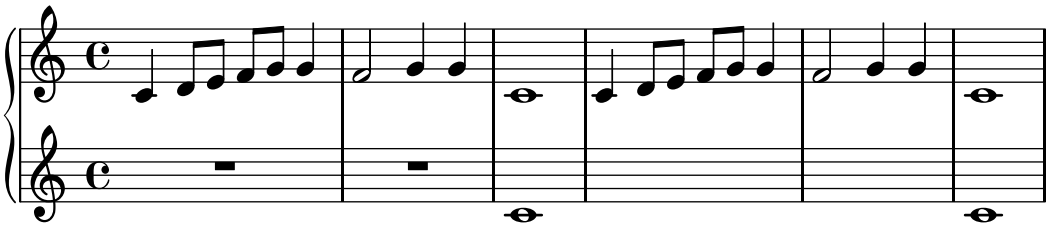
Allineamento sulle cadenze

Nell'ambito di una partitura per orchestra, le cadenze presentano un problema speciale: quando si scrive una partitura che include una cadenza o un altro passaggio solista, tutti gli altri strumenti devono saltare esattamente la durata complessiva delle note del passaggio, altrimenti inizieranno troppo presto o troppo tardi.

Una possibile soluzione a questo problema consiste nell'uso delle funzioni `mmrest-of-length` e `skip-of-length`. Queste funzioni Scheme prendono come argomento un pezzo di musica salvato in una variabile e generano una pausa multipla o `\skip` della lunghezza esatta del brano.

```
MyCadenza = \relative c' {
  c4 d8 e f g g4
```

```
  f2 g4 g
}

\new GrandStaff <<
  \new Staff {
    \MyCadenza c'1
    \MyCadenza c'1
  }
  \new Staff {
    #(mmrest-of-length MyCadenza)
    c'1
    #(skip-of-length MyCadenza)
    c'1
  }
>>
```



Vedi anche

Glossario musicale: Sezione "cadenza" in *Glossario Musicale*.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Gestione del tempo

Il tempo è gestito da `Timing_translator`, che si trova nel contesto `Score`. Un suo alias, `Timing`, viene aggiunto nel contesto nel quale si trova `Timing_translator`. Per assicurarsi che l'alias `Timing` sia disponibile, occorre istanziare esplicitamente il contesto che lo contiene (come `Voice` o `Staff`).

Si usano le seguenti proprietà di `Timing` per tenere traccia del tempo in una partitura.

`currentBarNumber`
: Il numero di battuta corrente. Un esempio che mostra l'uso di questa proprietà si trova in ⟨undefined⟩ [Bar numbers], pagina ⟨undefined⟩.

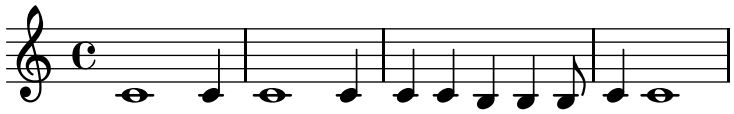
`measureLength`
: La durata delle misure nel tempo corrente. Per un tempo di 4/4 è 1, per un tempo di 6/8 è 3/4. Il suo valore determina quando debbano essere inserite le stanghette e come debbano essere generate le travature automatiche.

`measurePosition`
: Il punto della misura in cui ci troviamo. Questa quantità viene reimpostata sottraendo `measureLength` ogni volta che `measureLength` viene raggiunto o superato. Quando questo accade, `currentBarNumber` viene incrementato.

`timing`
: Se impostato su `#t`, le variabili precedenti sono aggiornate ad ogni momento temporale. Se impostato su `#f`, l'incisore rimane nella misura corrente per un tempo indefinito.

Si può cambiare il tempo impostando esplicitamente una qualsiasi di queste variabili. Nel prossimo esempio, viene visualizzata l'indicazione di tempo predefinita di 4/4, ma `measureLength` è impostato su 5/4. A 4/8 della terza misura, `measurePosition` si sposta in avanti di 1/8 fino a 5/8, diminuendo quella misura di 1/8. Quindi la stanghetta successiva si troverà a 9/8 invece che a 5/4.

```
\new Voice \relative c' {
  \set Timing.measureLength = #(ly:make-moment 5/4)
  c1 c4 |
  c1 c4 |
  c4 c
  \set Timing.measurePosition = #(ly:make-moment 5/8)
  b4 b b8 |
  c4 c1 |
}
```



Come mostra l'esempio, `ly:make-moment n m` definisce una durata di n/m della nota intera. Ad esempio, `ly:make-moment 1 8` corrisponde alla durata di un ottavo mentre `ly:make-moment 7 16` a quella di sette sedicesimi.

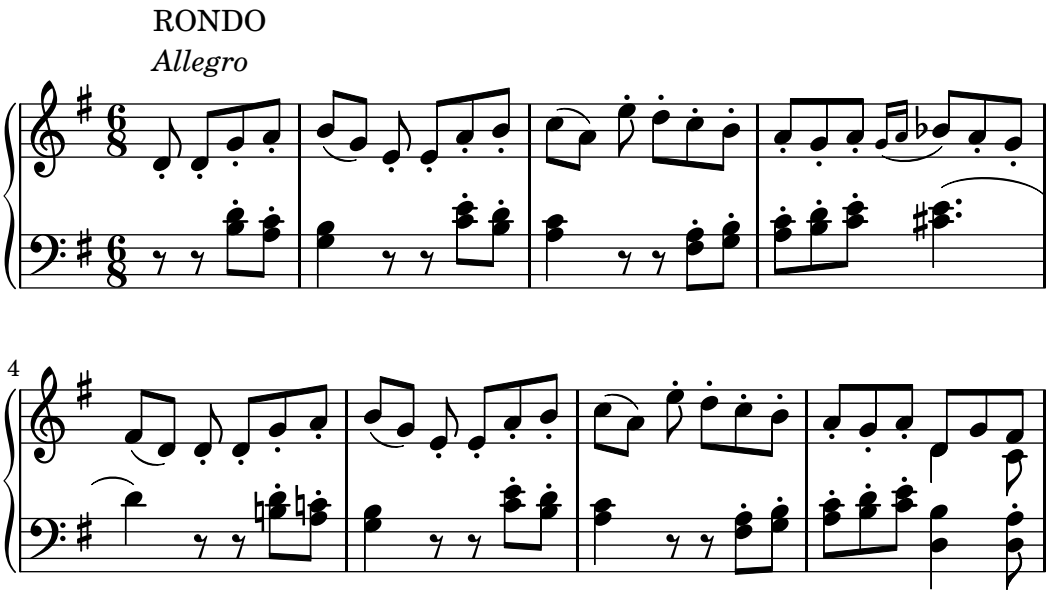
Vedi anche

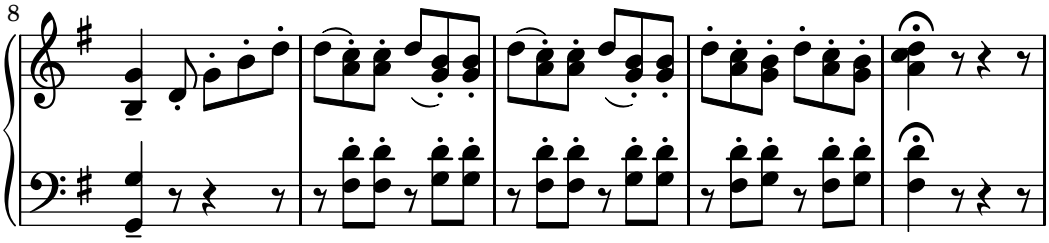
Guida alla notazione: ⟨undefined⟩ [Bar numbers], pagina ⟨undefined⟩, ⟨undefined⟩ [Unmetered music], pagina ⟨undefined⟩.

Frammenti di codice: Sezione "Rhythms" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Timing_translator" in *Guida al Funzionamento Interno*, Sezione "Score" in *Guida al Funzionamento Interno*.

1.3 Segni di espressione





Questa sezione elenca vari segni di espressione che si possono usare in una partitura.

1.3.1 Segni di espressione collegati alle note

Questa sezione spiega come creare segni di espressione che siano collegati alle note: articolazioni, abbellimenti e dinamiche. Sono trattati anche i metodi per creare nuovi segni di dinamica.

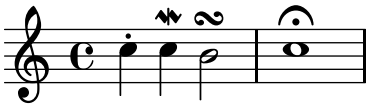
Articolazioni e abbellimenti

Una varietà di simboli che rappresentano articolazioni, ornamenti e altre indicazioni di esecuzione possono essere attaccati a una nota con questa sintassi:

```
nota\nome
```

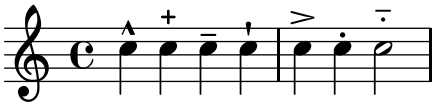
I valori possibili per *nome* sono elencati in Sezione A.13 [List of articulations], pagina 712. Ad esempio:

```
c4\staccato c\mordent b2\turn
c1\fermata
```



Alcune di queste articolazioni hanno delle abbreviazioni che semplificano l'inserimento. Le abbreviazioni sono attaccate al nome della nota e la loro sintassi è composta da un trattino `-` seguito da un simbolo che indica l'articolazione. Esistono abbreviazioni predefinite per *marcato*, *chiuso*, *tenuto*, *staccatissimo*, *accento*, *staccato* e *portato*. L'output corrispondente è:

```
c4-^ c-+ c-- c-!
c4-> c-. c2-_
```

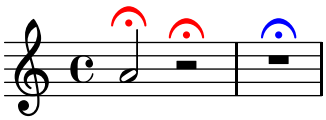


Le regole per il posizionamento predefinito delle articolazioni sono definite in '`scm/script.scm`'. Articolazioni e ornamenti possono essere posizionati manualmente sopra o sotto il rigo; si veda Sezione 5.4.2 [Direction and placement], pagina 585.

Le articolazioni sono oggetti `Script`. Le loro proprietà sono descritte in dettaglio in Sezione "Script" in *Guida al Funzionamento Interno*.

Le articolazioni possono essere attaccate alle pause e alle note ma non alle pause multiple. Esiste un comando speciale predefinito, `\fermataMarkup`, che permette di attaccare un segno di corona a una pausa multipla (e soltanto ad essa). Questo crea un oggetto `MultiMeasureRestText`.

```
\override Script.color = #red
\override MultiMeasureRestText.color = #blue
a2\fermata r\fermata
R1\fermataMarkup
```



Oltre alle articolazioni, si possono attaccare alle note anche il testo tra virgolette o in un blocco `\markup{}`. Si veda [Text scripts], pagina 221.

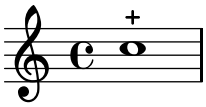
Maggiori informazioni sull'ordine degli oggetti Script e TextScript collegati alle note si trovano in Sezione "Posizionamento degli oggetti" in *Manuale di Apprendimento*.

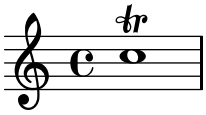
Frammenti di codice selezionati

Modificare i valori predefiniti per le abbreviazioni delle articolazioni

Le abbreviazioni sono definite in '`ly/script-init.ly`', dove sono assegnati valori predefiniti alle variabili `dashHat`, `dashPlus`, `dashDash`, `dashBar`, `dashLarger`, `dashDot` e `dashUnderscore`. Questi valori predefiniti possono essere modificati. Ad esempio, per associare l'abbreviazione `-+` (`dashPlus`) al simbolo del trillo invece che al simbolo `+` predefinito, si assegna il valore `trill` alla variabile `dashPlus`:

```
\relative c'' { c1-+ }

dashPlus = "trill"

\relative c'' { c1-+ }
```

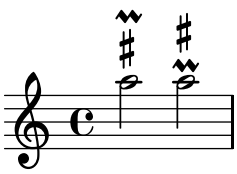




Controllo dell'ordine verticale degli script

L'ordine verticale degli script è determinato dalla proprietà `'script-priority`. Più il numero è piccolo, più sarà posto vicino alla nota. In questo esempio, il simbolo di diesis (oggetto `TextScript`) ha prima la priorità più bassa, dunque è posto più in basso nel primo esempio. Nel secondo, il trillo (oggetto `Script`) ha la priorità più bassa, quindi si trova all'interno. Quando due oggetti hanno la stessa priorità, l'ordine in cui sono inseriti determina quale viene prima.

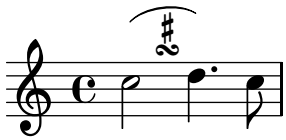
```
\relative c''' {
  \once \override TextScript.script-priority = #-100
  a2^\prall^\markup { \sharp }

  \once \override Script.script-priority = #-100
  a2^\prall^\markup { \sharp }
}
```



Creare un gruppetto ritardato

Creare un gruppetto ritardato, dove la nota più bassa del gruppetto usa l'alterazione, richiede vari \override. La proprietà `outside-staff-priority` deve essere impostata su `#f`, perché altrimenti questa avrebbe la precedenza sulla proprietà `avoid-slur`. Il valore di `halign` serve a posizionare il gruppo orizzontalmente.

```
\relative c'' {
  \once \override TextScript.avoid-slur = #'inside
  \once \override TextScript.outside-staff-priority = ##f
  c2(^\markup \tiny \override #'(baseline-skip . 1) {
    \halign #-4
    \center-column {
      \sharp
      \musicglyph #"scripts.turn"
    }
  }
  d4.) c8
}
```



Vedi anche

Glossario Musicale: Sezione “tenuto” in *Glossario Musicale*, Sezione “accento” in *Glossario Musicale*, Sezione “staccato” in *Glossario Musicale*, Sezione “portato” in *Glossario Musicale*.

Manuale di apprendimento: Sezione “Posizionamento degli oggetti” in *Manuale di Apprendimento*.

Guida alla notazione: [Text scripts], pagina 221, Sezione 5.4.2 [Direction and placement], pagina 585, Sezione A.13 [List of articulations], pagina 712, ⟨undefined⟩ [Trills], pagina ⟨undefined⟩.

File installati: ‘`scm/script.scm`’.

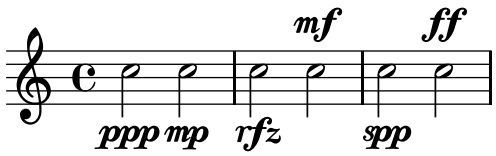
Frammenti: Sezione “Expressive marks” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Script” in *Guida al Funzionamento Interno*, Sezione “TextScript” in *Guida al Funzionamento Interno*.

Dinamiche

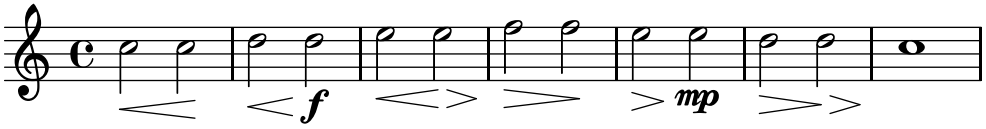
I segni di dinamica assoluta si indicano con un comando che segue una nota, come ad esempio `c4\ff`. I segni di dinamica disponibili sono `\ppppp`, `\pppp`, `\ppp`, `\pp`, `\p`, `\mp`, `\mf`, `\f`, `\ff`, `\fff`, `\ffff`, `\fffff`, `\fp`, `\sf`, `\sff`, `\sp`, `\spp`, `\sfz` e `\rfz`. I segni di dinamica possono essere posizionati manualmente sopra o sotto il rigo, come è spiegato in dettaglio in Sezione 5.4.2 [Direction and placement], pagina 585.

```
c2\ppp c\mp
c2\rfz c^\mf
c2_\spp c^\ff
```



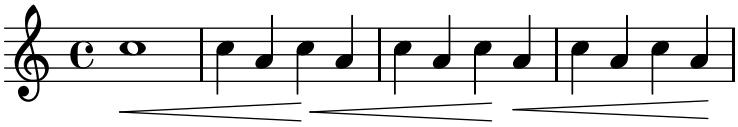
Un segno di *crescendo* inizia con `\<` e termina con `\!`, un segno di dinamica assoluta o un ulteriore segno di crescendo o decrescendo. Un segno di *decrescendo* inizia con `\>` termina nello stesso modo, ovvero con `\!`, un segno di dinamica assoluta oppure un altro segno di crescendo o decrescendo. Si possono usare `\cr` e `\decr` al posto di `\<` e `\>`. Le *forcelle* vengono create con questa notazione.

```
c2\< c\!
d2\< d\f
e2\< e\>
f2\> f\!
e2\> e\mp
d2\> d\>
c1\!
```



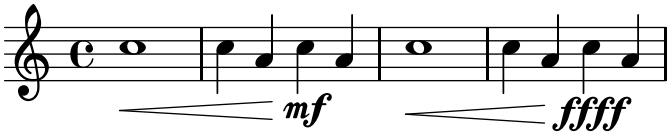
Una forcella che termina con `\!` si estenderà fino al margine destro della nota a cui è assegnato `\!`. Nel caso in cui sia terminata con l'inizio di un altro segno di *crescendo* o *decrescendo*, si estenderà fino al centro della nota a cui è assegnato il successivo `\<` o `\>`. La forcella successiva partirà dal margine destro della stessa nota invece che dal margine sinistro, come accade quando si termina con `\!`.

```
c1\< | c4 a c\< a | c4 a c\! a\< | c4 a c a\!
```



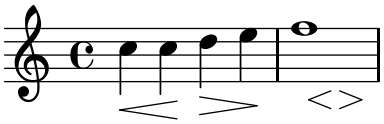
Le forcelle terminate con segni di dinamica assoluta invece che da `\!` avranno un aspetto simile. Tuttavia, la lunghezza della dinamica assoluta stessa può cambiare il punto in cui finisce la forcella precedente.

```
c1\< | c4 a c\mf a | c1\< | c4 a c\ffff a
```



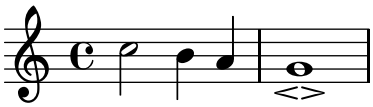
Occorre usare le pause spaziatrici per attaccare più di un segno a una nota. Questo è utile soprattutto quando si aggiunge un *crescendo* e un *decrescendo* alla stessa nota:

```
c4\< c\! d\> e\!
<< f1 { s4 s4\< s4\> s4\! } >>
```



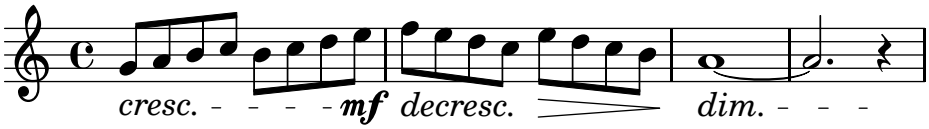
Il comando `\espressivo` permette di indicare un crescendo e un decrescendo sulla stessa nota. Tuttavia, si tenga presente che viene implementato come articolazione, non come dinamica.

```
c2 b4 a
g1\espressivo
```



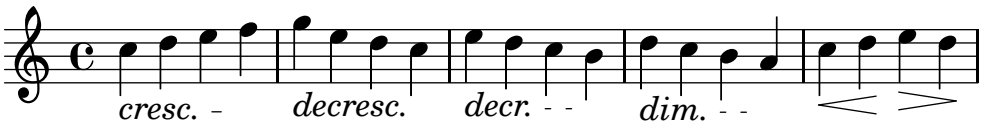
I segni di crescendo testuali iniziano con `\cresc`, quelli di decrescendo con `\decresc` o `\dim`. Le linee di estensione vengono aggiunte automaticamente.

```
g8\cresc a b c b c d e\mf |
f8\decresc e d c e\> d c b |
a1\dim ~ |
a2. r4\! |
```



I segni testuali per i cambi di dinamica possono sostituire anche le forcelle:

```
\crescTextCresc
c4\< d e f\! |
\dimTextDecresc
g4\> e d c\! |
\dimTextDecr
e4\> d c b\! |
\dimTextDim
d4\> c b a\! |
\crescHairpin
\dimHairpin
c4\< d\! e\> d\! |
```

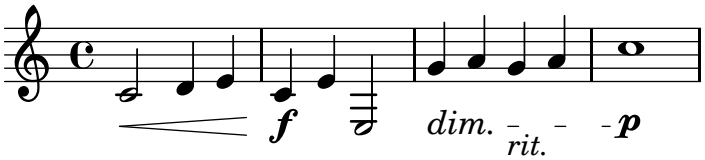


Per creare nuovi segni di dinamica assoluta o del testo da allineare alle dinamiche, si veda ⟨undefined⟩ [New dynamic marks], pagina ⟨undefined⟩.

Il posizionamento verticale della dinamica è gestito da Sezione "DynamicLineSpanner" in *Guida al Funzionamento Interno*.

Esiste un contesto `Dynamics` che permette di comporre i segni di dinamica sulla loro linea orizzontale. Si usano le pause spaziatrici per indicare il tempo (le note in un contesto `Dynamics` occupano anche il tempo musicale, ma non appaiono nel rigo). Il contesto `Dynamics` può contenere altri elementi utili come segni testuali, estensori del testo e segni di pedale del pianoforte.

```
<<
  \new Staff \relative c' {
    c2 d4 e |
    c4 e e,2 |
    g'4 a g a |
    c1 |
  }
  \new Dynamics {
    s1\< |
    s1\f |
    s2\dim s2-"rit." |
    s1\p |
  }
>>
```



Comandi predefiniti

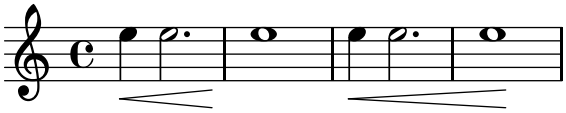
`\dynamicUp`, `\dynamicDown`, `\dynamicNeutral`, `\crescTextCresc`, `\dimTextDim`, `\dimTextDecr`, `\dimTextDecresc`, `\crescHairpin`, `\dimHairpin`.

Frammenti di codice selezionati

Impostare il comportamento delle forcelle sulle stanghette

Se la nota che termina una forcella si trova sul primo battito di una battuta, la forcella si ferma prima della stanghetta che precede la nota. Si può controllare questo comportamento modificando la proprietà `'to-barline`.

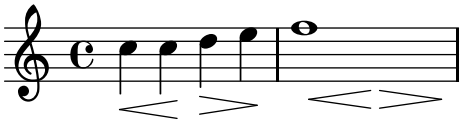
```
\relative c'' {
  e4\< e2.
  e1\!
  \override Hairpin.to-barline = ##f
  e4\< e2.
  e1\!
}
```



Impostare la lunghezza minima delle forcelle

Se le forcelle sono troppo corte, possono essere allungate modificando la proprietà `minimum-length` dell'oggetto `Hairpin`.

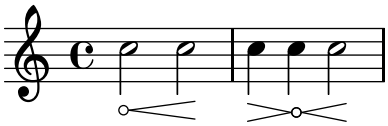
```
\relative c'' {
  c4\< c\! d\> e\!
  \override Hairpin.minimum-length = #5
  << f1 { s4 s\< s\> s\! } >>
}
```



Forcelle con notazione al niente

Le forcelle di dinamica possono essere rappresentate con ua punta tonda (notazione "al niente") impostando la proprietà `circled-tip` dell'oggetto `Hairpin` su `#t`.

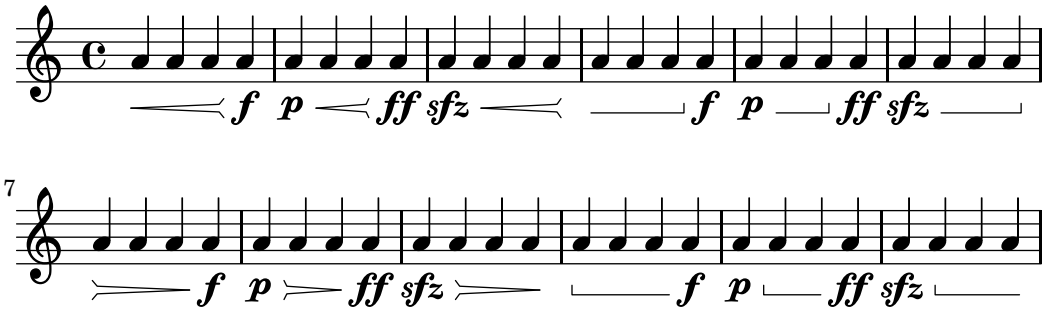
```
\relative c'' {
  \override Hairpin.circled-tip = ##t
  c2\< c\!
  c4\> c\< c2\!
}
```



Stampare le forcelle in vari stili

Il segno di dinamica della forcella può avere diversi stili

```
\relative c'' {
  \override Hairpin.stencil = #flared-hairpin
  a4\< a a a\f
  a4\p\< a a a\ff
  a4\sfz\< a a a\!
  \override Hairpin.stencil = #constante-hairpin
  a4\< a a a\f
  a4\p\< a a a\ff
  a4\sfz\< a a a\!
  \override Hairpin.stencil = #flared-hairpin
  a4\> a a a\f
  a4\p\> a a a\ff
  a4\sfz\> a a a\!
  \override Hairpin.stencil = #constante-hairpin
  a4\> a a a\f
  a4\p\> a a a\ff
  a4\sfz\> a a a\!
}
```



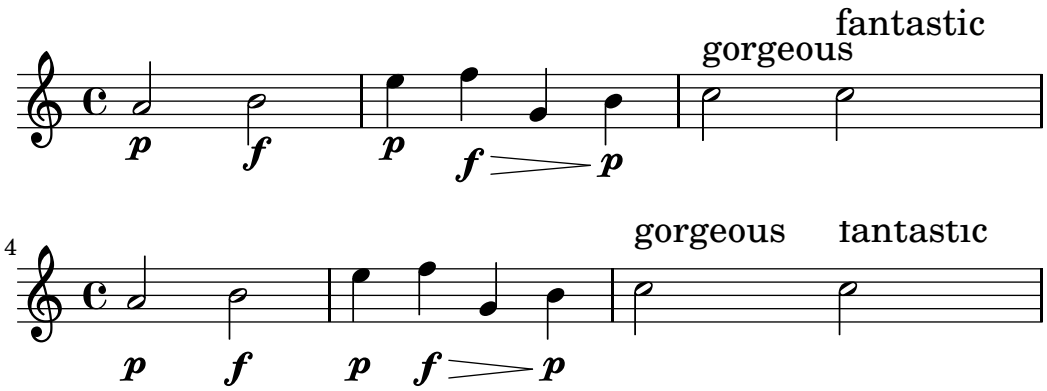
Dinamiche e segni testuali allineati verticalmente

Impostando la proprietà `'Y-extent` su un valore adatto, tutti gli oggetti `DynamicLineSpanner` (forcelle e testi di dinamica) possono essere allineati su un punto di riferimento comune, indipendentemente dalla loro reale estensione. In questo modo, ogni elemento sarà allineato verticalmente, producendo quindi un output più gradevole.

La stessa idea, insieme all'utilizzo di `\textLengthOn`, serve ad allineare i segni testuali sulla loro linea di base.

```
\markup \vspace #1 %avoid LSR-bug

music = \relative c' {
  a'2\p b\f
  e4\p f\f\> g, b\p
  c2^\markup { \huge gorgeous } c^\markup { \huge fantastic }
}

{
  \music
  \break
  \override DynamicLineSpanner.staff-padding = #2.0
  \override DynamicLineSpanner.Y-extent = #'(-1.5 . 1.5)
```

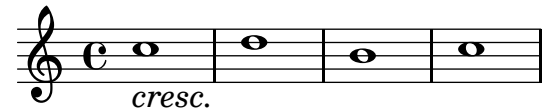
```
  \textLengthOn
  \override TextScript.Y-extent = #'(-1.5 . 1.5)
  \music
}
```



Nascondere la linea di estensione per le dinamiche testuali

I cambi di dinamica in stile testuale (come cresc. e dim.) appaiono con una linea tratteggiata che mostra la loro estensione. Questa linea può essere soppressa nel modo seguente:

```
\relative c'' {
  \override DynamicTextSpanner.style = #'none
  \crescTextCresc
  c1\< | d | b | c\!
}
```

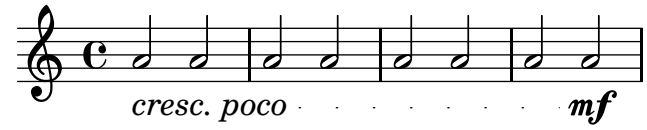


Nascondere la linea di estensione per le dinamiche testuali

Il testo usato per i crescendo e i decrescendo può essere cambiato modificando le proprietà di contesto `crescendoText` e `decrescendoText`.

Lo stile della linea dell'estensore può essere cambiato modificando la proprietà `'style` di `DynamicTextSpanner`. Il valore predefinito è `'dashed-line`; gli altri valori possibili sono `'line`, `'dotted-line` e `'none`.

```
\relative c'' {
  \set crescendoText = \markup { \italic { cresc. poco } }
  \set crescendoSpanner = #'text
  \override DynamicTextSpanner.style = #'dotted-line
  a2\< a
  a2 a
  a2 a
  a2 a\mf
}
```



Vedi anche

Glossario Musicale: Sezione “al niente” in *Glossario Musicale*, Sezione “crescendo” in *Glossario Musicale*, Sezione “decrescendo” in *Glossario Musicale*, Sezione “forcella” in *Glossario Musicale*. Manuale di apprendimento: Sezione “Articolazione e dinamiche” in *Manuale di Apprendimento*.

Guida alla notazione: Sezione 5.4.2 [Direction and placement], pagina 585, ⟨undefined⟩ [New dynamic marks], pagina ⟨undefined⟩, Sezione 3.5.4 [What goes into the MIDI output?], pagina 495, Sezione 3.5.6 [Controlling MIDI dynamics], pagina 497.

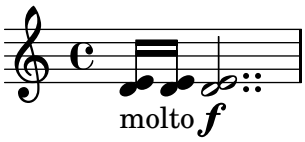
Frammenti: Sezione “Expressive marks” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “DynamicText” in *Guida al Funzionamento Interno*, Sezione “Hairpin” in *Guida al Funzionamento Interno*, Sezione “DynamicLineSpanner” in *Guida al Funzionamento Interno*, Sezione “Dynamics” in *Guida al Funzionamento Interno*.

Nuovi segni di dinamica

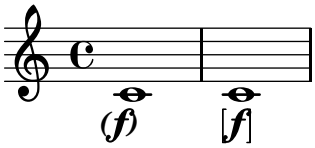
Il modo più semplice per creare indicazioni dinamiche è usare gli oggetti `\markup`.

```
moltoF = \markup { molto \dynamic f }

\relative c' {
  <d e>16_\moltoF <d e>
  <d e>2..
}
```



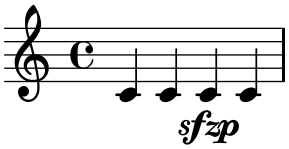
In modalità markup, si possono creare dinamiche editoriali (racchiuse tra parentesi normali o quadrate). La sintassi della modalità markup è descritta in Sezione 1.8.2 [Formatting text], pagina 229.

```
roundF = \markup {
    \center-align \concat { \bold { \italic ( }
           \dynamic f \bold { \italic ) } } }
boxF = \markup { \bracket { \dynamic f } }
\relative c' {
  c1_\roundF
  c1_\boxF
}
```



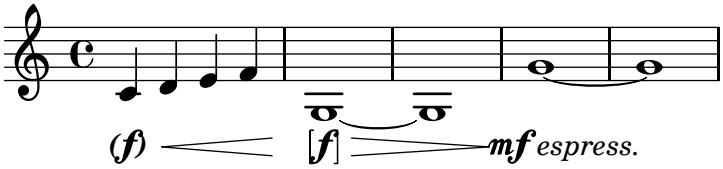
Segni di dinamica semplici e centrati si creano facilmente con la funzione `make-dynamic-script`.

```
sfzp = #(make-dynamic-script "sfzp")
\relative c' {
  c4 c c\sfzp c
}
```



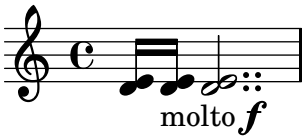
In generale, `make-dynamic-script` prende come argomento qualsiasi oggetto markup. Il tipo di carattere per la dinamica contiene solo i caretteri `f,m,p,r,s` e `z`; dunque se si desidera un'indicazione dinamica che contenga testo semplice e simboli di punteggiatura, occorre usare dei comandi markup che ripristinino la famiglia e la codifica del tipo di carattere per il testo normale, ad esempio `\normal-text`. Il vantaggio nell'uso di `make-dynamic-script` al posto di un normale markup è l'allineamento verticale degli oggetti markup e delle forcelle collegate alla stessa testa di nota.

```
roundF = \markup { \center-align \concat {
           \normal-text { \bold { \italic ( } }
           \dynamic f
           \normal-text { \bold { \italic ) } } } }
boxF = \markup { \bracket { \dynamic f } }
mfEspress = \markup { \center-align \line {
               \hspace #3.7 mf \normal-text \italic espress. } }
roundFdynamic = #(make-dynamic-script roundF)
boxFdynamic = #(make-dynamic-script boxF)
mfEspressDynamic = #(make-dynamic-script mfEspress)
\relative c' {
  c4_\roundFdynamic\< d e f
  g,1~_\boxFdynamic\>
  g1
  g'1~\mfEspressDynamic
  g1
}
```



Si può usare anche la forma Scheme della modalità markup. La sintassi è spiegata in Sezione "Markup construction in Scheme" in *Estendere*.

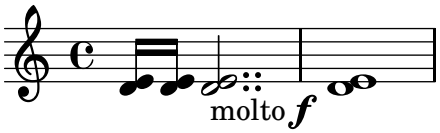
```
moltoF = #(make-dynamic-script
            (markup #:normal-text "molto"
                    #:dynamic "f"))
\relative c' {
  <d e>16 <d e>
  <d e>2..\moltoF
}
```



Per allineare a sinistra il testo di dinamica invece di centrarlo su una nota, si usa un `\tweak`:

```
moltoF = \tweak DynamicText.self-alignment-X #LEFT
         #(make-dynamic-script
```

```
            (markup #:normal-text "molto"
                    #:dynamic "f"))
\relative c' {
  <d e>16 <d e>
  <d e>2..\moltoF <d e>1
}
```



Le impostazioni dei tipi di carattere in modalità markup sono descritti in [Selecting font and font size], pagina 230.

Vedi anche

Guida alla notazione: Sezione 1.8.2 [Formatting text], pagina 229, [Selecting font and font size], pagina 230, Sezione 3.5.4 [What goes into the MIDI output?], pagina 495, Sezione 3.5.6 [Controlling MIDI dynamics], pagina 497.

Extending LilyPond: Sezione "Markup construction in Scheme" in *Estendere*.

Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

1.3.2 Segni di espressione in forma di curva

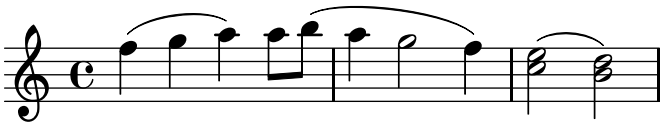
Questa sezione spiega come creare vari segni di espressione che hanno forma curva: legature di portamento, legature di frase, respiri, portamenti indeterminati verso il basso o verso l'alto.

Legature di portamento

Le *legature di portamento* si inseriscono con delle parentesi:

> **Nota:** Nella musica polifonica, una legatura di portamento deve terminare nella stessa voce in cui è iniziata.

```
f4( g a) a8 b(
a4 g2 f4)
<c e>2( <b d>2)
```



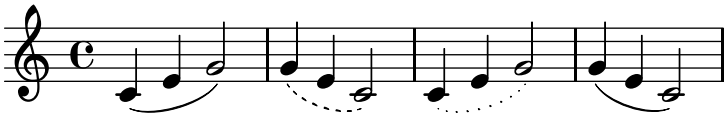
Le legature di portamento possono essere posizionate manualmente sopra o sotto il rigo, come è spiegato in Sezione 5.4.2 [Direction and placement], pagina 585.

Legature di portamento simultanee o sovrapposte non sono permesse, ma si può usare una legatura di frase per sovrapporre le legature. Questo permette di creare contemporaneamente due legature di portamento. Maggiori dettagli si trovano in ⟨undefined⟩ [Phrasing slurs], pagina ⟨undefined⟩.

Le legature di portamento possono essere continue, puntate o tratteggiate. Lo stile predefinito è quello continuo:

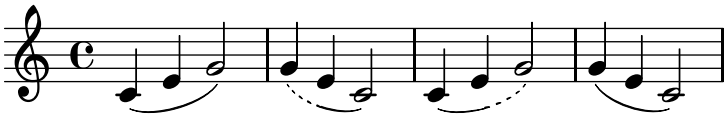
```
c4( e g2)
\slurDashed
```

```
g4( e c2)
\slurDotted
c4( e g2)
\slurSolid
g4( e c2)
```



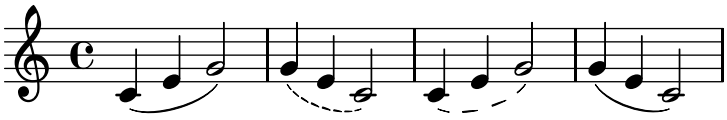
Le legature di portamento possono essere anche semitratteggiate (half-dashed), ovvero la prima metà tratteggiata, la seconda continua; oppure semicontinue (half-solid), ovvero la prima metà continua e la seconda metà tratteggiata:

```
c4( e g2)
\slurHalfDashed
g4( e c2)
\slurHalfSolid
c4( e g2)
\slurSolid
g4( e c2)
```



Si possono definire modelli di tratteggio personalizzati per le legature di portamento:

```
c4( e g2)
\slurDashPattern #0.7 #0.75
g4( e c2)
\slurDashPattern #0.5 #2.0
c4( e g2)
\slurSolid
g4( e c2)
```



Comandi predefiniti

`\slurUp`, `\slurDown`, `\slurNeutral`, `\slurDashed`, `\slurDotted`, `\slurHalfDashed`, `\slurHalfSolid`, `\slurDashPattern`, `\slurSolid`.

Frammenti di codice selezionati

Uso delle doppie legature di portamento per gli accordi legati

Alcuni compositori scrivono due legature di portamento per indicare gli accordi legati. Si può ottenere questo risultato impostando `doubleSlurs`.

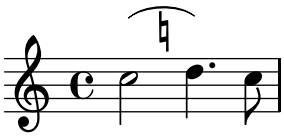
```
\relative c' {
  \set doubleSlurs = ##t
  <c e>4( <d f> <c e> <d f>)
```

```
}
```

Posizionare il testo a margine dentro le legature di portamento

I testi a margine devono avere la proprietà `outside-staff-priority` impostata su false per poter apparire dentro le legature di portamento.

```
\relative c'' {
  \override TextScript.avoid-slur = #'inside
  \override TextScript.outside-staff-priority = ##f
  c2(^\markup { \halign #-10 \natural } d4.) c8
}
```

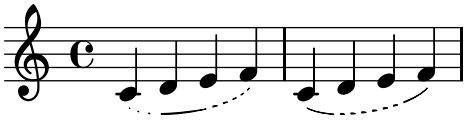


Legature di portamento con complesse strutture di tratteggio

Le legature di portamento possono avere schemi di tratteggio complessi definendo la proprietà `dash-definition`. `dash-definition` è una lista di `dash-elements`. Un `dash-element` è una lista di parametri che definiscono il comportamento del tratteggio per un segmento della legatura.

La legatura di portamento è definita come il parametro t della curva di bezier che va da 0 sul margine sinistro della legatura fino a 1 su quello destro. `dash-element` è una lista di `(inizio-t fine-t frazione-trattino punto-trattino)`. La regione della legatura di portamento che va da `inizio-t` a `fine-t` avrà una frazione `frazione-trattino` di ogni `punto-trattino` nero. `punto-trattino` viene definito in spazi rigo. `frazione-trattino` è impostato su 1 per una legatura di portamento continua.

```
\relative c' {
  \once \override
    Slur.dash-definition = #'((0 0.3 0.1 0.75)
                              (0.3 0.6 1 1)
                              (0.65 1.0 0.4 0.75))
  c4( d e f)
  \once \override
    Slur.dash-definition = #'((0 0.25 1 1)
                              (0.3 0.7 0.4 0.75)
                              (0.75 1.0 1 1))
  c4( d e f)
}
```



Vedi anche

Glossario Musicale: Sezione “legatura di portamento” in *Glossario Musicale*.

Manuale di apprendimento: Sezione “Sul non annidamento di parentesi e legature di valore” in *Manuale di Apprendimento*.

Guida alla notazione: Sezione 5.4.2 [Direction and placement], pagina 585, ⟨undefined⟩ [Phrasing slurs], pagina ⟨undefined⟩.

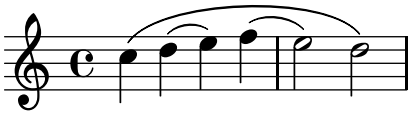
Frammenti: Sezione “Expressive marks” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Slur” in *Guida al Funzionamento Interno*.

Legature di frase

Le *legature di frase*, che indicano una frase musicale, si scrivono con i comandi `\(` e `\)`:

```
c4\( d( e) f(
e2) d\)
```

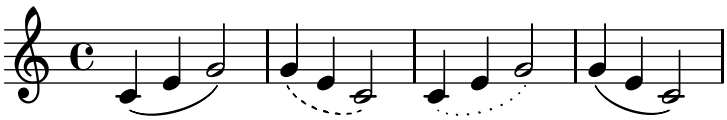


A livello tipografico, una legatura di frase si comporta in modo quasi identico a una normale legatura di portamento. Tuttavia, sono trattate come oggetti diversi; ad esempio, `\slurUp` non ha effetto su una legatura di frase. Le legature di frase possono essere posizionate sopra o sotto il rigo, come è spiegato in Sezione 5.4.2 [Direction and placement], pagina 585.

Legature di frase simultanee o sovrapposte non sono permesse.

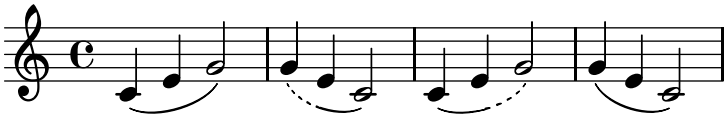
Le legature di frase possono essere continue, puntate o tratteggiate. Lo stile predefinito è quello continuo:

```
c4\( e g2\)
\phrasingSlurDashed
g4\( e c2\)
\phrasingSlurDotted
c4\( e g2\)
\phrasingSlurSolid
g4\( e c2\)
```



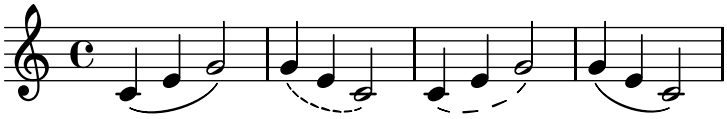
Le legature di frase possono essere anche semitratteggiate (la prima metà tratteggiata, la seconda metà continua) o semicontinue (la prima metà continua, la seconda metà tratteggiata):

```
c4\( e g2\)
\phrasingSlurHalfDashed
g4\( e c2\)
\phrasingSlurHalfSolid
c4\( e g2\)
\phrasingSlurSolid
g4\( e c2\)
```



Si possono definire modelli di tratteggio personalizzati anche per le legature di frase:

```
c4\( e g2\)
\phrasingSlurDashPattern #0.7 #0.75
g4\( e c2\)
\phrasingSlurDashPattern #0.5 #2.0
c4\( e g2\)
\phrasingSlurSolid
g4\( e c2\)
```



Le definizioni dei modelli di tratteggio per le legature di frase hanno la stessa struttura di quelle per le legature di portamento. Per maggiori informazioni sui modelli complessi di tratteggio si consultino i frammenti in ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.

Comandi predefiniti

`\phrasingSlurUp`, `\phrasingSlurDown`, `\phrasingSlurNeutral`, `\phrasingSlurDashed`, `\phrasingSlurDotted`, `\phrasingSlurHalfDashed`, `\phrasingSlurHalfSolid`, `\phrasingSlurDashPattern`, `\phrasingSlurSolid`.

Vedi anche

Manuale di apprendimento: Sezione "Sul non annidamento di parentesi e legature di valore" in *Manuale di Apprendimento*.

Guida alla notazione: Sezione 5.4.2 [Direction and placement], pagina 585, ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.

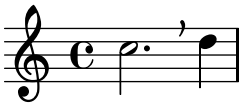
Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "PhrasingSlur" in *Guida al Funzionamento Interno*.

Respiri

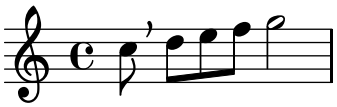
I respiri si inseriscono col comando `\breathe`:

```
c2. \breathe d4
```



Un respiro termina una travatura automatica; per evitare questo comportamento, si veda ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩.

```
c8 \breathe d e f g2
```



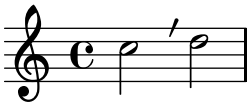
È supportata la divisio, indicatore del respiro nella musica antica. Maggiori dettagli in [Divisiones], pagina 427.

Frammenti di codice selezionati

Cambiare il simbolo del segno di respiro

Il glifo del respiro può essere modificato sovrascrivendo la proprietà `text` dell'oggetto di formattazione `BreathingSign` con qualsiasi testo incluso in un blocco markup.

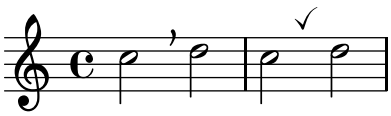
```
\relative c'' {
  c2
  \override BreathingSign.text =
    \markup { \musicglyph #"scripts.rvarcomma" }
  \breathe
  d2
}
```



Usare un segno di spunta come simbolo di respiro

La musica vocale e per fiati usa frequentemente il segno di spunta come segno di respiro. Questo indica un respiro che sottrae un po' di tempo alla nota precedente invece di prendere una piccola pausa, indicata dal segno di respiro rappresentato dalla virgola. Il segno può essere spostato un po' su per allontanarlo dal rigo.

```
\relative c'' {
  c2
  \breathe
  d2
  \override BreathingSign.Y-offset = #2.6
  \override BreathingSign.text =
    \markup { \musicglyph #"scripts.tickmark" }
  c2
  \breathe
  d2
}
```

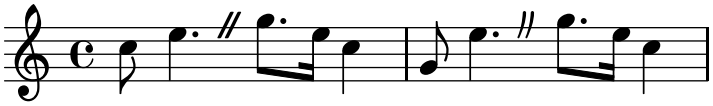


Inserire una cesura

I segni di cesura possono essere creati sovrascrivendo la proprietà `'text` dell'oggetto `BreathingSign`. È disponibile anche un segno di cesura curvo.

```
\relative c'' {
  \override BreathingSign.text = \markup {
    \musicglyph #"scripts.caesura.straight"
  }
  c8 e4. \breathe g8. e16 c4

  \override BreathingSign.text = \markup {
    \musicglyph #"scripts.caesura.curved"
  }
  g8 e'4. \breathe g8. e16 c4
```

```
}
```



Vedi anche

Glossario Musicale: Sezione "cesura" in *Glossario Musicale*.

Guida alla notazione: [Divisiones], pagina 427.

Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "BreathingEvent" in *Guida al Funzionamento Interno*, Sezione "BreathingSign" in *Guida al Funzionamento Interno*, Sezione "Breathing_sign_engraver" in *Guida al Funzionamento Interno*.

Portamenti indeterminati verso il basso e verso l'alto

I *portamenti indeterminati verso il basso e verso l'alto* possono essere aggiunti alle note col comando `\bendAfter`. La direzione del portamento è indicata con un più o un meno (su o giù). Il numero indica l'intervallo per cui il portamento si estenderà *oltre* la nota principale.

```
c2\bendAfter #+4
c2\bendAfter #-4
c2\bendAfter #+6.5
c2\bendAfter #-6.5
c2\bendAfter #+8
c2\bendAfter #-8
```

Frammenti di codice selezionati

Cambiare la forma dei portamenti indeterminati verso il basso o verso l'alto

La proprietà `shortest-duration-space` può essere modificata per cambiare la forma dei portamenti indeterminati verso il basso o verso l'alto.

```
\relative c'' {
  \override Score.SpacingSpanner.shortest-duration-space = #4.0
  c2-\bendAfter #5
  c2-\bendAfter #-4.75
  c2-\bendAfter #8.5
  c2-\bendAfter #-6
}
```

Vedi anche

Glossario Musicale: Sezione "portamento indeterminato verso il basso" in *Glossario Musicale*, Sezione "portamento indeterminato verso l'alto" in *Glossario Musicale*.

Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

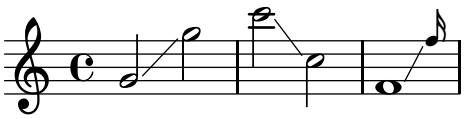
1.3.3 Segni di espressione in forma di linea

Questa sezione spiega come creare vari segni di espressione che seguono una traiettoria lineare: glissandi, arpeggi e trilli.

Glissando

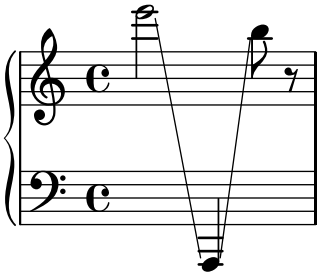
Un *glissando* si crea attaccando `\glissando` a una nota:

```
g2\glissando g'
c2\glissando c,
\afterGrace f,1\glissando f'16
```



Un glissando può collegare note appartenenti a righi diversi:

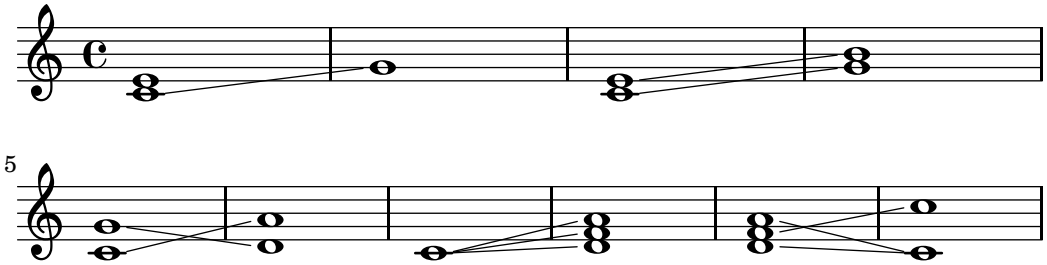
```
\new PianoStaff <<
  \new Staff = "right" {
    e'''2\glissando
    \change Staff = "left"
    a,,4\glissando
    \change Staff = "right"
    b''8 r |
  }
  \new Staff = "left" {
    \clef bass
    s1
  }
>>
```



Un glissando può collegare le note negli accordi. Se è necessario qualcosa di diverso dal normale abbinamento uno a uno delle note, si possono definire le connessioni tra le note attraverso `\glissandoMap`, dove le note di un accordo sono numerate a partire da zero nell'ordine in cui appaiono nel file di input '`.ly`'.

```
<c, e>1\glissando g' |
<c, e>1\glissando |
<g' b> |
\break
\set glissandoMap = #'((0 . 1) (1 . 0))
<c, g'>1\glissando |
<d a'> |
\set glissandoMap = #'((0 . 0) (0 . 1) (0 . 2))
c1\glissando |
```

```
<d f a> |
\set glissandoMap = #'((2 . 0) (1 . 0) (0 . 1))
<f d a'>1\glissando |
<c c'> |
```



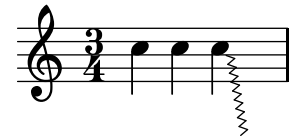
Si possono avere vari stili di glissando. Maggiori dettagli in Sezione 5.4.7 [Line styles], pagina 597.

Frammenti di codice selezionati

Glissando contemporaneo

Un glissando contemporaneo senza una nota finale può essere creato usando una nota nascosta e un tempo di cadenza.

```
\relative c'' {
  \time 3/4
  \override Glissando.style = #'zigzag
  c4 c
  \cadenzaOn
  c4\glissando
  \hideNotes
  c,,4
  \unHideNotes
  \cadenzaOff
  \bar "|"
}
```



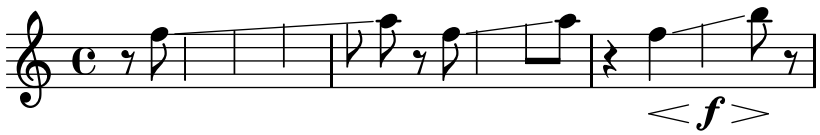
Aggiungere i segni di tempo per i glissandi lunghi

I battiti saltati nei glissandi molto lunghi vengono talvolta segnalati con delle indicazioni di tempo, che consistono solitamente in dei gambi privi di teste di nota. Questi gambi possono essere usati anche per contenere segni di espressione intermedi.

Se i gambi non si allineano bene al glissando, può essere necessario riposizionarli leggermente.

```
glissandoSkipOn = {
  \override NoteColumn.glissando-skip = ##t
  \override NoteHead.transparent = ##t
  \override NoteHead.no-ledgers = ##t
}

glissandoSkipOff = {
```

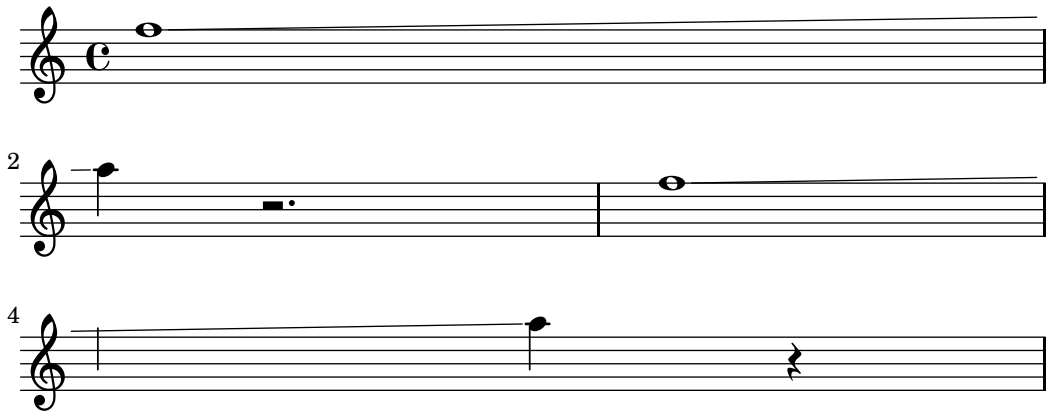
```
  \revert NoteColumn.glissando-skip
  \revert NoteHead.transparent
  \revert NoteHead.no-ledgers
}

\relative c'' {
  r8 f8\glissando
  \glissandoSkipOn
  f4 g a a8\noBeam
  \glissandoSkipOff
  a8

  r8 f8\glissando
  \glissandoSkipOn
  g4 a8
  \glissandoSkipOff
  a8 |

  r4 f\glissando \<
  \glissandoSkipOn
  a4\f \>
  \glissandoSkipOff
  b8\! r |
}
```



Lasciare che i glissandi vadano a capo

Per permettere a un glissando di andare a capo se capita su un'interruzione di riga, si impostano le proprietà `breakable` e `after-line-breaking` su `#t`:

```
glissandoSkipOn = {
  \override NoteColumn.glissando-skip = ##t
  \override NoteHead.transparent = ##t
  \override NoteHead.no-ledgers = ##t
}

\relative c'' {
  \override Glissando.breakable = ##t
  \override Glissando.after-line-breaking = ##t
  f1\glissando |
  \break
  a4 r2. |
  f1\glissando
  \once \glissandoSkipOn
  \break
  a2 a4 r4 |
}
```



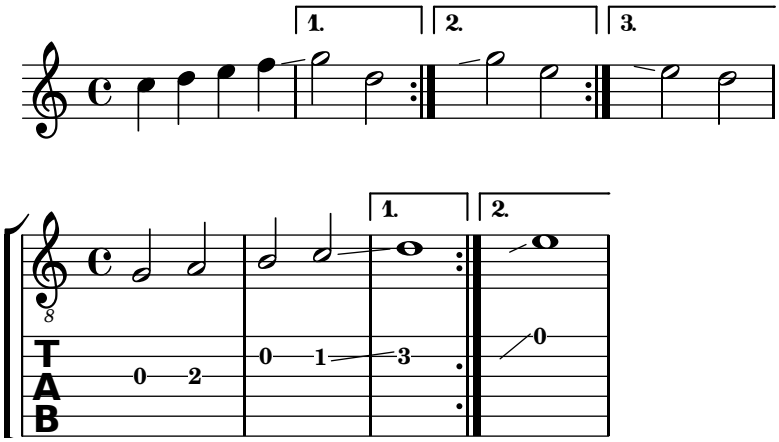
Estendere i glissandi sulle volte delle ripetizioni

Un glissando che si estende in vari blocchi `\alternative` può essere simulato aggiungendo all'inizio di ogni blocco `\alternative` una nota di abbellimento nascosta da cui inizia un glissando. La nota di abbellimento deve avere la stessa altezza della nota da cui parte il glissando iniziale. In questo frammento si usa una funzione musicale che prende come argomento l'altezza della nota di abbellimento.

Attenzione: nella musica polifonica la nota di abbellimento deve avere una nota di abbellimento corrispondente in tutte le altre voci.

```
repeatGliss = #(define-music-function (parser location grace)
  (ly:pitch?)
  #{
    % the next two lines ensure the glissando is long enough
    % to be visible
    \once \override Glissando.springs-and-rods
      = #ly:spanner::set-spacing-rods
    \once \override Glissando.minimum-length = #3.5
    \once \hideNotes
    \grace $grace \glissando
  #})

\score {
  \relative c'' {
    \repeat volta 3 { c4 d e f\glissando }
    \alternative {
      { g2 d }
      { \repeatGliss f g2 e }
      { \repeatGliss f e2 d }
    }
  }
}

music =  \relative c' {
  \voiceOne
  \repeat volta 2 {
    g a b c\glissando
  }
  \alternative {
    { d1 }
    { \repeatGliss c e1 }
  }
}
```

```
\score {
  \new StaffGroup <<
    \new Staff <<
      \context Voice { \clef "G_8" \music }
    >>
    \new TabStaff  <<
      \context TabVoice { \clef "moderntab" \music }
    >>
  >>
}
```



Vedi anche

Glossario Musicale: Sezione “glissando” in *Glossario Musicale*.

Guida alla notazione: Sezione 5.4.7 [Line styles], pagina 597.

Frammenti: Sezione “Expressive marks” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “Glissando” in *Guida al Funzionamento Interno*.

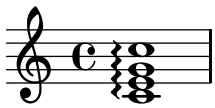
Problemi noti e avvertimenti

Non è supportato il testo lungo la linea del glissando (ad esempio *gliss.*).

Arpeggio

Un *arpeggio* su un accordo (detto anche accordo spezzato) si ottiene aggiungendo `\arpeggio` all’accordo:

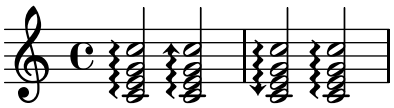
```
<c e g c>1\arpeggio
```



Si possono scrivere vari tipi di arpeggio. `\arpeggioNormal` ripristina l’arpeggio normale:

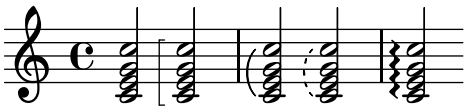
```
<c e g c>2\arpeggio

\arpeggioArrowUp
<c e g c>2\arpeggio
```

```
\arpeggioArrowDown
<c e g c>2\arpeggio

\arpeggioNormal
<c e g c>2\arpeggio
```



Si possono creare simboli di arpeggio speciali *in forma di parentesi*:

```
<c e g c>2

\arpeggioBracket
<c e g c>2\arpeggio

\arpeggioParenthesis
<c e g c>2\arpeggio

\arpeggioParenthesisDashed
<c e g c>2\arpeggio

\arpeggioNormal
<c e g c>2\arpeggio
```



Le proprietà del tratteggio della parentesi dell'arpeggio sono regolate dalla proprietà `'dash-details`, descritta in ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.

Gli arpeggi possono essere scritti in modo esplicito con le legature di valore. Per maggiori dettagli si veda ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.

Comandi predefiniti

`\arpeggio`, `\arpeggioArrowUp`, `\arpeggioArrowDown`, `\arpeggioNormal`, `\arpeggioBracket`, `\arpeggioParenthesis` `\arpeggioParenthesisDashed`.

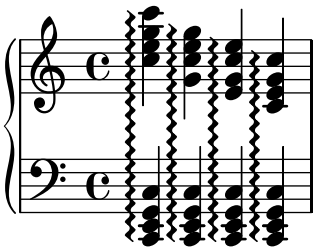
Frammenti di codice selezionati

Creare degli arpeggi che attraversano il rigo del pianoforte

In un rigo per pianoforte (`PianoStaff`), è possibile far sì che un arpeggio attraversi i righi impostando la proprietà `PianoStaff.connectArpeggios`.

```
\new PianoStaff \relative c'' <<
  \set PianoStaff.connectArpeggios = ##t
  \new Staff {
    <c e g c>4\arpeggio
    <g c e g>4\arpeggio
    <e g c e>4\arpeggio
    <c e g c>4\arpeggio
  }
  \new Staff {
```

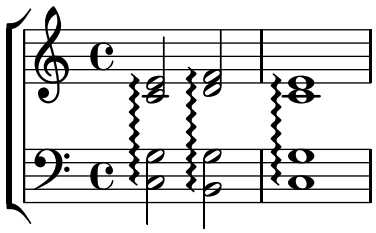
```
      \clef bass
      \repeat unfold 4 {
        <c,, e g c>4\arpeggio
      }
    }
  >>
```



Creare degli arpeggi che attraversano i righi in altri contesti

Si possono creare arpeggi che attraversano i righi in contesti diversi da `GrandStaff`, `PianoStaff` e `StaffGroup` se l'incisore `Span_arpeggio_engraver` è incluso nel contesto `Score`.

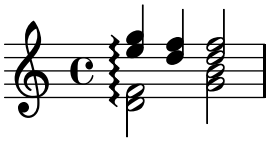
```
\score {
  \new ChoirStaff {
    \set Score.connectArpeggios = ##t
    <<
      \new Voice \relative c' {
        <c e>2\arpeggio
        <d f>2\arpeggio
        <c e>1\arpeggio
      }
      \new Voice \relative c {
        \clef bass
        <c g'>2\arpeggio
        <b g'>2\arpeggio
        <c g'>1\arpeggio
      }
    >>
  }
  \layout {
    \context {
      \Score
      \consists "Span_arpeggio_engraver"
    }
  }
}
```



Creare degli arpeggi che attraversano note appartenenti a voci diverse

Si può disegnare un arpeggio che attraversa delle note in voci diverse dello stesso rigo se si aggiunge l'incisore `Span_arpeggio_engraver` nel contesto `Staff`:

```
\new Staff \with {
  \consists "Span_arpeggio_engraver"
}
\relative c' {
  \set Staff.connectArpeggios = ##t
  <<
    { <e' g>4\arpeggio <d f> <d f>2 }
    \\
    { <d, f>2\arpeggio <g b>2 }
  >>
}
```



Vedi anche

Glossario Musicale: Sezione "arpeggio" in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩, ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.

Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "Arpeggio" in *Guida al Funzionamento Interno*, Sezione "Slur" in *Guida al Funzionamento Interno*, Sezione "PianoStaff" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Non è possibile avere arpeggi connessi e non connessi in un `PianoStaff` nello stesso momento temporale.

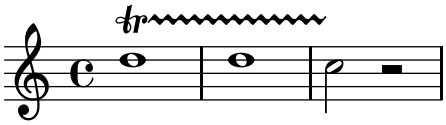
L'arpeggio in forma di parentesi non può essere impostato con facilità negli arpeggi che attraversano i righi; occorre ricorrere a metodi più complessi descritti in [Cross-staff stems], pagina 314.

Trilli

Trilli brevi senza la linea di estensione si ottengono col comando `\trill`; si veda ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

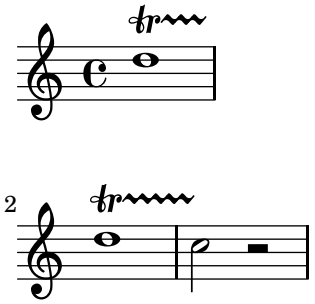
Trilli più lunghi con la linea di estensione si ottengono con `\startTrillSpan` e `\stopTrillSpan`:

```
d1\startTrillSpan
d1
c2\stopTrillSpan
r2
```



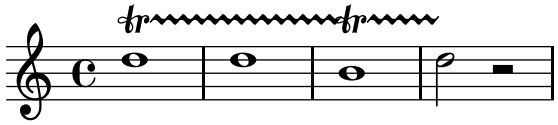
Un estensore del trillo che va a capo ricomincerà esattamente sopra la prima nota della nuova riga.

```
d1\startTrillSpan
\break
d1
c2\stopTrillSpan
r2
```



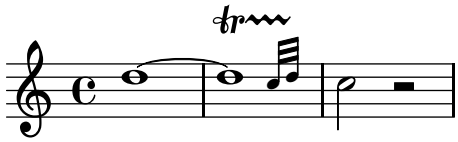
Trilli consecutivi funzionano senza dover esplicitare i comandi `\stopTrillSpan`, perché il trillo successivo diventerà automaticamente il limite destro di quello precedente.

```
d1\startTrillSpan
d1
b1\startTrillSpan
d2\stopTrillSpan
r2
```



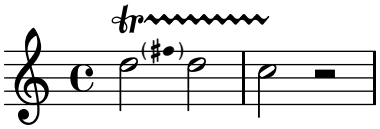
I trilli possono essere anche combinati con le note di abbellimento. La sintassi di questo costrutto e il metodo per posizionare in modo preciso gli abbellimenti sono descritti in ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩.

```
d1~\afterGrace
d1\startTrillSpan { c32[ d]\stopTrillSpan }
c2 r2
```



I trilli che richiedono una nota ausiliaria avente un'altezza esplicita si ottengono col comando `\pitchedTrill`. Il primo argomento è la nota principale e il secondo è la nota *trillata*, che appare come una testa di nota senza gambo e racchiusa tra parentesi.

```
\pitchedTrill
d2\startTrillSpan fis
d2
c2\stopTrillSpan
r2
```



Alterazioni successive della stessa nota nella stessa misura devono essere aggiunte manualmente. Apparirà solo l'alterazione del primo trillo con notina in una misura.

```
\pitchedTrill
eis4\startTrillSpan fis
eis4\stopTrillSpan
\pitchedTrill
eis4\startTrillSpan cis
eis4\stopTrillSpan
\pitchedTrill
eis4\startTrillSpan fis
eis4\stopTrillSpan
\pitchedTrill
eis4\startTrillSpan fis!
eis4\stopTrillSpan
```

Comandi predefiniti

`\startTrillSpan`, `\stopTrillSpan`.

Vedi anche

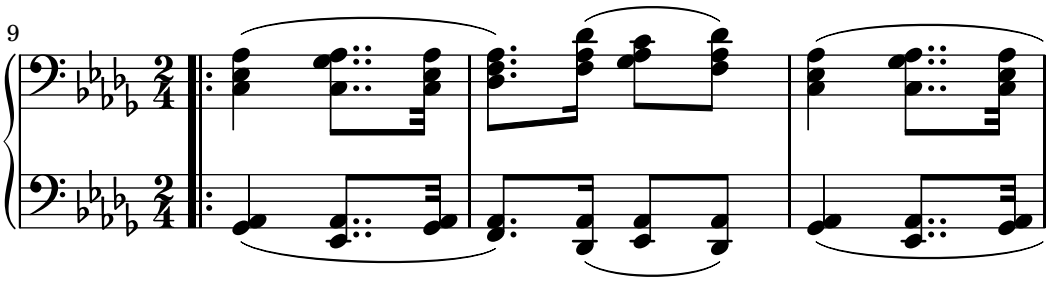
Glossario Musicale: Sezione "trillo" in *Glossario Musicale*.

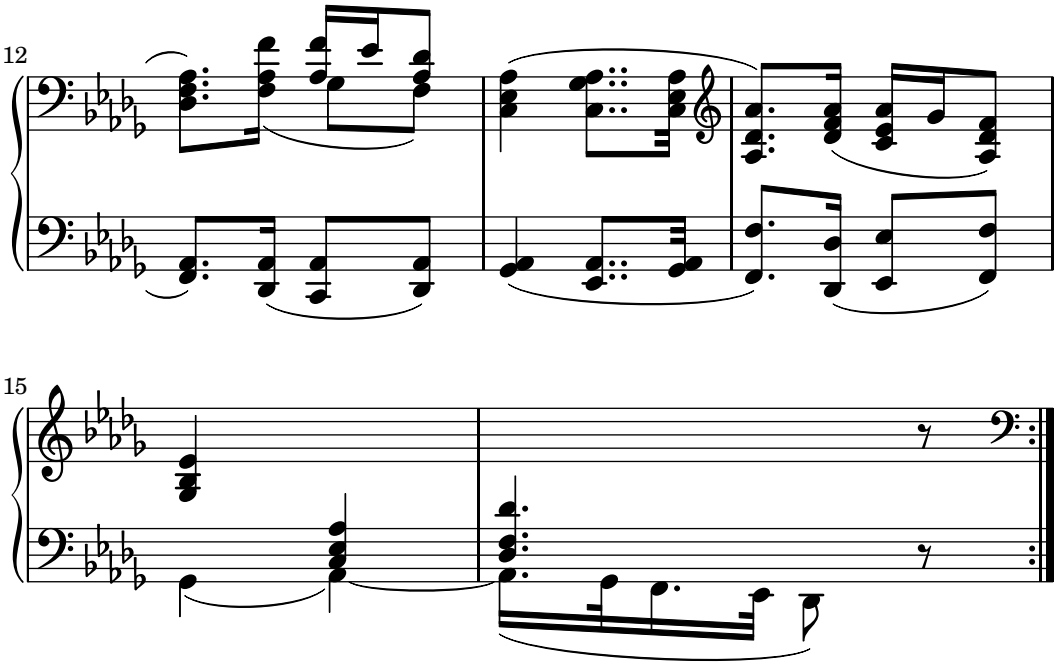
Guida alla notazione: ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩, ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩.

Frammenti: Sezione "Expressive marks" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "TrillSpanner" in *Guida al Funzionamento Interno*.

1.4 Ripetizioni





La ripetizione è un concetto chiave in musica e può essere resa con varie forme di notazione. LilyPond supporta i seguenti tipi di ripetizioni:

`volta` La musica ripetuta non viene scritta per intero ma racchiusa tra barre di ripetizione. Se la ripetizione si trova all'inizio di un brano, la barra di ripetizione appare soltanto alla fine della ripetizione. I finali alternativi (volte) appaiono da sinistra a destra e sono evidenziati da delle parentesi. Questa è la notazione standard per le ripetizioni con alternative.

`unfold` La musica ripetuta viene scritta per intero, tante volte quante sono specificate dal *`numero-ripetizioni`*. È utile quando si scrive musica ripetitiva.

`percent` Si tratta di ripetizioni del battito o della misura. Hanno l'aspetto di una barra obliqua o di segni di percentuale.

`tremolo` Si usa per scrivere travature con tremolo.

1.4.1 Ripetizioni lunghe

Questa sezione spiega come inserire ripetizioni lunghe (solitamente multimisura). Le ripetizioni possono avere due forme: quelle racchiuse tra segni di ripetizione; oppure quelle ricopiate interamente, che si usano per inserire musica ripetitiva. Si possono anche controllare manualmente i segni di ripetizione.

Ripetizioni normali

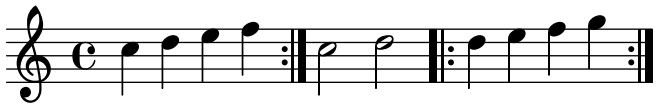
La sintassi per una normale ripetizione è

```
\repeat volta numero-di-ripetizioni espressione-musicale
```

dove *`espressione-musicale`* è la musica da ripetere.

Un'unica ripetizione senza finale alternativo:

```
\repeat volta 2 { c4 d e f }
c2 d
\repeat volta 2 { d4 e f g }
```



I finali alternativi si ottengono con `\alternative`. Ogni gruppo di alternative deve essere esso stesso racchiuso tra parentesi.

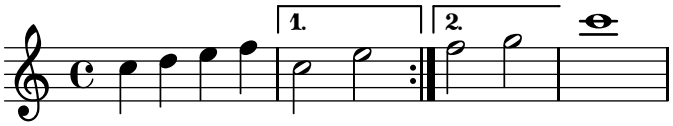
```
\repeat volta numero-di-ripetizioni espressione-musicale
\alternative {
  { espressione-musicale }
}
```

dove *espressione-musicale* è la musica.

Se il numero di ripetizioni è superiore a quello dei finali alternativi, alle prime ripetizioni viene assegnata la prima alternativa.

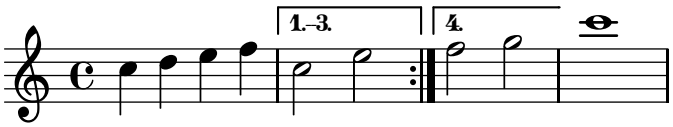
Una singola ripetizione con un finale alternativo:

```
\repeat volta 2 { c4 d e f | }
\alternative {
  { c2 e | }
  { f2 g | }
}
c1
```



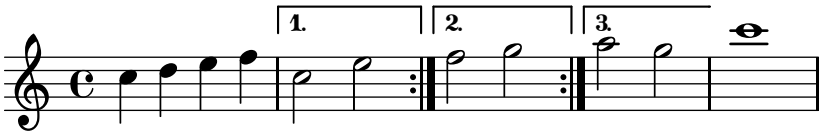
Molteplici ripetizioni con un finale alternativo:

```
\repeat volta 4 { c4 d e f | }
\alternative {
  { c2 e | }
  { f2 g | }
}
c1
```



Molteplici ripetizioni con più di un finale alternativo:

```
\repeat volta 3 { c4 d e f | }
\alternative {
  { c2 e | }
  { f2 g | }
  { a2 g | }
}
c1
```

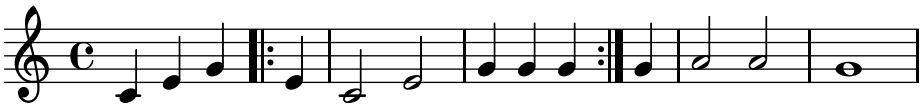


Nota: Se ci sono due o più finali alternativi, non ci deve essere niente tra la parentesi di chiusura di uno e quella di apertura di quello successivo all'interno di un blocco `\alternative`, altrimenti non si otterrà il numero atteso di finali.

Nota: Se si usa `\relative` dentro a un blocco `\repeat` senza istanziare esplicitamente il contesto `Voice`, appare un rigo in più (non desiderato). Vedi Sezione "Appare un rigo in più" in *Uso del Programma*.

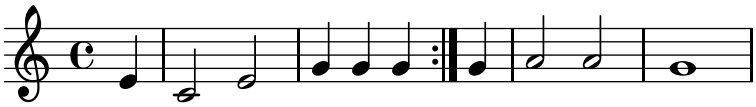
Se una ripetizione inizia in mezzo a una misura e non ha finali alternativi, solitamente anche la chiusura della ripetizione cadrà nel mezzo di una misura, così che tra le due estremità ci sia una misura completa. In queste situazioni i segni di ripetizione non sono delle vere e proprie stanghette. Non usare il comando `\partial` o i controlli di battuta nel punto in cui si trovano questi segni:

```
% nessun \partial qui
c4 e g  % nessun controllo di battuta qui
% nessun \partial qui
\repeat volta 4 {
  e4 |
  c2 e |
  % nessun \partial qui
  g4 g g  % nessun controllo di battuta qui
}
% nessun \partial qui
g4 |
a2 a |
g1 |
```



Analogalmente, se una ripetizione inizia con la misura parziale a inizio della partitura e non ha finali alternativi, si applicano le stesse condizioni dell'esempio precedente, a parte il fatto che in questo caso è richiesto il comando `\partial` all'inizio della partitura:

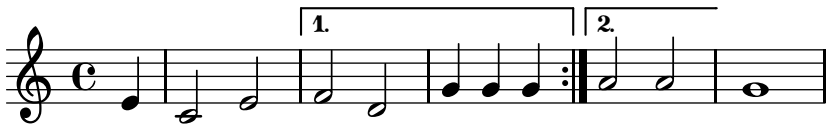
```
\partial 4  % necessario
\repeat volta 4 {
  e4 |
  c2 e |
  % nessun \partial qui
  g4 g g  % nessun controllo di battuta qui
}
% nessun \partial qui
g4 |
a2 a |
g1 |
```



Quando vengono aggiunti dei finali alternativi a una ripetizione che inizia con una misura incompleta, diventa necessario impostare manualmente la proprietà di contesto `Timing.measureLength` nei seguenti punti specifici:

- all'inizio di tutte le misure incomplete nel blocco `\alternative`, che di solito si trovano alla fine di ogni alternativa, con l'eccezione dell'ultima (nella maggior parte dei casi).
- all'inizio di ogni alternativa, eccetto la prima.

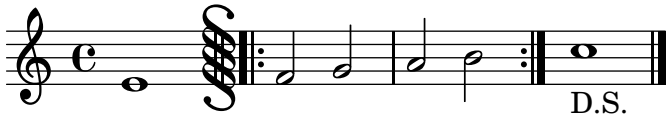
```
\partial 4
\repeat volta 2 { e4 | c2 e | }
\alternative {
  {
    f2 d |
    \set Timing.measureLength = #(ly:make-moment 3/4)
    g4 g g  % un controllo di battuta opzionale è permesso qui
  }
  {
    \set Timing.measureLength = #(ly:make-moment 4/4)
    a2 a |
  }
}
g1 |
```



La proprietà `measureLength` è descritta in ⟨undefined⟩ [Time administration], pagina ⟨undefined⟩.

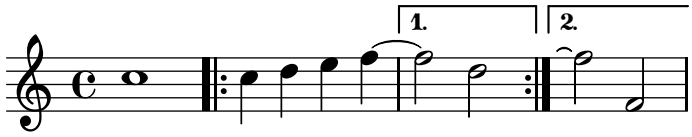
Il comando `\inStaffSegno` serve a posizionare il simbolo di segno in collaborazione col comando `\repeat volta`. Si possono impostare simboli alternativi delle stanghette modificando nel contesto Score le proprietà `segnoType`, `startRepeatSegnoType`, `endRepeatSegnoType` o `doubleRepeatSegnoType`.

```
e1
\repeat volta 2 {
  \inStaffSegno
  f2 g a b
}
c1_"D.S." \bar "|."
```



Si possono aggiungere delle legature di valore a un secondo finale:

```
c1
\repeat volta 2 { c4 d e f~ }
\alternative {
  { f2 d }
  { f2\repeatTie f, }
}
```

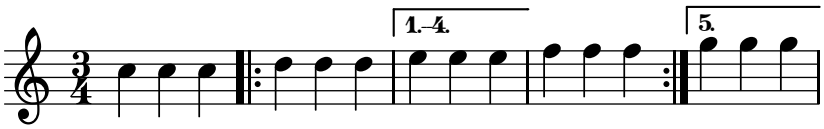


Frammenti di codice selezionati

Accorciare le parentesi delle volte

Per impostazione predefinita, le parentesi delle volte si estendono per tutta l'alternativa, ma si possono accorciare impostando `voltaSpannerDuration`. Nell'esempio seguente, la parentesi dura una misura, che ha una durata di 3/4.

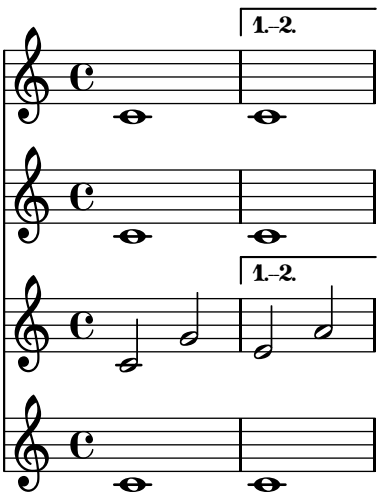
```
\relative c'' {
  \time 3/4
  c4 c c
  \set Score.voltaSpannerDuration = #(ly:make-moment 3/4)
  \repeat volta 5 { d4 d d }
  \alternative {
    {
      e4 e e
      f4 f f
    }
    { g4 g g }
  }
}
```



Aggiungere le parentesi delle volte a altri righi

L'incisore `Volta_engraver` risiede nel contesto `Score`, quindi le parentesi delle ripetizioni appaiono di norma soltanto sul rigo superiore. Questo comportamento può essere modificato aggiungendo l'incisore `Volta_engraver` al contesto `Staff` in cui si desidera far apparire le parentesi; si veda anche il frammento "Volta multirigo".

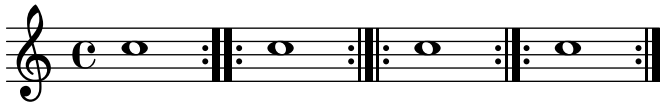
```
<<
  \new Staff { \repeat volta 2 { c'1 } \alternative { c' } }
  \new Staff { \repeat volta 2 { c'1 } \alternative { c' } }
  \new Staff \with { \consists "Volta_engraver" } { c'2 g' e' a' }
  \new Staff { \repeat volta 2 { c'1 } \alternative { c' } }
>>
```



Impostare la doppia ripetizione predefinita per le volte

Esistono tre diversi stili di doppie ripetizioni per le volte, che si possono impostare con `doubleRepeatType`.

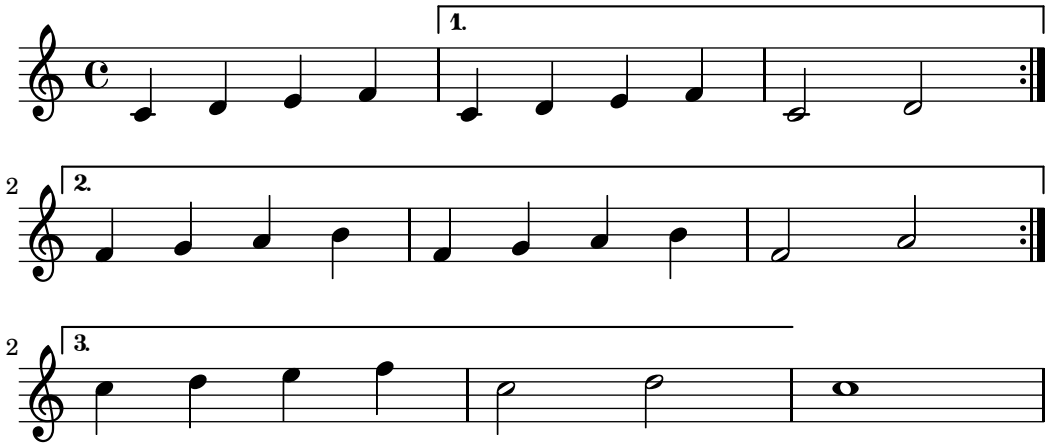
```
\relative c'' {
  \repeat volta 1 { c1 }
  \set Score.doubleRepeatType = #":..:"
  \repeat volta 1 { c1 }
  \set Score.doubleRepeatType = #":|.|:"
  \repeat volta 1 { c1 }
  \set Score.doubleRepeatType = #":|.:"
  \repeat volta 1 { c1 }
}
```

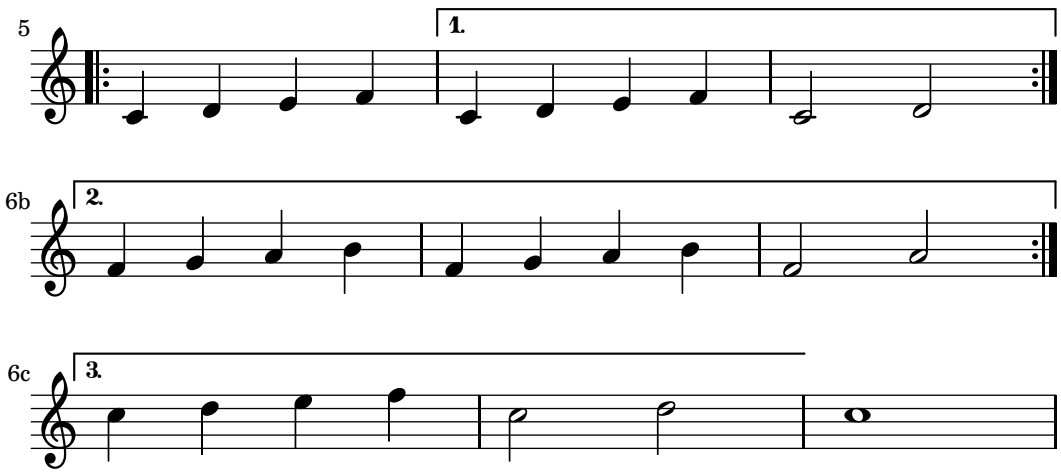


Numeri di battuta alternativi

Si possono impostare due metodi alternativi di numerazione della battuta, utili specialmente per le ripetizioni.

```
\relative c'{
  \set Score.alternativeNumberingStyle = #'numbers
  \repeat volta 3 { c4 d e f | }
    \alternative {
      { c4 d e f | c2 d \break }
      { f4 g a b | f4 g a b | f2 a | \break }
      { c4 d e f | c2 d }
    }
  c1 \break
  \set Score.alternativeNumberingStyle = #'numbers-with-letters
  \repeat volta 3 { c,4 d e f | }
    \alternative {
      { c4 d e f | c2 d \break }
      { f4 g a b | f4 g a b | f2 a | \break }
      { c4 d e f | c2 d }
    }
  c1
}
```





Vedi anche

Glossario Musicale: Sezione “ripetizione” in *Glossario Musicale*, Sezione “volta” in *Glossario Musicale*.

Guida alla notazione: ⟨undefined⟩ [Bar lines], pagina ⟨undefined⟩, Sezione 5.1.4 [Modifying context plug-ins], pagina 562, [Modifying ties and slurs], pagina 605, ⟨undefined⟩ [Time administration], pagina ⟨undefined⟩.

Frammenti: Sezione “Repeats” in *Frammenti di codice*.

Guida al funzionamento interno: Sezione “VoltaBracket” in *Guida al Funzionamento Interno*, Sezione “RepeatedMusic” in *Guida al Funzionamento Interno*, Sezione “VoltaRepeatedMusic” in *Guida al Funzionamento Interno*, Sezione “UnfoldedRepeatedMusic” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Le legature di portamento che si estendono da un blocco `\repeat` verso un blocco `\alternative` funzioneranno solo nel primo finale alternativo. L’aspetto visuale di una legatura di portamento che continua negli altri blocchi dell’alternativa può essere simulato con `\repeatTie` se la legatura si estende solo su una nota del blocco dell’alternativa, sebbene questo metodo non funzioni in `TabStaff`. Altri metodi che si possono adattare per indicare legature di portamento che continuano su varie note dei blocchi di alternativa, e che funzionano anche nei contesti `TabStaff`, sono presentati in [Modifying ties and slurs], pagina 605.

Inoltre le legature di portamento non possono ricollegarsi dalla fine di un’alternativa all’inizio della ripetizione.

I glissandi che si estendono da un blocco `\repeat` in un blocco `\alternative` funzioneranno soltanto per il primo finale alternativo. L’aspetto visuale di un glissando che continua negli altri blocchi dell’alternativa può essere indicato creando un glissando che inizia su una nota di abbellimento nascosta. Vedere ad esempio il frammento “Estendere i glissandi attraverso le ripetizioni” nei Frammenti Selezionati in [Glissando], pagina 133.

Se una ripetizione che inizia con una misura incompleta ha un blocco `\alternative` che contiene modifiche alla proprietà `measureLength`, l’uso di `\unfoldRepeats` causerà l’erroneo posizionamento delle stanghette e degli avvisi di controllo di battuta.

Una ripetizione annidata come la seguente

```
\repeat ...
\repeat ...
\alternative
```

è ambigua, perché non è chiaro a quale `\repeat` appartenga il blocco `\alternative`. Questa ambiguità si risolve facendo in modo che `\alternative` appartenga sempre al blocco `\repeat` interno. Per chiarezza, si consiglia di usare le parentesi in queste situazioni.

Segni di ripetizione manuali

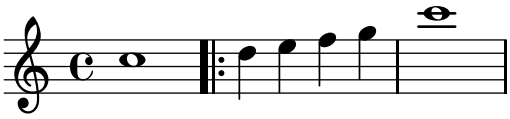
Nota: Questi metodi vengono usati solo per mostrare ripetizioni inusuali, e potrebbero causare un comportamento inaspettato. Nella maggior parte dei casi, le ripetizioni devono essere create col comando standard `\repeat` oppure stampando le stanghette opportune. Maggiori informazioni in ⟨undefined⟩ [Bar lines], pagina ⟨undefined⟩.

La proprietà `repeatCommands` permette di controllare la formattazione delle ripetizioni. Il suo valore è una lista Scheme dei comandi di ripetizione.

`start-repeat`

Stampa una stanghetta `.|:`.

```
c1
\set Score.repeatCommands = #'(start-repeat)
d4 e f g
c1
```

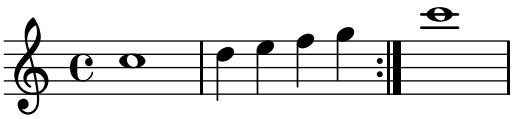


Come vuole la pratica comune di incisione, i segni di ripetizione non vengono stampati all'inizio di un brano.

`end-repeat`

Stampa una stanghetta `:|.`:

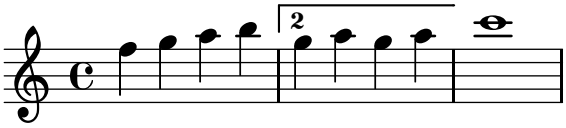
```
c1
d4 e f g
\set Score.repeatCommands = #'(end-repeat)
c1
```



`(volta` *numero*`) ... (volta #f)`

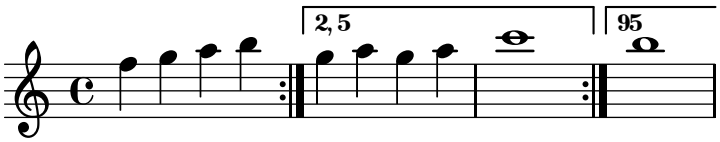
Crea una nuova volta col numero specificato. La parentesi della volta deve essere terminata esplicitamente, altrimenti non sarà stampata.

```
f4 g a b
\set Score.repeatCommands = #'((volta "2"))
g4 a g a
\set Score.repeatCommands = #'((volta #f))
c1
```



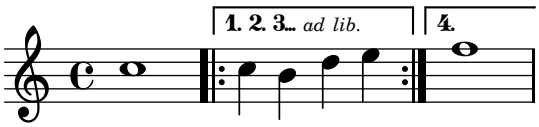
Comandi di ripetizione multipli possono trovarsi nello stesso punto:

```
f4 g a b
\set Score.repeatCommands = #'((volta "2, 5") end-repeat)
g4 a g a
c1
\set Score.repeatCommands = #'((volta #f) (volta "95") end-repeat)
b1
\set Score.repeatCommands = #'((volta #f))
```



Si può includere del testo nella parentesi della volta. Il testo può essere un numero o dei numeri o un'annotazione testuale, si veda Sezione 1.8.2 [Formatting text], pagina 229. Il modo più semplice per usare del testo è definirlo prima e poi includerlo nella lista Scheme,

```
voltaAdLib = \markup { 1. 2. 3... \text \italic { ad lib. } }
\relative c'' {
  c1
  \set Score.repeatCommands =
    #(list(list 'volta voltaAdLib) 'start-repeat)
  c4 b d e
  \set Score.repeatCommands = #'((volta #f) (volta "4.") end-repeat)
  f1
  \set Score.repeatCommands = #'((volta #f))
}
```



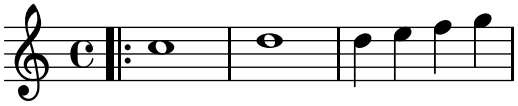
Frammenti di codice selezionati

Stampare un segno di ripetizione all'inizio di un brano

Una stanghetta `.|:` può apparire all'inizio di un brano, se si sovrascrive la proprietà pertinente:

```
\relative c'' {
  \once \override Score.BreakAlignment.break-align-orders =
    #(make-vector 3 '(instrument-name
                      left-edge
                      ambitus
                      breathing-sign
                      clef
                      key-signature
                      time-signature
                      staff-bar
                      custos))
  \once \override Staff.TimeSignature.space-alist =
    #'((first-note . (fixed-space . 2.0))
       (right-edge . (extra-space . 0.5))
       ;; free up some space between time signature
```

```
        ;; and repeat bar line
        (staff-bar . (extra-space . 1)))
  \bar ".|:"
  c1
  d1
  d4 e f g
}
```



Vedi anche

Guida alla notazione: ⟨undefined⟩ [Bar lines], pagina ⟨undefined⟩, Sezione 1.8.2 [Formatting text], pagina 229.

Frammenti: Sezione "Repeats" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "VoltaBracket" in *Guida al Funzionamento Interno*, Sezione "RepeatedMusic" in *Guida al Funzionamento Interno*, Sezione "VoltaRepeatedMusic" in *Guida al Funzionamento Interno*.

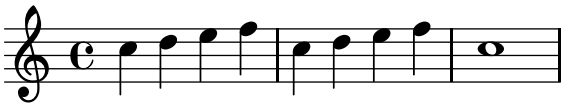
Ripetizioni ricopiate

Col comando `unfold`, le ripetizioni possono servire a semplificare la scrittura di musica ripetitiva. La sintassi è

```
\repeat unfold numero-di-ripetizioni espressione-musicale
```

dove *`espressione-musicale`* è la musica e *`numero-di-ripetizioni`* è il numero di volte per cui è ripetuta *`espressione-musicale`*.

```
\repeat unfold 2 { c4 d e f }
c1
```



In alcuni casi, specialmente in un contesto `\relative`, la funzione `\repeat unfold` non è equivalente alla scrittura dell'espressione musicale molteplici volte. Ad esempio

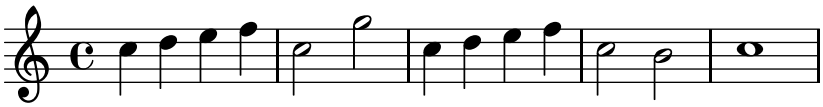
```
\repeat unfold 2 { a'4 b c }
```

non equivale a

```
a'4 b c | a'4 b c
```

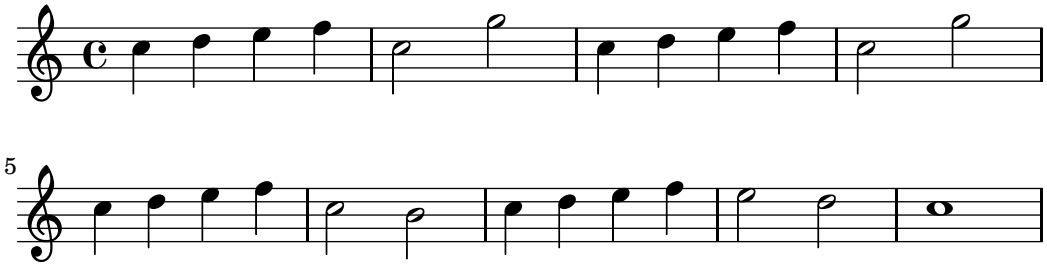
Le ripetizioni dispiegate (unfold) possono avere dei finali alternativi.

```
\repeat unfold 2 { c4 d e f }
\alternative {
  { c2 g' }
  { c,2 b }
}
c1
```



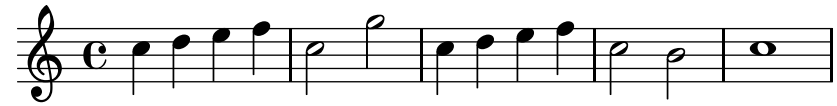
Se il numero di ripetizioni è maggiore del numero di finali alternativi, la prima alternativa viene applicata varie volte finché le alternative rimaste non completano il numero totale delle ripetizioni.

```
\repeat unfold 4 { c4 d e f }
\alternative {
  { c2 g' }
  { c,2 b }
  { e2 d }
 }
c1
```



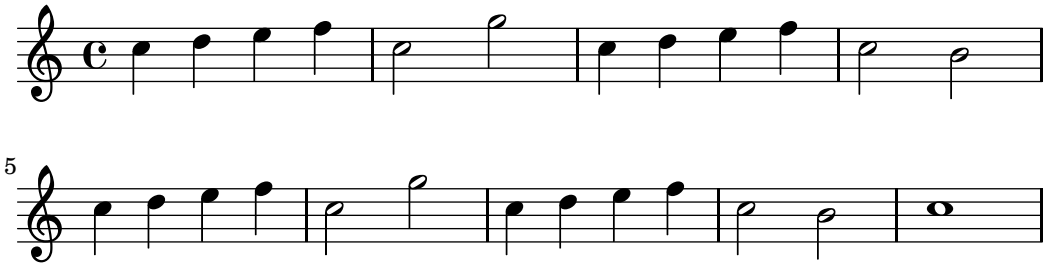
Se il numero di finali alternativi è maggiore del numero di ripetizioni, solo le prime alternative vengono applicate. Le alternative rimanenti saranno ignorate e non verranno stampate.

```
\repeat unfold 2 { c4 d e f }
\alternative {
  { c2 g' }
  { c,2 b }
  { e2 d }
}
c1
```



È anche possibile annidare molteplici funzioni `unfold` (con o senza finali alternativi).

```
\repeat unfold 2 {
  \repeat unfold 2 { c4 d e f }
  \alternative {
    { c2 g' }
    { c,2 b }
  }
}
c1
```



Gli accordi si ripetono col simbolo di ripetizione dell'accordo `q`. Vedi ⟨undefined⟩ [Chord repetition], pagina ⟨undefined⟩.

> **Nota:** Se si usa `\relative` dentro a un blocco `\repeat` senza istanziare esplicitamente il contesto `Voice`, appare un rigo in più (non desiderato). Vedi Sezione "Appare un rigo in più" in *Uso del Programma*.

Vedi anche

Guida alla notazione: ⟨undefined⟩ [Chord repetition], pagina ⟨undefined⟩.

Frammenti: Sezione "Repeats" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "RepeatedMusic" in *Guida al Funzionamento Interno*, Sezione "UnfoldedRepeatedMusic" in *Guida al Funzionamento Interno*.

1.4.2 Ripetizioni brevi

Questa sezione tratta il modo in cui inserire brevi ripetizioni. Le ripetizioni brevi possono avere due forme: segni di barra obliqua o percentuale per rappresentare le ripetizioni di una singola nota, di una singola misura o di due misure; tremolo negli altri casi.

Ripetizioni con percentuale

Brevi fraseggi ripetuti vengono stampati una volta e le ripetizioni vengono sostituite da un segno speciale.

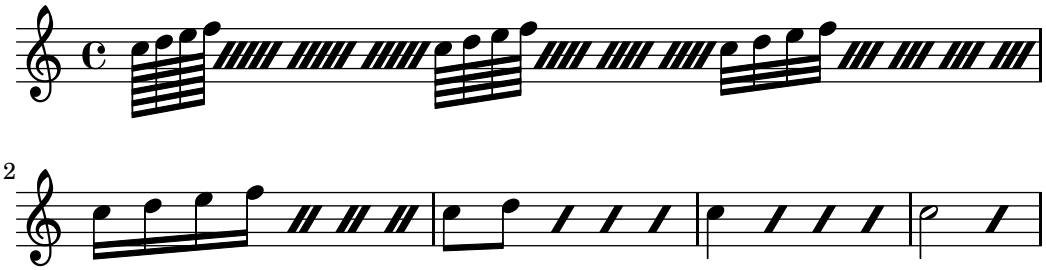
La sintassi è

```
\repeat percent numero espressione-musicale
```

dove *`espressione-musicale`* è l'espressione musicale da ripetere.

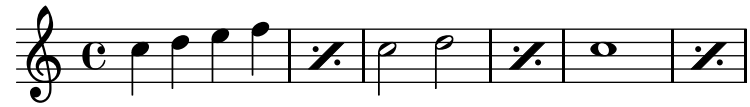
Fraseggi più brevi di una misura vengono sostituiti dalla barra obliqua.

```
\repeat percent 4 { c128 d e f }
\repeat percent 4 { c64 d e f }
\repeat percent 5 { c32 d e f }
\repeat percent 4 { c16 d e f }
\repeat percent 4 { c8 d }
\repeat percent 4 { c4 }
\repeat percent 2 { c2 }
```

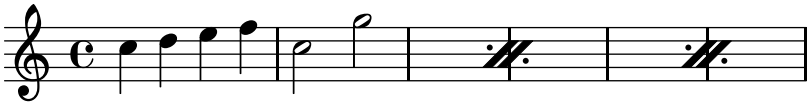


Fraseggi di una o due misure vengono sostituiti da simboli simili alla percentuale.

```
\repeat percent 2 { c4 d e f }
\repeat percent 2 { c2 d }
\repeat percent 2 { c1 }
```

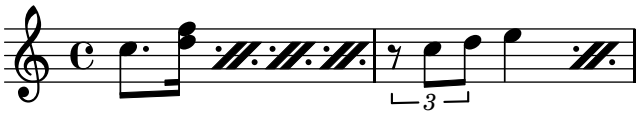


```
\repeat percent 3 { c4 d e f | c2 g' }
```



Fraseggi più brevi di una misura ma con durate miste usano un simbolo di doppia percentuale.

```
\repeat percent 4 { c8. <d f>16 }
\repeat percent 2 { \tuplet 3/2 { r8 c d } e4 }
```

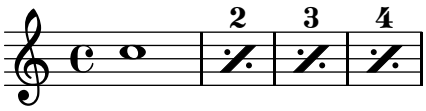


Frammenti di codice selezionati

Contatore della ripetizione con segno percentuale

Le ripetizioni di misura che hanno più di due ripetizioni possono avere un contatore se si cambia la proprietà opportuna, come mostra questo esempio:

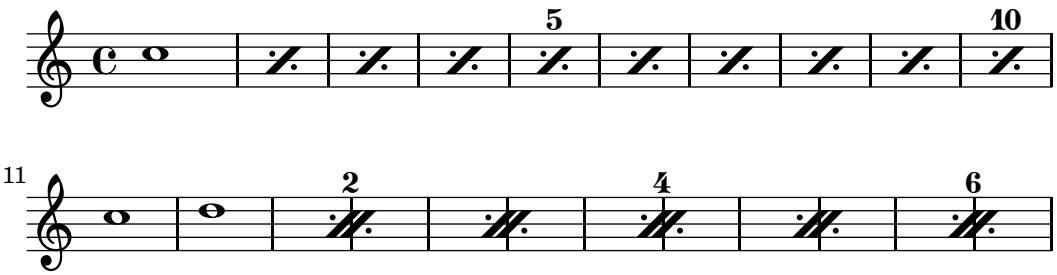
```
\relative c'' {
  \set countPercentRepeats = ##t
  \repeat percent 4 { c1 }
}
```



Visibilità del conto della ripetizione con segno percentuale

I contatori della ripetizione con segno percentuale possono essere mostrati a intervalli regolari impostando la proprietà di contesto `repeatCountVisibility`.

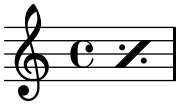
```
\relative c'' {
  \set countPercentRepeats = ##t
  \set repeatCountVisibility = #(every-nth-repeat-count-visible 5)
  \repeat percent 10 { c1 } \break
  \set repeatCountVisibility = #(every-nth-repeat-count-visible 2)
  \repeat percent 6 { c1 d1 }
}
```



Ripetizioni con segni di percentuale isolati

Si possono stampare anche segni di percentuale isolati.

```
makePercent =
#(define-music-function (parser location note) (ly:music?)
   "Make a percent repeat the same length as NOTE."
   (make-music 'PercentEvent
               'length (ly:music-length note)))

\relative c'' {
  \makePercent s1
}
```



Vedi anche

Glossario Musicale: Sezione "percent repeat" in *Glossario Musicale*, Sezione "simile" in *Glossario Musicale*.

Frammenti: Sezione "Repeats" in *Frammenti di codice*.

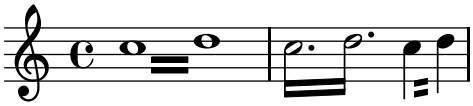
Guida al funzionamento interno: Sezione "RepeatSlash" in *Guida al Funzionamento Interno*, Sezione "RepeatSlashEvent" in *Guida al Funzionamento Interno*, Sezione "DoubleRepeatSlash" in *Guida al Funzionamento Interno*, Sezione "PercentRepeat" in *Guida al Funzionamento Interno*, Sezione "PercentRepeatCounter" in *Guida al Funzionamento Interno*, Sezione "PercentRepeatedMusic" in *Guida al Funzionamento Interno*, Sezione "Percent_repeat_engraver" in *Guida al Funzionamento Interno*, Sezione "DoublePercentEvent" in *Guida al Funzionamento Interno*, Sezione "DoublePercentRepeat" in *Guida al Funzionamento Interno*, Sezione "DoublePercentRepeatCounter" in *Guida al Funzionamento Interno*, Sezione "Double_percent_repeat_engraver" in *Guida al Funzionamento Interno*, Sezione "Slash_repeat_engraver" in *Guida al Funzionamento Interno*.

Ripetizioni con tremolo

I tremoli possono avere due forme: alternanza tra due accordi o due note, e rapida ripetizione di una singola nota o accordo. I tremoli costituiti da un'alternanza si indicano con delle travature che collegano le note o gli accordi che si alternano, mentre i tremoli che consistono in una rapida ripetizione di una nota singola si indicano aggiungendo delle travature o delle barre oblique alla singola nota.

Per inserire i segni del tremolo tra le note, si usa `\repeat` con lo stile tremolo:

```
\repeat tremolo 8 { c16 d }
\repeat tremolo 6 { c16 d }
\repeat tremolo 2 { c16 d }
```

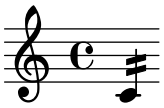


La sintassi di `\repeat tremolo` prevede esattamente due note all'interno delle parentesi, e il numero di ripetizioni deve corrispondere al valore di una nota che possa essere espressa con note normali o puntate. Dunque `\repeat tremolo 7` è valido e produce una nota doppiamente puntata, mentre `\repeat tremolo 9` non è valido.

La durata del tremolo equivale alla durata dell'espressione musicale tra parentesi moltiplicata per il numero di ripetizioni: `\repeat tremolo 8 { c16 d16 }` corrisponde a un tremolo di una semibreve, rappresentata come due semibrevi unite dalle travature del tremolo.

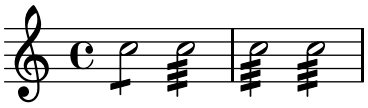
Ci sono due modi di inserire dei segni di tremolo su una singola nota. Anche in questo caso si usa la sintassi `\repeat tremolo`, ma la nota non deve essere racchiusa tra parentesi:

```
\repeat tremolo 4 c'16
```



Si può ottenere lo stesso output aggiungendo `:N` dopo la nota, dove *N* indica la durata della suddivisione (deve essere almeno 8). Se *N* è 8, viene aggiunta una travatura al gambo della nota. Se *N* è omesso, viene usato l'ultimo valore (salvato in `tremoloFlags`):

```
c2:8 c:32
c: c:
```

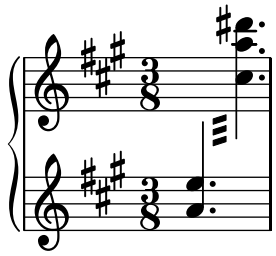


Frammenti di codice selezionati

Tremoli attraverso i righi

Dato che `\repeat tremolo` si aspetta esattamente due argomenti musicali per i tremoli di accordi, la nota o l'accordo che cambiano rigo in un tremolo che attraversa i righi devono essere posti tra parentesi graffe insieme al comando `\change Staff`.

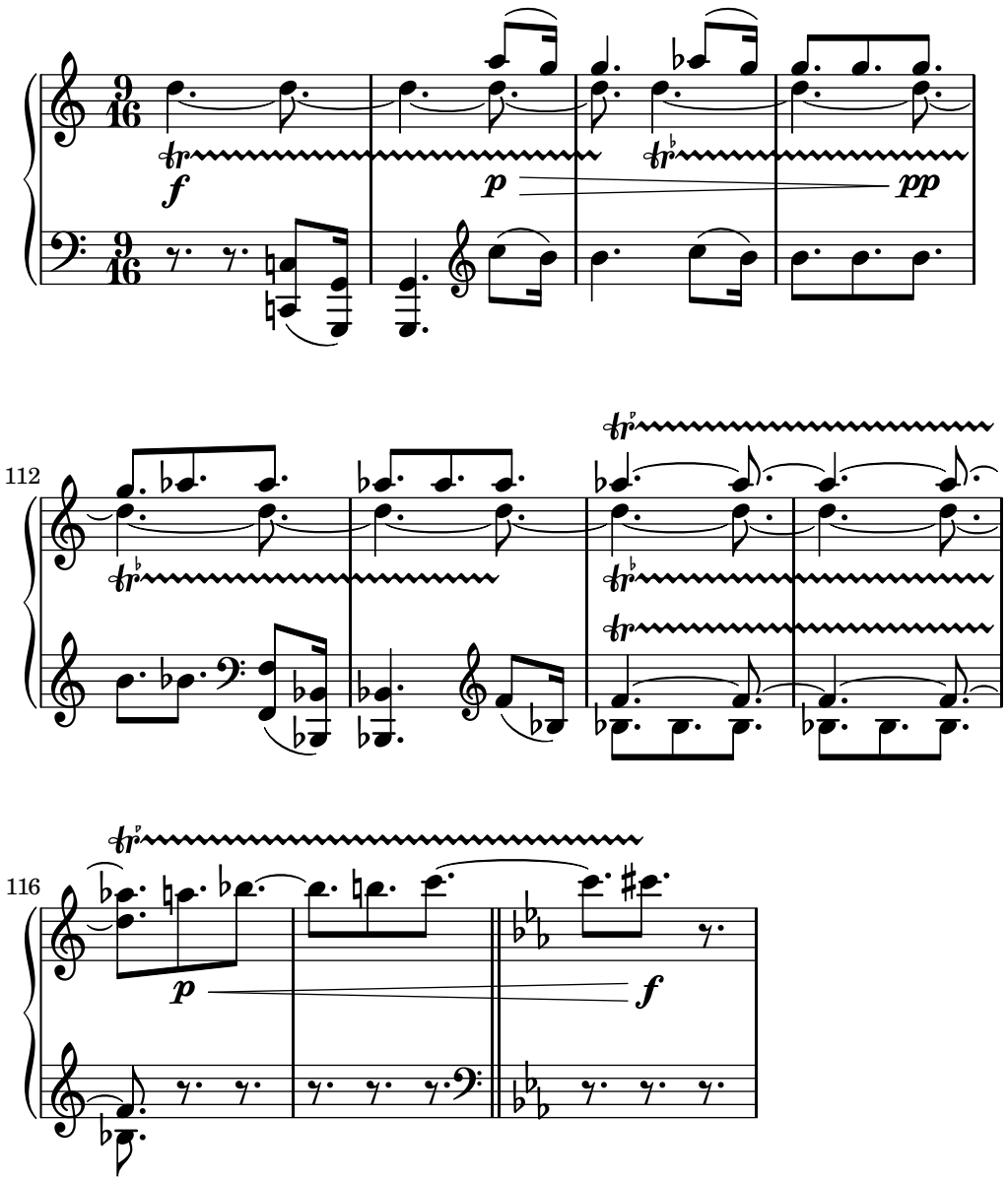
```
\new PianoStaff <<
  \new Staff = "up" \relative c'' {
    \key a \major
    \time 3/8
    s4.
  }
  \new Staff = "down" \relative c'' {
    \key a \major
    \time 3/8
    \voiceOne
    \repeat tremolo 6 {
      <a e'>32
      {
        \change Staff = "up"
        \voiceTwo
        <cis a' dis>32
      }
    }
  }
>>
```



Vedi anche

Frammenti: Sezione “Repeats” in *Frammenti di codice*.

1.5 Note simultanee



La polifonia in musica si riferisce alla presenza di più di una voce in un brano musicale. In LilyPond la polifonia si riferisce alla presenza di più di una voce sullo stesso rigo.

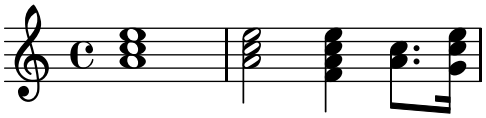
1.5.1 Una voce

In questa sezione vengono spiegate le note simultanee che fanno parte di un’unica voce.

Note in un accordo

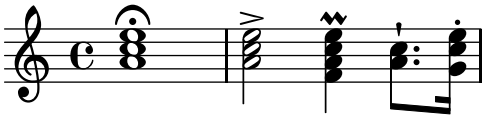
Un accordo si forma racchiudendo una serie di altezze tra `<` e `>` e può essere seguito da una durata, come accade per le semplici note.

```
<a c e>1 <a c e>2 <f a c e>4 <a c>8. <g c e>16
```



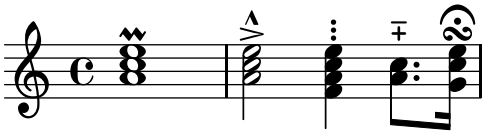
Proprio come per le note, si possono specificare delle articolazioni che si riferiscono all'accordo.

```
<a c e>1\fermata <a c e>2-> <f a c e>4\prall <a c>8.^! <g c e>16-.
```



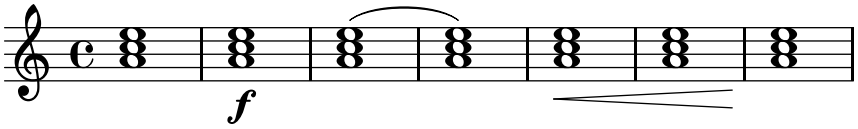
Si possono specificare abbellimenti e articolazioni per ogni nota interna all'accordo.

```
<a c\prall e>1 <a-> c-^ e>2 <f-. a c-. e-.>4
<a-+ c-->8. <g\fermata c e\turn>16
```



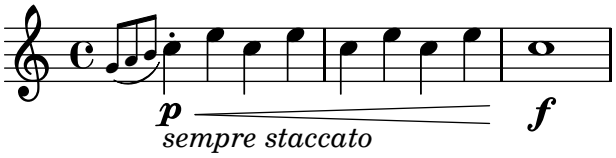
Tuttavia alcuni elementi della notazione, come le dinamiche, le forcelle e le legature di portamento, devono essere attaccate all'accordo invece che alle note dell'accordo, altrimenti non appariranno.

```
<a\f c( e>1 <a c) e>\f <a\< c e>( <a\! c e>)
<a c e>\< <a c e> <a c e>\!
```



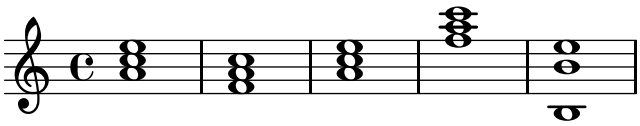
Un accordo si comporta semplicemente come un contenitore di note, articolazioni e altri elementi. Di conseguenza un accordo privo di note non ha una durata. Qualsiasi articolazione attaccata a un accordo vuoto si troverà nel momento musicale della nota o accordo seguenti e si combinerà con questi (possibilità più complesse di combinazione sono spiegate in ⟨undefined⟩ [Simultaneous expressions], pagina ⟨undefined⟩):

```
\grace { g8[( a b] }
<> ) \p \< -. -\markup \italic "sempre staccato"
\repeat unfold 4 { c4 e }  c1\f
```



Si può usare la modalità relativa per indicare l'altezza degli accordi. La prima nota di ogni accordo è sempre relativa alla prima nota dell'accordo che lo precede oppure, se non c'è un accordo precedente, è relativa all'altezza dell'ultima nota che precede l'accordo. Tutte le altre note dell'accordo sono relative alla nota che le precede *all'interno dell'accordo*.

```
<a c e>1 <f a c> <a c e> <f' a c> <b, e b,>
```



Maggiori informazioni sugli accordi si trovano in Sezione 2.7 [Chord notation], pagina 393.

Vedi anche

Glossario Musicale: Sezione “accordo” in *Glossario Musicale*.

Manuale d’apprendimento: Sezione “Combinare le note negli accordi” in *Manuale di Apprendimento*.

Guida alla notazione: Sezione 2.7 [Chord notation], pagina 393, ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩, ⟨undefined⟩ [Relative octave entry], pagina ⟨undefined⟩, ⟨undefined⟩ [Multiple voices], pagina ⟨undefined⟩.

Frammenti: Sezione “Simultaneous notes” in *Frammenti di codice*.

Problemi noti e avvertimenti

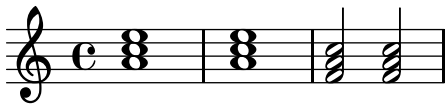
Gli accordi che contengono più di due altezze in uno spazio del rigo, come ad esempio ‘`<e f! fis!>`’, hanno le teste di nota sovrapposte. A seconda della situazione, si può migliorare l’aspetto con

- l’uso temporaneo di ⟨undefined⟩ [Multiple voices], pagina ⟨undefined⟩, ‘`<< f! \\ <e fis!> >>`’,
- la trascrizione enarmonica di una o più altezze, ‘`<e f ges>`’, oppure
- i ⟨undefined⟩ [Clusters], pagina ⟨undefined⟩.

Ripetizione di un accordo

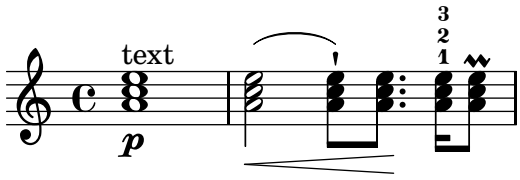
Per inserire la musica più rapidamente, si può usare una scorciatoia che ripete l’accordo precedente. Il simbolo di ripetizione dell’accordo è `q`:

```
<a c e>1 q <f a c>2 q
```



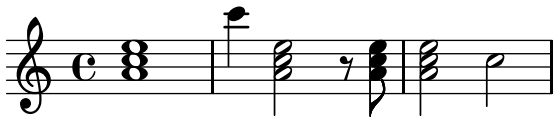
Come nel caso dei normali accordi, il simbolo di ripetzione dell’accordo si può usare con le durate, le articolazioni, i testi a margine, le legature di portamento, le travature, etc. dato che solo le altezze dell’accordo precedente vengono duplicate.

```
<a c e>1\p^"text" q2\<( q8)[-! q8.]\! q16-1-2-3 q8\prall
```



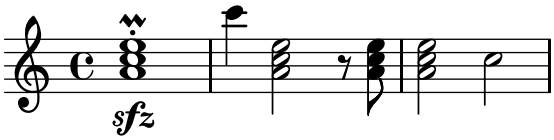
Il simbolo di ripetizione dell’accordo ricorda sempre l’ultimo accordo inserito, quindi è possibile inserire l’accordo più recente anche se nel frattempo sono state inserite altre note (senza accordo) o pause.

```
<a c e>1 c'4 q2 r8 q8 |
q2 c, |
```



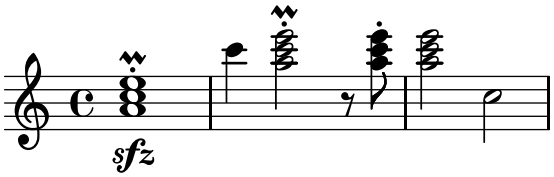
Tuttavia questo simbolo non conserva le dinamiche, le articolazioni o gli abbellimenti dell’accordo precedente.

```
<a-. c\prall e>1\sfz c'4 q2 r8 q8 |
q2 c, |
```



Per far sì che alcuni elementi siano conservati, si può invocare esplicitamente la funzione `\chordRepeats` con un'ulteriore argomento che indica una lista di *tipi di evento* da mantenere, a meno che eventi di quel tipo non siano già presenti nell'accordo `q` stesso.

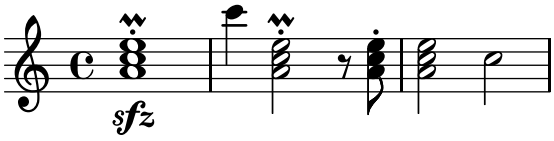
```
\relative c'' {
  \chordRepeats #'(articulation-event)
  { <a-. c\prall e>1\sfz c'4 q2 r8 q8-. } |
  q2 c, |
}
```



In questo esempio l'uso di `\chordRepeats` all'interno di un blocco `\relative` produce risultati indesiderati: gli eventi di un accordo, una volta che sono espansi, non si distinguono più per essere stati inseriti come accordi normali, quindi `\relative` assegna un'ottava basata sul contesto corrente.

Dato che `\relative` annidati non si influenzano l'un l'altro, si può usare un altro `\relative` dentro `\chordRepeats` per stabilire le relazioni di ottava prima di espandere gli accordi ripetuti. In questo caso l'intero contenuto del `\relative` più interno non influenza quello esterno; ecco perché in questo esempio la nota finale è stata specificata con un'ottava diversa.

```
\new Voice
\relative c'' {
  \chordRepeats #'(articulation-event)
  \relative c''
  { <a-. c\prall e>1\sfz c'4 q2 r8 q8-. } |
  q2 c |
}
```



Le interazioni con `\relative` si verificano solo con chiamate esplicite di `\chordRepeats`: l'espansione implicita all'inizio della creazione della partitura viene fatta in un momento in cui tutti i `\relative` sono stati già elaborati.

Vedi anche

Guida alla notazione: Sezione 2.7 [Chord notation], pagina 393, ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

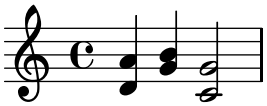
File installati: '`ly/chord-repetition-init.ly`'.

Espressioni simultanee

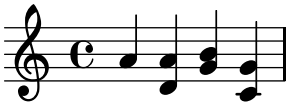
Una o più espressioni musicali racchiuse tra due parentesi uncinate sono considerate simultanee. Se la prima espressione inizia con una nota singola o se l'intera espressione simultanea appare esplicitamente all'interno di una voce, sarà posta in un solo rigo; altrimenti gli elementi dell'espressione simultanea saranno messi in righi separati.

Gli esempi seguenti mostrano espressioni simultanee su un rigo:

```
\new Voice {  % voce singola esplicita
  << { a4 b g2 } { d4 g c,2 } >>
}
```

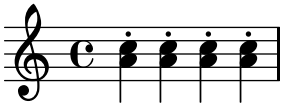


```
% prima nota singola
a << { a4 b g } { d4 g c, } >>
```



Questo può essere utile se le sezioni simultanee hanno durate identiche, ma i tentativi di collegare note con durate diverse allo stesso gambo causerà degli errori. Le note, le articolazioni e le modifiche delle proprietà in una *singola* voce ('`Voice`') sono raccolte e create secondo l'ordine della musica:

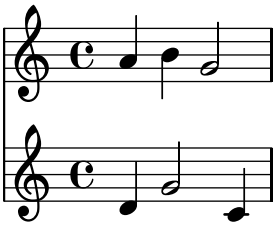
```
<a c>4-.  <>-. << c a >>  << { c-. <c a> } { a s-. } >>
```



Per poter inserire gambi o travature multiple e variare le durate o altre proprietà di note che accadono nello stesso momento musicale, occorre usare più voci.

L'esempio seguente mostra come le espressioni simultanee possano generare implicitamente righi multipli:

```
% nessuna singola nota precede l'espressione simultanea
<< { a4 b g2 } { d4 g2 c,4 } >>
```



In questo caso le durate diverse non causano problemi perché sono interpretate in voci diverse.

Problemi noti e avvertimenti

Se le note appartenenti a due o più voci, con gambi nella stessa direzione, si trovano nello stesso punto del rigo e non è stato specificato uno spostamento orizzontale (oppure è stato specificato lo stesso valore per lo spostamento), il messaggio:

```
attenzione: troppe collisioni tra colonne di note, ignorate
```

apparirà durante la compilazione del file. Si può evitare con:

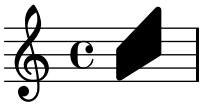
```
\override NoteColumn.ignore-collision = ##t
```

Però questo comando non solo elimina l'avvertimento ma impedisce qualsiasi risoluzione delle collisioni e potrebbe avere altri effetti indesiderati (vedi anche i *Problemi noti* in ⟨undefined⟩ [Collision resolution], pagina ⟨undefined⟩).

Cluster

Un cluster indica un insieme di note da suonare continuamente. Può essere rappresentato come un involucro di un insieme di note. Si inserisce applicando la funzione `\makeClusters` a una sequenza di accordi, ad esempio:

```
\makeClusters { <g b>2 <c g'> }
```



Si possono inserire insieme sullo stesso rigo le normali note e i cluster, anche in contemporanea. In tal caso non viene fatto alcun tentativo di evitare automaticamente collisioni tra le note normali e i cluster.

Vedi anche

Glossario Musicale: Sezione "cluster" in *Glossario Musicale*.

Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "ClusterSpanner" in *Guida al Funzionamento Interno*, Sezione "ClusterSpannerBeacon" in *Guida al Funzionamento Interno*, Sezione "Cluster_spanner_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

I cluster hanno un bell'aspetto solo se durano almeno per due accordi; altrimenti appaiono troppo stretti.

I cluster non hanno un gambo e non possono indicare delle durate da soli, ma la lunghezza del cluster è determinata dalle durate degli accordi che lo definiscono. Cluster distinti hanno bisogno di una pausa che li separi.

I cluster non generano output MIDI.

1.5.2 Più voci

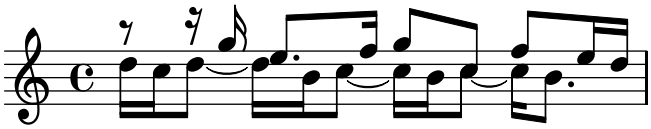
Questa sezione presenta le note simultanee in più voci o più righi.

Polifonia su un solo rigo

Istanziare esplicitamente le voci

La struttura di base necessaria per ottenere più voci indipendenti in un solo rigo è illustrata nell'esempio seguente:

```
\new Staff <<
  \new Voice = "prima"
    { \voiceOne r8 r16 g e8. f16 g8[ c,] f e16 d }
  \new Voice= "seconda"
    { \voiceTwo d16 c d8~ d16 b c8~ c16 b c8~ c16 b8. }
>>
```



Le voci sono istanziate esplicitamente e vengono collegate a dei nomi. I comandi `\voiceOne` ... `\voiceFour` impostano le voci in modo che la prima e terza voce abbiano i gambi in su, la seconda e la quarta voce i gambi in giù, le teste di nota della terza e quarta voce siano spostate orizzontalmente e le pause in ciascuna voce siano spostate automaticamente per evitare collisioni. Il comando `\oneVoice` ripristina tutte le impostazioni della voce alle direzioni neutrali predefinite.

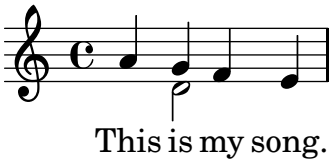
Pasaggi polifonici temporanei

Un passaggio polifonico temporaneo si può creare col seguente costrutto:

```
<< { \voiceOne ... }
  \new Voice { \voiceTwo ... }
>> \oneVoice
```

In questo esempio la prima espressione all'interno di un passaggio polifonico temporaneo è posta nel contesto `Voice` che era in uso immediatamente prima del passaggio polifonico e quello stesso contesto `Voice` continua dopo la sezione temporanea. Le altre espressioni comprese nelle parentesi uncinate vengono assegnate a voci temporanee distinte. Questo permette di assegnare il testo a una voce che continua prima, durante e dopo una sezione polifonica:

```
<<
  \new Voice = "melody" {
    a4
    <<
      {
        \voiceOne
        g f
      }
      \new Voice {
        \voiceTwo
        d2
      }
    >>
    \oneVoice
    e4
  }
  \new Lyrics \lyricsto "melody" {
  This is my song.
  }
>>
```



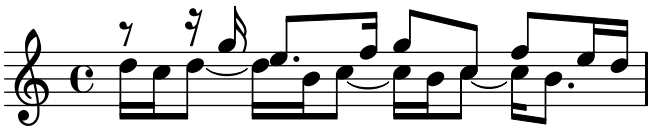
I comandi `\voiceOne` e `\voiceTwo` sono necessari per definire le impostazioni di ogni voce.

Il costrutto con la doppia barra inversa (backslash)

Il costrutto `<< {...} \\ {...} >>`, in cui due (o più) espressioni sono separate da due barre inverse (backslash), si comporta diversamentte dal costrutto simile privo delle due barre: *tutte* le espressioni in questo costrutto vengono assegnate a nuovi contesti `Voice`. Questi nuovi contesti `Voice` vengono creati implicitamente e ad essi vengono assegnati dei nomi prestabiliti `"1"`, `"2"`, etc.

Il primo esempio potrebbe essere riscritto nel modo seguente:

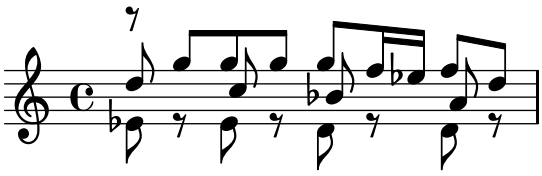
```
<<
  { r8 r16 g e8. f16 g8[ c,] f e16 d }
  \\
  { d16 c d8~ d16 b c8~ c16 b c8~ c16 b8. }
>>
```



Questa sintassi si usa quando non importa che le voci temporanee siano create e poi eliminate. A queste voci create implicitamente vengono assegnate le impostazioni equivalenti all'uso dei comandi `\voiceOne` ... `\voiceFour`, nell'ordine in cui appaiono nell'input.

Nell'esempio seguente, la voce intermedia ha i gambi in su, dunque viene inserita in terza posizione in modo che diventi la terza voce, che ha i gambi in su. Si usano le pause spaziatrici per evitare pause raddoppiate.

```
<<
  { r8 g g  g g f16 ees f8 d }
  \\
  { ees,8 r ees r d r d r }
  \\
  { d'8 s c s bes s a s }
>>
```



In tutti i brani eccetto i più semplici è consigliabile creare contesti `Voice` espliciti come è spiegato in Sezione "Contesti e incisori" in *Manuale di Apprendimento* e Sezione "Istanziare esplicitamente le voci" in *Manuale di Apprendimento*.

Ordine delle voci

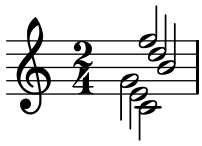
Quando si inseriscono più voci nel file di input, conviene usare il seguente ordine:

```
Voce 1: la più alta
Voce 2: la più bassa
Voce 3: la seconda più alta
```

```
Voce 4: la seconda più bassa
Voce 5: la  terza più alta
Voce 6: la terza più bassa
etc.
```

Sebbene possa sembrare controintuitivo, ciò semplifica il processo automatico di formattazione. Si noti che le voci con numero dispari hanno i gambi in su, quelle con numero pari hanno i gambi in giù:

```
\new Staff <<
  \time 2/4
  { f''2 }  % 1: la più alta
  \\
  { c'2  }  % 2: la più bassa
  \\
  { d''2 }  % 3: seconda più alta
  \\
  { e'2  }  % 4: seconda più bassa
  \\
  { b'2  }  % 5: terza più alta
  \\
  { g'2  }  % 6: terza più bassa
>>
```

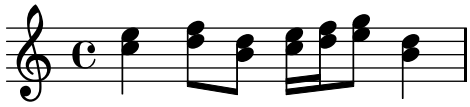


Nota: Il testo e gli estensori (come le legature di portamento e di valore, le forcelle, etc.) non possono 'attraversare' le voci.

Durate idenntiche

Nel caso speciale in cui si desideri inserire brani musicali paralleli che abbiano lo stesso ritmo, si possono combinare in un unico contesto `Voice`, dunque formando degli accordi. Per farlo si racchiudono in un semplice costrutto musicale simultaneo all'interno di una voce esplicita:

```
\new Voice <<
  { e4 f8 d e16 f g8 d4 }
  { c4 d8 b c16 d e8 b4 }
>>
```



Questo metodo produce strane travature e avvertimenti se i brani musicali non hanno lo stesso ritmo.

Comandi predefiniti

`\voiceOne`, `\voiceTwo`, `\voiceThree`, `\voiceFour`, `\oneVoice`.

Vedi anche

Manuale d'apprendimento: Sezione "Le voci contengono la musica" in *Manuale di Apprendimento*, Sezione "Definire esplicitamente le voci" in *Manuale di Apprendimento*.

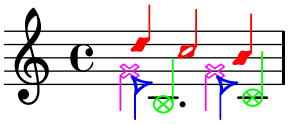
Guida alla notazione: [Percussion staves], pagina 373, ⟨undefined⟩ [Invisible rests], pagina ⟨undefined⟩, [Stems], pagina 215.

Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

Stili di voce

Si possono assegnare colori e forme diverse a ciascuna voce per facilitarne l'identificazione:

```
<<
  { \voiceOneStyle d4 c2 b4 }
  \\
  { \voiceTwoStyle e,2 e }
  \\
  { \voiceThreeStyle b2. c4 }
  \\
  { \voiceFourStyle g'2 g }
>>
```



Il comando `\voiceNeutralStyle` permette di ripristinare l'aspetto predefinito.

Comandi predefiniti

`\voiceOneStyle`, `\voiceTwoStyle`, `\voiceThreeStyle`, `\voiceFourStyle`, `\voiceNeutralStyle`.

Vedi anche

Manuale d'apprendimento: Sezione "Sento le Voci" in *Manuale di Apprendimento*, Sezione "Altre fonti di informazione" in *Manuale di Apprendimento*.

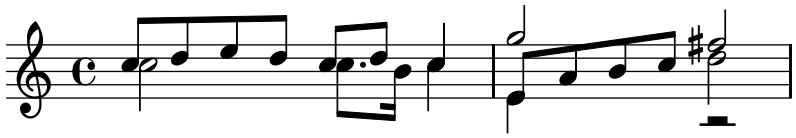
Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

Risoluzione delle collisioni

Le teste di note che si trovano in voci diverse ma hanno stessa altezza, stessa testa e direzione del gambo opposta, vengono unite automaticamente; invece le note che hanno la stessa testa o la stessa direzione del gambo non vengono unite. Le pause opposte a un gambo in una voce diversa vengono spostate verticalmente. L'esempio seguente mostra tre diverse circostanze, sul primo e terzo battito della prima battuta e sul primo battito della seconda battuta, in cui l'unione automatica delle teste di nota non funziona.

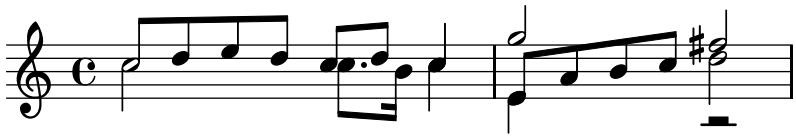
```
<<
  {
    c8 d e d c d c4
    g'2 fis
  } \\ {
    c2 c8. b16 c4
    e,2 r
  } \\ {
    \oneVoice
```

```
    s1
    e8 a b c d2
  }
>>
```



Note con teste diverse possono essere unite, come è mostrato sotto. In questo esempio le teste delle note nel primo battito della prima battuta sono unite:

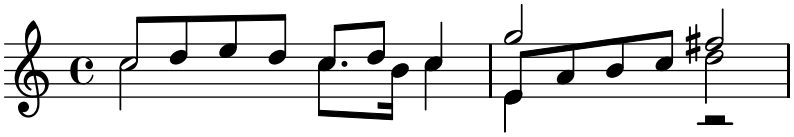
```
<<
  {
    \mergeDifferentlyHeadedOn
    c8 d e d c d c4
    g'2 fis
  } \\ {
    c2 c8. b16 c4
    e,2 r
  } \\ {
    \oneVoice
    s1
    e8 a b c d2
  }
>>
```



Le minime e le semiminime non sono unite in questo modo, perché sarebbe difficile distinguerle.

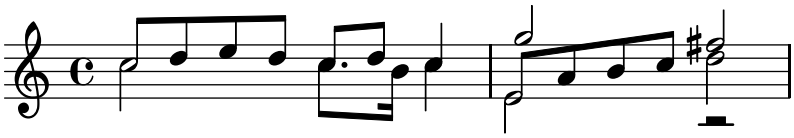
Anche le teste di note con diversi punti, come nel terzo battito della prima battuta, possono essere unite:

```
<<
  {
    \mergeDifferentlyHeadedOn
    \mergeDifferentlyDottedOn
    c8 d e d c d c4
    g'2 fis
  } \\ {
    c2 c8. b16 c4
    e,2 r
  } \\ {
    \oneVoice
    s1
    e8 a b c d2
  }
>>
```



La minima e la croma all'inizio della seconda misura sono unite per errore, perché l'unione automatica non riesce a completare correttamente l'unione quando tre o più note sono allineate sulla stessa colonna di note: in questo caso la testa di nota unita non è corretta. Per far sì che l'unione selezioni la testa di nota corretta, occorre applicare il comando `\shift` alla nota che non deve essere unita. In questo esempio si usa `\shiftOn` per spostare il Sol superiore (g) fuori dalla colonna e di conseguenza `\mergeDifferentlyHeadedOn` funziona correttamente.

```
<<
  {
    \mergeDifferentlyHeadedOn
    \mergeDifferentlyDottedOn
    c8 d e d c d c4
    \shiftOn
    g'2 fis
  } \\ {
    c2 c8. b16 c4
    e,2 r
  } \\ {
    \oneVoice
    s1
    e8 a b c d2
  }
>>
```



Il comando `\shiftOn` permette (senza forzare) lo spostamento delle note in una voce. Quando si applica `\shiftOn` a una voce, una nota o accordo in quella voce vengono spostati solo se il suo gambo entrerebbe altrimenti in collisione col gambo di un'altra voce, e solo se i gambi che collidono puntano nella stessa direzione. Il comando `\shiftOff` impedisce che accada questo tipo di spostamento.

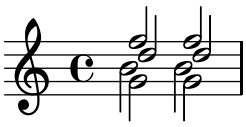
Per impostazione predefinita, le voci più esterne (solitamente la prima e la seconda voce) hanno specificato `\shiftOff`, mentre le voci più interne (terza e superiore) hanno specificato `\shiftOn`. Quando si applica uno spostamento, le voci con i gambi in su (voci con numero dispari) vengono spostate a destra, e le voci con i gambi in giù (voci con numeri pari) vengono spostate a sinistra.

Ecco un esempio che aiuta a visualizzare come un'espressione simultanea abbreviata viene espansa internamente.

> **Nota:** Attenzione: con tre o più voci, l'ordine verticale delle voci nel file di input non deve essere lo stesso dell'ordine verticale delle voci del rigo!

```
\new Staff \relative c'' {
  %% inserimento abbreviato
  <<
    { f2  }  % 1: più alta
    \\
```

```
    { g,2 }  % 2: più bassa
    \\
    { d'2 }  % 3: più alta centrale
    \\
    { b2  }  % 4: più  bassa centrale
  >>
  %% espansione interna dell'input precedente
  <<
    \new Voice = "1" { \voiceOne   \shiftOff f'2 }
    \new Voice = "2" { \voiceTwo   \shiftOff g,2 }
    \new Voice = "3" { \voiceThree \shiftOn  d'2 } % sposta a destra
    \new Voice = "4" { \voiceFour  \shiftOn  b2  } % sposta a sinistra
  >>
}
```



Due ulteriori comandi, `\shiftOnn` e `\shiftOnnn`, mettono a disposizione altri livelli di spostamento che possono essere specificati in modo temporaneo per risolvere delle collisioni in situazioni complesse – vedi Sezione "Esempio musicale" in *Manuale di Apprendimento*.

Le note vengono unite solo se hanno direzione dei gambi opposta (come accade, ad esempio, nella prima o seconda voce o quando i gambi sono impostati esplicitamente in direzioni opposte).

Comandi predefiniti

`\mergeDifferentlyDottedOn`, `\mergeDifferentlyDottedOff`, `\mergeDifferentlyHeadedOn`, `\mergeDifferentlyHeadedOff`.

`\shiftOn`, `\shiftOnn`, `\shiftOnnn`, `\shiftOff`.

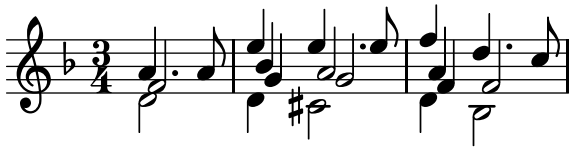
Frammenti di codice selezionati

Voci ulteriori per evitare le collisioni

In alcuni casi di musica polifonica complessa sono necessarie delle voci ulteriori per evitare le collisioni tra note. Se servono più di quattro voci parallele, si possono aggiungere altre voci definendo una variabile con la funzione Scheme function `context-spec-music`.

```
voiceFive = #(context-spec-music (make-voice-props-set 4) 'Voice)

\relative c'' {
  \time 3/4
  \key d \minor
  \partial 2
  <<
    \new Voice  {
      \voiceOne
      a4. a8
      e'4 e4. e8
      f4 d4. c8
    }
    \new Voice {
      \voiceTwo
```

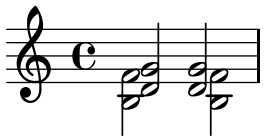
```
      d,2
      d4 cis2
      d4 bes2
    }
    \new Voice {
      \voiceThree
      f'2
      bes4 a2
      a4 s2
    }
    \new Voice {
      \voiceFive
      s2
      g4 g2
      f4 f2
    }
  >>
}
```



Forzare lo spostamento orizzonatale delle note

Quando il motore tipografico non riesce a risolvere una situazione, si può usare la sintassi che sovrascrive le decisioni tipografiche. L'unità di misura usata è lo spazio del rigo.

```
\relative c' <<
  {
    <d g>2 <d g>
  }
  \\
  {
    <b f'>2
    \once \override NoteColumn.force-hshift = #1.7
    <b f'>2
  }
>>
```



Vedi anche

Glossario Musicale: Sezione "polifonia" in *Glossario Musicale*.

Manuale d'apprendimento: Sezione "Note simultanee" in *Manuale di Apprendimento*, Sezione "Le voci contengono la musica" in *Manuale di Apprendimento*, Sezione "Esempio musicale" in *Manuale di Apprendimento*.

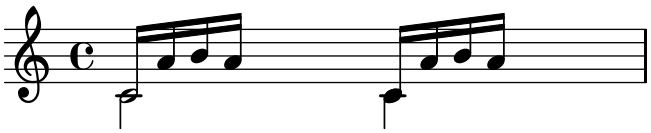
Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "NoteColumn" in *Guida al Funzionamento Interno*, Sezione "NoteCollision" in *Guida al Funzionamento Interno*, Sezione "RestCollision" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Se si usa `\override NoteColumn.ignore-collision = ##t`, saranno unite incorrettamente note con teste diverse che si trovano in voci diverse.

```
\mergeDifferentlyHeadedOn
<< { c16 a' b a } \\ { c,2 } >>
\override NoteColumn.ignore-collision = ##t
<< { c16 a' b a } \\ { c,2 } >>
```



Combinazione automatica delle parti

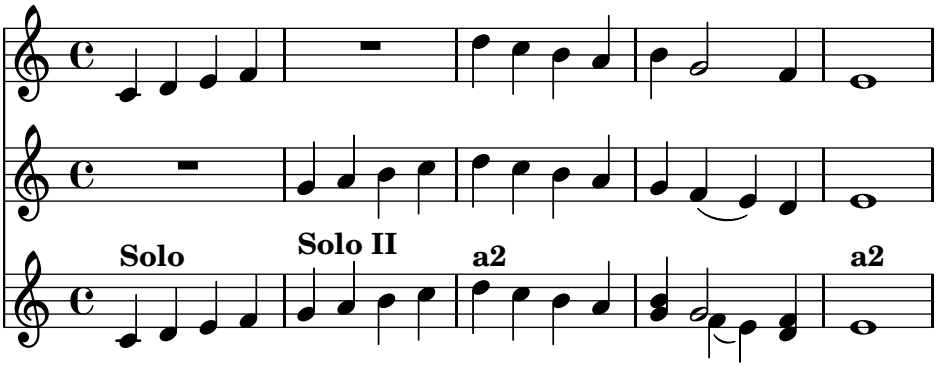
La combinazione automatica delle parti si usa per combinare in un unico rigo due parti musicali separate. Ciò è utile soprattutto quando si scrivono partiture orchestrali. Viene stampata una sola voce se le due parti musicali sono identiche, ma nei punti in cui sono diverse viene aggiunta una seconda voce. Le direzioni dei gambi sono impostate in su e in giù in base alla voce, mentre le parti soliste e *a due* sono anch'esse identificate e contrassegnate.

La sintassi per la combinazione automatica delle parti è:

`\partcombine` *`espressione-musicale1 espressione-musicale2`*

L'esempio seguente illustra il funzionamento di base: le parti sono poste su un unico rigo in modo polifonico e le direzioni dei gambi sono regolate di conseguenza. Si usano le stesse variabili per le parti indipendenti e il rigo combinato.

```
instrumentOne = \relative c' {
  c4 d e f |
  R1 |
  d'4 c b a |
  b4 g2 f4 |
  e1 |
}

instrumentTwo = \relative g' {
  R1 |
  g4 a b c |
  d4 c b a |
  g4 f( e) d |
  e1 |
}

<<
  \new Staff \instrumentOne
  \new Staff \instrumentTwo
  \new Staff \partcombine \instrumentOne \instrumentTwo
>>
```



Entrambe le parti hanno note identiche nella terza misura, dunque viene stampata una sola nota. Le direzioni dei gambi e delle legature di portamento e di valore sono impostate automaticamente, a seconda che le parti siano eseguite come solista o all'unisono. Quando si rende necessario in caso di polifonia, la prima parte (nel contesto `one`) ha i gambi in "su", mentre la seconda (nel contesto `two`) ha sempre i gambi in "giù". In caso di parti soliste, la prima e seconda parte sono contrassegnate con "Solo" e "Solo II", rispettivamente. Le parti (*a due*) all'unisono sono contrassegnate con la scritta "a2".

Entrambi gli argomenti di `\partcombine` sono interpretati come contesti `Voice` separati, dunque se la musica viene inserita in modo relativo *entrambe* le parti devono contenere una funzione `\relative`, ovvero:

```
\partcombine
  \relative ... espressione-musicale1
  \relative ... espressione-musicale2
```

Un blocco `\relative` che racchiude un `\partcombine` non ha effetto sulle altezze di *`espressione-musicale1`* e *`espressione-musicale2`*.

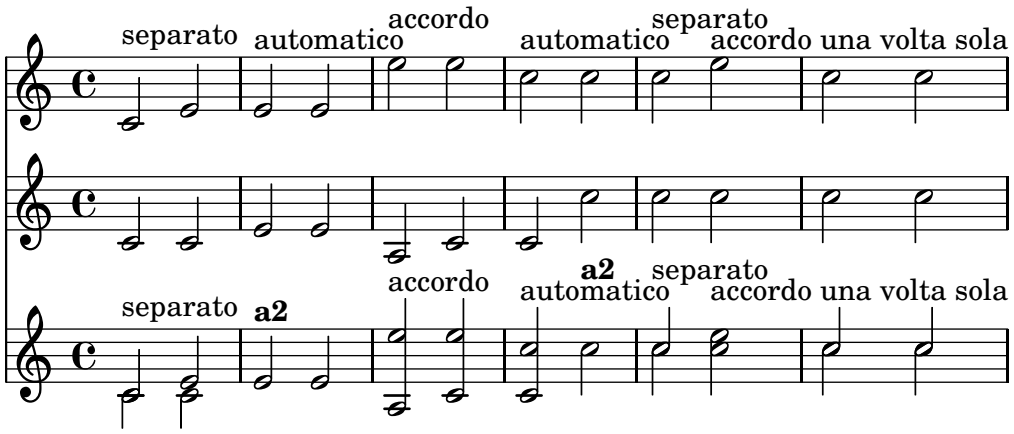
Nelle partiture professionali, spesso le voci sono tenute separate per lunghi passaggi anche se alcune note sono le stesse in entrambe le voci e potrebbero essere stampate come unisono. Combinare le note in un accordo o mostrare una voce come solista, dunque, non è la scelta ideale perché la funzione `\partcombine` considera ogni nota in modo separato. In questo caso si può sovrascrivere la funzione `\partcombine` con i comandi elencati sotto.

I comandi che finiscono con `...Once` si applicano soltanto alla nota successiva dell'espressione musicale.

- `\partcombineApart` e `\partcombineApartOnce` mantengono le note su due voci distinte, anche se potrebbero essere combinate in un accordo o in un unisono.
- `\partcombineChords` e `\partcombineChordsOnce` uniscono le note in un accordo.
- `\partcombineUnisono` e `\partcombineUnisonoOnce` uniscono entrambe le voci come "unisono".
- `\partcombineSoloI` e `\partcombineSoloIOnce` stampano soltanto la prima voce e la contrassegnano come un "Solo".
- `\partcombineSoloII` o `\partcombineSoloIIOnce` stampano soltanto la seconda voce e la contrassegnano come un "Solo".
- `\partcombineAutomatic` e `\partcombineAutomaticOnce` terminano le funzioni dei comandi precedenti e ripristinano il funzionamento predefinito di `\partcombine`.

```
instrumentOne = \relative c' {
  \partcombineApart c2^"separato" e |
  \partcombineAutomatic e2^"automatico" e |
  \partcombineChords e'2^"accordo" e |
  \partcombineAutomatic c2^"automatico" c |
  \partcombineApart c2^"separato" \partcombineChordsOnce e^"accordo una volta sola" |
  c2 c |
```

```
}
instrumentTwo = \relative c' {
  c2 c |
  e2 e |
  a,2 c |
  c2 c' |
  c2 c |
  c2 c |
}

<<
  \new Staff { \instrumentOne }
  \new Staff { \instrumentTwo }
  \new Staff { \partcombine \instrumentOne \instrumentTwo }
>>
```



Frammenti di codice selezionati

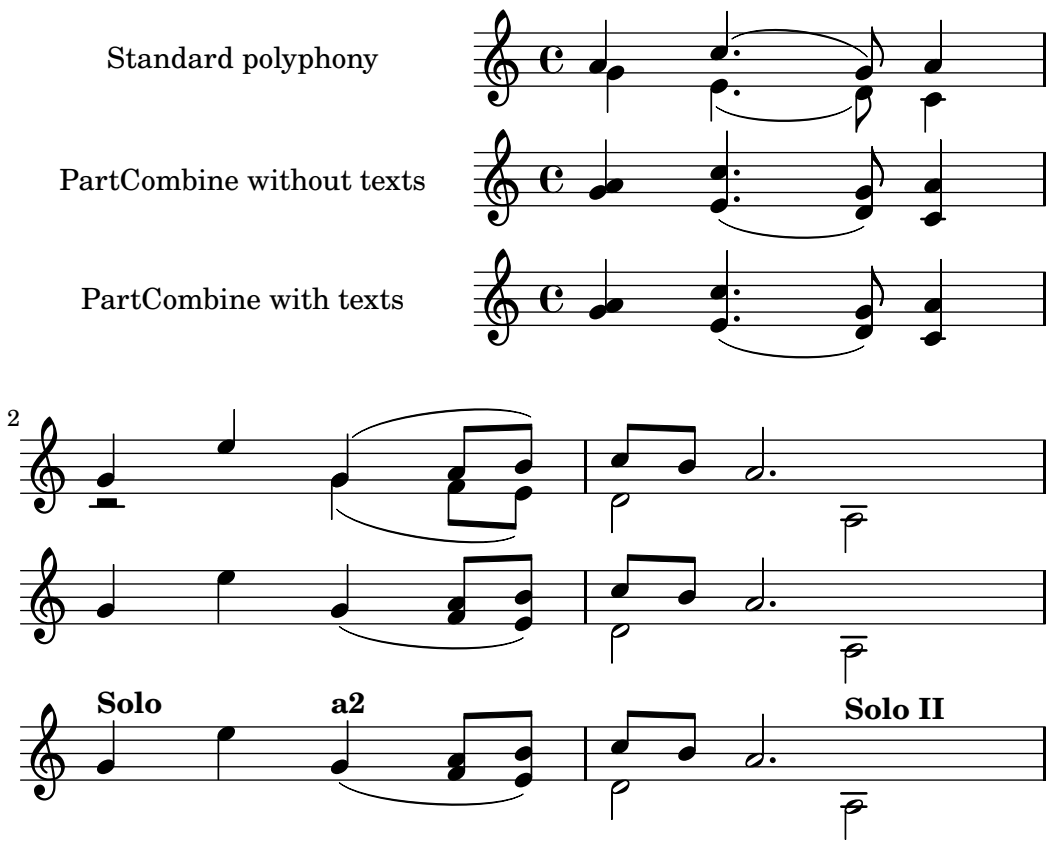
Combinare due parti sullo stesso rigo

Lo strumento di unione delle parti (il comando `\partcombine`) permette di combinare varie parti sullo stesso rigo. Indicazioni testuali come "solo" e "a2" sono aggiunte automaticamente; per toglierele basta impostare la proprietà `printPartCombineTexts` su `f`. Per le partiture vocali (inni), non c'è bisogno di aggiungere i testi "solo/a2", quindi dovrebbero essere disattivati. Tuttavia potrebbe convenire non usarlo se c'è una qualche parte solista, perché non verrebbe indicata. In tali casi è preferibile usare la notazione polifonica normale.

Questo frammento illustra i tre modi con cui due parti possono essere stampate su uno stesso rigo: normale polifonia, `\partcombine` senza testo e `\partcombine` con testo.

```
musicUp = \relative c'' {
  \time 4/4
  a4 c4.( g8) a4 |
  g4 e' g,( a8 b) |
  c b a2.
}

musicDown = \relative c'' {
  g4 e4.( d8) c4 |
  r2 g'4( f8 e) |
  d2 \stemDown a
```

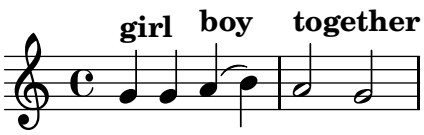
```
}

\score {
  <<
    <<
    \new Staff {
      \set Staff.instrumentName = #"Standard polyphony"
      << \musicUp \\ \musicDown >>
    }
    \new Staff \with { printPartCombineTexts = ##f } {
      \set Staff.instrumentName = #"PartCombine without texts"
      \partcombine \musicUp \musicDown
    }
    \new Staff {
      \set Staff.instrumentName = #"PartCombine with texts"
      \partcombine \musicUp \musicDown
    }
    >>
  >>
  \layout {
    indent = 6.0\cm
    \context {
      \Score
      \override SystemStartBar.collapse-height = #30
    }
  }
}
```



Modificare le indicazioni testuali di partcombine

Quando si usa la funzionalità di combinazione automatica delle parti, si può modificare il testo delle sezioni soliste e dell'unisono:

```
\new Staff <<
  \set Staff.soloText = #"girl"
  \set Staff.soloIIText = #"boy"
  \set Staff.aDueText = #"together"
  \partcombine
    \relative c'' {
      g4 g r r
      a2 g
    }
    \relative c'' {
      r4 r a( b)
      a2 g
    }
>>
```



Vedi anche

Glossario Musicale: Sezione "a due" in *Glossario Musicale*, Sezione "parte" in *Glossario Musicale*.

Guida alla notazione: Sezione 1.6.3 [Writing parts], pagina 197.

Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

Guida al funzionamento interno: Sezione "PartCombineMusic" in *Guida al Funzionamento Interno*, Sezione "Voice" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Tutte le funzioni `\partcombine...` possono accettare soltanto due voci e non sono progettate per funzionare col testo vocale; al punto che se una delle voci è nominata in modo esplicito per poterle assegnare del testo, l'unione delle parti smette di funzionare.

Le funzioni `\partcombine...` non possono essere inserite all'interno di un blocco `\tuplet` o `\relative`.

Se `printPartCombineTexts` è attivo e le due voci suonano le stesse note "in modo discontinuo" nella stessa misura, potrebbe apparire il testo `a2` più di una volta in quella misura.

`\partcombine` sa soltanto quando una nota inizia in una voce (`Voice`); non può, ad esempio, ricordare se una nota in una voce è già iniziata quando combina le note già iniziate nell'altra voce. Questo può portare a vari problemi inattesi, tra cui la stampa non corretta dei segni "Solo" e "Unisono".

`\partcombine` tiene tutti gli estensori (legature di portamento e di valore, forcine, etc.) nella stessa voce, quindi se uno di questi estensori inizia o termina in una voce diversa potrebbe essere stampato incorrettamente o affatto.

Se la funzione `\partcombine` non riesce a combinare le due espressioni musicali (ovvero quando le due voci hanno durate diverse), assegnerà alle voci, internamente, nomi personalizzati:

rispettivamente `one` e `two`. Ciò significa che se c'è un "passaggio" a un contesto `Voice` nominato diversamente, gli eventi in quel contesto verranno ignorati.

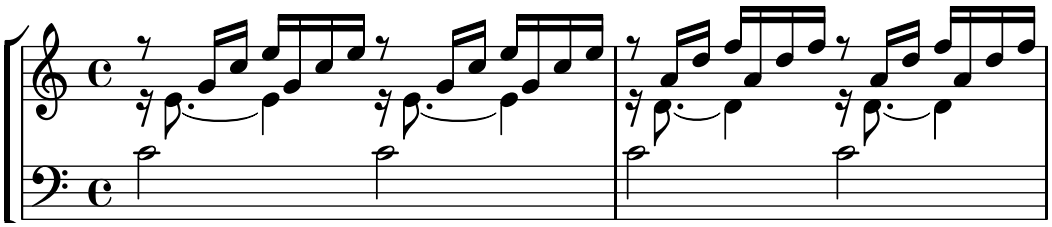
Consultare i *Problemi noti e avvertimenti* in [Default tablatures], pagina 328 se si usa `\partcombine` con l'intavolatura, e la *Nota* in ⟨undefined⟩ [Automatic beams], pagina ⟨undefined⟩ se si usa la disposizione automatica delle travature.

Scrivere la musica in parallelo

La musica che contiene varie parti può essere messa in parallelo nel codice di input. La funzione `\parallelMusic` accetta una lista contenente i nomi di un insieme di variabili da creare e un'espressione musicale. Il contenuto delle misure alternate nell'espressione diventa il valore delle rispettive variabili, in modo che possano essere usate successivamente per stampare la musica.

> **Nota:** L'uso dei controlli di battuta `|` è obbligatorio e le misure devono avere la stessa durata.

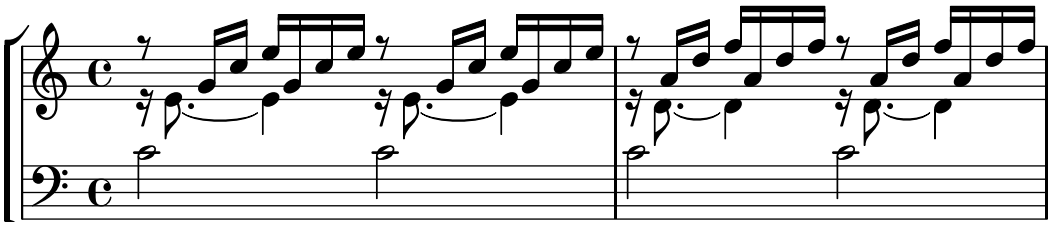
```
\parallelMusic #'(voiceA voiceB voiceC) {
  % Battuta 1
  r8 g'16 c'' e'' g' c'' e'' r8 g'16 c'' e'' g' c'' e'' |
  r16 e'8.~   e'4            r16 e'8.~   e'4            |
  c'2                        c'2                        |

  % Battuta 2
  r8 a'16 d'' f'' a' d'' f'' r8 a'16 d'' f'' a' d'' f'' |
  r16 d'8.~   d'4            r16 d'8.~   d'4            |
  c'2                        c'2                        |

}
\new StaffGroup <<
  \new Staff << \voiceA \\ \voiceB >>
  \new Staff { \clef bass \voiceC }
>>
```



L'uso del modo relativo è permesso. Attenzione: il comando `\relative` non deve essere messo dentro `\parallelMusic`. Le note sono relative alla nota precedente della voce, non a quella precedente nell'input. In altre parole, le note relative di `voiceA` ignorano le note in `voiceB`.

```
\parallelMusic #'(voiceA voiceB voiceC) {
  % Battuta 1
  r8 g16 c e g, c e r8 g,16 c e g, c e  |
  r16 e8.~ e4       r16 e8.~  e4        |
  c2                c                   |

  % Battuta 2
  r8 a,16 d f a, d f r8 a,16 d f a, d f |
```

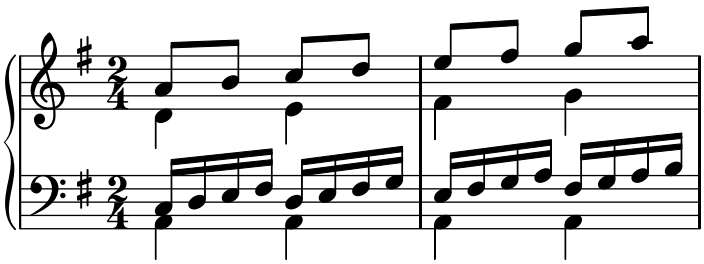
```
  r16 d8.~  d4       r16 d8.~  d4       |
  c2                 c                  |

 }
\new StaffGroup <<
  \new Staff << \relative c'' \voiceA \\ \relative c' \voiceB >>
  \new Staff \relative c' { \clef bass \voiceC }
>>
```



Questo è molto utile nella musica per pianoforte. Questo esempio associa quattro misure consecutive a quattro variabili:

```
global = {
  \key g \major
  \time 2/4
}

\parallelMusic #'(voiceA voiceB voiceC voiceD) {
  % Battuta 1
  a8    b     c   d     |
  d4          e         |
  c16 d e fis d e fis g |
  a4          a         |

  % Battuta 2
  e8      fis  g     a   |
  fis4         g         |
  e16 fis g  a fis g a b |
  a4           a         |

  % Bar 3 ...
}

\score {
  \new PianoStaff <<
     \new Staff {
       \global
       <<
         \relative c'' \voiceA
         \\
         \relative c'  \voiceB
       >>
     }
     \new Staff {
       \global \clef bass
       <<
```

```
            \relative c \voiceC
            \\
            \relative c \voiceD
          >>
        }
    >>
}
```

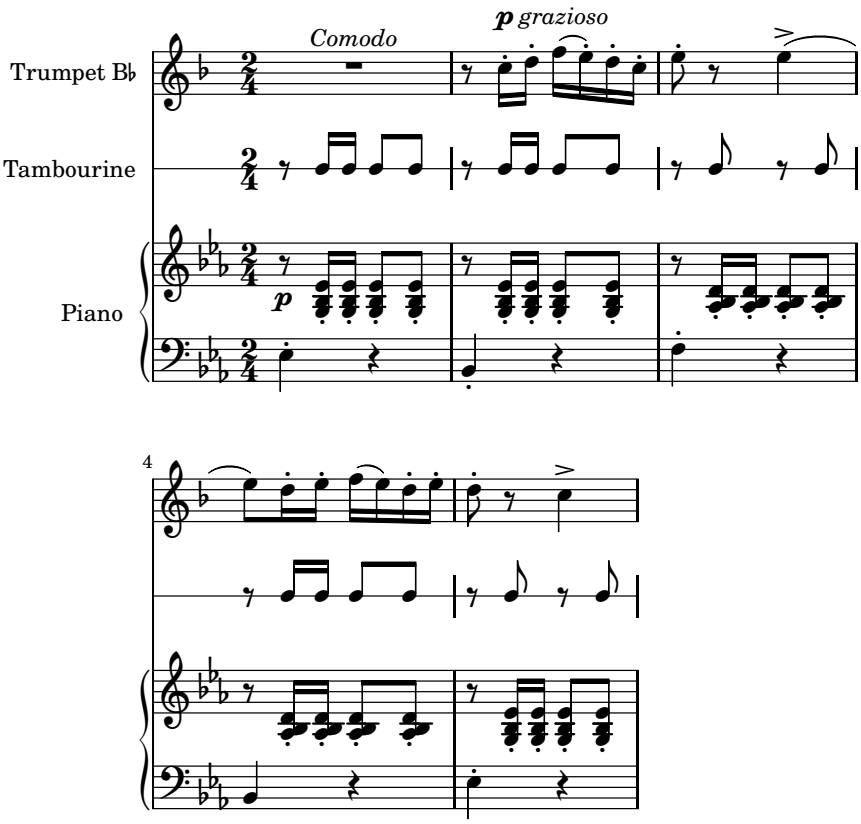


Vedi anche

Manuale d'apprendimento: Sezione "Organizzare i brani con le variabili" in *Manuale di Apprendimento*.

Frammenti: Sezione "Simultaneous notes" in *Frammenti di codice*.

1.6 Staff notation



This section explains how to influence the appearance of staves, how to print scores with more than one staff, and how to add tempo indications and cue notes to staves.

1.6.1 Displaying staves

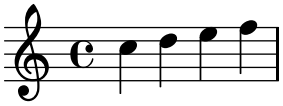
This section describes the different methods of creating and grouping staves.

Instantiating new staves

Staves (singular: *staff*) are created with the `\new` or `\context` commands. For details, see Sezione 5.1.2 [Creating and referencing contexts], pagina 557.

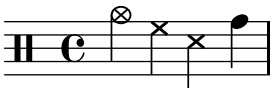
The basic staff context is `Staff`:

```
\new Staff { c4 d e f }
```



The `DrumStaff` context creates a five-line staff set up for a typical drum set. Each instrument is shown with a different symbol. The instruments are entered in drum mode following a `\drummode` command, with each instrument specified by name. For details, see [Percussion staves], pagina 373.

```
\new DrumStaff {
  \drummode { cymc hh ss tomh }
}
```

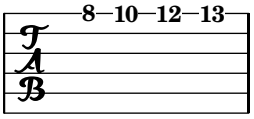


`RhythmicStaff` creates a single-line staff that only displays the rhythmic values of the input. Real durations are preserved. For details, see ⟨undefined⟩ [Showing melody rhythms], pagina ⟨undefined⟩.

```
\new RhythmicStaff { c4 d e f }
```

`TabStaff` creates a tablature with six strings in standard guitar tuning. For details, see [Default tablatures], pagina 328.

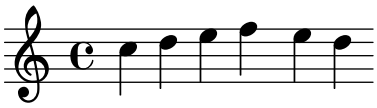
```
\new TabStaff { c4 d e f }
```



There are two staff contexts specific for the notation of ancient music: `MensuralStaff` and `VaticanaStaff`. They are described in [Pre-defined contexts], pagina 416.

The `GregorianTranscriptionStaff` context creates a staff to notate modern Gregorian chant. It does not show bar lines.

```
\new GregorianTranscriptionStaff { c4 d e f e d }
```



New single staff contexts may be defined. For details, see Sezione 5.1.6 [Defining new contexts], pagina 569.

Vedi anche

Music Glossary: Sezione “staff” in *Glossario Musicale*, Sezione “staves” in *Glossario Musicale*.

Notation Reference: Sezione 5.1.2 [Creating and referencing contexts], pagina 557, [Percussion staves], pagina 373, ⟨undefined⟩ [Showing melody rhythms], pagina ⟨undefined⟩, [Default tablatures], pagina 328, [Pre-defined contexts], pagina 416, [Staff symbol], pagina 187, [Gregorian chant contexts], pagina 425, [Mensural contexts], pagina 418, Sezione 5.1.6 [Defining new contexts], pagina 569.

Snippets: Sezione “Staff notation” in *Frammenti di codice*.

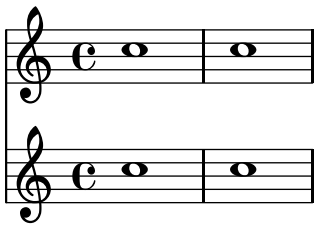
Internals Reference: Sezione “Staff” in *Guida al Funzionamento Interno*, Sezione “DrumStaff” in *Guida al Funzionamento Interno*, Sezione “GregorianTranscriptionStaff” in *Guida al Funzionamento Interno*, Sezione “RhythmicStaff” in *Guida al Funzionamento Interno*, Sezione “TabStaff” in *Guida al Funzionamento Interno*, Sezione “MensuralStaff” in *Guida al Funzionamento Interno*, Sezione “VaticanaStaff” in *Guida al Funzionamento Interno*, Sezione “StaffSymbol” in *Guida al Funzionamento Interno*.

Grouping staves

Various contexts exist to group single staves together in order to form multi-stave systems. Each grouping context sets the style of the system start delimiter and the behavior of bar lines.

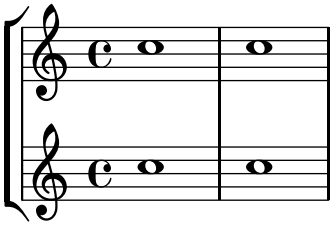
If no context is specified, the default properties will be used: the group is started with a vertical line, and the bar lines are not connected.

```
<<
  \new Staff { c1 c }
  \new Staff { c1 c }
>>
```



In the `StaffGroup` context, the group is started with a bracket and bar lines are drawn through all the staves.

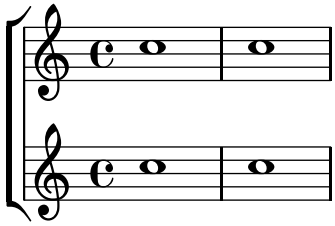
```
\new StaffGroup <<
  \new Staff { c1 c }
  \new Staff { c1 c }
>>
```



In a `ChoirStaff`, the group starts with a bracket, but bar lines are not connected.

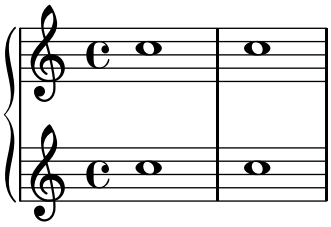
```
\new ChoirStaff <<
  \new Staff { c1 c }
```

```
  \new Staff { c1 c }
>>
```



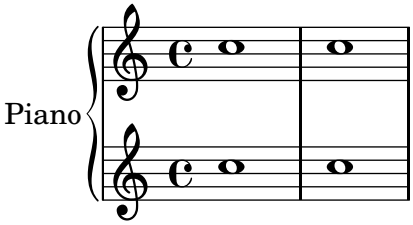
In a GrandStaff, the group begins with a brace, and bar lines are connected between the staves.

```
\new GrandStaff <<
  \new Staff { c1 c }
  \new Staff { c1 c }
>>
```



The PianoStaff is identical to a GrandStaff, except that it supports printing the instrument name directly. For details, see [Instrument names], pagina 197.

```
\new PianoStaff <<
  \set PianoStaff.instrumentName = #"Piano"
  \new Staff { c1 c }
  \new Staff { c1 c }
>>
```



Each staff group context sets the property systemStartDelimiter to one of the following values: SystemStartBar, SystemStartBrace, or SystemStartBracket. A fourth delimiter, SystemStartSquare, is also available, but it must be explicitly specified.

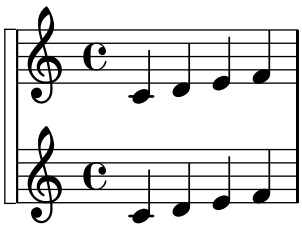
New staff group contexts may be defined. For details, see Sezione 5.1.6 [Defining new contexts], pagina 569.

Frammenti di codice selezionati

Use square bracket at the start of a staff group

The system start delimiter SystemStartSquare can be used by setting it explicitly in a StaffGroup or ChoirStaff context.

```
\score {
  \new StaffGroup { <<
  \set StaffGroup.systemStartDelimiter = #'SystemStartSquare
    \new Staff { c'4 d' e' f' }
    \new Staff { c'4 d' e' f' }
  >> }
}
```

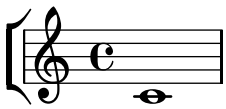


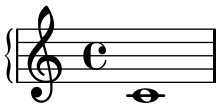
Display bracket with only one staff in a system

If there is only one staff in one of the staff types `ChoirStaff` or `StaffGroup`, by default the bracket and the starting bar line will not be displayed. This can be changed by overriding `collapse-height` to set its value to be less than the number of staff lines in the staff.

Note that in contexts such as `PianoStaff` and `GrandStaff` where the systems begin with a brace instead of a bracket, another property has to be set, as shown on the second system in the example.

```
\score {
  \new StaffGroup <<
    % Must be lower than the actual number of staff lines
    \override StaffGroup.SystemStartBracket.collapse-height = #4
    \override Score.SystemStartBar.collapse-height = #4
    \new Staff {
      c'1
    }
  >>
}
\score {
  \new PianoStaff <<
    \override PianoStaff.SystemStartBrace.collapse-height = #4
    \override Score.SystemStartBar.collapse-height = #4
    \new Staff {
      c'1
    }
  >>
}
```

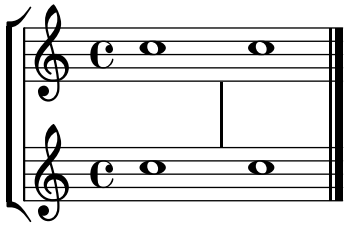




Mensurstriche layout (bar lines between the staves)

The mensurstriche-layout where the bar lines do not show on the staves but between staves can be achieved with a `StaffGroup` instead of a `ChoirStaff`. The bar line on staves is blanked out by setting the `transparent` property.

```
global = {
  \override Staff.BarLine.transparent = ##t
  s1 s
  % the final bar line is not interrupted
  \revert Staff.BarLine.transparent
  \bar "|."
}
\new StaffGroup \relative c'' {
  <<
    \new Staff { << \global { c1 c } >> }
    \new Staff { << \global { c c } >> }
  >>
}
```



Vedi anche

Music Glossary: Sezione "brace" in *Glossario Musicale*, Sezione "bracket" in *Glossario Musicale*, Sezione "grand staff" in *Glossario Musicale*.

Notation Reference: [Instrument names], pagina 197, Sezione 5.1.6 [Defining new contexts], pagina 569.

Snippets: Sezione "Staff notation" in *Frammenti di codice*.

Internals Reference: Sezione "Staff" in *Guida al Funzionamento Interno*, Sezione "StaffGroup" in *Guida al Funzionamento Interno*, Sezione "ChoirStaff" in *Guida al Funzionamento Interno*, Sezione "GrandStaff" in *Guida al Funzionamento Interno*, Sezione "PianoStaff" in *Guida al Funzionamento Interno*, Sezione "SystemStartBar" in *Guida al Funzionamento Interno*, Sezione "SystemStartBrace" in *Guida al Funzionamento Interno*, Sezione "SystemStartBracket" in *Guida al Funzionamento Interno*, Sezione "SystemStartSquare" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

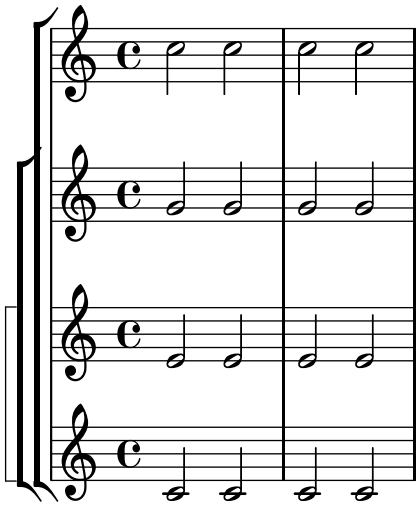
`PianoStaff` does not, by default, accept `ChordNames`.

Nested staff groups

Staff-group contexts can be nested to arbitrary depths. In this case, each child context creates a new bracket adjacent to the bracket of its parent group.

```
\new StaffGroup <<
  \new Staff { c2 c | c2 c }
  \new StaffGroup <<
    \new Staff { g2 g | g2 g }
```

```
    \new StaffGroup \with {
      systemStartDelimiter = #'SystemStartSquare
    }
    <<
      \new Staff { e2 e | e2 e }
      \new Staff { c2 c | c2 c }
    >>
  >>
>>
```



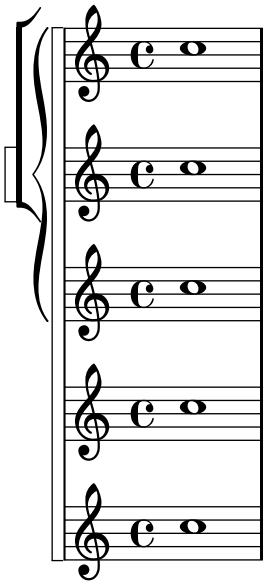
New nested staff group contexts can be defined. For details, see Sezione 5.1.6 [Defining new contexts], pagina 569.

Frammenti di codice selezionati

Nesting staves

The property `systemStartDelimiterHierarchy` can be used to make more complex nested staff groups. The command `\set StaffGroup.systemStartDelimiterHierarchy` takes an alphabetical list of the number of staves produced. Before each staff a system start delimiter can be given. It has to be enclosed in brackets and takes as much staves as the brackets enclose. Elements in the list can be omitted, but the first bracket takes always the complete number of staves. The possibilities are `SystemStartBar`, `SystemStartBracket`, `SystemStartBrace`, and `SystemStartSquare`.

```
\new StaffGroup
\relative c'' <<
  \set StaffGroup.systemStartDelimiterHierarchy
    = #'(SystemStartSquare (SystemStartBrace (SystemStartBracket a
                              (SystemStartSquare b)  ) c ) d)
  \new Staff { c1 }
  \new Staff { c1 }
  \new Staff { c1 }
  \new Staff { c1 }
  \new Staff { c1 }
>>
```



Vedi anche

Notation Reference: [Grouping staves], pagina 181, [Instrument names], pagina 197, Sezione 5.1.6 [Defining new contexts], pagina 569.

Snippets: Sezione "Staff notation" in *Frammenti di codice*.

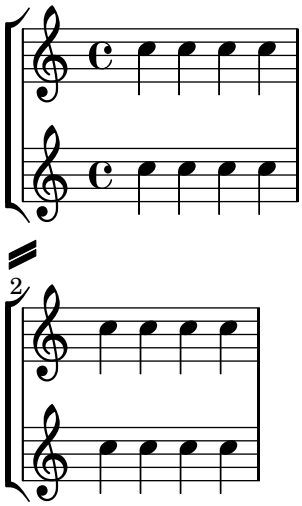
Internals Reference: Sezione "StaffGroup" in *Guida al Funzionamento Interno*, Sezione "ChoirStaff" in *Guida al Funzionamento Interno*, Sezione "SystemStartBar" in *Guida al Funzionamento Interno*, Sezione "SystemStartBrace" in *Guida al Funzionamento Interno*, Sezione "SystemStartBracket" in *Guida al Funzionamento Interno*, Sezione "SystemStartSquare" in *Guida al Funzionamento Interno*.

Separating systems

If the number of systems per page changes from page to page it is customary to separate the systems by placing a system separator mark between them. By default the system separator is blank, but can be turned on with a `\paper` option.

```
\book {
  \score {
    \new StaffGroup <<
      \new Staff {
        \relative c'' {
          c4 c c c
          \break
          c4 c c c
        }
      }
      \new Staff {
        \relative c'' {
          c4 c c c
          \break
          c4 c c c
        }
      }
    >>
  }
  \paper {
    system-separator-markup = \slashSeparator
```

```
    % following commands are needed only to format this documentation
    paper-width = 100\mm
    paper-height = 100\mm
    tagline = ##f
  }
}
```



Vedi anche

Notation Reference: Sezione 4.1 [Page layout], pagina 504.

Snippets: Sezione "Staff notation" in *Frammenti di codice*.

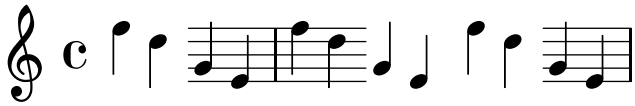
1.6.2 Modifying single staves

This section explains how to change specific attributes of one staff: for example, modifying the number of staff lines or the staff size. Methods to start and stop staves and set ossia sections are also described.

Staff symbol

The `\stopStaff` and `\startStaff` commands can be used to stop or (re)start the staff lines respectively, from being printed at any point witin a score.

```
\stopStaff f4 d \startStaff g, e
f'4 d \stopStaff g, e
f'4 d \startStaff g, e
```



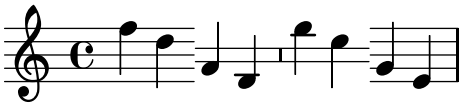
Comandi predefiniti

`\startStaff`, `\stopStaff`.

The lines of a staff belong to the `StaffSymbol` grob (including ledger lines) and can be modified using `StaffSymbol` properties, but these modifications must be made before the staff is (re)started.

The number of staff lines can be altered:

```
f4 d \stopStaff
\override Staff.StaffSymbol.line-count = #2
\startStaff g, e |

f'4 d \stopStaff
\revert Staff.StaffSymbol.line-count
\startStaff g, e |
```



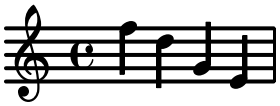
The position of each staff line can also be altered. A list of numbers sets each line's position. `0` corresponds to the normal center line, and the normal line positions are `(-4 -2 0 2 4)`. A single staff line is printed for every value entered so that the number of staff lines, as well as their position, can be changed with a single override.

```
f4 d \stopStaff
\override Staff.StaffSymbol.line-positions = #'(1 3 5 -1 -3)
\startStaff g, e |
f'4 d \stopStaff
\override Staff.StaffSymbol.line-positions = #'(8 6.5 -6 -8 -0.5)
\startStaff g, e
```

To preserve typical stem directions (in the bottom half of the staff stems point up, in the top half they point down), align the center line (or space) of the customized staff with the position of the normal center line (0). The clef position and the position of middle C may need to be adjusted accordingly to fit the new lines. See ⟨undefined⟩ [Clef], pagina ⟨undefined⟩.

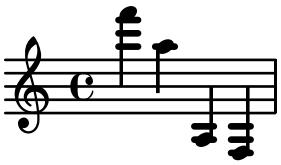
Staff line thickness can be altered. Ledger lines and note stems, by default, are also affected.

```
\new Staff \with {
  \override StaffSymbol.thickness = #3
}
{ f4 d g, e }
```



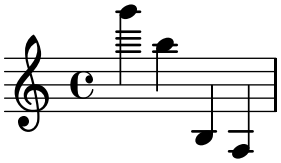
However, it is possible to set ledger line thickness independently of staff lines. The two values required multiply the staff line thickness with the staff line spacing and are then added together to give the ledger line thickness.

```
\new Staff \with {
  \override StaffSymbol.thickness = #2
  \override StaffSymbol.ledger-line-thickness = #'(0.5 . 0.4)
}
{ f'4 a, a,, f }
```



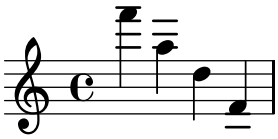
The vertical positions of ledger lines can be altered,

```
\new Staff \with {
  \override StaffSymbol.ledger-positions = #'(-3 -2 -1 2 5 6)
}
{ f'4 a, a,, f }
```



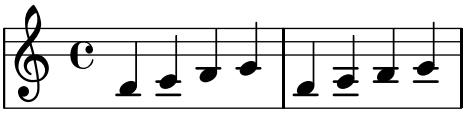
Additional ledger lines can be made to appear above or below note heads depending on the current position relative to other note heads that also have their own ledger lines.

```
\new Staff \with {
  \override StaffSymbol.ledger-extra = #4
}
{ f'4 a, d, f, }
```



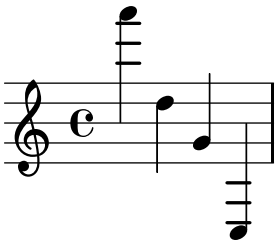
Ledger lines can also be made to appear inside the staff where custom staff lines are required. The example shows the default position of ledger lines when the explicit `ledger-position` is and is not set. The `\stopStaff` is needed in the example to revert the `\override` for the whole `StaffSymbol`.

```
\override Staff.StaffSymbol.line-positions = #'(-8 0 2 4)
d4 e f g
\stopStaff
\startStaff
\override Staff.StaffSymbol.ledger-positions = #'(-8 -6 (-4 -2) 0)
d4 e f g
```



The distance between staff lines can be altered. This affects ledger line spacing as well.

```
\new Staff \with {
  \override StaffSymbol.staff-space = #1.5
}
{ f'4 d, g, e, }
```

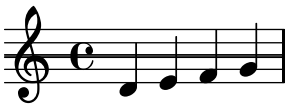


Frammenti di codice selezionati

Making some staff lines thicker than the others

For educational purposes, a staff line can be thickened (e.g., the middle line, or to emphasize the line of the G clef). This can be achieved by adding extra lines very close to the line that should be emphasized, using the `line-positions` property of the `StaffSymbol` object.

```
{
  \override Staff.StaffSymbol.line-positions =
    #'(-4 -2 -0.2 0 0.2 2 4)
  d'4 e' f' g'
}
```



Vedi anche

Music Glossary: Sezione “line” in *Glossario Musicale*, Sezione “ledger line” in *Glossario Musicale*, Sezione “staff” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Clef], pagina ⟨undefined⟩.

