Everything You Wanted to Know About DVD-Audio

By Gary S. Hall

When someone says "DVD", what most people think of is DVD-*Video*, the now-familiar format supported by tens of millions of players. DVD-Video ("DVD-V") offers a great picture, random access and interactivity, and it has nice audio features, too.

DVD-Audio ("DVD-A") is the "other" DVD format, using the same physical medium with a different set of content definitions, trading off video features for truly awesome audio fidelity in stereo and surround. DVD-A also includes special navigation features for music listeners. For audio and music producers, DVD-Audio is a natural.

A new generation of DVD-A authoring tools now makes it easy and cost-effective to distribute stereo and multi-channel recordings of unprecedented fidelity in any quantity, with user extras such as menu navigation, artist photos, lyrics and liner notes. DVD-Audio / DVD-Video hybrid discs can be made fully compatible with all DVD players as well.

At present, DVD-V is more prevalent, but DVD-A is gaining popularity. The DVD-Video spec was finalized several years ago, and players and titles have been available since 1998. By contrast, the specification for DVD-Audio was only truly completed in 2001. Today, increasing number of DVD players support DVD-Audio as well as DVD-Video (at very attractive prices, too). The number of DVD-Audio titles is now increasing rapidly, as major record companies and specialty labels rush to take advantage of the format's special features

What Makes DVD-Audio So Great?
The table below compares the features of DVD-Video and DVD-Audio. Both can deliver stereo at higher fidelity than CD, which was set at 44.1kHz / 16-bit twenty years ago. DVD-Audio is capable of sample rates up to 192 kHz, while DVD-Video tops out at 96 kHz. Both DVD formats support PCM resolution up to 24 bits. In practice, DVD-Video titles rarely take advantage of the format's fidelity features, allocating the bulk of disc space to picture.

In DVD-Audio, nearly all disc space is given over to sound, and when it comes to surround, DVD-Audio wins hands down. In DVD-Video, multichannel audio is <u>always</u> data-compressed, using either Dolby Digital (AC-3) or DTS, inevitably affecting audio fidelity. DVD-Audio, on the other hand, can render up to six full-bandwidth channels at resolution up to 24 bits and sample rate up to 96 kHz.

DVD-Audio does not use lossy data-compression, but it does have an option for lossless *bit-packing* for multiple channels at higher bit-depths and sample rates. MLP (Meridian Lossless Packing) bit-packing is used exclusively, and guarantees bit-for-bit accuracy, eliminating any potential loss of fidelity.

DVD-Video and DVD-Audio also differ in some of their user interaction features. DVD-Video provides great full screen, full motion picture. DVD-Audio provides for motion video only in the context of a "hybrid" DVD-A / DVD-V disc, but provides for still

pictures with transition effects such as fades and wipes that can be navigated independently of audio. In DVD-Video, still pictures are always tied to sound, and it's impossible to switch to a different still picture without also interrupting the audio. Both formats use on-screen menus for navigation, but DVD-Video provides some additional options for trick menu designs and logic-driven interactivity.

Applications of DVD-A

DVD-Audio is obviously a great format for audiophile recordings and multi-channel music. The population of players in the field, still dwarfed by that of DVD-Video, is growing rapidly, thanks to low-cost combination players and increasing awareness of the format. Also, titles for release can be prepared in hybrid DVD-A / DVD-V format that will play on any DVD player.

DVD-Audio is tremendously useful to professionals creating audiophile and multi-channel surround material. It's the only low-cost standard format that can reproduce 24-bit / 192kHz stereo, or uncompressed high-res multi-channel surround accurately. With today's cheap DVD burners, sensibly priced authoring software, and inexpensive players, producers and artists can use DVD-Audio discs to exchange rough cuts, proofs, and high-resolution production elements.

DVD-Audio is also terrific for presentations. Marketeers and presenters know that compelling sound and music can multiply the impact of a presentation. With DVD-A's ultra-fi surround capabilities, and graphics (slides), the drama of a product showing or board presentation can be enhanced to the ultimate degree.

Tools for DVD-A

Until recently, tools for DVD-Audio were few, expensive, and difficult to use. That has now changed.

Minnetonka Audio Software offers the *discWelder* series for DVD-Audio, making the format cost-effective for a wide range of professional users. Presently, there are two versions available, both running under Windows. The program's small footprint makes it simple to network one or more discWelder stations in even Mac-centric production environments.

discWelder STEEL ($495) provides basic DVD-Audio capability, suitable for high-resolution reference discs or specialty releases. It is designed for extreme ease-of-use, and makes it very inexpensive to get started in DVD-Audio. discWelder STEEL supports all PCM sample rates and bit-resolutions for DVD-Audio, but does not provide for use of MLP-packed audio data, slide shows, or Video-hybrid capability.

discWelder CHROME ($2,495) offers enhanced DVD-A capabilities for professional production, including multi-still slide shows with transition effects, and navigation from multiple menus. The program is also capable of working with any DVD-Video authoring program on the market to format compatible DVD-A / DVD-V hybrid discs.

discWelder CHROME also supports import of MLP-packed audio source files. Minnetonka offers the only standalone software encoder available for MLP - *SurCode MLP* ($2,495), which offers advanced features for quick and successful MLP encoding, and works seamlessly with discWelder CHROME.

Both discWelder versions are easy to use, and highly productive, offering powerful DVD-Audio authoring at attractive prices. A few of the more exotic features of the format, however, still require toolsets that are both more expensive and substantially harder to use. DVD-A titles that include highly-complex graphic menu designs, links between DVD-Audio and DVD-Video content, and use of data-scrambling for copy protection, for the time being still require the use of expensive "standard" tools. These remaining gaps will be addressed in updates and future releases in the discWelder series.

	DVD-Video	DVD-Audio
Stereo Audio Options	Data-compressed (encoded): Dolby Digital (AC-3) OR Uncompressed: PCM at 16, 20 or 24-bit resolution, sample rate of 48 or 96 kHz	Uncompressed PCM at 16, 20, or 24-bit resolution. Sample rates from 44.1 (CD standard) to 192 kHz
Multichannel Surround Audio Options	5.1 discrete surround using Dolby Digital (AC-3) and / or DTS data compression	6-channel surround, uncompressed, at resolution up to 24 bits and sample rate of 96 kHz
Visual Presentation	Full motion video or still pictures (fixed presentation)	Still pictures only, with user navigation independent of audio. Video may be added to create DVD-V / DVD-A hybrid discs.
Interactivity	Extensive user interaction possible.	Limited user interaction possible

Comparison of the features of DVD-Video and DVD-Audio formats. Both formats are capable rendering stereo audio at fidelity higher than that of CD. For multi-channel surround, DVD-Video requires data compression - Dolby Digital (AC-3) or DT S - while DVD-Audio can render up to six channels of uncompressed audio at high bit- and sample-rates.