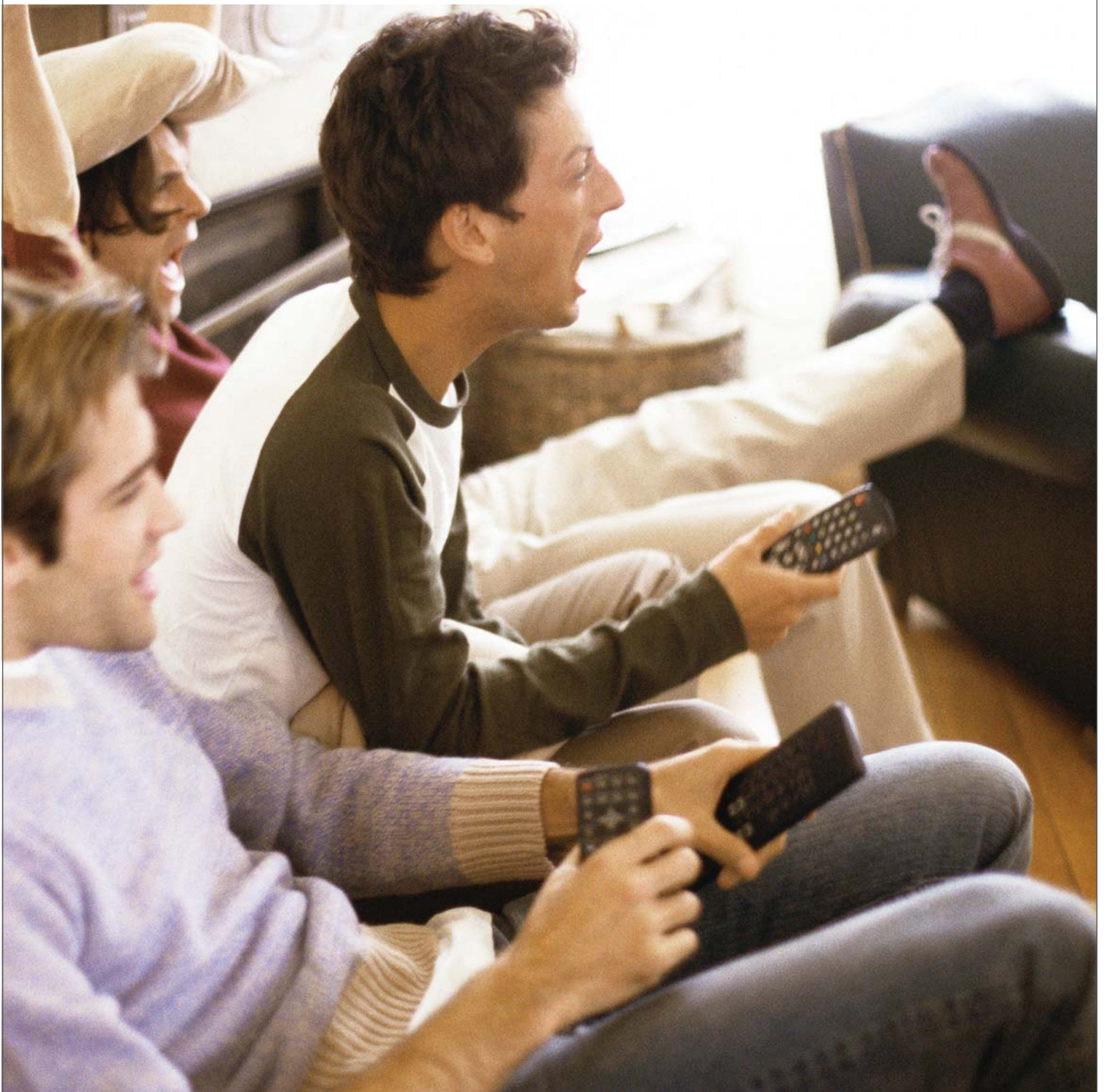




Turn Up the Broadcast Experience

Technology Overview



Dolby in Broadcast

In the cinema, in the home, and on the move, Dolby Laboratories is a leader in sound technology.



Dolby® technologies intensify the audio entertainment experience in cinemas, home cinema systems, DVD, broadcast, and gaming. Indeed, Dolby offers a comprehensive range of solutions that enables just about any entertainment medium to deliver realistic and involving sound. In broadcast, Dolby technologies and products make home viewing and listening experiences more realistic and compelling.