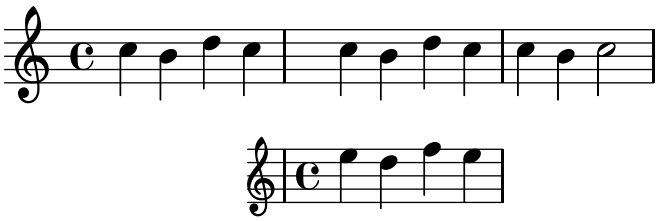
Snippets: Sezione “Staff notation” in *Frammenti di codice*.

Internals Reference: Sezione “StaffSymbol” in *Guida al Funzionamento Interno*, Sezione “staff-symbol-interface” in *Guida al Funzionamento Interno*.

Ossia staves

Ossia staves can be set by creating a new simultaneous staff in the appropriate location:

```
\new Staff \relative c'' {
  c4 b d c
  <<
    { c4 b d c }
    \new Staff { e4 d f e }
  >>
  c4 b c2
}
```

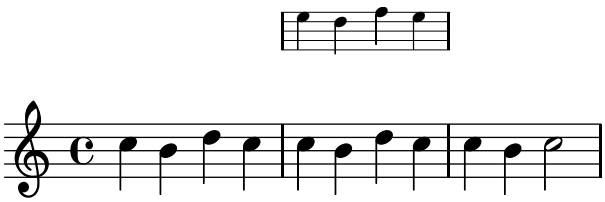


However, the above example is not what is usually desired. To create ossia staves that are above the original staff, have no time signature or clef, and have a smaller font size, tweaks must be

used. The Learning Manual describes a specific technique to achieve this goal, beginning with Sezione "Nesting music expressions" in *Manuale di Apprendimento*.

The following example uses the `alignAboveContext` property to align the ossia staff. This method is most appropriate when only a few ossia staves are needed.

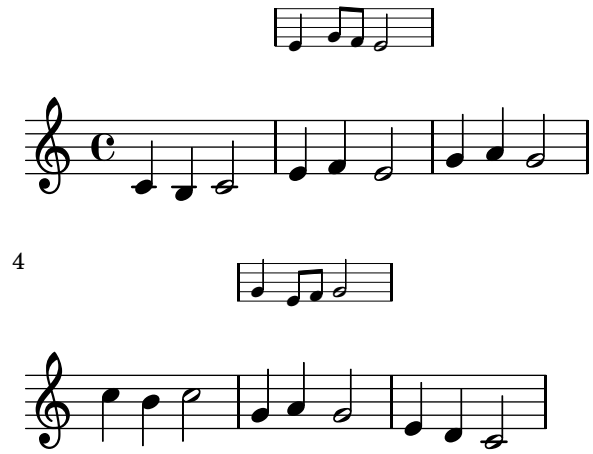
```
\new Staff = "main" \relative c'' {
  c4 b d c
  <<
    { c4 b d c }

    \new Staff \with {
      \remove "Time_signature_engraver"
      alignAboveContext = #"main"
      fontSize = #-3
      \override StaffSymbol.staff-space = #(magstep -3)
      \override StaffSymbol.thickness = #(magstep -3)
      firstClef = ##f
    }
    { e4 d f e }
  >>
  c4 b c2
}
```



If many isolated ossia staves are needed, creating an empty `Staff` context with a specific *context id* may be more appropriate; the ossia staves may then be created by *calling* this context and using `\startStaff` and `\stopStaff` at the desired locations. The benefits of this method are more apparent if the piece is longer than the following example.

```
<<
  \new Staff = "ossia" \with {
    \remove "Time_signature_engraver"
    \override Clef.transparent = ##t
    fontSize = #-3
    \override StaffSymbol.staff-space = #(magstep -3)
    \override StaffSymbol.thickness = #(magstep -3)
  }
  { \stopStaff s1*6 }

  \new Staff \relative c' {
    c4 b c2
    <<
      { e4 f e2 }
      \context Staff = "ossia" {
        \startStaff e4 g8 f e2 \stopStaff
      }
    >>
    g4 a g2 \break
```

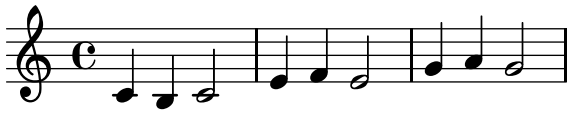
```
    c4 b c2
    <<
      { g4 a g2 }
      \context Staff = "ossia" {
        \startStaff g4 e8 f g2 \stopStaff
      }
    >>
    e4 d c2
  }
>>
```

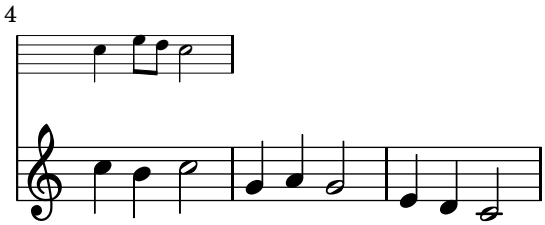


Using the `\Staff \RemoveEmptyStaves` command to create ossia staves may be used as an alternative. This method is most convenient when ossia staves occur immediately following a line break. For more information about `\Staff \RemoveEmptyStaves`, see [Hiding staves], pagina 194.

```
<<
  \new Staff = "ossia" \with {
    \remove "Time_signature_engraver"
    \override Clef.transparent = ##t
    fontSize = #-3
    \override StaffSymbol.staff-space = #(magstep -3)
    \override StaffSymbol.thickness = #(magstep -3)
  } \relative c'' {
    R1*3
    c4 e8 d c2
  }
  \new Staff \relative c' {
    c4 b c2
    e4 f e2
    g4 a g2 \break
    c4 b c2
    g4 a g2
    e4 d c2
  }
>>

\layout {
  \context {
```

```
    \Staff \RemoveEmptyStaves
    \override VerticalAxisGroup.remove-first = ##t
  }
}
```



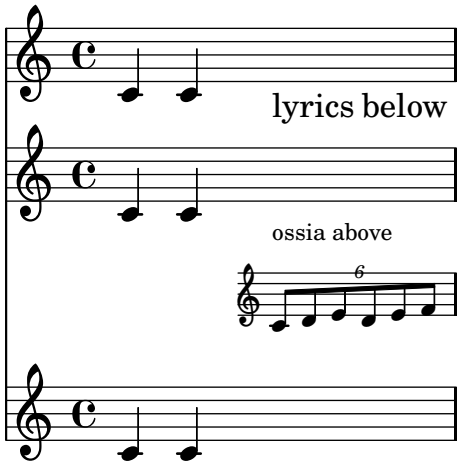


Frammenti di codice selezionati

Vertically aligning ossias and lyrics

This snippet demonstrates the use of the context properties `alignBelowContext` and `alignAboveContext` to control the positioning of lyrics and ossias.

```
\paper {
  ragged-right = ##t
}

\relative c' <<
  \new Staff = "1" { c4 c s2 }
  \new Staff = "2" { c4 c s2 }
  \new Staff = "3" { c4 c s2 }
  { \skip 2
    <<
      \lyrics {
        \set alignBelowContext = #"1"
        lyrics4 below
      }
      \new Staff \with {
        alignAboveContext = #"3"
        fontSize = #-2
        \override StaffSymbol.staff-space = #(magstep -2)
        \remove "Time_signature_engraver"
      } {
        \tuplet 6/4 {
          \override TextScript.padding = #3
          c8[^"ossia above" d e d e f]
        }
      }
    >>
  }
>>
```



Vedi anche

Music Glossary: Sezione “ossia” in *Glossario Musicale*, Sezione “staff” in *Glossario Musicale*, Sezione “Frenched staff” in *Glossario Musicale*.

Learning Manual: Sezione “Nesting music expressions” in *Manuale di Apprendimento*, Sezione “Size of objects” in *Manuale di Apprendimento*, Sezione “Length and thickness of objects” in *Manuale di Apprendimento*.

Notation Reference: [Hiding staves], pagina 194.

Snippets: Sezione “Staff notation” in *Frammenti di codice*.

Internals Reference: Sezione “StaffSymbol” in *Guida al Funzionamento Interno*.

Hiding staves

Staff lines can be hidden by removing the `Staff_symbol_engraver` from the `Staff` context. As an alternative, `\stopStaff` may be used.

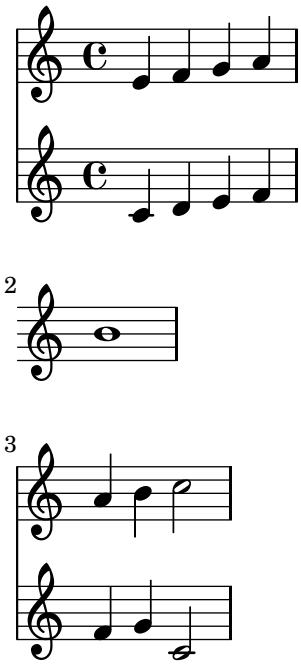
```
\new Staff \with {
  \remove "Staff_symbol_engraver"
}
\relative c''' { a8 f e16 d c b a2 }
```

Empty staves can be hidden by setting the `\Staff \RemoveEmptyStaves` command in the `\layout` block. In orchestral scores, this style is known as ‘Frenched Score’. By default, this command hides and removes all empty staves in a score except for those in the first system.

> **Nota:** A staff is considered empty when it contains only multi-measure rests, rests, skips, spacer rests, or a combination of these elements.

```
\layout {
  \context {
    \Staff \RemoveEmptyStaves
  }
}

\relative c' <<
  \new Staff {
    e4 f g a \break
```

```
    b1 \break
    a4 b c2
  }
  \new Staff {
    c,4 d e f \break
    R1 \break
    f4 g c,2
  }
>>
```



`\Staff \RemoveEmptyStaves` can also be used to create ossia sections for a staff. For details, see [Ossia staves], pagina 190.

The `\VaticanaStaff \RemoveEmptyStaves` command may be used to hide empty staves in ancient music contexts. Similarly, `\RhythmicStaff \RemoveEmptyStaves` may be used to hide empty `RhythmicStaff` contexts.

Comandi predefiniti

`\Staff \RemoveEmptyStaves`, `\VaticanaStaff \RemoveEmptyStaves`, `\RhythmicStaff \RemoveEmptyStaves`.

Frammenti di codice selezionati

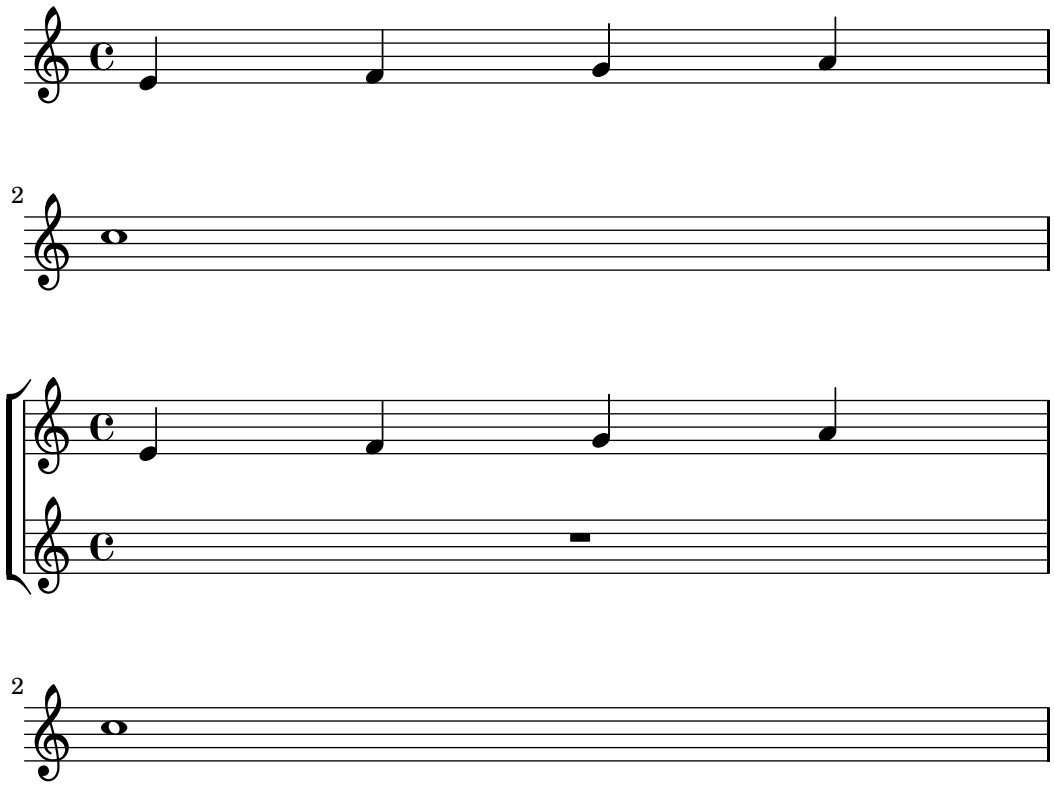
Removing the first empty line

The first empty staff can also be removed from the score by setting the `VerticalAxisGroup` property `remove-first`. This can be done globally inside the `\layout` block, or locally inside the specific staff that should be removed. In the latter case, you have to specify the context (`Staff` applies only to the current staff) in front of the property.

The lower staff of the second staff group is not removed, because the setting applies only to the specific staff inside of which it is written.

```
\layout {
  \context {
    \Staff \RemoveEmptyStaves
```

```
    % To use the setting globally, uncomment the following line:
    % \override VerticalAxisGroup.remove-first = ##t
  }
}
\new StaffGroup <<
  \new Staff \relative c' {
    e4 f g a \break
    c1
  }
  \new Staff {
    % To use the setting globally, comment this line,
    % uncomment the line in the \layout block above
    \override Staff.VerticalAxisGroup.remove-first = ##t
    R1 \break
    R
  }
>>
\new StaffGroup <<
  \new Staff \relative c' {
    e4 f g a \break
    c1
  }
  \new Staff {
    R1 \break
    R
  }
>>
```



Vedi anche

Music Glossary: Sezione "Frenched staff" in *Glossario Musicale*.

Learning Manual: Sezione "Visibility and color of objects" in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.1.5 [Changing context default settings], pagina 564, [Staff symbol], pagina 187, [Ossia staves], pagina 190, [Hidden notes], pagina 212, ⟨undefined⟩ [Invisible rests], pagina ⟨undefined⟩, Sezione 5.4.6 [Visibility of objects], pagina 592.

Snippets: Sezione "Staff notation" in *Frammenti di codice*.

Internals Reference: Sezione "ChordNames" in *Guida al Funzionamento Interno*, Sezione "FiguredBass" in *Guida al Funzionamento Interno*, Sezione "Lyrics" in *Guida al Funzionamento Interno*, Sezione "Staff" in *Guida al Funzionamento Interno*, Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno*, Sezione "Staff_symbol_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Removing `Staff_symbol_engraver` also hides bar lines. If bar line visibility is forced, formatting errors may occur. In this case, use the following overrides instead of removing the engraver:

```
\override StaffSymbol.stencil = ##f
\override NoteHead.no-ledgers = ##t
```

For the Known issues and warnings associated with `\Staff` `\RemoveEmptyStaves` see Sezione 5.1.5 [Changing context default settings], pagina 564.

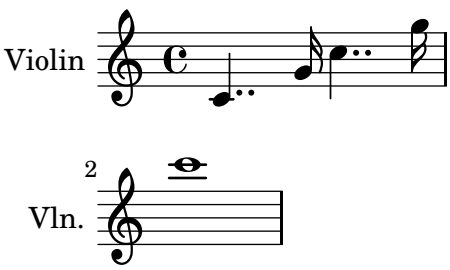
1.6.3 Writing parts

This section explains how to insert tempo indications and instrument names into a score. Methods to quote other voices and format cue notes are also described.

Instrument names

Instrument names can be printed on the left side of staves in the `Staff`, `PianoStaff`, `StaffGroup`, `GrandStaff` and `ChoirStaff` contexts. The value of `instrumentName` is used for the first staff, and the value of `shortInstrumentName` is used for all succeeding staves.

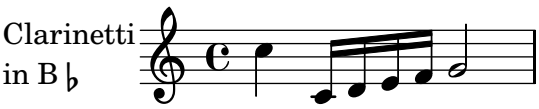
```
\new Staff \with {
  instrumentName = #"Violin "
  shortInstrumentName = #"Vln. "
}
{ c4.. g'16 c4.. g'16 \break | c1 }
```



`\markup` can be used to create more complex instrument names:

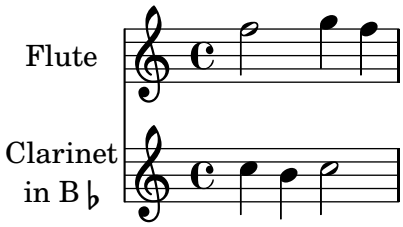
```
\new Staff \with {
  instrumentName = \markup {
    \column { "Clarinetti"
      \line { "in B" \smaller \flat }
    }
```

```
  }
}
{ c4 c,16 d e f g2 }
```



When two or more staff contexts are grouped together, the instrument names and short instrument names are centered by default. To center multi-line instrument names, `\center-column` must be used:

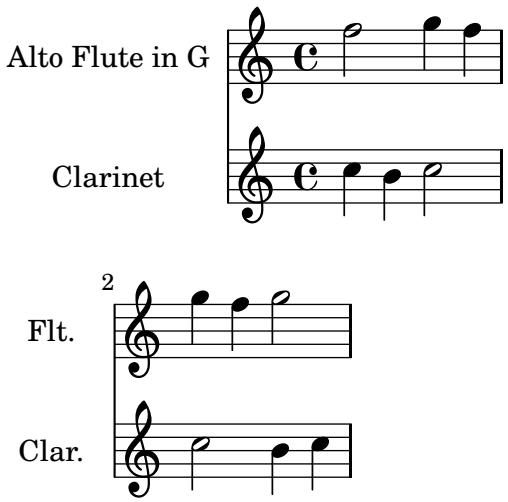
```
<<
  \new Staff \with {
    instrumentName = #"Flute"
  }
  { f2 g4 f }
  \new Staff \with {
    instrumentName = \markup {
      \center-column { "Clarinet"
        \line { "in B" \smaller \flat }
      }
    }
  }
  { c4 b c2 }
>>
```



However, if the instrument names are longer, the instrument names in a staff group may not be centered unless the `indent` and `short-indent` settings are increased. For details about these settings, see [\paper variables for shifts and indents], pagina 511.

```
\relative c'' {
  <<
    \new Staff \with {
      instrumentName = #"Alto Flute in G"
      shortInstrumentName = #"Flt."
    }
    {
      f2 g4 f \break
      g4 f g2
    }
    \new Staff \with {
      instrumentName = #"Clarinet"
      shortInstrumentName = #"Clar."
    }
    {
```

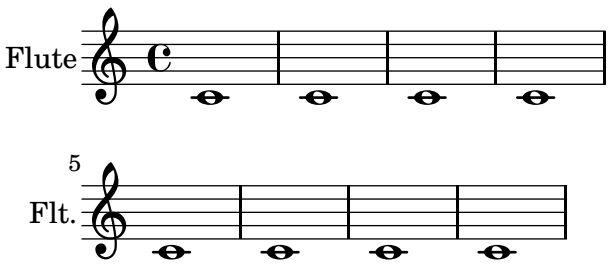
```
      c,4 b c2 \break
      c2 b4 c
    }
  >>
}

\layout {
  indent = 3.0\cm
  short-indent = 1.5\cm
}
```

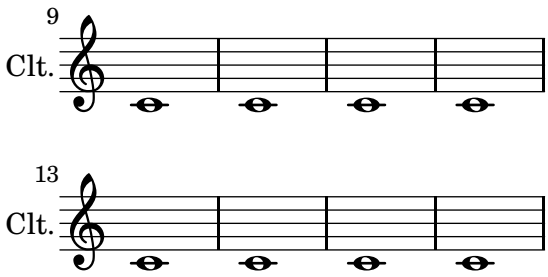


To add instrument names to other contexts (such as `ChordNames` or `FiguredBass`), `Instrument_name_engraver` must be added to that context. For details, see Sezione 5.1.4 [Modifying context plug-ins], pagina 562.

The `shortInstrumentName` may be changed in the middle of a piece. However, only the first instance of `instrumentName` will be printed and subsequent changes will be ignored:

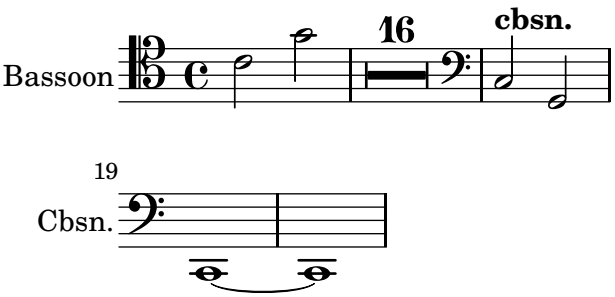
```
\new Staff \with {
  instrumentName = #"Flute"
  shortInstrumentName = #"Flt."
}
{
  c1 c c c \break
  c1 c c c \break
  \set Staff.instrumentName = #"Clarinet"
  \set Staff.shortInstrumentName = #"Clt."
  c1 c c c \break
  c1 c c c \break
}
```





If an instrument *switch* is needed, `\addInstrumentDefinition` may be used in combination with `\instrumentSwitch` to create a detailed list of the necessary changes for the switch. The `\addInstrumentDefinition` command has two arguments: an identifying string, and an association list of context properties and values to be used for the instrument. It must be placed in the toplevel scope. `\instrumentSwitch` is used in the music expression to declare the instrument switch:

```
\addInstrumentDefinition #"contrabassoon"
  #`((instrumentTransposition . ,(ly:make-pitch -1 0 0))
     (shortInstrumentName . "Cbsn.")
     (clefGlyph . "clefs.F")
     (middleCPosition . 6)
     (clefPosition . 2)
     (instrumentCueName . ,(make-bold-markup "cbsn."))
     (midiInstrument . "bassoon"))

\new Staff \with {
  instrumentName = #"Bassoon"
}
\relative c' {
  \clef tenor
  \compressFullBarRests
  c2 g'
  R1*16
  \instrumentSwitch "contrabassoon"
  c,,2 g \break
  c,1 ~ | c1
}
```



Vedi anche

Notation Reference: [\paper variables for shifts and indents], pagina 511, Sezione 5.1.4 [Modifying context plug-ins], pagina 562.

Snippets: Sezione "Staff notation" in *Frammenti di codice*.

Internals Reference: Sezione "InstrumentName" in *Guida al Funzionamento Interno*, Sezione "PianoStaff" in *Guida al Funzionamento Interno*, Sezione "Staff" in *Guida al Funzionamento Interno*.

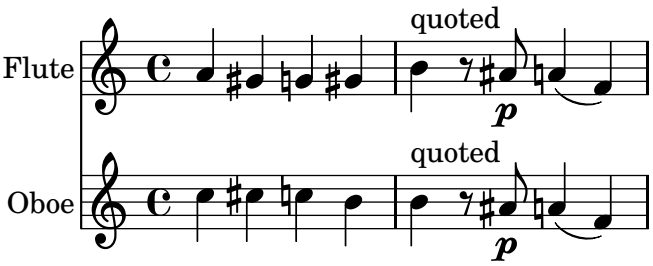
Quoting other voices

It is very common for one voice to use the same notes as those from another voice. For example, first and second violins playing the same phrase during a particular passage of the music. This is done by letting one voice *quote* the other, without having to re-enter the music all over again for the second voice.

The `\addQuote` command, used in the top level scope, defines a stream of music from which fragments can be quoted.

The `\quoteDuring` command is used to indicate the point where the quotation begins. It is followed by two arguments: the name of the quoted voice, as defined with `\addQuote`, and a music expression for the duration of the quote.

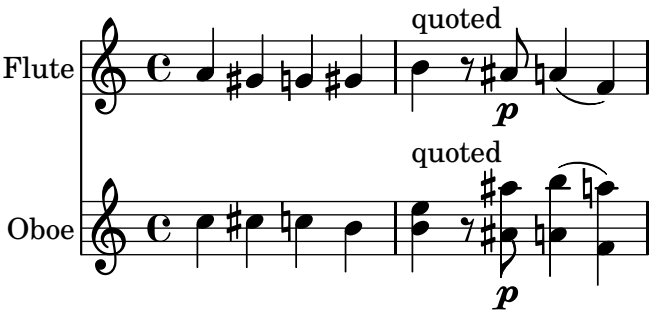
```
fluteNotes = \relative c'' {
  a4 gis g gis | b4^"quoted" r8 ais\p a4( f)
}

oboeNotes = \relative c'' {
  c4 cis c b \quoteDuring #"flute" { s1 }
}

\addQuote "flute" { \fluteNotes }

\score {
  <<
    \new Staff \with { instrumentName = "Flute" } \fluteNotes
    \new Staff \with { instrumentName = "Oboe" } \oboeNotes
  >>
}
```



If the music expression used in `\quoteDuring` contains notes instead of spacer or multimeasure rests then the quote will appear as polyphony and may produce unexpected results.

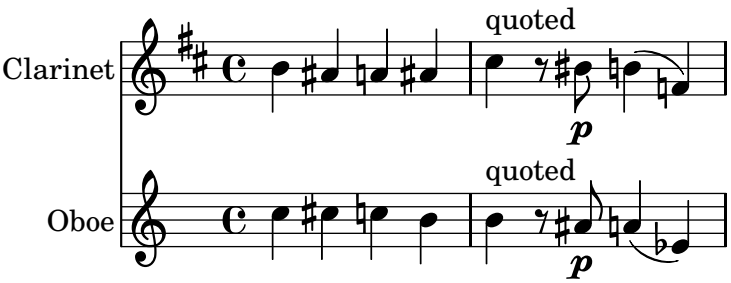
```
fluteNotes = \relative c'' {
  a4 gis g gis | b4^"quoted" r8 ais\p a4( f)
}

oboeNotes = \relative c'' {
  c4 cis c b \quoteDuring #"flute" { e4 r8 ais b4 a }
}

\addQuote "flute" { \fluteNotes }

\score {
  <<
    \new Staff \with { instrumentName = "Flute" } \fluteNotes
```

```
    \new Staff \with { instrumentName = "Oboe" } \oboeNotes
  >>
}
```



The `\quoteDuring` command uses the `\transposition` settings of both quoted and quoting parts to produce notes for the quoting part that have the same sounding pitch as those in the quoted part.

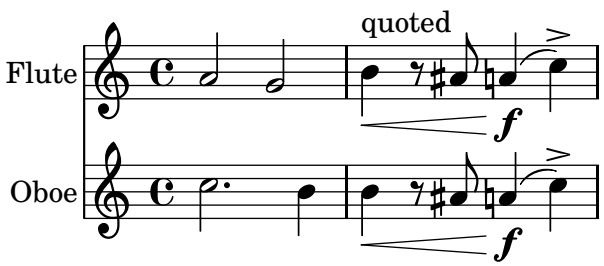
```
clarinetNotes = \relative c'' {
  \transposition bes
  \key d \major
  b4 ais a ais | cis4^"quoted" r8 bis\p b4( f)
}

oboeNotes = \relative c'' {
  c4 cis c b \quoteDuring #"clarinet" { s1 }
}

\addQuote "clarinet" { \clarinetNotes }


\score {
  <<
    \new Staff \with { instrumentName = "Clarinet" } \clarinetNotes
    \new Staff \with { instrumentName = "Oboe" } \oboeNotes
  >>
}
```



By default quoted music will include all articulations, dynamics, markups, etc., in the quoted expression. It is possible to choose which of these objects from the quoted music are displayed by using the `quotedEventTypes` context property.

```
fluteNotes = \relative c'' {
  a2 g2 |
  b4\<^"quoted" r8 ais a4\f( c->)
```

```
 }

oboeNotes = \relative c'' {
  c2. b4 |
  \quoteDuring #"flute" { s1 }
}

\addQuote "flute" { \fluteNotes }

\score {
  <<
    \set Score.quotedEventTypes = #'(note-event articulation-event
                                     crescendo-event rest-event
                                     slur-event dynamic-event)
    \new Staff \with { instrumentName = "Flute" } \fluteNotes
    \new Staff \with { instrumentName = "Oboe" } \oboeNotes
  >>
 }
```



Quotes can also be tagged, see [Using tags], pagina 484.

Vedi anche

Notation Reference: ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩, [Using tags], pagina 484.

Installed Files: ‘`scm/define-event-classes.scm`’.

Snippets: Sezione “Staff notation” in *Frammenti di codice*.

Internals Reference: Sezione “Music classes” in *Guida al Funzionamento Interno*, Sezione “QuoteMusic” in *Guida al Funzionamento Interno*, Sezione “Voice” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

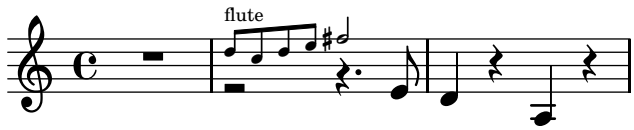
Only the contents of the first `Voice` occurring in an `\addQuote` command will be considered for quotation, so if the music expression contains `\new` or `\context Voice` statements, their contents will not be quoted. Quoting grace notes is unsupported and may cause LilyPond to crash whereas quoting nested triplets may result in poor notation.

Formatting cue notes

The simplest way to format cue notes is to explicitly create a `CueVoice` context within the part.

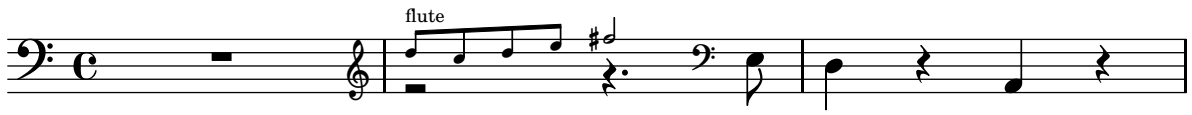
```
R1
<<
  { e2\rest r4. e8 }
  \new CueVoice {
```

```
    \stemUp d'8^"flute" c d e fis2
  }
>>
d,4 r a r
```



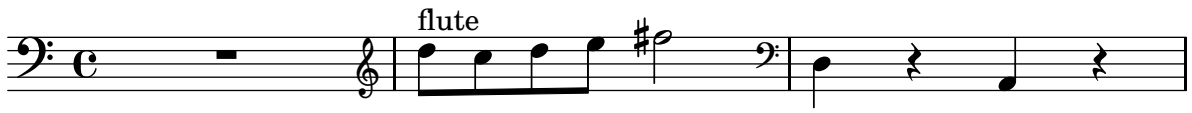
The \cueClef command can also be used with an explict CueVoice context if a change of clef is required and will print an appropriately sized clef for the cue notes. The \cueClefUnset command can then be used to switch back to the original clef, again with an appropriately sized clef.

```
\clef "bass"
R1
<<
  { e2\rest r4. \cueClefUnset e,8 }
  \new CueVoice {
    \cueClef "treble" \stemUp d''8^"flute" c d e fis2
  }
>>
d,,4 r a r
```



The \cueClef and \cueClefUnset command can also be used without a CueVoice if required.

```
\clef "bass"
R1
\cueClef "treble"
d'8^"flute" c d e fis2
\cueClefUnset
d,,4 r a r
```



For more complex cue note placement, e.g including transposition, or inserting cue notes from multiple music sources the \cueDuring or \cueDuringWithClef commands can be used. These are more specialized form of \quoteDuring, see [Quoting other voices], pagina 201 in the previous section.

The syntax is:

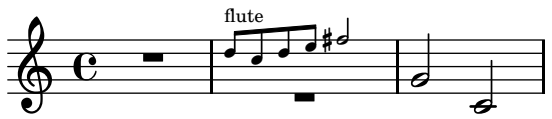
\cueDuring *#quotename #direction #music*

and

\cueDuringWithClef *#quotename #direction #clef #music*

The music from the corresponding measures of the *quote name* is added as a CueVoice context and occurs simultaneously with the *music*, which then creates a polyphonic situation. The *direction* takes the argument UP or DOWN, and corresponds to the first and second voices respectively, determining how the cue notes are printed in relation to the other voice.

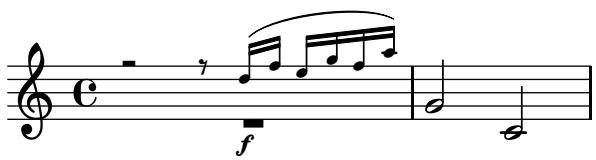
```
fluteNotes = \relative c'' {
  r2. c4 | d8 c d e fis2 | g2 d |
}

oboeNotes = \relative c'' {
  R1
  \new CueVoice { \set instrumentCueName = "flute" }
  \cueDuring #"flute" #UP { R1 }
  g2 c,
}

\addQuote "flute" { \fluteNotes }

\new Staff {
  \oboeNotes
}
```



It is possible to adjust which aspects of the music are quoted with `\cueDuring` by setting the `quotedCueEventTypes` property. Its default value is `'(note-event rest-event tie-event beam-event tuplet-span-event)`, which means that only notes, rests, ties, beams and tuplets are quoted, but not articulations, dynamic marks, markup etc.

Nota: When a `Voice` starts with `\cueDuring`, as in the following example, the `Voice` context must be explicitly declared, or else the entire music expression would belong to the `CueVoice` context.

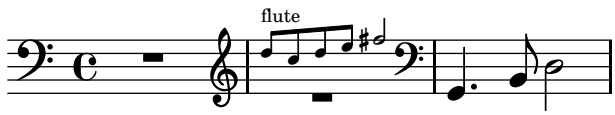
```
oboeNotes = \relative c'' {
  r2 r8 d16(\f f e g f a)
  g8 g16 g g2.
}
\addQuote "oboe" { \oboeNotes }

\new Voice \relative c'' {
  \set Score.quotedCueEventTypes = #'(note-event rest-event tie-event
                                      beam-event tuplet-span-event
                                      dynamic-event slur-event)
  \cueDuring #"oboe" #UP { R1 }
  g2 c,
}
```



The name of the instrument playing the cue can be printed by setting the `instrumentCueName` property in a temporary `CueVoice` context. The placement and style of the `instrumentCueName`

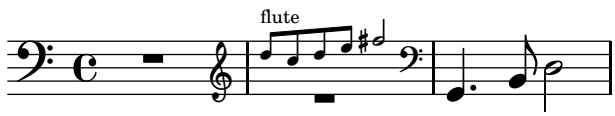
is controlled by the `\instrumentSwitch` object, see [Instrument names], pagina 197. If the cue notes require a change in clef, this can be done manually but the original clef should also be restored manually at the end of the cue notes.

```
fluteNotes = \relative c'' {
  r2. c4 d8 c d e fis2 g2 d2
}

bassoonNotes = \relative c {
  \clef bass
  R1
  \clef treble
  \new CueVoice { \set instrumentCueName = "flute" }
  \cueDuring #"flute" #UP { R1 }
  \clef bass
  g4. b8 d2
}

\addQuote "flute" { \fluteNotes }

\new Staff {
  \bassoonNotes
}
```



Alternatively, the `\cueDuringWithClef` function can be used instead. This command takes an extra argument to specify the change of clef that needs to be printed for the cue notes but will automatically print the original clef once the cue notes have finished.

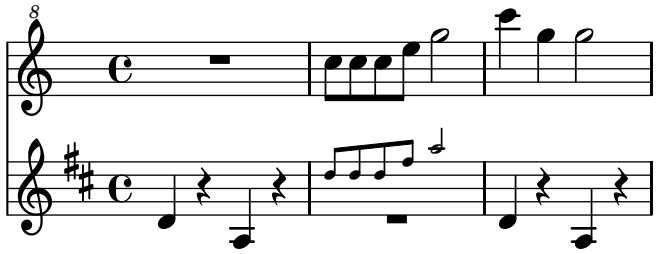
```
fluteNotes = \relative c'' {
  r2. c4 d8 c d e fis2 g2 d2
}

bassoonNotes = \relative c {
  \clef bass
  R1
  \new CueVoice { \set instrumentCueName = "flute" }
  \cueDuringWithClef #"flute" #UP #"treble" { R1 }
  g4. b8 d2
}

\addQuote "flute" { \fluteNotes }

\new Staff {
  \bassoonNotes
}
```



Like \quoteDuring, \cueDuring takes instrument transpositions into account. Cue notes are produced at the pitches that would be written for the instrument receiving the cue to produce the sounding pitches of the source instrument.

To transpose cue notes differently, use \transposedCueDuring. This command takes an extra argument to specify (in absolute mode) the printed pitch that you want to represent the sound of a concert middle C. This is useful for taking cues from an instrument in a completely different register.

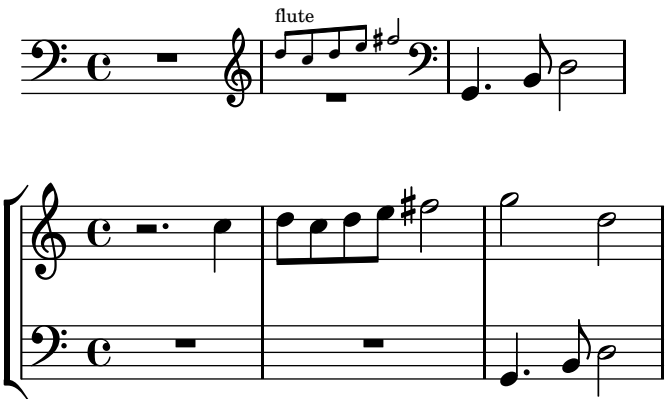
```
piccoloNotes = \relative c''' {
  \clef "treble^8"
  R1
  c8 c c e g2
  c4 g g2
}

bassClarinetNotes = \relative c' {
  \key d \major
  \transposition bes,
  d4 r a r
  \transposedCueDuring #"piccolo" #UP d { R1 }
  d4 r a r
}

\addQuote "piccolo" { \piccoloNotes }

<<
  \new Staff \piccoloNotes
  \new Staff \bassClarinetNotes
>>
```



The \killCues command removes cue notes from a music expression, so the same music expression can be used to produce the instrument part with cues and the score. The \killCues command removes only the notes and events that were quoted by \cueDuring. Other markup associated with cues, such as clef changes and a label identifying the source instrument, can be tagged for selective inclusion in the score; see [Using tags], pagina 484.

```
fluteNotes = \relative c'' {
  r2. c4 d8 c d e fis2 g2 d2
}

bassoonNotes = \relative c {
  \clef bass
  R1
  \tag #'part {
    \clef treble
```

```
    \new CueVoice { \set instrumentCueName = "flute" }
  }
  \cueDuring #"flute" #UP { R1 }
  \tag #'part \clef bass
  g4. b8 d2
}

\addQuote "flute" { \fluteNotes }

\new Staff {
  \bassoonNotes
}

\new StaffGroup <<
  \new Staff {
    \fluteNotes
  }
  \new Staff {
    \removeWithTag #'part { \killCues { \bassoonNotes } }
  }
>>
```



Alternatively, Clef changes and instrument labels can be collected into an instrument definition for repeated use, using `\addInstrumentDefinition` described in [Instrument names], pagina 197.

Vedi anche

Notation Reference: [Quoting other voices], pagina 201, ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩, [Instrument names], pagina 197, ⟨undefined⟩ [Clef], pagina ⟨undefined⟩, [Musical cues], pagina 291, [Using tags], pagina 484.

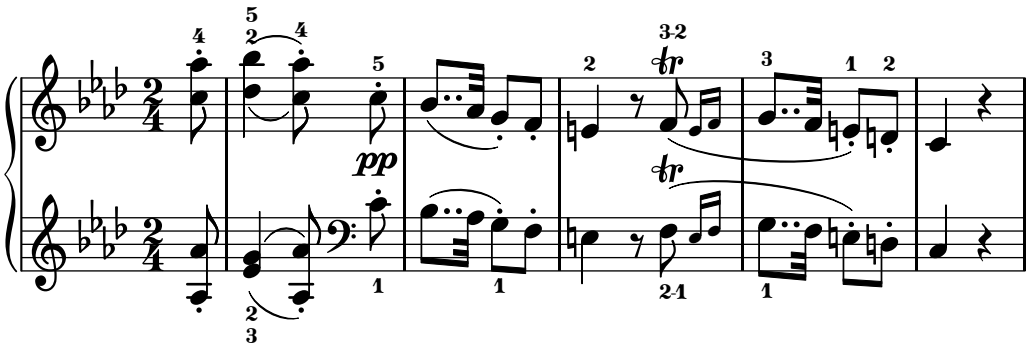
Snippets: Sezione "Staff notation" in *Frammenti di codice*.

Internals Reference: Sezione "CueVoice" in *Guida al Funzionamento Interno*, Sezione "Voice" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Collisions can occur with rests, when using `\cueDuring`, between `Voice` and `CueVoice` contexts. When using `\cueDuringWithClef` or `\transposedCueDuring` the extra argument required for each case must come after the quote and the direction.

1.7 Editorial annotations



This section discusses the various ways to change the appearance of notes and add analysis or educational emphasis.

1.7.1 Inside the staff

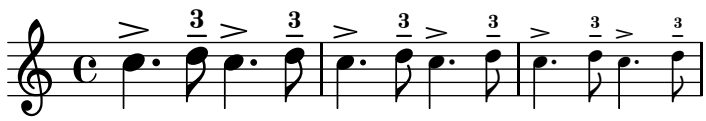
This section discusses how to add emphasis to elements that are inside the staff.

Selecting notation font size

The font size of notation elements may be altered. It does not change the size of variable symbols, such as beams or slurs.

Nota: For font sizes of text, see [Selecting font and font size], pagina 230.

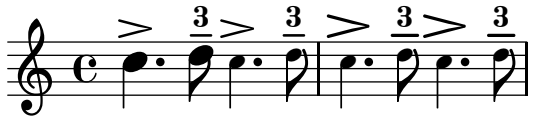
```
\huge
c4.-> d8---3
\large
c4.-> d8---3
\normalsize
c4.-> d8---3
\small
c4.-> d8---3
\tiny
c4.-> d8---3
\teeny
c4.-> d8---3
```



Internally, this sets the `fontSize` property. This in turn causes the `font-size` property to be set in all layout objects. The value of `font-size` is a number indicating the size relative to the standard size for the current staff height. Each step up is an increase of approximately 12% of the font size. Six steps is exactly a factor of two. The Scheme function `magstep` converts a `font-size` number to a scaling factor. The `font-size` property can also be set directly, so that only certain layout objects are affected.

```
\set fontSize = #3
c4.-> d8---3
\override NoteHead.font-size = #-4
c4.-> d8---3
```

```
\override Script.font-size = #2
c4.-> d8---3
\override Stem.font-size = #-5
c4.-> d8---3
```



Font size changes are achieved by scaling the design size that is closest to the desired size. The standard font size (for `font-size = #0`) depends on the standard staff height. For a 20pt staff, a 10pt font is selected.

The `font-size` property can only be set on layout objects that use fonts. These are the ones supporting the `font-interface` layout interface.

Comandi predefiniti

`\teeny`, `\tiny`, `\small`, `\normalsize`, `\large`, `\huge`.

Vedi anche

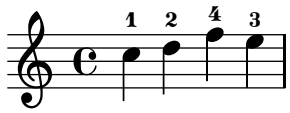
Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "font-interface" in *Guida al Funzionamento Interno*.

Fingering instructions

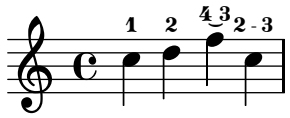
Fingering instructions can be entered using '*note-digit*':

```
c4-1 d-2 f-4 e-3
```



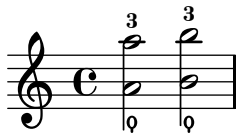
Markup texts or strings may be used for finger changes.

```
c4-1 d-2 f\finger \markup \tied-lyric #"4~3" c\finger "2 - 3"
```



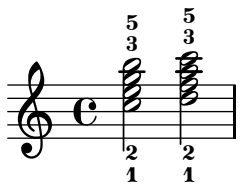
A thumb-script can be added (e.g. cello music) to indicate that a note should be played with the thumb.

```
<a_\thumb a'-3>2 <b_\thumb b'-3>
```



Fingerings for chords can also be added to individual notes by adding them after the pitches.

```
<c-1 e-2 g-3 b-5>2 <d-1 f-2 a-3 c-5>
```



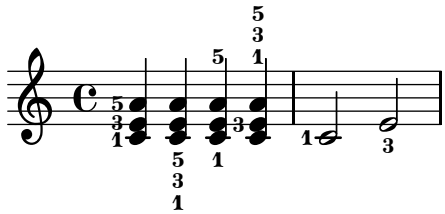
Fingering instructions may be manually placed above or below the staff, see Sezione 5.4.2 [Direction and placement], pagina 585.

Frammenti di codice selezionati

Controlling the placement of chord fingerings

The placement of fingering numbers can be controlled precisely. For fingering orientation to apply, you must use a chord construct <> even if it is a single note.

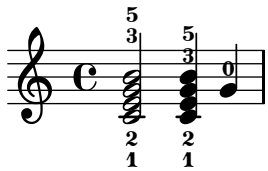
```
\relative c' {
  \set fingeringOrientations = #'(left)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(down)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(down right up)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(up)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(left)
  <c-1>2
  \set fingeringOrientations = #'(down)
  <e-3>2
}
```



Allowing fingerings to be printed inside the staff

By default, vertically oriented fingerings are positioned outside the staff. However, this behavior can be canceled. Note: you must use a chord construct <>, even if it is only a single note.

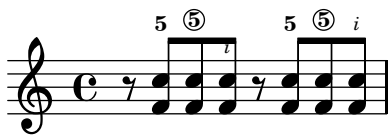
```
\relative c' {
  <c-1 e-2 g-3 b-5>2
  \override Fingering.staff-padding = #'()
  <c-1 e-2 g-3 b-5>4 <g'-0>
}
```



Avoiding collisions with chord fingerings

Fingerings and string numbers applied to individual notes will automatically avoid beams and stems, but this is not true by default for fingerings and string numbers applied to the individual notes of chords. The following example shows how this default behavior can be overridden.

```
\relative c' {
  \set fingeringOrientations = #'(up)
  \set stringNumberOrientations = #'(up)
  \set strokeFingerOrientations = #'(up)

  % Default behavior
  r8
  <f c'-5>8
  <f c'\5>8
  <f c'-\rightHandFinger #2 >8

  % Corrected to avoid collisions
  r8
  \override Fingering.add-stem-support = ##t
  <f c'-5>8
  \override StringNumber.add-stem-support = ##t
  <f c'\5>8
  \override StrokeFinger.add-stem-support = ##t
  <f c'-\rightHandFinger #2 >8
}
```



Vedi anche

Notation Reference: Sezione 5.4.2 [Direction and placement], pagina 585.

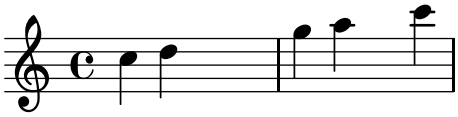
Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "FingeringEvent" in *Guida al Funzionamento Interno*, Sezione "fingering-event" in *Guida al Funzionamento Interno*, Sezione "Fingering_engraver" in *Guida al Funzionamento Interno*, Sezione "New_fingering_engraver" in *Guida al Funzionamento Interno*, Sezione "Fingering" in *Guida al Funzionamento Interno*.

Hidden notes

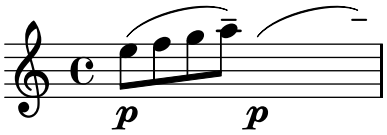
Hidden (or invisible or transparent) notes can be useful in preparing theory or composition exercises.

```
c4 d
\hideNotes
e4 f
\unHideNotes
g a
\hideNotes
b
\unHideNotes
c
```



Note heads, stems, and flags, and rests are invisible. Beams are invisible if they start on a hidden note. Objects that are attached to invisible notes are still visible.

```
e8(\p f g a)--
\hideNotes
e8(\p f g a)--
```



Comandi predefiniti

`\hideNotes`, `\unHideNotes`.

Vedi anche

Learning Manual: Sezione "Visibility and color of objects" in *Manuale di Apprendimento*.

Notation Reference: ⟨undefined⟩ [Invisible rests], pagina ⟨undefined⟩, Sezione 5.4.6 [Visibility of objects], pagina 592, [Hiding staves], pagina 194.

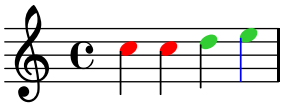
Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "Note_spacing_engraver" in *Guida al Funzionamento Interno*, Sezione "NoteSpacing" in *Guida al Funzionamento Interno*.

Coloring objects

Individual objects may be assigned colors. Valid color names are listed in the Sezione A.7 [List of colors], pagina 636.

```
\override NoteHead.color = #red
c4 c
\override NoteHead.color = #(x11-color 'LimeGreen)
d
\override Stem.color = #blue
e
```

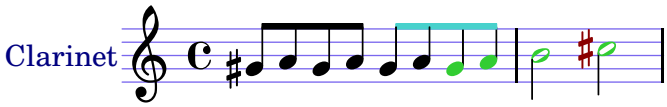


The full range of colors defined for X11 can be accessed by using the Scheme function `x11-color`. The function takes one argument; this can be a symbol in the form `'FooBar` or a string in the form `"FooBar"`. The first form is quicker to write and is more efficient. However, using the second form it is possible to access X11 colors by the multi-word form of its name.

If `x11-color` cannot make sense of the parameter then the color returned defaults to black.

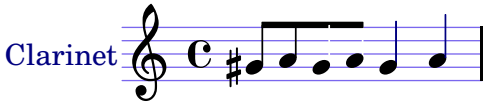
```
\override Staff.StaffSymbol.color = #(x11-color 'SlateBlue2)
\set Staff.instrumentName = \markup {
  \with-color #(x11-color 'navy) "Clarinet"
}

gis8 a
\override Beam.color = #(x11-color "medium turquoise")
```

```
gis a
\override Accidental.color = #(x11-color 'DarkRed)
gis a
\override NoteHead.color = #(x11-color "LimeGreen")
gis a
% this is deliberate nonsense; note that the stems remain black
\override Stem.color = #(x11-color 'Boggle)
b2 cis
```



Exact RGB colors can be specified using the Scheme function `rgb-color`.

```
\override Staff.StaffSymbol.color = #(x11-color 'SlateBlue2)
\set Staff.instrumentName = \markup {
  \with-color #(x11-color 'navy) "Clarinet"
}

\override Stem.color = #(rgb-color 0 0 0)
gis8 a
\override Stem.color = #(rgb-color 1 1 1)
gis8 a
\override Stem.color = #(rgb-color 0 0 0.5)
gis4 a
```



Vedi anche

Notation Reference: Sezione A.7 [List of colors], pagina 636, Sezione 5.3.4 [The tweak command], pagina 580.

Snippets: Sezione “Editorial annotations” in *Frammenti di codice*.

Problemi noti e avvertimenti

An X11 color is not necessarily exactly the same shade as a similarly named normal color.

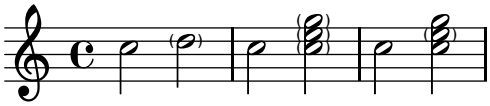
Not all X11 colors are distinguishable in a web browser, i.e., a web browser might not display a difference between `LimeGreen` and `ForestGreen`. For web use normal colors are recommended (i.e., `blue`, `green`, `red`).

Notes in a chord cannot be colored with `\override`; use `\tweak` instead, see Sezione 5.3.4 [The tweak command], pagina 580.

Parentheses

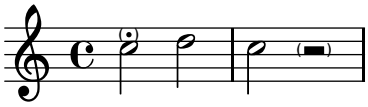
Objects may be parenthesized by prefixing `\parenthesize` to the music event. When prefixed to a chord, it parenthesizes every note. Individual notes inside a chord may also be parenthesized.

```
c2 \parenthesize d
c2 \parenthesize <c e g>
c2 <c \parenthesize e g>
```



Non-note objects may be parenthesized as well. For articulations, a hyphen is needed before the `\parenthesize` command.

```
c2-\parenthesize -. d
c2 \parenthesize r
```



Vedi anche

Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "Parenthesis_engraver" in *Guida al Funzionamento Interno*, Sezione "ParenthesesItem" in *Guida al Funzionamento Interno*, Sezione "parentheses-interface" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Parenthesizing a chord prints parentheses around each individual note, instead of a single large parenthesis around the entire chord.

Stems

Whenever a note is found, a `Stem` object is created automatically. For whole notes and rests, they are also created but made invisible.

Stems may be manually placed to point up or down; see Sezione 5.4.2 [Direction and placement], pagina 585.

Comandi predefiniti

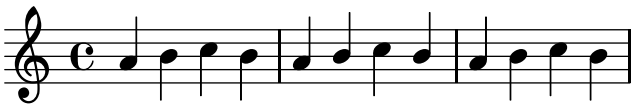
`\stemUp`, `\stemDown`, `\stemNeutral`.

Frammenti di codice selezionati

Default direction of stems on the center line of the staff

The default direction of stems on the center line of the staff is set by the `Stem` property `neutral-direction`.

```
\relative c'' {
  a4 b c b
  \override Stem.neutral-direction = #up
  a4 b c b
  \override Stem.neutral-direction = #down
  a4 b c b
}
```



Vedi anche

Notation Reference: Sezione 5.4.2 [Direction and placement], pagina 585.

Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "Stem_engraver" in *Guida al Funzionamento Interno*, Sezione "Stem" in *Guida al Funzionamento Interno*, Sezione "stem-interface" in *Guida al Funzionamento Interno*.

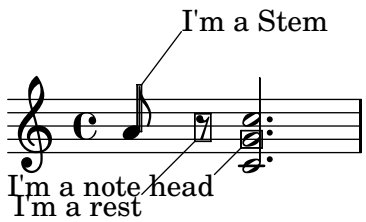
1.7.2 Outside the staff

This section discusses how to add emphasis to elements in the staff from outside of the staff.

Balloon help

Elements of notation can be marked and named with the help of a square balloon. The primary purpose of this feature is to explain notation.

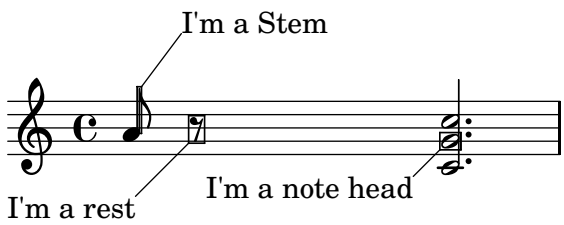
```
\new Voice \with { \consists "Balloon_engraver" }
{
  \balloonGrobText #'Stem #'(3 . 4) \markup { "I'm a Stem" }
  a8
  \balloonGrobText #'Rest #'(-4 . -4) \markup { "I'm a rest" }
  r
  <c, g'-\balloonText #'(-2 . -2) \markup { "I'm a note head" } c>2.
}
```



There are two music functions, `balloonGrobText` and `balloonText`; the former is used like `\once \override` to attach text to any grob, and the latter is used like `\tweak`, typically within chords, to attach text to an individual note.

Balloon text normally influences note spacing, but this can be altered:

```
\new Voice \with { \consists "Balloon_engraver" }
{
  \balloonLengthOff
  \balloonGrobText #'Stem #'(3 . 4) \markup { "I'm a Stem" }
  a8
  \balloonGrobText #'Rest #'(-4 . -4) \markup { "I'm a rest" }
  r
  \balloonLengthOn
  <c, g'-\balloonText #'(-2 . -2) \markup { "I'm a note head" } c>2.
}
```



Comandi predefiniti

`\balloonLengthOn`, `\balloonLengthOff`.

Vedi anche

Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

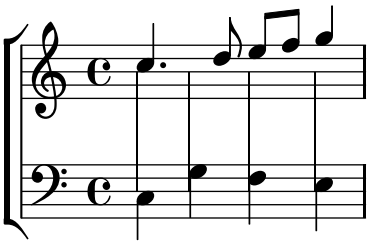
Internals Reference: Sezione "Balloon_engraver" in *Guida al Funzionamento Interno*, Sezione "BalloonTextItem" in *Guida al Funzionamento Interno*, Sezione "balloon-interface" in *Guida al Funzionamento Interno*.

Grid lines

Vertical lines can be drawn between staves synchronized with the notes.

The `Grid_point_engraver` must be used to create the end points of the lines, while the `Grid_line_span_engraver` must be used to actually draw the lines. By default this centers grid lines horizontally below and to the left side of each note head. Grid lines extend from the middle lines of each staff. The `gridInterval` must specify the duration between the grid lines.

```
\layout {
  \context {
    \Staff
    \consists "Grid_point_engraver"
    gridInterval = #(ly:make-moment 1/4)
  }
  \context {
    \Score
    \consists "Grid_line_span_engraver"
  }
}

\score {
  \new ChoirStaff <<
    \new Staff \relative c'' {
      \stemUp
      c4. d8 e8 f g4
    }
    \new Staff \relative c {
      \clef bass
      \stemDown
      c4 g' f e
    }
  >>
}
```

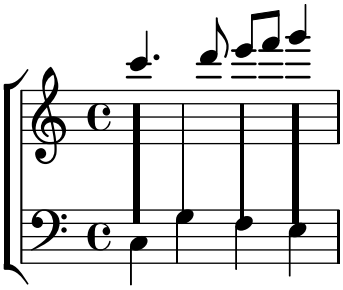


Frammenti di codice selezionati

Grid lines: changing their appearance

The appearance of grid lines can be changed by overriding some of their properties.

```
\score {
  \new ChoirStaff <<
    \new Staff {
      \relative c'' {
        \stemUp
        c'4. d8 e8 f g4
      }
    }
    \new Staff {
      \relative c {
        % this moves them up one staff space from the default position
        \override Score.GridLine.extra-offset = #'(0.0 . 1.0)
        \stemDown
        \clef bass
        \once \override Score.GridLine.thickness = #5.0
        c4
        \once \override Score.GridLine.thickness = #1.0
        g'4
        \once \override Score.GridLine.thickness = #3.0
        f4
        \once \override Score.GridLine.thickness = #5.0
        e4
      }
    }
  >>
  \layout {
    \context {
      \Staff
      % set up grids
      \consists "Grid_point_engraver"
      % set the grid interval to one quarter note
      gridInterval = #(ly:make-moment 1/4)
    }
    \context {
      \Score
      \consists "Grid_line_span_engraver"
      % this moves them to the right half a staff space
      \override NoteColumn.X-offset = #-0.5
    }
  }
}
```



Vedi anche

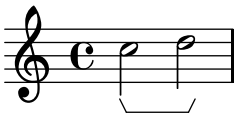
Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "Grid_line_span_engraver" in *Guida al Funzionamento Interno*, Sezione "Grid_point_engraver" in *Guida al Funzionamento Interno*, Sezione "GridLine" in *Guida al Funzionamento Interno*, Sezione "GridPoint" in *Guida al Funzionamento Interno*, Sezione "grid-line-interface" in *Guida al Funzionamento Interno*, Sezione "grid-point-interface" in *Guida al Funzionamento Interno*.

Analysis brackets

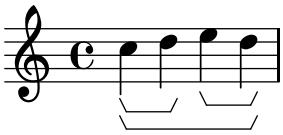
Brackets are used in musical analysis to indicate structure in musical pieces. Simple horizontal brackets are supported.

```
\layout {
  \context {
    \Voice
    \consists "Horizontal_bracket_engraver"
  }
}
\relative c'' {
  c2\startGroup
  d\stopGroup
}
```



Analysis brackets may be nested.

```
\layout {
  \context {
    \Voice
    \consists "Horizontal_bracket_engraver"
  }
}
\relative c'' {
  c4\startGroup\startGroup
  d4\stopGroup
  e4\startGroup
  d4\stopGroup\stopGroup
}
```

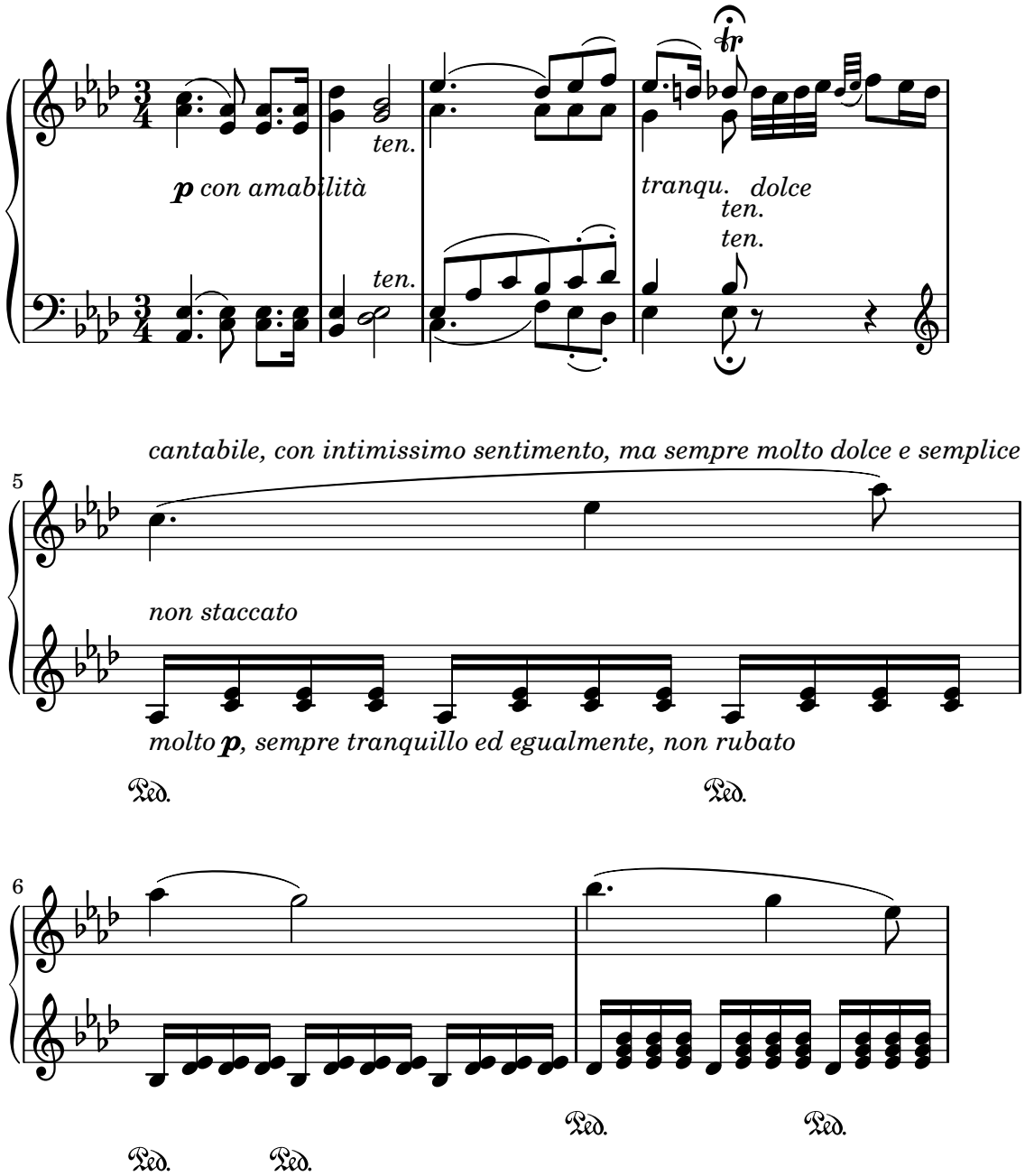


Vedi anche

Snippets: Sezione "Editorial annotations" in *Frammenti di codice*.

Internals Reference: Sezione "Horizontal_bracket_engraver" in *Guida al Funzionamento Interno*, Sezione "HorizontalBracket" in *Guida al Funzionamento Interno*, Sezione "horizontal-bracket-interface" in *Guida al Funzionamento Interno*, Sezione "Staff" in *Guida al Funzionamento Interno*.

1.8 Text



This section explains how to include text (with various formatting) in music scores.

Some text elements that are not dealt with here are discussed in other specific sections: Sezione 2.1 [Vocal music], pagina 246, Sezione 3.2 [Titles and headers], pagina 457.

1.8.1 Writing text

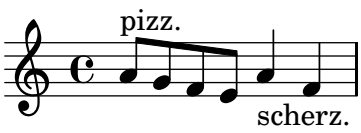
This section introduces different ways of adding text to a score.

Nota: To write accented and special text (such as characters from other languages), simply insert the characters directly into the LilyPond file. The file must be saved as UTF-8. For more information, see [Text encoding], pagina 487.

Text scripts

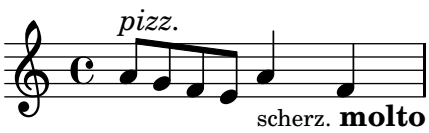
Simple "quoted text" indications may be added to a score, as demonstrated in the following example. Such indications may be manually placed above or below the staff, using the syntax described in Sezione 5.4.2 [Direction and placement], pagina 585.

```
a8^"pizz." g f e a4-"scherz." f
```



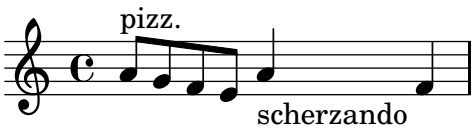
This syntax is actually a shorthand; more complex text formatting may be added to a note by explicitly using a `\markup` block, as described in Sezione 1.8.2 [Formatting text], pagina 229.

```
a8^\markup { \italic pizz. } g f e
a4_\markup { \tiny scherz. \bold molto } f
```



By default, text indications do not influence the note spacing. However, their widths can be taken into account: in the following example, the first text string does not affect spacing, whereas the second one does.

```
a8^"pizz." g f e
\textLengthOn
a4_"scherzando" f
```



In addition to text scripts, articulations can be attached to notes. For more information, see ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

For more information about the relative ordering of text scripts and articulations, see Sezione "Placement of objects" in *Manuale di Apprendimento*.

Comandi predefiniti

`\textLengthOn`, `\textLengthOff`.

Vedi anche

Learning Manual: Sezione “Placement of objects” in *Manuale di Apprendimento*.

Notation Reference: Sezione 1.8.2 [Formatting text], pagina 229, Sezione 5.4.2 [Direction and placement], pagina 585, ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

Snippets: Sezione “Text” in *Frammenti di codice*.

Internals Reference: Sezione “TextScript” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

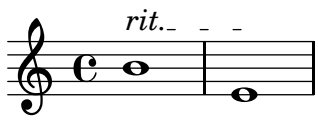
Checking to make sure that text scripts and lyrics are within the margins requires additonal calculations. In cases where slightly faster performance is desired, use

```
\override Score.PaperColumn.keep-inside-line = ##f
```

Text spanners

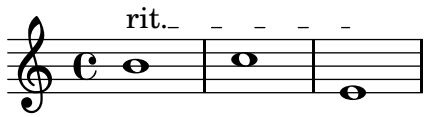
Some performance indications, e.g., *rallentando* or *accelerando*, are written as text and are extended over multiple notes with dotted lines. Such objects, called “spanners”, may be created from one note to another using the following syntax:

```
\override TextSpanner.bound-details.left.text = "rit."
b1\startTextSpan
e,\stopTextSpan
```



The string to be printed is set through object properties. By default it is printed in italic characters, but different formatting can be obtained using `\markup` blocks, as described in Sezione 1.8.2 [Formatting text], pagina 229.

```
\override TextSpanner.bound-details.left.text =
  \markup { \upright "rit." }
b1\startTextSpan c
e,\stopTextSpan
```



The line style, as well as the text string, can be defined as an object property. This syntax is described in Sezione 5.4.7 [Line styles], pagina 597.

Comandi predefiniti

`\textSpannerUp`, `\textSpannerDown`, `\textSpannerNeutral`.

Problemi noti e avvertimenti

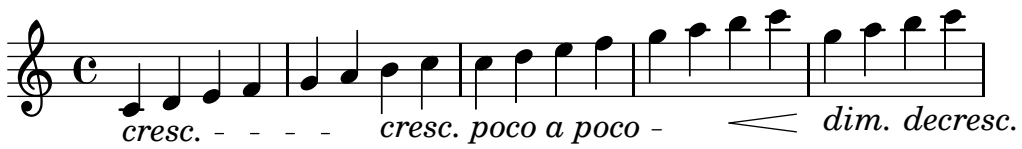
LilyPond is only able to handle one text spanner per voice.

Frammenti di codice selezionati

Dynamics text spanner postfix

Custom text spanners can be defined and used with hairpin and text crescendos. \< and \> produce hairpins by default, \cresc etc. produce text spanners by default.

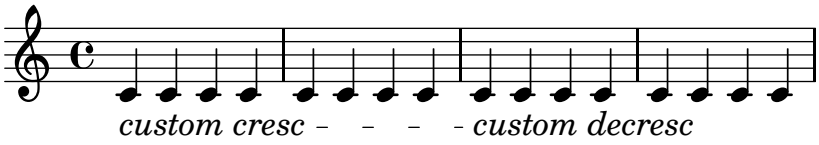
```
% Some sample text dynamic spanners, to be used as postfix operators
crpoco =
#(make-music 'CrescendoEvent
             'span-direction START
             'span-type 'text
             'span-text "cresc. poco a poco")

\relative c' {
  c4\cresc d4 e4 f4 |
  g4 a4\! b4\crpoco c4 |
  c4 d4 e4 f4 |
  g4 a4\! b4\< c4 |
  g4\dim a4 b4\decresc c4\!
}
```



Dynamics custom text spanner postfix

Postfix functions for custom crescendo text spanners. The spanners should start on the first note of the measure. One has to use -\mycresc, otherwise the spanner start will rather be assigned to the next note.

```
% Two functions for (de)crescendo spanners where you can explicitly give the
% spanner text.
mycresc =
#(define-music-function (parser location mymarkup) (markup?)
   (make-music 'CrescendoEvent
               'span-direction START
               'span-type 'text
               'span-text mymarkup))
mydecresc =
#(define-music-function (parser location mymarkup) (markup?)
   (make-music 'DecrescendoEvent
               'span-direction START
               'span-type 'text
               'span-text mymarkup))

\relative c' {
  c4-\mycresc "custom cresc" c4 c4 c4 |
  c4 c4 c4 c4 |
  c4-\mydecresc "custom decresc" c4 c4 c4 |
  c4 c4\! c4 c4
}
```



Vedi anche

Notation Reference: Sezione 5.4.7 [Line styles], pagina 597, ⟨undefined⟩ [Dynamics], pagina ⟨undefined⟩, Sezione 1.8.2 [Formatting text], pagina 229.

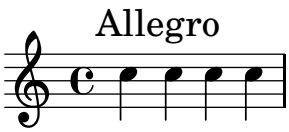
Snippets: Sezione "Text" in *Frammenti di codice*, Sezione "Expressive marks" in *Frammenti di codice*.

Internals Reference: Sezione "TextSpanner" in *Guida al Funzionamento Interno*.

Text marks

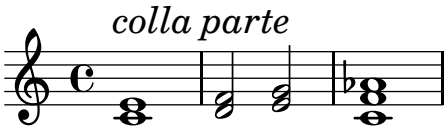
Various text elements may be added to a score using the syntax described in ⟨undefined⟩ [Rehearsal marks], pagina ⟨undefined⟩:

```
c4
\mark "Allegro"
c c c
```



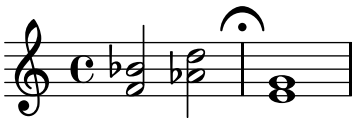
This syntax makes it possible to put any text on a bar line; more complex text formatting may be added using a `\markup` block, as described in Sezione 1.8.2 [Formatting text], pagina 229:

```
<c e>1
\mark \markup { \italic { colla parte } }
<d f>2 <e g>
<c f aes>1
```



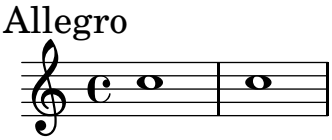
This syntax also allows to print special signs, like coda, segno or fermata, by specifying the appropriate symbol name as explained in [Music notation inside markup], pagina 239:

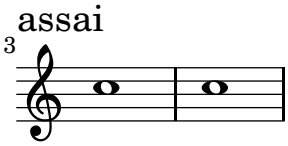
```
<bes f>2 <aes d>
\mark \markup { \musicglyph #"scripts.ufermata" }
<e g>1
```



Such objects are only typeset above the top staff of the score; depending on whether they are specified at the end or the middle of a bar, they can be placed above the bar line or between notes. When specified at a line break, the mark will be printed at the beginning of the next line.

```
\mark "Allegro"
c1 c
\mark "assai" \break
c  c
```





Comandi predefiniti

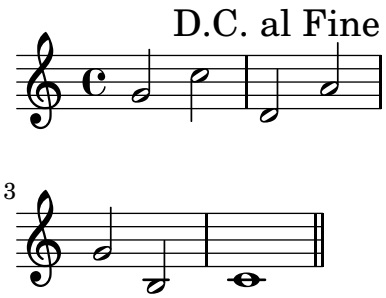
`\markLengthOn`, `\markLengthOff`.

Frammenti di codice selezionati

Printing marks at the end of a line

Marks can be printed at the end of the current line, instead of the beginning of the following line. In such cases, it might be preferable to align the right end of the mark with the bar line.

```
\relative c'' {
  g2 c
  d,2 a'
  \once \override Score.RehearsalMark.break-visibility = #end-of-line-visible
  \once \override Score.RehearsalMark.self-alignment-X = #RIGHT
  \mark "D.C. al Fine"
  \break
  g2 b,
  c1 \bar "||"
}
```



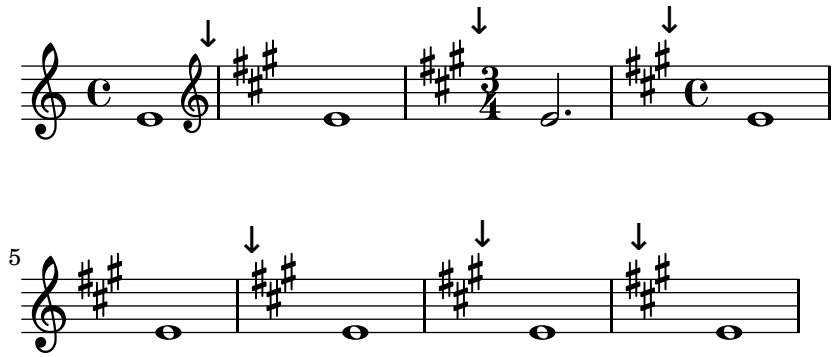
Aligning marks with various notation objects

If specified, text marks may be aligned with notation objects other than bar lines. These objects include `ambitus`, `breathing-sign`, `clef`, `custos`, `staff-bar`, `left-edge`, `key-cancellation`, `key-signature`, and `time-signature`.

In such cases, text marks will be horizontally centered above the object. However this can be changed, as demonstrated on the second line of this example (in a score with multiple staves, this setting should be done for all the staves).

```
\relative c' {
  e1

  % the RehearsalMark will be centered above the Clef
  \override Score.RehearsalMark.break-align-symbols = #'(clef)
  \key a \major
  \clef treble
  \mark \markup { \char ##x2193 }
```

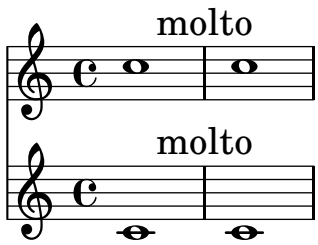
```
  e1

  % the RehearsalMark will be centered above the TimeSignature
  \override Score.RehearsalMark.break-align-symbols = #'(time-signature)
  \key a \major
  \clef treble
  \time 3/4
  \mark \markup { \char ##x2193 }
  e2.

  % the RehearsalMark will be centered above the KeySignature
  \override Score.RehearsalMark.break-align-symbols = #'(key-signature)
  \key a \major
  \clef treble
  \time 4/4
  \mark \markup { \char ##x2193 }
  e1

  \break
  e1

  % the RehearsalMark will be aligned with the left edge of the KeySignature
  \once \override Score.KeySignature.break-align-anchor-alignment = #LEFT
  \mark \markup { \char ##x2193 }
  \key a \major
  e1

  % the RehearsalMark will be aligned with the right edge of the KeySignature
  \once \override Score.KeySignature.break-align-anchor-alignment = #RIGHT
  \key a \major
  \mark \markup { \char ##x2193 }
  e1

  % the RehearsalMark will be aligned with the left edge of the KeySignature
  % and then shifted right by one unit.
  \once \override Score.KeySignature.break-align-anchor = #1
  \key a \major
  \mark \markup { \char ##x2193 }
  e1
}
```



Printing marks on every staff

Although text marks are normally only printed above the topmost staff, they may also be printed on every staff.

```
\score {
  <<
    \new Staff { c''1 \mark "molto" c'' }
    \new Staff { c'1 \mark "molto" c' }
  >>
  \layout {
    \context {
      \Score
      \remove "Mark_engraver"
      \remove "Staff_collecting_engraver"
    }
    \context {
      \Staff
      \consists "Mark_engraver"
      \consists "Staff_collecting_engraver"
    }
  }
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Rehearsal marks], pagina ⟨undefined⟩, Sezione 1.8.2 [Formatting text], pagina 229, [Music notation inside markup], pagina 239, Sezione A.8 [The Feta font], pagina 637.

Snippets: Sezione "Text" in *Frammenti di codice*.

Internals Reference: Sezione "MarkEvent" in *Guida al Funzionamento Interno*, Sezione "Mark_engraver" in *Guida al Funzionamento Interno*, Sezione "RehearsalMark" in *Guida al Funzionamento Interno*.

Separate text

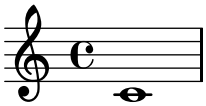
A `\markup` block can exist by itself, outside of any `\score` block, as a "top-level expression". This syntax is described in Sezione 3.1.5 [File structure], pagina 455.

```
\markup {
  Tomorrow, and tomorrow, and tomorrow...
}
```

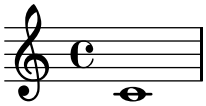
Tomorrow, and tomorrow, and tomorrow...

This allows printing text separately from the music, which is particularly useful when the input file contains several music pieces, as described in Sezione 3.1.2 [Multiple scores in a book], pagina 452.

```
\score {
  c'1
}
\markup {
  Tomorrow, and tomorrow, and tomorrow...
}
\score {
  c'1
}
```



Tomorrow, and tomorrow, and tomorrow...



Separate text blocks can be spread over multiple pages, making it possible to print text documents or books entirely within LilyPond. This feature, and the specific syntax it requires, are described in [Multi-page markup], pagina 241.

Comandi predefiniti

`\markup`, `\markuplist`.

Frammenti di codice selezionati

Stand-alone two-column markup

Stand-alone text may be arranged in several columns using `\markup` commands:

```
\markup {
  \fill-line {
    \hspace #1
    \column {
      \line { O sacrum convivium }
      \line { in quo Christus sumitur, }
      \line { recolitur memoria passionis ejus, }
      \line { mens impletur gratia, }
      \line { futurae gloriae nobis pignus datur. }
      \line { Amen. }
    }
    \hspace #2
    \column \italic {
      \line { O sacred feast }
      \line { in which Christ is received, }
      \line { the memory of His Passion is renewed, }
      \line { the mind is filled with grace, }
      \line { and a pledge of future glory is given to us. }
      \line { Amen. }
    }
    \hspace #1
```

```
  }
}
```

O sacrum convivium	*O sacred feast*
in quo Christus sumitur,	*in which Christ is received,*
recolitur memoria passionis ejus,	*the memory of His Passion is renewed,*
mens impletur gratia,	*the mind is filled with grace,*
futurae gloriae nobis pignus datur.	*and a pledge of future glory is given to us.*
Amen.	*Amen.*

Vedi anche

Notation Reference: Sezione 1.8.2 [Formatting text], pagina 229, Sezione 3.1.5 [File structure], pagina 455, Sezione 3.1.2 [Multiple scores in a book], pagina 452, [Multi-page markup], pagina 241.

Snippets: Sezione "Text" in *Frammenti di codice*.

Internals Reference: Sezione "TextScript" in *Guida al Funzionamento Interno*.

1.8.2 Formatting text

This section presents basic and advanced text formatting, using the `\markup` mode specific syntax.

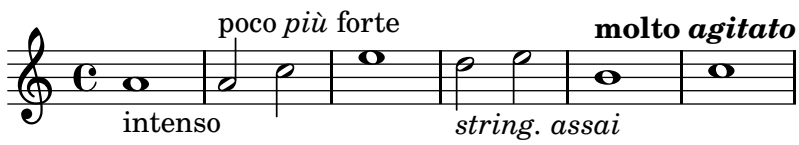
Text markup introduction

A `\markup` block is used to typeset text with an extensible syntax called "markup mode".

The markup syntax is similar to LilyPond's usual syntax: a `\markup` expression is enclosed in curly braces `{... }`. A single word is regarded as a minimal expression, and therefore does not need to be enclosed with braces.

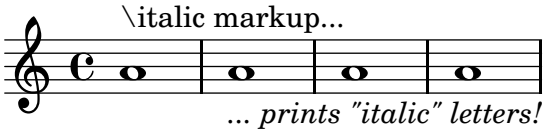
Unlike simple "quoted text" indications, `\markup` blocks may contain nested expressions or markup commands, entered using the backslash `\` character. Such commands only affect the first following expression.

```
a1-\markup intenso
a2^\markup { poco \italic più forte  }
c e1
d2_\markup { \italic "string. assai" }
e
b1^\markup { \bold { molto \italic  agitato } }
c
```



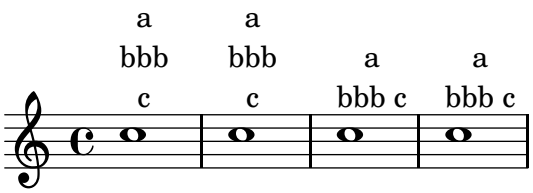
A `\markup` block may also contain quoted text strings. Such strings are treated as minimal text expressions, and therefore any markup command or special character (such as `\` and `#`) will be printed verbatim without affecting the formatting of the text. Double quotation marks themselves may be printed by preceding them with backslashes.

```
a1^"\italic markup..."
a_\markup { \italic "... prints \"italic\" letters!" }
a a
```



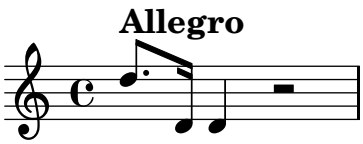
To be treated as a distinct expression, a list of words needs to be enclosed with double quotes or preceded by a command. The way markup expressions are defined affects how these expressions will be stacked, centered and aligned; in the following example, the second `\markup` expression is treated the same as the first one:

```
c1^\markup { \center-column { a bbb c } }
c1^\markup { \center-column { a { bbb c } } }
c1^\markup { \center-column { a \line { bbb c } } }
c1^\markup { \center-column { a "bbb c" } }
```



Markups can be stored in variables. Such variables may be directly attached to notes:

```
allegro = \markup { \bold \large Allegro }

{
  d''8.^\allegro
  d'16 d'4 r2
}
```



An exhaustive list of `\markup`-specific commands can be found in Sezione A.10 [Text markup commands], pagina 659.

Vedi anche

Notation Reference: Sezione A.10 [Text markup commands], pagina 659.

Snippets: Sezione "Text" in *Frammenti di codice*.

Installed Files: '`scm/markup.scm`'.

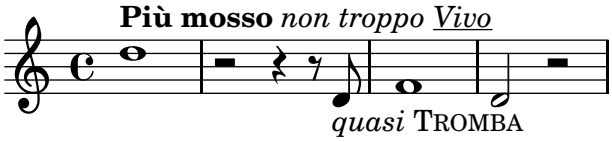
Problemi noti e avvertimenti

Syntax errors for markup mode can be confusing.

Selecting font and font size

Basic font switching is supported in markup mode:

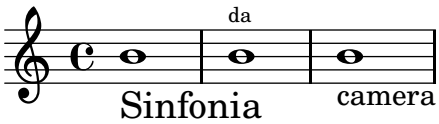
```
d1^\markup {
  \bold { Più mosso }
  \italic { non troppo \underline Vivo }
}
r2 r4 r8
d,_\markup { \italic quasi \smallCaps Tromba }
f1 d2 r
```



The font size can be altered, relative to the global staff size, in a number of different ways

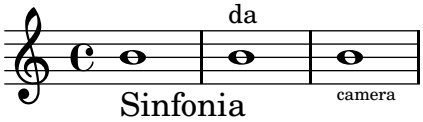
It can be set to predefined size,

```
b1_\markup { \huge Sinfonia }
b1^\markup { \teeny da }
b1-\markup { \normalsize camera }
```



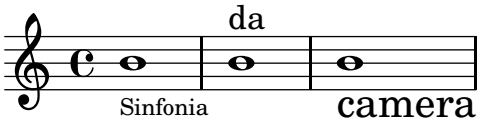
It can be set relative to its previous value,

```
b1_\markup { \larger Sinfonia }
b1^\markup { \smaller da }
b1-\markup { \magnify #0.6  camera }
```



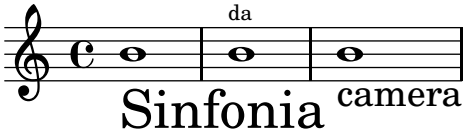
It can be increased or decreased relative to the value set by the global staff size,

```
b1_\markup { \fontsize #-2 Sinfonia }
b1^\markup { \fontsize #1 da }
b1-\markup { \fontsize #3 camera }
```



It can also be set to a fixed point-size, regardless of the global staff size,

```
b1_\markup { \abs-fontsize #20 Sinfonia }
b1^\markup { \abs-fontsize #8 da }
b1-\markup { \abs-fontsize #14 camera }
```



Text may be printed as subscript or superscript. By default these are printed in a smaller size, but a normal size can be used as well:

```
\markup {
  \column {
    \line { 1 \super st movement }
    \line { 1 \normal-size-super st movement
      \sub { (part two) }  }
  }
}
```

1st movement
1st movement (part two)

The markup mode provides an easy way to select alternate font families. The default serif font, of roman type, is automatically selected unless specified otherwise; on the last line of the following example, there is no difference between the first and the second word.

```
\markup {
  \column {
    \line { Act \number 1 }
    \line { \sans { Scene I. } }
    \line { \typewriter { Verona. An open place. } }
    \line { Enter \roman Valentine and Proteus. }
  }
}
```

Act 1
Scene I.
Verona. An open place.
Enter Valentine and Proteus.

Some of these font families, used for specific items such as numbers or dynamics, do not provide all characters, as mentioned in ⟨undefined⟩ [New dynamic marks], pagina ⟨undefined⟩ and ⟨undefined⟩ [Manual repeat marks], pagina ⟨undefined⟩.

When used inside a word, some font-switching or formatting commands may produce an unwanted blank space. This can easily be solved by concatenating the text elements together:

```
\markup {
  \column {
    \line {
      \concat { 1 \super st }
      movement
    }
    \line {
      \concat { \dynamic p , }
      \italic { con dolce espressione }
    }
  }
}
```

1st movement
p, con dolce espressione

An exhaustive list of font switching commands and custom font usage commands can be found in Sezione A.10.1 [Font], pagina 659.

Defining custom font sets is also possible, as explained in Sezione 1.8.3 [Fonts], pagina 242.

Comandi predefiniti

`\teeny`, `\tiny`, `\small`, `\normalsize`, `\large`, `\huge`, `\smaller`, `\larger`.

Vedi anche

Notation Reference: Sezione A.10.1 [Font], pagina 659, ⟨undefined⟩ [New dynamic marks], pagina ⟨undefined⟩, ⟨undefined⟩ [Manual repeat marks], pagina ⟨undefined⟩, Sezione 1.8.3 [Fonts], pagina 242.

Installed Files: '`scm/define-markup-commands.scm`'.

Snippets: Sezione "Text" in *Frammenti di codice*.

Internals Reference: Sezione "TextScript" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

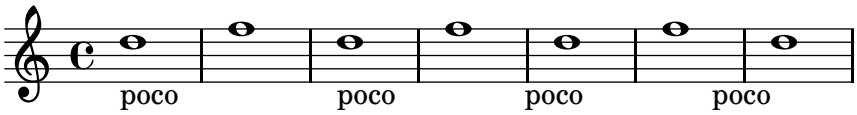
Using the font sizing commands `\teeny`, `\tiny`, `\small`, `\normalsize`, `\large`, and `\huge` will lead to inconsistent line spacing compared to using `\fontsize`.

Text alignment

This subsection discusses how to place text in markup mode. Markup objects can also be moved as a whole, using the syntax described in Sezione "Moving objects" in *Manuale di Apprendimento*.

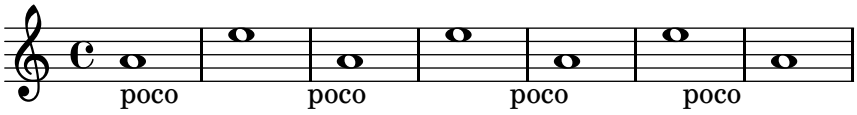
Markup objects may be aligned in different ways. By default, a text indication is aligned on its left edge: in the following example, there is no difference between the first and the second markup.

```
d1-\markup { poco }
f
d-\markup { \left-align poco }
f
d-\markup { \center-align { poco } }
f
d-\markup { \right-align poco }
```



Horizontal alignment may be fine-tuned using a numeric value:

```
a1-\markup { \halign #-1 poco }
e'
a,-\markup { \halign #0 poco }
e'
a,-\markup { \halign #0.5 poco }
e'
a,-\markup { \halign #2 poco }
```

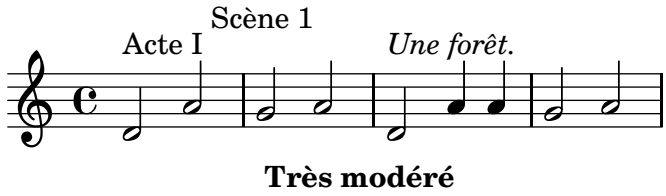


Some objects may have alignment procedures of their own, and therefore are not affected by these commands. It is possible to move such markup objects as a whole, as shown for instance in [Text marks], pagina 224.

Vertical alignment is a bit more complex. As stated above, markup objects can be moved as a whole; however, it is also possible to move specific elements inside a markup block. In this case,

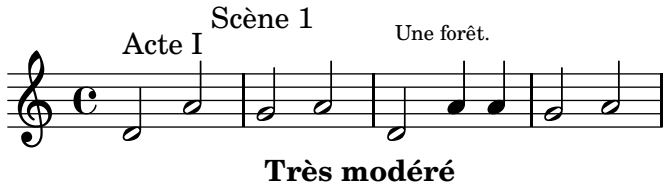
the element to be moved needs to be preceded with an *anchor point*, that can be another markup element or an invisible object. The following example demonstrates these two possibilities; the last markup in this example has no anchor point, and therefore is not moved.

```
d2^\markup {
  Acte I
  \raise #2 { Scène 1 }
}
a'
g_\markup {
  \null
  \lower #4 \bold { Très modéré }
}
a
d,^\markup {
  \raise #4 \italic { Une forêt. }
}
a'4 a g2 a
```



Some commands can affect both the horizontal and vertical alignment of text objects in markup mode. Any object affected by these commands must be preceded with an anchor point:

```
d2^\markup {
  Acte I
  \translate #'(-1 . 2) "Scène 1"
}
a'
g_\markup {
  \null
  \general-align #Y #3.2 \bold "Très modéré"
}
a
d,^\markup {
  \null
  \translate-scaled #'(-1 . 2) \teeny "Une forêt."
}
a'4 a g2 a
```



A markup object may include several lines of text. In the following example, each element or expression is placed on its own line, either left-aligned or centered:

```
\markup {
  \column {
    a
    "b c"
    \line { d e f }
  }
  \hspace #10
  \center-column {
    a
    "b c"
    \line { d e f }
  }
}
```

a a
b c b c
d e f d e f

Similarly, a list of elements or expressions may be spread to fill the entire horizontal line width (if there is only one element, it will be centered on the page). These expressions can, in turn, include multi-line text or any other markup expression:

```
\markup {
  \fill-line {
    \line { William S. Gilbert }
    \center-column {
      \huge \smallCaps "The Mikado"
      or
      \smallCaps "The Town of Titipu"
    }
    \line { Sir Arthur Sullivan }
  }
}
\markup {
  \fill-line { 1885 }
}
```

William S. Gilbert THE MIKADO Sir Arthur Sullivan
or
THE TOWN OF TITIPU

1885

Long text indications can also be automatically wrapped accordingly to the given line width. These will be either left-aligned or justified, as shown in the following example.

```
\markup {
  \column {
    \line  \smallCaps { La vida breve }
    \line \bold { Acto I }
    \wordwrap \italic {
      (La escena representa el corral de una casa de
      gitanos en el Albaicín de Granada.  Al fondo una
```

```
      puerta por la que se ve el negro interior de
      una Fragua, iluminado por los rojos resplandores
      del fuego.)
    }
    \hspace #0

    \line \bold { Acto II }
    \override #'(line-width . 50)
    \justify \italic {
      (Calle de Granada.  Fachada de la casa de Carmela
      y su hermano Manuel con grandes ventanas abiertas
      a través de las que se ve el patio
      donde se celebra una alegre fiesta)
    }
  }
}
```

LA VIDA BREVE

Acto I

(La escena representa el corral de una casa de gitanos en el Albaicín de Granada. Al fondo una puerta por la que se ve el negro interior de una Fragua, iluminado por los rojos resplandores del fuego.)

Acto II

(Calle de Granada. Fachada de la casa de Carmela y su hermano Manuel con grandes ventanas abiertas a través de las que se ve el patio donde se celebra una alegre fiesta)

An exhaustive list of text alignment commands can be found in Sezione A.10.2 [Align], pagina 667.

Vedi anche

Learning Manual: Sezione "Moving objects" in *Manuale di Apprendimento*.

Notation Reference: Sezione A.10.2 [Align], pagina 667, [Text marks], pagina 224.

Installed Files: '`scm/define-markup-commands.scm`'.

Snippets: Sezione "Text" in *Frammenti di codice*.

Internals Reference: Sezione "TextScript" in *Guida al Funzionamento Interno*.

Graphic notation inside markup

Various graphic objects may be added to a score, using markup commands.

Some markup commands allow decoration of text elements with graphics, as demonstrated in the following example.

```
\markup \fill-line {
  \center-column {
    \circle Jack
    \box "in the box"
    \null
    \line {
      Erik Satie
```

```
      \hspace #3
      \bracket "1866 - 1925"
    }
    \null
    \rounded-box \bold Prelude
  }
}
```

Jack
in the box

Erik Satie [1866 - 1925]

Prelude

Some commands may require an increase in the padding around the text; this is achieved with some markup commands exhaustively described in Sezione A.10.2 [Align], pagina 667.

```
\markup \fill-line {
  \center-column {
    \box "Charles Ives (1874 - 1954)"
    \null
    \box \pad-markup #2 "THE UNANSWERED QUESTION"
    \box \pad-x #8 "A Cosmic Landscape"
    \null
  }
}
\markup \column {
  \line {
    \hspace #10
    \box \pad-to-box #'(-5 . 20) #'(0 . 5)
      \bold "Largo to Presto"
  }
  \pad-around #3
      "String quartet keeps very even time,
Flute quartet keeps very uneven time."
}
```

Charles Ives (1874 - 1954)

THE UNANSWERED QUESTION

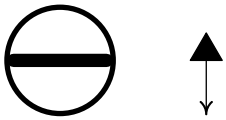
A Cosmic Landscape

Largo to Presto

String quartet keeps very even time, Flute quartet keeps very uneven time.

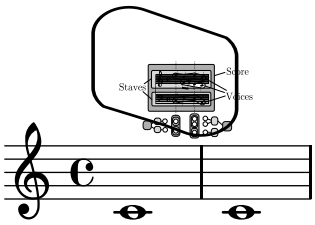
Other graphic elements or symbols may be printed without requiring any text. As with any markup expression, such objects can be combined.

```
\markup {
  \combine
    \draw-circle #4 #0.4 ##f
    \filled-box #'(-4 . 4) #'(-0.5 . 0.5) #1
  \hspace #5

  \center-column {
    \triangle ##t
    \combine
      \draw-line #'(0 . 4)
      \arrow-head #Y #DOWN ##f
  }
}
```



Advanced graphic features include the ability to include external image files converted to the Encapsulated PostScript format (*eps*), or to directly embed graphics into the input file, using native PostScript code. In such a case, it may be useful to explicitly specify the size of the drawing, as demonstrated below:

```
c1^\markup {
  \combine
    \epsfile #X #10 #"./context-example.eps"
    \with-dimensions #'(0 . 6) #'(0 . 10)
    \postscript #"
      -2 3 translate
      2.7 2 scale
      newpath
      2 -1 moveto
      4 -2 4 1 1 arct
      4 2 3 3 1 arct
      0 4 0 3 1 arct
      0 0 1 -1 1 arct
      closepath
      stroke"
  }
c
```



An exhaustive list of graphics-specific commands can be found in Sezione A.10.3 [Graphic], pagina 682.

Vedi anche

Notation Reference: Sezione A.10.3 [Graphic], pagina 682, Sezione 1.7 [Editorial annotations], pagina 209, Sezione A.10.2 [Align], pagina 667.

Installed Files: ‘`scm/define-markup-commands.scm`’, ‘`scm/stencil.scm`’.

Snippets: Sezione “Text” in *Frammenti di codice*.

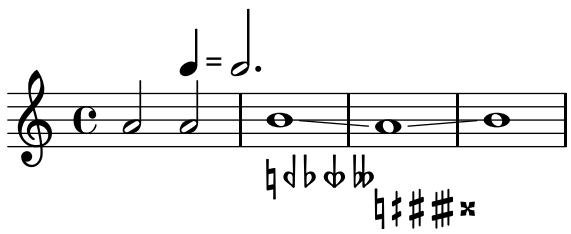
Internals Reference: Sezione “TextScript” in *Guida al Funzionamento Interno*.

Music notation inside markup

Various musical notation elements may be added to a score, inside a markup object.

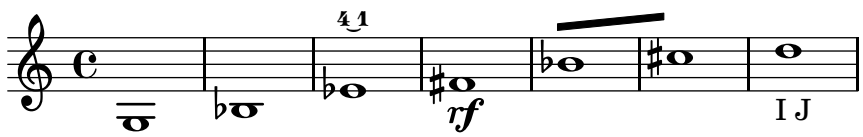
Notes and accidentals can be entered using markup commands:

```
a2 a^\markup {
  \note #"4" #1
  =
  \note-by-number #1 #1 #1.5
}
b1_\markup {
  \natural \semiflat \flat
  \sesquiflat \doubleflat
}
\glissando
a1_\markup {
  \natural \semisharp \sharp
  \sesquisharp \doublesharp
}
\glissando b
```



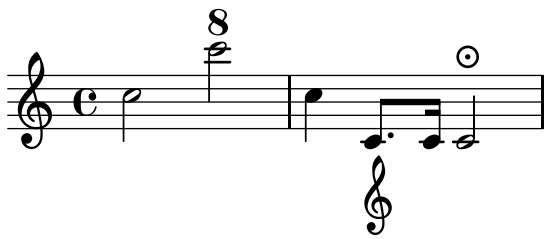
Other notation objects may also be printed in markup mode:

```
g1 bes
ees\finger \markup \tied-lyric #"4~1"
fis_\markup { \dynamic rf }
bes^\markup {
  \beam #8 #0.1 #0.5
}
cis
d-\markup {
  \markalphabet #8
  \markletter #8
}
```



More generally, any available musical symbol may be included separately in a markup object, as demonstrated below; an exhaustive list of these symbols and their names can be found in Sezione A.8 [The Feta font], pagina 637.

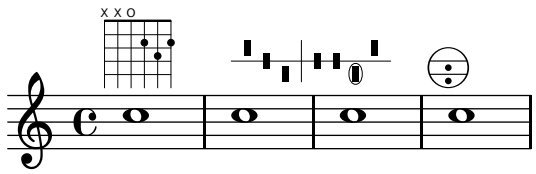
```
c2
c'^\markup { \musicglyph #"eight" }
c,4
c,8._\markup { \musicglyph #"clefs.G_change" }
c16
c2^\markup { \musicglyph #"timesig.neomensural94" }
```



Another way of printing non-text glyphs is described in [Fonts explained], pagina 242. This is useful for printing braces of various sizes.

The markup mode also supports diagrams for specific instruments:

```
c1^\markup {
  \fret-diagram-terse #"x;x;o;2;3;2;"
}
c^\markup {
  \harp-pedal #"^-v|--ov^"
}
c
c^\markup {
  \combine
    \musicglyph #"accordion.discant"
    \combine
      \raise #0.5 \musicglyph #"accordion.dot"
      \raise #1.5 \musicglyph #"accordion.dot"
}
```

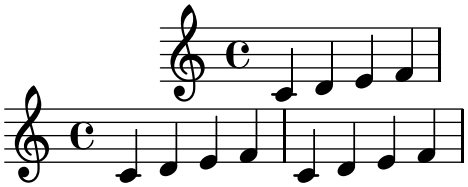


Such diagrams are documented in Sezione A.10.5 [Instrument Specific Markup], pagina 695.

A whole score can even be nested inside a markup object. In such a case, the nested `\score` block must contain a `\layout` block, as demonstrated here:

```
c4 d^\markup {
  \score {
    \relative c' { c4 d e f }
    \layout { }
  }
}
e f |
```

```
c d e f
```



An exhaustive list of music notation related commands can be found in Sezione A.10.4 [Music], pagina 690.

Vedi anche

Notation Reference: Sezione A.10.4 [Music], pagina 690, Sezione A.8 [The Feta font], pagina 637, [Fonts explained], pagina 242.

Installed Files: ‘`scm/define-markup-commands.scm`’, ‘`scm/fret-diagrams.scm`’, ‘`scm/harp-pedals.scm`’.

Snippets: Sezione “Text” in *Frammenti di codice*.

Internals Reference: Sezione “TextScript” in *Guida al Funzionamento Interno*.

Multi-page markup

Although standard markup objects are not breakable, a specific syntax makes it possible to enter lines of text that can spread over multiple pages:

```
\markuplist {
  \justified-lines {
    A very long text of justified lines.
    ...
  }
  \wordwrap-lines {
    Another very long paragraph.
    ...
  }
  ...
}
```

A very long text of justified lines. ...

Another very long paragraph. ...

...

This syntax accepts a list of markups, that can be

- the result of a markup list command,
- a list of markups,
- a list of markup lists.

An exhaustive list of markup list commands can be found in Sezione A.11 [Text markup list commands], pagina 709.

Vedi anche

Notation Reference: Sezione A.11 [Text markup list commands], pagina 709.

Extending LilyPond: Sezione “New markup list command definition” in *Estendere*.

Installed Files: ‘`scm/define-markup-commands.scm`’.

Snippets: Sezione “Text” in *Frammenti di codice*.

Internals Reference: Sezione “TextScript” in *Guida al Funzionamento Interno*.

Comandi predefiniti

`\markuplist`.

1.8.3 Fonts

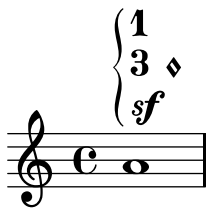
This section presents the way fonts are handled, and how they may be changed in scores.

Fonts explained

Fonts are handled through several libraries. FontConfig is used to detect available fonts on the system; the selected fonts are rendered using Pango.

Music notation fonts can be described as a set of specific glyphs, ordered in several families. The following syntax allows various LilyPond `feta` non-text fonts to be used directly in markup mode:

```
a1^\markup {
  \vcenter {
    \override #'(font-encoding . fetaBraces)
    \lookup #"brace120"
    \override #'(font-encoding . fetaText)
    \column { 1 3 sf }
    \override #'(font-encoding . fetaMusic)
    \lookup #"noteheads.s0petrucci"
  }
}
```



However, all these glyphs except the braces of various sizes contained in `fetaBraces` are available using the simpler syntax described in [Music notation inside markup], pagina 239.

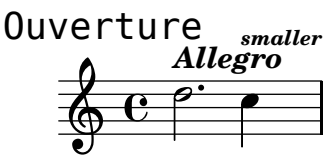
When using the glyphs contained in `fetaBraces`, the size of the brace is specified by the numerical part of the glyph name, in arbitrary units. Any integer from `0` to `575` inclusive may be specified, `0` giving the smallest brace. The optimum value must be determined by trial and error. These glyphs are all left braces; right braces may be obtained by rotation, see Sezione 5.4.8 [Rotating objects], pagina 598.

Three families of text fonts are made available: the *roman* (serif) font, that defaults to New Century Schoolbook, the *sans* font and the monospaced *typewriter* font – these last two families are determined by the Pango installation.

Nota: There are no default fonts associated with the *sans* and *typewriter* font-families. An input file that specifies either of these can lead to different output on different computers. To ensure consistent output among multiple platforms, fonts must be specified by name, and those fonts must be available on any system that processes the file. See [Single entry fonts], pagina 244 and [Entire document fonts], pagina 244.

Each family may include different shapes and series. The following example demonstrates the ability to select alternate families, shapes, series and sizes. The value supplied to `font-size` is the required change from the default size.

```
\override Score.RehearsalMark.font-family = #'typewriter
\mark \markup "Ouverture"
\override Voice.TextScript.font-shape = #'italic
\override Voice.TextScript.font-series = #'bold
d2.^\markup "Allegro"
\override Voice.TextScript.font-size = #-3
c4^smaller
```



A similar syntax may be used in markup mode; however in this case it is preferable to use the simpler syntax explained in [Selecting font and font size], pagina 230:

```
\markup {
  \column {
    \line {
      \override #'(font-shape . italic)
      \override #'(font-size . 4)
      Idomeneo,
    }
    \line {
      \override #'(font-family . typewriter)
      {
        \override #'(font-series . bold)
        re
        di
      }
      \override #'(font-family . sans)
      Creta
    }
  }
}
```

Although it is easy to switch between preconfigured fonts, it is also possible to use other fonts, as explained in the following sections: [Single entry fonts], pagina 244 and [Entire document fonts], pagina 244.

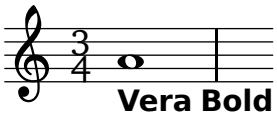
Vedi anche

Notation Reference: Sezione A.8 [The Feta font], pagina 637, [Music notation inside markup], pagina 239, Sezione 5.4.8 [Rotating objects], pagina 598, [Selecting font and font size], pagina 230, Sezione A.10.1 [Font], pagina 659.

Single entry fonts

Any font that is installed on the operating system and recognized by FontConfig may be used in a score, using the following syntax:

```
\override Staff.TimeSignature.font-name = #"Bitstream Charter"
\override Staff.TimeSignature.font-size = #2
\time 3/4

a1_\markup {
  \override #'(font-name . "Vera Bold")
    { Vera Bold }
}
```



The following command displays a list of all available fonts on the operating system:

```
lilypond -dshow-available-fonts x
```

Vedi anche

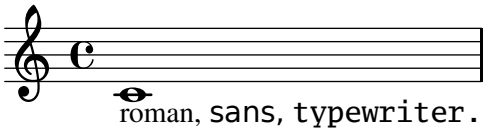
Notation Reference: [Fonts explained], pagina 242, [Entire document fonts], pagina 244.

Snippets: Sezione “Text” in *Frammenti di codice*.

Entire document fonts

It is possible to change the fonts to be used as the default fonts in the *roman*, *sans* and *typewriter* font families by specifying them, in that order, as shown in the example below, which automatically scales the fonts with the value set for the global staff size. For an explanation of fonts, see [Fonts explained], pagina 242.

```
\paper  {
  #(define fonts
    (make-pango-font-tree "Times New Roman"
                          "Nimbus Sans"
                          "Luxi Mono"
                          (/ staff-height pt 20)))
}

\relative c'{
  c1-\markup {
    roman,
    \sans sans,
    \typewriter typewriter. }
}
```



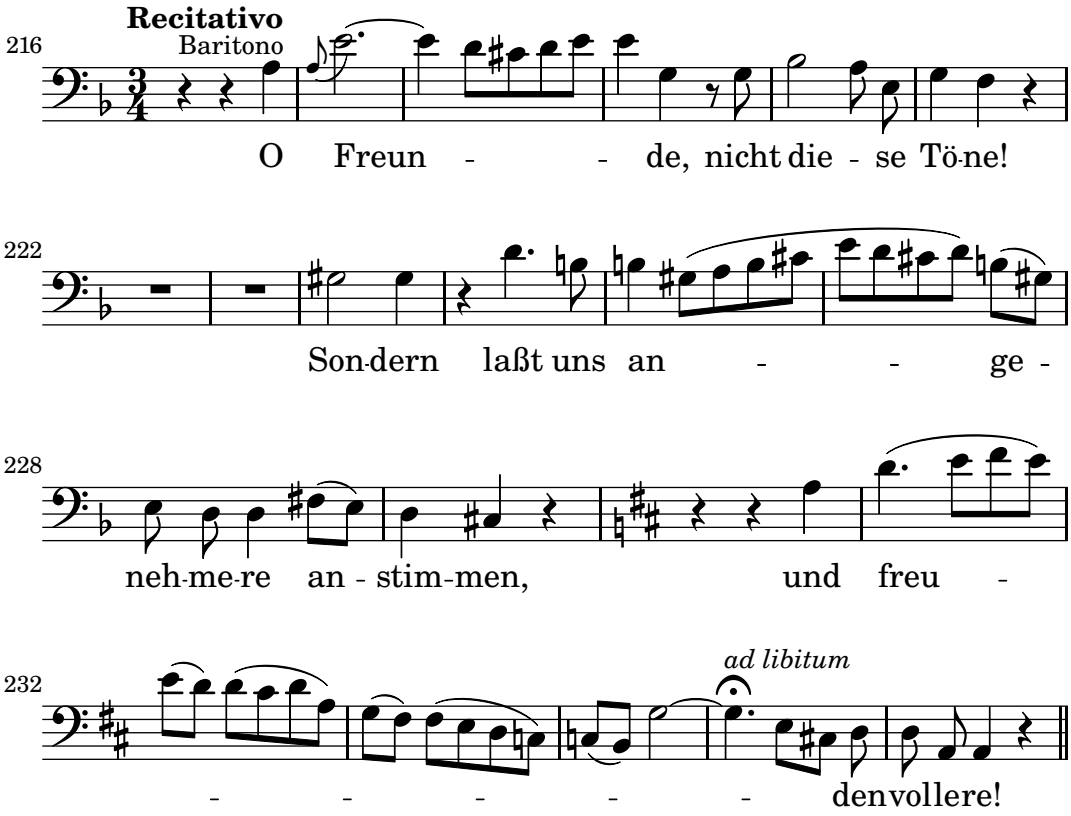
Vedi anche

Notation Reference: [Fonts explained], pagina 242, [Single entry fonts], pagina 244, [Selecting font and font size], pagina 230, Sezione A.10.1 [Font], pagina 659.

2 Specialist notation

This chapter explains how to create musical notation for specific types of instrument or in specific styles.

2.1 Vocal music



This section explains how to typeset vocal music, and make sure that the lyrics will be aligned with the notes of their melody.

2.1.1 Common notation for vocal music

This section discusses issues common to most types of vocal music.

References for vocal music

This section indicates where to find details of notation issues that may arise in any type of vocal music.

- Most styles of vocal music use written text as lyrics. An introduction to this notation is to be found in Sezione "Setting simple songs" in *Manuale di Apprendimento*.
- Vocal music is likely to require the use of `markup` mode, either for lyrics or for other text elements (characters' names, etc.) This syntax is described in [Text markup introduction], pagina 229.
- *Ambitus* may be added at the beginning of vocal staves, as explained in [Ambitus], pagina 33.
- Dynamic markings by default are placed below the staff, but in choral music they are usually placed above the staff in order to avoid the lyrics, as explained in [Score layouts for choral], pagina 286.

Vedi anche

Music Glossary: Sezione “ambitus” in *Glossario Musicale*.

Learning Manual: Sezione “Setting simple songs” in *Manuale di Apprendimento*.

Notation Reference: [Text markup introduction], pagina 229, [Ambitus], pagina 33, [Score layouts for choral], pagina 286.

Snippets: Sezione “Vocal music” in *Frammenti di codice*.

Entering lyrics

Lyrics are entered in a special input mode, which can be introduced by the keyword `\lyricmode`, or by using `\addlyrics` or `\lyricsto`. In this special input mode, the input `d` is not parsed as the pitch *D*, but rather as a one-letter syllable of text. In other words, syllables are entered like notes but with pitches replaced by text.

For example:

```
\lyricmode { Three4 blind mice,2 three4 blind mice2 }
```

There are two main methods for specifying the horizontal placement of the syllables, either by specifying the duration of each syllable explicitly, as in the example above, or by leaving the lyrics to be aligned automatically to a melody or other voice of music, using `\addlyrics` or `\lyricsto`. The former method is described below in [Manual syllable durations], pagina 252. The latter method is described in [Automatic syllable durations], pagina 250.

A word or syllable of lyrics begins with an alphabetic character (plus some other characters, see below) and is terminated by any white space or a digit. Later characters in the syllable can be any character that is not a digit or white space.

Because any character that is not a digit or white space is regarded as part of the syllable, a word is valid even if it ends with `}`, which often leads to the following mistake:

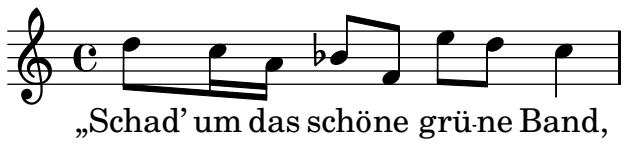
```
\lyricmode { lah lah lah}
```

In this example, the `}` is included in the final syllable, so the opening brace is not balanced and the input file will probably not compile. Instead, braces should always be surrounded with white space:

```
\lyricmode { lah lah lah }
```

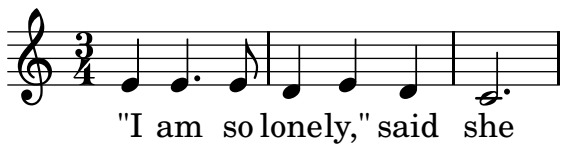
Punctuation, lyrics with accented characters, characters from non-English languages, or special characters (such as the heart symbol or slanted quotes), may simply be inserted directly into the input file, providing it is saved with UTF-8 encoding. For more information, see Sezione 3.3.3 [Special characters], pagina 487.

```
\relative c'' { d8 c16 a bes8 f e' d c4 }
\addlyrics { „Schad’ um das schö -- ne grü -- ne Band, }
```



Normal quotes may be used in lyrics, but they have to be preceded with a backslash character and the whole syllable has to be enclosed between additional quotes. For example,

```
\relative c' { \time 3/4 e4 e4. e8 d4 e d c2. }
\addlyrics { "\"I" am so lone -- "ly,\"" said she }
```



The full definition of a word start in lyrics mode is somewhat more complex. A word in lyrics mode is one that begins with an alphabetic character, `_`, `?`, `!`, `:`, `'`, the control characters `^A` through `^F`, `^Q` through `^W`, `^Y`, `^^`, any 8-bit character with an ASCII code over 127, or a two-character combination of a backslash followed by one of `` ` ``, `'`, `"`, or `^`.

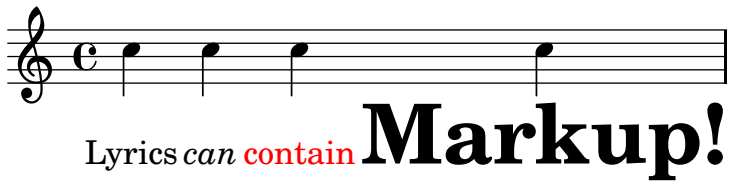
Great control over the appearance of lyrics comes from using `\markup` inside the lyrics themselves. For explanation of many options, see Sezione 1.8.2 [Formatting text], pagina 229.

Frammenti di codice selezionati

Formatting lyrics syllables

Markup mode may be used to format individual syllables in lyrics.

```
mel = \relative c'' { c4 c c c }
lyr = \lyricmode {
  Lyrics \markup { \italic can } \markup { \with-color #red contain }
  \markup { \fontsize #8 \bold Markup! }
}

<<
  \new Voice = melody \mel
  \new Lyrics \lyricsto melody \lyr
>>
```



Vedi anche

Learning Manual: Sezione “Songs” in *Manuale di Apprendimento*.

Notation Reference: [Automatic syllable durations], pagina 250, Sezione 1.8.3 [Fonts], pagina 242, Sezione 1.8.2 [Formatting text], pagina 229, Sezione 5.4.1 [Input modes], pagina 584, [Manual syllable durations], pagina 252, Sezione 3.3.3 [Special characters], pagina 487.

Internals Reference: Sezione “LyricText” in *Guida al Funzionamento Interno*.

Snippets: Sezione “Text” in *Frammenti di codice*.

Aligning lyrics to a melody

Lyrics are printed by interpreting them in the context called `Lyrics`, see Sezione 5.1.1 [Contexts explained], pagina 555.

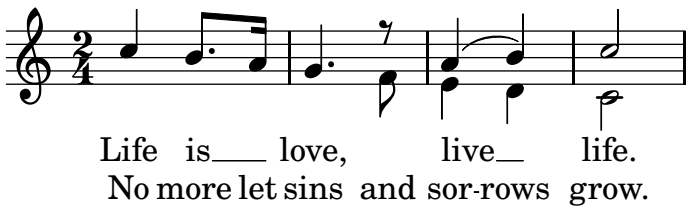
`\new Lyrics \lyricmode { ... }`

Lyrics can be aligned with melodies in two main ways:

- Lyrics can be aligned automatically, with the durations of the syllables being taken from another voice of music or (in special circumstances) an associated melody, using `\addlyrics`, `\lyricsto`, or by setting the `associatedVoice` property. For more details, see [Automatic syllable durations], pagina 250.

  ```
  <<
    \new Staff <<
      \time 2/4
      \new Voice = "one" \relative c'' {
  ```

```
      \voiceOne
      c4 b8. a16 g4. r8 a4 ( b ) c2
    }
    \new Voice = "two" \relative c' {
      \voiceTwo
       s2 s4. f8 e4 d c2
    }
  >>

% takes durations and alignment from notes in "one"
  \new Lyrics \lyricsto "one" {
    Life is __ _ love, live __ life.
  }

% takes durations and alignment from notes in "one" initially
% then switches to "two"
  \new Lyrics \lyricsto "one" {
    No more let
    \set associatedVoice = "two"  % must be set one syllable early
    sins and sor -- rows grow.
  }
>>
```



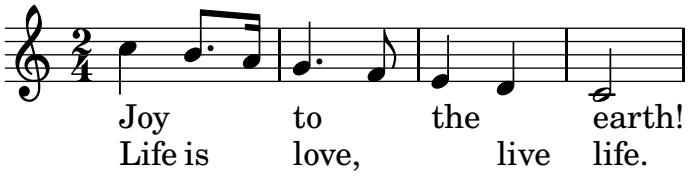
The first stanza shows the normal way of entering lyrics.

The second stanza shows how the voice from which the lyric durations are taken can be changed. This is useful if the words to different stanzas fit the notes in different ways and all the durations are available in Voice contexts. For more details, see Sezione 2.1.3 [Stanzas], pagina 277.

- Lyrics can be aligned independently of the duration of any notes if the durations of the syllables are specified explicitly, and entered with `\lyricmode`.

```
<<
  \new Voice = "one" \relative c'' {
    \time 2/4
    c4 b8. a16 g4. f8 e4 d c2
  }

% uses previous explicit duration of 2;
  \new Lyrics \lyricmode {
    Joy to the earth!
  }

% explicit durations, set to a different rhythm
  \new Lyrics \lyricmode {
    Life4 is love,2. live4 life.2
  }
```

```
>>
```



The first stanza is not aligned with the notes because the durations were not specified, and the previous value of 2 is used for each word.

The second stanza shows how the words can be aligned quite independently from the notes. This is useful if the words to different stanzas fit the notes in different ways and the required durations are not available in a music context. For more details see [Manual syllable durations], pagina 252. This technique is also useful when setting dialogue over music; for examples showing this, see [Dialogue over music], pagina 295.

When entered in this way the words are left-aligned to the notes by default, but may be center-aligned to the notes of a melody by specifying an associated voice, if one exists. For details, see [Manual syllable durations], pagina 252.

Vedi anche

Learning Manual: Sezione "Aligning lyrics to a melody" in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.1.1 [Contexts explained], pagina 555, [Automatic syllable durations], pagina 250, Sezione 2.1.3 [Stanzas], pagina 277, [Manual syllable durations], pagina 252, [Dialogue over music], pagina 295, [Manual syllable durations], pagina 252.

Internals Reference: Sezione "Lyrics" in *Guida al Funzionamento Interno*.

Automatic syllable durations

Lyrics can be automatically aligned to the notes of a melody in three ways:

- by specifying the named Voice context containing the melody with `\lyricsto`,
- by introducing the lyrics with `\addlyrics` and placing them immediately after the Voice context containing the melody,
- by setting the `associatedVoice` property, the alignment of the lyrics may be switched to a different named Voice context at any musical moment.

In all three methods hyphens can be drawn between the syllables of a word and extender lines can be drawn beyond the end of a word. For details, see [Extenders and hyphens], pagina 258.

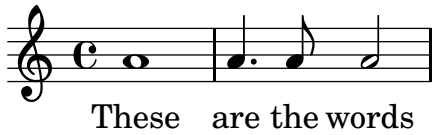
The `Voice` context containing the melody to which the lyrics are being aligned must not have "died", or the lyrics after that point will be lost. This can happen if there are periods when that voice has nothing to do. For methods of keeping contexts alive, see Sezione 5.1.3 [Keeping contexts alive], pagina 560.

Using `\lyricsto`

Lyrics can be aligned under a melody automatically by specifying the named Voice context containing the melody with `\lyricsto`:

```
<<
  \new Voice = "melody" {
    a1 a4. a8 a2
  }
  \new Lyrics \lyricsto "melody" {
    These are the words
```

```
  }
>>
```



This aligns the lyrics to the notes of the named `Voice` context, which must already exist. Therefore normally the `Voice` context is specified first, followed by the `Lyrics` context. The lyrics themselves follow the `\lyricsto` command. The `\lyricsto` command invokes lyric mode automatically, so the `\lyricmode` keyword may be omitted. By default, the lyrics are placed underneath the notes. For other placements, see [Placing lyrics vertically], pagina 260.

Using `\addlyrics`

The `\addlyrics` command is just a convenient shortcut that can sometimes be used instead of having to set up the lyrics through a more complicated LilyPond structure.

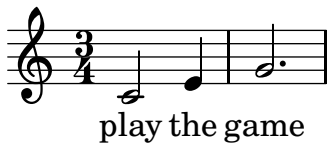
```
{ MUSIC }
\addlyrics { LYRICS }
```

is the same as

```
\new Voice = "blah" { MUSIC }
\new Lyrics \lyricsto "blah" { LYRICS }
```

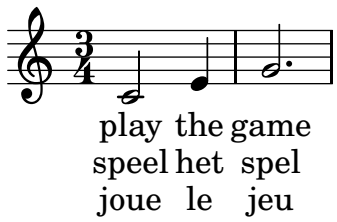
Here is an example,

```
{
  \time 3/4
  \relative c' { c2 e4 g2. }
  \addlyrics { play the game }
}
```



More stanzas can be added by adding more `\addlyrics` sections:

```
{
  \time 3/4
  \relative c' { c2 e4 g2. }
  \addlyrics { play the game }
  \addlyrics { speel het spel }
  \addlyrics { joue le jeu }
}
```



The command `\addlyrics` cannot handle polyphonic settings. Also, it cannot be used to associate lyrics to a `TabVoice`. For these cases one should use `\lyricsto`.

Using associatedVoice

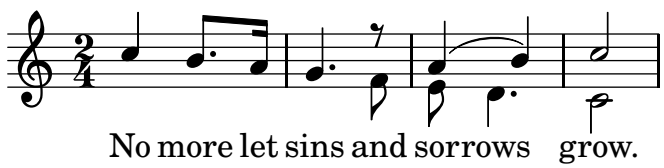
The melody to which the lyrics are being aligned can be changed by setting the `associatedVoice` property,

```
\set associatedVoice = #"lala"
```

The value of the property (here: `"lala"`) should be the name of a `Voice` context. For technical reasons, the `\set` command must be placed one syllable before the one to which the change in voice is to apply.

Here is an example demonstrating its use:

```
<<
  \new Staff <<
    \time 2/4
    \new Voice = "one" \relative c'' {
      \voiceOne
      c4 b8. a16 g4. r8 a4 ( b ) c2
    }
    \new Voice = "two" \relative c' {
      \voiceTwo
       s2 s4. f8 e8 d4. c2
    }
  >>
% takes durations and alignment from notes in "one" initially
% then switches to "two"
  \new Lyrics \lyricsto "one" {
    No more let
    \set associatedVoice = "two"  % must be set one syllable early
    sins and sor -- rows grow.
  }
>>
```



Vedi anche

Notation Reference: [Extenders and hyphens], pagina 258, Sezione 5.1.3 [Keeping contexts alive], pagina 560, [Placing lyrics vertically], pagina 260.

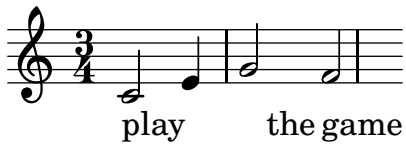
Manual syllable durations

In some complex vocal music, it may be desirable to place lyrics completely independently of notes. In this case do not use `\lyricsto` or `\addlyrics` and do not set `associatedVoice`. Syllables are entered like notes – but with pitches replaced by text – and the duration of each syllable is entered explicitly after the syllable.

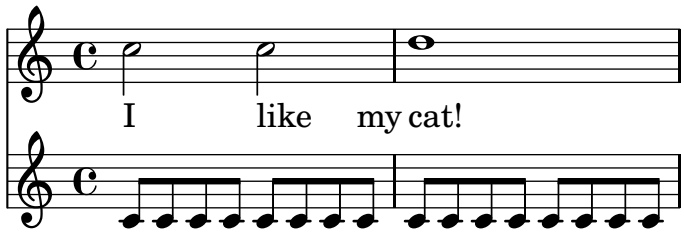
By default, syllables will be left-aligned to the corresponding musical moment. Hyphenated lines may be drawn between syllables as usual, but extender lines cannot be drawn when there is no associated voice.

Here are two examples:

```
<<
  \new Voice = "melody" {
    \time 3/4
    c2 e4 g2 f
  }
  \new Lyrics \lyricmode {
    play1 the4 game4
  }
>>
```




```
<<
  \new Staff {
    \relative c'' {
      c2 c2
      d1
    }
  }
  \new Lyrics {
    \lyricmode {
      I2 like4. my8 cat!1
    }
  }
  \new Staff {
    \relative c' {
      c8 c c c c c c c
      c8 c c c c c c c
    }
  }
>>
```

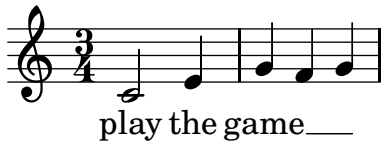


This technique is useful when writing dialogue over music, see [Dialogue over music], pagina 295.

To center-align syllables on the notes at the corresponding musical moments, set `associatedVoice` to the name of the Voice context containing those notes. When `associatedVoice` is set, both double hyphens and double underscores can be used to draw hyphenated lines and extenders under melismata correctly.

```
<<
  \new Voice = "melody" {
    \time 3/4
```

```
    c2 e4 g f g
  }
  \new Lyrics \lyricmode {
    \set associatedVoice = #"melody"
    play2 the4 game2. __
  }
>>
```



Vedi anche

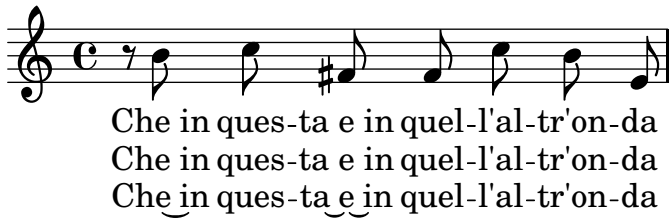
Notation Reference: [Dialogue over music], pagina 295.

Internals Reference: Sezione "Lyrics" in *Guida al Funzionamento Interno*, Sezione "Voice" in *Guida al Funzionamento Interno*.

Multiple syllables to one note

In order to assign more than one syllable to a single note with spaces between the syllables, you can surround the phrase with quotes or use a _ character. Alternatively, you can use the tilde symbol (~) to get a lyric tie.

```
{
  { \autoBeamOff
    r8 b c fis, fis c' b e,
  }
  \addlyrics
  {
    \override LyricHyphen.minimum-distance = #1.0 % Ensure hyphens are visible
    Che_in ques -- ta_e_in quel -- l'al -- tr'on -- da
  }
  \addlyrics { "Che in" ques -- "ta e in" quel -- l'al -- tr'on -- da }
  \addlyrics { Che~in ques -- ta~e~in quel -- l'al -- tr'on -- da }
}
```



Vedi anche

Internals Reference: Sezione "LyricCombineMusic" in *Guida al Funzionamento Interno*.

Multiple notes to one syllable

Sometimes, particularly in Medieval and baroque music, several notes are sung on one syllable; this is called melisma, see Sezione "melisma" in *Glossario Musicale*. The syllable to a melisma is usually left-aligned with the first note of the melisma.

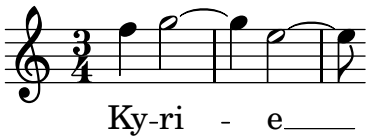
When a melisma occurs on a syllable other than the last one in a word, that syllable is usually joined to the following one with a hyphenated line. This is indicated by placing a double hyphen, `--`, immediately after the syllable.

Alternatively, when a melisma occurs on the last or only syllable in a word an extender line is usually drawn from the end of the syllable to the last note of the melisma. This is indicated by placing a double underscore, `__`, immediately after the word.

There are five ways in which melismata can be indicated:

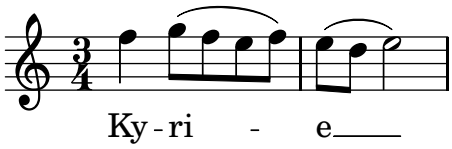
- Melismata are created automatically over notes which are tied together:

```
<<
  \new Voice = "melody" {
    \time 3/4
    f4 g2 ~ |
    g4 e2 ~ |
    e8
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- e __
  }
>>
```



- Melismata can be created automatically from the music by placing slurs over the notes of each melisma. This is the usual way of entering lyrics:

```
<<
  \new Voice = "melody" {
    \time 3/4
    f4 g8 ( f e f )
    e8 ( d e2 )
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- e __
  }
>>
```

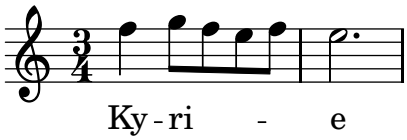


Note that phrasing slurs do not affect the creation of melismata.

- Notes are considered a melisma if they are manually beamed, providing automatic beaming is switched off. See ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩.

```
<<
  \new Voice = "melody" {
    \time 3/4
    \autoBeamOff
    f4 g8[ f e f]
```

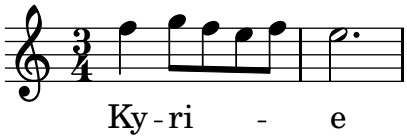
```
    e2.
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- e
  }
>>
```



Clearly this is not suited to melismata over notes which are longer than eighth notes.

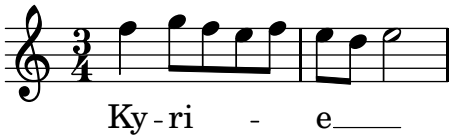
- An unslurred group of notes will be treated as a melisma if they are bracketed between `\melisma` and `\melismaEnd`.

```
<<
  \new Voice = "melody" {
    \time 3/4
    f4 g8
    \melisma
    f e f
    \melismaEnd
    e2.
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- e
  }
>>
```



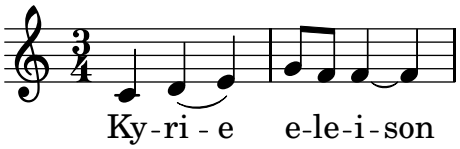
- A melisma can be defined entirely in the lyrics by entering a single underscore character, `_`, for every extra note that has to be added to the melisma.

```
<<
  \new Voice = "melody" {
    \time 3/4
    f4 g8 f e f
    e8 d e2
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- _ _ _ e __ _ _
  }
>>
```



It is possible to have ties, slurs and manual beams in the melody without their indicating melismata. To do this, set `melismaBusyProperties`:

```
<<
  \new Voice = "melody" {
    \time 3/4
    \set melismaBusyProperties = #'()
    c4 d ( e )
    g8 [ f ] f4 ~ f
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- e e -- le -- i -- son
  }
>>
```

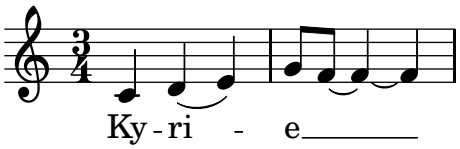


Other settings for `melismaBusyProperties` can be used to selectively include or exclude ties, slurs, and beams from the automatic detection of melismata; see `melismaBusyProperties` in Sezione "Tunable context properties" in *Guida al Funzionamento Interno*.

Alternatively, if all melismata indications are to be ignored, `ignoreMelismata` may be set true; see [Stanzas with different rhythms], pagina 278.

If a melisma is required during a passage in which `melismaBusyProperties` is active, it may be indicated by placing a single underscore in the lyrics for each note which should be included in the melisma:

```
<<
  \new Voice = "melody" {
    \time 3/4
    \set melismaBusyProperties = #'()
    c4 d ( e )
    g8 [ f ] ~ f4 ~ f
  }
  \new Lyrics \lyricsto "melody" {
    Ky -- ri -- _ e __ _ _ _
  }
>>
```



Comandi predefiniti

`\autoBeamOff`, `\autoBeamOn`, `\melisma`, `\melismaEnd`.

Vedi anche

Musical Glossary: Sezione "melisma" in *Glossario Musicale*.

Learning Manual: Sezione "Aligning lyrics to a melody" in *Manuale di Apprendimento*.

Notation Reference: [Aligning lyrics to a melody], pagina 248, [Automatic syllable durations], pagina 250, ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩, [Stanzas with different rhythms], pagina 278.

Internals Reference: Sezione "Tunable context properties" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Extender lines under melismata are not created automatically; they must be inserted manually with a double underscore.

Extenders and hyphens

In the last syllable of a word, melismata are sometimes indicated with a long horizontal line starting in the melisma syllable, and ending in the next one. Such a line is called an extender line, and it is entered as ' `__` ' (note the spaces before and after the two underscore characters).

Nota: Melismata are indicated in the score with extender lines, which are entered as one double underscore; but short melismata can also be entered by skipping individual notes, which are entered as single underscore characters; these do not make an extender line to be typeset by default.

Centered hyphens are entered as ' `--` ' between syllables of a same word (note the spaces before and after the two hyphen characters). The hyphen will be centered between the syllables, and its length will be adjusted depending on the space between the syllables.

In tightly engraved music, hyphens can be removed. Whether this happens can be controlled with the `minimum-distance` (minimum distance between two syllables) and the `minimum-length` (threshold below which hyphens are removed) properties of `LyricHyphen`.

Vedi anche

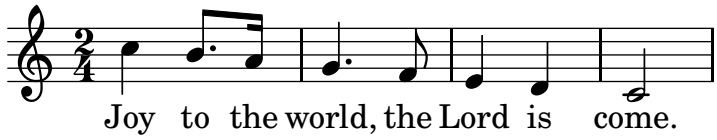
Internals Reference: Sezione "LyricExtender" in *Guida al Funzionamento Interno*, Sezione "LyricHyphen" in *Guida al Funzionamento Interno*.

2.1.2 Techniques specific to lyrics

Working with lyrics and variables

Variables containing lyrics can be created, but the lyrics must be entered in lyric mode:

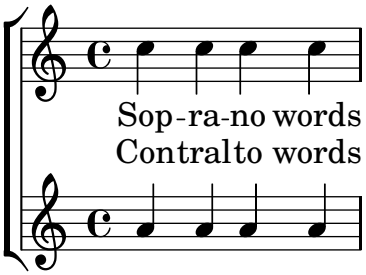
```
musicOne = \relative c'' {
  c4 b8. a16 g4. f8 e4 d c2
}
verseOne = \lyricmode {
  Joy to the world, the Lord is come.
}
\score {
  <<
    \new Voice = "one" {
      \time 2/4
      \musicOne
    }
    \new Lyrics \lyricsto "one" {
      \verseOne
    }
  >>
}
```



Durations do not need to be added if the variable is to be invoked with `\addlyrics` or `\lyricsto`.

For different or more complex orderings, the best way is to define the music and lyric variables first, then set up the hierarchy of staves and lyrics, omitting the lyrics themselves, and then add the lyrics using `\context` underneath. This ensures that the voices referenced by `\lyricsto` have always been defined earlier. For example:

```
sopranoMusic = \relative c'' { c4 c c c }
contraltoMusic = \relative c'' { a4 a a a }
sopranoWords = \lyricmode { Sop -- ra -- no words }
contraltoWords = \lyricmode { Con -- tral -- to words }

\score {
  \new ChoirStaff <<
    \new Staff {
      \new Voice = "sopranos" {
        \sopranoMusic
      }
    }
    \new Lyrics = "sopranos"
    \new Lyrics = "contraltos"
    \new Staff {
      \new Voice = "contraltos" {
        \contraltoMusic
      }
    }
    \context Lyrics = "sopranos" {
      \lyricsto "sopranos" {
        \sopranoWords
      }
    }
    \context Lyrics = "contraltos" {
      \lyricsto "contraltos" {
        \contraltoWords
      }
    }
  >>
}
```



Vedi anche

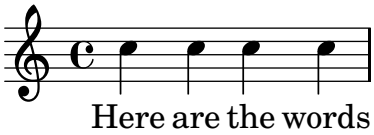
Notation Reference: [Placing lyrics vertically], pagina 260.

Internals Reference: Sezione "LyricCombineMusic" in *Guida al Funzionamento Interno*, Sezione "Lyrics" in *Guida al Funzionamento Interno*.

Placing lyrics vertically

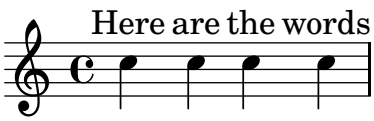
Depending on the type of music, lyrics may be positioned above the staff, below the staff, or between staves. Placing lyrics below the associated staff is the easiest, and can be achieved by simply defining the Lyrics context below the Staff context:

```
\score {
  <<
    \new Staff {
      \new Voice = "melody" {
        \relative c'' { c4 c c c }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Here are the words
      }
    }
  >>
}
```



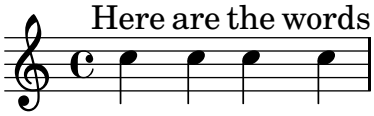
Lyrics may be positioned above the staff using one of two methods. The simplest (and preferred) method is to use the same syntax as above and explicitly specify the position of the lyrics:

```
\score {
  <<
    \new Staff = "staff" {
      \new Voice = "melody" {
        \relative c'' { c4 c c c }
      }
    }
    \new Lyrics \with { alignAboveContext = "staff" } {
      \lyricsto "melody" {
        Here are the words
      }
    }
  >>
}
```



Alternatively, a two-step process may be used. First the Lyrics context is declared (without any content) before the Staff and Voice contexts, then the `\lyricsto` command is placed after the Voice declaration it references by using `\context`, as follows:

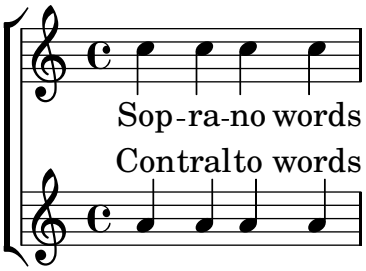
```
\score {
  <<
    \new Lyrics = "lyrics" \with {
      % lyrics above a staff should have this override
      \override VerticalAxisGroup.staff-affinity = #DOWN
    }
    \new Staff {
      \new Voice = "melody" {
        \relative c'' { c4 c c c }
      }
    }
    \context Lyrics = "lyrics" {
      \lyricsto "melody" {
        Here are the words
      }
    }
  >>
}
```



When there are two voices on separate staves the lyrics may be placed between the staves using either of these methods. Here is an example of the second method:

```
\score {
  \new ChoirStaff <<
    \new Staff {
      \new Voice = "sopranos" {
        \relative c'' { c4 c c c }
      }
    }
    \new Lyrics = "sopranos"
    \new Lyrics = "contraltos" \with {
      % lyrics above a staff should have this override
      \override VerticalAxisGroup.staff-affinity = #DOWN
    }
    \new Staff {
      \new Voice = "contraltos" {
        \relative c'' { a4 a a a }
      }
    }
    \context Lyrics = "sopranos" {
      \lyricsto "sopranos" {
        Sop -- ra -- no words
      }
    }
    \context Lyrics = "contraltos" {
      \lyricsto "contraltos" {
        Con -- tral -- to words
      }
    }
```

```
  >>
}
```



Other combinations of lyrics and staves may be generated by elaborating these examples, or by examining the templates in the Learning Manual, see Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.

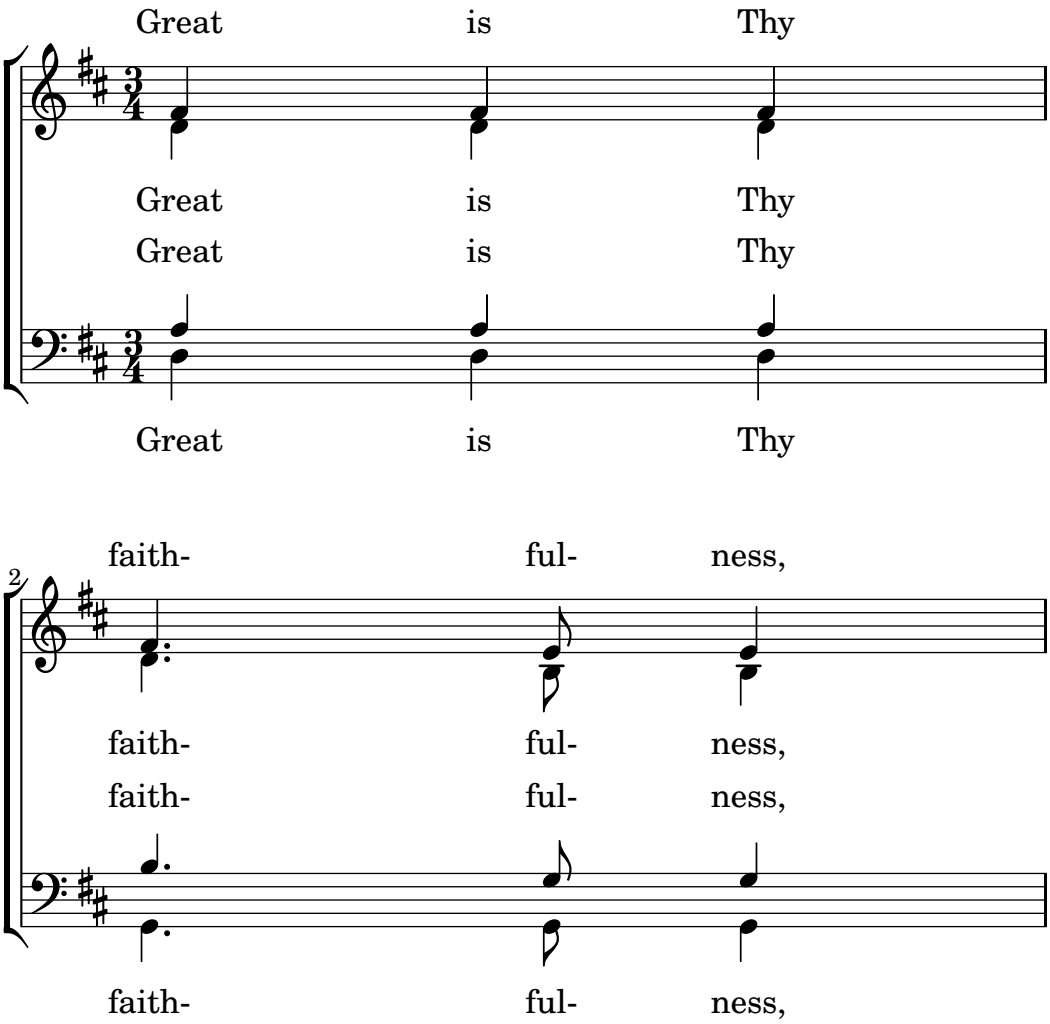
Frammenti di codice selezionati

Obtaining 2.12 lyrics spacing in newer versions

The vertical spacing engine changed for version 2.14. This can cause lyrics to be spaced differently. It is possible to set properties for `Lyric` and `Staff` contexts to get the spacing engine to behave as it did in version 2.12.

```
global = {
  \key d \major
  \time 3/4
}

sopMusic = \relative c' {
  % VERSE ONE
  fis4 fis fis | \break
  fis4. e8 e4
}

altoMusic = \relative c' {
  % VERSE ONE
  d4 d d |
  d4. b8 b4 |
}

tenorMusic = \relative c' {
  a4 a a |
  b4. g8 g4 |
}

bassMusic = \relative c {
  d4 d d |
  g,4. g8 g4 |
}

words = \lyricmode {
  Great is Thy faith- ful- ness,
}
```

```
\score {
  \new ChoirStaff <<
    \new Lyrics = sopranos
    \new Staff = women <<
      \new Voice = "sopranos" {
        \voiceOne
        \global \sopMusic
      }
      \new Voice = "altos" {
        \voiceTwo
        \global \altoMusic
      }
    >>
    \new Lyrics = "altos"
    \new Lyrics = "tenors"
    \new Staff = men <<
      \clef bass
      \new Voice = "tenors" {
        \voiceOne
        \global \tenorMusic
      }
      \new Voice = "basses" {
        \voiceTwo  \global \bassMusic
      }
    >>
    \new Lyrics = basses
    \context Lyrics = sopranos \lyricsto sopranos \words
    \context Lyrics = altos \lyricsto altos \words
    \context Lyrics = tenors \lyricsto tenors \words
    \context Lyrics = basses \lyricsto basses \words
  >>
  \layout {
    \context {
      \Lyrics
      \override VerticalAxisGroup.staff-affinity = ##f
      \override VerticalAxisGroup.staff-staff-spacing =
        #'((basic-distance . 0)
           (minimum-distance . 2)
           (padding . 2))
    }
    \context {
      \Staff
      \override VerticalAxisGroup.staff-staff-spacing =
        #'((basic-distance . 0)
           (minimum-distance . 2)
           (padding . 2))
    }
  }
}
```



Vedi anche

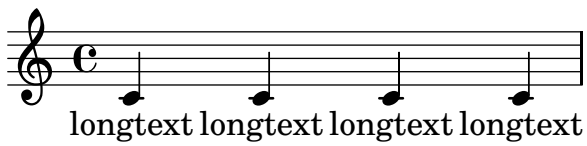
Learning Manual: Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.

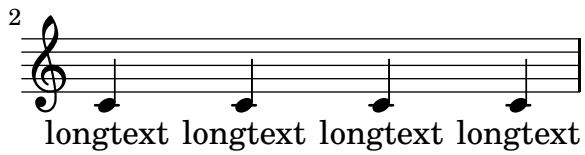
Notation Reference: Sezione 5.1.7 [Context layout order], pagina 571, Sezione 5.1.2 [Creating and referencing contexts], pagina 557.

Placing syllables horizontally

To increase the spacing between lyrics, set the `minimum-distance` property of `LyricSpace`.

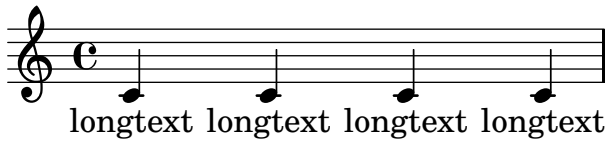
```
{
  c c c c
  \override Lyrics.LyricSpace.minimum-distance = #1.0
  c c c c
}
\addlyrics {
  longtext longtext longtext longtext
  longtext longtext longtext longtext
}
```

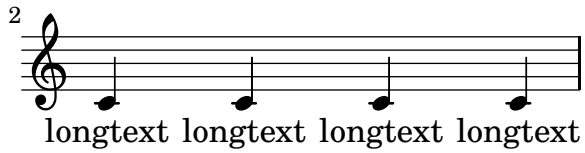




To make this change for all lyrics in the score, set the property in the `\layout` block.

```
\score {
  \relative c' {
  c c c c
  c c c c
  }
  \addlyrics {
  longtext longtext longtext longtext
  longtext longtext longtext longtext
  }
  \layout {
    \context {
      \Lyrics
      \override LyricSpace.minimum-distance = #1.0
    }
  }
}
```



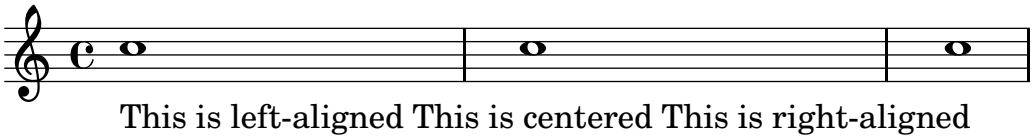


Frammenti di codice selezionati

Lyrics alignment

Horizontal alignment for lyrics can be set by overriding the `self-alignment-X` property of the `LyricText` object. `#-1` is left, `#0` is center and `#1` is right; however, you can use `#LEFT`, `#CENTER` and `#RIGHT` as well.

```
\layout { ragged-right = ##f }
\relative c'' {
  c1
  c1
  c1
}
\addlyrics {
  \once \override LyricText.self-alignment-X = #LEFT
  "This is left-aligned"
  \once \override LyricText.self-alignment-X = #CENTER
  "This is centered"
  \once \override LyricText.self-alignment-X = #1
  "This is right-aligned"
}
```



Checking to make sure that text scripts and lyrics are within the margins requires additional calculations. To speed up processing slightly, this feature can be disabled:

```
\override Score.PaperColumn.keep-inside-line = ##f
```

To make lyrics avoid bar lines as well, use

```
\layout {
  \context {
    \Lyrics
      \consists "Bar_engraver"
      \consists "Separating_line_group_engraver"
      \override BarLine.transparent = ##t
  }
}
```

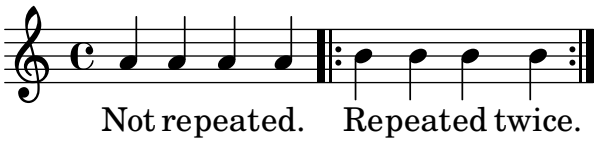
Lyrics and repeats

Simple repeats

Repeats in *music* are fully described elsewhere; see ⟨undefined⟩ [Repeats], pagina ⟨undefined⟩. This section explains how to add lyrics to repeated sections of music.

Lyrics to a section of music that is repeated should be surrounded by exactly the same repeat construct as the music, if the words are unchanged.

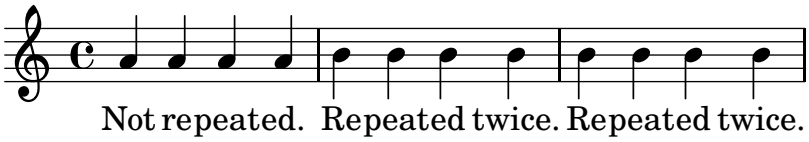
```
\score {
  <<
    \new Staff {
      \new Voice = "melody" {
        \relative c'' {
          a4 a a a
          \repeat volta 2 { b4 b b b }
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Not re -- peat -- ed.
        \repeat volta 2 { Re -- peat -- ed twice. }
      }
    }
  >>
}
```



The words will then be correctly expanded if the repeats are unfolded.

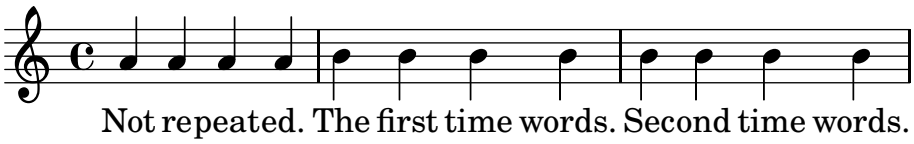
```
\score {
  \unfoldRepeats {
    <<
```

```
      \new Staff {
        \new Voice = "melody" {
          \relative c'' {
            a4 a a a
            \repeat volta 2 { b4 b b b }
          }
        }
      }
      \new Lyrics {
        \lyricsto "melody" {
          Not re -- peat -- ed.
          \repeat volta 2 { Re -- peat -- ed twice. }
        }
      }
    >>
  }
}
```



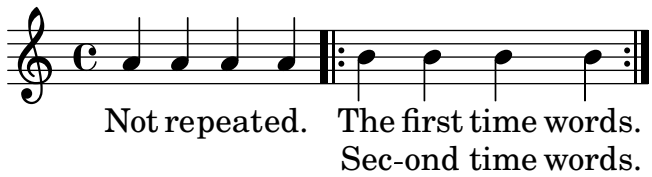
If the repeated section is to be unfolded and has different words, simply enter all the words:

```
\score {
  <<
    \new Staff {
      \new Voice = "melody" {
        \relative c'' {
          a4 a a a
          \repeat unfold 2 { b4 b b b }
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Not re -- peat -- ed.
        The first time words.
        Sec -- ond time words.
      }
    }
  >>
}
```



When the words to a repeated volta section are different, the words to each repeat must be entered in separate `Lyrics` contexts, correctly nested in parallel sections:

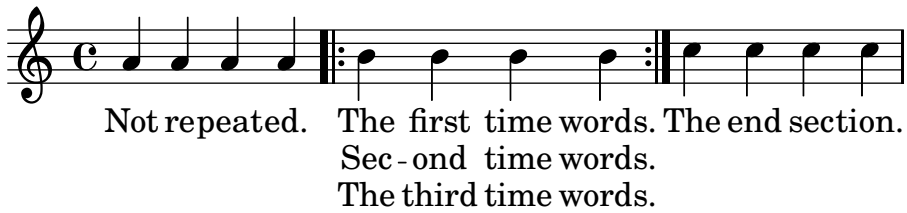
```
\score {
  <<
    \new Staff {
      \new Voice = "melody" {
        \relative c'' {
          a4 a a a
          \repeat volta 2 { b4 b b b }
        }
      }
    }
    \new Lyrics \lyricsto "melody" {
      Not re -- peat -- ed.
      <<
        { The first time words. }
        \new Lyrics {
          \set associatedVoice = "melody"
          Sec -- ond time words.
        }
      >>
    }
  >>
}
```



More verses may be added in a similar way:

```
\score {
  <<
    \new Staff {
      \new Voice = "singleVoice" {
        \relative c'' {
          a4 a a a
          \repeat volta 3 { b4 b b b }
          c4 c c c
        }
      }
    }
    \new Lyrics \lyricsto "singleVoice" {
      Not re -- peat -- ed.
      <<
        { The first time words. }
        \new Lyrics {
          \set associatedVoice = "singleVoice"
          Sec -- ond time words.
        }
        \new Lyrics {
          \set associatedVoice = "singleVoice"
          The third time words.
```

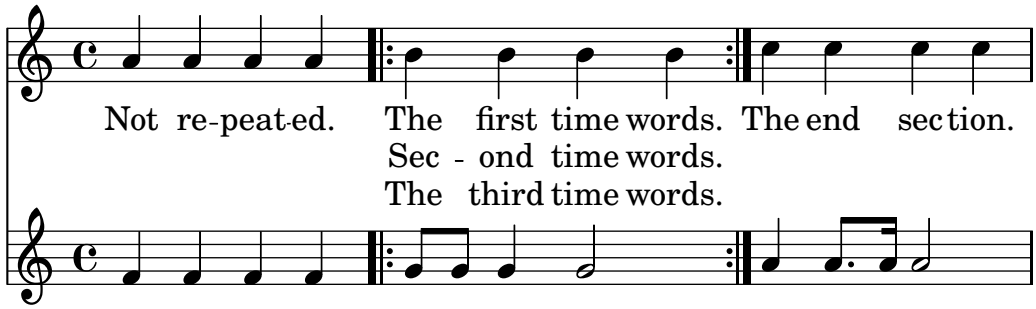
```
        }
      >>
      The end sec -- tion.
    }
  >>
}
```



However, if this construct is embedded within a multi-staved context such as a `ChoirStaff` the lyrics of the second and third verses will appear beneath the bottom staff.

To position them correctly use `alignBelowContext`:

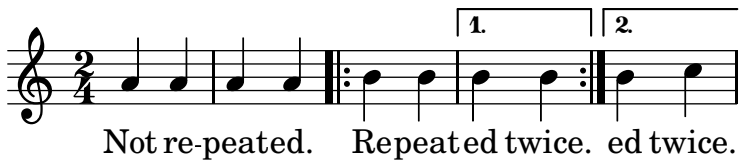
```
\score {
  <<
    \new Staff {
      \new Voice = "melody" {
        \relative c'' {
          a4 a a a
          \repeat volta 3 { b4 b b b }
          c4 c c c
        }
      }
    }
    \new Lyrics = "firstVerse" \lyricsto "melody" {
      Not re -- peat -- ed.
      <<
        { The first time words. }
        \new Lyrics = "secondVerse"
        \with { alignBelowContext = #"firstVerse" } {
          \set associatedVoice = "melody"
          Sec -- ond time words.
        }
        \new Lyrics = "thirdVerse"
        \with { alignBelowContext = #"secondVerse" } {
          \set associatedVoice = "melody"
          The third time words.
        }
      >>
      The end sec -- tion.
    }
    \new Voice = "harmony" {
      \relative c' {
        f4 f f f \repeat volta 2 { g8 g g4 g2 } a4 a8. a16 a2
      }
    }
  >>
}
```



Repeats with alternative endings

If the words of the repeated section are the same, exactly the same structure can be used for both the lyrics and music.

```
\score {
  <<
    \new Staff {
      \time 2/4
      \new Voice = "melody" {
        \relative c'' {
          a4 a a a
          \repeat volta 2 { b4 b }
          \alternative { { b b } { b c } }
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Not re -- peat -- ed.
        \repeat volta 2 { Re -- peat -- }
        \alternative { { ed twice. } { ed twice. } }
      }
    }
  >>
}
```



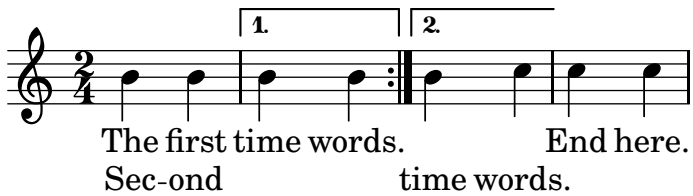
But when the repeated section has different words, a repeat construct cannot be used around the words and `\skip` commands have to be inserted manually to skip over the notes in the alternative sections which do not apply.

Note: do not use an underscore, `_`, to skip notes – an underscore indicates a melisma, causing the preceding syllable to be left-aligned.

Nota: The `\skip` command must be followed by a number, but this number is ignored in lyrics which derive their durations from the notes in an associated melody through `\addlyrics` or `\lyricsto`. Each `\skip` skips a single note of any value, irrespective of the value of the following number.

```
\score {
  <<
    \new Staff {
```

```
      \time 2/4
      \new Voice = "melody" {
        \relative c'' {
          \repeat volta 2 { b4 b }
          \alternative { { b b } { b c } }
          c4 c
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        The first time words.
        \repeat unfold 2 { \skip 1 }
        End here.
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Sec -- ond
        \repeat unfold 2 { \skip 1 }
        time words.
      }
    }
  >>
}
```

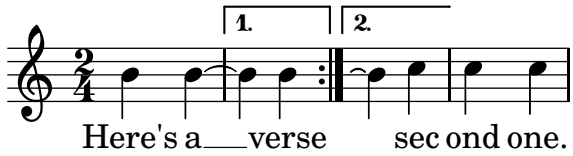


When a note is tied over into two or more alternative endings a tie is used to carry the note into the first alternative ending and a `\repeatTie` is used in the second and subsequent endings. This structure causes difficult alignment problems when lyrics are involved and increasing the length of the alternative sections so the tied notes are contained wholly within them may give a more acceptable result.

The tie creates a melisma into the first alternative, but not into the second and subsequent alternatives, so to align the lyrics correctly it is necessary to disable the automatic creation of melismata over the volta section and insert manual skips.

```
\score {
  <<
    \new Staff {
      \time 2/4
      \new Voice = "melody" {
        \relative c'' {
          \set melismaBusyProperties = #'()
          \repeat volta 2 { b4 b ~}
          \alternative { { b b } { b \repeatTie c } }
          \unset melismaBusyProperties
          c4 c
```

```
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        \repeat volta 2 { Here's a __ }
        \alternative {
          { \skip 1 verse }
          { \skip 1 sec }
        }
        ond one.
      }
    }
  >>
}
```

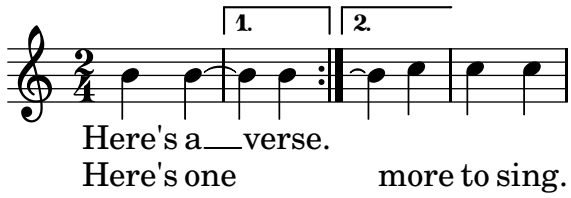


Note that if `\unfoldRepeats` is used around a section containing `\repeatTie`, the `\repeatTie` should be removed to avoid both types of tie being printed.

When the repeated section has different words a `\repeat` cannot be used around the lyrics and `\skip` commands need to be inserted manually, as before.

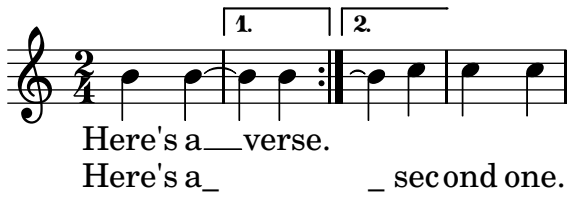
```
\score {
  <<
    \new Staff {
      \time 2/4
      \new Voice = "melody" {
        \relative c'' {
          \repeat volta 2 { b4 b ~}
          \alternative { { b b } { b \repeatTie c } }
          c4 c
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Here's a __ verse.
        \repeat unfold 2 { \skip 1 }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Here's one
        \repeat unfold 2 { \skip 1 }
        more to sing.
      }
    }
  >>
```

```
}
```



If you wish to show extenders and hyphens into and out of alternative sections these must be inserted manually.

```
\score {
  <<
    \new Staff {
      \time 2/4
      \new Voice = "melody" {
        \relative c'' {
          \repeat volta 2 { b4 b ~}
          \alternative { { b b } { b \repeatTie c } }
          c4 c
        }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Here's a __ verse.
        \repeat unfold 2 { \skip 1 }
      }
    }
    \new Lyrics {
      \lyricsto "melody" {
        Here's "a_"
        \skip 1
        "_" sec -- ond one.
      }
    }
  >>
}
```



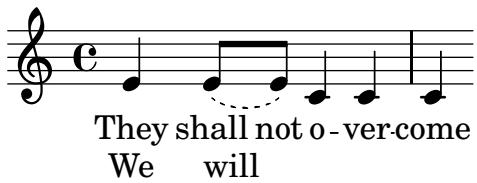
Vedi anche

Notation Reference: Sezione 5.1.3 [Keeping contexts alive], pagina 560, ⟨undefined⟩ [Repeats], pagina ⟨undefined⟩.

Divisi lyrics

When just the words and rhythms of the two parts differ with the pitches remaining the same, temporarily turning off the automatic detection of melismata and indicating the melisma in the lyrics may be the appropriate method to use:

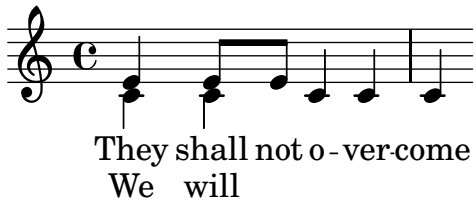
```
\score {
  <<
    \new Voice = "melody" {
      \relative c' {
        \set melismaBusyProperties = #'()
        \slurDown
        \slurDashed
        e4 e8 ( e ) c4 c |
        \unset melismaBusyProperties
        c
      }
    }
    \new Lyrics \lyricsto "melody" {
      They shall not o -- ver -- come
    }
    \new Lyrics \lyricsto "melody" {
      We will _
    }
  >>
}
```



When both music and words differ it may be better to display the differing music and lyrics by naming voice contexts and attaching lyrics to those specific contexts:

```
\score {
  <<
    \new Voice = "melody" {
      \relative c' {
        <<
          {
            \voiceOne
            e4 e8 e
          }
          \new Voice = "splitpart" {
            \voiceTwo
            c4 c
          }
        >>
        \oneVoice
        c4 c |
        c
      }
```

```
    }
    \new Lyrics \lyricsto "melody" {
      They shall not o -- ver -- come
    }
    \new Lyrics \lyricsto "splitpart" {
      We will
    }
  >>
}
```

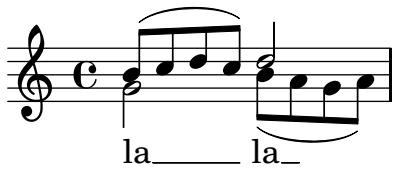


It is common in choral music to have a voice part split for several measures. The `<< {...} \\ {...} >>` construct, where the two (or more) musical expressions are separated by double backslashes, might seem the proper way to set the split voices. This construct, however, will assign **all** the expressions within it to **NEW Voice contexts** which will result in *no lyrics* being set for them since the lyrics will be set to the original voice context – not, typically, what one wants. The temporary polyphonic passage is the proper construct to use, see section *Temporary polyphonic passages* in ⟨undefined⟩ [Single-staff polyphony], pagina ⟨undefined⟩.

Polyphony with shared lyrics

When two voices with different rhythms share the same lyrics, aligning the lyrics to one of the voices may lead to problems in the other voice. For example, the second lyric extender below is too short, since the lyrics are aligned only to the top voice:

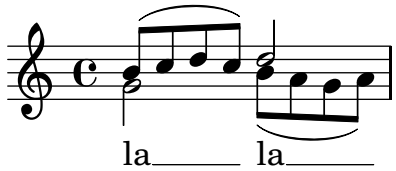
```
soprano = \relative { b'8( c d c) d2 }
alto = \relative { g'2 b8( a g a) }
words = \lyricmode { la __ la __ }

\new Staff <<
  \new Voice = "sopranoVoice" { \voiceOne \soprano }
  \new Voice { \voiceTwo \alto }
  \new Lyrics \lyricsto "sopranoVoice" \words
>>
```



To get the desired result, align the lyrics to a new `NullVoice` context containing a suitable combination of the two voices. The notes of the `NullVoice` context do not appear on the printed page, but can be used to align the lyrics appropriately:

```
soprano = \relative { b'8( c d c) d2 }
alto = \relative { g'2 b8( a g a) }
aligner = \relative { b'8( c d c) b( a g a) }
words = \lyricmode { la __ la __ }
```

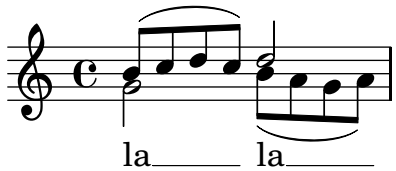
```
\new Staff <<
  \new Voice { \voiceOne \soprano }
  \new Voice { \voiceTwo \alto }
  \new NullVoice = "aligner" \aligner
  \new Lyrics \lyricsto "aligner" \words
>>
```



The `NullVoice` context must be inside a `Staff` context, and should only contain notes that are already being displayed in that staff, and in the same octave. Otherwise the `NullVoice` may interact with the printed voices in unexpected ways. For example, arbitrary notes in the `NullVoice` may cause accidentals to appear (or disappear) on the staff.

This method also can be used with the `\partcombine` function, which does not allow lyrics on its own:

```
soprano = \relative { b'8( c d c) d2 }
alto = \relative { g'2 b8( a g a) }
aligner = \relative { b'8( c d c) b( a g a) }
words = \lyricmode { la __ la __ }

\new Staff <<
  \new Voice \partcombine \soprano \alto
  \new NullVoice = "aligner" \aligner
  \new Lyrics \lyricsto "aligner" \words
>>
```

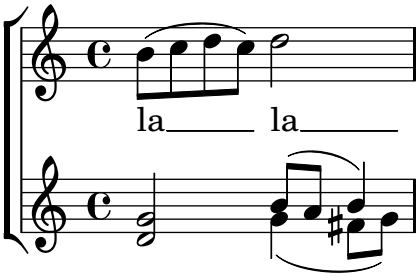


The `\partcombine` function is described in ⟨undefined⟩ [Automatic part combining], pagina ⟨undefined⟩.

Lastly, this method can be used even when the voices are in different staves, and is not limited to only two voices:

```
soprano = \relative { b'8( c d c) d2 }
altoOne = \relative { g'2 b8( a b4) }
altoTwo = \relative { d'2 g4( fis8 g) }
aligner = \relative { b'8( c d c) d( d d d) }
words = \lyricmode { la __ la __ }

\new ChoirStaff <<
  \new Staff <<
    \soprano
    \new NullVoice = "aligner" \aligner
  >>
```

```
  \new Lyrics \lyricsto "aligner" \words
  \new Staff \partcombine \altoOne \altoTwo
>>
```



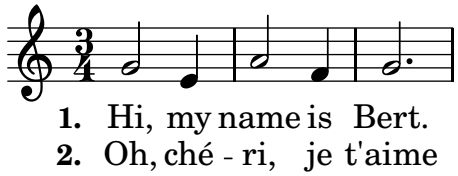
However, note that in the second half of the measure above, the notes in the `NullVoice` context reflect the rhythm of the lower staff, but they do not deviate from the single pitch being displayed in the staff to which the `NullVoice` belongs. While not actually required in this particular example, it is a good idea in general to enter the notes in this way.

2.1.3 Stanzas

Adding stanza numbers

Stanza numbers can be added by setting `stanza`, e.g.,

```
\new Voice {
  \time 3/4 g2 e4 a2 f4 g2.
} \addlyrics {
  \set stanza = #"1. "
  Hi, my name is Bert.
} \addlyrics {
  \set stanza = #"2. "
  Oh, ché -- ri, je t'aime
}
```



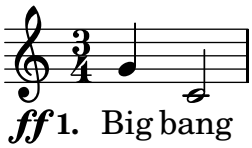
These numbers are put just before the start of the first syllable.

Adding dynamics marks to stanzas

Stanzas differing in loudness may be indicated by putting a dynamics mark before each stanza. In LilyPond, everything coming in front of a stanza goes into the `StanzaNumber` object; dynamics marks are no different. For technical reasons, you have to set the stanza outside `\lyricmode`:

```
text = {
  \set stanza = \markup { \dynamic "ff" "1. " }
  \lyricmode {
    Big bang
  }
}

<<
```

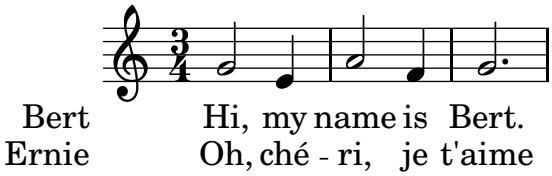
```
  \new Voice = "tune" {
    \time 3/4
    g'4 c'2
  }
\new Lyrics \lyricsto "tune" \text
>>
```



Adding singers' names to stanzas

Names of singers can also be added. They are printed at the start of the line, just like instrument names. They are created by setting `vocalName`. A short version may be entered as `shortVocalName`.

```
\new Voice {
  \time 3/4 g2 e4 a2 f4 g2.
} \addlyrics {
  \set vocalName = #"Bert "
  Hi, my name is Bert.
} \addlyrics {
  \set vocalName = #"Ernie "
  Oh, ché -- ri, je t'aime
}
```



Stanzas with different rhythms

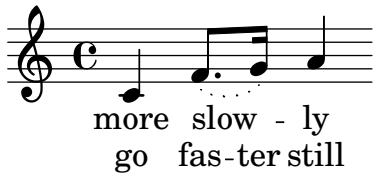
Often, different stanzas of one song are put to one melody in slightly differing ways. Such variations can still be captured with `\lyricsto`.

Ignoring melismata

One possibility is that the text has a melisma in one stanza, but multiple syllables in another. One solution is to make the faster voice ignore the melisma. This is done by setting `ignoreMelismata` in the Lyrics context.

```
<<
  \relative c' \new Voice = "lahlah" {
    \set Staff.autoBeaming = ##f
    c4
    \slurDotted
    f8.[( g16])
    a4
  }
  \new Lyrics \lyricsto "lahlah" {
    more slow -- ly
  }
```

```
  \new Lyrics \lyricsto "lahlah" {
    go
    \set ignoreMelismata = ##t
    fas -- ter
    \unset ignoreMelismata
    still
  }
>>
```



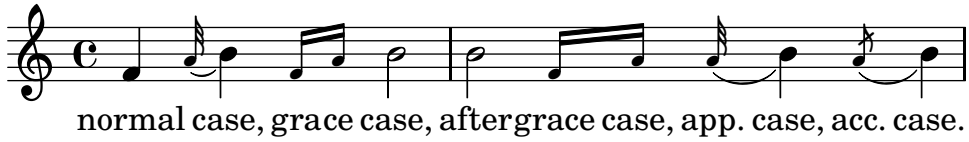
Problemi noti e avvertimenti

Unlike most `\set` commands, `\set ignoreMelismata` does not work if prefixed with `\once`. It is necessary to use `\set` and `\unset` to bracket the lyrics where melismata are to be ignored.

Adding syllables to grace notes

By default, grace notes (e.g. via `\grace`) do not get assigned syllables when using `\lyricsto`, but this behavior can be changed:

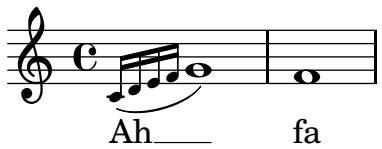
```
<<
  \new Voice = melody \relative c' {
    f4 \appoggiatura a32 b4
    \grace { f16[ a16] } b2
    \afterGrace b2 { f16[ a16] }
    \appoggiatura a32 b4
    \acciaccatura a8 b4
  }
  \new Lyrics
  \lyricsto melody {
    normal
    \set includeGraceNotes = ##t
    case,
    gra -- ce case,
    after -- grace case,
    \set ignoreMelismata = ##t
    app. case,
    acc. case.
  }
>>
```



Problemi noti e avvertimenti

Like `associatedVoice`, `includeGraceNotes` needs to be set at latest one syllable before the one which is to be put under a grace note. For the case of a grace note at the very beginning of a piece of music, consider using a `\with` or `\context` block:

```
<<
  \new Voice = melody \relative c' {
    \grace { c16[( d e f] }
    g1) f
  }
  \new Lyrics \with { includeGraceNotes = ##t }
  \lyricsto melody {
    Ah __ fa
  }
>>
```

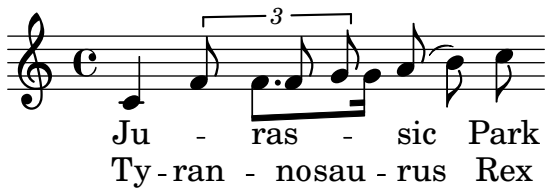


Switching to an alternative melody

More complex variations in setting lyrics to music are possible. The melody to which the lyrics are being set can be changed from within the lyrics by setting the `associatedVoice` property:

```
<<
  \relative c' \new Voice = "lahlah" {
    \set Staff.autoBeaming = ##f
    c4
    <<
      \new Voice = "alternative" {
        \voiceOne
        \tuplet 3/2 {
          % show associations clearly.
          \override NoteColumn.force-hshift = #-3
          f8 f g
        }
      }
      {
        \voiceTwo
        f8.[ g16]
        \oneVoice
      } >>
    a8( b) c
  }
  \new Lyrics \lyricsto "lahlah" {
    Ju -- ras -- sic Park
  }
  \new Lyrics \lyricsto "lahlah" {
    % Tricky: need to set associatedVoice
    % one syllable too soon!
    \set associatedVoice = "alternative" % applies to "ran"
    Ty --
```

```
    ran --
    no --
    \set associatedVoice = "lahlah" % applies to "rus"
    sau -- rus Rex
  } >>
```



The text for the first stanza is set to the melody called 'lahlah' in the usual way, but the second stanza is set initally to the `lahlah` context and is then switched to the `alternative` melody for the syllables 'ran' to 'sau' by the lines:

```
\set associatedVoice = "alternative" % applies to "ran"
Ty --
ran --
no --
\set associatedVoice = "lahlah" % applies to "rus"
sau -- rus Rex
```

Here, `alternative` is the name of the `Voice` context containing the triplet.

Note the placement of the `\set associatedVoice` command – it appears to be one syllable too early, but this is correct.

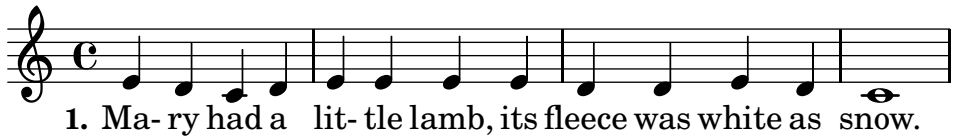
Nota: The `\set associatedVoice` command must be placed one syllable *before* the one at which the switch to the new voice is to occur. In other words, changing the associated Voice happens one syllable later than expected. This is for technical reasons, and it is not a bug.

Printing stanzas at the end

Sometimes it is appropriate to have one stanza set to the music, and the rest added in verse form at the end of the piece. This can be accomplished by adding the extra verses into a `\markup` section outside of the main score block. Notice that there are two different ways to force linebreaks when using `\markup`.

```
melody = \relative c' {
e d c d | e e e e |
d d e d | c1 |
}

text = \lyricmode {
\set stanza = #"1." Ma- ry had a lit- tle lamb,
its fleece was white as snow.
}

\score{ <<
  \new Voice = "one" { \melody }
  \new Lyrics \lyricsto "one" \text
>>
  \layout { }
}
```

```
\markup { \column{
  \line{ Verse 2. }
  \line{ All the children laughed and played }
  \line{ To see a lamb at school. }
  }
}
\markup{
  \wordwrap-string #"
  Verse 3.

  Mary took it home again,

  It was against the rule."
}
```



Verse 2.
All the children laughed and played
To see a lamb at school.

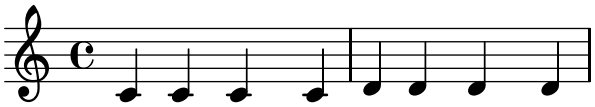
Verse 3.
Mary took it home again,
It was against the rule.

Printing stanzas at the end in multiple columns

When a piece of music has many verses, they are often printed in multiple columns across the page. An outdented verse number often introduces each verse. The following example shows how to produce such output in LilyPond.

```
melody = \relative c' {
  c4 c c c | d d d d
}

text = \lyricmode {
  \set stanza = #"1." This is verse one.
  It has two lines.
}

\score {
  <<
    \new Voice = "one" { \melody }
    \new Lyrics \lyricsto "one" \text
  >>
  \layout { }
}

\markup {
```

```
  \fill-line {
    \hspace #0.1 % moves the column off the left margin;
     % can be removed if space on the page is tight
     \column {
      \line { \bold "2."
        \column {
          "This is verse two."
          "It has two lines."
        }
      }
      \combine \null \vspace #0.1 % adds vertical spacing between verses
      \line { \bold "3."
        \column {
          "This is verse three."
          "It has two lines."
        }
      }
    }
    \hspace #0.1 % adds horizontal spacing between columns;
    \column {
      \line { \bold "4."
        \column {
          "This is verse four."
          "It has two lines."
        }
      }
      \combine \null \vspace #0.1 % adds vertical spacing between verses
      \line { \bold "5."
        \column {
          "This is verse five."
          "It has two lines."
        }
      }
    }
  \hspace #0.1 % gives some extra space on the right margin;
  % can be removed if page space is tight
  }
}
```



1. This is verse one. It has two lines.

2. This is verse two.
It has two lines.

3. This is verse three.
It has two lines.

4. This is verse four.
It has two lines.

5. This is verse five.
It has two lines.

Vedi anche

Internals Reference: Sezione "LyricText" in *Guida al Funzionamento Interno*, Sezione "StanzaNumber" in *Guida al Funzionamento Interno*.

2.1.4 Songs

References for songs

Songs are usually written on three staves with the melody for the singer on the top staff and two staves of piano accompaniment at the bottom. The lyrics of the first stanza are printed immediately underneath the top staff. If there are just a small number of further stanzas these can be printed immediately under the first one, but if there are more stanzas than can be easily accommodated there the second and subsequent stanzas are printed after the music as stand-alone text.

All the notational elements needed to write songs are fully described elsewhere:

- For constructing the staff layout, see Sezione 1.6.1 [Displaying staves], pagina 180.
- For writing piano music, see Sezione 2.2 [Keyboard and other multi-staff instruments], pagina 309.
- For writing the lyrics to a melody line, see Sezione 2.1.1 [Common notation for vocal music], pagina 246.
- For placing the lyrics, see [Placing lyrics vertically], pagina 260.
- For entering stanzas, see Sezione 2.1.3 [Stanzas], pagina 277.
- Songs are frequently printed with the chording indicated by chord names above the staves. This is described in Sezione 2.7.2 [Displaying chords], pagina 399.
- To print fret diagrams of the chords for guitar accompaniment or accompaniment by other fretted instruments, see "Fret diagram markups" in Sezione 2.4.1 [Common notation for fretted strings], pagina 326.

Vedi anche

Learning Manual: Sezione "Songs" in *Manuale di Apprendimento*.

Notation Reference: Sezione 2.1.1 [Common notation for vocal music], pagina 246, Sezione 2.7.2 [Displaying chords], pagina 399, Sezione 1.6.1 [Displaying staves], pagina 180, Sezione 2.2 [Keyboard and other multi-staff instruments], pagina 309, [Placing lyrics vertically], pagina 260, Sezione 2.1.3 [Stanzas], pagina 277.

Snippets: Sezione "Vocal music" in *Frammenti di codice*.

Lead sheets

Lead sheets may be printed by combining vocal parts and 'chord mode'; this syntax is explained in Sezione 2.7 [Chord notation], pagina 393.

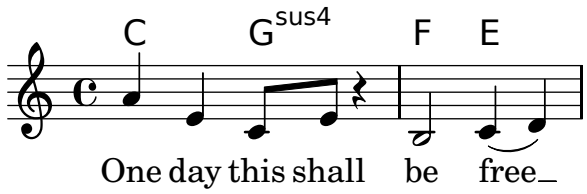
Frammenti di codice selezionati

Simple lead sheet

When put together, chord names, a melody, and lyrics form a lead sheet:

```
<<
  \chords { c2 g:sus4 f e }
  \relative c'' {
    a4 e c8 e r4
    b2 c4( d)
  }
```

```
  \addlyrics { One day this shall be free __ }
>>
```



Vedi anche

Notation Reference: Sezione 2.7 [Chord notation], pagina 393.

2.1.5 Choral

This section discusses notation issues that relate most directly to choral music. This includes anthems, part songs, oratorio, etc.

References for choral

Choral music is usually notated on two, three or four staves within a `ChoirStaff` group. Accompaniment, if required, is placed beneath in a `PianoStaff` group, which is usually reduced in size for rehearsal of *a cappella* choral works. The notes for each vocal part are placed in a `Voice` context, with each staff being given either a single vocal part (i.e., one `Voice`) or a pair of vocal parts (i.e., two `Voices`).

Words are placed in `Lyrics` contexts, either underneath each corresponding music staff, or one above and one below the music staff if this contains the music for two parts.

Several common topics in choral music are described fully elsewhere:

- An introduction to creating an SATB vocal score can be found in the Learning Manual, see Sezione "Four-part SATB vocal score" in *Manuale di Apprendimento*.
- Several templates suitable for various styles of choral music can also be found in the Learning Manual, see Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.
- For information about `ChoirStaff` and `PianoStaff` see [Grouping staves], pagina 181.
- Shape note heads, as used in Sacred Harp and similar notation, are described in ⟨undefined⟩ [Shape note heads], pagina ⟨undefined⟩.
- When two vocal parts share a staff the stems, ties, slurs, etc., of the higher part will be directed up and those of the lower part down. To do this, use `\voiceOne` and `\voiceTwo`. See ⟨undefined⟩ [Single-staff polyphony], pagina ⟨undefined⟩.
- When a vocal part temporarily splits, you should use *Temporary polyphonic passages* (see ⟨undefined⟩ [Single-staff polyphony], pagina ⟨undefined⟩).

Comandi predefiniti

`\oneVoice`, `\voiceOne`, `\voiceTwo`.

Vedi anche

Learning Manual: Sezione "Four-part SATB vocal score" in *Manuale di Apprendimento*, Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.1.7 [Context layout order], pagina 571, [Grouping staves], pagina 181, ⟨undefined⟩ [Shape note heads], pagina ⟨undefined⟩, ⟨undefined⟩ [Single-staff polyphony], pagina ⟨undefined⟩.

Snippets: Sezione "Vocal music" in *Frammenti di codice*.

Internals Reference: Sezione "ChoirStaff" in *Guida al Funzionamento Interno*, Sezione "Lyrics" in *Guida al Funzionamento Interno*, Sezione "PianoStaff" in *Guida al Funzionamento Interno*.

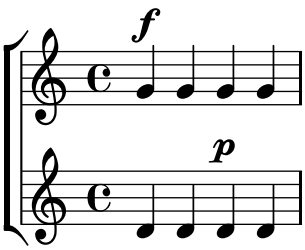
Score layouts for choral

Choral music containing four staves, with or without piano accompaniment, is usually laid out with two systems per page. Depending on the page size, achieving this may require changes to several default settings. The following settings should be considered:

- The global staff size can be modified to change the overall size of the elements of the score. See Sezione 4.2.2 [Setting the staff size], pagina 516.
- The distances between the systems, the staves and the lyrics can all be adjusted independently. See Sezione 4.4 [Vertical spacing], pagina 525.
- The dimensions of the vertical layout variables can be displayed as an aid to adjusting the vertical spacing. This and other possibilities for fitting the music onto fewer pages are described in Sezione 4.6 [Fitting music onto fewer pages], pagina 551.
- If the number of systems per page changes from one to two it is customary to indicate this with a system separator mark between the two systems. See [Separating systems], pagina 186.
- For details of other page formatting properties, see Sezione 4.1 [Page layout], pagina 504.

Dynamic markings by default are placed below the staff, but in choral music they are usually placed above the staff in order to avoid the lyrics. The predefined command `\dynamicUp` does this for the dynamic markings in a single `Voice` context. If there are many `Voice` contexts this predefined command would have to be placed in every one. Alternatively its expanded form can be used to place all dynamic markings in the entire score above their respective staves, as shown here:

```
\score {
  \new ChoirStaff <<
    \new Staff {
      \new Voice {
        \relative c'' { g4\f g g g }
      }
    }
    \new Staff {
      \new Voice {
        \relative c' { d4 d d\p d }
      }
    }
  >>
  \layout {
    \context {
      \Score
      \override DynamicText.direction = #UP
      \override DynamicLineSpanner.direction = #UP
    }
  }
}
```



Comandi predefiniti

`\dynamicUp`, `\dynamicDown`, `\dynamicNeutral`.

Vedi anche

Notation Reference: Sezione 4.6.2 [Changing spacing], pagina 552, Sezione 4.6.1 [Displaying spacing], pagina 551, Sezione 4.6 [Fitting music onto fewer pages], pagina 551, Sezione 4.1 [Page layout], pagina 504, Sezione 4.2 [Score layout], pagina 514, [Separating systems], pagina 186, Sezione 4.2.2 [Setting the staff size], pagina 516, Sezione 4.3.8 [Using an extra voice for breaks], pagina 523, Sezione 4.4 [Vertical spacing], pagina 525.

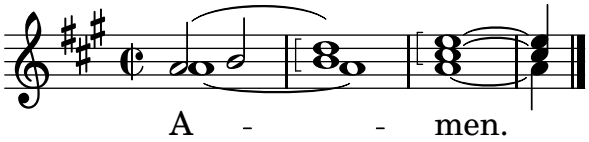
Internals Reference: Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno*, Sezione "StaffGrouper" in *Guida al Funzionamento Interno*.

Divided voices

Using arpeggioBracket to make divisi more visible

The `arpeggioBracket` can be used to indicate the division of voices where there are no stems to provide the information. This is often seen in choral music.

