



DIGITAL AUDIO FOR PROFESSIONALS

## DOLBY® DIGITAL PLUS

Delivering the future of surround sound.



### **Dolby Digital Plus offers audio professionals new creative power and freedom.**

Dolby® Digital Plus is a highly sophisticated and versatile audio coding system that incorporates revolutionary new advancements in audio coding. Based on Dolby Digital (AC-3) technology, Dolby Digital Plus is designed specifically to adapt to the evolving demands of content delivery, and the capabilities of new storage media. Simultaneously, it retains compatibility with the millions of Dolby Digital home theater systems. Dolby Digital Plus has applications both in high-definition (HD) broadcast and in HD packaged media.

### **Dolby Digital Plus for Broadcast**

The latest improvements in video coding technology, such as the H.264 compression standard, offer broadcasters increased capacity and capability within the same spectrum they are using today. From the point of view of broadcast providers, this means offering more HD channels overall and more programs with multichannel audio. Yet consumers expect the same high audio quality they currently enjoy.

Dolby Digital Plus for broadcast provides this high quality with coding efficiencies that complement new video coding technologies. Dolby Digital Plus can deliver the same high-quality signal even more efficiently than

traditional Dolby Digital, with data rate improvements of up to 50 percent. Even with this improvement, content providers can be assured that their programming will have audio that is completely compatible with Dolby Digital home theater receivers (see diagram).

Dolby Digital Plus for broadcast is also the economical choice. Inside the set-top box, the Dolby Digital Plus bitstream is automatically converted to a Dolby Digital bitstream to feed the digital audio output, retaining compatibility with any Dolby Digital home theater system. Compared to coding systems that do not retain this compatibility, Dolby Digital Plus is easier and more economical to implement. New consumer media interfaces, such as HDMI, will allow the Dolby Digital Plus stream to be decoded inside A/V receivers for programs with more than 5.1 discrete channels, improved audio fidelity, and other features, thereby increasing the flexibility of delivery systems.

### **Dolby Digital Plus for Packaged Media**

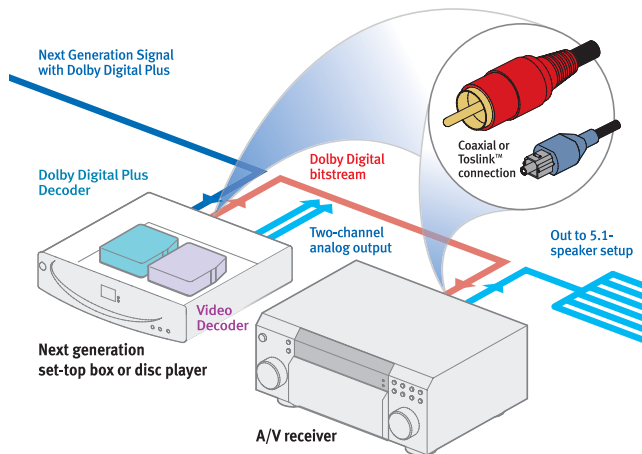
Upcoming advances in optical (such as HD DVD and Blu-ray Disc) and hard-disk-drive media storage, together with new video coding efficiencies, offer an unprecedented opportunity to create and deliver enhanced audio performances for higher-bandwidth environments.

Dolby Digital Plus provides the tools to take full advantage of this new potential. This powerful, next-generation audio codec elevates digital audio to new levels. Supporting data rates as high as 6 Mbps, Dolby Digital Plus allows content creators to deliver higher audio quality using less bit-rate reduction. The pristine mix can be delivered to the home with the same quality as in the studio.

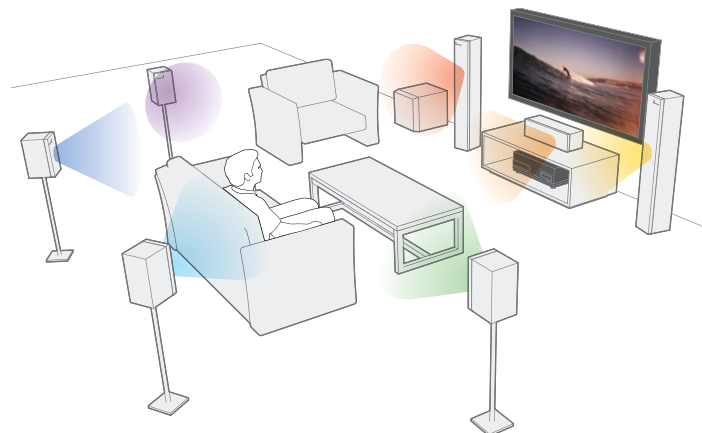
For content creators who want to expand the directionality and widen the soundfield of their audio mix, Dolby Digital Plus allows for fully discrete channel extensions up to 13.1 channels. Popular new 7.1 configurations have three channels across the front and four surround channels (see diagram), but future configurations will allow alternatives. Dolby Digital Plus provides a new freedom to create an involving and exciting mix.

Dolby Digital Plus is also ideal for interactive delivery of audio that can accompany future packaged media applications. For instance, viewers can watch a movie while listening to the director's commentary streamed from the studio website.

As the new HD formats take hold, consumers will increasingly demand this level of performance from all home entertainment programs.



Dolby Digital Plus Connected to A/V Receiver



Typical 7.1-Speaker Setup

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**Technical Advances**

The core of Dolby Digital Plus is based on the Dolby Digital format. It achieves its improved audio performance, coding efficiency, and channel and program extensions through several unique technical advances.

**Transient pre-noise processing** virtually eliminates pre-noise distortion often associated with “difficult to encode” transient material. A time scaling synthesis technique improves the “definition” of transient signals to give the listener a more accurate representation of the original signal.

**Enhanced channel coupling** adds phase compensation to the channel coupling process. Adjusting interchannel phase improves the dimensionality of the reproduced signal by restoring the original phase relationships at the decoder outputs. This improves the performance of matrix-based systems that rely on phase and amplitude information, such as Dolby Pro Logic® II.

**Adaptive hybrid transform processing** improves coding efficiency and quality by combining improved spectral resolution, higher-resolution bit allocation, and improved quantization techniques for pseudo-stationary signals. This also simplifies compatibility with existing Dolby Digital decoders.

**Software Differences Between Dolby Digital and Dolby Digital Plus**

	Dolby Digital	Dolby Digital Plus
Channels	1.0 to 5.1 discrete	1.0 to 13.1 discrete
Data rate	96–640 kbps	30 kbps–6 Mbps
Discrete sounds	Yes	Yes
Metadata parameters (dialogue normalization, dynamic range, downmixing)	Yes	Yes
Connection	S/PDIF or Toslink	IEEE 1394 HDMI™
Mixing/Streaming capabilities	No	Yes
Backward compatibility	Yes—analog output to Dolby Surround A/V receivers	Yes—S/PDIF to legacy A/V receivers
Availability	Current	Late 2005

**Dolby Laboratories, Inc.**  
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