```
\include "english.ly"

\score {
  \relative c'' {
    \key a \major
    \time 2/2
    <<
      \new Voice = "upper"
      <<
        { \voiceOne \arpeggioBracket
          a2( b2
          <b d>1\arpeggio)
          <cs e>\arpeggio ~
          <cs e>4
        }
        \addlyrics { \lyricmode { A -- men. } }
      >>
      \new Voice = "lower"
      { \voiceTwo
        a1 ~
        a
        a ~
        a4 \bar "|."
      }
    >>
  }
  \layout { ragged-right = ##t }
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Expressive marks as lines], pagina ⟨undefined⟩.

2.1.6 Opera and stage musicals

The music, lyrics and dialogue to opera and stage musicals are usually set out in one or more of the following forms:

- A *Conductors' Score* containing the full orchestral and vocal parts, together with libretto cues if there are spoken passages.
- *Orchestral Parts* containing the music for the individual instruments of the orchestra or band.
- A *Vocal Score* containing all vocal parts with piano accompaniment. The accompaniment is usually an orchestral reduction, and if so the name of the original orchestral instrument is often indicated. Vocal scores sometimes includes stage directions and libretto cues.
- A *Vocal Book* containing just the vocal parts (no accompaniment), sometimes combined with the libretto.
- A *Libretto* containing the extended passages of spoken dialogue usually found in musicals, together with the words to the sung parts. Stage directions are usually included. LilyPond can be used to typeset libretti but as they contain no music alternative methods may be preferable.

The sections in the LilyPond documentation which cover the topics needed to create scores in the styles commonly found in opera and musicals are indicated in the References below. This is followed by sections covering those techniques which are peculiar to typesetting opera and musical scores.

References for opera and stage musicals

- A conductors' score contains many grouped staves and lyrics. Ways of grouping staves is shown in [Grouping staves], pagina 181. To nest groups of staves see [Nested staff groups], pagina 184.
- The printing of empty staves in conductors' scores and vocal scores is often suppressed. To create such a "Frenched score" see [Hiding staves], pagina 194.
- Writing orchestral parts is covered in Sezione 1.6.3 [Writing parts], pagina 197. Other sections in the Specialist notation chapter may be relevant, depending on the orchestration used. Many instruments are transposing instruments, see ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩.
- If the number of systems per page changes from page to page it is customary to separate the systems with a system separator mark. See [Separating systems], pagina 186.
- For details of other page formatting properties, see Sezione 4.1 [Page layout], pagina 504.
- Dialogue cues, stage directions and footnotes can be inserted, see Sezione 3.2.3 [Creating footnotes], pagina 469 and Sezione 1.8 [Text], pagina 220. Extensive stage directions can also be added with a section of stand-alone markups between two `\score` blocks, see [Separate text], pagina 227.

Vedi anche

Musical Glossary: Sezione "Frenched score" in *Glossario Musicale*, Sezione "Frenched staves" in *Glossario Musicale*, Sezione "transposing instrument" in *Glossario Musicale*.

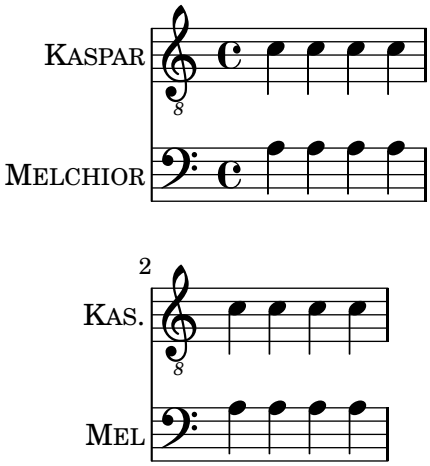
Notation Reference: Sezione 3.2.3 [Creating footnotes], pagina 469, [Grouping staves], pagina 181, [Hiding staves], pagina 194, ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩, [Nested staff groups], pagina 184, Sezione 4.1 [Page layout], pagina 504, [Separating systems], pagina 186, ⟨undefined⟩ [Transpose], pagina ⟨undefined⟩, Sezione 1.6.3 [Writing parts], pagina 197, Sezione 1.8.1 [Writing text], pagina 221.

Snippets: Sezione "Vocal music" in *Frammenti di codice*.

Character names

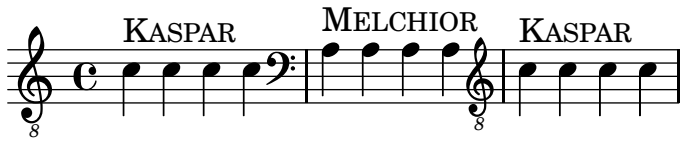
Character names are usually shown to the left of the staff when the staff is dedicated to that character alone:

```
\score {
  <<
    \new Staff {
      \set Staff.vocalName = \markup \smallCaps Kaspar
      \set Staff.shortVocalName = \markup \smallCaps Kas.
      \relative c' {
        \clef "G_8"
        c4 c c c
        \break
        c4 c c c
      }
    }
    \new Staff {
      \set Staff.vocalName = \markup \smallCaps Melchior
      \set Staff.shortVocalName = \markup \smallCaps Mel
      \clef "bass"
      \relative c' {
        a4 a a a
        a4 a a a
      }
    }
  >>
}
```



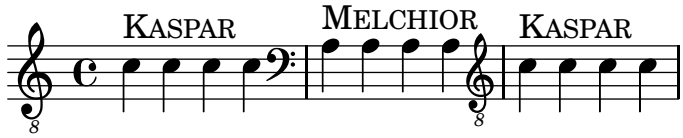
When two or more characters share a staff the character's name is usually printed above the staff at the start of every section applying to that character. This can be done with markup. Often a specific font is used for this purpose.

```
\clef "G_8"
c4^\markup \fontsize #1 \smallCaps Kaspar
c c c
\clef "bass"
a4^\markup \fontsize #1 \smallCaps Melchior
a a a
\clef "G_8"
c4^\markup \fontsize #1 \smallCaps Kaspar
c c c
```



Alternatively, if there are many character changes, it may be easier to set up "instrument" definitions for each character at the top level so that `\instrumentSwitch` can be used to indicate each change.

```
\addInstrumentDefinition #"kaspar"
  #`((instrumentTransposition . ,(ly:make-pitch -1 0 0))
     (shortInstrumentName . "Kas.")
     (clefGlyph . "clefs.G")
     (clefTransposition . -7)
     (middleCPosition . 1)
     (clefPosition . -2)
     (instrumentCueName . ,(markup #:fontsize 1 #:smallCaps "Kaspar"))
     (midiInstrument . "voice oohs"))

\addInstrumentDefinition #"melchior"
  #`((instrumentTransposition . ,(ly:make-pitch 0 0 0))
     (shortInstrumentName . "Mel.")
     (clefGlyph . "clefs.F")
     (clefTransposition . 0)
     (middleCPosition . 6)
     (clefPosition . 2)
     (instrumentCueName . ,(markup #:fontsize 1 #:smallCaps "Melchior"))
     (midiInstrument . "choir aahs"))

\relative c' {
  \instrumentSwitch "kaspar"
  c4 c c c
  \instrumentSwitch "melchior"
  a4 a a a
  \instrumentSwitch "kaspar"
  c4 c c c
}
```



Vedi anche

Notation Reference: [Instrument names], pagina 197, Sezione A.21 [Scheme functions], pagina 759, Sezione 1.8 [Text], pagina 220, Sezione A.10 [Text markup commands], pagina 659.

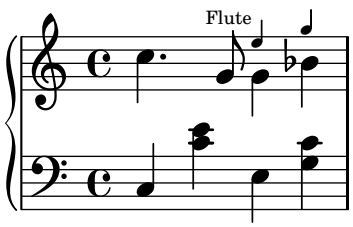
Extending LilyPond: Sezione "Markup construction in Scheme" in *Estendere*.

Musical cues

Musical cues can be inserted in Vocal Scores, Vocal Books and Orchestral Parts to indicate what music in another part immediately precedes an entry. Also, cues are often inserted in the piano reduction in Vocal Scores to indicate what each orchestral instrument is playing. This aids the conductor when a full Conductors' Score is not available.

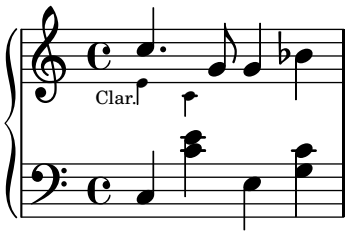
The basic mechanism for inserting cues is fully explained in the main text, see [Quoting other voices], pagina 201 and [Formatting cue notes], pagina 203. But when many cues have to be inserted, for example, as an aid to a conductor in a vocal score, the instrument name must be positioned carefully just before and close to the start of the cue notes. The following example shows how this is done.

```
flute = \relative c'' {
  s4 s4 e g
}
\addQuote "flute" { \flute }

pianoRH = \relative c'' {
  c4. g8
  % position name of cue-ing instrument just before the cue notes,
  % and above the staff
  \new CueVoice {
    \override InstrumentSwitch.self-alignment-X = #RIGHT
    \set instrumentCueName = "Flute"
  }
  \cueDuring "flute" #UP { g4 bes4 }
}
pianoLH = \relative c { c4 <c' e> e, <g c> }

\score {
  \new PianoStaff <<
    \new Staff {
      \pianoRH
    }
    \new Staff {
      \clef "bass"
      \pianoLH
    }
  >>
}
```



If a transposing instrument is being quoted the instrument part should specify its key so the conversion of its cue notes will be done automatically. The example below shows this transposition for a B-flat clarinet. The notes in this example are low on the staff so `DOWN` is specified in `\cueDuring` (so the stems are down) and the instrument name is positioned below the staff. Note also that the piano right-hand voice is explicitly declared. This is because the cue notes in this example begin at the start of the first bar and this would otherwise cause the entire piano right-hand notes to be placed in a `CueVoice` context.

```
clarinet = \relative c' {
  \transposition bes
  fis4 d d c
}
\addQuote "clarinet" { \clarinet }

pianoRH = \relative c'' {
  \transposition c'
  % position name of cue-ing instrument below the staff
  \new CueVoice {
    \override InstrumentSwitch.self-alignment-X = #RIGHT
    \override InstrumentSwitch.direction = #DOWN
    \set instrumentCueName = "Clar."
  }
  \cueDuring "clarinet" #DOWN { c4. g8 }
  g4 bes4
}
pianoLH = \relative c { c4 <c' e> e, <g c> }

\score {
  <<
    \new PianoStaff <<
      \new Staff {
        \new Voice {
          \pianoRH
        }
      }
      \new Staff {
        \clef "bass"
        \pianoLH
      }
    >>
  >>
}
```



From these two examples it is clear that inserting many cues in a Vocal Score would be tedious, and the notes of the piano part would become obscured. However, as the following

snippet shows, it is possible to define a music function to reduce the amount of typing and to make the piano notes clearer.

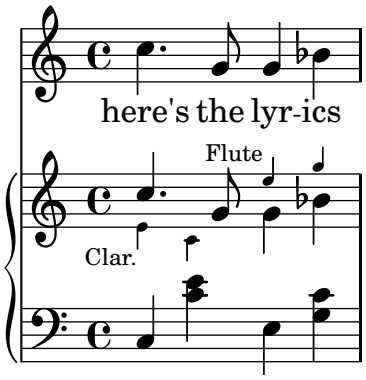
Frammenti di codice selezionati

Adding orchestral cues to a vocal score

This shows one approach to simplify adding many orchestral cues to the piano reduction in a vocal score. The music function `\cueWhile` takes four arguments: the music from which the cue is to be taken, as defined by `\addQuote`, the name to be inserted before the cue notes, then either `#UP` or `#DOWN` to specify either `\voiceOne` with the name above the staff or `\voiceTwo` with the name below the staff, and finally the piano music in parallel with which the cue notes are to appear. The name of the cued instrument is positioned to the left of the cued notes. Many passages can be cued, but they cannot overlap each other in time.

```
cueWhile =
#(define-music-function
   (parser location instrument name dir music)
   (string? string? ly:dir? ly:music?)
   #{
     \cueDuring $instrument #dir {
       \once \override TextScript.self-alignment-X = #RIGHT
       \once \override TextScript.direction = $dir
       <>-\markup { \tiny #name }
       $music
     }
   #})

flute = \relative c'' {
  \transposition c'
  s4 s4 e g
}
\addQuote "flute" { \flute }

clarinet = \relative c' {
  \transposition bes
  fis4 d d c
}
\addQuote "clarinet" { \clarinet }

singer = \relative c'' { c4. g8 g4 bes4 }
words = \lyricmode { here's the lyr -- ics }

pianoRH = \relative c'' {
  \transposition c'
  \cueWhile "clarinet" "Clar." #DOWN { c4. g8 }
  \cueWhile "flute" "Flute" #UP { g4 bes4 }
}
pianoLH = \relative c { c4 <c' e> e, <g c> }

\score {
  <<
    \new Staff {
      \new Voice = "singer" {
```

```
        \singer
      }
    }
    \new Lyrics {
      \lyricsto "singer"
      \words
    }
    \new PianoStaff <<
      \new Staff {
        \new Voice {
          \pianoRH
        }
      }
      \new Staff {
        \clef "bass"
        \pianoLH
      }
    >>
  >>
}
```



Vedi anche

Musical Glossary: Sezione “cue-notes” in *Glossario Musicale*.

Notation Reference: Sezione 5.5.1 [Aligning objects], pagina 599, Sezione 5.4.2 [Direction and placement], pagina 585, [Formatting cue notes], pagina 203, [Quoting other voices], pagina 201, Sezione 5.6 [Using music functions], pagina 610.

Snippets: Sezione “Vocal music” in *Frammenti di codice*.

Internals Reference: Sezione “InstrumentSwitch” in *Guida al Funzionamento Interno*, Sezione “CueVoice” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

`\cueDuring` automatically inserts a `CueVoice` context and all cue notes are placed in that context. This means it is not possible to have two overlapping sequences of cue notes by this technique. Overlapping sequences could be entered by explicitly declaring separate `CueVoice` contexts and using `\quoteDuring` to extract and insert the cue notes.

Spoken music

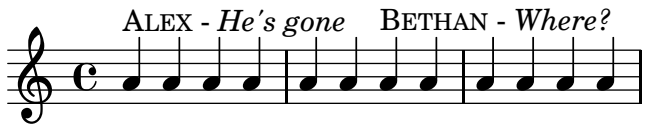
Such effects as 'parlato' or 'Sprechgesang' require performers to speak without pitch but still with rhythm; these are notated by cross note heads, as demonstrated in ⟨undefined⟩ [Special note heads], pagina ⟨undefined⟩.

Dialogue over music

Dialogue over music is usually printed over the staves in an italic font, with the start of each phrase keyed in to a particular music moment.

For short interjections a simple markup suffices.

```
a4^\markup { \smallCaps { Alex - } \italic { He's gone } } a a a
a4 a a^\markup { \smallCaps { Bethan - } \italic Where? } a
a4 a a a
```



For longer phrases it may be necessary to expand the music to make the words fit neatly. There is no provision in LilyPond to do this fully automatically, and some manual intervention to layout the page will be necessary.

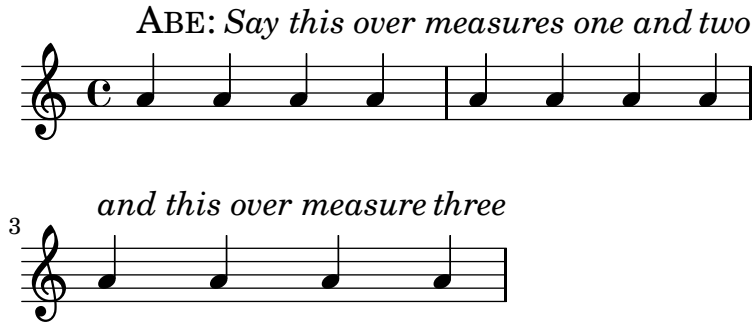
For long phrases or for passages with a lot of closely packed dialogue, using a Lyrics context will give better results. The Lyrics context should not be associated with a music Voice; instead each section of dialogue should be given an explicit duration. If there is a gap in the dialogue, the final word should be separated from the rest and the duration split between them so that the underlying music spaces out smoothly.

If the dialogue extends for more than one line it will be necessary to manually insert `\break`s and adjust the placing of the dialogue to avoid running into the right margin. The final word of the last measure on a line should also be separated out, as above.

Here is an example illustrating how this might be done.

```
music = \relative c'' {
  \repeat unfold 3 { a4 a a a }
}

dialogue = \lyricmode {
  \markup {
    \fontsize #1 \upright \smallCaps Abe:
    "Say this over measures one and"
  }4*7
  "two"4 |
  \break
  "and this over measure"4*3
  "three"4 |
}

\score {
  <<
    \new Lyrics \with {
      \override LyricText.font-shape = #'italic
      \override LyricText.self-alignment-X = #LEFT
    }
```

```
    { \dialogue }
    \new Staff {
      \new Voice { \music }
    }
  >>
}
```



Vedi anche

Notation Reference: [Manual syllable durations], pagina 252, Sezione 1.8 [Text], pagina 220.

Internal Reference: Sezione "LyricText" in *Guida al Funzionamento Interno*.

2.1.7 Chants psalms and hymns

The music and words for chants, psalms and hymns usually follow a well-established format in any particular church. Although the formats may differ from church to church the type-setting problems which arise are broadly similar, and are covered in this section.

References for chants and psalms

Typesetting Gregorian chant in various styles of ancient notation is described in Sezione 2.9 [Ancient notation], pagina 414.

Vedi anche

Notation reference: Sezione 2.9 [Ancient notation], pagina 414.

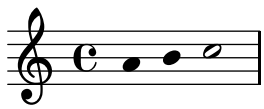
Snippets: Sezione "Vocal music" in *Frammenti di codice*.

Setting a chant

Modern chant settings use modern notation with varying numbers of elements taken from ancient notation. Some of the elements and methods to consider are shown here.

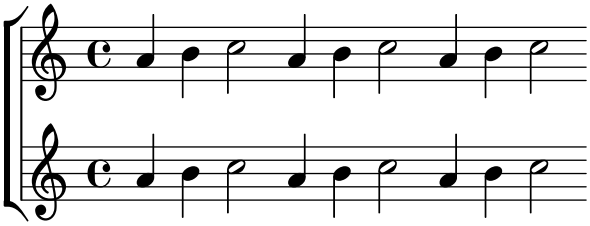
Chants often use quarter notes without stems to indicate the pitch, with the rhythm being taken from the spoken rhythm of the words.

```
stemOff = { \override Staff.Stem.transparent = ##t }

\relative c' {
  \stemOff
  a'4 b c2 |
}
```



Chants often omit the bar lines or use shortened or dotted bar lines to indicate pauses in the music. To omit all bar lines from all staves remove the bar line engraver completely:

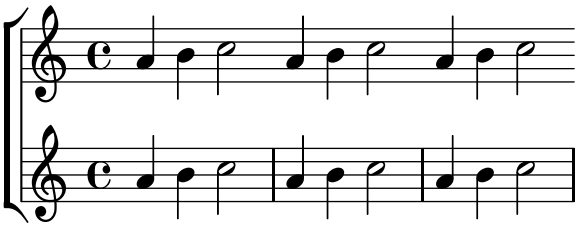
```
\score {
  \new StaffGroup <<
    \new Staff {
      \relative c'' {
        a4 b c2 |
        a4 b c2 |
        a4 b c2 |
      }
    }
    \new Staff {
      \relative c'' {
        a4 b c2 |
        a4 b c2 |
        a4 b c2 |
      }
    }
  >>
  \layout {
    \context {
      \Staff
      \remove "Bar_engraver"
    }
  }
}
```



Bar lines can also be removed on a staff-by-staff basis:

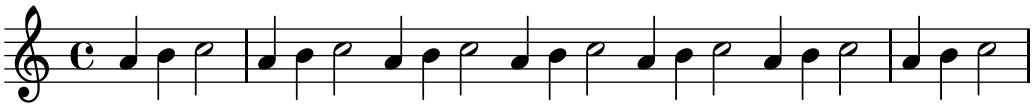
```
\score {
  \new ChoirStaff <<
    \new Staff
    \with { \remove "Bar_engraver" } {
      \relative c'' {
        a4 b c2 |
        a4 b c2 |
        a4 b c2 |
      }
    }
    \new Staff {
      \relative c'' {
        a4 b c2 |
        a4 b c2 |
        a4 b c2 |
      }
```

```
    }
  >>
}
```



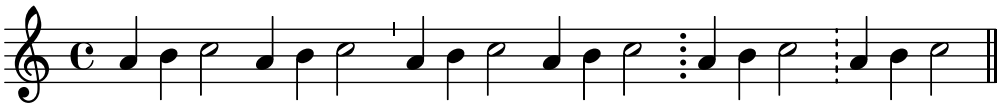
To remove bar lines from just a section of music treat it as a cadenza. If the section is long you may need to insert dummy bar lines with `\bar ""` to show where the line should break.

```
a4 b c2 |
\cadenzaOn
a4 b c2
a4 b c2
\bar ""
a4 b c2
a4 b c2
\cadenzaOff
a4 b c2 |
a4 b c2 |
```



Rests or pauses in chants can be indicated by modified bar lines.

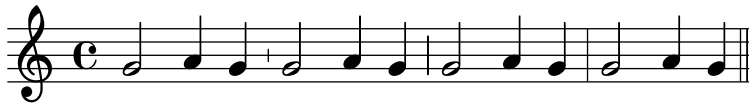
```
a4
\cadenzaOn
b c2
a4 b c2
\bar "'"
a4 b c2
a4 b c2
\bar ";"
a4 b c2
\bar "!"
a4 b c2
\bar "||"
```



Alternatively, the notation used in Gregorian chant for pauses or rests is sometimes used even though the rest of the notation is modern. This uses a modified `\breathe` mark:

```
divisioMinima = {
  \once \override BreathingSign.stencil = #ly:breathing-sign::divisio-minima
  \once \override BreathingSign.Y-offset = #0
```

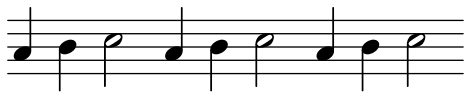
```
  \breathe
}
divisioMaior = {
  \once \override BreathingSign.stencil = #ly:breathing-sign::divisio-maior
  \once \override BreathingSign.Y-offset = #0
  \breathe
}
divisioMaxima = {
  \once \override BreathingSign.stencil = #ly:breathing-sign::divisio-maxima
  \once \override BreathingSign.Y-offset = #0
  \breathe
}
finalis = {
  \once \override BreathingSign.stencil = #ly:breathing-sign::finalis
  \once \override BreathingSign.Y-offset = #0
  \breathe
}

\score {
  \relative c'' {
    g2 a4 g
    \divisioMinima
    g2 a4 g
    \divisioMaior
    g2 a4 g
    \divisioMaxima
    g2 a4 g
    \finalis
  }
  \layout {
    \context {
      \Staff
      \remove "Bar_engraver"
    }
  }
}
```



Chants usually omit the time signature and often omit the clef too.

```
\score {
  \new Staff {
    \relative c'' {
      a4 b c2 |
      a4 b c2 |
      a4 b c2 |
    }
  }
  \layout {
    \context {
```

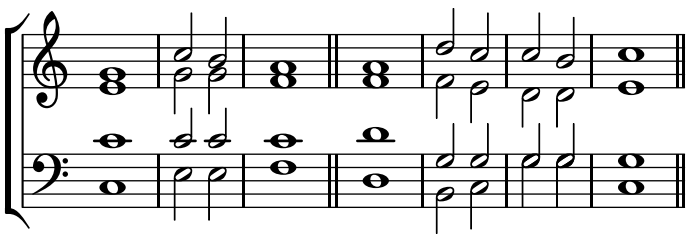
```
      \Staff
      \remove "Bar_engraver"
      \remove "Time_signature_engraver"
      \remove "Clef_engraver"
    }
  }
}
```



Chants for psalms in the Anglican tradition are usually either *single*, with 7 bars of music, or *double*, with two lots of 7 bars. Each group of 7 bars is divided into two halves, corresponding to the two halves of each verse, usually separated by a double bar line. Only whole and half notes are used. The 1st bar in each half always contains a single chord of whole notes. This is the "reciting note". Chants are usually centered on the page.

```
SopranoMusic = \relative g' {
  g1 | c2 b | a1 | \bar "||"
  a1 | d2 c | c b | c1 | \bar "||"
}

AltoMusic = \relative c' {
  e1 | g2 g | f1 |
  f1 | f2 e | d d | e1 |
}

TenorMusic = \relative a {
  c1 | c2 c | c1 |
  d1 | g,2 g | g g | g1 |
}

BassMusic =  \relative c {
  c1 | e2 e | f1 |
  d1 | b2 c | g' g | c,1 |
}

global = {
  \time 2/2
}

% Use markup to center the chant on the page
\markup {
  \fill-line {
    \score {  % centered
      <<
        \new ChoirStaff <<
          \new Staff <<
            \global
            \clef "treble"
            \new Voice = "Soprano" <<
              \voiceOne
```

```
            \SopranoMusic
          >>
          \new Voice = "Alto" <<
            \voiceTwo
            \AltoMusic
          >>
        >>
        \new Staff <<
          \clef "bass"
          \global
          \new Voice = "Tenor" <<
            \voiceOne
            \TenorMusic
          >>
          \new Voice = "Bass" <<
            \voiceTwo
            \BassMusic
          >>
        >>
      >>
    >>
    \layout {
      \context {
        \Score
        \override SpacingSpanner.base-shortest-duration = #(ly:make-moment 1/2)
      }
      \context {
        \Staff
        \remove "Time_signature_engraver"
      }
    }
  }  % End score
 }
}  % End markup
```



Some other approaches to setting such a chant are shown in the first of the following snippets.

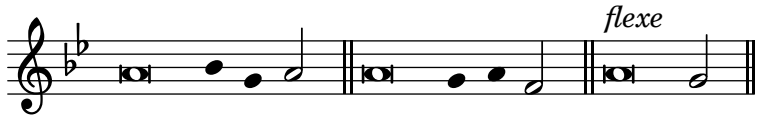
Frammenti di codice selezionati

Chant or psalms notation

This form of notation is used for the chant of the Psalms, where verses aren't always the same length.

```
stemOff = \hide Staff.Stem
stemOn  = \undo \stemOff
```

```
\score {
  \new Staff \with { \remove "Time_signature_engraver" }
  {
    \key g \minor
    \cadenzaOn
    \stemOff a'\breve bes'4 g'4
    \stemOn a'2 \bar "||"
    \stemOff a'\breve g'4 a'4
    \stemOn f'2 \bar "||"
    \stemOff a'\breve^\markup { \italic flexe }
    \stemOn g'2 \bar "||"
  }
}
```



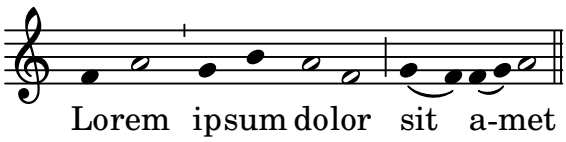
Canticles and other liturgical texts may be set more freely, and may use notational elements from ancient music. Often the words are shown underneath and aligned with the notes. If so, the notes are spaced in accordance with the syllables rather than the notes' durations.

Modello per notazione antica – trascrizione moderna di musica gregoriana

Questo esempio mostra come realizzare una trascrizione moderna di musica gregoriana. La musica gregoriana non presenta suddivisione in misure né gambi; utilizza soltanto le teste della minima e della semiminima, e dei segni appositi che indicano pause di diversa lunghezza.

```
\include "gregorian.ly"

chant = \relative c' {
  \set Score.timing = ##f
  f4 a2 \divisioMinima
  g4 b a2 f2 \divisioMaior
  g4( f) f( g) a2 \finalis
}

verba = \lyricmode {
  Lo -- rem ip -- sum do -- lor sit a -- met
}

\score {
  \new Staff <<
    \new Voice = "melody" \chant
    \new Lyrics = "one" \lyricsto melody \verba
  >>
  \layout {
    \context {
      \Staff
      \remove "Time_signature_engraver"
      \remove "Bar_engraver"
      \override Stem.transparent = ##t
    }
    \context {
```

```
      \Voice
      \override Stem.length = #0
    }
    \context {
      \Score
      barAlways = ##t
    }
  }
}
```



Vedi anche

Learning Manual: Sezione "Visibility and color of objects" in *Manuale di Apprendimento*, Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.

Notation Reference: Sezione 2.9 [Ancient notation], pagina 414, ⟨undefined⟩ [Bar lines], pagina ⟨undefined⟩, Sezione 5.1.4 [Modifying context plug-ins], pagina 562, Sezione 2.9.4 [Typesetting Gregorian chant], pagina 425, ⟨undefined⟩ [Unmetered music], pagina ⟨undefined⟩, Sezione 5.4.6 [Visibility of objects], pagina 592.

Pointing a psalm

The words to an Anglican psalm are usually printed in separate verses centered underneath the chant.

Single chants (with 7 bars) are repeated for every verse. Double chants (with 14 bars) are repeated for every pair of verses. Marks are inserted in the words to show how they should be fitted to the chant. Each verse is divided into two halves. A colon is usually used to indicate this division. This corresponds to the double bar line in the music. The words before the colon are sung to the first three bars of music; the words after the colon are sung to the last four bars.

Single bar lines (or in some psalters an inverted comma or similar symbol) are inserted between words to indicate where the bar lines in the music fall. In markup mode a single bar line can be entered with the bar check symbol, `|`.

```
\markup {
  \fill-line {
    \column {
      \left-align {
        \line { O come let us sing | unto the | Lord : let }
        \line { us heartily rejoice in the | strength of | our }
        \line { sal- | -vation. }
      }
    }
  }
}
```

O come let us sing | unto the | Lord : let
us heartily rejoice in the | strength of | our
sal- | -vation.

Other symbols may require glyphs from the `fetaMusic` fonts. For details, see Sezione 1.8.3 [Fonts], pagina 242.

```
tick = \markup {
  \raise #1 \fontsize #-5 \musicglyph #"scripts.rvarcomma"
}
\markup {
  \fill-line {
    \column {
      \left-align {
        \line { O come let us sing \tick unto the \tick Lord : let }
        \line {
          us heartily rejoice in the \tick strength of \tick our
        }
        \line { sal \tick vation. }
      }
    }
  }
}
```

O come let us sing ′ unto the ′ Lord : let
us heartily rejoice in the ′ strength of ′ our
sal ′ vation.

Where there is one whole note in a bar all the words corresponding to that bar are recited on that one note in speech rhythm. Where there are two notes in a bar there will usually be only one or two corresponding syllables. If there are more that two syllables a dot is usually inserted to indicate where the change in note occurs.

```
dot = \markup {
  \raise #0.7 \musicglyph #"dots.dot"
}
tick = \markup {
  \raise #1 \fontsize #-5 \musicglyph #"scripts.rvarcomma"
}
\markup {
  \fill-line {
    \column {
      \left-align {
        \line {
          O come let us sing \tick unto \dot the \tick Lord : let
        }
        \line {
          us heartily rejoice in the \tick strength of \tick our
        }
        \line { sal \tick vation. }
      }
    }
  }
}
```

O come let us sing ′ unto • the ′ Lord : let
us heartily rejoice in the ′ strength of ′ our
sal ′ vation.

In some psalters an asterisk is used to indicate a break in a recited section instead of a comma, and stressed or slightly lengthened syllables are indicated in bold text.

```
dot = \markup {
  \raise #0.7 \musicglyph #"dots.dot"
}
tick = \markup {
  \raise #1 \fontsize #-5 \musicglyph #"scripts.rvarcomma"
}
\markup {
  \fill-line {
    \column {
      \left-align {
        \line { Today if ye will hear his voice * }
        \line {
          \concat { \bold hard en }
          | not your | hearts : as in the pro-
        }
        \line { vocation * and as in the \bold day of tempt- | }
        \line { -ation | in the | wilderness. }
      }
    }
  }
}
```

Today if ye will hear his voice *
harden | not your | hearts : as in the pro-
vocation * and as in the **day** of tempt- |
-ation | in the | wilderness.

In other psalters an accent is placed over the syllable to indicate stress.

```
tick = \markup {
  \raise #2 \fontsize #-5 \musicglyph #"scripts.rvarcomma"
}
\markup {
  \fill-line {
    \column {
      \left-align {
        \line {
          O come let us \concat {
            si \combine \tick ng
          }
          | unto the | Lord : let
        }
        \line {
          us heartily \concat {
            rejo \combine \tick ice
          }
          in the | strength of | our
        }
        \line { sal- | -vation. }
      }
```

```
    }
  }
}
```

O come let us sing | unto the | Lord : let
us heartily rejoice in the | strength of | our
sal- | -vation.

The use of markup to center text, and arrange lines in columns is described in Sezione 1.8.2 [Formatting text], pagina 229.

Most of these elements are shown in one or other of the two verses in the template, see Sezione "Psalms" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Psalms" in *Manuale di Apprendimento*, Sezione "Vocal ensembles templates" in *Manuale di Apprendimento*.

Notation Reference: Sezione 1.8.3 [Fonts], pagina 242, Sezione 1.8.2 [Formatting text], pagina 229.

Partial measures in hymn tunes

Hymn tunes frequently start and end every line of music with partial measures so that each line of music corresponds exactly with a line of text. This requires a `\partial` command at the start of the music and `\bar "|"` or `\bar "||"` commands at the end of each line.

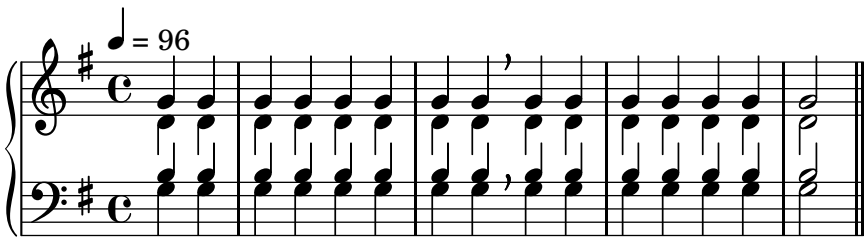
Modello per inno

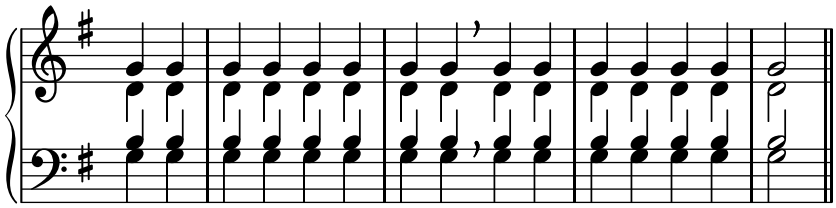
Il codice seguente presenta un modo di impostare un inno in cui ogni verso inizia e finisce con una misura parziale. Mostra anche come aggiungere delle strofe come testo separato sotto la musica.

```
Timeline = {
  \time 4/4
  \tempo 4=96
  \partial 2
  s2 | s1 | s2 \breathe s2 | s1 | s2 \bar "||" \break
  s2 | s1 | s2 \breathe s2 | s1 | s2 \bar "||"
}

SopranoMusic = \relative g' {
  g4 g | g g g g | g g g g | g g g g | g2
  g4 g | g g g g | g g g g | g g g g | g2
}

AltoMusic = \relative c' {
  d4 d | d d d d | d d d d | d d d d | d2
  d4 d | d d d d | d d d d | d d d d | d2
}

TenorMusic = \relative a {
  b4 b | b b b b | b b b b | b b b b | b2
  b4 b | b b b b | b b b b | b b b b | b2
}
```

```
BassMusic =  \relative g {
  g4 g | g g g g | g g g g | g g g g | g2
  g4 g | g g g g | g g g g | g g g g | g2
}

global = {
 \key g \major
}

\score {  % Start score
  <<
    \new PianoStaff <<  % Start pianostaff
      \new Staff <<  % Start Staff = RH
        \global
        \clef "treble"
        \new Voice = "Soprano" <<  % Start Voice = "Soprano"
          \Timeline
          \voiceOne
          \SopranoMusic
        >>  % End Voice = "Soprano"
        \new Voice = "Alto" <<  % Start Voice = "Alto"
          \Timeline
          \voiceTwo
          \AltoMusic
        >>  % End Voice = "Alto"
      >>  % End Staff = RH
      \new Staff <<  % Start Staff = LH
        \global
        \clef "bass"
        \new Voice = "Tenor" <<  % Start Voice = "Tenor"
          \Timeline
          \voiceOne
          \TenorMusic
        >>  % End Voice = "Tenor"
        \new Voice = "Bass" <<  % Start Voice = "Bass"
          \Timeline
          \voiceTwo
          \BassMusic
        >>  % End Voice = "Bass"
      >>  % End Staff = LH
    >>  % End pianostaff
  >>
}  % End score

\markup {
  \fill-line {
    ""
    {
      \column {
        \left-align {
          "This is line one of the first verse"
          "This is line two of the same"
```

```
          "And here's line three of the first verse"
          "And the last line of the same"
        }
      }
    }
    ""
  }
}

\paper {  % Start paper block
  indent = 0     % don't indent first system
  line-width = 130   % shorten line length to suit music
}  % End paper block
```





This is line one of the first verse
This is line two of the same
And here's line three of the first verse
And the last line of the same

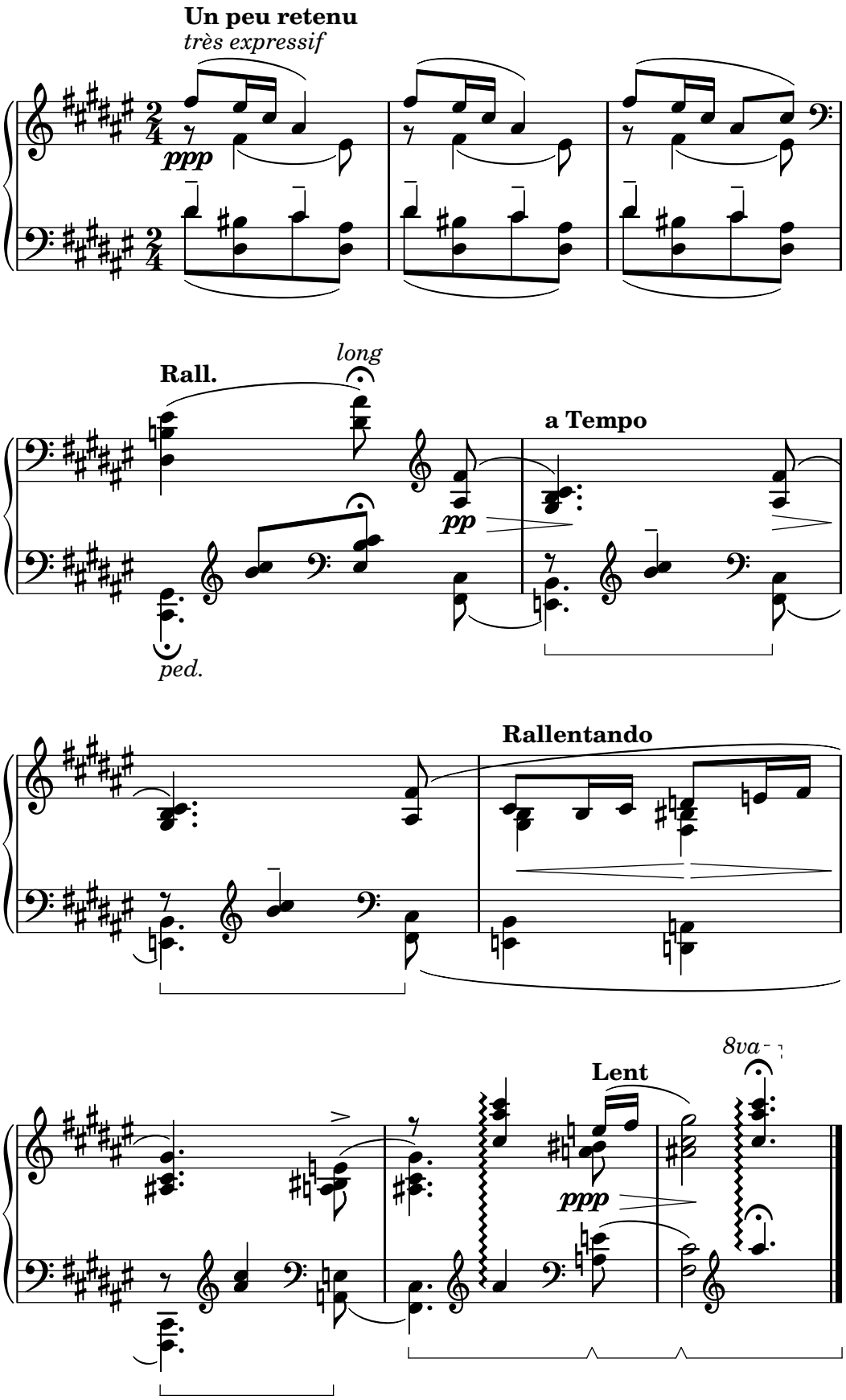
2.1.8 Ancient vocal music

Ancient vocal music is supported, as explained in Sezione 2.9 [Ancient notation], pagina 414.

Vedi anche

Notation Reference: Sezione 2.9 [Ancient notation], pagina 414.

2.2 Keyboard and other multi-staff instruments



This section discusses several aspects of music notation that are unique to keyboard instruments and other instruments notated on many staves, such as harps and vibraphones. For the purposes of this section this entire group of multi-staff instruments is called "keyboards" for short, even though some of them do not have a keyboard.

2.2.1 Common notation for keyboards

This section discusses notation issues that may arise for most keyboard instruments.

References for keyboards

Keyboard instruments are usually notated with Piano staves. These are two or more normal staves coupled with a brace. The same notation is also used for other keyed instruments. Organ music is normally written with two staves inside a `PianoStaff` group and third, normal staff for the pedals.

The staves in keyboard music are largely independent, but sometimes voices can cross between the two staves. This section discusses notation techniques particular to keyboard music.

Several common issues in keyboard music are covered elsewhere:

- Keyboard music usually contains multiple voices and the number of voices may change regularly; this is described in ⟨undefined⟩ [Collision resolution], pagina ⟨undefined⟩.
- Keyboard music can be written in parallel, as described in ⟨undefined⟩ [Writing music in parallel], pagina ⟨undefined⟩.
- Dynamics may be placed in a `Dynamics` context, between the two `Staff` contexts to align the dynamic marks on a horizontal line centered between the staves; see ⟨undefined⟩ [Dynamics], pagina ⟨undefined⟩.
- Fingerings are indicated with [Fingering instructions], pagina 210.
- Organ pedal indications are inserted as articulations, see Sezione A.13 [List of articulations], pagina 712.
- Vertical grid lines can be shown with [Grid lines], pagina 217.
- Keyboard music often contains *Laissez vibrer* ties as well as ties on arpeggios and tremolos, described in ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.
- Placing arpeggios across multiple voices and staves is covered in [Arpeggio], pagina 137.
- Tremolo marks are described in ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.
- Several of the tweaks that can occur in keyboard music are demonstrated in Sezione "Real music example" in *Manuale di Apprendimento*.
- Hidden notes can be used to produce ties that cross voices, as shown in Sezione "Other uses for tweaks" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Real music example" in *Manuale di Apprendimento*, Sezione "Other uses for tweaks" in *Manuale di Apprendimento*.

Notation Reference: [Grouping staves], pagina 181, [Instrument names], pagina 197, ⟨undefined⟩ [Collision resolution], pagina ⟨undefined⟩, ⟨undefined⟩ [Writing music in parallel], pagina ⟨undefined⟩, [Fingering instructions], pagina 210, Sezione A.13 [List of articulations], pagina 712, [Grid lines], pagina 217, ⟨undefined⟩ [Ties], pagina ⟨undefined⟩, [Arpeggio], pagina 137, ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.

Internals Reference: Sezione "PianoStaff" in *Guida al Funzionamento Interno*.

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

Changing staff manually

Voices can be switched between staves manually, using the command

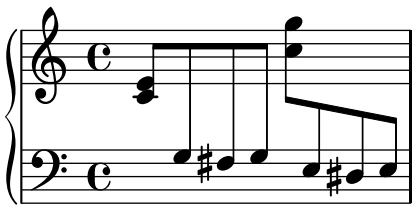
`\change Staff = staffname`

The string *staffname* is the name of the staff. It switches the current voice from its current staff to the staff called *staffname*. Typical values for *staffname* are `"up"` and `"down"`, or `"RH"` and `"LH"`.

The staff to which the voice is being switched must exist at the time of the switch. If necessary, staves should be "kept alive", see Sezione 5.1.3 [Keeping contexts alive], pagina 560.

Cross-staff notes are beamed automatically:

```
\new PianoStaff <<
  \new Staff = "up" {
    <e' c'>8
    \change Staff = "down"
    g8 fis g
    \change Staff = "up"
    <g'' c''>8
    \change Staff = "down"
    e8 dis e
    \change Staff = "up"
  }
  \new Staff = "down" {
    \clef bass
    % keep staff alive
    s1
  }
>>
```

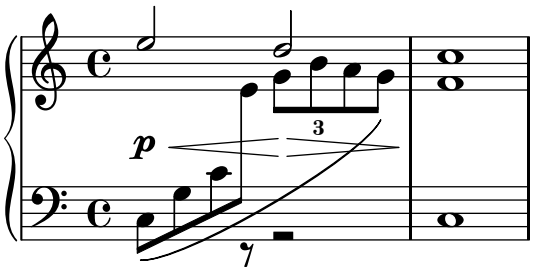


If the beaming needs to be tweaked, make any changes to the stem directions first. The beam positions are then measured from the center of the staff that is closest to the beam. For a simple example of beam tweaking, see Sezione "Fixing overlapping notation" in *Manuale di Apprendimento*.

Overlapping notation can result when voices cross staves:

```
\new PianoStaff <<
  \new Staff = "up" {
    \voiceOne
    % Make space for fingering in the cross-staff voice
    \once\override DynamicLineSpanner.staff-padding = #3.4
    e''2\p\< d''\>
    c''1\!
  }
  \new Staff = "down" <<
    {
      \clef bass
```

```
      s4. e,8\rest g,2\rest
      c1
    } \\ {
      c8\( g c'
      \change Staff = "up"
      e' g' b'-3 a' g'\)
      f'1
    }
  >>
>>
```



The stem and slur overlap the intervening line of dynamics because automatic collision resolution is suspended for beams, slurs and other spanners that connect notes on different staves, as well as for stems and articulations if their placement is affected by a cross-staff spanner. The resulting collisions must be resolved manually, where necessary, using the methods in Sezione "Fixing overlapping notation" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Fixing overlapping notation" in *Manuale di Apprendimento*.

Notation Reference: [Stems], pagina 215, ⟨undefined⟩ [Automatic beams], pagina ⟨undefined⟩, Sezione 5.1.3 [Keeping contexts alive], pagina 560.

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

Internals Reference: Sezione "Beam" in *Guida al Funzionamento Interno*, Sezione "ContextChange" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Beam collision avoidance does not work for automatic beams that end right before a change in staff. In this case use manual beams.

Changing staff automatically

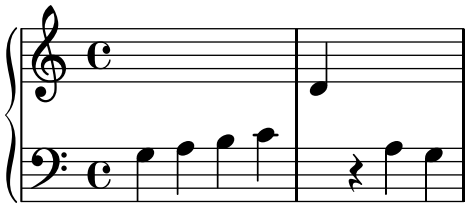
Voices can be made to switch automatically between the top and the bottom staff. The syntax for this is

`\autochange ...music...`

This will create two staves inside the current staff group (usually a `PianoStaff`), called `"up"` and `"down"`. The lower staff will be in the bass clef by default. The autochanger switches on the basis of the pitch (middle C is the turning point), and it looks ahead skipping over rests to switch in advance.

```
\new PianoStaff {
  \autochange {
    g4 a b c'
    d'4 r a g
  }
```

```
}
```



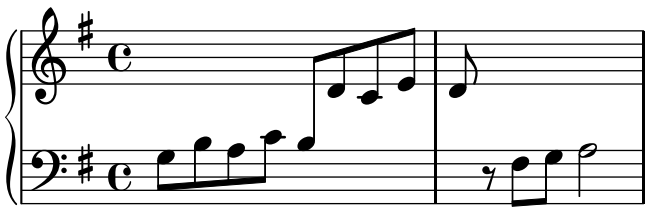
A `\relative` section that is outside of `\autochange` has no effect on the pitches of the music, so if necessary, put `\relative` inside `\autochange`.

If additional control is needed over the individual staves, they can be created manually with the names `"up"` and `"down"`. The `\autochange` command will then switch its voice between the existing staves.

Nota: If staves are created manually, they *must* be named `"up"` and `"down"`.

For example, staves must be created manually in order to place a key signature in the lower staff:

```
\new PianoStaff <<
  \new Staff = "up" {
    \new Voice = "melOne" {
      \key g \major
      \autochange \relative c' {
        g8 b a c b d c e
        d8 r fis, g a2
      }
    }
  }
  \new Staff = "down" {
    \key g \major
    \clef bass
  }
>>
```



Vedi anche

Notation Reference: [Changing staff manually], pagina 311.

Snippets: Sezione “Keyboards” in *Frammenti di codice*.

Internals Reference: Sezione “AutoChangeMusic” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

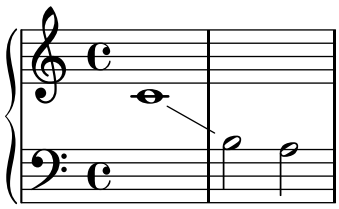
The staff switches may not end up in optimal places. For high quality output, staff switches should be specified manually.

Chords will not be split across the staves; they will be assigned to a staff based on the first note named in the chord construct.

Staff-change lines

Whenever a voice switches to another staff, a line connecting the notes can be printed automatically:

```
\new PianoStaff <<
  \new Staff = "one" {
    \showStaffSwitch
    c1
    \change Staff = "two"
    b2 a
  }
  \new Staff = "two" {
    \clef bass
    s1*2
  }
>>
```



Comandi predefiniti

`\showStaffSwitch`, `\hideStaffSwitch`.

Vedi anche

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

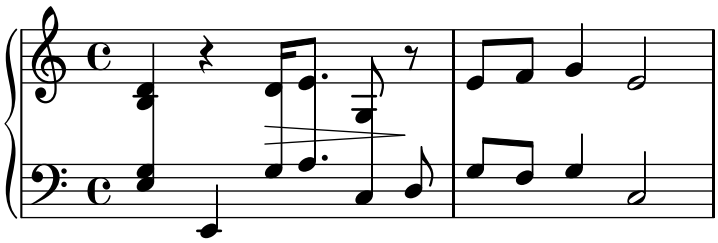
Internals Reference: Sezione "Note_head_line_engraver" in *Guida al Funzionamento Interno*, Sezione "VoiceFollower" in *Guida al Funzionamento Interno*.

Cross-staff stems

Chords that cross staves may be produced using the `Span_stem_engraver`. Care must be taken to ensure that automatic beams do not beam the notes on one staff when it's not required on the other.

```
\layout {
  \context {
    \PianoStaff
    \consists #Span_stem_engraver
  }
}

{
  \new PianoStaff <<
    \new Staff {
      <b d'>4 r d'16\> e'8. g8 r\!
      e'8 f' g'4 e'2
    }
    \new Staff {
      \clef bass
```

```
      \voiceOne
      \autoBeamOff
      \crossStaff { <e g>4 e, g16 a8. c8} d
      \autoBeamOn
      g8 f g4 c2
    }
  >>
}
```



For the time being, this engraver can not be specified by its name in double quotes, but rather prefixing its name with a hash symbol #, due to the way it is implemented.

Frammenti di codice selezionati

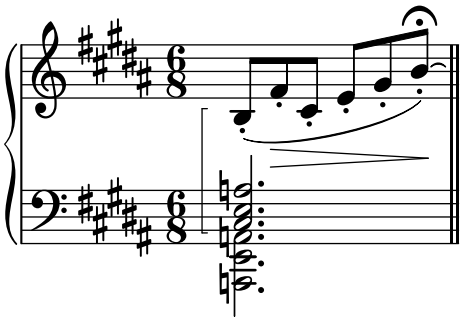
Indicating cross-staff chords with arpeggio bracket

An arpeggio bracket can indicate that notes on two different staves are to be played with the same hand. In order to do this, the PianoStaff must be set to accept cross-staff arpeggios and the arpeggios must be set to the bracket shape in the PianoStaff context.

(Debussy, Les collines d'Anacapri, m. 65)

```
\new PianoStaff <<
  \set PianoStaff.connectArpeggios = ##t
  \override PianoStaff.Arpeggio.stencil = #ly:arpeggio::brew-chord-bracket
  \new Staff {
    \relative c' {
      \key b \major
      \time 6/8
      b8-.(\arpeggio fis'-.\> cis-. e-. gis-. b-.)\!\fermata^\laissezVibrer
      \bar "||"
    }
  }
  \new Staff {
    \relative c' {
      \clef bass
      \key b \major
      <<
        {
          <a e cis>2.\arpeggio
        }
        \\
        {
          <a, e a,>2.
        }
      >>
    }
```

```
  }
>>
```



Vedi anche

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

Internals Reference: Sezione "Stem" in *Guida al Funzionamento Interno*.

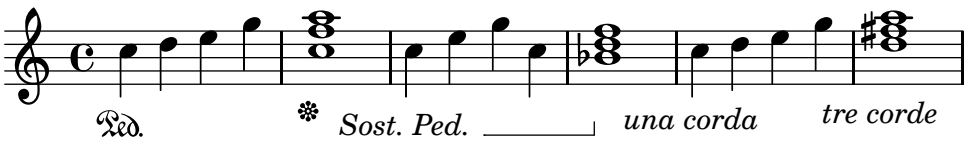
2.2.2 Piano

This section discusses notation issues that relate most directly to the piano.

Piano pedals

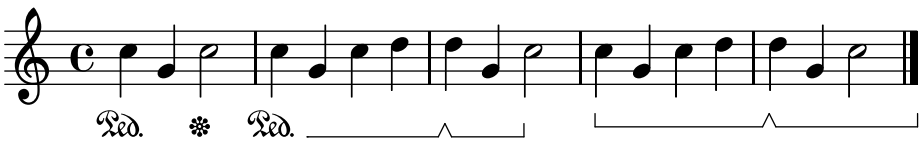
Pianos generally have three pedals that alter the way sound is produced: *sustain*, *sostenuto* (*sos.*), and *una corda* (*U.C.*). Sustain pedals are also found on vibraphones and celestas.

```
c4\sustainOn d e g
<c, f a>1\sustainOff
c4\sostenutoOn e g c,
<bes d f>1\sostenutoOff
c4\unaCorda d e g
<d fis a>1\treCorde
```



There are three styles of pedal indications: text, bracket, and mixed. The sustain pedal and the una corda pedal use the text style by default while the sostenuto pedal uses mixed by default.

```
c4\sustainOn g c2\sustainOff
\set Staff.pedalSustainStyle = #'mixed
c4\sustainOn g c d
d\sustainOff\sustainOn g, c2\sustainOff
\set Staff.pedalSustainStyle = #'bracket
c4\sustainOn g c d
d\sustainOff\sustainOn g, c2
\bar "|."
```



The placement of the pedal commands matches the physical movement of the sustain pedal during piano performance. Pedalling to the final bar line is indicated by omitting the final pedal off command.

Pedal indications may be placed in a `Dynamics` context, which aligns them on a horizontal line.

Vedi anche

Notation Reference: ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

Internals Reference: Sezione "SustainPedal" in *Guida al Funzionamento Interno*, Sezione "SustainPedalLineSpanner" in *Guida al Funzionamento Interno*, Sezione "SustainEvent" in *Guida al Funzionamento Interno*, Sezione "SostenutoPedal" in *Guida al Funzionamento Interno*, Sezione "SostenutoPedalLineSpanner" in *Guida al Funzionamento Interno*, Sezione "SostenutoEvent" in *Guida al Funzionamento Interno*, Sezione "UnaCordaPedal" in *Guida al Funzionamento Interno*, Sezione "UnaCordaPedalLineSpanner" in *Guida al Funzionamento Interno*, Sezione "UnaCordaEvent" in *Guida al Funzionamento Interno*, Sezione "PianoPedalBracket" in *Guida al Funzionamento Interno*, Sezione "Piano_pedal_engraver" in *Guida al Funzionamento Interno*.

2.2.3 Accordion

This section discusses notation that is unique to the accordion.

Discant symbols

Accordions are often built with more than one set of reeds that may be in unison with, an octave above, or an octave below the written pitch. Each accordion maker has different names for the *shifts* that select the various reed combinations, such as *oboe*, *musette*, or *bandonium*, so a system of symbols has come into use to simplify the performance instructions.

Frammenti di codice selezionati

Accordion-discant symbols

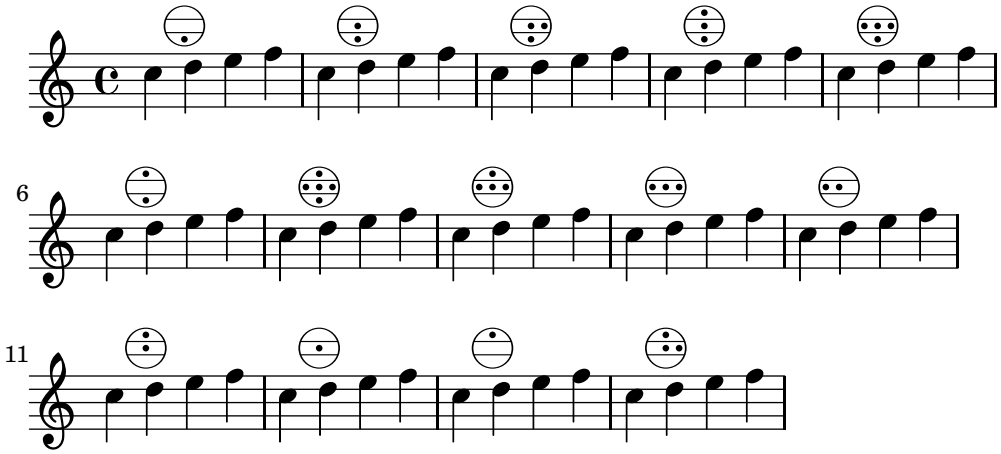
Accordion discant-specific symbols are added using `\markup`. The placement of the symbols can be tweaked by changing the `\translate-scaled` arguments. `\translate-scaled` is used here rather than `\translate` in order to let the positioning of the symbol parts adapt to changes of `font-size`.

```
discant = \markup {
  \musicglyph #"accordion.discant"
}
dot = \markup {
  \musicglyph #"accordion.dot"
}

\layout { ragged-right = ##t }

% 16 voets register
accBasson = ^\markup {
  \combine
  \discant
  \translate-scaled #'(0 . 0.5) \dot
}

% een korig 8 en 16 voets register
```

```
accBandon = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \translate-scaled #'(0 . 1.5) \dot
}

accVCello = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \combine
        \translate-scaled #'(0 . 1.5) \dot
        \translate-scaled #'(1 . 1.5) \dot
}

% 4-8-16 voets register
accHarmon = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \combine
        \translate-scaled #'(0 . 1.5) \dot
        \translate-scaled #'(0 . 2.5) \dot
}

accTrombon = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \combine
        \translate-scaled #'(0 . 1.5) \dot
        \combine
          \translate-scaled #'(1 . 1.5) \dot
          \translate-scaled #'(-1 . 1.5) \dot
}

% eenkorig 4 en 16 voets register
accOrgan = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \translate-scaled #'(0 . 2.5) \dot
}

accMaster = ^\markup {
  \combine
```

```
    \discant
    \combine
      \translate-scaled #'(0 . 0.5) \dot
      \combine
        \translate-scaled #'(0 . 1.5) \dot
        \combine
          \translate-scaled #'(1 . 1.5) \dot
          \combine
            \translate-scaled #'(-1 . 1.5) \dot
            \translate-scaled #'(0 . 2.5) \dot
}

accAccord = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 1.5) \dot
      \combine
        \translate-scaled #'(1 . 1.5) \dot
        \combine
          \translate-scaled #'(-1 . 1.5) \dot
          \translate-scaled #'(0 . 2.5) \dot
}

accMusette = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 1.5) \dot
      \combine
        \translate-scaled #'(1 . 1.5) \dot
        \translate-scaled #'(-1 . 1.5) \dot
}

accCeleste = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 1.5) \dot
      \translate-scaled #'(-1 . 1.5) \dot
}

accOboe = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 1.5) \dot
      \translate-scaled #'(0 . 2.5) \dot
}

accClarin = ^\markup {
  \combine
```

```
    \discant
    \translate-scaled #'(0 . 1.5) \dot
}

accPiccolo = ^\markup {
    \combine
       \discant
       \translate-scaled #'(0 . 2.5) \dot
}

accViolin = ^\markup {
  \combine
    \discant
    \combine
      \translate-scaled #'(0 . 1.5) \dot
      \combine
        \translate-scaled #'(1 . 1.5) \dot
        \translate-scaled #'(0 . 2.5) \dot
}

\relative c'' {
  c4 d\accBasson e f
  c4 d\accBandon e f
  c4 d\accVCello e f
  c4 d\accHarmon e f
  c4 d\accTrombon e f
  \break
  c4 d\accOrgan e f
  c4 d\accMaster e f
  c4 d\accAccord e f
  c4 d\accMusette e f
  c4 d\accCeleste e f
  \break
  c4 d\accOboe e f
  c4 d\accClarin e f
  c4 d\accPiccolo e f
  c4 d\accViolin e f
}
```



Vedi anche

Snippets: Sezione "Keyboards" in *Frammenti di codice*.

2.2.4 Harp

This section discusses notation issues that are unique to the harp.

References for harps

Some common characteristics of harp music are covered elsewhere:

- The glissando is the most characteristic harp technique, [Glissando], pagina 133.
- A *bisbigliando* is written as a tremelo ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.
- Natural harmonics are covered under [Harmonics], pagina 323.
- For directional arpeggios and non-arpeggios, see [Arpeggio], pagina 137.

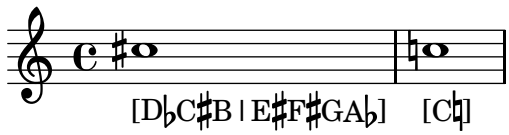
Vedi anche

Notation Reference: ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩, [Glissando], pagina 133, [Arpeggio], pagina 137, [Harmonics], pagina 323.

Harp pedals

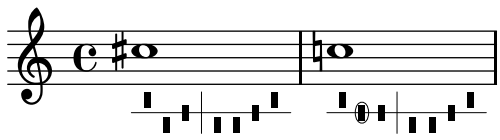
Harps have seven strings per octave that may be sounded at the natural, flattened, or sharpened pitch. In lever harps, each string is adjusted individually, but in pedal harps every string with the same pitch name is controlled by a single pedal. From the player's left to right, the pedals are D, C, and B on the left and E, F, G, and A on the right. The position of the pedals may be indicated with text marks:

```
\textLengthOn
cis1_\markup \concat \vcenter {
  [D \flat C \sharp B|E \sharp F \sharp G A \flat] }
c!1_\markup \concat \vcenter {
  [ C \natural ] }
```



or pedal diagrams:

```
\textLengthOn
cis1_\markup { \harp-pedal #"^v-|vv-^" }
c!1_\markup { \harp-pedal #"^o--|vv-^" }
```

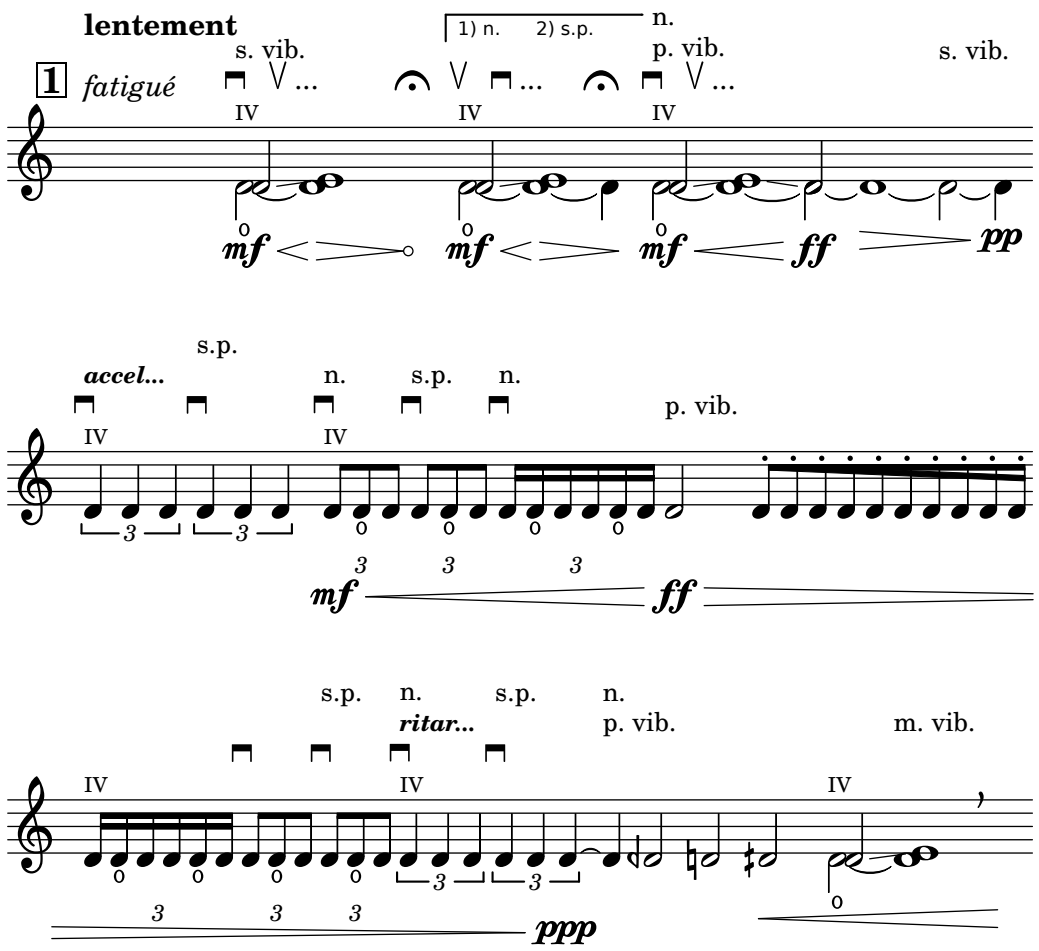


The `\harp-pedal` command accepts a string of characters, where `^` is the highest pedal position (flattened pitch), `-` is the middle pedal position (natural pitch), `v` is the lowest pedal position (sharpened pitch), and `|` is the divider. A prefixed `o` will circle the following pedal symbol.

Vedi anche

Notation Reference: [Text scripts], pagina 221, Sezione A.10.5 [Instrument Specific Markup], pagina 695.

2.3 Unfretted string instruments



This section provides information and references which are helpful when writing for unfretted string instruments, principally orchestral strings.

2.3.1 Common notation for unfretted strings

There is little specialist notation for unfretted string instruments. The music is notated on a single staff, and usually only a single voice is required. Two voices might be required for some double-stopped or divisi passages.

References for unfretted strings

Most of the notation which is useful for orchestral strings and other bowed instruments is covered elsewhere:

- Textual indications such as “pizz.” and “arco” are added as simple text – see [Text scripts], pagina 221.
- Fingerings, including the thumb indication, are described in [Fingering instructions], pagina 210.
- Double stopping is normally indicated by writing a chord, see ⟨undefined⟩ [Chorded notes], pagina ⟨undefined⟩. Directives for playing chords may be added, see [Arpeggio], pagina 137.
- Templates for string quartets can be found in Sezione “String quartet templates” in *Manuale di Apprendimento*. Others are shown in the snippets.

Vedi anche

Learning Manual: Sezione “String quartet templates” in *Manuale di Apprendimento*.

Notation Reference: [Text scripts], pagina 221, [Fingering instructions], pagina 210, ⟨undefined⟩ [Chorded notes], pagina ⟨undefined⟩, [Arpeggio], pagina 137.

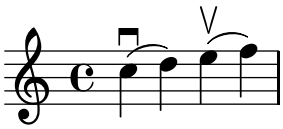
Snippets: Sezione “Unfretted strings” in *Frammenti di codice*.

Bowing indications

Bowing indications are created as articulations, which are described in ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

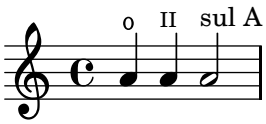
The bowing commands, `\upbow` and `\downbow`, are used with slurs as follows:

```
c4(\downbow d) e(\upbow f)
```



and the following example shows three ways in which an open A string on a violin might be indicated:

```
a4 \open
a^\markup { \teeny "II" }
a2^\markup { \small "sul A" }
```



Comandi predefiniti

`\downbow`, `\upbow`, `\open`.

Vedi anche

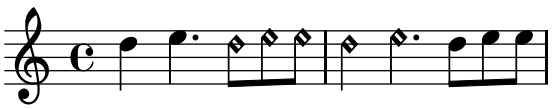
Notation Reference: ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩, ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.

Harmonics

Natural harmonics

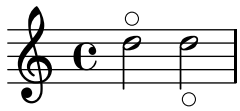
Natural harmonics can be notated in several ways. A diamond-shaped note head generally means to touch the string where you would stop the note if it were not a diamond.

```
d4 e4.
\harmonicsOn
d8 e e
d4 e4.
\harmonicsOff
d8 e e
```



Alternatively a normal note head is shown at the pitch to be sounded together with a small circle to indicate it should be played as a harmonic:

```
d2^\flageolet d_\flageolet
```



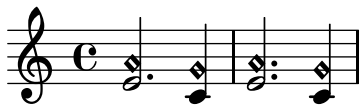
A smaller circle may be created, see the snippet list in [References for unfretted strings], pagina 322.

Artificial harmonics

Artificial harmonics are notated with two notes, one with a normal note head indicating the stopped position and one with an open diamond note head to indicate the harmonic position.

Artificial harmonics indicated with `\harmonic` do not show the dots. The context property `harmonicDots` should be set if dots are required.

```
<e a\harmonic>2.  <c g'\harmonic>4
\set harmonicDots = ##t
<e a\harmonic>2.  <c g'\harmonic>4
```



Nota: `\harmonic` **must** be placed inside a chord construct even if there is only a single note. Normally `\harmonicsOn` would be used in this situation.

Vedi anche

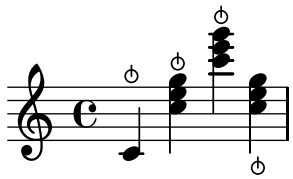
Music Glossary: Sezione “harmonics” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Special note heads], pagina ⟨undefined⟩, [References for unfretted strings], pagina 322.

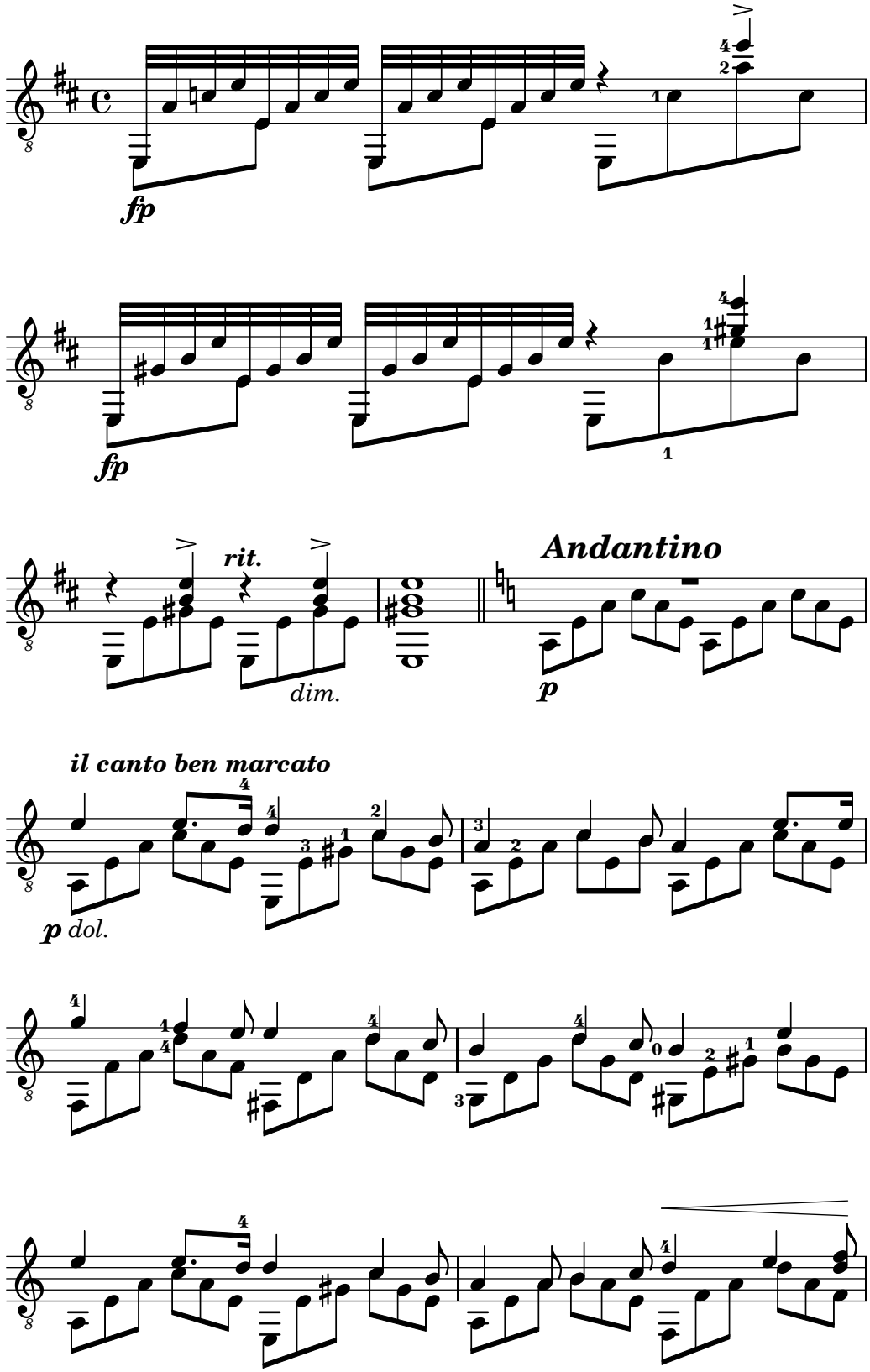
Snap (Bartók) pizzicato

A *snap pizzicato* (also known as “Bartok pizz”) is a type of pizzicato where the string is deliberately plucked upwards (rather than sideways) such that it hits the fingerboard.

```
c4\snappizzicato
<c' e g>4\snappizzicato
<c' e g>4^\snappizzicato
<c, e g>4_\snappizzicato
```



2.4 Fretted string instruments



This section discusses several aspects of music notation that are unique to fretted string instruments.

2.4.1 Common notation for fretted strings

This section discusses common notation that is unique to fretted string instruments.

References for fretted strings

Music for fretted string instruments is normally notated on a single staff, either in traditional music notation or in tablature. Sometimes the two types are combined, and it is especially common in popular music to use chord diagrams above a staff of traditional notation. The guitar and the banjo are transposing instruments, sounding an octave lower than written. Scores for these instruments should use the `"treble_8"` clef (or `\transposition c` to get correct MIDI output). Some other elements pertinent to fretted string instruments are covered elsewhere:

- Fingerings are indicated as shown in [Fingering instructions], pagina 210.
- Instructions for *Laissez vibrer* ties as well as ties on arpeggios and tremolos can be found in ⟨undefined⟩ [Ties], pagina ⟨undefined⟩.
- Instructions for handling multiple voices can be found in ⟨undefined⟩ [Collision resolution], pagina ⟨undefined⟩.
- Instructions for indicating harmonics can be found in [Harmonics], pagina 323.

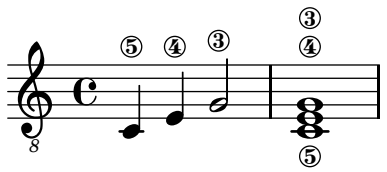
Vedi anche

Notation Reference: [Fingering instructions], pagina 210, ⟨undefined⟩ [Ties], pagina ⟨undefined⟩, ⟨undefined⟩ [Collision resolution], pagina ⟨undefined⟩, [Instrument names], pagina 197, ⟨undefined⟩ [Writing music in parallel], pagina ⟨undefined⟩, [Arpeggio], pagina 137, Sezione A.13 [List of articulations], pagina 712, ⟨undefined⟩ [Clef], pagina ⟨undefined⟩, ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩.

String number indications

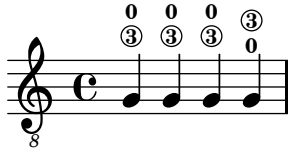
The string on which a note should be played may be indicated by appending `\number` to a note.

```
\clef "treble_8"
c4\5 e\4 g2\3
<c,\5 e\4 g\3>1
```



When fingerings and string indications are used together, their placement can be controlled by the order in which the two items appear in the code *only* if they appear inside of an explicit chord: applied to whole chords or single notes *outside* of chords, fingerings are placed using a different mechanism.

```
\clef "treble_8"
g4\3-0
g-0\3
<g\3-0>
<g-0\3>
```

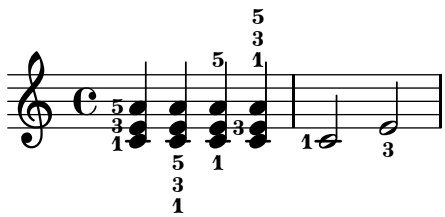


Frammenti di codice selezionati

Controlling the placement of chord fingerings

The placement of fingering numbers can be controlled precisely. For fingering orientation to apply, you must use a chord construct <> even if it is a single note.

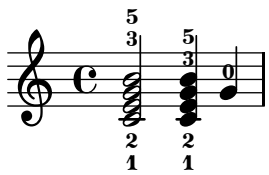
```
\relative c' {
  \set fingeringOrientations = #'(left)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(down)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(down right up)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(up)
  <c-1 e-3 a-5>4
  \set fingeringOrientations = #'(left)
  <c-1>2
  \set fingeringOrientations = #'(down)
  <e-3>2
}
```



Allowing fingerings to be printed inside the staff

By default, vertically oriented fingerings are positioned outside the staff. However, this behavior can be canceled. Note: you must use a chord construct <>, even if it is only a single note.

```
\relative c' {
  <c-1 e-2 g-3 b-5>2
  \override Fingering.staff-padding = #'()
  <c-1 e-2 g-3 b-5>4 <g'-0>
}
```



Vedi anche

Notation Reference: [Fingering instructions], pagina 210.

Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

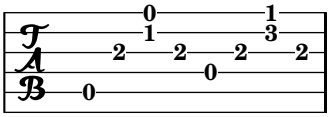
Internals Reference: Sezione “StringNumber” in *Guida al Funzionamento Interno*, Sezione “Fingering” in *Guida al Funzionamento Interno*.

Default tablatures

Music for plucked string instruments is frequently notated using a finger/touch notation or tablature. In contrast to traditional notation pitches are not denoted with note heads, but by numbers (or letter-like symbols in historical intavolatura). The staff lines in tablature indicate the string on which the note is to be played, and a number placed on a staff line indicated the fret at which the corresponding string is to be pressed. Notes that are to be played simultaneously are vertically aligned.

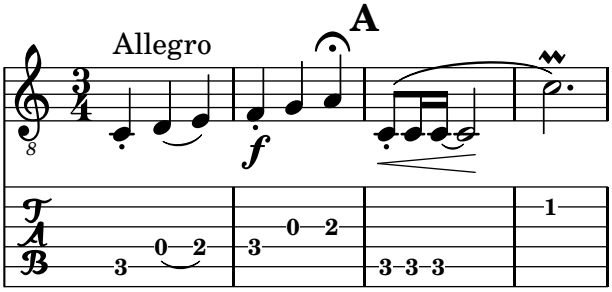
By default, string 1 is the highest string, and corresponds to the top line on the `TabStaff`. The tuning of the `TabStaff` strings defaults to the standard guitar tuning (with 6 strings). The notes are printed as tablature, by using `TabStaff` and `TabVoice` contexts. A calligraphic tablature clef is added automatically.

```
\new TabStaff \relative c' {
  a,8 a' <c e> a
  d,8 a' <d f> a
}
```



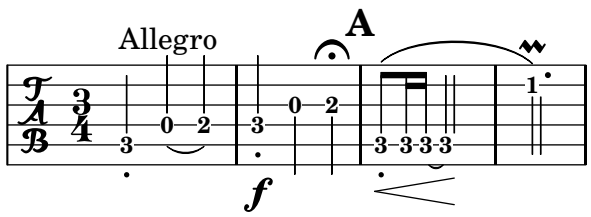
Default tablatures do not contain any symbols for tone duration nor any other musical symbols such as e.g. expressive marks.

```
symbols = {
  \time 3/4
  c4-.^"Allegro" d( e)
  f4-.\f g a^\fermata
  \mark \default
  c8_.\<\( c16 c~ c2\!
  c'2.\prall\)
}

\score {
  <<
    \new Staff { \clef "G_8" \symbols }
    \new TabStaff { \symbols }
  >>
}
```



If all musical symbols used in traditional notation should also show up in tablature one has to apply the command `\tabFullNotation` in a `TabStaff`-context. Please bear in mind that half notes are double-stemmed in tablature in order to distinguish them from quarter notes.

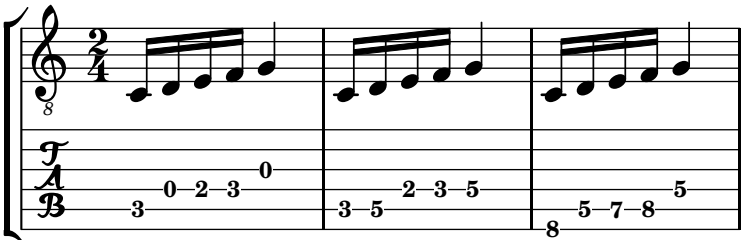
```
symbols = {
  \time 3/4
  c4-.^"Allegro" d( e)
  f4-.\f g a^\fermata
  \mark \default
  c8_.\<\( c16 c~ c2\!
  c'2.\prall\)
}

\score {
  \new TabStaff {
    \tabFullNotation
    \symbols
  }
}
```



By default pitches are assigned to the lowest playing position on the fret-board (first position). Open strings are automatically preferred. If you would like a certain pitch to be played on a specific string you can add a string number indication to the pitch name. If you don't want to have string number indications appear in traditional notation, you can override the respective stencil. Usually it will be more comfortable to define the playing position by using the value of `minimumFret`. The default value for minimumFret is 0.

Even when `minimumFret` is set, open strings are used whenever possible. This behaviour can be changed by setting `restrainOpenStrings` to `#t`.

```
\layout { \override Voice.StringNumber.stencil = ##f }
\new StaffGroup <<
   \new Staff \relative c {
     \clef "treble_8"
     \time 2/4
     c16 d e f g4
     c,16\5 d\5 e\4 f\4 g4\4
     c,16 d e f g4
   }
   \new TabStaff \relative c {
     c16 d e f g4
     c,16\5 d\5 e\4 f\4 g4\4
     \set TabStaff.minimumFret = #5
     \set TabStaff.restrainOpenStrings = ##t
     c,16 d e f g4
   }
>>
```

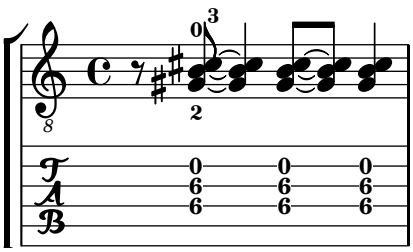


Chord constructs can be repeated by the chord repetition symbol `q`. In combination with tabulatures, its behavior of removing string and finger numbers alongside with other events is cumbersome, so you'll want to run

```
\chordRepeats #'(string-number-event fingering-event)
```

explicitly on music expressions in tabulature using ⟨undefined⟩ [Chord repetition], pagina ⟨undefined⟩. This particular command is so common that it is available as `\tabChordRepeats`.

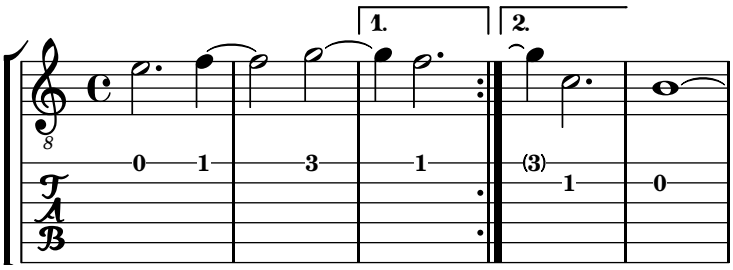
```
guitar = \relative c' {
  r8 <gis-2 cis-3 b-0>~ q4 q8~ q q4
}

\new StaffGroup <<
  \new Staff {
    \clef "treble_8"
    \guitar
  }
  \new TabStaff {
    \tabChordRepeats \guitar
  }
>>
```

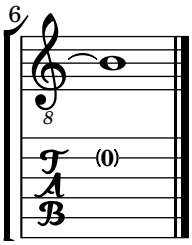


Ties over a line break are parenthesized by default. The same holds for the second alternative of a repeat.

```
ties = \relative c' {
  \repeat volta 2 {
    e2. f4~
    f2 g2~
  }
  \alternative {
     { g4 f2. }
     { g4\repeatTie c,2. }
  }
  b1~
  \break
  b1
  \bar "|."
}

\score {
```

```
  <<
    \new StaffGroup  <<
      \new Staff {
        \clef "treble_8"
        \ties
      }
      \new TabStaff {
        \ties
      }
    >>
  >>
  \layout {
  indent = #0
  ragged-right = ##t
  }
}
```

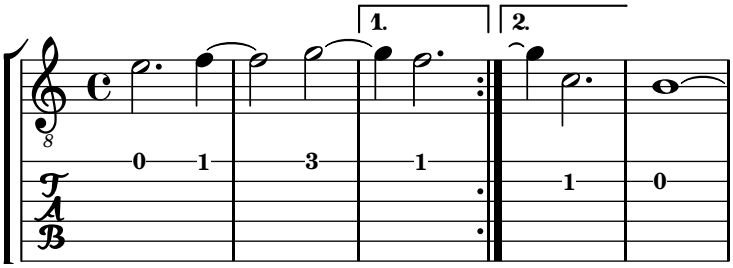


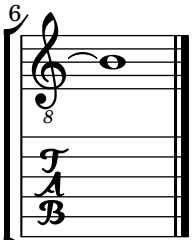


The command `\hideSplitTiedTabNotes` cancels the behavior of engraving fret numbers in parentheses:

```
ties = \relative c' {
  \repeat volta 2 {
    e2. f4~
    f2 g2~ }
  \alternative {
    { g4 f2. }
    { g4\repeatTie c,2. }
  }
  b1~
  \break
  b1
  \bar "|."
}

\score {
  <<
```

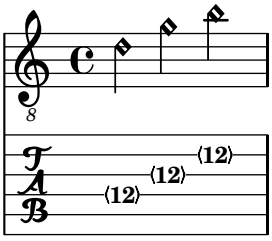
```
    \new StaffGroup  <<
      \new Staff {
        \clef "treble_8"
        \ties
      }
      \new TabStaff {
      \hideSplitTiedTabNotes
        \ties
      }
    >>
  >>
  \layout {
  indent = #0
  ragged-right = ##t
  }
}
```





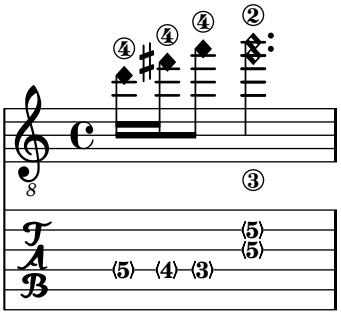
Harmonic indications can be added to tablature notation as sounding pitches:

```
\layout { \override Voice.StringNumber.stencil = ##f }
firstHarmonic = {
  d'4\4\harmonic
  g'4\3\harmonic
  b'2\2\harmonic
}
\score {
  <<
    \new Staff {
      \clef "treble_8"
      \firstHarmonic
    }
    \new TabStaff { \firstHarmonic }
  >>
}
```



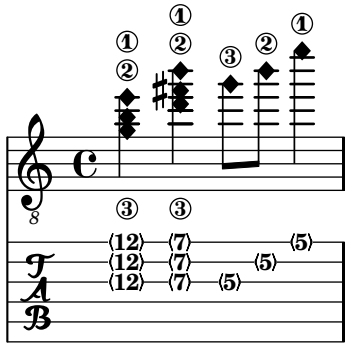
Note that the command `\harmonic` must always be attached to single notes (possibly inside of a chord) instead of whole chords. It only makes sense for open-string harmonics in the 12th fret. All other harmonics should be calculated by LilyPond. This can be achieved by indicating the fret where a finger of the fretting hand should touch a string.

```
fretHarmonics = {
  \harmonicByFret #5 d16\4
  \harmonicByFret #4 d16\4
  \harmonicByFret #3 d8\4
  \harmonicByFret #5 <g\3 b\2>2.
}
\score {
  <<
    \new Staff {
      \clef "treble_8"
      \fretHarmonics
    }
    \new TabStaff { \fretHarmonics }
  >>
}
```



Alternatively, harmonics can be computed by defining the ratio of string lengths above and below the harmonic fingering.

```
ratioHarmonics = {
  \harmonicByRatio #1/2 <g\3 b\2 e'\1>4
  \harmonicByRatio #1/3 <g\3 b\2 e'\1>4
  \harmonicByRatio #1/4 { g8\3 b8\2 e'4\1 }
}
\score {
  <<
    \new Staff {
      \clef "treble_8"
      \ratioHarmonics
    }
    \new TabStaff { \ratioHarmonics }
  >>
}
```

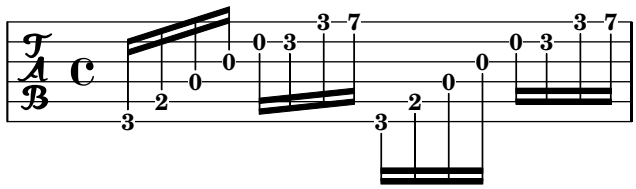


Frammenti di codice selezionati

Stem and beam behavior in tablature

The direction of stems is controlled the same way in tablature as in traditional notation. Beams can be made horizontal, as shown in this example.

```
\new TabStaff {
  \relative c {
    \tabFullNotation
    g16 b d g b d g b
    \stemDown
    \override Beam.concaveness = #10000
    g,,16 b d g b d g b
  }
}
```

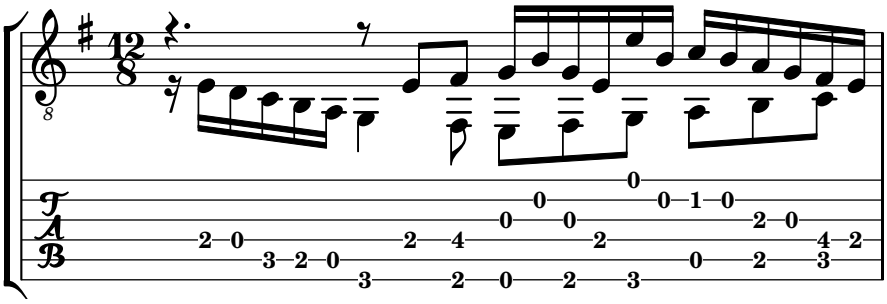


Polyphony in tablature

Polyphony is created the same way in a `TabStaff` as in a regular staff.

```
upper = \relative c' {
  \time 12/8
  \key e \minor
  \voiceOne
  r4. r8 e, fis g16 b g e e' b c b a g fis e
}

lower = \relative c {
  \key e \minor
  \voiceTwo
  r16 e d c b a g4 fis8 e fis g a b c
}

\score {
  <<
    \new StaffGroup = "tab with traditional" <<
      \new Staff = "guitar traditional" <<
        \clef "treble_8"
        \context Voice = "upper" \upper
        \context Voice = "lower" \lower
```

```
      >>
      \new TabStaff = "guitar tab" <<
        \context TabVoice = "upper" \upper
        \context TabVoice = "lower" \lower
      >>
    >>
  >>
}
```

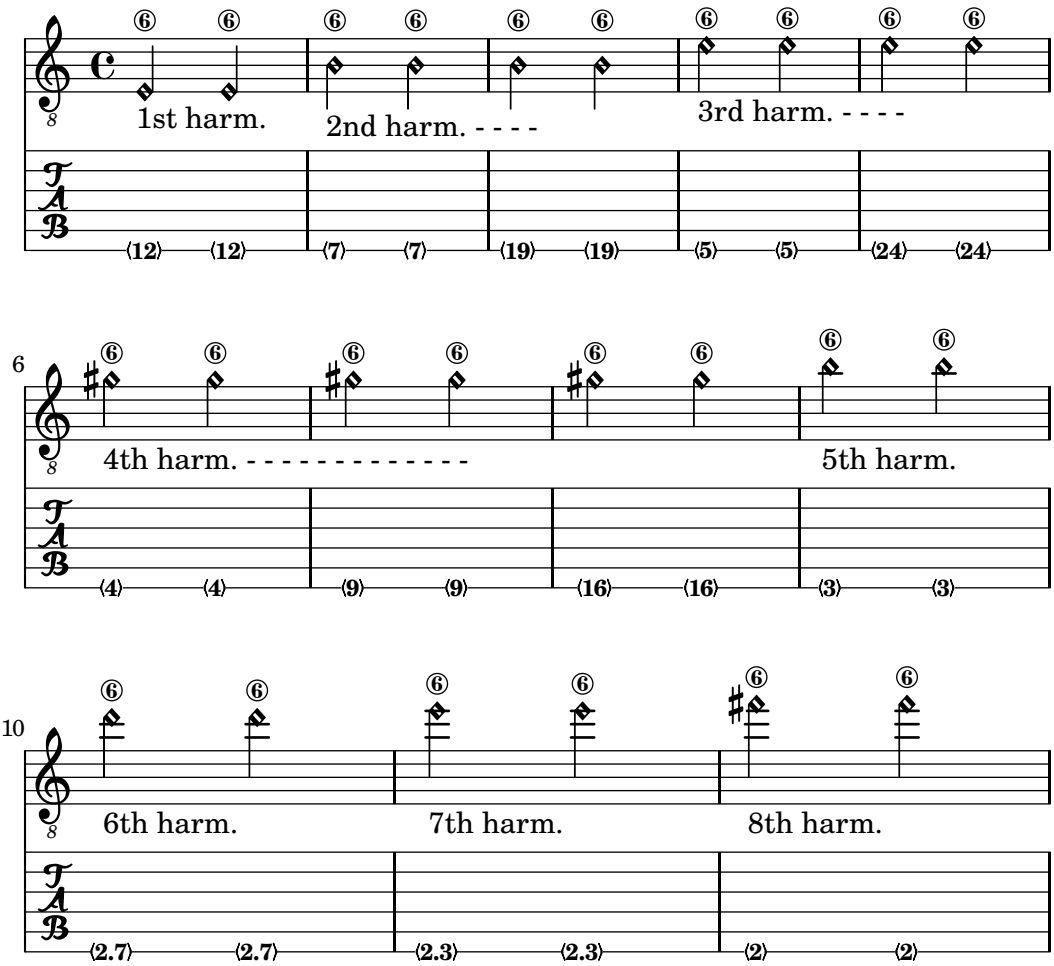


Open string harmonics in tablature

This snippet demonstrates open-string harmonics

```
openStringHarmonics = {
  %first harmonic
  \harmonicByFret #12 e,2\6_\markup{"1st harm."}
  \harmonicByRatio #1/2 e,\6
  %second harmonic
  \harmonicByFret #7 e,\6_\markup{"2nd harm. - - - -"}
  \harmonicByRatio #1/3 e,\6
  \harmonicByFret #19 e,\6
  \harmonicByRatio #2/3 e,\6
  %\harmonicByFret #19 < e,\6 a,\5 d\4 >
  %\harmonicByRatio #2/3 < e,\6 a,\5 d\4 >
  %third harmonic
  \harmonicByFret #5 e,\6_\markup{"3rd harm. - - - -"}
  \harmonicByRatio #1/4 e,\6
  \harmonicByFret #24 e,\6
  \harmonicByRatio #3/4 e,\6
  \break
  %fourth harmonic
  \harmonicByFret #4 e,\6_\markup{"4th harm. - - - - - - - - - - - - -"}
  \harmonicByRatio #1/5 e,\6
  \harmonicByFret #9 e,\6
  \harmonicByRatio #2/5 e,\6
  \harmonicByFret #16 e,\6
  \harmonicByRatio #3/5 e,\6
  %fifth harmonic
  \harmonicByFret #3 e,\6_\markup{"5th harm."}
  \harmonicByRatio #1/6 e,\6
  \break
  %sixth harmonic
  \harmonicByFret #2.7 e,\6_\markup{"6th harm."}
  \harmonicByRatio #1/7 e,\6
```

```
  %seventh harmonic
  \harmonicByFret #2.3 e,\6_\markup{"7th harm."}
  \harmonicByRatio #1/8 e,\6
  %eighth harmonic
  \harmonicByFret #2 e,\6_\markup{"8th harm."}
  \harmonicByRatio #1/9 e,\6
}

\score {
  <<
    \new Staff {
      \new Voice {
        \clef "treble_8"
        \openStringHarmonics
      }
    }
    \new TabStaff {
      \new TabVoice {
        \openStringHarmonics
      }
    }
  >>
}
```

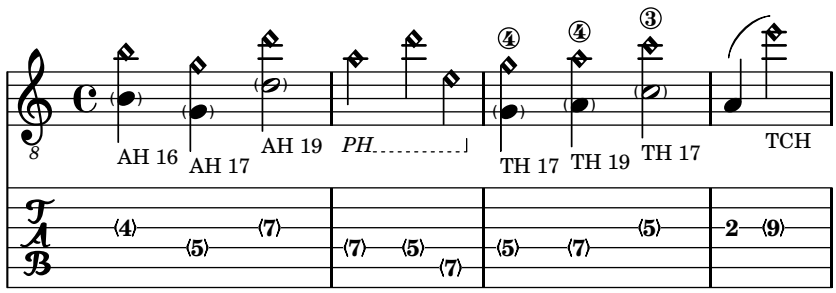


Fretted-string harmonics in tablature

Demonstrates fretted-string harmonics in tablature

```
pinchedHarmonics = {
   \textSpannerDown
   \override TextSpanner.bound-details.left.text =
      \markup {\halign #-0.5 \teeny "PH" }
      \override TextSpanner.style =
         #'dashed-line
   \override TextSpanner.dash-period = #0.6
   \override TextSpanner.bound-details.right.attach-dir = #1
   \override TextSpanner.bound-details.right.text =
      \markup { \draw-line #'(0 . 1) }
   \override TextSpanner.bound-details.right.padding = #-0.5
}

harmonics = {
  %artificial harmonics (AH)
  \textLengthOn
  <\parenthesize b b'\harmonic>4_\markup{ \teeny "AH 16" }
  <\parenthesize g g'\harmonic>4_\markup{ \teeny "AH 17" }
  <\parenthesize d' d''\harmonic>2_\markup{ \teeny "AH 19" }
  %pinched harmonics (PH)
  \pinchedHarmonics
  <a'\harmonic>2\startTextSpan
  <d''\harmonic>4
  <e'\harmonic>4\stopTextSpan
  %tapped harmonics (TH)
  <\parenthesize g\4 g'\harmonic>4_\markup{ \teeny "TH 17" }
  <\parenthesize a\4 a'\harmonic>4_\markup{ \teeny "TH 19" }
  <\parenthesize c'\3 c''\harmonic>2_\markup{ \teeny "TH 17" }
  %touch harmonics (TCH)
  a4( <e''\harmonic>2. )_\markup{ \teeny "TCH" }
}

frettedStrings = {
  %artificial harmonics (AH)
  \harmonicByFret #4 g4\3
  \harmonicByFret #5 d4\4
  \harmonicByFret #7 g2\3
  %pinched harmonics (PH)
  \harmonicByFret #7 d2\4
  \harmonicByFret #5 d4\4
  \harmonicByFret #7 a4\5
  %tapped harmonics (TH)
  \harmonicByFret #5 d4\4
  \harmonicByFret #7 d4\4
  \harmonicByFret #5 g2\3
  %touch harmonics (TCH)
  a4 \harmonicByFret #9 g2.\3
}
```

```
\score {
  <<
    \new Staff {
      \new Voice {
        \clef "treble_8"
        \harmonics
      }
    }
    \new TabStaff {
      \new TabVoice {
        \frettedStrings
      }
    }
  >>
}
```

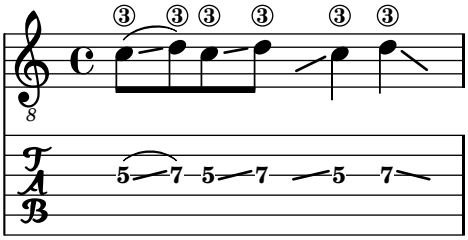


Slides in tablature

Slides can be typeset in both `Staff` and `TabStaff` contexts:

```
slides = {
  c'8\3(\glissando d'8\3)
  c'8\3\glissando d'8\3
  \hideNotes
  \grace { g16\glissando }
  \unHideNotes
  c'4\3
  \afterGrace d'4\3\glissando {
  \stemDown \hideNotes
  g16 }
  \unHideNotes
}

\score {
  <<
    \new Staff { \clef "treble_8" \slides }
    \new TabStaff { \slides }
  >>
  \layout {
    \context {
      \Score
      \override Glissando.minimum-length = #4
      \override Glissando.springs-and-rods =
                          #ly:spanner::set-spacing-rods
```

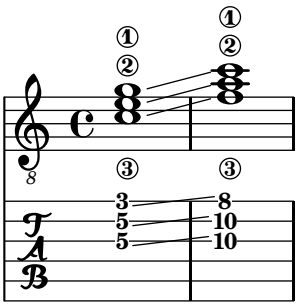
```
      \override Glissando.thickness = #2
    }
  }
}
```



Chord glissando in tablature

Slides for chords can be indicated in both `Staff` and `TabStaff`. String numbers are necessary for `TabStaff` because automatic string calculations are different for chords and for single notes.

```
myMusic = \relative c' {
  <c\3 e\2 g\1>1 \glissando <f\3 a\2 c\1>
}

\score {
  <<
    \new Staff {
      \clef "treble_8"
      \myMusic
    }
    \new TabStaff {
      \myMusic
    }
  >>
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Chord repetition], pagina ⟨undefined⟩, [Glissando], pagina 133, [Harmonics], pagina 323, [Stems], pagina 215, ⟨undefined⟩ [Written-out repeats], pagina ⟨undefined⟩.

Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

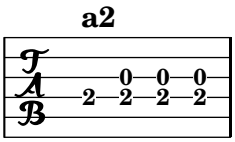
Internals Reference: Sezione “TabNoteHead” in *Guida al Funzionamento Interno*, Sezione “TabStaff” in *Guida al Funzionamento Interno*, Sezione “TabVoice” in *Guida al Funzionamento Interno*, Sezione “Beam” in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Chords are not handled in a special way, and hence the automatic string selector may easily select the same string for two notes in a chord.

In order to handle `\partcombine`, a `TabStaff` must use specially-created voices:

```
melodia = \partcombine { e4 g g g } { e4 e e e }
<<
  \new TabStaff <<
    \new TabVoice = "one" s1
    \new TabVoice = "two" s1
    \new TabVoice = "shared" s1
    \new TabVoice = "solo" s1
    { \melodia }
  >>
>>
```



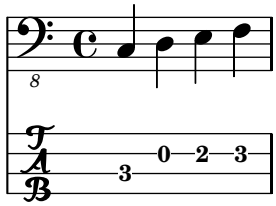
Guitar special effects are limited to harmonics and slides.

Custom tablatures

LilyPond tablature automatically calculates the fret for a note based on the string to which the note is assigned. In order to do this, the tuning of the strings must be specified. The tuning of the strings is given in the `stringTunings` property.

LilyPond comes with predefined string tunings for banjo, mandolin, guitar, bass guitar, ukulele, violin, viola, cello, and double bass. LilyPond automatically sets the correct transposition for predefined tunings. The following example is for bass guitar, which sounds an octave lower than written.

```
<<
  \new Voice \with {
    \override StringNumber.stencil = ##f
  } {
    \clef "bass_8"
    \relative c, {
      c4 d e f
    }
  }
  \new TabStaff \with {
    stringTunings = #bass-tuning
  } {
    \relative c, {
      c4 d e f
    }
  }
>>
```

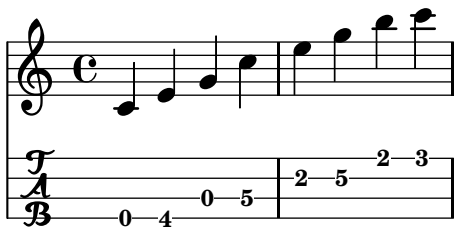


The default string tuning is `guitar-tuning`, which is the standard EADGBE tuning. Some other predefined tunings are `guitar-open-g-tuning`, `mandolin-tuning` and `banjo-open-g-tuning`. The predefined string tunings are found in '`ly/string-tunings-init.ly`'.

Any desired string tuning can be created. The `\stringTuning` function can be used to define a string tuning which can be used to set `stringTunings` for the current context.

Its argument is a chord construct defining the pitches of each string in the tuning. The chord construct must be in absolute octave mode, see ⟨undefined⟩ [Absolute octave entry], pagina ⟨undefined⟩. The string with the highest number (generally the lowest string) must come first in the chord. For example, we can define a string tuning for a four-string instrument with pitches of `a''`, `d''`, `g'`, and `c'`:

```
mynotes = {
  c'4 e' g' c'' |
  e''4 g'' b'' c'''
}

<<
  \new Staff {
    \clef treble
    \mynotes
  }
  \new TabStaff {
    \set Staff.stringTunings = \stringTuning <c' g' d'' a''>
    \mynotes
  }
>>
```



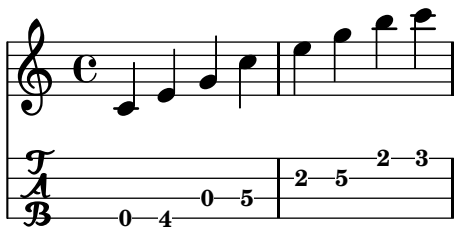
The `stringTunings` property is also used by `FretBoards` to calculate automatic fret diagrams.

String tunings are used as part of the hash key for predefined fret diagrams (see [Predefined fret diagrams], pagina 352).

The previous example could also be written as follows:

```
custom-tuning = \stringTuning <c' g' d'' a''>

mynotes = {
  c'4 e' g' c'' |
  e''4 g'' b'' c'''
}
```

```
<<
  \new Staff {
    \clef treble
    \mynotes
  }
  \new TabStaff {
    \set TabStaff.stringTunings = #custom-tuning
    \mynotes
  }
>>
```



Internally, a string tuning is a Scheme list of string pitches, one for each string, ordered by string number from 1 to N, where string 1 is at the top of the tablature staff and string N is at the bottom. This ordinarily results in ordering from highest pitch to lowest pitch, but some instruments (e.g. ukulele) do not have strings ordered by pitch.

A string pitch in a string tuning list is a LilyPond pitch object. Pitch objects are created with the Scheme function `ly:make-pitch` (see Sezione A.21 [Scheme functions], pagina 759).

`\stringTuning` creates such an object from chord input.

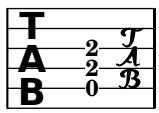
LilyPond automatically calculates the number of lines in the `TabStaff` and the number of strings in an automatically calculated `FretBoard` as the number of elements in `stringTunings`.

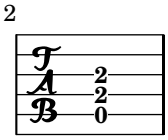
To let all TabStaff contexts use the same custom tuning by default, you can use

```
\layout {
  \context {
    \TabStaff
    stringTunings = \stringTuning \notemode { <c' g' d'' a''> }
  }
}
```

A modern tab clef can also be used.

```
\new TabStaff {
  \clef moderntab
  <a, e a>1
  \break
  \clef tab
  <a, e a>1
}
```





The modern tab clef supports tablatures from 4 to 7 strings.

Vedi anche

Notation Reference: ⟨undefined⟩ [Absolute octave entry], pagina ⟨undefined⟩, [Predefined fret diagrams], pagina 352, Sezione A.21 [Scheme functions], pagina 759.

Installed Files: '`ly/string-tunings-init.ly`', '`scm/tablature.scm`'.

Snippets: Sezione "Fretted strings" in *Frammenti di codice*.

Internals Reference: Sezione "Tab_note_heads_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

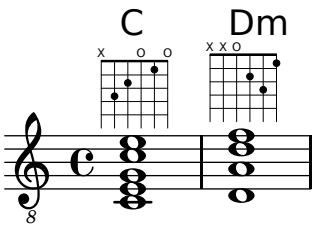
Automatic tablature calculations do not work properly in most cases for instruments where string pitches do not vary monotonically with string number, such as ukuleles.

Fret diagram markups

Fret diagrams can be added to music as a markup to the desired note. The markup contains information about the desired fret diagram. There are three different fret-diagram markup interfaces: standard, terse, and verbose. The three interfaces produce equivalent markups, but have varying amounts of information in the markup string. Details about the syntax of the different markup strings used to define fret diagrams are found at Sezione A.10.5 [Instrument Specific Markup], pagina 695.

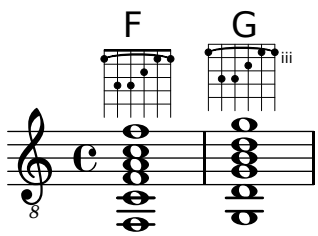
The standard fret diagram markup string indicates the string number and the fret number for each dot to be placed on the string. In addition, open and unplayed (muted) strings can be indicated.

```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram #"6-x;5-3;4-2;3-o;2-1;1-o;"
    }
    <d a d' f'>1^\markup {
      \fret-diagram #"6-x;5-x;4-o;3-2;2-3;1-1;"
    }
  }
>>
```



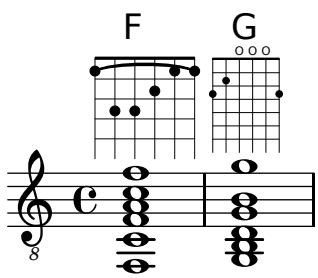
Barre indications can be added to the diagram from the fret-diagram markup string.

```
<<
  \new ChordNames {
     \chordmode {
       f1 g
     }
  }
  \new Staff {
    \clef "treble_8"
    <f, c f a c' f'>1^\markup {
      \fret-diagram #"c:6-1-1;6-1;5-3;4-3;3-2;2-1;1-1;"
    }
    <g, d g b d' g'>1^\markup {
      \fret-diagram #"c:6-1-3;6-3;5-5;4-5;3-4;2-3;1-3;"
    }
  }
>>
```



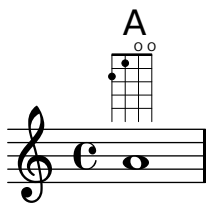
The size of the fret diagram, and the number of frets in the diagram can be changed in the fret-diagram markup string.

```
<<
  \new ChordNames {
     \chordmode {
       f1 g
     }
  }
  \new Staff {
    \clef "treble_8"
    <f, c f a c' f'>1^\markup {
      \fret-diagram #"s:1.5;c:6-1-1;6-1;5-3;4-3;3-2;2-1;1-1;"
    }
    <g, b, d g b g'>1^\markup {
      \fret-diagram #"h:6;6-3;5-2;4-o;3-o;2-o;1-3;"
    }
  }
>>
```



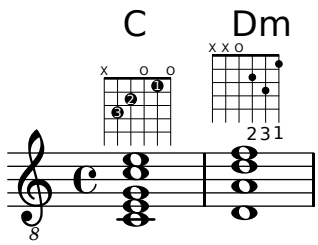
The number of strings in a fret diagram can be changed to accommodate different instruments such as banjos and ukuleles with the fret-diagram markup string.

```
<<
  \new ChordNames {
    \chordmode {
      a1
    }
  }
  \new Staff {
    % An 'A' chord for ukulele
    a'1^\markup {
      \fret-diagram #"w:4;4-2-2;3-1-1;2-o;1-o;"
    }
  }
>>
```



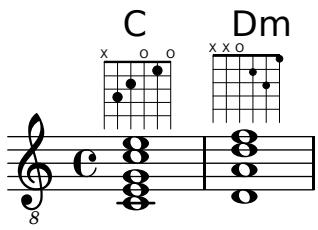
Fingering indications can be added, and the location of fingering labels can be controlled by the fret-diagram markup string.

```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram #"f:1;6-x;5-3-3;4-2-2;3-o;2-1-1;1-o;"
    }
    <d a d' f'>1^\markup {
      \fret-diagram #"f:2;6-x;5-x;4-o;3-2-2;2-3-3;1-1-1;"
    }
  }
>>
```



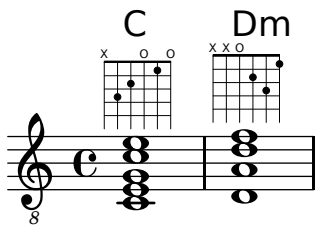
Dot radius and dot position can be controlled with the fret-diagram markup string.

```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram #"d:0.35;6-x;5-3;4-2;3-o;2-1;1-o;"
    }
    <d a d' f'>1^\markup {
      \fret-diagram #"p:0.2;6-x;5-x;4-o;3-2;2-3;1-1;"
    }
  }
>>
```



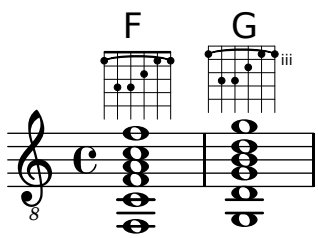
The fret-diagram-terse markup string omits string numbers; the string number is implied by the presence of semicolons. There is one semicolon for each string in the diagram. The first semicolon corresponds to the highest string number and the last semicolon corresponds to the first string. Mute strings, open strings, and fret numbers can be indicated.

```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram-terse #"x;3;2;o;1;o;"
    }
    <d a d' f'>1^\markup {
      \fret-diagram-terse #"x;x;o;2;3;1;"
    }
  }
>>
```



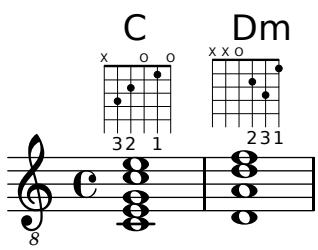
Barre indicators can be included in the fret-diagram-terse markup string.

```
<<
  \new ChordNames {
    \chordmode {
      f1 g
    }
  }
  \new Staff {
    \clef "treble_8"
    <f, c f a c' f'>1^\markup {
      \fret-diagram-terse #"1-(;3;3;2;1;1-);"
    }
    <g, d g b d' g'>1^\markup {
      \fret-diagram-terse #"3-(;5;5;4;3;3-);"
    }
  }
>>
```



Fingering indications can be included in the fret-diagram-terse markup string.

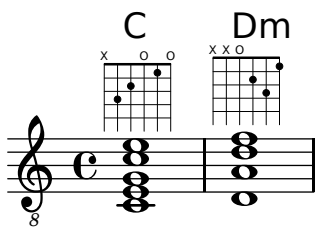
```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new Staff {
    \override Voice.TextScript.fret-diagram-details.finger-code = #'below-string
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram-terse #"x;3-3;2-2;o;1-1;o;"
    }
    <d a d' f'>1^\markup {
      \fret-diagram-terse #"x;x;o;2-2;3-3;1-1;"
    }
  }
>>
```



Other fret diagram properties must be adjusted using `\override` when using the fret-diagram-terse markup.

The fret-diagram-verbose markup string is in the format of a Scheme list. Each element of the list indicates an item to be placed on the fret diagram.

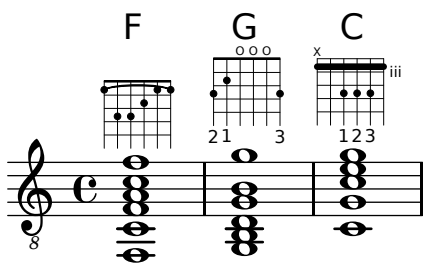
```
<<
    \new ChordNames {
      \chordmode {
        c1 d:m
      }
    }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1^\markup {
      \fret-diagram-verbose #'(
        (mute 6)
        (place-fret 5 3)
        (place-fret 4 2)
        (open 3)
        (place-fret 2 1)
        (open 1)
      )
    }
    <d a d' f'>1^\markup {
      \fret-diagram-verbose #'(
        (mute 6)
        (mute 5)
        (open 4)
        (place-fret 3 2)
        (place-fret 2 3)
        (place-fret 1 1)
      )
    }
  }
>>
```



Fingering indications and barres can be included in a fret-diagram-verbose markup string. Unique to the fret-diagram-verbose interface is a capo indication that can be placed on the fret diagram. The capo indication is a thick bar that covers all strings. The fret with the capo will be the lowest fret in the fret diagram.

```
<<
    \new ChordNames {
      \chordmode {
        f1 g c
      }
```

```
    }
  \new Staff {
    \clef "treble_8"
    \override Voice.TextScript.fret-diagram-details.finger-code = #'below-string
    <f, c f a c' f'>1^\markup {
      \fret-diagram-verbose #'(
        (place-fret 6 1)
        (place-fret 5 3)
        (place-fret 4 3)
        (place-fret 3 2)
        (place-fret 2 1)
        (place-fret 1 1)
        (barre 6 1 1)
      )
    }
    <g, b, d g b g'>1^\markup {
      \fret-diagram-verbose #'(
        (place-fret 6 3 2)
        (place-fret 5 2 1)
        (open 4)
        (open 3)
        (open 2)
        (place-fret 1 3 3)
      )
    }
    <c g c' e' g'>1^\markup {
      \fret-diagram-verbose #'(
        (capo 3)
        (mute 6)
        (place-fret 4 5 1)
        (place-fret 3 5 2)
        (place-fret 2 5 3)
      )
    }
  }
>>
```



All other fret diagram properties must be adjusted using `\override` when using the fret-diagram-verbose markup.

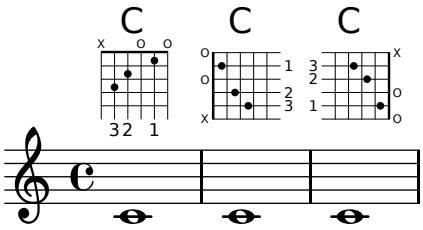
The graphical layout of a fret diagram can be customized according to user preference through the properties of the `fret-diagram-interface`. Details are found at Sezione "fret-diagram-interface" in *Guida al Funzionamento Interno*. For a fret diagram markup, the interface properties belong to `Voice.TextScript`.

Frammenti di codice selezionati

Changing fret orientations

Fret diagrams can be oriented in three ways. By default the top string or fret in the different orientations will be aligned.

```
\include "predefined-guitar-fretboards.ly"

<<
  \chords {
    c1
    c1
    c1
  }
  \new FretBoards {
    \chordmode {
      c1
      \override FretBoard.fret-diagram-details.orientation =
        #'landscape
      c1
      \override FretBoard.fret-diagram-details.orientation =
        #'opposing-landscape
      c1
    }
  }
  \new Voice {
    c'1
    c'1
    c'
  }
>>
```



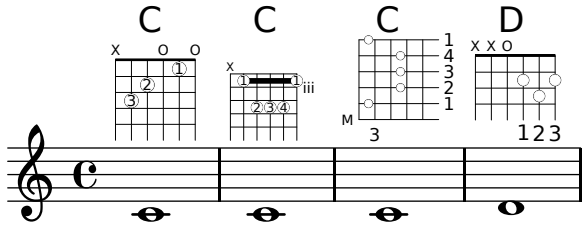
Customizing markup fret diagrams

Fret diagram properties can be set through `'fret-diagram-details`. For markup fret diagrams, overrides can be applied to the `Voice.TextScript` object or directly to the markup.

```
<<
  \chords { c1 | c | c | d }

  \new Voice = "mel" {
    \textLengthOn
    % Set global properties of fret diagram
    \override TextScript.size = #'1.2
    \override TextScript.fret-diagram-details.finger-code = #'in-dot
    \override TextScript.fret-diagram-details.dot-color = #'white

    %% C major for guitar, no barre, using defaults
```

```
   % terse style
c'1^\markup { \fret-diagram-terse #"x;3-3;2-2;o;1-1;o;" }

%% C major for guitar, barred on third fret
   % verbose style
   % size 1.0
   % roman fret label, finger labels below string, straight barre
c'1^\markup {
  % standard size
  \override #'(size . 1.0) {
    \override #'(fret-diagram-details . (
                 (number-type . roman-lower)
                 (finger-code . in-dot)
                 (barre-type . straight))) {
      \fret-diagram-verbose #'((mute 6)
                               (place-fret 5 3 1)
                               (place-fret 4 5 2)
                               (place-fret 3 5 3)
                               (place-fret 2 5 4)
                               (place-fret 1 3 1)
                               (barre 5 1 3))
    }
  }
}

%% C major for guitar, barred on third fret
   % verbose style
   % landscape orientation, arabic numbers, M for mute string
   % no barre, fret label down or left, small mute label font
c'1^\markup {
  \override #'(fret-diagram-details . (
               (finger-code . below-string)
               (number-type . arabic)
               (label-dir . -1)
               (mute-string . "M")
               (orientation . landscape)
               (barre-type . none)
               (xo-font-magnification . 0.4)
               (xo-padding . 0.3))) {
    \fret-diagram-verbose #'((mute 6)
                             (place-fret 5 3 1)
                             (place-fret 4 5 2)
                             (place-fret 3 5 3)
                             (place-fret 2 5 4)
                             (place-fret 1 3 1)
                             (barre 5 1 3))
  }
}

%% simple D chord
   % terse style
   % larger dots, centered dots, fewer frets
```

```
      % label below string
    d'1^\markup {
      \override #'(fret-diagram-details . (
                   (finger-code . below-string)
                   (dot-radius . 0.35)
                   (dot-position . 0.5)
                   (fret-count . 3))) {
        \fret-diagram-terse #"x;x;o;2-1;3-2;2-3;"
      }
    }
  }
>>
```



Vedi anche

Notation Reference: Sezione A.10.5 [Instrument Specific Markup], pagina 695.

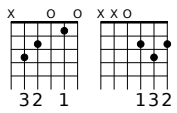
Snippets: Sezione "Fretted strings" in *Frammenti di codice*.

Internals Reference: Sezione "fret-diagram-interface" in *Guida al Funzionamento Interno*.

Predefined fret diagrams

Fret diagrams can be displayed using the `FretBoards` context. By default, the `FretBoards` context will display fret diagrams that are stored in a lookup table:

```
\include "predefined-guitar-fretboards.ly"
\new FretBoards {
  \chordmode {
    c1 d
  }
}
```

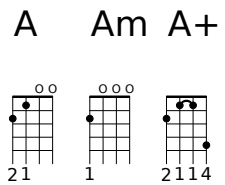


The default predefined fret diagrams are contained in the file '`predefined-guitar-fretboards.ly`'. Fret diagrams are stored based on the pitches of a chord and the value of `stringTunings` that is currently in use. '`predefined-guitar-fretboards.ly`' contains predefined fret diagrams only for `guitar-tuning`. Predefined fret diagrams can be added for other instruments or other tunings by following the examples found in '`predefined-guitar-fretboards.ly`'.

Fret diagrams for the ukulele are contained in the file '`predefined-ukulele-fretboards.ly`'.

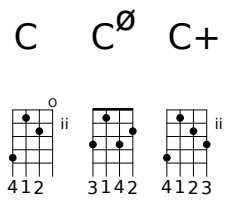
```
\include "predefined-ukulele-fretboards.ly"

myChords = \chordmode { a1 a:m a:aug }
```

```
\new ChordNames {
  \myChords
}

\new FretBoards {
  \set Staff.stringTunings = #ukulele-tuning
  \myChords
}
```



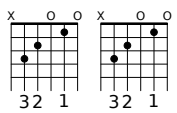
Fret diagrams for the mandolin are contained in the file ‘`predefined-mandolin-fretboards.ly`’.

```
\include "predefined-mandolin-fretboards.ly"

myChords = \chordmode { c1 c:m7.5- c:aug }

\new ChordNames {
  \myChords
}

\new FretBoards {
  \set Staff.stringTunings = #mandolin-tuning
  \myChords
}
```



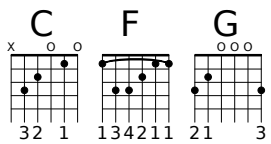
Chord pitches can be entered either as simultaneous music or using chord mode (see [Chord mode overview], pagina 393).

```
\include "predefined-guitar-fretboards.ly"
\new FretBoards {
  \chordmode { c1 }
  <c' e' g'>1
}
```



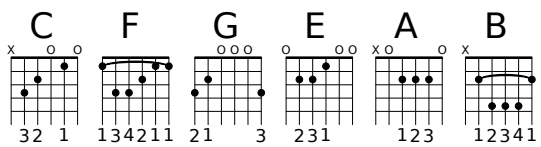
It is common that both chord names and fret diagrams are displayed together. This is achieved by putting a `ChordNames` context in parallel with a `FretBoards` context and giving both contexts the same music.

```
\include "predefined-guitar-fretboards.ly"
mychords = \chordmode{
  c1 f g
}

<<
  \new ChordNames {
    \mychords
  }
  \new FretBoards {
    \mychords
  }
>>
```



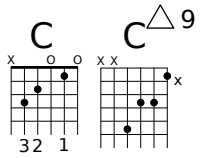
Predefined fret diagrams are transposable, as long as a diagram for the transposed chord is stored in the fret diagram table.

```
\include "predefined-guitar-fretboards.ly"
mychords = \chordmode{
  c1 f g
}

mychordlist = {
  \mychords
  \transpose c e { \mychords }
}
<<
  \new ChordNames {
    \mychordlist
  }
  \new FretBoards {
    \mychordlist
  }
>>
```



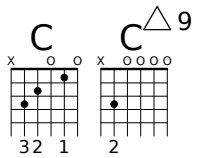
The predefined fret diagram table for guitar contains eight chords (major, minor, augmented, diminished, dominant seventh, major seventh, minor seventh, dominant ninth) for each of 17 keys. The predefined fret diagram table for ukulele contains these chords plus an additional three chords (major sixth, suspended second, and suspended fourth). A complete list of the predefined fret diagrams is shown in Sezione A.4 [Predefined fretboard diagrams], pagina 618. If there is no entry in the table for a chord, the FretBoards engraver will calculate a fret-diagram using the automatic fret diagram functionality described in [Automatic fret diagrams], pagina 362.

```
\include "predefined-guitar-fretboards.ly"
mychords = \chordmode{
  c1 c:maj9
}

<<
  \new ChordNames {
    \mychords
  }
  \new FretBoards {
    \mychords
  }
>>
```



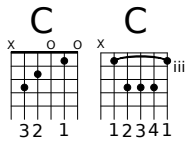
Fret diagrams can be added to the fret diagram table. To add a diagram, you must specify the hash table for the diagram, the chord for the diagram, the tuning to be used, and a definition for the diagram. Normally, the hash table will be *default-fret-table*. The diagram definition can be either a fret-diagram-terse definition string or a fret-diagram-verbose marking list.

```
\include "predefined-guitar-fretboards.ly"

\storePredefinedDiagram #default-fret-table
                        \chordmode { c:maj9 }
                        #guitar-tuning
                        #"x;3-2;o;o;o;o;"

mychords = \chordmode {
  c1 c:maj9
}

<<
  \new ChordNames {
    \mychords
  }
  \new FretBoards {
    \mychords
  }
>>
```



Different fret diagrams for the same chord name can be stored using different octaves of pitches. The different octave should be at least two octaves above or below the default octave, because the octaves above and below the default octave are used for transposing fretboards.

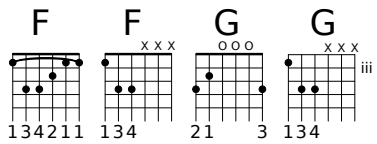
```
\include "predefined-guitar-fretboards.ly"

\storePredefinedDiagram #default-fret-table
                        \chordmode { c'' }
                        #guitar-tuning
                        #(offset-fret 2 (chord-shape 'bes guitar-tuning))

mychords = \chordmode {
  c1 c''
}

<<
  \new ChordNames {
    \mychords
  }
  \new FretBoards {
    \mychords
  }
>>
```



In addition to fret diagrams, LilyPond stores an internal list of chord shapes. The chord shapes are fret diagrams that can be shifted along the neck to different positions to provide different chords. Chord shapes can be added to the internal list and then used to define predefined fret diagrams. Because they can be moved to various positions on the neck, chord shapes will normally not contain any open strings. Like fret diagrams, chord shapes can be entered as either fret-diagram-terse strings or fret-diagram-verbose marking lists.

```
\include "predefined-guitar-fretboards.ly"

% Add a new chord shape

\addChordShape #'powerf #guitar-tuning #"1-1;3-3;3-4;x;x;x;"

% add some new chords based on the power chord shape

\storePredefinedDiagram #default-fret-table
                        \chordmode { f'' }
                        #guitar-tuning
                        #(chord-shape 'powerf guitar-tuning)
\storePredefinedDiagram #default-fret-table
                        \chordmode { g'' }
                        #guitar-tuning
                        #(offset-fret 2 (chord-shape 'powerf guitar-tuning))

mychords = \chordmode{
  f1 f'' g g''
}
```

```
<<
  \new ChordNames {
    \mychords
  }
  \new FretBoards {
    \mychords
  }
>>
```



The graphical layout of a fret diagram can be customized according to user preference through the properties of the `fret-diagram-interface`. Details are found at Sezione "fret-diagram-interface" in *Guida al Funzionamento Interno*. For a predefined fret diagram, the interface properties belong to `FretBoards.FretBoard`.

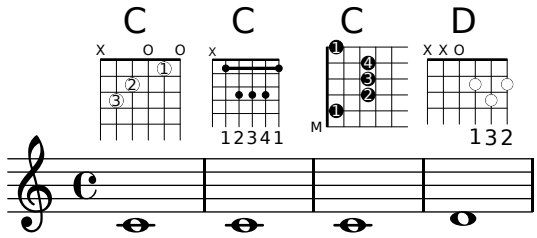
Frammenti di codice selezionati

Customizing fretboard fret diagrams

Fret diagram properties can be set through `'fret-diagram-details`. For FretBoard fret diagrams, overrides are applied to the `FretBoards.FretBoard` object. Like `Voice`, `FretBoards` is a bottom level context, therefore can be omitted in property overrides.

```
\include "predefined-guitar-fretboards.ly"
\storePredefinedDiagram #default-fret-table \chordmode { c' }
                        #guitar-tuning
                        #"x;1-1-(;3-2;3-3;3-4;1-1-);"
<<
  \new ChordNames {
    \chordmode { c1 | c | c | d }
  }
  \new FretBoards {
    % Set global properties of fret diagram
    \override FretBoards.FretBoard.size = #'1.2
    \override FretBoard.fret-diagram-details.finger-code = #'in-dot
    \override FretBoard.fret-diagram-details.dot-color = #'white
    \chordmode {
      c
      \once \override FretBoard.size = #'1.0
      \once \override FretBoard.fret-diagram-details.barre-type = #'straight
      \once \override FretBoard.fret-diagram-details.dot-color = #'black
      \once \override FretBoard.fret-diagram-details.finger-code = #'below-string
      c'
      \once \override FretBoard.fret-diagram-details.barre-type = #'none
      \once \override FretBoard.fret-diagram-details.number-type = #'arabic
      \once \override FretBoard.fret-diagram-details.orientation = #'landscape
      \once \override FretBoard.fret-diagram-details.mute-string = #"M"
      \once \override FretBoard.fret-diagram-details.label-dir = #LEFT
      \once \override FretBoard.fret-diagram-details.dot-color = #'black
      c'
      \once \override FretBoard.fret-diagram-details.finger-code = #'below-string
```

```
      \once \override FretBoard.fret-diagram-details.dot-radius = #0.35
      \once \override FretBoard.fret-diagram-details.dot-position = #0.5
      \once \override FretBoard.fret-diagram-details.fret-count = #3
      d
    }
  }
  \new Voice {
    c'1 | c' | c' | d'
  }
>>
```



Defining predefined fretboards for other instruments

Predefined fret diagrams can be added for new instruments in addition to the standards used for guitar. This file shows how this is done by defining a new string-tuning and a few predefined fretboards for the Venezuelan cuatro.

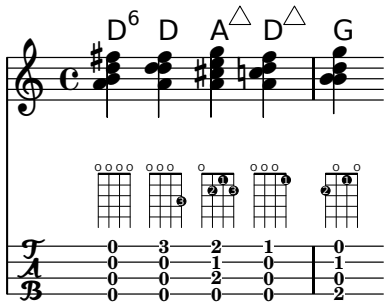
This file also shows how fingerings can be included in the chords used as reference points for the chord lookup, and displayed in the fret diagram and the `TabStaff`, but not the music.

These fretboards are not transposable because they contain string information. This is planned to be corrected in the future.

```
% add FretBoards for the Cuatro
%   Note: This section could be put into a separate file
%      predefined-cuatro-fretboards.ly
%      and \included into each of your compositions

cuatroTuning = #`(,(ly:make-pitch 0 6 0)
                  ,(ly:make-pitch 1 3 SHARP)
                  ,(ly:make-pitch 1 1 0)
                  ,(ly:make-pitch 0 5 0))

dSix = { <a\4 b\1 d\3 fis\2> }
dMajor = { <a\4 d\1 d\3 fis \2> }
aMajSeven = { <a\4 cis\1 e\3 g\2> }
dMajSeven = { <a\4 c\1 d\3 fis\2> }
gMajor = { <b\4 b\1 d\3 g\2> }

\storePredefinedDiagram #default-fret-table \dSix
                        #cuatroTuning
                        #"o;o;o;o;"
\storePredefinedDiagram #default-fret-table \dMajor
                        #cuatroTuning
                        #"o;o;o;3-3;"
\storePredefinedDiagram #default-fret-table \aMajSeven
                        #cuatroTuning
                        #"o;2-2;1-1;2-3;"
```

```
\storePredefinedDiagram #default-fret-table \dMajSeven
                        #cuatroTuning
                        #"o;o;o;1-1;"
\storePredefinedDiagram #default-fret-table \gMajor
                        #cuatroTuning
                        #"2-2;o;1-1;o;"

% end of potential include file /predefined-cuatro-fretboards.ly


#(set-global-staff-size 16)

primerosNames = \chordmode {
  d:6 d a:maj7 d:maj7
  g
}
primeros = {
  \dSix \dMajor \aMajSeven \dMajSeven
  \gMajor
}

\score {
  <<
    \new ChordNames {
      \set chordChanges = ##t
      \primerosNames
    }

    \new Staff {
      \new Voice \with {
        \remove "New_fingering_engraver"
      }
      \relative c'' {
        \primeros
      }
    }

    \new FretBoards {
      \set Staff.stringTunings = #cuatroTuning
%      \override FretBoard
%        #'(fret-diagram-details string-count) = #'4
      \override FretBoard.fret-diagram-details.finger-code = #'in-dot
      \primeros
    }

    \new TabStaff \relative c'' {
      \set TabStaff.stringTunings = #cuatroTuning
      \primeros
    }

  >>
```

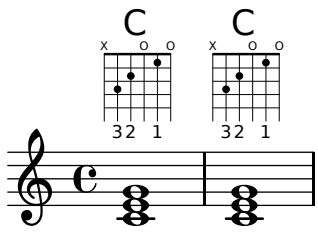
```
  \layout {
    \context {
      \Score
      \override SpacingSpanner.base-shortest-duration = #(ly:make-moment 1/16)
    }
  }
  \midi { }
}
```

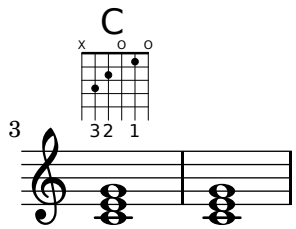


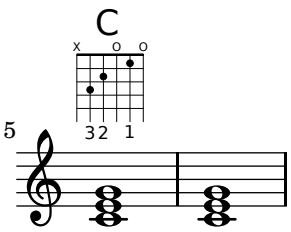
ChordChanges for FretBoards

FretBoards can be set to display only when the chord changes or at the beginning of a new line.

```
\include "predefined-guitar-fretboards.ly"

myChords = \chordmode {
  c1 c1 \break
  \set chordChanges = ##t
  c1 c1 \break
  c1 c1
}

<<
  \new ChordNames { \myChords }
  \new FretBoards { \myChords }
  \new Staff { \myChords }
>>
```







Fretboards alternate tables

Alternate fretboard tables can be created. These would be used in order to have alternate fretboards for a given chord.

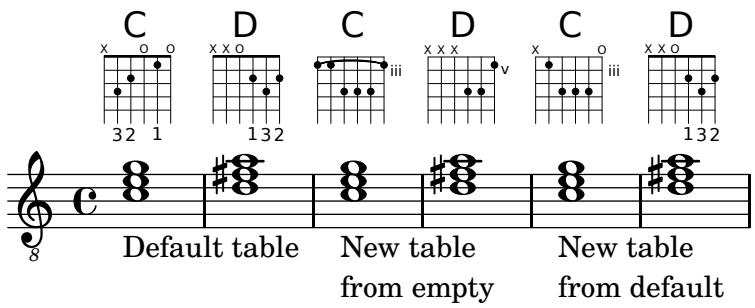
In order to use an alternate fretboard table, the table must first be created. Fretboards are then added to the table.

The created fretboard table can be blank, or it can be copied from an existing table.

The table to be used in displaying predefined fretboards is selected by the property `\predefinedDiagramTable`.

```
\include "predefined-guitar-fretboards.ly"

% Make a blank new fretboard table
#(define custom-fretboard-table-one (make-fretboard-table))

% Make a new fretboard table as a copy of default-fret-table
#(define custom-fretboard-table-two (make-fretboard-table default-fret-table))

% Add a chord to custom-fretboard-table-one
\storePredefinedDiagram #custom-fretboard-table-one
                        \chordmode{c}
                        #guitar-tuning
                        "3-(;3;5;5;5;3-);"

% Add a chord to custom-fretboard-table-two
\storePredefinedDiagram #custom-fretboard-table-two
                        \chordmode{c}
                        #guitar-tuning
                        "x;3;5;5;5;o;"

<<
  \chords {
    c1 | d1 |
    c1 | d1 |
    c1 | d1 |
  }
  \new FretBoards {
    \chordmode {
      \set predefinedDiagramTable = #default-fret-table
      c1 | d1 |
      \set predefinedDiagramTable = #custom-fretboard-table-one
      c1 | d1 |
      \set predefinedDiagramTable = #custom-fretboard-table-two
      c1 | d1 |
    }
  }
  \new Staff {
    \clef "treble_8"
```

```
    <<
      \chordmode {
        c1 | d1 |
        c1 | d1 |
        c1 | d1 |
      }
      {
        s1_\markup "Default table" | s1 |
        s1_\markup \column {"New table" "from empty"} | s1 |
        s1_\markup \column {"New table" "from default"} | s1 |
      }
    >>
  }
>>
```



Vedi anche

Notation Reference: [Custom tablatures], pagina 340, [Automatic fret diagrams], pagina 362, [Chord mode overview], pagina 393, Sezione A.4 [Predefined fretboard diagrams], pagina 618.

Installed Files: ‘`ly/predefined-guitar-fretboards.ly`’, ‘`ly/predefined-guitar-ninth-fretboards.ly`’, ‘`ly/predefined-ukulele-fretboards.ly`’, ‘`ly/predefined-mandolin-fretboards.ly`’.

Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

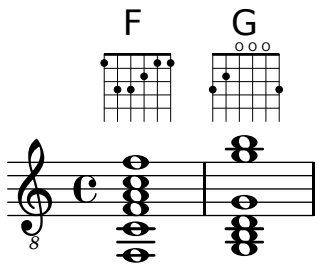
Internals Reference: Sezione “fret-diagram-interface” in *Guida al Funzionamento Interno*.

Automatic fret diagrams

Fret diagrams can be automatically created from entered notes using the `FretBoards` context. If no predefined diagram is available for the entered notes in the active `stringTunings`, this context calculates strings and frets that can be used to play the notes.

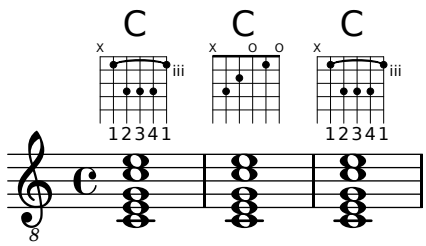
```
<<
  \new ChordNames {
    \chordmode {
      f1 g
    }
  }
  \new FretBoards {
    <f, c f a c' f'>1
    <g,\6 b, d g b g'>1
  }
  \new Staff {
    \clef "treble_8"
```

```
    <f, c f a c' f'>1
    <g, b, d g b' g'>1
  }
>>
```



As no predefined diagrams are loaded by default, automatic calculation of fret diagrams is the default behavior. Once default diagrams are loaded, automatic calculation can be enabled and disabled with predefined commands:

```
\storePredefinedDiagram #default-fret-table
                        <c e g c' e'>
                        #guitar-tuning
                        #"x;3-1-(;5-2;5-3;5-4;3-1-1-);"
<<
  \new ChordNames {
    \chordmode {
      c1 c c
    }
  }
  \new FretBoards {
    <c e g c' e'>1
    \predefinedFretboardsOff
    <c e g c' e'>1
    \predefinedFretboardsOn
    <c e g c' e'>1
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1
    <c e g c' e'>1
    <c e g c' e'>1
  }
>>
```

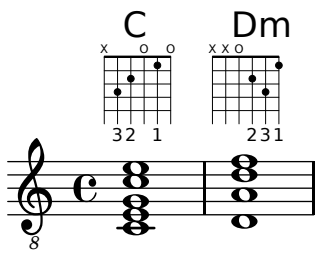


Sometimes the fretboard calculator will be unable to find an acceptable diagram. This can often be remedied by manually assigning a note to a string. In many cases, only one note need

be manually placed on a string; the rest of the notes will then be placed appropriately by the `FretBoards` context.

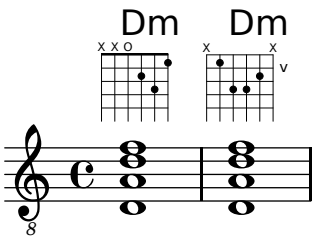
Fingerings can be added to FretBoard fret diagrams.

```
<<
  \new ChordNames {
    \chordmode {
      c1 d:m
    }
  }
  \new FretBoards {
    <c-3 e-2 g c'-1 e'>1
    <d a-2 d'-3 f'-1>1
  }
  \new Staff {
    \clef "treble_8"
    <c e g c' e'>1
    <d a d' f'>1
  }
>>
```



The minimum fret to be used in calculating strings and frets for the FretBoard context can be set with the `minimumFret` property.

```
<<
  \new ChordNames {
    \chordmode {
      d1:m d:m
    }
  }
  \new FretBoards {
    <d a d' f'>1
    \set FretBoards.minimumFret = #5
    <d a d' f'>1
  }
  \new Staff {
    \clef "treble_8"
    <d a d' f'>1
    <d a d' f'>1
  }
>>
```



The strings and frets for the `FretBoards` context depend on the `stringTunings` property, which has the same meaning as in the TabStaff context. See [Custom tablatures], pagina 340 for information on the `stringTunings` property.

The graphical layout of a fret diagram can be customized according to user preference through the properties of the `fret-diagram-interface`. Details are found at Sezione "fret-diagram-interface" in *Guida al Funzionamento Interno*. For a `FretBoards` fret diagram, the interface properties belong to `FretBoards.FretBoard`.

Comandi predefiniti

`\predefinedFretboardsOff`, `\predefinedFretboardsOn`.

Vedi anche

Notation Reference: [Custom tablatures], pagina 340.

Snippets: Sezione "Fretted strings" in *Frammenti di codice*.

Internals Reference: Sezione "fret-diagram-interface" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

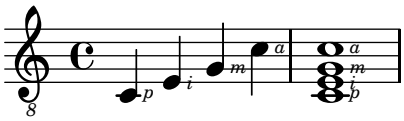
Automatic fretboard calculations do not work properly for instruments with non-monotonic tunings.

Right-hand fingerings

Right-hand fingerings *p-i-m-a* must be entered using `\rightHandFinger` followed by a number.

> **Nota:** If the number is entered in Scheme notation, remember to append a space before following it with a closing `>` or similar.

```
\clef "treble_8"
c4\rightHandFinger #1
e\rightHandFinger #2
g\rightHandFinger #3
c\rightHandFinger #4
<c,\rightHandFinger #1 e\rightHandFinger #2
 g\rightHandFinger #3 c\rightHandFinger #4 >1
```



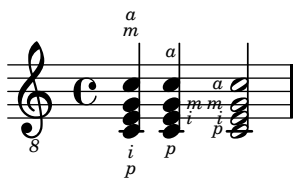
For convenience, you can abbreviate `\rightHandFinger` to something short, for example `RH`, `RH=#rightHandFinger`

Frammenti di codice selezionati

Placement of right-hand fingerings

It is possible to exercise greater control over the placement of right-hand fingerings by setting a specific property, as demonstrated in the following example. Note: you must use a chord construct

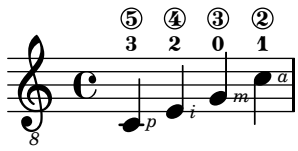
```
#(define RH rightHandFinger)

\relative c {
  \clef "treble_8"

  \set strokeFingerOrientations = #'(up down)
  <c-\RH #1 e-\RH #2 g-\RH #3 c-\RH #4 >4

  \set strokeFingerOrientations = #'(up right down)
  <c-\RH #1 e-\RH #2 g-\RH #3 c-\RH #4 >4

  \set strokeFingerOrientations = #'(left)
  <c-\RH #1 e-\RH #2 g-\RH #3 c-\RH #4 >2
}
```



Fingerings string indications and right-hand fingerings

This example combines left-hand fingering, string indications, and right-hand fingering.

```
#(define RH rightHandFinger)

\relative c {
  \clef "treble_8"
  <c-3\5-\RH #1 >4
  <e-2\4-\RH #2 >4
  <g-0\3-\RH #3 >4
  <c-1\2-\RH #4 >4
}
```



Vedi anche

Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

Internals Reference: Sezione “StrokeFinger” in *Guida al Funzionamento Interno*.

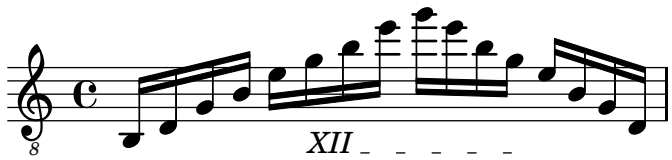
2.4.2 Guitar

Most of the notational issues associated with guitar music are covered sufficiently in the general fretted strings section, but there are a few more worth covering here. Occasionally users want to create songbook-type documents having only lyrics with chord indications above them. Since LilyPond is a music typesetter, it is not recommended for documents that have no music notation in them. A better alternative is a word processor, text editor, or, for experienced users, a typesetter like GuitarTeX.

Indicating position and barring

This example demonstrates how to include guitar position and barring indications.

```
\clef "treble_8"
b16 d g b e
\textSpannerDown
\override TextSpanner.bound-details.left.text = #"XII "
g16\startTextSpan
b16 e g e b g\stopTextSpan
e16 b g d
```



Vedi anche

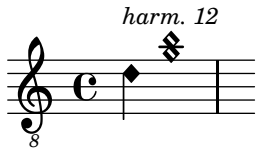
Notation Reference: [Text spanners], pagina 222.

Snippets: Sezione "Fretted strings" in *Frammenti di codice*, Sezione "Expressive marks" in *Frammenti di codice*.

Indicating harmonics and dampened notes

Special note heads can be used to indicate dampened notes or harmonics. Harmonics are normally further explained with a text markup.

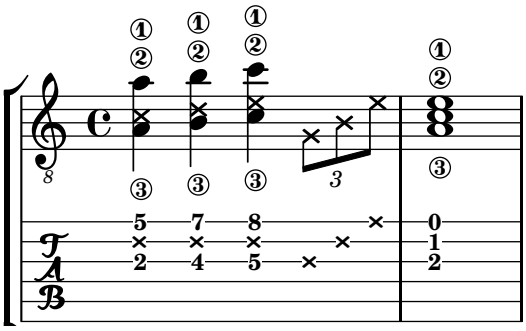
```
\relative c' {
  \clef "treble_8"
  \override Staff.NoteHead.style = #'harmonic-mixed
  d^\markup { \italic { \fontsize #-2 { "harm. 12" }}} <g b>1
}
```



Dampened notes (also called *dead notes*) are supported within normal and tablature staves:

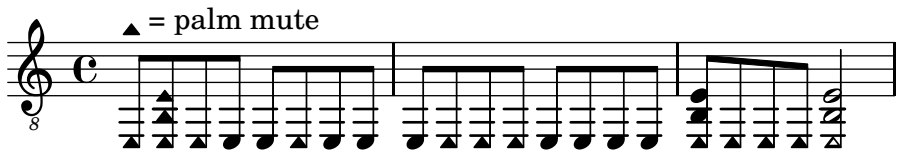
```
music = \relative c' {
  < a\3 \deadNote c\2 a'\1 >4
  < b\3 \deadNote d\2 b'\1 >
  < c\3 \deadNote e\2 c'\1 >
  \deadNotesOn
  \tuplet 3/2 { g8 b e }
  \deadNotesOff
  < a,\3 c\2 e\1 >1
}
\new StaffGroup <<
  \new Staff {
    \clef "treble_8"
    \music
  }
```

```
  \new TabStaff {
    \music
  }
>>
```



Another playing technique (especially used on electric guitars) is called *palm mute*. The string is hereby partly muted by the palm of the striking hand (hence the name). Lilypond supports the notation of palm mute-style notes by changing the note head to a triangle shape.

```
\new Voice { % Warning: explicit Voice instantiation is
             %    required to have palmMuteOff work properly
             %    when palmMuteOn comes at the beginning of
             %    the piece.
  \relative c, {
    \clef "G_8"
    \palmMuteOn
    e8^\markup { \musicglyph #"noteheads.u2do"  = palm mute }
    < e b' e > e
    \palmMuteOff
    e e  \palmMute e e e |
    e8 \palmMute { e e e } e e e e |
    < \palmMute e b' e >8 \palmMute { e e e } < \palmMute e b' e >2
  }
}
```



Vedi anche

Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

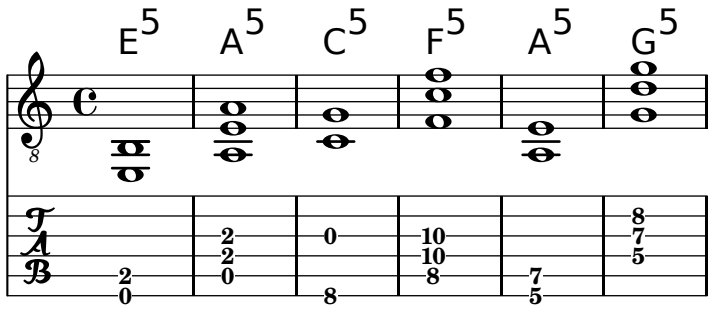
Notation Reference: ⟨undefined⟩ [Special note heads], pagina ⟨undefined⟩, Sezione A.9 [Note head styles], pagina 658.

Indicating power chords

Power chords and their symbols can be engraved in chord mode or as chord constructs:

```
ChordsAndSymbols = {
  \chordmode {
    \powerChords
    e,,1:1.5
```

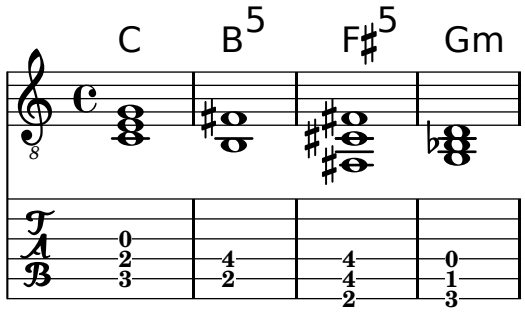
```
    a,,1:1.5.8
    \set minimumFret = #8
    c,1:1.5
    f,1:1.5.8
  }
  \set minimumFret = #5
  <a, e>1
  <g d' g'>1
}
\score {
  <<
    \new ChordNames {
    \ChordsAndSymbols
    }
    \new Staff {
      \clef "treble_8"
      \ChordsAndSymbols
    }
    \new TabStaff {
      \ChordsAndSymbols
    }
  >>
}
```



Power chord symbols are automatically switched off as soon as one of the other common chord modifier is used:

```
mixedChords = \chordmode {
  c,1
  \powerChords
  b,,1:1.5
  fis,,1:1.5.8
  g,,1:m
}
\score {
  <<
    \new ChordNames {
      \mixedChords
    }
    \new Staff {
      \clef "treble_8"
      \mixedChords
    }
```

```
    \new TabStaff {
      \mixedChords
    }
  >>
}
```



Vedi anche

Music Glossary: Sezione “power chord” in *Glossario Musicale*.

Notation Reference: [Extended and altered chords], pagina 396, [Printing chord names], pagina 399.

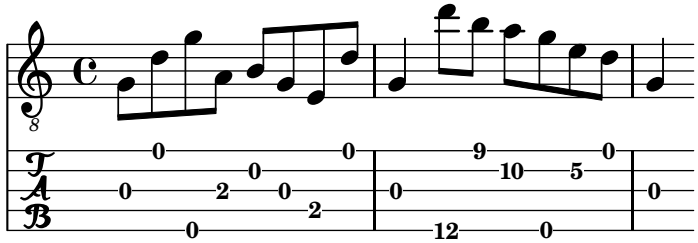
Snippets: Sezione “Fretted strings” in *Frammenti di codice*.

2.4.3 Banjo

Banjo tablatures

LilyPond has basic support for the five-string banjo. When making tablatures for five-string banjo, use the banjo tablature format function to get correct fret numbers for the fifth string:

```
music = {
  g8 d' g'\5 a b g e d' |
  g4 d''8\5 b' a'\2 g'\5 e'\2 d' |
  g4
}

<<
  \new Staff \with { \omit StringNumber }
  { \clef "treble_8"  \music }
  \new TabStaff \with {
    tablatureFormat = #fret-number-tablature-format-banjo
    stringTunings = #banjo-open-g-tuning
  }
  { \music }
>>
```



A number of common tunings for the five-string banjo are predefined: `banjo-c-tuning` (gCGBD), `banjo-modal-tuning` (gDGCD), `banjo-open-d-tuning` (aDF#AD) and `banjo-open-dm-tuning` (aDFAD).

These may be converted to four-string tunings using the `four-string-banjo` function:

```
\set TabStaff.stringTunings = #(four-string-banjo banjo-c-tuning)
```

Vedi anche

Installed Files: '`ly/string-tunings-init.ly`'.

Snippets: Sezione "Fretted strings" in *Frammenti di codice*.

2.5 Percussion

2.5.1 Common notation for percussion

Rhythmic music is primarily used for percussion and drum notation, but it can also be used to show the rhythms of melodies.

References for percussion

- Some percussion may be notated on a rhythmic staff; this is discussed in ⟨undefined⟩ [Showing melody rhythms], pagina ⟨undefined⟩, and [Instantiating new staves], pagina 180.
- MIDI output is discussed in a separate section; please see Sezione 3.5.7 [Percussion in MIDI], pagina 501.

Vedi anche

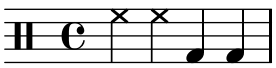
Notation Reference: ⟨undefined⟩ [Showing melody rhythms], pagina ⟨undefined⟩, [Instantiating new staves], pagina 180. Sezione 3.5.7 [Percussion in MIDI], pagina 501.

Snippets: Sezione "Percussion" in *Frammenti di codice*.

Basic percussion notation

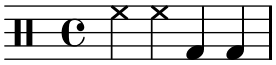
Percussion notes may be entered in `\drummode` mode, which is similar to the standard mode for entering notes. The simplest way to enter percussion notes is to use the `\drums` command, which creates the correct context and entry mode for percussion:

```
\drums {
  hihat4 hh bassdrum bd
}
```



This is shorthand for:

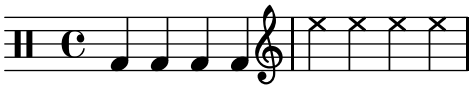
```
\new DrumStaff {
  \drummode {
    hihat4 hh bassdrum bd
  }
}
```



Each piece of percussion has a full name and an abbreviated name, and both can be used in input files. The full list of percussion note names may be found in Sezione A.14 [Percussion notes], pagina 713.

Note that the normal notation of pitches (such as `cis4`) in a `DrumStaff` context will cause an error message. Percussion clefs are added automatically to a `DrumStaff` context but they can also be set explicitly. Other clefs may be used as well.

```
\drums {
  \clef percussion
  bd4 bd bd bd
  \clef treble
  hh4 hh hh hh
}
```



There are a few issues concerning MIDI support for percussion instruments; for details please see Sezione 3.5.7 [Percussion in MIDI], pagina 501.

Vedi anche

Notation Reference: Sezione 3.5.7 [Percussion in MIDI], pagina 501, Sezione A.14 [Percussion notes], pagina 713.

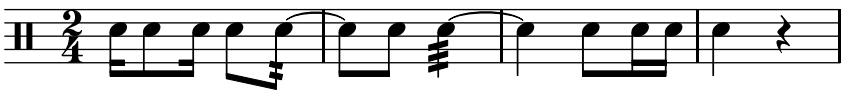
Installed Files: '`ly/drumpitch-init.ly`'.

Snippets: Sezione "Percussion" in *Frammenti di codice*.

Drum rolls

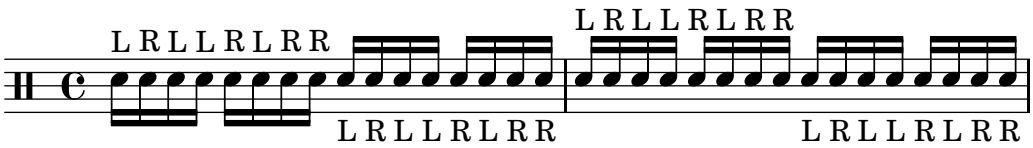
Drum rolls are indicated with three slashes across the stem. For quarter notes or longer the three slashes are shown explicitly, eighth notes are shown with two slashes (the beam being the third), and drum rolls shorter than eighths have one stem slash to supplement the beams. This is achieved with the tremolo notation, as described in ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.

```
\drums {
  \time 2/4
  sn16 sn8 sn16 sn8 sn8:32 ~
  sn8 sn8 sn4:32 ~
  sn4 sn8 sn16 sn16
  sn4 r4
}
```



Sticking can be indicated by placing a markup for `"R"` or `"L"` above or below notes, as discussed in Sezione 5.4.2 [Direction and placement], pagina 585. The `staff-padding` property may be overridden to achieve a pleasing baseline.

```
\drums {
  \repeat unfold 2 {
    sn16^"L" sn^"R" sn^"L" sn^"L" sn^"R" sn^"L" sn^"R" sn^"R"
    \stemUp
    sn16_"L" sn_"R" sn_"L" sn_"L" sn_"R" sn_"L" sn_"R" sn_"R"
  }
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.

Snippets: Sezione "Percussion" in *Frammenti di codice*.

Pitched percussion

Certain pitched percussion instruments (e.g. xylophone, vibraphone, and timpani) are written using normal staves. This is covered in other sections of the manual.

Vedi anche

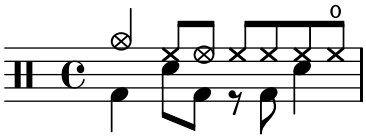
Notation Reference: Sezione 3.5.7 [Percussion in MIDI], pagina 501.

Snippets: Sezione "Percussion" in *Frammenti di codice*.

Percussion staves

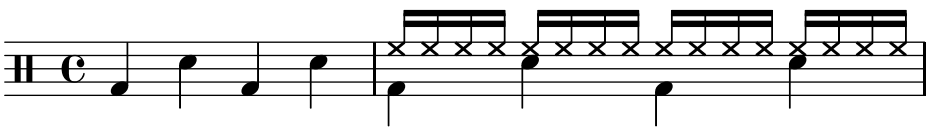
A percussion part for more than one instrument typically uses a multiline staff where each position in the staff refers to one piece of percussion. To typeset the music, the notes must be interpreted in `DrumStaff` and `DrumVoice` context.

```
up = \drummode {
  crashcymbal4 hihat8 halfopenhihat hh hh hh openhihat
}
down = \drummode {
  bassdrum4 snare8 bd r bd sn4
}
\new DrumStaff <<
  \new DrumVoice { \voiceOne \up }
  \new DrumVoice { \voiceTwo \down }
>>
```



The above example shows verbose polyphonic notation. The short polyphonic notation, described in Sezione "I'm hearing Voices" in *Manuale di Apprendimento*, can also be used. For example,

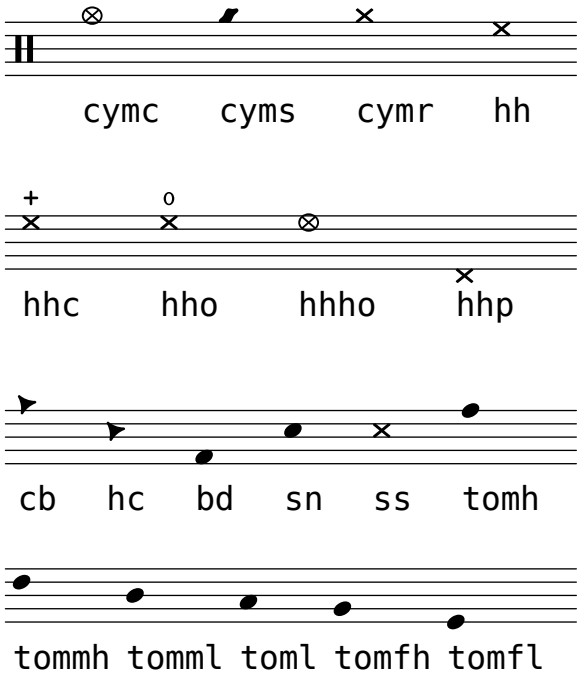
```
\new DrumStaff <<
  \drummode {
    bd4 sn4 bd4 sn4
    << {
      \repeat unfold 16 hh16
    } \\ {
      bd4 sn4 bd4 sn4
    } >>
  }
>>
```



There are also other layout possibilities. To use these, set the property `drumStyleTable` in context `DrumVoice`. The following variables have been predefined:

`drums-style`

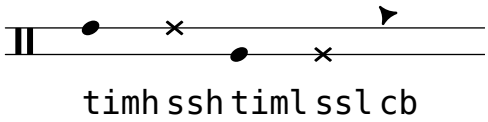
This is the default. It typesets a typical drum kit on a five-line staff:



The drum scheme supports six different toms. When there are fewer toms, simply select the toms that produce the desired result. For example, to get toms on the three middle lines you use `tommh`, `tomml`, and `tomfh`.

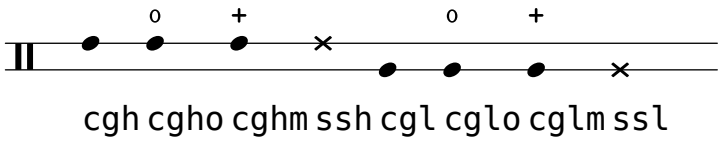
`timbales-style`

This typesets timbales on a two line staff:



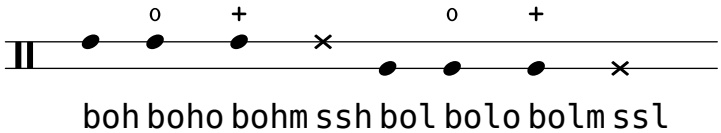
`congas-style`

This typesets congas on a two line staff:



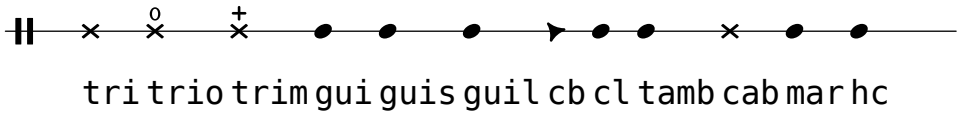
`bongos-style`

This typesets bongos on a two line staff:



`percussion-style`

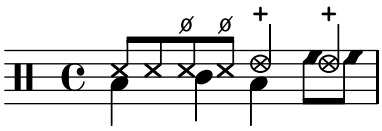
To typeset all kinds of simple percussion on one line staves:



Custom percussion staves

If you do not like any of the predefined lists you can define your own list at the top of your file.

```
#(define mydrums '(
         (bassdrum        default   #f           -1)
         (snare           default   #f           0)
         (hihat           cross     #f           1)
         (halfopenhihat   cross     "halfopen"   1)
         (pedalhihat      xcircle   "stopped"    2)
         (lowtom          diamond   #f           3)))
up = \drummode { hh8 hh hhho hhho hhp4 hhp }
down = \drummode { bd4 sn bd toml8 toml }

\new DrumStaff <<
  \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)
  \new DrumVoice { \voiceOne \up }
  \new DrumVoice { \voiceTwo \down }
>>
```



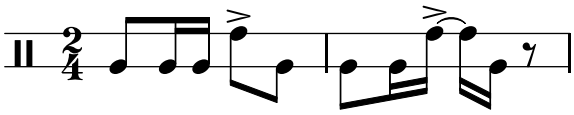
Frammenti di codice selezionati

Here are some examples:

Two Woodblocks, entered with wbh (high woodblock) and wbl (low woodblock)

```
% These lines define the position of the woodblocks in the stave;
% if you like, you can change it or you can use special note heads
% for the woodblocks.
#(define mydrums '((hiwoodblock default #t  3)
                   (lowoodblock default #t -2)))

woodstaff = {
  % This defines a staff with only two lines.
  % It also defines the positions of the two lines.
  \override Staff.StaffSymbol.line-positions = #'(-2 3)

  % This is necessary; if not entered, the barline would be too short!
  \override Staff.BarLine.bar-extent = #'(-1.5 . 1.5)
}

\new DrumStaff {
  \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)
```

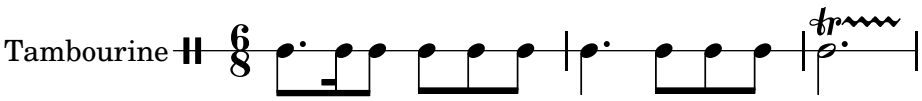
```
  % with this you load your new drum style table
  \woodstaff

  \drummode {
    \time 2/4
    wbl8 wbl16 wbl wbh8-> wbl |
    wbl8 wbl16 wbh-> ~ wbh wbl16 r8 |
  }
}
```



Note that in this special case the length of the barline must altered with `\override Staff.BarLine.bar-extent #'(from . to)`. Otherwise it would be too short. And you have also to define the positions of the two stafflines. For more information about these delicate things have a look at [Staff symbol], pagina 187.

A tambourine, entered with 'tamb':

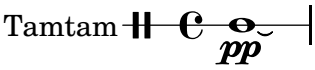
```
#(define mydrums '((tambourine default #t 0)))

tambustaff = {
  \override Staff.StaffSymbol.line-positions = #'( 0 )
  \override Staff.BarLine.bar-extent = #'(-1.5 . 1.5)
  \set DrumStaff.instrumentName = #"Tambourine"
}

\new DrumStaff {
  \tambustaff
  \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)

  \drummode {
    \time 6/8
    tamb8. tamb16 tamb8 tamb tamb tamb |
    tamb4. tamb8 tamb tamb |
    % the trick with the scaled duration and the shorter rest
    % is neccessary for the correct ending of the trill-span!
    tamb2.*5/6 \startTrillSpan s8 \stopTrillSpan |
  }
}
```



Music for Tam-Tam (entered with 'tt'):

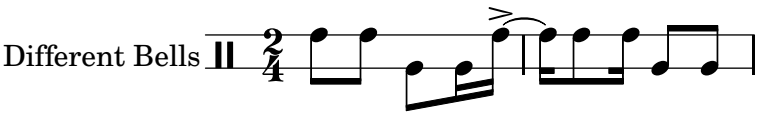
```
#(define mydrums '((tamtam default #t 0)))

tamtamstaff = {
  \override Staff.StaffSymbol.line-positions = #'( 0 )
  \override Staff.BarLine.bar-extent = #'(-1.5 . 1.5)
```

```
  \set DrumStaff.instrumentName = #"Tamtam"
}

\new DrumStaff {
  \tamtamstaff
  \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)

  \drummode {
    tt 1 \pp \laissezVibrer
  }
}
```



Two different bells, entered with ‘cb’ (cowbell) and ‘rb’ (ridebell)

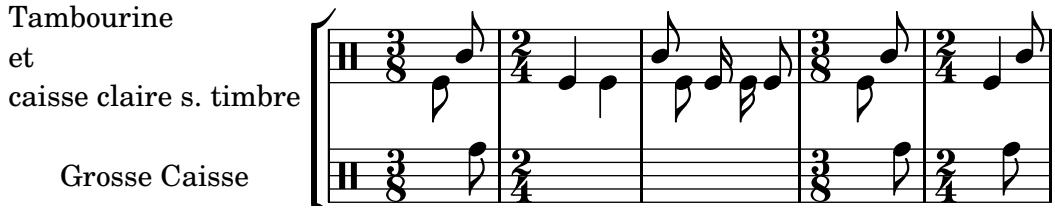
```
#(define mydrums '((ridebell default #t  3)
                   (cowbell  default #t -2)))

bellstaff = {
  \override DrumStaff.StaffSymbol.line-positions = #'(-2 3)
  \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)
  \override Staff.BarLine.bar-extent = #'(-1.5 . 1.5)
  \set DrumStaff.instrumentName = #"Different Bells"
}

\new DrumStaff {
  \bellstaff
  \drummode {
    \time 2/4
    rb8 rb cb cb16 rb-> ~ |
    rb16 rb8 rb16 cb8 cb |
  }
}
```



Here a short example taken from Stravinsky’s ‘L’histoire du Soldat’.

```
#(define mydrums '((bassdrum   default #t  4)
                   (snare      default #t -4)
                   (tambourine default #t  0)))

global = {
  \time 3/8 s4.
  \time 2/4 s2*2
  \time 3/8 s4.
  \time 2/4 s2
}

drumsA = {
```

```
  \context DrumVoice <<
    { \global }
    { \drummode {
        \autoBeamOff
        \stemDown sn8 \stemUp tamb s8 |
        sn4 \stemDown sn4 |
        \stemUp tamb8 \stemDown sn8 \stemUp sn16 \stemDown sn \stemUp sn8 |
        \stemDown sn8 \stemUp tamb s8 |
        \stemUp sn4 s8 \stemUp tamb
      }
    }
  >>
}

drumsB = {
  \drummode {
    s4 bd8 s2*2 s4 bd8 s4 bd8 s8
  }
}

\layout {
  indent = #40
}

\score {
  \new StaffGroup <<
    \new DrumStaff {
      \set DrumStaff.instrumentName = \markup {
        \column {
          "Tambourine"
          "et"
          "caisse claire s. timbre"
        }
      }
      \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)
      \drumsA
    }

   \new DrumStaff {
     \set DrumStaff.instrumentName = #"Grosse Caisse"
     \set DrumStaff.drumStyleTable = #(alist->hash-table mydrums)
     \drumsB }
  >>
}
```



Vedi anche

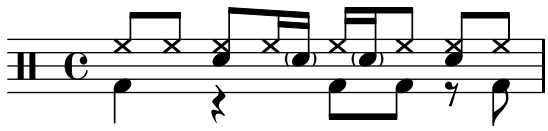
Snippets: Sezione “Percussion” in *Frammenti di codice*.

Internals Reference: Sezione “DrumStaff” in *Guida al Funzionamento Interno*, Sezione “DrumVoice” in *Guida al Funzionamento Interno*.

Ghost notes

Ghost notes for drums and percussion may be created using the `\parenthesize` command detailed in [Parentheses], pagina 214. However, the default `\drummode` does not include the `Parenthesis_engraver` plugin which allows this.

```
\new DrumStaff \with {
  \consists "Parenthesis_engraver"
}
<<
  \context DrumVoice  = "1" { s1 }
  \context DrumVoice  = "2" { s1 }
  \drummode {
    <<
      {
        hh8[ hh] <hh sn> hh16
        < \parenthesize sn > hh
        < \parenthesize sn > hh8 <hh sn> hh
      } \\
      {
        bd4 r4 bd8 bd r8 bd
      }
    >>
  }
>>
```

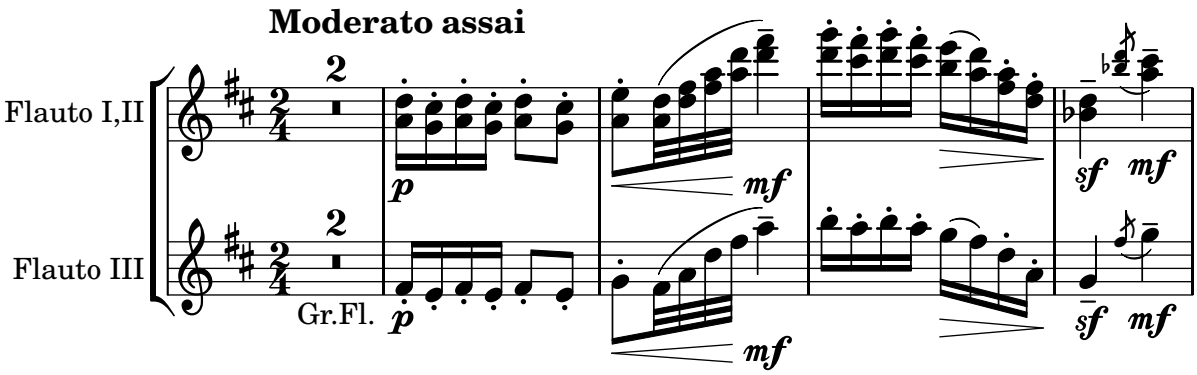


Also note that you must add chords (< > brackets) around each `\parenthesize` statement.

Vedi anche

Snippets: Sezione “Percussion” in *Frammenti di codice*.

2.6 Wind instruments



This section includes elements of music notation that arise when writing specifically for wind instruments.

2.6.1 Common notation for wind instruments

This section discusses notation common to most wind instruments.

References for wind instruments

Many notation issues for wind instruments pertain to breathing and tonguing:

- Breathing can be specified by rests or ⟨undefined⟩ [Breath marks], pagina ⟨undefined⟩.
- Legato playing is indicated by ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩.
- Different types of tonguings, ranging from legato to non-legato to staccato are usually shown by articulation marks, sometimes combined with slurs, see ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩ and Sezione A.13 [List of articulations], pagina 712.
- Flutter tonguing is usually indicated by placing a tremolo mark and a text markup on the note. See ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩.

Other aspects of musical notation that can apply to wind instruments:

- Many wind instruments are transposing instruments, see ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩.
- Slide glissandi are characteristic of the trombone, but other winds may perform keyed or valved glissandi. See [Glissando], pagina 133.
- Harmonic series glissandi, which are possible on all brass instruments but common for French Horns, are usually written out as ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩.
- Pitch inflections at the end of a note are discussed in ⟨undefined⟩ [Falls and doits], pagina ⟨undefined⟩.
- Key slaps or valve slaps are often shown by the `cross` style of ⟨undefined⟩ [Special note heads], pagina ⟨undefined⟩.
- Woodwinds can overblow low notes to sound harmonics. These are shown by the `flageolet` articulation. See Sezione A.13 [List of articulations], pagina 712.
- The use of brass mutes is usually indicated by a text markup, but where there are many rapid changes it is better to use the `stopped` and `open` articulations. See ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩ and Sezione A.13 [List of articulations], pagina 712.
- Stopped horns are indicated by the `stopped` articulation. See ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

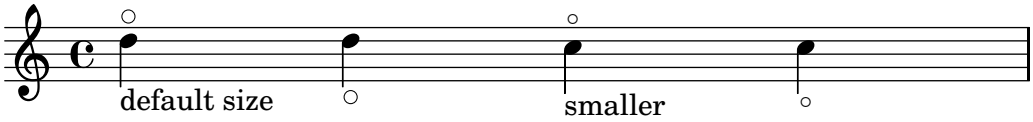
Frammenti di codice selezionati

Changing \flageolet mark size

To make the `\flageolet` circle smaller use the following Scheme function.

```
smallFlageolet =
#(let ((m (make-articulation "flageolet")))
   (set! (ly:music-property m 'tweaks)
         (acons 'font-size -3
                (ly:music-property m 'tweaks)))
   m)

\layout { ragged-right = ##f }

\relative c'' {
  d4^\flageolet_\markup { default size } d_\flageolet
```

```
  c4^\smallFlageolet_\markup { smaller } c_\smallFlageolet
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Breath marks], pagina ⟨undefined⟩, ⟨undefined⟩ [Slurs], pagina ⟨undefined⟩, ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩, Sezione A.13 [List of articulations], pagina 712, ⟨undefined⟩ [Tremolo repeats], pagina ⟨undefined⟩, ⟨undefined⟩ [Instrument transpositions], pagina ⟨undefined⟩, [Glissando], pagina 133, ⟨undefined⟩ [Grace notes], pagina ⟨undefined⟩, ⟨undefined⟩ [Falls and doits], pagina ⟨undefined⟩, ⟨undefined⟩ [Special note heads], pagina ⟨undefined⟩,

Snippets: Sezione "Winds" in *Frammenti di codice*.

Fingerings

All wind instruments other than the trombone require the use of several fingers to produce each pitch. Some fingering examples are shown in the snippets below.

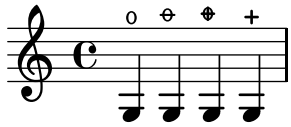
Woodwind diagrams can be produced and are described in Sezione 2.6.3.1 [Woodwind diagrams], pagina 385.

Frammenti di codice selezionati

Fingering symbols for wind instruments

Special symbols can be achieved by combining existing glyphs, which is useful for wind instruments.

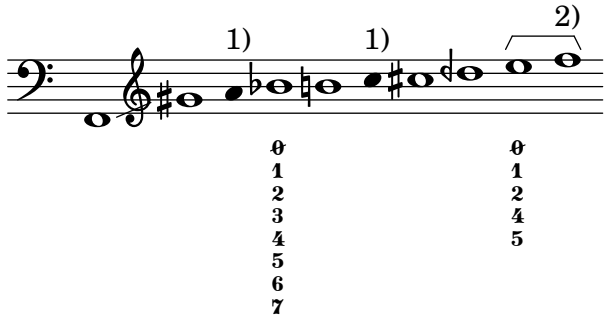
```
centermarkup = {
  \once \override TextScript.self-alignment-X = #CENTER
  \once \override TextScript.X-offset =#(ly:make-simple-closure
    `(,+
      ,(ly:make-simple-closure (list
        ly:self-alignment-interface::centered-on-x-parent))
      ,(ly:make-simple-closure (list
        ly:self-alignment-interface::x-aligned-on-self))))
}
\score
{\relative c'
  {
    g\open
    \once \override TextScript.staff-padding = #-1.0 \centermarkup
    g^\markup{\combine \musicglyph #"scripts.open" \musicglyph
    #"scripts.tenuto"}
    \centermarkup g^\markup{\combine \musicglyph #"scripts.open"
    \musicglyph #"scripts.stopped"}
    g\stopped
  }
}
```



Recorder fingering chart

The following example demonstrates how fingering charts for wind instruments can be realized.

```
% range chart for paetzold contrabass recorder

centermarkup = {
  \once \override TextScript.self-alignment-X = #CENTER
  \once \override TextScript.X-offset =#(ly:make-simple-closure
  `(,+
  ,(ly:make-simple-closure (list
  ly:self-alignment-interface::centered-on-x-parent))
  ,(ly:make-simple-closure (list
  ly:self-alignment-interface::x-aligned-on-self))))
}

\score {
  \new Staff \with {
    \remove "Time_signature_engraver"
    \override Stem.stencil = ##f
    \override Flag.stencil = ##f
    \consists "Horizontal_bracket_engraver"
  }
  {
    \clef bass
    \set Score.timing = ##f
    f,1*1/4 \glissando
    \clef violin
    gis'1*1/4
    \stemDown a'4^\markup{1)}
    \centermarkup
    \once \override TextScript.padding = #2
    bes'1*1/4_\markup{\override #'(baseline-skip . 1.7) \column
      { \fontsize #-5 \slashed-digit #0 \finger 1 \finger 2 \finger 3 \finger 4
    \finger 5 \finger 6 \finger 7} }
    b'1*1/4
    c''4^\markup{1)}
    \centermarkup
    \once \override TextScript.padding = #2
    cis''1*1/4
    deh''1*1/4
    \centermarkup
    \once \override TextScript.padding = #2
    \once \override Staff.HorizontalBracket.direction = #UP
    e''1*1/4_\markup{\override #'(baseline-skip . 1.7) \column
      { \fontsize #-5 \slashed-digit #0 \finger 1 \finger 2 \finger 4
    \finger 5} }\startGroup
    f''1*1/4^\markup{2)}\stopGroup
  }
}
```



Vedi anche

Notation Reference: Sezione 2.6.3.1 [Woodwind diagrams], pagina 385.

Snippets: Sezione "Winds" in *Frammenti di codice*.

2.6.2 Bagpipes

This section discusses notation common bagpipes.

Bagpipe definitions

LilyPond contains special definitions for Scottish, Highland Bagpipe music; to use them, add

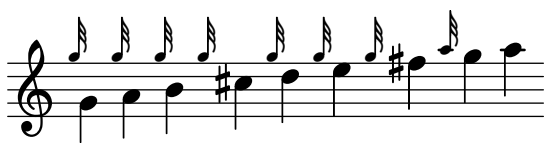
```
\include "bagpipe.ly"
```

to the top of your input file. This lets you add the special grace notes common to bagpipe music with short commands. For example, you could write `\taor` instead of

```
\grace { \small G32[ d G e] }
```

'`bagpipe.ly`' also contains pitch definitions for the bagpipe notes in the appropriate octaves, so you do not need to worry about `\relative` or `\transpose`.

```
\include "bagpipe.ly"
{ \grg G4 \grg a \grg b \grg c \grg d \grg e \grg f \grA g A }
```



Bagpipe music nominally uses the key of D Major (even though that isn't really true). However, since that is the only key that can be used, the key signature is normally not written out. To set this up correctly, always start your music with `\hideKeySignature`. If you for some reason want to show the key signature, you can use `\showKeySignature` instead.

Some modern music use cross fingering on c and f to flatten those notes. This can be indicated by `cflat` or `fflat`. Similarly, the piobaireachd high g can be written `gflat` when it occurs in light music.

Vedi anche

Snippets: Sezione "Winds" in *Frammenti di codice*.

Bagpipe example

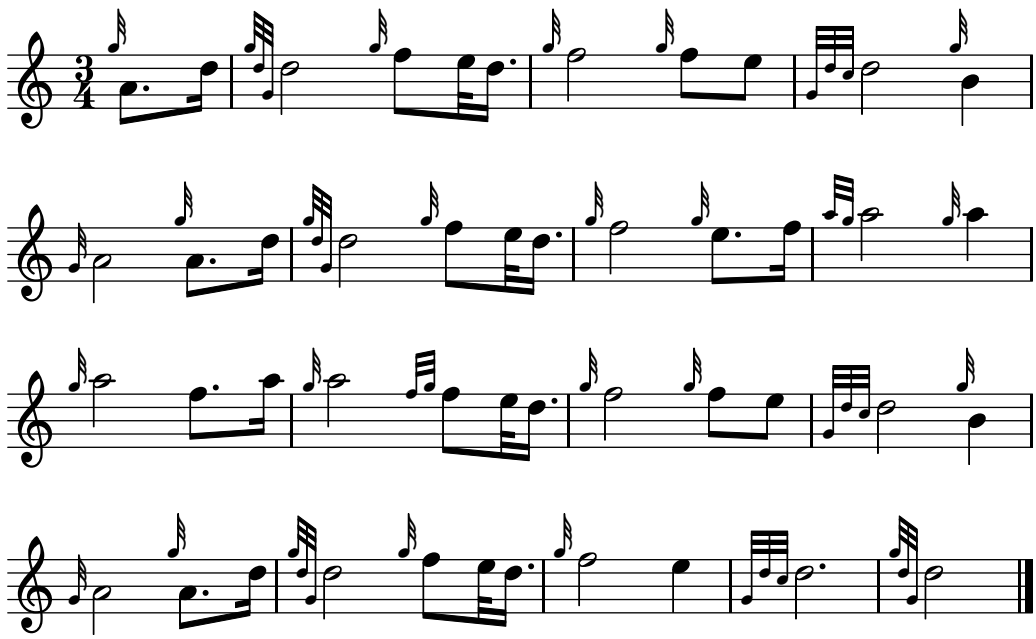
This is what the well known tune Amazing Grace looks like in bagpipe notation.

```
\include "bagpipe.ly"
\layout {
  indent = 0.0\cm
  \context { \Score \remove "Bar_number_engraver" }
}
```

```
\header {
  title = "Amazing Grace"
  meter = "Hymn"
  arranger = "Trad. arr."
}

{
  \hideKeySignature
  \time 3/4
  \grg \partial 4 a8. d16
  \slurd d2 \grg f8[ e32 d16.]
  \grg f2 \grg f8 e
  \thrwd d2 \grg b4
  \grG a2 \grg a8. d16
  \slurd d2 \grg f8[ e32 d16.]
  \grg f2 \grg e8. f16
  \dblA A2 \grg A4
  \grg A2 f8. A16
  \grg A2 \hdblf f8[ e32 d16.]
  \grg f2 \grg f8 e
  \thrwd d2 \grg b4
  \grG a2 \grg a8. d16
  \slurd d2 \grg f8[ e32 d16.]
  \grg f2 e4
  \thrwd d2.
  \slurd d2
  \bar "|."
}
```

Amazing Grace

Hymn Trad. arr.



Vedi anche

Snippets: Sezione “Winds” in *Frammenti di codice*.

2.6.3 Woodwinds

This section discusses notation specifically for woodwind instruments.

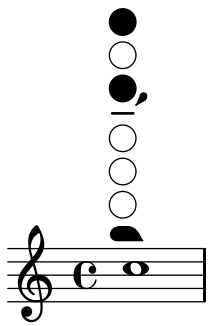
2.6.3.1 Woodwind diagrams

Woodwind diagrams can be used to indicate the fingering to be used for specific notes and are available for the following instruments:

- piccolo
- flute
- oboe
- clarinet
- bass clarinet
- saxophone
- bassoon
- contrabassoon

Woodwind diagrams are created as markups:

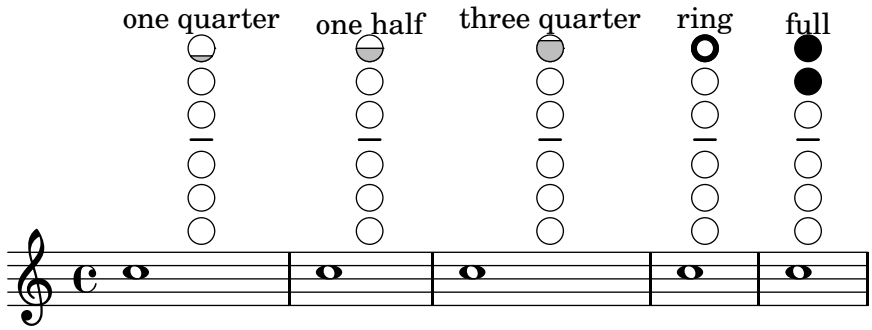
```
c1^\markup {
  \woodwind-diagram #'piccolo #'((lh . (gis))
                                 (cc . (one three))
                                 (rh . (ees)))
}
```



Keys can be open, partially-covered, ring-depressed, or fully covered:

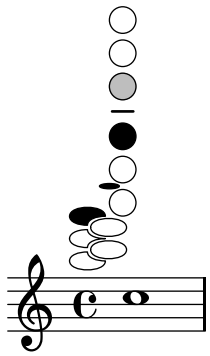
```
\textLengthOn
c1^\markup {
  \center-column {
    "one quarter"
    \woodwind-diagram #'flute #'((cc . (one1q))
                                 (lh . ())
                                 (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "one half"
    \woodwind-diagram #'flute #'((cc . (one1h))
```

```
                                  (lh . ())
                                  (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "three quarter"
    \woodwind-diagram #'flute #'((cc . (one3q))
                                  (lh . ())
                                  (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "ring"
    \woodwind-diagram #'flute #'((cc . (oneR))
                                  (lh . ())
                                  (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "full"
    \woodwind-diagram #'flute #'((cc . (oneF two))
                                  (lh . ())
                                  (rh . ()))
  }
}
```



Trills are indicated as shaded keys:

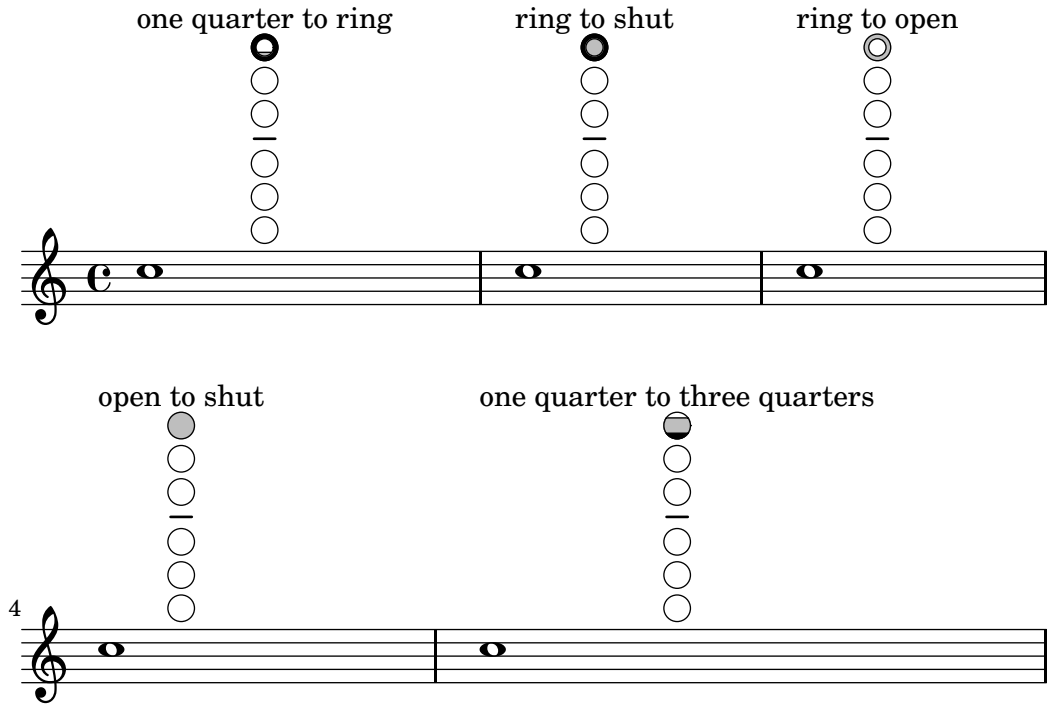
```
c1^\markup {
  \woodwind-diagram #'bass-clarinet
                    #'((cc . (threeT four))
                       (lh . ())
                       (rh . (b fis)))
}
```



A variety of trills can be displayed:

```
\textLengthOn
c1^\markup {
  \center-column {
    "one quarter to ring"
    \woodwind-diagram #'flute #'((cc . (one1qTR))
                                 (lh . ())
                                 (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "ring to shut"
    \woodwind-diagram #'flute #'((cc . (oneTR))
                                 (lh . ())
                                 (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "ring to open"
    \woodwind-diagram #'flute #'((cc . (oneRT))
                                 (lh . ())
                                 (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "open to shut"
    \woodwind-diagram #'flute #'((cc . (oneT))
                                 (lh . ())
                                 (rh . ()))
  }
}

c1^\markup {
  \center-column {
    "one quarter to three quarters"
    \woodwind-diagram #'flute #'((cc . (one1qT3q))
                                 (lh . ())
```

```
                                    (rh . ()))
  }
}
```



The list of all possible keys and settings for a given instrument can be displayed on the console using `#(print-keys-verbose 'flute)` or in the log file using `#(print-keys-verbose 'flute (current-error-port))`, although they will not show up in the music output.

Creating new diagrams is possible, although this will require Scheme ability and may not be accessible to all users. The patterns for the diagrams are in '`scm/define-woodwind-diagrams.scm`' and '`scm/display-woodwind-diagrams.scm`'.

Comandi predefiniti

Frammenti di codice selezionati

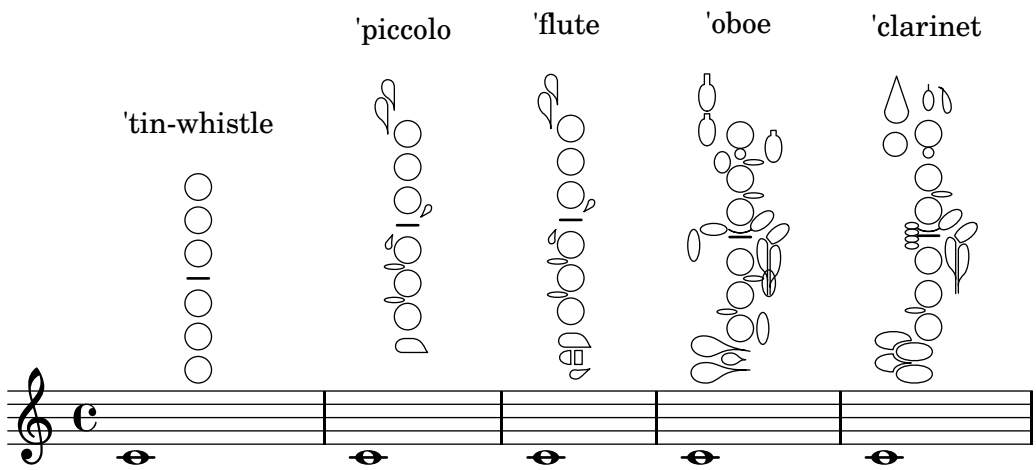
Woodwind diagrams listing

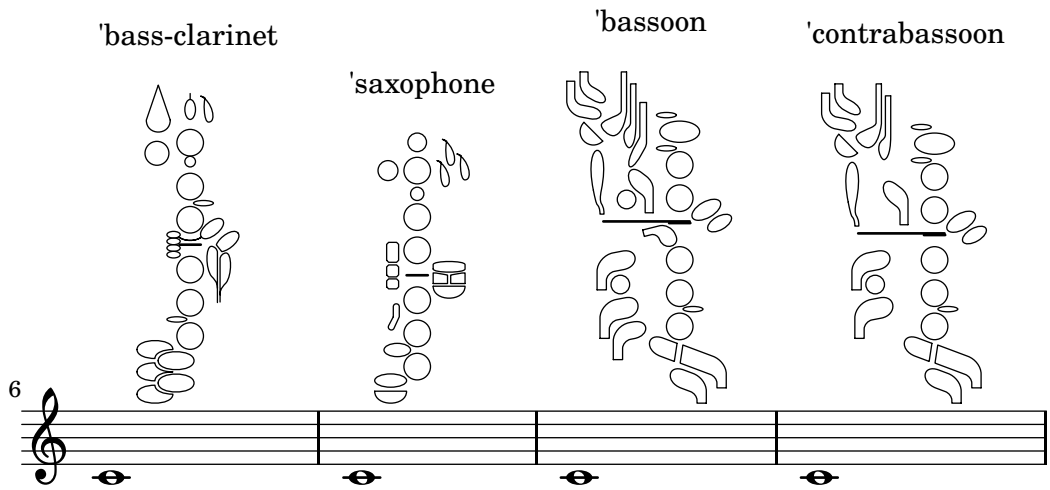
The following music shows all of the woodwind diagrams currently defined in LilyPond.

```
\relative c' {
  \textLengthOn
  c1^
  \markup {
    \center-column {
      'tin-whistle
      " "
       \woodwind-diagram
                  #'tin-whistle
                  #'()
    }
  }

  c1^
```

```
\markup {
  \center-column {
    'piccolo
    " "
     \woodwind-diagram
                #'piccolo
                #'()
  }
}

c1^
\markup {
  \center-column {
     'flute
     " "
     \woodwind-diagram
        #'flute
        #'()
  }
}
c1^\markup {
  \center-column {
    'oboe
    " "
    \woodwind-diagram
      #'oboe
      #'()
  }
}

c1^\markup {
  \center-column {
    'clarinet
    " "
    \woodwind-diagram
      #'clarinet
      #'()
  }
}

c1^\markup {
  \center-column {
    'bass-clarinet
    " "
    \woodwind-diagram
      #'bass-clarinet
      #'()
  }
}

c1^\markup {
  \center-column {
```

```
      'saxophone
      " "
      \woodwind-diagram
        #'saxophone
        #'()
    }
  }

  c1^\markup {
    \center-column {
      'bassoon
      " "
      \woodwind-diagram
        #'bassoon
        #'()
    }
  }

  c1^\markup {
    \center-column {
      'contrabassoon
      " "
      \woodwind-diagram
        #'contrabassoon
        #'()
    }
  }
}
```

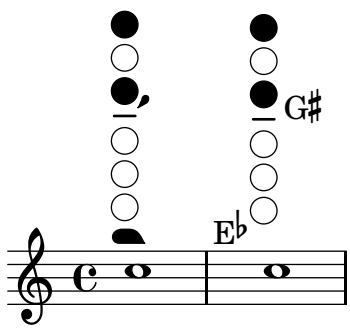




Graphical and text woodwind diagrams

In many cases, the keys other than the central column can be displayed by key name as well as by graphical means.

```
\relative c'' {
  \textLengthOn
  c1^\markup
    \woodwind-diagram
      #'piccolo
      #'((cc . (one three))
         (lh . (gis))
         (rh . (ees)))

  c^\markup
    \override #'(graphical . #f) {
      \woodwind-diagram
        #'piccolo
        #'((cc . (one three))
           (lh . (gis))
           (rh . (ees)))
    }
}
```

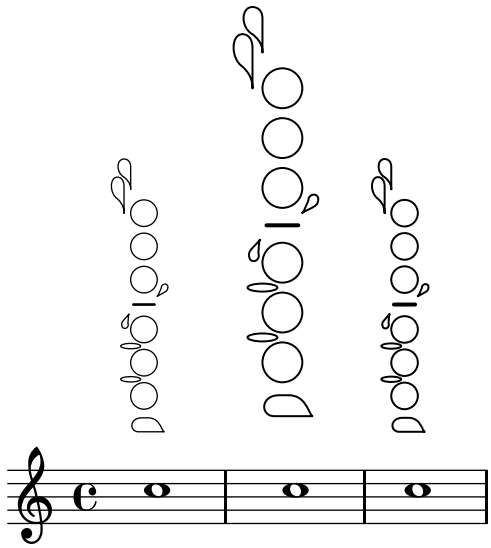


Changing the size of woodwind diagrams

The size and thickness of woodwind diagrams can be changed.

```
\relative c'' {
  \textLengthOn
  c1^\markup
    \woodwind-diagram
      #'piccolo
```

```
      #'()

  c^\markup
    \override #'(size . 1.5) {
      \woodwind-diagram
        #'piccolo
        #'()
    }
  c^\markup
    \override #'(thickness . 0.15) {
      \woodwind-diagram
        #'piccolo
        #'()
    }
}
```



Woodwind diagrams key lists

The snippet below produces a list of all possible keys and key settings for woodwind diagrams as defined in '`scm/define-woodwind-diagrams.scm`'. The list will be displayed in the log file, but not in the music. If output to the console is wanted, omit the `(current-error-port)` from the commands.

```
#(print-keys-verbose 'piccolo (current-error-port))
#(print-keys-verbose 'flute (current-error-port))
#(print-keys-verbose 'flute-b-extension (current-error-port))
#(print-keys-verbose 'tin-whistle (current-error-port))
#(print-keys-verbose 'oboe (current-error-port))
#(print-keys-verbose 'clarinet (current-error-port))
#(print-keys-verbose 'bass-clarinet (current-error-port))
#(print-keys-verbose 'low-bass-clarinet (current-error-port))
#(print-keys-verbose 'saxophone (current-error-port))
#(print-keys-verbose 'soprano-saxophone (current-error-port))
#(print-keys-verbose 'alto-saxophone (current-error-port))
#(print-keys-verbose 'tenor-saxophone (current-error-port))
#(print-keys-verbose 'baritone-saxophone (current-error-port))
#(print-keys-verbose 'bassoon (current-error-port))
```

```
#(print-keys-verbose 'contrabassoon (current-error-port))
```

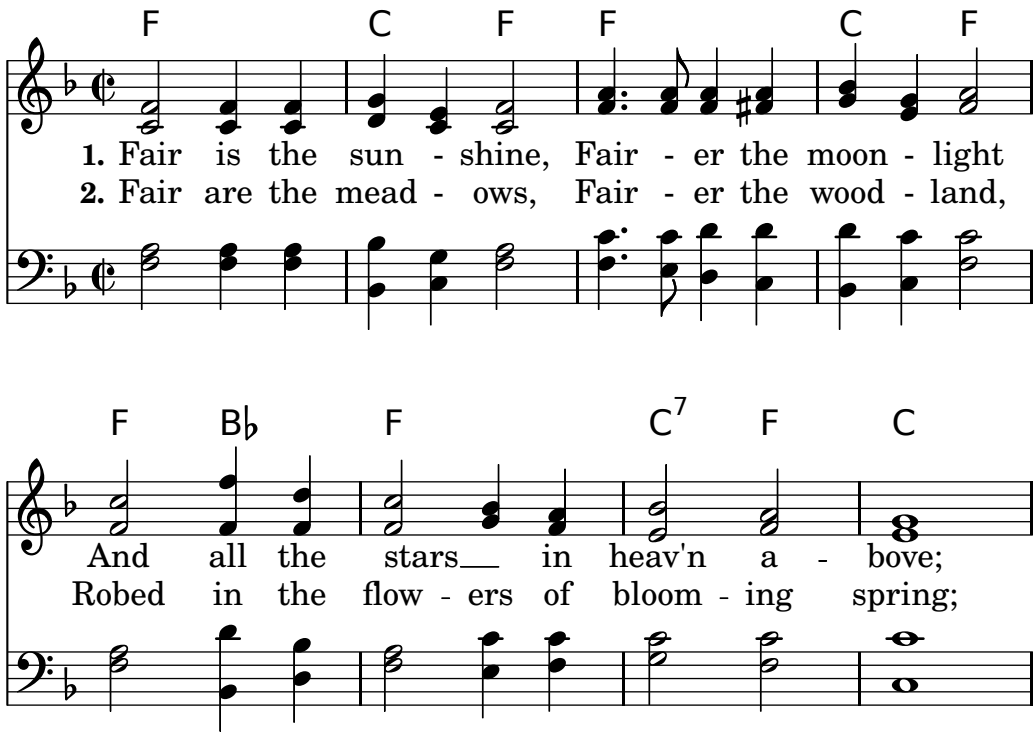
Vedi anche

Installed Files: ‘`scm/define-woodwind-diagrams.scm`’, ‘`scm/display-woodwind-diagrams.scm`’.

Snippets: Sezione “Winds” in *Frammenti di codice*.

Internals Reference: Sezione “TextScript” in *Guida al Funzionamento Interno*, Sezione “instrument-specific-markup-interface” in *Guida al Funzionamento Interno*.

2.7 Chord notation



Chords can be entered either as normal notes or in chord mode and displayed using a variety of traditional European chord naming conventions. Chord names and figured bass notation can also be displayed.

2.7.1 Chord mode

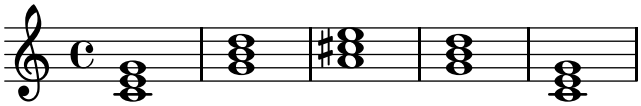
Chord mode is used to enter chords using an indicator of the chord structure, rather than the chord pitches.

Chord mode overview

Chords can be entered as simultaneous music, as discussed in ⟨undefined⟩ [Chorded notes], pagina ⟨undefined⟩.

Chords can also be entered in “chord mode”, which is an input mode that focuses on the structures of chords in traditional European music, rather than on specific pitches. This is convenient for those who are familiar with using chord names to describe chords. More information on different input modes can be found at Sezione 5.4.1 [Input modes], pagina 584.

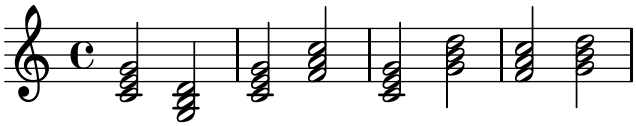
```
\chordmode { c1 g a g c }
```



Chords entered using chord mode are music elements, and can be transposed just like chords entered using simultaneous music. `\chordmode` is absolute, as `\relative` has no effect on `chordmode` blocks. However, in `\chordmode` the absolute pitches are one octave higher than in note mode.

Chord mode and note mode can be mixed in sequential music:

```
<c e g>2 <g b d>
\chordmode { c2 f }
<c e g>2 <g' b d>
\chordmode { f2 g }
```



Vedi anche

Music Glossary: Sezione “chord” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Chorded notes], pagina ⟨undefined⟩, Sezione 5.4.1 [Input modes], pagina 584.

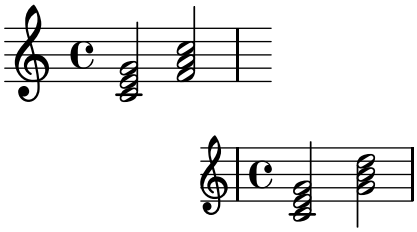
Snippets: Sezione “Chords” in *Frammenti di codice*.

Problemi noti e avvertimenti

Predefined shorthands for articulations and ornaments cannot be used on notes in chord mode, see ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

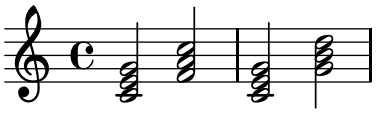
When chord mode and note mode are mixed in sequential music, and chord mode comes first, the note mode will create a new `Staff` context:

```
\chordmode { c2 f }
<c e g>2 <g' b d>
```



To avoid this behavior, explicitly create the `Staff` context:

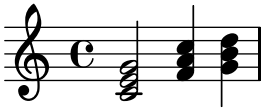
```
\new Staff {
  \chordmode { c2 f }
  <c e g>2  <g' b d>
}
```



Common chords

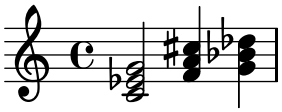
Major triads are entered by including the root and an optional duration:

```
\chordmode { c2 f4 g }
```



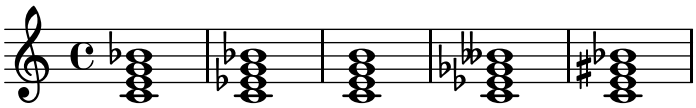
Minor, augmented, and diminished triads are entered by placing `:` and a quality modifier string after the duration:

```
\chordmode { c2:m f4:aug g:dim }
```

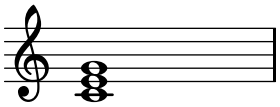
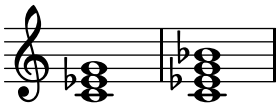
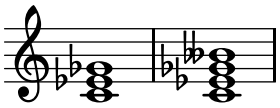
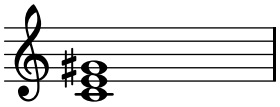


Seventh chords can be created:

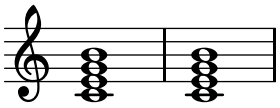
```
\chordmode { c1:7 c:m7 c:maj7 c:dim7 c:aug7 }
```



The table below shows the actions of the quality modifiers on triads and seventh chords. The default seventh step added to chords is a minor or flatted seventh, which makes the dominant seventh the basic seventh chord. All alterations are relative to the dominant seventh. A more complete table of modifier usage is found at Sezione A.2 [Common chord modifiers], pagina 614.

Modifier	**Action**	**Example**
None	The default action; produces a major triad.	
m, m7	The minor chord. This modifier lowers the 3rd.	
dim, dim7	The diminished chord. This modifier lowers the 3rd, 5th and (if present) the 7th step.	
aug	The augmented chord. This modifier raises the 5th step.	

maj, maj7 — The major 7th chord. This modifier adds a raised 7th step. The `7` following `maj` is optional. Do NOT use this modifier to create a major triad.



Vedi anche

Notation Reference: Sezione A.2 [Common chord modifiers], pagina 614, [Extended and altered chords], pagina 396.

Snippets: Sezione "Chords" in *Frammenti di codice*.

Problemi noti e avvertimenti

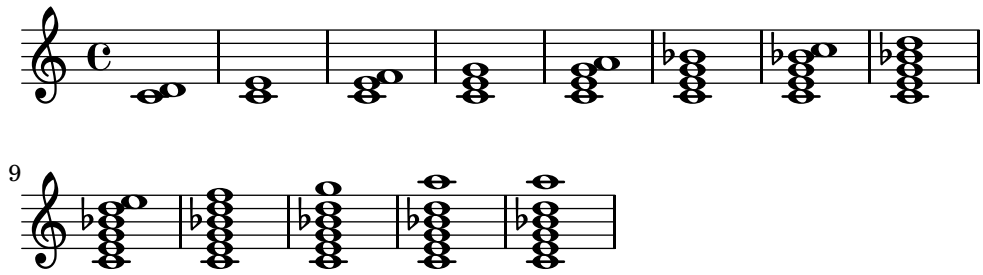
Only one quality modifier should be used per chord, typically on the highest step present in the chord. Chords with more than quality modifier will be parsed without an error or warning, but the results are unpredictable. Chords that cannot be achieved with a single quality modifier should be altered by individual pitches, as described in [Extended and altered chords], pagina 396.

Extended and altered chords

Chord structures of arbitrary complexity can be created in chord mode. The modifier string can be used to extend a chord, add or remove chord steps, raise or lower chord steps, and add a bass note or create an inversion.

The first number following the `:` is taken to be the extent of the chord. The chord is constructed by sequentially adding thirds to the root until the specified number has been reached. Note that the seventh step added as part of an extended chord will be the minor or flatted seventh, not the major seventh. If the extent is not a third (e.g., 6), thirds are added up to the highest third below the extent, and then the step of the extent is added. The largest possible value for the extent is 13. Any larger value is interpreted as 13.

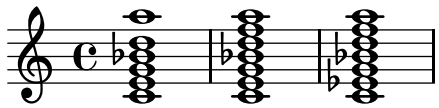
```
\chordmode {
  c1:2 c:3 c:4 c:5
  c1:6 c:7 c:8 c:9
  c1:10 c:11 c:12 c:13
  c1:14
}
```



Note that both `c:5` and `c` produce a C major triad.

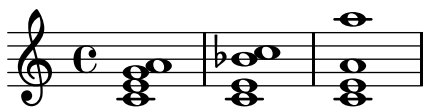
Since an unaltered 11 does not sound good when combined with an unaltered 13, the 11 is removed from a `:13` chord (unless it is added explicitly).

```
\chordmode {
  c1:13 c:13.11 c:m13
}
```



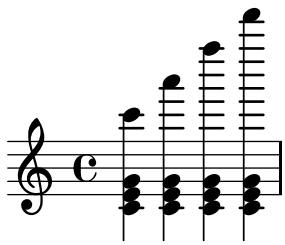
Individual steps can be added to a chord. Additions follow the extent and are prefixed by a dot (`.`). The basic seventh step added to a chord is the minor or flatted seventh, rather than the major seventh.

```
\chordmode {
  c1:5.6 c:3.7.8 c:3.6.13
}
```



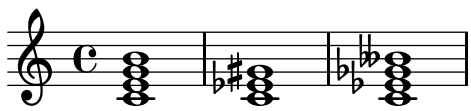
Added steps can be as high as desired.

```
\chordmode {
  c4:5.15 c:5.20 c:5.25 c:5.30
}
```



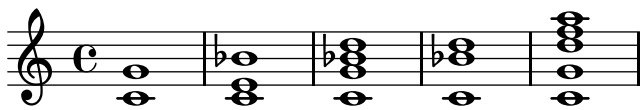
Added chord steps can be altered by suffixing a `-` or `+` sign to the number. To alter a step that is automatically included as part of the basic chord structure, add it as an altered step.

```
\chordmode {
  c1:7+ c:5+.3- c:3-.5-.7-
}
```



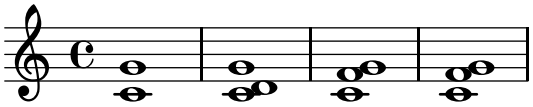
Following any steps to be added, a series of steps to be removed is introduced in a modifier string with a prefix of `^`. If more than one step is to be removed, the steps to be removed are separated by `.` following the initial `^`.

```
\chordmode {
  c1^3 c:7^5 c:9^3 c:9^3.5 c:13.11^3.7
}
```



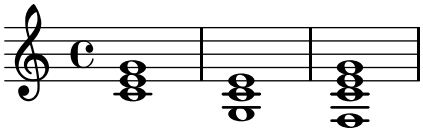
The modifier `sus` can be added to the modifier string to create suspended chords. This removes the 3rd step from the chord. Append either `2` or `4` to add the 2nd or 4th step to the chord. `sus` is equivalent to `^3`; `sus4` is equivalent to `.4^3`.

```
\chordmode {
  c1:sus c:sus2 c:sus4 c:5.4^3
}
```



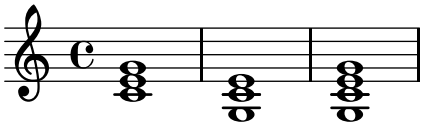
Inversions (putting a pitch other than the root on the bottom of the chord) and added bass notes can be specified by appending `/`*pitch* to the chord.

```
\chordmode {
  c1 c/g c/f
}
```



A bass note that is part of the chord can be added, instead of moved as part of an inversion, by using `/+`*pitch*.

```
\chordmode {
  c1 c/g c/+g
}
```



Chord modifiers that can be used to produce a variety of standard chords are shown in Sezione A.2 [Common chord modifiers], pagina 614.

Vedi anche

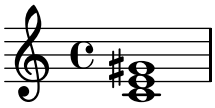
Notation Reference: Sezione A.2 [Common chord modifiers], pagina 614.

Snippets: Sezione “Chords” in *Frammenti di codice*.

Problemi noti e avvertimenti

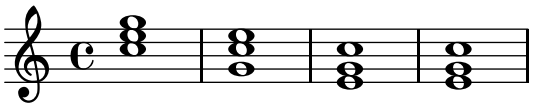
Each step can only be present in a chord once. The following simply produces the augmented chord, since `5+` is interpreted last.

```
\chordmode { c1:5.5-.5+ }
```



Only the second inversion can be created by adding a bass note. The first inversion requires changing the root of the chord.

```
\chordmode {
  c'1: c':/g e:6-3-^5 e:m6-^5
}
```



2.7.2 Displaying chords

Chords can be displayed by name, in addition to the standard display as notes on a staff.

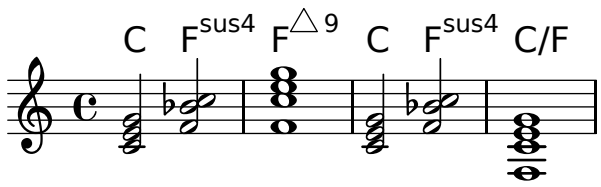
Printing chord names

Chord names are printed in the `ChordNames` context:

```
\new ChordNames {
  \chordmode {
    c2 f4. g8
  }
}
```

Chords can be entered as simultaneous notes or through the use of chord mode. The displayed chord name will be the same, regardless of the mode of entry, unless there are inversions or added bass notes:

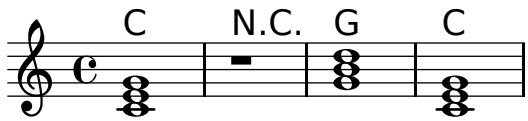
```
chordmusic = \relative c' {
  <c e g>2 <f bes c>
  <f c' e g>1
  \chordmode {
    c2 f:sus4 c1:/f
  }
}
<<
  \new ChordNames {
    \chordmusic
  }
  {
    \chordmusic
  }
>>
```



Rests passed to a `ChordNames` context will cause the `noChordSymbol` markup to be displayed.

```
<<
  \new ChordNames \chordmode {
    c1
    r1
    g1
    c1
  }
  \chordmode {
    c1
    r1
    g1
    c1
```

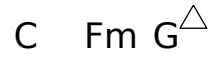
```
  }
>>
```



`\chords { ... }` is a shortcut notation for `\new ChordNames { \chordmode { ... }}`.

```
\chords {
  c2 f4.:m g8:maj7
}
```

```
\new ChordNames {
  \chordmode {
    c2 f4.:m g8:maj7
  }
}
```

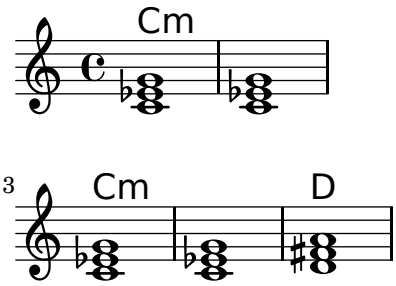


Frammenti di codice selezionati

Showing chords at changes

Chord names can be displayed only at the start of lines and when the chord changes.

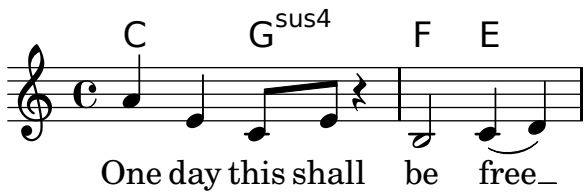
```
harmonies = \chordmode {
  c1:m c:m \break c:m c:m d
}
<<
  \new ChordNames {
    \set chordChanges = ##t
    \harmonies
  }
  \new Staff {
    \relative c' { \harmonies }
  }
>>
```



Simple lead sheet

When put together, chord names, a melody, and lyrics form a lead sheet:

```
<<
  \chords { c2 g:sus4 f e }
  \relative c'' {
    a4 e c8 e r4
    b2 c4( d)
  }
  \addlyrics { One day this shall be free __ }
>>
```



Vedi anche

Music Glossary: Sezione "chord" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Writing music in parallel], pagina ⟨undefined⟩.

Snippets: Sezione "Chords" in *Frammenti di codice*.

Internals Reference: Sezione "ChordNames" in *Guida al Funzionamento Interno*, Sezione "ChordName" in *Guida al Funzionamento Interno*, Sezione "Chord_name_engraver" in *Guida al Funzionamento Interno*, Sezione "Volta_engraver" in *Guida al Funzionamento Interno*, Sezione "Bar_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

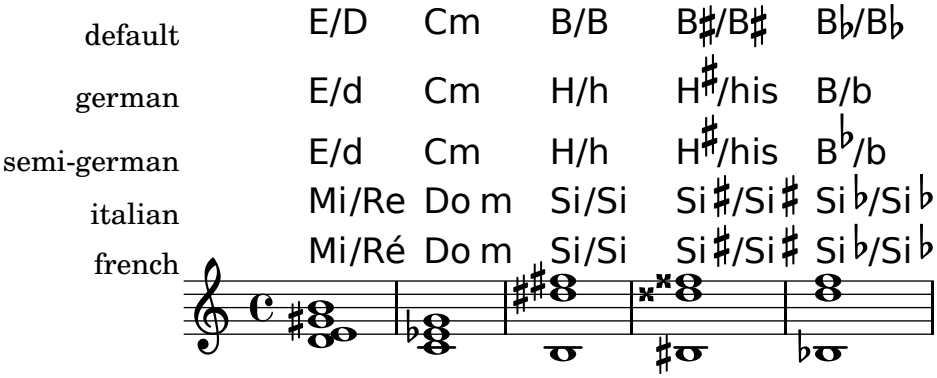
Chords containing inversions or altered bass notes are not named properly if entered using simultaneous music.

Customizing chord names

There is no unique system for naming chords. Different musical traditions use different names for the same set of chords. There are also different symbols displayed for a given chord name. The names and symbols displayed for chord names are customizable.

The basic chord name layout is a system for Jazz music, proposed by Klaus Ignatzek (see Sezione "Literature list" in *Saggio*). The chord naming system can be modified as described below. An alternate jazz chord system has been developed using these modifications. The Ignatzek and alternate Jazz notation are shown on the chart in Sezione A.1 [Chord name chart], pagina 613.

In addition to the different naming systems, different note names are used for the root in different languages. The predefined commands `\germanChords`, `\semiGermanChords`, `\italianChords` and `\frenchChords` set these variables. The effect is demonstrated here:



German songbooks may indicate minor chords as lowercase letters, without any *m* suffix. This can be obtained by setting the `chordNameLowercaseMinor` property:

```
\chords {
  \set chordNameLowercaseMinor = ##t
  c2 d:m e:m f
}
```

C d e F

If none of the existing settings give the desired output, the chord name display can be tuned through the following properties.

`chordRootNamer`
: The chord name is usually printed as a letter for the root with an optional alteration. The transformation from pitch to letter is done by this function. Special note names (for example, the German 'H' for a B-chord) can be produced by storing a new function in this property.

`majorSevenSymbol`
: This property contains the markup object used to follow the output of `chordRootNamer` to identify a major 7 chord. Predefined options are `whiteTriangleMarkup` and `blackTriangleMarkup`.

`additionalPitchPrefix`
: When the chord name contains additional pitches, they can optionally be prefixed with some text. The default is no prefix, in order to avoid too much visual clutter, but for small numbers of additional pitches this can be visually effective.

```
\new ChordNames {
  <c e g d'>    % add9
  \set additionalPitchPrefix = #"add"
  <c e g d'>    % add9
}
```

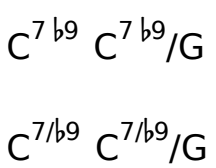
C^{9} C^{add9}

`chordNoteNamer`
: When the chord name contains additional pitches other than the root (e.g., an added bass note), this function is used to print the additional pitch. By default the pitch is printed using `chordRootNamer`. The `chordNoteNamer` property can be set to a specialized function to change this behavior. For example, the bass note can be printed in lower case.

`chordNameSeparator`
: Different parts of a chord name are normally separated by a small amount of horizontal space. By setting `chordNameSeparator`, you can use any desired markup for

a separator. This does not affect the separator between a chord and its bass note; to customize that, use `slashChordSeparator`.

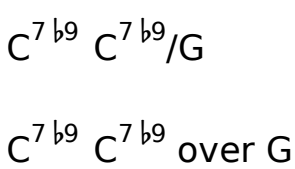
```
\chords {
  c4:7.9- c:7.9-/g
  \set chordNameSeparator = \markup { "/" }
  \break
  c4:7.9- c:7.9-/g
}
```



`slashChordSeparator`

Chords can be played over a bass note other than the conventional root of the chord. These are known as "inversions" or "slash chords", because the default way of notating them is with a forward slash between the main chord and the bass note. Therefore the value of `slashChordSeparator` defaults to a forward slash, but you can change it to any markup you choose.

```
\chords {
  c4:7.9- c:7.9-/g
  \set slashChordSeparator = \markup { " over " }
  \break
  c4:7.9- c:7.9-/g
}
```



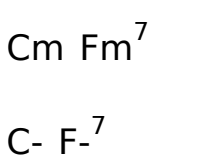
`chordNameExceptions`

This property is a list of pairs. The first item in each pair is a set of pitches used to identify the steps present in the chord. The second item is a markup that will follow the `chordRootNamer` output to create the chord name.

`minorChordModifier`

Minor chords are often denoted via a 'm' suffix to the right of the root of the chord. However some idioms prefer other suffices, such as a minus sign.

```
\chords {
  c4:min f:min7
  \set minorChordModifier = \markup { "-" }
  \break
  c4:min f:min7
}
```



`chordPrefixSpacer`
: The modifier for minor chords as determined by `minorChordModifier` is usually printed immediately to the right of the root of the chord. A spacer can be placed between the root and the modifier by setting `chordPrefixSpacer`. The spacer is not used when the root is altered.

Comandi predefiniti

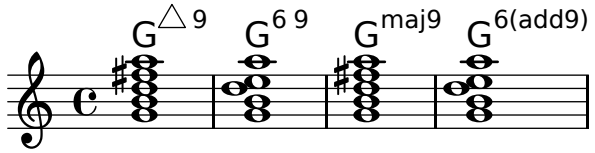
`\whiteTriangleMarkup`, `\blackTriangleMarkup`, `\germanChords`, `\semiGermanChords`, `\italianChords`, `\frenchChords`.

Frammenti di codice selezionati

Chord name exceptions

The property `chordNameExceptions` can be used to store a list of special notations for specific chords.

```
% modify maj9 and 6(add9)
% Exception music is chords with markups
chExceptionMusic = {
  <c e g b d'>1-\markup { \super "maj9" }
  <c e g a d'>1-\markup { \super "6(add9)" }
}

% Convert music to list and prepend to existing exceptions.
chExceptions = #( append
  ( sequential-music-to-chord-exceptions chExceptionMusic #t)
  ignatzekExceptions)

theMusic = \chordmode {
  g1:maj9 g1:6.9
  \set chordNameExceptions = #chExceptions
  g1:maj9 g1:6.9
}

\layout {
  ragged-right = ##t
}

<< \context ChordNames \theMusic
   \context Voice \theMusic
>>
```



chord name major7

The layout of the major 7 can be tuned with `majorSevenSymbol`.

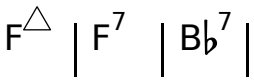
```
\chords {
  c:7+
  \set majorSevenSymbol = \markup { j7 }
```

```
  c:7+
}
```

Adding bar lines to ChordNames context

To add bar line indications in the `ChordNames` context, add the `Bar_engraver`.

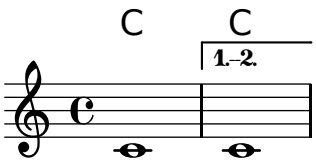
```
\new ChordNames \with {
  \override BarLine.bar-extent = #'(-2 . 2)
  \consists "Bar_engraver"
}
\chordmode {
  f1:maj7 f:7 bes:7
}
```



Volta below chords

By adding the `Volta_engraver` to the relevant staff, volte can be put under chords.

```
\score {
  <<
    \chords {
      c1
      c1
    }
    \new Staff \with {
      \consists "Volta_engraver"
    }
    {
      \repeat volta 2 { c'1 }
      \alternative { c' }
    }
  >>
  \layout {
    \context {
      \Score
      \remove "Volta_engraver"
    }
  }
}
```



Changing chord separator

The separator between different parts of a chord name can be set to any markup.

```
\chords {
  c:7sus4
  \set chordNameSeparator
    = \markup { \typewriter | }
  c:7sus4
}
```

C7 sus4 C7|sus4

Vedi anche

Notation Reference: Sezione A.1 [Chord name chart], pagina 613, Sezione A.2 [Common chord modifiers], pagina 614.

Essay on automated music engraving: Sezione "Literature list" in *Saggio*.

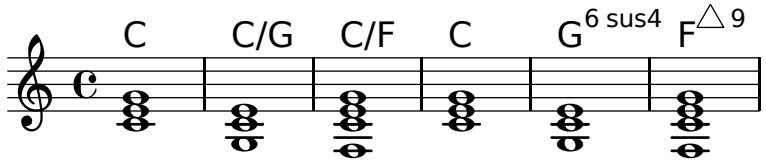
Installed Files: 'scm/chords-ignatzek.scm', 'scm/chord-entry.scm', 'ly/chord-modifier-init.ly'.

Snippets: Sezione "Chords" in *Frammenti di codice*.

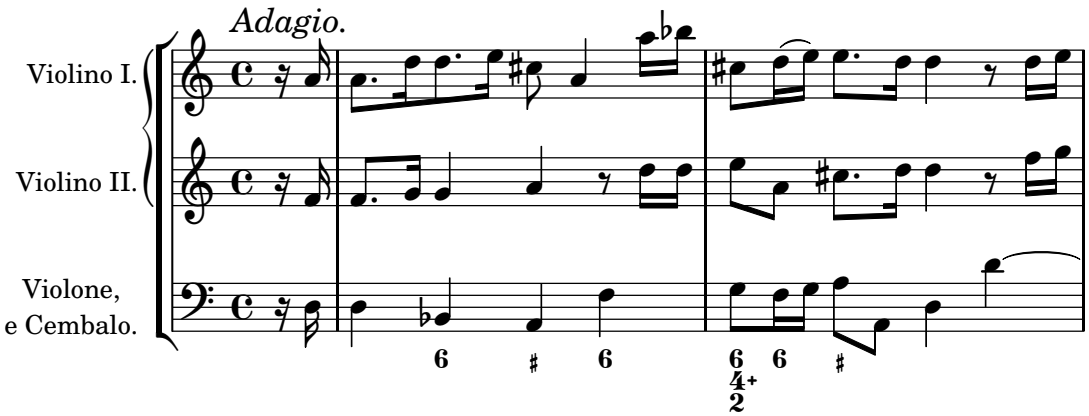
Problemi noti e avvertimenti

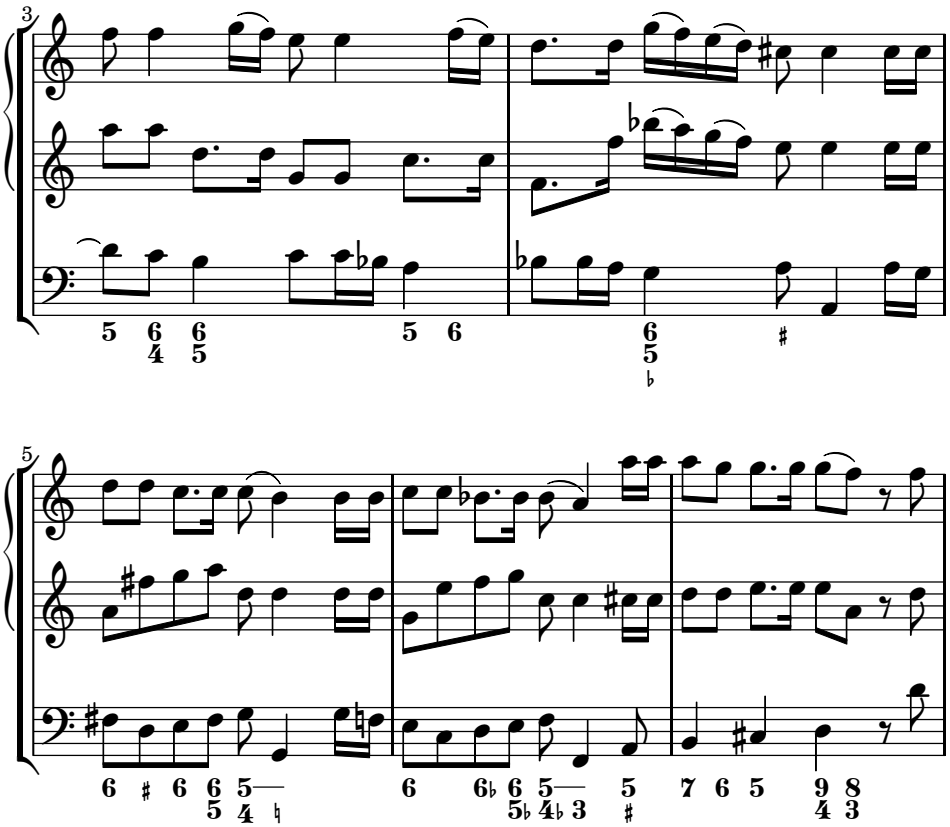
Chord names are determined from both the pitches that are present in the chord and the information on the chord structure that may have been entered in `\chordmode`. If the simultaneous pitches method of entering chords is used, undesired names result from inversions or bass notes.

```
myChords = \relative c' {
  \chordmode { c1 c/g c/f }
  <c e g>1 <g c e> <f c' e g>
}
<<
  \new ChordNames { \myChords }
  \new Staff { \myChords }
>>
```



2.7.3 Figured bass



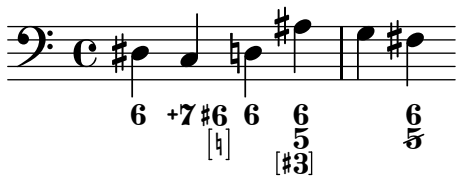


Figured bass notation can be displayed.

Introduction to figured bass

LilyPond has support for figured bass, also called thorough bass or basso continuo:

```
<<
  \new Voice { \clef bass dis4 c d ais g fis}
  \new FiguredBass {
    \figuremode {
      < 6 >4 < 7\+ >8 < 6+ [_!] >
      < 6 >4 <6 5 [3+] >
      < _ >4 < 6 5/>4
    }
  }
>>
```



The support for figured bass consists of two parts: there is an input mode, introduced by `\figuremode`, that accepts entry of bass figures, and there is a context named `FiguredBass` that takes care of displaying `BassFigure` objects. Figured bass can also be displayed in `Staff` contexts.

`\figures{ ... }` is a shortcut notation for `\new FiguredBass { \figuremode { ... } }`.

Although the support for figured bass may superficially resemble chord support, it is much simpler. `\figuremode` mode simply stores the figures and the `FiguredBass` context prints them as entered. There is no conversion to pitches.

Vedi anche

Music Glossary: Sezione “figured bass” in *Glossario Musicale*.

Snippets: Sezione “Chords” in *Frammenti di codice*.

Entering figured bass

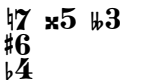
`\figuremode` is used to switch the input mode to figure mode. More information on different input modes can be found at Sezione 5.4.1 [Input modes], pagina 584.

In figure mode, a group of bass figures is delimited by `<` and `>`. The duration is entered after the `>`.

```
\new FiguredBass {
  \figuremode {
    <6 4>2
  }
}
```

Accidentals (including naturals) can be added to figures:

```
\figures {
  <7! 6+ 4-> <5++> <3-->
}
```



Augmented and diminished steps can be indicated:

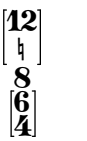
```
\figures {
  <6\+ 5/> <7/>
}
```

A backward slash through a figure (typically used for raised sixth steps) can be created:

```
\figures {
  <6> <6\\>
}
```

Vertical spaces and brackets can be included in figures:

```
\figures {
  <[12 _!] 8 [6  4]>
}
```

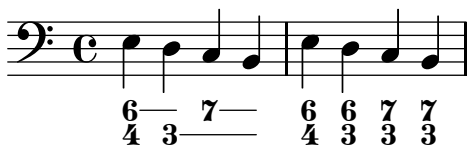


Any text markup can be inserted as a figure:

```
\figures {
  <\markup { \tiny \number 6 \super (1) } 5>
}
```

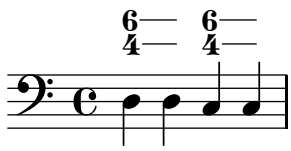
Continuation lines can be used to indicate repeated figures:

```
<<
  {
    \clef bass
    e4 d c b,
    e4 d c b,
  }
  \figures {
    \bassFigureExtendersOn
    <6 4>4 <6 3> <7 3> <7 3>
    \bassFigureExtendersOff
    <6 4>4 <6 3> <7 3> <7 3>
  }
>>
```

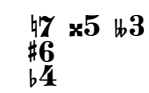


In this case, the extender lines replace existing figures, unless the continuation lines have been explicitly terminated.

```
<<
  \figures {
    \bassFigureExtendersOn
    <6 4>4 <6 4> <6\! 4\!> <6 4>
  }
  {
    \clef bass
    d4 d c c
  }
>>
```



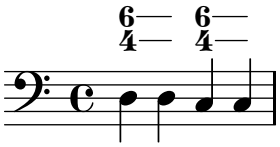
The table below summarizes the figure modifiers available.

Modifier	Purpose	Example
+, -, !	Accidentals	

\+, / Augmented and diminished steps

\\ Raised sixth step

\! End of continuation line



Comandi predefiniti

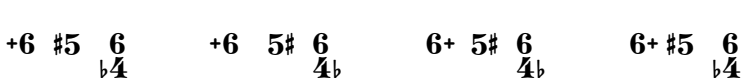
`\bassFigureExtendersOn`, `\bassFigureExtendersOff`.

Frammenti di codice selezionati

Changing the positions of figured bass alterations

Accidentals and plus signs can appear before or after the numbers, depending on the `figuredBassAlterationDirection` and `figuredBassPlusDirection` properties.

```
\figures {
  <6\+> <5+> <6 4-> r
  \set figuredBassAlterationDirection = #RIGHT
  <6\+> <5+> <6 4-> r
  \set figuredBassPlusDirection = #RIGHT
  <6\+> <5+> <6 4-> r
  \set figuredBassAlterationDirection = #LEFT
  <6\+> <5+> <6 4-> r
}
```



Vedi anche

Snippets: Sezione “Chords” in *Frammenti di codice*.

Internals Reference: Sezione “BassFigure” in *Guida al Funzionamento Interno*, Sezione “BassFigureAlignment” in *Guida al Funzionamento Interno*, Sezione “BassFigureLine” in *Guida al Funzionamento Interno*, Sezione “BassFigureBracket” in *Guida al Funzionamento Interno*, Sezione “BassFigureContinuation” in *Guida al Funzionamento Interno*, Sezione “FiguredBass” in *Guida al Funzionamento Interno*.

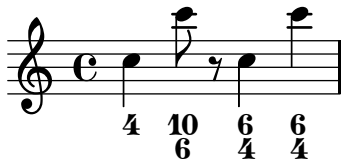
Displaying figured bass

Figured bass can be displayed using the `FiguredBass` context, or in most staff contexts.

When displayed in a `FiguredBass` context, the vertical location of the figures is independent of the notes on the staff.

```
<<
  \relative c'' {
    c4 c'8 r8 c,4 c'
  }
  \new FiguredBass {
```

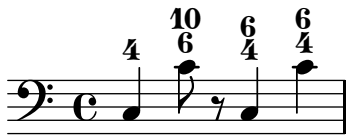
```
    \figuremode {
      <4>4 <10 6>8 s8
      <6 4>4 <6 4>
    }
  }
>>
```



In the example above, the `FiguredBass` context must be explicitly instantiated to avoid creating a second (empty) staff.

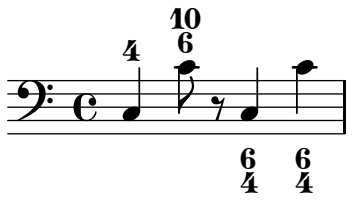
Figured bass can also be added to `Staff` contexts directly. In this case, the vertical position of the figures is adjusted automatically.

```
<<
  \new Staff = "myStaff"
  \figuremode {
    <4>4 <10 6>8 s8
    <6 4>4 <6 4>
  }
  %% Put notes on same Staff as figures
  \context Staff = "myStaff"
  {
    \clef bass
    c4 c'8 r8 c4 c'
  }
>>
```



When added in a `Staff` context, figured bass can be displayed above or below the staff.

```
<<
  \new Staff = "myStaff"
  \figuremode {
    <4>4 <10 6>8 s8
    \bassFigureStaffAlignmentDown
    <6 4>4 <6 4>
  }
  %% Put notes on same Staff as figures
  \context Staff = "myStaff"
  {
    \clef bass
    c4 c'8 r8 c4 c'
  }
>>
```



Comandi predefiniti

`\bassFigureStaffAlignmentDown`, `\bassFigureStaffAlignmentUp`, `\bassFigureStaffAlignmentNeutral`.

Vedi anche

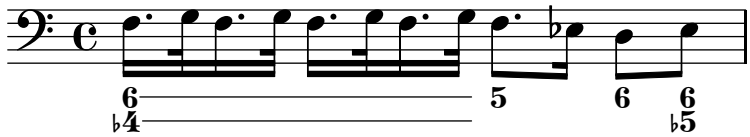
Snippets: Sezione "Chords" in *Frammenti di codice*.

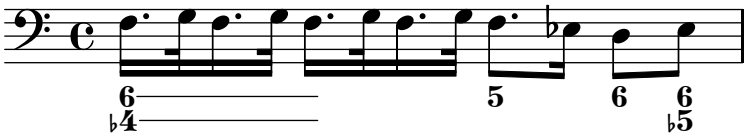
Internals Reference: Sezione "BassFigure" in *Guida al Funzionamento Interno*, Sezione "BassFigureAlignment" in *Guida al Funzionamento Interno*, Sezione "BassFigureLine" in *Guida al Funzionamento Interno*, Sezione "BassFigureBracket" in *Guida al Funzionamento Interno*, Sezione "BassFigureContinuation" in *Guida al Funzionamento Interno*, Sezione "FiguredBass" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

To ensure that continuation lines work properly, it is safest to use the same rhythm in the figure line as in the bass line.

```
<<
  {
    \clef bass
    \repeat unfold 4 { f16. g32 } f8. es16 d8 es
  }
  \figures {
    \bassFigureExtendersOn
    % The extenders are correct here, with the same rhythm as the bass
    \repeat unfold 4 { <6 4->16. <6 4->32 }
    <5>8. r16 <6>8 <6\! 5->
  }
>>
<<
  {
    \clef bass
    \repeat unfold 4 { f16. g32 } f8. es16 d8 es
  }
  \figures {
    \bassFigureExtendersOn
    % The extenders are incorrect here, even though the timing is the same
    <6 4->4 <6 4->4
    <5>8. r16 <6>8 <6\! 5->
  }
>>
```





2.8 Contemporary music

From the beginning of the 20th Century there has been a massive expansion of compositional style and technique. New harmonic and rhythmic developments, an expansion of the pitch spectrum and the development of a wide range of new instrumental techniques have been accompanied by a parallel evolution and expansion of musical notation. The purpose of this section is to provide references and information relevant to working with these new notational techniques.

2.8.1 Pitch and harmony in contemporary music

This section highlights issues that are relevant to notating pitch and harmony in contemporary music.

References for pitch and harmony in contemporary music

- Standard quarter-tone notation is addressed in ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩.
- Non-standard key signatures are addressed in ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩.
- Contemporary practises in displaying accidentals are addressed in ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩.

Microtonal notation

Contemporary key signatures and harmony

2.8.2 Contemporary approaches to rhythm

This section highlights issues that are relevant to the notation of rhythm in contemporary music.

References for contemporary approaches to rhythm

- Compound time signatures are addressed in ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.
- Basic polymetric notation is addressed in ⟨undefined⟩ [Polymetric notation], pagina ⟨undefined⟩.
- Feathered beams are addressed in ⟨undefined⟩ [Feathered beams], pagina ⟨undefined⟩.
- Mensurstriche bar lines (bar lines between staves only) are addressed in [Grouping staves], pagina 181.

Tuplets in contemporary music

Contemporary time signatures

Extended polymetric notation

Beams in contemporary music

Bar lines in contemporary music

2.8.3 Graphical notation

2.8.4 Contemporary scoring techniques

2.8.5 New instrumental techniques

2.8.6 Further reading and scores of interest

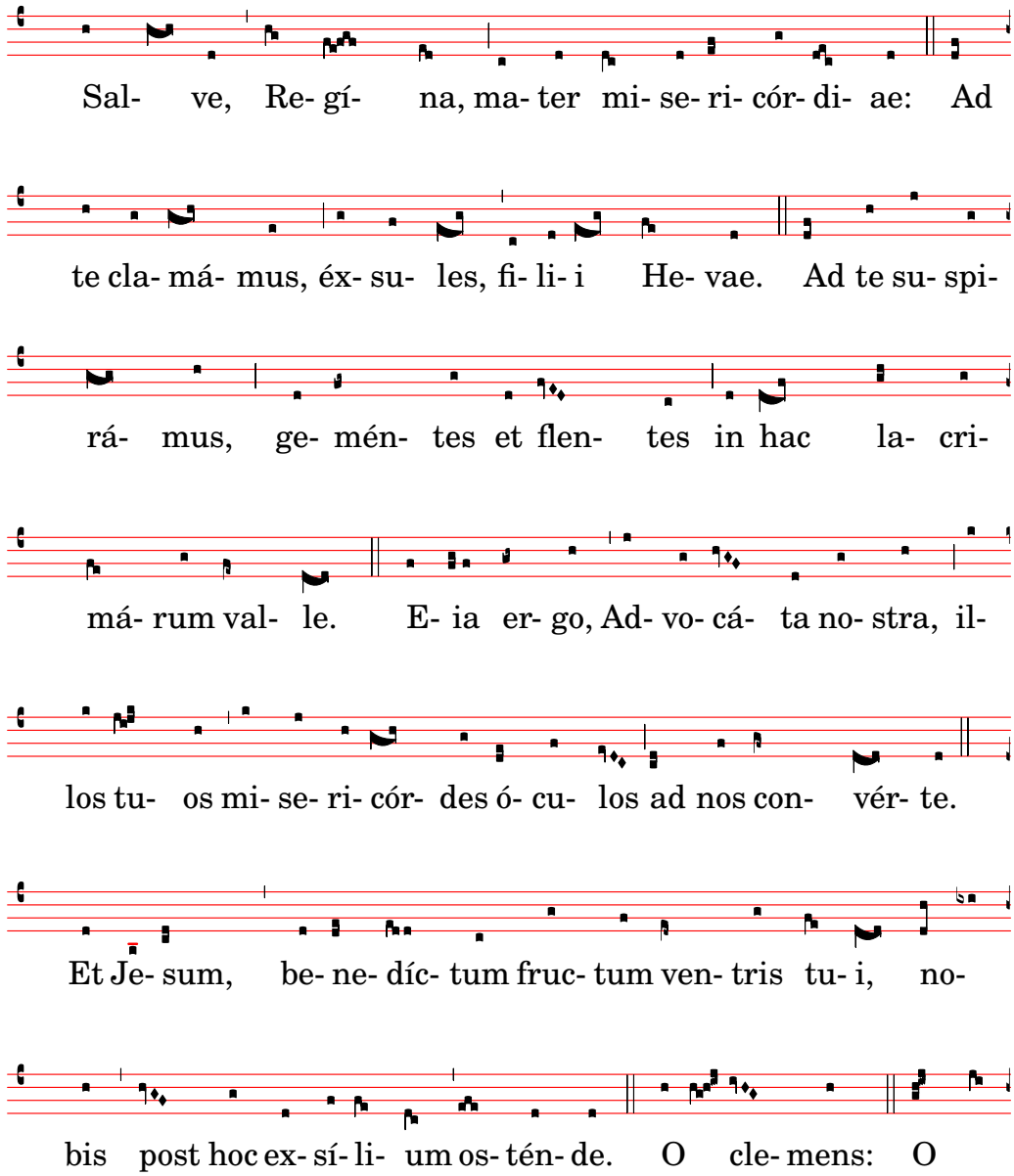
This section suggests books, musical examples and other resources useful in studying contemporary musical notation.

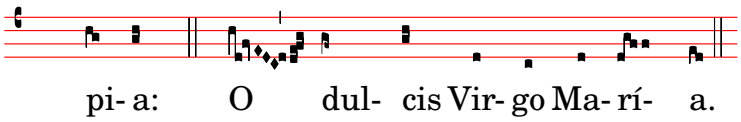
Books and articles on contemporary musical notation

- *Music Notation in the Twentieth Century: A Practical Guidebook* by Kurt Stone [W. W. Norton, 1980]
- *Music Notation: A Manual of Modern Practice* by Gardner Read [Taplinger, 1979]
- *Instrumentation and Orchestration* by Alfred Blatter [Schirmer, 2nd ed. 1997]

Scores and musical examples

2.9 Ancient notation





Support for ancient notation includes features for mensural notation, Gregorian chant notation, and Kievan square notation. These features can be accessed either by modifying style properties of graphical objects such as note heads and rests, or by using one of the pre-defined contexts for these styles.

Many graphical objects, such as note heads and flags, accidentals, time signatures, and rests, provide a `style` property, which can be changed to emulate several different styles of ancient notation. See

- [Mensural note heads], pagina 421,
- [Mensural accidentals and key signatures], pagina 423,
- [Mensural rests], pagina 422,
- [Mensural clefs], pagina 418,
- [Gregorian clefs], pagina 426,
- [Mensural flags], pagina 421,
- [Mensural time signatures], pagina 420.

Some notational concepts are introduced specifically for ancient notation,

- [Custodes], pagina 417,
- [Divisiones], pagina 427,
- [Ligatures], pagina 416.

Vedi anche

Music Glossary: Sezione “custos” in *Glossario Musicale*, Sezione “ligature” in *Glossario Musicale*, Sezione “mensural notation” in *Glossario Musicale*.

Notation Reference: [Mensural note heads], pagina 421, [Mensural accidentals and key signatures], pagina 423, [Mensural rests], pagina 422, [Gregorian clefs], pagina 426, [Mensural flags], pagina 421, [Mensural time signatures], pagina 420, [Custodes], pagina 417, [Divisiones], pagina 427, [Ligatures], pagina 416.

2.9.1 Overview of the supported styles

Three styles are available for typesetting Gregorian chant:

- *Editio Vaticana* is a complete style for Gregorian chant, following the appearance of the Solesmes editions, the official chant books of the Vatican since 1904. LilyPond has support for all the notational signs used in this style, including ligatures, *custodes*, and special signs such as the quilisma and the oriscus.
- The *Editio Medicaea* style offers certain features used in the Medicaea (or Ratisbona) editions which were used prior to the Solesmes editions. The most significant differences from the *Vaticana* style are the clefs, which have downward-slanted strokes, and the note heads, which are square and regular.
- The *Hufnagel* (“horseshoe nail”) or *Gothic* style mimics the writing style in chant manuscripts from Germany and Central Europe during the middle ages. It is named after the basic note shape (the *virga*), which looks like a small nail.

Three styles emulate the appearance of late-medieval and renaissance manuscripts and prints of mensural music:

- The *Mensural* style most closely resembles the writing style used in late-medieval and early renaissance manuscripts, with its small and narrow, diamond-shaped note heads and its rests which approach a hand-drawn style.

- The *Neomensural* style is a modernized and stylized version of the former: the note heads are broader and the rests are made up of straight lines. This style is particularly suited, e.g., for incipits of transcribed pieces of mensural music.
- The *Petrucci* style is named after Ottaviano Petrucci (1466-1539), the first printer to use movable type for music (in his *Harmonice musices odhecaton*, 1501). The style uses larger note heads than the other mensural styles.

Baroque and *Classical* are not complete styles but differ from the default style only in some details: certain note heads (Baroque) and the quarter rest (Classical).

Only the mensural style has alternatives for all aspects of the notation. Thus, there are no rests or flags in the Gregorian styles, since these signs are not used in plainchant notation, and the Petrucci style has no flags or accidentals of its own.

Each element of the notation can be changed independently of the others, so that one can use mensural flags, petrucci note heads, classical rests and vaticana clefs in the same piece, if one wishes.

Vedi anche

Music Glossary: Sezione "mensural notation" in *Glossario Musicale*, Sezione "flag" in *Glossario Musicale*.

2.9.2 Ancient notation—common features

Pre-defined contexts

For Gregorian chant and mensural notation, there are pre-defined voice and staff contexts available, which set all the various notation signs to values suitable for these styles. If one is satisfied with these defaults, one can proceed directly with note entry without worrying about the details on how to customize a context. See one of the pre-defined contexts `VaticanaVoice`, `VaticanaStaff`, `MensuralVoice`, and `MensuralStaff`. See further

- [Gregorian chant contexts], pagina 425,
- [Mensural contexts], pagina 418.

Vedi anche

Music Glossary: Sezione "mensural notation" in *Glossario Musicale*.

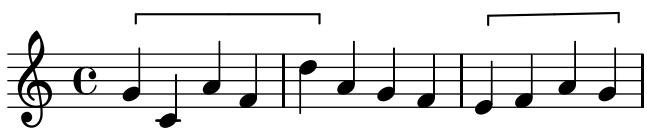
Notation Reference: [Gregorian chant contexts], pagina 425, [Mensural contexts], pagina 418.

Ligatures

A ligature is a graphical symbol that represents at least two distinct notes. Ligatures originally appeared in the manuscripts of Gregorian chant notation to denote ascending or descending sequences of notes on the same syllable. They are also used in mensural notation.

Ligatures are entered by *enclosing* them in `\[` and `\]`. Some ligature styles may need additional input syntax specific for this particular type of ligature. By default, the `LigatureBracket` engraver just puts a square bracket above the ligature.

```
\relative c'' {
  \[ g c, a' f d' \]
  a g f
  \[ e f a g \]
}
```



Two other ligature styles are available: the Vaticana for Gregorian chant, and the Mensural for mensural music (only white mensural ligatures are supported for mensural music, and with certain limitations). To use any of these styles, the default `Ligature_bracket_engraver` has to be replaced with one of the specialized ligature engravers in the `Voice` context, as explained in [White mensural ligatures], pagina 424 and [Gregorian square neume ligatures], pagina 429.

Vedi anche

Music Glossary: Sezione "ligature" in *Glossario Musicale*.

Notation Reference: [White mensural ligatures], pagina 424, [Gregorian square neume ligatures], pagina 429.

Problemi noti e avvertimenti

Ligatures need special spacing that has not yet been implemented. As a result, there is too much space between ligatures most of the time, and line breaking often is unsatisfactory. Also, lyrics do not correctly align with ligatures.

Accidentals must not be printed within a ligature, but instead need to be collected and printed in front of it.

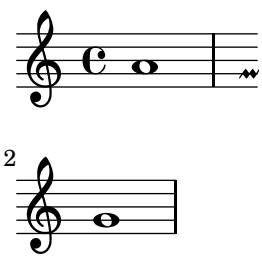
The syntax still uses the deprecated infix style `\[ music expr \]`. For consistency reasons, it will eventually be changed to postfix style `note\[ ... note\]`.

Custodes

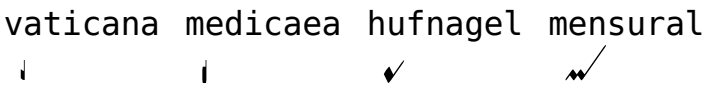
A *custos* (plural: *custodes*; Latin word for "guard") is a symbol that appears at the end of a staff. It anticipates the pitch of the first note of the following line, thus helping the performer to manage line breaks during performance.

Custodes were frequently used in music notation until the seventeenth century. Nowadays, they have survived only in a few particular forms of musical notation such as contemporary editions of Gregorian chant like the *Editio Vaticana*. There are different custos glyphs used in different flavors of notational style.

For typesetting custodes, just put a `Custos_engraver` into the `Staff` context when declaring the `\layout` block, and change the style of the custos with an `\override` if desired, as shown in the following example:



The custos glyph is selected by the `style` property. The styles supported are `vaticana`, `medicaea`, `hufnagel`, and `mensural`. They are demonstrated in the following fragment.



Vedi anche

Music Glossary: Sezione "custos" in *Glossario Musicale*.

Snippets: Sezione "Ancient notation" in *Frammenti di codice*.

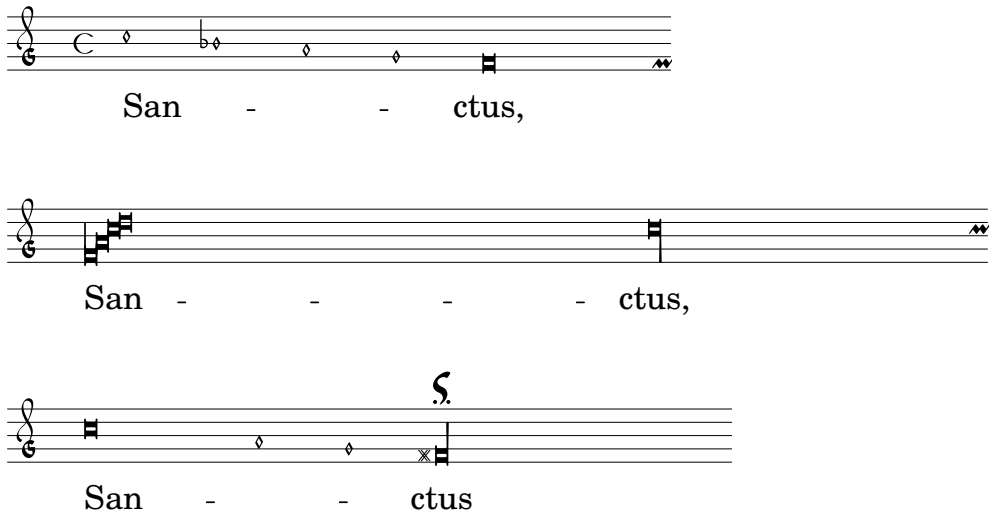
Internals Reference: Sezione "Custos" in *Guida al Funzionamento Interno*.

2.9.3 Typesetting mensural music

Mensural contexts

The predefined `MensuralVoice` and `MensuralStaff` contexts can be used to engrave a piece in mensural style. These contexts initialize all relevant context properties and grob properties to proper values, so you can immediately go ahead entering the chant, as the following excerpt demonstrates:

```
\score {
  <<
    \new MensuralVoice = "discantus" \relative c'' {
      \override Score.BarNumber.transparent = ##t {
        c1\melisma bes a g\melismaEnd
        f\breve
        \[ f1\melisma a c\breve d\melismaEnd \]
        c\longa
        c\breve\melisma a1 g1\melismaEnd
        fis\longa^\signumcongruentiae
      }
    }
    \new Lyrics \lyricsto "discantus" {
      San -- ctus, San -- ctus, San -- ctus
    }
  >>
}
```



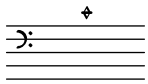
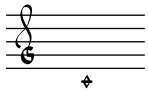
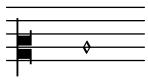
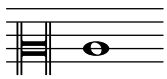
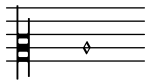
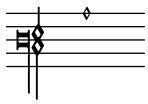
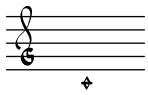
Vedi anche

Music Glossary: Sezione “mensural notation” in *Glossario Musicale*.

Mensural clefs

The following table shows all mensural clefs that are supported via the `\clef` command. Some of the clefs use the same glyph, but differ only with respect to the line they are printed on. In such cases, a trailing number in the name is used to enumerate these clefs, numbered from the lowest to the highest line. You can manually force a clef glyph to be typeset on an arbitrary line, as described in ⟨undefined⟩ [Clef], pagina ⟨undefined⟩. The note printed to the right side of each clef in the example column denotes the `c'` with respect to that clef.

Petrucci used C clefs with differently balanced left-side vertical beams, depending on which staff line it is printed.

Description	**Supported Clefs**	**Example**
mensural C clef	`mensural-c1`, `mensural-c2`, `mensural-c3`, `mensural-c4`, `mensural-c5`	
mensural F clef	`mensural-f`	
mensural G clef	`mensural-g`	
black mensural C clef	`blackmensural-c1`, `blackmensural-c2`, `blackmensural-c3`, `blackmensural-c4`, `blackmensural-c5`	
neomensural C clef	`neomensural-c1`, `neomensural-c2`, `neomensural-c3`, `neomensural-c4`	
petrucci style C clefs, for use on different staff lines (the example shows the 2nd staff line C clef)	`petrucci-c1`, `petrucci-c2`, `petrucci-c3`, `petrucci-c4`, `petrucci-c5`	
petrucci style F clefs, for use on different staff lines (the example shows the 3rd staff line F clef)	`petrucci-f3`, `petrucci-f4`, `petrucci-f5`	
petrucci style G clef	`petrucci-g`	

Vedi anche

Music Glossary: Sezione “mensural notation” in *Glossario Musicale*, Sezione “clef” in *Glossario Musicale*.

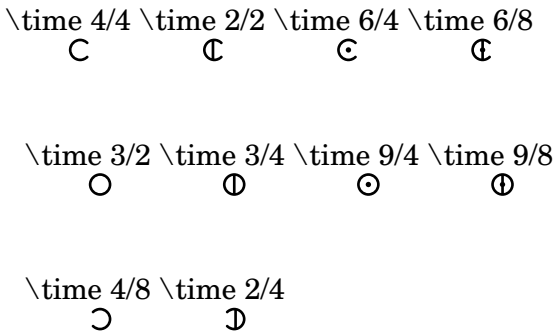
Notation Reference: ⟨undefined⟩ [Clef], pagina ⟨undefined⟩.

Problemi noti e avvertimenti

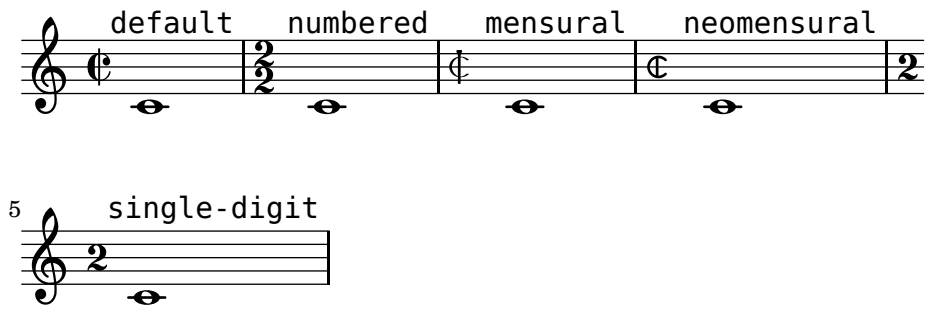
The mensural g clef is mapped to the Petrucci g clef.

Mensural time signatures

There is limited support for mensuration signs (which are similar to, but not exactly the same as time signatures). The glyphs are hard-wired to particular time fractions. In other words, to get a particular mensuration sign with the `\time n/m` command, `n` and `m` have to be chosen according to the following table



Use the `style` property of grob `TimeSignature` to select ancient time signatures. Supported styles are `neomensural` and `mensural`. The above table uses the `neomensural` style. The following examples show the differences in style:



⟨undefined⟩ [Time signature], pagina ⟨undefined⟩, gives a general introduction to the use of time signatures.

Vedi anche

Music Glossary: Sezione "mensural notation" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

Problemi noti e avvertimenti

Ratios of note durations cannot change with the time signature, as those are not constant. For example, the ratio of 1 breve = 3 semibreves (*tempus perfectum*) can be made by hand, by setting

```
breveTP = #(ly:make-duration -1 0 3/2)
...
{ c\breveTP f1 }
```

This sets `breveTP` to 3/2 times 2 = 3 times a whole note.

The `mensural68alt` and `neomensural68alt` symbols (alternate symbols for 6/8) are not addressable with `\time`. Use `\markup {\musicglyph #"timesig.mensural68alt" }` instead.

Mensural note heads

For ancient notation, a note head style other than the `default` style may be chosen. This is accomplished by setting the `style` property of the `NoteHead` object to `baroque`, `neomensural`, `mensural`, `petrucci`, `blackpetrucci` or `semipetrucci`.

The `baroque` style differs from the `default` style by:

- Providing a `maxima` note head, and
- Using a square shape for `\breve` note heads.

The `neomensural`, `mensural`, and `petrucci` styles differ from the `baroque` style by:

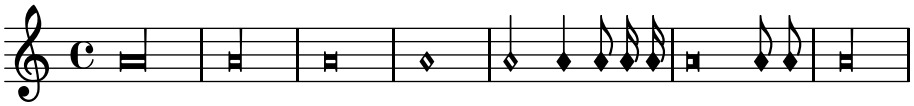
- Using rhomboidal heads for semibreves and all smaller durations, and
- Centering the stems on the note heads.

The `blackpetrucci` style produces note heads usable in black mensural notation or coloratio sections in white mensural notation. Because note head style does not influence flag count, in this style a semiminima should be notated as `a8*2`, not `a4`, otherwise it will look like a minima. The multiplyer can be different if coloratio is used e.g. to notate triplets.

Use `semipetrucci` style to draw half-colored note heads (breves, longas and maximas).

The following example demonstrates the `petrucci` style:

```
\set Score.skipBars = ##t
\autoBeamOff
\override NoteHead.style = #'petrucci
a'\maxima a'\longa a'\breve a'1 a'2 a'4 a'8 a'16 a'
\override NoteHead.style = #'semipetrucci
a'\breve*5/6
\override NoteHead.style = #'blackpetrucci
a'8*4/3 a'
\override NoteHead.style = #'petrucci
a'\longa
```



Sezione A.9 [Note head styles], pagina 658, gives an overview of all available note head styles.

Vedi anche

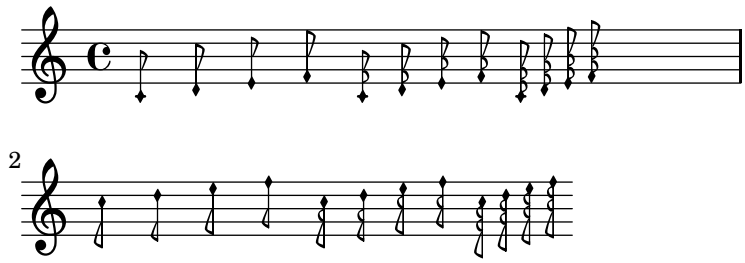
Music Glossary: Sezione “mensural notation” in *Glossario Musicale*, Sezione “note head” in *Glossario Musicale*.

Notation Reference: Sezione A.9 [Note head styles], pagina 658.

Mensural flags

Use the `flag-style` property of grob `Stem` to select ancient flags. Besides the `default` flag style, only the `mensural` style is supported.

```
\override Flag.style = #'mensural
\override Stem.thickness = #1.0
\override NoteHead.style = #'mensural
\autoBeamOff
c'8 d'8 e'8 f'8 c'16 d'16 e'16 f'16 c'32 d'32 e'32 f'32 s8
c''8 d''8 e''8 f''8 c''16 d''16 e''16 f''16 c''32 d''32 e''32 f''32
```



Note that the innermost flare of each mensural flag always is vertically aligned with a staff line.

There is no particular flag style for neo-mensural or Petrucci notation. There are no flags in Gregorian chant notation.

Vedi anche

Music Glossary: Sezione "mensural notation" in *Glossario Musicale*, Sezione "flag" in *Glossario Musicale*.

Problemi noti e avvertimenti

The attachment of ancient flags to stems is slightly off.

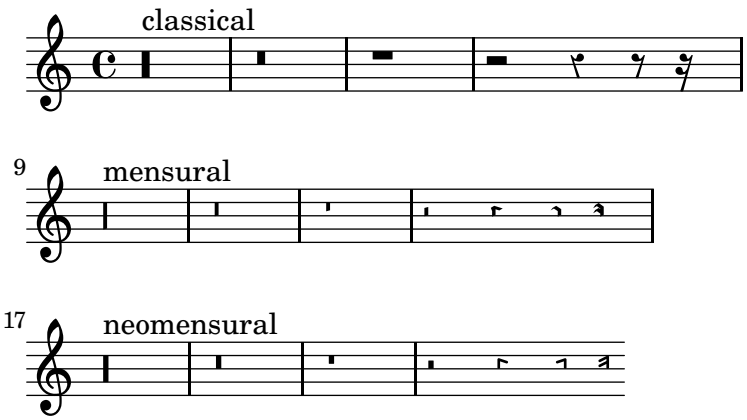
Vertically aligning each flag with a staff line assumes that stems always end either exactly on or exactly in the middle between two staff lines. This may not always be true when using advanced layout features of classical notation (which however are typically out of scope for mensural notation).

Mensural rests

Use the `style` property of grob `Rest` to select ancient rests. Supported styles are `classical`, `neomensural`, and `mensural`. `classical` differs from the `default` style only in that the quarter rest looks like a horizontally mirrored 8th rest. The `mensural` and the `neomensural` styles mimic the appearance of rests in manuscripts and prints up to the 16th century.

The following example demonstrates the `mensural` and `neomensural` styles:

```
\set Score.skipBars = ##t
\override Rest.style = #'classical
r\longa^"classical" r\breve r1 r2 r4 r8 r16 s \break
\override Rest.style = #'mensural
r\longa^"mensural" r\breve r1 r2 r4 r8 r16 s \break
\override Rest.style = #'neomensural
r\longa^"neomensural" r\breve r1 r2 r4 r8 r16
```



There are no 32th and 64th rests specifically for the mensural or neo-mensural style. Instead, the rests from the default style will be taken.

Vedi anche

Music Glossary: Sezione “mensural notation” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Rests], pagina ⟨undefined⟩.

Snippets: Sezione “Ancient notation” in *Frammenti di codice*.

Problemi noti e avvertimenti

The glyph for the maxima rest in mensural style is actually a perfect longa rest; use two (or three) longa rests to print a maxima rest. Longa rests are not grouped automatically, so have to be done manually by using pitched rests.

Mensural accidentals and key signatures

The `mensural` style provides a sharp and a flat sign different from the default style. If called for, the natural sign will be taken from the `vaticana` style.

mensural

The style for accidentals and key signatures is controlled by the `glyph-name-alist` property of the grobs `Accidental` and `KeySignature`, respectively; e.g.:

```
\override Staff.Accidental.glyph-name-alist =
  #alteration-mensural-glyph-name-alist
```

Vedi anche

Music Glossary: Sezione “mensural notation” in *Glossario Musicale*, Sezione “Pitch names” in *Glossario Musicale*, Sezione “accidental” in *Glossario Musicale*, Sezione “key signature” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Pitches], pagina ⟨undefined⟩, ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩.

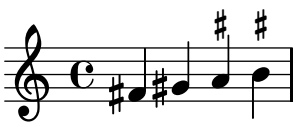
Internals Reference: Sezione “KeySignature” in *Guida al Funzionamento Interno*.

Annotational accidentals (*musica ficta*)

In European music from before about 1600, singers were expected to chromatically alter notes at their own initiative according to certain rules. This is called *musica ficta*. In modern transcriptions, these accidentals are usually printed over the note.

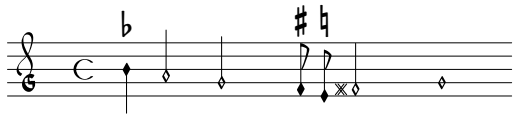
Support for such suggested accidentals is included, and can be switched on by setting `suggestAccidentals` to true.

```
fis gis
\set suggestAccidentals = ##t
ais bis
```



This will treat *every* subsequent accidental as *musica ficta* until it is unset with `\set suggestAccidentals = ##f`. A more practical way is to use `\once \set suggestAccidentals = ##t`, which can even be defined as a convenient shorthand:

```
ficta = { \once \set suggestAccidentals = ##t }
\score { \relative c''
  \new MensuralVoice  {
    \once \set suggestAccidentals = ##t
    bes4 a2 g2 \ficta fis8 \ficta e! fis2 g1
  }
}
```



Vedi anche

Internals Reference: Sezione "Accidental_engraver" in *Guida al Funzionamento Interno*, Sezione "AccidentalSuggestion" in *Guida al Funzionamento Interno*.

White mensural ligatures

There is limited support for white mensural ligatures.

To engrave white mensural ligatures, in the layout block, replace the `Ligature_bracket_engraver` with the `Mensural_ligature_engraver` in the `Voice` context:

```
\layout {
  \context {
    \Voice
    \remove "Ligature_bracket_engraver"
    \consists "Mensural_ligature_engraver"
  }
}
```

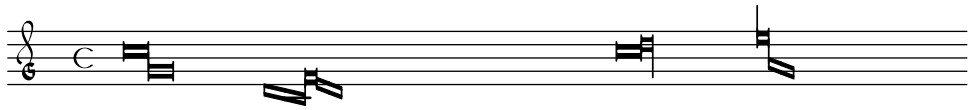
There is no additional input language to describe the shape of a white mensural ligature. The shape is rather determined solely from the pitch and duration of the enclosed notes. While this approach may take a new user a while to get accustomed to, it has the great advantage that the full musical information of the ligature is known internally. This is not only required for correct MIDI output, but also allows for automatic transcription of the ligatures.

At certain places two consecutive notes can be represented either as two squares or as an oblique parallelogram (flexa shape). In such cases the default is the two squares, but a flexa can be required by setting the `ligature-flexa` property of the *second* note head. The length of a flexa can be set by the note head property `flexa-width`.

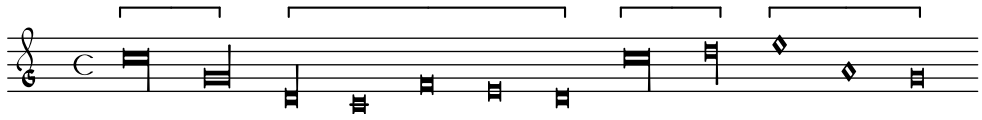
For example,

```
\score {
  \relative c' {
    \set Score.timing = ##f
    \set Score.defaultBarType = "-"
    \override NoteHead.style = #'petrucci
    \override Staff.TimeSignature.style = #'mensural
    \clef "petrucci-g"
    \[ c'\maxima g \]
    \[ d\longa
       \override NoteHead.ligature-flexa = ##t
       \once \override NoteHead.flexa-width = #3.2
```

```
      c\breve f e d \]
    \[ c'\maxima d\longa \]
    \[ e1 a, g\breve \]
  }
  \layout {
    \context {
      \Voice
      \remove "Ligature_bracket_engraver"
      \consists "Mensural_ligature_engraver"
    }
  }
}
```



Without replacing `Ligature_bracket_engraver` with `Mensural_ligature_engraver`, the same music transcribes to the following



Vedi anche

Music Glossary: Sezione "ligature" in *Glossario Musicale*.

Notation Reference: [Gregorian square neume ligatures], pagina 429, [Ligatures], pagina 416.

Problemi noti e avvertimenti

Horizontal spacing of ligatures is poor. Accidentals may collide with previous notes.

2.9.4 Typesetting Gregorian chant

When typesetting a piece in Gregorian chant notation, the `Vaticana_ligature_engraver` automatically selects the proper note heads, so there is no need to explicitly set the note head style. Still, the note head style can be set, e.g., to `vaticana_punctum` to produce punctum neumes. Similarly, the `Mensural_ligature_engraver` automatically assembles mensural ligatures.

Vedi anche

Music Glossary: Sezione "ligature" in *Glossario Musicale*.

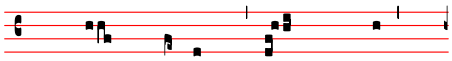
Notation Reference: [White mensural ligatures], pagina 424, [Ligatures], pagina 416.

Gregorian chant contexts

The predefined `VaticanaVoiceContext` and `VaticanaStaffContext` can be used to engrave a piece of Gregorian chant in the style of the Editio Vaticana. These contexts initialize all relevant context properties and grob properties to proper values, so you can immediately go ahead entering the chant, as the following excerpt demonstrates:

```
\include "gregorian.ly"
\score {
  <<
    \new VaticanaVoice = "cantus" {
```

```
      \[ c'\melisma c' \flexa a \]
      \[ a \flexa \deminutum g\melismaEnd \]
      f \divisioMinima
      \[ f\melisma \pes a c' c' \pes d'\melismaEnd \]
      c' \divisioMinima \break
      \[ c'\melisma c' \flexa a \]
      \[ a \flexa \deminutum g\melismaEnd \] f \divisioMinima
    }
    \new Lyrics \lyricsto "cantus" {
      San- ctus, San- ctus, San- ctus
    }
  >>
}
```

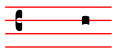
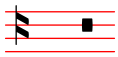
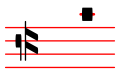


San- ctus, San- ctus,

San- ctus

Gregorian clefs

The following table shows all Gregorian clefs that are supported via the `\clef` command. Some of the clefs use the same glyph, but differ only with respect to the line they are printed on. In such cases, a trailing number in the name is used to enumerate these clefs, numbered from the lowest to the highest line. Still, you can manually force a clef glyph to be typeset on an arbitrary line, as described in ⟨undefined⟩ [Clef], pagina ⟨undefined⟩. The note printed to the right side of each clef in the example column denotes the `c'` with respect to that clef.

Description	Supported Clefs	Example
Editio Vaticana style do clef	`vaticana-do1`, `vaticana-do2`, `vaticana-do3`	
Editio Vaticana style fa clef	`vaticana-fa1`, `vaticana-fa2`	
Editio Medicaea style do clef	`medicaea-do1`, `medicaea-do2`, `medicaea-do3`	
Editio Medicaea style fa clef	`medicaea-fa1`, `medicaea-fa2`	

hufnagel style do clef	`hufnagel-do1`, `hufnagel-do2`, `hufnagel-do3`	
hufnagel style fa clef	`hufnagel-fa1`, `hufnagel-fa2`	
hufnagel style combined do/fa clef	`hufnagel-do-fa`	

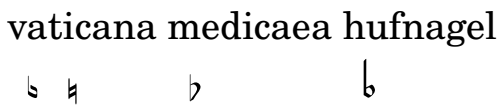
Vedi anche

Music Glossary: Sezione "clef" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Clef], pagina ⟨undefined⟩.

Gregorian accidentals and key signatures

Accidentals for the three different Gregorian styles are available:



As shown, not all accidentals are supported by each style. When trying to access an unsupported accidental, LilyPond will switch to a different style.

The style for accidentals and key signatures is controlled by the `glyph-name-alist` property of the grobs `Accidental` and `KeySignature`, respectively; e.g.:

```
\override Staff.Accidental.glyph-name-alist =
  #alteration-mensural-glyph-name-alist
```

Vedi anche

Music Glossary: Sezione "accidental" in *Glossario Musicale*, Sezione "key signature" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Pitches], pagina ⟨undefined⟩, ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩.

Internals Reference: Sezione "KeySignature" in *Guida al Funzionamento Interno*.

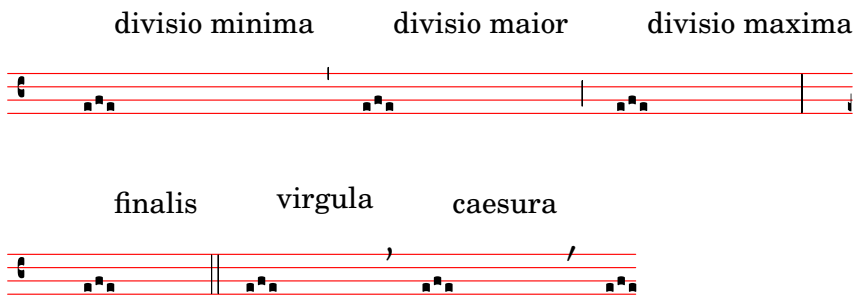
Divisiones

There are no rests in Gregorian chant notation; instead, it uses [Divisiones], pagina 427.

A *divisio* (plural: *divisiones*; Latin word for 'division') is a staff context symbol that is used to indicate the phrase and section structure of Gregorian music. The musical meaning of *divisio minima*, *divisio maior*, and *divisio maxima* can be characterized as short, medium, and long pause, somewhat like the breath marks from ⟨undefined⟩ [Breath marks], pagina ⟨undefined⟩. The *finalis* sign not only marks the end of a chant, but is also frequently used within a single antiphonal/responsorial chant to mark the end of each section.

To use divisiones, include the file '`gregorian.ly`'. It contains definitions that you can apply by just inserting `\divisioMinima`, `\divisioMaior`, `\divisioMaxima`, and `\finalis` at proper

places in the input. Some editions use *virgula* or *caesura* instead of divisio minima. Therefore, '`gregorian.ly`' also defines `\virgula` and `\caesura`



Comandi predefiniti

`\virgula`, `\caesura`, `\divisioMinima`, `\divisioMaior`, `\divisioMaxima`, `\finalis`.

Vedi anche

Music Glossary: Sezione "caesura" in *Glossario Musicale*, Sezione "divisio" in *Glossario Musicale*.

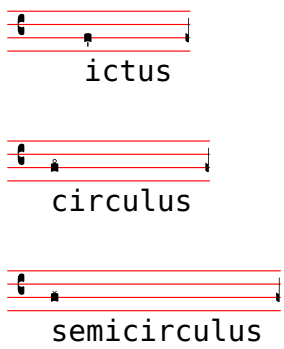
Notation Reference: ⟨undefined⟩ [Breath marks], pagina ⟨undefined⟩.

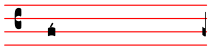
Installed Files: '`ly/gregorian.ly`'.

Gregorian articulation signs

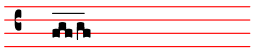
In addition to the standard articulation signs described in section ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩, articulation signs specifically designed for use with notation in *Editio Vaticana* style are provided.

```
\include "gregorian.ly"
\score {
  \new VaticanaVoice {
    \override TextScript.font-family = #'typewriter
    \override TextScript.font-shape = #'upright
    \override Script.padding = #-0.1
    a\ictus_"ictus " \bar "" \break
    a\circulus_"circulus " \bar "" \break
    a\semicirculus_"semicirculus " \bar "" \break
    a\accentus_"accentus " \bar "" \break
    \[ a_"episema" \episemInitium \pes b \flexa a b \episemFinis \flexa a \]
  }
}
```





accentus



episema

Vedi anche

Notation Reference: ⟨undefined⟩ [Articulations and ornamentations], pagina ⟨undefined⟩.

Snippets: Sezione "Ancient notation" in *Frammenti di codice*.

Internals Reference: Sezione "Episema" in *Guida al Funzionamento Interno*, Sezione "EpisemaEvent" in *Guida al Funzionamento Interno*, Sezione "Episema_engraver" in *Guida al Funzionamento Interno*, Sezione "Script" in *Guida al Funzionamento Interno*, Sezione "ScriptEvent" in *Guida al Funzionamento Interno*, Sezione "Script_engraver" in *Guida al Funzionamento Interno*.

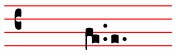
Problemi noti e avvertimenti

Some articulations are vertically placed too closely to the corresponding note heads.

Augmentum dots (*morae*)

Augmentum dots, also called *morae*, are added with the music function `\augmentum`. Note that `\augmentum` is implemented as a unary music function rather than as head prefix. It applies to the immediately following music expression only. That is, `\augmentum \virga c` will have no visible effect. Instead, say `\virga \augmentum c` or `\augmentum {\virga c}`. Also note that you can say `\augmentum {a g}` as a shortcut for `\augmentum a \augmentum g`.

```
\include "gregorian.ly"
\score {
  \new VaticanaVoice {
    \[ \augmentum a \flexa \augmentum g \]
    \augmentum g
  }
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Breath marks], pagina ⟨undefined⟩.

Internals Reference: Sezione "BreathingSign" in *Guida al Funzionamento Interno*.

Snippets: Sezione "Ancient notation" in *Frammenti di codice*.

Gregorian square neume ligatures

There is limited support for Gregorian square neumes notation (following the style of the Editio Vaticana). Core ligatures can already be typeset, but essential issues for serious typesetting are still lacking, such as (among others) horizontal alignment of multiple ligatures, lyrics alignment, and proper handling of accidentals.

The support for Gregorian neumes is enabled by `\include`ing '`gregorian.ly`' at the beginning of the file. This makes available a number of extra commands to produce the neume symbols used in plainchant notation.

Note heads can be *modified* and/or *joined*.

- The shape of the note head can be modified by *prefixing* the note name with any of the following commands: `\virga`, `\stropha`, `\inclinatum`, `\auctum`, `\descendens`, `\ascendens`, `\oriscus`, `\quilisma`, `\deminutum`, `\cavum`, `\linea`.
- Ligatures, properly speaking (i.e. notes joined together), are produced by placing one of the joining commands `\pes` or `\flexa`, for upwards and downwards movement, respectively, *between* the notes to be joined.

A note name without any qualifiers will produce a *punctum*. All other neumes, including the single-note neumes with a different shape such as the *virga*, are in principle considered as ligatures and should therefore be placed between `\[...\]`.

Single-note neumes:

- The *punctum* is the basic note shape (in the *Vaticana* style: a square with some curvation for typographical finesse). In addition to the regular *punctum*, there is also the oblique *punctum inclinatum*, produced with the prefix `\inclinatum`. The regular *punctum* can be modified with `\cavum`, which produces a hollow note, and `\linea`, which draws vertical lines on either side of the note.
- The *virga* has a descending stem on the right side. It is produced by the modifier `\virga`.

Ligatures

Unlike most other neumes notation systems, the typographical appearance of ligatures is not directly dictated by the input commands, but follows certain conventions dependent on musical meaning. For example, a three-note ligature with the musical shape low-high-low, such as `\[ a \pes b \flexa g \]`, produces a Torculus consisting of three Punctum heads, while the shape high-low-high, such as `\[ a \flexa g \pes b \]`, produces a Porrectus with a curved flexa shape and only a single Punctum head. There is no command to explicitly typeset the curved flexa shape; the decision of when to typeset a curved flexa shape is based on the musical input. The idea of this approach is to separate the musical aspects of the input from the notation style of the output. This way, the same input can be reused to typeset the same music in a different style of Gregorian chant notation.

Liquescent neumes

Another main category of notes in Gregorian chant is the so-called liquescent neumes. They are used under certain circumstances at the end of a syllable which ends in a 'liquescent' letter, i.e. the sounding consonants that can hold a tone (the nasals, l, r, v, j, and their diphthong equivalents). Thus, the liquescent neumes are never used alone (although some of them can be produced), and they always fall at the end of a ligature.

Liquescent neumes are represented graphically in two different, more or less interchangeable ways: with a smaller note or by 'twisting' the main note upwards or downwards. The first is produced by making a regular `pes` or `flexa` and modifying the shape of the second note: `\[ a \pes \deminutum b \]` , the second by modifying the shape of a single-note neume with `\auctum` and one of the direction markers `\descendens` or `\ascendens`, e.g., `\[ \auctum \descendens a \]` .

Special signs

A third category of signs is made up of a small number of signs with a special meaning (which, incidentally, in most cases is only vaguely known): the *quilisma*, the *oriscus*, and the *strophicus*. These are all produced by prefixing a note name with the corresponding modifier, `\quilisma`, `\oriscus`, or `\stropha`.

Virtually, within the ligature delimiters `\[` and `\]`, any number of heads may be accumulated to form a single ligature, and head prefixes like `\pes`, `\flexa`, `\virga`, `\inclinatum`, etc. may be mixed in as desired. The use of the set of rules that underlies the construction of the ligatures in the above table is accordingly extrapolated. This way, infinitely many different ligatures can be created.

Note that the use of these signs in the music itself follows certain rules, which are not checked by LilyPond. E.g., the *quilisma* is always the middle note of an ascending ligature, and usually falls on a half-tone step, but it is perfectly possible, although incorrect, to make a single-note quilisma.

In addition to the note signs, '`gregorian.ly`' also defines the commands `\versus`, `\responsum`, `\ij`, `\iij`, `\IJ`, and `\IIJ`, that will produce the corresponding characters, e.g., for use in lyrics, as section markers, etc. These commands use special Unicode characters and will only work if a font is used which supports them.

The following table shows a limited, but still representative pool of Gregorian ligatures, together with the code fragments that produce the ligatures. The table is based on the extended neumes table of the 2nd volume of the Antiphonale Romanum (*Liber Hymnarius*), published 1983 by the monks of Solesmes. The first column gives the name of the ligature, with the main form in boldface and the liquescent forms in italics. The third column shows the code fragment that produces this ligature, using `g`, `a`, and `b` as example pitches.

Single-note neums

Basic and *Liquescent* forms	**Output**	**LilyPond code**
Punctum		`\[ b \]`
		`\[ \cavum b \]`
		`\[ \linea b \]`
Punctum Auctum Ascendens		`\[ \auctum \ascendens b \]`
Punctum Auctum Descendens		`\[ \auctum \descendens b \]`
Punctum inclinatum		`\[ \inclinatum b \]`

Punctum Inclinatum Auctum

```
\[ \inclinatum \auctum b \]
```

Punctum Inclinatum Parvum

```
\[ \inclinatum \deminutum b \]
```

Virga

Two-note ligatures

Clivis vel Flexa

```
\[ b \flexa g \]
```

Clivis Aucta Descendens

```
\[ b \flexa \auctum \descendens
g \]
```

Clivis Aucta Ascendens

```
\[ b \flexa \auctum \ascendens
g \]
```

Cephalicus

```
\[ b \flexa \deminutum g \]
```

Podatus/Pes

```
\[ g \pes b \]
```

Pes Auctus Descendens

```
\[ g \pes \auctum \descendens b
\]
```

Pes Auctus Ascendens

```
\[ g \pes \auctum \ascendens b
\]
```

Epiphonus

```
\[ g \pes \deminutum b \]
```

Pes Initio Debilis

```
\[ \deminutum g \pes b \]
```

Pes Auctus Descendens Initio Debilis

```
\[ \deminutum g \pes \auctum
\descendens b \]
```

Multi-note ligatures

Torculus

```
\[ a \pes b \flexa g \]
```

Torculus Auctus Descendens

```
\[ a \pes b \flexa \auctum
\descendens g \]
```

Torculus Deminutus

```
\[ a \pes b \flexa \deminutum g
\]
```

Torculus Initio Debilis

```
\[ \deminutum a \pes b \flexa g
\]
```

Torculus Auctus Descendens Initio Debilis

```
\[ \deminutum a \pes b \flexa
\auctum \descendens g \]
```

Torculus Deminutus Initio Debilis

```
\[ \deminutum a \pes b \flexa
\deminutum g \]
```

Porrectus

```
\[ a \flexa g \pes b \]
```

Porrectus Auctus Descendens

```
\[ a \flexa g \pes \auctum
\descendens b \]
```

Porrectus Deminutus

```
\[ a \flexa g \pes \deminutum b
\]
```

Climacus

```
\[ \virga b \inclinatum a
\inclinatum g \]
```

Climacus Auctus

```
\[ \virga b \inclinatum a
\inclinatum \auctum g \]
```

Climacus Deminutus

```
\[ \virga b \inclinatum a
\inclinatum \deminutum g \]
```

Scandicus

```
\[ g \pes a \virga b \]
```

Scandicus Auctus Descendens

```
\[ g \pes a \pes \auctum
\descendens b \]
```

Scandicus Deminutus

```
\[ g \pes a \pes \deminutum b \]
```

Special Signs

Quilisma

```
\[ g \pes \quilisma a \pes b \]
```

Quilisma Pes Auctus Descendens

```
\[ \quilisma g \pes \auctum
\descendens b \]
```

Oriscus

```
\[ \oriscus b \]
```

Pes Quassus

```
\[ \oriscus g \pes \virga b \]
```

Pes Quassus Auctus Descendens

```
\[ \oriscus g \pes \auctum
\descendens b \]
```

Salicus

```
\[ g \oriscus a \pes \virga b \]
```

Salicus Auctus Descendens

```
\[ g \oriscus a \pes \auctum
\descendens b \]
```

(Apo)stropha

```
\[ \stropha b \]
```

Stropha Aucta

```
\[ \stropha \auctum b \]
```

Bistropha

```
\[ \stropha b \stropha b \]
```

Tristropha

```
\[ \stropha b \stropha b
\stropha b \]
```

Trigonus

```
\[ \stropha b \stropha b
\stropha a \]
```

Comandi predefiniti

The following head prefixes are supported: `\virga`, `\stropha`, `\inclinatum`, `\auctum`, `\descendens`, `\ascendens`, `\oriscus`, `\quilisma`, `\deminutum`, `\cavum`, `\linea`.

Head prefixes can be accumulated, though restrictions apply. For example, either `\descendens` or `\ascendens` can be applied to a head, but not both to the same head.

Two adjacent heads can be tied together with the `\pes` and `\flexa` infix commands for a rising and falling line of melody, respectively.

Use the unary music function `\augmentum` to add augmentum dots.

Vedi anche

Music Glossary: Sezione “ligature” in *Glossario Musicale*.

Notation Reference: [Gregorian square neume ligatures], pagina 429, [White mensural ligatures], pagina 424, [Ligatures], pagina 416.

Problemi noti e avvertimenti

When an `\augmentum` dot appears at the end of the last staff within a ligature, it is sometimes vertically placed wrong. As a workaround, add an additional skip note (e.g., `s8`) as last note of the staff.

`\augmentum` should be implemented as a head prefix rather than a unary music function, such that `\augmentum` can be intermixed with head prefixes in arbitrary order.

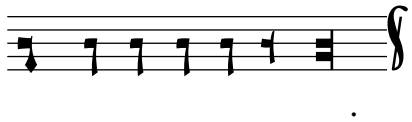
2.9.5 Typesetting Kievan square notation

Kievan contexts

As with Mensural and Gregorian notation, the predefined `KievanVoice` and `KievanStaff` contexts can be used to engrave a piece in square notation. These contexts initialize all relevant context properties and grob properties to proper values, so you can immediately go ahead entering the chant:

```
\score {
```

```
  <<
    \new KievanVoice = "melody" \relative c' {
      \cadenzaOn
        c4 c c c c2 b\longa
        \bar "k"
    }
    \new Lyrics \lyricsto "melody" {
      Го -- спо -- ди по -- ми -- луй.
    }
  >>
}
```



Vedi anche

Music Glossary: Sezione "kievan notation" in *Glossario Musicale*.

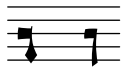
Problemi noti e avvertimenti

LilyPond supports Kievan notation of the Synodal style, as used in the corpus of chantbooks printed by the Russian Holy Synod in the 1910's and recently reprinted by the Moscow Patriarchate Publishing House. LilyPond does not support the older (less common) forms of Kievan notation that were used in Galicia to notate Rusyn plainchant.

Kievan clefs

There is only one clef used in Kievan notation (the Tse-fa-ut Clef). It is used to indicate the position of `c`:

```
\clef "kievan-do"
\kievanOn
c
```



Vedi anche

Music Glossary: Sezione "kievan notation" in *Glossario Musicale*, Sezione "clef" in *Glossario Musicale*.

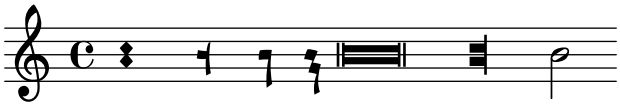
Notation Reference: ⟨undefined⟩ [Clef], pagina ⟨undefined⟩.

Kievan notes

For Kievan square notation, the appropriate note head style needs to be chosen and the flags and stems need to be turned off. This is accomplished by calling the `\kievanOn` function, which sets the appropriate properties of the note head, stems, and flags. Once Kievan note heads are not needed, these properties can be reverted by calling the `\kievanOff` function.

The Kievan final note, which usually comes at the end of a piece of music, may be selected by setting the duration to `\longa`. The Kievan recitative mark, used to indicate the chanting of several syllables on one note, may be selected by setting the duration to `\breve`. The following example demonstrates the various Kievan note heads:

```
\autoBeamOff
\cadenzaOn
\kievanOn
b'1 b'2 b'4 b'8 b'\breve b'\longa
\kievanOff
b'2
```



Vedi anche

Music Glossary: Sezione "kievan notation" in *Glossario Musicale*, Sezione "note head" in *Glossario Musicale*.

Notation Reference: Sezione A.9 [Note head styles], pagina 658.

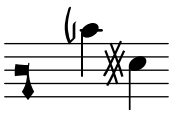
Problemi noti e avvertimenti

LilyPond automatically determines if the stem up or stem down form of a note is drawn. When setting chant in square notation, however, it is customary to have the stems point in the same direction within a single melisma. This can be done manually by setting the `direction` property of the `Stem` object.

Kievan accidentals

The `kievan` style for accidentals is selected with the `glyph-name-alist` property of the grob `Accidental`. The `kievan` style provides a sharp and a flat sign different from the default style. There is no natural sign in Kievan notation. The sharp sign is not used in Synodal music but may occur in earlier manuscripts. It has been included primarily for the sake of compatibility.

```
\clef "kievan-do"
\override Accidental.glyph-name-alist =
 #alteration-kievan-glyph-name-alist
bes' dis,
```



Vedi anche

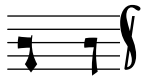
Music Glossary: Sezione "kievan notation" in *Glossario Musicale*, Sezione "accidental" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩, Sezione A.8 [The Feta font], pagina 637

Kievan bar line

A decorative figure is commonly placed at the end of a piece of Kievan notation, which may be called the Kievan final bar line. It can be invoked as `\bar "k"`.

```
\kievanOn
\clef "kievan-do"
c \bar "k"
```



Vedi anche

⟨undefined⟩ [Bars], pagina ⟨undefined⟩, Sezione A.8 [The Feta font], pagina 637

Kievan melismata

Notes within a Kievan melisma are usually placed close to each other and the melismata separated by whitespace. This is done to allow the chanter to quickly identify the melodic structures of Znamenny chant. In LilyPond, melismata are treated as ligatures and the spacing is implemented by the `Kievan_ligature_engraver`.

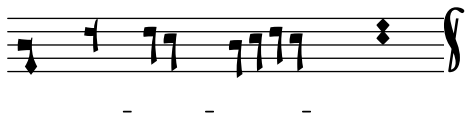
When the `KievanVoice` and `KievanStaff` contexts are used, the `Kievan_ligature_engraver` is enabled by default. In other contexts, it can be invoked by replacing the `Ligature_bracket_engraver` with the `Kievan_ligature_engraver` in the layout block:

```
\layout {
  \context {
    \Voice
    \remove "Ligature_bracket_engraver"
    \consists "Kievan_ligature_engraver"
  }
}
```

The spacing between the notes within a Kievan ligature can be controlled by setting the `padding` property of the `KievanLigature`.

The following example demonstrates the use of Kievan ligatures:

```
\score {
  <<
    \new KievanVoice = "melody" \relative c' {
      \cadenzaOn
        e2 \[ e4( d4 ) \] \[ c4( d e  d ) \] e1 \bar "k"
    }
    \new Lyrics \lyricsto "melody" {
      Га -- вpi -- и -- лу
    }
  >>
}
```



Vedi anche

Music Glossary: Sezione “ligature” in *Glossario Musicale*.

Notation Reference: [White mensural ligatures], pagina 424, [Gregorian square neume ligatures], pagina 429, [Ligatures], pagina 416.

Problemi noti e avvertimenti

Horizontal spacing of ligatures is poor.

2.9.6 Working with ancient music—scenarios and solutions

Working with ancient music frequently involves particular tasks which differ considerably from the modern notation for which LilyPond is designed. In the rest of this section, a number of typical scenarios are outlined, with suggestions of solutions. These involve:

- how to make incipits (i.e. prefatory material to indicate what the original has looked like) to modern transcriptions of mensural music;
- how to achieve the *Mensurstriche* layout frequently used for modern transcriptions of polyphonic music;
- how to transcribe Gregorian chant in modern notation;
- how to generate both ancient and modern notation from the same source.

Incipits

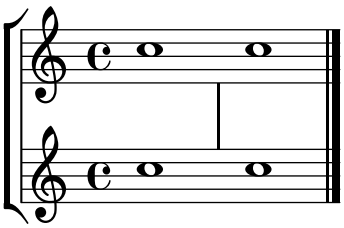
TBC

Mensurstriche layout

Mensurstriche ('mensuration lines') is the accepted term for bar lines that are drawn between the staves of a system but not through the staves themselves. It is a common way to preserve the rhythmic appearance of the original, i.e. not having to break syncopated notes at bar lines, while still providing the orientation aids that bar lines give.

The mensurstriche-layout where the bar lines do not show on the staves but between staves can be achieved with a `StaffGroup` instead of a `ChoirStaff`. The bar line on staves is blanked out by setting the `transparent` property.

```
global = {
  \override Staff.BarLine.transparent = ##t
  s1 s
  % the final bar line is not interrupted
  \revert Staff.BarLine.transparent
  \bar "|."
}
\new StaffGroup \relative c'' {
  <<
    \new Staff { << \global { c1 c } >> }
    \new Staff { << \global { c c } >> }
  >>
}
```



Transcribing Gregorian chant

Gregorian chant can be transcribed into modern notation with a number of simple tweaks.

Stems. Stems can be left out altogether by `\remove`-ing the `Stem_engraver` from the Voice context:

```
\layout {
  ...
```

```
  \context {
    \Voice
      \remove "Stem_engraver"
  }
}
```

However, in some transcription styles, stems are used occasionally, for example to indicate the transition from a single-tone recitative to a fixed melodic gesture. In these cases, one can use either `\override Stem.transparent = ##t` or `\override Stem.length = #0` instead, and restore the stem when needed with the corresponding `\once \override Stem.transparent = ##f` (see example below). When using stems that carry flags, make sure to set `\override Flag.transparent = ##t` as well.

Timing. For unmetered chant, there are several alternatives.

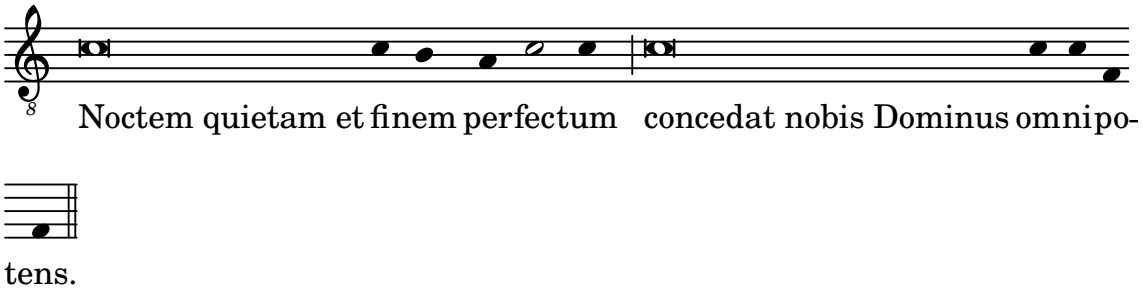
The Time_signature_engraver can be removed from the Staff context without any negative side effects. The alternative, to make it transparent, will leave an empty space in the score, since the invisible signature will still take up space.

In many cases, `\set Score.timing = ##f` will give good results. Another alternative is to use `\CadenzaOn` and `\CadenzaOff`.

To remove the bar lines, the radical approach is to `\remove` the Bar_engraver from the Staff context. Again, one may want to use `\override BarLine.transparent = ##t` instead, if an occasional barline is wanted.

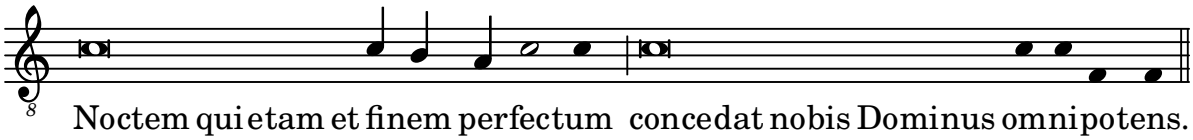
A common type of transcription is recitativic chant where the repeated notes are indicated with a single breve. The text to the recitation tone can be dealt with in two different ways: either set as a single, left-aligned syllable:

```
\include "gregorian.ly"
chant = \relative c' {
  \clef "G_8"
  c\breve c4 b4 a c2 c4  \divisioMaior
  c\breve c4 c f, f \finalis
}

verba = \lyricmode {
  \once \override LyricText.self-alignment-X = #-1
  "Noctem quietam et" fi -- nem per -- fec -- tum
  \once \override LyricText.self-alignment-X = #-1
  "concedat nobis Dominus" om -- ni -- po -- tens.
}
\score {
  \new Staff <<
  \new Voice = "melody" \chant
  \new Lyrics = "one" \lyricsto melody \verba
  >>
  \layout {
    \context {
      \Staff
      \remove "Time_signature_engraver"
      \remove "Bar_engraver"
      \override Stem.transparent = ##t
    }
  }
}
```



This works fine, as long as the text doesn't span a line break. If that is the case, an alternative is to add hidden notes to the score, here in combination with changing stem visibility:

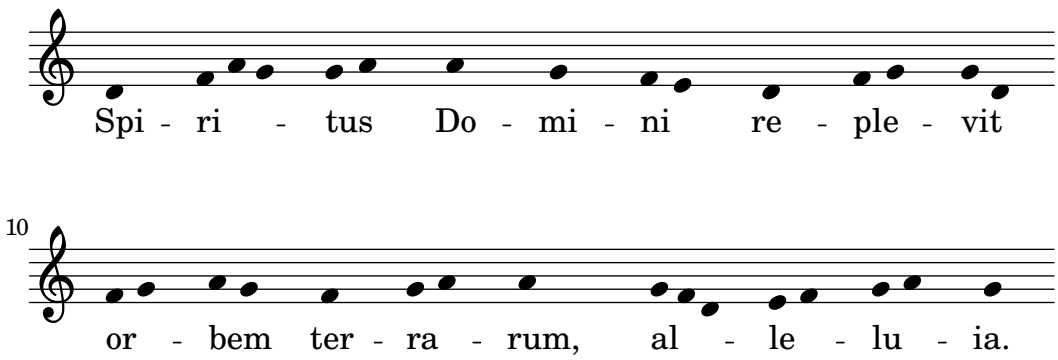
```
\include "gregorian.ly"
chant = \relative c' {
  \clef "G_8"
  \set Score.timing = ##f
  c\breve \override NoteHead.transparent = ##t  c c c c c
  \revert NoteHead.transparent
  \override Stem.transparent = ##f \stemUp c4 b4 a
  \override Stem.transparent = ##t c2 c4  \divisioMaior
  c\breve \override NoteHead.transparent = ##t c c c c c c c
  \revert NoteHead.transparent c4 c f, f \finalis
}

verba = \lyricmode {
  No -- ctem qui -- e -- tam et fi -- nem per -- fec -- tum
  con -- ce -- dat no -- bis Do -- mi -- nus om -- ni -- po -- tens.
}

\score {
  \new Staff <<
    \new Voice = "melody" \chant
    \new Lyrics \lyricsto "melody" \verba
  >>
  \layout {
    \context {
      \Staff
      \remove "Time_signature_engraver"
      \override BarLine.transparent = ##t
      \override Stem.transparent = ##t
    }
  }
}
```



Another common situation is transcription of neumatic or melismatic chants, i.e. chants with a varying number of notes to each syllable. In this case, one would want to set the syllable groups clearly apart, usually also the subdivisions of a longer melisma. One way to achieve this is to use a fixed `\time`, e.g., 1/4, and let each syllable or note group fill one of these measures, with the help of tuplets or shorter durations. If the bar lines and all other rhythmical indications are made transparent, and the space around the bar lines is increased, this will give a fairly good representation in modern notation of the original.

To avoid that syllables of different width (such as “-ri” and “-rum”) spread the syllable note groups unevenly apart, the `'X-extent` property of the `LyricText` object may be set to a fixed value. Another, more cumbersome way would be to add the syllables as `\markup` elements. If further adjustments are necessary, this can be easily done with `s` ‘notes’.

```
spiritus = \relative c' {
  \time 1/4
  \override Lyrics.LyricText.X-extent  = #'(0 . 3)
  d4 \tuplet 3/2 { f8 a g } g a a4 g f8 e
  d4 f8 g g8 d f g a g f4 g8 a a4  s
  \tuplet 3/2 { g8 f d } e f g a g4
}

spirLyr = \lyricmode {
  Spi -- ri -- _ _ tus  _ Do -- mi -- ni  _ re -- ple -- _ vit _
  or -- _ bem _  ter -- ra -- _ rum, al -- _ _ le -- _ lu
  -- _ ia.
}
\score {
  \new Staff <<
    \new Voice = "chant" \spiritus
    \new Lyrics = "one" \lyricsto "chant" \spirLyr
  >>
  \layout {
    \context {
      \Staff
      \remove "Time_signature_engraver"
      \override BarLine.X-extent = #'(-1 . 1)
      \override Stem.transparent = ##t
      \override Beam.transparent = ##t
      \override BarLine.transparent = ##t
      \override TupletNumber.transparent = ##t
    }
  }
}
```



Ancient and modern from one source

TBC

Editorial markings

2.10 World music

The purpose of this section is to highlight musical notation issues that are relevant to traditions outside the Western tradition.

2.10.1 Common notation for non-Western music

This section discusses how to enter and print music scores that do not belong to the Western classical tradition, also referred to as *Common Practice Period*.

Extending notation and tuning systems

Standard classical notation (also known as *Common Practice Period* notation) is commonly used in all sorts of music, not limited to 'classical' Western music. This notation is discussed in ⟨undefined⟩ [Writing pitches], pagina ⟨undefined⟩, and the various note names that may be used are explained in ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩.

However, many types of non-Western music (and some types of Western folk and traditional music) employ alternative or extended tuning systems that do not fit readily into standard classical notation.

In some cases standard notation is still used, with the pitch differences being implicit. For example, *Arabic music* is notated with standard semitone and quarter-tone accidentals, with the precise pitch alterations being determined by context. Italian note names are typically used, while the init file '`arabic.ly`' provides a suitable set of macros and definitions extending the standard notation. For more details, see Sezione 2.10.2 [Arabic music], pagina 445.

Other types of music require extended or unique notations. *Turkish classical music* or Ottoman music, for example, employs melodic forms known as *makamlar*, whose intervals are based on 1/9 divisions of the whole tone. Standard Western staff notes are still used, but with special accidentals unique to Turkish music, that are defined in the file '`makam.ly`'. For further information on Turkish classical music and makamlar, see Sezione 2.10.3 [Turkish classical music], pagina 450.

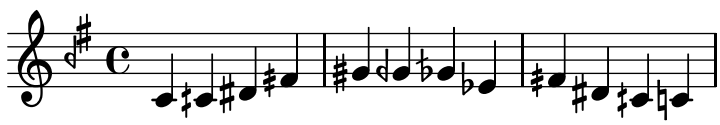
To locate init files such as '`arabic.ly`' or '`makam.ly`' on your system, see Sezione "Other sources of information" in *Manuale di Apprendimento*.

Frammenti di codice selezionati

Makam example

Makam is a type of melody from Turkey using 1/9th-tone microtonal alterations. Consult the initialization file '`ly/makam.ly`' for details of pitch names and alterations.

```
% Initialize makam settings
\include "makam.ly"

\relative c' {
  \set Staff.keySignature = #`((6 . ,(- KOMA)) (3 . ,BAKIYE))
  c4 cc db fk
  gbm4 gfc gfb efk
  fk4 db cc c
}
```



Vedi anche

Music Glossary: Sezione "Common Practice Period" in *Glossario Musicale*, Sezione "makamlar" in *Glossario Musicale*.

Learning Manual: Sezione "Other sources of information" in *Manuale di Apprendimento*.

Notation Reference: ⟨undefined⟩ [Writing pitches], pagina ⟨undefined⟩, ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩, Sezione 2.10.2 [Arabic music], pagina 445, Sezione 2.10.3 [Turkish classical music], pagina 450.

2.10.2 Arabic music

This section highlights issues that are relevant to notating Arabic music.

References for Arabic music

Arabic music so far has been mainly an oral tradition. When music is transcribed, it is usually in a sketch format, on which performers are expected to improvise significantly. Increasingly, Western notation, with a few variations, is adopted in order to communicate and preserve Arabic music.

Some elements of Western musical notation such as the transcription of chords or independent parts, are not required to typeset the more traditional Arabic pieces. There are however some different issues, such as the need to indicate medium intervals that are somewhere between a semi-tone and a tone, in addition to the minor and major intervals that are used in Western music. There is also the need to group and indicate a large number of different maqams (modes) that are part of Arabic music.

In general, Arabic music notation does not attempt to precisely indicate microtonal elements that are present in musical practice.

Several issues that are relevant to Arabic music are covered elsewhere:

- Note names and accidentals (including quarter tones) can be tailored as discussed in Sezione 2.10.1 [Common notation for non-Western music], pagina 444.
- Additional key signatures can also be tailored as described in ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩.
- Complex time signatures may require that notes be grouped manually as described in ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩.
- *Takasim* which are rhythmically free improvisations may be written down omitting bar lines as described in ⟨undefined⟩ [Unmetered music], pagina ⟨undefined⟩.

Vedi anche

Notation Reference: Sezione 2.10.1 [Common notation for non-Western music], pagina 444, ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩, ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩.

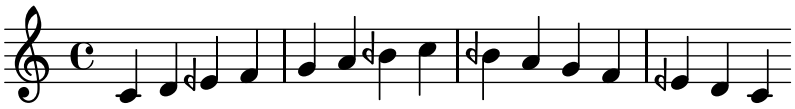
Snippets: Sezione "World music" in *Frammenti di codice*.

Arabic note names

The more traditional Arabic note names can be quite long and are not suitable for the purpose of music writing, so they are not used. English note names are not very familiar in Arabic music education, so Italian or Solfege note names (`do, re, mi, fa, sol, la, si`) are used instead; modifiers (accidentals) can also be used. Italian note names and accidentals are explained in ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩; the use of standard Western notation to notate non-Western music is discussed in Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

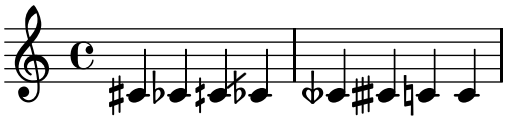
For example, this is how the Arabic *rast* scale can be notated:

```
\include "arabic.ly"
\relative do' {
  do re misb fa sol la sisb do sisb la sol fa misb re do
}
```



The symbol for semi-flat does not match the symbol which is used in Arabic notation. The `\dwn` symbol defined in '`arabic.ly`' may be used preceding a flat symbol as a work around if it is important to use the specific Arabic semi-flat symbol. The appearance of the semi-flat symbol in the key signature cannot be altered by using this method.

```
\include "arabic.ly"
\relative do' {
  \set Staff.extraNatural = ##f
  dod dob dosd \dwn dob dobsb dodsd do do
}
```



Vedi anche

Notation Reference: ⟨undefined⟩ [Note names in other languages], pagina ⟨undefined⟩, Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

Snippets: Sezione "World music" in *Frammenti di codice*.

Arabic key signatures

In addition to the minor and major key signatures, the following key signatures are defined in '`arabic.ly`': *bayati*, *rast*, *sikah*, *iraq*, and *kurd*. These key signatures define a small number of maqam groups rather than the large number of maqams that are in common use.

In general, a maqam uses the key signature of its group, or a neighbouring group, and varying accidentals are marked throughout the music.

For example to indicate the key signature of a maqam muhayer piece:

```
\key re \bayati
```

Here *re* is the default pitch of the muhayer maqam, and *bayati* is the name of the base maqam in the group.

While the key signature indicates the group, it is common for the title to indicate the more specific maqam, so in this example, the name of maqam muhayer should appear in the title.

Other maqams in the same bayati group, as shown in the table below: (bayati, hussaini, saba, and ushaq) can be indicated in the same way. These are all variations of the base and most common maqam in the group, which is bayati. They usually differ from the base maqam in their upper tetrachords, or certain flow details that don't change their fundamental nature, as siblings.

The other maqam in the same group (Nawa) is related to bayati by modulation which is indicated in the table in parenthesis for those maqams that are modulations of their base maqam. Arabic maqams admit of only limited modulations, due to the nature of Arabic musical instruments. Nawa can be indicated as follows:

`\key sol \bayati`

In Arabic music, the same term such as bayati that is used to indicate a maqam group, is also a maqam which is usually the most important in the group, and can also be thought of as a base maqam.

Here is one suggested grouping that maps the more common maqams to key signatures:

maqam group	**key**	**finalis**	**Other maqmas in group (finalis)**
ajam	major	sib	jaharka (fa)
bayati	bayati	re	hussaini, muhayer, saba, ushaq, nawa (sol)
hijaz	kurd	re	shahnaz, shad arban (sol), hijazkar (do)
iraq	iraq	sisb	-
kurd	kurd	re	hijazkar kurd (do)
nahawand	minor	do	busalik (re), farah faza (sol)
nakriz	minor	do	nawa athar, hisar (re)
rast	rast	do	mahur, yakah (sol)
sikah	sikah	misb	huzam

Frammenti di codice selezionati

Armature di chiave non tradizionali

Il comando `\key` comunemente usato imposta la proprietà `keySignature`, che fa parte del contesto `Staff`.

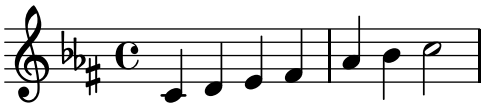
Per creare armature di chiave non standard, tale proprietà va impostata esplicitamente. Il formato di questo comando è una lista:

`\set Staff.keySignature = #`(((ottava . grado) . alterazione) ((ottava . grado) . alterazione) ...)` dove, per ogni elemento della lista, `ottava` indica l'ottava (0 è l'ottava dal Do centrale al Si precedente), `grado` indica la nota all'interno dell'ottava (0 significa Do e 6 significa Si) e `alterazione` può essere `,SHARP` `,FLAT` `,DOUBLE-SHARP` etc. (Si noti la virgola iniziale.)

Altrimenti, usando, per ogni elemento della lista, il formato breve `(grado . alterazione)`, ciò indica che la stessa alterazione deve essere presente in tutte le ottave.

Ecco un esempio di una possibile armatura per generare una scala a tono intero:

```
\relative c' {
  \set Staff.keySignature = #`(((0 . 6) . ,FLAT)
                              ((0 . 5) . ,FLAT)
                              ((0 . 3) . ,SHARP))
  c4 d e fis
  aes4 bes c2
}
```



Vedi anche

Music Glossary: Sezione "maqam" in *Glossario Musicale*, Sezione "bayati" in *Glossario Musicale*, Sezione "rast" in *Glossario Musicale*, Sezione "sikah" in *Glossario Musicale*, Sezione "iraq" in *Glossario Musicale*, Sezione "kurd" in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Key signature], pagina ⟨undefined⟩.

Learning Manual: Sezione "Accidentals and key signatures" in *Manuale di Apprendimento*.

Internals Reference: Sezione “KeySignature” in *Guida al Funzionamento Interno*.

Snippets: Sezione “World music” in *Frammenti di codice*, Sezione “Pitches” in *Frammenti di codice*.

Arabic time signatures

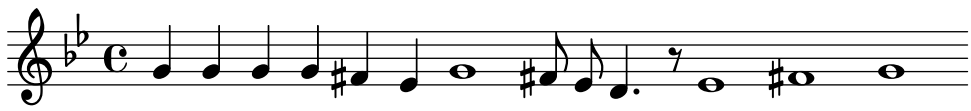
Some Arabic and Turkish music classical forms such as *Semai* use unusual time signatures such as 10/8. This may lead to an automatic grouping of notes that is quite different from existing typeset music, where notes may not be grouped on the beat, but in a manner that is difficult to match by adjusting automatic beaming. The alternative is to switch off automatic beaming and beam the notes manually. Even if a match to existing typeset music is not required, it may still be desirable to adjust the automatic beaming behaviour and/or use compound time signatures.

Frammenti di codice selezionati

Arabic improvisation

For improvisations or taqasim which are temporarily free, the time signature can be omitted and `\cadenzaOn` can be used. Adjusting the accidental style might be required, since the absence of bar lines will cause the accidental to be marked only once. Here is an example of what could be the start of a hijaz improvisation:

```
\include "arabic.ly"

\relative sol' {
  \key re \kurd
  \accidentalStyle forget
  \cadenzaOn
  sol4 sol sol sol fad mib sol1 fad8 mib re4. r8 mib1 fad sol
}
```



Vedi anche

Music Glossary: Sezione “semai” in *Glossario Musicale*, Sezione “taqasim” in *Glossario Musicale*.

Notation Reference: ⟨undefined⟩ [Manual beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic beams], pagina ⟨undefined⟩, ⟨undefined⟩ [Unmetered music], pagina ⟨undefined⟩, ⟨undefined⟩ [Automatic accidentals], pagina ⟨undefined⟩, ⟨undefined⟩ [Setting automatic beam behavior], pagina ⟨undefined⟩, ⟨undefined⟩ [Time signature], pagina ⟨undefined⟩.

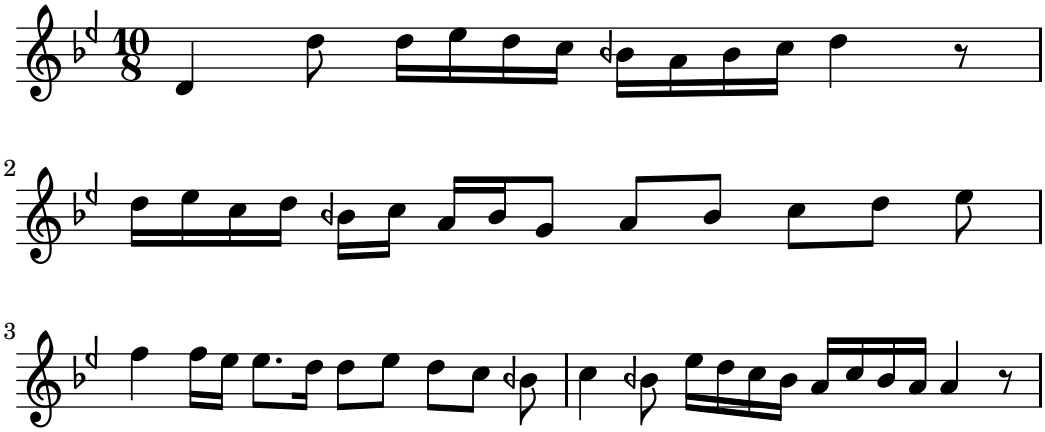
Snippets: Sezione “World music” in *Frammenti di codice*.

Arabic music example

Here is a template that also uses the start of a Turkish *Semai* that is familiar in Arabic music education in order to illustrate some of the peculiarities of Arabic music notation, such as medium intervals and unusual modes that are discussed in this section.

```
\include "arabic.ly"
\score {
  \relative re' {
    \set Staff.extraNatural = ##f
    \set Staff.autoBeaming = ##f
```

```
    \key re \bayati
    \time 10/8

    re4 re'8 re16 [misb re do] sisb [la sisb do] re4 r8
    re16 [misb do re] sisb [do] la [sisb sol8] la [sisb] do [re] misb
    fa4 fa16 [misb] misb8. [re16] re8 [misb] re  [do] sisb
    do4 sisb8 misb16 [re do sisb] la [do sisb la] la4 r8
  }
  \header {
    title = "Semai Muhayer"
    composer = "Jamil Bek"
  }
}
```



Vedi anche

Snippets: Sezione "World music" in *Frammenti di codice*.

Further reading for Arabic music

1. *The music of the Arabs* by Habib Hassan Touma [Amadeus Press, 1996], contains a discussion of maqams and their method of groupings.

   There are also various web sites that explain maqams and some provide audio examples such as :

   - http://www.maqamworld.com/
   - http://www.turath.org/

   There are some variations in the details of how maqams are grouped, despite agreement on the criteria of grouping maqams that are related through common lower tetra chords, or through modulation.

2. There is not a complete consistency, sometimes even in the same text on how key signatures for particular maqams should be specified. It is common, however, to use a key signature per group, rather than a different key signature for each different maqam.

   Method books by the following authors for the *Oud*, the Arabic lute, contain examples of mainly Turkish and Arabic compositions.

   - Charbel Rouhana
   - George Farah
   - Ibrahim Ali Darwish Al-masri

2.10.3 Turkish classical music

This section highlights issues that are relevant to notating Turkish classical music.

References for Turkish classical music

Turkish classical music developed in the Ottoman Empire in a period roughly contemporaneous with classical music in Europe, and has continued on into the 20th and 21st centuries as a vibrant and distinct tradition with its own compositional forms, theory and performance styles. Among its striking features is the use of microtonal intervals based on 'commas' of 1/9 of a tone, from which are constructed the melodic forms known as *makam* (plural *makamlar*).

Some issues relevant to Turkish classical music are covered elsewhere:

- Special note names and accidentals are explained in Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

Turkish note names

Pitches in Turkish classical music traditionally have unique names, and the basis of pitch on 1/9-tone divisions means makamlar employ a completely different set of intervals from Western scales and modes: *koma* (1/9 of a tone), *eksik bakiye* (3/9), *bakiye* (4/9), *kücük mücenneb* (5/9), *büyük mücenneb* (8/9), *tanîni* (a whole tone) and *artık ikili* (12/9 or 13/9 of a tone).

From a modern notational point of view it is convenient to use the standard Western staff notes (c, d, e, . . .) with special accidentals that raise or lower notes by intervals of 1/9, 4/9, 5/9 and 8/9 of a tone. These accidentals are defined in the file '`makam.ly`'.

The following table lists:

- the name of these special accidentals,
- the accidental suffix that must be added to notes,
- and their pitch alteration as a fraction of one whole tone.

Accidental name	**suffix**	**pitch alteration**
büyük mücenneb (sharp)	-bm	+8/9
kücük mücenneb (sharp)	-k	+5/9
bakiye (sharp)	-b	+4/9
koma (sharp)	-c	+1/9
koma (flat)	-fc	-1/9
bakiye (flat)	-fb	-4/9
kücük mücenneb (flat)	-fk	-5/9
büyük mücenneb (flat)	-fbm	-8/9

For a more general explanation of non-Western music notation, see Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

Vedi anche

Music Glossary: Sezione "makam" in *Glossario Musicale*, Sezione "makamlar" in *Glossario Musicale*.

Notation Reference: Sezione 2.10.1 [Common notation for non-Western music], pagina 444.

3 General input and output

This section deals with general LilyPond input and output issues, rather than specific notation.

3.1 Input structure

The main format of input for LilyPond are text files. By convention, these files end with '`.ly`'.

3.1.1 Structure of a score

A `\score` block must contain a single music expression delimited by curly brackets:

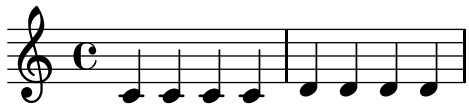
```
\score {
  ...
}
```

Nota: There must be **only one** outer music expression in a `\score` block, and it **must** be surrounded by curly brackets.

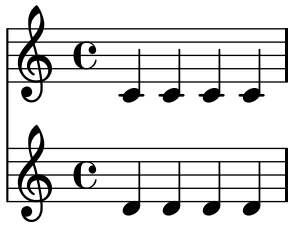
This single music expression may be of any size, and may contain other music expressions to any complexity. All of these examples are music expressions:

```
{ c'4 c' c' c' }
```

```
{
  { c'4 c' c' c' }
  { d'4 d' d' d' }
}
```



```
<<
  \new Staff { c'4 c' c' c' }
  \new Staff { d'4 d' d' d' }
>>
```



```
{
  \new GrandStaff <<
    \new StaffGroup <<
      \new Staff { \flute }
      \new Staff { \oboe }
    >>
    \new StaffGroup <<
      \new Staff { \violinI }
      \new Staff { \violinII }
    >>
  >>
```

```
}
```

Comments are one exception to this general rule. (For others see Sezione 3.1.5 [File structure], pagina 455.) Both single-line comments and comments delimited by `%{ ... %}` may be placed anywhere within an input file. They may be placed inside or outside a `\score` block, and inside or outside the single music expression within a `\score` block.

Remember that even in a file containing only a `\score` block, it is implicitly enclosed in a \book block. A \book block in a source file produces at least one output file, and by default the name of the output file produced is derived from the name of the input file, so '`fandangoforelephants.ly`' will produce '`fandangoforelephants.pdf`'.

(For more details about `\book` blocks, see Sezione 3.1.2 [Multiple scores in a book], pagina 452, Sezione 3.1.3 [Multiple output files from one input file], pagina 453 Sezione 3.1.5 [File structure], pagina 455.)

Vedi anche

Learning Manual: Sezione "Working on input files" in *Manuale di Apprendimento*, Sezione "Music expressions explained" in *Manuale di Apprendimento*, Sezione "Score is a (single) compound musical expression" in *Manuale di Apprendimento*.

3.1.2 Multiple scores in a book

A document may contain multiple pieces of music and text. Examples of these are an etude book, or an orchestral part with multiple movements. Each movement is entered with a `\score` block,

```
\score {
  ...music...
}
```

and texts are entered with a `\markup` block,

```
\markup {
  ...text...
}
```

All the movements and texts which appear in the same '`.ly`' file will normally be typeset in the form of a single output file.

```
\score {
  ...
}
\markup {
  ...
}
\score {
  ...
}
```

One important exception is within lilypond-book documents, where you explicitly have to add a `\book` block, otherwise only the first `\score` or `\markup` will appear in the output.

The header for each piece of music can be put inside the `\score` block. The `piece` name from the header will be printed before each movement. The title for the entire book can be put inside the `\book`, but if it is not present, the `\header` which is at the top of the file is inserted.

```
\header {
  title = "Eight miniatures"
  composer = "Igor Stravinsky"
}
```

```
\score {
  ...
  \header { piece = "Romanze" }
}
\markup {
   ...text of second verse...
}
\markup {
   ...text of third verse...
}
\score {
  ...
  \header { piece = "Menuetto" }
}
```

Pieces of music may be grouped into book parts using `\bookpart` blocks. Book parts are separated by a page break, and can start with a title, like the book itself, by specifying a `\header` block.

```
\bookpart {
  \header {
    title = "Book title"
    subtitle = "First part"
  }
  \score { ... }
  ...
}
\bookpart {
  \header {
    subtitle = "Second part"
  }
  \score { ... }
  ...
}
```

3.1.3 Multiple output files from one input file

If you want multiple output files from the same '`.ly`' file, then you can add multiple `\book` blocks, where each such \book block will result in a separate output file. If you do not specify any `\book` block in the input file, LilyPond will implicitly treat the whole file as a single \book block, see Sezione 3.1.5 [File structure], pagina 455.

When producing multiple files from a single source file, Lilypond ensures that none of the output files from any `\book` block overwrites the output file produced by a preceding `\book` from the same input file.

It does this by adding a suffix to the output name for each `\book` which uses the default output file name derived from the input source file.

The default behaviour is to append a version-number suffix for each name which may clash, so

```
\book {
  \score { ... }
  \paper { ... }
}
\book {
```

```
  \score { ... }
  \paper { ... }
}
\book {
  \score { ... }
  \paper { ... }
}
```

in source file ‘eightminiatures.ly’ will produce

- ‘eightminiatures.pdf’,
- ‘eightminiatures-1.pdf’ and
- ‘eightminiatures-2.pdf’.

3.1.4 Output file names

Lilypond provides facilities to allow you to control what file names are used by the various back-ends when producing output files.

In the previous section, we saw how Lilypond prevents name-clashes when producing several ouputs from a single source file. You also have the ability to specify your own suffixes for each \book block, so for example you can produce files called ‘eightminiatures-Romanze.pdf’, ‘eightminiatures-Menuetto.pdf’ and ‘eightminiatures-Nocturne.pdf’ by adding a \bookOutputSuffix declaration inside each \book block.

```
\book {
  \bookOutputSuffix "Romanze"
  \score { ... }
  \paper { ... }
}
\book {
  \bookOutputSuffix "Menuetto"
  \score { ... }
  \paper { ... }
}
\book {
  \bookOutputSuffix "Nocturne"
  \score { ... }
  \paper { ... }
}
```

You can also specify a different output filename for book block, by using \bookOutputName declarations

```
\book {
  \bookOutputName "Romanze"
  \score { ... }
  \paper { ... }
}
\book {
  \bookOutputName "Menuetto"
  \score { ... }
  \paper { ... }
}
\book {
  \bookOutputName "Nocturne"
  \score { ... }
```

```
  \paper { ... }
}
```

The file above will produce these output files:

- 'Romanze.pdf',
- 'Menuetto.pdf' and
- 'Nocturne.pdf'.

3.1.5 File structure

A '.ly' file may contain any number of toplevel expressions, where a toplevel expression is one of the following:

- An output definition, such as \paper, \midi, and \layout. Such a definition at the toplevel changes the default book-wide settings. If more than one such definition of the same type is entered at the top level the definitions are combined, but in conflicting situations the later definitions take precedence. For details of how this affects the \layout block see Sezione 4.2.1 [The \layout block], pagina 514.
- A direct scheme expression, such as #(set-default-paper-size "a7" 'landscape) or #(ly:set-option 'point-and-click #f).
- A \header block. This sets the global (i.e. the top of file) header block. This is the block containing the default settings of titling fields like composer, title, etc. for all books within the file (see [Titles explained], pagina 457).
- A \score block. This score will be collected with other toplevel scores, and combined as a single \book. This behavior can be changed by setting the variable toplevel-score-handler at toplevel. The default handler is defined in the init file '../scm/lily.scm'.
- A \book block logically combines multiple movements (i.e., multiple \score blocks) in one document. If there are a number of \scores, one output file will be created for each \book block, in which all corresponding movements are concatenated. The only reason to explicitly specify \book blocks in a '.ly' file is if you wish to create multiple output files from a single input file. One exception is within lilypond-book documents, where you explicitly have to add a \book block if you want more than a single \score or \markup in the same example. This behavior can be changed by setting the variable toplevel-book-handler at toplevel. The default handler is defined in the init file '../scm/lily.scm'.
- A \bookpart block. A book may be divided into several parts, using \bookpart blocks, in order to ease the page breaking, or to use different \paper settings in different parts.
- A compound music expression, such as

  ```
  { c'4 d' e'2 }
  ```

  This will add the piece in a \score and format it in a single book together with all other toplevel \scores and music expressions. In other words, a file containing only the above music expression will be translated into

  ```
  \book {
    \score {
      \new Staff {
        \new Voice {
          { c'4 d' e'2 }
        }
      }
      \layout { }
    }
    \paper { }
```

```
  \header { }
}
```

This behavior can be changed by setting the variable `toplevel-music-handler` at toplevel. The default handler is defined in the init file '`../scm/lily.scm`'.

- A markup text, a verse for example

```
\markup {
   2.  The first line verse two.
}
```

Markup texts are rendered above, between or below the scores or music expressions, wherever they appear.

- A variable, such as

```
foo = { c4 d e d }
```

This can be used later on in the file by entering `\foo`. The name of a variable should have alphabetic characters only; no numbers, underscores or dashes.

The following example shows three things that may be entered at toplevel

```
\layout {
  % Don't justify the output
  ragged-right = ##t
}

\header {
   title = "Do-re-mi"
}

{ c'4 d' e2 }
```

At any point in a file, any of the following lexical instructions can be entered:

- `\version`
- `\include`
- `\sourcefilename`
- `\sourcefileline`
- A single-line comment, introduced by a leading `%` sign.
- A multi-line comment delimited by `%{ ... %}`.

Whitespace between items in the input stream is generally ignored, and may be freely omitted or extended to enhance readability. However, whitespace should always be used in the following circumstances to avoid errors:

- Around every opening and closing curly bracket.
- After every command or variable, i.e. every item that begins with a `\` sign.
- After every item that is to be interpreted as a Scheme expression, i.e. every item that begins with a `#` sign.
- To separate all elements of a Scheme expression.
- In `lyricmode` before and after `\set` and `\override` commands.

Vedi anche

Learning Manual: Sezione "How LilyPond input files work" in *Manuale di Apprendimento*.

Notation Reference: [Titles explained], pagina 457, Sezione 4.2.1 [The \layout block], pagina 514.

3.2 Titles and headers

Almost all printed music includes a title and the composer's name; some pieces include a lot more information.

3.2.1 Creating titles headers and footers

Titles explained

Each `\book` block in a single input file produces a separate output file, see Sezione 3.1.5 [File structure], pagina 455. Within each output file three types of titling areas are provided: *Book Titles* at the beginning of each book, *Bookpart Titles* at the beginning of each bookpart and *Score Titles* at the beginning of each score.

Values of titling fields such as `title` and `composer` are set in `\header` blocks. (For the syntax of `\header` blocks and a complete list of the fields available by default see [Default layout of bookpart and score titles], pagina 460). Book Titles, Bookpart Titles and Score Titles can all contain the same fields, although by default the fields in Score Titles are limited to `piece` and `opus`.

`\header` blocks may be placed in four different places to form a descending hierarchy of `\header` blocks:

- At the top of the input file, before all `\book`, `\bookpart`, and `\score` blocks.
- Within a `\book` block but outside all the `\bookpart` and `\score` blocks within that book.
- Within a `\bookpart` block but outside all `\score` blocks within that bookpart.
- After the music expression in a `\score` block.

The values of the fields filter down this hierarchy, with the values set higher in the hierarchy persisting unless they are over-ridden by a value set lower in the hierarchy, so:

- A Book Title is derived from fields set at the top of the input file, modified by fields set in the `\book` block. The resulting fields are used to print the Book Title for that book, providing that there is other material which generates a page at the start of the book, before the first bookpart. A single `\pageBreak` will suffice.
- A Bookpart Title is derived from fields set at the top of the input file, modified by fields set in the `\book` block, and further modified by fields set in the `\bookpart` block. The resulting values are used to print the Bookpart Title for that bookpart.
- A Score Title is derived from fields set at the top of the input file, modified by fields set in the `\book` block, further modified by fields set in the `\bookpart` block and finally modified by fields set in the `\score` block. The resulting values are used to print the Score Title for that score. Note, though, that only `piece` and `opus` fields are printed by default in Score Titles unless the `\paper` variable, `print-all-headers`, is set to `#t`.

Nota: Remember when placing a `\header` block inside a `\score` block, that the music expression must come before the `\header` block.

It is not necessary to provide `\header` blocks in all four places: any or even all of them may be omitted. Similarly, simple input files may omit the `\book` and `\bookpart` blocks, leaving them to be created implicitly.

If the book has only a single score, the `\header` block should normally be placed at the top of the file so that just a Bookpart Title is produced, making all the titling fields available for use.

If the book has multiple scores a number of different arrangements of `\header` blocks are possible, corresponding to the various types of musical publications. For example, if the publication contains several pieces by the same composer a `\header` block placed at the top of the file

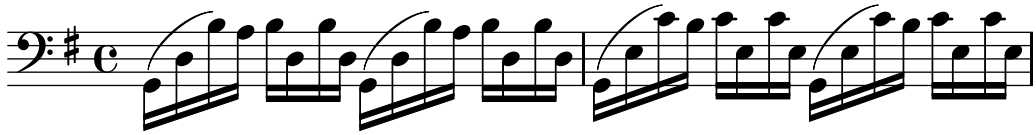
specifying the book title and the composer with `\header` blocks in each `\score` block specifying the `piece` and/or `opus` would be most suitable, as here:

```
\header {
  title = "SUITE I."
  composer = "J. S. Bach."
}

\score {
  \new Staff \relative g, {
    \clef bass
    \key g \major
    \repeat unfold 2 { g16( d' b') a b d, b' d, } |
    \repeat unfold 2 { g,16( e' c') b c e, c' e, } |
  }
  \header {
    piece = "Prélude."
  }
}

\score {
  \new Staff \relative b {
    \clef bass
    \key g \major
    \partial 16 b16 |
    <g, d' b'~>4 b'16 a( g fis) g( d e fis) g( a b c) |
    d16( b g fis) g( e d c) b(c d e) fis( g a b) |
  }
  \header {
    piece = "Allemande."
  }
}
```

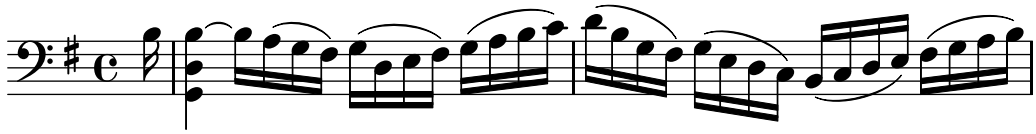
SUITE I.

J. S. Bach.

Prélude.

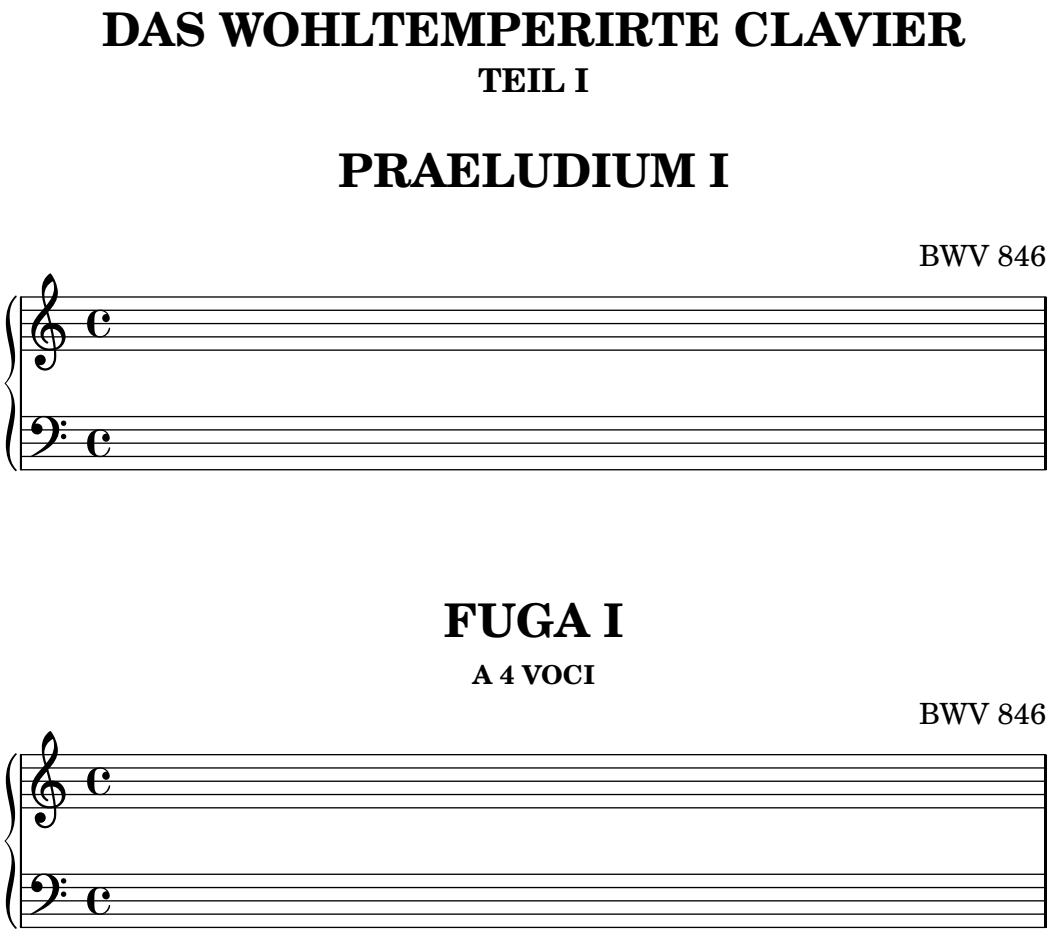


Allemande.



More complicated arrangements are possible. For example, text fields from the `\header` block in a book can be displayed in all Score Titles, with some fields over-ridden and some manually suppressed:

```
\book {
  \paper {
    print-all-headers = ##t
  }
  \header {
    title = "DAS WOHLTEMPERIRTE CLAVIER"
    subtitle = "TEIL I"
    % Do not display the tagline for this book
    tagline = ##f
  }
  \markup { \vspace #1 }
  \score {
    \new PianoStaff <<
      \new Staff { s1 }
      \new Staff { \clef "bass" s1 }
    >>
    \header {
      title = "PRAELUDIUM I"
      opus = "BWV 846"
      % Do not display the subtitle for this score
      subtitle = ##f
    }
  }
  \score {
    \new PianoStaff <<
      \new Staff { s1 }
      \new Staff { \clef "bass" s1 }
    >>
    \header {
      title = "FUGA I"
      subsubtitle = "A 4 VOCI"
      opus = "BWV 846"
      % Do not display the subtitle for this score
      subtitle = ##f
    }
  }
}
```



Vedi anche

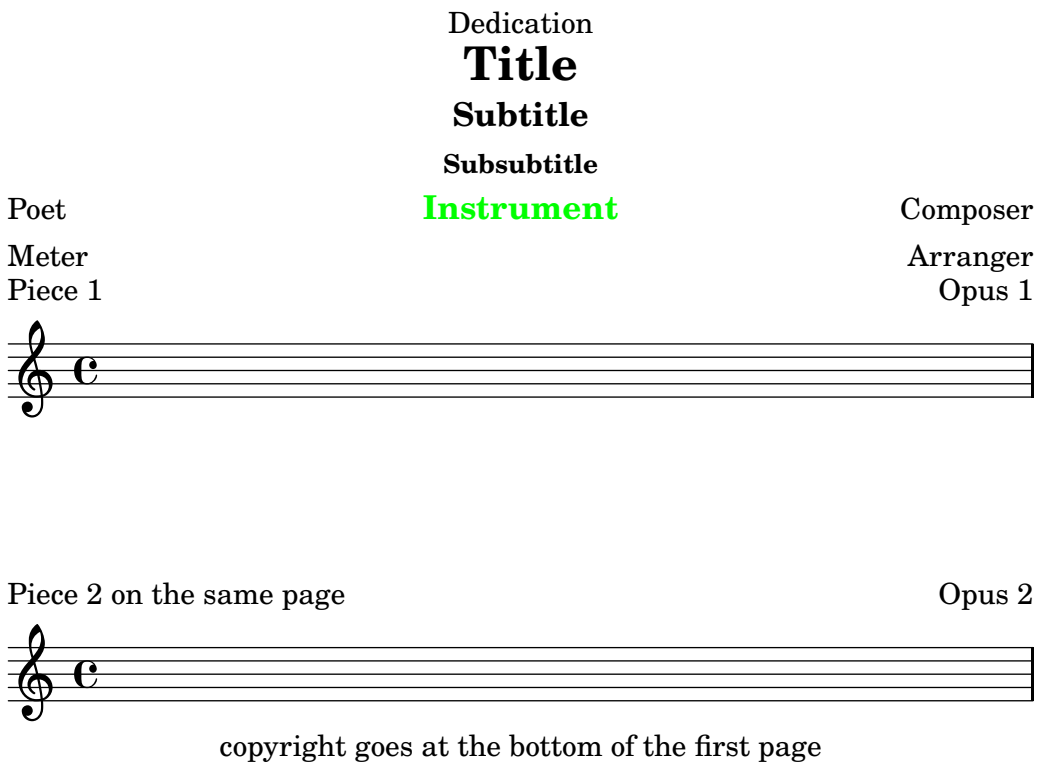
Notation Reference: Sezione 3.1.5 [File structure], pagina 455, [Default layout of bookpart and score titles], pagina 460, [Custom layout for titles], pagina 465.

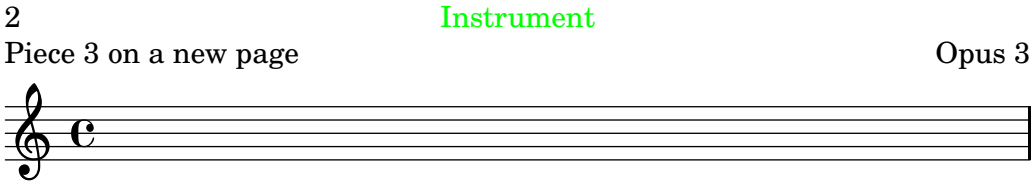
Default layout of bookpart and score titles

This example demonstrates all `\header` variables:

```
\book {
  \header {
      % The following fields are centered
    dedication = "Dedication"
    title = "Title"
    subtitle = "Subtitle"
    subsubtitle = "Subsubtitle"
      % The following fields are evenly spread on one line
      % the field "instrument" also appears on following pages
    instrument = \markup \with-color #green "Instrument"
    poet = "Poet"
    composer = "Composer"
      % The following fields are placed at opposite ends of the same line
    meter = "Meter"
    arranger = "Arranger"
      % The following fields are centered at the bottom
    tagline = "tagline goes at the bottom of the last page"
    copyright = "copyright goes at the bottom of the first page"
  }
  \score {
```

```
    { s1 }
    \header {
        % The following fields are placed at opposite ends of the same line
      piece = "Piece 1"
      opus = "Opus 1"
    }
  }
  \score {
    { s1 }
    \header {
        % The following fields are placed at opposite ends of the same line
      piece = "Piece 2 on the same page"
      opus = "Opus 2"
    }
  }
  \pageBreak
  \score {
    { s1 }
    \header {
        % The following fields are placed at opposite ends of the same line
      piece = "Piece 3 on a new page"
      opus = "Opus 3"
    }
  }
}
```





tagline goes at the bottom of the last page

Note that

- The instrument name will be repeated on every page.
- Only `piece` and `opus` are printed in a `\score` when the paper variable `print-all-headers` is set to `##f` (the default).
- Text fields left unset in a `\header` block are replaced with `\null` markups so that the space is not wasted.
- The default settings for `scoreTitleMarkup` place the `piece` and `opus` text fields at opposite ends of the same line.

To change the default layout see [Custom layout for titles], pagina 465.

If a `\book` block starts immediately with a `\bookpart` block, no Book Title will be printed, as there is no page on which to print it. If a Book Title is required, begin the `\book` block with some markup material or a `\pageBreak` command.

Use the `breakbefore` variable inside a `\header` block that is itself in a `\score` block, to make the higher-level `\header` block titles appear on the first page on their own, with the music (defined in the `\score` block) starting on the next.

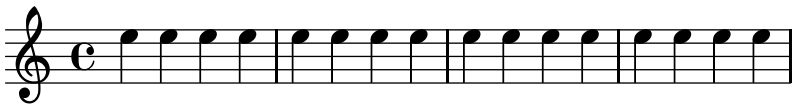
```
\book {
  \header {
    title = "This is my Title"
    subtitle = "This is my Subtitle"
    copyright = "This is the bottom of the first page"
  }
  \score {
    \repeat unfold 4 { e'' e'' e'' e'' }
    \header {
      piece = "This is the Music"
      breakbefore = ##t
    }
  }
}
```

This is my Title

This is my Subtitle

This is the bottom of the first page

2
This is the Music



Music engraving by LilyPond 2.17.26—www.lilypond.org

Vedi anche

Learning Manual: Sezione "How LilyPond input files work" in *Manuale di Apprendimento*,

Notation Reference: [Custom layout for titles], pagina 465, Sezione 3.1.5 [File structure], pagina 455.

Installed Files: '`ly/titling-init.ly`'.

Default layout of headers and footers

Headers and *footers* are lines of text appearing at the top and bottom of pages, separate from the main text of a book. They are controlled by the following `\paper` variables:

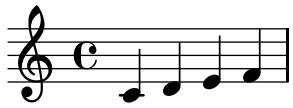
- `oddHeaderMarkup`
- `evenHeaderMarkup`
- `oddFooterMarkup`
- `evenFooterMarkup`

These markup variables can only access text fields from top-level `\header` blocks (which apply to all scores in the book) and are defined in '`ly/titling-init.ly`'. By default:

- page numbers are automatically placed on the top far left (if even) or top far right (if odd), starting from the second page.
- the `instrument` text field is placed in the center of every page, starting from the second page.
- the `copyright` text is centered on the bottom of the first page.
- the `tagline` is centered on the bottom of the last page, and below the `copyright` text if there is only a single page.

The default tagline can be changed by adding a `tagline` in the top-level `\header` block.

```
\book {
  \header {
    tagline = "... music notation for Everyone"
  }
  \score {
    \relative c' {
      c4 d e f
    }
  }
}
```



... music notation for Everyone

To remove the `tagline` set the value to `##f`.

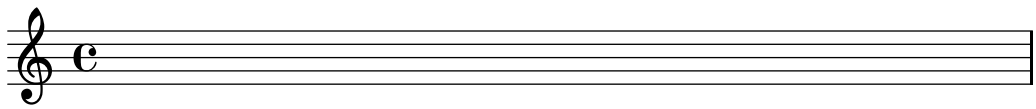
3.2.2 Custom titles headers and footers

Custom text formatting for titles

Standard `\markup` commands can be used to customize any header, footer and title text within the `\header` block.

```
\score {
  { s1 }
  \header {
    piece = \markup { \fontsize #4 \bold "PRAELUDIUM I" }
    opus = \markup { \italic "BWV 846" }
  }
}
```

PRAELUDIUM I *BWV 846*



Vedi anche

Notation Reference: Sezione 1.8.2 [Formatting text], pagina 229.

Custom layout for titles

`\markup` commands in the `\header` block are useful for simple text formatting, but they do not allow precise control over the placement of titles. To customize the placement of the text fields, change either or both of the following `\paper` variables:

- `bookTitleMarkup`
- `scoreTitleMarkup`

The placement of titles when using the default values of these `\markup` variables is shown in the examples in [Default layout of bookpart and score titles], pagina 460.

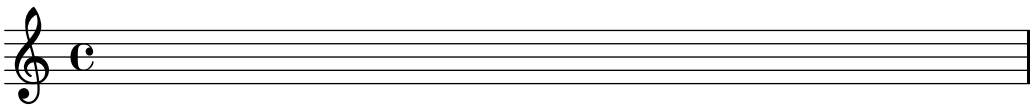
The default settings for `scoreTitleMarkup` as defined in '`ly/titling-init.ly`' are:

```
scoreTitleMarkup = \markup { \column {
  \on-the-fly \print-all-headers { \bookTitleMarkup \hspace #1 }
  \fill-line {
    \fromproperty #'header:piece
    \fromproperty #'header:opus
  }
}
}
```

This places the `piece` and `opus` text fields at opposite ends of the same line:

```
\score {
  { s1 }
  \header {
    piece = "PRAELUDIUM I"
    opus = "BWV 846"
  }
}
```

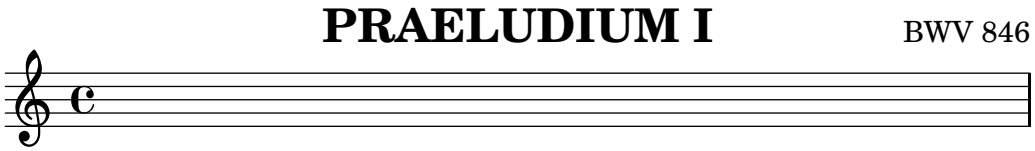
PRAELUDIUM I BWV 846



This example redefines `scoreTitleMarkup` so that the `piece` text field is centered and in a large, bold font.

```
\book {
  \paper {
    indent = 0\mm
    scoreTitleMarkup = \markup {
      \fill-line {
        \null
        \fontsize #4 \bold \fromproperty #'header:piece
        \fromproperty #'header:opus
      }
    }
  }
  \header { tagline = ##f }
```

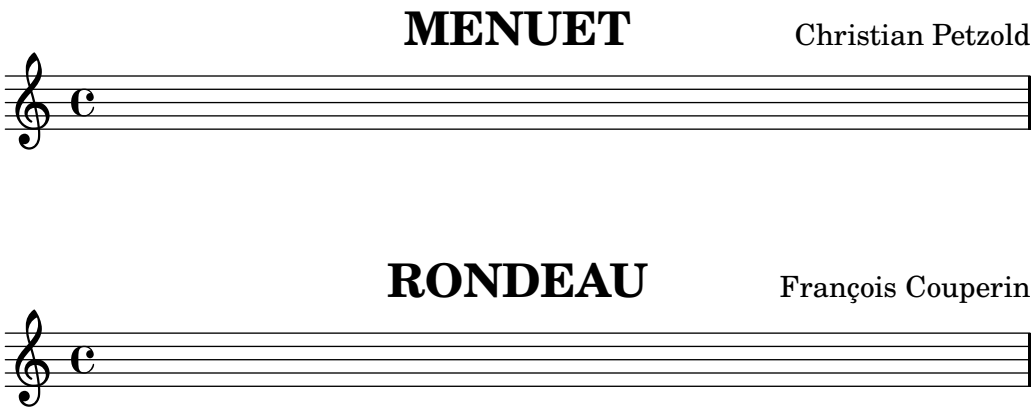
```
  \score {
    { s1 }
    \header {
      piece = "PRAELUDIUM I"
      opus = "BWV 846"
    }
  }
}
```



Text fields not normally effective in score `\header` blocks can be printed in the Score Title area if `print-all-headers` is placed inside the `\paper` block. A disadvantage of using this method is that text fields that are intended specifically for the Bookpart Title area need to be manually suppressed in every `\score` block. See [Titles explained], pagina 457.

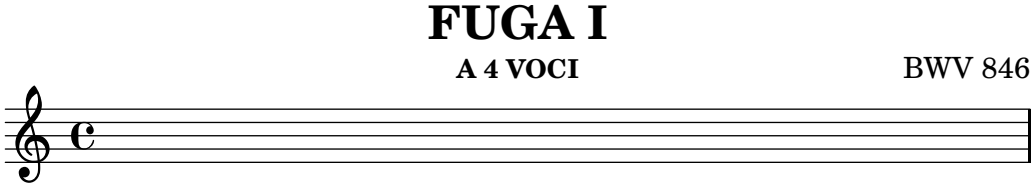
To avoid this, add the desired text field to the `scoreTitleMarkup` definition. In the following example, the `composer` text field (normally associated with `bookTitleMarkup`) is added to `scoreTitleMarkup`, allowing each score to list a different composer:

```
\book {
  \paper {
    indent = 0\mm
    scoreTitleMarkup = \markup {
      \fill-line {
        \null
        \fontsize #4 \bold \fromproperty #'header:piece
        \fromproperty #'header:composer
      }
    }
  }
  \header { tagline = ##f }
  \score {
    { s1 }
    \header {
      piece = "MENUET"
      composer = "Christian Petzold"
    }
  }
  \score {
    { s1 }
    \header {
      piece = "RONDEAU"
      composer = "François Couperin"
    }
  }
}
```



It is also possible to create your own custom text fields, and refer to them in the markup definition.

```
\book {
  \paper {
    indent = 0\mm
    scoreTitleMarkup = \markup {
      \fill-line {
        \null
        \override #`(direction . ,UP) {
          \dir-column {
            \center-align \fontsize #-1 \bold
              \fromproperty #'header:mycustomtext %% User-defined field
            \center-align \fontsize #4 \bold
              \fromproperty #'header:piece
          }
        }
        \fromproperty #'header:opus
      }
    }
  }
  \header { tagline = ##f }
  \score {
    { s1 }
    \header {
      piece = "FUGA I"
      mycustomtext = "A 4 VOCI" %% User-defined field
      opus = "BWV 846"
    }
  }
}
```



Vedi anche

Notation Reference: [Titles explained], pagina 457.

Custom layout for headers and footers

\markup commands in the \header block are useful for simple text formatting, but they do not allow precise control over the placement of headers and footers. To customize the placement of the text fields, use either or both of the following \paper variables:

- oddHeaderMarkup
- evenHeaderMarkup
- oddFooterMarkup
- evenFooterMarkup

The \markup command \on-the-fly can be used to add markup conditionally to header and footer text defined within the \paper block, using the following syntax:

```
variable = \markup {
  ...
  \on-the-fly  \procedure  markup
  ...
}
```

The *procedure* is called each time the \markup command in which it appears is evaluated. The *procedure* should test for a particular condition and interpret (i.e. print) the *markup* argument if and only if the condition is true.

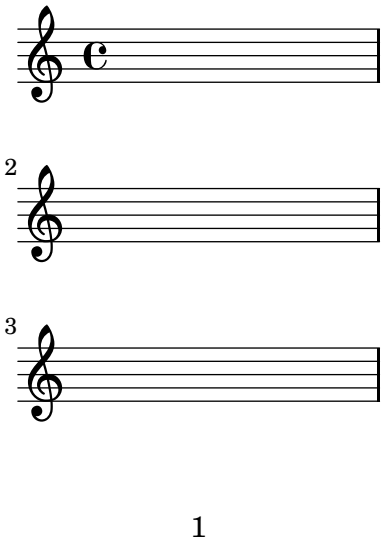
A number of ready-made procedures for testing various conditions are provided:

Procedure name	**Condition tested**
print-page-number-check-first	should this page number be printed?
create-page-number-stencil	print-page-numbers true?
print-all-headers	print-all-headers true?
first-page	first page in the book?
(on-page nmbr)	page number = nmbr?
last-page	last page in the book?
not-first-page	not first page in the book?
part-first-page	first page in the book part?
part-last-page	last page in the book part?
not-single-page	pages in book part > 1?

The following example centers page numbers at the bottom of every page. First, the default settings for oddHeaderMarkup and evenHeaderMarkup are removed by defining each as a *null* markup. Then, oddFooterMarkup is redefined with the page number centered. Finally, evenFooterMarkup is given the same layout by defining it as \oddFooterMarkup:

```
\book {
  \paper {
    print-page-number = ##t
    print-first-page-number = ##t
    oddHeaderMarkup = \markup \null
    evenHeaderMarkup = \markup \null
    oddFooterMarkup = \markup {
      \fill-line {
        \on-the-fly \print-page-number-check-first
        \fromproperty #'page:page-number-string
      }
```

```
    }
    evenFooterMarkup = \oddFooterMarkup
  }
  \score {
    \new Staff { s1 \break s1 \break s1 }
  }
}
```



1

Several `\on-the-fly` conditions can be combined with an 'and' operation, for example,

```
\on-the-fly \first-page
\on-the-fly \last-page
{ \markup ... \fromproperty #'header: ... }
```

determines if the output is a single page.

Vedi anche

Notation Reference: [Titles explained], pagina 457, [Default layout of bookpart and score titles], pagina 460.

Installed Files: '`../ly/titling-init.ly`'.

3.2.3 Creating footnotes

Footnotes may be used in many different situations. In all cases, a 'footnote mark' is placed as a reference in text or music, and the corresponding 'footnote text' appears at the bottom of the same page.

Footnotes within music expressions and footnotes in stand-alone text outside music expressions are created in different ways.

Footnotes in music expressions

Music footnotes overview

Footnotes in music expressions fall into two categories:

Event-based footnotes
: are attached to a particular event. Examples for such events are single notes, articulations (like fingering indications, accents, dynamics), and post-events (like slurs and manual beams). The general form for event-based footnotes is as follows:

[*direction*] \footnote [*mark*] *offset footnote music*

Time-based footnotes
are bound to a particular point of time in a musical context. Some commands like \time and \clef don't actually use events for creating objects like time signatures and clefs. Neither does a chord create an event of its own: its stem or flag is created at the end of a time step (nominally through one of the note events inside). Exactly which of a chord's multiple note events will be deemed the root cause of a stem or flag is undefined. So for annotating those, time-based footnotes are preferable as well.

A time-based footnote allows such layout objects to be annotated without referring to an event. The general form for Time-based footnotes is:

\footnote [*mark*] *offset footnote* [*Context*].*GrobName*

The elements for both forms are:

direction If (and only if) the \footnote is being applied to a post-event or articulation, it must be preceded with a direction indicator (-, _, ^) in order to attach *music* (with a footnote mark) to the preceding note or rest.

mark is a markup or string specifying the footnote mark which is used for marking both the reference point and the footnote itself at the bottom of the page. It may be omitted (or equivalently replaced with \default) in which case a number in sequence will be generated automatically. Such numerical sequences restart on each page containing a footnote.

offset is a number pair such as '#(2 . 1)' specifying the X and Y offsets in units of staff-spaces from the boundary of the object where the mark should be placed. Positive values of the offsets are taken from the right/top edge, negative values from the left/bottom edge and zero implies the mark is centered on the edge.

Context is the context in which the grob being footnoted is created. It may be omitted if the grob is in a bottom context, e.g. a Voice context.

GrobName
specifies a type of grob to mark (like 'Flag'). If it is specified, the footnote is not attached to a music expression in particular, but rather to all grobs of the type specified which occur at that moment of musical time.

footnote is the markup or string specifying the footnote text to use at the bottom of the page.

music is the music event or post-event or articulation that is being annotated.

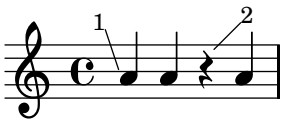
Event-based footnotes

A footnote may be attached to a layout object directly caused by the event corresponding to *music* with the syntax:

\footnote [*mark*] *offset footnote music*

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    \footnote #'(-1 . 3) "A note" a4
    a4
    \footnote #'(2 . 2) "A rest" r4
    a4
  }
```

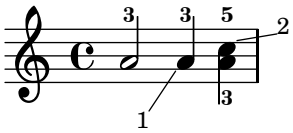
```
}
```



[1]A note
[2]A rest

Marking a *whole* chord with an event-based footnote is not possible: a chord, even one containing just a single note, does not produce an actual event of its own. However, individual notes *inside* of the chord can be marked:

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    \footnote #'(2 . 3) "Does not work" <a-3>2
    <\footnote #'(-2 . -3) "Does work" a-3>4
    <a-3 \footnote #'(3 . 1/2) "Also works" c-5>4
  }
}
```



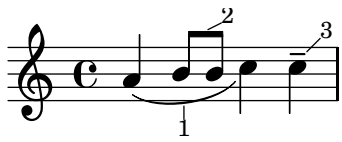
[1]Does work
[2]Also works

If the footnote is to be attached to a post-event or articulation the `\footnote` command *must* be preceded by a direction indicator, `-`, `_`, `^`, and followed by the post-event or articulation to be annotated as the *music* argument. In this form the `\footnote` can be considered to be simply a copy of its last argument with a footnote mark attached to it. The syntax is:

direction `\footnote` [*mark*] *offset footnote music*

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    a4_\footnote #'(0 . -1) "A slur forced down" (
    b8^\footnote #'(1 . 0.5) "A manual beam forced up" [
    b8 ]
    c4 )
    c-\footnote #'(1 . 1) "Tenuto" --
  }
```

```
}
```

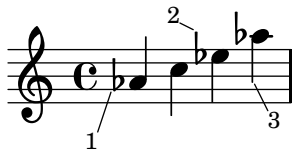


[1]A slur forced down
[2]A manual beam forced up
[3]Tenuto

Time-based footnotes

If the layout object being footmarked is *indirectly* caused by an event (like an `Accidental` or `Stem` caused by a `NoteHead` event), the *GrobName* of the layout object is required after the footnote text instead of *music*:

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    \footnote #'(-1 . -3) "A flat" Accidental
    aes4 c
    \footnote #'(-1 . 0.5) "Another flat" Accidental
    ees
    \footnote #'(1 . -2) "A stem" Stem
    aes
  }
}
```

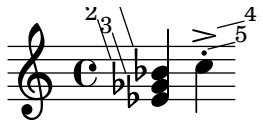


[1]A flat
[2]Another flat
[3]A stem

Note, however, that when a GrobName is specified, a footnote will be attached to all grobs of that type at the current time step:

```
\book {
  \header { tagline = ##f }
  \relative c' {
    \footnote #'(-1 . 3) "A flat" Accidental
    <ees ges bes>4
    \footnote #'(2 . 0.5) "Articulation" Script
    c'->-.
```

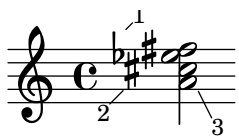
```
  }
}
```



[1]A flat
[2]A flat
[3]A flat
[4]Articulation
[5]Articulation

A note inside of a chord can be given an individual (event-based) footnote. A '`NoteHead`' is the only grob directly caused from a chord note, so an event-based footnote command is *only* suitable for adding a footnote to the '`NoteHead`' within a chord. All other chord note grobs are indirectly caused. The `\footnote` command itself offers no syntax for specifying *both* a particular grob type *as well as* a particular event to attach to. However, one can use a time-based `\footnote` command for specifying the grob type, and then prefix this command with `\single` in order to have it applied to just the following event:

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    < \footnote #'(1 . -2) "An A" a
      \single \footnote #'(-1 . -1) "A sharp" Accidental
      cis
      \single \footnote #'(0.5 . 0.5) "A flat" Accidental
      ees fis
    >2
  }
}
```



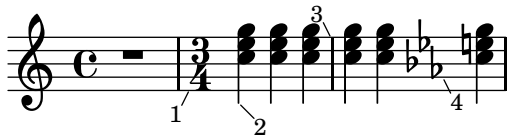
[1]A flat
[2]A sharp
[3]An A

Nota: When footnotes are attached to several musical elements at the same musical moment, as they are in the example above, the footnotes are numbered from the higher to the lower elements as they appear in the printed output, not in the order in which they are written in the input stream.

Layout objects like clefs and key-change signatures are mostly caused as a consequence of changed properties rather than actual events. Others, like bar lines and bar numbers, are a direct consequence of timing. For this reason, footnotes on such objects have to be based on their musical timing. Time-based footnotes are also preferable when marking features like stems and beams on *chords*: while such per-chord features are nominally assigned to *one* event inside the chord, relying on a particular choice would be imprudent.

The layout object in question must always be explicitly specified for time-based footnotes, and the appropriate context must be specified if the grob is created in a context other than the bottom context.

```
\book {
  \header { tagline = ##f }
  \relative c'' {
    r1 |
    \footnote #'(-0.5 . -1) "Meter change" Staff.TimeSignature
    \time 3/4
    \footnote #'(1 . -1) "Chord stem" Stem
    <c e g>4 q q
    \footnote #'(-0.5 . 1) "Bar line" Staff.BarLine
    q q
    \footnote #'(0.5 . -1) "Key change" Staff.KeySignature
    \key c \minor
    q
  }
}
```

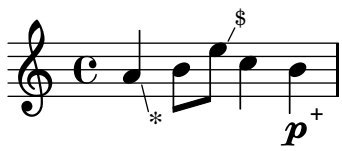


[1]Meter change
[2]Chord stem
[3]Bar line
[4]Key change

Custom marks can be used as alternatives to numerical marks, and the annotation line joining the marked object to the mark can be suppressed:

```
\book {
  \header { tagline = ##f }
  \relative c' {
    \footnote "*" #'(0.5 . -2) \markup { \italic "* The first note" } a'4
    b8
    \footnote \markup { \super "$" } #'(0.5 . 1)
      \markup { \super "$" \italic " The second note" } e
    c4
    \once \override Score.FootnoteItem.annotation-line = ##f
    b-\footnote \markup \tiny "+" #'(0.1 . 0.1)
      \markup { \super "+" \italic " Editorial" } \p
  }
```

```
}
```



* *The first note*
$ *The second note*
\+ *Editorial*

More examples of custom marks are shown in [Footnotes in stand-alone text], pagina 475.

Footnotes in stand-alone text

These are for use in markup outside of music expressions. They do not have a line drawn to their point of reference: their marks simply follow the referenced markup. Marks can be inserted automatically, in which case they are numerical. Alternatively, custom marks can be provided manually.

Footnotes to stand-alone text with automatic and custom marks are created in different ways.

Footnotes in stand-alone text with automatic marks

The syntax of a footnote in stand-alone text with automatic marks is

`\markup { ... \auto-footnote` *`text footnote`* `... }`

The elements are:

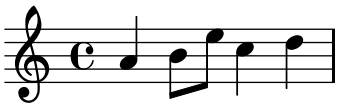
text is the markup or string to be marked.

footnote is the markup or string specifying the footnote text to use at the bottom of the page.

For example:

```
\book {
  \header { tagline = ##f }
  \markup {
    "A simple"
    \auto-footnote "tune" \italic " By me"
    "is shown below.  It is a"
    \auto-footnote "recent" \italic " Aug 2012"
    "composition."
  }
  \relative c' {
    a'4 b8 e c4 d
  }
}
```

A simple tune[1] is shown below. It is a recent[2] composition.



[1] *By me*
[2] *Aug 2012*

Footnotes in stand-alone text with custom marks

The syntax of a footnote in stand-alone text with custom marks is

```
\markup { ... \footnote mark footnote ... }
```

The elements are:

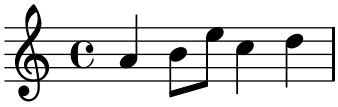
mark is a markup or string specifying the footnote mark which is used for marking the reference point. Note that this mark is *not* inserted automatically before the footnote itself.

footnote is the markup or string specifying the footnote text to use at the bottom of the page, preceded by the *mark*.

Any easy-to-type character such as * or + may be used as a mark, as shown in [Footnotes in music expressions], pagina 469. Alteratively, ASCII aliases may be used (see [ASCII aliases], pagina 489):

```
\book {
  \paper { #(include-special-characters) }
  \header { tagline = ##f }
  \markup {
    "A simple tune"
    \footnote "*" \italic "* By me"
    "is shown below.  It is a recent"
    \footnote \super &dagger; \concat {
      \super &dagger; \italic " Aug 2012"
    }
    "composition."
  }
  \relative c' {
    a'4 b8 e c4 d
  }
}
```

A simple tune * is shown below. It is a recent † composition.



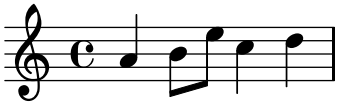
* *By me*

† *Aug 2012*

Unicode character codes may also be used to specify marks (see [Unicode], pagina 488):

```
\book {
  \header { tagline = ##f }
  \markup {
    "A simple tune"
    \footnote \super \char##x00a7 \concat {
      \super \char##x00a7 \italic " By me"
    }
    "is shown below.  It is a recent"
    \footnote \super \char##x00b6 \concat {
      \super \char##x00b6 \italic " Aug 2012"
    }
    "composition."
  }
  \relative c' {
    a'4 b8 e c4 d
  }
}
```

A simple tune § is shown below. It is a recent ¶ composition.



§ *By me*

¶ *Aug 2012*

Vedi anche

Learning Manual: Sezione “Objects and interfaces” in *Manuale di Apprendimento*.

Notation Reference: [ASCII aliases], pagina 489, [Balloon help], pagina 216, Sezione A.12 [List of special characters], pagina 710, [Text marks], pagina 224, [Text scripts], pagina 221, [Unicode], pagina 488.

Internals Reference: Sezione "FootnoteEvent" in *Guida al Funzionamento Interno*, Sezione "FootnoteItem" in *Guida al Funzionamento Interno*, Sezione "FootnoteSpanner" in *Guida al Funzionamento Interno*, Sezione "Footnote_engraver" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

Multiple footnotes for the same page can only be stacked, one above the other; they cannot be printed on the same line.

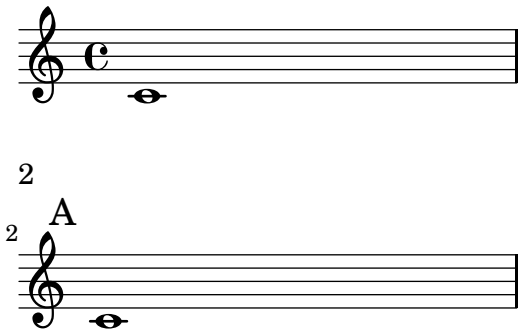
Footnotes cannot be attached to `MultiMeasureRests` or automatic beams or lyrics.

Footnote marks may collide with staves, `\markup` objects, other footnote marks and annotation lines.

3.2.4 Reference to page numbers

A particular place of a score can be marked using the `\label` command, either at top-level or inside music. This label can then be referred to in a markup, to get the number of the page where the marked point is placed, using the `\page-ref` markup command.

```
\header { tagline = ##f }
\book {
  \label #'firstScore
  \score {
    {
      c'1
      \pageBreak \mark A \label #'markA
      c'1
    }
  }
  \markup { The first score begins on page \page-ref #'firstScore "0" "?" }
  \markup { Mark A is on page \page-ref #'markA "0" "?" }
}
```



The first score begins on page 1
Mark A is on page 2

The `\page-ref` markup command takes three arguments:

1. the label, a scheme symbol, eg. `#'firstScore`;

2. a markup that will be used as a gauge to estimate the dimensions of the markup;
3. a markup that will be used in place of the page number if the label is not known;

The reason why a gauge is needed is that, at the time markups are interpreted, the page breaking has not yet occurred, so the page numbers are not yet known. To work around this issue, the actual markup interpretation is delayed to a later time; however, the dimensions of the markup have to be known before, so a gauge is used to decide these dimensions. If the book has between 10 and 99 pages, it may be "00", ie. a two digit number.

Comandi predefiniti

`\label`, `\page-ref`.

3.2.5 Table of contents

A table of contents is included using the `\markuplist \table-of-contents` command. The elements which should appear in the table of contents are entered with the `\tocItem` command, which may be used either at top-level, or inside a music expression.

```
\markuplist \table-of-contents
\pageBreak

\tocItem \markup "First score"
\score {
  {
    c'4  % ...
    \tocItem \markup "Some particular point in the first score"
    d'4  % ...
  }
}

\tocItem \markup "Second score"
\score {
  {
    e'4 % ...
  }
}
```

The markups which are used to format the table of contents are defined in the `\paper` block. The default ones are `tocTitleMarkup`, for formatting the title of the table, and `tocItemMarkup`, for formatting the toc elements, composed of the element title and page number. These variables may be changed by the user:

```
\paper {
  %% Translate the toc title into French:
  tocTitleMarkup = \markup \huge \column {
    \fill-line { \null "Table des matières" \null }
    \hspace #1
  }
  %% use larger font size
  tocItemMarkup = \markup \large \fill-line {
    \fromproperty #'toc:text \fromproperty #'toc:page
  }
}
```

Note how the toc element text and page number are referred to in the `tocItemMarkup` definition.

New commands and markups may also be defined to build more elaborated table of contents:

- first, define a new markup variable in the `\paper` block
- then, define a music function which aims at adding a toc element using this markup paper variable.

In the following example, a new style is defined for entering act names in the table of contents of an opera:

```
\paper {
  tocActMarkup = \markup \large \column {
    \hspace #1
    \fill-line { \null \italic \fromproperty #'toc:text \null }
    \hspace #1
  }
}

tocAct =
#(define-music-function (parser location text) (markup?)
   (add-toc-item! 'tocActMarkup text))
```

Table of Contents

Atto Primo

Coro. Viva il nostro Alcide 1
Cesare. Presti omai l'Egizzia terra 1

Atto Secondo

Sinfonia 1
Cleopatra. V'adoro, pupille, saette d'Amore 1

Dots can be added to fill the line between an item and its page number:

```
\header { tagline = ##f }
\paper {
  tocItemMarkup = \tocItemWithDotsMarkup
}

\book {
  \markuplist \table-of-contents
  \tocItem \markup { Allegro }
  \tocItem \markup { Largo }
  \markup \null
}
```

Table of Contents

Allegro 1
Largo 1

Vedi anche

Installed Files: ‘`ly/toc-init.ly`’.

Comandi predefiniti

`\table-of-contents`, `\tocItem`.

3.3 Working with input files

3.3.1 Including LilyPond files

A large project may be split up into separate files. To refer to another file, use

```
\include "otherfile.ly"
```

The line `\include "otherfile.ly"` is equivalent to pasting the contents of ‘`otherfile.ly`’ into the current file at the place where the `\include` appears. For example, in a large project you might write separate files for each instrument part and create a “full score” file which brings together the individual instrument files. Normally the included file will define a number of variables which then become available for use in the full score file. Tagged sections can be marked in included files to assist in making them usable in different places in a score, see Sezione 3.3.2 [Different editions from one source], pagina 482.

Files in the current working directory may be referenced by specifying just the file name after the `\include` command. Files in other locations may be included by giving either a full path reference or a relative path reference (but use the UNIX forward slash, /, rather than the DOS/Windows back slash, \, as the directory separator.) For example, if ‘`stuff.ly`’ is located one directory higher than the current working directory, use

```
\include "../stuff.ly"
```

or if the included orchestral parts files are all located in a subdirectory called ‘`parts`’ within the current directory, use

```
\include "parts/VI.ly"
\include "parts/VII.ly"
... etc
```

Files which are to be included can also contain `\include` statements of their own. By default, these second-level `\include` statements are not interpreted until they have been brought into the main file, so the file names they specify must all be relative to the directory containing the main file, not the directory containing the included file. However, this behavior can be changed globally by passing the option ‘`-drelative-includes`’ option at the command line (or by adding `#(ly:set-option 'relative-includes #t)` at the top of the main input file).

When `relative-includes` is set to `#t`, the path for each `\include` command will be taken relative to the file containing that command. This behavior is recommended and it will become the default behavior in a future version of lilypond.

Files relative to the main directory and files relative to some other directory may both be `\included` by setting `relative-includes` to `#t` or `#f` at appropriate places in the files. For example, if a general library, libA, has been created which itself uses sub-files which are `\included` by the entry file of that library, those `\include` statements will need to be preceded by `#(ly:set-option #relative-includes #t)` so they are interpreted correctly when brought into the main `.ly` file, like this:

```
libA/
  libA.ly
  A1.ly
  A2.ly
  ...
```

then the entry file, `libA.ly`, will contain

```
#(ly:set-option 'relative-includes #t)
\include "A1.ly"
\include "A2.ly"
...
% return to default setting
#(ly:set-option 'relative-includes #f)
```

Any '`.ly`' file can then include the entire library simply with

```
\include "~/libA/libA.ly"
```

More complex file structures may be devised by switching at appropriate places.

Files can also be included from a directory in a search path specified as an option when invoking LilyPond from the command line. The included files are then specified using just their file name. For example, to compile '`main.ly`' which includes files located in a subdirectory called '`parts`' by this method, cd to the directory containing '`main.ly`' and enter

```
lilypond --include=parts main.ly
```

and in main.ly write

```
\include "VI.ly"
\include "VII.ly"
... etc
```

Files which are to be included in many scores may be placed in the LilyPond directory '`../ly`'. (The location of this directory is installation-dependent - see Sezione "Other sources of information" in *Manuale di Apprendimento*). These files can then be included simply by naming them on an `\include` statement. This is how the language-dependent files like '`english.ly`' are included.

LilyPond includes a number of files by default when you start the program. These includes are not apparent to the user, but the files may be identified by running `lilypond --verbose` from the command line. This will display a list of paths and files that LilyPond uses, along with much other information. Alternatively, the more important of these files are discussed in Sezione "Other sources of information" in *Manuale di Apprendimento*. These files may be edited, but changes to them will be lost on installing a new version of LilyPond.

Some simple examples of using `\include` are shown in Sezione "Scores and parts" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Other sources of information" in *Manuale di Apprendimento*, Sezione "Scores and parts" in *Manuale di Apprendimento*.

Problemi noti e avvertimenti

If an included file is given a name which is the same as one in LilyPond's installation files, LilyPond's file from the installation files takes precedence.

3.3.2 Different editions from one source

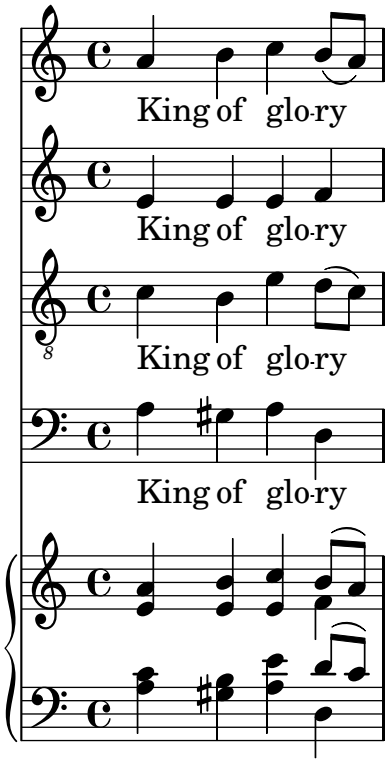
Several methods can be used to generate different versions of a score from the same music source. Variables are perhaps the most useful for combining lengthy sections of music and/or annotation. Tags are more useful for selecting one section from several alternative shorter sections of music, and can also be used for splicing pieces of music together at different points.

Whichever method is used, separating the notation from the structure of the score will make it easier to change the structure while leaving the notation untouched.

Using variables

If sections of the music are defined in variables they can be reused in different parts of the score, see Sezione "Organizing pieces with variables" in *Manuale di Apprendimento*. For example, an *a cappella* vocal score frequently includes a piano reduction of the parts for rehearsal purposes which is identical to the vocal music, so the music need be entered only once. Music from two variables may be combined on one staff, see ⟨undefined⟩ [Automatic part combining], pagina ⟨undefined⟩. Here is an example:

```
sopranoMusic = \relative c'' { a4 b c b8( a) }
altoMusic = \relative g' { e4 e e f }
tenorMusic = \relative c' { c4 b e d8( c) }
bassMusic = \relative c' { a4 gis a d, }
allLyrics = \lyricmode {King of glo -- ry }
<<
  \new Staff = "Soprano" \sopranoMusic
  \new Lyrics \allLyrics
  \new Staff = "Alto" \altoMusic
  \new Lyrics \allLyrics
  \new Staff = "Tenor" {
    \clef "treble_8"
    \tenorMusic
  }
  \new Lyrics \allLyrics
  \new Staff = "Bass" {
    \clef "bass"
    \bassMusic
  }
  \new Lyrics \allLyrics
  \new PianoStaff <<
    \new Staff = "RH" {
      \set Staff.printPartCombineTexts = ##f
      \partcombine
      \sopranoMusic
      \altoMusic
    }
    \new Staff = "LH" {
      \set Staff.printPartCombineTexts = ##f
      \clef "bass"
      \partcombine
      \tenorMusic
      \bassMusic
    }
  >>
>>
```



Separate scores showing just the vocal parts or just the piano part can be produced by changing just the structural statements, leaving the musical notation unchanged.

For lengthy scores, the variable definitions may be placed in separate files which are then included, see Sezione 3.3.1 [Including LilyPond files], pagina 481.

Using tags

The `\tag #'partA` command marks a music expression with the name *partA*. Expressions tagged in this way can be selected or filtered out by name later, using either `\keepWithTag #'name` or `\removeWithTag #'name`. The result of applying these filters to tagged music is as follows:

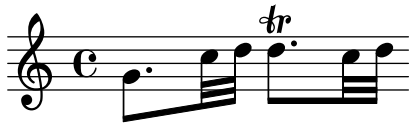
Filter	**Result**
Tagged music preceded by `\keepWithTag #'name` or `\keepWithTag #'(name1 name2...)`	Untagged music and music tagged with any of the given tag names is included; music tagged with any other tag name is excluded.
Tagged music preceded by `\removeWithTag #'name` or `\removeWithTag #'(name1 name2...)`	Untagged music and music not tagged with any of the given tag names is included; music tagged with any of the given tag names is excluded.
Tagged music not preceded by either `\keepWithTag` or `\removeWithTag`	All tagged and untagged music is included.

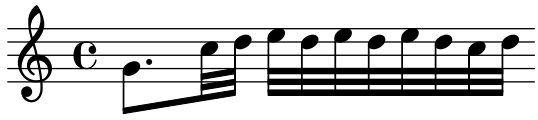
The arguments of the `\tag`, `\keepWithTag` and `\removeWithTag` commands should be a symbol (such as `#'score` or `#'part`), followed by a music expression.

In the following example, we see two versions of a piece of music, one showing trills with the usual notation, and one with trills explicitly expanded:

```
music = \relative g' {
  g8. c32 d
  \tag #'trills { d8.\trill }
  \tag #'expand { \repeat unfold 3 { e32 d } }
  c32 d
 }
```

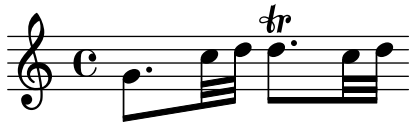
```
\score {
  \keepWithTag #'trills \music
}
\score {
  \keepWithTag #'expand \music
}
```

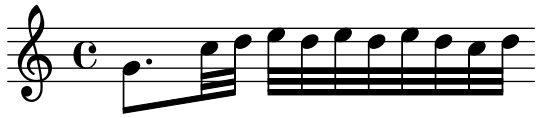




Alternatively, it is sometimes easier to exclude sections of music:

```
music = \relative g' {
  g8. c32 d
  \tag #'trills { d8.\trill }
  \tag #'expand {\repeat unfold 3 { e32 d } }
  c32 d
 }

\score {
  \removeWithTag #'expand
  \music
}
\score {
  \removeWithTag #'trills
  \music
}
```





Tagged filtering can be applied to articulations, texts, etc. by prepending

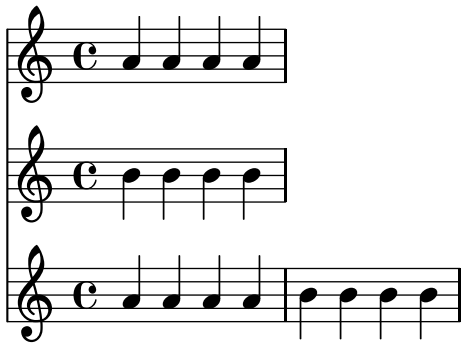
`-\tag #'`*`your-tag`*

to an articulation. For example, this would define a note with a conditional fingering indication and a note with a conditional annotation:

```
c1-\tag #'finger ^4
c1-\tag #'warn ^"Watch!"
```

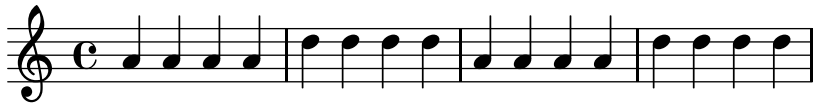
Multiple tags may be placed on expressions with multiple `\tag` entries, or by combining multiple tags into one symbol list:

```
music = \relative c'' {
  \tag #'a \tag #'both { a4 a a a }
  \tag #'(b both) { b4 b b b }
}
<<
\keepWithTag #'a \music
\keepWithTag #'b \music
\keepWithTag #'both \music
>>
```



Multiple `\removeWithTag` filters may be applied to a single music expression to remove several differently named tagged sections. Alternatively, you can use a single `\removeWithTag` with a list of tags.

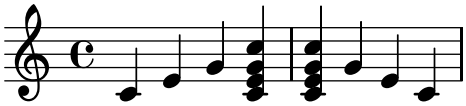
```
music = \relative c'' {
  \tag #'A { a4 a a a }
  \tag #'B { b4 b b b }
  \tag #'C { c4 c c c }
  \tag #'D { d4 d d d }
}
\new Voice {
  \removeWithTag #'B
  \removeWithTag #'C
  \music
  \removeWithTag #'(B C)
  \music
}
```



Two or more `\keepWithTag` filters applied to a single music expression will cause *all* tagged sections to be removed, as the first filter will remove all tagged sections except the one named, and the second filter will remove even that tagged section. Usually you would rather want to use a single `\keepWithTag` command with a list of multiple tags: this will only remove tagged sections not given in *any* of the tags.

Sometimes you want to splice some music at a particular place in an existing music expression. You can use `\pushToTag` and `\appendToTag` for adding material at the front or end of the `elements` of an existing music construct. Not every music construct has `elements`, but sequential and simultaneous music are safe bets:

```
test = { \tag #'here { \tag #'here <<c''>> } }

{
  \pushToTag #'here c'
  \pushToTag #'here e'
  \pushToTag #'here g' \test
  \appendToTag #'here c'
  \appendToTag #'here e'
  \appendToTag #'here g' \test
}
```



Both commands get a tag, the material to splice in at every occurence of the tag, and the tagged expression. The commands make sure to copy everything that they change so that the original `\test` retains its meaning.

Vedi anche

Learning Manual: Sezione "Organizing pieces with variables" in *Manuale di Apprendimento*.

Notation Reference: ⟨undefined⟩ [Automatic part combining], pagina ⟨undefined⟩, Sezione 3.3.1 [Including LilyPond files], pagina 481.

Problemi noti e avvertimenti

Calling `\relative` on a music expression obtained by filtering music through `\keepWithTag` or `\removeWithTag` might cause the octave relations to change, as only the pitches actually remaining in the filtered expression will be considered. Applying `\relative` first, before `\keepWithTag` or `\removeWithTag`, avoids this danger as `\relative` then acts on all the pitches as-input.

Using global settings

Global settings can be included from a separate file:

```
lilypond -dinclude-settings=MY_SETTINGS.ly MY_SCORE.ly
```

Groups of settings such as page size, font or type face can be stored in separate files. This allows different editions from the same score as well as standard settings to be applied to many scores, simply by specifying the proper settings file.

This technique also works well with the use of style sheets, as discussed in Sezione "Style sheets" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Organizing pieces with variables" in *Manuale di Apprendimento*, Sezione "Style sheets" in *Manuale di Apprendimento*.

Notation Reference: Sezione 3.3.1 [Including LilyPond files], pagina 481.

3.3.3 Special characters

Text encoding

LilyPond uses the character repertoire defined by the Unicode consortium and ISO/IEC 10646. This defines a unique name and code point for the character sets used in virtually all modern languages and many others too. Unicode can be implemented using several different encodings.

LilyPond uses the UTF-8 encoding (UTF stands for Unicode Transformation Format) which represents all common Latin characters in one byte, and represents other characters using a variable length format of up to four bytes.

The actual appearance of the characters is determined by the glyphs defined in the particular fonts available - a font defines the mapping of a subset of the Unicode code points to glyphs. LilyPond uses the Pango library to layout and render multi-lingual texts.

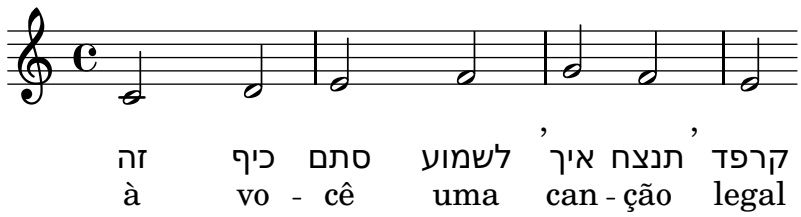
LilyPond does not perform any input-encoding conversions. This means that any text, be it title, lyric text, or musical instruction containing non-ASCII characters, must be encoded in UTF-8. The easiest way to enter such text is by using a Unicode-aware editor and saving the file with UTF-8 encoding. Most popular modern editors have UTF-8 support, for example, vim, Emacs, jEdit, and GEdit do. All MS Windows systems later than NT use Unicode as their native character encoding, so even Notepad can edit and save a file in UTF-8 format. A more functional alternative for Windows is BabelPad.

If a LilyPond input file containing a non-ASCII character is not saved in UTF-8 format the error message

```
FT_Get_Glyph_Name () error: invalid argument
```

will be generated.

Here is an example showing Cyrillic, Hebrew and Portuguese text:



Unicode

To enter a single character for which the Unicode code point is known but which is not available in the editor being used, use either `\char ##xhhhh` or `\char #dddd` within a `\markup` block, where `hhhh` is the hexadecimal code for the character required and `dddd` is the corresponding decimal value. Leading zeroes may be omitted, but it is usual to specify all four characters in the hexadecimal representation. (Note that the UTF-8 encoding of the code point should *not* be used after `\char`, as UTF-8 encodings contain extra bits indicating the number of octets.) Unicode code charts and a character name index giving the code point in hexadecimal for any character can be found on the Unicode Consortium website, http://www.unicode.org/.

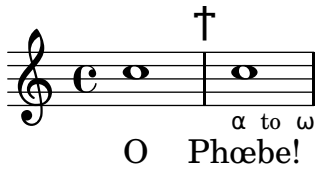
For example, `\char ##x03BE` and `\char #958` would both enter the Unicode U+03BE character, which has the Unicode name "Greek Small Letter Xi".

Any Unicode code point may be entered in this way and if all special characters are entered in this format it is not necessary to save the input file in UTF-8 format. Of course, a font containing all such encoded characters must be installed and available to LilyPond.

The following example shows Unicode hexadecimal values being entered in four places – in a rehearsal mark, as articulation text, in lyrics and as stand-alone text below the score:

```
\score {
  \relative c'' {
    c1 \mark \markup { \char ##x03EE }
    c1_\markup { \tiny { \char ##x03B1 " to " \char ##x03C9 } }
  }
  \addlyrics { O \markup { \concat { Ph \char ##x0153 be! } } }
}
```

```
\markup { "Copyright 2008--2012" \char ##x00A9 }
```



Copyright 2008--2012 ©

To enter the copyright sign in the copyright notice use:

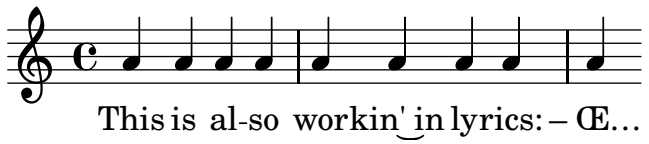
```
\header {
  copyright = \markup { \char ##x00A9 "2008" }
}
```

ASCII aliases

A list of ASCII aliases for special characters can be included:

```
\paper {
  #(include-special-characters)
}

\markup "&flqq; &ndash; &OE;uvre incomplète&hellip; &frqq;"

\score {
  \new Staff { \repeat unfold 9 a'4 }
  \addlyrics {
    This is al -- so wor -- kin'~in ly -- rics: &ndash;_&OE;&hellip;
  }
}

\markup \column {
  "The replacement can be disabled:"
  "&ndash; &OE; &hellip;"
  \override #'(replacement-alist . ()) "&ndash; &OE; &hellip;"
}
```

« – Œuvre incomplète… »



The replacement can be disabled:
– Œ …
– &OE; …

You can also make your own aliases, either globally:

```
\paper {
  #(add-text-replacements!
    '(("100" . "hundred")
      ("dpi" . "dots per inch")))
}
\markup "A 100 dpi."
```

A hundred dots per inch.

or locally:

```
\markup \replace #'(("100" . "hundred")
                    ("dpi" . "dots per inch")) "A 100 dpi."
```

A hundred dots per inch.

Vedi anche

Notation Reference: Sezione A.12 [List of special characters], pagina 710.

Installed Files: '`ly/text-replacements.ly`'.

3.4 Controlling output

3.4.1 Extracting fragments of music

It is possible to quote small fragments of a large score directly from the output. This can be compared to clipping a piece of a paper score with scissors.

This is done by defining the measures that need to be cut out separately. For example, including the following definition

```
\layout {
  clip-regions
  = #(list
      (cons
       (make-rhythmic-location 5 1 2)
       (make-rhythmic-location 7 3 4)))
}
```

will extract a fragment starting halfway the fifth measure, ending in the seventh measure. The meaning of `5 1 2` is: after a 1/2 note in measure 5, and `7 3 4` after 3 quarter notes in measure 7.

More clip regions can be defined by adding more pairs of rhythmic-locations to the list.

In order to use this feature, LilyPond must be invoked with '`-dclip-systems`'. The clips are output as EPS files, and are converted to PDF and PNG if these formats are switched on as well.

For more information on output formats, see Sezione "Invoking lilypond" in *Uso del Programma*.

3.4.2 Skipping corrected music

When entering or copying music, usually only the music near the end (where you are adding notes) is interesting to view and correct. To speed up this correction process, it is possible to skip typesetting of all but the last few measures. This is achieved by putting

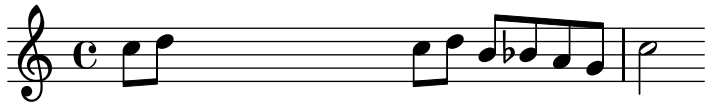
```
showLastLength = R1*5
\score { ... }
```

in your source file. This will render only the last 5 measures (assuming 4/4 time signature) of every `\score` in the input file. For longer pieces, rendering only a small part is often an order of magnitude quicker than rendering it completely. When working on the beginning of a score you have already typeset (e.g. to add a new part), the `showFirstLength` property may be useful as well.

Skipping parts of a score can be controlled in a more fine-grained fashion with the property `Score.skipTypesetting`. When it is set, no typesetting is performed at all.

This property is also used to control output to the MIDI file. Note that it skips all events, including tempo and instrument changes. You have been warned.

```
c8 d
\set Score.skipTypesetting = ##t
e8 e e e e e e
\set Score.skipTypesetting = ##f
c8 d b bes a g c2
```



In polyphonic music, `Score.skipTypesetting` will affect all voices and staves, saving even more time.

3.4.3 Alternative output formats

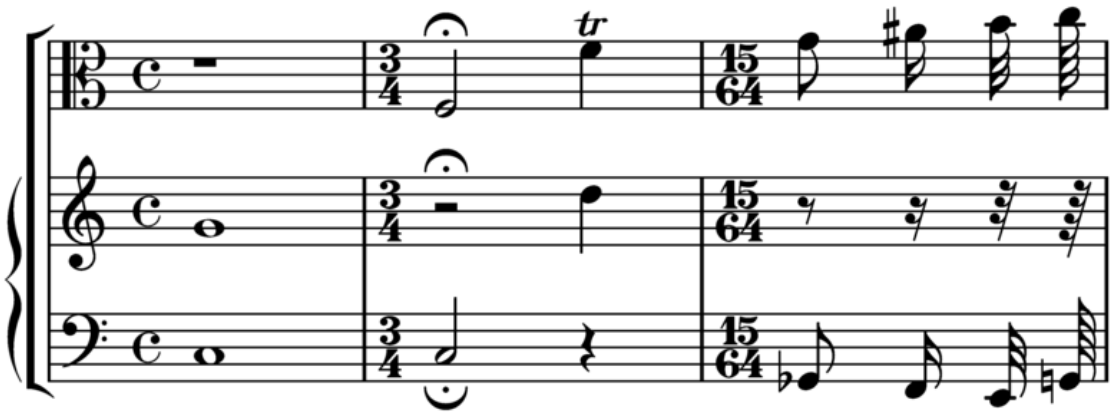
The default output formats for the printed score are Portable Document Format (PDF) and PostScript (PS). Scalable Vector Graphics (SVG), Encapsulated PostScript (EPS) and Portable Network Graphics (PNG) output formats are also available through command line options, see Sezione "Basic command line options for LilyPond" in *Uso del Programma*.

3.4.4 Replacing the notation font

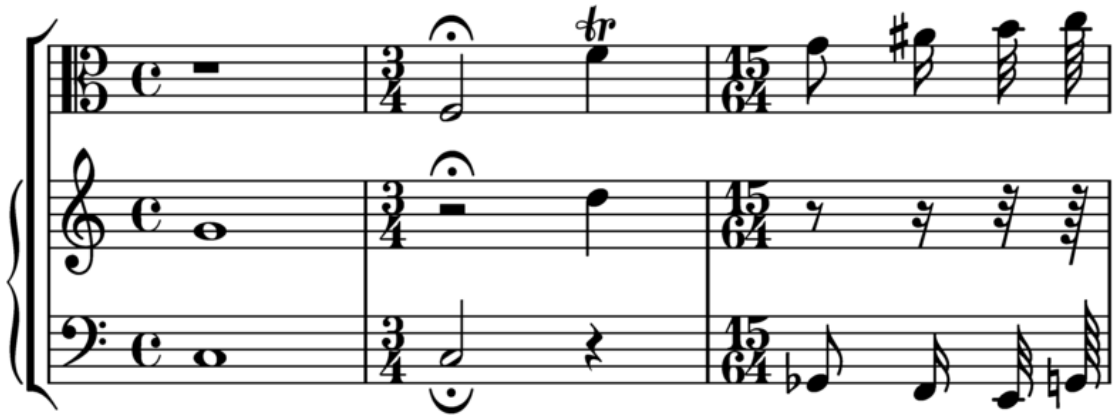
Gonville is an alternative to the Feta font used in LilyPond and can be downloaded from:

http://www.chiark.greenend.org.uk/~sgtatham/gonville/

Here are a few sample bars of music set in Gonville:



Here are a few sample bars of music set in LilyPond's Feta font:



Installation Instructions for MacOS

Download and extract the zip file. Copy the `lilyfonts` directory to '*SHARE_DIR*/`lilypond/current`'; for more information, see Sezione "Other sources of information" in *Manuale di Apprendimento*. Rename the existing `fonts` directory to `fonts_orig` and the `lilyfonts` directory to `fonts`. To revert back to Feta, reverse the process.

Vedi anche

Learning Manual: Sezione "Other sources of information" in *Manuale di Apprendimento*.

Problemi noti e avvertimenti

Gonville cannot be used to typeset 'Ancient Music' notation and it is likely newer glyphs in later releases of LilyPond may not exist in the Gonville font family. Please refer to the author's website for more information on these and other specifics, including licensing of Gonville.

3.5 MIDI output

MIDI (Musical Instrument Digital Interface) is a standard for connecting and controlling digital instruments. A MIDI file is a series of notes in a number of tracks. It is not an actual sound file; you need special software to translate between the series of notes and actual sounds.

Pieces of music can be converted to MIDI files, so you can listen to what was entered. This is convenient for checking the music; octaves that are off or accidentals that were mistyped stand out very much when listening to the MIDI output.

Standard MIDI output is somewhat crude; optionally, an enhanced and more realistic MIDI output is available by means of Sezione 3.5.8 [The Articulate script], pagina 501.

The MIDI output allocates a channel for each staff, and reserves channel 10 for drums. There are only 16 MIDI channels per device, so if the score contains more than 15 staves, MIDI channels will be reused.

3.5.1 Creating MIDI files

To create a MIDI output file from a LilyPond input file, add a `\midi` block to a score, for example,

```
\score {
  ...music...
  \midi { }
}
```

If there is a \midi block in a \score with no \layout block, only MIDI output will be produced. When notation is needed too, a \layout block must also be present.

```
\score {
  ...music...
  \midi { }
  \layout { }
}
```

Pitches, rhythms, ties, dynamics, and tempo changes are interpreted and translated correctly to the MIDI output. Dynamic marks, crescendi and decrescendi translate into MIDI volume levels. Dynamic marks translate to a fixed fraction of the available MIDI volume range. Crescendi and decrescendi make the volume vary linearly between their two extremes. The effect of dynamic markings on the MIDI output can be removed completely, see Sezione 3.5.3 [MIDI block], pagina 494.

The initial tempo and later tempo changes can be specified with the \tempo command within the music notation. These are reflected in tempo changes in the MIDI output. This command will normally result in the metronome mark being printed, but this can be suppressed, see ⟨undefined⟩ [Metronome marks], pagina ⟨undefined⟩. An alternative way of specifying the initial or overall MIDI tempo is described below, see Sezione 3.5.3 [MIDI block], pagina 494.

Due to some limitations on Windows, the default extension for MIDI files on Windows is .mid. Other operating systems still use the extension .midi. If a different extension is preferred, insert the following line at the top-level of the input file, before the start of any \book, \bookpart or \score blocks:

```
#(ly:set-option 'midi-extension "midi")
```

The line above will set the default extension for MIDI files to .midi.

Alternatively, this option can also be supplied on the command line:

```
lilypond ... -dmidi-extension=midi lilyFile.ly
```

Frammenti di codice selezionati

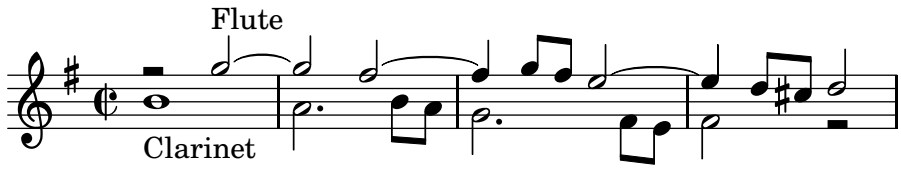
Changing MIDI output to one channel per voice

When outputting MIDI, the default behavior is for each staff to represent one MIDI channel, with all the voices on a staff amalgamated. This minimizes the risk of running out of MIDI channels, since there are only 16 available per MIDI port, and most devices support only one port.

However, by moving the Staff_performer to the Voice context, each voice on a staff can have its own MIDI channel, as is demonstrated by the following example: despite being on the same staff, two MIDI channels are created, each with a different midiInstrument.

```
\score {
  \new Staff <<
    \new Voice \relative c''' {
      \set midiInstrument = #"flute"
      \voiceOne
      \key g \major
      \time 2/2
      r2 g-"Flute" ~
      g fis ~
      fis4 g8 fis e2 ~
      e4 d8 cis d2
    }
    \new Voice \relative c'' {
```

```
      \set midiInstrument = #"clarinet"
      \voiceTwo
      b1-"Clarinet"
      a2. b8 a
      g2. fis8 e
      fis2 r
    }
  >>
  \layout { }
  \midi {
    \context {
      \Staff
      \remove "Staff_performer"
    }
    \context {
      \Voice
      \consists "Staff_performer"
    }
    \tempo 2 = 72
  }
}
```



Problemi noti e avvertimenti

Changes in the MIDI volume take place only on starting a note, so crescendi and decrescendi cannot affect the volume of a single note.

Not all midi players correctly handle tempo changes in the midi output. Players that are known to work include MS Windows Media Player and timidity.

3.5.2 MIDI Instruments

The MIDI instrument to be used is specified by setting the `Staff.midiInstrument` property to the instrument name. The name should be chosen from the list in Sezione A.6 [MIDI instruments], pagina 635.

```
\new Staff {
  \set Staff.midiInstrument = #"glockenspiel"
  ...notes...
}
\new Staff \with {midiInstrument = #"cello"} {
  ...notes...
}
```

If the selected instrument does not exactly match an instrument from the list of MIDI instruments, the Grand Piano (`"acoustic grand"`) instrument is used.

3.5.3 MIDI block

A `\midi` block must appear within a score block if MIDI output is required. It is analogous to the layout block, but somewhat simpler. Often, the `\midi` block is left empty, but it can

contain context rearrangements, new context definitions or code to set the values of properties. For example, the following will set the initial tempo exported to a MIDI file without causing a tempo indication to be printed:

```
\score {
  ...music...
  \midi {
    \tempo 4 = 72
  }
}
```

In this example the tempo is set to 72 quarter note beats per minute. `\tempo` is actually a music command for setting properties during the interpretation of music: in the context of output definitions like a `\midi` block, as a matter of courtesy those are reinterpreted as if they were context modifications.

Context definitions follow precisely the same syntax as those within a `\layout` block. Translation modules for sound are called performers. The contexts for MIDI output are defined in '`../ly/performer-init.ly`', see Sezione "Other sources of information" in *Manuale di Apprendimento*. For example, to remove the effect of dynamics from the MIDI output, insert the following lines in the `\midi{ }` block.

```
\midi {
  ...
  \context {
    \Voice
    \remove "Dynamic_performer"
  }
}
```

MIDI output is created only when a `\midi` block is included within a score block defined with a `\score` command.

```
\score {
  { ...notes... }
  \midi { }
}
```

3.5.4 What goes into the MIDI output?

Supported in MIDI

The following items of notation are reflected in the MIDI output:

- Pitches
- Microtones (See ⟨undefined⟩ [Accidentals], pagina ⟨undefined⟩. Rendering needs a player that supports pitch bend.)
- Chords entered as chord names
- Rhythms entered as note durations, including tuplets
- Tremolos entered without '`:`[*number*]'
- Ties
- Dynamic marks
- Crescendi, decrescendi over multiple notes
- Tempo changes entered with a tempo marking
- Lyrics

Using Sezione 3.5.8 [The Articulate script], pagina 501, a number of items are added to the above list:

- Articulations (slurs, staccato, etc)
- Trills, turns
- Rallentando and accelerando

Unsupported in MIDI

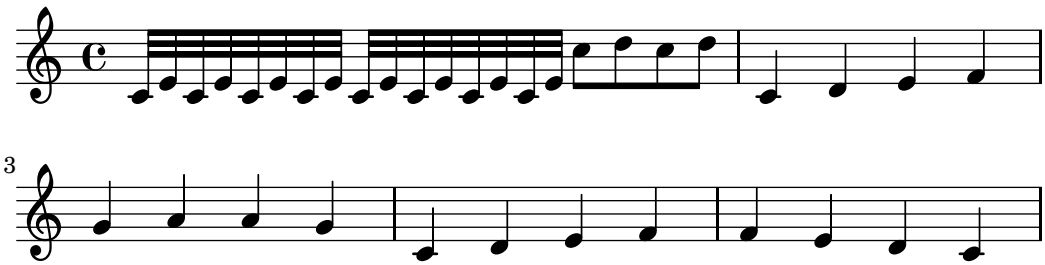
The following items of notation have no effect on the MIDI output, unless you use Sezione 3.5.8 [The Articulate script], pagina 501:

- Rhythms entered as annotations, e.g. swing
- Tempo changes entered as annotations with no tempo marking
- Staccato and other articulations and ornamentations
- Slurs and Phrasing slurs
- Crescendi, decrescendi over a single note
- Tremolos entered with '`:`[*number*]'
- Figured bass
- Microtonal chords

3.5.5 Repeats in MIDI

With a few minor additions, all types of repeats can be represented in the MIDI output. This is achieved by applying the `\unfoldRepeats` music function. This function changes all repeats to unfold repeats.

```
\unfoldRepeats {
  \repeat tremolo 8 { c'32 e' }
  \repeat percent 2 { c''8 d'' }
  \repeat volta 2 { c'4 d' e' f' }
  \alternative {
    { g' a' a' g' }
    { f' e' d' c' }
  }
}
\bar "|."
```



In scores containing multiple voices, unfolding of repeats in MIDI output will only occur correctly if *each* voice contains fully notated repeat indications.

When creating a score file using `\unfoldRepeats` for MIDI, it is necessary to make two `\score` blocks: one for MIDI (with unfolded repeats) and one for notation (with volta, tremolo, and percent repeats). For example,

```
\score {
  ...music...
  \layout { ... }
}
\score {
  \unfoldRepeats ...music...
  \midi { ... }
}
```

3.5.6 Controlling MIDI dynamics

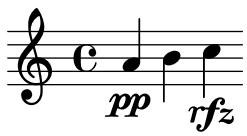
MIDI dynamics are implemented by the Dynamic_performer which lives by default in the Voice context. It is possible to control the overall MIDI volume, the relative volume of dynamic markings and the relative volume of different instruments.

Dynamic marks

Dynamic marks are translated to a fixed fraction of the available MIDI volume range. The default fractions range from 0.25 for *ppppp* to 0.95 for *fffff*. The set of dynamic marks and the associated fractions can be seen in '`../scm/midi.scm`', see Sezione "Other sources of information" in *Manuale di Apprendimento*. This set of fractions may be changed or extended by providing a function which takes a dynamic mark as its argument and returns the required fraction, and setting `Score.dynamicAbsoluteVolumeFunction` to this function.

For example, if a *rinforzando* dynamic marking, `\rfz`, is required, this will not by default have any effect on the MIDI volume, as this dynamic marking is not included in the default set. Similarly, if a new dynamic marking has been defined with `make-dynamic-script` that too will not be included in the default set. The following example shows how the MIDI volume for such dynamic markings might be added. The Scheme function sets the fraction to 0.9 if a dynamic mark of rfz is found, or calls the default function otherwise.

```
#(define (myDynamics dynamic)
    (if (equal? dynamic "rfz")
      0.9
      (default-dynamic-absolute-volume dynamic)))

\score {
  \new Staff {
    \set Staff.midiInstrument = #"cello"
    \set Score.dynamicAbsoluteVolumeFunction = #myDynamics
    \new Voice {
      \relative c'' {
        a4\pp b c-\rfz
      }
    }
  }
  \layout {}
  \midi {}
}
```



Alternatively, if the whole table of fractions needs to be redefined, it would be better to use the *default-dynamic-absolute-volume* procedure in '`../scm/midi.scm`' and the associated table as a model. The final example in this section shows how this might be done.

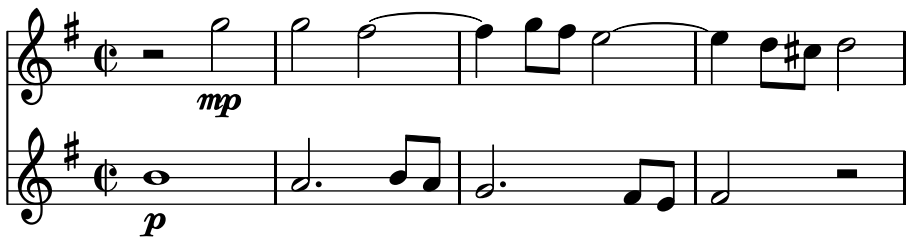
Overall MIDI volume

The minimum and maximum overall volume of MIDI dynamic markings is controlled by setting the properties `midiMinimumVolume` and `midiMaximumVolume` at the `Score` level. These properties have an effect only at the start of a voice and on dynamic marks. The fraction corresponding to each dynamic mark is modified with this formula

`midiMinimumVolume + (midiMaximumVolume - midiMinimumVolume) * fraction`

In the following example the dynamic range of the overall MIDI volume is limited to the range 0.2 - 0.5.

```
\score {
  <<
    \new Staff {
      \key g \major
      \time 2/2
      \set Staff.midiInstrument = #"flute"
      \new Voice \relative c''' {
        r2 g\mp g fis~
        fis4 g8 fis e2~
        e4 d8 cis d2
      }
    }
    \new Staff {
      \key g \major
      \set Staff.midiInstrument = #"clarinet"
      \new Voice \relative c'' {
        b1\p a2. b8 a
        g2. fis8 e
        fis2 r
      }
    }
  >>
  \layout {}
  \midi {
    \tempo 2 = 72
    \context {
      \Score
      midiMinimumVolume = #0.2
      midiMaximumVolume = #0.5
    }
  }
}
```

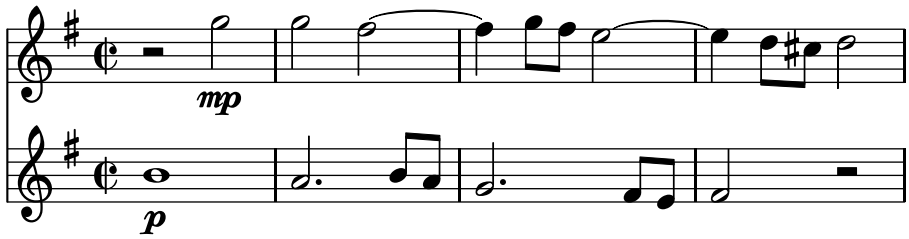


Equalizing different instruments (i)

If the minimum and maximum MIDI volume properties are set in the `Staff` context the relative volumes of the MIDI instruments can be controlled. This gives a basic instrument equalizer, which can enhance the quality of the MIDI output remarkably.

In this example the volume of the clarinet is reduced relative to the volume of the flute.

```
\score {
  <<
    \new Staff {
      \key g \major
      \time 2/2
      \set Staff.midiInstrument = #"flute"
      \set Staff.midiMinimumVolume = #0.7
      \set Staff.midiMaximumVolume = #0.9
      \new Voice \relative c''' {
        r2 g\mp g fis~
        fis4 g8 fis e2~
        e4 d8 cis d2
      }
    }
    \new Staff {
      \key g \major
      \set Staff.midiInstrument = #"clarinet"
      \set Staff.midiMinimumVolume = #0.3
      \set Staff.midiMaximumVolume = #0.6
      \new Voice \relative c'' {
        b1\p a2. b8 a
        g2. fis8 e
        fis2 r
      }
    }
  >>
  \layout {}
  \midi {
    \tempo 2 = 72
  }
}
```



Equalizing different instruments (ii)

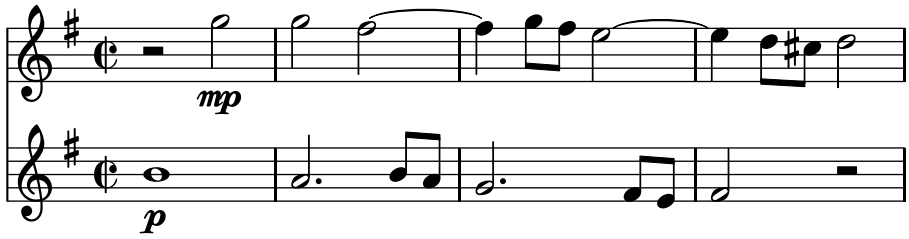
If the MIDI minimum and maximum volume properties are not set LilyPond will, by default, apply a small degree of equalization to a few instruments. The instruments and the equalization applied are shown in the table *instrument-equalizer-alist* in '`../scm/midi.scm`'.

This basic default equalizer can be replaced by setting `instrumentEqualizer` in the `Score` context to a new Scheme procedure which accepts a MIDI instrument name as its only ar-

gument and returns a pair of fractions giving the minimum and maximum volumes to be applied to that instrument. This replacement is done in the same way as shown for resetting the `dynamicAbsoluteVolumeFunction` at the start of this section. The default equalizer, *default-instrument-equalizer*, in '`../scm/midi.scm`' shows how such a procedure might be written.

The following example sets the relative flute and clarinet volumes to the same values as the previous example.

```
#(define my-instrument-equalizer-alist '())

#(set! my-instrument-equalizer-alist
  (append
    '(
      ("flute" . (0.7 . 0.9))
      ("clarinet" . (0.3 . 0.6)))
    my-instrument-equalizer-alist))

#(define (my-instrument-equalizer s)
  (let ((entry (assoc s my-instrument-equalizer-alist)))
    (if entry
      (cdr entry))))

\score {
  <<
    \new Staff {
      \key g \major
      \time 2/2
      \set Score.instrumentEqualizer = #my-instrument-equalizer
      \set Staff.midiInstrument = #"flute"
      \new Voice \relative c''' {
        r2 g\mp g fis~
        fis4 g8 fis e2~
        e4 d8 cis d2
      }
    }
    \new Staff {
      \key g \major
      \set Staff.midiInstrument = #"clarinet"
      \new Voice \relative c'' {
        b1\p a2. b8 a
        g2. fis8 e
        fis2 r
      }
    }
  >>
  \layout { }
  \midi {
    \tempo 2 = 72
  }
}
```



3.5.7 Percussion in MIDI

Percussion instruments are generally notated in a `DrumStaff` context and when notated in this way they are outputted correctly to MIDI channel 10, but some pitched percussion instruments, like the xylophone, marimba, vibraphone, timpani, etc., are treated like "normal" instruments and music for these instruments should be entered in a normal `Staff` context, not a `DrumStaff` context, to obtain the correct MIDI output.

Some non-pitched percussion sounds included in the general MIDI standard, like melodic tom, taiko drum, synth drum, etc., cannot be reached via MIDI channel 10, so the notation for such instruments should also be entered in a normal `Staff` context, using suitable normal pitches.

Many percussion instruments are not included in the general MIDI standard, e.g. castanets. The easiest, although unsatisfactory, method of producing some MIDI output when writing for such instruments is to substitute the nearest sound from the standard set.

Problemi noti e avvertimenti

Because the general MIDI standard does not contain rim shots, the sidestick is used for this purpose instead.

3.5.8 The Articulate script

A more realistic MIDI output is possible when using the Articulate script. It tries to take articulations (slurs, staccato, etc) into account, by replacing notes with sequential music of suitably time-scaled note plus skip. It also tries to unfold trills turns etc., and take rallentando and accelerando into account.

To use the Articulate script, you have to include it at the top of your input file,

```
\include "articulate.ly"
```

and in the `\score` section do

```
\unfoldRepeats \articulate <<
all the rest of the score...
>>
```

After altering your input file this way, the visual output is heavily altered, but the standard `\midi` block will produce a better MIDI file.

Although not essential for the Articulate script to work, you may want to insert the `\unfoldRepeats` command as it appears in the example shown above as it enables performing abbreviatures such as *trills*.

Problemi noti e avvertimenti

Articulate shortens chords and some music (esp. organ music) could sound worse.

3.6 Extracting musical information

In addition to creating graphical output and MIDI, LilyPond can display musical information as text.

3.6.1 Displaying LilyPond notation

Displaying a music expression in LilyPond notation can be done with the music function `\displayLilyMusic`. To see the output, you will typically want to call LilyPond using the command line. For example,

```
{
  \displayLilyMusic \transpose c a, { c4 e g a bes }
}
```

will display

```
{ a,4 cis e fis g }
```

By default, LilyPond will print these messages to the console along with all the other LilyPond compilation messages. To split up these messages and save the results of `\displayLilyMusic`, redirect the output to a file.

```
lilypond file.ly >display.txt
```

Note that Lilypond does not just display the music expression, but also interprets it (since `\displayLilyMusic` returns it in addition to displaying it). This is convenient since you can just insert `\displayLilyMusic` into existing music in order to get information about it. If you don't actually want Lilypond to interpret the displayed music as well as display it, use `\void` in order to have it ignored:

```
{
  \void \displayLilyMusic \transpose c a, { c4 e g a bes }
}
```

3.6.2 Displaying scheme music expressions

See Sezione "Displaying music expressions" in *Estendere*.

3.6.3 Saving music events to a file

Music events can be saved to a file on a per-staff basis by including a file in your main score.

```
\include "event-listener.ly"
```

This will create file(s) called '`FILENAME-STAFFNAME.notes`' or '`FILENAME-unnamed-staff.notes`' for each staff. Note that if you have multiple unnamed staves, the events for all staves will be mixed together in the same file. The output looks like this:

```
0.000   note     57       4   p-c 2 12
0.000   dynamic  f
0.250   note     62       4   p-c 7 12
0.500   note     66       8   p-c 9 12
0.625   note     69       8   p-c 14 12
0.750   rest     4
0.750   breathe
```

The syntax is a tab-delimited line, with two fixed fields on each line followed by optional parameters.

`time  type  ...params...`

This information can easily be read into other programs such as python scripts, and can be very useful for researchers wishing to perform musical analysis or playback experiments with LilyPond.

Problemi noti e avvertimenti

Not all lilypond music events are supported by '`event-listener.ly`'. It is intended to be a well-crafted "proof of concept". If some events that you want to see are not included, copy '`event-listener.ly`' into your lilypond directory and modify the file so that it outputs the information you want.

4 Spacing issues

The global paper layout is determined by three factors: the page layout, the line breaks, and the spacing. These all influence each other. The choice of spacing determines how densely each system of music is set. This influences where line breaks are chosen, and thus ultimately, how many pages a piece of music takes.

Globally speaking, this procedure happens in four steps: first, flexible distances ('springs') are chosen, based on durations. All possible line breaking combinations are tried, and a 'badness' score is calculated for each. Then the height of each possible system is estimated. Finally, a page breaking and line breaking combination is chosen so that neither the horizontal nor the vertical spacing is too cramped or stretched.

Two types of blocks can contain layout settings: `\paper {...}` and `\layout {...}`. The `\paper` block contains page layout settings that are expected to be the same for all scores in a book or bookpart, such as the paper height, or whether to print page numbers, etc. See Sezione 4.1 [Page layout], pagina 504. The `\layout` block contains score layout settings, such as the number of systems to use, or the space between staff-groups, etc. See Sezione 4.2 [Score layout], pagina 514.

4.1 Page layout

This section discusses page layout options for the `\paper` block.

4.1.1 The \paper block

`\paper` blocks may be placed in three different places to form a descending hierarchy of `\paper` blocks:

- At the top of the input file, before all `\book`, `\bookpart`, and `\score` blocks.
- Within a `\book` block but outside all the `\bookpart` and `\score` blocks within that book.
- Within a `\bookpart` block but outside all `\score` blocks within that bookpart.

A `\paper` block cannot be placed within a `\score` block.

The values of the fields filter down this hierarchy, with the values set higher in the hierarchy persisting unless they are over-ridden by a value set lower in the hierarchy.

Several `\paper` blocks can appear at each of the levels, for example as parts of several `\included` files. If so, the fields at each level are merged, with values encountered last taking precedence if duplicated fields appear.

Settings that can appear in a `\paper` block include:

- the `set-paper-size` scheme function,
- `\paper` variables used for customizing page layout, and
- markup definitions used for customizing the layout of headers, footers, and titles.

The `set-paper-size` function is discussed in the next section, Sezione 4.1.2 [Paper size and automatic scaling], pagina 505. The `\paper` variables that deal with page layout are discussed in later sections. The markup definitions that deal with headers, footers, and titles are discussed in Sezione 3.2.2 [Custom titles headers and footers], pagina 464.

Most `\paper` variables will only work in a `\paper` block. The few that will also work in a `\layout` block are listed in Sezione 4.2.1 [The \layout block], pagina 514.

Except when specified otherwise, all `\paper` variables that correspond to distances on the page are measured in millimeters, unless a different unit is specified by the user. For example, the following declaration sets `top-margin` to ten millimeters:

```
\paper {
  top-margin = 10
}
```

To set it to 0.5 inches, use the \in unit suffix:

```
\paper {
  top-margin = 0.5\in
}
```

The available unit suffixes are \mm, \cm, \in, and \pt. These units are simple values for converting from millimeters; they are defined in 'ly/paper-defaults-init.ly'. For the sake of clarity, when using millimeters, the \mm is typically included in the code, even though it is not technically necessary.

It is also possible to define \paper values using Scheme. The Scheme equivalent of the above example is:

```
\paper {
  #(define top-margin (* 0.5 in))
}
```

Vedi anche

Notation Reference: Sezione 4.1.2 [Paper size and automatic scaling], pagina 505, Sezione 3.2.2 [Custom titles headers and footers], pagina 464, Sezione 4.2.1 [The \layout block], pagina 514.

Installed Files: 'ly/paper-defaults-init.ly'.

4.1.2 Paper size and automatic scaling

Setting the paper size

'A4' is the default value when no explicit paper size is set. However, there are two functions that can be used to change it set-default-paper-size,

```
#(set-default-paper-size "quarto")
```

which must always be placed at the toplevel scope. and set-paper-size,

```
\paper {
  #(set-paper-size "tabloid")
}
```

which must always be placed in a \paper block.

If the set-default-paper-size function is used in the toplevel scope, it must come before the any \paper block. set-default-paper-size sets the paper size for all pages, whereas set-paper-size only sets the paper size for the pages that the \paper block applies to. For example, if the \paper block is at the top of the file, then it will apply the paper size to all pages. If the \paper block is inside a \book, then the paper size will only apply to that book.

When the set-paper-size function is used, it must be placed *before* any other functions used within the same \paper block. See [Automatic scaling to paper size], pagina 506.

Paper sizes are defined in 'scm/paper.scm', and while it is possible to add custom sizes, they will be overwritten on subsequent software updates. The available paper sizes are listed in Sezione A.5 [Predefined paper sizes], pagina 632.

The following command can be used in the file to add a custom paper size which can then be used with set-default-paper-size or set-paper-size as appropriate,

```
#(set! paper-alist (cons '("my size" . (cons (* 15 in) (* 3 in))) paper-alist))

\paper {
```

```
  #(set-paper-size "my size")
}
```

The units `in` (inches), `cm` (centimeters) and `mm` (millimeters) can all be used.

If the symbol `'landscape` is added to the paper size function, pages will be rotated by 90 degrees, and wider line widths will be set accordingly.

```
#(set-default-paper-size "a6" 'landscape)
```

Swapping the paper dimensions *without* having the print rotated (like when printing to postcard size, or creating graphics for inclusion rather than a standalone document) can be achieved by appending '`landscape`' to the name of the paper size itself:

```
#(set-default-paper-size "a6landscape")
```

When the paper size ends with an explicit '`landscape`' or '`portrait`', the presence of a `'landscape` symbol *only* affects print orientation, not the paper dimensions used for layout.

Vedi anche

Notation Reference: [Automatic scaling to paper size], pagina 506, Sezione A.5 [Predefined paper sizes], pagina 632.

Installed Files: '`scm/paper.scm`'.

Automatic scaling to paper size

If the paper size is changed with one of the scheme functions (`set-default-paper-size` or `set-paper-size`), the values of several `\paper` variables are automatically scaled to the new size. To bypass the automatic scaling for a particular variable, set the variable after setting the paper size. Note that the automatic scaling is not triggered by setting the `paper-height` or `paper-width` variables, even though `paper-width` can influence other values (this is separate from scaling and is discussed below). The `set-default-paper-size` and `set-paper-size` functions are described in [Setting the paper size], pagina 505.

The vertical dimensions affected by automatic scaling are `top-margin` and `bottom-margin` (see Sezione 4.1.3 [Fixed vertical spacing \paper variables], pagina 506). The horizontal dimensions affected by automatic scaling are `left-margin`, `right-margin`, `inner-margin`, `outer-margin`, `binding-offset`, `indent`, and `short-indent` (see Sezione 4.1.5 [Horizontal spacing \paper variables], pagina 509).

The default values for these dimensions are set in '`ly/paper-defaults-init.ly`', using internal variables named `top-margin-default`, `bottom-margin-default`, etc. These are the values that result at the default paper size `a4`. For reference, with `a4` paper the `paper-height` is `297\mm` and the `paper-width` is `210\mm`.

Vedi anche

Notation Reference: Sezione 4.1.3 [Fixed vertical spacing \paper variables], pagina 506, Sezione 4.1.5 [Horizontal spacing \paper variables], pagina 509.

Installed Files: '`ly/paper-defaults-init.ly`', '`scm/paper.scm`'.

4.1.3 Fixed vertical spacing `\paper` variables

Nota: Some `\paper` dimensions are automatically scaled to the paper size, which may lead to unexpected behavior. See [Automatic scaling to paper size], pagina 506.

Default values (before scaling) are defined in '`ly/paper-defaults-init.ly`'.

`paper-height`
: The height of the page, unset by default. Note that the automatic scaling of some vertical dimensions is not affected by this.

`top-margin`
: The margin between the top of the page and the top of the printable area. If the paper size is modified, this dimension's default value is scaled accordingly.

`bottom-margin`
: The margin between the bottom of the printable area and the bottom of the page. If the paper size is modified, this dimension's default value is scaled accordingly.

`ragged-bottom`
: If set to true, systems will not spread vertically down the page. This does not affect the last page. This should be set to true for pieces that have only two or three systems per page, for example orchestral scores.

`ragged-last-bottom`
: If set to false, systems will spread vertically down the last page. Pieces that amply fill two pages or more should have this set to false. It also affects the last page of book parts, i.e. parts of a book created with `\bookpart` blocks.

Vedi anche

Notation Reference: [Automatic scaling to paper size], pagina 506.

Installed Files: '`ly/paper-defaults-init.ly`'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Problemi noti e avvertimenti

The titles (from the `\header` block) are treated as a system, so `ragged-bottom` and `ragged-last-bottom` will add space between the titles and the first system of the score.

Explicitly defined paper-sizes will override any user-defined top or bottom margin settings.

4.1.4 Flexible vertical spacing `\paper` variables

In most cases, it is preferable for the vertical distances between certain items (such as margins, titles, systems, and separate scores) to be flexible, so that they stretch and compress nicely according to each situation. A number of `\paper` variables (listed below) are available to fine-tune the stretching behavior of these dimensions.

Note that the `\paper` variables discussed in this section do not control the spacing of staves within individual systems. Within-system spacing is controlled by grob properties, with settings typically entered inside a `\score` or `\layout` block, and not inside a `\paper` block. See Sezione 4.4.1 [Flexible vertical spacing within systems], pagina 525.

Structure of flexible vertical spacing alists

Each of the flexible vertical spacing `\paper` variables is an alist (association list) containing four *keys*:

- `basic-distance` – the vertical distance, measured in staff-spaces, between the *reference points* of the two items, when no collisions would result, and no stretching or compressing is in effect. The reference point of a (title or top-level) markup is its highest point, and the reference point of a system is the vertical center of the nearest `StaffSymbol` – even if a non-staff line (such as a `Lyrics` context) is in the way. Values for `basic-distance` that are less than either `padding` or `minimum-distance` are not meaningful, since the resulting distance will never be less than either `padding` or `minimum-distance`.

- `minimum-distance` – the smallest allowable vertical distance, measured in staff-spaces, between the reference points of the two items, when compressing is in effect. Values for `minimum-distance` that are less than `padding` are not meaningful, since the resulting distance will never be less than `padding`.
- `padding` – the minimum required amount of unobstructed vertical whitespace between the bounding boxes (or skylines) of the two items, measured in staff-spaces.
- `stretchability` – a unitless measure of the dimension's relative propensity to stretch. If zero, the distance will not stretch (unless collisions would result). When positive, the significance of a particular dimension's `stretchability` value lies only in its relation to the `stretchability` values of the other dimensions. For example, if one dimension has twice the `stretchability` of another, it will stretch twice as easily. Values should be non-negative and finite. The value `+inf.0` triggers a `programming_error` and is ignored, but `1.0e7` can be used for an almost infinitely stretchable spring. If unset, the default value is set to `basic-distance`. Note that the dimension's propensity to *compress* cannot be directly set by the user and is equal to (`basic-distance` − `minimum-distance`).

If a page has a ragged bottom, the resulting distance is the largest of:

- `basic-distance`,
- `minimum-distance`, and
- `padding` plus the smallest distance necessary to eliminate collisions.

For multi-page scores with a ragged bottom on the last page, the last page uses the same spacing as the preceding page, provided there is enough space for that.

Specific methods for modifying alists are discussed in Sezione 5.3.6 [Modifying alists], pagina 582. The following example demonstrates the two ways these alists can be modified. The first declaration updates one key-value individually, and the second completely redefines the variable:

```
\paper {
  system-system-spacing #'basic-distance = #8
  score-system-spacing =
    #'((basic-distance . 12)
       (minimum-distance . 6)
       (padding . 1)
       (stretchability . 12))
}
```

List of flexible vertical spacing \paper variables

The names of these variables follow the format *`upper-lower-spacing`*, where *`upper`* and *`lower`* are the items to be spaced. Each distance is measured between the reference points of the two items (see the description of the alist structure above). Note that in these variable names, the term '`markup`' refers to both *title markups* (`bookTitleMarkup` or `scoreTitleMarkup`) and *top-level markups* (see Sezione 3.1.5 [File structure], pagina 455). All distances are measured in staff-spaces.

Default settings are defined in '`ly/paper-defaults-init.ly`'.

`markup-system-spacing`
: the distance between a (title or top-level) markup and the system that follows it.

`score-markup-spacing`
: the distance between the last system of a score and the (title or top-level) markup that follows it.

`score-system-spacing`
: the distance between the last system of a score and the first system of the score that follows it, when no (title or top-level) markup exists between them.

`system-system-spacing`
: the distance between two systems in the same score.

`markup-markup-spacing`
: the distance between two (title or top-level) markups.

`last-bottom-spacing`
: the distance from the last system or top-level markup on a page to the bottom of the printable area (i.e. the top of the bottom margin).

`top-system-spacing`
: the distance from the top of the printable area (i.e. the bottom of the top margin) to the first system on a page, when there is no (title or top-level) markup between the two.

`top-markup-spacing`
: the distance from the top of the printable area (i.e. the bottom of the top margin) to the first (title or top-level) markup on a page, when there is no system between the two.

Vedi anche

Notation Reference: Sezione 4.4.1 [Flexible vertical spacing within systems], pagina 525.

Installed Files: '`ly/paper-defaults-init.ly`'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.1.5 Horizontal spacing \paper variables

Nota: Some `\paper` dimensions are automatically scaled to the paper size, which may lead to unexpected behavior. See [Automatic scaling to paper size], pagina 506.

\paper variables for widths and margins

Default values (before scaling) that are not listed here are defined in '`ly/paper-defaults-init.ly`'.

`paper-width`
: The width of the page, unset by default. While `paper-width` has no effect on the automatic scaling of some horizontal dimensions, it does influence the `line-width` variable. If both `paper-width` and `line-width` are set, then `left-margin` and `right-margin` will also be updated. Also see `check-consistency`.

`line-width`
: The horizontal extent of the staff lines in unindented, non-ragged systems, equal to `(paper-width - left-margin - right-margin)` when unset. If `line-width` is set, and both `left-margin` and `right-margin` are unset, then the margins will be updated to center the systems on the page automatically. Also see `check-consistency`. This variable can also be set in a `\layout` block.

`left-margin`
: The margin between the left edge of the page and the start of the staff lines in unindented systems. If the paper size is modified, this dimension's default value is scaled accordingly. If `left-margin` is unset, and both `line-width` and `right-margin` are set, then `left-margin` is set to `(paper-width - line-width - right-margin)`. If only `line-width` is set, then both margins are set to `((paper-width - line-width) / 2)`, and the systems are consequently centered on the page. Also see `check-consistency`.

`right-margin`
: The margin between the right edge of the page and the end of the staff lines in non-ragged systems. If the paper size is modified, this dimension's default value is scaled accordingly. If `right-margin` is unset, and both `line-width` and `left-margin` are set, then `right-margin` is set to `(paper-width - line-width - left-margin)`. If only `line-width` is set, then both margins are set to `((paper-width - line-width) / 2)`, and the systems are consequently centered on the page. Also see `check-consistency`.

`check-consistency`
: If set to true, print a warning if `left-margin`, `line-width`, and `right-margin` do not exactly add up to `paper-width`, and replace each of these (except `paper-width`) with its default value (scaled to the paper size if necessary). If set to false, ignore any inconsistencies and allow systems to run off the edge of the page.

`ragged-right`
: If set to true, systems will not fill the line width. Instead, systems end at their natural horizontal length. Default: `#t` for scores with only one system, and `#f` for scores with two or more systems. This variable can also be set in a `\layout` block.

`ragged-last`
: If set to true, the last system in the score will not fill the line width. Instead the last system ends at its natural horizontal length. Default: `#f`. This variable can also be set in a `\layout` block.

Vedi anche

Notation Reference: [Automatic scaling to paper size], pagina 506.

Installed Files: '`ly/paper-defaults-init.ly`'.

Problemi noti e avvertimenti

Explicitly defined paper-sizes will override any user-defined left or right margin settings.

`\paper` variables for two-sided mode

Default values (before scaling) are defined in '`ly/paper-defaults-init.ly`'.

`two-sided`
: If set to true, use `inner-margin`, `outer-margin` and `binding-offset` to determine margins depending on whether the page number is odd or even. This overrides `left-margin` and `right-margin`.

`inner-margin`
: The margin all pages have at the inner side if they are part of a book. If the paper size is modified, this dimension's default value is scaled accordingly. Works only with `two-sided` set to true.

`outer-margin`
: The margin all pages have at the outer side if they are part of a book. If the paper size is modified, this dimension's default value is scaled accordingly. Works only with `two-sided` set to true.

`binding-offset`
: The amount `inner-margin` is increased to make sure nothing will be hidden by the binding. If the paper size is modified, this dimension's default value is scaled accordingly. Works only with `two-sided` set to true.

Vedi anche

Notation Reference: [Automatic scaling to paper size], pagina 506.

Installed Files: '`ly/paper-defaults-init.ly`'.

\paper variables for shifts and indents

Default values (before scaling) that are not listed here are defined in '`ly/paper-defaults-init.ly`'.

`horizontal-shift`
: The amount that all systems (including titles and system separators) are shifted to the right. Default: `0.0\mm`.

`indent`
: The level of indentation for the first system in a score. If the paper size is modified, this dimension's default value is scaled accordingly. This variable can also be set in a `\layout` block.

`short-indent`
: The level of indentation for all systems in a score besides the first system. If the paper size is modified, this dimension's default value is scaled accordingly. This variable can also be set in a `\layout` block.

Vedi anche

Notation Reference: [Automatic scaling to paper size], pagina 506.

Installed Files: '`ly/paper-defaults-init.ly`'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.1.6 Other \paper variables

\paper variables for line breaking

`max-systems-per-page`
: The maximum number of systems that will be placed on a page. This is currently supported only by the `ly:optimal-breaking` algorithm. Default: unset.

`min-systems-per-page`
: The minimum number of systems that will be placed on a page. This may cause pages to be overfilled if it is made too large. This is currently supported only by the `ly:optimal-breaking` algorithm. Default: unset.

`systems-per-page`
: The number of systems that should be placed on each page. This is currently supported only by the `ly:optimal-breaking` algorithm. Default: unset.

`system-count`
: The number of systems to be used for a score. Default: unset. This variable can also be set in a `\layout` block.

Vedi anche

Notation Reference: Sezione 4.3.1 [Line breaking], pagina 517.

\paper variables for page breaking

Default values not listed here are defined in 'ly/paper-defaults-init.ly'

page-breaking
: The page-breaking algorithm to use. Choices are ly:minimal-breaking, ly:page-turn-breaking, ly:one-line-breaking and ly:optimal-breaking (the default).

page-breaking-system-system-spacing
: Tricks the page breaker into thinking that system-system-spacing is set to something different than it really is. For example, if page-breaking-system-system-spacing #'padding is set to something substantially larger than system-system-spacing #'padding, then the page-breaker will put fewer systems on each page. Default: unset.

page-count
: The number of pages to be used for a score, unset by default.

The following variables are effective only when page-breaking is set to ly:page-turn-breaking. Page breaks are then chosen to minimize the number of page turns. Since page turns are required on moving from an odd-numbered page to an even-numbered one, a layout in which the last page is odd-numbered will usually be favoured. Places where page turns are preferred can be indicated manually by inserting \allowPageTurn or automatically by including the Page_turn_engraver (see Sezione 4.3.4 [Optimal page turning], pagina 520).

If there are insufficient choices available for making suitable page turns, LilyPond may insert a blank page either within a score, between scores (if there are two or more scores), or by ending a score on an even-numbered page. The values of the following three variables may be increased to make these actions less likely.

The values are penalties, i.e. the higher the value the less likely will be the associated action relative to other choices.

blank-page-penalty
: The penalty for having a blank page in the middle of a score. If blank-page-penalty is large and ly:page-turn-breaking is selected, then LilyPond will be less likely to insert a page in the middle of a score. Instead, it will space out the music further to fill the blank page and the following one. Default: 5.

blank-last-page-penalty
: The penalty for ending the score on an even-numbered page. If blank-last-page-penalty is large and ly:page-turn-breaking is selected, then LilyPond will be less likely to produce a score in which the last page is even-numbered. Instead, it will adjust the spacing in order to use one page more or one page less. Default: 0.

blank-after-score-page-penalty
: The penalty for having a blank page after the end of one score and before the next. By default, this is smaller than blank-page-penalty, so that blank pages after scores are inserted in preference to blank pages within a score. Default: 2.

Vedi anche

Notation Reference: Sezione 4.3.2 [Page breaking], pagina 519, Sezione 4.3.3 [Optimal page breaking], pagina 520, Sezione 4.3.4 [Optimal page turning], pagina 520, Sezione 4.3.5 [Minimal page breaking], pagina 521, Sezione 4.3.6 [One-line page breaking], pagina 521.

Installed Files: 'ly/paper-defaults-init.ly'.

\paper variables for page numbering

Default values not listed here are defined in 'ly/paper-defaults-init.ly'

auto-first-page-number
: The page breaking algorithm is affected by the first page number being odd or even. If set to true, the page breaking algorithm will decide whether to start with an odd or even number. This will result in the first page number remaining as is or being increased by one. Default: #f.

first-page-number
: The value of the page number on the first page.

print-first-page-number
: If set to true, a page number is printed on the first page.

print-page-number
: If set to false, page numbers are not printed.

Vedi anche

Installed Files: 'ly/paper-defaults-init.ly'.

Problemi noti e avvertimenti

Odd page numbers are always on the right. If you want the music to start on page 1 there must be a blank page on the back of the cover page so that page 1 is on the right hand side.

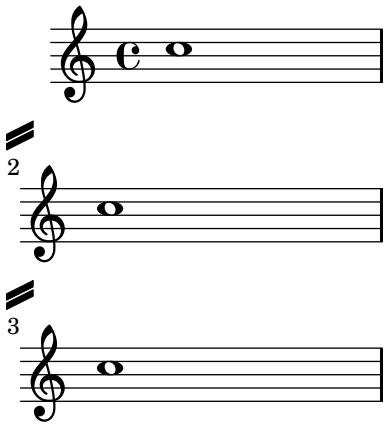
Miscellaneous \paper variables

page-spacing-weight
: The relative importance of page (vertical) spacing and line (horizontal) spacing. High values will make page spacing more important. Default: 10.

print-all-headers
: If set to true, this will print all headers for each \score in the output. Normally only the piece and opus header variables are printed. Default: #f.

system-separator-markup
: A markup object that is inserted between systems, often used for orchestral scores. Default: unset. The \slashSeparator markup, defined in 'ly/titling-init.ly', is provided as a sensible default, for example:

```
#(set-default-paper-size "a8")

\book {
  \paper {
    system-separator-markup = \slashSeparator
  }
  \header {
    tagline = ##f
  }
  \score {
    \relative c'' { c1 \break c1 \break c1 }
  }
}
```



Vedi anche

Installed Files: '`ly/titling-init.ly`'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Problemi noti e avvertimenti

The default page header puts the page number and the `instrument` field from the `\header` block on a line.

4.2 Score layout

This section discusses score layout options for the `\layout` block.

4.2.1 The `\layout` block

While the `\paper` block contains settings that relate to the page formatting of the whole document, the `\layout` block contains settings for score-specific layout. To set score layout options globally, enter them in a toplevel `\layout` block. To set layout options for an individual score, enter them in a `\layout` block inside the `\score` block, after the music. Settings that can appear in a `\layout` block include:

- the `layout-set-staff-size` scheme function,
- context modifications in `\context` blocks, and
- `\paper` variables that affect score layout.

The `layout-set-staff-size` function is discussed in the next section, Sezione 4.2.2 [Setting the staff size], pagina 516. Context modifications are discussed in a separate chapter; see Sezione 5.1.4 [Modifying context plug-ins], pagina 562 and Sezione 5.1.5 [Changing context default settings], pagina 564. The `\paper` variables that can appear in a `\layout` block are:

- `line-width`, `ragged-right` and `ragged-last` (see [\paper variables for widths and margins], pagina 509)
- `indent` and `short-indent` (see [\paper variables for shifts and indents], pagina 511)
- `system-count` (see [\paper variables for line breaking], pagina 511)

Here is an example `\layout` block:

```
\layout {
  indent = 2\cm
  \context {
    \StaffGroup
    \override StaffGrouper.staff-staff-spacing.basic-distance = #8
  }
  \context {
    \Voice
```

```
    \override TextScript.padding = #1
    \override Glissando.thickness = #3
  }
}
```

Multiple `\layout` blocks can be entered as toplevel expressions. This can, for example, be useful if different settings are stored in separate files and included optionally. Internally, when a `\layout` block is evaluated, a copy of the current `\layout` configuration is made, then any changes defined within the block are applied and the result is saved as the new current configuration. From the user's perspective the `\layout` blocks are combined, but in conflicting situations (when the same property is changed in different blocks) the later definitions take precedence.

For example, if this block:

```
\layout {
  \context {
    \Voice
    \override TextScript.color = #magenta
    \override Glissando.thickness = #1.5
  }
}
```

is placed after the one from the preceding example the `'padding` and `'color` overrides for `TextScript` are combined, but the later `'thickness` override for `Glissando` replaces (or hides) the earlier one.

`\layout` blocks may be assigned to variables for reuse later, but the way this works is slightly but significantly different from writing them literally.

If a variable is defined like this:

```
layoutVariable = \layout {
  \context {
    \Voice
    \override NoteHead.font-size = #4
  }
}
```

it will hold the current `\layout` configuration with the `NoteHead.font-size` override added, but this combination is *not* saved as the new current configuration. Be aware that the 'current configuration' is read when the variable is defined and not when it is used, so the content of the variable is dependent on its position in the source.

The variable can then be used inside another `\layout` block, for example:

```
\layout {
  \layoutVariable
  \context {
    \Voice
    \override NoteHead.color = #red
  }
}
```

A `\layout` block containing a variable, as in the example above, does *not* copy the current configuration but instead uses the content of `\layoutVariable` as the base configuration for the further additions. This means that any changes defined between the definition and the use of the variable are lost.

If `layoutVariable` is defined (or `\included`) immediately before being used, its content is just the current configuration plus the overrides defined within it. So in the example above showing the use of `\layoutVariable` the final `\layout` block would consist of:

```
TextScript.padding = #1
TextScript.color = #magenta
Glissando.thickness = #1.5
NoteHead.font-size = #4
NoteHead.color = #red
```

plus the `indent` and the `StaffGrouper` overrides.

But if the variable had already been defined before the first `\layout` block the current configuration would now contain only

```
NoteHead.font-size = #4 % (written in the variable definition)
NoteHead.color = #red % (added after the use of the variable)
```

If carefully planned, `\layout` variables can be a valuable tool to structure the layout design of sources, and also to reset the `\layout` configuration to a known state.

Vedi anche

Notation Reference: Sezione 5.1.5 [Changing context default settings], pagina 564.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.2.2 Setting the staff size

The default **staff size** is set to 20 points. This may be changed in two ways:

To set the staff size globally for all scores in a file (or in a `book` block, to be precise), use `set-global-staff-size`.

```
#(set-global-staff-size 14)
```

This sets the global default size to 14pt staff height and scales all fonts accordingly.

To set the staff size individually for each score, use

```
\score{
  ...
  \layout {
    #(layout-set-staff-size 15)
  }
}
```

The Feta font provides musical symbols at eight different sizes. Each font is tuned for a different staff size: at a smaller size the font becomes heavier, to match the relatively heavier staff lines. The recommended font sizes are listed in the following table:

font name	staff height (pt)	staff height (mm)	use
feta11	11.22	3.9	pocket scores
feta13	12.60	4.4	
feta14	14.14	5.0	
feta16	15.87	5.6	
feta18	17.82	6.3	song books
feta20	20	7.0	standard parts
feta23	22.45	7.9	
feta26	25.2	8.9	

These fonts are available in any sizes. The context property `fontSize` and the layout property `staff-space` (in Sezione "StaffSymbol" in *Guida al Funzionamento Interno*) can be used to tune the size for individual staves. The sizes of individual staves are relative to the global size.

Vedi anche

Notation Reference: [Selecting notation font size], pagina 209.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Problemi noti e avvertimenti

`layout-set-staff-size` does not change the distance between the staff lines.

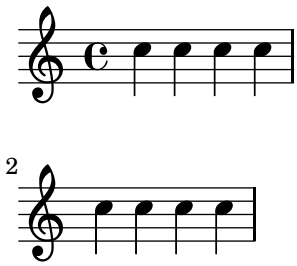
4.3 Breaks

4.3.1 Line breaking

Line breaks are normally determined automatically. They are chosen so that lines look neither cramped nor loose, and consecutive lines have similar density.

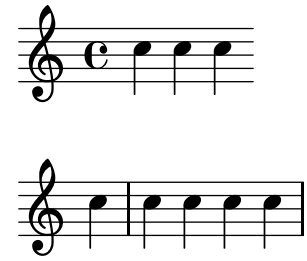
To manually force a line break at a bar line, use the `\break` command:

```
c4 c c c | \break
c4 c c c |
```



By default, a `\break` in the middle of a measure is ignored, and a warning is printed. To force a line break in the middle of a measure, add an invisible bar line with '`\bar ""`':

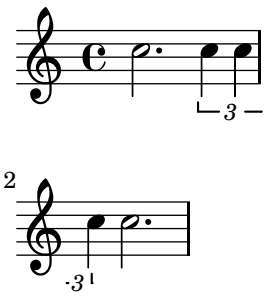
```
c4 c c
\bar "" \break
c |
c4 c c c |
```



A `\break` occurring at a bar line is also ignored if the previous measure ends in the middle of a note, such as when a tuplet begins and ends in different measures. To allow `\break` commands to work in these situations, remove the `Forbid_line_break_engraver` from the `Voice` context. Note that manually forced line breaks have to be added in parallel with the music:

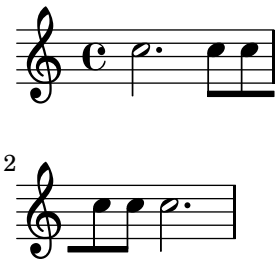
```
\new Voice \with {
  \remove "Forbid_line_break_engraver"
} \relative c'' {
  <<
    { c2. \tuplet 3/2 { c4 c c } c2. | }
    { s1 | \break s1 | }
```

```
  >>
}
```



Similarly, line breaks are normally forbidden when beams cross bar lines. This behavior can be changed by setting `\override Beam.breakable = ##t`:

```
\override Beam.breakable = ##t
c2. c8[ c | \break
c8 c] c2. |
```



The `\noBreak` command forbids a line break at the bar line where it is inserted.

The most basic settings influencing line spacing are `indent` and `line-width`. They are set in the `\layout` block. They control the indentation of the first line of music, and the lengths of the lines.

If `ragged-right` is set to true in the `\layout` block, then systems end at their natural horizontal length, instead of being spread horizontally to fill the whole line. This is useful for short fragments, and for checking how tight the natural spacing is.

The option `ragged-last` is similar to `ragged-right`, but affects only the last line of the piece.

```
\layout {
  indent = 0\mm
  line-width = 150\mm
  ragged-last = ##t
}
```

For line breaks at regular intervals use `\break` separated by skips and repeated with `\repeat`. For example, this would cause the following 28 measures (assuming 4/4 time) to be broken every 4 measures, and only there:

```
<<
  \repeat unfold 7 {
    s1 \noBreak s1 \noBreak
    s1 \noBreak s1 \break
  }
  { the actual music... }
>>
```

Comandi predefiniti

\break, \noBreak.

Vedi anche

Notation Reference: [\paper variables for line breaking], pagina 511.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Internals Reference: Sezione "LineBreakEvent" in *Guida al Funzionamento Interno*.

4.3.2 Page breaking

The default page breaking may be overridden by inserting \pageBreak or \noPageBreak commands. These commands are analogous to \break and \noBreak. They should be inserted at a bar line. These commands force and forbid a page-break from happening. Of course, the \pageBreak command also forces a line break.

The \pageBreak and \noPageBreak commands may also be inserted at top-level, between scores and top-level markups.

There are also analogous settings to ragged-right and ragged-last which have the same effect on vertical spacing: ragged-bottom and ragged-last-bottom. If set to #t the systems on all pages or just the last page respectively will not be justified vertically. See Sezione 4.1.3 [Fixed vertical spacing \paper variables], pagina 506.

Page breaks are computed by the page-breaking function. LilyPond provides three algorithms for computing page breaks, ly:optimal-breaking, ly:page-turn-breaking and ly:minimal-breaking. The default is ly:optimal-breaking, but the value can be changed in the \paper block:

```
\paper {
  page-breaking = #ly:page-turn-breaking
}
```

When a book has many scores and pages, the page breaking problem may be difficult to solve, requiring large processing time and memory. To ease the page breaking process, \bookpart blocks are used to divide the book into several parts: the page breaking occurs separately on each part. Different page breaking functions may also be used in different book parts.

```
\bookpart {
  \header {
    subtitle = "Preface"
  }
  \paper {
     %% In a part consisting mostly of text,
     %% ly:minimal-breaking may be preferred
     page-breaking = #ly:minimal-breaking
  }
  \markup { ... }
  ...
}
\bookpart {
  %% In this part, consisting of music, the default optimal
  %% page breaking function is used.
  \header {
    subtitle = "First movement"
  }
  \score { ... }
```

```
  ...
}
```

Comandi predefiniti

`\pageBreak`, `\noPageBreak`.

Vedi anche

Notation Reference: [\paper variables for page breaking], pagina 512.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.3.3 Optimal page breaking

The `ly:optimal-breaking` function is LilyPond's default method of determining page breaks. It attempts to find a page breaking that minimizes cramping and stretching, both horizontally and vertically. Unlike `ly:page-turn-breaking`, it has no concept of page turns.

Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.3.4 Optimal page turning

Often it is necessary to find a page breaking configuration so that there is a rest at the end of every second page. This way, the musician can turn the page without having to miss notes. The `ly:page-turn-breaking` function attempts to find a page breaking minimizing cramping and stretching, but with the additional restriction that it is only allowed to introduce page turns in specified places.

There are two steps to using this page breaking function. First, you must enable it in the `\paper` block, as explained in Sezione 4.3.2 [Page breaking], pagina 519. Then you must tell the function where you would like to allow page breaks.

There are two ways to achieve the second step. First, you can specify each potential page turn manually, by inserting `\allowPageTurn` into your input file at the appropriate places.

If this is too tedious, you can add a `Page_turn_engraver` to a Staff or Voice context. The `Page_turn_engraver` will scan the context for sections without notes (note that it does not scan for rests; it scans for the absence of notes. This is so that single-staff polyphony with rests in one of the parts does not throw off the `Page_turn_engraver`). When it finds a sufficiently long section without notes, the `Page_turn_engraver` will insert an `\allowPageTurn` at the final bar line in that section, unless there is a 'special' bar line (such as a double bar), in which case the `\allowPageTurn` will be inserted at the final 'special' bar line in the section.

The `Page_turn_engraver` reads the context property `minimumPageTurnLength` to determine how long a note-free section must be before a page turn is considered. The default value for `minimumPageTurnLength` is `(ly:make-moment 1/1)`. If you want to disable page turns, you can set it to something very large.

```
\new Staff \with { \consists "Page_turn_engraver" }
{
  a4 b c d |
  R1 | % a page turn will be allowed here
  a4 b c d |
  \set Staff.minimumPageTurnLength = #(ly:make-moment 5/2)
  R1 | % a page turn will not be allowed here
  a4 b r2 |
  R1*2 | % a page turn will be allowed here
  a1
```

```
}
```

The `Page_turn_engraver` detects volta repeats. It will only allow a page turn during the repeat if there is enough time at the beginning and end of the repeat to turn the page back. The `Page_turn_engraver` can also disable page turns if the repeat is very short. If you set the context property `minimumRepeatLengthForPageTurn` then the `Page_turn_engraver` will only allow turns in repeats whose duration is longer than this value.

The page turning commands, `\pageTurn`, `\noPageTurn` and `\allowPageTurn`, may also be used at top-level, between scores and top-level markups.

Comandi predefiniti

`\pageTurn`, `\noPageTurn`, `\allowPageTurn`.

Vedi anche

Notation Reference: [\paper variables for line breaking], pagina 511.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Problemi noti e avvertimenti

There should only be one `Page_turn_engraver` in a score. If there is more than one, they will interfere with each other.

4.3.5 Minimal page breaking

The `ly:minimal-breaking` function performs minimal computations to calculate the page breaking: it fills a page with as many systems as possible before moving to the next one. Thus, it may be preferred for scores with many pages, where the other page breaking functions could be too slow or memory demanding, or a lot of texts. It is enabled using:

```
\paper {
  page-breaking = #ly:minimal-breaking
}
```

Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.3.6 One-line page breaking

The `ly:one-line-breaking` function is a special-purpose page breaking algorithm that puts each score on its own page, and on a single line. This page breaking function does not typeset titles or margins; only the score will be displayed.

The page width will be adjusted so that the longest score fits on one line. In particular, `paper-width`, `line-width` and `indent` variables in the `\paper` block will be ignored, although `left-margin` and `right-margin` will still be honored. The height of the page will be left unmodified.

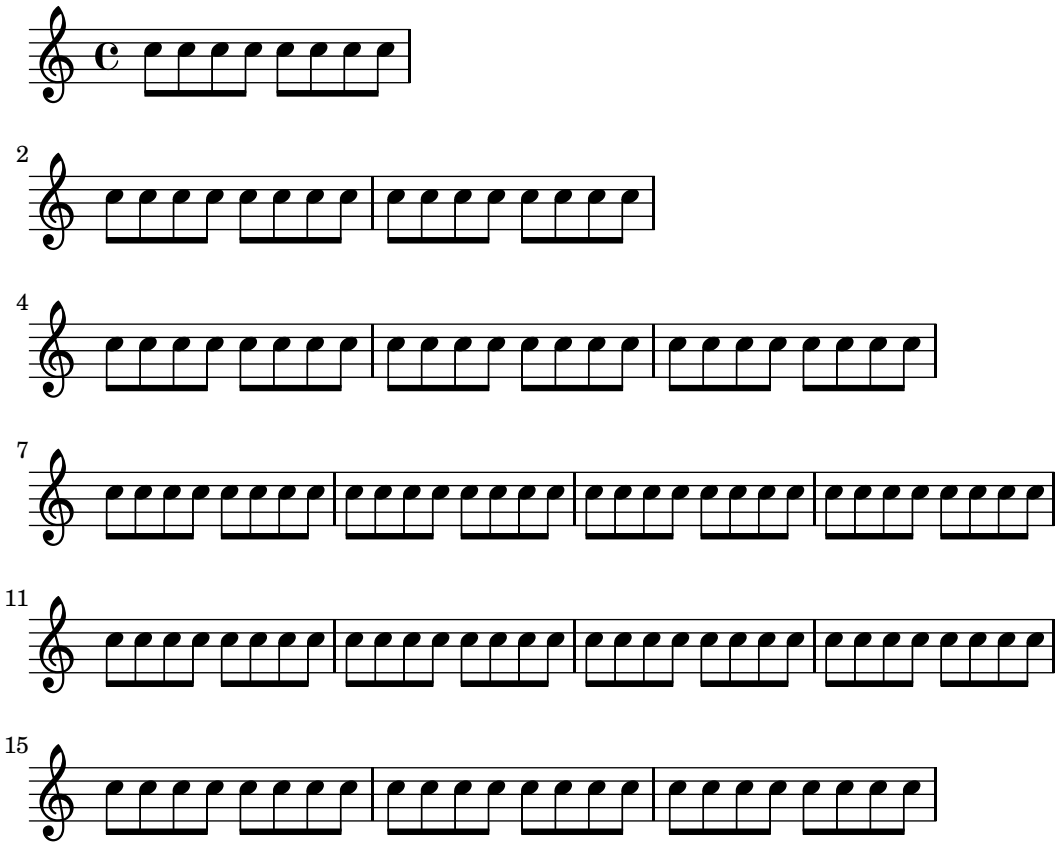
4.3.7 Explicit breaks

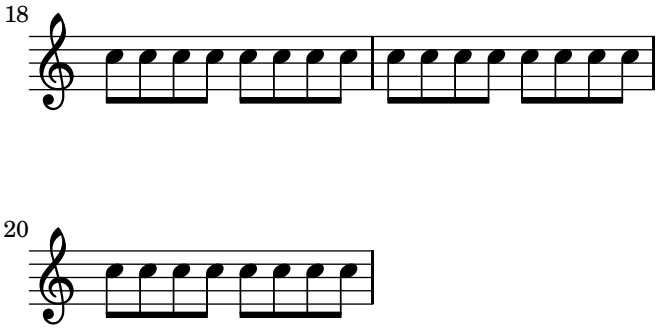
Lily sometimes rejects explicit `\break` and `\pageBreak` commands. There are two commands to override this behavior:

```
\override NonMusicalPaperColumn.line-break-permission = ##f
\override NonMusicalPaperColumn.page-break-permission = ##f
```

When `line-break-permission` is overridden to false, Lily will insert line breaks at explicit `\break` commands and nowhere else. When `page-break-permission` is overridden to false, Lily will insert page breaks at explicit `\pageBreak` commands and nowhere else.

```
\paper {
  indent = #0
  ragged-right = ##t
  ragged-bottom = ##t
}

music = \relative c'' { c8 c c c }

\score {
  \new Staff {
    \repeat unfold 2 { \music } \break
    \repeat unfold 4 { \music } \break
    \repeat unfold 6 { \music } \break
    \repeat unfold 8 { \music } \pageBreak
    \repeat unfold 8 { \music } \break
    \repeat unfold 6 { \music } \break
    \repeat unfold 4 { \music } \break
    \repeat unfold 2 { \music }
  }
  \layout {
    \context {
      \Score
      \override NonMusicalPaperColumn.line-break-permission = ##f
      \override NonMusicalPaperColumn.page-break-permission = ##f
    }
  }
}
```





Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

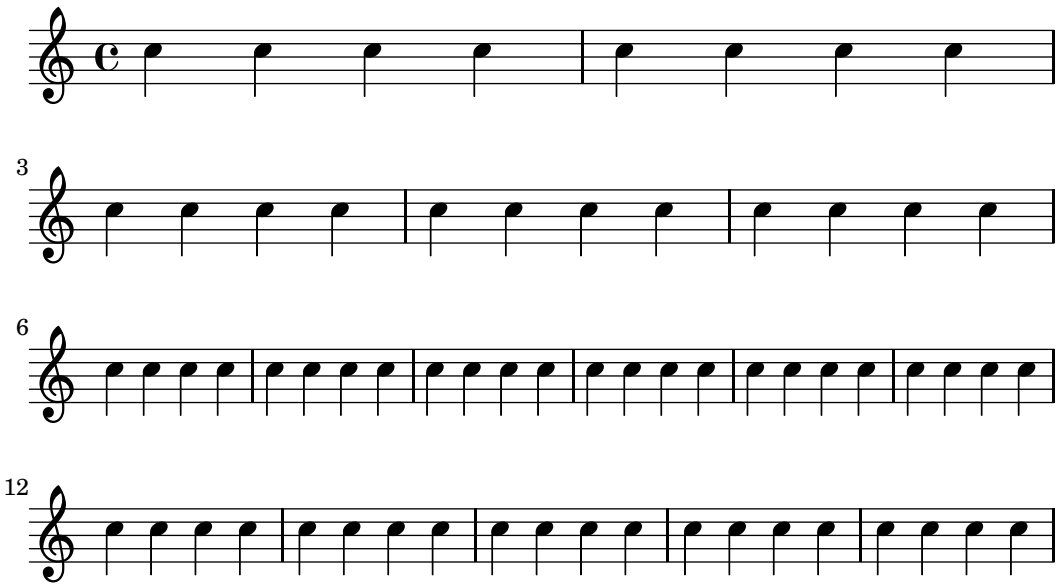
4.3.8 Using an extra voice for breaks

Line- and page-breaking information usually appears within note entry directly.

```
music = \relative c'' { c4 c c c }

\score {
  \new Staff {
    \repeat unfold 2 { \music } \break
    \repeat unfold 3 { \music }
  }
}
```

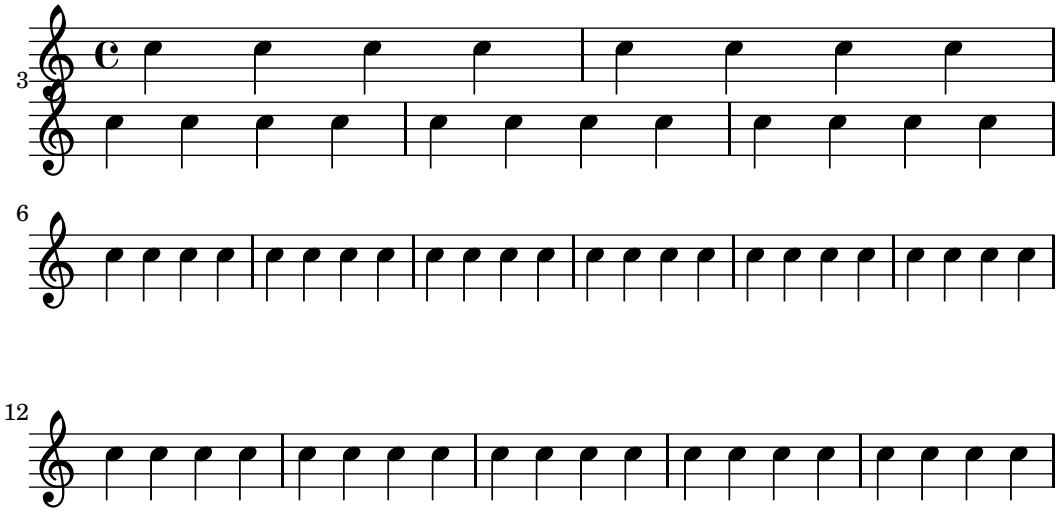
This makes `\break` and `\pageBreak` commands easy to enter but mixes music entry with information that specifies how music should lay out on the page. You can keep music entry and line- and page-breaking information in two separate places by introducing an extra voice to contain the breaks. This extra voice contains only skips together with `\break`, `pageBreak` and other breaking layout information.

```
music = \relative c'' { c4 c c c }

\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    \new Staff <<
      \new Voice {
        s1 * 2 \break
        s1 * 3 \break
        s1 * 6 \break
        s1 * 5 \break
      }
      \new Voice {
        \repeat unfold 2 { \music }
        \repeat unfold 3 { \music }
        \repeat unfold 6 { \music }
        \repeat unfold 5 { \music }
      }
    >>
  }
}
```



This pattern becomes especially helpful when overriding `line-break-system-details` and the other useful but long properties of `NonMusicalPaperColumnGrob`, as explained in Sezione 4.4 [Vertical spacing], pagina 525.

```
music = \relative c'' { c4 c c c }

\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    \new Staff <<
      \new Voice {
        \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
          #'((Y-offset . 0))
        s1 * 2 \break

        \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
          #'((Y-offset . 5))
        s1 * 3 \break

        \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
          #'((Y-offset . 15))
        s1 * 6 \break

        \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
          #'((Y-offset . 30))
        s1 * 5 \break
      }
      \new Voice {
        \repeat unfold 2 { \music }
        \repeat unfold 3 { \music }
        \repeat unfold 6 { \music }
        \repeat unfold 5 { \music }
      }
    >>
  }
}
```



Vedi anche

Notation Reference: Sezione 4.4 [Vertical spacing], pagina 525.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.4 Vertical spacing

Vertical spacing is controlled by three things: the amount of space available (i.e., paper size and margins), the amount of space between systems, and the amount of space between staves inside a system.

4.4.1 Flexible vertical spacing within systems

Three separate mechanisms control the flexible vertical spacing within systems, one for each of the following categories:

- *ungrouped staves*,
- *grouped staves* (staves within a staff-group such as `ChoirStaff`, etc.), and
- *non-staff lines* (such as `Lyrics`, `ChordNames`, etc.).

The height of each system is determined in two steps. First, all of the staves are spaced according to the amount of space available. Then, the non-staff lines are distributed between the staves.

Note that the spacing mechanisms discussed in this section only control the vertical spacing of staves and non-staff lines within individual systems. The vertical spacing between separate systems, scores, markups, and margins is controlled by `\paper` variables, which are discussed in Sezione 4.1.4 [Flexible vertical spacing \paper variables], pagina 507.

Within-system spacing properties

The within-system vertical spacing mechanisms are controlled by two sets of grob properties. The first set is associated with the `VerticalAxisGroup` grob, which is created by all staves and non-staff lines. The second set is associated with the `StaffGrouper` grob, which can be created by staff-groups, but only if explicitly called. These properties are described individually at the end of this section.

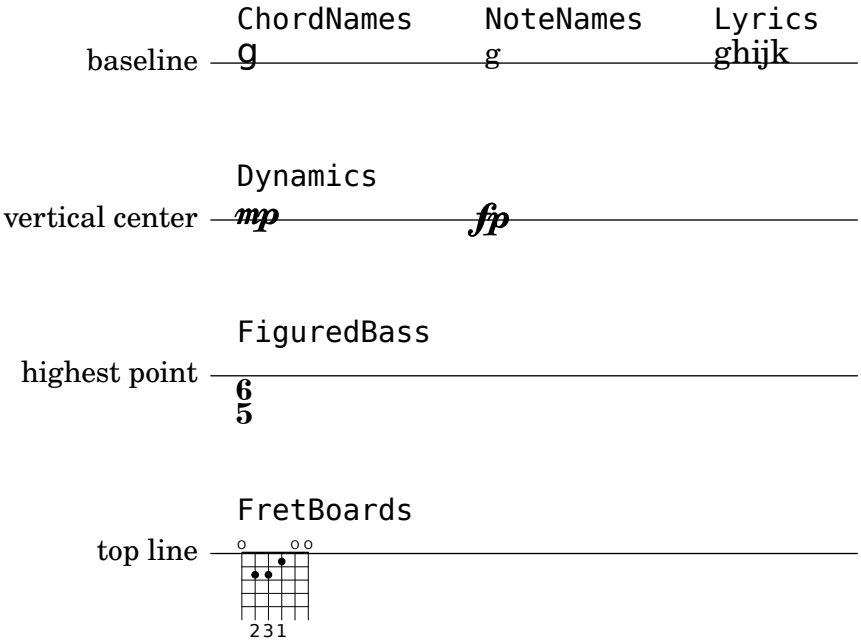
The names of these properties (except for `staff-affinity`) follow the format *`item1`*`-`*`item2`*`-spacing`, where *`item1`* and *`item2`* are the items to be spaced. Note that *`item2`* is not necessarily below *`item1`*; for example, `nonstaff-relatedstaff-spacing` will measure upwards from the non-staff line if `staff-affinity` is `UP`.

Each distance is measured between the *reference points* of the two items. The reference point for a staff is the vertical center of its `StaffSymbol` (i.e. the middle line if `line-count` is odd;

the middle space if `line-count` is even). The reference points for individual non-staff lines are given in the following table:

Non-staff line	Reference point
`ChordNames`	baseline
`NoteNames`	baseline
`Lyrics`	baseline
`Dynamics`	vertical center
`FiguredBass`	highest point
`FretBoards`	top line

In the following image, horizontal lines indicate the positions of these reference points:



Each of the vertical spacing grob properties (except `staff-affinity`) uses the same alist structure as the `\paper` spacing variables discussed in Sezione 4.1.4 [Flexible vertical spacing \paper variables], pagina 507. Specific methods for modifying alists are discussed in Sezione 5.3.6 [Modifying alists], pagina 582. Grob properties should be adjusted with an `\override` inside a `\score` or `\layout` block, and not inside a `\paper` block.

The following example demonstrates the two ways these alists can be modified. The first declaration updates one key-value individually, and the second completely re-defines the property:

```
\new Staff \with {
  \override VerticalAxisGroup.default-staff-staff-spacing.basic-distance = #10
} { ... }

\new Staff \with {
  \override VerticalAxisGroup.default-staff-staff-spacing =
    #'((basic-distance . 10)
       (minimum-distance . 9)
       (padding . 1)
       (stretchability . 10))
} { ... }
```

To change any spacing settings globally, put them in the `\layout` block:

```
\layout {
  \context {
    \Staff
    \override VerticalAxisGroup.default-staff-staff-spacing.basic-distance = #10
  }
}
```

Standard settings for the vertical spacing grob properties are listed in Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno* and Sezione "StaffGrouper" in *Guida al Funzionamento Interno*. Default overrides for specific types of non-staff lines are listed in the relevant context descriptions in Sezione "Contexts" in *Guida al Funzionamento Interno*.

Properties of the `VerticalAxisGroup` grob

`VerticalAxisGroup` properties are typically adjusted with an `\override` at the `Staff` level (or equivalent).

`staff-staff-spacing`

Used to determine the distance between the current staff and the staff just below it in the same system, even if one or more non-staff lines (such as `Lyrics`) are placed between the two staves. Does not apply to the bottom staff of a system.

Initially, the `staff-staff-spacing` of a `VerticalAxisGroup` is a Scheme function that applies the properties of the `StaffGrouper` if the staff is part of a group, or the `default-staff-staff-spacing` of the staff otherwise. This allows staves to be spaced differently when they are grouped. For uniform spacing regardless of grouping, this function may be replaced by a flexible-spacing alist, using the complete-redefinition form of override shown above.

`default-staff-staff-spacing`

A flexible-spacing alist defining the `staff-staff-spacing` used for ungrouped staves, unless `staff-staff-spacing` has been explicitly set with an `\override`.

`staff-affinity`

The direction of the staff to use for spacing the current non-staff line. Choices are `UP`, `DOWN`, and `CENTER`. If `CENTER`, the non-staff line will be placed equidistant between the two nearest staves on either side, unless collisions or other spacing constraints prevent this. Adjacent non-staff lines should have non-increasing `staff-affinity` from top to bottom, e.g. a non-staff line set to `UP` should not immediately follow one that is set to `DOWN`. Non-staff lines at the top of a system should use `DOWN`; those at the bottom should use `UP`. Setting `staff-affinity` for a staff causes it to be treated as a non-staff line. Setting `staff-affinity` to `#f` causes a non-staff line to be treated as a staff. Setting `staff-affinity` to `UP`, `CENTER`, or `DOWN` causes a staff to be spaced as a non-staff line.

`nonstaff-relatedstaff-spacing`

The distance between the current non-staff line and the nearest staff in the direction of `staff-affinity`, if there are no non-staff lines between the two, and `staff-affinity` is either `UP` or `DOWN`. If `staff-affinity` is `CENTER`, then `nonstaff-relatedstaff-spacing` is used for the nearest staves on *both* sides, even if other non-staff lines appear between the current one and either of the staves. This means that the placement of a non-staff line depends on both the surrounding staves and the surrounding non-staff lines. Setting the `stretchability` of one of these types of spacing to a small value will make that spacing dominate. Setting the `stretchability` to a large value will make that spacing have little effect.

`nonstaff-nonstaff-spacing`
: The distance between the current non-staff line and the next non-staff line in the direction of `staff-affinity`, if both are on the same side of the related staff, and `staff-affinity` is either `UP` or `DOWN`.

`nonstaff-unrelatedstaff-spacing`
: The distance between the current non-staff line and the staff in the opposite direction from `staff-affinity`, if there are no other non-staff lines between the two, and `staff-affinity` is either `UP` or `DOWN`. This can be used, for example, to require a minimum amount of padding between a `Lyrics` line and the staff to which it does not belong.

Properties of the `StaffGrouper` grob

`StaffGrouper` properties are typically adjusted with an `\override` at the `StaffGroup` level (or equivalent).

`staff-staff-spacing`
: The distance between consecutive staves within the current staff-group. The `staff-staff-spacing` property of an individual staff's `VerticalAxisGroup` grob can be overriden with different spacing settings for that staff.

`staffgroup-staff-spacing`
: The distance between the last staff of the current staff-group and the staff just below it in the same system, even if one or more non-staff lines (such as `Lyrics`) exist between the two staves. Does not apply to the bottom staff of a system. The `staff-staff-spacing` property of an individual staff's `VerticalAxisGroup` grob can be overriden with different spacing settings for that staff.

Vedi anche

Notation Reference: Sezione 4.1.4 [Flexible vertical spacing \paper variables], pagina 507, Sezione 5.3.6 [Modifying alists], pagina 582.

Installed Files: '`ly/engraver-init.ly`', '`scm/define-grobs.scm`'.

Internals Reference: Sezione "Contexts" in *Guida al Funzionamento Interno*, Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno*, Sezione "StaffGrouper" in *Guida al Funzionamento Interno*.

Spacing of ungrouped staves

Staves (such as `Staff`, `DrumStaff`, `TabStaff`, etc.) are contexts that can contain one or more voice contexts, but cannot contain any other staves.

The following properties affect the spacing of *ungrouped* staves:

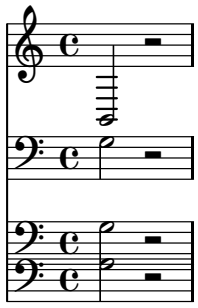
- `VerticalAxisGroup` properties:
  - `default-staff-staff-spacing`
  - `staff-staff-spacing`

These grob properties are described individually above; see [Within-system spacing properties], pagina 525.

Additional properties are involved for staves that are part of a staff-group; see [Spacing of grouped staves], pagina 529.

The following example shows how the `default-staff-staff-spacing` property can affect the spacing of ungrouped staves. The same overrides applied to `staff-staff-spacing` would have the same effect, but would also apply in cases where the staves are combined in a group or groups.

```
\layout {
  \context {
    \Staff
    \override VerticalAxisGroup.default-staff-staff-spacing =
      #'((basic-distance . 8)
         (minimum-distance . 7)
         (padding . 1))
  }
}

<<
  % The very low note here needs more room than 'basic-distance
  % can provide, so the distance between this staff and the next
  % is determined by 'padding.
  \new Staff { b,2 r | }

  % Here, 'basic-distance provides enough room, and there is no
  % need to compress the space (towards 'minimum-distance) to make
  % room for anything else on the page, so the distance between
  % this staff and the next is determined by 'basic-distance.
  \new Staff { \clef bass g2 r | }

  % By setting 'padding to a negative value, staves can be made to
  % collide.  The lowest acceptable value for 'basic-distance is 0.
  \new Staff \with {
    \override VerticalAxisGroup.default-staff-staff-spacing =
      #'((basic-distance . 3.5)
         (padding . -10))
  } { \clef bass g2 r | }
  \new Staff { \clef bass g2 r | }
>>
```



Vedi anche

Installed Files: ‘`scm/define-grobs.scm`’.

Snippets: Sezione “Spacing” in *Frammenti di codice*.

Internals Reference: Sezione “VerticalAxisGroup” in *Guida al Funzionamento Interno*.

Spacing of grouped staves

In orchestral and other large scores, it is common to place staves in groups. The space between groups is typically larger than the space between staves of the same group.

Staff-groups (such as `StaffGroup`, `ChoirStaff`, etc.) are contexts that can contain one or more staves simultaneously.

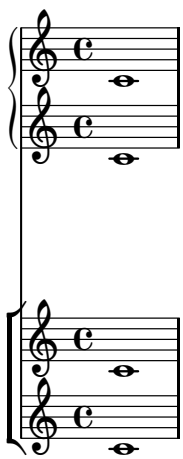
The following properties affect the spacing of staves inside staff-groups:

- `VerticalAxisGroup` properties:
  - `staff-staff-spacing`
- `StaffGrouper` properties:
  - `staff-staff-spacing`
  - `staffgroup-staff-spacing`

These grob properties are described individually above; see [Within-system spacing properties], pagina 525.

The following example shows how properties of the `StaffGrouper` grob can affect the spacing of grouped staves:

```
\layout {
  \context {
    \Score
    \override StaffGrouper.staff-staff-spacing.padding = #0
    \override StaffGrouper.staff-staff-spacing.basic-distance = #1
  }
}

<<
  \new PianoStaff \with {
    \override StaffGrouper.staffgroup-staff-spacing.basic-distance = #20
  } <<
    \new Staff { c'1 }
    \new Staff { c'1 }
  >>

  \new StaffGroup <<
    \new Staff { c'1 }
    \new Staff { c'1 }
  >>
>>
```



Vedi anche

Installed Files: 'scm/define-grobs.scm'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Internals Reference: Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno*, Sezione "StaffGrouper" in *Guida al Funzionamento Interno*.

Spacing of non-staff lines

Non-staff lines (such as `Lyrics`, `ChordNames`, etc.) are contexts whose layout objects are engraved like staves (i.e. in horizontal lines within systems). Specifically, non-staff lines are non-staff contexts that create the `VerticalAxisGroup` layout object.

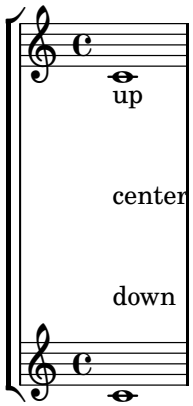
The following properties affect the spacing of non-staff lines:

- `VerticalAxisGroup` properties:
  - `staff-affinity`
  - `nonstaff-relatedstaff-spacing`
  - `nonstaff-nonstaff-spacing`
  - `nonstaff-unrelatedstaff-spacing`

These grob properties are described individually above; see [Within-system spacing properties], pagina 525.

The following example shows how the `nonstaff-nonstaff-spacing` property can affect the spacing of consecutive non-staff lines. Here, by setting the `stretchability` key to a very high value, the lyrics are able to stretch much more than usual:

```
\layout {
  \context {
    \Lyrics
    \override VerticalAxisGroup.nonstaff-nonstaff-spacing.stretchability = #1000
  }
}

\new StaffGroup
<<
  \new Staff \with {
    \override VerticalAxisGroup.staff-staff-spacing = #'((basic-distance . 30))
  } { c'1 }
  \new Lyrics \with {
    \override VerticalAxisGroup.staff-affinity = #UP
  } \lyricmode { up }
  \new Lyrics \with {
    \override VerticalAxisGroup.staff-affinity = #CENTER
  } \lyricmode { center }
  \new Lyrics \with {
    \override VerticalAxisGroup.staff-affinity = #DOWN
  } \lyricmode { down }
  \new Staff { c'1 }
>>
```



Vedi anche

Installed Files: 'ly/engraver-init.ly', 'scm/define-grobs.scm'.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Internals Reference: Sezione "Contexts" in *Guida al Funzionamento Interno*, Sezione "VerticalAxisGroup" in *Guida al Funzionamento Interno*.

4.4.2 Explicit staff and system positioning

One way to understand the flexible vertical spacing mechanisms explained above is as a collection of settings that control the amount of vertical padding between staves and systems.

It is possible to approach vertical spacing in a different way using `NonMusicalPaperColumn.line-break-system-details`. While the flexible vertical spacing mechanisms specify vertical padding, `NonMusicalPaperColumn.line-break-system-details` can specify exact vertical positions on the page.

`NonMusicalPaperColumn.line-break-system-details` accepts an associative list of three different settings:

- `X-offset`
- `Y-offset`
- `alignment-distances`

Grob overrides, including the overrides for `NonMusicalPaperColumn` below, can occur in any of three different places in an input file:

- in the middle of note entry directly
- in a `\context` block
- in the `\with` block

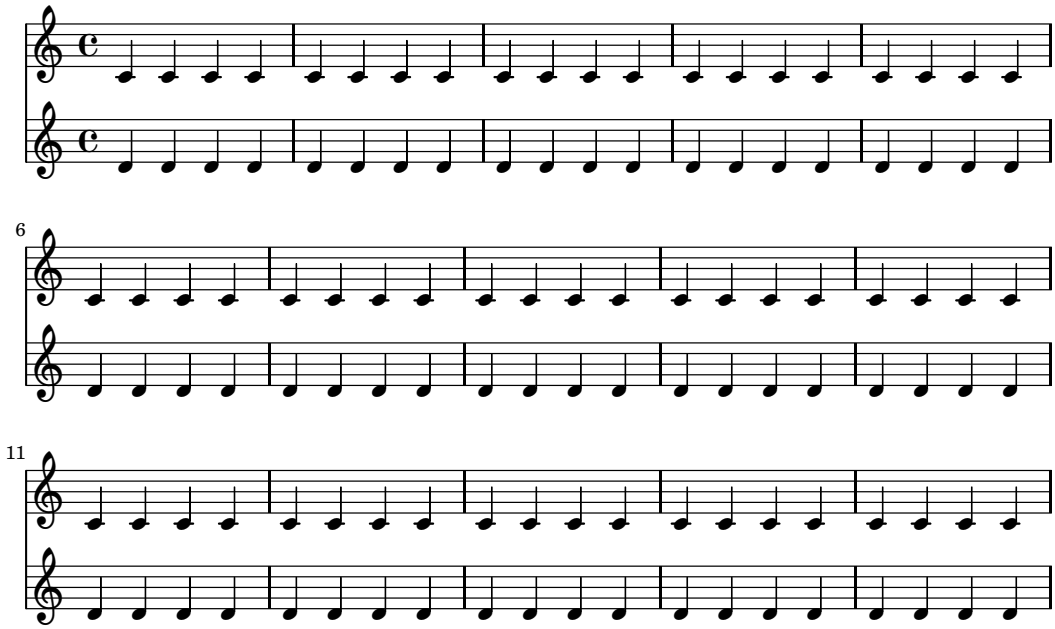
When we override `NonMusicalPaperColumn`, we use the usual `\override` command in `\context` blocks and in the `\with` block. On the other hand, when we override `NonMusicalPaperColumn` in the middle of note entry, use the special `\overrideProperty` command. Here are some example `NonMusicalPaperColumn` overrides with the special `\overrideProperty` command:

```
\overrideProperty NonMusicalPaperColumn.line-break-system-details
  #'((X-offset . 20))

\overrideProperty NonMusicalPaperColumn.line-break-system-details
  #'((Y-offset . 40))

\overrideProperty NonMusicalPaperColumn.line-break-system-details
  #'((X-offset . 20)
     (Y-offset . 40))
```

```
\overrideProperty NonMusicalPaperColumn.line-break-system-details
  #'((alignment-distances . (15)))

\overrideProperty NonMusicalPaperColumn.line-break-system-details
  #'((X-offset . 20)
     (Y-offset . 40)
     (alignment-distances . (15)))
```

To understand how each of these different settings work, we begin by looking at an example that includes no overrides at all.

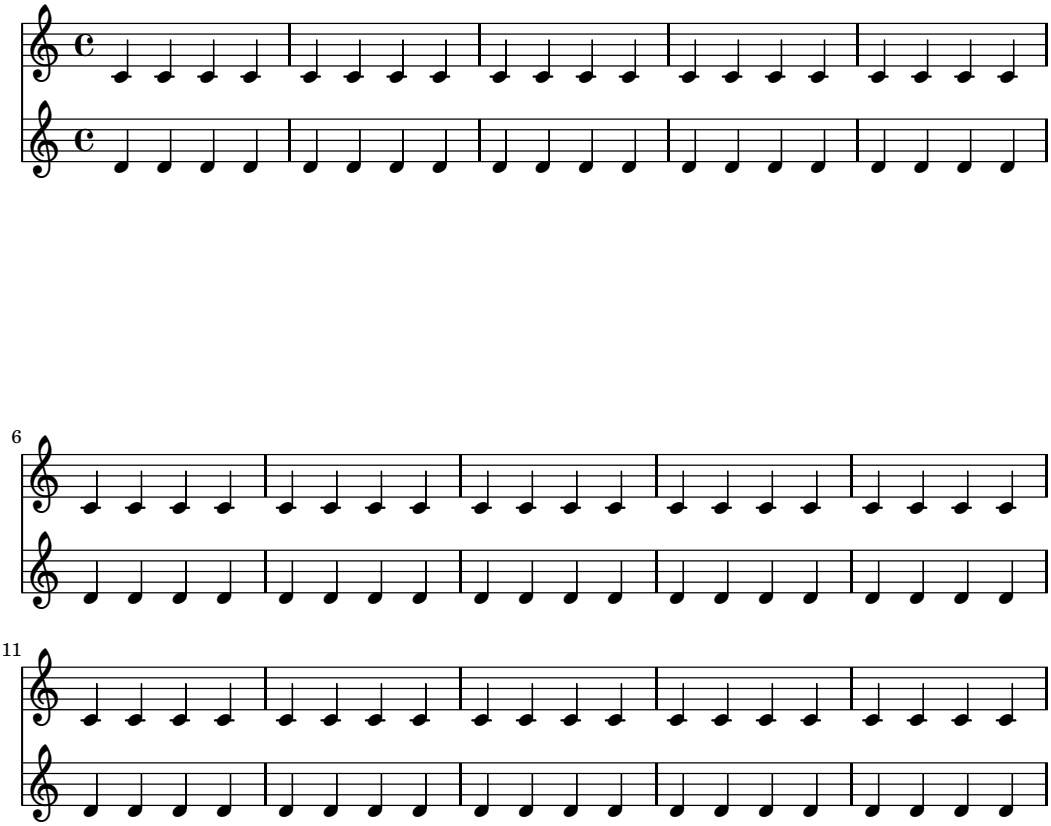
```
\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    <<
      \new Staff <<
        \new Voice {
          s1*5 \break
          s1*5 \break
          s1*5 \break
        }
        \new Voice { \repeat unfold 15 { c'4 c' c' c' } }
      >>
      \new Staff {
        \repeat unfold 15 { d'4 d' d' d' }
      }
    >>
  }
}
```



This score isolates line- and page-breaking information in a dedicated voice. This technique of creating a breaks voice will help keep layout separate from music entry as our example becomes more complicated. See Sezione 4.3.8 [Using an extra voice for breaks], pagina 523.

Explicit `\breaks` evenly divide the music into six measures per line. Vertical spacing results from LilyPond's defaults. To set the vertical startpoint of each system explicitly, we can set the `Y-offset` pair in the `line-break-system-details` attribute of the `NonMusicalPaperColumn` grob:

```
\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    <<
      \new Staff <<
        \new Voice {
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 0))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 40))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 60))
          s1*5 \break
        }
        \new Voice { \repeat unfold 15 { c'4 c' c' c' } }
      >>
      \new Staff {
        \repeat unfold 15 { d'4 d' d' d' }
      }
    >>
  }
}
```

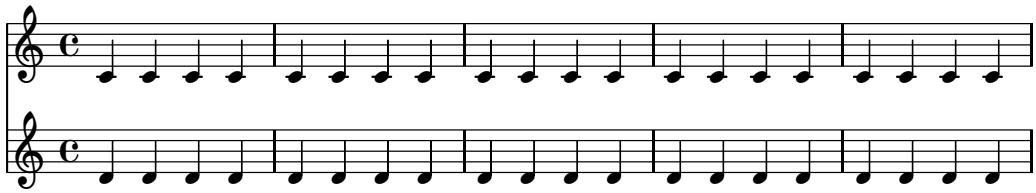


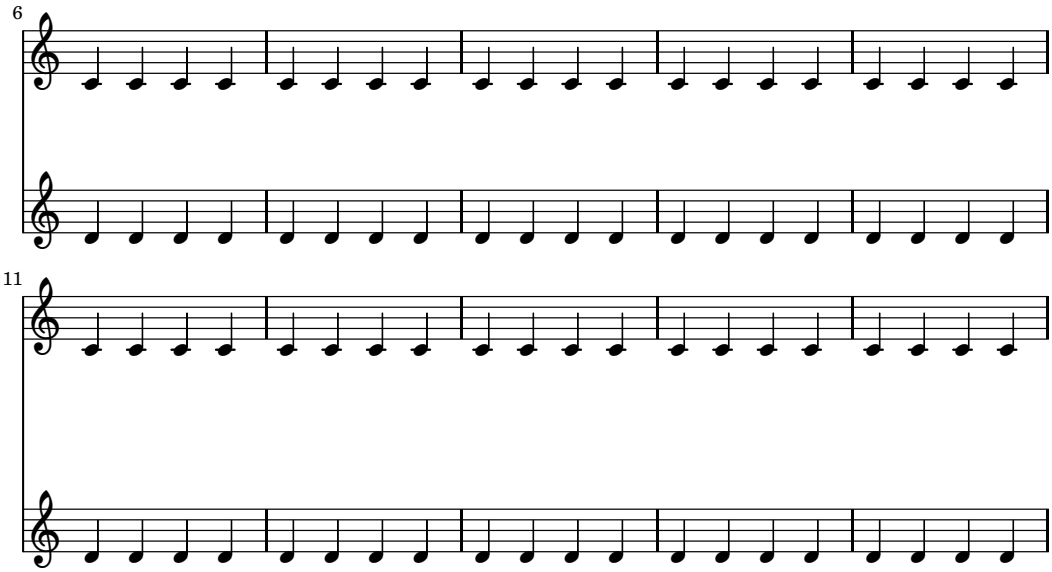
Note that `line-break-system-details` takes an associative list of potentially many values, but that we set only one value here. Note, too, that the `Y-offset` property here determines the exact vertical position on the page at which each new system will render.

Now that we have set the vertical startpoint of each system explicitly, we can also set the vertical distances between staves within each system manually. We do this using the `alignment-distances` subproperty of `line-break-system-details`.

```
\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    <<
      \new Staff <<
        \new Voice {
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 20)
               (alignment-distances . (10)))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 60)
               (alignment-distances . (15)))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
          #'((Y-offset . 85)
             (alignment-distances . (20)))
          s1*5 \break
        }
        \new Voice { \repeat unfold 15 { c'4 c' c' c' } }
      >>
      \new Staff {
        \repeat unfold 15 { d'4 d' d' d' }
```

```
      }
    >>
  }
}
```

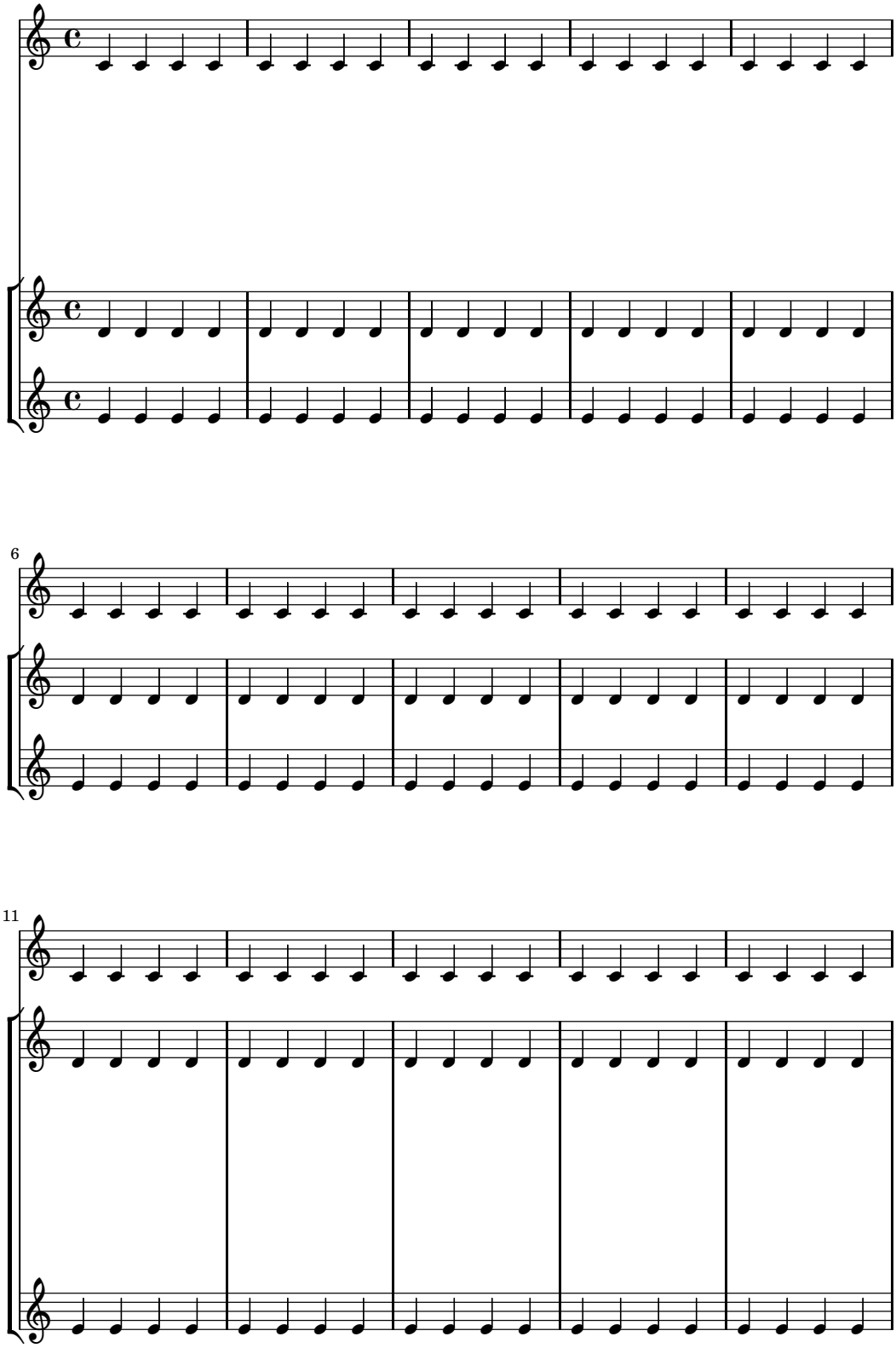




Note that here we assign two different values to the `line-break-system-details` attribute of the `NonMusicalPaperColumn` grob. Though the `line-break-system-details` attribute alist accepts many additional spacing parameters (including, for example, a corresponding `X-offset` pair), we need only set the `Y-offset` and `alignment-distances` pairs to control the vertical startpoint of every system and every staff. Finally, note that `alignment-distances` specifies the vertical positioning of staves but not of staff groups.

```
\header { tagline = ##f }
\paper { left-margin = 0\mm }
\book {
  \score {
    <<
```

```
      \new Staff <<
        \new Voice {
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 0)
               (alignment-distances . (30 10)))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 60)
               (alignment-distances . (10 10)))
          s1*5 \break
          \overrideProperty Score.NonMusicalPaperColumn.line-break-system-details
            #'((Y-offset . 100)
               (alignment-distances . (10 30)))
          s1*5 \break
        }
        \new Voice { \repeat unfold 15 { c'4 c' c' c' } }
      >>
      \new StaffGroup <<
        \new Staff { \repeat unfold 15 { d'4 d' d' d' } }
        \new Staff { \repeat unfold 15 { e'4 e' e' e' } }
      >>
    >>
  }
}
```



Some points to consider:

- When using `alignment-distances`, lyrics and other non-staff lines do not count as a staff.
- The units of the numbers passed to `X-offset`, `Y-offset` and `alignment-distances` are interpreted as multiples of the distance between adjacent staff lines. Positive values move staves and lyrics up, negative values move staves and lyrics down.
- Because the `NonMusicalPaperColumn.line-break-system-details` settings given here allow the positioning of staves and systems anywhere on the page, it is possible to violate

paper or margin boundaries or even to print staves or systems on top of one another. Reasonable values passed to these different settings will avoid this.

Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

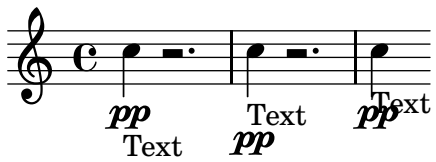
4.4.3 Vertical collision avoidance

Intuitively, there are some objects in musical notation that belong to the staff and there are other objects that should be placed outside the staff. Objects belonging outside the staff include things such as rehearsal marks, text and dynamic markings (from now on, these will be called outside-staff objects). LilyPond's rule for the vertical placement of outside-staff objects is to place them as close to the staff as possible but not so close that they collide with another object.

LilyPond uses the `outside-staff-priority` property to determine whether a grob is an outside-staff object: if `outside-staff-priority` is a number, the grob is an outside-staff object. In addition, `outside-staff-priority` tells LilyPond in which order the objects should be placed.

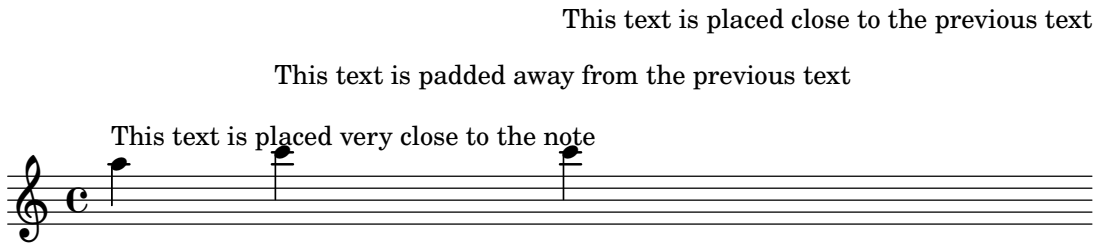
First, LilyPond places all the objects that do not belong outside the staff. Then it sorts the outside-staff objects according to their `outside-staff-priority` (in increasing order). One by one, LilyPond takes the outside-staff objects and places them so that they do not collide with any objects that have already been placed. That is, if two outside-staff grobs are competing for the same space, the one with the lower `outside-staff-priority` will be placed closer to the staff.

```
c4_"Text"\pp
r2.
\once \override TextScript.outside-staff-priority = #1
c4_"Text"\pp % this time the text will be closer to the staff
r2.
% by setting outside-staff-priority to a non-number,
% we disable the automatic collision avoidance
\once \override TextScript.outside-staff-priority = ##f
\once \override DynamicLineSpanner.outside-staff-priority = ##f
c4_"Text"\pp % now they will collide
```



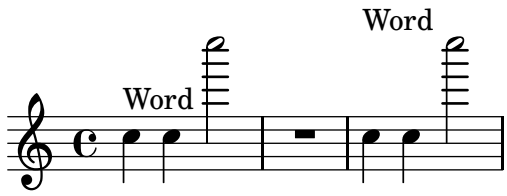
The vertical padding between an outside-staff object and the previously-positioned grobs can be controlled with `outside-staff-padding`.

```
\once \override TextScript.outside-staff-padding = #0
a'^"This text is placed very close to the note"
\once \override TextScript.outside-staff-padding = #3
c^"This text is padded away from the previous text"
c^"This text is placed close to the previous text"
```



By default, outside-staff objects are placed so they avoid a horizontal collision with previously-positioned grobs. This can lead to situations in which objects are placed close to each other horizontally. As shown in the example below, setting `outside-staff-horizontal-padding` increases the horizontal spacing required, and in this case moves the text up to prevent it from getting too close to the ledger lines.

```
c4^"Word" c c''2
R1
\once \override TextScript.outside-staff-horizontal-padding = #1
c,,4^"Word" c c''2
```



Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

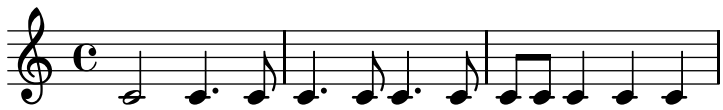
4.5 Horizontal spacing

4.5.1 Horizontal spacing overview

The spacing engine translates differences in durations into stretchable distances ('springs') of differing lengths. Longer durations get more space, shorter durations get less. The shortest durations get a fixed amount of space (which is controlled by `shortest-duration-space` in the Sezione "SpacingSpanner" in *Guida al Funzionamento Interno* object). The longer the duration, the more space it gets: doubling a duration adds a fixed amount (this amount is controlled by `spacing-increment`) of space to the note.

For example, the following piece contains lots of half, quarter, and 8th notes; the eighth note is followed by 1 note head width (NHW). The quarter note is followed by 2 NHW, the half by 3 NHW, etc.

```
c2 c4. c8
c4. c8 c4. c8
c8 c c4 c c
```



Normally, `spacing-increment` is set to 1.2 staff space, which is approximately the width of a note head, and `shortest-duration-space` is set to 2.0, meaning that the shortest note gets 2.4 staff space (2.0 times the `spacing-increment`) of horizontal space. This space is counted from the left edge of the symbol, so the shortest notes are generally followed by one NHW of space.

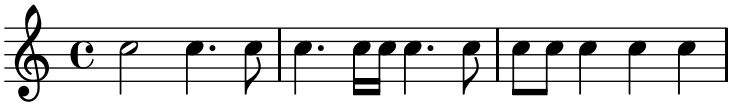
If one would follow the above procedure exactly, then adding a single 32nd note to a score that uses 8th and 16th notes, would widen up the entire score a lot. The shortest note is no longer a 16th, but a 32nd, thus adding 1 NHW to every note. To prevent this, the shortest duration for spacing is not the shortest note in the score, but rather the one which occurs most frequently.

The most common shortest duration is determined as follows: in every measure, the shortest duration is determined. The most common shortest duration is taken as the basis for the spacing, with the stipulation that this shortest duration should always be equal to or shorter than an 8th note. The shortest duration is printed when you run `lilypond` with the '`--verbose`' option.

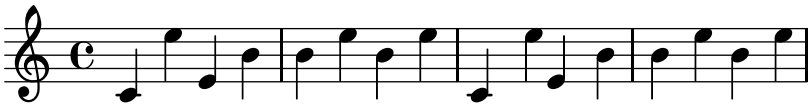
These durations may also be customized. If you set the `common-shortest-duration` in Sezione "SpacingSpanner" in *Guida al Funzionamento Interno*, then this sets the base duration for spacing. The maximum duration for this base (normally an 8th), is set through `base-shortest-duration`.

Notes that are even shorter than the common shortest note are followed by a space that is proportional to their duration relative to the common shortest note. So if we were to add only a few 16th notes to the example above, they would be followed by half a NHW:

```
c2 c4. c8 | c4. c16[ c] c4. c8 | c8 c c4 c c
```



In the *Essay on automated music engraving*, it was explained that stem directions influence spacing (see Sezione "Optical spacing" in *Saggio*). This is controlled with the `stem-spacing-correction` property in the Sezione "NoteSpacing" in *Guida al Funzionamento Interno*, object. These are generated for every Sezione "Voice" in *Guida al Funzionamento Interno* context. The `StaffSpacing` object (generated in Sezione "Staff" in *Guida al Funzionamento Interno* context) contains the same property for controlling the stem/bar line spacing. The following example shows these corrections, once with default settings, and once with exaggerated corrections:



Proportional notation is supported; see Sezione 4.5.5 [Proportional notation], pagina 545.

Vedi anche

Essay on automated music engraving: Sezione "Optical spacing" in *Saggio*.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

Internals Reference: Sezione "SpacingSpanner" in *Guida al Funzionamento Interno*, Sezione "NoteSpacing" in *Guida al Funzionamento Interno*, Sezione "StaffSpacing" in *Guida al Funzionamento Interno*, Sezione "NonMusicalPaperColumn" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

There is no convenient mechanism to manually override spacing. The following work-around may be used to insert extra space into a score, adjusting the padding value as necessary.

```
\override Score.NonMusicalPaperColumn.padding = #10
```

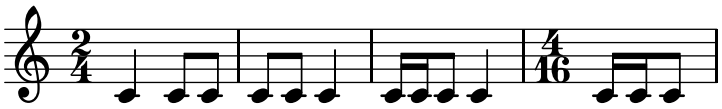
No work-around exists for decreasing the amount of space.

4.5.2 New spacing area

New sections with different spacing parameters can be started with `newSpacingSection`. This is useful when there are sections with a different notions of long and short notes.

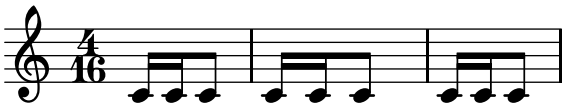
In the following example, the time signature change introduces a new section, and hence the 16ths notes are automatically spaced slightly wider.

```
\time 2/4
c4 c8 c
c8 c c4 c16[ c c8] c4
\newSpacingSection
\time 4/16
c16[ c c8]
```



The `\newSpacingSection` command creates a new `SpacingSpanner` object at that musical moment. If the automatic spacing adjustments do not give the required spacing, manual `\overrides` may be applied to its properties. These must be applied at the same musical moment as the `\newSpacingSection` command itself. They will then affect the spacing of all the following music until the properties are changed in a new spacing section, for example,

```
\time 4/16
c16[ c c8]
\newSpacingSection
\override Score.SpacingSpanner.spacing-increment = #2
c16[ c c8]
\newSpacingSection
\revert Score.SpacingSpanner.spacing-increment
c16[ c c8]
```



Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

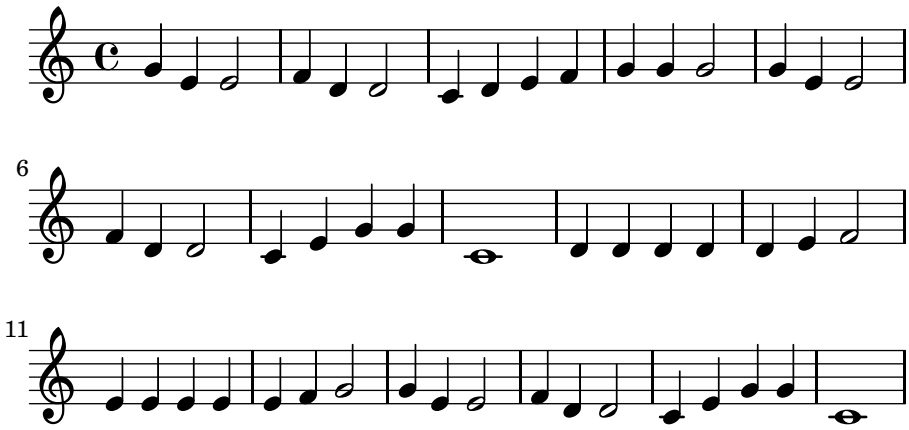
Internals Reference: Sezione "SpacingSpanner" in *Guida al Funzionamento Interno*.

4.5.3 Changing horizontal spacing

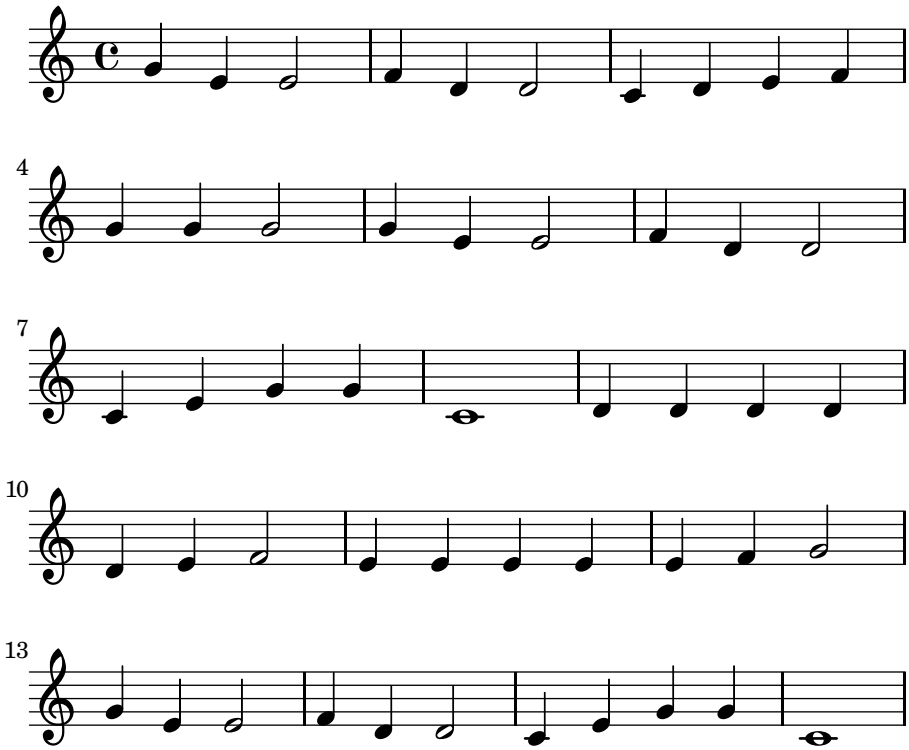
Horizontal spacing may be altered with the `base-shortest-duration` property. Here we compare the same music; once without altering the property, and then altered. Larger values of `ly:make-moment` will produce smaller music. Note that `ly:make-moment` constructs a duration, so `1 4` is a longer duration than `1 16`.

```
\score {
  \relative c'' {
    g4 e e2 | f4 d d2 | c4 d e f | g4 g g2 |
    g4 e e2 | f4 d d2 | c4 e g g | c,1 |
    d4 d d d | d4 e f2 | e4 e e e | e4 f g2 |
    g4 e e2 | f4 d d2 | c4 e g g | c,1 |
  }
```

```
}
```



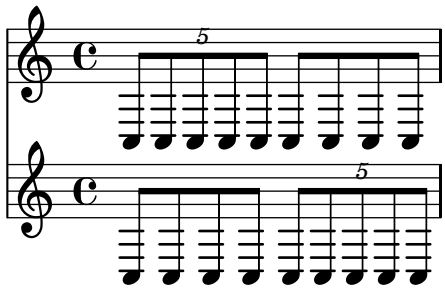
```
\score {
  \relative c'' {
    g4 e e2 | f4 d d2 | c4 d e f | g4 g g2 |
    g4 e e2 | f4 d d2 | c4 e g g | c,1 |
    d4 d d d | d4 e f2 | e4 e e e | e4 f g2 |
    g4 e e2 | f4 d d2 | c4 e g g | c,1 |
  }
  \layout {
    \context {
      \Score
      \override SpacingSpanner.base-shortest-duration = #(ly:make-moment 1/16)
    }
  }
}
```



Frammenti di codice selezionati

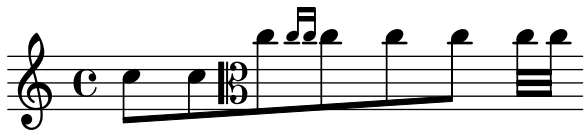
By default, spacing in tuplets depends on various non-duration factors (such as accidentals, clef changes, etc). To disregard such symbols and force uniform equal-duration spacing, use `Score.SpacingSpanner.uniform-stretching`. This property can only be changed at the beginning of a score,

```
\score {
  <<
    \new Staff {
      \tuplet 5/4 { c8 c c c c } c8 c c c
    }
    \new Staff {
      c8 c c c \tuplet 5/4 { c8 c c c c }
    }
  >>
  \layout {
    \context {
      \Score
      \override SpacingSpanner.uniform-stretching = ##t
    }
  }
}
```



When `strict-note-spacing` is set, notes are spaced without regard for clefs, bar lines, and grace notes,

```
\override Score.SpacingSpanner.strict-note-spacing = ##t
\new Staff { c8[ c \clef alto c \grace { c16[ c] } c8 c c]  c32[ c] }
```



Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.5.4 Line length

The most basic settings influencing the spacing are `indent` and `line-width`. They are set in the `\layout` block. They control the indentation of the first line of music, and the lengths of the lines.

If `ragged-right` is set to true in the `\layout` block, then systems ends at their natural horizontal length, instead of being spread horizontally to fill the whole line. This is useful for

short fragments, and for checking how tight the natural spacing is. The normal default setting is false, but if the score has only one system the default value is true.

The option `ragged-last` is similar to `ragged-right`, but only affects the last line of the piece. No restrictions are put on that line. The result is similar to formatting text paragraphs. In a paragraph, the last line simply takes its natural horizontal length.

```
\layout {
  indent = #0
  line-width = #150
  ragged-last = ##t
}
```

Vedi anche

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.5.5 Proportional notation

LilyPond supports proportional notation, a type of horizontal spacing in which each note consumes an amount of horizontal space exactly equivalent to its rhythmic duration. This type of proportional spacing is comparable to horizontal spacing on top of graph paper. Some late 20th- and early 21st-century scores use proportional notation to clarify complex rhythmic relationships or to facilitate the placement of timelines or other graphics directly in the score.

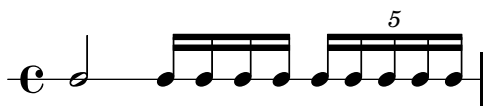
LilyPond supports five different settings for proportional notation, which may be used together or alone:

- `proportionalNotationDuration`
- `uniform-stretching`
- `strict-note-spacing`
- `\remove "Separating_line_group_engraver"`
- `\override PaperColumn.used = ##t`

In the examples that follow, we explore these five different proportional notation settings and examine how these settings interact.

We start with the following one-measure example, which uses classical spacing with ragged-right turned on.

```
\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
  >>
}
```

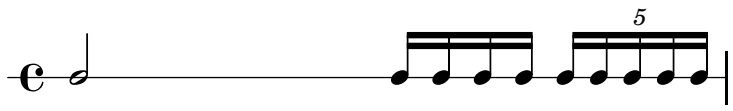


Notice that the half note which begins the measure takes up far less than half of the horizontal space of the measure. Likewise, the sixteenth notes and sixteenth-note quintuplets (or twentieth notes) which end the measure together take up far more than half the horizontal space of the measure.

In classical engraving, this spacing may be exactly what we want because we can borrow horizontal space from the half note and conserve horizontal space across the measure as a whole.

On the other hand, if we want to insert a measured timeline or other graphic above or below our score, we need proportional notation. We turn proportional notation on with the proportionalNotationDuration setting.

```
\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
  >>
 \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/20)
    }
  }
}
```



The half note at the beginning of the measure and the faster notes in the second half of the measure now occupy equal amounts of horizontal space. We could place a measured timeline or graphic above or below this example.

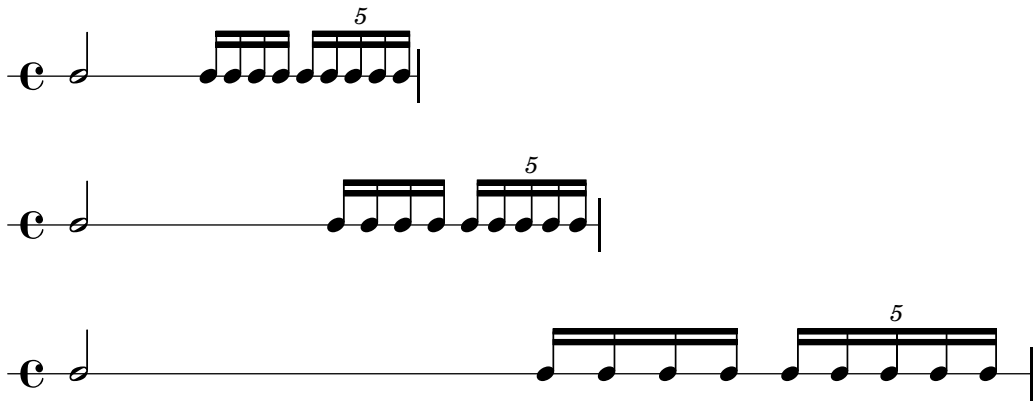
The `proportionalNotationDuration` setting is a context setting that lives in `Score`. Remember that context settings can appear in one of three locations within our input file – in a `\with` block, in a `\context` block, or directly in music entry preceded by the `\set` command. As with all context settings, users can pick which of the three different locations they would like to set `proportionalNotationDuration` in to.

The `proportionalNotationDuration` setting takes a single argument, which is the reference duration against that all music will be spaced. The LilyPond Scheme function `make-moment` takes two arguments – a numerator and denominator which together express some fraction of a whole note. The call `(ly:make-moment 1/20)` therefore produces a reference duration of a twentieth note. Values such as `(ly:make-moment 1/16)`, `(ly:make-moment 1/8)`, and `(ly:make-moment 3/97)` are all possible as well.

How do we select the right reference duration to pass to `proportionalNotationDuration`? Usually by a process of trial and error, beginning with a duration close to the fastest (or smallest) duration in the piece. Smaller reference durations space music loosely; larger reference durations space music tightly.

```
\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
  >>
  \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/8)
    }
  }
```

```
}

\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
  >>
  \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/16)
    }
  }
}

\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
  >>
  \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/32)
    }
  }
}
```



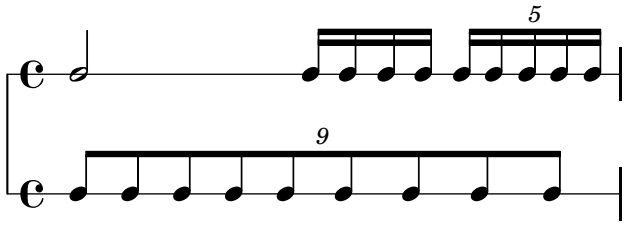
Note that too large a reference duration – such as the eighth note, above – spaces music too tightly and can cause note head collisions. Also that proportional notation in general takes up more horizontal space than classical spacing. Proportional spacing provides rhythmic clarity at the expense of horizontal space.

Next we examine how to optimally space overlapping tuplets.

We start by examining what happens to our original example, with classical spacing, when we add a second staff with a different type of tuplet.

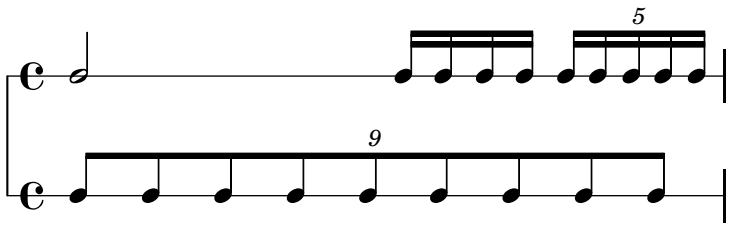
```
\score {
  <<
```

```
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
    \new RhythmicStaff {
      \tuplet 9/8 { c'8 c' c' c' c' c' c' c' c' }
    }
  >>
}
```



The spacing is bad because the evenly spaced notes of the bottom staff do not stretch uniformly. Classical engravings include very few complex triplets and so classical engraving rules can generate this type of result. Setting `proportionalNotationDuration` fixes this.

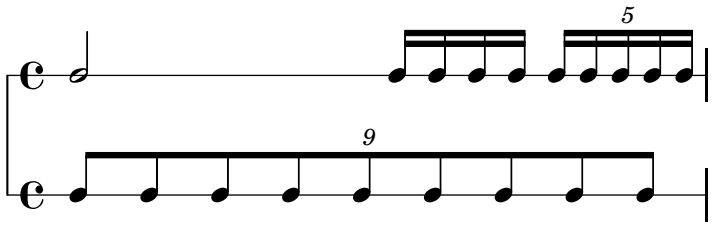
```
\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
    \new RhythmicStaff {
      \tuplet 9/8 { c'8 c' c' c' c' c' c' c' c' }
    }
  >>
  \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/20)
    }
  }
}
```



But if we look very carefully we can see that notes of the second half of the 9-tuplet space ever so slightly more widely than the notes of the first half of the 9-tuplet. To ensure uniform stretching, we turn on `uniform-stretching`, which is a property of `SpacingSpanner`.

```
\score {
  <<
    \new RhythmicStaff {
      c'2 c'16 c' c' c' \tuplet 5/4 { c'16 c' c' c' c' }
    }
```

```
    \new RhythmicStaff {
      \tuplet 9/8 { c'8 c' c' c' c' c' c' c' c' }
    }
  >>
  \layout {
    \context {
      \Score
      proportionalNotationDuration = #(ly:make-moment 1/20)
      \override SpacingSpanner.uniform-stretching = ##t
    }
  }
}
```



Our two-staff example now spaces exactly, our rhythmic relationships are visually clear, and we can include a measured timeline or graphic if we want.

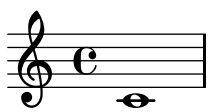
Note that the LilyPond's proportional notation package expects that all proportional scores set the SpacingSpanner's 'uniform-stretching attribute to ##t. Setting proportionalNotationDuration without also setting the SpacingSpanner's 'uniform-stretching attribute to ##t will, for example, cause Skips to consume an incorrect amount of horizontal space.

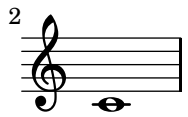
The SpacingSpanner is an abstract grob that lives in the Score context. As with our settings of proportionalNotationDuration, overrides to the SpacingSpanner can occur in any of three different places in our input file – in the Score \with block, in a Score \context block, or in note entry directly.

There is by default only one `SpacingSpanner` per `Score`. This means that, by default, `uniform-stretching` is either turned on for the entire score or turned off for the entire score. We can, however, override this behavior and turn on different spacing features at different places in the score. We do this with the command `\newSpacingSection`. See Sezione 4.5.2 [New spacing area], pagina 542, for more info.

Next we examine the effects of the `Separating_line_group_engraver` and see why proportional scores frequently remove this engraver. The following example shows that there is a small amount of "prefatory" space just before the first note in each system.

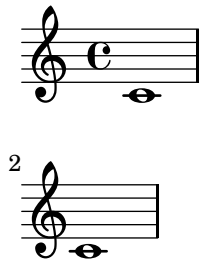
```
\paper {
  indent = #0
}

\new Staff {
  c'1
  \break
  c'1
}
```





The amount of this prefatory space is the same whether after a time signature, a key signature or a clef. `Separating_line_group_engraver` is responsible for this space. Removing `Separating_line_group_engraver` reduces this space to zero.

```
\paper {
  indent = #0
}

\new Staff \with {
  \remove "Separating_line_group_engraver"
} {
  c'1
  \break
  c'1
}
```

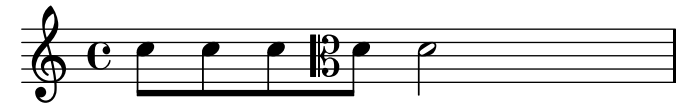


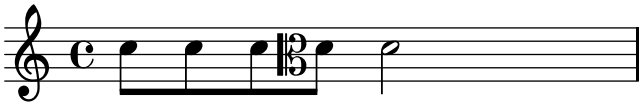
non-musical elements like time signatures, key signatures, clefs and accidentals are problematic in proportional notation. None of these elements has rhythmic duration. But all of these elements consume horizontal space. Different proportional scores approach these problems differently.

It may be possible to avoid spacing problems with key signatures simply by not having any. This is a valid option since most proportional scores are contemporary music. The same may be true of time signatures, especially for those scores that include a measured timeline or other graphic. But these scores are exceptional and most proportional scores include at least some time signatures. Clefs and accidentals are even more essential.

So what strategies exist for spacing non-musical elements in a proportional context? One good option is the `strict-note-spacing` property of `SpacingSpanner`. Compare the two scores below:

```
\new Staff {
  \set Score.proportionalNotationDuration = #(ly:make-moment 1/16)
  c''8 c'' c'' \clef alto d' d'2
}

\new Staff {
  \set Score.proportionalNotationDuration = #(ly:make-moment 1/16)
  \override Score.SpacingSpanner.strict-note-spacing = ##t
  c''8 c'' c'' \clef alto d' d'2
}
```





Both scores are proportional, but the spacing in the first score is too loose because of the clef change. The spacing of the second score remains strict, however, because strict-note-spacing is turned on. Turning on strict-note-spacing causes the width of time signatures, key signatures, clefs and accidentals to play no part in the spacing algorithm.

In addition to the settings given here, there are other settings that frequently appear in proportional scores. These include:

- `\override SpacingSpanner.strict-grace-spacing = ##t`
- `\set tupletFullLength = ##t`
- `\override Beam.breakable = ##t`
- `\override Glissando.breakable = ##t`
- `\override TextSpanner.breakable = ##t`
- `\remove "Forbid_line_break_engraver" in the Voice context`

These settings space grace notes strictly, extend tuplet brackets to mark both rhythmic start- and stop-points, and allow spanning elements to break across systems and pages. See the respective parts of the manual for these related settings.

Vedi anche

Notation Reference: Sezione 4.5.2 [New spacing area], pagina 542.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.6 Fitting music onto fewer pages

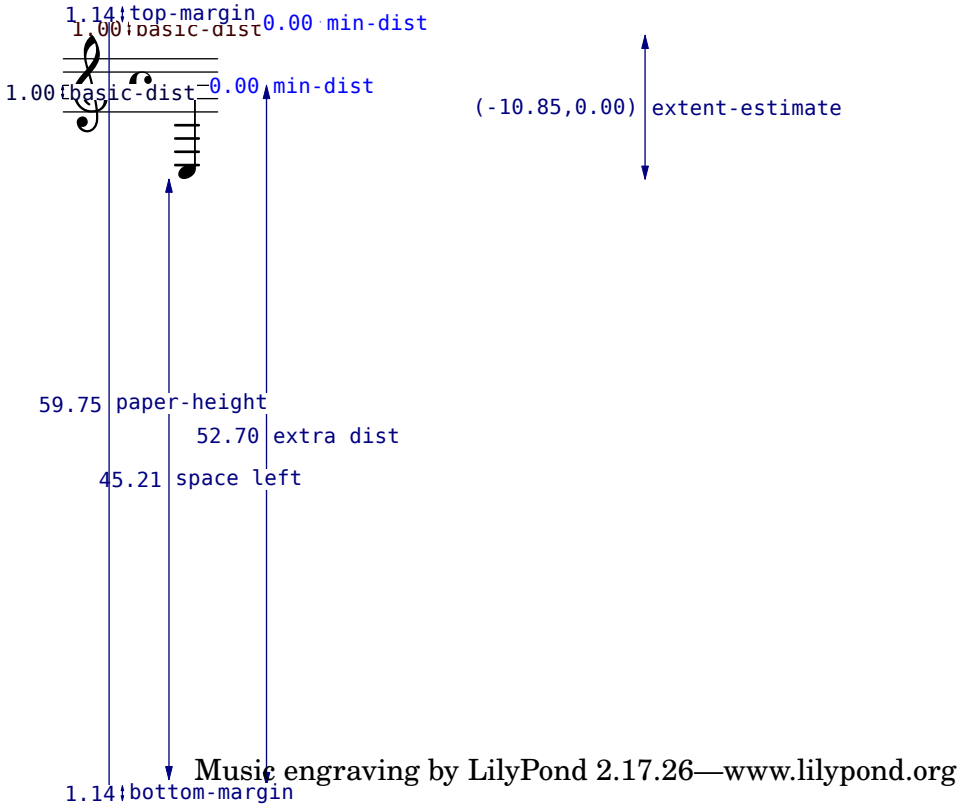
Sometimes you can end up with one or two staves on a second (or third, or fourth...) page. This is annoying, especially if you look at previous pages and it looks like there is plenty of room left on those.

When investigating layout issues, `annotate-spacing` is an invaluable tool. This command prints the values of various layout spacing variables; for more details see the following section, Sezione 4.6.1 [Displaying spacing], pagina 551.

4.6.1 Displaying spacing

To graphically display the dimensions of vertical layout variables that may be altered for page formatting, set `annotate-spacing` in the `\paper` block:

```
\book {
  \score { { c4 } }
  \paper { annotate-spacing = ##t }
}
```



All layout dimensions are displayed in staff-spaces, regardless of the units specified in the `\paper` or `\layout` block. In the above example, `paper-height` has a value of 59.75 `staff-spaces`, and the `staff-size` is 20 points (the default value). Note that:

1 point = (25.4/72.27) mm

1 staff-space = (`staff-size`)/4 pts
= (`staff-size`)/4 * (25.4/72.27) mm

In this case, one `staff-space` is approximately equal to 1.757mm. Thus the `paper-height` measurement of 59.75 `staff-spaces` is equivalent to 105 millimeters, the height of `a6` paper in landscape orientation. The pairs (a,b) are intervals, where a is the lower edge and b the upper edge of the interval.

Vedi anche

Notation Reference: Sezione 4.2.2 [Setting the staff size], pagina 516.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

4.6.2 Changing spacing

The output of `annotate-spacing` reveals vertical dimensions in great detail. For details about modifying margins and other layout variables, see Sezione 4.1 [Page layout], pagina 504.

Other than margins, there are a few other options to save space:

- Force systems to move as close together as possible (to fit as many systems as possible onto a page) while being spaced so that there is no blank space at the bottom of the page.

```
\paper {
  system-system-spacing = #'((basic-distance . 0.1) (padding . 0))
  ragged-last-bottom = ##f
  ragged-bottom = ##f
}
```

- Force the number of systems. This can help in two ways. Just setting a value, even the same value as the number of systems being typeset by default, will sometimes cause more systems to be fitted onto each page, as an estimation step is then bypassed, giving a more accurate fit to each page. Also, forcing an actual reduction in the number of systems may save a further page. For example, if the default layout has 11 systems, the following assignment will force a layout with 10 systems.

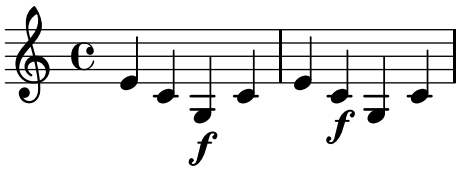
```
\paper {
  system-count = #10
}
```

- Force the number of pages. For example, the following assignment will force a layout with 2 pages.

```
\paper {
  page-count = #2
}
```

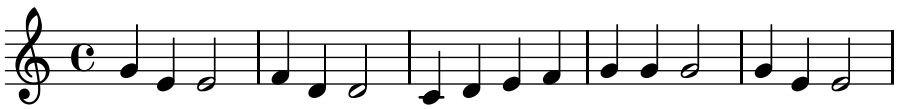
- Avoid (or reduce) objects that increase the vertical size of a system. For example, volta repeats (or alternate repeats) require extra space. If these repeats are spread over two systems, they will take up more space than one system with the volta repeats and another system without. For example, dynamics that 'stick out' of a system can be moved closer to the staff:

```
e4 c g\f c
e4 c g-\tweak X-offset #-2.7 \f c
```



- Alter the horizontal spacing via `SpacingSpanner`. For more details, see Sezione 4.5.3 [Changing horizontal spacing], pagina 542. The following example illustrates the default spacing:

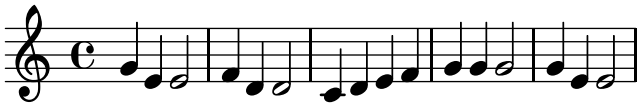
```
\score {
  \relative c'' {
    g4 e e2 |
    f4 d d2 |
    c4 d e f |
    g4 g g2 |
    g4 e e2 |
  }
}
```



The next example modifies `common-shortest-duration` from a value of `1/4` to `1/2`. The quarter note is the most common and shortest duration in this example, so by making this duration longer, a 'squeezing' effect occurs:

```
\score {
  \relative c'' {
    g4 e e2 |
    f4 d d2 |
```

```
    c4 d e f |
    g4 g g2 |
    g4 e e2 |
  }
  \layout {
    \context {
      \Score
      \override SpacingSpanner.common-shortest-duration =
        #(ly:make-moment 1/2)
    }
  }
}
```



The `common-shortest-duration` property cannot be modified dynamically, so it must always be placed in a `\context` block so that it applies to the whole score.

Vedi anche

Notation Reference: Sezione 4.1 [Page layout], pagina 504, Sezione 4.5.3 [Changing horizontal spacing], pagina 542.

Snippets: Sezione "Spacing" in *Frammenti di codice*.

5 Changing defaults

The purpose of LilyPond's design is to provide the finest quality output by default. Nevertheless, it may happen that you need to change this default layout. The layout is controlled through a large number of 'knobs and switches' collectively called 'properties'. A tutorial introduction to accessing and modifying these properties can be found in the Learning Manual, see Sezione "Tweaking output" in *Manuale di Apprendimento*. This should be read first. This chapter covers similar ground, but in a style more appropriate to a reference manual.

The definitive description of the controls available for tuning can be found in a separate document: Sezione "the Internals Reference" in *Guida al Funzionamento Interno*. That manual lists all the variables, functions and options available in LilyPond. It is written as a HTML document, which is available on-line, and is also included with the LilyPond documentation package.

Internally, LilyPond uses Scheme (a LISP dialect) to provide infrastructure. Overriding layout decisions in effect accesses the program internals, which requires Scheme input. Scheme elements are introduced in a '`.ly`' file with the hash mark `#`.[1]

5.1 Interpretation contexts

This section describes what contexts are, and how to modify them.

Vedi anche

Learning Manual: Sezione "Contexts and engravers" in *Manuale di Apprendimento*.

Installed Files: '`ly/engraver-init.ly`', '`ly/performer-init.ly`'.

Snippets: Sezione "Contexts and engravers" in *Frammenti di codice*.

Internals Reference: Sezione "Contexts" in *Guida al Funzionamento Interno*, Sezione "Engravers and Performers" in *Guida al Funzionamento Interno*.

5.1.1 Contexts explained

Contexts are arranged hierarchically:

Score - the master of all contexts

This is the top level notation context. No other context can contain a Score context. By default the Score context handles the administration of time signatures and makes sure that items such as clefs, time signatures, and key-signatures are aligned across staves.

A Score context is instantiated implicitly when a `\score {...}` or `\layout {...}` block is processed.

Top-level contexts - staff containers

StaffGroup

Groups staves while adding a bracket on the left side, grouping the staves together. The bar lines of the contained staves are connected vertically. `StaffGroup` only consists of a collection of staves, with a bracket in front and spanning bar lines.

ChoirStaff

Identical to `StaffGroup` except that the bar lines of the contained staves are not connected vertically.

GrandStaff

[1] Sezione "Scheme tutorial" in *Estendere*, contains a short tutorial on entering numbers, lists, strings, and symbols in Scheme.

A group of staves, with a brace on the left side, grouping the staves together. The bar lines of the contained staves are connected vertically.

PianoStaff

Just like `GrandStaff`, but with support for instrument names to the left of each system.

Intermediate-level contexts - staves

Staff

Handles clefs, bar lines, keys, accidentals. It can contain `Voice` contexts.

RhythmicStaff

Like `Staff` but for printing rhythms. Pitches are ignored; the notes are printed on one line.

TabStaff

Context for generating tablature. By default lays the music expression out as a guitar tablature, printed on six lines.

DrumStaff

Handles typesetting for percussion. Can contain `DrumVoice`

VaticanaStaff

Same as `Staff`, except that it is designed for typesetting a piece in gregorian style.

MensuralStaff

Same as `Staff`, except that it is designed for typesetting a piece in mensural style.

Bottom-level contexts - voices

Voice-level contexts initialise certain properties and start appropriate engravers. A bottom-level context is one without `defaultchild`. While it is possible to let it accept/contain subcontexts, they can only be created and entered explicitly.

Voice

Corresponds to a voice on a staff. This context handles the conversion of dynamic signs, stems, beams, super- and sub-scripts, slurs, ties, and rests. You have to instantiate this explicitly if you require multiple voices on the same staff.

VaticanaVoice

Same as `Voice`, except that it is designed for typesetting a piece in gregorian style.

MensuralVoice

Same as `Voice`, with modifications for typesetting a piece in mensural style.

Lyrics

Corresponds to a voice with lyrics. Handles the printing of a single line of lyrics.

DrumVoice

The voice context used in a percussion staff.

FiguredBass

The context in which `BassFigure` objects are created from input entered in `\figuremode` mode.

TabVoice

The voice context used within a `TabStaff` context. Usually left to be created implicitly.

CueVoice

A voice context used to render notes of a reduced size, intended primarily for adding cue notes to a staff, see [Formatting cue notes], pagina 203. Usually left to be created implicitly.

ChordNames

Typesets chord names.

5.1.2 Creating and referencing contexts

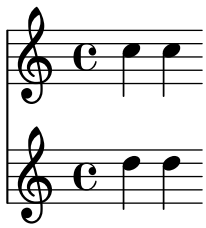
LilyPond will create lower-level contexts automatically if a music expression is encountered before a suitable context exists, but this is usually successful only for simple scores or music fragments like the ones in the documentation. For more complex scores it is advisable to specify all contexts explicitly with either the `\new` or `\context` command. The syntax of these two commands is very similar:

`[\new | \context]` *`Context`* `[ = ` *`name`*`] [`*`music-expression`*`]`

where either `\new` or `\context` may be specified. *Context* is the type of context which is to be created, *name* is an optional name to be given to the particular context being created and *music-expression* is a single music expression that is to be interpreted by the engravers and performers in this context.

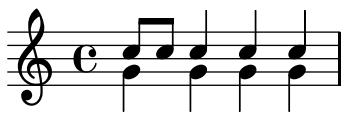
The `\new` prefix without a name is commonly used to create scores with many staves:

```
<<
  \new Staff {
    % leave the Voice context to be created implicitly
    c4 c
  }
  \new Staff {
    d4 d
  }
>>
```



and to place several voices into one staff:

```
<<
  \new Staff <<
    \new Voice {
      \voiceOne
      c8 c c4 c c
    }
    \new Voice {
      \voiceTwo
      g4 g g g
    }
  >>
>>
```

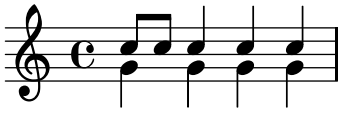


`\new` should always be used to specify unnamed contexts.

The difference between `\new` and `\context` is in the action taken:

- \new with or without a name will always create a fresh, distinct, context, even if one with the same name already exists:

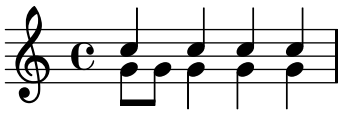
```
<<
  \new Staff <<
    \new Voice = "A" {
      \voiceOne
      c8 c c4 c c
    }
    \new Voice = "A" {
      \voiceTwo
      g4 g g g
    }
  >>
>>
```



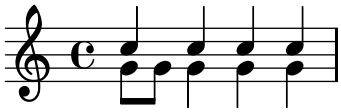
- \context with a name specified will create a distinct context only if a context of the same type with the same name in the same context hierarchy does not already exist. Otherwise it will be taken as a reference to that previously created context, and its music expression will be passed to that context for interpretation.

  One application of named contexts is in separating the score layout from the musical content. Either of these two forms is valid:

```
\score {
  <<
    % score layout
    \new Staff <<
      \new Voice = "one" {
        \voiceOne
      }
      \new Voice = "two" {
        \voiceTwo
      }
    >>

    % musical content
    \context Voice = "one" {
      \relative c'' {
        c4 c c c
      }
    }
    \context Voice = "two" {
      \relative c'' {
        g8 g g4 g g
      }
    }
  >>
}
```



```
\score {
  <<
    % score layout
    \new Staff <<
      \context Voice = "one" {
        \voiceOne
      }
      \context Voice = "two" {
        \voiceTwo
      }
    >>

    % musical content
    \context Voice = "one" {
      \relative c'' {
        c4 c c c
      }
    }
    \context Voice = "two" {
      \relative c'' {
        g8 g g4 g g
      }
    }
  >>
}
```



Alternatively, variables may be employed to similar effect. See Sezione "Organizing pieces with variables" in *Manuale di Apprendimento*.

- `\context` with no name will match the first of any previously created contexts of the same type in the same context heirarchy, even one that has been given a name, and its music expression will be passed to that context for interpretation. This form is rarely useful. However, `\context` with no name and no music expression is used to set the context in which a Scheme procedure specified with `\applyContext` is executed:

```
\new Staff \relative c' {
  c1
  \context Timing
  \applyContext #(lambda (ctx)
                  (newline)
                  (display (ly:context-current-moment ctx)))
  c1
}
```

A context must be named if it is to be referenced later, for example when lyrics are associated with music:

```
\new Voice = "tenor" music
...
```

`\new Lyrics \lyricsto "tenor" lyrics`

For details of associating lyrics with music see [Automatic syllable durations], pagina 250.

The properties of all contexts of a particular type can be modified in a `\layout` block (with a different syntax), see [Changing all contexts of the same type], pagina 564. This construct also provides a means of keeping layout instructions separate from the musical content. If a single context is to be modified, a `\with` block must be used, see [Changing just one specific context], pagina 567.

Vedi anche

Learning Manual: Sezione "Organizing pieces with variables" in *Manuale di Apprendimento*.

Notation Reference: [Changing just one specific context], pagina 567, [Automatic syllable durations], pagina 250.

5.1.3 Keeping contexts alive

Contexts are usually terminated at the first musical moment in which they have nothing to do. So `Voice` contexts die as soon as they contain no events; `Staff` contexts die as soon as all the `Voice` contexts within them contain no events; etc. This can cause difficulties if earlier contexts which have died have to be referenced, for example, when changing staves with `\change` commands, associating lyrics with a voice with `\lyricsto` commands, or when adding further musical events to an earlier context.

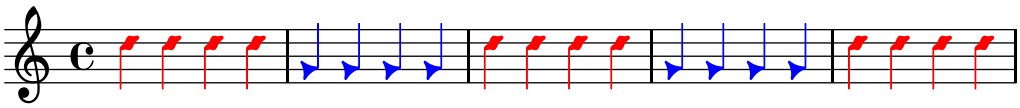
There is an exception to this general rule: just one of the `Voice` contexts in a `Staff` context or in a `<<...>>` construct will always persist to the end of the enclosing `Staff` context or `<<...>>` construct, even though there may be periods when it has nothing to do. The context to persist in this way will be the first one encountered in the first enclosed `{...}` construct, ignoring any in enclosed `<<...>>` constructs.

Any context can be kept alive by ensuring it has something to do at every musical moment. `Staff` contexts are kept alive by ensuring one of their voices is kept alive. One way of doing this is to add spacer rests to a voice in parallel with the real music. These need to be added to every `Voice` context which needs to be kept alive. If several voices are to be used sporadically it is safest to keep them all alive rather than attempting to rely on the exceptions mentioned above.

In the following example, both voice A and voice B are kept alive in this way for the duration of the piece:

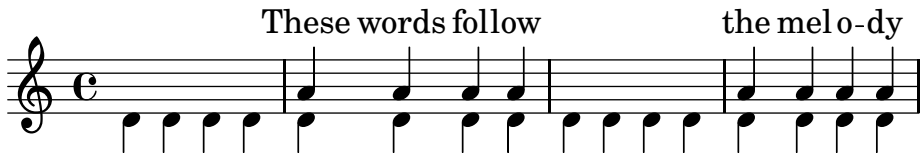
```
musicA = \relative c'' { d4 d d d }
musicB = \relative c'' { g4 g g g }
keepVoicesAlive = {
  <<
    \new Voice = "A" { s1*5 }  % Keep Voice "A" alive for 5 bars
    \new Voice = "B" { s1*5 }  % Keep Voice "B" alive for 5 bars
  >>
}

music = {
  \context Voice = "A" {
    \voiceOneStyle
    \musicA
  }
  \context Voice = "B" {
    \voiceTwoStyle
    \musicB
  }
```

```
  \context Voice = "A" { \musicA }
  \context Voice = "B" { \musicB }
  \context Voice = "A" { \musicA }
}

\score {
  \new Staff <<
    \keepVoicesAlive
    \music
  >>
}
```



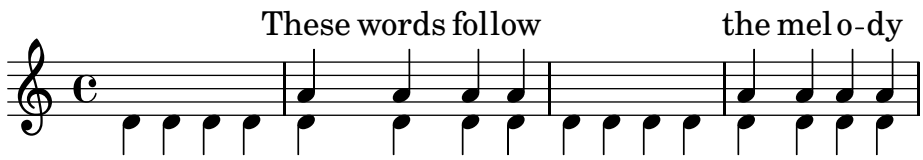
The following example shows how a sporadic melody line with lyrics might be written using this approach. In a real situation the melody and accompaniment would consist of several different sections, of course.

```
melody = \relative c'' { a4 a a a }
accompaniment = \relative c' { d4 d d d }
words = \lyricmode { These words fol -- low the mel -- o -- dy }
\score {
  <<
    \new Staff = "music" {
      <<
        \new Voice = "melody" {
          \voiceOne
          s1*4  % Keep Voice "melody" alive for 4 bars
        }
        {
          \new Voice = "accompaniment" {
            \voiceTwo
            \accompaniment
          }
          <<
            \context Voice = "melody" { \melody }
            \context Voice = "accompaniment" { \accompaniment }
          >>
          \context Voice = "accompaniment" { \accompaniment }
          <<
            \context Voice = "melody" { \melody }
            \context Voice = "accompaniment" { \accompaniment }
          >>
        }
      >>
    }
    \new Lyrics \with { alignAboveContext = #"music" }
    \lyricsto "melody" { \words }
  >>
}
```



An alternative way, which may be better in many circumstances, is to keep the melody line alive by simply including spacer notes to line it up correctly with the accompaniment:

```
melody = \relative c'' {
  s1  % skip a bar
  a4 a a a
  s1  % skip a bar
  a4 a a a
}
accompaniment = \relative c' {
  d4 d d d
  d4 d d d
  d4 d d d
  d4 d d d
}
words = \lyricmode { These words fol -- low the mel -- o -- dy }

\score {
  <<
    \new Staff = "music" {
      <<
        \new Voice = "melody" {
          \voiceOne
          \melody
        }
        \new Voice = "accompaniment" {
          \voiceTwo
          \accompaniment
        }
      >>
    }
    \new Lyrics \with { alignAboveContext = #"music" }
    \lyricsto "melody" { \words }
  >>
}
```



5.1.4 Modifying context plug-ins

Notation contexts (like `Score` and `Staff`) not only store properties, they also contain plug-ins called 'engravers' that create notation elements. For example, the `Voice` context contains a `Note_heads_engraver` and the `Staff` context contains a `Key_engraver`.

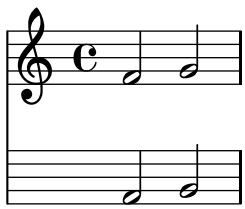
For a full a description of each plug-in, see Internals Reference ↦ Translation ↦ Engravers. Every context described in Internals Reference ↦ Translation ↦ Context. lists the engravers used for that context.

It can be useful to shuffle around these plug-ins. This is done by starting a new context with `\new` or `\context`, and modifying it,

```
\new context \with {
  \consists ...
  \consists ...
  \remove ...
  \remove ...
  etc.
}
{
  ...music...
}
```

where the ... should be the name of an engraver. Here is a simple example which removes `Time_signature_engraver` and `Clef_engraver` from a `Staff` context,

```
<<
  \new Staff {
    f2 g
  }
  \new Staff \with {
     \remove "Time_signature_engraver"
     \remove "Clef_engraver"
  } {
    f2 g2
  }
>>
```

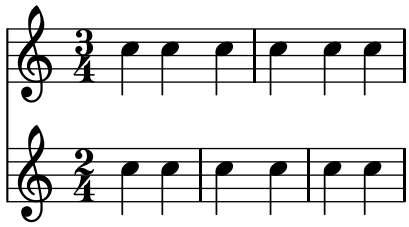


In the second staff there are no time signature or clef symbols. This is a rather crude method of making objects disappear since it will affect the entire staff. This method also influences the spacing, which may or may not be desirable. More sophisticated methods of blanking objects are shown in Sezione "Visibility and color of objects" in *Manuale di Apprendimento*.

The next example shows a practical application. Bar lines and time signatures are normally synchronized across the score. This is done by the `Timing_translator` and `Default_bar_line_engraver`. This plug-in keeps an administration of time signature, location within the measure, etc. By moving these engraver from `Score` to `Staff` context, we can have a score where each staff has its own time signature.

```
\score {
  <<
    \new Staff \with {
      \consists "Timing_translator"
      \consists "Default_bar_line_engraver"
    }
    \relative c'' {
        \time 3/4
        c4 c c c c c
    }
  \new Staff \with {
```

```
    \consists "Timing_translator"
    \consists "Default_bar_line_engraver"
  }
  \relative c'' {
      \time 2/4
      c4 c c c c c
  }
>>
\layout {
  \context {
    \Score
    \remove "Timing_translator"
    \remove "Default_bar_line_engraver"
    }
  }
}
```



Problemi noti e avvertimenti

The order in which the engravers are specified is the order in which they are called to carry out their processing. Usually the order in which the engravers are specified does not matter, but in a few special cases the order is important, for example where one engraver writes a property and another reads it, or where one engraver creates a grob and another must process it.

The following orderings are important:

- the `Bar_engraver` must normally be first,
- the `New_fingering_engraver` must come before the `Script_column_engraver`,
- the `Timing_translator` must come before the `Bar_number_engraver`.

Vedi anche

Installed Files: '`ly/engraver-init.ly`'.

5.1.5 Changing context default settings

Context and grob properties can be changed with `\set` and `\override` commands, as described in Sezione 5.3 [Modifying properties], pagina 575. These commands create music events, making the changes take effect at the point in time the music is being processed.

In contrast, this section explains how to change the *default* values of context and grob properties at the time the context is created. There are two ways of doing this. One modifies the default values in all contexts of a particular type, the other modifies the default values in just one particular instance of a context.

Changing all contexts of the same type

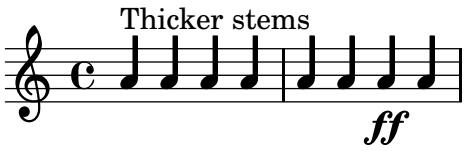
The context settings which are to be used by default in `Score`, `Staff`, `Voice` and other contexts may be specified in a `\context` block within any `\layout` block. The `\layout` block should be placed within the `\score` block to which it is to apply, after the music.

```
\layout {
  \context {
    \Voice
    [context settings for all Voice contexts]
  }
  \context {
    \Staff
    [context settings for all Staff contexts]
  }
}
```

The following types of settings may be specified:

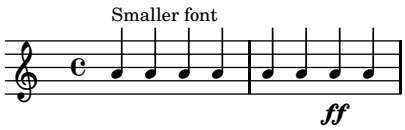
- An `\override` command, but with the context name omitted

```
\score {
  \relative c'' {
    a4^"Thicker stems" a a a
    a4 a a\ff a
  }
  \layout {
    \context {
      \Staff
      \override Stem.thickness = #4.0
    }
  }
}
```



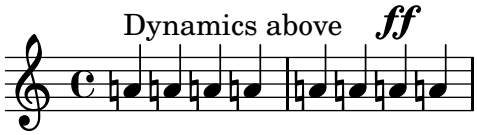
- Directly setting a context property

```
\score {
  \relative c'' {
    a4^"Smaller font" a a a
    a4 a a\ff a
  }
  \layout {
    \context {
      \Staff
      fontSize = #-4
    }
  }
}
```



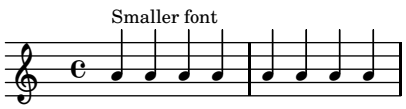
- A predefined command such as `\dynamicUp` or a music expression like `\accidentalStyle dodecaphonic`

```
\score {
  \relative c'' {
    a4^"Dynamics above" a a a
    a4 a a\ff a
  }
  \layout {
    \context {
      \Voice
      \dynamicUp
    }
    \context {
      \Staff
      \accidentalStyle dodecaphonic
    }
  }
}
```



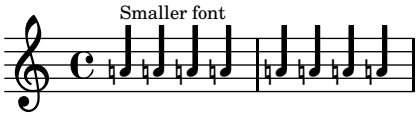
- A user-defined variable containing a `\with` block; for details of the `\with` block see [Changing just one specific context], pagina 567.

```
StaffDefaults = \with {
  fontSize = #-4
}

\score {
  \new Staff {
    \relative c'' {
      a4^"Smaller font" a a a
      a4 a a a
    }
  }
  \layout {
    \context {
      \Staff
      \StaffDefaults
    }
  }
}
```



Property-setting commands can be placed in a `\layout` block without being enclosed in a `\context` block. Such settings are equivalent to including the same property-setting commands at the start of every context of the type specified. If no context is specified *every* bottom-level context is affected, see [Bottom-level contexts - voices], pagina 556. The syntax of a property-setting command in a `\layout` block is the same as the same command written in the music stream.

```
\score {
  \new Staff {
    \relative c'' {
      a4^"Smaller font" a a a
      a4 a a a
    }
  }
  \layout {
    \accidentalStyle dodecaphonic
    \set fontSize = #-4
    \override Voice.Stem.thickness = #4.0
  }
}
```



Changing just one specific context

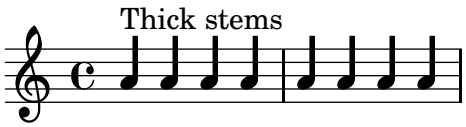
The context properties of just one specific context instance can be changed in a `\with` block. All other context instances of the same type retain the default settings built into LilyPond and modified by any `\layout` block within scope. The `\with` block must be placed immediately after the `\new` *context-type* command:

```
\new Staff \with { [context settings for this context instance only] }
{
  ...
}
```

The following types of settings may be specified:

- An `\override` command, but with the context name omitted

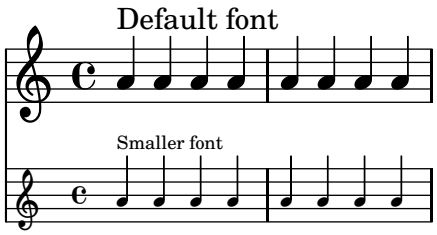
```
\score {
  \new Staff {
    \new Voice \with { \override Stem.thickness = #4.0 }
    {
      \relative c'' {
        a4^"Thick stems" a a a
        a4 a a a
      }
    }
  }
}
```



- Directly setting a context property

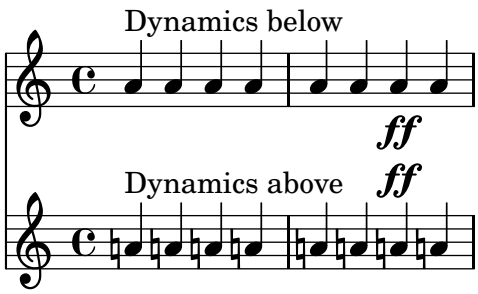
```
\score {
  <<
    \new Staff {
      \relative c'' {
```

```
        a4^"Default font" a a a
        a4 a a a
      }
    }
    \new Staff \with { fontSize = #-4 }
    {
      \relative c'' {
        a4^"Smaller font" a a a
        a4 a a a
      }
    }
  >>
}
```



- A predefined command such as `\dynamicUp`

```
\score {
  <<
    \new Staff {
      \new Voice {
        \relative c'' {
          a4^"Dynamics below" a a a
          a4 a a\ff a
        }
      }
    }
    \new Staff \with { \accidentalStyle dodecaphonic }
    {
      \new Voice \with { \dynamicUp }
      {
        \relative c'' {
          a4^"Dynamics above" a a a
          a4 a a\ff a
        }
      }
    }
  >>
}
```



Order of precedence

The value of a property which applies at a particular time is determined as follows:

- if an `\override` or `\set` command in the input stream is in effect that value is used,
- otherwise the default value taken from a `\with` statement on the context initiation statement is used,
- otherwise the default value taken from the most recent appropriate `\context` block in the `\layout` blocks is used,
- otherwise the LilyPond built-in default is used.

Vedi anche

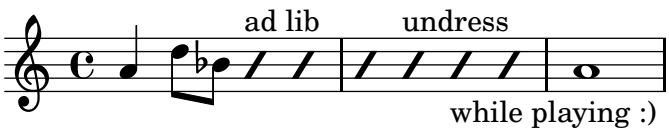
Learning Manual: Sezione "Modifying context properties" in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.1.1 [Contexts explained], pagina 555, [Bottom-level contexts - voices], pagina 556, Sezione 5.3.2 [The set command], pagina 576, Sezione 5.3.3 [The override command], pagina 578, Sezione 4.2.1 [The \layout block], pagina 514.

5.1.6 Defining new contexts

Specific contexts, like `Staff` and `Voice`, are made from simple building blocks. It is possible to create new types of contexts with different combinations of engraver plug-ins.

The next example shows how to build a different type of `Voice` context from scratch. It will be similar to `Voice`, but only prints centered slash note heads. It can be used to indicate improvisation in jazz pieces,



These settings are defined within a `\context` block inside a `\layout` block,

```
\layout {
  \context {
    ...
  }
}
```

In the following discussion, the example input shown should go in place of the ... in the previous fragment.

First it is necessary to define a name for the new context:

```
\name ImproVoice
```

Since it is similar to the `Voice` context, we want commands that work in (existing) `Voice` contexts to continue working. This is achieved by giving the new context an alias of `Voice`,

```
\alias Voice
```

The context will print notes and instructive texts, so we need to add the engravers which provide this functionality, plus the engraver which groups notes, stems and rests which occur at the same musical moment into columns,

```
\consists "Note_heads_engraver"
\consists "Text_engraver"
\consists "Rhythmic_column_engraver"
```

The note heads should all be placed on the center line,

```
\consists "Pitch_squash_engraver"
squashedPosition = #0
```

The `Pitch_squash_engraver` modifies note heads (created by the `Note_heads_engraver`) and sets their vertical position to the value of `squashedPosition`, in this case `0`, the center line.

The notes look like a slash, and have no stem,

```
\override NoteHead.style = #'slash
\override Stem.transparent = ##t
```

All these plug-ins have to cooperate, and this is achieved with a special plug-in, which must be marked with the keyword `\type`. This should always be `Engraver_group`.

```
\type "Engraver_group"
```

Put together, we get

```
\context {
  \name ImproVoice
  \type "Engraver_group"
  \consists "Note_heads_engraver"
  \consists "Text_engraver"
  \consists "Rhythmic_column_engraver"
  \consists "Pitch_squash_engraver"
  squashedPosition = #0
  \override NoteHead.style = #'slash
  \override Stem.transparent = ##t
  \alias Voice
}
```

Contexts form hierarchies. We want to place the `ImproVoice` context within the `Staff` context, just like normal `Voice` contexts. Therefore, we modify the `Staff` definition with the `\accepts` command,

```
\context {
  \Staff
  \accepts ImproVoice
}
```

The opposite of `\accepts` is `\denies`, which is sometimes needed when reusing existing context definitions.

Putting both into a `\layout` block, like

```
\layout {
  \context {
    \name ImproVoice
    ...
  }
  \context {
    \Staff
    \accepts "ImproVoice"
  }
}
```

Then the output at the start of this subsection can be entered as

```
\relative c'' {
  a4 d8 bes8
  \new ImproVoice {
    c4^"ad lib" c
    c4 c^"undress"
    c c_"while playing :)"
  }
  a1
}
```

Vedi anche

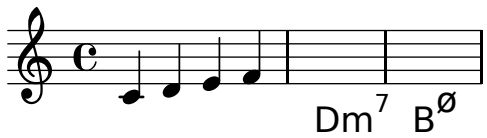
Internals Reference: Sezione "Engraver_group" in *Guida al Funzionamento Interno*, Sezione "Note_heads_engraver" in *Guida al Funzionamento Interno*, Sezione "Text_engraver" in *Guida al Funzionamento Interno*, Sezione "Rhythmic_column_engraver" in *Guida al Funzionamento Interno*, Sezione "Pitch_squash_engraver" in *Guida al Funzionamento Interno*.

5.1.7 Context layout order

Contexts are normally positioned in a system from top to bottom in the order in which they are encountered in the input file. When contexts are nested, the outer context will include inner nested contexts as specified in the input file, provided the inner contexts are included in the outer context's "accepts" list. Nested contexts which are not included in the outer context's "accepts" list will be repositioned below the outer context rather than nested within it.

The "accepts" list of a context can be changed with the `\accepts` and `\denies` commands. `\accepts` adds a context to the "accepts" list and `\denies` removes a context from the list. For example, it would not normally be desirable for chord names to be nested within a `Staff` context, so the `ChordNames` context is not included by default in the "accepts" list of the `Staff` context, but if this were to be required it can be done:

```
\score {
  \new Staff {
    c' d' e' f'
    \chords { d1:m7 b1:min7.5- }
  }
}
```




```
\score {
  \new Staff {
    c' d' e' f'
    \chords { d1:m7 b1:min7.5- }
  }
  \layout {
    \context {
      \Staff
      \accepts "ChordNames"
    }
  }
}
```

| Dm7 | Bø |

\denies is mainly used when a new context is being based on another, but the required nesting differs. For example, the VaticanaStaff context is based on the Staff context, but with the VaticanaVoice context substituted for the Voice context in the "accepts" list.

Note that a context will be silently created implicitly if a command is encountered when there is no suitable context available to contain it.

Within a context definition, the type of subcontext to be implicitly created is specified using \defaultchild. A number of music events require a 'Bottom' context: when such an event is encountered, subcontexts are created recursively until reaching a context with no 'defaultchild' setting.

Implicit context creation can at times give rise to unexpected new staves or scores. Using \new to create contexts explicitly avoids those problems.

Sometimes a context is required to exist for just a brief period, a good example being the staff context for an ossia. This is usually achieved by introducing the context definition at the appropriate place in parallel with corresponding section of the main music. By default, the temporary context will be placed below all the existing contexts. To reposition it above the context called "main", it should be defined like this:

```
\new Staff \with { alignAboveContext = #"main" }
```

A similar situation arises when positioning a temporary lyrics context within a multi-staved layout such as a ChoirStaff, for example, when adding a second verse to a repeated section. By default the temporary lyrics context will be placed beneath the lower staves. By defining the temporary lyrics context with alignBelowContext it can be positioned correctly beneath the (named) lyrics context containing the first verse.

Examples showing this repositioning of temporary contexts can be found elsewhere — see Sezione "Nesting music expressions" in *Manuale di Apprendimento*, Sezione 1.6.2 [Modifying single staves], pagina 187 and Sezione 2.1.2 [Techniques specific to lyrics], pagina 258.

Vedi anche

Learning Manual: Sezione "Nesting music expressions" in *Manuale di Apprendimento*.

Notation Reference: Sezione 1.6.2 [Modifying single staves], pagina 187, Sezione 2.1.2 [Techniques specific to lyrics], pagina 258.

Application Usage: Sezione "An extra staff appears" in *Uso del Programma*.

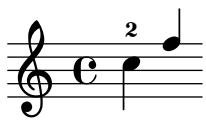
Installed Files: 'ly/engraver-init.ly'.

5.2 Explaining the Internals Reference

5.2.1 Navigating the program reference

Suppose we want to move the fingering indication in the fragment below:

```
c-2
\stemUp
f
```



If you visit the documentation on fingering instructions (in [Fingering instructions], pagina 210), you will notice:

See also

Internals Reference: Sezione "Fingering" in *Guida al Funzionamento Interno*.

The programmer's reference is available as an HTML document. It is highly recommended that you read it in HTML form, either online or by downloading the HTML documentation. This section will be much more difficult to understand if you are using the PDF manual.

Follow the link to Sezione "Fingering" in *Guida al Funzionamento Interno*. At the top of the page, you will see

Fingering objects are created by: Sezione "Fingering_engraver" in *Guida al Funzionamento Interno* and Sezione "New_fingering_engraver" in *Guida al Funzionamento Interno*.

By following related links inside the program reference, we can follow the flow of information within the program:

- Sezione "Fingering" in *Guida al Funzionamento Interno*: Sezione "Fingering" in *Guida al Funzionamento Interno* objects are created by: Sezione "Fingering_engraver" in *Guida al Funzionamento Interno*
- Sezione "Fingering_engraver" in *Guida al Funzionamento Interno*: Music types accepted: Sezione "fingering-event" in *Guida al Funzionamento Interno*
- Sezione "fingering-event" in *Guida al Funzionamento Interno*: Music event type `fingering-event` is in Music expressions named Sezione "FingeringEvent" in *Guida al Funzionamento Interno*

This path goes against the flow of information in the program: it starts from the output, and ends at the input event. You could also start at an input event, and read with the flow of information, eventually ending up at the output object(s).

The program reference can also be browsed like a normal document. It contains chapters on `Music definitions` on Sezione "Translation" in *Guida al Funzionamento Interno*, and the Sezione "Backend" in *Guida al Funzionamento Interno*. Every chapter lists all the definitions used and all properties that may be tuned.

5.2.2 Layout interfaces

The HTML page that we found in the previous section describes the layout object called Sezione "Fingering" in *Guida al Funzionamento Interno*. Such an object is a symbol within the score. It has properties that store numbers (like thicknesses and directions), but also pointers to related objects. A layout object is also called a *Grob*, which is short for Graphical Object. For more details about Grobs, see Sezione "grob-interface" in *Guida al Funzionamento Interno*.

The page for `Fingering` lists the definitions for the `Fingering` object. For example, the page says

`padding` (dimension, in staff space):

`0.5`

which means that the number will be kept at a distance of at least 0.5 of the note head.

Each layout object may have several functions as a notational or typographical element. For example, the Fingering object has the following aspects

- Its size is independent of the horizontal spacing, unlike slurs or beams.
- It is a piece of text. Granted, it is usually a very short text.
- That piece of text is typeset with a font, unlike slurs or beams.
- Horizontally, the center of the symbol should be aligned to the center of the note head.
- Vertically, the symbol is placed next to the note and the staff.
- The vertical position is also coordinated with other superscript and subscript symbols.

Each of these aspects is captured in so-called *interfaces*, which are listed on the Sezione "Fingering" in *Guida al Funzionamento Interno* page at the bottom

This object supports the following interfaces: Sezione "item-interface" in *Guida al Funzionamento Interno*, Sezione "self-alignment-interface" in *Guida al Funzionamento Interno*, Sezione "side-position-interface" in *Guida al Funzionamento Interno*, Sezione "text-interface" in *Guida al Funzionamento Interno*, Sezione "text-script-interface" in *Guida al Funzionamento Interno*, Sezione "font-interface" in *Guida al Funzionamento Interno*, Sezione "finger-interface" in *Guida al Funzionamento Interno*, and Sezione "grob-interface" in *Guida al Funzionamento Interno*.

Clicking any of the links will take you to the page of the respective object interface. Each interface has a number of properties. Some of them are not user-serviceable ('Internal properties'), but others can be modified.

We have been talking of *the* `Fingering` object, but actually it does not amount to much. The initialization file (see Sezione "Other sources of information" in *Manuale di Apprendimento*) '`scm/define-grobs.scm`' shows the soul of the 'object',

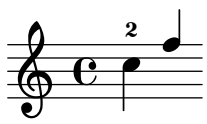
```
(Fingering
  . ((padding . 0.5)
     (avoid-slur . around)
     (slur-padding . 0.2)
     (staff-padding . 0.5)
     (self-alignment-X . 0)
     (self-alignment-Y . 0)
     (script-priority . 100)
     (stencil . ,ly:text-interface::print)
     (direction . ,ly:script-interface::calc-direction)
     (font-encoding . fetaText)
     (font-size . -5)  ; don't overlap when next to heads.
     (meta . ((class . Item)
     (interfaces . (finger-interface
                    font-interface
                    text-script-interface
                    text-interface
                    side-position-interface
                    self-alignment-interface
                    item-interface))))))
```

As you can see, the `Fingering` object is nothing more than a bunch of variable settings, and the webpage in the Internals Reference is directly generated from this definition.

5.2.3 Determining the grob property

Recall that we wanted to change the position of the **2** in

```
c-2
\stemUp
f
```



Since the **2** is vertically positioned next to its note, we have to meddle with the interface associated with this positioning. This is done using `side-position-interface`. The page for this interface says

`side-position-interface`

Position a victim object (this one) next to other objects (the support). The property `direction` signifies where to put the victim object relative to the support (left or right, up or down?)

Below this description, the variable `padding` is described as

`padding` (dimension, in staff space)

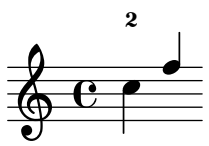
Add this much extra space between objects that are next to each other.

By increasing the value of `padding`, we can move the fingering away from the note head. The following command inserts 3 staff spaces of white between the note and the fingering:

```
\once \override Voice.Fingering.padding = #3
```

Inserting this command before the Fingering object is created, i.e., before `c2`, yields the following result:

```
\once \override Voice.Fingering.padding = #3
c-2
\stemUp
f
```



In this case, the context for this tweak is `Voice`. This fact can also be deduced from the program reference, for the page for the Sezione "Fingering_engraver" in *Guida al Funzionamento Interno* plug-in says

Fingering_engraver is part of contexts: . . . Sezione "Voice" in *Guida al Funzionamento Interno*

5.2.4 Naming conventions

Another thing that is needed, is an overview of the various naming conventions:

- scheme functions: lowercase-with-hyphens (incl. one-word names)
- scheme functions: ly:plus-scheme-style
- music events, music classes and music properties: as-scheme-functions
- Grob interfaces: scheme-style
- backend properties: scheme-style (but X and Y!)
- contexts (and MusicExpressions and grobs): Capitalized or CamelCase
- context properties: lowercaseFollowedByCamelCase
- engravers: Capitalized_followed_by_lowercase_and_with_underscores

Questions to be answered:

- Which of these are conventions and which are rules?
- Which are rules of the underlying language, and which are LP-specific?

5.3 Modifying properties

5.3.1 Overview of modifying properties

Each context is responsible for creating certain types of graphical objects. The settings used for printing these objects are also stored by context. By changing these settings, the appearance of objects can be altered.

There are two different kinds of properties stored in contexts: context properties and grob properties. Context properties are properties that apply to the context as a whole and control how the context itself is displayed. In contrast, grob properties apply to specific grob types that will be displayed in the context.

The `\set` and `\unset` commands are used to change values for context properties. The `\override` and `\revert` commands are used to change values for grob properties.

Vedi anche

Internals Reference: Sezione "Backend" in *Guida al Funzionamento Interno*, Sezione "All layout objects" in *Guida al Funzionamento Interno*, Sezione "OverrideProperty" in *Guida al Funzionamento Interno*, Sezione "RevertProperty" in *Guida al Funzionamento Interno*, Sezione "PropertySet" in *Guida al Funzionamento Interno*.

Problemi noti e avvertimenti

The back-end is not very strict in type-checking object properties. Cyclic references in Scheme values for properties can cause hangs or crashes, or both.

5.3.2 The `\set` command

Each context has a set of *properties*, variables contained in that context. Context properties are changed with the `\set` command, which has the following syntax:

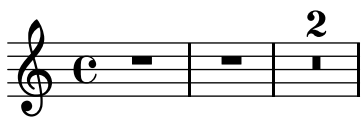
`\set` *`context.property`* `=` `#`*`value`*

value is a Scheme object, which is why it must be preceded by the `#` character.

Contexts properties are usually named in `studlyCaps`. They mostly control the translation from music to notation, e.g. `localKeySignature` (for determining whether to print accidentals), or `measurePosition` (for determining when to print a bar line). Context properties can change value over time while interpreting a piece of music; `measurePosition` is an obvious example of this. Context properties are modified with `\set`.

For example, multimeasure rests will be combined into a single bar if the context property `skipBars` is set to `#t`:

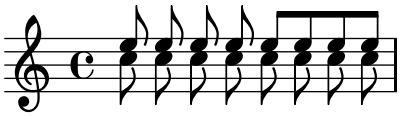
```
R1*2
\set Score.skipBars = ##t
R1*2
```



If the *context* argument is left out, then the property will be set in the current bottom context (typically `ChordNames`, `Voice`, `TabVoice`, or `Lyrics`).

```
\set Score.autoBeaming = ##f
<<
  {
    e8 e e e
    \set autoBeaming = ##t
    e8 e e e
```

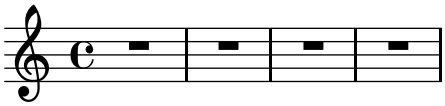
```
  } \\ {
    c8 c c c c8 c c c
  }
>>
```



The change is applied 'on-the-fly', during the music, so that the setting only affects the second group of eighth notes.

Note that the bottom-most context does not always contain the property that you wish to change – for example, attempting to set the `skipBars` property of the default bottom context, in this case `Voice`, will have no effect, because skipBars is a property of the `Score` context.

```
R1*2
\set skipBars = ##t
R1*2
```



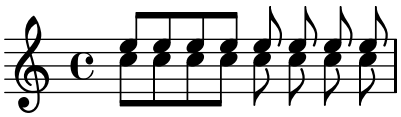
Contexts are hierarchical, so if an enclosing context was specified, for example `Staff`, then the change would also apply to all `Voice`s in the current staff.

The `\unset` command:

`\unset` *`context.property`*

is used to remove the definition of *property* from *context*. This command removes the definition only if it is set in *context*. Properties that have been set in enclosing contexts will not be altered by an unset in an enclosed context:

```
\set Score.autoBeaming = ##t
<<
  {
    \unset autoBeaming
    e8 e e e
    \unset Score.autoBeaming
    e8 e e e
  } \\ {
    c8 c c c c8 c c c
  }
>>
```



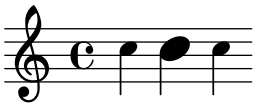
Like `\set`, the *context* argument does not have to be specified for a bottom context, so the two statements

```
\set Voice.autoBeaming = ##t
\set autoBeaming = ##t
```

are equivalent if the current bottom context is `Voice`.

Preceding a `\set` command by `\once` makes the setting apply to only a single time-step:

```
c4
\once \set fontSize = #4.7
c4
c4
```



A full description of all available context properties is in the internals reference, see Translation ↦ Tunable context properties.

Vedi anche

Internals Reference: Sezione "Tunable context properties" in *Guida al Funzionamento Interno*.

5.3.3 The `\override` command

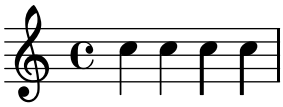
There is a special type of context property: the grob description. Grob descriptions are named in `StudlyCaps` (starting with capital letters). They contain the 'default settings' for a particular kind of grob as an association list. See '`scm/define-grobs.scm`' to see the settings for each grob description. Grob descriptions are modified with `\override`.

The syntax for the `\override` command is

`\override [`*`context.`*`]`*`GrobName.property`* `= #`*`value`*

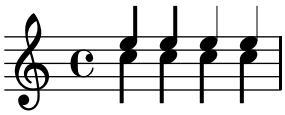
For example, we can increase the thickness of a note stem by overriding the `thickness` property of the `Stem` object:

```
c4 c
\override Voice.Stem.thickness = #3.0
c4 c
```



If no context is specified in an `\override`, the bottom context is used:

```
{ \override Staff.Stem.thickness = #3.0
  <<
    {
      e4 e
      \override Stem.thickness = #0.5
      e4 e
    } \\ {
      c4 c c c
    }
  >>
}
```



Some tweakable options are called 'subproperties' and reside inside properties. To tweak those, use commands in the form

```
\override Stem.details.beamed-lengths = #'(4 4 3)
```

or to modify the ends of spanners, use a form like these

```
\override TextSpanner.bound-details.left.text = #"left text"
\override TextSpanner.bound-details.right.text = #"right text"
```

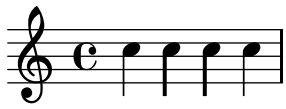
The effects of `\override` can be undone by `\revert`.

The syntax for the `\revert` command is

`\revert [`*`context`*`.]`*`GrobName.property`*

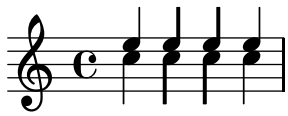
For example,

```
c4
\override Voice.Stem.thickness = #3.0
c4 c
\revert Voice.Stem.thickness
c4
```



The effects of `\override` and `\revert` apply to all grobs in the affected context from the current time forward:

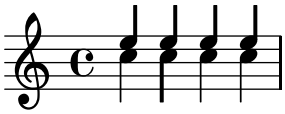
```
{
  <<
    {
      e4
      \override Staff.Stem.thickness = #3.0
      e4 e e
    } \\ {
      c4 c c
      \revert Staff.Stem.thickness
      c4
    }
  >>
}
```



`\once` can be used with `\override` to affect only the current time step:

```
{
  <<
    {
      \override Stem.thickness = #3.0
      e4 e e e
    } \\ {
      c4
      \once \override Stem.thickness = #3.0
      c4 c c
    }
  >>
```

```
}
```



Vedi anche

Internals Reference: Sezione "Backend" in *Guida al Funzionamento Interno*

5.3.4 The `\tweak` command

Changing grob properties with `\override` causes the changes to apply to all of the given grobs in the context at the moment the change applies. Sometimes, however, it is desirable to have changes apply to just one grob, rather than to all grobs in the affected context. This is accomplished with the `\tweak` command, which has the following syntax:

`\tweak [`*`layout-object.`*`]`*`grob-property value`*

Specifying *layout-object* is optional. The `\tweak` command applies to the music object that immediately follows *value* in the music stream.

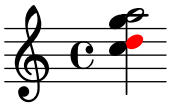
For an introduction to the syntax and uses of the tweak command see Sezione "Tweaking methods" in *Manuale di Apprendimento*.

When several similar items are placed at the same musical moment, the `\override` command cannot be used to modify just one of them – this is where the `\tweak` command must be used. Items which may appear more than once at the same musical moment include the following:

- note heads of notes inside a chord
- articulation signs on a single note
- ties between notes in a chord
- tuplet brackets starting at the same time

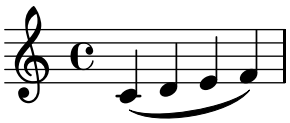
In this example, the color of one note head and the type of another note head are modified within a single chord:

```
< c
  \tweak color #red
  d
  g
  \tweak duration-log #1
  a
> 4
```



`\tweak` can be used to modify slurs:

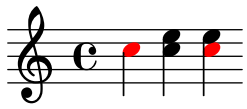
```
c-\tweak thickness #5 ( d e f)
```



For the `\tweak` command to work, it must remain immediately adjacent to the object to which it is to apply after the input file has been converted to a music stream. Tweaking a whole

chord does not do anything since its music event only acts as a container, and all layout objects are created from events inside of the `EventChord`:

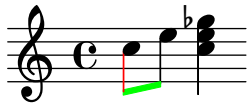
```
\tweak color #red c4
\tweak color #red <c e>4
<\tweak color #red c e>4
```



The simple `\tweak` command cannot be used to modify any object that is not directly created from the input. In particular it will not affect stems, automatic beams or accidentals, since these are generated later by `NoteHead` layout objects rather than by music elements in the input stream.

Such indirectly created layout objects can be tweaked using the form of the `\tweak` command in which the grob name is specified explicitly:

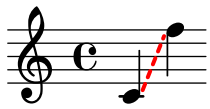
```
\tweak Stem.color #red
\tweak Beam.color #green c8 e
<c e \tweak Accidental.font-size #-3 ges>4
```



`\tweak` cannot be used to modify clefs or time signatures, since these become separated from any preceding `\tweak` command in the input stream by the automatic insertion of extra elements required to specify the context.

Several `\tweak` commands may be placed before a notational element – all affect it:

```
c
-\tweak style #'dashed-line
-\tweak dash-fraction #0.2
-\tweak thickness #3
-\tweak color #red
 \glissando
f'
```



The music stream which is generated from a section of an input file, including any automatically inserted elements, may be examined, see Sezione "Displaying music expressions" in *Estendere*. This may be helpful in determining what may be modified by a `\tweak` command, or in determining how to adjust the input to make a `\tweak` apply.

Vedi anche

Learning Manual: Sezione "Tweaking methods" in *Manuale di Apprendimento*.

Extending LilyPond: Sezione "Displaying music expressions" in *Estendere*.

Problemi noti e avvertimenti

The `\tweak` command cannot be used to modify the control points of just one of several ties in a chord, other than the first one encountered in the input file.

5.3.5 \set vs. \override

5.3.6 Modifying alists

Some user-configurable properties are internally represented as *alists* (association lists), which store pairs of *keys* and *values*. The structure of an alist is:

```
'((key1 . value1)
  (key2 . value2)
  (key3 . value3)
  ...)
```

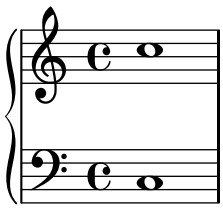
If an alist is a grob property or `\paper` variable, its keys can be modified individually without affecting other keys.

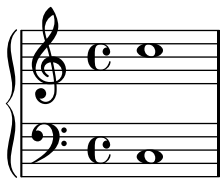
For example, to reduce the space between adjacent staves in a staff-group, use the `staff-staff-spacing` property of the `StaffGrouper` grob. The property is an alist with four keys: `basic-distance`, `minimum-distance`, `padding`, and `stretchability`. The standard settings for this property are listed in the "Backend" section of the Internals Reference (see Sezione "StaffGrouper" in *Guida al Funzionamento Interno*):

```
'((basic-distance . 9)
  (minimum-distance . 7)
  (padding . 1)
  (stretchability . 5))
```

One way to bring the staves closer together is by reducing the value of the `basic-distance` key (9) to match the value of `minimum-distance` (7). To modify a single key individually, use a *nested declaration*:

```
% default space between staves
\new PianoStaff <<
  \new Staff { \clef treble c''1 }
  \new Staff { \clef bass   c1   }
>>

% reduced space between staves
\new PianoStaff \with {
  % this is the nested declaration
  \override StaffGrouper.staff-staff-spacing.basic-distance = #7
} <<
  \new Staff { \clef treble c''1 }
  \new Staff { \clef bass   c1   }
>>
```

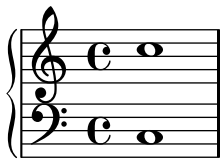




Using a nested declaration will update the specified key (such as `basic-distance` in the above example) without altering any other keys already set for the same property.

Now suppose we want the staves to be as close as possible without overlapping. The simplest way to do this is to set all four alist keys to zero. However, it is not necessary to enter four nested declarations, one for each key. Instead, the property can be completely re-defined with one declaration, as an alist:

```
\new PianoStaff \with {
  \override StaffGrouper.staff-staff-spacing =
    #'((basic-distance . 0)
       (minimum-distance . 0)
       (padding . 0)
       (stretchability . 0))
} <<
  \new Staff { \clef treble c''1 }
  \new Staff { \clef bass   c1   }
>>
```



Note that any keys not explicitly listed in the alist definition will be reset to their *default-when-unset* values. In the case of `staff-staff-spacing`, any unset key-values would be reset to zero (except `stretchability`, which takes the value of `basic-distance` when unset). Thus the following two declarations are equivalent:

```
\override StaffGrouper.staff-staff-spacing =
  #'((basic-distance . 7))

\override StaffGrouper.staff-staff-spacing =
  #'((basic-distance . 7)
     (minimum-distance . 0)
     (padding . 0)
     (stretchability . 7))
```

One (possibly unintended) consequence of this is the removal of any standard settings that are set in an initialization file and loaded each time an input file is compiled. In the above example, the standard settings for `padding` and `minimum-distance` (defined in '`scm/define-grobs.scm`') are reset to their default-when-unset values (zero for both keys). Defining a property or variable as an alist (of any size) will always reset all unset key-values to their default-when-unset values. Unless this is the intended result, it is safer to update key-values individually with a nested declaration.

Nota: Nested declarations will not work for context property alists (such as `beamExceptions`, `keySignature`, `timeSignatureSettings`, etc.). These properties can only be modified by completely re-defining them as alists.

5.4 Useful concepts and properties

5.4.1 Input modes

The way in which the notation contained within an input file is interpreted is determined by the current input mode.

Chord mode

This is activated with the `\chordmode` command, and causes input to be interpreted with the syntax of chord notation, see Sezione 2.7 [Chord notation], pagina 393. Chords are rendered as notes on a staff.

Chord mode is also activated with the `\chords` command. This also creates a new `ChordNames` context and causes the following input to be interpreted with the syntax of chord notation and rendered as chord names in the `ChordNames` context, see [Printing chord names], pagina 399.

Drum mode

This is activated with the `\drummode` command, and causes input to be interpreted with the syntax of drum notation, see [Basic percussion notation], pagina 371.

Drum mode is also activated with the `\drums` command. This also creates a new `DrumStaff` context and causes the following input to be interpreted with the syntax of drum notation and rendered as drum symbols on a drum staff, see [Basic percussion notation], pagina 371.

Figure mode

This is activated with the `\figuremode` command, and causes input to be interpreted with the syntax of figured bass, see [Entering figured bass], pagina 408.

Figure mode is also activated with the `\figures` command. This also creates a new `FiguredBass` context and causes the following input to be interpreted with the figured bass syntax and rendered as figured bass symbols in the `FiguredBass` context, see [Introduction to figured bass], pagina 407.

Fret and tab modes

There are no special input modes for entering fret and tab symbols.

To create tab diagrams, enter notes or chords in note mode and render them in a `TabStaff` context, see [Default tablatures], pagina 328.

To create fret diagrams above a staff, you have two choices. You can either use the `FretBoards` context (see [Automatic fret diagrams], pagina 362 or you can enter them as a markup above the notes using the `\fret-diagram` command (see [Fret diagram markups], pagina 343).

Lyrics mode

This is activated with the `\lyricmode` command, and causes input to be interpreted as lyric syllables with optional durations and associated lyric modifiers, see Sezione 2.1 [Vocal music], pagina 246.

Lyric mode is also activated with the `\addlyrics` command. This also creates a new `Lyrics` context and an implicit `\lyricsto` command which associates the following lyrics with the preceding music.

Markup mode

This is activated with the `\markup` command, and causes input to be interpreted with the syntax of markup, see Sezione A.10 [Text markup commands], pagina 659.

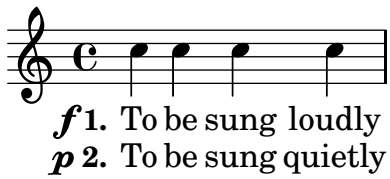
Note mode

This is the default mode or it may be activated with the `\notemode` command. Input is interpreted as pitches, durations, markup, etc and typeset as musical notation on a staff.

It is not normally necessary to specify note mode explicitly, but it may be useful to do so in certain situations, for example if you are in lyric mode, chord mode or any other mode and want to insert something that only can be done with note mode syntax.

For example, to indicate dynamic markings for the verses of a choral pieces it is necessary to enter note mode to interpret the markings:

```
{ c4 c4 c4 c4 }
\addlyrics {
  \notemode{\set stanza = \markup{ \dynamic f 1. } }
  To be sung loudly
}
\addlyrics {
  \notemode{\set stanza = \markup{ \dynamic p 2. } }
  To be sung quietly
}
```



5.4.2 Direction and placement

In typesetting music the direction and placement of many items is a matter of choice. For example, the stems of notes can be directed up or down; lyrics, dynamics, and other expressive marks may be placed above or below the staff; text may be aligned left, right or center; etc. Most of these choices may be left to be determined automatically by LilyPond, but in some cases it may be desirable to force a particular direction or placement.

Articulation direction indicators

By default some directions are always up or always down (e.g. dynamics or fermata), while other things can alternate between up or down based on the stem direction (like slurs or accents).

The default action may be overridden by prefixing the articulation by a *direction indicator*. Three direction indicators are available: `^` (meaning "up"), `_` (meaning "down") and `-` (meaning "use default direction"). The direction indicator can usually be omitted, in which case `-` is assumed, but a direction indicator is **always** required before

- `\tweak` commands
- `\markup` commands
- `\tag` commands
- string markups, e.g. `-"string"`
- fingering instructions, e.g. `-1`
- articulation shortcuts, e.g. `-.`, `->`, `--`

Direction indicators affect only the next note:

```
c2( c)
c2_( c)
c2( c)
c2^( c)
```

The direction property

The position or direction of many layout objects is controlled by the `direction` property.

The value of the `direction` property may be set to `1`, meaning "up" or "above", or to `-1`, meaning "down" or "below". The symbols `UP` and `DOWN` may be used instead of `1` and `-1` respectively. The default direction may be specified by setting `direction` to `0` or `CENTER`. Alternatively, in many cases predefined commands exist to specify the direction. These are of the form

`\xxxUp, \xxxDown or \xxxNeutral`

where `\xxxNeutral` means "use the default" direction. See Sezione "Within-staff objects" in *Manuale di Apprendimento*.

In a few cases, arpeggio for example, the value of the `direction` property can specify whether the object is to be placed to the right or left of the parent. In this case `-1` or `LEFT` means "to the left" and `1` or `RIGHT` means "to the right". `0` or `CENTER` means "use the default" direction.

These indications affect all notes until they are canceled.

```
c2( c)
\slurDown
c2( c)
c2( c)
\slurNeutral
c2( c)
```

In polyphonic music, it is generally better to specify an explicit `voice` than change an object's direction. For more information. See ⟨undefined⟩ [Multiple voices], pagina ⟨undefined⟩.

Vedi anche

Learning Manual: Sezione "Within-staff objects" in *Manuale di Apprendimento*.

Notation Reference: ⟨undefined⟩ [Multiple voices], pagina ⟨undefined⟩.

5.4.3 Distances and measurements

Distances in LilyPond are of two types: absolute and scaled.

Absolute distances are used for specifying margins, indents, and other page layout details, and are by default specified in millimeters. Distances may be specified in other units by following the quantity by `\mm`, `\cm`, `\in` (inches), or `\pt` (points, 1/72.27 of an inch). Page layout distances can also be specified in scalable units (see the following paragraph) by appending `\staff-space` to the quantity. Page layout is described in detail in Sezione 4.1 [Page layout], pagina 504.

Scaled distances are always specified in units of the staff-space or, rarely, the half staff-space. The staff-space is the distance between two adjacent staff lines. The default value can be changed globally by setting the global staff size, or it can be overridden locally by changing the `staff-space` property of `StaffSymbol`. Scaled distances automatically scale with any change to the either the global staff size or the `staff-space` property of `StaffSymbol`, but fonts scale automatically only with changes to the global staff size. The global staff size thus enables the overall size of a rendered score to be easily varied. For the methods of setting the global staff size see Sezione 4.2.2 [Setting the staff size], pagina 516.

If just a section of a score needs to be rendered to a different scale, for example an ossia section or a footnote, the global staff size cannot simply be changed as this would affect the entire

score. In such cases the change in size is made by overriding both the `staff-space` property of `StaffSymbol` and the size of the fonts. A Scheme function, `magstep`, is available to convert from a font size change to the equivalent change in `staff-space`. For an explanation and an example of its use, see Sezione "Length and thickness of objects" in *Manuale di Apprendimento*.

Vedi anche

Learning Manual: Sezione "Length and thickness of objects" in *Manuale di Apprendimento*.

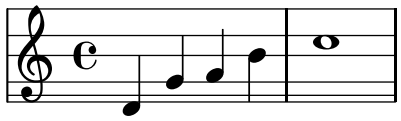
Notation Reference: Sezione 4.1 [Page layout], pagina 504, Sezione 4.2.2 [Setting the staff size], pagina 516.

5.4.4 Staff symbol properties

The vertical position of staff lines and the number of staff lines can be defined at the same time. As the following example shows, note positions are not influenced by the staff line positions.

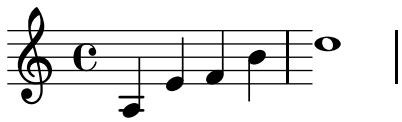
Nota: The `'line-positions` property overrides the `'line-count` property. The number of staff lines is implicitly defined by the number of elements in the list of values for `'line-positions`.

```
\new Staff \with {
  \override StaffSymbol.line-positions = #'(7 3 0 -4 -6 -7)
}
{ a4 e' f b | d1 }
```



The width of a staff can be modified. The units are staff spaces. The spacing of objects inside the staff is not affected by this setting.

```
\new Staff \with {
  \override StaffSymbol.width = #23
}
{ a4 e' f b | d1 }
```



5.4.5 Spanners

Many objects of musical notation extend over several notes or even several bars. Examples are slurs, beams, tuplet brackets, volta repeat brackets, crescendi, trills, and glissandi. Such objects are collectively called "spanners", and have special properties to control their appearance and behaviour. Some of these properties are common to all spanners; others are restricted to a sub-set of the spanners.

All spanners support the `spanner-interface`. A few, essentially those that draw a straight line between the two objects, support in addition the `line-spanner-interface`.

Using the `spanner-interface`

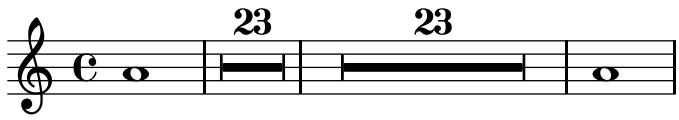
This interface provides two properties that apply to several spanners.

The `minimum-length` *property*

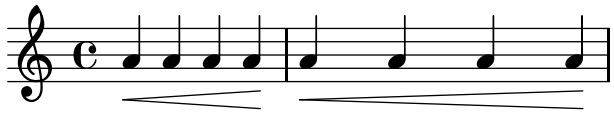
The minimum length of the spanner is specified by the `minimum-length` property. Increasing this usually has the necessary effect of increasing the spacing of the notes between the two end points. However, this override has no effect on many spanners, as their length is determined by other considerations. A few examples where it is effective are shown below.

```
a~ a
a
% increase the length of the tie
-\tweak minimum-length #5
~ a
```

```
a1
\compressFullBarRests
R1*23
% increase the length of the rest bar
\once \override MultiMeasureRest.minimum-length = #20
R1*23
a1
```

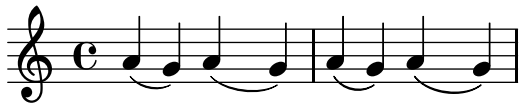



```
a \< a a a \!
% increase the length of the hairpin
\override Hairpin.minimum-length = #20
a \< a a a \!
```



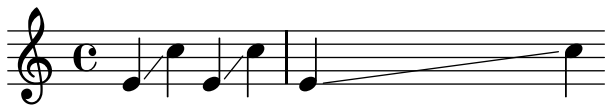
This override can also be used to increase the length of slurs and phrasing slurs:

```
a( g)
a
-\tweak minimum-length #5
( g)

a\( g\)
a
-\tweak minimum-length #5
\( g\)
```



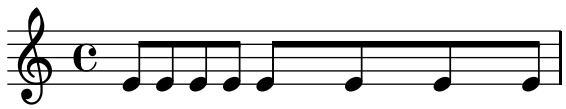
For some layout objects, the `minimum-length` property becomes effective only if the `set-spacing-rods` procedure is called explicitly. To do this, the `springs-and-rods` property should be set to `ly:spanner::set-spacing-rods`. For example, the minimum length of a glissando has no effect unless the `springs-and-rods` property is set:

```
% default
e \glissando c'

% not effective alone
\once \override Glissando.minimum-length = #20
e, \glissando c'

% effective only when both overrides are present
\once \override Glissando.minimum-length = #20
\once \override Glissando.springs-and-rods = #ly:spanner::set-spacing-rods
e, \glissando c'
```



The same is true of the `Beam` object:

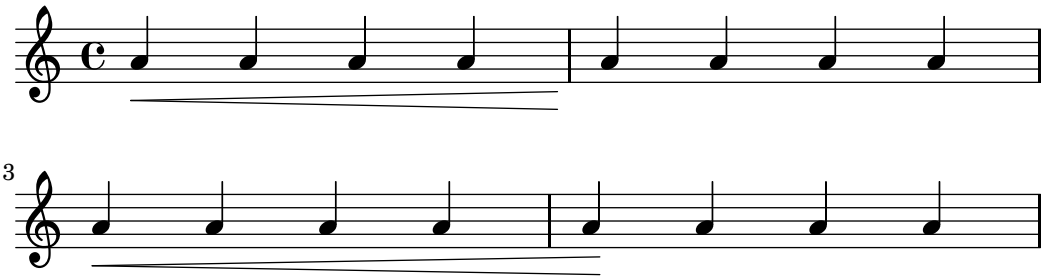
```
% not effective alone
\once \override Beam.minimum-length = #20
e8 e e e

% effective only when both overrides are present
\once \override Beam.minimum-length = #20
\once \override Beam.springs-and-rods = #ly:spanner::set-spacing-rods
e8 e e e
```



The `to-barline` *property*

The second useful property of the `spanner-interface` is `to-barline`. By default this is true, causing hairpins and other spanners which are terminated on the first note of a measure to end instead on the immediately preceding bar line. If set to false, the spanner will extend beyond the bar line and end on the note itself:

```
a \< a a a a \! a a a \break
\override Hairpin.to-barline = ##f
a \< a a a a \! a a a
```



This property is not effective for all spanners. For example, setting it to `#t` has no effect on slurs or phrasing slurs or on other spanners for which terminating on the bar line would not be meaningful.

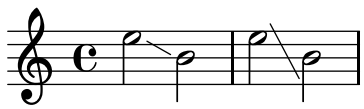
Using the `line-spanner-interface`

Objects which support the `line-spanner-interface` include

- `DynamicTextSpanner`
- `Glissando`
- `TextSpanner`
- `TrillSpanner`
- `VoiceFollower`

The routine responsible for drawing the stencils for these spanners is `ly:line-interface::print`. This routine determines the exact location of the two end points and draws a line between them, in the style requested. The locations of the two end points of the spanner are computed on-the-fly, but it is possible to override their Y-coordinates. The properties which need to be specified are nested two levels down within the property hierarchy, but the syntax of the `\override` command is quite simple:

```
e2 \glissando b
\once \override Glissando.bound-details.left.Y = #3
\once \override Glissando.bound-details.right.Y = #-2
e2 \glissando b
```

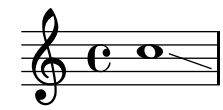


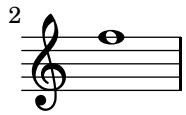
The units for the `Y` property are `staff-spaces`, with the center line of the staff being the zero point. For the glissando, this is the value for `Y` at the X-coordinate corresponding to the center point of each note head, if the line is imagined to be extended to there.

If `Y` is not set, the value is computed from the vertical position of the corresponding attachment point of the spanner.

In case of a line break, the values for the end points are specified by the `left-broken` and `right-broken` sub-lists of `bound-details`. For example:

```
\override Glissando.breakable = ##t
\override Glissando.bound-details.right-broken.Y = #-3
c1 \glissando \break
f1
```





A number of further properties of the `left` and `right` sub-lists of the `bound-details` property may be modified in the same way as `Y`:

`Y` This sets the Y-coordinate of the end point, in `staff-spaces` offset from the staff center line. By default, it is the center of the bound object, so a glissando points to the vertical center of the note head.

For horizontal spanners, such as text spanners and trill spanners, it is hardcoded to 0.

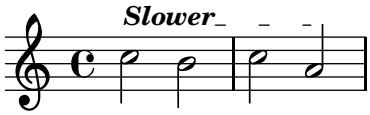
`attach-dir`
This determines where the line starts and ends in the X-direction, relative to the bound object. So, a value of `-1` (or `LEFT`) makes the line start/end at the left side of the note head it is attached to.

`X` This is the absolute X-coordinate of the end point. It is usually computed on the fly, and overriding it has little useful effect.

`stencil` Line spanners may have symbols at the beginning or end, which is contained in this sub-property. This is for internal use; it is recommended that `text` be used instead.

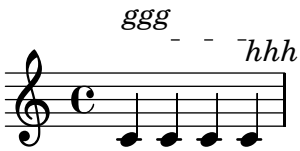
`text` This is a markup that is evaluated to yield the stencil. It is used to put *cresc.*, *tr* and other text on horizontal spanners.

```
\override TextSpanner.bound-details.left.text
   = \markup { \small \bold Slower }
c2\startTextSpan b c a\stopTextSpan
```



`stencil-align-dir-y`
`stencil-offset`
Without setting one of these, the stencil is simply put at the end-point, centered on the line, as defined by the `X` and `Y` sub-properties. Setting either `stencil-align-dir-y` or `stencil-offset` will move the symbol at the edge vertically relative to the end point of the line:

```
\override TextSpanner.bound-details.left.stencil-align-dir-y = #-2
\override TextSpanner.bound-details.right.stencil-align-dir-y = #UP

\override TextSpanner.bound-details.left.text = #"ggg"
\override TextSpanner.bound-details.right.text = #"hhh"
c4^\startTextSpan c c c \stopTextSpan
```



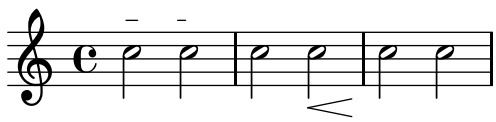
Note that negative values move the text *up*, contrary to the effect that might be expected, as a value of `-1` or `DOWN` means align the *bottom* edge of the text with the spanner line. A value of `1` or `UP` aligns the top edge of the text with the spanner line.

`arrow` Setting this sub-property to `#t` produces an arrowhead at the end of the line.

`padding` This sub-property controls the space between the specified end point of the line and the actual end. Without padding, a glissando would start and end in the center of each note head.

The music function `\endSpanners` terminates the spanner which starts on the immediately following note prematurely. It is terminated after exactly one note, or at the following bar line if `to-barline` is true and a bar line occurs before the next note.

```
\endSpanners
c2 \startTextSpan c2 c2
\endSpanners
c2 \< c2 c2
```



When using `\endSpanners` it is not necessary to close \startTextSpan with \stopTextSpan, nor is it necessary to close hairpins with `\!`.

Vedi anche

Internals Reference: Sezione "TextSpanner" in *Guida al Funzionamento Interno*, Sezione "Glissando" in *Guida al Funzionamento Interno*, Sezione "VoiceFollower" in *Guida al Funzionamento Interno*, Sezione "TrillSpanner" in *Guida al Funzionamento Interno*, Sezione "line-spanner-interface" in *Guida al Funzionamento Interno*.

5.4.6 Visibility of objects

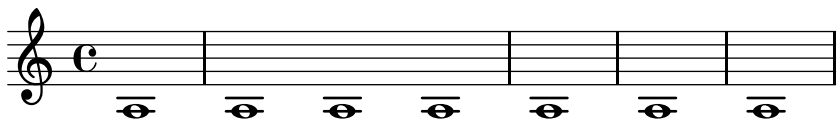
There are four main ways in which the visibility of layout objects can be controlled: their stencil can be removed, they can be made transparent, they can be colored white, or their `break-visibility` property can be overridden. The first three apply to all layout objects; the last to just a few – the *breakable* objects. The Learning Manual introduces these four techniques, see Sezione "Visibility and color of objects" in *Manuale di Apprendimento*.

There are also a few other techniques which are specific to certain layout objects. These are covered under Special considerations.

Removing the stencil

Every layout object has a stencil property. By default this is set to the specific function which draws that object. If this property is overridden to `#f` no function will be called and the object will not be drawn. The default action can be recovered with `\revert`.

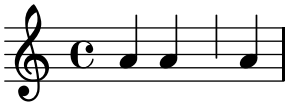
```
a1 a
\override Score.BarLine.stencil = ##f
a a
\revert Score.BarLine.stencil
a a a
```



Making objects transparent

Every layout object has a transparent property which by default is set to `#f`. If set to `#t` the object still occupies space but is made invisible.

```
a4 a
\once \override NoteHead.transparent = ##t
a a
```



Painting objects white

Every layout object has a color property which by default is set to `black`. If this is overridden to `white` the object will be indistinguishable from the white background. However, if the object crosses other objects the color of the crossing points will be determined by the order in which they are drawn, and this may leave a ghostly image of the white object, as shown here:

```
\override Staff.Clef.color = #white
a1
```

This may be avoided by changing the order of printing the objects. All layout objects have a `layer` property which should be set to an integer. Objects with the lowest value of `layer` are drawn first, then objects with progressively higher values are drawn, so objects with higher values overwrite objects with lower values. By default most objects are assigned a `layer` value of `1`, although a few objects, including `StaffSymbol` and `BarLine`, are assigned a value of `0`. The order of printing objects with the same value of `layer` is indeterminate.

In the example above the white clef, with a default `layer` value of `1`, is drawn after the staff lines (default `layer` value `0`), so overwriting them. To change this, the `Clef` object must be given in a lower value of `layer`, say `-1`, so that it is drawn earlier:

```
\override Staff.Clef.color = #white
\override Staff.Clef.layer = #-1
a1
```

Using break-visibility

Most layout objects are printed only once, but some like bar lines, clefs, time signatures and key signatures, may need to be printed twice when a line break occurs – once at the end of the line and again at the start of the next line. Such objects are called *breakable*, and have a property, the `break-visibility` property to control their visibility at the three positions in which they may appear – at the start of a line, within a line if they are changed, and at the end of a line if a change takes place there.

For example, the time signature by default will be printed at the start of the first line, but nowhere else unless it changes, when it will be printed at the point at which the change occurs. If this change occurs at the end of a line the new time signature will be printed at the start of the next line and a cautionary time signature will be printed at the end of the previous line as well.

This behaviour is controlled by the `break-visibility` property, which is explained in Sezione "Visibility and color of objects" in *Manuale di Apprendimento*. This property takes a vector of three booleans which, in order, determine whether the object is printed at the end of, within the body of, or at the beginning of a line. Or to be more precise, before a line break, where there is no line break, or after a line break.

Alternatively, these eight combinations may be specified by pre-defined functions, defined in '`scm/output-lib.scm`', where the last three columns indicate whether the layout objects will be visible in the positions shown at the head of the columns:

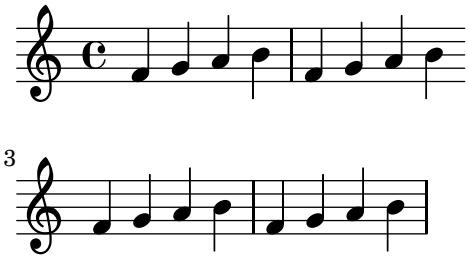
Function form	Vector form	Before break	At no break	After break
`all-visible`	`'#(#t #t #t)`	yes	yes	yes
`begin-of-line-visible`	`'#(#f #f #t)`	no	no	yes
`center-visible`	`'#(#f #t #f)`	no	yes	no
`end-of-line-visible`	`'#(#t #f #f)`	yes	no	no
`begin-of-line-invisible`	`'#(#t #t #f)`	yes	yes	no
`center-invisible`	`'#(#t #f #t)`	yes	no	yes
`end-of-line-invisible`	`'#(#f #t #t)`	no	yes	yes
`all-invisible`	`'#(#f #f #f)`	no	no	no

The default settings of `break-visibility` depend on the layout object. The following table shows all the layout objects of interest which are affected by `break-visibility` and the default setting of this property:

Layout object	Usual context	Default setting
`BarLine`	`Score`	calculated
`BarNumber`	`Score`	`begin-of-line-visible`
`BreathingSign`	`Voice`	`begin-of-line-invisible`
`Clef`	`Staff`	`begin-of-line-visible`
`Custos`	`Staff`	`end-of-line-visible`
`DoublePercentRepeat`	`Voice`	`begin-of-line-invisible`
`KeyCancellation`	`Staff`	`begin-of-line-invisible`
`KeySignature`	`Staff`	`begin-of-line-visible`
`ClefModifier`	`Staff`	`begin-of-line-visible`
`RehearsalMark`	`Score`	`end-of-line-invisible`
`TimeSignature`	`Staff`	`all-visible`

The example below shows the use of the vector form to control the visibility of bar lines:

```
f4 g a b
f4 g a b
% Remove bar line at the end of the current line
\once \override Score.BarLine.break-visibility = ##(#f #t #t)
\break
f4 g a b
f4 g a b
```



Although all three components of the vector used to override `break-visibility` must be present, not all of them are effective with every layout object, and some combinations may even give errors. The following limitations apply:

- Bar lines cannot be printed at start of line.

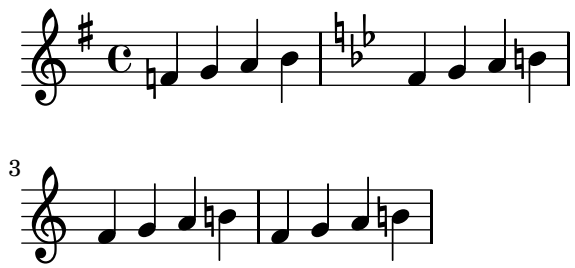
- A bar number cannot be printed at the start of the first line unless it is set to be different from 1.
- Clef – see below
- Double percent repeats are either all printed or all suppressed. Use begin-of line-invisible to print and all-invisible to suppress.
- Key signature – see below
- ClefModifier – see below

Special considerations

Visibility following explicit changes

The `break-visibility` property controls the visibility of key signatures and changes of clef only at the start of lines, i.e. after a break. It has no effect on the visibility of the key signature or clef following an explicit key change or an explicit clef change within or at the end of a line. In the following example the key signature following the explicit change to B-flat major is still visible, even though `all-invisible` is set.

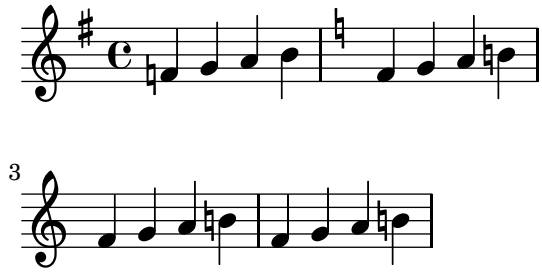
```
\key g \major
f4 g a b
% Try to remove all key signatures
\override Staff.KeySignature.break-visibility = #all-invisible
\key bes \major
f4 g a b
\break
f4 g a b
f4 g a b
```



The visibility of such explicit key signature and clef changes is controlled by the `explicitKeySignatureVisibility` and `explicitClefVisibility` properties. These are the equivalent of the `break-visibility` property and both take a vector of three booleans or the predefined functions listed above, exactly like `break-visibility`. Both are properties of the Staff context, not the layout objects themselves, and so they are set using the `\set` command. Both are set by default to `all-visible`. These properties control only the visibility of key signatures and clefs resulting from explicit changes and do not affect key signatures and clefs at the beginning of lines; `break-visibility` must still be overridden in the appropriate object to remove these.

```
\key g \major
f4 g a b
\set Staff.explicitKeySignatureVisibility = #all-invisible
\override Staff.KeySignature.break-visibility = #all-invisible
\key bes \major
f4 g a b \break
f4 g a b
```

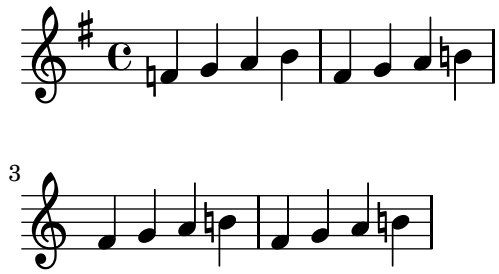
```
f4 g a b
```



Visibility of cancelling accidentals

To remove the cancelling accidentals printed at an explicit key change, set the Staff context property `printKeyCancellation` to `#f`:

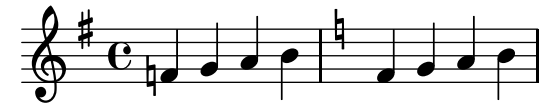
```
\key g \major
f4 g a b
\set Staff.explicitKeySignatureVisibility = #all-invisible
\set Staff.printKeyCancellation = ##f
\override Staff.KeySignature.break-visibility = #all-invisible
\key bes \major
f4 g a b \break
f4 g a b
f4 g a b
```

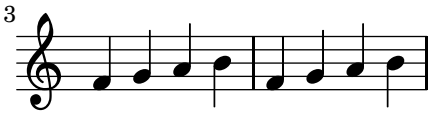


With these overrides only the accidentals before the notes remain to indicate the change of key.

Note that when changing the key to C major or A minor the cancelling accidentals would be the *only* indication of the key change. In this case setting `printKeyCancellation` to `#f` has no effect:

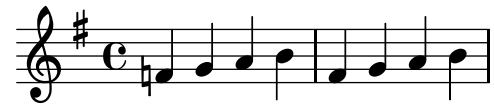
```
\key g \major
f4 g a b
\set Staff.explicitKeySignatureVisibility = #all-invisible
\set Staff.printKeyCancellation = ##f
\key c \major
f4 g a b \break
f4 g a b
f4 g a b
```

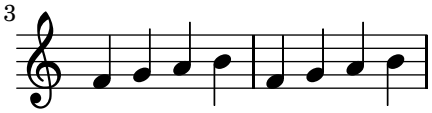




To suppress the cancelling accidentals even when the key is changed to C major or A minor, override the visibility of the `KeyCancellation` grob instead:

```
\key g \major
f4 g a b
\set Staff.explicitKeySignatureVisibility = #all-invisible
\override Staff.KeyCancellation.break-visibility = #all-invisible
\key c \major
f4 g a b \break
f4 g a b
f4 g a b
```





Automatic bars

As a special case, the printing of bar lines can also be turned off by setting the `automaticBars` property in the Score context. If set to `#f`, bar lines will not be printed automatically; they must be explicitly created with a `\bar` command. Unlike the `\cadenzaOn` predefined command, measures are still counted. Bar generation will resume according to that count if this property is later set to `#t`. When set to `#f`, line breaks can occur only at explicit `\bar` commands.

Transposed clefs

The small transposition symbol on transposed clefs is produced by the `ClefModifier` layout object. Its visibility is automatically inherited from the `Clef` object, so it is not necessary to apply any required `break-visibility` overrides to the `ClefModifier` layout objects to suppress transposition symbols for invisible clefs.

For explicit clef changes, the `explicitClefVisibility` property controls both the clef symbol and any transposition symbol associated with it.

Vedi anche

Learning Manual: Sezione “Visibility and color of objects” in *Manuale di Apprendimento*.

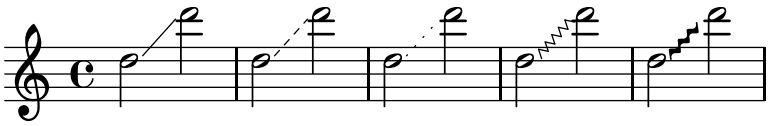
5.4.7 Line styles

Some performance indications, e.g., *rallentando* and *accelerando* and *trills* are written as text and are extended over many measures with lines, sometimes dotted or wavy.

These all use the same routines as the glissando for drawing the texts and the lines, and tuning their behavior is therefore also done in the same way. It is done with a spanner, and the routine responsible for drawing the spanners is `ly:line-interface::print`. This routine determines the exact location of the two *span points* and draws a line between them, in the style requested.

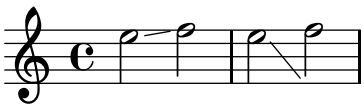
Here is an example showing the different line styles available, and how to tune them.

```
d2 \glissando d'2
\once \override Glissando.style = #'dashed-line
d,2 \glissando d'2
\override Glissando.style = #'dotted-line
d,2 \glissando d'2
\override Glissando.style = #'zigzag
d,2 \glissando d'2
\override Glissando.style = #'trill
d,2 \glissando d'2
```



The locations of the end-points of the spanner are computed on-the-fly for every graphic object, but it is possible to override these:

```
e2 \glissando f
\once \override Glissando.bound-details.right.Y = #-2
e2 \glissando f
```



The value for `Y` is set to `-2` for the right end point. The left side may be similarly adjusted by specifying `left` instead of `right`.

If `Y` is not set, the value is computed from the vertical position of the left and right attachment points of the spanner.

Other adjustments of spanners are possible, for details, see Sezione 5.4.5 [Spanners], pagina 587.

5.4.8 Rotating objects

Both layout objects and elements of markup text can be rotated by any angle about any point, but the method of doing so differs.

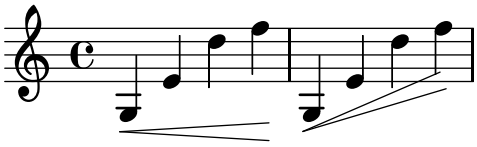
Rotating layout objects

All layout objects which support the `grob-interface` can be rotated by setting their `rotation` property. This takes a list of three items: the angle of rotation counter-clockwise, and the x and y coordinates of the point relative to the object's reference point about which the rotation is to be performed. The angle of rotation is specified in degrees and the coordinates in staff-spaces.

The angle of rotation and the coordinates of the rotation point must be determined by trial and error.

There are only a few situations where the rotation of layout objects is useful; the following example shows one situation where they may be:

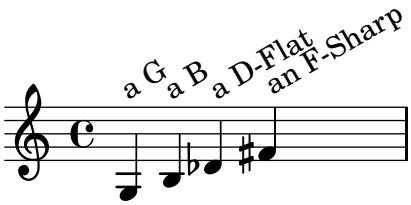
```
g4\< e' d' f\!
\override Hairpin.rotation = #'(20 -1 0)
g,,4\< e' d' f\!
```



Rotating markup

All markup text can be rotated to lie at any angle by prefixing it with the `\rotate` command. The command takes two arguments: the angle of rotation in degrees counter-clockwise and the text to be rotated. The extents of the text are not rotated: they take their values from the extremes of the x and y coordinates of the rotated text. In the following example the `outside-staff-priority` property for text is set to `#f` to disable the automatic collision avoidance, which would push some of the text too high.

```
\override TextScript.outside-staff-priority = ##f
g4^\markup { \rotate #30 "a G" }
b^\markup { \rotate #30 "a B" }
des^\markup { \rotate #30 "a D-Flat" }
fis^\markup { \rotate #30 "an F-Sharp" }
```



5.5 Advanced tweaks

This section discusses various approaches to fine tuning the appearance of the printed score.

Vedi anche

Learning Manual: Sezione “Tweaking output” in *Manuale di Apprendimento*, Sezione “Other sources of information” in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.2 [Explaining the Internals Reference], pagina 572, Sezione 5.3 [Modifying properties], pagina 575.

Extending LilyPond: Sezione “Interfaces for programmers” in *Estendere*.

Installed Files: ‘`scm/define-grobs.scm`’.

Snippets: Sezione “Tweaks and overrides” in *Frammenti di codice*.

Internals Reference: Sezione “All layout objects” in *Guida al Funzionamento Interno*.

5.5.1 Aligning objects

Graphical objects which support the `self-alignment-interface` and/or the `side-position-interface` can be aligned to a previously placed object in a variety of ways. For a list of these objects, see Sezione “self-alignment-interface” in *Guida al Funzionamento Interno* and Sezione “side-position-interface” in *Guida al Funzionamento Interno*.

All graphical objects have a reference point, a horizontal extent and a vertical extent. The horizontal extent is a pair of numbers giving the displacements from the reference point of the left and right edges, displacements to the left being negative. The vertical extent is a pair of numbers giving the displacement from the reference point to the bottom and top edges, displacements down being negative.

An object’s position on a staff is given by the values of the `X-offset` and `Y-offset` properties. The value of `X-offset` gives the displacement from the X coordinate of the reference point of

the parent object, and the value of `Y-offset` gives the displacement from the center line of the staff. The values of `X-offset` and `Y-offset` may be set directly or may be set to be calculated by procedures in order to achieve alignment with the parent object.

Nota: Many objects have special positioning considerations which cause any setting of `X-offset` or `Y-offset` to be ignored or modified, even though the object supports the `self-alignment-interface`. Overriding the `X-offset` or `Y-offset` properties to a fixed value causes the respective `self-alignment` property to be disregarded.

For example, an accidental can be repositioned vertically by setting `Y-offset` but any changes to `X-offset` have no effect.

Rehearsal marks may be aligned with breakable objects such as bar lines, clef symbols, time signature symbols and key signatures. There are special properties to be found in the `break-aligned-interface` for positioning rehearsal marks on such objects.

Vedi anche

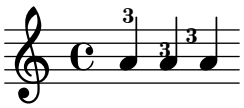
Notation Reference: [Using the break-alignable-interface], pagina 602.

Extending LilyPond: Sezione “Callback functions” in *Estendere*.

Setting `X-offset` and `Y-offset` directly

Numerical values may be given to the `X-offset` and `Y-offset` properties of many objects. The following example shows three notes with the default fingering position and the positions with `X-offset` and `Y-offset` modified.

```
a-3
a
-\tweak X-offset #0
-\tweak Y-offset #0
-3
a
-\tweak X-offset #-1
-\tweak Y-offset #1
-3
```



Using the `side-position-interface`

An object which supports the `side-position-interface` can be placed next to its parent object so that the specified edges of the two objects touch. The object may be placed above, below, to the right or to the left of the parent. The parent cannot be specified; it is determined by the order of elements in the input stream. Most objects have the associated note head as their parent.

The values of the `side-axis` and `direction` properties determine where the object is to be placed, as follows:

`side-axis` **property**	`direction` **property**	**Placement**
`0`	`-1`	left

0	1	right
1	-1	below
1	1	above

When side-axis is 0, X-offset should be set to the procedure ly:side-position-interface::x-aligned-side. This procedure will return the correct value of X-offset to place the object to the left or right side of the parent according to value of direction.

When side-axis is 1, Y-offset should be set to the procedure ly:side-position-interface::y-aligned-side. This procedure will return the correct value of Y-offset to place the object to the top or bottom of the parent according to value of direction.

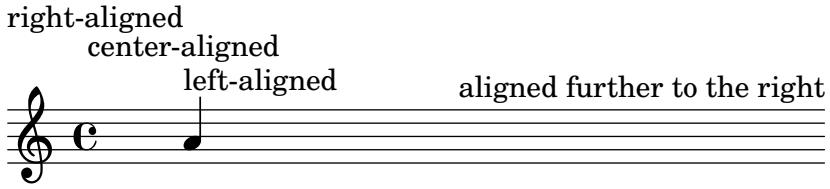
Using the self-alignment-interface

Self-aligning objects horizontally

The horizontal alignment of an object which supports the self-alignment-interface is controlled by the value of the self-alignment-X property, provided the object's X-offset property is set to ly:self-alignment-interface::x-aligned-on-self. self-alignment-X may be given any real value, in units of half the total X extent of the object. Negative values move the object to the right, positive to the left. A value of 0 centers the object on the reference point of its parent, a value of -1 aligns the left edge of the object on the reference point of its parent, and a value of 1 aligns the right edge of the object on the reference point of its parent. The symbols LEFT, CENTER, and RIGHT may be used instead of the values -1, 0, and 1, respectively.

Normally the \override command would be used to modify the value of self-alignment-X, but the \tweak command can be used to separately align several annotations on a single note:

```
a'
-\tweak self-alignment-X #-1
^"left-aligned"
-\tweak self-alignment-X #0
^"center-aligned"
-\tweak self-alignment-X #RIGHT
^"right-aligned"
-\tweak self-alignment-X #-2.5
^"aligned further to the right"
```



Self-aligning objects vertically

Objects may be aligned vertically in an analogous way to aligning them horizontally if the Y-offset property is set to ly:self-alignment-interface::y-aligned-on-self. However, other mechanisms are often involved in vertical alignment: the value of Y-offset is just one variable taken into account. This may make adjusting the value of some objects tricky. The units are just half the vertical extent of the object, which is usually quite small, so quite large numbers may be required. A value of -1 aligns the lower edge of the object with the reference point of the parent object, a value of 0 aligns the center of the object with the reference point

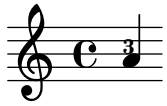
of the parent, and a value of 1 aligns the top edge of the object with the reference point of the parent. The symbols DOWN, CENTER, and UP may be substituted for -1, 0, and 1, respectively.

Self-aligning objects in both directions

By setting both X-offset and Y-offset, an object may be aligned in both directions simultaneously.

The following example shows how to adjust a fingering mark so that it nestles close to the note head.

```
a
-\tweak self-alignment-X #0.5  % move horizontally left
-\tweak Y-offset #ly:self-alignment-interface::y-aligned-on-self
-\tweak self-alignment-Y #-1  % move vertically up
-3  % third finger
```

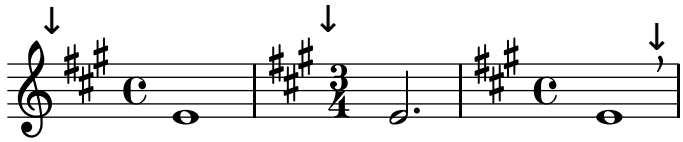


Using the break-alignable-interface

Rehearsal marks and bar numbers may be aligned with notation objects other than bar lines. These objects include ambitus, breathing-sign, clef, custos, staff-bar, left-edge, key-cancellation, key-signature, and time-signature.

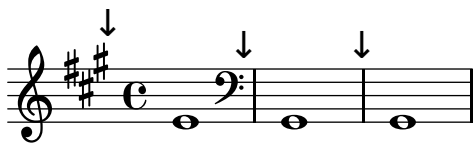
Each type of object has its own default reference point, to which rehearsal marks are aligned:

```
% The rehearsal mark will be aligned to right edge of the Clef
\override Score.RehearsalMark.break-align-symbols = #'(clef)
\key a \major
\clef treble
\mark ""
e1
% The rehearsal mark will be centered above the Time Signature
\override Score.RehearsalMark.break-align-symbols = #'(time-signature)
\key a \major
\clef treble
\time 3/4
\mark ""
e2.
% The rehearsal mark will be centered above the Breath Mark
\override Score.RehearsalMark.break-align-symbols = #'(breathing-sign)
\key a \major
\clef treble
\time 4/4
e1
\breathe
\mark ""
```



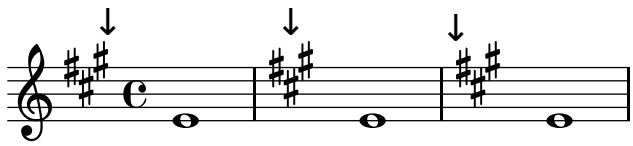
A list of possible target alignment objects may be specified. If some of the objects are invisible at that point due to the setting of `break-visibility` or the explicit visibility settings for keys and clefs, the rehearsal mark or bar number is aligned to the first object in the list which is visible. If no objects in the list are visible the object is aligned to the bar line. If the bar line is invisible the object is aligned to the place where the bar line would be.

```
% The rehearsal mark will be aligned to the right edge of the Key Signature
\override Score.RehearsalMark.break-align-symbols = #'(key-signature clef)
\key a \major
\clef treble
\mark ""
e1
% The rehearsal mark will be aligned to the right edge of the Clef
\set Staff.explicitKeySignatureVisibility = #all-invisible
\override Score.RehearsalMark.break-align-symbols = #'(key-signature clef)
\key a \major
\clef bass
\mark ""
gis,,1
% The rehearsal mark will be centered above the Bar Line
\set Staff.explicitKeySignatureVisibility = #all-invisible
\set Staff.explicitClefVisibility = #all-invisible
\override Score.RehearsalMark.break-align-symbols = #'(key-signature clef)
\key a \major
\clef treble
\mark ""
e''1
```



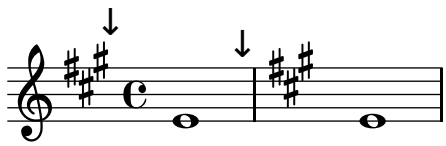
The alignment of the rehearsal mark relative to the notation object can be changed, as shown in the following example. In a score with multiple staves, this setting should be done for all the staves.

```
% The RehearsalMark will be aligned with the right edge of the Key Signature
\override Score.RehearsalMark.break-align-symbols = #'(key-signature)
\key a \major
\clef treble
\time 4/4
\mark ""
e1
% The RehearsalMark will be centered above the Key Signature
\once \override Score.KeySignature.break-align-anchor-alignment = #CENTER
\mark ""
\key a \major
e1
% The RehearsalMark will be aligned with the left edge of the Key Signature
\once \override Score.KeySignature.break-align-anchor-alignment = #LEFT
\key a \major
\mark ""
e1
```



The rehearsal mark can also be offset to the right or left of the left edge by an arbitrary amount. The units are staff-spaces:

```
% The RehearsalMark will be aligned with the left edge of the Key Signature
% and then shifted right by 3.5 staff-spaces
\override Score.RehearsalMark.break-align-symbols = #'(key-signature)
\once \override Score.KeySignature.break-align-anchor = #3.5
\key a \major
\mark ""
e1
% The RehearsalMark will be aligned with the left edge of the Key Signature
% and then shifted left by 2 staff-spaces
\once \override Score.KeySignature.break-align-anchor = #-2
\key a \major
\mark ""
e1
```



5.5.2 Vertical grouping of grobs

The VerticalAlignment and VerticalAxisGroup grobs work together. VerticalAxisGroup groups together different grobs like Staff, Lyrics, etc. VerticalAlignment then vertically aligns the different grobs grouped together by VerticalAxisGroup. There is usually only one VerticalAlignment per score but every Staff, Lyrics, etc. has its own VerticalAxisGroup.

5.5.3 Modifying stencils

All layout objects have a `stencil` property which is part of the `grob-interface`. By default, this property is usually set to a function specific to the object that is tailor-made to render the symbol which represents it in the output. For example, the standard setting for the `stencil` property of the `MultiMeasureRest` object is `ly:multi-measure-rest::print`.

The standard symbol for any object can be replaced by modifying the `stencil` property to reference a different, specially-written, procedure. This requires a high level of knowledge of the internal workings of LilyPond, but there is an easier way which can often produce adequate results.

This is to set the `stencil` property to the procedure which prints text – `ly:text-interface::print` – and to add a `text` property to the object which is set to contain the markup text which produces the required symbol. Due to the flexibility of markup, much can be achieved – see in particular [Graphic notation inside markup], pagina 236.

The following example demonstrates this by changing the note head symbol to a cross within a circle.

```
XinO = {
  \once \override NoteHead.stencil = #ly:text-interface::print
  \once \override NoteHead.text = \markup {
    \combine
      \halign #-0.7 \draw-circle #0.85 #0.2 ##f
      \musicglyph #"noteheads.s2cross"
```

```
  }
}
\relative c'' {
  a a \XinO a a
}
```

Any of the glyphs in the feta Font can be supplied to the `\musicglyph` markup command – see Sezione A.8 [The Feta font], pagina 637.

Vedi anche

Notation Reference: [Graphic notation inside markup], pagina 236, Sezione 1.8.2 [Formatting text], pagina 229, Sezione A.10 [Text markup commands], pagina 659, Sezione A.8 [The Feta font], pagina 637.

5.5.4 Modifying shapes

Modifying ties and slurs

`Ties`, `Slurs`, `PhrasingSlurs`, `LaissezVibrerTies` and `RepeatTies` are all drawn as third-order Bézier curves. If the shape of the tie or slur which is calculated automatically is not optimum, the shape may be modified manually in two ways:

a. by specifying the displacements to be made to the control points of the automatically calculated Bézier curve, or
b. by explicitly specifying the positions of the four control points required to define the wanted curve.

Both methods are explained below. The first method is more suitable if only slight adjustments to the curve are required; the second may be better for creating curves which are related to just a single note.

Cubic Bézier curves

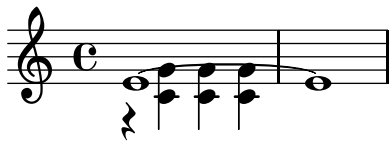
Third-order or cubic Bézier curves are defined by four control points. The first and fourth control points are precisely the starting and ending points of the curve. The intermediate two control points define the shape. Animations showing how the curve is drawn can be found on the web, but the following description may be helpful. The curve starts from the first control point heading directly towards the second, gradually bending over to head towards the third and continuing to bend over to head towards the fourth, arriving there travelling directly from the third control point. The curve is entirely contained in the quadrilateral defined by the four control points. Translations, rotations and scaling of the control points all result in exactly the same operations on the curve.

Specifying displacements from current control points

In this example the automatic placement of the tie is not optimum, and `\tieDown` would not help.

```
<<
  { e1~ e }
\\
  { r4 <g c,> <g c,> <g c,> }
```

```
>>
```



Adjusting the control points of the tie with `\shape` allows the collisions to be avoided.

The syntax of `\shape` is

`[-]\shape` *`displacements item`*

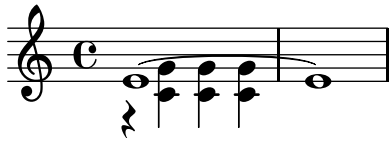
This will reposition the control-points of *item* by the amounts given by *displacements*. The *displacements* argument is a list of number pairs or a list of such lists. Each element of a pair represents the displacement of one of the coordinates of a control-point. If *item* is a string, the result is `\once\override` for the specified grob type. If *item* is a music expression, the result is the same music expression with an appropriate tweak applied.

In other words, the `\shape` function can act as either a `\once\override` command or a `\tweak` command depending on whether the *item* argument is a grob name, like "Slur", or a music expression, like "(". The *displacements* argument specifies the displacements of the four control points as a list of four pairs of (dx . dy) values in units of staff-spaces (or a list of such lists if the curve has more than one segment).

The leading hyphen is required if and only if the `\tweak` form is being used.

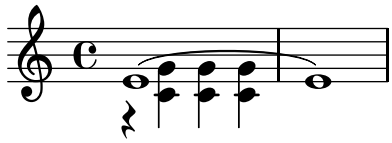
So, using the same example as above and the `\once\override` form of `\shape`, this will raise the tie by half a staff-space:

```
<<
  {
    \shape #'((0 . 0.5) (0 . 0.5) (0 . 0.5) (0 . 0.5)) Tie
    e1~ e
  }
\\
  { r4 <g c,> <g c,> <g c,> }
>>
```



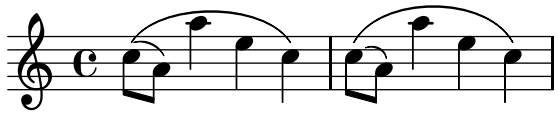
This positioning of the tie is better, but maybe it should be raised more in the center. The following example does this, this time using the alternative `\tweak` form:

```
<<
  {
    e1-\shape #'((0 . 0.5) (0 . 1) (0 . 1) (0 . 0.5)) ~ e
  }
\\
  { r4 <g c,> <g c,> <g c,> }
>>
```



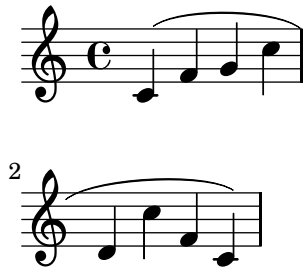
Changes to the horizontal positions of the control points may be made in the same way, and two different curves starting at the same musical moment may also be shaped:

```
c8(\( a) a'4 e c\)
\shape #'((0.7 . -0.4) (0.5 . -0.4) (0.3 . -0.3) (0 . -0.2)) Slur
\shape #'((0 . 0) (0 . 0.5) (0 . 0.5) (0 . 0)) PhrasingSlur
c8(\( a) a'4 e c\)
```



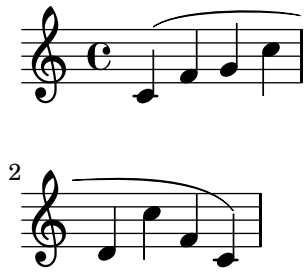
The `\shape` function can also displace the control points of curves which stretch across line breaks. Each piece of the broken curve can be given its own list of offsets. If changes to a particular segment are not needed, the empty list can serve as a placeholder. In this example the line break makes the single slur look like two:

```
c4( f g c
\break
d,4 c' f, c)
```



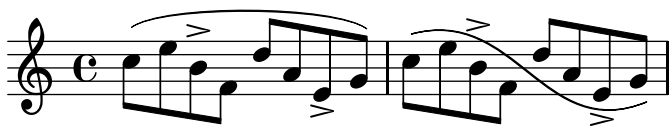
Changing the shapes of the two halves of the slur makes it clearer that the slur continues over the line break:

```
% () may be used as a shorthand for ((0 . 0) (0 . 0) (0 . 0) (0 . 0))
% if any of the segments does not need to be changed
\shape #'(
           (( 0 . 0) (0 . 0) (0 . 0) (0 . 1))
           ((0.5 . 1.5) (1 . 0) (0 . 0) (0 . -1.5))
         ) Slur
c4( f g c
\break
d,4 c' f, c)
```



If an S-shaped curve is required the control points must always be adjusted manually — LilyPond will never select such shapes automatically.

```
c8( e b-> f d' a e-> g)
\shape #'((0 . -1) (5.5 . -0.5) (-5.5 . -10.5) (0 . -5.5)) PhrasingSlur
c8\( e b-> f d' a e-> g\)
```

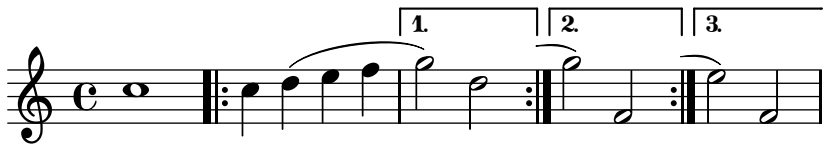


Specifying control points explicitly

The coordinates of the Bézier control points are specified in units of staff-spaces. The X coordinate is relative to the reference point of the note to which the tie or slur is attached, and the Y coordinate is relative to the staff center line. The coordinates are specified as a list of four pairs of decimal numbers (reals). One approach is to estimate the coordinates of the two end points, and then guess the two intermediate points. The optimum values are then found by trial and error. Be aware that these values may need to be manually adjusted if any further changes are made to the music or the layout.

One situation where specifying the control points explicitly is preferable to specifying displacements is when they need to be specified relative to a single note. Here is an example of this. It shows one way of indicating a slur extending into alternative sections of a volta repeat.

```
c1
\repeat volta 3 { c4 d( e f }
\alternative {
  { g2) d }
  {
    g2
    % create a slur and move it to a new position
    % the <> is just an empty chord to carry the slur termination
    -\tweak control-points #'((-2 . 3.8) (-1 . 3.9) (0 . 4) (1 . 3.4)) ( <> )
    f,
  }
  {
    e'2
    % create a slur and move it to a new position
    -\tweak control-points #'((-2 . 3) (-1 . 3.1) (0 . 3.2) (1 . 2.4)) ( <> )
    f,
  }
}
```



Problemi noti e avvertimenti

It is not possible to modify shapes of ties or slurs by changing the `control-points` property if there are multiple ties or slurs at the same musical moment – the `\tweak` command will also not work in this case. However, the `tie-configuration` property of `TieColumn` can be overridden to set start line and direction as required.

Vedi anche

Internals Reference: Sezione "TieColumn" in *Guida al Funzionamento Interno*.

5.5.5 Unpure-pure containers

Unpure-pure containers are useful for overriding *Y-axis* spacing calculations - specifically `Y-offset` and `Y-extent` - with a Scheme function instead of a literal (i.e. a number or pair).

For certain grobs, the `Y-extent` is based on the `stencil` property, overriding the stencil property of one of these will require an additional `Y-extent` override with an unpure-pure container. When a function overrides a `Y-offset` and/or `Y-extent` it is assumed that this will trigger line breaking calculations too early during compilation. So the function is not evaluated at all (usually returning a value of '`0`' or '`'(0 . 0)`') which can result in collisions. A 'pure' function will not affect properties, objects or grob suicides and therefore will always have its Y-axis-related evaluated correctly.

Currently, there are about thirty functions that are already considered 'pure' and Unpure-pure containers are a way to set functions not on this list as 'pure'. The 'pure' function is evaluated *before* any line-breaking and so the horizontal spacing can be adjusted 'in time'. The 'unpure' function is then evaluated *after* line breaking.

Nota: As it is difficult to always know which functions are on this list we recommend that any 'pure' functions you create do not use `Beam` or `VerticalAlignment` grobs.

An unpure-pure container is constructed as follows;

`(ly:make-unpure-pure-container f0 f1)`

where `f0` is a function taking *n* arguments (*n* >= *1*) and the first argument must always be the grob. This is the function that gives the actual result. *f1* is the function being labeled as 'pure' that takes *n* + *2* arguments. Again, the first argument must always still be the grob but the second and third are 'start' and 'end' arguments.

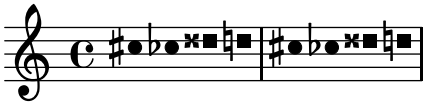
start and *end* are, for all intents and purposes, dummy values that only matter for `Spanners` (i.e `Hairpin` or `Beam`), that can return different height estimations based on a starting and ending column.

The rest are the other arguments to the first function (which may be none if *n* = *1*).

The results of the second function are used as an approximation of the value needed which is then used by the first function to get the real value which is then used for fine-tuning much later during the spacing process.

```
#(define (square-line-circle-space grob)
(let* ((pitch (ly:event-property (ly:grob-property grob 'cause) 'pitch))
      (notename (ly:pitch-notename pitch)))
 (if (= 0 (modulo notename 2))
     (make-circle-stencil 0.5 0.0 #t)
     (make-filled-box-stencil '(0 . 1.0)
                              '(-0.5 . 0.5)))))

squareLineCircleSpace = {
  \override NoteHead.stencil = #square-line-circle-space
}

smartSquareLineCircleSpace = {
  \squareLineCircleSpace
  \override NoteHead.Y-extent =
```

```
   #(ly:make-unpure-pure-container
      ly:grob::stencil-height
      (lambda (grob start end) (ly:grob::stencil-height grob)))
}

\new Voice \with { \remove "Stem_engraver" }
\relative c'' {
  \squareLineCircleSpace
  cis4 ces disis d
  \smartSquareLineCircleSpace
  cis4 ces disis d
}
```



In the first measure, without the unpure-pure container, the spacing engine does not know the width of the note head and lets it collide with the accidentals. In the second measure, with unpure-pure containers, the spacing engine knows the width of the note heads and avoids the collision by lengthening the line accordingly.

Usually for simple calculations nearly-identical functions for both the 'unpure' and 'pure' parts can be used, by only changing the number of arguments passed to, and the scope of, the function.

Nota: If a function is labeled as 'pure' and it turns out not to be, the results can be unexpected.

5.6 Using music functions

Where tweaks need to be reused with different music expressions, it is often convenient to make the tweak part of a *music function*. In this section, we discuss only *substitution* functions, where the object is to substitute a variable into a piece of LilyPond input code. Other more complex functions are described in Sezione "Music functions" in *Estendere*.

5.6.1 Substitution function syntax

Making a function that substitutes a variable into LilyPond code is easy. The general form of these functions is

```
function =
#(define-music-function
     (parser location arg1 arg2 ...)
     (type1? type2? ...)
   #{
     ...music...
   #})
```

where

argN	*n*th argument
typeN?	a scheme *type predicate* for which *argN* must return `#t`.

...music... normal LilyPond input, using `$` (in places where only Lilypond constructs are allowed) or `#` (to use it as a Scheme value or music function argument or music inside of music lists) to reference arguments (eg. '`#arg1`').

The `parser` and `location` arguments are mandatory, and are used in some advanced situations as described in the 'Extending' manual (see Sezione "Music functions" in *Estendere*). For substitution functions, just be sure to include them.

The list of type predicates is also required. Some of the most common type predicates used in music functions are:

```
boolean?
cheap-list?  (use instead of 'list?'
 for faster processing)
ly:duration?
ly:music?
ly:pitch?
markup?
number?
pair?
string?
symbol?
```

For a list of available type predicates, see Sezione A.20 [Predefined type predicates], pagina 757. User-defined type predicates are also allowed.

Vedi anche

Notation Reference: Sezione A.20 [Predefined type predicates], pagina 757.

Extending Lilypond: Sezione "Music functions" in *Estendere*.

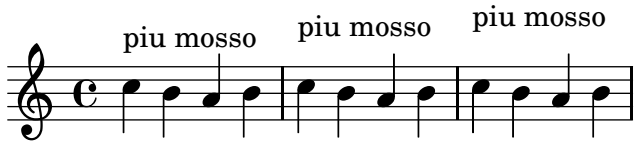
Installed Files: '`lily/music-scheme.cc`', '`scm/c++.scm`', '`scm/lily.scm`'.

5.6.2 Substitution function examples

This section introduces some substitution function examples. These are not intended to be exhaustive, but rather to demonstrate some of the possibilities of simple substitution functions.

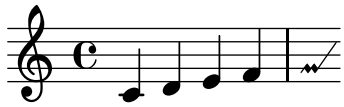
In the first example, a function is defined that simplifies setting the padding of a TextScript:

```
padText =
#(define-music-function
     (parser location padding)
     (number?)
   #{
     \once \override TextScript.padding = #padding
   #})

\relative c'' {
  c4^"piu mosso" b a b
  \padText #1.8
  c4^"piu mosso" b a b
  \padText #2.6
  c4^"piu mosso" b a b
}
```



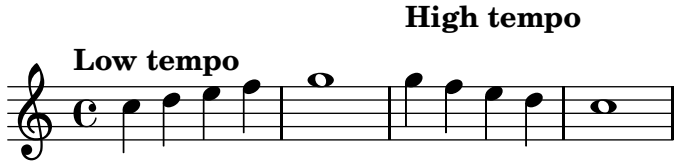
In addition to numbers, we can use music expressions such as notes for arguments to music functions:

```
custosNote =
#(define-music-function
     (parser location note)
     (ly:music?)
   #{
     \tweak NoteHead.stencil #ly:text-interface::print
     \tweak NoteHead.text
        \markup \musicglyph #"custodes.mensural.u0"
     \tweak Stem.stencil ##f
     #note
   #})

\relative c' { c4 d e f \custosNote g }
```



Substitution functions with multiple arguments can be defined:

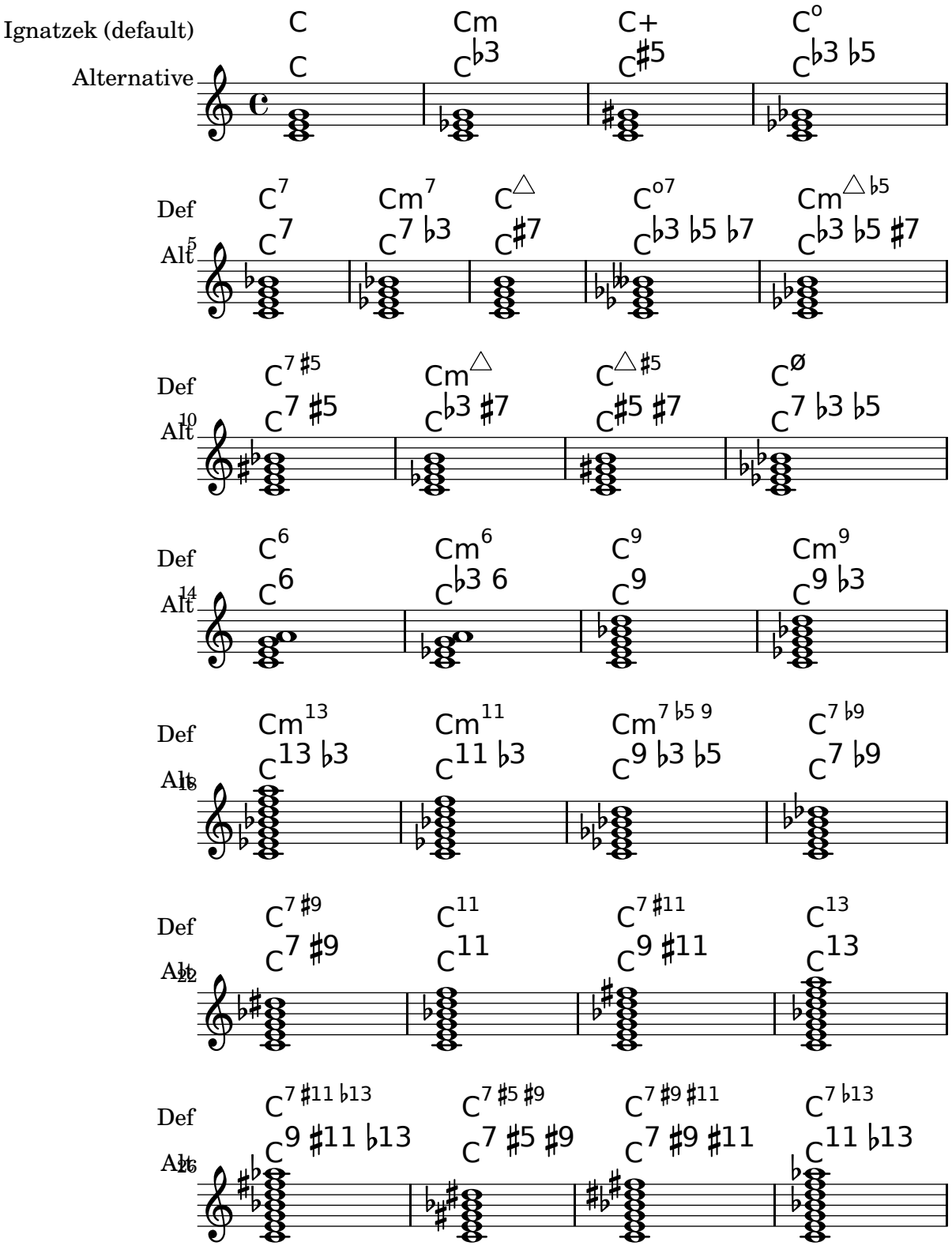
```
tempoPadded =
#(define-music-function
     (parser location padding tempotext)
     (number? markup?)
   #{
     \once \override Score.MetronomeMark.padding = #padding
     \tempo \markup { \bold #tempotext }
   #})

\relative c'' {
  \tempo \markup { "Low tempo" }
  c4 d e f g1
  \tempoPadded #4.0 "High tempo"
  g4 f e d c1
}
```

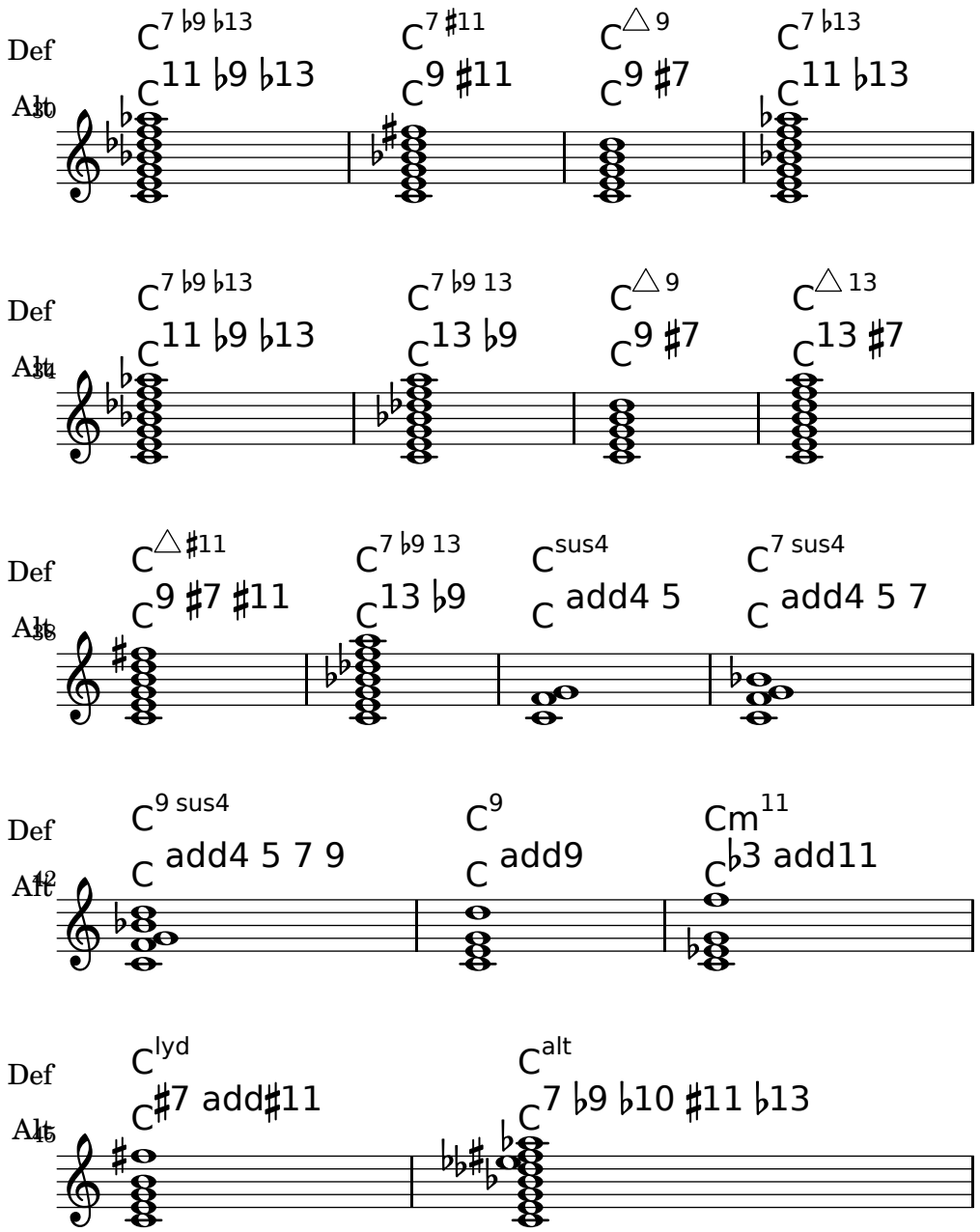


Appendice A Notation manual tables

A.1 Chord name chart

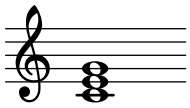
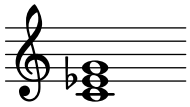
The following chart shows two standard systems for printing chord names, along with the pitches they represent.

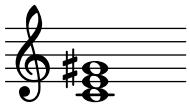
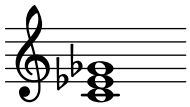
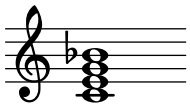
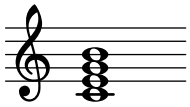
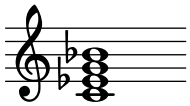
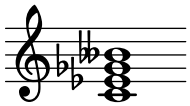
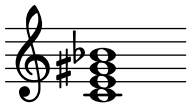
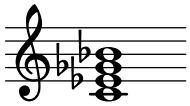
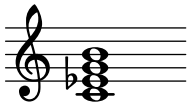
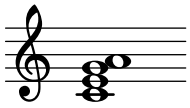


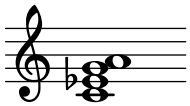
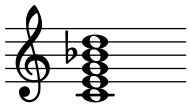
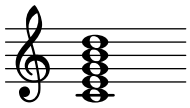
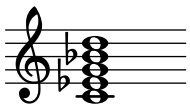
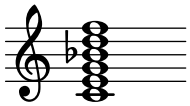
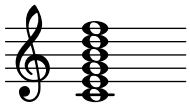
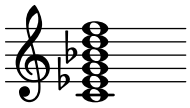
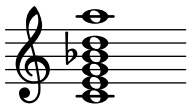
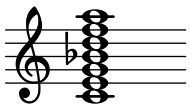
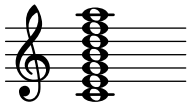


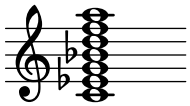
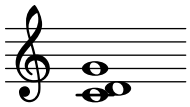
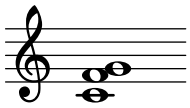
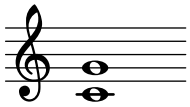
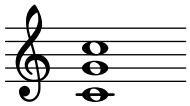
A.2 Common chord modifiers

The following table shows chord modifiers that can be used in `\chordmode` to generate standard chord structures.

Chord type	**Intervals**	**Modifier(s)**	**Example**
Major	Major third, perfect fifth	`5` or nothing	
Minor	Minor third, perfect fifth	`m` or `m5`	

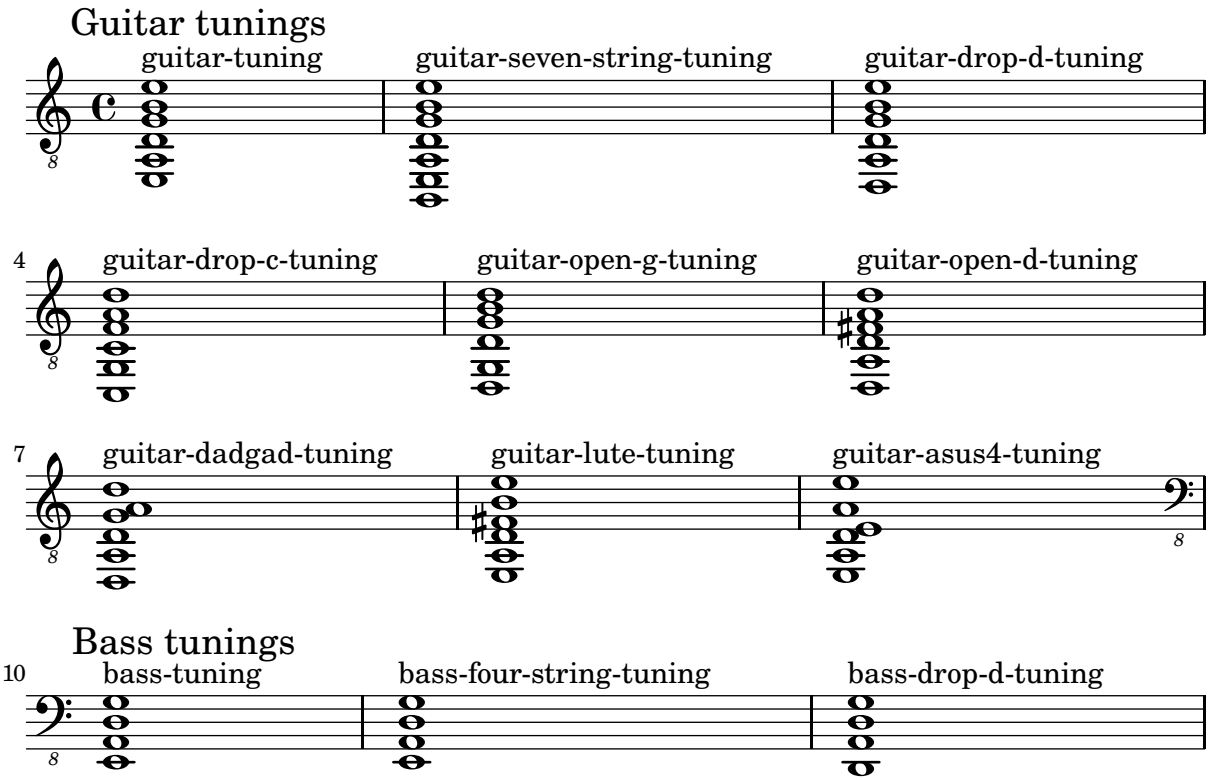
Augmented	Major third, augmented fifth	`aug`	
Diminished	Minor third, diminished fifth	`dim`	
Dominant seventh	Major triad, minor seventh	`7`	
Major seventh	Major triad, major seventh	`maj7` or `maj`	
Minor seventh	Minor triad, minor seventh	`m7`	
Diminished seventh	Diminished triad, diminished seventh	`dim7`	
Augmented seventh	Augmented triad, minor seventh	`aug7`	
Half-diminished seventh	Diminished triad, minor seventh	`m7.5-`	
Minor-major seventh	Minor triad, major seventh	`m7+`	
Major sixth	Major triad, sixth	`6`	

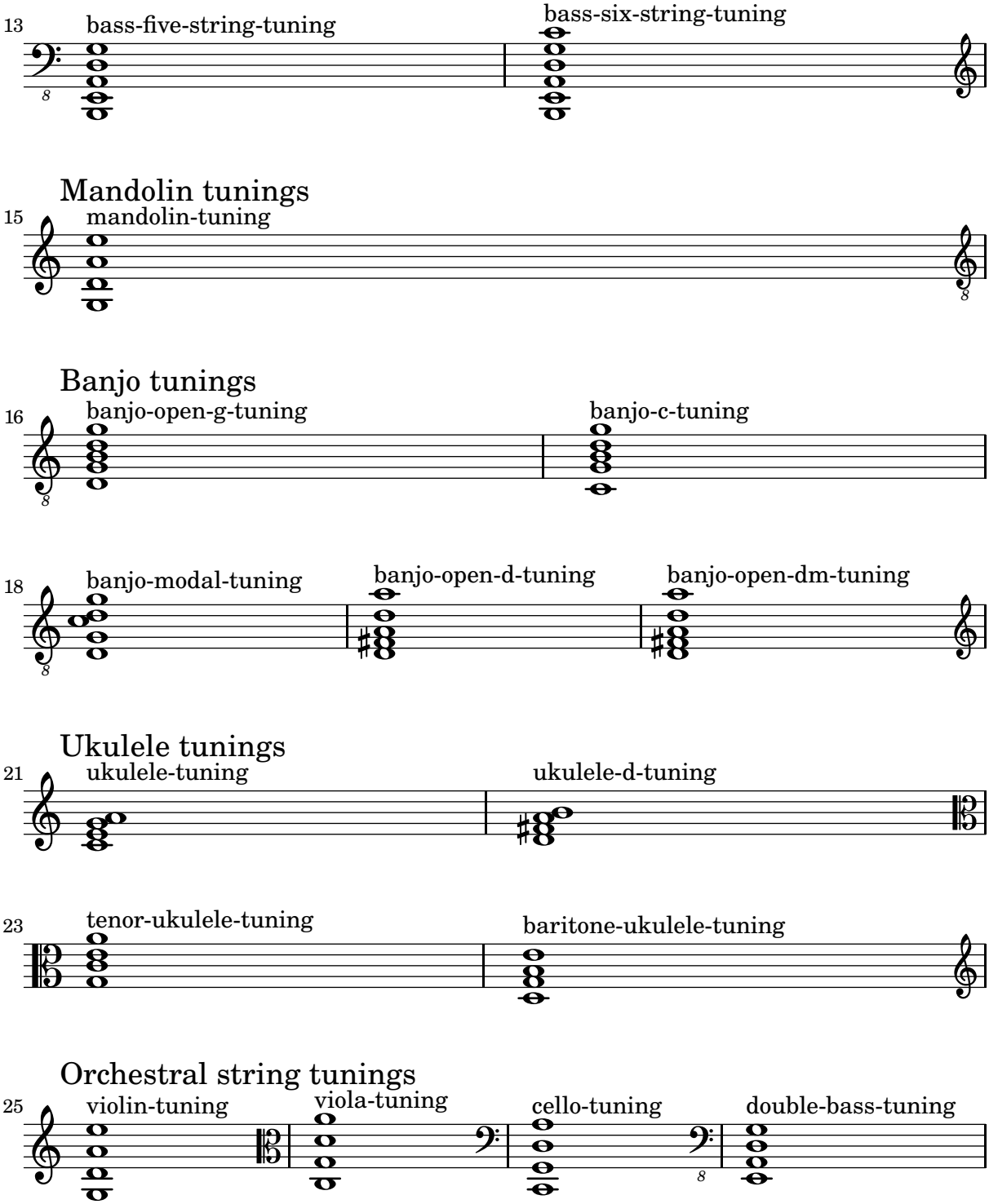
Minor sixth	Minor triad, sixth	`m6`	
Dominant ninth	Dominant seventh, major ninth	`9`	
Major ninth	Major seventh, major ninth	`maj9`	
Minor ninth	Minor seventh, major ninth	`m9`	
Dominant eleventh	Dominant ninth, perfect eleventh	`11`	
Major eleventh	Major ninth, perfect eleventh	`maj11`	
Minor eleventh	Minor ninth, perfect eleventh	`m11`	
Dominant thirteenth	Dominant ninth, major thirteenth	`13`	
Dominant thirteenth	Dominant eleventh, major thirteenth	`13.11`	
Major thirteenth	Major eleventh, major thirteenth	`maj13.11`	

Minor thirteenth	Minor eleventh, major thirteenth	`m13.11`	
Suspended second	Major second, perfect fifth	`sus2`	
Suspended fourth	Perfect fourth, perfect fifth	`sus4`	
Power chord (two-voiced)	Perfect fifth	`1.5`	
Power chord (three-voiced)	Perfect fifth, octave	`1.5.8`	

A.3 Predefined string tunings

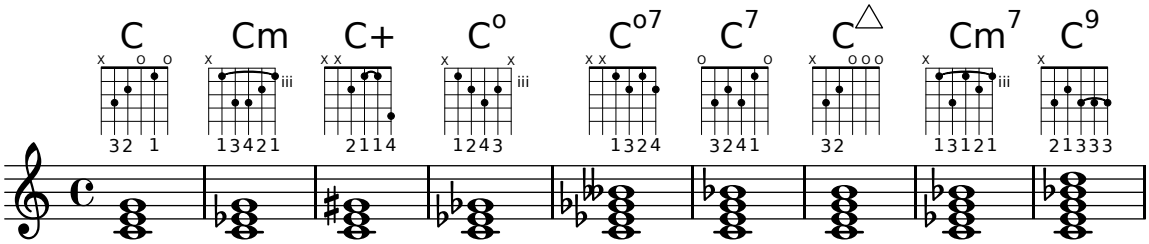
The chart below shows the predefined string tunings.

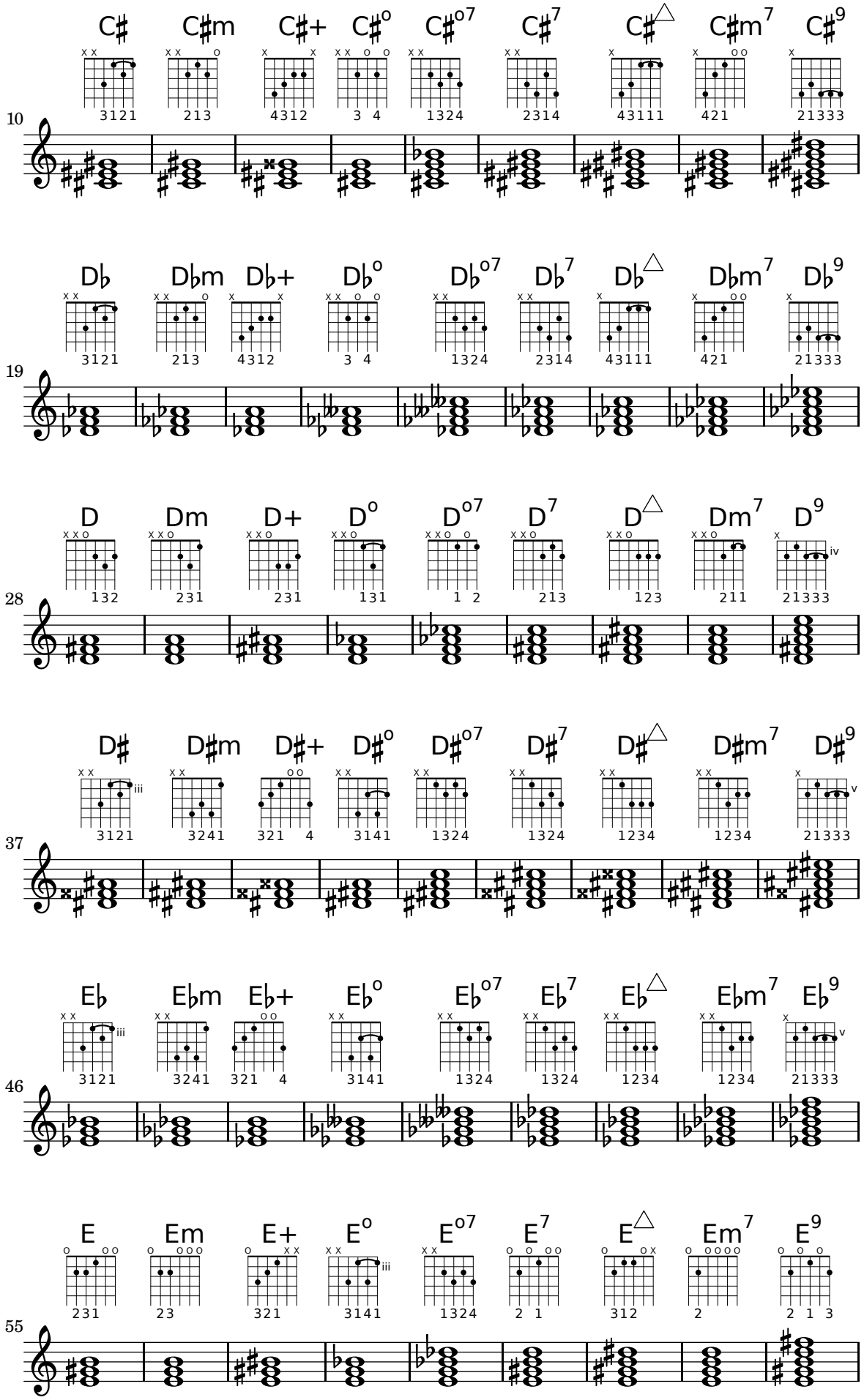


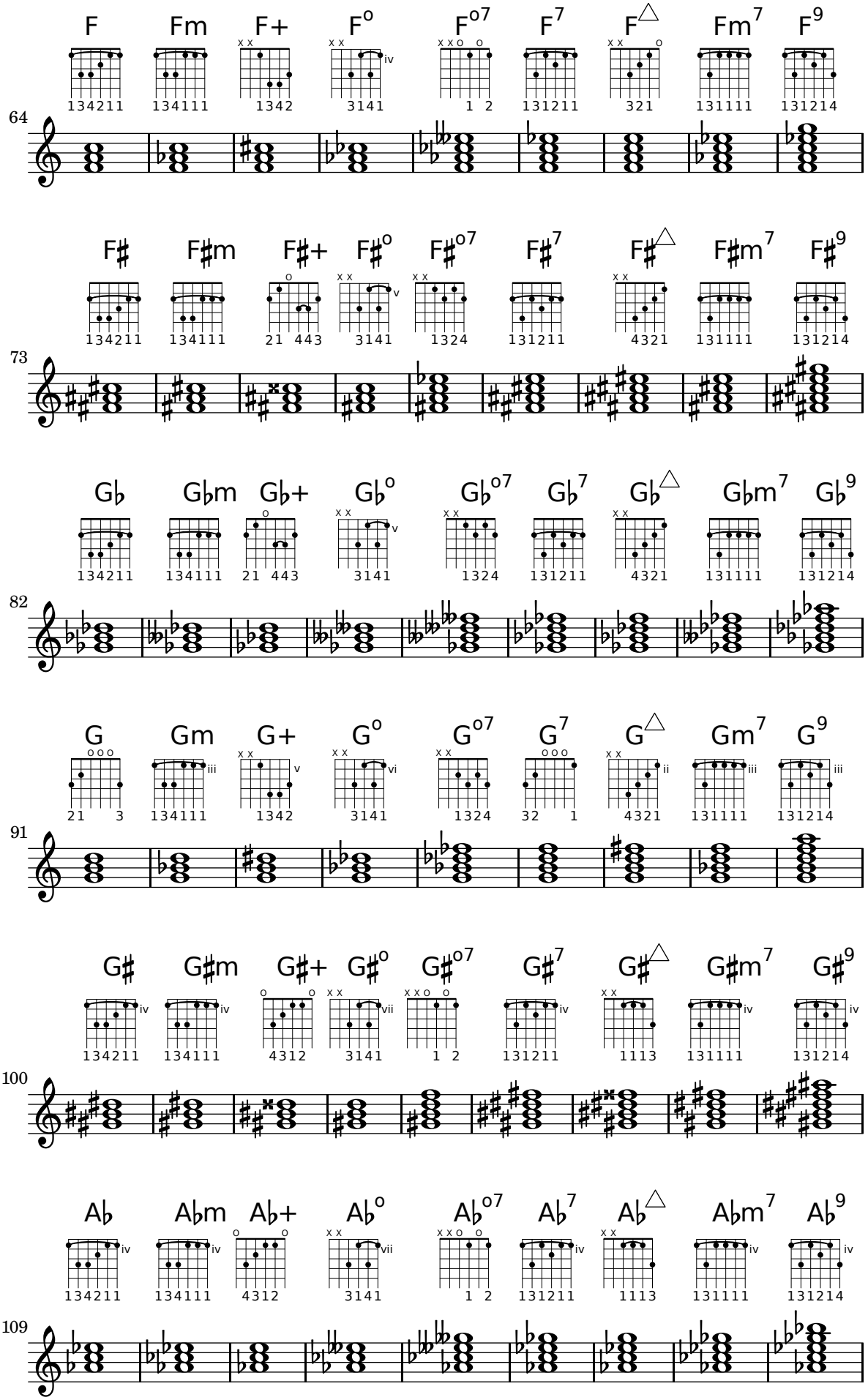


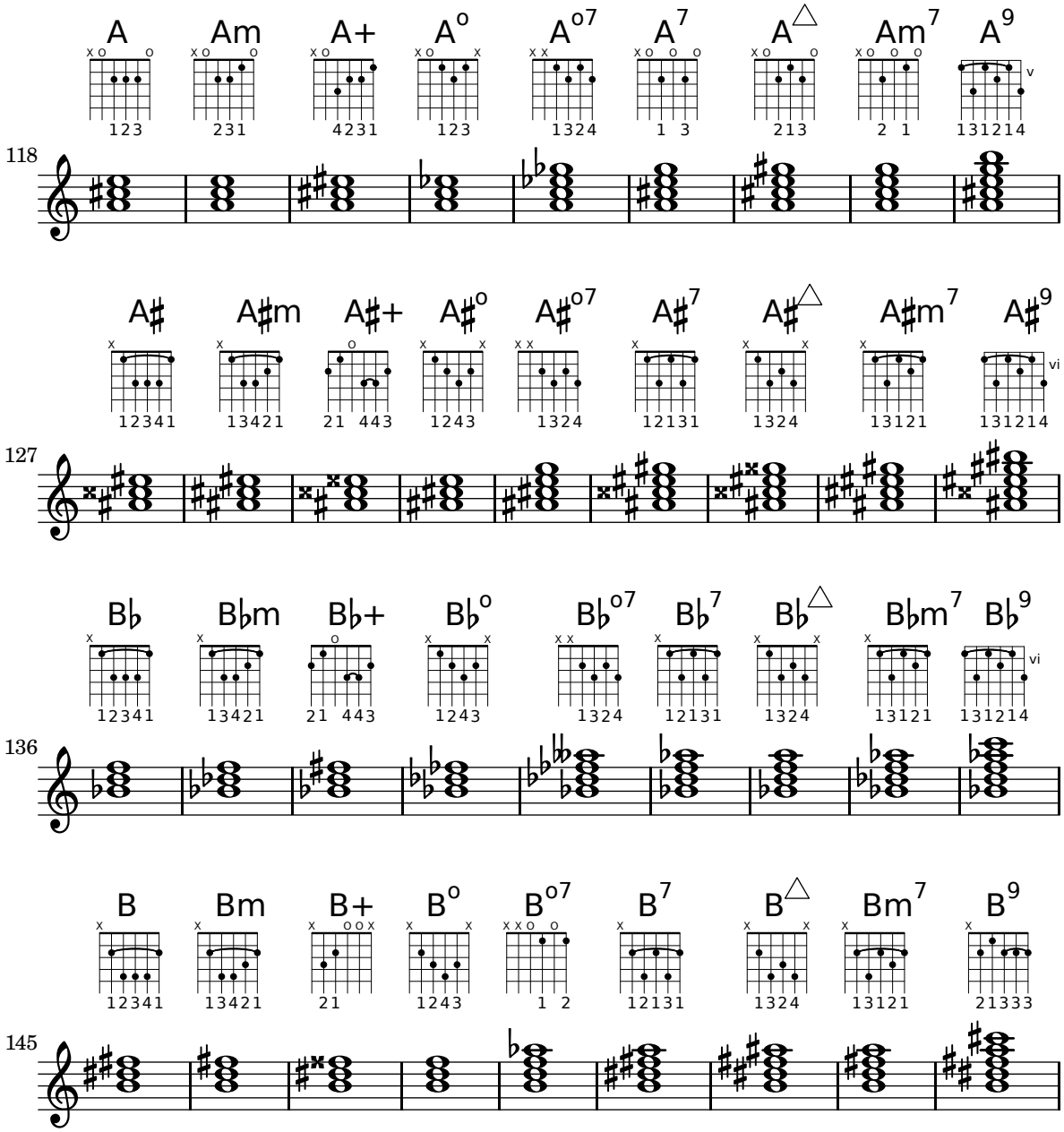
A.4 Predefined fretboard diagrams

The chart below shows the predefined fretboard diagrams for guitar.

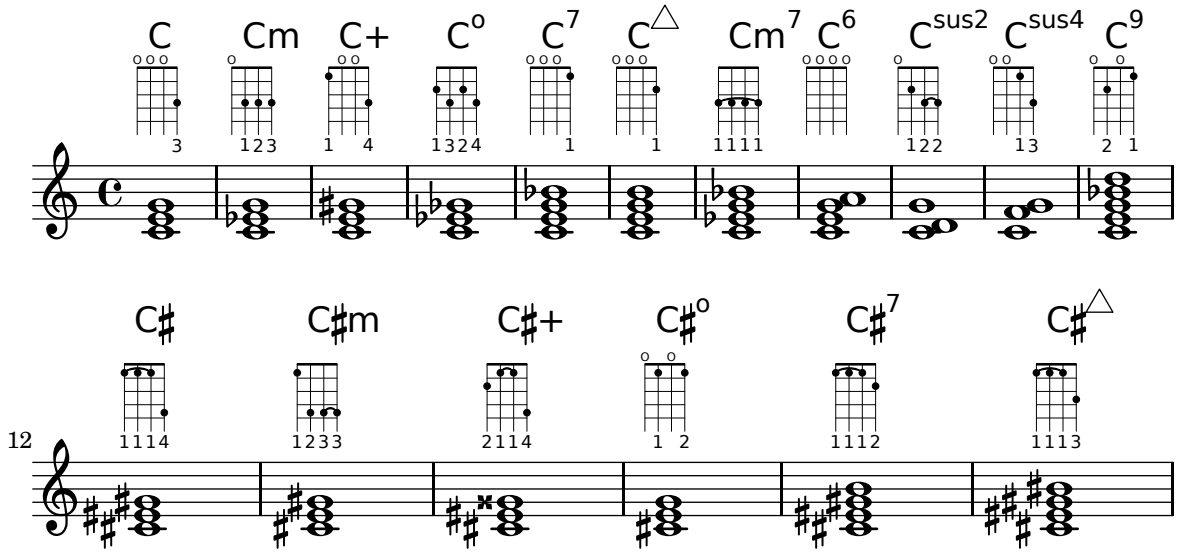


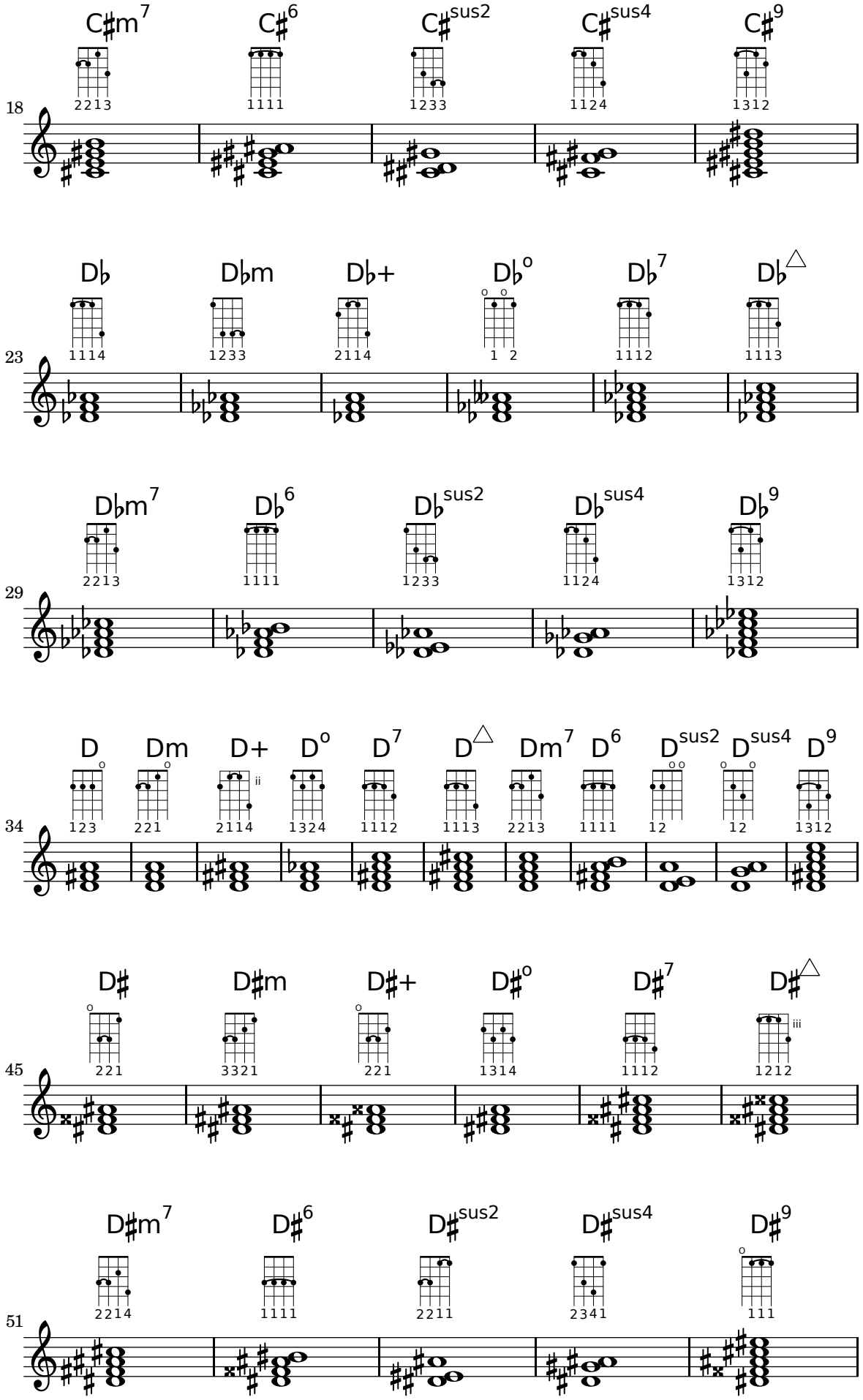

C♯ C♯m C♯+ C♯o C♯o7 C♯7 C♯△ C♯m7 C♯9
3121 213 4312 3 4 1324 2314 43111 421 21333
10
D♭ D♭m D♭+ D♭o D♭o7 D♭7 D♭△ D♭m7 D♭9
3121 213 4312 3 4 1324 2314 43111 421 21333
19
D Dm D+ Do Do7 D7 D△ Dm7 D9
132 231 231 131 1 2 213 123 211 21333
28
D♯ D♯m D♯+ D♯o D♯o7 D♯7 D♯△ D♯m7 D♯9
3121 3241 321 4 3141 1324 1324 1234 1234 21333
37
E♭ E♭m E♭+ E♭o E♭o7 E♭7 E♭△ E♭m7 E♭9
3121 3241 321 4 3141 1324 1324 1234 1234 21333
46
E Em E+ Eo Eo7 E7 E△ Em7 E9
231 23 321 3141 1324 2 1 312 2 2 1 3
55

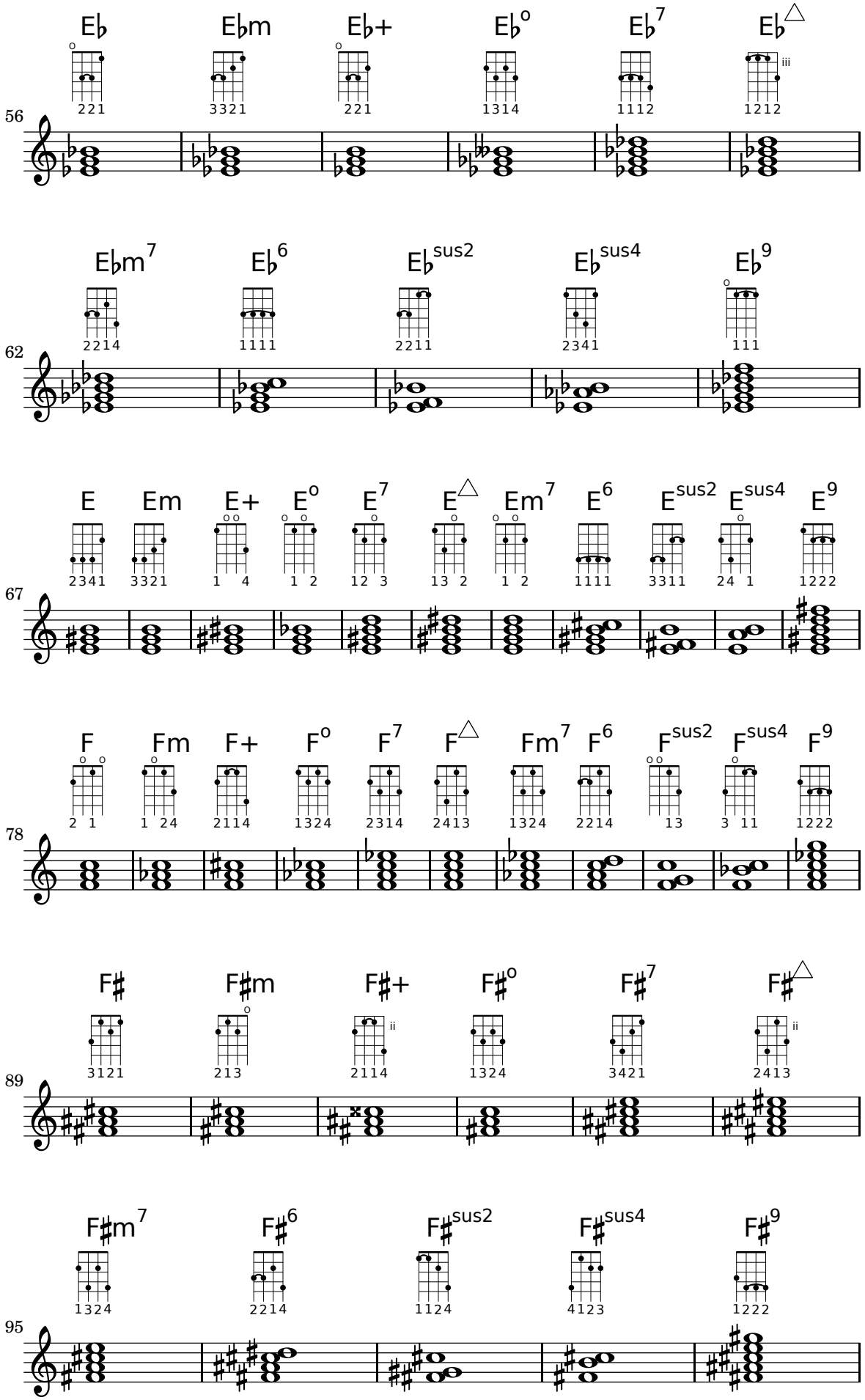

F Fm F+ F° F°7 F7 F△ Fm7 F9
134211 134111 1342 3141 1 2 131211 321 131111 131214
64
F♯ F♯m F♯+ F♯° F♯°7 F♯7 F♯△ F♯m7 F♯9
134211 134111 21 443 3141 1324 131211 4321 131111 131214
73
G♭ G♭m G♭+ G♭° G♭°7 G♭7 G♭△ G♭m7 G♭9
134211 134111 21 443 3141 1324 131211 4321 131111 131214
82
G Gm G+ G° G°7 G7 G△ Gm7 G9
21 3 134111 1342 3141 1324 32 1 4321 131111 131214
91
G♯ G♯m G♯+ G♯° G♯°7 G♯7 G♯△ G♯m7 G♯9
134211 134111 4312 3141 1 2 131211 1113 131111 131214
100
A♭ A♭m A♭+ A♭° A♭°7 A♭7 A♭△ A♭m7 A♭9
134211 134111 4312 3141 1 2 131211 1113 131111 131214
109

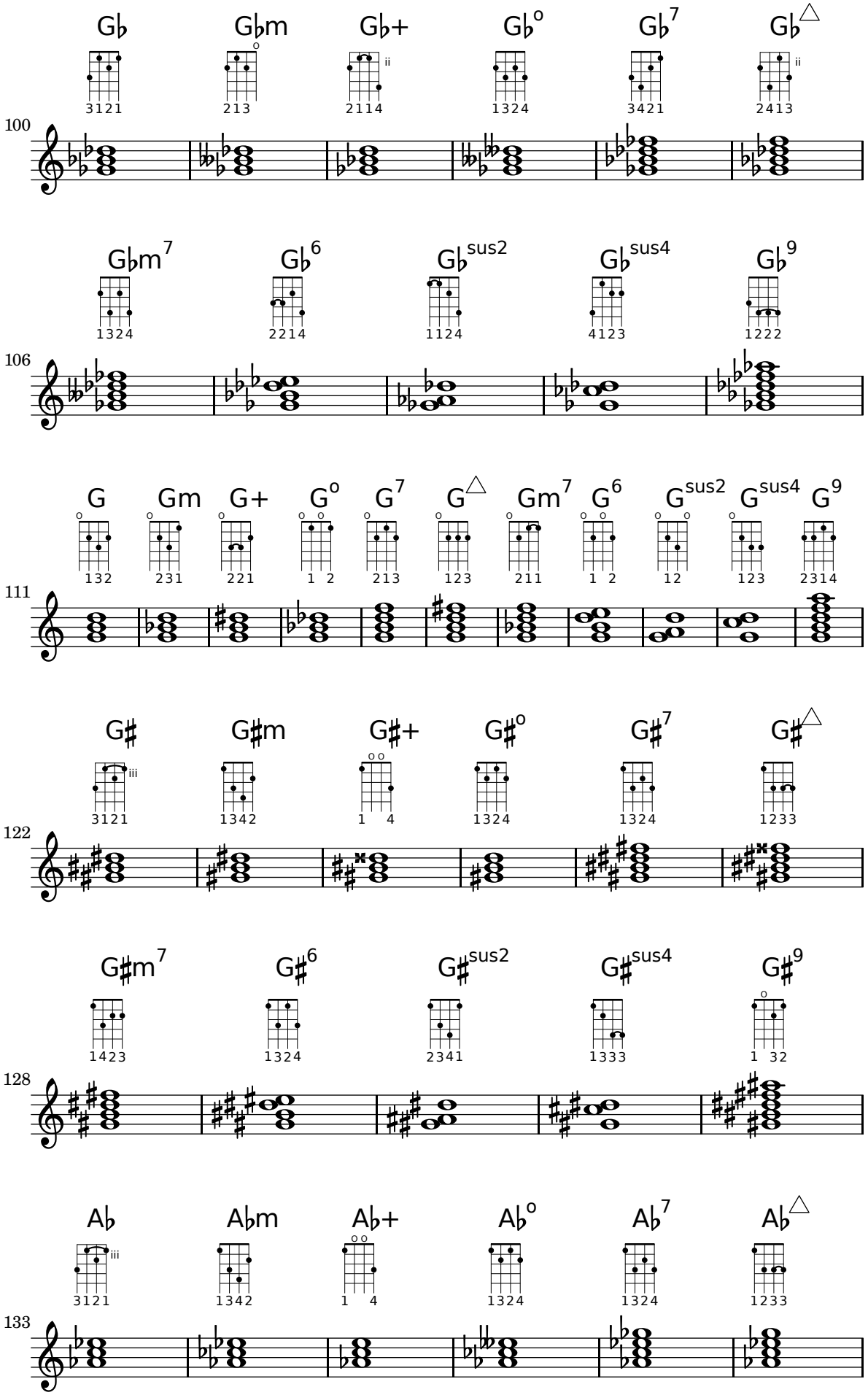


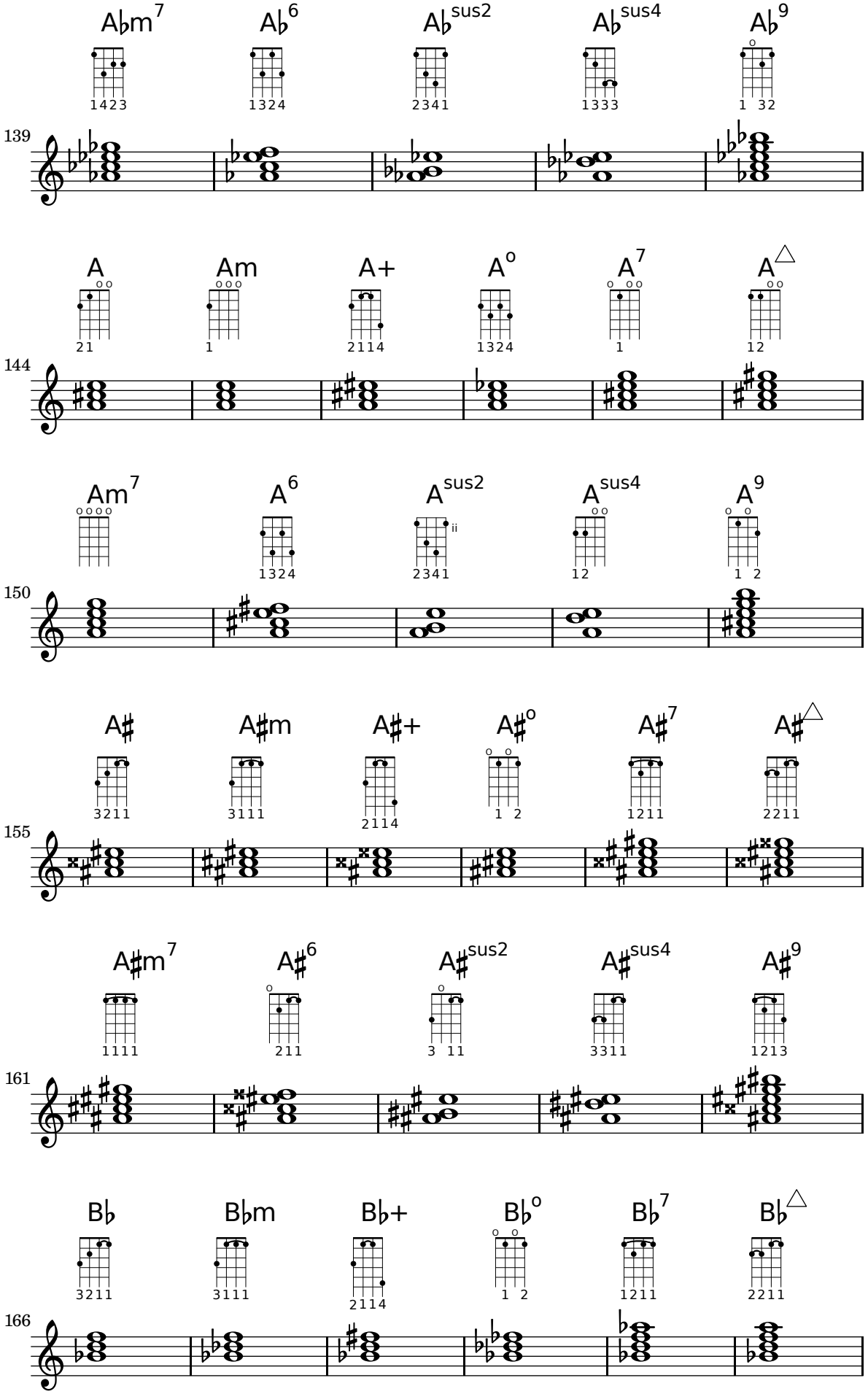
The chart below shows the predefined fretboard diagrams for ukulele.

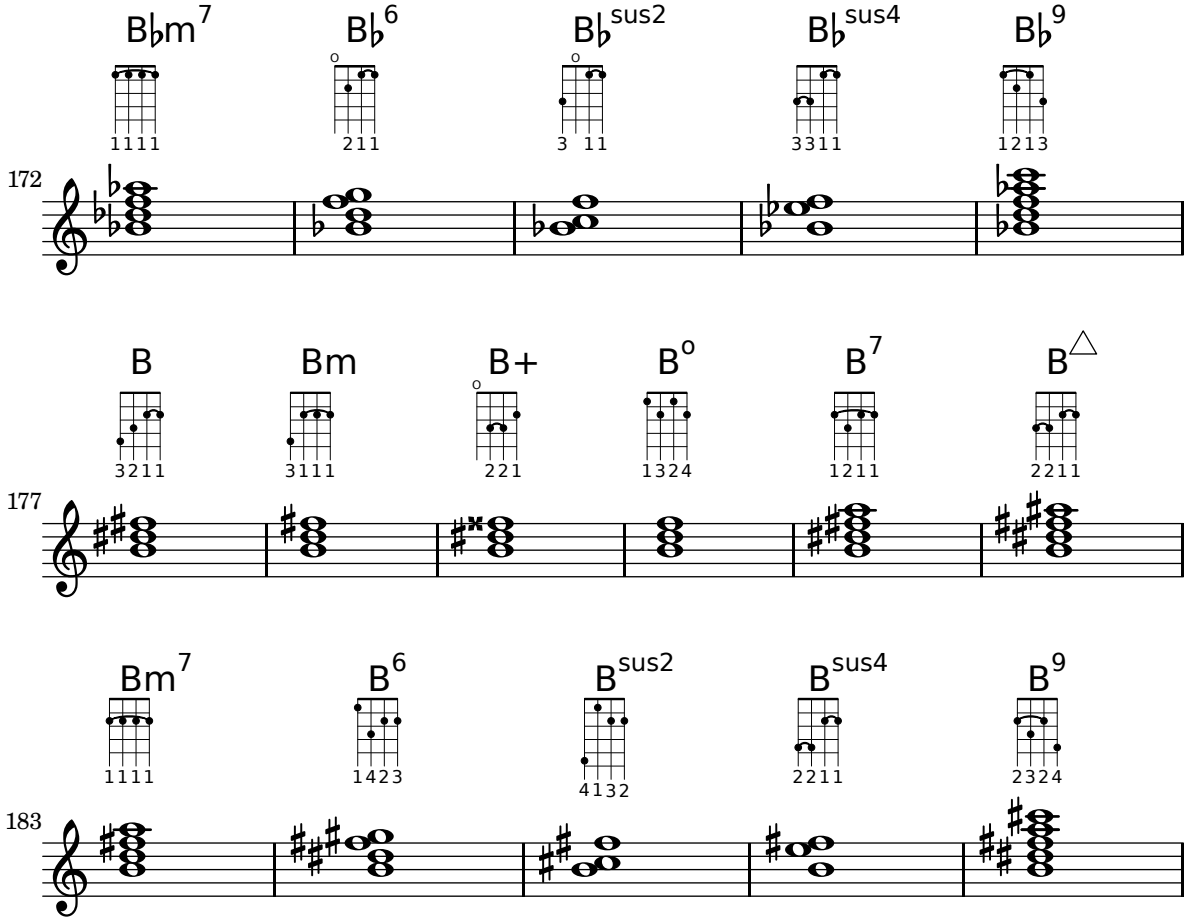



18
C♯m7 2213
C♯6 1111
C♯sus2 1233
C♯sus4 1124
C♯9 1312
23
D♭ 1114
D♭m 1233
D♭+ 2114
D♭o o o 1 2
D♭7 1112
D♭△ 1113
29
D♭m7 2213
D♭6 1111
D♭sus2 1233
D♭sus4 1124
D♭9 1312
34
D o 123
Dm o 221
D+ ii 2114
Do 1324
D7 1112
D△ 1113
Dm7 2213
D6 1111
Dsus2 o o 12
Dsus4 o o 12
D9 1312
45
D♯ o 221
D♯m 3321
D♯+ o 221
D♯o 1314
D♯7 1112
D♯△ iii 1212
51
D♯m7 2214
D♯6 1111
D♯sus2 2211
D♯sus4 2341
D♯9 o 111

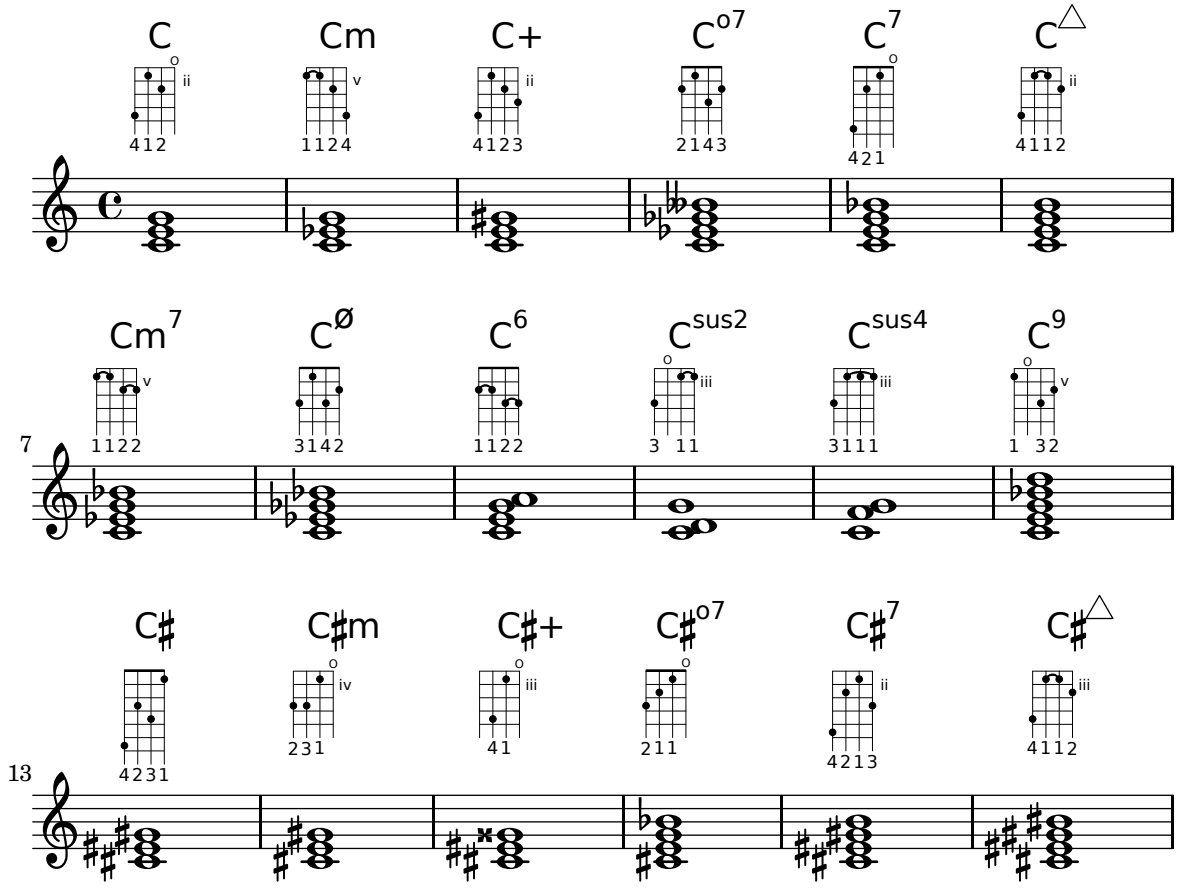

56
E♭ E♭m E♭+ E♭o E♭7 E♭△
221 3321 221 1314 1112 1212
62
E♭m7 E♭6 E♭sus2 E♭sus4 E♭9
2214 1111 2211 2341 111
67
E Em E+ Eo E7 E△ Em7 E6 Esus2 Esus4 E9
2341 3321 1 4 1 2 12 3 13 2 1 2 1111 3311 24 1 1222
78
F Fm F+ Fo F7 F△ Fm7 F6 Fsus2 Fsus4 F9
2 1 1 24 2114 1324 2314 2413 1324 2214 13 3 11 1222
89
F♯ F♯m F♯+ F♯o F♯7 F♯△
3121 213 2114 1324 3421 2413
95
F♯m7 F♯6 F♯sus2 F♯sus4 F♯9
1324 2214 1124 4123 1222

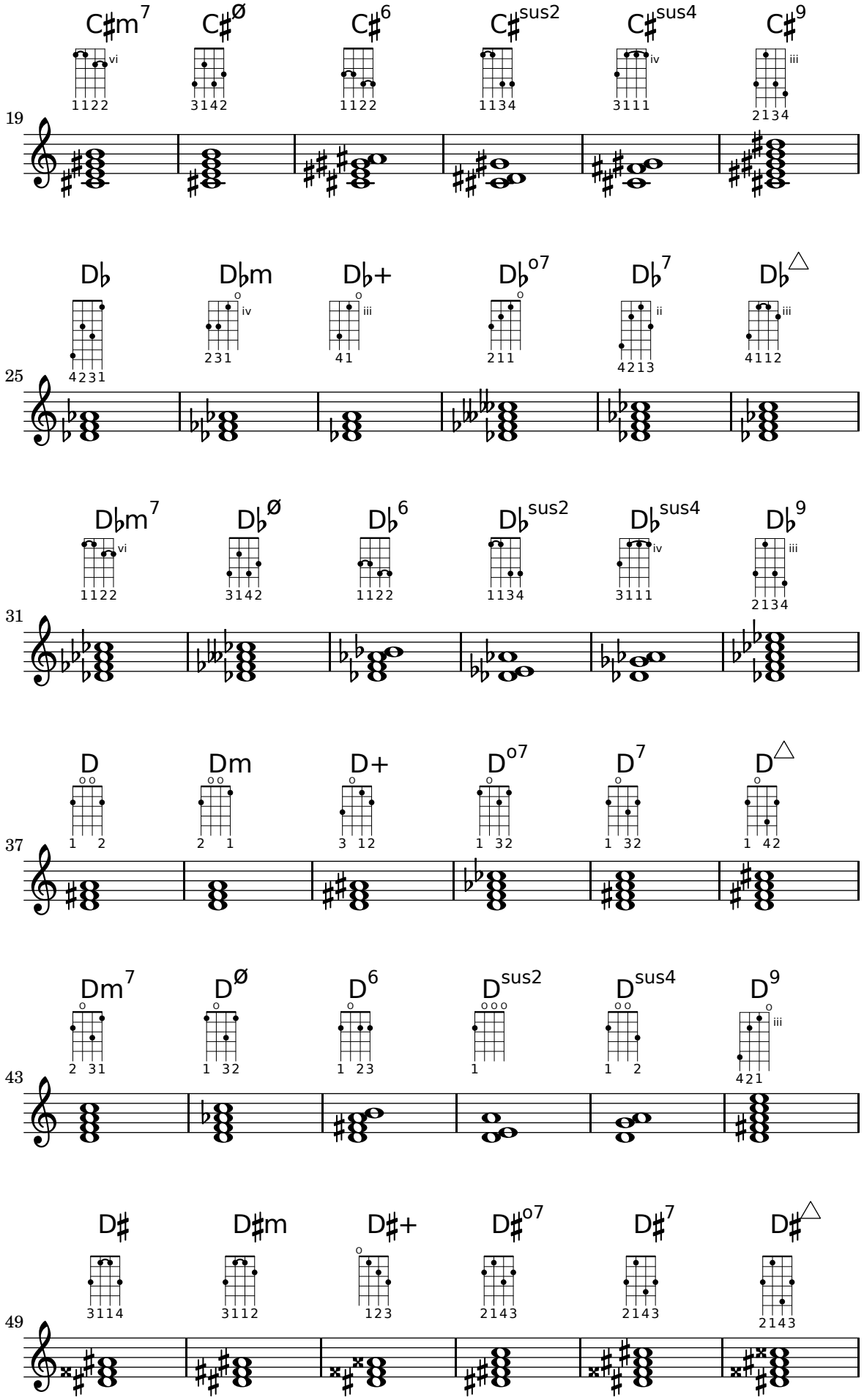

G♭ G♭m G♭+ G♭o G♭7 G♭△
3121 213 2114 1324 3421 2413
100
G♭m7 G♭6 G♭sus2 G♭sus4 G♭9
1324 2214 1124 4123 1222
106
G Gm G+ Go G7 G△ Gm7 G6 Gsus2 Gsus4 G9
132 231 221 1 2 213 123 211 1 2 12 123 2314
111
G♯ G♯m G♯+ G♯o G♯7 G♯△
3121 1342 1 4 1324 1324 1233
122
G♯m7 G♯6 G♯sus2 G♯sus4 G♯9
1423 1324 2341 1333 1 32
128
A♭ A♭m A♭+ A♭o A♭7 A♭△
3121 1342 1 4 1324 1324 1233
133

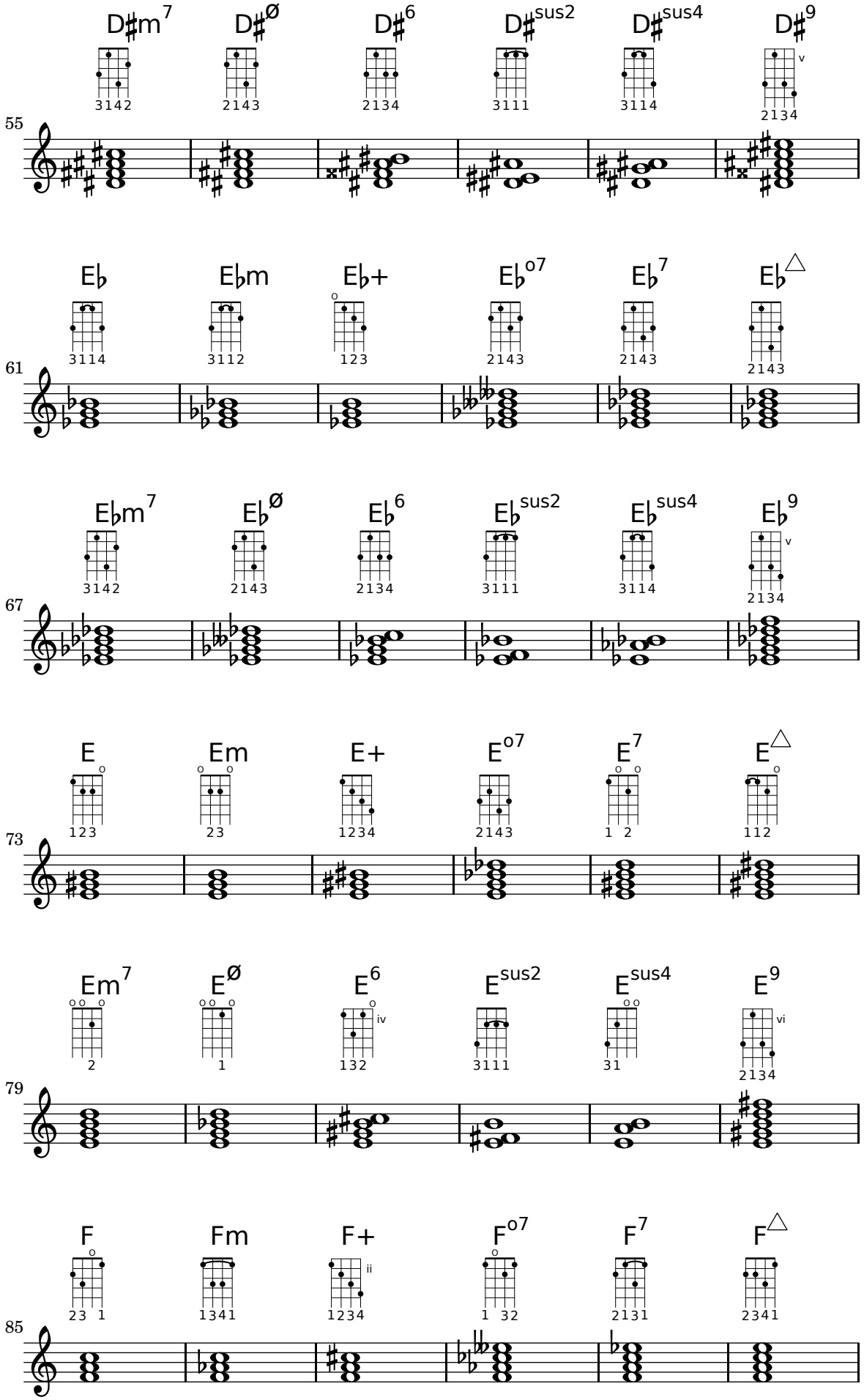

A♭m7
A♭6
A♭sus2
A♭sus4
A♭9
1423
1324
2341
1333
1 32
139
A
Am
A+
Ao
A7
A△
21
1
2114
1324
1
12
144
Am7
A6
Asus2
Asus4
A9
1324
2341
ii
12
1 2
150
A♯
A♯m
A♯+
A♯o
A♯7
A♯△
3211
3111
2114
1 2
1211
2211
155
A♯m7
A♯6
A♯sus2
A♯sus4
A♯9
1111
211
3 11
3311
1213
161
B♭
B♭m
B♭+
B♭o
B♭7
B♭△
3211
3111
2114
1 2
1211
2211
166

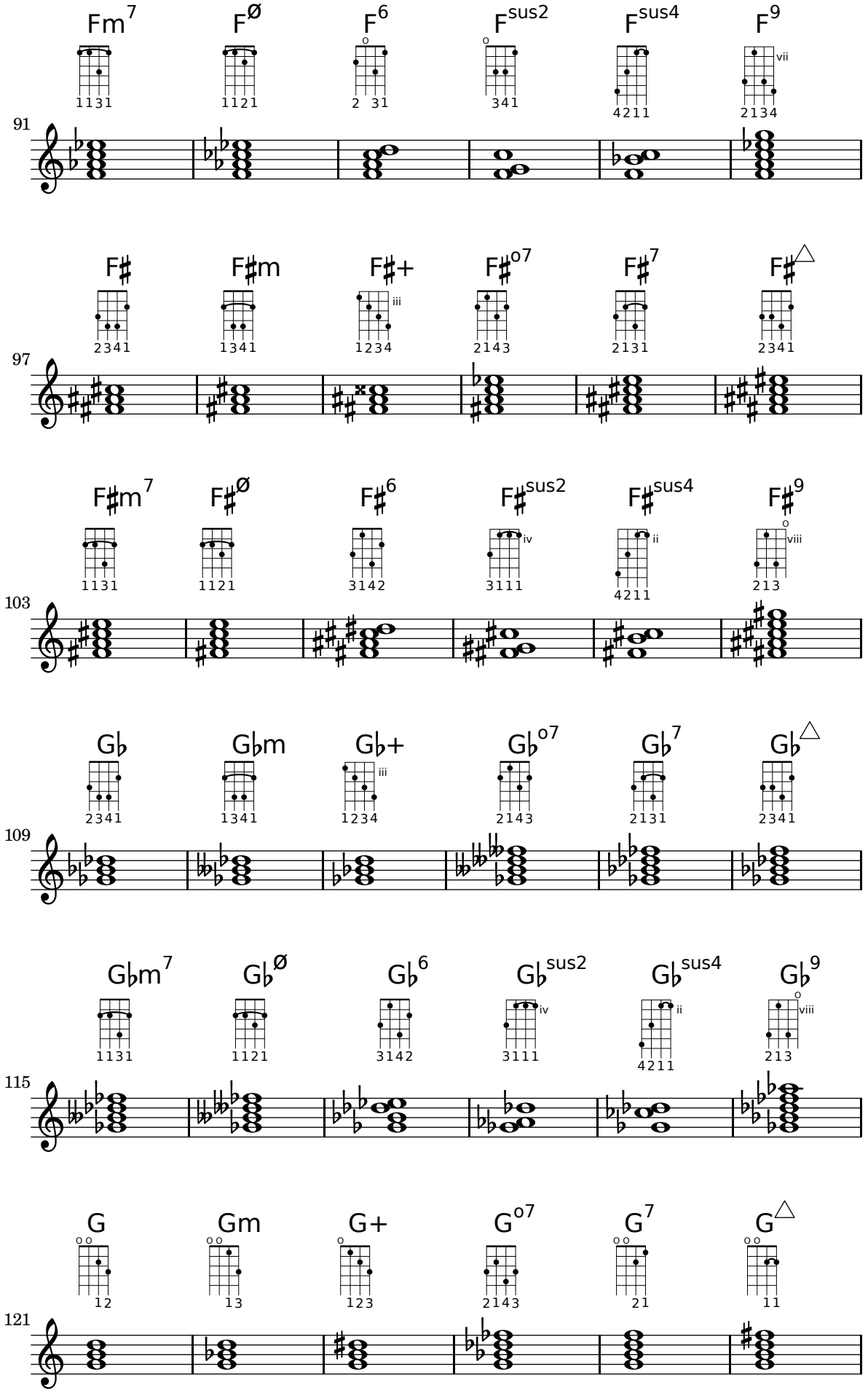


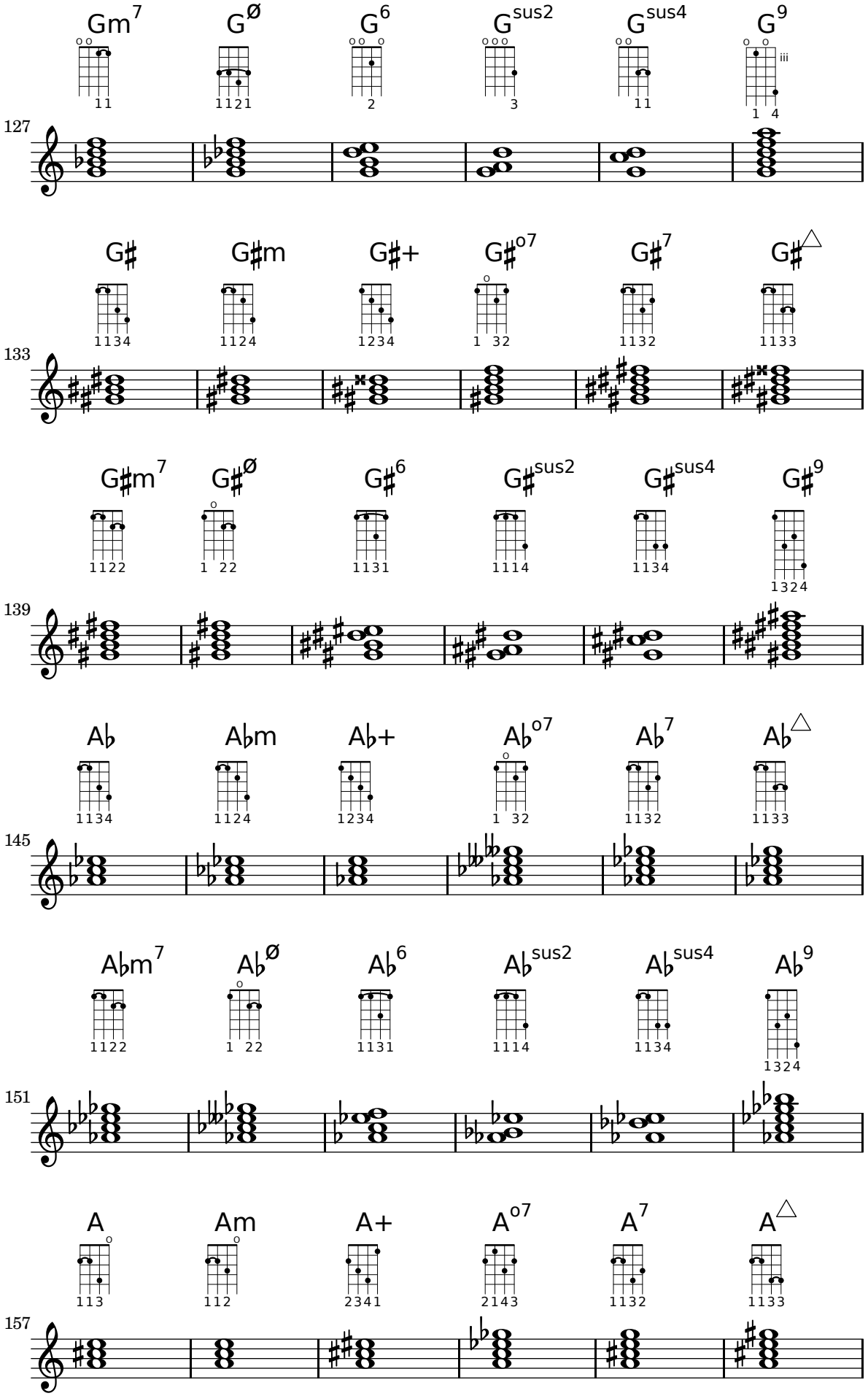
The chart below shows the predefined fretboard diagrams for mandolin.

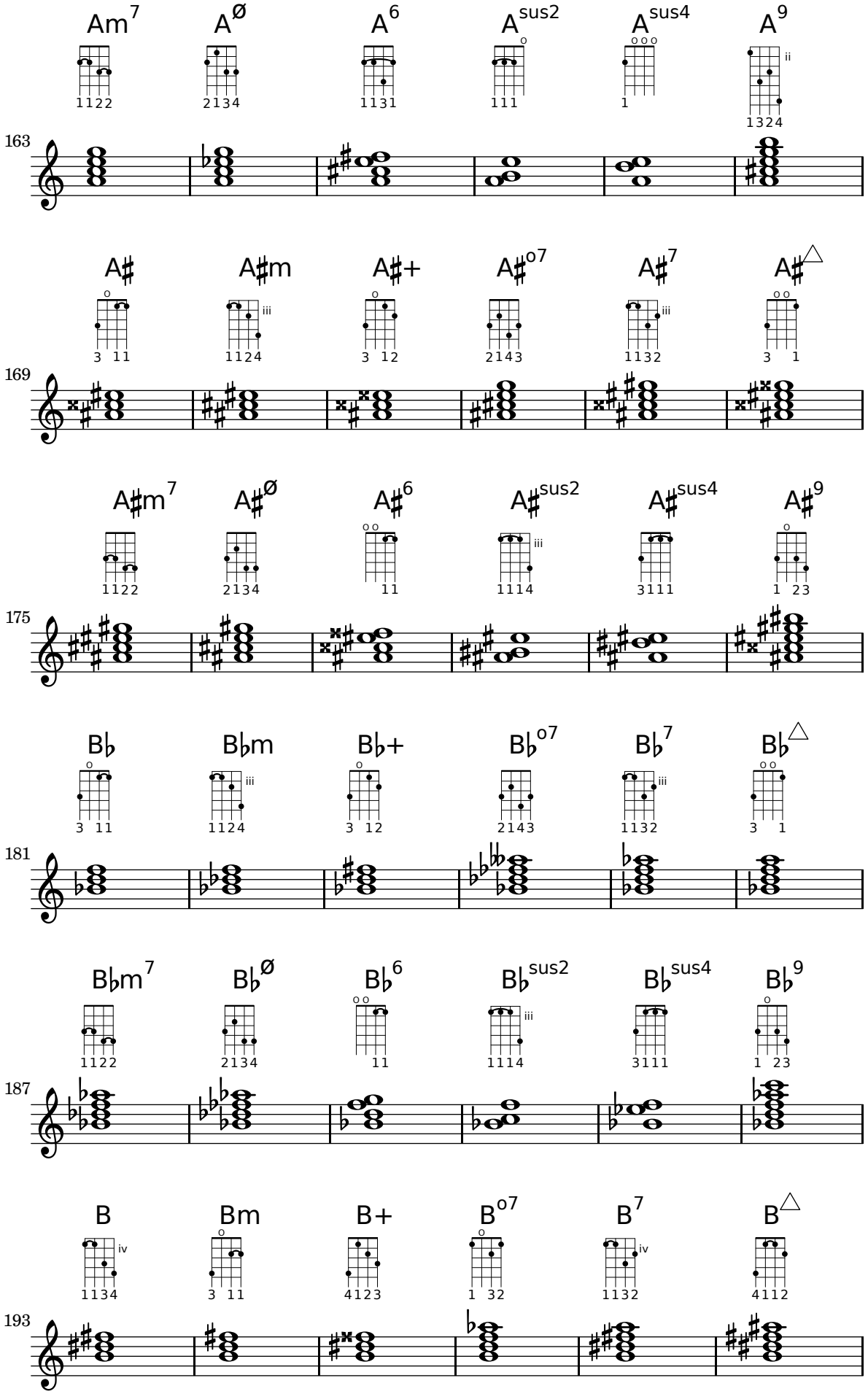


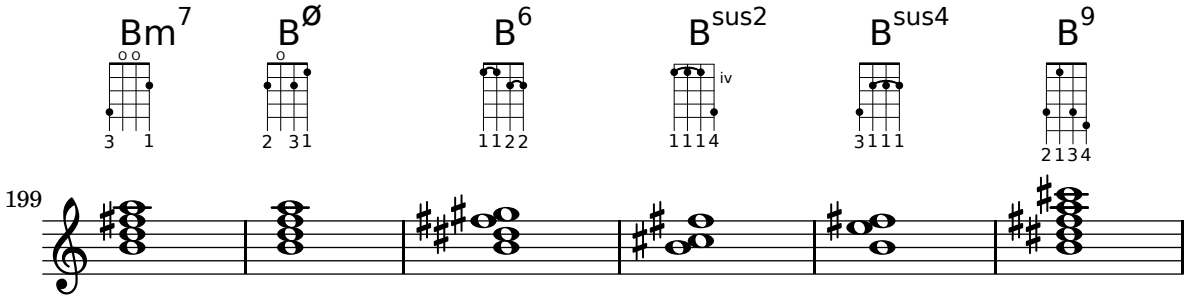

C♯m7
C♯ø
C♯6
C♯sus2
C♯sus4
C♯9
19
D♭
D♭m
D♭+
D♭o7
D♭7
D♭△
25
D♭m7
D♭ø
D♭6
D♭sus2
D♭sus4
D♭9
31
D
Dm
D+
Do7
D7
D△
37
Dm7
Dø
D6
Dsus2
Dsus4
D9
43
D♯
D♯m
D♯+
D♯o7
D♯7
D♯△
49


55
D♯m7 3142
D♯Ø 2143
D♯6 2134
D♯sus2 3111
D♯sus4 3114
D♯9 v 2134
61
E♭ 3114
E♭m 3112
E♭+ o 123
E♭o7 2143
E♭7 2143
E♭△ 2143
67
E♭m7 3142
E♭Ø 2143
E♭6 2134
E♭sus2 3111
E♭sus4 3114
E♭9 v 2134
73
E o 123
Em o o 23
E+ 1234
Eo7 2143
E7 o o 1 2
E△ o 112
79
Em7 o o o 2
EØ o o o 1
E6 o iv 132
Esus2 3111
Esus4 o o 31
E9 vi 2134
85
F o 23 1
Fm 1341
F+ ii 1234
Fo7 o 1 32
F7 2131
F△ 2341


Fm7
1131
Fø
1121
F6
2 31
Fsus2
341
Fsus4
4211
F9
vii
2134
91
F♯
2341
F♯m
1341
F♯+
iii
1234
F♯o7
2143
F♯7
2131
F♯△
2341
97
F♯m7
1131
F♯ø
1121
F♯6
3142
F♯sus2
iv
3111
F♯sus4
ii
4211
F♯9
viii
213
103
G♭
2341
G♭m
1341
G♭+
iii
1234
G♭o7
2143
G♭7
2131
G♭△
2341
109
G♭m7
1131
G♭ø
1121
G♭6
3142
G♭sus2
iv
3111
G♭sus4
ii
4211
G♭9
viii
213
115
G
12
Gm
13
G+
123
Go7
2143
G7
21
G△
11
121


Gm7
G∅
G6
Gsus2
Gsus4
G9
127
G♯
G♯m
G♯+
G♯o7
G♯7
G♯△
133
G♯m7
G♯∅
G♯6
G♯sus2
G♯sus4
G♯9
139
A♭
A♭m
A♭+
A♭o7
A♭7
A♭△
145
A♭m7
A♭∅
A♭6
A♭sus2
A♭sus4
A♭9
151
A
Am
A+
Ao7
A7
A△
157


Am7
Aø
A6
Asus2
Asus4
A9
1122
2134
1131
111
1
1324
163
A♯
A♯m
A♯+
A♯o7
A♯7
A♯△
3 11
1124
3 12
2143
1132
3 1
169
A♯m7
A♯ø
A♯6
A♯sus2
A♯sus4
A♯9
1122
2134
11
1114
3111
1 23
175
B♭
B♭m
B♭+
B♭o7
B♭7
B♭△
3 11
1124
3 12
2143
1132
3 1
181
B♭m7
B♭ø
B♭6
B♭sus2
B♭sus4
B♭9
1122
2134
11
1114
3111
1 23
187
B
Bm
B+
Bo7
B7
B△
1134
3 11
4123
1 32
1132
4112
193



A.5 Predefined paper sizes

Paper sizes are defined in '`scm/paper.scm`'

The "ISO 216" A Series

`"a10"`	(26 x 37 mm)
`"a9"`	(37 x 52 mm)
`"a8"`	(52 x 74 mm)
`"a7"`	(74 x 105 mm)
`"a6"`	(105 x 148 mm)
`"a5"`	(148 x 210 mm)
`"a4"`	(210 x 297 mm)
`"a3"`	(297 x 420 mm)
`"a2"`	(420 x 594 mm)
`"a1"`	(594 x 841 mm)
`"a0"`	(841 x 1189 mm)

The "ISO 216" B Series

`"b10"`	(31 x 44 mm)
`"b9"`	(44 x 62 mm)
`"b8"`	(62 x 88 mm)
`"b7"`	(88 x 125 mm)
`"b6"`	(125 x 176 mm)
`"b5"`	(176 x 250 mm)
`"b4"`	(250 x 353 mm)
`"b3"`	(353 x 500 mm)
`"b2"`	(500 x 707 mm)
`"b1"`	(707 x 1000 mm)
`"b0"`	(1000 x 1414 mm)

Two extended sizes as defined in "DIN 476"

`"4a0"`	(1682 x 2378 mm)
`"2a0"`	(1189 x 1682 mm)

"ISO 269" standard C series

`"c10"`	(28 x 40 mm)

`"c9"` (40 x 57 mm)

`"c8"` (57 x 81 mm)

`"c7"` (81 x 114 mm)

`"c6"` (114 x 162 mm)

`"c5"` (162 x 229 mm)

`"c4"` (229 x 324 mm)

`"c3"` (324 x 458 mm)

`"c2"` (458 x 648 mm)

`"c1"` (648 x 917 mm)

`"c0"` (917 x 1297 mm)

North American paper sizes

`"junior-legal"`
(8.0 x 5.0 in)

`"legal"` (8.5 x 14.0 in)

`"ledger"` (17.0 x 11.0 in)

`"letter"` (8.5 x 11.0 in)

`"tabloid"`
(11.0 x 17.0 in)

`"11x17"` (11.0 x 17.0 in)

`"17x11"` (17.0 x 11.0 in)

Government-letter by IEEE Printer Working Group, for children's writing

`"government-letter"`
(8 x 10.5 in)

`"government-legal"`
(8.5 x 13.0 in)

`"philippine-legal"`
(8.5 x 13.0 in)

ANSI sizes

`"ansi a"` (8.5 x 11.0 in)

`"ansi b"` (17.0 x 11.0 in)

`"ansi c"` (17.0 x 22.0 in)

`"ansi d"` (22.0 x 34.0 in)

`"ansi e"` (34.0 x 44.0 in)

`"engineering f"`
(28.0 x 40.0 in)

North American Architectural sizes

`"arch a"` (9.0 x 12.0 in)

`"arch b"` (12.0 x 18.0 in)

`"arch c"` (18.0 x 24.0 in)

`"arch d"` (24.0 x 36.0 in)

`"arch e"` (36.0 x 48.0 in)

`"arch e1"` (30.0 x 42.0 in)

Antique sizes still used in the United Kingdom

`"statement"`
(5.5 x 8.5 in)

`"half letter"`
(5.5 x 8.5 in)

`"quarto"` (8.0 x 10.0 in)

`"octavo"` (6.75 x 10.5 in)

`"executive"`
(7.25 x 10.5 in)

`"monarch"`
(7.25 x 10.5 in)

`"foolscap"`
(8.27 x 13.0 in)

`"folio"` (8.27 x 13.0 in)

`"super-b"`
(13.0 x 19.0 in)

`"post"` (15.5 x 19.5 in)

`"crown"` (15.0 x 20.0 in)

`"large post"`
(16.5 x 21.0 in)

`"demy"` (17.5 x 22.5 in)

`"medium"` (18.0 x 23.0 in)

`"broadsheet"`
(18.0 x 24.0 in)

`"royal"` (20.0 x 25.0 in)

`"elephant"`
(23.0 x 28.0 in)

`"double demy"`
(22.5 x 35.0 in)

`"quad demy"`
(35.0 x 45.0 in)

`"atlas"` (26.0 x 34.0 in)

`"imperial"`
(22.0 x 30.0 in)

`"antiquarian"`
(31.0 x 53.0 in)

PA4 based sizes

"pa0" (840 x 1120 mm)

"pa1" (560 x 840 mm)

"pa2" (420 x 560 mm)

"pa3" (280 x 420 mm)

"pa4" (210 x 280 mm)

"pa5" (140 x 210 mm)

"pa6" (105 x 140 mm)

"pa7" (70 x 105 mm)

"pa8" (52 x 70 mm)

"pa9" (35 x 52 mm)

"pa10" (26 x 35 mm)

Used in Southeast Asia and Australia

"f4" (210 x 330 mm)

Used for very small `@lilypond` examples in the documentation based on a8 landscape.

"a8landscape"
(74 x 52 mm)

A.6 MIDI instruments

The following is a list of names that can be used for the `midiInstrument` property. The order of the instruments below, starting in the left-hand column moving down, corresponds to the General MIDI Standard's 128 Program Numbers.

```
acoustic grand
bright acoustic
electric grand
honky-tonk
electric piano 1
electric piano 2
harpsichord
clav
celesta
glockenspiel
music box
vibraphone
marimba
xylophone
tubular bells
dulcimer
drawbar organ
percussive organ
rock organ
church organ
reed organ
accordion
contrabass
tremolo strings
pizzicato strings
orchestral harp
timpani
string ensemble 1
string ensemble 2
synthstrings 1
synthstrings 2
choir aahs
voice oohs
synth voice
orchestra hit
trumpet
trombone
tuba
muted trumpet
french horn
brass section
synthbrass 1
synthbrass 2
soprano sax
lead 7 (fifths)
lead 8 (bass+lead)
pad 1 (new age)
pad 2 (warm)
pad 3 (polysynth)
pad 4 (choir)
pad 5 (bowed)
pad 6 (metallic)
pad 7 (halo)
pad 8 (sweep)
fx 1 (rain)
fx 2 (soundtrack)
fx 3 (crystal)
fx 4 (atmosphere)
fx 5 (brightness)
fx 6 (goblins)
fx 7 (echoes)
fx 8 (sci-fi)
sitar
banjo
shamisen
koto
```

harmonica	alto sax	kalimba
concertina	tenor sax	bagpipe
acoustic guitar (nylon)	baritone sax	fiddle
acoustic guitar (steel)	oboe	shanai
electric guitar (jazz)	english horn	tinkle bell
electric guitar (clean)	bassoon	agogo
electric guitar (muted)	clarinet	steel drums
overdriven guitar	piccolo	woodblock
distorted guitar	flute	taiko drum
guitar harmonics	recorder	melodic tom
acoustic bass	pan flute	synth drum
electric bass (finger)	blown bottle	reverse cymbal
electric bass (pick)	shakuhachi	guitar fret noise
fretless bass	whistle	breath noise
slap bass 1	ocarina	seashore
slap bass 2	lead 1 (square)	bird tweet
synth bass 1	lead 2 (sawtooth)	telephone ring
synth bass 2	lead 3 (calliope)	helicopter
violin	lead 4 (chiff)	applause
viola	lead 5 (charang)	gunshot
cello	lead 6 (voice)	

A.7 List of colors

Normal colors

Usage syntax is detailed in [Coloring objects], pagina 213.

black	white	red	green
blue	cyan	magenta	yellow
grey	darkred	darkgreen	darkblue
darkcyan	darkmagenta	darkyellow	

X color names

X color names come several variants:

Any name that is spelled as a single word with capitalization (e.g. 'LightSlateBlue') can also be spelled as space separated words without capitalization (e.g. 'light slate blue').

The word 'grey' can always be spelled 'gray' (e.g. 'DarkSlateGray').

Some names can take a numerical suffix (e.g. 'LightSalmon4').

Color Names without a numerical suffix:

snow	GhostWhite	WhiteSmoke	gainsboro	FloralWhite
OldLace	linen	AntiqueWhite	PapayaWhip	BlanchedAlmond
bisque	PeachPuff	NavajoWhite	moccasin	cornsilk
ivory	LemonChiffon	seashell	honeydew	MintCream
azure	AliceBlue	lavender	LavenderBlush	MistyRose
white	black	DarkSlateGrey	DimGrey	SlateGrey
LightSlateGrey	grey	LightGrey	MidnightBlue	navy
NavyBlue	CornflowerBlue	DarkSlateBlue	SlateBlue	MediumSlateBlue
LightSlateBlue	MediumBlue	RoyalBlue	blue	DodgerBlue
DeepSkyBlue	SkyBlue	LightSkyBlue	SteelBlue	LightSteelBlue
LightBlue	PowderBlue	PaleTurquoise	DarkTurquoise	MediumTurquoise

turquoise	cyan	LightCyan	CadetBlue	MediumAquamarine
aquamarine	DarkGreen	DarkOliveGreen	DarkSeaGreen	SeaGreen
MediumSeaGreen	LightSeaGreen	PaleGreen	SpringGreen	LawnGreen
green	chartreuse	MediumSpringGreen	GreenYellow	LimeGreen
YellowGreen	ForestGreen	OliveDrab	DarkKhaki	khaki
PaleGoldenrod	LightGoldenrodYellow	LightYellow	yellow	gold
LightGoldenrod	goldenrod	DarkGoldenrod	RosyBrown	IndianRed
SaddleBrown	sienna	peru	burlywood	beige
wheat	SandyBrown	tan	chocolate	firebrick
brown	DarkSalmon	salmon	LightSalmon	orange
DarkOrange	coral	LightCoral	tomato	OrangeRed
red	HotPink	DeepPink	pink	LightPink
PaleVioletRed	maroon	MediumVioletRed	VioletRed	magenta
violet	plum	orchid	MediumOrchid	DarkOrchid
DarkViolet	BlueViolet	purple	MediumPurple	thistle
DarkGrey	DarkBlue	DarkCyan	DarkMagenta	DarkRed
LightGreen				

Color names with a numerical suffix

In the following names the suffix N can be a number in the range 1-4:

snowN	seashellN	AntiqueWhiteN	bisqueN	PeachPuffN
NavajoWhiteN	LemonChiffonN	cornsilkN	ivoryN	honeydewN
LavenderBlushN	MistyRoseN	azureN	SlateBlueN	RoyalBlueN
blueN	DodgerBlueN	SteelBlueN	DeepSkyBlueN	SkyBlueN
LightSkyBlueN	LightSteelBlueN	LightBlueN	LightCyanN	PaleTurquoiseN
CadetBlueN	turquoiseN	cyanN	aquamarineN	DarkSeaGreenN
SeaGreenN	PaleGreenN	SpringGreenN	greenN	chartreuseN
OliveDrabN	DarkOliveGreenN	khakiN	LightGoldenrodN	LightYellowN
yellowN	goldN	goldenrodN	DarkGoldenrodN	RosyBrownN
IndianRedN	siennaN	burlywoodN	wheatN	tanN
chocolateN	firebrickN	brownN	salmonN	LightSalmonN
orangeN	DarkOrangeN	coralN	tomatoN	OrangeRedN
redN	DeepPinkN	HotPinkN	pinkN	LightPinkN
PaleVioletRedN	maroonN	VioletRedN	magentaN	orchidN
plumN	MediumOrchidN	DarkOrchidN	purpleN	MediumPurpleN
thistleN				

Grey Scale

A grey scale can be obtained using:

```
greyN
```

Where N is in the range 0-100.

A.8 The Feta font

The following symbols are available in the Emmentaler font and may be accessed directly using text markup with the name of the glyph as shown in the tables below, such as `g^\markup {\musicglyph #"scripts.segno" }` or `\markup {\musicglyph #"five"}`. For more information, see Sezione 1.8.2 [Formatting text], pagina 229.

Clef glyphs

clefs.C	𝄡	clefs.C_change	𝄡
clefs.F	𝄢	clefs.F_change	𝄢
clefs.G	𝄞	clefs.G_change	𝄞
clefs.percussion	𝄥	clefs.percussion_change	𝄥
clefs.tab	𝄦	clefs.tab_change	𝄦

Time Signature glyphs

timesig.C44	𝄴	timesig.C22	𝄵

Number glyphs

plus	+	comma	,
hyphen	-	period	.
zero	𝟬	one	𝟭
two	𝟮	three	𝟯
four	𝟰	five	𝟱
six	𝟲	seven	𝟳
eight	𝟴	nine	𝟵

Accidental glyphs

accidentals.sharp	♯	accidentals .sharp.arrowup	♯
accidentals .sharp.arrowdown	♯	accidentals .sharp.arrowboth	♯
accidentals.sharp .slashslash.stem	♯	accidentals.sharp .slashslashslash.stemstem	♯
accidentals.sharp .slashslashslash.stem	♯	accidentals.sharp .slashslash.stemstemstem	♯
accidentals.natural	♮	accidentals .natural.arrowup	♮
accidentals .natural.arrowdown	♮	accidentals .natural.arrowboth	♮
accidentals.flat	♭	accidentals.flat.arrowup	♭
accidentals .flat.arrowdown	♭	accidentals .flat.arrowboth	♭
accidentals.flat.slash	♭	accidentals.flat .slashslash	♭
accidentals .mirroredflat.flat	♭	accidentals.mirroredflat	♭
accidentals .mirroredflat.backslash	♭	accidentals.flatflat	♭♭
accidentals .flatflat.slash	♭♭	accidentals.doublesharp	𝄪
accidentals.rightparen	)	accidentals.leftparen	(

Default Notehead glyphs

noteheads.uM2		noteheads.dM2	
noteheads.sM1		noteheads.s0	
noteheads.s1		noteheads.s2	

Special Notehead glyphs

noteheads.sM1double		noteheads.s0diamond	
noteheads.s1diamond		noteheads.s2diamond	
noteheads.s0triangle		noteheads.d1triangle	
noteheads.u1triangle		noteheads.u2triangle	
noteheads.d2triangle		noteheads.s0slash	
noteheads.s1slash		noteheads.s2slash	
noteheads.s0cross		noteheads.s1cross	
noteheads.s2cross		noteheads.s2xcircle	
noteheads.s0harmonic		noteheads.s2harmonic	

Shape-note Notehead glyphs

noteheads.s0do		noteheads.d1do	
noteheads.u1do		noteheads.d2do	
noteheads.u2do		noteheads.s0doThin	
noteheads.d1doThin		noteheads.u1doThin	
noteheads.d2doThin		noteheads.u2doThin	
noteheads.s0re		noteheads.u1re	
noteheads.d1re		noteheads.u2re	
noteheads.d2re		noteheads.s0reThin	
noteheads.u1reThin		noteheads.d1reThin	
noteheads.u2reThin		noteheads.d2reThin	
noteheads.s0mi		noteheads.s1mi	
noteheads.s2mi		noteheads.s0miMirror	
noteheads.s1miMirror		noteheads.s2miMirror	
noteheads.s0miThin		noteheads.s1miThin	

noteheads.s2miThin		noteheads.u0fa	
noteheads.d0fa		noteheads.u1fa	
noteheads.d1fa		noteheads.u2fa	
noteheads.d2fa		noteheads.u0faThin	
noteheads.d0faThin		noteheads.u1faThin	
noteheads.d1faThin		noteheads.u2faThin	
noteheads.d2faThin		noteheads.s0sol	
noteheads.s1sol		noteheads.s2sol	
noteheads.s0la		noteheads.s1la	
noteheads.s2la		noteheads.s0laThin	
noteheads.s1laThin		noteheads.s2laThin	
noteheads.s0ti		noteheads.u1ti	
noteheads.d1ti		noteheads.u2ti	
noteheads.d2ti		noteheads.s0tiThin	
noteheads.u1tiThin		noteheads.d1tiThin	

noteheads.u2tiThin	◆	noteheads.d2tiThin	◆
noteheads.u0doFunk	D	noteheads.d0doFunk	D
noteheads.u1doFunk	D	noteheads.d1doFunk	D
noteheads.u2doFunk	D	noteheads.d2doFunk	D
noteheads.u0reFunk	▷	noteheads.d0reFunk	◁
noteheads.u1reFunk	▷	noteheads.d1reFunk	◁
noteheads.u2reFunk	▶	noteheads.d2reFunk	◀
noteheads.u0miFunk	◇	noteheads.d0miFunk	◇
noteheads.u1miFunk	◇	noteheads.d1miFunk	◇
noteheads.s2miFunk	◆	noteheads.u0faFunk	◁
noteheads.d0faFunk	◁	noteheads.u1faFunk	◁
noteheads.d1faFunk	◁	noteheads.u2faFunk	◤
noteheads.d2faFunk	◣	noteheads.s0solFunk	o
noteheads.s1solFunk	o	noteheads.s2solFunk	●
noteheads.s0laFunk	□	noteheads.s1laFunk	□

noteheads.s2laFunk	■	noteheads.u0tiFunk	◔
noteheads.d0tiFunk	◁	noteheads.u1tiFunk	◔
noteheads.d1tiFunk	◁	noteheads.u2tiFunk	◕
noteheads.d2tiFunk	◕	noteheads.s0doWalker	⊿
noteheads.u1doWalker	▽	noteheads.d1doWalker	⊿
noteheads.u2doWalker	▼	noteheads.d2doWalker	▲
noteheads.s0reWalker	◺	noteheads.u1reWalker	◻
noteheads.d1reWalker	◺	noteheads.u2reWalker	◗
noteheads.d2reWalker	◖	noteheads.s0miWalker	◇
noteheads.s1miWalker	◇	noteheads.s2miWalker	◆
noteheads.s0faWalker	◺	noteheads.u1faWalker	◹
noteheads.d1faWalker	◺	noteheads.u2faWalker	◥
noteheads.d2faWalker	◣	noteheads.s0laWalker	□
noteheads.s1laWalker	□	noteheads.s2laWalker	■
noteheads.s0tiWalker	◁	noteheads.u1tiWalker	▷
noteheads.d1tiWalker	◁	noteheads.u2tiWalker	▶
noteheads.d2tiWalker	◀		

Rest glyphs

rests.0		rests.1	
rests.0o		rests.1o	
rests.M3		rests.M2	
rests.M1		rests.M1o	
rests.2		rests.2classical	
rests.3		rests.4	
rests.5		rests.6	
rests.7			

Flag glyphs

flags.u3		flags.u4	
flags.u5		flags.u6	
flags.u7		flags.d3	
flags.d4		flags.d5	
flags.d6		flags.d7	
flags.ugrace		flags.dgrace	

Dot glyphs

dots.dot	.

Dynamic glyphs

space		f	*f*
m	*m*	p	*p*
r	*r*	s	*s*
z	*z*		

Script glyphs

scripts.ufermata		scripts.dfermata	
scripts.ushortfermata		scripts.dshortfermata	
scripts.ulongfermata		scripts.dlongfermata	
scripts.uverylongfermata		scripts.dverylongfermata	
scripts.thumb		scripts.sforzato	>
scripts.espr	<>	scripts.staccato	.
scripts.ustaccatissimo		scripts.dstaccatissimo	
scripts.tenuto	–	scripts.uportato	

scripts.dportato	⸗	scripts.umarcato	⋏
scripts.dmarcato	⋎	scripts.open	⊙
scripts.halfopen	⌀	scripts.halfopenvertical	⌽
scripts.stopped	+	scripts.upbow	⋁
scripts.downbow	⊓	scripts.reverseturn	∽
scripts.turn	∾	scripts.trill	*tr*
scripts.upedalheel	∪	scripts.dpedalheel	∩
scripts.upedaltoe	⋁	scripts.dpedaltoe	⋀
scripts.flageolet	○	scripts.segno	𝄋
scripts.varsegno	§	scripts.coda	⌽
scripts.varcoda	⌽	scripts.rcomma	⸌
scripts.lcomma	⸌	scripts.rvarcomma	⸍
scripts.lvarcomma	⸍	scripts.arpeggio	⸎
scripts.trill_element	∼	scripts.arpeggio .arrow.M1	⸏
scripts.arpeggio.arrow.1	⸏	scripts.trilelement	⸐

scripts.prall		scripts.mordent	
scripts.prallprall		scripts.prallmordent	
scripts.upprall		scripts.upmordent	
scripts.pralldown		scripts.downprall	
scripts.downmordent		scripts.prallup	
scripts.lineprall		scripts.caesura.curved	
scripts.caesura.straight		scripts.tickmark	
scripts.snappizzicato		scripts.ictus	
scripts.uaccentus		scripts.daccentus	
scripts.usemicirculus		scripts.dsemicirculus	
scripts.circulus		scripts.augmentum	
scripts .usignumcongruentiae		scripts .dsignumcongruentiae	

Arrowhead glyphs

arrowheads.open.01		arrowheads.open.0M1	
arrowheads.open.11		arrowheads.open.1M1	
arrowheads.close.01		arrowheads.close.0M1	
arrowheads.close.11		arrowheads.close.1M1	

Bracket-tip glyphs

brackettips.up		brackettips.down	

Pedal glyphs

pedal.*		pedal.M	
pedal..	.	pedal.P	
pedal.d		pedal.e	
pedal.Ped			

Accordion glyphs

accordion.discant		accordion.dot	
accordion.freebass		accordion.stdbass	
accordion.bayanbass		accordion.oldEE	
accordion.push		accordion.pull	

Tie glyphs

ties.lyric.short		ties.lyric.default	

Vaticana glyphs

clefs.vaticana.do		clefs.vaticana.do_change	
clefs.vaticana.fa		clefs.vaticana.fa_change	
custodes.vaticana.u0		custodes.vaticana.u1	
custodes.vaticana.u2		custodes.vaticana.d0	
custodes.vaticana.d1		custodes.vaticana.d2	
accidentals.vaticanaM1		accidentals.vaticana0	
dots.dotvaticana		noteheads .svaticana.punctum	
noteheads.svaticana .punctum.cavum		noteheads.svaticana .linea.punctum	
noteheads.svaticana .linea.punctum.cavum		noteheads.svaticana .inclinatum	
noteheads.svaticana.lpes		noteheads .svaticana.vlpes	
noteheads.svaticana.upes		noteheads .svaticana.vupes	
noteheads .svaticana.plica		noteheads .svaticana.vplica	
noteheads .svaticana.epiphonus		noteheads.svaticana .vepiphonus	
noteheads.svaticana .reverse.plica		noteheads.svaticana .reverse.vplica	
noteheads.svaticana .inner.cephalicus		noteheads.svaticana .cephalicus	
noteheads .svaticana.quilisma			

Medicaea glyphs

clefs.medicaea.do		clefs.medicaea.do_change	
clefs.medicaea.fa		clefs.medicaea.fa_change	
custodes.medicaea.u0		custodes.medicaea.u1	
custodes.medicaea.u2		custodes.medicaea.d0	
custodes.medicaea.d1		custodes.medicaea.d2	
accidentals.medicaeaM1		noteheads.smedicaea .inclinatum	
noteheads .smedicaea.punctum		noteheads .smedicaea.rvirga	
noteheads .smedicaea.virga			

Hufnagel glyphs

clefs.hufnagel.do		clefs.hufnagel.do_change	
clefs.hufnagel.fa		clefs.hufnagel.fa_change	
clefs.hufnagel.do.fa		clefs.hufnagel .do.fa_change	
custodes.hufnagel.u0		custodes.hufnagel.u1	
custodes.hufnagel.u2		custodes.hufnagel.d0	
custodes.hufnagel.d1		custodes.hufnagel.d2	

accidentals.hufnagelM1	♭	noteheads .shufnagel.punctum	◆
noteheads .shufnagel.virga	⬆	noteheads.shufnagel.lpes	▰

Mensural glyphs

rests.M3mensural		rests.M2mensural	
rests.M1mensural		rests.0mensural	
rests.1mensural		rests.2mensural	
rests.3mensural		rests.4mensural	
clefs.mensural.c		clefs.mensural.c_change	
clefs.blackmensural.c		clefs.blackmensural .c_change	
clefs.mensural.f		clefs.mensural.f_change	
clefs.mensural.g		clefs.mensural.g_change	
custodes.mensural.u0		custodes.mensural.u1	
custodes.mensural.u2		custodes.mensural.d0	
custodes.mensural.d1		custodes.mensural.d2	
accidentals.mensural1		accidentals.mensuralM1	♭
flags.mensuralu03		flags.mensuralu13	

flags.mensuralu23		flags.mensurald03	
flags.mensurald13		flags.mensurald23	
flags.mensuralu04		flags.mensuralu14	
flags.mensuralu24		flags.mensurald04	
flags.mensurald14		flags.mensurald24	
flags.mensuralu05		flags.mensuralu15	
flags.mensuralu25		flags.mensurald05	
flags.mensurald15		flags.mensurald25	
flags.mensuralu06		flags.mensuralu16	
flags.mensuralu26		flags.mensurald06	
flags.mensurald16		flags.mensurald26	
timesig.mensural44		timesig.mensural22	
timesig.mensural32		timesig.mensural64	
timesig.mensural94		timesig.mensural34	

timesig.mensural68		timesig.mensural98	
timesig.mensural48		timesig.mensural68alt	
timesig.mensural24		noteheads.uM3mensural	
noteheads.dM3mensural		noteheads.sM3ligmensural	
noteheads.uM2mensural		noteheads.dM2mensural	
noteheads.sM2ligmensural		noteheads.sM1mensural	
noteheads.urM3mensural		noteheads.drM3mensural	
noteheads .srM3ligmensural		noteheads.urM2mensural	
noteheads.drM2mensural		noteheads .srM2ligmensural	
noteheads.srM1mensural		noteheads .uM3semimensural	
noteheads .dM3semimensural		noteheads .sM3semiligmensural	
noteheads .uM2semimensural		noteheads .dM2semimensural	
noteheads .sM2semiligmensural		noteheads .sM1semimensural	
noteheads .urM3semimensural		noteheads .drM3semimensural	
noteheads .srM3semiligmensural		noteheads .urM2semimensural	

noteheads .drM2semimensural		noteheads .srM2semiligmensural	
noteheads .srM1semimensural		noteheads .uM3blackmensural	
noteheads .dM3blackmensural		noteheads .sM3blackligmensural	
noteheads .uM2blackmensural		noteheads .dM2blackmensural	
noteheads .sM2blackligmensural		noteheads .sM1blackmensural	
noteheads.s0mensural		noteheads.s1mensural	
noteheads.s2mensural		noteheads .s0blackmensural	

Neomensural glyphs

rests.M3neomensural		rests.M2neomensural	
rests.M1neomensural		rests.0neomensural	
rests.1neomensural		rests.2neomensural	
rests.3neomensural		rests.4neomensural	
clefs.neomensural.c		clefs.neomensural .c_change	
timesig.neomensural44		timesig.neomensural22	
timesig.neomensural32		timesig.neomensural64	
timesig.neomensural94		timesig.neomensural34	

timesig.neomensural68		timesig.neomensural98	
timesig.neomensural48		timesig.neomensural68alt	
timesig.neomensural24		noteheads.uM3neomensural	
noteheads.dM3neomensural		noteheads.uM2neomensural	
noteheads.dM2neomensural		noteheads.sM1neomensural	
noteheads .urM3neomensural		noteheads .drM3neomensural	
noteheads .urM2neomensural		noteheads .drM2neomensural	
noteheads .srM1neomensural		noteheads.s0neomensural	
noteheads.s1neomensural		noteheads.s2neomensural	

Petrucci glyphs

clefs.petrucci.c1		clefs.petrucci.c1_change	
clefs.petrucci.c2		clefs.petrucci.c2_change	
clefs.petrucci.c3		clefs.petrucci.c3_change	
clefs.petrucci.c4		clefs.petrucci.c4_change	
clefs.petrucci.c5		clefs.petrucci.c5_change	

clefs.petrucci.f		clefs.petrucci.f_change	
clefs.petrucci.g		clefs.petrucci.g_change	
noteheads.s0petrucci		noteheads.s1petrucci	
noteheads.s2petrucci		noteheads .s0blackpetrucci	
noteheads .s1blackpetrucci		noteheads .s2blackpetrucci	

Solesmes glyphs

noteheads.ssolesmes .incl.parvum		noteheads .ssolesmes.auct.asc	
noteheads .ssolesmes.auct.desc		noteheads.ssolesmes .incl.auctum	
noteheads .ssolesmes.stropha		noteheads.ssolesmes .stropha.aucta	
noteheads .ssolesmes.oriscus			

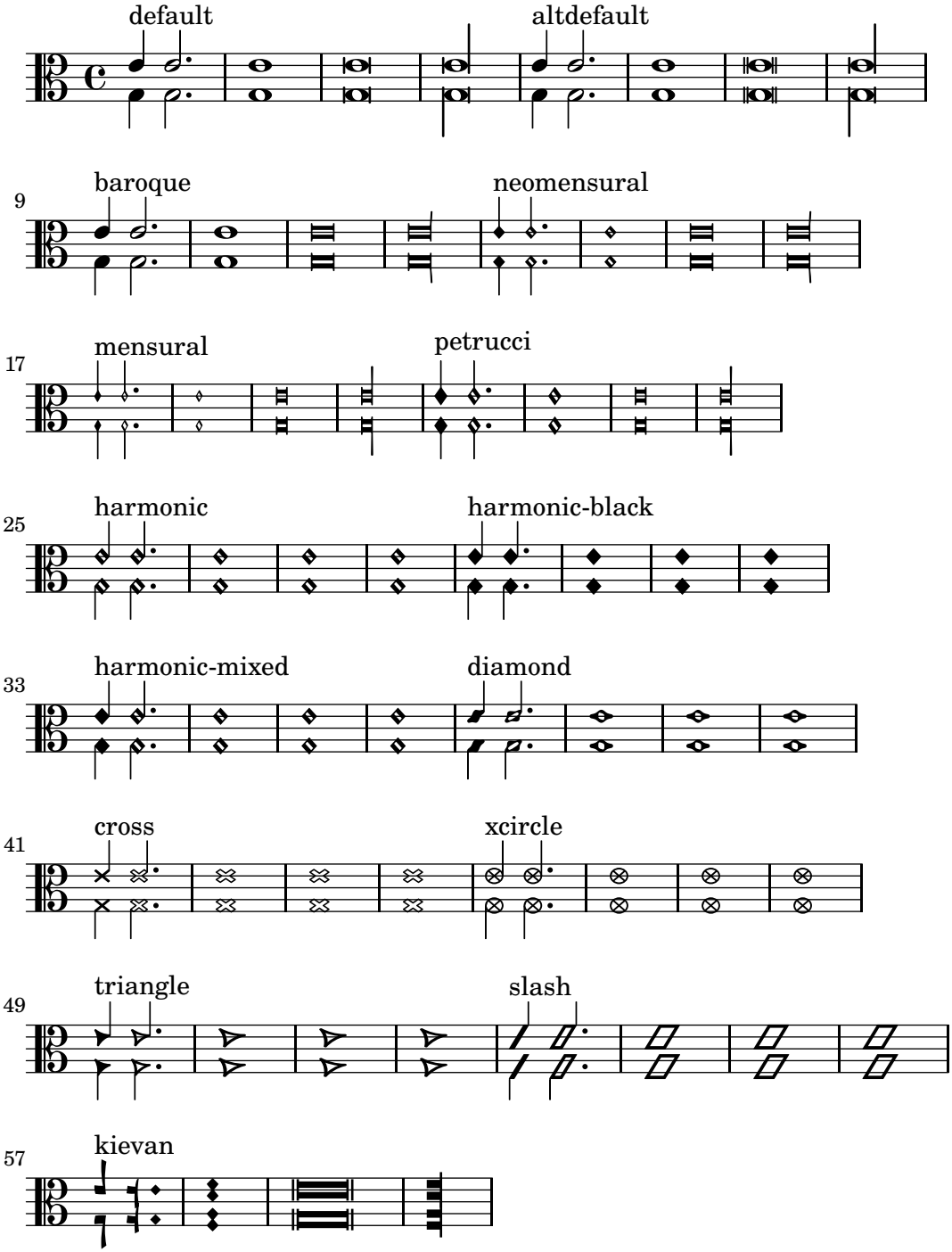
Kievan Notation glyphs

clefs.kievan.do		clefs.kievan.do_change	
accidentals.kievan1		accidentals.kievanM1	
scripts.barline.kievan		dots.dotkievan	
noteheads.sM2kievan		noteheads.sM1kievan	
noteheads.s0kievan		noteheads.d2kievan	

`noteheads.u2kievan`		`noteheads.s1kievan`	
`noteheads.sr1kievan`		`noteheads.d3kievan`	
`noteheads.u3kievan`			

A.9 Note head styles

The following styles may be used for note heads.



A.10 Text markup commands

The following commands can all be used inside `\markup { }`.

A.10.1 Font

`\abs-fontsize` *size* (number) *arg* (markup)

Use *size* as the absolute font size to display *arg*. Adjusts `baseline-skip` and `word-space` accordingly.

```
\markup {
  default text font size
  \hspace #2
  \abs-fontsize #16 { text font size 16 }
  \hspace #2
  \abs-fontsize #12 { text font size 12 }
}
```

default text font size text font size 16 text font size 12

`\bold` *arg* (markup)

Switch to bold font-series.

```
\markup {
  default
  \hspace #2
  \bold
  bold
}
```

default **bold**

`\box` *arg* (markup)

Draw a box round *arg*. Looks at `thickness`, `box-padding` and `font-size` properties to determine line thickness and padding around the markup.

```
\markup {
  \override #'(box-padding . 0.5)
  \box
  \line { V. S. }
}
```

V. S.

Used properties:

- `box-padding` (0.2)
- `font-size` (0)
- `thickness` (1)

`\caps` *arg* (markup)

Copy of the `\smallCaps` command.

```
\markup {
  default
  \hspace #2
  \caps {
```

```
    Text in small caps
  }
}
```

default TEXT IN SMALL CAPS

`\dynamic` *arg* (markup)

Use the dynamic font. This font only contains **s**, **f**, **m**, **z**, **p**, and **r**. When producing phrases, like 'più **f**', the normal words (like 'più') should be done in a different font. The recommended font for this is bold and italic.

```
\markup {
  \dynamic {
    sfzp
  }
}
```

sfzp

`\finger` *arg* (markup)

Set *arg* as small numbers.

```
\markup {
  \finger {
    1 2 3 4 5
  }
}
```

1 2 3 4 5

`\fontCaps` *arg* (markup)

Set `font-shape` to `caps`

Note: `\fontCaps` requires the installation and selection of fonts which support the `caps` font shape.

`\fontsize` *increment* (number) *arg* (markup)

Add *increment* to the font-size. Adjusts `baseline-skip` accordingly.

```
\markup {
  default
  \hspace #2
  \fontsize #-1.5
  smaller
}
```

default smaller

Used properties:

- `baseline-skip` (2)
- `word-space` (1)
- `font-size` (0)

`\huge` *arg* (markup)

Set font size to +2.

```
\markup {
  default
  \hspace #2
  \huge
  huge
}
```

default huge

`\italic` *arg* (markup)
Use italic `font-shape` for *arg*.

```
\markup {
  default
  \hspace #2
  \italic
  italic
}
```

default *italic*

`\large` *arg* (markup)
Set font size to +1.

```
\markup {
  default
  \hspace #2
  \large
  large
}
```

default large

`\larger` *arg* (markup)
Increase the font size relative to the current setting.

```
\markup {
  default
  \hspace #2
  \larger
  larger
}
```

default larger

`\magnify` *sz* (number) *arg* (markup)
Set the font magnification for its argument. In the following example, the middle A is 10% larger:

```
A \magnify #1.1 { A } A
```

Note: Magnification only works if a font name is explicitly selected. Use `\fontsize` otherwise.

```
\markup {
  default
  \hspace #2
```

```
  \magnify #1.5 {
    50% larger
  }
}
```

default 50% larger

`\medium` *arg* (markup)

Switch to medium font-series (in contrast to bold).

```
\markup {
  \bold {
    some bold text
    \hspace #2
    \medium {
      medium font series
    }
    \hspace #2
    bold again
  }
}
```

some bold text medium font series **bold again**

`\normal-size-sub` *arg* (markup)

Set *arg* in subscript with a normal font size.

```
\markup {
  default
  \normal-size-sub {
    subscript in standard size
  }
}
```

default $_{\text{subscript in standard size}}$

Used properties:

- `baseline-skip`

`\normal-size-super` *arg* (markup)

Set *arg* in superscript with a normal font size.

```
\markup {
  default
  \normal-size-super {
    superscript in standard size
  }
}
```

default $^{\text{superscript in standard size}}$

Used properties:

- `baseline-skip`

`\normal-text` *arg* (markup)

Set all font related properties (except the size) to get the default normal text font, no matter what font was used earlier.

```
\markup {
  \huge \bold \sans \caps {
    huge bold sans caps
    \hspace #2
    \normal-text {
      huge normal
    }
    \hspace #2
    as before
  }
}
```

HUGE BOLD SANS CAPS huge normal **AS BEFORE**

`\normalsize` *arg* (markup)

Set font size to default.

```
\markup {
  \teeny {
    this is very small
    \hspace #2
    \normalsize {
      normal size
    }
    \hspace #2
    teeny again
  }
}
```

this is very small normal size teeny again

`\number` *arg* (markup)

Set font family to `number`, which yields the font used for time signatures and fingerings. This font contains numbers and some punctuation; it has no letters.

```
\markup {
  \number {
    0 1 2 3 4 5 6 7 8 9 . ,
  }
}
```

0123456789.,

`\replace` *replacements* (list) *arg* (markup)

Used to automatically replace a string by another in the markup *arg*. Each pair of the alist *replacements* specifies what should be replaced. The `key` is the string to be replaced by the `value` string.

```
\markup \replace #'(("thx" . "Thanks!")) thx
```

Thanks!

`\roman` *arg* (markup)
Set font family to `roman`.

```
\markup {
  \sans \bold {
    sans serif, bold
    \hspace #2
    \roman {
      text in roman font family
    }
    \hspace #2
    return to sans
  }
}
```

sans serif, bold **text in roman font family** **return to sans**

`\sans` *arg* (markup)
Switch to the sans serif font family.

```
\markup {
  default
  \hspace #2
  \sans {
    sans serif
  }
}
```

default sans serif

`\simple` *str* (string)
A simple text string; `\markup { foo }` is equivalent with `\markup { \simple #"foo" }`.

Note: for creating standard text markup or defining new markup commands, the use of `\simple` is unnecessary.

```
\markup {
  \simple #"simple"
  \simple #"text"
  \simple #"strings"
}
```

simple text strings

`\small` *arg* (markup)
Set font size to -1.

```
\markup {
  default
  \hspace #2
  \small
  small
}
```

default small

`\smallCaps` *arg* (markup)

Emit *arg* as small caps.

Note: `\smallCaps` does not support accented characters.

```
\markup {
  default
  \hspace #2
  \smallCaps {
    Text in small caps
  }
}
```

default TEXT IN SMALL CAPS

`\smaller` *arg* (markup)

Decrease the font size relative to the current setting.

```
\markup {
  \fontsize #3.5 {
    some large text
    \hspace #2
    \smaller {
      a bit smaller
    }
    \hspace #2
    more large text
  }
}
```

some large text a bit smaller more large text

`\sub` *arg* (markup)

Set *arg* in subscript.

```
\markup {
  \concat {
    H
    \sub {
      2
    }
    O
  }
}
```

H_2O

Used properties:

- `baseline-skip`
- `font-size` (0)

`\super` *arg* (markup)

Set *arg* in superscript.

```
\markup {
  E =
  \concat {
    mc
    \super
    2
  }
}
```

$E = mc^2$

Used properties:

- `baseline-skip`
- `font-size` (0)

`\teeny` *arg* (markup)
Set font size to -3.

```
\markup {
  default
  \hspace #2
  \teeny
  teeny
}
```

default teeny

`\text` *arg* (markup)
Use a text font instead of music symbol or music alphabet font.

```
\markup {
  \number {
    1, 2,
    \text {
      three, four,
    }
    5
  }
}
```

1, 2, three, four, **5**

`\tiny` *arg* (markup)
Set font size to -2.

```
\markup {
  default
  \hspace #2
  \tiny
  tiny
}
```

default tiny

`\typewriter` *arg* (markup)
Use `font-family` typewriter for *arg*.

```
\markup {
  default
  \hspace #2
  \typewriter
  typewriter
}
```

default typewriter

`\underline` *arg* (markup)

Underline *arg*. Looks at `thickness` to determine line thickness, and `offset` to determine line y-offset.

```
\markup \fill-line {
  \underline "underlined"
  \override #'(offset . 5)
  \override #'(thickness . 1)
  \underline "underlined"
  \override #'(offset . 1)
  \override #'(thickness . 5)
  \underline "underlined"
}
```

underlined underlined underlined

Used properties:

- `offset` (2)
- `thickness` (1)

`\upright` *arg* (markup)

Set `font-shape` to `upright`. This is the opposite of `italic`.

```
\markup {
  \italic {
    italic text
    \hspace #2
    \upright {
      upright text
    }
    \hspace #2
    italic again
  }
}
```

italic text upright text *italic again*

A.10.2 Align

`\center-align` *arg* (markup)

Align `arg` to its X center.

```
\markup {
  \column {
    one
    \center-align
```

```
    two
    three
  }
}
```

one
two
three

`\center-column` *args* (markup list)

Put `args` in a centered column.

```
\markup {
  \center-column {
    one
    two
    three
  }
}
```

one
two
three

Used properties:

- `baseline-skip`

`\column` *args* (markup list)

Stack the markups in *args* vertically. The property `baseline-skip` determines the space between markups in *args*.

```
\markup {
  \column {
    one
    two
    three
  }
}
```

one
two
three

Used properties:

- `baseline-skip`

`\combine` *arg1* (markup) *arg2* (markup)

Print two markups on top of each other.

Note: `\combine` cannot take a list of markups enclosed in curly braces as an argument; the follow example will not compile:

```
\combine { a list }
```

```
\markup {
  \fontsize #5
  \override #'(thickness . 2)
```

```
  \combine
    \draw-line #'(0 . 4)
    \arrow-head #Y #DOWN ##f
}
```

↓

`\concat` *args* (markup list)

Concatenate *args* in a horizontal line, without spaces in between. Strings and simple markups are concatenated on the input level, allowing ligatures. For example, `\concat { "f" \simple #"i" }` is equivalent to `"fi"`.

```
\markup {
  \concat {
    one
    two
    three
  }
}
```

onetwothree

`\dir-column` *args* (markup list)

Make a column of *args*, going up or down, depending on the setting of the `direction` layout property.

```
\markup {
  \override #`(direction . ,UP) {
    \dir-column {
      going up
    }
  }
  \hspace #1
  \dir-column {
    going down
  }
  \hspace #1
  \override #'(direction . 1) {
    \dir-column {
      going up
    }
  }
}
```

up going
up going down

Used properties:

- `baseline-skip`
- `direction`

`\fill-line` *args* (markup list)

Put *markups* in a horizontal line of width *line-width*. The markups are spaced or flushed to fill the entire line. If there are no arguments, return an empty stencil.

```
\markup {
  \column {
    \fill-line {
      Words evenly spaced across the page
    }
    \null
    \fill-line {
      \line { Text markups }
      \line {
        \italic { evenly spaced }
      }
      \line { across the page }
    }
  }
}
```

Words evenly spaced across the page

Text markups *evenly spaced* across the page

Used properties:

- `line-width` (#f)
- `word-space` (0.6)
- `text-direction` (1)

`\fill-with-pattern` *space* (number) *dir* (direction) *pattern* (markup) *left* (markup) *right* (markup)

Put *left* and *right* in a horizontal line of width `line-width` with a line of markups *pattern* in between. Patterns are spaced apart by *space*. Patterns are aligned to the *dir* markup.

```
\markup \column {
  "right-aligned :"
  \fill-with-pattern #1 #RIGHT . first right
  \fill-with-pattern #1 #RIGHT . second right
  \null
  "center-aligned :"
  \fill-with-pattern #1.5 #CENTER - left right
  \null
  "left-aligned :"
  \override #'(line-width . 50)
  \fill-with-pattern #2 #LEFT : left first
  \override #'(line-width . 50)
  \fill-with-pattern #2 #LEFT : left second
}
```

right-aligned :
first . . . . . right
second . . . . . right

center-aligned :
left - right

left-aligned :
left : : : : : : : : : : : : : : : : first
left : : : : : : : : : : : : : : : second

Used properties:

- `line-width`
- `word-space`

`\general-align` *axis* (integer) *dir* (number) *arg* (markup)
Align *arg* in *axis* direction to the *dir* side.

```
\markup {
  \column {
    one
    \general-align #X #LEFT
    two
    three
    \null
    one
    \general-align #X #CENTER
    two
    three
    \null
    \line {
      one
      \general-align #Y #UP
      two
      three
    }
    \null
    \line {
      one
      \general-align #Y #3.2
      two
      three
    }
  }
}
```

one
two
three

one
two
three

one two three

one three
two

`\halign` *dir* (number) *arg* (markup)

Set horizontal alignment. If *dir* is `-1`, then it is left-aligned, while `+1` is right. Values in between interpolate alignment accordingly.

```
\markup {
  \column {
    one
    \halign #LEFT
    two
    three
    \null
    one
    \halign #CENTER
    two
    three
    \null
    one
    \halign #RIGHT
    two
    three
    \null
    one
    \halign #-5
    two
    three
  }
}
```

one
two
three

one
two
three

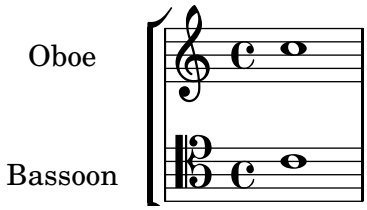
one
two
three

one
two
three

\hcenter-in *length* (number) *arg* (markup)

Center *arg* horizontally within a box of extending *length*/2 to the left and right.

```
\new StaffGroup <<
  \new Staff {
    \set Staff.instrumentName = \markup {
      \hcenter-in #12
      Oboe
    }
    c''1
  }
  \new Staff {
    \set Staff.instrumentName = \markup {
      \hcenter-in #12
      Bassoon
    }
    \clef tenor
    c'1
  }
>>
```



\hspace *amount* (number)

Create an invisible object taking up horizontal space *amount*.

```
\markup {
  one
  \hspace #2
  two
  \hspace #8
  three
}
```

one two three

`\justify-field` *symbol* (symbol)

Justify the data which has been assigned to *symbol*.

```
\header {
  title = "My title"
  myText = "Lorem ipsum dolor sit amet, consectetur adipisicing
    elit, sed do eiusmod tempor incididunt ut labore et dolore magna
    aliqua.  Ut enim ad minim veniam, quis nostrud exercitation ullamco
    laboris nisi ut aliquip ex ea commodo consequat."
}

\paper {
  bookTitleMarkup = \markup {
    \column {
      \fill-line { \fromproperty #'header:title }
      \null
      \justify-field #'header:myText
    }
  }
}

\markup {
  \null
}
```

My title

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

`\justify` *args* (markup list)

Like `\wordwrap`, but with lines stretched to justify the margins. Use `\override #'(line-width . X)` to set the line width; *X* is the number of staff spaces.

```
\markup {
  \justify {
    Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed
    do eiusmod tempor incididunt ut labore et dolore magna aliqua.
    Ut enim ad minim veniam, quis nostrud exercitation ullamco
    laboris nisi ut aliquip ex ea commodo consequat.
  }
}
```

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Used properties:

- text-direction (1)
- word-space
- line-width (#f)
- baseline-skip

\justify-string *arg* (string)

Justify a string. Paragraphs may be separated with double newlines

```
\markup {
  \override #'(line-width . 40)
  \justify-string #"Lorem ipsum dolor sit amet, consectetur
      adipisicing elit, sed do eiusmod tempor incididunt ut labore
      et dolore magna aliqua.


      Ut enim ad minim veniam, quis nostrud exercitation ullamco
      laboris nisi ut aliquip ex ea commodo consequat.


      Excepteur sint occaecat cupidatat non proident, sunt in culpa
      qui officia deserunt mollit anim id est laborum"
}
```

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

Used properties:

- text-direction (1)
- word-space
- line-width
- baseline-skip

\left-align *arg* (markup)

Align *arg* on its left edge.

```
\markup {
  \column {
    one
    \left-align
    two
    three
  }
}
```

one
two
three

`\left-column` *args* (markup list)
Put `args` in a left-aligned column.

```
\markup {
  \left-column {
    one
    two
    three
  }
}
```

one
two
three

Used properties:

- `baseline-skip`

`\line` *args* (markup list)
Put *args* in a horizontal line. The property `word-space` determines the space between markups in *args*.

```
\markup {
  \line {
    one two three
  }
}
```

one two three

Used properties:

- `text-direction` (1)
- `word-space`

`\lower` *amount* (number) *arg* (markup)
Lower *arg* by the distance *amount*. A negative *amount* indicates raising; see also `\raise`.

```
\markup {
  one
  \lower #3
  two
  three
}
```

one three
two

`\pad-around` *amount* (number) *arg* (markup)
Add padding *amount* all around *arg*.

```
\markup {
  \box {
    default
```

```
    }
    \hspace #2
    \box {
      \pad-around #0.5 {
        padded
      }
    }
  }
```

default padded

`\pad-markup` *amount* (number) *arg* (markup)

Add space around a markup object. Identical to `pad-around`.

```
\markup {
  \box {
    default
  }
  \hspace #2
  \box {
    \pad-markup #1 {
      padded
    }
  }
}
```

default padded

`\pad-to-box` *x-ext* (pair of numbers) *y-ext* (pair of numbers) *arg* (markup)

Make *arg* take at least *x-ext*, *y-ext* space.

```
\markup {
  \box {
    default
  }
  \hspace #4
  \box {
    \pad-to-box #'(0 . 10) #'(0 . 3) {
      padded
    }
  }
}
```

default padded

`\pad-x` *amount* (number) *arg* (markup)

Add padding *amount* around *arg* in the X direction.

```
\markup {
  \box {
    default
  }
  \hspace #4
```

```
  \box {
    \pad-x #2 {
      padded
    }
  }
}
```

default padded

`\put-adjacent` *axis* (integer) *dir* (direction) *arg1* (markup) *arg2* (markup)
Put *arg2* next to *arg1*, without moving *arg1*.

`\raise` *amount* (number) *arg* (markup)
Raise *arg* by the distance *amount*. A negative *amount* indicates lowering, see also `\lower`.

The argument to `\raise` is the vertical displacement amount, measured in (global) staff spaces. `\raise` and `\super` raise objects in relation to their surrounding markups.

If the text object itself is positioned above or below the staff, then `\raise` cannot be used to move it, since the mechanism that positions it next to the staff cancels any shift made with `\raise`. For vertical positioning, use the `padding` and/or `extra-offset` properties.

```
\markup {
  C
  \small
  \bold
  \raise #1.0
  9/7+
}
```

C **9/7+**

`\right-align` *arg* (markup)
Align *arg* on its right edge.

```
\markup {
  \column {
    one
    \right-align
    two
    three
  }
}
```

one
two
three

`\right-column` *args* (markup list)
Put `args` in a right-aligned column.

```
\markup {
  \right-column {
    one
```

```
    two
    three
  }
}
```

one
two
three

Used properties:

- `baseline-skip`

`\rotate` *ang* (number) *arg* (markup)

Rotate object with *ang* degrees around its center.

```
\markup {
  default
  \hspace #2
  \rotate #45
  \line {
    rotated 45˚
  }
}
```

default rotated 45°

`\translate` *offset* (pair of numbers) *arg* (markup)

Translate *arg* relative to its surroundings. *offset* is a pair of numbers representing the displacement in the X and Y axis.

```
\markup {
  *
  \translate #'(2 . 3)
  \line { translated two spaces right, three up }
}
```

translated two spaces right, three up
*

`\translate-scaled` *offset* (pair of numbers) *arg* (markup)

Translate *arg* by *offset*, scaling the offset by the `font-size`.

```
\markup {
  \fontsize #5 {
    * \translate #'(2 . 3) translate
    \hspace #2
    * \translate-scaled #'(2 . 3) translate-scaled
  }
}
```

* translate * translate-scaled

Used properties:

- font-size (0)

\vcenter *arg* (markup)

Align arg to its Y center.

```
\markup {
  one
  \vcenter
  two
  three
}
```

one two three

\vspace *amount* (number)

Create an invisible object taking up vertical space of *amount* multiplied by 3.

```
\markup {
    \center-column {
    one
    \vspace #2
    two
    \vspace #5
    three
  }
}
```

one

two

three

\wordwrap-field *symbol* (symbol)

Wordwrap the data which has been assigned to *symbol*.

```
\header {
  title = "My title"
  myText = "Lorem ipsum dolor sit amet, consectetur adipisicing
    elit, sed do eiusmod tempor incididunt ut labore et dolore
    magna aliqua.  Ut enim ad minim veniam, quis nostrud
    exercitation ullamco laboris nisi ut aliquip ex ea commodo
    consequat."
}

\paper {
  bookTitleMarkup = \markup {
    \column {
      \fill-line { \fromproperty #'header:title }
```

```
        \null
        \wordwrap-field #'header:myText
      }
    }
  }

  \markup {
    \null
  }
```

My title

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

`\wordwrap` *args* (markup list)

Simple wordwrap. Use `\override #'(line-width . X)` to set the line width, where X is the number of staff spaces.

```
\markup {
  \wordwrap {
    Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed
    do eiusmod tempor incididunt ut labore et dolore magna aliqua.
    Ut enim ad minim veniam, quis nostrud exercitation ullamco
    laboris nisi ut aliquip ex ea commodo consequat.
  }
}
```

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width` (#f)
- `baseline-skip`

`\wordwrap-string` *arg* (string)

Wordwrap a string. Paragraphs may be separated with double newlines.

```
\markup {
  \override #'(line-width . 40)
  \wordwrap-string #"Lorem ipsum dolor sit amet, consectetur
      adipisicing elit, sed do eiusmod tempor incididunt ut labore
      et dolore magna aliqua.
```

```
      Ut enim ad minim veniam, quis nostrud exercitation ullamco
      laboris nisi ut aliquip ex ea commodo consequat.


      Excepteur sint occaecat cupidatat non proident, sunt in culpa
      qui officia deserunt mollit anim id est laborum"
}
```

Lorem ipsum dolor sit amet,
consectetur adipisicing elit, sed do
eiusmod tempor incididunt ut labore
et dolore magna aliqua.
Ut enim ad minim veniam, quis
nostrud exercitation ullamco laboris
nisi ut aliquip ex ea commodo
consequat.
Excepteur sint occaecat cupidatat non
proident, sunt in culpa qui officia
deserunt mollit anim id est laborum

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width`
- `baseline-skip`

A.10.3 Graphic

`\arrow-head` *axis* (integer) *dir* (direction) *filled* (boolean)

Produce an arrow head in specified direction and axis. Use the filled head if *filled* is specified.

```
\markup {
  \fontsize #5 {
    \general-align #Y #DOWN {
      \arrow-head #Y #UP ##t
      \arrow-head #Y #DOWN ##f
      \hspace #2
      \arrow-head #X #RIGHT ##f
      \arrow-head #X #LEFT ##f
    }
  }
}
```

▲Y ≻≺

`\beam` *width* (number) *slope* (number) *thickness* (number)

Create a beam with the specified parameters.

```
\markup {
  \beam #5 #1 #2
```

```
}
```

`\bracket` *arg* (markup)

Draw vertical brackets around *arg*.

```
\markup {
  \bracket {
    \note #"2." #UP
  }
}
```

`\circle` *arg* (markup)

Draw a circle around *arg*. Use `thickness`, `circle-padding` and `font-size` properties to determine line thickness and padding around the markup.

```
\markup {
  \circle {
    Hi
  }
}
```

Used properties:

- `circle-padding` (0.2)
- `font-size` (0)
- `thickness` (1)

`\draw-circle` *radius* (number) *thickness* (number) *filled* (boolean)

A circle of radius *radius* and thickness *thickness*, optionally filled.

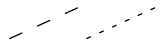
```
\markup {
  \draw-circle #2 #0.5 ##f
  \hspace #2
  \draw-circle #2 #0 ##t
}
```

`\draw-dashed-line` *dest* (pair of numbers)

A dashed line.

If `full-length` is set to #t (default) the dashed-line extends to the whole length given by *dest*, without white space at beginning or end. `off` will then be altered to fit. To insist on the given (or default) values of `on`, `off` use `\override #'(full-length . #f)` Manual settings for `on`,`off` and `phase` are possible.

```
\markup {
  \draw-dashed-line #'(5.1 . 2.3)
  \override #'(on . 0.3)
  \override #'(off . 0.5)
  \draw-dashed-line #'(5.1 . 2.3)
}
```



Used properties:

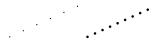
- `full-length` (#t)
- `phase` (0)
- `off` (1)
- `on` (1)
- `thickness` (1)

`\draw-dotted-line` *dest* (pair of numbers)

A dotted line.

The dotted-line always extends to the whole length given by *dest*, without white space at beginning or end. Manual settings for `off` are possible to get larger or smaller space between the dots. The given (or default) value of `off` will be altered to fit the line-length.

```
\markup {
  \draw-dotted-line #'(5.1 . 2.3)
  \override #'(thickness . 2)
  \override #'(off . 0.2)
  \draw-dotted-line #'(5.1 . 2.3)
}
```



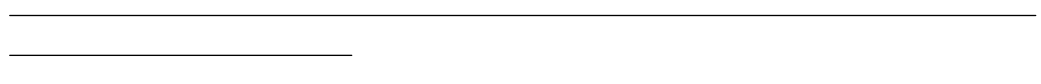
Used properties:

- `phase` (0)
- `off` (1)
- `thickness` (1)

`\draw-hline`

Draws a line across a page, where the property `span-factor` controls what fraction of the page is taken up.

```
\markup {
  \column {
    \draw-hline
    \override #'(span-factor . 1/3)
    \draw-hline
  }
}
```



Used properties:

- `span-factor` (1)
- `line-width`
- `draw-line-markup`

`\draw-line` *dest* (pair of numbers)

A simple line.

```
\markup {
  \draw-line #'(4 . 4)
  \override #'(thickness . 5)
  \draw-line #'(-3 . 0)
}
```

Used properties:

- `thickness` (1)

`\ellipse` *arg* (markup)

Draw an ellipse around *arg*. Use `thickness`, `x-padding`, `y-padding` and `font-size` properties to determine line thickness and padding around the markup.

```
\markup {
  \ellipse {
    Hi
  }
}
```

Hi

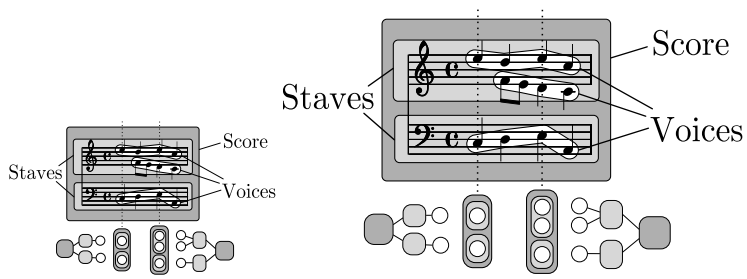
Used properties:

- `y-padding` (0.2)
- `x-padding` (0.2)
- `font-size` (0)
- `thickness` (1)

`\epsfile` *axis* (number) *size* (number) *file-name* (string)

Inline an EPS image. The image is scaled along *axis* to *size*.

```
\markup {
  \general-align #Y #DOWN {
    \epsfile #X #20 #"context-example.eps"
    \epsfile #Y #20 #"context-example.eps"
  }
}
```



`\filled-box` *xext* (pair of numbers) *yext* (pair of numbers) *blot* (number)

Draw a box with rounded corners of dimensions *xext* and *yext*. For example,

```
\filled-box #'(-.3 . 1.8) #'(-.3 . 1.8) #0
```

creates a box extending horizontally from -0.3 to 1.8 and vertically from -0.3 up to 1.8, with corners formed from a circle of diameter 0 (i.e., sharp corners).

```
\markup {
  \filled-box #'(0 . 4) #'(0 . 4) #0
  \filled-box #'(0 . 2) #'(-4 . 2) #0.4
  \filled-box #'(1 . 8) #'(0 . 7) #0.2
  \with-color #white
  \filled-box #'(-4.5 . -2.5) #'(3.5 . 5.5) #0.7
}
```

`\hbracket` *arg* (markup)

Draw horizontal brackets around *arg*.

```
\markup {
  \hbracket {
    \line {
      one two three
    }
  }
}
```

one two three

`\oval` *arg* (markup)

Draw a oval around *arg*. Use `thickness`, `x-padding`, `x-padding` and `font-size` properties to determine line thickness and padding around the markup.

```
\markup {
  \oval {
    Hi
  }
}
```

Hi

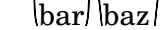
Used properties:

- `y-padding` (0.75)
- `x-padding` (0.75)
- `font-size` (0)
- `thickness` (1)

`\parenthesize` *arg* (markup)

Draw parentheses around *arg*. This is useful for parenthesizing a column containing several lines of text.

```
\markup {
  \line {
    \parenthesize {
      \column {
        foo
        bar
      }
    }
    \override #'(angularity . 2) {
      \parenthesize {
        \column {
          bah
          baz
        }
      }
    }
  }
}
```



Used properties:

- `width` (0.25)
- `thickness` (1)
- `size` (1)
- `padding`
- `angularity` (0)

`\path` *thickness* (number) *commands* (list)

Draws a path with line thickness *thickness* according to the directions given in *commands*. *commands* is a list of lists where the `car` of each sublist is a drawing command and the `cdr` comprises the associated arguments for each command.

Line-cap styles and line-join styles may be customized by overriding the `line-cap-style` and `line-join-style` properties, respectively. Available line-cap styles are `'butt`, `'round`, and `'square`. Available line-join styles are `'miter`, `'round`, and `'bevel`.

The property `filled` specifies whether or not the path is filled with color.

There are seven commands available to use in the list `commands`: `moveto`, `rmoveto`, `lineto`, `rlineto`, `curveto`, `rcurveto`, and `closepath`. Note that the commands that begin with *r* are the relative variants of the other three commands.

The commands `moveto`, `rmoveto`, `lineto`, and `rlineto` take 2 arguments; they are the X and Y coordinates for the destination point.

The commands `curveto` and `rcurveto` create cubic Bézier curves, and take 6 arguments; the first two are the X and Y coordinates for the first control point, the second two are the X and Y coordinates for the second control point, and the last two are the X and Y coordinates for the destination point.

The `closepath` command takes zero arguments and closes the current subpath in the active path.

Note that a sequence of commands *must* begin with a `moveto` or `rmoveto` to work with the SVG output.

```
samplePath =
  #'((moveto 0 0)
     (lineto -1 1)
     (lineto 1 1)
     (lineto 1 -1)
     (curveto -5 -5 -5 5 -1 0)
     (closepath))

\markup {
  \path #0.25 #samplePath
}
```

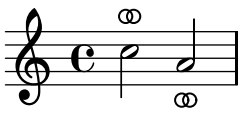
Used properties:

- `filled` (#f)
- `line-join-style` (round)
- `line-cap-style` (round)

`\postscript` *str* (string)

This inserts *str* directly into the output as a PostScript command string.

```
ringsps = #"
  0.15 setlinewidth
  0.9 0.6 moveto
  0.4 0.6 0.5 0 361 arc
  stroke
  1.0 0.6 0.5 0 361 arc
  stroke
  "

rings = \markup {
  \with-dimensions #'(-0.2 . 1.6) #'(0 . 1.2)
  \postscript #ringsps
}

\relative c'' {
  c2^\rings
  a2_\rings
}
```

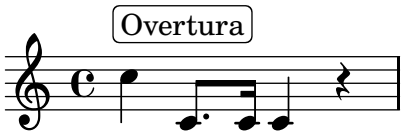


`\rounded-box` *arg* (markup)

Draw a box with rounded corners around *arg*. Looks at `thickness`, `box-padding` and `font-size` properties to determine line thickness and padding around the markup; the `corner-radius` property makes it possible to define another shape for the corners (default is 1).

```
c4^\markup {
  \rounded-box {
```

```
    Overtura
  }
}
c,8. c16 c4 r
```



Used properties:

- `box-padding` (0.5)
- `font-size` (0)
- `corner-radius` (1)
- `thickness` (1)

`\scale` *factor-pair* (pair of numbers) *arg* (markup)

Scale *arg*. *factor-pair* is a pair of numbers representing the scaling-factor in the X and Y axes. Negative values may be used to produce mirror images.

```
\markup {
  \line {
    \scale #'(2 . 1)
    stretched
    \scale #'(1 . -1)
    mirrored
  }
}
```

stretched mirrored

`\triangle` *filled* (boolean)

A triangle, either filled or empty.

```
\markup {
  \triangle ##t
  \hspace #2
  \triangle ##f
}
```

▲ △

Used properties:

- `baseline-skip` (2)
- `font-size` (0)
- `thickness` (0.1)

`\with-url` *url* (string) *arg* (markup)

Add a link to URL *url* around *arg*. This only works in the PDF backend.

```
\markup {
  \with-url #"http://lilypond.org/" {
    LilyPond ... \italic {
      music notation for everyone
```

```
      }
    }
  }
```

LilyPond ... *music notation for everyone*

A.10.4 Music

`\customTabClef` *num-strings* (integer) *staff-space* (number)

Draw a tab clef sans-serif style.

`\doubleflat`

Draw a double flat symbol.

```
\markup {
  \doubleflat
}
```

𝄫

`\doublesharp`

Draw a double sharp symbol.

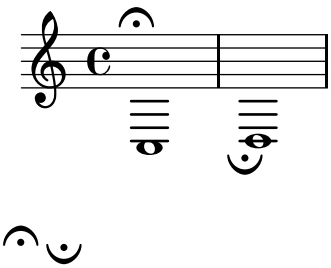
```
\markup {
  \doublesharp
}
```

𝄪

`\fermata`

Create a fermata glyph. When *direction* is `DOWN`, use an inverted glyph. Note that within music, one would usually use the `\fermata` articulation instead of a markup.

```
{ c1^\markup \fermata d1_\markup \fermata }

\markup { \fermata \override #`(direction . ,DOWN) \fermata }
```



Used properties:

- `direction` (1)

`\flat`

Draw a flat symbol.

```
\markup {
  \flat
}
```

♭

`\musicglyph` *glyph-name* (string)

glyph-name is converted to a musical symbol; for example, `\musicglyph #"accidentals.natural"` selects the natural sign from the music font. See Sezione "The Feta font" in *Guida alla Notazione* for a complete listing of the possible glyphs.

```
\markup {
  \musicglyph #"f"
  \musicglyph #"rests.2"
  \musicglyph #"clefs.G_change"
}
```

`\natural`

Draw a natural symbol.

```
\markup {
  \natural
}
```

`\note-by-number` *log* (number) *dot-count* (number) *dir* (number)

Construct a note symbol, with stem and flag. By using fractional values for *dir*, longer or shorter stems can be obtained. Supports all note-head-styles. Supported flag-styles are `default`, `old-straight-flag` and `modern-straight-flag`.

```
\markup {
  \note-by-number #3 #0 #DOWN
  \hspace #2
  \note-by-number #1 #2 #0.8
}
```

Used properties:

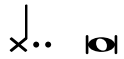
- `style` ('())
- `flag-style` ('())
- `font-size` (0)

`\note` *duration* (string) *dir* (number)

This produces a note with a stem pointing in *dir* direction, with the *duration* for the note head type and augmentation dots. For example, `\note #"4." #-0.75` creates a dotted quarter note, with a shortened down stem.

```
\markup {
  \override #'(style . cross) {
    \note #"4.." #UP
  }
  \hspace #2
  \note #"breve" #0
```

```
}
```



Used properties:

- `style` ('())
- `flag-style` ('())
- `font-size` (0)

`\rest-by-number` *log* (number) *dot-count* (number)

A rest or multi-measure-rest symbol.

```
\markup {
  \rest-by-number #3 #2
  \hspace #2
  \rest-by-number #0 #1
  \hspace #2
  \override #'(multi-measure-rest . #t)
  \rest-by-number #0 #0
}
```

Used properties:

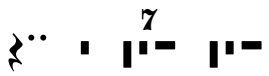
- `multi-measure-rest` (#f)
- `style` ('())
- `font-size` (0)

`\rest` *duration* (string)

This produces a rest, with the *duration* for the rest type and augmentation dots. `"breve"`, `"longa"` and `"maxima"` are valid input-strings.

Printing MultiMeasureRests could be enabled with `\override #'(multi-measure-rest . #t)` If MultiMeasureRests are taken, the MultiMeasureRestNumber is printed above. This is enabled for all styles using default-glyphs. Could be disabled with `\override #'(multi-measure-rest-number . #f)`

```
\markup {
  \rest #"4.."
  \hspace #2
  \rest #"breve"
  \hspace #2
  \override #'(multi-measure-rest . #t)
  {
  \rest #"7"
  \hspace #2
  \override #'(multi-measure-rest-number . #f)
  \rest #"7"
  }
}
```



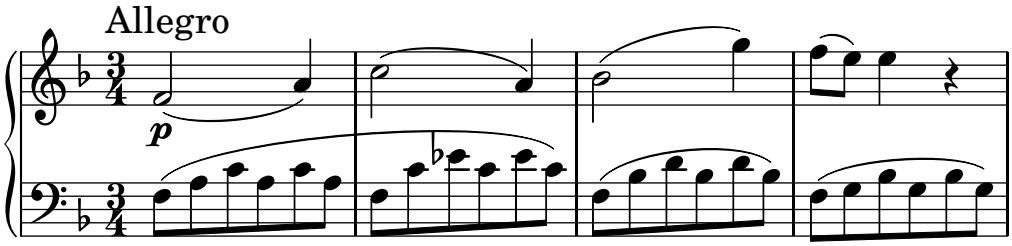
Used properties:

- `word-space` (0.6)
- `multi-measure-rest-number` (#t)
- `multi-measure-rest` (#f)
- `style` ('())

`\score` *score* (score)

Inline an image of music. The reference point (usually the middle staff line) of the lowest staff in the top system is placed on the baseline.

```
\markup {
  \score {
    \new PianoStaff <<
      \new Staff \relative c' {
        \key f \major
        \time 3/4
        \mark \markup { Allegro }
        f2\p( a4)
        c2( a4)
        bes2( g'4)
        f8( e) e4 r
      }
      \new Staff \relative c {
        \clef bass
        \key f \major
        \time 3/4
        f8( a c a c a
        f c' es c es c)
        f,( bes d bes d bes)
        f( g bes g bes g)
      }
    >>
    \layout {
      indent = 0.0\cm
      \context {
        \Score
        \override RehearsalMark
          #'break-align-symbols = #'(time-signature key-signature)
        \override RehearsalMark
          #'self-alignment-X = #LEFT
      }
      \context {
        \Staff
        \override TimeSignature
          #'break-align-anchor-alignment = #LEFT
      }
    }
  }
}
```



Used properties:

- `baseline-skip`

`\semiflat`

Draw a semiflat symbol.

```
\markup {
  \semiflat
}
```

𝄾

`\semisharp`

Draw a semisharp symbol.

```
\markup {
  \semisharp
}
```

𝄿

`\sesquiflat`

Draw a 3/2 flat symbol.

```
\markup {
  \sesquiflat
}
```

𝄫

`\sesquisharp`

Draw a 3/2 sharp symbol.

```
\markup {
  \sesquisharp
}
```

𝄪

`\sharp`

Draw a sharp symbol.

```
\markup {
  \sharp
}
```

♯

`\tied-lyric` *str* (string)

Like simple-markup, but use tie characters for '~' tilde symbols.

```
\markup \column {
  \tied-lyric #"Siam navi~all'onde~algenti Lasciate~in abbandono"
  \tied-lyric #"Impetuosi venti I nostri~affetti sono"
  \tied-lyric #"Ogni diletto~e scoglio Tutta la vita~e~un mar."
}
```

Siam navi‿all'onde‿algenti Lasciate‿in abbandono
Impetuosi venti I nostri‿affetti sono
Ogni diletto‿e scoglio Tutta la vita‿e‿un mar.

Used properties:

- `word-space`

A.10.5 Instrument Specific Markup

`\fret-diagram` *definition-string* (string)

Make a (guitar) fret diagram. For example, say

`\markup \fret-diagram #"s:0.75;6-x;5-x;4-o;3-2;2-3;1-2;"`

for fret spacing 3/4 of staff space, D chord diagram

Syntax rules for *definition-string*:

- Diagram items are separated by semicolons.
- Possible items:
  - `s:`*number* – Set the fret spacing of the diagram (in staff spaces). Default: 1.
  - `t:`*number* – Set the line thickness (relative to normal line thickness). Default: 0.5.
  - `h:`*number* – Set the height of the diagram in frets. Default: 4.
  - `w:`*number* – Set the width of the diagram in strings. Default: 6.
  - `f:`*number* – Set fingering label type (0 = none, 1 = in circle on string, 2 = below string). Default: 0.
  - `d:`*number* – Set radius of dot, in terms of fret spacing. Default: 0.25.
  - `p:`*number* – Set the position of the dot in the fret space. 0.5 is centered; 1 is on lower fret bar, 0 is on upper fret bar. Default: 0.6.
  - `c:`*string1*`-`*string2*`-`*fret* – Include a barre mark from *string1* to *string2* on *fret*.
  - *string*`-`*fret* – Place a dot on *string* at *fret*. If *fret* is '`o`', *string* is identified as open. If *fret* is '`x`', *string* is identified as muted.
  - *string*`-`*fret*`-`*fingering* – Place a dot on *string* at *fret*, and label with *fingering* as defined by the `f:` code.
- Note: There is no limit to the number of fret indications per string.

Used properties:

- `thickness` (0.5)
- `fret-diagram-details`
- `size` (1.0)
- `align-dir` (-0.4)

`\fret-diagram-terse` *definition-string* (string)

Make a fret diagram markup using terse string-based syntax.

Here is an example

```
\markup \fret-diagram-terse #"x;x;o;2;3;2;"
```

for a D chord diagram.

Syntax rules for *definition-string*:

- Strings are terminated by semicolons; the number of semicolons is the number of strings in the diagram.
- Mute strings are indicated by '`x`'.
- Open strings are indicated by '`o`'.
- A number indicates a fret indication at that fret.
- If there are multiple fret indicators desired on a string, they should be separated by spaces.
- Fingerings are given by following the fret number with a `-`, followed by the finger indicator, e.g. '`3-2`' for playing the third fret with the second finger.
- Where a barre indicator is desired, follow the fret (or fingering) symbol with `-(` to start a barre and `-)` to end the barre.

Used properties:

- `thickness` (0.5)
- `fret-diagram-details`
- `size` (1.0)
- `align-dir` (-0.4)

`\fret-diagram-verbose` *marking-list* (pair)

Make a fret diagram containing the symbols indicated in *marking-list*.

For example,

```
\markup \fret-diagram-verbose
  #'((mute 6) (mute 5) (open 4)
     (place-fret 3 2) (place-fret 2 3) (place-fret 1 2))
```

produces a standard D chord diagram without fingering indications.

Possible elements in *marking-list*:

`(mute` *`string-number`*`)`
: Place a small 'x' at the top of string *string-number*.

`(open` *`string-number`*`)`
: Place a small 'o' at the top of string *string-number*.

`(barre` *`start-string end-string fret-number`*`)`
: Place a barre indicator (much like a tie) from string *start-string* to string *end-string* at fret *fret-number*.

`(capo` *`fret-number`*`)`
: Place a capo indicator (a large solid bar) across the entire fretboard at fret location *fret-number*. Also, set fret *fret-number* to be the lowest fret on the fret diagram.

`(place-fret` *`string-number fret-number`* `[`*`finger-value`* `[`*`color-modifier`*`]])`
: Place a fret playing indication on string *string-number* at fret *fret-number* with an optional fingering label *finger-value*, and an optional color modifier *color-modifier*. By default, the fret playing indicator is a solid dot. This can be globally changed by setting the value of the variable *dot-color*. Setting *color-modifier* to `inverted` inverts the dot color for a specific fingering. If the *finger* part of the `place-fret` element is

present, *finger-value* will be displayed according to the setting of the variable *finger-code*. There is no limit to the number of fret indications per string.

Used properties:

- `thickness` (0.5)
- `fret-diagram-details`
- `size` (1.0)
- `align-dir` (-0.4)

`\harp-pedal` *definition-string* (string)

Make a harp pedal diagram.

Possible elements in *definition-string*:

`^`	pedal is up
`-`	pedal is neutral
`v`	pedal is down
`|`	vertical divider line
`o`	the following pedal should be circled (indicating a change)

The function also checks if the string has the typical form of three pedals, then the divider and then the remaining four pedals. If not it prints out a warning. However, in any case, it will also print each symbol in the order as given. This means you can place the divider (even multiple dividers) anywhere you want, but you'll have to live with the warnings.

The appearance of the diagram can be tweaked inter alia using the size property of the TextScript grob (`\override Voice.TextScript #'size = #0.3`) for the overall, the thickness property (`\override Voice.TextScript #'thickness = #3`) for the line thickness of the horizontal line and the divider. The remaining configuration (box sizes, offsets and spaces) is done by the harp-pedal-details list of properties (`\override Voice.TextScript #'harp-pedal-details #'box-width = #1`). It contains the following settings: `box-offset` (vertical shift of the box center for up/down pedals), `box-width`, `box-height`, `space-before-divider` (the spacing between two boxes before the divider) and `space-after-divider` (box spacing after the divider).

```
\markup \harp-pedal #"^-v|--ov^"
```

Used properties:

- `thickness` (0.5)
- `harp-pedal-details` ('())
- `size` (1.2)

`\woodwind-diagram` *instrument* (symbol) *user-draw-commands* (list)

Make a woodwind-instrument diagram. For example, say

```
\markup \woodwind-diagram
  #'oboe #'((lh . (d ees)) (cc . (five3qT1q)) (rh . (gis)))
```

for an oboe with the left-hand d key, left-hand ees key, and right-hand gis key depressed while the five-hole of the central column effectuates a trill between 1/4 and 3/4 closed.

The following instruments are supported:

- piccolo
- flute
- oboe
- clarinet
- bass-clarinet
- saxophone
- bassoon
- contrabassoon

To see all of the callable keys for a given instrument, include the function `(print-keys 'instrument)` in your .ly file, where instrument is the instrument whose keys you want to print.

Certain keys allow for special configurations. The entire gamut of configurations possible is as follows:

- 1q (1/4 covered)
- 1h (1/2 covered)
- 3q (3/4 covered)
- R (ring depressed)
- F (fully covered; the default if no state put)

Additionally, these configurations can be used in trills. So, for example, `three3qTR` effectuates a trill between 3/4 full and ring depressed on the three hole. As another example, `threeRT` effectuates a trill between R and open, whereas `threeTR` effectuates a trill between open and shut. To see all of the possibilities for all of the keys of a given instrument, invoke `(print-keys-verbose 'instrument)`.

Lastly, substituting an empty list for the pressed-key alist will result in a diagram with all of the keys drawn but none filled, for example:

```
\markup \woodwind-diagram #'oboe #'()
```

Used properties:

- `graphical` (#t)
- `thickness` (0.1)
- `size` (1)

A.10.6 Accordion Registers

`\discant` *name* (string)

`\discant` *`name`* generates a discant accordion register symbol.

To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

The register names in the default `\discant` register set have modeled after numeric Swiss notation like depicted in http://de.wikipedia.org/wiki/Register_%28Akkordeon%29, omitting the slashes and dropping leading zeros.

The string *name* is basically a three-digit number with the lowest digit specifying the number of 16' reeds, the tens the number of 8' reeds, and the hundreds specifying the number of 4' reeds. Without modification, the specified number of reeds in 8' is centered in the symbol. Newer instruments may have registrations where 8' can be

used either within or without a tone chamber, 'cassotto'. Notationally, the central dot then indicates use of cassotto. One can suffix the tens' digits '1' and '2' with '+' or '-' to indicate clustering the dots at the right or left respectively rather than centered.

Some examples are

\discant #"1"

\discant #"1+0"

\discant #"120"

\discant #"131"

Used properties:

- font-size (0)

\freeBass *name* (string)

\freeBass *name* generates a free bass/converter accordion register symbol for the usual two-reed layout.

To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

Available registrations are

\freeBass #"1"

\freeBass #"11"

\freeBass #"10"

Used properties:

- font-size (0)

\stdBass *name* (string)

\stdBass *name* generates a standard bass accordion register symbol.

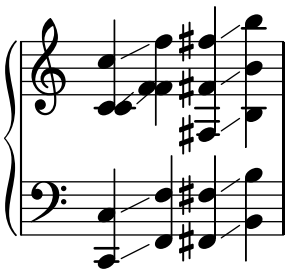
To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

The default bass register definitions have been modeled after the article http://www.accordions.com/index/art/stradella.shtml originally appearing in Accord Magazine.

The underlying register model is



This kind of overlapping arrangement is common for Italian instruments though the exact location of the octave breaks differ.

When not composing for a particular target instrument, using the five reed definitions makes more sense than using a four reed layout: in that manner, the '`Master`' register is unambiguous. This is rather the rule in literature bothering about bass registrations at all.

Available registrations are

\stdBass #"Soprano"

\stdBass #"Soft Bass"

\stdBass #"Alto"

\stdBass #"Soft Tenor"

\stdBass #"Tenor"

\stdBass #"Bass/Alto"

\stdBass #"Master"

Used properties:

- `font-size` (0)

`\stdBassIV` *name* (string)

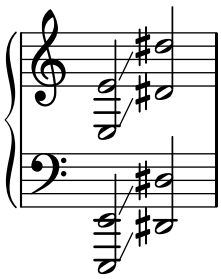
`\stdBassIV` *`name`* generates a standard bass accordion register symbol.

To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

The main use is for four-reed standard bass instruments with reedbank layout



Notable instruments are Morino models with MIII (the others are five-reed instead) and the Atlantic IV. Most of those models have three register switches. Some newer Morinos with MIII might have five or even seven.

The prevalent three-register layout uses the middle three switches '`Tenor`', '`Master`', '`Soft Bass`'. Note that the sound is quite darker than the same registrations of '`c,`'-based instruments.

Available registrations are

\stdBassIV #"Soprano"

\stdBassIV #"Soft Bass"

\stdBassIV #"Alto"

\stdBassIV #"Bass/Alto"

\stdBassIV #"Tenor"

\stdBassIV #"Soft Bass/Alto"

\stdBassIV #"Master"

\stdBassIV #"Soft Tenor"

Used properties:

- `font-size` (0)

`\stdBassV` *name* (string)

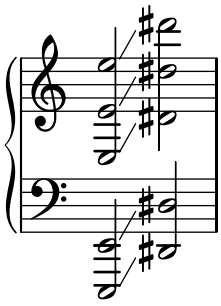
`\stdBassV` *`name`* generates a standard bass accordion register symbol.

To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

The main use is for five-reed standard bass instruments with reedbank layout



This tends to be the bass layout for Hohner's Morino series without convertor or MIII manual.

With the exception of the rather new 7-register layout, the highest two chord reeds are usually sounded together. The Older instruments offer 5 or 3 bass registers. The Tango VM offers an additional '`Solo Bass`' setting that mutes the chord reeds. The symbol on the register buttons of the Tango VM would actually match the physical five-octave layout reflected here, but it is not used in literature.

Composers should likely prefer the five-reed versions of these symbols. The mismatch of a four-reed instrument with five-reed symbols is easier to resolve for the player than the other way round.

Available registrations are

\stdBassV #"Bass/Alto"

\stdBassV #"Soft Bass"

\stdBassV #"Soft Bass/Alto"

\stdBassV #"Soft Tenor"

\stdBassV #"Alto"

\stdBassV #"Soprano"

\stdBassV #"Tenor"

\stdBassV #"Sopranos"

\stdBassV #"Master"

\stdBassV #"Solo Bass"

Used properties:

- `font-size` (0)

`\stdBassVI` *name* (string)

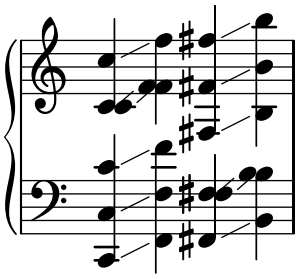
`\stdBassVI` *`name`* generates a standard bass accordion register symbol for six reed basses.

To make it available,

```
#(use-modules (scm accreg))
```

is required near the top of your input file.

This is primarily the register layout for the Hohner "Gola" model. The layout is



The registers are effectively quite similar to that of `\stdBass`. An additional bass reed at alto pitch is omitted for esthetical reasons from the '`Master`' setting, so the symbols are almost the same except for the '`Alto/Soprano`' register with bass notes at Alto pitch and chords at Soprano pitch.

Available registrations are

\stdBassVI #"Soprano"

\stdBassVI #"Alto/Soprano"

\stdBassVI #"Alto"

\stdBassVI #"Bass/Alto"

\stdBassVI #"Soft Tenor"

\stdBassVI #"Soft Bass"

\stdBassVI #"Master"

Used properties:

- font-size (0)

A.10.7 Other

\auto-footnote *mkup* (markup) *note* (markup)

Have footnote *note* act as an annotation to the markup *mkup*.

```
\markup {
  \auto-footnote a b
  \override #'(padding . 0.2)
  \auto-footnote c d
}
```

a c

The footnote will be annotated automatically.

Used properties:

- padding (0.0)
- raise (0.5)

\backslashed-digit *num* (integer)

A feta number, with backslash. This is for use in the context of figured bass notation.

```
\markup {
  \backslashed-digit #5
  \hspace #2
  \override #'(thickness . 3)
  \backslashed-digit #7
}
```

5 7

Used properties:

- thickness (1.6)
- font-size (0)

\char *num* (integer)

Produce a single character. Characters encoded in hexadecimal format require the prefix #x.

```
\markup {
  \char #65 \char ##x00a9
}
```

A ©

`\eyeglasses`

Prints out eyeglasses, indicating strongly to look at the conductor.

```
\markup { \eyeglasses }
```

`\footnote` *mkup* (markup) *note* (markup)

Have footnote *note* act as an annotation to the markup *mkup*.

```
\markup {
  \auto-footnote a b
  \override #'(padding . 0.2)
  \auto-footnote c d
}
```

a c

The footnote will not be annotated automatically.

`\fraction` *arg1* (markup) *arg2* (markup)

Make a fraction of two markups.

```
\markup {

  \fraction 355 113
}
```

$$\pi \approx \frac{355}{113}$$

Used properties:

- `font-size` (0)

`\fromproperty` *symbol* (symbol)

Read the *symbol* from property settings, and produce a stencil from the markup contained within. If *symbol* is not defined, it returns an empty markup.

```
\header {
  myTitle = "myTitle"
  title = \markup {
    from
    \italic
    \fromproperty #'header:myTitle
  }
}
\markup {
  \null
}
```

from *myTitle*

`\left-brace` *size* (number)

A feta brace in point size *size*.

```
\markup {
  \left-brace #35
  \hspace #2
  \left-brace #45
}
```

`\lookup` *glyph-name* (string)

Lookup a glyph by name.

```
\markup {
  \override #'(font-encoding . fetaBraces) {
    \lookup #"brace200"
    \hspace #2
    \rotate #180
    \lookup #"brace180"
  }
}
```

`\markalphabet` *num* (integer)

Make a markup letter for *num*. The letters start with A to Z and continue with double letters.

```
\markup {
  \markalphabet #8
  \hspace #2
  \markalphabet #26
}
```

I AA

`\markletter` *num* (integer)

Make a markup letter for *num*. The letters start with A to Z (skipping letter I), and continue with double letters.

```
\markup {
  \markletter #8
  \hspace #2
  \markletter #26
}
```

J AB

`\null`

An empty markup with extents of a single point.

```
\markup {
  \null
}
```

`\on-the-fly` *procedure* (procedure) *arg* (markup)

Apply the *procedure* markup command to *arg*. *procedure* should take a single argument.

`\override` *new-prop* (pair) *arg* (markup)

Add the argument *new-prop* to the property list. Properties may be any property supported by Sezione "font-interface" in *Guida al Funzionamento Interno*, Sezione "text-interface" in *Guida al Funzionamento Interno* and Sezione "instrument-specific-markup-interface" in *Guida al Funzionamento Interno*.

```
\markup {
  \line {
    \column {
      default
      baseline-skip
    }
    \hspace #2
    \override #'(baseline-skip . 4) {
      \column {
        increased
        baseline-skip
      }
    }
  }
}
```

default baseline-skip **increased baseline-skip**

`\page-link` *page-number* (number) *arg* (markup)

Add a link to the page *page-number* around *arg*. This only works in the PDF backend.

```
\markup {
  \page-link #2  { \italic { This links to page 2... } }
}
```

This links to page 2...

`\page-ref` *label* (symbol) *gauge* (markup) *default* (markup)

Reference to a page number. *label* is the label set on the referenced page (using the `\label` command), *gauge* a markup used to estimate the maximum width of the page number, and *default* the value to display when *label* is not found.

`\pattern` *count* (integer) *axis* (integer) *space* (number) *pattern* (markup)

Prints *count* times a *pattern* markup. Patterns are spaced apart by *space*. Patterns are distributed on *axis*.

```
\markup \column {
  "Horizontally repeated :"
  \pattern #7 #X #2 \flat
  \null
  "Vertically repeated :"
  \pattern #3 #Y #0.5 \flat
}
```

Horizontally repeated :

♭ ♭ ♭ ♭ ♭ ♭ ♭

Vertically repeated :

♭

♭

♭

`\property-recursive` *symbol* (symbol)

Print out a warning when a header field markup contains some recursive markup definition.

`\right-brace` *size* (number)

A feta brace in point size *size*, rotated 180 degrees.

```
\markup {
  \right-brace #45
  \hspace #2
  \right-brace #35
}
```

`\slashed-digit` *num* (integer)

A feta number, with slash. This is for use in the context of figured bass notation.

```
\markup {
  \slashed-digit #5
  \hspace #2
  \override #'(thickness . 3)
  \slashed-digit #7
}
```

5̸ 7̸

Used properties:

- `thickness` (1.6)
- `font-size` (0)

`\stencil` *stil* (stencil)

Use a stencil as markup.

```
\markup {
  \stencil #(make-circle-stencil 2 0 #t)
}
```

`\strut`

Create a box of the same height as the space in the current font.

`\transparent` *arg* (markup)

Make *arg* transparent.

```
\markup {
  \transparent {
    invisible text
  }
}
```

`\verbatim-file` *name* (string)

Read the contents of file *name*, and include it verbatim.

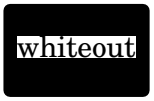
```
\markup {
  \verbatim-file #"simple.ly"
}
```

```
%% A simple piece in LilyPond, a scale.
\relative c' {
  c d e f g a b c
}
%% Optional helper for automatic updating by convert-ly.
%% May be omitted.
\version "2.16.0"
```

`\whiteout` *arg* (markup)

Provide a white background for *arg*.

```
\markup {
  \combine
    \filled-box #'(-1 . 10) #'(-3 . 4) #1
    \whiteout whiteout
}
```



`\with-color` *color* (color) *arg* (markup)

Draw *arg* in color specified by *color*.

```
\markup {
  \with-color #red
  red
  \hspace #2
  \with-color #green
  green
  \hspace #2
  \with-color #blue
  blue
}
```

red green blue

`\with-dimensions` *x* (pair of numbers) *y* (pair of numbers) *arg* (markup)
Set the dimensions of *arg* to *x* and *y*.

`\with-link` *label* (symbol) *arg* (markup)
Add a link to the page holding label *label* around *arg*. This only works in the PDF backend.

```
\markup {
  \with-link #'label {
    \italic { This links to the page containing the label... }
  }
}
```

This links to the page containing the label...

A.11 Text markup list commands

The following commands can all be used with `\markuplist`:

`\column-lines` *args* (markup list)
Like `\column`, but return a list of lines instead of a single markup. `baseline-skip` determines the space between each markup in *args*.

Used properties:

- `baseline-skip`

`\justified-lines` *args* (markup list)
Like `\justify`, but return a list of lines instead of a single markup. Use `\override-lines #'(line-width . X)` to set the line width; *X* is the number of staff spaces.

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width` (#f)
- `baseline-skip`

`\map-markup-commands` *compose* (procedure) *args* (markup list)
This applies the function *compose* to every markup in *args* (including elements of markup list command calls) in order to produce a new markup list. Since the return value from a markup list command call is not a markup list but rather a list of stencils, this requires passing those stencils off as the results of individual markup calls. That way, the results should work out as long as no markups rely on side effects.

`\override-lines` *new-prop* (pair) *args* (markup list)
Like `\override`, for markup lists.

`\score-lines` *score* (score)
This is the same as the `\score` markup but delivers its systems as a list of lines. This is not usually called directly by the user. Instead, it is called when the parser encounters `\score` in a context where only markup lists are allowed. When used as the argument of a toplevel `\markuplist`, the result can be split across pages.

`\table-of-contents`
`\wordwrap-internal` *justify* (boolean) *args* (markup list)
Internal markup list command used to define `\justify` and `\wordwrap`.

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width` (#f)

`\wordwrap-lines` *args* (markup list)
Like `\wordwrap`, but return a list of lines instead of a single markup. Use `\override-lines #'(line-width . X)` to set the line width, where *X* is the number of staff spaces.

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width` (#f)
- `baseline-skip`

`\wordwrap-string-internal` *justify* (boolean) *arg* (string)
Internal markup list command used to define `\justify-string` and `\wordwrap-string`.

Used properties:

- `text-direction` (1)
- `word-space`
- `line-width`

A.12 List of special characters

The following special characters references can be used; for more details, see [ASCII aliases], pagina 489.

The HTML syntax is used and most of these references are the same as HTML. The rest of them are inspired by LaTeX.

The characters are boxed so that you can see their size. A small padding has been added between the character and the box for more readability.

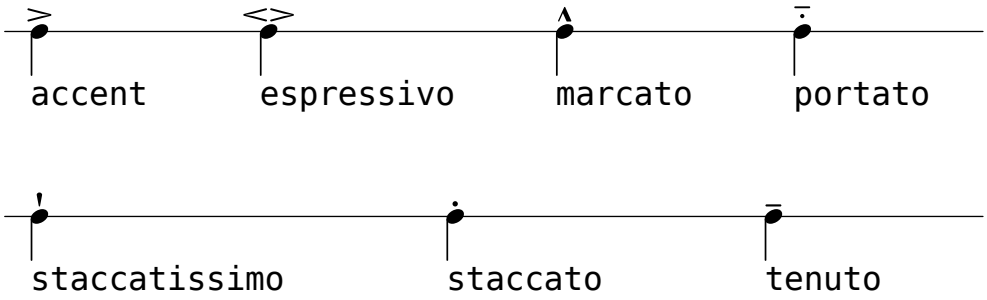
…	…	–	–	—	—	¡	¡		
¿	¿	&solidus;	/	&flq;	‹	&frq;	›		
&flqq;	«	&frqq;	»	&glq;	‚	&grq;	‘		

&glqq;	”	&grqq;	“	&elq;	‘	&erq;	’
&elqq;	“	&erqq;	”		⎵		⎵
	⎵		⎵	&nnbsp;	⎵	‍	▫
‌	▫	·	⊡	•	⊡	&copyright;	©
&registered;	®	&trademark;	™	†	†	‡	‡
№	☐	ª	ª	º	º	¶	¶
§	§	°	°	№	☐	‰	‰
¦	¦	´	´	&acutedbl;	˝	`	`
˘	˘	ˇ	ˇ	&cedilla;	¸	&circumflex;	^
&diaeresis;	¨	&macron;	¯	&aa;	å	&AA;	Å
&ae;	æ	&AE;	Æ	&dh;	ð	&DH;	Ð
&dj;	đ	&DJ;	Đ	&l;	ł	&L;	Ł
&ng;	☐	&NG;	☐	&o;	ø	&O;	Ø
&oe;	œ	&OE;	Œ	&s;	▯	&ss;	ß
&th;	þ	&TH;	Þ	+	+	−	−
×	×	÷	÷	¹	1	²	2
³	3	&sqrt;	√	&increment;	Δ	&infty;	▭
∑	∑	±	±	&bulletop;	⊡	&partial;	∂
&neg;	¬	&currency;	¤	$	$	€	€
&pounds;	£	¥	¥	¢	¢		

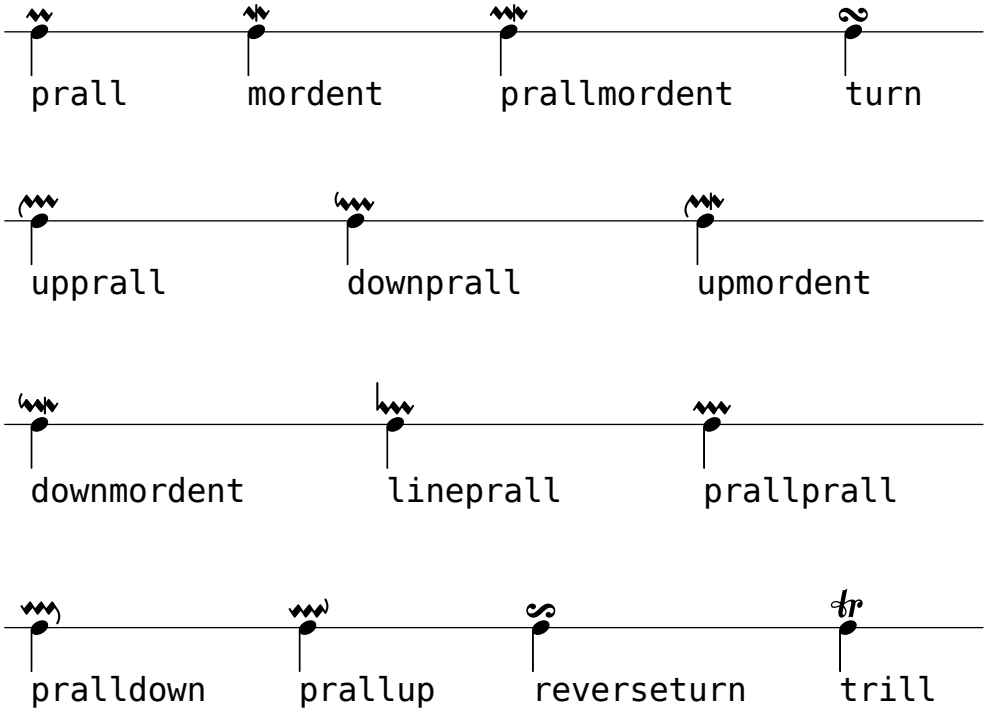
A.13 List of articulations

The following scripts are available in the Feta font and may be attached to notes (eg. '`c\accent`').

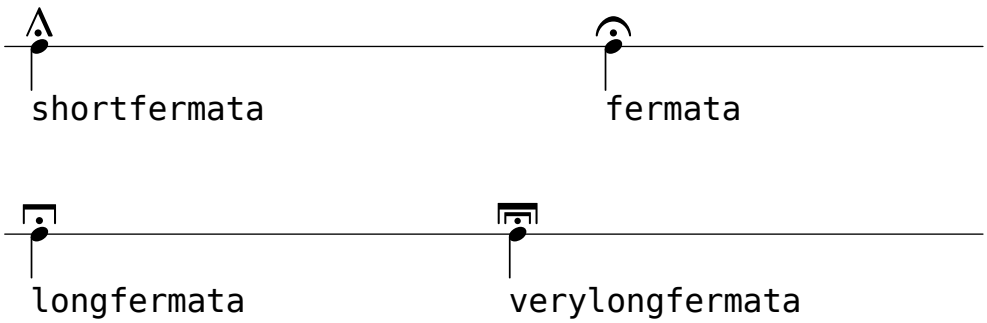
Articulation scripts



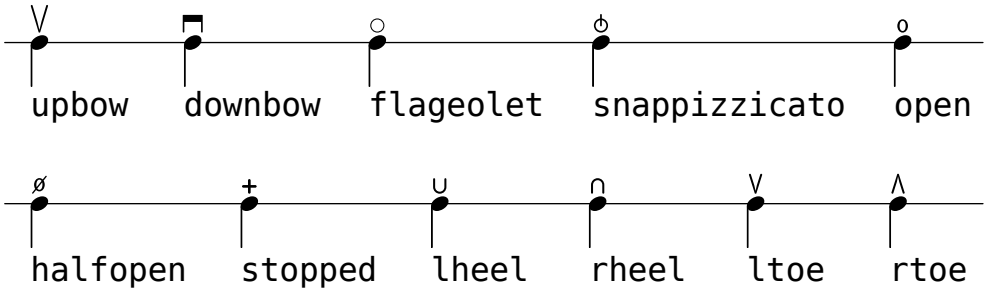
Ornament scripts



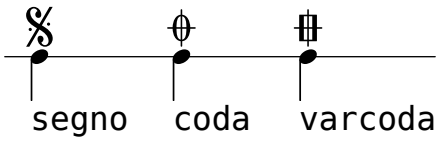
Fermata scripts



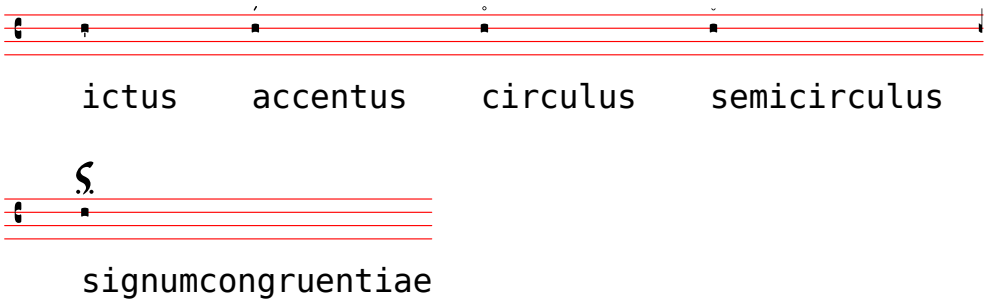
Instrument-specific scripts



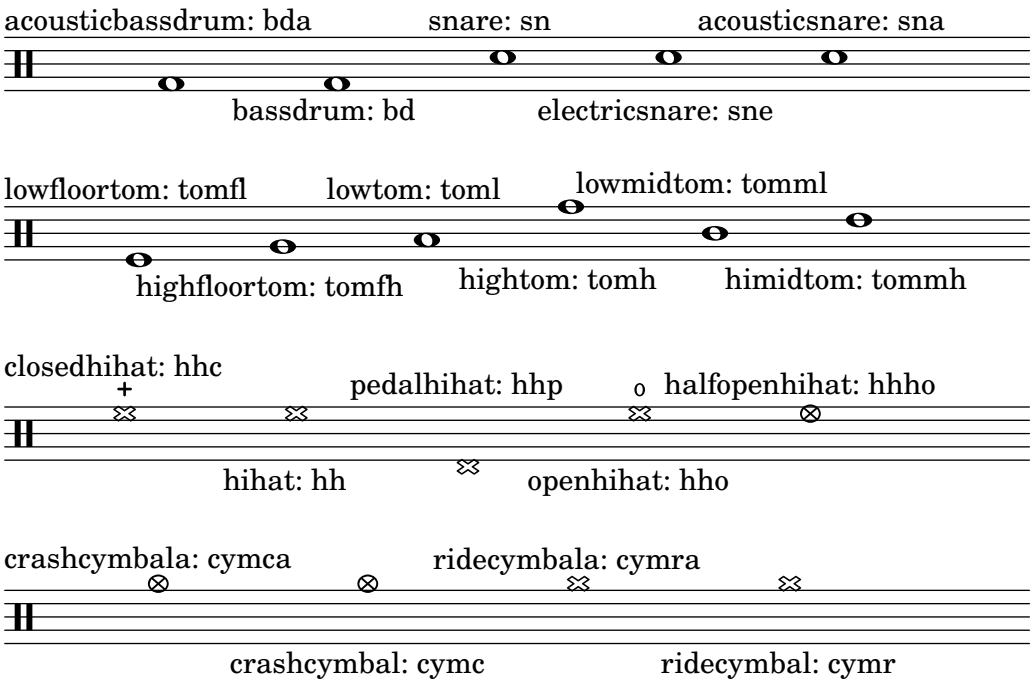
Repeat sign scripts

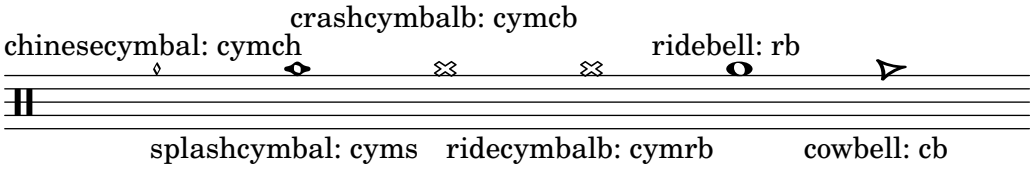


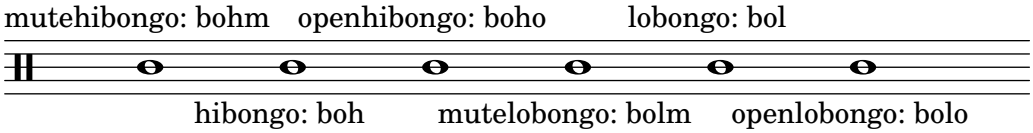
Ancient scripts

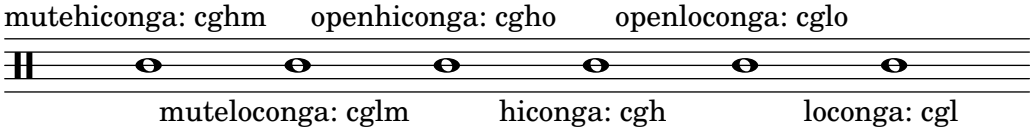


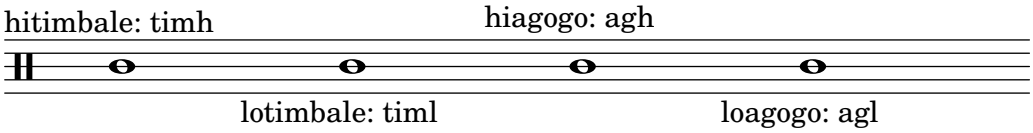
A.14 Percussion notes



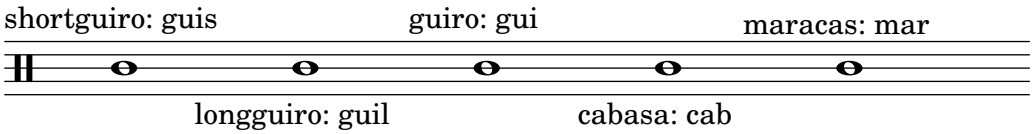

crashcymbalb: cymcb
chinesecymbal: cymch
ridebell: rb
splashcymbal: cyms
ridecymbalb: cymrb
cowbell: cb

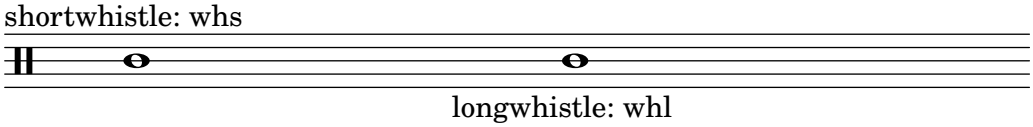

mutehibongo: bohm
openhibongo: boho
lobongo: bol
hibongo: boh
mutelobongo: bolm
openlobongo: bolo

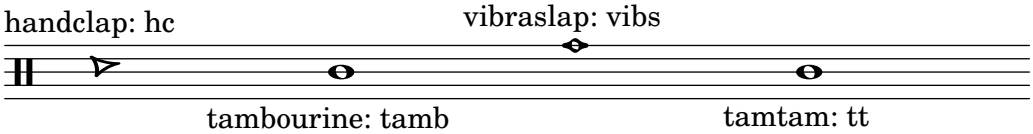

mutehiconga: cghm
openhiconga: cgho
openloconga: cglo
muteloconga: cglm
hiconga: cgh
loconga: cgl

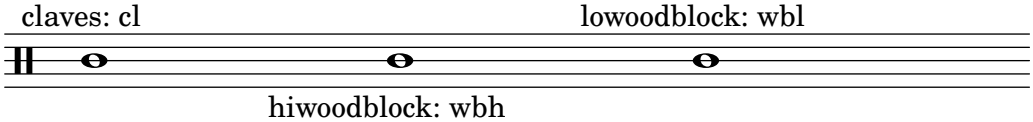

hitimbale: timh
hiagogo: agh
lotimbale: timl
loagogo: agl

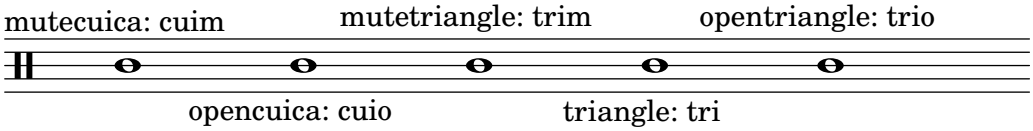
hisidestick: ssh
losidestick: ssl
sidestick: ss

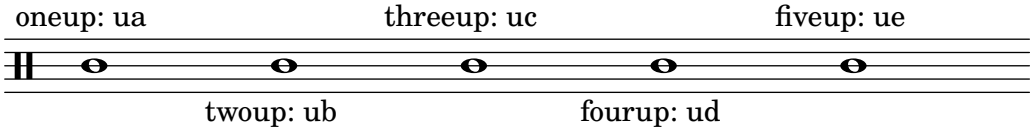

shortguiro: guis
guiro: gui
maracas: mar
longguiro: guil
cabasa: cab

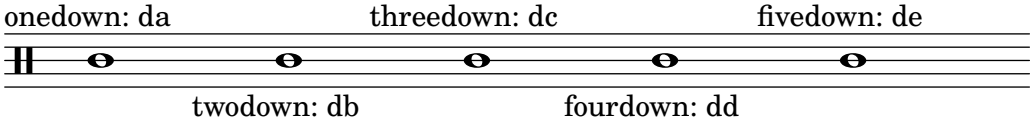

shortwhistle: whs
longwhistle: whl


handclap: hc
vibraslap: vibs
tambourine: tamb
tamtam: tt


claves: cl
lowoodblock: wbl
hiwoodblock: wbh


mutecuica: cuim
mutetriangle: trim
opentriangle: trio
opencuica: cuio
triangle: tri


oneup: ua
threeup: uc
fiveup: ue
twoup: ub
fourup: ud


onedown: da
threedown: dc
fivedown: de
twodown: db
fourdown: dd

A.15 Technical glossary

A glossary of the technical terms and concepts used internally in LilyPond. These terms may appear in the manuals, on mailing lists or in the source code.

alist

An association list or **alist** for short is a Scheme pair which associates a value with a key: `(key . value)`. For example, in '`scm/lily.scm`', the alist "type-p-name-alist" associates certain type predicates (e.g. `ly:music?`) with names (e.g. "music") so that type-check failures can be reported with a console message that includes the name of the expected type predicate.

callback

A **callback** is a routine, function or method whose reference is passed as an argument in a call to another routine, so allowing the called routine to invoke it. The technique enables a lower-level software layer to call a function defined in a higher layer. Callbacks are used extensively in LilyPond to permit user-level Scheme code to define how many low-level actions are performed.

closure

In Scheme, a **closure** is created when a function, usually a lambda expression, is passed as a variable. The closure contains the function's code plus references to the lexical bindings of the function's free variables (i.e. those variables used in the expression but defined outside it). When this function is applied to different arguments later, the free variable bindings that were captured in the closure are used to obtain the values of the free variables to be used in the calculation. One useful property of closures is the retention of internal variable values between invocations, so permitting state to be maintained.

A **simple closure** is a closure whose expression has no free variables and hence no free variable bindings.

A simple closure is represented in LilyPond by a smob containing the expression and a method to apply the expression to a passed list of arguments.

glyph

A **glyph** is a particular graphical representation of a typographic character, or a combination of two characters formating a ligature. A set of glyphs with a single style and shape comprise a font, and a set of fonts covering several styles and sizes comprise a typeface.

Vedi anche

Notation Reference: Sezione 1.8.3 [Fonts], pagina 242, Sezione 3.3.3 [Special characters], pagina 487.

grob

LilyPond objects which represent items of notation in the printed output such as note heads, stems, slurs, ties, fingering, clefs, etc are called 'Layout objects', often known as 'GRaphical OBjects', or **grobs** for short. They are represented by instances of the `Grob` class.

Vedi anche

Learning Manual: Sezione "Objects and interfaces" in *Manuale di Apprendimento*, Sezione "Naming conventions of objects and properties" in *Manuale di Apprendimento*, Sezione "Properties of layout objects" in *Manuale di Apprendimento*.

Internals Reference: Sezione "grob-interface" in *Guida al Funzionamento Interno*, Sezione "All layout objects" in *Guida al Funzionamento Interno*.

immutable

An **immutable** object is one whose state cannot be modified after creation, in contrast to a mutable object, which can be modified after creation.

In LilyPond, immutable or shared properties define the default style and behavior of grobs. They are shared between many objects. In apparent contradiction to the name, they can be changed using `\override` and `\revert`.

Vedi anche

Notation Reference: [mutable], pagina 716.

interface

Actions and properties which are common to a number of grobs are grouped together in an object called a `grob-interface`, or just 'interface' for short.

Vedi anche

Learning Manual: Sezione "Objects and interfaces" in *Manuale di Apprendimento*, Sezione "Naming conventions of objects and properties" in *Manuale di Apprendimento*, Sezione "Properties found in interfaces" in *Manuale di Apprendimento*.

Notation Reference: Sezione 5.2.2 [Layout interfaces], pagina 573.

Internals Reference: Sezione "Graphical Object Interfaces" in *Guida al Funzionamento Interno*.

lexer

A **lexer** is a program which converts a sequence of characters into a sequence of tokens, a process called lexical analysis. The LilyPond lexer converts the stream obtained from an input '`.ly`' file into a tokenized stream more suited to the next stage of processing - parsing, for which see [parser], pagina 716. The LilyPond lexer is built with Flex from the lexer file '`lily/lexer.ll`' which contains the lexical rules. This file is part of the source code and is not included in the LilyPond binary installation.

mutable

A **mutable** object is one whose state can be modified after creation, in contrast to an immutable object, whose state is fixed at the time of creation.

In LilyPond, mutable properties contain values that are specific to one grob. Typically, lists of other objects or results from computations are stored in mutable properties.

Vedi anche

Notation Reference: [immutable], pagina 716.

output-def

An instance of the `Output-def` class contains the methods and data structures associated with an output block. Instances are created for midi, layout and paper blocks.

parser

A **parser** analyzes the sequence of tokens produced by a lexer to determine its grammatical structure, grouping the tokens progressively into larger groupings according to the rules of the grammar. If the sequence of tokens is valid the end product is a tree of tokens whose root is the grammar's start symbol. If this cannot be achieved the file is invalid and an appropriate error message is produced. The syntactic groupings and the rules for constructing the groupings

from their parts for the LilyPond syntax are defined in '`lily/parser.yy`' and shown in Backus Normal Form (BNF) in Sezione "LilyPond grammar" in *Guida del Collaboratore*. This file is used to build the parser during the program build by the parser generator, Bison. It is part of the source code and is not included in the LilyPond binary installation.

parser variable

These are variables defined directly in Scheme. Their direct use by users is strongly discouraged, because their scoping semantics can be confusing.

When the value of such a variable is changed in a '`.ly`' file, the change is global, and unless explicitly reverted, the new value will persist to the end of the file, affecting subsequent `\score` blocks as well as external files added with the `\include` command. This can lead to unintended consequences and in complex typesetting projects the consequent errors can be difficult to track down.

LilyPond uses the following parser variables:

- afterGraceFraction
- musicQuotes
- mode
- output-count
- output-suffix
- partCombineListener
- pitchnames
- toplevel-bookparts
- toplevel-scores
- showLastLength
- showFirstLength

prob

PRoperty OBjects, or **probs** for short, are instances of the `Prob` class, a simple base class for objects which have mutable and immutable property alists and the methods to manipulate them. The `Music` and `Stream_event` classes derive from `Prob`. Instances of the `Prob` class are also created to hold the formatted content of system grobs and titling blocks during page layout.

simple closure

See [closure], pagina 715.

smob

Smobs, or ScheMe OBjects, are part of the mechanism used by Guile to export C and C++ objects to Scheme code. In LilyPond, smobs are created from C++ objects through macros. There are two types of smob objects: simple smobs, intended for simple immutable objects like numbers, and complex smobs, used for objects with identities. If you have access to the LilyPond sources, more information can be found in '`lily/includes/smob.hh`'.

stencil

An instance of the **stencil** class holds the information required to print a typographical object. It is a simple smob containing a confining box, which defines the vertical and horizontal extents of the object, and a Scheme expression which will print the object when evaluated. Stencils may be combined to form more complex stencils defined by a tree of Scheme expressions formed from the Scheme expressions of the component stencils.

The `stencil` property, which connects a grob to its stencil, is defined in the `grob-interface` interface.

Vedi anche

Internals Reference: Sezione "grob-interface" in *Guida al Funzionamento Interno*.

A.16 All context properties

`accidentalGrouping` (symbol)
: If set to `'voice`, accidentals on the same note in different octaves may be horizontally staggered if in different voices.

`additionalPitchPrefix` (string)
: Text with which to prefix additional pitches within a chord name.

`aDueText` (markup)
: Text to print at a unisono passage.

`alignAboveContext` (string)
: Where to insert newly created context in vertical alignment.

`alignBassFigureAccidentals` (boolean)
: If true, then the accidentals are aligned in bass figure context.

`alignBelowContext` (string)
: Where to insert newly created context in vertical alignment.

`alternativeNumberingStyle` (symbol)
: The style of an alternative's bar numbers. Can be `numbers` for going back to the same number or `numbers-with-letters` for going back to the same number with letter suffixes. No setting will not go back in measure-number time.

`associatedVoice` (string)
: Name of the `Voice` that has the melody for this `Lyrics` line.

`autoAccidentals` (list)
: List of different ways to typeset an accidental.

  For determining when to print an accidental, several different rules are tried. The rule that gives the highest number of accidentals is used.

  Each entry in the list is either a symbol or a procedure.

  symbol The symbol is the name of the context in which the following rules are to be applied. For example, if *context* is Sezione "Score" in *Guida al Funzionamento Interno* then all staves share accidentals, and if *context* is Sezione "Staff" in *Guida al Funzionamento Interno* then all voices in the same staff share accidentals, but staves do not.

  procedure The procedure represents an accidental rule to be applied to the previously specified context.

  The procedure takes the following arguments:

  `context` The current context to which the rule should be applied.

  `pitch` The pitch of the note to be evaluated.

  `barnum` The current bar number.

  `measurepos` The current measure position.

The procedure returns a pair of booleans. The first states whether an extra natural should be added. The second states whether an accidental should be printed. `(#t . #f)` does not make sense.

`autoBeamCheck` (procedure)
A procedure taking three arguments, *context*, *dir* [start/stop (-1 or 1)], and *test* [shortest note in the beam]. A non-`#f` return value starts or stops the auto beam.

`autoBeaming` (boolean)
If set to true then beams are generated automatically.

`autoCautionaries` (list)
List similar to `autoAccidentals`, but it controls cautionary accidentals rather than normal ones. Both lists are tried, and the one giving the most accidentals wins. In case of draw, a normal accidental is typeset.

`automaticBars` (boolean)
If set to false then bar lines will not be printed automatically; they must be explicitly created with a `\bar` command. Unlike the `\cadenzaOn` keyword, measures are still counted. Bar line generation will resume according to that count if this property is unset.

`barAlways` (boolean)
If set to true a bar line is drawn after each note.

`barCheckSynchronize` (boolean)
If true then reset `measurePosition` when finding a bar check.

`barNumberFormatter` (procedure)
A procedure that takes a bar number, measure position, and alternative number and returns a markup of the bar number to print.

`barNumberVisibility` (procedure)
A procedure that takes a bar number and a measure position and returns whether the corresponding bar number should be printed. Note that the actual print-out of bar numbers is controlled with the `break-visibility` property.

The following procedures are predefined:

`all-bar-numbers-visible`
Enable bar numbers for all bars, including the first one and broken bars (which get bar numbers in parentheses).

`first-bar-number-invisible`
Enable bar numbers for all bars (including broken bars) except the first one. If the first bar is broken, it doesn't get a bar number either.

`first-bar-number-invisible-save-broken-bars`
Enable bar numbers for all bars (including broken bars) except the first one. A broken first bar gets a bar number.

`first-bar-number-invisible-and-no-parenthesized-bar-numbers`
Enable bar numbers for all bars except the first bar and broken bars. This is the default.

`(every-nth-bar-number-visible` *n*`)`
Assuming *n* is value 2, for example, this enables bar numbers for bars 2, 4, 6, etc.

`(modulo-bar-number-visible` *n m*`)`
If bar numbers 1, 4, 7, etc., should be enabled, *n* (the modulo) must be set to 3 and *m* (the division remainder) to 1.

`baseMoment` (moment)
Smallest unit of time that will stand on its own as a subdivided section.

`bassFigureFormatFunction` (procedure)
A procedure that is called to produce the formatting for a `BassFigure` grob. It takes a list of `BassFigureEvent`s, a context, and the grob to format.

`bassStaffProperties` (list)
An alist of property settings to apply for the down staff of `PianoStaff`. Used by `\autochange`.

`beamExceptions` (list)
An alist of exceptions to autobeam rules that normally end on beats.

`beamHalfMeasure` (boolean)
Whether to allow a beam to begin halfway through the measure in triple time, which could look like 6/8.

`beatStructure` (list)
List of `baseMoment`s that are combined to make beats.

`chordChanges` (boolean)
Only show changes in chords scheme?

`chordNameExceptions` (list)
An alist of chord exceptions. Contains `(`*`chord . markup`*`)` entries.

`chordNameExceptionsFull` (list)
An alist of full chord exceptions. Contains `(`*`chord . markup`*`)` entries.

`chordNameExceptionsPartial` (list)
An alist of partial chord exceptions. Contains `(`*`chord . (prefix-markup suffix-markup)`*`)` entries.

`chordNameFunction` (procedure)
The function that converts lists of pitches to chord names.

`chordNameLowercaseMinor` (boolean)
Downcase roots of minor chords?

`chordNameSeparator` (markup)
The markup object used to separate parts of a chord name.

`chordNoteNamer` (procedure)
A function that converts from a pitch object to a text markup. Used for single pitches.

`chordPrefixSpacer` (number)
The space added between the root symbol and the prefix of a chord name.

`chordRootNamer` (procedure)
A function that converts from a pitch object to a text markup. Used for chords.

`clefGlyph` (string)
Name of the symbol within the music font.

`clefPosition` (number)
Where should the center of the clef symbol go, measured in half staff spaces from the center of the staff.

`clefTransposition` (integer)
Add this much extra transposition. Values of 7 and -7 are common.

`clefTranspositionFormatter` (procedure)
A procedure that takes the Transposition number as a string and the style as a symbol and returns a markup.

`clefTranspositionStyle` (symbol)
Determines the way the ClefModifier grob is displayed. Possible values are '`default`', '`parenthesized`' and '`bracketed`'.

`completionBusy` (boolean)
Whether a completion-note head is playing.

`completionUnit` (moment)
Sub-bar unit of completion.

`connectArpeggios` (boolean)
If set, connect arpeggios across piano staff.

`countPercentRepeats` (boolean)
If set, produce counters for percent repeats.

`createKeyOnClefChange` (boolean)
Print a key signature whenever the clef is changed.

`createSpacing` (boolean)
Create `StaffSpacing` objects? Should be set for staves.

`crescendoSpanner` (symbol)
The type of spanner to be used for crescendi. Available values are '`hairpin`' and '`text`'. If unset, a hairpin crescendo is used.

`crescendoText` (markup)
The text to print at start of non-hairpin crescendo, i.e., '`cresc.`'.

`cueClefGlyph` (string)
Name of the symbol within the music font.

`cueClefPosition` (number)
Where should the center of the clef symbol go, measured in half staff spaces from the center of the staff.

`cueClefTransposition` (integer)
Add this much extra transposition. Values of 7 and -7 are common.

`cueClefTranspositionFormatter` (procedure)
A procedure that takes the Transposition number as a string and the style as a symbol and returns a markup.

`cueClefTranspositionStyle` (symbol)
Determines the way the ClefModifier grob is displayed. Possible values are '`default`', '`parenthesized`' and '`bracketed`'.

`currentBarNumber` (integer)
Contains the current barnumber. This property is incremented at every bar line.

`decrescendoSpanner` (symbol)
The type of spanner to be used for decrescendi. Available values are '`hairpin`' and '`text`'. If unset, a hairpin decrescendo is used.

`decrescendoText` (markup)
The text to print at start of non-hairpin decrescendo, i.e., '`dim.`'.

`defaultBarType` (string)
Set the default type of bar line. See `whichBar` for information on available bar types.

This variable is read by Sezione "Timing_translator" in *Guida al Funzionamento Interno* at Sezione "Score" in *Guida al Funzionamento Interno* level.

`defaultStrings` (list)
A list of strings to use in calculating frets for tablatures and fretboards if no strings are provided in the notes for the current moment.

`doubleRepeatSegnoType` (string)
Set the default bar line for the combinations double repeat with segno. Default is '`:|.S.|:`'.

`doubleRepeatType` (string)
Set the default bar line for double repeats.

`doubleSlurs` (boolean)
If set, two slurs are created for every slurred note, one above and one below the chord.

`drumPitchTable` (hash table)
A table mapping percussion instruments (symbols) to pitches.

`drumStyleTable` (hash table)
A hash table which maps drums to layout settings. Predefined values: '`drums-style`', '`timbales-style`', '`congas-style`', '`bongos-style`', and '`percussion-style`'.

The layout style is a hash table, containing the drum-pitches (e.g., the symbol '`hihat`') as keys, and a list `(notehead-style script vertical-position)` as values.

`endRepeatSegnoType` (string)
Set the default bar line for the combinations ending of repeat with segno. Default is '`:|.S`'.

`endRepeatType` (string)
Set the default bar line for the ending of repeats.

`explicitClefVisibility` (vector)
'`break-visibility`' function for clef changes.

`explicitCueClefVisibility` (vector)
'`break-visibility`' function for cue clef changes.

`explicitKeySignatureVisibility` (vector)
'`break-visibility`' function for explicit key changes. '`\override`' of the `break-visibility` property will set the visibility for normal (i.e., at the start of the line) key signatures.

`extendersOverRests` (boolean)
Whether to continue extenders as they cross a rest.

`extraNatural` (boolean)
Whether to typeset an extra natural sign before accidentals that reduce the effect of a previous alteration.

`figuredBassAlterationDirection` (direction)
Where to put alterations relative to the main figure.

`figuredBassCenterContinuations` (boolean)
Whether to vertically center pairs of extender lines. This does not work with three or more lines.

`figuredBassFormatter` (procedure)
A routine generating a markup for a bass figure.

`figuredBassPlusDirection` (direction)
Where to put plus signs relative to the main figure.

`fingeringOrientations` (list)
A list of symbols, containing '`left`', '`right`', '`up`' and/or '`down`'. This list determines where fingerings are put relative to the chord being fingered.

`firstClef` (boolean)
If true, create a new clef when starting a staff.

`followVoice` (boolean)
If set, note heads are tracked across staff switches by a thin line.

`fontSize` (number)
The relative size of all grobs in a context.

`forbidBreak` (boolean)
If set to `#t`, prevent a line break at this point.

`forceClef` (boolean)
Show clef symbol, even if it has not changed. Only active for the first clef after the property is set, not for the full staff.

`fretLabels` (list)
A list of strings or Scheme-formatted markups containing, in the correct order, the labels to be used for lettered frets in tablature.

`glissandoMap` (list)
A map in the form of '((source1 . target1) (source2 . target2) (sourcen . targetn)) showing the glissandi to be drawn for note columns. The value '() will default to '((0 . 0) (1 . 1) (n . n)), where n is the minimal number of note-heads in the two note columns between which the glissandi occur.

`gridInterval` (moment)
Interval for which to generate `GridPoint`s.

`handleNegativeFrets` (symbol)
How the automatic fret calculator should handle calculated negative frets. Values include `'ignore`, to leave them out of the diagram completely, `'include`, to include them as calculated, and `'recalculate`, to ignore the specified string and find a string where they will fit with a positive fret number.

`harmonicAccidentals` (boolean)
If set, harmonic notes in chords get accidentals.

`harmonicDots` (boolean)
If set, harmonic notes in dotted chords get dots.

`highStringOne` (boolean)
Whether the first string is the string with highest pitch on the instrument. This used by the automatic string selector for tablature notation.

`ignoreBarChecks` (boolean)
Ignore bar checks.

`ignoreFiguredBassRest` (boolean)
Don't swallow rest events.

`ignoreMelismata` (boolean)
Ignore melismata for this Sezione "Lyrics" in *Guida al Funzionamento Interno* line.

`implicitBassFigures` (list)
A list of bass figures that are not printed as numbers, but only as extender lines.

`implicitTimeSignatureVisibility` (vector)
break visibility for the default time signature.

`includeGraceNotes` (boolean)
Do not ignore grace notes for Sezione "Lyrics" in *Guida al Funzionamento Interno*.

`instrumentCueName` (markup)
The name to print if another instrument is to be taken.

`instrumentEqualizer` (procedure)
A function taking a string (instrument name), and returning a `(min . max)` pair of numbers for the loudness range of the instrument.

`instrumentName` (markup)
The name to print left of a staff. The `instrumentName` property labels the staff in the first system, and the `shortInstrumentName` property labels following lines.

`instrumentTransposition` (pitch)
Define the transposition of the instrument. Its value is the pitch that sounds when the instrument plays written middle C. This is used to transpose the MIDI output, and `\quotes`.

`internalBarNumber` (integer)
Contains the current barnumber. This property is used for internal timekeeping, among others by the `Accidental_engraver`.

`keepAliveInterfaces` (list)
A list of symbols, signifying grob interfaces that are worth keeping a staff with `remove-empty` set around for.

`keyAlterationOrder` (list)
An alist that defines in what order alterations should be printed. The format is `(step . alter)`, where *step* is a number from 0 to 6 and *alter* from -2 (sharp) to 2 (flat).

`keySignature` (list)
The current key signature. This is an alist containing `(step . alter)` or `((octave . step) . alter)`, where *step* is a number in the range 0 to 6 and *alter* a fraction, denoting alteration. For alterations, use symbols, e.g. `keySignature = #`((6 . ,FLAT))`.

`lyricMelismaAlignment` (number)
Alignment to use for a melisma syllable.

`majorSevenSymbol` (markup)
How should the major 7th be formatted in a chord name?

`markFormatter` (procedure)
A procedure taking as arguments the context and the rehearsal mark. It should return the formatted mark as a markup object.

`maximumFretStretch` (number)
Don't allocate frets further than this from specified frets.

`measureLength` (moment)
Length of one measure in the current time signature.

`measurePosition` (moment)
: How much of the current measure have we had. This can be set manually to create incomplete measures.

`melismaBusyProperties` (list)
: A list of properties (symbols) to determine whether a melisma is playing. Setting this property will influence how lyrics are aligned to notes. For example, if set to `'(melismaBusy beamMelismaBusy)`, only manual melismata and manual beams are considered. Possible values include `melismaBusy`, `slurMelismaBusy`, `tieMelismaBusy`, and `beamMelismaBusy`.

`metronomeMarkFormatter` (procedure)
: How to produce a metronome markup. Called with two arguments: a `TempoChangeEvent` and context.

`middleCClefPosition` (number)
: The position of the middle C, as determined only by the clef. This can be calculated by looking at `clefPosition` and `clefGlyph`.

`middleCCuePosition` (number)
: The position of the middle C, as determined only by the clef of the cue notes. This can be calculated by looking at `cueClefPosition` and `cueClefGlyph`.

`middleCOffset` (number)
: The offset of middle C from the position given by `middleCClefPosition` This is used for ottava brackets.

`middleCPosition` (number)
: The place of the middle C, measured in half staff-spaces. Usually determined by looking at `middleCClefPosition` and `middleCOffset`.

`midiChannelMapping` (symbol)
: How to map MIDI channels: per `instrument` (default), `staff` or `voice`.

`midiInstrument` (string)
: Name of the MIDI instrument to use.

`midiMaximumVolume` (number)
: Analogous to `midiMinimumVolume`.

`midiMergeUnisons` (boolean)
: If true, output only one MIDI note-on event when notes with the same pitch, in the same MIDI-file track, overlap.

`midiMinimumVolume` (number)
: Set the minimum loudness for MIDI. Ranges from 0 to 1.

`minimumFret` (number)
: The tablature auto string-selecting mechanism selects the highest string with a fret at least `minimumFret`.

`minimumPageTurnLength` (moment)
: Minimum length of a rest for a page turn to be allowed.

`minimumRepeatLengthForPageTurn` (moment)
: Minimum length of a repeated section for a page turn to be allowed within that section.

`minorChordModifier` (markup)
: Markup displayed following the root for a minor chord

`noChordSymbol` (markup)
Markup to be displayed for rests in a ChordNames context.

`noteToFretFunction` (procedure)
Convert list of notes and list of defined strings to full list of strings and fret numbers. Parameters: The context, a list of note events, a list of tabstring events, and the fretboard grob if a fretboard is desired.

`ottavation` (markup)
If set, the text for an ottava spanner. Changing this creates a new text spanner.

`output` (music output)
The output produced by a score-level translator during music interpretation.

`partCombineTextsOnNote` (boolean)
Print part-combine texts only on the next note rather than immediately on rests or skips.

`pedalSostenutoStrings` (list)
See `pedalSustainStrings`.

`pedalSostenutoStyle` (symbol)
See `pedalSustainStyle`.

`pedalSustainStrings` (list)
A list of strings to print for sustain-pedal. Format is `(up updown down)`, where each of the three is the string to print when this is done with the pedal.

`pedalSustainStyle` (symbol)
A symbol that indicates how to print sustain pedals: `text`, `bracket` or `mixed` (both).

`pedalUnaCordaStrings` (list)
See `pedalSustainStrings`.

`pedalUnaCordaStyle` (symbol)
See `pedalSustainStyle`.

`predefinedDiagramTable` (hash table)
The hash table of predefined fret diagrams to use in FretBoards.

`printKeyCancellation` (boolean)
Print restoration alterations before a key signature change.

`printOctaveNames` (boolean)
Print octave marks for the `NoteNames` context.

`printPartCombineTexts` (boolean)
Set ‘Solo’ and ‘A due’ texts in the part combiner?

`proportionalNotationDuration` (moment)
Global override for shortest-playing duration. This is used for switching on proportional notation.

`rehearsalMark` (integer)
The last rehearsal mark printed.

`repeatCommands` (list)
This property is a list of commands of the form `(list 'volta x)`, where *x* is a string or `#f`. `'end-repeat` is also accepted as a command.

`repeatCountVisibility` (procedure)
A procedure taking as arguments an integer and context, returning whether the corresponding percent repeat number should be printed when `countPercentRepeats` is set.

`restCompletionBusy` (boolean)
Signal whether a completion-rest is active.

`restNumberThreshold` (number)
If a multimeasure rest has more measures than this, a number is printed.

`restrainOpenStrings` (boolean)
Exclude open strings from the automatic fret calculator.

`searchForVoice` (boolean)
Signal whether a search should be made of all contexts in the context hierarchy for a voice to provide rhythms for the lyrics.

`segnoType` (string)
Set the default bar line for a requested segno. Default is '`S`'.

`shapeNoteStyles` (vector)
Vector of symbols, listing style for each note head relative to the tonic (qv.) of the scale.

`shortInstrumentName` (markup)
See `instrumentName`.

`shortVocalName` (markup)
Name of a vocal line, short version.

`skipBars` (boolean)
If set to true, then skip the empty bars that are produced by multimeasure notes and rests. These bars will not appear on the printed output. If not set (the default), multimeasure notes and rests expand into their full length, printing the appropriate number of empty bars so that synchronization with other voices is preserved.

```
{
  r1 r1*3 R1*3
  \set Score.skipBars= ##t
  r1*3 R1*3
}
```

`skipTypesetting` (boolean)
If true, no typesetting is done, speeding up the interpretation phase. Useful for debugging large scores.

`slashChordSeparator` (markup)
The markup object used to separate a chord name from its root note in case of inversions or slash chords.

`soloIIText` (markup)
The text for the start of a solo for voice 'two' when part-combining.

`soloText` (markup)
The text for the start of a solo when part-combining.

`squashedPosition` (integer)
Vertical position of squashing for Sezione "Pitch_squash_engraver" in *Guida al Funzionamento Interno*.

`staffLineLayoutFunction` (procedure)
Layout of staff lines, `traditional`, or `semitone`.

`stanza` (markup)
Stanza 'number' to print before the start of a verse. Use in `Lyrics` context.

`startRepeatSegnoType` (string)
Set the default bar line for the combinations beginning of repeat with segno. Default is '`S.|:`'.

`startRepeatType` (string)
Set the default bar line for the beginning of repeats.

`stemLeftBeamCount` (integer)
Specify the number of beams to draw on the left side of the next note. Overrides automatic beaming. The value is only used once, and then it is erased.

`stemRightBeamCount` (integer)
See `stemLeftBeamCount`.

`strictBeatBeaming` (boolean)
Should partial beams reflect the beat structure even if it causes flags to hang out?

`stringNumberOrientations` (list)
See `fingeringOrientations`.

`stringOneTopmost` (boolean)
Whether the first string is printed on the top line of the tablature.

`stringTunings` (list)
The tablature strings tuning. It is a list of the pitches of each string (starting with the lowest numbered one).

`strokeFingerOrientations` (list)
See `fingeringOrientations`.

`subdivideBeams` (boolean)
If set, multiple beams will be subdivided at `baseMoment` positions by only drawing one beam over the beat.

`suggestAccidentals` (boolean)
If set, accidentals are typeset as cautionary suggestions over the note.

`systemStartDelimiter` (symbol)
Which grob to make for the start of the system/staff? Set to `SystemStartBrace`, `SystemStartBracket` or `SystemStartBar`.

`systemStartDelimiterHierarchy` (pair)
A nested list, indicating the nesting of a start delimiters.

`tablatureFormat` (procedure)
A function formatting a tablature note head. Called with three arguments: context, string number and, fret number. It returns the text as a markup.

`tabStaffLineLayoutFunction` (procedure)
A function determining the staff position of a tablature note head. Called with two arguments: the context and the string.

`tempoHideNote` (boolean)
Hide the note = count in tempo marks.

`tempoWholesPerMinute` (moment)
The tempo in whole notes per minute.

`tieWaitForNote` (boolean)
If true, tied notes do not have to follow each other directly. This can be used for writing out arpeggios.

`timeSignatureFraction` (fraction, as pair)
A pair of numbers, signifying the time signature. For example, `'(4 . 4)` is a 4/4 time signature.

`timeSignatureSettings` (list)
A nested alist of settings for time signatures. Contains elements for various time signatures. The element for each time signature contains entries for `baseMoment`, `beatStructure`, and `beamExceptions`.

`timing` (boolean)
Keep administration of measure length, position, bar number, etc.? Switch off for cadenzas.

`tonic` (pitch)
The tonic of the current scale.

`topLevelAlignment` (boolean)
If true, the *Vertical_align_engraver* will create a *VerticalAlignment*; otherwise, it will create a *StaffGrouper*

`trebleStaffProperties` (list)
An alist of property settings to apply for the up staff of `PianoStaff`. Used by `\autochange`.

`tremoloFlags` (integer)
The number of tremolo flags to add if no number is specified.

`tupletFullLength` (boolean)
If set, the tuplet is printed up to the start of the next note.

`tupletFullLengthNote` (boolean)
If set, end at the next note, otherwise end on the matter (time signatures, etc.) before the note.

`tupletSpannerDuration` (moment)
Normally, a tuplet bracket is as wide as the `\times` expression that gave rise to it. By setting this property, you can make brackets last shorter.

```
{
  \set tupletSpannerDuration = #(ly:make-moment 1 4)
  \times 2/3 { c8 c c c c c }
}
```

`useBassFigureExtenders` (boolean)
Whether to use extender lines for repeated bass figures.

`vocalName` (markup)
Name of a vocal line.

`voltaSpannerDuration` (moment)
This specifies the maximum duration to use for the brackets printed for `\alternative`. This can be used to shrink the length of brackets in the situation where one alternative is very large.

`whichBar` (string)
This property is read to determine what type of bar line to create.

Example:

```
\set Staff.whichBar = ".|:"
```

This will create a start-repeat bar in this staff only. Valid values are described in '`scm/bar-line.scm`'.

A.17 Layout properties

`add-stem-support` (boolean)
: If set, the `Stem` object is included in this script's support.

`after-line-breaking` (boolean)
: Dummy property, used to trigger callback for `after-line-breaking`.

`align-dir` (direction)
: Which side to align? `-1`: left side, `0`: around center of width, `1`: right side.

`allow-loose-spacing` (boolean)
: If set, column can be detached from main spacing.

`allow-span-bar` (boolean)
: If false, no inter-staff bar line will be created below this bar line.

`alteration` (number)
: Alteration numbers for accidental.

`alteration-alist` (list)
: List of `(`*`pitch`*` . `*`accidental`*`)` pairs for key signature.

`annotation` (string)
: Annotate a grob for debug purposes.

`annotation-balloon` (boolean)
: Print the balloon around an annotation.

`annotation-line` (boolean)
: Print the line from an annotation to the grob that it annotates.

`arpeggio-direction` (direction)
: If set, put an arrow on the arpeggio squiggly line.

`arrow-length` (number)
: Arrow length.

`arrow-width` (number)
: Arrow width.

`auto-knee-gap` (dimension, in staff space)
: If a gap is found between note heads where a horizontal beam fits that is larger than this number, make a kneed beam.

`automatically-numbered` (boolean)
: Should a footnote be automatically numbered?

`average-spacing-wishes` (boolean)
: If set, the spacing wishes are averaged over staves.

`avoid-note-head` (boolean)
: If set, the stem of a chord does not pass through all note heads, but starts at the last note head.

`avoid-scripts` (boolean)
: If set, a tuplet bracket avoids the scripts associated with the note heads it encompasses.

`avoid-slur` (symbol)
: Method of handling slur collisions. Choices are `inside`, `outside`, `around`, and `ignore`. `inside` adjusts the slur if needed to keep the grob inside the slur. `outside`

moves the grob vertically to the outside of the slur. `around` moves the grob vertically to the outside of the slur only if there is a collision. `ignore` does not move either. In grobs whose notational significance depends on vertical position (such as accidentals, clefs, etc.), `outside` and `around` behave like `ignore`.

`axes` (list) List of axis numbers. In the case of alignment grobs, this should contain only one number.

`bar-extent` (pair of numbers)
The Y-extent of the actual bar line. This may differ from `Y-extent` because it does not include the dots in a repeat bar line.

`base-shortest-duration` (moment)
Spacing is based on the shortest notes in a piece. Normally, pieces are spaced as if notes at least as short as this are present.

`baseline-skip` (dimension, in staff space)
Distance between base lines of multiple lines of text.

`beam-gap` (pair of numbers)
Size of a gap in a `Beam`.

`beam-thickness` (dimension, in staff space)
Beam thickness, measured in `staff-space` units.

`beam-width` (dimension, in staff space)
Width of the tremolo sign.

`beamed-stem-shorten` (list)
How much to shorten beamed stems, when their direction is forced. It is a list, since the value is different depending on the number of flags and beams.

`beaming` (pair)
Pair of number lists. Each number list specifies which beams to make. `0` is the central beam, `1` is the next beam toward the note, etc. This information is used to determine how to connect the beaming patterns from stem to stem inside a beam.

`beamlet-default-length` (pair)
A pair of numbers. The first number specifies the default length of a beamlet that sticks out of the left hand side of this stem; the second number specifies the default length of the beamlet to the right. The actual length of a beamlet is determined by taking either the default length or the length specified by `beamlet-max-length-proportion`, whichever is smaller.

`beamlet-max-length-proportion` (pair)
The maximum length of a beamlet, as a proportion of the distance between two adjacent stems.

`before-line-breaking` (boolean)
Dummy property, used to trigger a callback function.

`between-cols` (pair)
Where to attach a loose column to.

`bound-details` (list)
An alist of properties for determining attachments of spanners to edges.

`bound-padding` (number)
The amount of padding to insert around spanner bounds.

`bracket-flare` (pair of numbers)
A pair of numbers specifying how much edges of brackets should slant outward. Value `0.0` means straight edges.

`bracket-visibility` (boolean or symbol)
This controls the visibility of the tuplet bracket. Setting it to false prevents printing of the bracket. Setting the property to `if-no-beam` makes it print only if there is no beam associated with this tuplet bracket.

`break-align-anchor` (number)
Grobs aligned to this break-align grob will have their X-offsets shifted by this number. In bar lines, for example, this is used to position grobs relative to the (visual) center of the bar line.

`break-align-anchor-alignment` (number)
Read by `ly:break-aligned-interface::calc-extent-aligned-anchor` for aligning an anchor to a grob's extent.

`break-align-orders` (vector)
Defines the order in which prefatory matter (clefs, key signatures) appears. The format is a vector of length 3, where each element is one order for end-of-line, middle of line, and start-of-line, respectively. An order is a list of symbols.

For example, clefs are put after key signatures by setting

```
\override Score.BreakAlignment #'break-align-orders =
  #(make-vector 3 '(span-bar
                    breathing-sign
                    staff-bar
                    key
                    clef
                    time-signature))
```

`break-align-symbol` (symbol)
This key is used for aligning and spacing breakable items.

`break-align-symbols` (list)
A list of symbols that determine which break-aligned grobs to align this to. If the grob selected by the first symbol in the list is invisible due to break-visibility, we will align to the next grob (and so on). Choices are `left-edge`, `ambitus`, `breathing-sign`, `clef`, `staff-bar`, `key-cancellation`, `key-signature`, `time-signature`, and `custos`.

`break-overshoot` (pair of numbers)
How much does a broken spanner stick out of its bounds?

`break-visibility` (vector)
A vector of 3 booleans, `#(`*`end-of-line unbroken begin-of-line`*`)`. `#t` means visible, `#f` means killed.

`breakable` (boolean)
Allow breaks here.

`broken-bound-padding` (number)
The amount of padding to insert when a spanner is broken at a line break.

`circled-tip` (boolean)
Put a circle at start/end of hairpins (al/del niente).

`clip-edges` (boolean)
Allow outward pointing beamlets at the edges of beams?

`collapse-height` (dimension, in staff space)
: Minimum height of system start delimiter. If equal or smaller, the bracket/brace/line is removed.

`collision-bias` (number)
: Number determining how much to favor the left (negative) or right (positive). Larger absolute values in either direction will push a collision in this direction.

`collision-interfaces` (list)
: A list of interfaces for which automatic beam-collision resolution is run.

`collision-padding` (number)
: Amount of padding to apply after a collision is detected via the self-alignment-interface.

`collision-voice-only` (boolean)
: Does automatic beam collsion apply only to the voice in which the beam was created?

`color` (color)
: The color of this grob.

`common-shortest-duration` (moment)
: The most common shortest note length. This is used in spacing. Enlarging this sets the score tighter.

`concaveness` (number)
: A beam is concave if its inner stems are closer to the beam than the two outside stems. This number is a measure of the closeness of the inner stems. It is used for damping the slope of the beam.

`connect-to-neighbor` (pair)
: Pair of booleans, indicating whether this grob looks as a continued break.

`control-points` (list)
: List of offsets (number pairs) that form control points for the tie, slur, or bracket shape. For Béziers, this should list the control points of a third-order Bézier curve.

`count-from` (integer)
: The first measure in a measure count receives this number. The following measures are numbered in increments from this initial value.

`damping` (number)
: Amount of beam slope damping.

`dash-definition` (pair)
: List of `dash-elements` defining the dash structure. Each `dash-element` has a starting t value, an ending t-value, a `dash-fraction`, and a `dash-period`.

`dash-fraction` (number)
: Size of the dashes, relative to `dash-period`. Should be between `0.0` (no line) and `1.0` (continuous line).

`dash-period` (number)
: The length of one dash together with whitespace. If negative, no line is drawn at all.

`default-direction` (direction)
: Direction determined by note head positions.

`default-staff-staff-spacing` (list)
: The settings to use for `staff-staff-spacing` when it is unset, for ungrouped staves and for grouped staves that do not have the relevant `StaffGrouper` property set (`staff-staff-spacing` or `staffgroup-staff-spacing`).

`details` (list)
: Alist of parameters for detailed grob behavior. More information on the allowed parameters for a grob can be found by looking at the top of the Internals Reference page for each interface having a `details` property.

`digit-names` (vector)
: Names for string finger digits.

`direction` (direction)
: If `side-axis` is `0` (or `X`), then this property determines whether the object is placed `LEFT`, `CENTER` or `RIGHT` with respect to the other object. Otherwise, it determines whether the object is placed `UP`, `CENTER` or `DOWN`. Numerical values may also be used: `UP=1`, `DOWN=-1`, `LEFT=-1`, `RIGHT=1`, `CENTER=0`.

`dot-count` (integer)
: The number of dots.

`dot-negative-kern` (number)
: The space to remove between a dot and a slash in percent repeat glyphs. Larger values bring the two elements closer together.

`dot-placement-list` (list)
: List consisting of `(`*`description string-number fret-number finger-number`*`)` entries used to define fret diagrams.

`duration-log` (integer)
: The 2-log of the note head duration, i.e., `0` = whole note, `1` = half note, etc.

`eccentricity` (number)
: How asymmetrical to make a slur. Positive means move the center to the right.

`edge-height` (pair)
: A pair of numbers specifying the heights of the vertical edges: `(`*`left-height . right-height`*`)`.

`edge-text` (pair)
: A pair specifying the texts to be set at the edges: `(`*`left-text . right-text`*`)`.

`expand-limit` (integer)
: Maximum number of measures expanded in church rests.

`extra-dy` (number)
: Slope glissandi this much extra.

`extra-offset` (pair of numbers)
: A pair representing an offset. This offset is added just before outputting the symbol, so the typesetting engine is completely oblivious to it. The values are measured in `staff-space` units of the staff's `StaffSymbol`.

`extra-spacing-height` (pair of numbers)
: In the horizontal spacing problem, we increase the height of each item by this amount (by adding the 'car' to the bottom of the item and adding the 'cdr' to the top of the item). In order to make a grob infinitely high (to prevent the horizontal spacing problem from placing any other grobs above or below this grob), set this to `(-inf.0 . +inf.0)`.

`extra-spacing-width` (pair of numbers)
: In the horizontal spacing problem, we pad each item by this amount (by adding the 'car' on the left side of the item and adding the 'cdr' on the right side of the item). In order to make a grob take up no horizontal space at all, set this to `(+inf.0 . -inf.0)`.

`flag-count` (number)
The number of tremolo beams.

`flat-positions` (list)
Flats in key signatures are placed within the specified ranges of staff-positions. The general form is a list of pairs, with one pair for each type of clef, in order of the staff-position at which each clef places C: `(alto treble tenor soprano baritone mezzosoprano bass)`. If the list contains a single element it applies for all clefs. A single number in place of a pair sets accidentals within the octave ending at that staff-position.

`font-encoding` (symbol)
The font encoding is the broadest category for selecting a font. Currently, only lilypond's system fonts (Emmentaler) are using this property. Available values are `fetaMusic` (Emmentaler), `fetaBraces`, `fetaText` (Emmentaler).

`font-family` (symbol)
The font family is the broadest category for selecting text fonts. Options include: `sans`, `roman`.

`font-name` (string)
Specifies a file name (without extension) of the font to load. This setting overrides selection using `font-family`, `font-series` and `font-shape`.

`font-series` (symbol)
Select the series of a font. Choices include `medium`, `bold`, `bold-narrow`, etc.

`font-shape` (symbol)
Select the shape of a font. Choices include `upright`, `italic`, `caps`.

`font-size` (number)
The font size, compared to the 'normal' size. `0` is style-sheet's normal size, `-1` is smaller, `+1` is bigger. Each step of 1 is approximately 12% larger; 6 steps are exactly a factor 2 larger. Fractional values are allowed.

`footnote` (boolean)
Should this be a footnote or in-note?

`footnote-music` (music)
Music creating a footnote.

`footnote-text` (markup)
A footnote for the grob.

`force-hshift` (number)
This specifies a manual shift for notes in collisions. The unit is the note head width of the first voice note. This is used by Sezione "note-collision-interface" in *Guida al Funzionamento Interno*.

`forced-spacing` (number)
Spacing forced between grobs, used in various ligature engravers.

`fraction` (fraction, as pair)
Numerator and denominator of a time signature object.

`french-beaming` (boolean)
Use French beaming style for this stem. The stem stops at the innermost beams.

`fret-diagram-details` (list)
An alist of detailed grob properties for fret diagrams. Each alist entry consists of a `(`*`property`*` . `*`value`*`)` pair. The properties which can be included in `fret-diagram-details` include the following:

- `barre-type` – Type of barre indication used. Choices include `curved`, `straight`, and `none`. Default `curved`.
- `capo-thickness` – Thickness of capo indicator, in multiples of fret-space. Default value 0.5.
- `dot-color` – Color of dots. Options include `black` and `white`. Default `black`.
- `dot-label-font-mag` – Magnification for font used to label fret dots. Default value 1.
- `dot-position` – Location of dot in fret space. Default 0.6 for dots without labels, 0.95-`dot-radius` for dots with labels.
- `dot-radius` – Radius of dots, in terms of fret spaces. Default value 0.425 for labeled dots, 0.25 for unlabeled dots.
- `finger-code` – Code for the type of fingering indication used. Options include `none`, `in-dot`, and `below-string`. Default `none` for markup fret diagrams, `below-string` for `FretBoards` fret diagrams.
- `fret-count` – The number of frets. Default 4.
- `fret-label-custom-format` – The format string to be used label the lowest fret number, when `number-type` equals to `custom`. Default `"~a"`.
- `fret-label-font-mag` – The magnification of the font used to label the lowest fret number. Default 0.5.
- `fret-label-vertical-offset` – The offset of the fret label from the center of the fret in direction parallel to strings. Default 0.
- `label-dir` – Side to which the fret label is attached. `-1`, `LEFT`, or `DOWN` for left or down; `1`, `RIGHT`, or `UP` for right or up. Default `RIGHT`.
- `mute-string` – Character string to be used to indicate muted string. Default `"x"`.
- `number-type` – Type of numbers to use in fret label. Choices include `roman-lower`, `roman-upper`, `arabic` and `custom`. In the later case, the format string is supplied by the `fret-label-custom-format` property. Default `roman-lower`.
- `open-string` – Character string to be used to indicate open string. Default `"o"`.
- `orientation` – Orientation of fret-diagram. Options include `normal`, `landscape`, and `opposing-landscape`. Default `normal`.
- `string-count` – The number of strings. Default 6.
- `string-label-font-mag` – The magnification of the font used to label fingerings at the string, rather than in the dot. Default value 0.6 for `normal` orientation, 0.5 for `landscape` and `opposing-landscape`.
- `string-thickness-factor` – Factor for changing thickness of each string in the fret diagram. Thickness of string k is given by `thickness` * (1+`string-thickness-factor`) ^ (k-1). Default 0.
- `top-fret-thickness` – The thickness of the top fret line, as a multiple of the standard thickness. Default value 3.
- `xo-font-magnification` – Magnification used for mute and open string indicators. Default value 0.5.
- `xo-padding` – Padding for open and mute indicators from top fret. Default value 0.25.

`full-length-padding` (number)

How much padding to use at the right side of a full-length tuplet bracket.

`full-length-to-extent` (boolean)
Run to the extent of the column for a full-length tuplet bracket.

`full-measure-extra-space` (number)
Extra space that is allocated at the beginning of a measure with only one note. This property is read from the NonMusicalPaperColumn that begins the measure.

`full-size-change` (boolean)
Don't make a change clef smaller.

`gap` (dimension, in staff space)
Size of a gap in a variable symbol.

`gap-count` (integer)
Number of gapped beams for tremolo.

`glissando-skip` (boolean)
Should this `NoteHead` be skipped by glissandi?

`glyph` (string)
A string determining what 'style' of glyph is typeset. Valid choices depend on the function that is reading this property.

In combination with (span) bar lines, it is a string resembling the bar line appearance in ASCII form.

`glyph-name` (string)
The glyph name within the font.

In the context of (span) bar lines, *glyph-name* represents a processed form of `glyph`, where decisions about line breaking etc. are already taken.

`glyph-name-alist` (list)
An alist of key-string pairs.

`graphical` (boolean)
Display in graphical (vs. text) form.

`grow-direction` (direction)
Crescendo or decrescendo?

`hair-thickness` (number)
Thickness of the thin line in a bar line.

`harp-pedal-details` (list)
An alist of detailed grob properties for harp pedal diagrams. Each alist entry consists of a `(`*`property`*` . `*`value`*`)` pair. The properties which can be included in harp-pedal-details include the following:

- `box-offset` – Vertical shift of the center of flat/sharp pedal boxes above/below the horizontal line. Default value 0.8.
- `box-width` – Width of each pedal box. Default value 0.4.
- `box-height` – Height of each pedal box. Default value 1.0.
- `space-before-divider` – Space between boxes before the first divider (so that the diagram can be made symmetric). Default value 0.8.
- `space-after-divider` – Space between boxes after the first divider. Default value 0.8.
- `circle-thickness` – Thickness (in unit of the line-thickness) of the ellipse around circled pedals. Default value 0.5.

- `circle-x-padding` – Padding in X direction of the ellipse around circled pedals. Default value 0.15.
- `circle-y-padding` – Padding in Y direction of the ellipse around circled pedals. Default value 0.2.

`head-direction` (direction)
Are the note heads left or right in a semitie?

`height` (dimension, in staff space)
Height of an object in `staff-space` units.

`height-limit` (dimension, in staff space)
Maximum slur height: The longer the slur, the closer it is to this height.

`hide-tied-accidental-after-break` (boolean)
If set, an accidental that appears on a tied note after a line break will not be displayed.

`horizon-padding` (number)
The amount to pad the axis along which a `Skyline` is built for the `side-position-interface`.

`horizontal-shift` (integer)
An integer that identifies ranking of `NoteColumn`s for horizontal shifting. This is used by Sezione "note-collision-interface" in *Guida al Funzionamento Interno*.

`horizontal-skylines` (pair of skylines)
Two skylines, one to the left and one to the right of this grob.

`id` (string)
An id string for the grob. Depending on the typestting backend being used, this id will be assigned to a group containing all of the stencils that comprise a given grob. For example, in the svg backend, the string will be assigned to the `id` attribute of a group (`<g>`) that encloses the stencils that comprise the grob. In the Postscript backend, as there is no way to group items, the setting of the id property will have no effect.

`ignore-collision` (boolean)
If set, don't do note collision resolution on this `NoteColumn`.

`implicit` (boolean)
Is this an implicit bass figure?

`inspect-index` (integer)
If debugging is set, set beam and slur configuration to this index, and print the respective scores.

`inspect-quants` (pair of numbers)
If debugging is set, set beam and slur quants to this position, and print the respective scores.

`keep-inside-line` (boolean)
If set, this column cannot have objects sticking into the margin.

`kern` (dimension, in staff space)
Amount of extra white space to add. For bar lines, this is the amount of space after a thick line.

`knee` (boolean)
Is this beam kneed?

`knee-spacing-correction` (number)
: Factor for the optical correction amount for kneed beams. Set between `0` for no correction and `1` for full correction.

`labels` (list)
: List of labels (symbols) placed on a column.

`layer` (integer)
: An integer which determines the order of printing objects. Objects with the lowest value of layer are drawn first, then objects with progressively higher values are drawn, so objects with higher values overwrite objects with lower values. By default most objects are assigned a layer value of 1.

`ledger-extra` (dimension, in staff space)
: Extra distance from staff line to draw ledger lines for.

`ledger-line-thickness` (pair of numbers)
: The thickness of ledger lines. It is the sum of 2 numbers: The first is the factor for line thickness, and the second for staff space. Both contributions are added.

`ledger-positions` (list)
: Repeating pattern for the vertical positions of ledger lines. Bracketed groups are always shown together.

`left-bound-info` (list)
: An alist of properties for determining attachments of spanners to edges.

`left-padding` (dimension, in staff space)
: The amount of space that is put left to an object (e.g., a lyric extender).

`length` (dimension, in staff space)
: User override for the stem length of unbeamed stems.

`length-fraction` (number)
: Multiplier for lengths. Used for determining ledger lines and stem lengths.

`line-break-penalty` (number)
: Penalty for a line break at this column. This affects the choices of the line breaker; it avoids a line break at a column with a positive penalty and prefers a line break at a column with a negative penalty.

`line-break-permission` (symbol)
: Instructs the line breaker on whether to put a line break at this column. Can be `force` or `allow`.

`line-break-system-details` (list)
: An alist of properties to use if this column is the start of a system.

`line-count` (integer)
: The number of staff lines.

`line-positions` (list)
: Vertical positions of staff lines.

`line-thickness` (number)
: The thickness of the tie or slur contour.

`long-text` (markup)
: Text markup. See Sezione “Formatting text” in *Guida alla Notazione*.

`max-beam-connect` (integer)
: Maximum number of beams to connect to beams from this stem. Further beams are typeset as beamlets.

`max-stretch` (number)
: The maximum amount that this `VerticalAxisGroup` can be vertically stretched (for example, in order to better fill a page).

`maximum-gap` (number)
: Maximum value allowed for `gap` property.

`measure-count` (integer)
: The number of measures for a multi-measure rest.

`measure-length` (moment)
: Length of a measure. Used in some spacing situations.

`merge-differently-dotted` (boolean)
: Merge note heads in collisions, even if they have a different number of dots. This is normal notation for some types of polyphonic music.

  `merge-differently-dotted` only applies to opposing stem directions (i.e., voice 1 & 2).

`merge-differently-headed` (boolean)
: Merge note heads in collisions, even if they have different note heads. The smaller of the two heads is rendered invisible. This is used in polyphonic guitar notation. The value of this setting is used by Sezione "note-collision-interface" in *Guida al Funzionamento Interno*.

  `merge-differently-headed` only applies to opposing stem directions (i.e., voice 1 & 2).

`minimum-distance` (dimension, in staff space)
: Minimum distance between rest and notes or beam.

`minimum-length` (dimension, in staff space)
: Try to make a spanner at least this long, normally in the horizontal direction. This requires an appropriate callback for the `springs-and-rods` property. If added to a `Tie`, this sets the minimum distance between noteheads.

`minimum-length-fraction` (number)
: Minimum length of ledger line as fraction of note head size.

`minimum-space` (dimension, in staff space)
: Minimum distance that the victim should move (after padding).

`minimum-X-extent` (pair of numbers)
: Minimum size of an object in X dimension, measured in `staff-space` units.

`minimum-Y-extent` (pair of numbers)
: Minimum size of an object in Y dimension, measured in `staff-space` units.

`neutral-direction` (direction)
: Which direction to take in the center of the staff.

`neutral-position` (number)
: Position (in half staff spaces) where to flip the direction of custos stem.

`next` (graphical (layout) object)
: Object that is next relation (e.g., the lyric syllable following an extender).

`no-alignment` (boolean)
: If set, don't place this grob in a `VerticalAlignment`; rather, place it using its own `Y-offset` callback.

`no-ledgers` (boolean)
If set, don't draw ledger lines on this object.

`no-stem-extend` (boolean)
If set, notes with ledger lines do not get stems extending to the middle staff line.

`non-break-align-symbols` (list)
A list of symbols that determine which NON-break-aligned interfaces to align this to.

`non-default` (boolean)
Set for manually specified clefs.

`non-musical` (boolean)
True if the grob belongs to a `NonMusicalPaperColumn`.

`nonstaff-nonstaff-spacing` (list)
The spacing alist controlling the distance between the current non-staff line and the next non-staff line in the direction of `staff-affinity`, if both are on the same side of the related staff, and `staff-affinity` is either `UP` or `DOWN`. See `staff-staff-spacing` for a description of the alist structure.

`nonstaff-relatedstaff-spacing` (list)
The spacing alist controlling the distance between the current non-staff line and the nearest staff in the direction of `staff-affinity`, if there are no non-staff lines between the two, and `staff-affinity` is either `UP` or `DOWN`. If `staff-affinity` is `CENTER`, then `nonstaff-relatedstaff-spacing` is used for the nearest staves on *both* sides, even if other non-staff lines appear between the current one and either of the staves. See `staff-staff-spacing` for a description of the alist structure.

`nonstaff-unrelatedstaff-spacing` (list)
The spacing alist controlling the distance between the current non-staff line and the nearest staff in the opposite direction from `staff-affinity`, if there are no other non-staff lines between the two, and `staff-affinity` is either `UP` or `DOWN`. See `staff-staff-spacing` for a description of the alist structure.

`normalized-endpoints` (pair)
Represents left and right placement over the total spanner, where the width of the spanner is normalized between 0 and 1.

`note-names` (vector)
Vector of strings containing names for easy-notation note heads.

`outside-staff-horizontal-padding` (number)
By default, an outside-staff-object can be placed so that is it very close to another grob horizontally. If this property is set, the outside-staff-object is raised so that it is not so close to its neighbor.

`outside-staff-padding` (number)
The padding to place between this grob and the staff when spacing according to `outside-staff-priority`.

`outside-staff-placement-directive` (symbol)
One of four directives telling how outside staff objects should be placed.

- `left-to-right-greedy` – Place each successive grob from left to right.
- `left-to-right-polite` – Place a grob from left to right only if it does not potentially overlap with another grob that has been placed on a pass through a grob array. If there is overlap, do another pass to determine placement.

- `right-to-left-greedy` – Same as `left-to-right-greedy`, but from right to left.
- `right-to-left-polite` – Same as `left-to-right-polite`, but from right to left.

`outside-staff-priority` (number)
: If set, the grob is positioned outside the staff in such a way as to avoid all collisions. In case of a potential collision, the grob with the smaller `outside-staff-priority` is closer to the staff.

`packed-spacing` (boolean)
: If set, the notes are spaced as tightly as possible.

`padding` (dimension, in staff space)
: Add this much extra space between objects that are next to each other.

`padding-pairs` (list)
: An alist mapping `(name . name)` to distances.

`page-break-penalty` (number)
: Penalty for page break at this column. This affects the choices of the page breaker; it avoids a page break at a column with a positive penalty and prefers a page break at a column with a negative penalty.

`page-break-permission` (symbol)
: Instructs the page breaker on whether to put a page break at this column. Can be `force` or `allow`.

`page-turn-penalty` (number)
: Penalty for a page turn at this column. This affects the choices of the page breaker; it avoids a page turn at a column with a positive penalty and prefers a page turn at a column with a negative penalty.

`page-turn-permission` (symbol)
: Instructs the page breaker on whether to put a page turn at this column. Can be `force` or `allow`.

`parenthesized` (boolean)
: Parenthesize this grob.

`positions` (pair of numbers)
: Pair of staff coordinates `(left . right)`, where both *left* and *right* are in `staff-space` units of the current staff. For slurs, this value selects which slur candidate to use; if extreme positions are requested, the closest one is taken.

`prefer-dotted-right` (boolean)
: For note collisions, prefer to shift dotted up-note to the right, rather than shifting just the dot.

`protrusion` (number)
: In an arpeggio bracket, the length of the horizontal edges.

`ratio` (number)
: Parameter for slur shape. The higher this number, the quicker the slur attains its `height-limit`.

`remove-empty` (boolean)
: If set, remove group if it contains no interesting items.

`remove-first` (boolean)
: Remove the first staff of an orchestral score?

`replacement-alist` (list)
: Alist of strings. The key is a string of the pattern to be replaced. The value is a string of what should be displayed. Useful for ligatures.

`restore-first` (boolean)
: Print a natural before the accidental.

`rhythmic-location` (rhythmic location)
: Where (bar number, measure position) in the score.

`right-bound-info` (list)
: An alist of properties for determining attachments of spanners to edges.

`right-padding` (dimension, in staff space)
: Space to insert on the right side of an object (e.g., between note and its accidentals).

`rotation` (list)
: Number of degrees to rotate this object, and what point to rotate around. For example, `'(45 0 0)` rotates by 45 degrees around the center of this object.

`round-up-exceptions` (list)
: A list of pairs where car is the numerator and cdr the denominator of a moment. Each pair in this list means that the multi-measure rests of the corresponding length will be rounded up to the longer rest. See *round-up-to-longer-rest*.

`round-up-to-longer-rest` (boolean)
: Displays the longer multi-measure rest when the length of a measure is between two values of `usable-duration-logs`. For example, displays a breve instead of a whole in a 3/2 measure.

`rounded` (boolean)
: Decide whether lines should be drawn rounded or not.

`same-direction-correction` (number)
: Optical correction amount for stems that are placed in tight configurations. This amount is used for stems with the same direction to compensate for note head to stem distance.

`script-priority` (number)
: A key for determining the order of scripts in a stack, by being added to the position of the script in the user input, the sum being the overall priority. Smaller means closer to the head.

`self-alignment-X` (number)
: Specify alignment of an object. The value `-1` means left aligned, `0` centered, and `1` right-aligned in X direction. Other numerical values may also be specified.

`self-alignment-Y` (number)
: Like `self-alignment-X` but for the Y axis.

`sharp-positions` (list)
: Sharps in key signatures are placed within the specified ranges of staff-positions. The general form is a list of pairs, with one pair for each type of clef, in order of the staff-position at which each clef places C: `(alto treble tenor soprano baritone mezzosoprano bass)`. If the list contains a single element it applies for all clefs. A single number in place of a pair sets accidentals within the octave ending at that staff-position.

`shorten-pair` (pair of numbers)
: The lengths to shorten a text-spanner on both sides, for example a pedal bracket. Positive values shorten the text-spanner, while negative values lengthen it.

`shortest-duration-space` (dimension, in staff space)
Start with this much space for the shortest duration. This is expressed in `spacing-increment` as unit. See also Sezione "spacing-spanner-interface" in *Guida al Funzionamento Interno*.

`shortest-playing-duration` (moment)
The duration of the shortest note playing here.

`shortest-starter-duration` (moment)
The duration of the shortest note that starts here.

`side-axis` (number)
If the value is `X` (or equivalently `0`), the object is placed horizontally next to the other object. If the value is `Y` or `1`, it is placed vertically.

`side-relative-direction` (direction)
Multiply direction of `direction-source` with this to get the direction of this object.

`simple-Y` (boolean)
Should the Y placement of a spanner disregard changes in system heights?

`size` (number)
Size of object, relative to standard size.

`skip-quanting` (boolean)
Should beam quanting be skipped?

`skyline-horizontal-padding` (number)
For determining the vertical distance between two staves, it is possible to have a configuration which would result in a tight interleaving of grobs from the top staff and the bottom staff. The larger this parameter is, the farther apart the staves are placed in such a configuration.

`skyline-vertical-padding` (number)
The amount by which the left and right skylines of a column are padded vertically, beyond the `Y-extent`s and `extra-spacing-height`s of the constituent grobs in the column. Increase this to prevent interleaving of grobs from adjacent columns.

`slash-negative-kern` (number)
The space to remove between slashes in percent repeat glyphs. Larger values bring the two elements closer together.

`slope` (number)
The slope of this object.

`slur-padding` (number)
Extra distance between slur and script.

`snap-radius` (number)
The maximum distance between two objects that will cause them to snap to alignment along an axis.

`space-alist` (list)
A table that specifies distances between prefatory items, like clef and time-signature. The format is an alist of spacing tuples: `(`*`break-align-symbol type . distance`*`)`, where *type* can be the symbols `minimum-space` or `extra-space`.

`space-to-barline` (boolean)
If set, the distance between a note and the following non-musical column will be measured to the bar line instead of to the beginning of the non-musical column. If

there is a clef change followed by a bar line, for example, this means that we will try to space the non-musical column as though the clef is not there.

`spacing-increment` (number)
Add this much space for a doubled duration. Typically, the width of a note head. See also Sezione "spacing-spanner-interface" in *Guida al Funzionamento Interno*.

`spacing-pair` (pair)
A pair of alignment symbols which set an object's spacing relative to its left and right `BreakAlignment`s.

For example, a `MultiMeasureRest` will ignore prefatory items at its bounds (i.e., clefs, key signatures and time signatures) using the following override:

```
\override MultiMeasureRest
  #'spacing-pair = #'(staff-bar . staff-bar)
```

`spanner-id` (string)
An identifier to distinguish concurrent spanners.

`springs-and-rods` (boolean)
Dummy variable for triggering spacing routines.

`stacking-dir` (direction)
Stack objects in which direction?

`staff-affinity` (direction)
The direction of the staff to use for spacing the current non-staff line. Choices are `UP`, `DOWN`, and `CENTER`. If `CENTER`, the non-staff line will be placed equidistant between the two nearest staves on either side, unless collisions or other spacing constraints prevent this. Setting `staff-affinity` for a staff causes it to be treated as a non-staff line. Setting `staff-affinity` to `#f` causes a non-staff line to be treated as a staff.

`staff-padding` (dimension, in staff space)
Maintain this much space between reference points and the staff. Its effect is to align objects of differing sizes (like the dynamics **p** and **f**) on their baselines.

`staff-position` (number)
Vertical position, measured in half staff spaces, counted from the middle line.

`staff-space` (dimension, in staff space)
Amount of space between staff lines, expressed in global `staff-space`.

`staff-staff-spacing` (list)
When applied to a staff-group's `StaffGrouper` grob, this spacing alist controls the distance between consecutive staves within the staff-group. When applied to a staff's `VerticalAxisGroup` grob, it controls the distance between the staff and the nearest staff below it in the same system, replacing any settings inherited from the `StaffGrouper` grob of the containing staff-group, if there is one. This property remains in effect even when non-staff lines appear between staves. The alist can contain the following keys:

- `basic-distance` – the vertical distance, measured in staff-spaces, between the reference points of the two items when no collisions would result, and no stretching or compressing is in effect.
- `minimum-distance` – the smallest allowable vertical distance, measured in staff-spaces, between the reference points of the two items, when compressing is in effect.

- `padding` – the minimum required amount of unobstructed vertical whitespace between the bounding boxes (or skylines) of the two items, measured in staff-spaces.
- `stretchability` – a unitless measure of the dimension's relative propensity to stretch. If zero, the distance will not stretch (unless collisions would result).

`staffgroup-staff-spacing` (list)
The spacing alist controlling the distance between the last staff of the current staff-group and the staff just below it in the same system, even if one or more non-staff lines exist between the two staves. If the `staff-staff-spacing` property of the staff's `VerticalAxisGroup` grob is set, that is used instead. See `staff-staff-spacing` for a description of the alist structure.

`stem-attachment` (pair of numbers)
An `(x . y)` pair where the stem attaches to the notehead.

`stem-begin-position` (number)
User override for the begin position of a stem.

`stem-spacing-correction` (number)
Optical correction amount for stems that are placed in tight configurations. For opposite directions, this amount is the correction for two normal sized stems that overlap completely.

`stemlet-length` (number)
How long should be a stem over a rest?

`stencil` (stencil)
The symbol to print.

`stencils` (list)
Multiple stencils, used as intermediate value.

`strict-grace-spacing` (boolean)
If set, main notes are spaced normally, then grace notes are put left of the musical columns for the main notes.

`strict-note-spacing` (boolean)
If set, unbroken columns with non-musical material (clefs, bar lines, etc.) are not spaced separately, but put before musical columns.

`stroke-style` (string)
Set to `"grace"` to turn stroke through flag on.

`style` (symbol)
This setting determines in what style a grob is typeset. Valid choices depend on the `stencil` callback reading this property.

`text` (markup)
Text markup. See Sezione "Formatting text" in *Guida alla Notazione*.

`text-direction` (direction)
This controls the ordering of the words. The default `RIGHT` is for roman text. Arabic or Hebrew should use `LEFT`.

`thick-thickness` (number)
Bar line thickness, measured in `line-thickness`.

`thickness` (number)
Line thickness, generally measured in `line-thickness`.

`thin-kern` (number)
The space after a hair-line in a bar line.

`tie-configuration` (list)
List of `(`*`position`*` . `*`dir`*`)` pairs, indicating the desired tie configuration, where *position* is the offset from the center of the staff in staff space and *dir* indicates the direction of the tie (`1`=>up, `-1`=>down, `0`=>center). A non-pair entry in the list causes the corresponding tie to be formatted automatically.

`to-barline` (boolean)
If true, the spanner will stop at the bar line just before it would otherwise stop.

`toward-stem-shift` (number)
Amount by which scripts are shifted toward the stem if their direction coincides with the stem direction. `0.0` means keep the default position (centered on the note head), `1.0` means centered on the stem. Interpolated values are possible.

`transparent` (boolean)
This makes the grob invisible.

`uniform-stretching` (boolean)
If set, items stretch proportionally to their durations. This looks better in complex polyphonic patterns.

`usable-duration-logs` (list)
List of `duration-log`s that can be used in typesetting the grob.

`use-skylines` (boolean)
Should skylines be used for side positioning?

`used` (boolean)
If set, this spacing column is kept in the spacing problem.

`vertical-skylines` (pair of skylines)
Two skylines, one above and one below this grob.

`when` (moment)
Global time step associated with this column happen?

`whiteout` (boolean)
If true, the grob is printed over a white background to white-out underlying material, if the grob is visible. Usually #f by default.

`width` (dimension, in staff space)
The width of a grob measured in staff space.

`word-space` (dimension, in staff space)
Space to insert between words in texts.

`X-extent` (pair of numbers)
Hard coded extent in X direction.

`X-offset` (number)
The horizontal amount that this object is moved relative to its X-parent.

`X-positions` (pair of numbers)
Pair of X staff coordinates of a spanner in the form `(`*`left`*` . `*`right`*`)`, where both *left* and *right* are in `staff-space` units of the current staff.

`Y-extent` (pair of numbers)
Hard coded extent in Y direction.

`Y-offset` (number)
The vertical amount that this object is moved relative to its Y-parent.

`zigzag-length` (dimension, in staff space)
The length of the lines of a zigzag, relative to `zigzag-width`. A value of `1` gives 60-degree zigzags.

`zigzag-width` (dimension, in staff space)
The width of one zigzag squiggle. This number is adjusted slightly so that the glissando line can be constructed from a whole number of squiggles.

A.18 Available music functions

`absolute` [music] - *music* (music)
Make *music* absolute. This does not actually change the music itself but rather hides it from surrounding `\relative` commands.

`acciaccatura` [music] - *music* (music)
Create an acciaccatura from the following music expression

`accidentalStyle` [music] - *style* (symbol list)
Set accidental style to symbol list *style* in the form '`piano-cautionary`'. If *style* has a form like '`Staff.piano-cautionary`', the settings are applied to that context. Otherwise, the context defaults to '`Staff`', except for piano styles, which use '`GrandStaff`' as a context.

`addChordShape` [void] - *key-symbol* (symbol) *tuning* (pair) *shape-definition* (string or pair)
Add chord shape *shape-definition* to the *chord-shape-table* hash with the key `(cons key-symbol tuning)`.

`addInstrumentDefinition` [void] - *name* (string) *lst* (list)
Create instrument *name* with properties *list*.

`addQuote` [void] - *name* (string) *music* (music)
Define *music* as a quotable music expression named *name*

`afterGrace` [music] - *main* (music) *grace* (music)
Create *grace* note(s) after a *main* music expression.

`allowPageTurn` [music]
Allow a page turn. May be used at toplevel (ie between scores or markups), or inside a score.

`allowVoltaHook` [void] - *bar* (string)
(undocumented; fixme)

`alterBroken` [music] - *property* (symbol list or symbol) *arg* (list) *item* (symbol list or music)
Override *property* for pieces of broken spanner *item* with values *arg*. *item* may either be music in the form of a starting spanner event, or a symbol list in the form '`Context.Grob`' or just '`Grob`'. Iff *item* is in the form of a spanner event, *property* may also have the form '`Grob.property`' for specifying a directed tweak.

`appendToTag` [music] - *tag* (symbol) *more* (music) *music* (music)
Append *more* to the `elements` of all music expressions in *music* that are tagged with *tag*.

`applyContext` [music] - *proc* (procedure)
Modify context properties with Scheme procedure *proc*.

`applyMusic` [music] - *func* (procedure) *music* (music)
Apply procedure *func* to *music*.

`applyOutput` [music] - *ctx* (symbol) *proc* (procedure)
Apply function `proc` to every layout object in context `ctx`

`appoggiatura` [music] - *music* (music)
Create an appoggiatura from *music*

`assertBeamQuant` [music] - *l* (pair) *r* (pair)
Testing function: check whether the beam quants *l* and *r* are correct

`assertBeamSlope` [music] - *comp* (procedure)
Testing function: check whether the slope of the beam is the same as `comp`

`autochange` [music] - *music* (music)
Make voices that switch between staves automatically

`balloonGrobText` [music] - *grob-name* (symbol) *offset* (pair of numbers) *text* (markup)
Attach *text* to *grob-name* at offset *offset* (use like `\once`)

`balloonText` [post event] - *offset* (pair of numbers) *text* (markup)
Attach *text* at *offset* (use like `\tweak`)

`bar` [music] - *type* (string)
Insert a bar line of type *type*

`barNumberCheck` [music] - *n* (integer)
Print a warning if the current bar number is not *n*.

`bendAfter` [post event] - *delta* (real number)
Create a fall or doit of pitch interval *delta*.

`bookOutputName` [void] - *newfilename* (string)
Direct output for the current book block to *newfilename*.

`bookOutputSuffix` [void] - *newsuffix* (string)
Set the output filename suffix for the current book block to *newsuffix*.

`breathe` [music]
Insert a breath mark.

`chordRepeats` [music] - *event-types* [list] *music* (music)
Walk through *music* putting the notes of the previous chord into repeat chords, as well as an optional list of *event-types* such as `#'(string-number-event)`.

`clef` [music] - *type* (string)
Set the current clef to *type*.

`compoundMeter` [music] - *args* (pair)
Create compound time signatures. The argument is a Scheme list of lists. Each list describes one fraction, with the last entry being the denominator, while the first entries describe the summands in the enumerator. If the time signature consists of just one fraction, the list can be given directly, i.e. not as a list containing a single list. For example, a time signature of (3+1)/8 + 2/4 would be created as `\compoundMeter #'((3 1 8) (2 4))`, and a time signature of (3+2)/8 as `\compoundMeter #'((3 2 8))` or shorter `\compoundMeter #'(3 2 8)`.

`crossStaff` [music] - *notes* (music)
Create cross-staff stems

`cueClef` [music] - *type* (string)
Set the current cue clef to *type*.

`cueClefUnset` [music]
Unset the current cue clef.

`cueDuring` [music] - *what* (string) *dir* (direction) *main-music* (music)
Insert contents of quote *what* corresponding to *main-music*, in a CueVoice oriented by *dir*.

`cueDuringWithClef` [music] - *what* (string) *dir* (direction) *clef* (string) *main-music* (music)
Insert contents of quote *what* corresponding to *main-music*, in a CueVoice oriented by *dir*.

`deadNote` [music] - *note* (music)
Print *note* with a cross-shaped note head.

`defaultNoteHeads` [music]
Revert to the default note head style.

`defineBarLine` [void] - *bar* (string) *glyph-list* (list)
Define bar line settings for bar line *bar*. The list *glyph-list* must have three entries which define the appearance at the end of line, at the beginning of the next line, and the span bar, respectively.

`displayLilyMusic` [music] - *music* (music)
Display the LilyPond input representation of *music* to the console.

`displayMusic` [music] - *music* (music)
Display the internal representation of *music* to the console.

`displayScheme` (any type) - *expr* (any type)
Display the internal representation of *expr* to the console.

`endSpanners` [music] - *music* (music)
Terminate the next spanner prematurely after exactly one note without the need of a specific end spanner.

`eventChords` [music] - *music* (music)
Compatibility function wrapping `EventChord` around isolated rhythmic events occuring since version 2.15.28, after expanding repeat chords '`q`'.

`featherDurations` [music] - *factor* (moment) *argument* (music)
Adjust durations of music in *argument* by rational *factor*.

`finger` [post event] - *finger* (number or markup)
Apply *finger* as a fingering indication.

`footnote` [music] - *mark* [markup] *offset* (pair of numbers) *footnote* (markup) *item* (symbol list or music)
Make the markup *footnote* a footnote on *item*. The footnote is marked with a markup *mark* moved by *offset* with respect to the marked music.

If *mark* is not given or specified as `\`*default*, it is replaced by an automatically generated sequence number. If *item* is a symbol list of form '`Grob`' or '`Context.Grob`', then grobs of that type will be marked at the current time step in the given context (default `Bottom`).

If *item* is music, the music will get a footnote attached to a grob immediately attached to the event, like `\`*tweak* does. For attaching a footnote to an *indirectly* caused grob, write `\single\footnote`, use *item* to specify the grob, and follow it with the music to annotate.

Like with `\tweak`, if you use a footnote on a following post-event, the `\footnote` command itself needs to be attached to the preceding note or rest as a post-event with `-`.

`grace` [music] - *music* (music)
Insert *music* as grace notes.

`grobdescriptions` (any type) - *descriptions* (list)
Create a context modification from *descriptions*, a list in the format of `all-grob-descriptions`.

`harmonicByFret` [music] - *fret* (number) *music* (music)
Convert *music* into mixed harmonics; the resulting notes resemble harmonics played on a fretted instrument by touching the strings at *fret*.

`harmonicByRatio` [music] - *ratio* (number) *music* (music)
Convert *music* into mixed harmonics; the resulting notes resemble harmonics played on a fretted instrument by touching the strings at the point given through *ratio*.

`harmonicNote` [music] - *note* (music)
Print *note* with a diamond-shaped note head.

`harmonicsOn` [music]
Set the default note head style to a diamond-shaped style.

`hide` [music] - *item* (symbol list or music)
Set *item*'s '`transparent`' property to `#t`, making it invisible while still retaining its dimensions.

If *item* is a symbol list of form `GrobName` or `Context.GrobName`, the result is an override for the grob name specified by it. If *item* is a music expression, the result is the same music expression with an appropriate tweak applied to it.

`inStaffSegno` [music]
Put the segno variant 'varsegno' at this position into the staff, compatible with the repeat command.

`instrumentSwitch` [music] - *name* (string)
Switch instrument to *name*, which must be predefined with `\addInstrumentDefinition`.

`inversion` [music] - *around* (pitch) *to* (pitch) *music* (music)
Invert *music* about *around* and transpose from *around* to *to*.

`keepWithTag` [music] - *tag* (symbol list or symbol) *music* (music)
Include only elements of *music* that are either untagged or tagged with one of the tags in *tag*. *tag* may be either a single symbol or a list of symbols.

`key` [music] - *tonic* [pitch] *pitch-alist* [list]
Set key to *tonic* and scale *pitch-alist*. If both are null, just generate `KeyChangeEvent`.

`killCues` [music] - *music* (music)
Remove cue notes from *music*.

`label` [music] - *label* (symbol)
Create *label* as a bookmarking label.

`language` [void] - *language* (string)
Set note names for language *language*.

`languageRestore` [void]
Restore a previously-saved pitchnames alist.

`languageSaveAndChange` [void] - *language* (string)
Store the previous pitchnames alist, and set a new one.

`makeClusters` [music] - *arg* (music)
Display chords in *arg* as clusters.

`makeDefaultStringTuning` [void] - *symbol* (symbol) *pitches* (list)
This defines a string tuning *symbol* via a list of *pitches*. The *symbol* also gets registered in `defaultStringTunings` for documentation purposes.

`mark` [music] - *label* [any type]
Make the music for the \mark command.

`modalInversion` [music] - *around* (pitch) *to* (pitch) *scale* (music) *music* (music)
Invert *music* about *around* using *scale* and transpose from *around* to *to*.

`modalTranspose` [music] - *from* (pitch) *to* (pitch) *scale* (music) *music* (music)
Transpose *music* from pitch *from* to pitch *to* using *scale*.

`musicMap` [music] - *proc* (procedure) *mus* (music)
Apply *proc* to *mus* and all of the music it contains.

`noPageBreak` [music]
Forbid a page break. May be used at toplevel (i.e., between scores or markups), or inside a score.

`noPageTurn` [music]
Forbid a page turn. May be used at toplevel (i.e., between scores or markups), or inside a score.

`octaveCheck` [music] - *pitch* (pitch)
Octave check.

`omit` [music] - *item* (symbol list or music)
Set *item*'s '`stencil`' property to `#f`, effectively omitting it without taking up space.

If *item* is a symbol list of form `GrobName` or `Context.GrobName`, the result is an override for the grob name specified by it. If *item* is a music expression, the result is the same music expression with an appropriate tweak applied to it.

`once` [music] - *music* (music)
Set `once` to `#t` on all layout instruction events in *music*.

`ottava` [music] - *octave* (integer)
Set the octavation.

`overrideProperty` [music] - *grob-property-path* (symbol list) *value* (any type)
Set the grob property specified by *grob-property-path* to *value*. *grob-property-path* is a symbol list of the form `Context.GrobName.property` or `GrobName.property`, possibly with subproperties given as well.

`overrideTimeSignatureSettings` [music] - *time-signature* (pair) *base-moment* (pair) *beat-structure* (list) *beam-exceptions* (list)
Override `timeSignatureSettings` for time signatures of *time-signature* to have settings of *base-moment*, *beat-structure*, and *beam-exceptions*.

`pageBreak` [music]
Force a page break. May be used at toplevel (i.e., between scores or markups), or inside a score.

`pageTurn` [music]
Force a page turn between two scores or top-level markups.

`palmMute` [music] - *note* (music)
Print *note* with a triangle-shaped note head.

`palmMuteOn` [music]
Set the default note head style to a triangle-shaped style.

`parallelMusic` [void] - *voice-ids* (list) *music* (music)
Define parallel music sequences, separated by '`|`' (bar check signs), and assign them to the identifiers provided in *voice-ids*.

voice-ids: a list of music identifiers (symbols containing only letters)

music: a music sequence, containing BarChecks as limiting expressions.

Example:

```
  \parallelMusic #'(A B C) {
    c c | d d | e e |
    d d | e e | f f |
  }
<==>
  A = { c c | d d | }
  B = { d d | e e | }
  C = { e e | f f | }
```

`parenthesize` [music] - *arg* (music)
Tag *arg* to be parenthesized.

`partcombine` [music] - *part1* (music) *part2* (music)
Take the music in *part1* and *part2* and typeset so that they share a staff.

`partcombineDown` [music] - *part1* (music) *part2* (music)
Take the music in *part1* and *part2* and typeset so that they share a staff with stems directed downward.

`partcombineForce` [music] - *type* (symbol-or-boolean) *once* (boolean)
Override the part-combiner.

`partcombineUp` [music] - *part1* (music) *part2* (music)
Take the music in *part1* and *part2* and typeset so that they share a staff with stems directed upward.

`partial` [music] - *dur* (duration)
Make a partial measure.

`phrasingSlurDashPattern` [music] - *dash-fraction* (number) *dash-period* (number)
Set up a custom style of dash pattern for *dash-fraction* ratio of line to space repeated at *dash-period* interval for phrasing slurs.

`pitchedTrill` [music] - *main-note* (music) *secondary-note* (music)
Print a trill with *main-note* as the main note of the trill and print *secondary-note* as a stemless note head in parentheses.

`pointAndClickOff` [void]
Suppress generating extra code in final-format (e.g. pdf) files to point back to the lilypond source statement.

`pointAndClickOn` [void]
Enable generation of code in final-format (e.g. pdf) files to reference the originating lilypond source statement; this is helpful when developing a score but generates bigger final-format files.

`pointAndClickTypes` [void] - *types* (symbol list or symbol)
Set a type or list of types (such as `#'note-event`) for which point-and-click info is generated.

`pushToTag` [music] - *tag* (symbol) *more* (music) *music* (music)
Add *more* to the front of `elements` of all music expressions in *music* that are tagged with *tag*.

`quoteDuring` [music] - *what* (string) *main-music* (music)
Indicate a section of music to be quoted. *what* indicates the name of the quoted voice, as specified in an `\addQuote` command. *main-music* is used to indicate the length of music to be quoted; usually contains spacers or multi-measure rests.

`relative` [music] - *pitch* [pitch] *music* (music)
Make *music* relative to *pitch*. If *pitch* is omitted, the first note in *music* is given in absolute pitch.

`removeWithTag` [music] - *tag* (symbol list or symbol) *music* (music)
Remove elements of *music* that are tagged with one of the tags in *tag*. *tag* may be either a single symbol or a list of symbols.

`resetRelativeOctave` [music] - *pitch* (pitch)
Set the octave inside a \relative section.

`retrograde` [music] - *music* (music)
Return *music* in reverse order.

`revertTimeSignatureSettings` [music] - *time-signature* (pair)
Revert `timeSignatureSettings` for time signatures of *time-signature*.

`rightHandFinger` [post event] - *finger* (number or markup)
Apply *finger* as a fingering indication.

`scaleDurations` [music] - *fraction* (fraction, as pair) *music* (music)
Multiply the duration of events in *music* by *fraction*.

`settingsFrom` (any type) - *ctx* [symbol] *music* (music)
Take the layout instruction events from *music*, optionally restricted to those applying to context type *ctx*, and return a context modification duplicating their effect.

`shape` [music] - *offsets* (list) *item* (symbol list or music)
Offset control-points of *item* by *offsets*. The argument is a list of number pairs or list of such lists. Each element of a pair represents an offset to one of the coordinates of a control-point. If *item* is a string, the result is `\once\override` for the specified grob type. If *item* is a music expression, the result is the same music expression with an appropriate tweak applied.

`shiftDurations` [music] - *dur* (integer) *dots* (integer) *arg* (music)
Change the duration of *arg* by adding *dur* to the `durlog` of *arg* and *dots* to the `dots` of *arg*.

`single` [music] - *overrides* (music) *music* (music)
Convert *overrides* to tweaks and apply them to *music*. This does not convert `\revert`, `\set` or `\unset`.

`skip` [music] - *dur* (duration)
Skip forward by *dur*.

`slashedGrace` [music] - *music* (music)
Create slashed graces (slashes through stems, but no slur) from the following music expression

`slurDashPattern` [music] - *dash-fraction* (number) *dash-period* (number)
Set up a custom style of dash pattern for *dash-fraction* ratio of line to space repeated at *dash-period* interval for slurs.

`spacingTweaks` [music] - *parameters* (list)
Set the system stretch, by reading the 'system-stretch property of the 'parameters' assoc list.

`storePredefinedDiagram` [void] - *fretboard-table* (hash table) *chord* (music) *tuning* (pair) *diagram-definition* (string or pair)
Add predefined fret diagram defined by *diagram-definition* for the chord pitches *chord* and the stringTuning *tuning*.

`stringTuning` (any type) - *chord* (music)
Convert *chord* to a string tuning. *chord* must be in absolute pitches and should have the highest string number (generally the lowest pitch) first.

`styledNoteHeads` [music] - *style* (symbol) *heads* (symbol list or symbol) *music* (music)
Set *heads* in *music* to *style*.

`tabChordRepeats` [music] - *event-types* [list] *music* (music)
Walk through *music* putting the notes, fingerings and string numbers of the previous chord into repeat chords, as well as an optional list of *event-types* such as `#'(articulation-event)`.

`tabChordRepetition` [void]
Include the string and fingering information in a chord repetition. This function is deprecated; try using `\tabChordRepeats` instead.

`tag` [music] - *tag* (symbol list or symbol) *music* (music)
Tag the following *music* with *tag* and return the result, by adding the single symbol or symbol list *tag* to the `tags` property of *music*.

`temporary` [music] - *music* (music)
Make any `\override` in *music* replace an existing grob property value only temporarily, restoring the old value when a corresponding `\revert` is executed. This is achieved by clearing the '`pop-first`' property normally set on `\overrides`.

An `\override`/`\revert` sequence created by using `\temporary` and `\undo` on the same music containing overrides will cancel out perfectly or cause a warning.

Non-property-related music is ignored, warnings are generated for any property-changing music that isn't an `\override`.

`tieDashPattern` [music] - *dash-fraction* (number) *dash-period* (number)
Set up a custom style of dash pattern for *dash-fraction* ratio of line to space repeated at *dash-period* interval for ties.

`time` [music] - *beat-structure* [number list] *fraction* (fraction, as pair)
Set *fraction* as time signature, with optional number list *beat-structure* before it.

`times` [music] - *fraction* (fraction, as pair) *music* (music)
Scale *music* in time by *fraction*.

`tocItem` [music] - *text* (markup)
Add a line to the table of content, using the `tocItemMarkup` paper variable markup

`transpose` [music] - *from* (pitch) *to* (pitch) *music* (music)
Transpose *music* from pitch *from* to pitch *to*.

`transposedCueDuring` [music] - *what* (string) *dir* (direction) *pitch* (pitch) *main-music* (music)
Insert notes from the part *what* into a voice called `cue`, using the transposition defined by *pitch*. This happens simultaneously with *main-music*, which is usually a rest. The argument *dir* determines whether the cue notes should be notated as a first or second voice.

`transposition` [music] - *pitch* (pitch)
Set instrument transposition

`tuplet` [music] - *ratio* (fraction, as pair) *tuplet-span* [duration] *music* (music)
Scale the given *music* to tuplets. *ratio* is a fraction that specifies how many notes are played in place of the nominal value: it will be '`3/2`' for triplets, namely three notes being played in place of two. If the optional duration *tuplet-span* is specified, it is used instead of `tupletSpannerDuration` for grouping the tuplets. For example,

```
\tuplet 3/2 4 { c8 c c c c c }
```

will result in two groups of three tuplets, each group lasting for a quarter note.

`tupletSpan` [music] - *tuplet-span* [duration]
Set `tupletSpannerDuration`, the length into which `\tuplet` without an explicit '`tuplet-span`' argument of its own will group its tuplets, to the duration *tuplet-span*. To revert to the default of not subdividing the contents of a `\tuplet` command without explicit '`tuplet-span`', use

```
\tupletSpan \default
```

`tweak` [music] - *prop* (symbol list or symbol) *value* (any type) *item* (symbol list or music)
Add a tweak to the following *item*, usually music. Layout objects created by *item* get their property *prop* set to *value*. If *prop* has the form '`Grob.property`', like with

```
\tweak Accidental.color #red cis'
```

an indirectly created grob ('`Accidental`' is caused by '`NoteHead`') can be tweaked; otherwise only directly created grobs are affected.

As a special case, *item* may be a symbol list specifying a grob path, in which case `\once\override` is called on it instead of creating tweaked music. This is mainly useful when using `\tweak` as as a component for building other functions.

prop can contain additional elements in which case a nested property (inside of an alist) is tweaked.

`undo` [music] - *music* (music)
Convert `\override` and `\set` in *music* to `\revert` and `\unset`, respectively. Any reverts and unsets already in *music* cause a warning. Non-property-related music is ignored.

`unfoldRepeats` [music] - *music* (music)
Force any `\repeat volta`, `\repeat tremolo` or `\repeat percent` commands in *music* to be interpreted as `\repeat unfold`.

`void` [void] - *arg* (any type)
Accept a scheme argument, return a void expression. Use this if you want to have a scheme expression evaluated because of its side-effects, but its value ignored.

`withMusicProperty` [music] - *sym* (symbol) *val* (any type) *music* (music)
Set *sym* to *val* in *music*.

`xNote` [music] - *note* (music)
Print *note* with a cross-shaped note head.

`xNotesOn` [music]
Set the default note head style to a cross-shaped style.

A.19 Context modification identifiers

The following commands are defined for use as context modifications within a `\layout` or `\with` block.

`RemoveEmptyStaves`

Remove staves which are considered to be empty according to the list of interfaces set by `keepAliveInterfaces`.

- Sets grob property `remove-empty` in Sezione ‘‘VerticalAxisGroup’’ in *Guida al Funzionamento Interno* to `#t`.

A.20 Predefined type predicates

R5RS primary predicates

Type predicate	Description
`boolean?`	boolean
`char?`	character
`number?`	number
`pair?`	pair
`port?`	port
`procedure?`	procedure
`string?`	string
`symbol?`	symbol
`vector?`	vector

R5RS secondary predicates

Type predicate	Description
`char-alphabetic?`	alphabetic character
`char-lower-case?`	lower-case character
`char-numeric?`	numeric character
`char-upper-case?`	upper-case character
`char-whitespace?`	whitespace character
`complex?`	complex number
`eof-object?`	end-of-file object
`even?`	even number
`exact?`	exact number
`inexact?`	inexact number
`input-port?`	input port
`integer?`	integer
`list?`	list *(use* `cheap-list?` *for faster processing)*
`negative?`	negative number
`null?`	null
`odd?`	odd number
`output-port?`	output port
`positive?`	positive number
`rational?`	rational number
`real?`	real number
`zero?`	zero

Guile predicates

Type predicate	Description
`hash-table?`	hash table

LilyPond scheme predicates

Type predicate	Description
`boolean-or-symbol?`	boolean or symbol
`cheap-list?`	list *(use this instead of* `list?` *for faster processing)*
`color?`	color
`fraction?`	fraction, as pair
`grob-list?`	list of grobs
`index?`	non-negative integer
`markup?`	markup
`markup-command-list?`	markup command list
`markup-list?`	markup list
`moment-pair?`	pair of moment objects
`number-list?`	number list
`number-or-grob?`	number or grob
`number-or-markup?`	number or markup
`number-or-pair?`	number or pair
`number-or-string?`	number or string
`number-pair?`	pair of numbers
`rhythmic-location?`	rhythmic location
`scheme?`	any type
`string-or-music?`	string or music
`string-or-pair?`	string or pair
`string-or-symbol?`	string or symbol
`symbol-list?`	symbol list
`symbol-list-or-music?`	symbol list or music
`symbol-list-or-symbol?`	symbol list or symbol
`void?`	void

LilyPond exported predicates

Type predicate	Description
`ly:book?`	book
`ly:box?`	box
`ly:context?`	context
`ly:context-def?`	context definition
`ly:context-mod?`	context modification
`ly:dimension?`	dimension, in staff space
`ly:dir?`	direction
`ly:dispatcher?`	dispatcher
`ly:duration?`	duration
`ly:event?`	post event
`ly:font-metric?`	font metric
`ly:grob?`	graphical (layout) object
`ly:grob-array?`	array of grobs
`ly:input-location?`	input location
`ly:item?`	item
`ly:iterator?`	iterator
`ly:lily-lexer?`	lily-lexer
`ly:lily-parser?`	lily-parser
`ly:listener?`	listener

`ly:moment?`	moment
`ly:music?`	music
`ly:music-function?`	music function
`ly:music-list?`	list of music objects
`ly:music-output?`	music output
`ly:otf-font?`	OpenType font
`ly:output-def?`	output definition
`ly:page-marker?`	page marker
`ly:pango-font?`	pango font
`ly:paper-book?`	paper book
`ly:paper-system?`	paper-system Prob
`ly:pitch?`	pitch
`ly:prob?`	property object
`ly:score?`	score
`ly:simple-closure?`	simple closure
`ly:skyline?`	skyline
`ly:skyline-pair?`	pair of skylines
`ly:source-file?`	source file
`ly:spanner?`	spanner
`ly:spring?`	spring
`ly:stencil?`	stencil
`ly:stream-event?`	stream event
`ly:translator?`	translator
`ly:translator-group?`	translator group
`ly:unpure-pure-container?`	unpure/pure container

A.21 Scheme functions

`ly:add-context-mod` *contextmods modification* [Funzione]
Adds the given context *modification* to the list *contextmods* of context modifications.

`ly:add-file-name-alist` *alist* [Funzione]
Add mappings for error messages from *alist*.

`ly:add-interface` *iface desc props* [Funzione]
Add a new grob interface. *iface* is the interface name, *desc* is the interface description, and *props* is the list of user-settable properties for the interface.

`ly:add-listener` *list disp cl* [Funzione]
Add the listener *list* to the dispatcher *disp*. Whenever *disp* hears an event of class *cl*, it is forwarded to *list*.

`ly:add-option` *sym val description* [Funzione]
Add a program option *sym*. *val* is the default value and *description* is a string description.

`ly:all-grob-interfaces` [Funzione]
Return the hash table with all grob interface descriptions.

`ly:all-options` [Funzione]
Get all option settings in an alist.

`ly:all-stencil-expressions` [Funzione]
Return all symbols recognized as stencil expressions.

`ly:assoc-get` *key alist default-value strict-checking* [Funzione]
Return value if *key* in *alist*, else *default-value* (or `#f` if not specified). If *strict-checking* is set to `#t` and *key* is not in *alist*, a programming_error is output.

`ly:axis-group-interface::add-element` *grob grob-element* [Funzione]
Set *grob* the parent of *grob-element* on all axes of *grob*.

`ly:basic-progress` *str rest* [Funzione]
A Scheme callable function to issue a basic progress message *str*. The message is formatted with `format` and *rest*.

`ly:beam-score-count` [Funzione]
count number of beam scores.

`ly:book?` *x* [Funzione]
Is *x* a `Book` object?

`ly:book-add-bookpart!` *book-smob book-part* [Funzione]
Add *book-part* to *book-smob* book part list.

`ly:book-add-score!` *book-smob score* [Funzione]
Add *score* to *book-smob* score list.

`ly:book-book-parts` *book* [Funzione]
Return book parts in *book*.

`ly:book-header` *book* [Funzione]
Return header in *book*.

`ly:book-paper` *book* [Funzione]
Return paper in *book*.

`ly:book-process` *book-smob default-paper default-layout output* [Funzione]
Print book. *output* is passed to the backend unchanged. For example, it may be a string (for file based outputs) or a socket (for network based output).

`ly:book-process-to-systems` *book-smob default-paper default-layout output* [Funzione]
Print book. *output* is passed to the backend unchanged. For example, it may be a string (for file based outputs) or a socket (for network based output).

`ly:book-scores` *book* [Funzione]
Return scores in *book*.

`ly:book-set-header!` *book module* [Funzione]
Set the book header.

`ly:box?` *x* [Funzione]
Is *x* a `Box` object?

`ly:bp` *num* [Funzione]
num bigpoints (1/72th inch).

`ly:bracket` *a iv t p* [Funzione]
Make a bracket in direction *a*. The extent of the bracket is given by *iv*. The wings protrude by an amount of *p*, which may be negative. The thickness is given by *t*.

`ly:broadcast` *disp ev* [Funzione]
Send the stream event *ev* to the dispatcher *disp*.

`ly:camel-case->lisp-identifier` *name-sym* [Funzione]
Convert `FooBar_Bla` to `foo-bar-bla` style symbol.

`ly:chain-assoc-get` *key achain default-value strict-checking* [Funzione]
Return value for *key* from a list of alists *achain*. If no entry is found, return *default-value* or `#f` if *default-value* is not specified. With *strict-checking* set to `#t`, a programming_error is output in such cases.

`ly:check-expected-warnings` [Funzione]
Check whether all expected warnings have really been triggered.

`ly:cm` *num* [Funzione]
num cm.

`ly:command-line-code` [Funzione]
The Scheme code specified on command-line with '`-e`'.

`ly:command-line-options` [Funzione]
The Scheme options specified on command-line with '`-d`'.

`ly:connect-dispatchers` *to from* [Funzione]
Make the dispatcher *to* listen to events from *from*.

`ly:context?` *x* [Funzione]
Is *x* a `Context` object?

`ly:context-current-moment` *context* [Funzione]
Return the current moment of *context*.

`ly:context-def?` *x* [Funzione]
Is *x* a `Context_def` object?

`ly:context-def-lookup` *def sym val* [Funzione]
Return the value of *sym* in output definition *def* (e.g., `\paper`). If no value is found, return *val* or `'()` if *val* is undefined.

`ly:context-def-modify` *def mod* [Funzione]
Return the result of applying the context-mod *mod* to the context definition *def*. Does not change *def*.

`ly:context-event-source` *context* [Funzione]
Return `event-source` of context *context*.

`ly:context-events-below` *context* [Funzione]
Return a `stream-distributor` that distributes all events from *context* and all its subcontexts.

`ly:context-find` *context name* [Funzione]
Find a parent of *context* that has name or alias *name*. Return `#f` if not found.

`ly:context-grob-definition` *context name* [Funzione]
Return the definition of *name* (a symbol) within *context* as an alist.

`ly:context-id` *context* [Funzione]
Return the ID string of *context*, i.e., for `\context Voice = "one" ...` return the string `one`.

`ly:context-mod?` *x* [Funzione]
Is *x* a `Context_mod` object?

`ly:context-mod-apply!` *context mod* [Funzione]
Apply the context modification *mod* to *context*.

`ly:context-name` *context* [Funzione]
Return the name of *context*, i.e., for `\context Voice = "one" ...` return the symbol `Voice`.

`ly:context-now` *context* [Funzione]
Return `now-moment` of context *context*.

`ly:context-parent` *context* [Funzione]
Return the parent of *context*, `#f` if none.

`ly:context-property` *context sym def* [Funzione]
Return the value for property *sym* in *context*. If *def* is given, and property value is `'()`, return *def*.

`ly:context-property-where-defined` *context name* [Funzione]
Return the context above *context* where *name* is defined.

`ly:context-pushpop-property` *context grob eltprop val* [Funzione]
Do a single `\override` or `\revert` operation in *context*. The grob definition *grob* is extended with *eltprop* (if *val* is specified) or reverted (if unspecified).

`ly:context-set-property!` *context name val* [Funzione]
Set value of property *name* in context *context* to *val*.

`ly:context-unset-property` *context name* [Funzione]
Unset value of property *name* in context *context*.

`ly:debug` *str rest* [Funzione]
A Scheme callable function to issue a debug message *str*. The message is formatted with `format` and *rest*.

`ly:default-scale` [Funzione]
Get the global default scale.

`ly:dimension?` *d* [Funzione]
Return *d* as a number. Used to distinguish length variables from normal numbers.

`ly:dir?` *s* [Funzione]
Is *s* a direction? Valid directions are `-1`, `0`, or `1`, where `-1` represents left or down, `1` represents right or up, and `0` represents a neutral direction.

`ly:dispatcher?` *x* [Funzione]
Is *x* a `Dispatcher` object?

`ly:duration?` *x* [Funzione]
Is *x* a `Duration` object?

`ly:duration<?` *p1 p2* [Funzione]
Is *p1* shorter than *p2*?

`ly:duration->string` *dur* [Funzione]
Convert *dur* to a string.

`ly:duration-dot-count` *dur* [Funzione]
Extract the dot count from *dur*.

`ly:duration-factor` *dur* [Funzione]
Extract the compression factor from *dur*. Return it as a pair.

`ly:duration-length` *dur* [Funzione]
The length of the duration as a `moment`.

`ly:duration-log` *dur* [Funzione]
Extract the duration log from *dur*.

`ly:duration-scale` *dur* [Funzione]
Extract the compression factor from *dur*. Return it as a rational.

`ly:effective-prefix` [Funzione]
Return effective prefix.

`ly:encode-string-for-pdf` *str* [Funzione]
Encode the given string to either Latin1 (which is a subset of the PDFDocEncoding) or if that's not possible to full UTF-16BE with Byte-Order-Mark (BOM).

`ly:engraver-announce-end-grob` *engraver grob cause* [Funzione]
Announce the end of a grob (i.e., the end of a spanner) originating from given *engraver* instance, with *grob* being a grob. *cause* should either be another grob or a music event.

`ly:engraver-make-grob` *engraver grob-name cause* [Funzione]
Create a grob originating from given *engraver* instance, with given *grob-name*, a symbol. *cause* should either be another grob or a music event.

`ly:error` *str rest* [Funzione]
A Scheme callable function to issue the error *str*. The error is formatted with `format` and *rest*.

`ly:eval-simple-closure` *delayed closure scm-start scm-end* [Funzione]
Evaluate a simple *closure* with the given *delayed* argument. If *scm-start* and *scm-end* are defined, evaluate it purely with those start and end points.

`ly:event?` *obj* [Funzione]
Is *obj* a proper (non-rhythmic) event object?

`ly:event-deep-copy` *m* [Funzione]
Copy *m* and all sub expressions of *m*.

`ly:event-property` *sev sym val* [Funzione]
Get the property *sym* of stream event *sev*. If *sym* is undefined, return *val* or `'()` if *val* is not specified.

`ly:event-set-property!` *ev sym val* [Funzione]
Set property *sym* in event *ev* to *val*.

`ly:expand-environment` *str* [Funzione]
Expand `$VAR` and `${VAR}` in *str*.

`ly:expect-warning` *str rest* [Funzione]
A Scheme callable function to register a warning to be expected and subsequently suppressed. If the warning is not encountered, a warning about the missing warning will be shown. The message should be translated with `(_ ...)` and changing parameters given after the format string.

`ly:find-file` *name* [Funzione]
Return the absolute file name of *name*, or `#f` if not found.

`ly:font-config-add-directory` *dir* [Funzione]
Add directory *dir* to FontConfig.

`ly:font-config-add-font` *font* [Funzione]
Add font *font* to FontConfig.

`ly:font-config-display-fonts` [Funzione]
Dump a list of all fonts visible to FontConfig.

`ly:font-config-get-font-file` *name* [Funzione]
Get the file for font *name*.

`ly:font-design-size` *font* [Funzione]
Given the font metric *font*, return the design size, relative to the current output-scale.

`ly:font-file-name` *font* [Funzione]
Given the font metric *font*, return the corresponding file name.

`ly:font-get-glyph` *font name* [Funzione]
Return a stencil from *font* for the glyph named *name*. If the glyph is not available, return an empty stencil.

Note that this command can only be used to access glyphs from fonts loaded with `ly:system-font-load`; currently, this means either the Emmentaler or Emmentaler-Brace fonts, corresponding to the font encodings `fetaMusic` and `fetaBraces`, respectively.

`ly:font-glyph-name-to-charcode` *font name* [Funzione]
Return the character code for glyph *name* in *font*.

Note that this command can only be used to access glyphs from fonts loaded with `ly:system-font-load`; currently, this means either the Emmentaler or Emmentaler-Brace fonts, corresponding to the font encodings `fetaMusic` and `fetaBraces`, respectively.

`ly:font-glyph-name-to-index` *font name* [Funzione]
Return the index for *name* in *font*.

Note that this command can only be used to access glyphs from fonts loaded with `ly:system-font-load`; currently, this means either the Emmentaler or Emmentaler-Brace fonts, corresponding to the font encodings `fetaMusic` and `fetaBraces`, respectively.

`ly:font-index-to-charcode` *font index* [Funzione]
Return the character code for *index* in *font*.

Note that this command can only be used to access glyphs from fonts loaded with `ly:system-font-load`; currently, this means either the Emmentaler or Emmentaler-Brace fonts, corresponding to the font encodings `fetaMusic` and `fetaBraces`, respectively.

`ly:font-magnification` *font* [Funzione]
Given the font metric *font*, return the magnification, relative to the current output-scale.

`ly:font-metric?` *x* [Funzione]
Is *x* a `Font_metric` object?

`ly:font-name` *font* [Funzione]
Given the font metric *font*, return the corresponding name.

`ly:font-sub-fonts` *font* [Funzione]
Given the font metric *font* of an OpenType font, return the names of the subfonts within *font*.

`ly:format` *str rest* [Funzione]
LilyPond specific format, supporting `~a` and `~[0-9]f`. Basic support for `~s` is also provided.

`ly:format-output` *context* [Funzione]
Given a global context in its final state, process it and return the `Music_output` object in its final state.

`ly:get-all-function-documentation` [Funzione]
Get a hash table with all LilyPond Scheme extension functions.

`ly:get-all-translators` [Funzione]
Return a list of all translator objects that may be instantiated.

`ly:get-context-mods` *contextmod* [Funzione]
Returns the list of context modifications stored in *contextmod*.

`ly:get-option` *var* [Funzione]
Get a global option setting.

`ly:get-spacing-spec` *from-scm to-scm* [Funzione]
Return the spacing spec going between the two given grobs, *from_scm* and *to_scm*.

`ly:get-undead` *undead* [Funzione]
Get back object from *undead*.

`ly:gettext` *original* [Funzione]
A Scheme wrapper function for `gettext`.

`ly:grob?` *x* [Funzione]
Is *x* a `Grob` object?

`ly:grob-alist-chain` *grob global* [Funzione]
Get an alist chain for grob *grob*, with *global* as the global default. If unspecified, `font-defaults` from the layout block is taken.

`ly:grob-array?` *x* [Funzione]
Is *x* a `Grob_array` object?

`ly:grob-array->list` *grob-arr* [Funzione]
Return the elements of *grob-arr* as a Scheme list.

`ly:grob-array-length` *grob-arr* [Funzione]
Return the length of *grob-arr*.

`ly:grob-array-ref` *grob-arr index* [Funzione]
Retrieve the *index*th element of *grob-arr*.

`ly:grob-basic-properties` *grob* [Funzione]
Get the immutable properties of *grob*.

`ly:grob-chain-callback` *grob proc sym* [Funzione]
Find the callback that is stored as property *sym* of grob *grob* and chain *proc* to the head of this, meaning that it is called using *grob* and the previous callback's result.

`ly:grob-common-refpoint` *grob other axis* [Funzione]
Find the common refpoint of *grob* and *other* for *axis*.

`ly:grob-common-refpoint-of-array` *grob others axis* [Funzione]
Find the common refpoint of *grob* and *others* (a grob-array) for *axis*.

`ly:grob-default-font` *grob* [Funzione]
Return the default font for grob *grob*.

`ly:grob-extent` *grob refp axis* [Funzione]
Get the extent in *axis* direction of *grob* relative to the grob *refp*.

`ly:grob-get-vertical-axis-group-index` *grob* [Funzione]
Get the index of the vertical axis group the grob *grob* belongs to; return `-1` if none is found.

`ly:grob-interfaces` *grob* [Funzione]
Return the interfaces list of grob *grob*.

`ly:grob-layout` *grob* [Funzione]
Get `\layout` definition from grob *grob*.

`ly:grob-object` *grob sym* [Funzione]
Return the value of a pointer in grob *grob* of property *sym*. It returns `'()` (end-of-list) if *sym* is undefined in *grob*.

`ly:grob-original` *grob* [Funzione]
Return the unbroken original grob of *grob*.

`ly:grob-parent` *grob axis* [Funzione]
Get the parent of *grob*. *axis* is 0 for the X-axis, 1 for the Y-axis.

`ly:grob-pq<?` *a b* [Funzione]
Compare two grob priority queue entries. This is an internal function.

`ly:grob-properties` *grob* [Funzione]
Get the mutable properties of *grob*.

`ly:grob-property` *grob sym val* [Funzione]
Return the value for property *sym* of *grob*. If no value is found, return *val* or `'()` if *val* is not specified.

`ly:grob-property-data` *grob sym* [Funzione]
Return the value for property *sym* of *grob*, but do not process callbacks.

`ly:grob-pure-height` *grob refp beg end val* [Funzione]
Return the pure height of *grob* given refpoint *refp*. If no value is found, return *val* or `'()` if *val* is not specified.

`ly:grob-pure-property` *grob sym beg end val* [Funzione]
Return the pure value for property *sym* of *grob*. If no value is found, return *val* or `'()` if *val* is not specified.

`ly:grob-relative-coordinate` *grob refp axis* [Funzione]
Get the coordinate in *axis* direction of *grob* relative to the grob *refp*.

`ly:grob-robust-relative-extent` *grob refp axis* [Funzione]
Get the extent in *axis* direction of *grob* relative to the grob *refp*, or `(0,0)` if empty.

`ly:grob-script-priority-less` *a b* [Funzione]
Compare two grobs by script priority. For internal use.

`ly:grob-set-nested-property!` *grob symlist val* [Funzione]
Set nested property *symlist* in grob *grob* to value *val*.

`ly:grob-set-object!` *grob sym val* [Funzione]
Set *sym* in grob *grob* to value *val*.

`ly:grob-set-parent!` *grob axis parent-grob* [Funzione]
Set *parent-grob* the parent of grob *grob* in axis *axis*.

`ly:grob-set-property!` *grob sym val* [Funzione]
Set *sym* in grob *grob* to value *val*.

`ly:grob-staff-position` *sg* [Funzione]
Return the Y-position of *sg* relative to the staff.

`ly:grob-suicide!` *grob* [Funzione]
Kill *grob*.

`ly:grob-system` *grob* [Funzione]
Return the system grob of *grob*.

`ly:grob-translate-axis!` *grob d a* [Funzione]
Translate *grob* on axis *a* over distance *d*.

`ly:grob-vertical<?` *a b* [Funzione]
Does *a* lie above *b* on the page?

`ly:gulp-file` *name size* [Funzione]
Read *size* characters from the file *name*, and return its contents in a string. If *size* is undefined, the entire file is read. The file is looked up using the search path.

`ly:hash-table-keys` *tab* [Funzione]
Return a list of keys in *tab*.

`ly:inch` *num* [Funzione]
num inches.

`ly:input-both-locations` *sip* [Funzione]
Return input location in *sip* as `(file-name first-line first-column last-line last-column)`.

`ly:input-file-line-char-column` *sip* [Funzione]
Return input location in *sip* as `(file-name line char column)`.

`ly:input-location?` *x* [Funzione]
Is *x* an `input-location`?

`ly:input-message` *sip msg rest* [Funzione]
Print *msg* as a GNU compliant error message, pointing to the location in *sip*. *msg* is interpreted similar to `format`'s argument, using *rest*.

`ly:input-warning` *sip msg rest* [Funzione]
Print *msg* as a GNU compliant warning message, pointing to the location in *sip*. *msg* is interpreted similar to `format`'s argument, using *rest*.

`ly:interpret-music-expression` *mus ctx* [Funzione]
Interpret the music expression *mus* in the global context *ctx*. The context is returned in its final state.

`ly:interpret-stencil-expression` *expr func arg1 offset* [Funzione]
Parse *expr*, feed bits to *func* with first arg *arg1* having offset *offset*.

`ly:intlog2` *d* [Funzione]
The 2-logarithm of $1/d$.

`ly:item?` *g* [Funzione]
Is *g* an `Item` object?

`ly:item-break-dir` *it* [Funzione]
The break status direction of item *it*. `-1` means end of line, `0` unbroken, and `1` beginning of line.

`ly:iterator?` *x* [Funzione]
Is *x* a `Music_iterator` object?

`ly:lexer-keywords` *lexer* [Funzione]
Return a list of `(KEY . CODE)` pairs, signifying the LilyPond reserved words list.

`ly:lily-lexer?` *x* [Funzione]
Is *x* a `Lily_lexer` object?

`ly:lily-parser?` *x* [Funzione]
Is *x* a `Lily_parser` object?

`ly:listened-event-class?` *disp cl* [Funzione]
Does *disp* listen to any event type in the list *cl*?

`ly:listened-event-types` *disp* [Funzione]
Return a list of all event types that *disp* listens to.

`ly:listener?` *x* [Funzione]
Is *x* a `Listener` object?

`ly:make-book` *paper header scores* [Funzione]
Make a `\book` of *paper* and *header* (which may be `#f` as well) containing `\scores`.

`ly:make-book-part` *scores* [Funzione]
Make a `\bookpart` containing `\scores`.

`ly:make-context-mod` *mod-list* [Funzione]
Creates a context modification, optionally initialized via the list of modifications *mod-list*.

`ly:make-dispatcher` [Funzione]
Return a newly created dispatcher.

`ly:make-duration` *length dotcount num den* [Funzione]
length is the negative logarithm (base 2) of the duration: 1 is a half note, 2 is a quarter note, 3 is an eighth note, etc. The number of dots after the note is given by the optional argument *dotcount*.

The duration factor is optionally given by integers *num* and *den*, alternatively by a single rational number.

A duration is a musical duration, i.e., a length of time described by a power of two (whole, half, quarter, etc.) and a number of augmentation dots.

`ly:make-global-context` *output-def* [Funzione]
Set up a global interpretation context, using the output block *output-def*. The context is returned.

`ly:make-global-translator` *global* [Funzione]
Create a translator group and connect it to the global context *global*. The translator group is returned.

`ly:make-listener` *callback* [Funzione]
Create a listener. Any time the listener hears an object, it will call *callback* with that object.

callback should take exactly one argument.

`ly:make-moment` *m g gn gd* [Funzione]
Create the moment with rational main timing *m*, and optional grace timing *g*.

A *moment* is a point in musical time. It consists of a pair of rationals (*m*, *g*), where *m* is the timing for the main notes, and *g* the timing for grace notes. In absence of grace notes, *g* is zero.

For compatibility reasons, it is possible to write two numbers specifying numerator and denominator instead of the rationals. These forms cannot be mixed, and the two-argument form is disambiguated by the sign of the second argument: if it is positive, it can only be a denominator and not a grace timing.

`ly:make-music` *props* [Funzione]
Make a C++ `Music` object and initialize it with *props*.

This function is for internal use and is only called by `make-music`, which is the preferred interface for creating music objects.

`ly:make-music-function` *signature func* [Funzione]
Make a function to process music, to be used for the parser. *func* is the function, and *signature* describes its arguments. *signature*'s cdr is a list containing either `ly:music?` predicates or other type predicates. Its car is the syntax function to call.

`ly:make-music-relative!` *music pitch* [Funzione]
Make *music* relative to *pitch*, return final pitch.

`ly:make-output-def` [Funzione]
Make an output definition.

`ly:make-page-label-marker` *label* [Funzione]
Return page marker with label *label*.

`ly:make-page-permission-marker` *symbol permission* [Funzione]
Return page marker with page breaking and turning permissions.

`ly:make-pango-description-string` *chain size* [Funzione]
Make a `PangoFontDescription` string for the property alist *chain* at size *size*.

`ly:make-paper-outputter` *port format* [Funzione]
Create an outputter that evaluates within `output-`*format*, writing to *port*.

`ly:make-pitch` *octave note alter* [Funzione]
octave is specified by an integer, zero for the octave containing middle C. *note* is a number indexing the global default scale, with 0 corresponding to pitch C and 6 usually corresponding to pitch B. Optional *alter* is a rational number of 200-cent whole tones for alteration.

`ly:make-prob` *type init rest* [Funzione]
Create a `Prob` object.

`ly:make-scale` *steps* [Funzione]
Create a scale. The argument is a vector of rational numbers, each of which represents the number of 200 cent tones of a pitch above the tonic.

`ly:make-score` *music* [Funzione]
Return score with *music* encapsulated in it.

`ly:make-simple-closure` *expr* [Funzione]
Make a simple closure. *expr* should be form of `(func a1 a2 ...)`, and will be invoked as `(func delayed-arg a1 a2 ...)`.

`ly:make-spring` *ideal min-dist* [Funzione]
Make a spring. *ideal* is the ideal distance of the spring, and *min-dist* is the minimum distance.

`ly:make-stencil` *expr xext yext* [Funzione]
Stencils are device independent output expressions. They carry two pieces of information:

1. A specification of how to print this object. This specification is processed by the output backends, for example '`scm/output-ps.scm`'.
2. The vertical and horizontal extents of the object, given as pairs. If an extent is unspecified (or if you use `empty-interval` as its value), it is taken to be empty.

`ly:make-stream-event` *cl proplist* [Funzione]
Create a stream event of class *cl* with the given mutable property list.

`ly:make-undead` *object* [Funzione]
This packages *object* in a manner that keeps it from triggering "Parsed object should be dead" messages.

`ly:make-unpure-pure-container` *unpure pure* [Funzione]
Make an unpure-pure container. *unpure* should be an unpure expression, and *pure* should be a pure expression. If *pure* is omitted, the value of *unpure* will be used twice, except that a callback is given two extra arguments that are ignored for the sake of pure calculations.

`ly:message` *str rest* [Funzione]
A Scheme callable function to issue the message *str*. The message is formatted with `format` and *rest*.

`ly:minimal-breaking` *pb* [Funzione]
Break (pages and lines) the `Paper_book` object *pb* without looking for optimal spacing: stack as many lines on a page before moving to the next one.

`ly:mm` *num* [Funzione]
num mm.

`ly:module->alist` *mod* [Funzione]
Dump the contents of module *mod* as an alist.

`ly:module-copy` *dest src* [Funzione]
Copy all bindings from module *src* into *dest*.

`ly:modules-lookup` *modules sym def* [Funzione]
Look up *sym* in the list *modules*, returning the first occurence. If not found, return *def* or `#f` if *def* isn't specified.

`ly:moment?` *x* [Funzione]
Is *x* a `Moment` object?

`ly:moment<?` *a b* [Funzione]
Compare two moments.

`ly:moment-add` *a b* [Funzione]
Add two moments.

`ly:moment-div` *a b* [Funzione]
Divide two moments.

`ly:moment-grace` *mom* [Funzione]
Extract grace timing as a rational number from *mom*.

`ly:moment-grace-denominator` *mom* [Funzione]
Extract denominator from grace timing.

`ly:moment-grace-numerator` *mom* [Funzione]
Extract numerator from grace timing.

`ly:moment-main` *mom* [Funzione]
Extract main timing as a rational number from *mom*.

`ly:moment-main-denominator` *mom* [Funzione]
Extract denominator from main timing.

`ly:moment-main-numerator` *mom* [Funzione]
Extract numerator from main timing.

`ly:moment-mod` *a b* [Funzione]
Modulo of two moments.

`ly:moment-mul` *a b* [Funzione]
Multiply two moments.

`ly:moment-sub` *a b* [Funzione]
Subtract two moments.

`ly:music?` *obj* [Funzione]
Is *obj* a music object?

`ly:music-compress` *m factor* [Funzione]
Compress music object *m* by moment *factor*.

`ly:music-deep-copy` *m* [Funzione]
Copy *m* and all sub expressions of *m*. *m* may be an arbitrary type; cons cells and music are copied recursively.

`ly:music-duration-compress` *mus fact* [Funzione]
Compress *mus* by factor *fact*, which is a `Moment`.

`ly:music-duration-length` *mus* [Funzione]
Extract the duration field from *mus* and return the length.

`ly:music-function?` *x* [Funzione]
Is *x* a `music-function`?

`ly:music-function-extract` *x* [Funzione]
Return the Scheme function inside *x*.

`ly:music-function-signature` *x* [Funzione]
Return the function signature inside *x*.

`ly:music-length` *mus* [Funzione]
Get the length of music expression *mus* and return it as a `Moment` object.

`ly:music-list?` *lst* [Funzione]
Is *lst* a list of music objects?

`ly:music-mutable-properties` *mus* [Funzione]
Return an alist containing the mutable properties of *mus*. The immutable properties are not available, since they are constant and initialized by the `make-music` function.

`ly:music-output?` *x* [Funzione]
Is *x* a `Music_output` object?

`ly:music-property` *mus sym val* [Funzione]
Return the value for property *sym* of music expression *mus*. If no value is found, return *val* or `'()` if *val* is not specified.

`ly:music-set-property!` *mus sym val* [Funzione]
Set property *sym* in music expression *mus* to *val*.

`ly:music-transpose` *m p* [Funzione]
Transpose *m* such that central C is mapped to *p*. Return *m*.

`ly:note-column-accidentals` *note-column* [Funzione]
Return the `AccidentalPlacement` grob from *note-column* if any, or `SCM_EOL` otherwise.

`ly:note-column-dot-column` *note-column* [Funzione]
Return the `DotColumn` grob from *note-column* if any, or `SCM_EOL` otherwise.

`ly:note-head::stem-attachment` *font-metric glyph-name* [Funzione]
Get attachment in *font-metric* for attaching a stem to notehead *glyph-name*.

`ly:number->string` *s* [Funzione]
Convert *s* to a string without generating many decimals.

`ly:one-line-breaking` *pb* [Funzione]
Put each score on a single line, and put each line on its own page. The paper-width setting will be modified so that every page will be wider than the widest line.

`ly:optimal-breaking` *pb* [Funzione]
Optimally break (pages and lines) the `Paper_book` object *pb* to minimize badness in bother vertical and horizontal spacing.

`ly:option-usage` *port* [Funzione]
Print `ly:set-option` usage. Optional *port* argumentfor the destination defaults to current output port.

`ly:otf->cff` *otf-file-name* [Funzione]
Convert the contents of an OTF file to a CFF file, returning it as a string.

`ly:otf-font?` *font* [Funzione]
Is *font* an OpenType font?

`ly:otf-font-glyph-info` *font glyph* [Funzione]
Given the font metric *font* of an OpenType font, return the information about named glyph *glyph* (a string).

`ly:otf-font-table-data` *font tag* [Funzione]
Extract a table *tag* from *font*. Return empty string for non-existent *tag*.

`ly:otf-glyph-count` *font* [Funzione]
Return the number of glyphs in *font*.

`ly:otf-glyph-list` *font* [Funzione]
Return a list of glyph names for *font*.

`ly:output-def?` *def* [Funzione]
Is *def* an output definition?

`ly:output-def-clone` *def* [Funzione]
Clone output definition *def*.

`ly:output-def-lookup` *def sym val* [Funzione]
Return the value of *sym* in output definition *def* (e.g., `\paper`). If no value is found, return *val* or `'()` if *val* is undefined.

`ly:output-def-parent` *def* [Funzione]
Return the parent output definition of *def*.

`ly:output-def-scope` *def* [Funzione]
Return the variable scope inside *def*.

`ly:output-def-set-variable!` *def sym val* [Funzione]
Set an output definition *def* variable *sym* to *val*.

`ly:output-description` *output-def* [Funzione]
Return the description of translators in *output-def*.

`ly:output-find-context-def` *output-def context-name* [Funzione]
Return an alist of all context defs (matching *context-name*if given) in *output-def*.

`ly:output-formats` [Funzione]
Formats passed to '`--format`' as a list of strings, used for the output.

`ly:outputter-close` *outputter* [Funzione]
Close port of *outputter*.

`ly:outputter-dump-stencil` *outputter stencil* [Funzione]
Dump stencil *expr* onto *outputter*.

`ly:outputter-dump-string` *outputter str* [Funzione]
Dump *str* onto *outputter*.

`ly:outputter-module` *outputter* [Funzione]
Return output module of *outputter*.

`ly:outputter-output-scheme` *outputter expr* [Funzione]
Eval *expr* in module of *outputter*.

`ly:outputter-port` *outputter* [Funzione]
Return output port for *outputter*.

`ly:page-marker?` *x* [Funzione]
Is *x* a `Page_marker` object?

`ly:page-turn-breaking` *pb* [Funzione]
Optimally break (pages and lines) the `Paper_book` object *pb* such that page turns only happen in specified places, returning its pages.

`ly:pango-font?` *f* [Funzione]
Is *f* a pango font?

`ly:pango-font-physical-fonts` *f* [Funzione]
Return alist of `(ps-name file-name font-index)` lists for Pango font *f*.

`ly:paper-book?` *x* [Funzione]
Is *x* a `Paper_book` object?

`ly:paper-book-header` *pb* [Funzione]
Return the header definition (`\header`) in `Paper_book` object *pb*.

`ly:paper-book-pages` *pb* [Funzione]
Return pages in `Paper_book` object *pb*.

`ly:paper-book-paper` *pb* [Funzione]
Return the paper output definition (`\paper`) in `Paper_book` object *pb*.

`ly:paper-book-performances` *pb* [Funzione]
Return performances in `Paper_book` object *pb*.

`ly:paper-book-scopes` *pb* [Funzione]
Return scopes in `Paper_book` object *pb*.

`ly:paper-book-systems` *pb* [Funzione]
Return systems in `Paper_book` object *pb*.

`ly:paper-fonts` *def* [Funzione]
Return a list containing the fonts from output definition *def* (e.g., `\paper`).

`ly:paper-get-font` *def chain* [Funzione]
Find a font metric in output definition *def* satisfying the font-qualifiers in alist chain *chain*, and return it. (An alist chain is a list of alists, containing grob properties.)

`ly:paper-get-number` *def sym* [Funzione]
Return the value of variable *sym* in output definition *def* as a double.

`ly:paper-outputscale` *def* [Funzione]
Return the output-scale for output definition *def*.

`ly:paper-score-paper-systems` *paper-score* [Funzione]
Return vector of `paper_system` objects from *paper-score*.

`ly:paper-system?` *obj* [Funzione]
Is *obj* a C++ `Prob` object of type `paper-system`?

`ly:paper-system-minimum-distance` *sys1 sys2* [Funzione]
Measure the minimum distance between these two paper-systems, using their stored skylines if possible and falling back to their extents otherwise.

`ly:parse-file` *name* [Funzione]
Parse a single `.ly` file. Upon failure, throw `ly-file-failed` key.

`ly:parse-string-expression` *parser-smob ly-code filename line* [Funzione]
Parse the string *ly-code* with *parser-smob*. Return the contained music expression. *filename* and *line* are optional source indicators.

`ly:parsed-undead-list!` [Funzione]
Return the list of objects that have been found live that should have been dead, and clear that list.

`ly:parser-clear-error` *parser* [Funzione]
Clear the error flag for the parser.

`ly:parser-clone` *parser-smob closures location* [Funzione]
Return a clone of *parser-smob*. An association list of port positions to closures can be specified in *closures* in order to have `$` and `#` interpreted in their original lexical environment. If *location* is a valid location, it becomes the source of all music expressions inside.

`ly:parser-define!` *parser-smob symbol val* [Funzione]
Bind *symbol* to *val* in *parser-smob*'s module.

`ly:parser-error` *parser msg input* [Funzione]
Display an error message and make the parser fail.

`ly:parser-has-error?` *parser* [Funzione]
Does *parser* have an error flag?

`ly:parser-include-string` *parser-smob ly-code* [Funzione]
Include the string *ly-code* into the input stream for *parser-smob*. Can only be used in immediate Scheme expressions (`$` instead of `#`).

`ly:parser-lexer` *parser-smob* [Funzione]
Return the lexer for *parser-smob*.

`ly:parser-lookup` *parser-smob symbol* [Funzione]
Look up *symbol* in *parser-smob*'s module. Return `'()` if not defined.

`ly:parser-output-name` *parser* [Funzione]
Return the base name of the output file.

`ly:parser-parse-string` *parser-smob ly-code* [Funzione]
Parse the string *ly-code* with *parser-smob*. Upon failure, throw `ly-file-failed` key.

`ly:parser-set-note-names` *parser names* [Funzione]
Replace current note names in *parser*. *names* is an alist of symbols. This only has effect if the current mode is notes.

`ly:performance-write` *performance filename* [Funzione]
Write *performance* to *filename*.

`ly:pfb->pfa` *pfb-file-name* [Funzione]
Convert the contents of a Type 1 font in PFB format to PFA format.

`ly:pitch?` *x* [Funzione]
Is *x* a `Pitch` object?

`ly:pitch<?` *p1 p2* [Funzione]
Is *p1* lexicographically smaller than *p2*?

`ly:pitch-alteration` *pp* [Funzione]
Extract the alteration from pitch *pp*.

`ly:pitch-diff` *pitch root* [Funzione]
Return pitch *delta* such that *pitch* transposed by *delta* equals *root*.

`ly:pitch-negate` *p* [Funzione]
Negate *p*.

`ly:pitch-notename` *pp* [Funzione]
Extract the note name from pitch *pp*.

`ly:pitch-octave` *pp* [Funzione]
Extract the octave from pitch *pp*.

`ly:pitch-quartertones` *pp* [Funzione]
Calculate the number of quarter tones of *pp* from middle C.

`ly:pitch-semitones` *pp* [Funzione]
Calculate the number of semitones of *pp* from middle C.

`ly:pitch-steps` *p* [Funzione]
Number of steps counted from middle C of the pitch *p*.

`ly:pitch-tones` *pp* [Funzione]
Calculate the number of tones of *pp* from middle C as a rational number.

`ly:pitch-transpose` *p delta* [Funzione]
Transpose *p* by the amount *delta*, where *delta* is relative to middle C.

`ly:pointer-group-interface::add-grob` *grob sym grob-element* [Funzione]
Add *grob-element* to *grob*'s *sym* grob array.

`ly:position-on-line?` *sg spos* [Funzione]
Return whether *spos* is on a line of the staff associated with the grob *sg* (even on an extender line).

`ly:prob?` *x* [Funzione]
Is *x* a `Prob` object?

`ly:prob-immutable-properties` *prob* [Funzione]
Retrieve an alist of immutable properties.

`ly:prob-mutable-properties` *prob* [Funzione]
Retrieve an alist of mutable properties.

`ly:prob-property` *prob sym val* [Funzione]
Return the value for property *sym* of Prob object *prob*. If no value is found, return *val* or `'()` if *val* is not specified.

`ly:prob-property?` *obj sym* [Funzione]
Is boolean prop *sym* of *sym* set?

`ly:prob-set-property!` *obj sym value* [Funzione]
Set property *sym* of *obj* to *value*.

`ly:prob-type?` *obj type* [Funzione]
Is *obj* the specified prob-type?

`ly:programming-error` *str rest* [Funzione]
A Scheme callable function to issue the internal warning *str*. The message is formatted with `format` and *rest*.

`ly:progress` *str rest* [Funzione]
A Scheme callable function to print progress *str*. The message is formatted with `format` and *rest*.

`ly:property-lookup-stats` *sym* [Funzione]
Return hash table with a property access corresponding to *sym*. Choices are `prob`, `grob`, and `context`.

`ly:protects` [Funzione]
Return hash of protected objects.

`ly:pt` *num* [Funzione]
num printer points.

`ly:register-stencil-expression` *symbol* [Funzione]
Add *symbol* as head of a stencil expression.

`ly:relative-group-extent` *elements common axis* [Funzione]
Determine the extent of *elements* relative to *common* in the *axis* direction.

`ly:reset-all-fonts` [Funzione]
Forget all about previously loaded fonts.

`ly:round-filled-box` *xext yext blot* [Funzione]
Make a `Stencil` object that prints a black box of dimensions *xext*, *yext* and roundness *blot*.

`ly:round-filled-polygon` *points blot* [Funzione]
Make a `Stencil` object that prints a black polygon with corners at the points defined by *points* (list of coordinate pairs) and roundness *blot*.

`ly:run-translator` *mus output-def* [Funzione]
Process *mus* according to *output-def*. An interpretation context is set up, and *mus* is interpreted with it. The context is returned in its final state.

Optionally, this routine takes an object-key to to uniquely identify the score block containing it.

`ly:score?` *x* [Funzione]
Is *x* a `Score` object?

`ly:score-add-output-def!` *score def* [Funzione]
Add an output definition *def* to *score*.

`ly:score-embedded-format` *score layout* [Funzione]
Run *score* through *layout* (an output definition) scaled to correct output-scale already, returning a list of layout-lines.

`ly:score-error?` *score* [Funzione]
Was there an error in the score?

`ly:score-header` *score* [Funzione]
Return score header.

`ly:score-music` *score* [Funzione]
Return score music.

`ly:score-output-defs` *score* [Funzione]
All output definitions in a score.

`ly:score-set-header!` *score module* [Funzione]
Set the score header.

`ly:set-default-scale` *scale* [Funzione]
Set the global default scale. This determines the tuning of pitches with no accidentals or key signatures. The first pitch is C. Alterations are calculated relative to this scale. The number of pitches in this scale determines the number of scale steps that make up an octave. Usually the 7-note major scale.

`ly:set-grob-modification-callback` *cb* [Funzione]
Specify a procedure that will be called every time LilyPond modifies a grob property. The callback will receive as arguments the grob that is being modified, the name of the C++ file in which the modification was requested, the line number in the C++ file in which the modification was requested, the name of the function in which the modification was requested, the property to be changed, and the new value for the property.

`ly:set-middle-C!` *context* [Funzione]
Set the `middleCPosition` variable in *context* based on the variables `middleCClefPosition` and `middleCOffset`.

`ly:set-option` *var val* [Funzione]
Set a program option.

`ly:set-property-cache-callback` *cb* [Funzione]
Specify a procedure that will be called whenever lilypond calculates a callback function and caches the result. The callback will receive as arguments the grob whose property it is, the name of the property, the name of the callback that calculated the property, and the new (cached) value of the property.

`ly:simple-closure?` *clos* [Funzione]
Is *clos* a simple closure?

`ly:skyline?` *x* [Funzione]
Is *x* a `Skyline` object?

`ly:skyline-empty?` *sky* [Funzione]
Return whether *sky* is empty.

`ly:skyline-pair?` *x* [Funzione]
Is *x* a `Skyline_pair` object?

`ly:slur-score-count` [Funzione]
count number of slur scores.

`ly:smob-protects` [Funzione]
Return LilyPond's internal smob protection list.

`ly:solve-spring-rod-problem` *springs rods length ragged* [Funzione]
Solve a spring and rod problem for *count* objects, that are connected by *count*-1 *springs*, and an arbitrary number of *rods*. *count* is implicitly given by *springs* and *rods*. The *springs*

argument has the format `(ideal, inverse_hook)` and *rods* is of the form `(idx1, idx2, distance)`.

length is a number, *ragged* a boolean.

The function returns a list containing the force (positive for stretching, negative for compressing and `#f` for non-satisfied constraints) followed by *spring-count*+1 positions of the objects.

`ly:source-file?` *x* [Funzione]
Is *x* a `Source_file` object?

`ly:spanner?` *g* [Funzione]
Is *g* a spanner object?

`ly:spanner-bound` *spanner dir* [Funzione]
Get one of the bounds of *spanner*. *dir* is `-1` for left, and `1` for right.

`ly:spanner-broken-into` *spanner* [Funzione]
Return broken-into list for *spanner*.

`ly:spanner-set-bound!` *spanner dir item* [Funzione]
Set grob *item* as bound in direction *dir* for *spanner*.

`ly:spawn` *command rest* [Funzione]
Simple interface to g_spawn_sync *str*. The error is formatted with `format` and *rest*.

`ly:spring?` *x* [Funzione]
Is *x* a `Spring` object?

`ly:spring-set-inverse-compress-strength!` *spring strength* [Funzione]
Set the inverse compress *strength* of *spring*.

`ly:spring-set-inverse-stretch-strength!` *spring strength* [Funzione]
Set the inverse stretch *strength* of *spring*.

`ly:staff-symbol-line-thickness` *grob* [Funzione]
Returns the `line-thickness` of the staff associated with *grob*.

`ly:staff-symbol-staff-radius` *grob* [Funzione]
Returns the radius of the staff associated with *grob*.

`ly:staff-symbol-staff-space` *grob* [Funzione]
Returns the `staff-space` of the staff associated with *grob*.

`ly:start-environment` [Funzione]
Return the environment (a list of strings) that was in effect at program start.

`ly:stderr-redirect` *file-name mode* [Funzione]
Redirect stderr to *file-name*, opened with *mode*.

`ly:stencil?` *x* [Funzione]
Is *x* a `Stencil` object?

`ly:stencil-add` *args* [Funzione]
Combine stencils. Takes any number of arguments.

`ly:stencil-aligned-to` *stil axis dir* [Funzione]
Align *stil* using its own extents. *dir* is a number. `-1` and `1` are left and right, respectively. Other values are interpolated (so `0` means the center).

`ly:stencil-combine-at-edge` *first axis direction second padding* [Funzione]
Construct a stencil by putting *second* next to *first*. *axis* can be 0 (x-axis) or 1 (y-axis). *direction* can be -1 (left or down) or 1 (right or up). The stencils are juxtaposed with *padding* as extra space. *first* and *second* may also be `'()` or `#f`.

`ly:stencil-empty?` *stil axis* [Funzione]
Return whether *stil* is empty. If an optional *axis* is supplied, the emptiness check is restricted to that axis.

`ly:stencil-expr` *stil* [Funzione]
Return the expression of *stil*.

`ly:stencil-extent` *stil axis* [Funzione]
Return a pair of numbers signifying the extent of *stil* in *axis* direction (`0` or `1` for x and y axis, respectively).

`ly:stencil-fonts` *s* [Funzione]
Analyze *s*, and return a list of fonts used in *s*.

`ly:stencil-in-color` *stc r g b* [Funzione]
Put *stc* in a different color.

`ly:stencil-rotate` *stil angle x y* [Funzione]
Return a stencil *stil* rotated *angle* degrees around the relative offset (*x*, *y*). E.g., an offset of (-1, 1) will rotate the stencil around the left upper corner.

`ly:stencil-rotate-absolute` *stil angle x y* [Funzione]
Return a stencil *stil* rotated *angle* degrees around point (*x*, *y*), given in absolute coordinates.

`ly:stencil-scale` *stil x y* [Funzione]
Scale *stil* using the horizontal and vertical scaling factors *x* and *y*.

`ly:stencil-stack` *first axis direction second padding mindist* [Funzione]
Construct a stencil by stacking *second* next to *first*. *axis* can be 0 (x-axis) or 1 (y-axis). *direction* can be -1 (left or down) or 1 (right or up). The stencils are juxtaposed with *padding* as extra space. *first* and *second* may also be `'()` or `#f`. As opposed to `ly:stencil-combine-at-edge`, metrics are suited for successively accumulating lines of stencils. Also, *second* stencil is drawn last.

If *mindist* is specified, reference points are placed apart at least by this distance. If either of the stencils is spacing, *padding* and *mindist* do not apply.

`ly:stencil-translate` *stil offset* [Funzione]
Return a *stil*, but translated by *offset* (a pair of numbers).

`ly:stencil-translate-axis` *stil amount axis* [Funzione]
Return a copy of *stil* but translated by *amount* in *axis* direction.

`ly:stream-event?` *obj* [Funzione]
Is *obj* a `Stream_event` object?

`ly:string-percent-encode` *str* [Funzione]
Encode all characters in string *str* with hexadecimal percent escape sequences, with the following exceptions: characters `-`, `.`, `/`, and `_`; and characters in ranges `0-9`, `A-Z`, and `a-z`.

`ly:string-substitute` *a b s* [Funzione]
Replace string *a* by string *b* in string *s*.

`ly:system-font-load` *name* [Funzione]

Load the OpenType system font '*name*`.otf`'. Fonts loaded with this command must contain three additional SFNT font tables called `LILC`, `LILF`, and `LILY`, needed for typesetting musical elements. Currently, only the Emmentaler and the Emmentaler-Brace fonts fulfill these requirements.

Note that only `ly:font-get-glyph` and derived code (like `\lookup`) can access glyphs from the system fonts; text strings are handled exclusively via the Pango interface.

`ly:text-interface::interpret-markup` [Funzione]

Convert a text markup into a stencil. Takes three arguments, *layout*, *props*, and *markup*.

layout is a `\layout` block; it may be obtained from a grob with `ly:grob-layout`. *props* is an alist chain, i.e. a list of alists. This is typically obtained with `(ly:grob-alist-chain grob (ly:output-def-lookup layout 'text-font-defaults))`. *markup* is the markup text to be processed.

`ly:translate-cpp-warning-scheme` *str* [Funzione]

Translates a string in C++ printf format and modifies it to use it for scheme formatting.

`ly:translator?` *x* [Funzione]

Is *x* a `Translator` object?

`ly:translator-context` *trans* [Funzione]

Return the context of the translator object *trans*.

`ly:translator-description` *me* [Funzione]

Return an alist of properties of translator *me*.

`ly:translator-group?` *x* [Funzione]

Is *x* a `Translator_group` object?

`ly:translator-name` *trans* [Funzione]

Return the type name of the translator object *trans*. The name is a symbol.

`ly:transpose-key-alist` *l pit* [Funzione]

Make a new key alist of *l* transposed by pitch *pit*.

`ly:truncate-list!` *lst i* [Funzione]

Take at most the first *i* of list *lst*.

`ly:ttf->pfa` *ttf-file-name idx* [Funzione]

Convert the contents of a TrueType font file to PostScript Type 42 font, returning it as a string. The optional *idx* argument is useful for TrueType collections (TTC) only; it specifies the font index within the TTC. The default value of *idx* is 0.

`ly:ttf-ps-name` *ttf-file-name idx* [Funzione]

Extract the PostScript name from a TrueType font. The optional *idx* argument is useful for TrueType collections (TTC) only; it specifies the font index within the TTC. The default value of *idx* is 0.

`ly:undead?` *x* [Funzione]

Is *x* a `Undead` object?

`ly:unit` [Funzione]

Return the unit used for lengths as a string.

`ly:unpure-pure-container?` *clos* [Funzione]

Is *clos* an unpure pure container?

`ly:unpure-pure-container-pure-part` *pc* [Funzione]
Return the pure part of *pc*.

`ly:unpure-pure-container-unpure-part` *pc* [Funzione]
Return the unpure part of *pc*.

`ly:usage` [Funzione]
Print usage message.

`ly:verbose-output?` [Funzione]
Was verbose output requested, i.e. loglevel at least `DEBUG`?

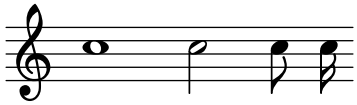
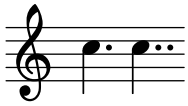
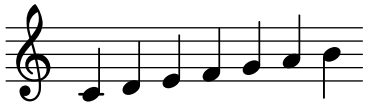
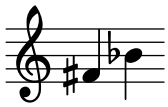
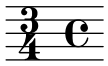
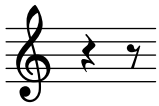
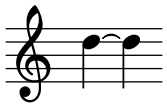
`ly:version` [Funzione]
Return the current lilypond version as a list, e.g., `(1 3 127 uu1)`.

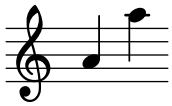
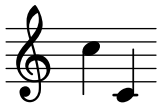
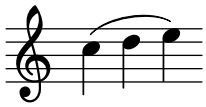
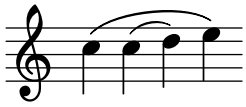
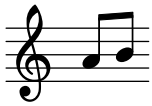
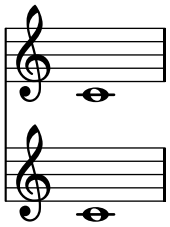
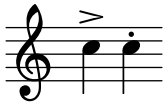
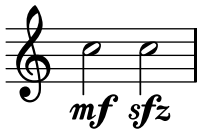
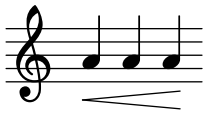
`ly:warning` *str rest* [Funzione]
A Scheme callable function to issue the warning *str*. The message is formatted with `format` and *rest*.

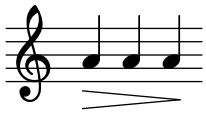
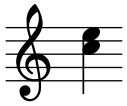
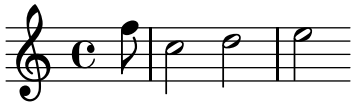
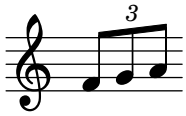
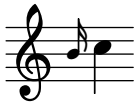
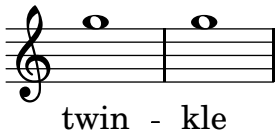
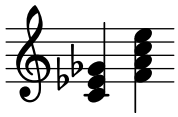
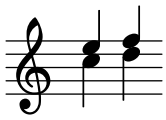
`ly:warning-located` *location str rest* [Funzione]
A Scheme callable function to issue the warning *str* at the specified location in an input file. The message is formatted with `format` and *rest*.

`ly:wide-char->utf-8` *wc* [Funzione]
Encode the Unicode codepoint *wc*, an integer, as UTF-8.

Appendice B Cheat sheet

Syntax	Description	Example
`1 2 8 16`	durations	
`c4. c4..`	augmentation dots	
`c d e f g a b`	scale	
`fis bes`	alteration	
`\clef treble \clef bass`	clefs	
`\time 3/4 \time 4/4`	time signature	
`r4 r8`	rest	
`d ~ d`	tie	
`\key es \major`	key signature	

note`'`	raise octave	
note`,`	lower octave	
`c( d e)`	slur	
`c\( c( d) e\)`	phrasing slur	
`a8[ b]`	beam	
`<< \new Staff ... >>`	more staves	
`c-> c-.`	articulations	
`c2\mf c\sfz`	dynamics	
`a\< a a\!`	crescendo	

`a\> a a\!`	decrescendo	
`< >`	chord	
`\partial 8`	pickup / upbeat	
`\tuplet 3/2 {f g a}`	triplets	
`\grace`	grace notes	
`\lyricmode { twinkle }`	entering lyrics	twinkle
`\new Lyrics`	printing lyrics	twinkle
`twin -- kle`	lyric hyphen	
`\chordmode { c:dim f:maj7 }`	chords	
`\context ChordNames`	printing chord names	C° F△
`<<{e f} \\ {c d}>>`	polyphony	

`s4 s8 s16`	spacer rests

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Appendice D Indice dei comandi di LilyPond

Questo indice elenca tutti i comandi e le parole chiave di LilyPond con dei collegamenti alle sezioni del manuale che descrivono il loro uso. Ogni collegamento è composto da due parti. La prima parte porta al punto esatto del manuale in cui compaiono il comando o la parola chiave; la seconda parte porta all'inizio della sezione del manuale in cui compaiono il comando o la parola.

!

! 6

"

"|" 105

'

' 2

,

, ... 2

-

- 116

.

. 43

/

/ 398
/+ 398

:

: 157

<

< 158
<...> 158

=

= 9

>

> 158

?

? 6

[

[..... 90

]

] 90

^

^ 397

_

_ 254

\

\! 118
\(..... 129
\) 129
\< 118
\> 118
\abs-fontsize 231, 659
\absolute 2
\accent 116
\accepts 569, 570, 571
\acciaccatura 108
\accidentalStyle 26
\addChordShape 356
\addInstrumentDefinition 200, 207
\addlyrics 248, 250, 251
\addQuote 201
\aeolian 21
\afterGrace 109
\aikenHeads 39
\aikenHeadsMinor 39
\alias 569
\allowPageTurn 521
\alternative 143
\appendToTag 484
\appoggiatura 108
\arpeggio 137
\arpeggioArrowDown 137
\arpeggioArrowUp 137
\arpeggioBracket 138
\arpeggioNormal 137
\arpeggioParenthesis 138
\arpeggioParenthesisDashed 138
\arrow-head 238, 682
\ascendens 430, 436
\auctum 430, 436
\augmentum 436
\auto-footnote 703
\autoBeamOff 79, 314
\autoBeamOn 79
\autochange 312
\backslashed-digit 703
\balloonGrobText 216
\balloonLengthOff 216

\balloonLengthOn ... 216
\balloonText ... 216
\bar ... 94, 100
\barNumberCheck ... 106
\beam ... 682
\bendAfter ... 132
\bold ... 230, 659
\book ... 452, 455
\bookOutputName ... 454
\bookOutputSuffix ... 454
\bookpart ... 453, 455
\bookpart ... 519
\box ... 236, 659
\bracket ... 124, 236, 683
\break ... 519
\breathe ... 130
\breve ... 43
\breve ... 54
\cadenzaOff ... 71
\cadenzaOn ... 71
\caesura ... 428
\caps ... 659
\cavum ... 430, 436
\center-align ... 233, 667
\center-column ... 234, 668
\change ... 311
\char ... 703
\chordmode ... 5, 13, 353
\chordRepeats ... 330
\chords ... 400
\circle ... 236, 683
\clef ... 17
\cm ... 586
\coda ... 116
\column ... 234, 668
\column-lines ... 709
\combine ... 238, 668
\compoundMeter ... 75
\compressFullBarRests ... 58
\compressFullBarRests ... 59
\concat ... 669
\consists ... 569
\context ... 557, 564
\cr ... 118
\cresc ... 120
\crescHairpin ... 120
\crescTextCresc ... 120
\crossStaff ... 314
\cueClef ... 203
\cueDuring ... 203
\cueDuringWithClef ... 203
\customTabClef ... 690
\decr ... 118
\decresc ... 120
\defaultchild ... 572
\defaultTimeSignature ... 62
\defineBarLine ... 98
\deminutum ... 430, 436
\denies ... 569, 570, 571
\descendens ... 430, 436
\dim ... 120
\dimHairpin ... 120
\dimTextDecr ... 120
\dimTextDecresc ... 120
\dimTextDim ... 120
\dir-column ... 669
\discant ... 698
\displayLilyMusic ... 502
\divisioMaior ... 428
\divisioMaxima ... 428
\divisioMinima ... 428
\dorian ... 21
\dotsDown ... 44
\dotsNeutral ... 44
\dotsUp ... 44
\doubleflat ... 690
\doublesharp ... 690
\downbow ... 116, 323
\downmordent ... 116
\downprall ... 116
\draw-circle ... 238, 683
\draw-dashed-line ... 683
\draw-dotted-line ... 684
\draw-hline ... 684
\draw-line ... 238, 685
\drummode ... 180
\dynamic ... 124, 660
\dynamicDown ... 120
\dynamicNeutral ... 120
\dynamicUp ... 120
\easyHeadsOff ... 37
\easyHeadsOn ... 37
\ellipse ... 685
\epsfile ... 238, 685
\espressivo ... 116, 119
\expandFullBarRests ... 58
\expandFullBarRests ... 59
\eyeglasses ... 704
\f ... 118
\featherDurations ... 93
\fermata ... 116, 690
\fermataMarkup ... 58
\fermataMarkup ... 59
\fermataMarkup ... 116
\ff ... 118
\fff ... 118
\ffff ... 118
\fffff ... 118
\fill-line ... 235, 669
\fill-with-pattern ... 670
\filled-box ... 238, 686
\finalis ... 428
\finger ... 210, 660
\flageolet ... 116
\flat ... 690
\flexa ... 436
\fontCaps ... 660
\fontsize ... 231, 660
\footnote ... 469, 704
\fp ... 118
\fraction ... 704
\freeBass ... 699
\frenchChords ... 404
\fret-diagram ... 344, 695
\fret-diagram-terse ... 346, 695
\fret-diagram-verbose ... 348, 696
\fromproperty ... 704
\funkHeads ... 39
\funkHeadsMinor ... 39
\general-align ... 234, 671

\germanChords ... 404
\glissando ... 133
\grace ... 108
\halfopen ... 116
\halign ... 233, 672
\harmonic ... 323, 332
\harmonicByFret ... 332
\harmonicByRatio ... 332
\harmonicsOff ... 323
\harmonicsOn ... 323
\harp-pedal ... 697
\hbracket ... 236, 686
\hcenter-in ... 673
\header ... 455
\hideKeySignature ... 383
\hideNotes ... 212
\hideSplitTiedTabNotes ... 331
\hideStaffSwitch ... 314
\hspace ... 673
\huge ... 209, 232, 660
\improvisationOff ... 41, 77
\improvisationOn ... 41, 77
\in ... 586
\inclinatum ... 430, 436
\include ... 481
\inStaffSegno ... 146
\instrumentSwitch ... 200
\inversion ... 13
\ionian ... 21
\italianChords ... 404
\italic ... 230, 661
\justified-lines ... 241, 709
\justify ... 235, 674
\justify-field ... 674
\justify-string ... 675
\keepWithTag ... 484
\key ... 20, 39
\killCues ... 207
\label ... 479
\laissezVibrer ... 51
\large ... 209, 232, 661
\larger ... 231, 232, 661
\layout ... 455, 514, 564
\left-align ... 233, 675
\left-brace ... 705
\left-column ... 676
\lheel ... 116
\line ... 676
\linea ... 430, 436
\lineprall ... 116
\locrian ... 21
\longa ... 43
\longa ... 54
\longfermata ... 116
\lookup ... 705
\lower ... 233, 676
\ltoe ... 116
\lydian ... 21
\lyricmode ... 247, 248
\lyricsto ... 248, 250
\magnify ... 231, 661
\major ... 21
\makeClusters ... 163
\map-markup-commands ... 709
\marcato ... 116
\mark ... 106, 224
\markalphabet ... 705
\markLengthOff ... 68, 225
\markLengthOn ... 68, 225
\markletter ... 705
\markup ... 224, 227, 228, 229
\markuplist ... 228, 241, 242
\maxima ... 43
\maxima ... 54
\medium ... 662
\melisma ... 254
\melismaEnd ... 254
\mergeDifferentlyDottedOff ... 167
\mergeDifferentlyDottedOn ... 167
\mergeDifferentlyHeadedOff ... 167
\mergeDifferentlyHeadedOn ... 167
\mf ... 118
\midi ... 455
\minor ... 21
\mixolydian ... 21
\mm ... 586
\modalInversion ... 15
\modalTranspose ... 14
\mordent ... 116
\mp ... 118
\musicglyph ... 107, 691
\name ... 569
\natural ... 691
\new ... 557
\newSpacingSection ... 542
\noBeam ... 91
\noBreak ... 519
\noPageBreak ... 520
\noPageTurn ... 521
\normal-size-sub ... 662
\normal-size-super ... 231, 662
\normal-text ... 663
\normalsize ... 209, 232, 663
\note ... 691
\note-by-number ... 691
\null ... 233, 706
\number ... 663
\numericTimeSignature ... 62
\octaveCheck ... 9
\on-the-fly ... 468, 706
\once ... 579
\oneVoice ... 163
\open ... 116, 323
\oriscus ... 430, 436
\ottava ... 23
\oval ... 686
\override ... 578, 706
\override-lines ... 710
\overrideTimeSignatureSettings ... 62
\p ... 118
\pad-around ... 237, 676
\pad-markup ... 237, 677
\pad-to-box ... 237, 677
\pad-x ... 237, 677
\page-link ... 706
\page-ref ... 479, 706
\pageBreak ... 520
\pageTurn ... 521
\paper ... 455, 505
\parallelMusic ... 177

\parenthesize ... 214, 686
\partcombine ... 172, 275
\partcombineApart ... 173
\partcombineAutomatic ... 173
\partcombineChords ... 173
\partcombineSoloI ... 173
\partcombineSoloII ... 173
\partcombineUnisono ... 173
\partial ... 70, 143, 145
\path ... 687
\pattern ... 707
\pes ... 436
\phrasingSlurDashed ... 129
\phrasingSlurDashPattern ... 130
\phrasingSlurDotted ... 129
\phrasingSlurDown ... 129
\phrasingSlurHalfDashed ... 129
\phrasingSlurHalfSolid ... 129
\phrasingSlurNeutral ... 129
\phrasingSlurSolid ... 129
\phrasingSlurUp ... 129
\phrygian ... 21
\pitchedTrill ... 141
\portato ... 116
\postscript ... 238, 688
\powerChords ... 368
\pp ... 118
\ppp ... 118
\pppp ... 118
\ppppp ... 118
\prall ... 116
\pralldown ... 116
\prallmordent ... 116
\prallprall ... 116
\prallup ... 116
\predefinedFretboardsOff ... 363
\predefinedFretboardsOn ... 363
\property-recursive ... 707
\pt ... 586
\pushToTag ... 484
\put-adjacent ... 678
\quilisma ... 430, 436
\quoteDuring ... 201, 203
\raise ... 233, 678
\relative ... 2, 5, 13, 313
\RemoveEmptyStaves ... 194, 195
\removeWithTag ... 484
\repeat ... 143
\repeat percent ... 154
\repeat tremolo ... 156
\repeatTie ... 51
\repeatTie ... 146
\repeatTie ... 271
\replace ... 663
\rest ... 54
\rest ... 692
\rest-by-number ... 692
\retrograde ... 14
\reverseturn ... 116
\revert ... 579
\revertTimeSignatureSettings ... 64
\rfz ... 118
\rheel ... 116
\right-align ... 233, 678
\right-brace ... 707
\right-column ... 678
\rightHandFinger ... 365
\roman ... 664
\rotate ... 679
\rounded-box ... 236, 688
\rtoe ... 116
\sacredHarpHeads ... 39
\sacredHarpHeadsMinor ... 39
\sans ... 664
\scale ... 689
\scaleDurations ... 50, 73
\score ... 451, 455, 693
\score-lines ... 710
\segno ... 116
\semiflat ... 694
\semiGermanChords ... 404
\semisharp ... 694
\sesquiflat ... 694
\sesquisharp ... 694
\set ... 82, 576
\sf ... 118
\sff ... 118
\sfz ... 118
\shape ... 605
\sharp ... 694
\shiftOff ... 167
\shiftOn ... 167
\shiftOnn ... 167
\shiftOnnn ... 167
\shortfermata ... 116
\showKeySignature ... 383
\showStaffSwitch ... 314
\signumcongruentiae ... 116
\simple ... 664
\skip ... 56, 270
\slashed-digit ... 707
\slashedGrace ... 108
\slurDashed ... 126
\slurDashPattern ... 127
\slurDotted ... 126
\slurDown ... 126
\slurHalfDashed ... 127
\slurHalfSolid ... 127
\slurNeutral ... 126
\slurSolid ... 126
\slurUp ... 127
\small ... 209, 232, 664
\smallCaps ... 665
\smaller ... 231, 232, 665
\snappizzicato ... 116
\sostenutoOff ... 316
\sostenutoOn ... 316
\southernHarmonyHeads ... 39
\southernHarmonyHeadsMinor ... 39
\sp ... 118
\spp ... 118
\staccatissimo ... 116
\staccato ... 116
\startGroup ... 219
\startStaff ... 187, 190
\startTrillSpan ... 140
\stdBass ... 699
\stdBassIV ... 700
\stdBassV ... 701
\stdBassVI ... 702

\stemDown ... 215
\stemNeutral ... 215
\stemUp ... 215
\stencil ... 708
\stopGroup ... 219
\stopped ... 116
\stopStaff ... 187, 190, 194
\stopTrillSpan ... 140
\storePredefinedDiagram ... 356
\stringTuning ... 341
\stropha ... 430, 436
\strut ... 708
\sub ... 231, 665
\super ... 231, 665
\sustainOff ... 316
\sustainOn ... 316
\tabChordRepeats ... 330
\tabFullNotation ... 328
\table-of-contents ... 481, 710
\tag ... 484
\taor ... 383
\teeny ... 209, 232, 666
\tempo ... 66
\tenuto ... 116
\text ... 666
\textLengthOff ... 59, 221
\textLengthOn ... 59, 221
\textSpannerDown ... 222
\textSpannerNeutral ... 222
\textSpannerUp ... 222
\thumb ... 116, 210
\tied-lyric ... 694
\tieDashed ... 52
\tieDotted ... 52
\tieDown ... 52
\tieNeutral ... 52
\tieSolid ... 52
\tieUp ... 52
\time ... 61, 82
\tiny ... 209, 232, 666
\tocItem ... 481
\translate ... 234, 679
\translate-scaled ... 234, 679
\transparent ... 708
\transpose ... 5, 10, 13
\transposedCueDuring ... 207
\transposition ... 24, 201
\treCorde ... 316
\triangle ... 238, 689
\trill ... 116, 140
\tuplet ... 45, 73
\tupletDown ... 45
\tupletNeutral ... 45
\tupletUp ... 45
\turn ... 116
\tweak ... 580
\type ... 569
\typewriter ... 666
\unaCorda ... 316
\underline ... 230, 667
\unfoldRepeats ... 496
\unHideNotes ... 212
\unset ... 577
\upbow ... 116, 323
\upmordent ... 116
\upprall ... 116
\upright ... 667
\varcoda ... 116
\vcenter ... 680
\verbatim-file ... 708
\verylongfermata ... 116
\virga ... 430, 436
\virgula ... 428
\voiceFourStyle ... 167
\voiceNeutralStyle ... 167
\voiceOne ... 163
\voiceOne ... \voiceFour ... 163
\voiceOneStyle ... 167
\voiceThreeStyle ... 167
\voiceTwoStyle ... 167
\void ... 502
\vspace ... 680
\walkerHeads ... 39
\walkerHeadsMinor ... 39
\whiteout ... 708
\with ... 562, 567
\with-color ... 213, 708
\with-dimensions ... 709
\with-link ... 709
\with-url ... 689
\woodwind-diagram ... 697
\wordwrap ... 235, 681
\wordwrap-field ... 680
\wordwrap-internal ... 710
\wordwrap-lines ... 241, 710
\wordwrap-string ... 681
\wordwrap-string-internal ... 710

|

| ... 105

~

~ ... 50

A

absolute ... 2, 748
accepts ... 569
acciaccatura ... 748
accidentalStyle ... 748
addChordShape ... 356, 748
addInstrumentDefinition ... 200, 207, 748
additionalPitchPrefix ... 402
addQuote ... 201, 748
aeolian ... 21
afterGrace ... 109, 748
aikenHeads ... 39
aikenHeadsMinor ... 39
alias ... 569
alignAboveContext ... 572
alignBelowContext ... 269, 572
allowPageTurn ... 748
allowVoltaHook ... 748
alterBroken ... 748
annotate-spacing ... 551
appendToTag ... 748
applyContext ... 748

applyMusic ... 748
applyOutput ... 749
appoggiatura ... 749
arpeggio ... 137
arpeggioArrowDown ... 137
arpeggioArrowUp ... 137
arpeggioBracket ... 138
arpeggioNormal ... 137
arpeggioParenthesis ... 138
arpeggioParenthesisDashed ... 138
arrow-head ... 238
assertBeamQuant ... 749
assertBeamSlope ... 749
aug ... 395
auto-first-page-number ... 513
autoBeaming ... 82
autoBeamOff ... 79
autoBeamOn ... 79
autochange ... 312, 749

B

Balloon_engraver ... 216
balloonGrobText ... 216
balloonGrobText ... 749
balloonLengthOff ... 216
balloonLengthOn ... 216
balloonText ... 216
balloonText ... 749
banjo-c-tuning ... 371
banjo-modal-tuning ... 371
banjo-open-d-tuning ... 371
banjo-open-dm-tuning ... 371
bar ... 94, 100, 749
barCheckSynchronize ... 105
BarNumber ... 101
barNumberCheck ... 106, 749
barNumberVisibility ... 101
bartype ... 100
base-shortest-duration ... 541
baseMoment ... 82
beamExceptions ... 82
beatStructure ... 82
bendAfter ... 132, 749
binding-offset ... 510
blank-after-score-page-penalty ... 512
blank-last-page-penalty ... 512
blank-page-penalty ... 512
bold ... 230
bookOutputName ... 749
bookOutputSuffix ... 749
bookTitleMarkup ... 465
bottom-margin ... 507
box ... 236
bracket ... 124, 236, 316
breakable ... 80
breathe ... 130
breathe ... 749
breve ... 43
breve ... 54

C

cadenzaOff ... 71
cadenzaOn ... 71
center-align ... 233
center-column ... 234
change ... 311
check-consistency ... 510
chordChanges ... 400
chordmode ... 5, 13, 353
chordNameExceptions ... 403
chordNameLowercaseMinor ... 402
ChordNames ... 353
chordNameSeparator ... 402
chordNoteNamer ... 402
chordPrefixSpacer ... 404
chordRepeats ... 749
chordRootNamer ... 402
circle ... 236
clef ... 17, 749
color ... 213
column ... 234
combine ... 238
common-shortest-duration ... 541
Completion_heads_engraver ... 76
Completion_rest_engraver ... 76
compoundMeter ... 749
compressFullBarRests ... 58
compressFullBarRests ... 59
consists ... 569
controlpitch ... 9
cr ... 118
cresc ... 120
crescHairpin ... 120
crescTextCresc ... 120
cross ... 35
crossStaff ... 749
cueClef ... 203, 749
cueClefUnset ... 749
cueDuring ... 203, 750
cueDuringWithClef ... 203, 750
currentBarNumber ... 101, 114

D

deadNote ... 750
decr ... 118
decresc ... 120
default ... 26, 28
default-staff-staff-spacing ... 525
defaultBarType ... 100
defaultNoteHeads ... 750
defaultTimeSignature ... 62
defineBarLine ... 98, 750
denies ... 569
dim ... 120
dim ... 395
dimHairpin ... 120
dimTextDecr ... 120
dimTextDecresc ... 120
dimTextDim ... 120
displayLilyMusic ... 750
displayMusic ... 750
displayScheme ... 750
dodecaphonic ... 31
dorian ... 21
dotsDown ... 44

dotsNeutral ... 44
dotsUp ... 44
draw-circle ... 238
draw-line ... 238
drummode ... 180
DrumStaff ... 180
dynamic ... 124
dynamicDown ... 120
DynamicLineSpanner ... 120
dynamicNeutral ... 120
dynamicUp ... 120

E

easyHeadsOff ... 37
easyHeadsOn ... 37
endSpanners ... 750
epsfile ... 238
espressivo ... 119
eventChords ... 750
expandFullBarRests ... 58
expandFullBarRests ... 59
extra-offset ... 525

F

f ... 118
featherDurations ... 93
featherDurations ... 750
fermataMarkup ... 58
fermataMarkup ... 59
ff ... 118
fff ... 118
ffff ... 118
fffff ... 118
fill-line ... 235
filled-box ... 238
finger ... 210, 750
first-page-number ... 513
followVoice ... 314
font-interface ... 210, 242
font-size ... 209, 210
fontsize ... 231
fontSize ... 209
footnote ... 750
forget ... 31
four-string-banjo ... 371
fp ... 118
fret-diagram ... 344
fret-diagram-interface ... 349
fret-diagram-terse ... 346
fret-diagram-verbose ... 348
FretBoards ... 352
funkHeads ... 39
funkHeadsMinor ... 39

G

general-align ... 234
glissando ... 133
grace ... 751
GregorianTranscriptionStaff ... 180
Grid_line_span_engraver ... 217
Grid_point_engraver ... 217
gridInterval ... 217
grobdescriptions ... 751
grow-direction ... 93

H

halign ... 233
harmonicByFret ... 751
harmonicByRatio ... 751
harmonicNote ... 751
harmonicsOn ... 751
hbracket ... 236
hide ... 751
hideKeySignature ... 383
hideNotes ... 212
hideStaffSwitch ... 314
horizontal-shift ... 511
Horizontal_bracket_engraver ... 219
huge ... 209, 232

I

improvisationOff ... 41, 77
improvisationOn ... 41, 77
indent ... 198, 511, 544
inner-margin ... 510
inStaffSegno ... 751
instrumentSwitch ... 200, 751
inversion ... 751
ionian ... 21
italic ... 230

J

justified-lines ... 241
justify ... 235

K

keepWithTag ... 751
key ... 20, 39, 751
killCues ... 207, 751

L

label ... 751
laissezVibrer ... 51
language ... 751
languageRestore ... 751
languageSaveAndChange ... 751
large ... 209, 232
larger ... 231, 232
last-bottom-spacing ... 509
layout file ... 516
left-align ... 233
left-margin ... 509
line-width ... 509, 544
locrian ... 21
longa ... 43
longa ... 54
lower ... 233
ly:minimal-breaking ... 521
ly:one-line-breaking ... 521
ly:optimal-breaking ... 520

ly:page-turn-breaking ... 520
lydian ... 21

M

m ... 395
magnify ... 231
magstep ... 209, 586
maj ... 395
major ... 21
major seven symbols ... 404
majorSevenSymbol ... 402
make-dynamic-script ... 124
make-pango-font-tree ... 244
makeClusters ... 163, 752
makeDefaultStringTuning ... 752
mark ... 106, 224, 752
markLengthOff ... 68, 225
markLengthOn ... 68, 225
markup ... 224, 227, 228, 229
markup-markup-spacing ... 509
markup-system-spacing ... 508
markuplist ... 228, 241, 242
max-systems-per-page ... 511
maxima ... 43
maxima ... 54
measureLength ... 82, 114
measurePosition ... 70, 114
MensuralStaff ... 180
mergeDifferentlyDottedOff ... 167
mergeDifferentlyDottedOn ... 167
mergeDifferentlyHeadedOff ... 167
mergeDifferentlyHeadedOn ... 167
mf ... 118
min-systems-per-page ... 511
minimum-Y-extent ... 525
minimumFret ... 329, 364
minimumPageTurnLength ... 520
minimumRepeatLengthForPageTurn ... 521
minor ... 21
minorChordModifier ... 403
mixed ... 316
mixolydian ... 21
modalInversion ... 15, 752
modalTranspose ... 14, 752
modern ... 28
modern-cautionary ... 29
modern-voice ... 29
modern-voice-cautionary ... 29
mp ... 118
MultiMeasureRestText ... 58
musicglyph ... 107
musicMap ... 752

N

name ... 569
neo-modern ... 30
neo-modern-cautionary ... 30
neo-modern-voice ... 30
neo-modern-voice-cautionary ... 31
no-reset ... 31
noBeam ... 91
nonstaff-nonstaff-spacing ... 525
nonstaff-relatedstaff-spacing ... 525
nonstaff-unrelatedstaff-spacing ... 525
noPageBreak ... 752
noPageTurn ... 752
normal-size-super ... 231
normalsize ... 209, 232
Note_heads_engraver ... 76
null ... 233
numericTimeSignature ... 62

O

octaveCheck ... 9, 752
omit ... 752
once ... 752
oneVoice ... 163
ottava ... 23, 752
outer-margin ... 510
outside-staff-horizontal-padding ... 539
outside-staff-padding ... 539
outside-staff-priority ... 539
overrideProperty ... 752
overrideTimeSignatureSettings ... 752

P

p ... 118
pad-around ... 237
pad-markup ... 237
pad-to-box ... 237
pad-x ... 237
page-breaking ... 512
page-breaking-system-system-spacing ... 512
page-count ... 512
page-spacing-weight ... 513
pageBreak ... 752
pageTurn ... 752
palmMute ... 752
palmMuteOn ... 753
paper-height ... 507
paper-width ... 509
parallelMusic ... 177, 753
parenthesize ... 214, 753
partcombine ... 172, 753
partcombineApart ... 173
partcombineAutomatic ... 173
partcombineChords ... 173
partcombineDown ... 753
partcombineForce ... 753
partcombineSoloI ... 173
partcombineSoloII ... 173
partcombineUnisono ... 173
partcombineUp ... 753
partial ... 70, 753
pedalSustainStyle ... 316
percent ... 154
phrasingSlurDashed ... 129
phrasingSlurDashPattern ... 130
phrasingSlurDashPattern ... 753
phrasingSlurDotted ... 129
phrasingSlurDown ... 129
phrasingSlurHalfDashed ... 129
phrasingSlurHalfSolid ... 129
phrasingSlurNeutral ... 129

phrasingSlurSolid ... 129
phrasingSlurUp ... 129
phrygian ... 21
piano ... 29
piano-cautionary ... 30
PianoStaff ... 310, 312
Pitch_squash_engraver ... 77
pitchedTrill ... 141, 753
pointAndClickOff ... 753
pointAndClickOn ... 753
pointAndClickTypes ... 753
postscript ... 238
powerChords ... 368
pp ... 118
ppp ... 118
pppp ... 118
ppppp ... 118
predefinedFretboardsOff ... 363
predefinedFretboardsOn ... 363
print-all-headers ... 513
print-first-page-number ... 513
print-page-number ... 513
pushToTag ... 754

Q

quotedCueEventTypes ... 202
quotedEventTypes ... 202
quoteDuring ... 201, 203, 754

R

r ... 54
R ... 57
ragged-bottom ... 507
ragged-last ... 510, 544
ragged-last-bottom ... 507
ragged-right ... 510, 544
raise ... 233
relative ... 2, 5, 13, 313, 754
removeWithTag ... 754
repeatCommands ... 150
repeatTie ... 51
resetRelativeOctave ... 754
rest ... 54
restrainOpenStrings ... 329
retrograde ... 14, 754
revertTimeSignatureSettings ... 754
rfz ... 118
rgb-color ... 214
RhythmicStaff ... 180
right-align ... 233
right-margin ... 510
rightHandFinger ... 365, 754
rounded-box ... 236

S

s ... 56
sacredHarpHeads ... 39
sacredHarpHeadsMinor ... 39
scaleDurations ... 50, 73, 754
score-markup-spacing ... 508
score-system-spacing ... 508
scoreTitleMarkup ... 465
self-alignment-X ... 525
set ... 82
set-octavation ... 23
settingsFrom ... 754
sf ... 118
sff ... 118
sfz ... 118
shape ... 754
shiftDurations ... 754
shiftOff ... 167
shiftOn ... 167
shiftOnn ... 167
shiftOnnn ... 167
short-indent ... 198, 511
show-available-fonts ... 244
showFirstLength ... 490
showKeySignature ... 383
showLastLength ... 490
showStaffSwitch ... 314
single ... 754
skip ... 56, 754
skipTypesetting ... 490
slashChordSeparator ... 403
slashedGrace ... 754
slurDashed ... 126
slurDashPattern ... 127, 754
slurDotted ... 126
slurDown ... 126
slurHalfDashed ... 127
slurHalfSolid ... 127
slurNeutral ... 126
slurSolid ... 126
slurUp ... 127
small ... 209, 232
smaller ... 231, 232
sostenutoOff ... 316
sostenutoOn ... 316
southernHarmonyHeads ... 39
southernHarmonyHeadsMinor ... 39
sp ... 118
spacing ... 541
spacingTweaks ... 755
Span_stem_engraver ... 314
spp ... 118
staff-affinity ... 525
staff-staff-spacing ... 525
Staff.midiInstrument ... 494
Staff_symbol_engraver ... 194
staffgroup-staff-spacing ... 525
start-repeat ... 150
startGroup ... 219
startStaff ... 187, 190
startTrillSpan ... 140
Stem ... 314
stem-spacing-correction ... 541
stemDown ... 215
stemLeftBeamCount ... 91
stemNeutral ... 215
stemRightBeamCount ... 91
stemUp ... 215
stopGroup ... 219
stopStaff ... 187, 190, 194
stopTrillSpan ... 140
storePredefinedDiagram ... 356, 755

stringTuning ... 341, 755
stringTunings ... 340, 352
styledNoteHeads ... 755
sub ... 231
suggestAccidentals ... 423
super ... 231
sus ... 397
sustainOff ... 316
sustainOn ... 316
system-count ... 511
system-separator-markup ... 513
system-system-spacing ... 509
systems-per-page ... 511

T

tabChordRepeats ... 755
tabChordRepetition ... 755
TabStaff ... 180, 328
TabVoice ... 328
tag ... 755
taor ... 383
teaching ... 31
teeny ... 209, 232
tempo ... 66
temporary ... 755
text ... 316
textLengthOff ... 59, 221
textLengthOn ... 59, 221
textSpannerDown ... 222
textSpannerNeutral ... 222
textSpannerUp ... 222
thumb ... 210
tieDashed ... 52
tieDashPattern ... 755
tieDotted ... 52
tieDown ... 52
tieNeutral ... 52
tieSolid ... 52
tieUp ... 52
time ... 61, 82, 755
times ... 755
timeSignatureFraction ... 73
tiny ... 209, 232
tocItem ... 755
top-margin ... 507
top-markup-spacing ... 509
top-system-spacing ... 509
translate ... 234
translate-scaled ... 234
transpose ... 5, 10, 13, 755
transposedCueDuring ... 207, 755
transposition ... 24, 201, 756
treCorde ... 316
tremolo ... 156
tremoloFlags ... 157
triangle ... 238
trill ... 140
tuplet ... 45, 73, 756
tupletDown ... 45
tupletNeutral ... 45
TupletNumber ... 46
tupletNumberFormatFunction ... 46
tupletSpan ... 756
tupletSpannerDuration ... 46
tupletUp ... 45
tweak ... 756
two-sided ... 510
type ... 569

U

unaCorda ... 316
underline ... 230
undo ... 756
unfold ... 152
unfoldRepeats ... 756
unHideNotes ... 212

V

VaticanaStaff ... 180
VerticalAxisGroup ... 525
voice ... 26, 28
Voice ... 163
voiceOne ... 163
void ... 756

W

walkerHeads ... 39
walkerHeadsMinor ... 39
whichBar ... 100
with-color ... 213
withMusicProperty ... 756
wordwrap ... 235
wordwrap-lines ... 241

X

X-offset ... 525
x11-color ... 213, 214
xNote ... 756
xNotesOn ... 756

Appendice E Indice di LilyPond

Oltre a tutti i comandi e le parole chiave di LilyPond, questo indice elenca i termini musicali e le espressioni che si riferiscono a ognuno di essi, corredati di collegamenti alle relative sezioni del manuale. Ogni collegamento è composto da due parti. La prima parte porta al punto esatto del manuale in cui compare l'argomento; la seconda parte porta all'inizio della sezione del manuale in cui l'argomento è trattato.

!

! 6

"

"|" 105

'

' 2

,

, ... 2

-

- 116

.

. 43

/

/ 398
/+ 398

:

: 157

<

< 158
<...> 158

=

= 9

>

> 158

?

? 6

[

[..... 90

]

] 90

^

^ 397

_

_ 254

\

\! 118
\(..... 129
\) 129
\< 118
\> 118
\abs-fontsize 231, 659
\absolute 2
\accent 116
\accepts 569, 570, 571
\acciaccatura 108
\accidentalStyle 26
\addChordShape 356
\addInstrumentDefinition 200, 207
\addlyrics 248, 250, 251
\addQuote 201
\aeolian 21
\afterGrace 109
\aikenHeads 39
\aikenHeadsMinor 39
\alias 569
\allowPageTurn 521
\alternative 143
\appendToTag 484
\appoggiatura 108
\arpeggio 137
\arpeggioArrowDown 137
\arpeggioArrowUp 137
\arpeggioBracket 138
\arpeggioNormal 137
\arpeggioParenthesis 138
\arpeggioParenthesisDashed 138
\arrow-head 238, 682
\ascendens 430, 436
\auctum 430, 436
\augmentum 436
\auto-footnote 703
\autoBeamOff 79, 314
\autoBeamOn 79
\autochange 312
\backslashed-digit 703
\balloonGrobText 216

\balloonLengthOff ... 216
\balloonLengthOn ... 216
\balloonText ... 216
\bar ... 94, 100
\barNumberCheck ... 106
\beam ... 682
\bendAfter ... 132
\bold ... 230, 659
\book ... 452, 455
\bookOutputName ... 454
\bookOutputSuffix ... 454
\bookpart ... 453, 455
\bookpart ... 519
\box ... 236, 659
\bracket ... 124, 236, 683
\break ... 519
\breathe ... 130
\breve ... 43
\breve ... 54
\cadenzaOff ... 71
\cadenzaOn ... 71
\caesura ... 428
\caps ... 659
\cavum ... 430, 436
\center-align ... 233, 667
\center-column ... 234, 668
\change ... 311
\char ... 703
\chordmode ... 5, 13, 353
\chordRepeats ... 330
\chords ... 400
\circle ... 236, 683
\clef ... 17
\cm ... 586
\coda ... 116
\column ... 234, 668
\column-lines ... 709
\combine ... 238, 668
\compoundMeter ... 75
\compressFullBarRests ... 58
\compressFullBarRests ... 59
\concat ... 669
\consists ... 569
\context ... 557, 564
\context in \layout block ... 564
\cr ... 118
\cresc ... 120
\crescHairpin ... 120
\crescTextCresc ... 120
\crossStaff ... 314
\cueClef ... 203
\cueDuring ... 203
\cueDuringWithClef ... 203
\customTabClef ... 690
\decr ... 118
\decresc ... 120
\defaultchild ... 572
\defaultTimeSignature ... 62
\defineBarLine ... 98
\deminutum ... 430, 436
\denies ... 569, 570, 571
\descendens ... 430, 436
\dim ... 120
\dimHairpin ... 120
\dimTextDecr ... 120
\dimTextDecresc ... 120
\dimTextDim ... 120
\dir-column ... 669
\discant ... 698
\displayLilyMusic ... 502
\divisioMaior ... 428
\divisioMaxima ... 428
\divisioMinima ... 428
\dorian ... 21
\dotsDown ... 44
\dotsNeutral ... 44
\dotsUp ... 44
\doubleflat ... 690
\doublesharp ... 690
\downbow ... 116, 323
\downmordent ... 116
\downprall ... 116
\draw-circle ... 238, 683
\draw-dashed-line ... 683
\draw-dotted-line ... 684
\draw-hline ... 684
\draw-line ... 238, 685
\drummode ... 180
\dynamic ... 124, 660
\dynamicDown ... 120
\dynamicNeutral ... 120
\dynamicUp ... 120
\easyHeadsOff ... 37
\easyHeadsOn ... 37
\ellipse ... 685
\epsfile ... 238, 685
\espressivo ... 116, 119
\expandFullBarRests ... 58
\expandFullBarRests ... 59
\eyeglasses ... 704
\f ... 118
\featherDurations ... 93
\fermata ... 116, 690
\fermataMarkup ... 58
\fermataMarkup ... 59
\fermataMarkup ... 116
\ff ... 118
\fff ... 118
\ffff ... 118
\fffff ... 118
\fill-line ... 235, 669
\fill-with-pattern ... 670
\filled-box ... 238, 686
\finalis ... 428
\finger ... 210, 660
\flageolet ... 116
\flat ... 690
\flexa ... 436
\fontCaps ... 660
\fontsize ... 231, 660
\footnote ... 469, 704
\fp ... 118
\fraction ... 704
\freeBass ... 699
\frenchChords ... 404
\fret-diagram ... 344, 695
\fret-diagram-terse ... 346, 695
\fret-diagram-verbose ... 348, 696
\fromproperty ... 704
\funkHeads ... 39

\funkHeadsMinor ... 39
\general-align ... 234, 671
\germanChords ... 404
\glissando ... 133
\grace ... 108
\halfopen ... 116
\halign ... 233, 672
\harmonic ... 323, 332
\harmonicByFret ... 332
\harmonicByRatio ... 332
\harmonicsOff ... 323
\harmonicsOn ... 323
\harp-pedal ... 697
\hbracket ... 236, 686
\hcenter-in ... 673
\header ... 455
\hideKeySignature ... 383
\hideNotes ... 212
\hideSplitTiedTabNotes ... 331
\hideStaffSwitch ... 314
\hspace ... 673
\huge ... 209, 232, 660
\improvisationOff ... 41, 77
\improvisationOn ... 41, 77
\in ... 586
\inclinatum ... 430, 436
\include ... 481
\inStaffSegno ... 146
\instrumentSwitch ... 200
\inversion ... 13
\ionian ... 21
\italianChords ... 404
\italic ... 230, 661
\justified-lines ... 241, 709
\justify ... 235, 674
\justify-field ... 674
\justify-string ... 675
\keepWithTag ... 484
\key ... 20, 39
\killCues ... 207
\label ... 479
\laissezVibrer ... 51
\large ... 209, 232, 661
\larger ... 231, 232, 661
\layout ... 455, 514, 564
\left-align ... 233, 675
\left-brace ... 705
\left-column ... 676
\lheel ... 116
\line ... 676
\linea ... 430, 436
\lineprall ... 116
\locrian ... 21
\longa ... 43
\longa ... 54
\longfermata ... 116
\lookup ... 705
\lower ... 233, 676
\ltoe ... 116
\lydian ... 21
\lyricmode ... 247, 248
\lyricsto ... 248, 250
\magnify ... 231, 661
\major ... 21
\makeClusters ... 163
\map-markup-commands ... 709
\marcato ... 116
\mark ... 106, 224
\markalphabet ... 705
\markLengthOff ... 68, 225
\markLengthOn ... 68, 225
\markletter ... 705
\markup ... 224, 227, 228, 229
\markuplist ... 228, 241, 242
\maxima ... 43
\maxima ... 54
\medium ... 662
\melisma ... 254
\melismaEnd ... 254
\mergeDifferentlyDottedOff ... 167
\mergeDifferentlyDottedOn ... 167
\mergeDifferentlyHeadedOff ... 167
\mergeDifferentlyHeadedOn ... 167
\mf ... 118
\midi ... 455
\minor ... 21
\mixolydian ... 21
\mm ... 586
\modalInversion ... 15
\modalTranspose ... 14
\mordent ... 116
\mp ... 118
\musicglyph ... 107, 691
\name ... 569
\natural ... 691
\new ... 557
\newSpacingSection ... 542
\noBeam ... 91
\noBreak ... 519
\noPageBreak ... 520
\noPageTurn ... 521
\normal-size-sub ... 662
\normal-size-super ... 231, 662
\normal-text ... 663
\normalsize ... 209, 232, 663
\note ... 691
\note-by-number ... 691
\null ... 233, 706
\number ... 663
\numericTimeSignature ... 62
\octaveCheck ... 9
\on-the-fly ... 468, 706
\once ... 577
\once ... 579
\oneVoice ... 163
\open ... 116, 323
\oriscus ... 430, 436
\ottava ... 23
\oval ... 686
\override ... 578, 706
\override-lines ... 710
\overrideTimeSignatureSettings ... 62
\p ... 118
\pad-around ... 237, 676
\pad-markup ... 237, 677
\pad-to-box ... 237, 677
\pad-x ... 237, 677
\page-link ... 706
\page-ref ... 479, 706
\pageBreak ... 520

\pageTurn ... 521
\paper ... 455, 505
\parallelMusic ... 177
\parenthesize ... 214, 686
\partcombine ... 172, 275
\partcombine and lyrics ... 275
\partcombineApart ... 173
\partcombineAutomatic ... 173
\partcombineChords ... 173
\partcombineSoloI ... 173
\partcombineSoloII ... 173
\partcombineUnisono ... 173
\partial ... 70, 143, 145
\path ... 687
\pattern ... 707
\pes ... 436
\phrasingSlurDashed ... 129
\phrasingSlurDashPattern ... 130
\phrasingSlurDotted ... 129
\phrasingSlurDown ... 129
\phrasingSlurHalfDashed ... 129
\phrasingSlurHalfSolid ... 129
\phrasingSlurNeutral ... 129
\phrasingSlurSolid ... 129
\phrasingSlurUp ... 129
\phrygian ... 21
\pitchedTrill ... 141
\portato ... 116
\postscript ... 238, 688
\powerChords ... 368
\pp ... 118
\ppp ... 118
\pppp ... 118
\ppppp ... 118
\prall ... 116
\pralldown ... 116
\prallmordent ... 116
\prallprall ... 116
\prallup ... 116
\predefinedFretboardsOff ... 363
\predefinedFretboardsOn ... 363
\property-recursive ... 707
\pt ... 586
\pushToTag ... 484
\put-adjacent ... 678
\quilisma ... 430, 436
\quoteDuring ... 201, 203
\raise ... 233, 678
\relative ... 2, 5, 13, 313
\RemoveEmptyStaves ... 194, 195
\removeWithTag ... 484
\repeat ... 143
\repeat percent ... 154
\repeat tremolo ... 156
\repeatTie ... 51
\repeatTie ... 146
\repeatTie ... 271
\replace ... 663
\rest ... 54
\rest ... 692
\rest-by-number ... 692
\retrograde ... 14
\reverseturn ... 116
\revert ... 579
\revertTimeSignatureSettings ... 64
\rfz ... 118
\rheel ... 116
\right-align ... 233, 678
\right-brace ... 707
\right-column ... 678
\rightHandFinger ... 365
\roman ... 664
\rotate ... 679
\rounded-box ... 236, 688
\rtoe ... 116
\sacredHarpHeads ... 39
\sacredHarpHeadsMinor ... 39
\sans ... 664
\scale ... 689
\scaleDurations ... 50, 73
\score ... 451, 455, 693
\score-lines ... 710
\segno ... 116
\semiflat ... 694
\semiGermanChords ... 404
\semisharp ... 694
\sesquiflat ... 694
\sesquisharp ... 694
\set ... 82, 576
\sf ... 118
\sff ... 118
\sfz ... 118
\shape ... 605
\sharp ... 694
\shiftOff ... 167
\shiftOn ... 167
\shiftOnn ... 167
\shiftOnnn ... 167
\shortfermata ... 116
\showKeySignature ... 383
\showStaffSwitch ... 314
\signumcongruentiae ... 116
\simple ... 664
\skip ... 56, 270
\slashed-digit ... 707
\slashedGrace ... 108
\slurDashed ... 126
\slurDashPattern ... 127
\slurDotted ... 126
\slurDown ... 126
\slurHalfDashed ... 127
\slurHalfSolid ... 127
\slurNeutral ... 126
\slurSolid ... 126
\slurUp ... 127
\small ... 209, 232, 664
\smallCaps ... 665
\smaller ... 231, 232, 665
\snappizzicato ... 116
\sostenutoOff ... 316
\sostenutoOn ... 316
\southernHarmonyHeads ... 39
\southernHarmonyHeadsMinor ... 39
\sp ... 118
\spp ... 118
\staccatissimo ... 116
\staccato ... 116
\startGroup ... 219
\startStaff ... 187, 190
\startTrillSpan ... 140

\stdBass ... 699
\stdBassIV ... 700
\stdBassV ... 701
\stdBassVI ... 702
\stemDown ... 215
\stemNeutral ... 215
\stemUp ... 215
\stencil ... 708
\stopGroup ... 219
\stopped ... 116
\stopStaff ... 187, 190, 194
\stopTrillSpan ... 140
\storePredefinedDiagram ... 356
\stringTuning ... 341
\stropha ... 430, 436
\strut ... 708
\sub ... 231, 665
\super ... 231, 665
\sustainOff ... 316
\sustainOn ... 316
\tabChordRepeats ... 330
\tabFullNotation ... 328
\table-of-contents ... 481, 710
\tag ... 484
\taor ... 383
\teeny ... 209, 232, 666
\tempo ... 66
\tenuto ... 116
\text ... 666
\textLengthOff ... 59, 221
\textLengthOn ... 59, 221
\textSpannerDown ... 222
\textSpannerNeutral ... 222
\textSpannerUp ... 222
\thumb ... 116, 210
\tied-lyric ... 694
\tieDashed ... 52
\tieDotted ... 52
\tieDown ... 52
\tieNeutral ... 52
\tieSolid ... 52
\tieUp ... 52
\time ... 61, 82
\tiny ... 209, 232, 666
\tocItem ... 481
\translate ... 234, 679
\translate-scaled ... 234, 679
\transparent ... 708
\transpose ... 5, 10, 13
\transposedCueDuring ... 207
\transposition ... 24, 201
\treCorde ... 316
\triangle ... 238, 689
\trill ... 116, 140
\tuplet ... 45, 73
\tupletDown ... 45
\tupletNeutral ... 45
\tupletUp ... 45
\turn ... 116
\tweak ... 580
\type ... 569
\typewriter ... 666
\unaCorda ... 316
\underline ... 230, 667
\unfoldRepeats ... 496
\unHideNotes ... 212
\unset ... 577
\upbow ... 116, 323
\upmordent ... 116
\upprall ... 116
\upright ... 667
\varcoda ... 116
\vcenter ... 680
\verbatim-file ... 708
\verylongfermata ... 116
\virga ... 430, 436
\virgula ... 428
\voiceFourStyle ... 167
\voiceNeutralStyle ... 167
\voiceOne ... 163
\voiceOne ... \voiceFour ... 163
\voiceOneStyle ... 167
\voiceThreeStyle ... 167
\voiceTwoStyle ... 167
\void ... 502
\vspace ... 680
\walkerHeads ... 39
\walkerHeadsMinor ... 39
\whiteout ... 708
\with ... 562, 567
\with-color ... 213, 708
\with-dimensions ... 709
\with-link ... 709
\with-url ... 689
\woodwind-diagram ... 697
\wordwrap ... 235, 681
\wordwrap-field ... 680
\wordwrap-internal ... 710
\wordwrap-lines ... 241, 710
\wordwrap-string ... 681
\wordwrap-string-internal ... 710

|

| ... 105

~

~ ... 50

1

15ma ... 23

8

8va ... 23
8ve ... 23

A

abbellimenti ... 108, 116
abbellimenti al termine di una nota ... 109
abbellimenti all'interno della parentesi di un gruppo irregolare ... 49
abbellimenti, modifica delle impostazioni di formattazione ... 110
abbellimenti, modifica manuale ... 110
absolute ... 2, 748

accelerando in MIDI ... 495
accent ... 712
accento ... 116
accentus ... 712
accepts ... 569
acciaccatura ... 108
acciaccatura ... 748
acciaccatura su più note ... 112
Accidental, musica ficta ... 423
accidentals ... 423, 427, 438
accidentalStyle ... 748
accordi ... 158
accordi e legature di valore ... 51
accordi e ottava relativa ... 4
accordi per chitarra, tabella ... 77
accordi vuoti ... 159
accordi, alterazioni in ... 32
accordi, altezza relativa ... 159
accordion ... 317
accordion discant symbols ... 317
accordion shift symbols ... 317
accordion shifts ... 317
accordo, ripetizione ... 160
addChordShape ... 356, 748
adding a white background to text ... 708
adding custom fret diagrams ... 355
addInstrumentDefinition ... 200, 207, 748
additionalPitchPrefix ... 402
additions, in chords ... 397
addQuote ... 201, 748
adjusting staff symbol ... 587
aeolian ... 21
afterGrace ... 109, 748
afterGraceFraction ... 717
Aiken, testa di nota ... 39
aikenHeads ... 39
aikenHeadsMinor ... 39
al niente ... 121
alias ... 569
align to objects ... 602
alignAboveContext ... 572
alignBelowContext ... 269, 572
aligning markup text ... 233
aligning markups ... 233
aligning text ... 233
alignment, text, commands ... 236
alist ... 715
allineamento sulla cadenza ... 113
allowPageTurn ... 748
allowVoltaHook ... 748
alterazione ... 5
alterazione di cortesia ... 6
alterazione di sicurezza ... 6
alterazione di un quarto di tono ... 7
alterazione e legatura di valore ... 6
alterazione tra parentesi ... 6
alterazione, di cortesia ... 6
alterazione, di sicurezza ... 6
alterazione, quarto di tono ... 7
alterazione, tra parentesi ... 6
alterazioni ... 26
alterazioni automatiche ... 26
alterazioni di precauzione in stile moderno ... 29
alterazioni e note simultanee ... 32
alterazioni in stile moderno ... 29
alterazioni moderne ... 29
alterazioni negli accordi ... 32
alterazioni su più voci ... 29
alterazioni, cadenze ... 71
alterazioni, musica in tempo libero ... 71
alterazioni, stile *modern-cautionary* ... 29
alterazioni, stile moderno delle ... 28
alterBroken ... 748
altered chords ... 396
alternate endings ... 143
alternative endings and lyrics ... 270
alternative melody, switching to ... 280
altezza naturale ... 5
altezza relativa, accordi ... 159
altezze ... 1
altezze, trasposizione delle ... 10
alto, chiave di ... 17
Amazing Grace bagpipe example ... 383
ambito delle altezze ... 33
ambitus ... 33
anacrusi ... 70
anacrusi in una ripetizione ... 145
analysis, musicological ... 219
angled hairpins ... 598
annidamento, ripetizioni ... 149
annotate-spacing ... 551
annotazione su pausa multipla ... 58
anthems ... 285
antica, chiave ... 17
aperto (\open) ... 116
appendToTag ... 748
applyContext ... 748
applyMusic ... 748
applyOutput ... 749
appoggiatura ... 108
appoggiatura ... 749
Arabic key signatures ... 446
Arabic music ... 445
Arabic music example ... 448
Arabic music template ... 448
Arabic note names ... 445
Arabic semi-flat symbol ... 446
Arabic time signatures ... 448
arcata in giù ... 116
arcata in su ... 116
armatura di chiave ... 5, 20
armonico (\flageolet) ... 116
arpeggio ... 137
arpeggio attraverso il rigo, stile della parentesi ... 140
arpeggio spezzato ... 137
arpeggio, simboli speciali ... 138
arpeggioArrowDown ... 137
arpeggioArrowUp ... 137
arpeggioBracket ... 138
arpeggioNormal ... 137
arpeggioParenthesis ... 138
arpeggioParenthesisDashed ... 138
arrow-head ... 238
Articlulate scripts ... 495
articolazione "espressivo" ... 119
articolazioni ... 116
articulation-event ... 202
articulations ... 428
articulations in MIDI ... 495
artificial harmonics ... 324

assertBeamQuant ... 749
assertBeamSlope ... 749
associatedVoice ... 248
associatedVoice ... 250, 280
association list ... 715
assoluta, ottava ... 1
assoluto ... 1
aug ... 395
auto-first-page-number ... 513
autoBeaming ... 82
autoBeamOff ... 79
autoBeamOn ... 79
autochange ... 312, 749
autochange and relative music ... 313
automatic chord diagrams ... 362
automatic fret diagrams ... 362
automatic staff changes ... 312
automaticBars ... 597
available fonts, listing ... 244

B

backslashed digits ... 703
bagpipe ... 383
bagpipe example ... 383
balloon ... 216
balloon help ... 216
Balloon_engraver ... 216
balloonGrobText ... 216
balloonGrobText ... 749
balloonLengthOff ... 216
balloonLengthOn ... 216
balloonText ... 216
balloonText ... 749
banjo tablature ... 325
banjo tablatures ... 370
banjo tunings ... 371
banjo-c-tuning ... 371
banjo-modal-tuning ... 371
banjo-open-d-tuning ... 371
banjo-open-dm-tuning ... 371
bar ... 94, 100, 749
bar lines, suppressing ... 597
bar lines, symbols on ... 224
barCheckSynchronize ... 105
baritono, chiave di ... 17
BarNumber ... 101
barNumberCheck ... 106, 749
barNumberVisibility ... 101
barre indications ... 343
Bartók pizzicato ... 324
bartype ... 100
base-shortest-duration ... 541
baseMoment ... 82
bass note, for chords ... 398
Bass, figured ... 407
Bass, thorough ... 407
Basso continuo ... 407
basso, chiave di ... 17
battiti per minuto ... 66
battiti, raggruppamenti ... 87
battuta in levare ... 70
battuta, controlli ... 105
battuta, numeri ... 101
battuta, numero, formato del ... 102
battuta, stanghette ... 94
battuta, stanghette manuali ... 94
battute delle ripetizioni ... 94
beamExceptions ... 82
beams, cross-staff ... 311
beatStructure ... 82
bemolle ... 5
bemolle, doppio ... 5
bendAfter ... 132, 749
Bézier curves, control points ... 605
binari ferroviari ... 131
binding gutter ... 510
binding-offset ... 510
bisbiglando ... 321
Bison ... 716
blank-after-score-page-penalty ... 512
blank-last-page-penalty ... 512
blank-page-penalty ... 512
BNF ... 716
bold ... 230
bookOutputName ... 749
bookOutputSuffix ... 749
bookTitleMarkup ... 465
bottom-margin ... 507
bowing indications ... 323
box ... 236
brace, vertical ... 181
braces, nesting of ... 184
braces, various sizes ... 242
bracket ... 124, 236, 316
bracket, horizontal ... 219
bracket, phrasing ... 219
bracket, vertical ... 181
brackets ... 214, 219
brackets, nesting of ... 184
break-align-symbols ... 602
break-visibility ... 593
breakable ... 80
breakbefore ... 462
breaking lines ... 517
breaking pages ... 544
breathe ... 130
breathe ... 749
breve ... 43
breve ... 54

C

cadenza ... 71, 113
cadenza, allineamento su ... 113
cadenza, alterazioni ... 71
cadenza, interruzioni di linea ... 72
cadenza, interruzioni di pagina ... 72
cadenza, numeri di battuta ... 71
cadenza, stanghette ... 71
cadenza, travature ... 71
cadenzaOff ... 71
cadenzaOn ... 71
callback ... 715
capo ... 348
center-align ... 233
center-column ... 234
centered dynamics in piano music ... 310
centering a column of text ... 668

centering text on the page . . . 235
cesura . . . 131
change . . . 311
changing direction of text columns . . . 669
changing fonts . . . 230
changing instrument names . . . 199
changing properties . . . 576
changing staff automatically . . . 312
changing staff manually . . . 311
chants . . . 296
character names . . . 289
check-consistency . . . 510
chiave . . . 5, 17
chiave antica . . . 17
chiave di baritono . . . 17
chiave di basso . . . 17
chiave di contralto . . . 17
chiave di Do . . . 17
chiave di Fa . . . 17
chiave di mezzosoprano . . . 17
chiave di Sol . . . 17
chiave di soprano . . . 17
chiave di subbasso . . . 17
chiave di tenore . . . 17
chiave di tenore per coro . . . 18
chiave di varbaritono . . . 17
chiave di violino . . . 17
chiave francese . . . 17
chiave traspositrice . . . 18
chiuso (\stopped) . . . 116
choir staff . . . 181
chord chords . . . 393
chord diagrams . . . 343, 352
chord diagrams, automatic . . . 362
chord glissandi . . . 339
chord inversions . . . 398
chord mode . . . 393
chord names . . . 393, 399
Chord names in MIDI . . . 495
chord names with fret diagrams . . . 353
chord quality . . . 395
chord shapes for fretted instruments . . . 356
chord steps, altering . . . 397
chord, modifying one note in . . . 580
Chord, repetition . . . 330
chordChanges . . . 400
chordmode . . . 5, 13, 353
chordNameExceptions . . . 403
chordNameLowercaseMinor . . . 402
ChordNames . . . 353
chordNameSeparator . . . 402
chordNoteNamer . . . 402
chordPrefixSpacer . . . 404
chordRepeats . . . 749
chordRootNamer . . . 402
chords . . . 399
chords, cross-staff . . . 314
chords, fingering . . . 210
chords, jazz . . . 401
chords, power . . . 368
chords, splitting across staves with \autochange . . . 313
chords, suppressing repeated . . . 400
Christian Harmony, testa di nota . . . 39
circle . . . 236
circling text . . . 683
circulus . . . 712
clef . . . 17, 749
clef, moderntab . . . 342
clef, percussion . . . 371
clef, tab . . . 342
clef, visibility following explicit change . . . 595
clefs . . . 418, 426, 437
clefs, visibility of transposition . . . 597
closure . . . 715
cluster . . . 163
cluster di note . . . 163
coda . . . 107, 116, 712
coda on bar line . . . 224
collisione, numeri di battuta . . . 105
collisioni . . . 167
collisioni di note . . . 167
collisioni, ignorare . . . 162
collisioni, troppe colonne di note che si urtano . . . 162
collisioni,ignorare . . . 172
collisions, cross-staff voices . . . 311
color . . . 213
color in chords . . . 214
color, rgb . . . 214
colorare le voci . . . 167
colored notes . . . 213
colored notes in chords . . . 214
colored objects . . . 213
coloring notes . . . 213
coloring objects . . . 213, 593
coloring text . . . 708
colors . . . 213
Colors, list of . . . 636
column . . . 234
columns, text . . . 234
combinatore delle parti . . . 172
combinazione automatica delle parti . . . 172
combine . . . 238
comma intervals . . . 450
common-shortest-duration . . . 541
Completion_heads_engraver . . . 76
Completion_rest_engraver . . . 76
compoundMeter . . . 749
compressFullBarRests . . . 58
compressFullBarRests . . . 59
comprimere la musica . . . 50
concatenating text . . . 669
condensare le pause normali . . . 61
consists . . . 569
constante-hairpins . . . 122
context properties, changing defaults . . . 564
Contexts, creating and referencing . . . 557
contexts, defining new . . . 569
contexts, implicit . . . 572
contexts, keeping alive . . . 560
contexts, layout order . . . 571
contexts, lifetime . . . 560
control points, Bézier curves . . . 605
control points, tweaking . . . 581
controlli del numero di battuta . . . 105
controlli di battuta . . . 105
controlling general text alignment . . . 671
controllo dell'ottava . . . 9
controllo della misura . . . 105
controllo delle altezze . . . 9

controlpitch ... 9
convergenti/divergenti, travature ... 93
copyright sign ... 489
corona ... 107, 116
correzione dell'ottava ... 9
cr ... 118
creating empty text objects ... 706
creating horizontal spaces in text ... 673
creating text fractions ... 704
creating vertical spaces in text ... 680, 708
cresc ... 120
crescendo ... 118
crescendo-event ... 202
crescHairpin ... 120
crescTextCresc ... 120
cross ... 35
cross note heads ... 35
cross staff chords ... 314
cross staff line ... 314
cross staff notes ... 314
cross staff stems ... 314
cross-staff ... 314
cross-staff beams ... 311
cross-staff chords ... 314
cross-staff collisions ... 311
cross-staff line ... 314
cross-staff notes ... 311, 314
cross-staff stems ... 314
cross-staff tremolo ... 158
crossStaff ... 749
cue notes ... 201, 203
cue notes, formatting ... 203
cue notes, removing ... 207
cueClef ... 203, 749
cueClefUnset ... 749
cueDuring ... 203, 750
cueDuringWithClef ... 203, 750
cues, musical ... 291
CueVoice ... 203
currentBarNumber ... 101, 114
custodes ... 417
custom fret diagrams ... 343
custom fret diagrams, adding ... 355
custom string tunings ... 341
customized fret diagram ... 349
customizing chord names ... 401
custos ... 417

D

D.S. al Fine ... 107
dampened notes on fretted instruments ... 367
dashed phrasing slur ... 129
deadNote ... 750
decorating text ... 236
decr ... 118
decresc ... 120
decrescendo ... 118
default ... 26, 28
default context properties, changing ... 564
default-staff-staff-spacing ... 525
defaultBarType ... 100
defaultNoteHeads ... 750
defaultTimeSignature ... 62
defineBarLine ... 98, 750
definire le stanghette ... 98
denies ... 569
diagram, fret, customized ... 349
diagramma degli accordi per chitarra ... 77
diagrams, chord for fretted instruments ... 343
diagrams, fret ... 343
diagrams, fret, transposing ... 354
diamond note heads ... 35
diamond-shaped note heads ... 323
diesis ... 5
diesis, doppio ... 5
dim ... 120
dim ... 395
dimHairpin ... 120
diminuendo ... 118
dimTextDecr ... 120
dimTextDecresc ... 120
dimTextDim ... 120
dinamica, nuovi segni di ... 124
dinamiche ... 118
dinamiche assolute ... 118
dinamiche, posizionamento verticale ... 120
discant symbols, accordion ... 317
displayLilyMusic ... 750
displayMusic ... 750
displayScheme ... 750
disposizione delle travature, proprietà predefinite delle indicazioni di tempo ... 62
distance between staves ... 525
distances, absolute ... 586
distances, scaled ... 586
diteggiature e pause multiple ... 61
divided lyrics ... 274
divisio ... 427
divisione delle note ... 76
divisione delle pause ... 76
divisiones ... 427
Do, chiave di ... 17
dodecaphonic ... 31
dodecaphonic, stile delle alterazioni ... 31
doppio bemolle ... 5
doppio diesis ... 5
doppio mordente (\prallmordent) ... 116
doppio mordente (\prallprall) ... 116
doppio punto, note ... 43
dorian ... 21
dorico ... 21
dotsDown ... 44
dotsNeutral ... 44
dotsUp ... 44
dotted phrasing slurs ... 129
down bow indication ... 323
downbow ... 712
downmordent ... 712
downprall ... 712
draw-circle ... 238
draw-line ... 238
drawing a line across a page ... 684
drawing beams within text ... 682
drawing boxes with rounded corners ... 686
drawing boxes with rounded corners around text ... 688
drawing circles within text ... 683
drawing dashed lines within text ... 683
drawing dotted lines within text ... 684

drawing ellipse around text ... 685
drawing graphic objects ... 236
drawing lines within text ... 685
drawing oval around text ... 686
drawing paths ... 687
drawing solid boxes within text ... 686
drawing staff symbol ... 587
drawing triangles within text ... 689
drum staff ... 180
drummode ... 180
drums ... 371, 373
DrumStaff ... 180
durata delle note ... 43
durata predefinita ... 43
durate, scalare ... 49
dynamic ... 124
dynamic-event ... 202
dynamicDown ... 120
DynamicLineSpanner ... 120
dynamicNeutral ... 120
dynamics, centered in keyboard music ... 310
dynamics, editorial ... 124
dynamics, parenthesis ... 124
dynamicUp ... 120

E

easyHeadsOff ... 37
easyHeadsOn ... 37
editorial dynamics ... 124
embedded graphics ... 238
embedding graphic objects ... 236
empty staves ... 194
encapsulated postscript output ... 491
enclosing text in a box with rounded corners ... 688
enclosing text within a box ... 659
endSpanners ... 750
engravers, including in contexts ... 569
entering lyrics ... 247
eolio ... 21
EPS output ... 491
epsfile ... 238
espandere la musica ... 50
espressivo ... 116
espressivo ... 119
espressivo ... 712
estensione ... 33
eventChords ... 750
eventi segnaposto ... 159
exceptions, chord names ... 404
expandFullBarRests ... 58
expandFullBarRests ... 59
explicitClefVisibility ... 595
explicitKeySignatureVisibility ... 595
expressions, markup ... 229
extended chords ... 396
extender ... 258
extra-offset ... 525

F

f ... 118
Fa, chiave di ... 17
featherDurations ... 93
featherDurations ... 750
fermata ... 712
fermata on bar line ... 224
fermata su pausa multipla ... 58
fermataMarkup ... 58
fermataMarkup ... 59
Ferneyhough, forcelle ... 122
Feta font ... 637
ff ... 118
fff ... 118
ffff ... 118
fffff ... 118
Figured bass ... 407
figured bass alignment ... 412
figured bass extender lines ... 410
fill-line ... 235
filled-box ... 238
finali alternati, ripetizioni ... 152
finali alternativi, con legature di valore ... 146
finalis ... 427
finding available fonts ... 244
fine ripetizione ... 150
finger ... 210, 750
finger change ... 210
fingering ... 210
fingering chords ... 210
fingering instructions for chords ... 210
fingering vs. string numbers ... 326
fingerings, adding to fret diagrams ... 364
fingerings, right hand for fretted instruments ... 365
first-page-number ... 513
flageolet ... 712
flags ... 421
flared-hairpin ... 122
Flex ... 716
follow voice ... 314
followVoice ... 314
font ... 715
font families ... 232
font families, setting ... 244
font size ... 231
font size (notation) ... 209
font size (notation) scaling ... 209
font size (notation), standard ... 210
font size, setting ... 516
font switching ... 230
Font, Feta ... 637
font-interface ... 210, 242
font-size ... 209, 210
fonts, changing for entire document ... 244
fonts, explained ... 242
fonts, finding available ... 244
fonts, non-text in markup ... 242
fontsize ... 231
fontSize ... 209
footnote ... 750
footnotes ... 469
footnotes in music expressions ... 469
footnotes in stand-alone text ... 475
footnotes, event-based ... 470
footnotes, time-based ... 472
forcella ... 118
forcelle allargate (flared-hairpins) ... 122
forcelle continue (constante-hairpins) ... 122
forcelle Ferneyhough ... 122

`forget` ... 31
forget, stile delle alterazioni ... 31
formato del segno di chiamata ... 107
formattazione del gruppo irregolare ... 46
formattazione della terzina ... 46
formatting in lyrics ... 247
formatting text spanners ... 222
formatting, cue notes ... 203
four bar music ... 518
`four-string-banjo` ... 371
`fp` ... 118
fragments ... 203
fragments, quoting ... 201
framing text ... 236
francese, chiave ... 17
frase, legature di ... 129
Frenched score ... 194
Frenched staff ... 194
Frenched staves ... 190
fret ... 329
fret diagram, customized ... 349
fret diagrams ... 343, 352
fret diagrams with chord names ... 353
fret diagrams, adding custom ... 355
fret diagrams, adding fingerings ... 364
fret diagrams, automatic ... 362
fret diagrams, custom ... 343
fret diagrams, mandolin ... 352
fret diagrams, transposing ... 354
fret diagrams, ukulele ... 352
`fret-diagram` ... 344
fret-diagram markup ... 344
`fret-diagram-interface` ... 349
`fret-diagram-terse` ... 346
fret-diagram-terse markup ... 346
`fret-diagram-verbose` ... 348
fret-diagram-verbose markup ... 348
`FretBoards` ... 352
fretted instruments, chord shapes ... 356
fretted instruments, dampened notes ... 367
fretted instruments, harmonics ... 367
fretted instruments, indicating position and barring ... 367
fretted instruments, predefined string tunings ... 340
fretted instruments, right hand fingerings ... 365
frigio ... 21
Funk, testa di nota ... 39
`funkHeads` ... 39
`funkHeadsMinor` ... 39

G

gambo barrato ... 110
`general-align` ... 234
gestione del tempo ... 114
ghost notes ... 214
glifi musicali ... 107
glissandi e ripetizioni ... 149
`glissando` ... 133
global variable ... 717
glyph ... 715
`grace` ... 751
grace notes ... 383
grace notes and lyrics ... 279
grammar for LilyPond ... 716
grand staff ... 181
graphic notation ... 238
graphic objects, drawing ... 236
graphic objects, embedding ... 236
graphical object interfaces ... 716
graphical objects ... 715
graphics, embedding ... 236, 238
Gregorian square neumes ligatures ... 429
Gregorian transcription staff ... 180
`GregorianTranscriptionStaff` ... 180
grid lines ... 217
`Grid_line_span_engraver` ... 217
`Grid_point_engraver` ... 217
`gridInterval` ... 217
grob ... 573, 715
grob properties ... 578
grob-interface ... 716
`grobdescriptions` ... 751
grobs, overwriting ... 593
grobs, visibility of ... 592
`grow-direction` ... 93
gruppetto (\turn) ... 116
gruppetto rovesciato (\reverseturn) ... 116
gruppi irregolari ... 45
gruppi irregolari, raggruppamento ... 45
gruppo irregolare, formattazione del ... 46
gruppo irregolare, modifiche del numero del ... 46
gruppo irregolare, posizionamento della parentesi quadra ... 45
guitar note heads ... 35
guitar tablature ... 325
gutter ... 510

H

hairpins, angled ... 598
halfopen ... 712
`halign` ... 233
harmonic indications in tablature notation ... 332
harmonic note heads ... 35
Harmonica Sacra, testa di nota ... 39
`harmonicByFret` ... 751
`harmonicByRatio` ... 751
`harmonicNote` ... 751
harmonics on fretted instruments ... 367
harmonics, artificial ... 324
harmonics, natural ... 323
`harmonicsOn` ... 751
harp pedal diagrams ... 321
harp pedals ... 321
harps ... 321
`hbracket` ... 236
help, balloon ... 216
hidden notes ... 212
`hide` ... 751
`hideKeySignature` ... 383
`hideNotes` ... 212
`hideStaffSwitch` ... 314
hiding ancient staves ... 195
hiding of staves ... 194
hiding rhythmic staves ... 195
horizontal bracket ... 219
horizontal spacing ... 540
horizontal spacing, overriding ... 609

horizontal text alignment ... 233
horizontal-shift ... 511
Horizontal_bracket_engraver ... 219
horizontally centering text ... 667
hufnagel ... 415
huge ... 209, 232
hymns ... 296
hyphens ... 258

I

ictus ... 712
images, embedding ... 238
immutable objects ... 716
immutable properties ... 716
implicit contexts ... 572
importing stencils into text ... 708
improvisationOff ... 41, 77
improvisationOn ... 41, 77
improvvisazione ... 41
include-settings ... 487
including files ... 481
indent ... 198, 511, 544
indicating No Chord in ChordNames ... 399
indicating position and barring for fretted instruments ... 367
indicazione di tempo ... 61
indicazione di tempo, impostazioni predefinite ... 62
indicazione di tempo, stile ... 62
indicazione di tempo, visibilità dell' ... 62
indicazione metronomica ... 66
indicazione metronomica con testo ... 66
indicazioni di tempo composto ... 75
indicazioni di tempo doppie ... 73
indicazioni di tempo polimetrico ... 73
indicazioni di tempo, ripristinare i valori predefiniti delle proprietà delle ... 64
indicazioni polimetriche ... 73
informazioni sul tempo e ripetizioni ... 149
inizio ripetizione ... 150
inlining an Encapsulated PostScript image ... 685
inner-margin ... 510
inserting music into text ... 693
inserting PostScript directly into text ... 688
inserting URL links into text ... 689
inStaffSegno ... 751
instrument names ... 197, 494
instrument names, adding to other contexts ... 199
instrument names, centering ... 198
instrument names, changing ... 199
instrument names, complex ... 197
instrument names, short ... 197
instrument switch ... 200
instrumentSwitch ... 200, 751
interface ... 716
interface, layout ... 573
Internals Reference ... 555
interruzioni di linea ... 94
interruzioni di linea, cadenze ... 72
interruzioni di linea, musica in tempo libero ... 72
interruzioni di linea, travature ... 80
interruzioni di pagina, cadenze ... 72
interruzioni di pagina, musica in tempo libero ... 72
interruzioni nella musica in tempo libero ... 72
inversion ... 751
inversione ... 13
inversione modale ... 15
invisible notes ... 212
invisible stem ... 215
ionian ... 21
ionio ... 21
italic ... 230

J

jazz chords ... 401
justified text ... 235
justified-lines ... 241
justify ... 235
justifying lines of text ... 709
justifying text ... 674

K

keep tagged music ... 484
keepWithTag ... 751
key ... 20, 39, 751
key signature ... 423, 427
key signature, visibility following explicit change ... 595
keyboard instrument staves ... 310
keyboard music, centering dynamics ... 310
keyed instrument staves ... 310
KievanStaffContext ... 436
KievanVoiceContext ... 436
killCues ... 207, 751
kirchenpausen ... 59

L

label ... 751
laissez vibrer ... 51
laissezVibrer ... 51
language ... 751
languageRestore ... 751
languageSaveAndChange ... 751
large ... 209, 232
larger ... 231, 232
last-bottom-spacing ... 509
layers ... 593
layout file ... 516
layout interface ... 573
layout objects ... 715
ledger lines ... 187
ledger lines, internal ... 187
ledger lines, modifying ... 187
left aligning text ... 675
left-align ... 233
left-margin ... 509
legatura di frase ... 126
legatura di frase, definizione dei modelli di tratteggio ... 130
legatura di frase, metà continua e metà tratteggiata ... 129
legatura di portamento continua ... 126
legatura di portamento e ripetizioni ... 149
legatura di portamento puntata ... 126
legatura di portamento tratteggiata ... 126

legatura di portamento, definizione dei modelli di tratteggio per il fraseggio . . . 130
legatura di portamento, definizione del modello di tratteggio . . . 127
legatura di portamento, fraseggio metà continuo e metà tratteggiato . . . 129
legatura di portamento, fraseggio multiplo . . . 129
legatura di portamento, fraseggio simultaneo . . . 129
legatura di portamento, fraseggio, definizione dei modelli di tratteggio . . . 130
legatura di portamento, metà tratteggiata e metà continua . . . 127
legatura di valore . . . 50
legatura di valore e alterazione . . . 6
legatura di valore, laissez vibrer . . . 51
legature di frase . . . 129
legature di frase multiple . . . 129
legature di frase simultanee . . . 129
legature di portamento . . . 126
legature di portamento multiple . . . 126
legature di portamento simultanee . . . 126
legature di portamento, posizionamento manuale . . . 126
legature di portamento, sopra le note . . . 126
legature di portamento, sotto le note . . . 126
legature di portamento, stile . . . 126
legature di valore e accordi . . . 51
legature di valore e parentesi della volta . . . 51
legature di valore puntate . . . 52
legature di valore tratteggiate . . . 52
legature di valore, aspetto . . . 52
legature di valore, finali alternativi . . . 146
legature di valore, nelle ripetizioni . . . 146
legature di valore, posizionamento . . . 52
legature di valore, ripetizione . . . 51
lexer . . . 716
lheel . . . 712
lidio . . . 21
Ligatures . . . 416, 439
ligatures in text . . . 669
LilyPond grammar . . . 716
line breaks . . . 517
line, cross-staff . . . 314
line, staff-change . . . 314
line, staff-change follower . . . 314
`line-width` . . . 509, 544
lineette della travatura, direzione . . . 87
lineprall . . . 712
lines, grid . . . 217
lines, vertical between staves . . . 217
lingua, nomi delle altezze in un'altra . . . 7
lingua, nomi delle note in un'altra . . . 7
List of colors . . . 636
listing available fonts . . . 244
`locrian` . . . 21
locrio . . . 21
`longa` . . . 43
`longa` . . . 54
longfermata . . . 712
`lower` . . . 233
lowering text . . . 676
ltoe . . . 712
lunghezza delle note . . . 43
`ly:minimal-breaking` . . . 521
`ly:one-line-breaking` . . . 521
`ly:optimal-breaking` . . . 520
`ly:page-turn-breaking` . . . 520
`lydian` . . . 21
lyrics and melodies . . . 250
lyrics and tied notes . . . 271
lyrics on grace notes . . . 279
lyrics punctuation . . . 247
lyrics, aligning to a melody . . . 248
lyrics, aligning with sporadic melody . . . 561
lyrics, divided . . . 274
lyrics, entering . . . 247
lyrics, formatting . . . 247
Lyrics, increasing space between . . . 264
lyrics, keeping inside margin . . . 222
lyrics, positioning . . . 260
lyrics, repeating . . . 266
lyrics, repeats with alternative endings . . . 270
lyrics, shared among voices . . . 275
lyrics, skipping notes . . . 270
lyrics, using variables . . . 258

M

`m` . . . 395
maggiore . . . 21
`magnify` . . . 231
magnifying text . . . 661
`magstep` . . . 209, 586
`maj` . . . 395
`major` . . . 21
`major seven symbols` . . . 404
`majorSevenSymbol` . . . 402
makam . . . 450
makamlar . . . 450
`make-dynamic-script` . . . 124
`make-pango-font-tree` . . . 244
`makeClusters` . . . 163, 752
`makeDefaultStringTuning` . . . 752
manual staff changes . . . 311
`Manuali` . . . 1
maqam . . . 445
maqams . . . 445
marcato . . . 116, 712
margin, text running over . . . 222
`mark` . . . 106, 224, 752
`markLengthOff` . . . 68, 225
`markLengthOn` . . . 68, 225
marks, text . . . 224
`markup` . . . 224, 227, 228, 229
markup expressions . . . 229
markup mode, quoted text . . . 229
markup mode, special characters . . . 229
markup syntax . . . 229
markup text . . . 229
markup text alignment commands . . . 236
markup text padding . . . 237
markup text, aligning . . . 233
markup text, decorating . . . 236
markup text, framing . . . 236
markup text, justified . . . 235
markup text, multi-page . . . 241
markup text, wordwrapped . . . 235
markup, centering on the page . . . 235
markup, conditional . . . 468

markup, multi-line ... 234
markup, multi-page ... 241
markup, music notation inside ... 239
markup, score inside ... 240
markup-markup-spacing ... 509
markup-system-spacing ... 508
markuplist ... 228, 241, 242
markups, aligning ... 233
max-systems-per-page ... 511
maxima ... 43
maxima ... 54
measureLength ... 82, 114
measurePosition ... 70, 114
Medicaea, Editio ... 415
medium intervals ... 445
melisma ... 254, 258
melismata ... 254
melismi, con travature ... 80
melodia, mostrare i ritmi della ... 77
mensural ... 415
Mensural ligatures ... 424
mensural music, transcription of ... 184
MensuralStaff ... 180
MensuralStaffContext ... 418
MensuralVoiceContext ... 418
mensuration sign ... 420
mensurstriche layout ... 184
mergeDifferentlyDottedOff ... 167
mergeDifferentlyDottedOn ... 167
mergeDifferentlyHeadedOff ... 167
mergeDifferentlyHeadedOn ... 167
merging text ... 668
mezzosoprano, chiave di ... 17
mf ... 118
Microtones in MIDI ... 495
microtoni ... 8
MIDI ... 24, 492
MIDI block ... 494
MIDI context definitions ... 495
MIDI, articulations ... 495
MIDI, chord names ... 495
MIDI, instruments ... 494
MIDI, microtones ... 495
MIDI, Pitches ... 495
MIDI, quarter tones ... 495
MIDI, Rhythms ... 495
min-systems-per-page ... 511
minimum-Y-extent ... 525
minimumFret ... 329, 364
minimumPageTurnLength ... 520
minimumRepeatLengthForPageTurn ... 521
minor ... 21
minorChordModifier ... 403
minore ... 21
mirroring markup ... 689
misolidio ... 21
misura ... 61
misura parziale ... 70
misura, numeri ... 101
misura, raggruppamenti ... 87
misura, ripetizioni ... 154
misura, sottoraggruppamenti ... 87
misura, stanghette ... 94
misura, stanghette manuali ... 94
mixed ... 316
mixolydian ... 21
modale, inversione ... 15
modale, trasposizione ... 14
modali, trasposizioni ... 14
modalInversion ... 15, 752
modalTranspose ... 14, 752
mode ... 717
modern ... 28
modern, stile delle alterazioni ... 28, 29
modern-cautionary ... 29
modern-cautionary, stile delle alterazioni ... 28, 29
modern-voice ... 29
modern-voice-cautionary ... 29
modern-voice-cautionary, stile delle alterazioni ... 29
moderntab clef ... 342
modi ... 21
modi ecclesiastici ... 21
modificare gli abbellimenti ... 110
modifiers, in chords ... 395
mordent ... 712
mordente inferiore (\mordent) ... 116
mordente inferiore, giù ... 116
mordente inferiore, su ... 116
mordente superiore (\prall) ... 116
mordente superiore, giù ... 116
mordente superiore, su ... 116
movements, multiple ... 452
mp ... 118
multi-line markup ... 234
multi-line text ... 234
multi-page markup ... 241
MultiMeasureRestText ... 58
music inside markup ... 239
Musica ficta ... 423
musica in tempo libero ... 71, 114
musica in tempo libero, alterazioni ... 71
musica in tempo libero, interruzioni di linea ... 72
musica in tempo libero, interruzioni di pagina ... 72
musica in tempo libero, numeri di battuta ... 71
musica in tempo libero, stanghette ... 71
musica in tempo libero, travature ... 71
musica parallela ... 177
musica per principianti ... 37
musica polifonica ... 167
musical cues ... 291
musicglyph ... 107
musicMap ... 752
musicological analysis ... 219
musicQuotes ... 717
mutable objects ... 716
mutable properties ... 716

N

N.C. symbol ... 399
name ... 569
name of singer ... 278
names, character ... 289
natural harmonics ... 323
neo-modern ... 30
neo-modern, stile delle alterazioni ... 30
neo-modern-cautionary ... 30
neo-modern-cautionary, stile delle alterazioni ... 30
neo-modern-voice ... 30

neo-modern-voice, stile delle alterazioni 30
neo-modern-voice-cautionary 31
neo-modern-voice-cautionary, stile delle alterazioni 31
neomensural 416
nested staff brackets 184
nesting of staves 184
new contexts 557
new spacing area 542
new staff 180
niente, al 121
no chord symbol 399
no-reset 31
no-reset, stile delle alterazioni 31
noBeam 91
nomi delle altezze 1
nomi delle altezze, altre lingue 7
nomi delle note predefiniti 5
nomi delle note, altre lingue 7
nomi delle note, olandese 5
nomi delle note, predefinito 5
non-ASCII characters 487
non-empty texts 221
non-musical symbols 238
non-text fonts in markup 242
nonstaff-nonstaff-spacing 525
nonstaff-relatedstaff-spacing 525
nonstaff-unrelatedstaff-spacing 525
noPageBreak 752
noPageTurn 752
normal repeat 143
normal-size-super 231
normalsize 209, 232
nota spaziatrice 56
nota, durata predefinita 43
nota, spostamento 167
notation font size 209
notation inside markup 239
notation, explaining 216
notation, graphic 238
notazione semplificata 37
note a forma variabile 39
note doppiamente puntate 43
note grouping bracket 219
note head styles 35, 658
note heads 209
note heads, ancient 421, 437
note heads, cross 35
note heads, diamond 35
note heads, diamond-shaped 323
note heads, guitar 35
note heads, harmonic 35
note heads, parlato 35
note puntate 43
note simultanee e alterazioni 32
note, divisione 76
note, durata delle 43
note, lunghezza delle 43
note, trasposizione delle 10
note-event 202
Note_heads_engraver 76
notes within text by log and dot-count 691
notes within text by string 691
notes, colored 213
notes, colored in chords 214
notes, cross-staff 311, 314
notes, ghost 214
notes, hidden 212
notes, invisible 212
notes, parenthesized 214
notes, smaller 203
notes, spacing horizontally 542
notes, transparent 212
null 233
NullVoice 275
numeri di battuta 101
numeri di battuta, cadenze 71
numeri di battuta, collisione 105
numeri di battuta, con lettere 103
numeri di battuta, con ripetizioni 103
numeri di battuta, controlli 105
numeri di battuta, musica in tempo libero 71
numeri di battuta, spaziatura regolare 101
numericTimeSignature 62
numero del gruppo irregolare, modifiche del 46
numero della misura e ripetizioni 149
numero di battuta 114
numero di battuta, allineamento 104
numero di battuta, formato 102
numero di ripetizione, modificare 150

O

objects, colored 213
objects, coloring 593
objects, overwriting 593
objects, rotating 598
objects, visibility of 592
octaveCheck 9, 752
omit 752
on-the-fly 468
once 752
oneVoice 163
open 712
open string indication 323
operazione, inversione 13
operazione, inversione modale 15
operazione, retrogradazione 14
operazioni, modali 14
operazone, trasposizione 14
oratorio 285
orchestral strings 322
organo, segni del pedale 116
ornamenti 108
ossia 190, 195
ottava 23, 752
ottava assoluta 1
ottava relativa 2
ottava relativa e accordi 4
ottava relativa e trasposizione 5
ottava, controllo 9
ottavazione 23
Ottoman music 450
outer-margin 510
output-count 717
output-def 716
output-suffix 717
outside-staff-horizontal-padding 539
outside-staff-padding 539

outside-staff-priority ... 539
overrideProperty ... 752
overrides, reverting ... 579
overrideTimeSignatureSettings ... 752
overriding for only one moment ... 579
overriding properties within text markup ... 706
overwriting objects ... 593

P

p ... 118
pad-around ... 237
pad-markup ... 237
pad-to-box ... 237
pad-x ... 237
padding ... 575
padding around text ... 237
padding text ... 677
padding text horizontally ... 677
page breaks ... 544
page layout ... 545
page numbers, auto-numbering ... 513
page numbers, specify the first ... 513
page numbers, suppress ... 513
page size ... 505
page, orientation ... 506
page-breaking ... 512
page-breaking-system-system-spacing ... 512
page-count ... 512
page-spacing-weight ... 513
pageBreak ... 752
pageTurn ... 752
palmMute ... 752
palmMuteOn ... 753
Pango ... 242
paper size ... 505
paper size, landscape ... 506
paper size, orientation ... 506
paper-height ... 507
paper-width ... 509
parallela, musica ... 177
parallelMusic ... 177, 753
parentesi della volta ... 150
parentesi della volta bracket con testo ... 151
parentesi della volta e legature di valore ... 51
parentesi uncinate (o angolari) ... 158
parentesi, stile nell'arpeggio attraverso il rigo ... 140
parentheses ... 214
parenthesize ... 214, 753
parlato ... 295
parlato note heads ... 35
parser ... 716
parser variable ... 717
part songs ... 285
partcombine ... 172, 753
partcombineApart ... 173
partcombineAutomatic ... 173
partcombineChords ... 173
partcombineDown ... 753
partcombineForce ... 753
partCombineListener ... 717
partcombineSoloI ... 173
partcombineSoloII ... 173
partcombineUnisono ... 173
partcombineUp ... 753
parte a due ... 172
parte solista ... 172
partial ... 70, 753
parziale, misura ... 70
paths, drawing ... 687
pausa ... 54
pausa d'intero ... 54
pausa di breve ... 54
pausa di longa ... 54
pausa di maxima ... 54
pausa ecclesiastica ... 59
pausa intera per una misura intera ... 57
pausa invisibile ... 56
pausa multipla ... 54
pausa multipla con testo a margine ... 58
pausa multipla, attaccare fermata ... 58
pausa multipla, attaccare testo ... 58
pausa multipla, espansione ... 58
pausa multipla, script ... 58
pausa mutlipla, contrazione ... 58
pausa spaziatrice ... 56
pausa, collisioni di ... 61
pausa, inserire le durate ... 54
pausa, specificare la posizione verticale ... 54
pausa, spostamento automatico ... 167
pause d'intero ... 57
pause multiple ... 57
pause multiple e diteggiature ... 61
pause multiple, posizionamento ... 60
pause, condensare ... 61
pause, divisione ... 76
pedal diagrams, harp ... 321
pedal indication styles ... 316
pedal indication, bracket ... 316
pedal indication, mixed ... 316
pedal indication, text ... 316
pedal sustain style ... 316
pedal, sostenuto ... 316
pedal, sustain ... 316
pedale, segni ... 116
pedals, harp ... 321
pedals, piano ... 316
pedalSustainStyle ... 316
percent ... 154
percentuale, ripetizioni ... 154
percussion ... 371, 373
percussion clef ... 371
percussion staff ... 180
Petrucci ... 415, 416
phrasing bracket ... 219
phrasing slur, dashed ... 129
phrasing slur, dotted ... 129
phrasing, in lyrics ... 254
phrasingSlurDashed ... 129
phrasingSlurDashPattern ... 130
phrasingSlurDashPattern ... 753
phrasingSlurDotted ... 129
phrasingSlurDown ... 129
phrasingSlurHalfDashed ... 129
phrasingSlurHalfSolid ... 129
phrasingSlurNeutral ... 129
phrasingSlurSolid ... 129
phrasingSlurUp ... 129
phrygian ... 21

piano ... 29
piano e alterazioni ... 29, 30
piano music, centering dynamics ... 310
piano pedals ... 316
piano staff ... 181
piano staves ... 310
piano, stile delle alterazioni ... 29
piano-cautionary ... 30
piano-cautionary, stile delle alterazioni ... 30
PianoStaff ... 310, 312
Pitch_squash_engraver ... 77
pitchedTrill ... 141, 753
Pitches in MIDI ... 495
pitchnames ... 717
pizzicato, Bartók ... 324
pizzicato, snap ... 324
placement of lyrics ... 260
placing horizontal brackets around text ... 686
placing parentheses around text ... 686
placing vertical brackets around text ... 683
pointAndClickOff ... 753
pointAndClickOn ... 753
pointAndClickTypes ... 753
polifonia su un rigo singolo ... 163
polimetriche, indicazioni ... 73
pollice, segno del (\thumb) ... 116
polymetric scores ... 563
polyphony, shared lyrics ... 275
portamenti indeterminati verso il basso e verso l'alto ... 132
portato ... 116, 712
posizionamento della parentesi quadra del gruppo irregolare ... 45
posizionamento verticale delle dinamiche ... 120
posizionare pause multiple ... 60
postscript ... 238
power chords ... 368
powerChords ... 368
pp ... 118
ppp ... 118
pppp ... 118
ppppp ... 118
practice note heads ... 37
prall ... 712
pralldown ... 712
prallmordent ... 712
prallprall ... 712
prallup ... 712
predefined string tunings for fretted instruments ... 340
predefinedFretboardsOff ... 363
predefinedFretboardsOn ... 363
prima volta ... 143
principianti, musica ... 37
print-all-headers ... 513
print-first-page-number ... 513
print-page-number ... 513
printing chord names ... 399
printing order ... 593
printing reserved characters ... 229
printing special characters ... 229
prob ... 717
properties ... 576
properties, grob ... 578
property object ... 717
proprietà di disposizione automatica delle travature per le indicazioni di tempo ... 62
psalms ... 296
punctuation in lyrics ... 247
punto, note ... 43
pure containers, Scheme ... 609
pushToTag ... 754
putting space around text ... 677

Q

Quarter tones in MIDI ... 495
quarto di tono ... 6
quote, voices ... 201
quoted text ... 221
quoted text in markup mode ... 229
quotedCueEventTypes ... 202
quotedEventTypes ... 202
quoteDuring ... 201, 203, 754
quotes in lyrics ... 247
quotes, in lyrics ... 254

R

r ... 54
R ... 57
ragged-bottom ... 507
ragged-last ... 510, 544
ragged-last-bottom ... 507
ragged-right ... 510, 544
raggruppamento dei gruppi irregolari ... 45
raise ... 233
raising text ... 678
rallentando in MIDI ... 495
Ratisbona, Editio ... 415
referencing contexts ... 557
referencing page labels in text ... 709
referencing page numbers in text ... 706
regular line breaks ... 518
relativa, ottava ... 2
relative ... 2, 5, 13, 313, 754
relative music and autochange ... 313
relativo ... 2
religious music ... 296
removals, in chords ... 397
remove tagged music ... 484
RemoveEmptyStaves ... 757
removeWithTag ... 754
removing cue notes ... 207
renaissance music ... 184
repeat with alternate endings ... 143
repeat, normal ... 143
repeatCommands ... 150
repeating lyrics with alternative endings ... 270
repeats and lyrics ... 266
repeats in MIDI ... 496
repeatTie ... 51
repetition, using **q** ... 330
reserved characters, printing ... 229
resetRelativeOctave ... 754
resizing of staves ... 190
respiri ... 130
rest ... 54
rest-event ... 202

restrainOpenStrings ... 329
rests or multi-measure-rests within text by log and dot-count ... 692
rests or multi-measure-rests within text by string ... 692
rests, ancient ... 422
retrogradazione, trasformazione ... 14
retrograde ... 14, 754
reverseturn ... 712
reverting overrides ... 579
revertTimeSignatureSettings ... 754
rfz ... 118
rgb color ... 214
rgb-color ... 214
rheel ... 712
rhythmic staff ... 180
RhythmicStaff ... 180
Rhythms in MIDI ... 495
ricopiate, ripetizioni ... 152
right aligning text ... 678
right hand fingerings for fretted instruments ... 365
right-align ... 233
right-margin ... 510
rightHandFinger ... 365, 754
ripetere le legature di valore ... 51
ripetizione con anacrusi ... 145
ripetizione e numero della misura ... 149
ripetizione, breve ... 154
ripetizione, fine ... 150
ripetizione, inizio ... 150
ripetizione, manuale ... 150
ripetizione, tremolo ... 156
ripetizione, uso di **q** ... 160
ripetizioni ... 97
ripetizioni alternate ... 152
ripetizioni annidate ... 149
ripetizioni con percentuale ... 154
ripetizioni della misura ... 154
ripetizioni e glissandi ... 149
ripetizioni e informazioni sul tempo ... 149
ripetizioni e legatura di portamento ... 149
ripetizioni ricopiate ... 152
ripetizioni, alternativa ... 152
ripetizioni, ambiguità ... 149
ripetizioni, con legature di valore ... 146
ripetizioni, numeri di battuta alternativi ... 148
ripetizioni, numeri di battuta con lettere ... 148
ripetizioni, unfold ... 152
ripristinare le proprietà predefinite delle indicazioni di tempo ... 64
ritmi di accompagnamento per chitarra, mostrare ... 77
ritmi di accompagnamento, mostrare ... 77
ritmi, mostrare la melodia ... 77
root of chord ... 395
rotating objects ... 598
rotating text ... 679
rounded-box ... 236
rtoe ... 712

S

s ... 56
Sacred Harp, testa di nota ... 39
sacredHarpHeads ... 39
sacredHarpHeadsMinor ... 39
SATB ... 285
scalable vector graphics output ... 491
scalare le durate ... 49
scaleDurations ... 50, 73, 754
scaling markup ... 689
scaling text ... 679
Scheme object ... 717
Scheme variable ... 717
Scheme, pure containers ... 609
Scheme, unpure containers ... 609
score inside markup ... 240
score-markup-spacing ... 508
score-system-spacing ... 508
scoreTitleMarkup ... 465
Scottish highland bagpipe ... 383
script ... 116
script su pausa multipla ... 58
scrivere la musica in parallelo ... 177
seconda volta ... 143
segni del pedale ... 116
segni del pedale dell'organo ... 116
segni di chiamata ... 106
segni di dinamica multipli su una nota ... 119
segni di dinamica nuovi ... 124
segni di dinamica, più di un segno su una nota ... 119
segni di tempo all'interno delle parentesi di un gruppo irregolare ... 49
segni di tremolo ... 157
segno ... 96, 107, 116, 712
segno del pollice (\thumb) ... 116
segno di bequadro ... 5
segno di chiamata manuale ... 107
segno di chiamata personalizzato ... 107
segno di chiamata, formato ... 107
segno di chiamata, stile ... 107
segno di modifica dell'ottava ... 2
segno di pausa ... 130
segno di spunta ... 131
segno manuale di ripetizione ... 150
segno on bar line ... 224
segno, di chiamata, formato ... 107
segno, di chiamata, stile ... 107
selecting font size (notation) ... 209
self-alignment-X ... 525
Semai form ... 448
semi-bemolle ... 6, 8
semi-diesis ... 6, 8
Semi-flat symbol appearance ... 446
semicirculus ... 712
separate text ... 227
sesqui-bemolle ... 8
sesqui-diesis ... 8
set ... 82
set-octavation ... 23
setting extent of text objects ... 709
setting horizontal text alignment ... 672
setting subscript in standard font size ... 662
setting superscript in standard font size ... 662
settingsFrom ... 754
seventh chords ... 395
sf ... 118
sff ... 118
sfz ... 118
shape ... 754

shaping slurs and ties . . . 605
shared properties . . . 716
shiftDurations . . . 754
shiftOff . . . 167
shiftOn . . . 167
shiftOnn . . . 167
shiftOnnn . . . 167
short-indent . . . 198, 511
shortfermata . . . 712
show-available-fonts . . . 244
showFirstLength . . . 490
showFirstLength . . . 717
showKeySignature . . . 383
showLastLength . . . 490
showLastLength . . . 717
showStaffSwitch . . . 314
signumcongruentiae . . . 712
simboli speciali di arpeggio . . . 138
simple closure . . . 715
simple text strings . . . 664
simple text strings with tie characters . . . 694
sincronizzazione degli abbellimenti . . . 112
singer name . . . 278
single . . . 754
skip . . . 56, 754
skipping notes in lyrics . . . 270
skipTypesetting . . . 490
slashChordSeparator . . . 403
slashed digits . . . 707
slashedGrace . . . 754
slides in tablature notation . . . 338
slur, dashed phrasing . . . 129
slur, dotted phrasing . . . 129
slur-event . . . 202
slurDashed . . . 126
slurDashPattern . . . 127, 754
slurDotted . . . 126
slurDown . . . 126
slurHalfDashed . . . 127
slurHalfSolid . . . 127
slurNeutral . . . 126
slurs, modifying . . . 605
slurSolid . . . 126
slurUp . . . 127
small . . . 209, 232
smaller . . . 231, 232
smaller notes . . . 203
smob . . . 717
snap pizzicato . . . 324
snappizzicato . . . 712
Sol, chiave di . . . 17
Solesmes . . . 415
soprano, chiave di . . . 17
sos. . . . 316
sostenuto pedal . . . 316
sostenutoOff . . . 316
sostenutoOn . . . 316
Sound . . . 492
Southern Harmony, testa di nota . . . 39
southernHarmonyHeads . . . 39
southernHarmonyHeadsMinor . . . 39
sp . . . 118
space between staves . . . 525
space inside systems . . . 525
spaces in lyrics . . . 247
spaces, in lyrics . . . 254
spacing . . . 541
spacing area, new . . . 542
Spacing lyrics . . . 264
spacing, display of layout . . . 551
spacing, horizontal . . . 540
spacing, vertical . . . 525
spacingTweaks . . . 755
Span_stem_engraver . . . 314
special characters . . . 487
special characters in markup mode . . . 229
speciali, teste di nota . . . 35
spezzato, arpeggio . . . 137
splice into tagged music . . . 484
spostamento automatico della pausa . . . 167
spostare le voci . . . 167
spostare una nota . . . 167
spp . . . 118
Sprechgesang . . . 295
spunta, segno di . . . 131
Square neumes ligatures . . . 429
staccatissimo . . . 116, 712
staccato . . . 116, 712
stacking text in a column . . . 668
staff change line . . . 314
staff changes, automatic . . . 312
staff changes, manual . . . 311
staff distance . . . 525
staff group . . . 181
staff initiation . . . 180
staff instantiation . . . 180
staff lines, modifying . . . 187
staff lines, stopping and starting . . . 187
staff size, setting . . . 516
staff switching . . . 314
staff symbol . . . 187
staff symbol, setting of . . . 587
staff, choir . . . 181
staff, drum . . . 180
staff, empty . . . 194
staff, Frenched . . . 190
staff, grand . . . 181
staff, hiding . . . 194
staff, multiple . . . 181
staff, nested . . . 184
staff, new . . . 180
staff, percussion . . . 180
staff, piano . . . 181
staff, resizing of . . . 190
staff, single . . . 180
staff-affinity . . . 525
staff-change line . . . 314
staff-staff-spacing . . . 525
Staff.midiInstrument . . . 494
Staff_symbol_engraver . . . 194
staffgroup-staff-spacing . . . 525
standalone text . . . 227
standard font size (notation) . . . 210
stanghette . . . 94
stanghette di chiusura . . . 94
stanghette doppie . . . 94
stanghette invisibili . . . 94
stanghette manuali . . . 94
stanghette predefinite, modifica . . . 100
stanghette, cadenze . . . 71

stanghette, definire ... 98
stanghette, musica in tempo libero ... 71
stanza number ... 277
start of system ... 181
start-repeat ... 150
startGroup ... 219
startStaff ... 187, 190
startTrillSpan ... 140
staves, keyboard instruments ... 310
staves, keyed instruments ... 310
staves, multiple ... 181
staves, nested ... 184
staves, piano ... 310
stem ... 215
Stem ... 314
stem, direction ... 215
stem, down ... 215
stem, invisible ... 215
stem, neutral ... 215
stem, up ... 215
stem-spacing-correction ... 541
stemDown ... 215
stemLeftBeamCount ... 91
stemNeutral ... 215
stemRightBeamCount ... 91
stems, cross-staff ... 314
stemUp ... 215
stencil ... 717
stencil, removing ... 592
stile del segno di chiamata ... 107
stile delle alterazioni *default* ... 28
stile delle alterazioni di precauzione *modern voice* ... 29
stile delle alterazioni *dodecaphonic* ... 31
stile delle alterazioni *forget* ... 31
stile delle alterazioni *modern* ... 28, 29
stile delle alterazioni *modern-cautionary* ... 28
stile delle alterazioni *modern-voice-cautionary* ... 29
stile delle alterazioni *neo-modern* ... 30
stile delle alterazioni *neo-modern-cautionary* ... 30
stile delle alterazioni *neo-modern-voice-cautionary* ... 31
stile delle alterazioni *no-reset* ... 31
stile delle alterazioni *piano* ... 29
stile delle alterazioni *piano-cautionary* ... 30
stile delle alterazioni *teaching* ... 31
stile delle alterazioni *voice* ... 28
stile delle alterazioni, *neo-modern-voice* ... 30
stile di alterazione ... 26
stile di alterazione predefinito ... 26
stile moderno delle alterazioni ... 28
stile, legatura di portamento ... 126
stili di voce ... 167
stopGroup ... 219
stopped ... 712
stopStaff ... 187, 190, 194
stopTrillSpan ... 140
storePredefinedDiagram ... 356, 755
string numbers ... 326
string vs. fingering numbers ... 326
string, indicating open ... 323
strings, orchestral ... 322
strings, writing for ... 322
stringTuning ... 341, 755
stringTunings ... 340, 352
strumenti traspositori ... 11
strumento traspositore ... 24
styledNoteHeads ... 755
styles, note heads ... 35
sub ... 231
subbasso, chiave di ... 17
subscript ... 231
subscript text ... 665
suggestAccidentals ... 423
super ... 231
superscript ... 231
superscript text ... 665
sus ... 397
sustain pedal ... 316
sustain pedal style ... 316
sustainOff ... 316
sustainOn ... 316
SVG output ... 491
switching fonts ... 230
switching instruments ... 200
syllable durations, automatic ... 250
symbols, non-musical ... 238
syntax, markup ... 229
system ... 181
system separator mark ... 186
system start delimiters ... 181
system start delimiters, nested ... 184
system-count ... 511
system-separator-markup ... 513
system-system-spacing ... 509
systems-per-page ... 511

T

tab clef ... 342
tabChordRepeats ... 755
tabChordRepetition ... 755
tablature ... 180, 325
tablature and harmonic indications ... 332
tablature and slides ... 338
tablature, banjo ... 325, 340, 370
tablature, bass ... 340
tablature, bass guitar ... 340
tablature, cello ... 340
tablature, custom string tunings ... 341
tablature, double bass ... 340
tablature, guitar ... 325, 340
tablature, mandolin ... 340
tablature, predefined string tunings ... 340
tablature, ukulele ... 340
tablature, viola ... 340
tablature, violin ... 340
tablatures, basic ... 328
tablatures, custom ... 340
tablatures, default ... 328
tabstaff ... 180
TabStaff ... 180, 328
TabVoice ... 328
tag ... 484
tag ... 755
tagliata, testa di nota ... 41
tante voci ... 167
taor ... 383
taqasim ... 448

teaching ... 31
teaching, stile delle alterazioni ... 31
teeny ... 209, 232
tempi polimetrici, con travature ... 73
Template Arabic music ... 448
tempo ... 61
tempo ... 66
tempo (all'interno della partitura) ... 114
tempo composto, indicazioni ... 75
tempo, polimetrico ... 73
tempo, stile ... 62
temporary ... 755
tenore, chiave di ... 17
tenuto ... 116, 712
terzina, formattazione della ... 46
terzine ... 45
testa di nota tagliata ... 41
testa di nota, Aiken ... 39
testa di nota, Christian Harmony ... 39
testa di nota, forma ... 39
testa di nota, Funk ... 39
testa di nota, Harmonica Sacra ... 39
testa di nota, improvvisazione ... 41
testa di nota, Sacred Harp ... 39
testa di nota, Southern Harmony ... 39
testa di nota, Walker ... 39
teste di nota facili da suonare ... 37
teste di nota speciali ... 35
teste di nota, esercizio ... 37
teste di nota, notazione semplificata ... 37
testo assegnato a una voce ... 163
testo nella parentesi della volta ... 151
testo su pausa multipla ... 58
testo, \skip ... 56
testo, con travature ... 82
text ... 316
text alignment commands ... 236
text columns, left-aligned ... 676
text columns, right-aligned ... 678
text in columns ... 234
text items, non-empty ... 221
text marks ... 224
text markup ... 229
text on bar line ... 224
text outside margin ... 222
text padding ... 237
Text scripts ... 221
text size ... 231
text spanners ... 222
text spanners, formatting ... 222
text spread over multiple pages ... 241
text, aligning ... 233
text, centering on the page ... 235
text, decorating ... 236
text, framing ... 236
text, horizontal alignment ... 233
text, justified ... 235
text, keeping inside margin ... 222
text, multi-line ... 234
Text, other languages ... 221
text, separate ... 227
text, standalone ... 227
text, top-level ... 227
text, vertical alignment ... 233
text, wordwrapped ... 235
textLengthOff ... 59, 221
textLengthOn ... 59, 221
textSpannerDown ... 222
textSpannerNeutral ... 222
textSpannerUp ... 222
Thorough bass ... 407
thumb ... 210
thumb ... 712
thumb-script ... 210
tieDashed ... 52
tieDashPattern ... 755
tieDotted ... 52
tieDown ... 52
tieNeutral ... 52
ties, in lyrics ... 254
ties, modifying ... 605
tieSolid ... 52
tieUp ... 52
time ... 61, 82, 755
time signatures ... 420
Time signatures, multiple ... 563
times ... 755
timeSignatureFraction ... 73
tiny ... 209, 232
tocItem ... 755
Top ... 1
top-level text ... 227
top-margin ... 507
top-markup-spacing ... 509
top-system-spacing ... 509
toplevel-bookparts ... 717
toplevel-scores ... 717
transcription of mensural music ... 184
translate ... 234
translate-scaled ... 234
translating text ... 679
transparent notes ... 212
transparent, making objects ... 592
transpose ... 5, 10, 13, 755
transposed clefs, visibility of ... 597
transposedCueDuring ... 207, 755
transposing fret diagrams ... 354
transposition ... 24, 201, 756
trasformazione retrograda ... 14
trasporre ... 10
trasporitori, strumenti ... 11
trasposizione ... 10
trasposizione dell'ottava ... 18
trasposizione delle altezze ... 10
trasposizione delle note ... 10
trasposizione e ottava relativa ... 5
trasposizione MIDI ... 24
trasposizione modale ... 14
trasposizione opzionale dell'ottava ... 18
trasposizione, chiave ... 18
trasposizione, MIDI ... 24
trasposizione, strumento ... 24
trasposizioni modali ... 14
travatura, direzione delle lineette della ... 87
travatura, estremità in una partitura ... 88
travatura, estremità in voci multiple ... 88
travature angolari ... 80
travature convergenti o divergenti ... 93
travature del tremolo ... 156
travature manuali ... 79, 90

travature manuali, abbellimenti ... 90
travature manuali, scorciatoia per impostare la direzione ... 90
travature, \partcombine con \autoBeamOff ... 80
travature, cadenze ... 71
travature, con melismi ... 80
travature, con tempi polimetrici ... 73
travature, con testo ... 82
travature, interruzioni di linea ... 80
travature, musica in tempo libero ... 71
travature, personalizzazione delle regole ... 79
travature, suddivisione ... 86
tre corde ... 316
`treCorde` ... 316
`tremolo` ... 156
tremolo, cross-staff ... 158
tremolo, segni ... 157
`tremoloFlags` ... 157
triads ... 395
`triangle` ... 238
`trill` ... 140
trill ... 712
trilli ... 140
trilli con alterazione ... 142
trilli con altezza ... 141
trilli con notina ... 141
trilli con notina e alterazione ... 142
trillo (\trill) ... 116
trills in MIDI ... 495
tuning, non-Western ... 444
tunings, banjo ... 371
`tuplet` ... 45, 73, 756
`tupletDown` ... 45
`tupletNeutral` ... 45
`TupletNumber` ... 46
`tupletNumberFormatFunction` ... 46
`tupletSpan` ... 756
`tupletSpannerDuration` ... 46
`tupletUp` ... 45
Turkish music ... 450
Turkish note names ... 450
turn ... 712
turns in MIDI ... 495
`tweak` ... 756
tweaking ... 580
tweaking control points ... 581
`two-sided` ... 510
`type` ... 569
typeface ... 715
typeset text ... 229

U

U.C. ... 316
ukulele ... 344
una corda ... 316
`unaCorda` ... 316
`underline` ... 230
underlining text ... 667
`undo` ... 756
`unfold` ... 152
unfold, finali alternativi ... 152
unfold, ripetizione ... 152
`unfoldRepeats` ... 756
`unHideNotes` ... 212
Unicode ... 488
unione delle parti ... 172
unire le note ... 167
unpure containers, Scheme ... 609
up bow indication ... 323
upbow ... 712
upmordent ... 712
upprall ... 712
UTF-8 ... 487

V

varbaritono, chiave di ... 17
varcoda ... 116, 712
variables ... 456
variables, use of ... 483
Vaticana, Editio ... 415
`VaticanaStaff` ... 180
VaticanaStaffContext ... 425
VaticanaVoiceContext ... 425
vertical lines between staves ... 217
vertical spacing ... 525, 545
vertical text alignment ... 233
`VerticalAxisGroup` ... 525
vertically centering text ... 680
verylongfermata ... 712
violino, chiave di ... 17
visibility of objects ... 592
visibility of transposed clefs ... 597
voce ... 163
voci multiple ... 167
voci, \partcombine con \autoBeamOff ... 80
voci, stili ... 167
`voice` ... 26, 28
`Voice` ... 163
voice, following ... 314
voice, stile delle alterazioni ... 28
`voiceOne` ... 163
voices, divided ... 287
voices, quoting ... 201, 203
`void` ... 756
volta ... 143
volta della ripetizione, modificare ... 150
volta, parentesi ... 150
volta, prima ... 143
volta, seconda ... 143

W

Walker, testa di nota ... 39
`walkerHeads` ... 39
`walkerHeadsMinor` ... 39
`whichBar` ... 100
White mensural ligatures ... 424
whitespace ... 456
wind instruments ... 380
`with-color` ... 213
`withMusicProperty` ... 756
`wordwrap` ... 235
`wordwrap-lines` ... 241
wordwrapped text ... 235

X

`X-offset` 525
x11 color 213, 214
`x11-color` 213, 214
`xNote` 756
`xNotesOn` 756