Flexible surround sound solutions enable broadcasters to deliver thrilling sound that captures and holds the audience's attention, no matter whether the service is analogue or digital. Back in the studio, the production of surround and multi-version content is made easy with Dolby production, distribution, and monitoring tools.

Dolby Technologies for Broadcast



Dolby Digital

Thrilling surround sound

Dolby Digital is a leading audio technology for digital entertainment. It combines outstanding audio quality and thrilling 5.1 surround sound capabilities to bring home audiences the same audio intensity as they get with Dolby Digital releases in the cinema. Dolby Digital is not only the format for nearly all DVD discs, but is also used extensively on digital satellite, cable, and terrestrial television services including DVB, ATSC, and SCTE systems.

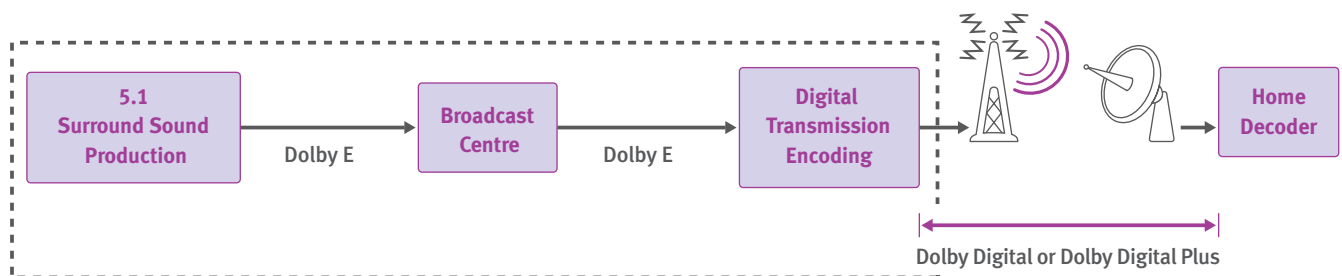
Dolby Digital Plus is an extension of Dolby Digital that enhances the technology for HDTV and other next-generation applications. Designed with new video codecs such as MPEG4 in mind, Dolby Digital Plus offers improved data rate efficiency as well as extended features for further flexibility in the future.

Dolby E

Making multichannel distribution easy

Dolby E helps broadcasters to distribute surround and multichannel audio throughout the broadcast chain prior to transmission. As a professional audio coding system, it enables broadcasters to carry up to eight channels of audio using existing stereo equipment, and can be carried by a single AES/EBU pair on digital videotapes, video servers, contribution links, switchers, and routers.

In addition to carrying multichannel audio, Dolby E carries metadata, which makes it a compelling solution for carrying 5.1 surround soundtracks prior to transmission as Dolby Digital or Dolby Digital Plus. Dolby E can be used within the broadcast infrastructure to carry multilingual or other multiple-version programming using existing stereo equipment.



Together, Dolby E, Dolby Digital, and Dolby Digital Plus deliver thrilling digital surround sound from the studio to the home



Turn Up The Broadcast Experience

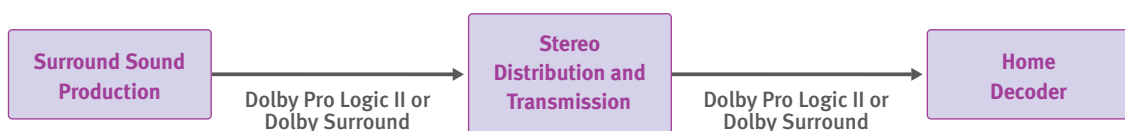
- > Movies
- > Dramas
- > Sports Broadcasts
- > Documentaries
- > Concerts and Events
- > Entertainment Shows

Dolby Pro Logic II

Immersive audio for two-channel media

Dolby Pro Logic® II enables broadcasters to carry convincing, realistic surround sound on their stereo-only services. By employing the latest matrix-steering techniques and two rear channels, the system gives realistic surround sound when the transmission medium is limited to 2 channels. Dolby Pro Logic II programmes are matrix-encoded onto two tracks during production, treated as stereo throughout the broadcast chain, and finally decoded back into surround sound by the home cinema or surround sound-equipped television.

Viewers with Dolby Pro Logic II home systems can also enjoy programming produced in Dolby Surround, the original Dolby matrix surround technology. Thousands of feature films and hundreds of television shows are available in Dolby Surround.



Broadcasting Dolby Digital

Dolby Digital delivers thrilling premium sound for digital entertainment



Thrilling surround sound for digital TV

Dolby Digital is an audio delivery system that enables high-quality 5.1 surround sound to be delivered to the home user via digital media such as DTV or DVD.

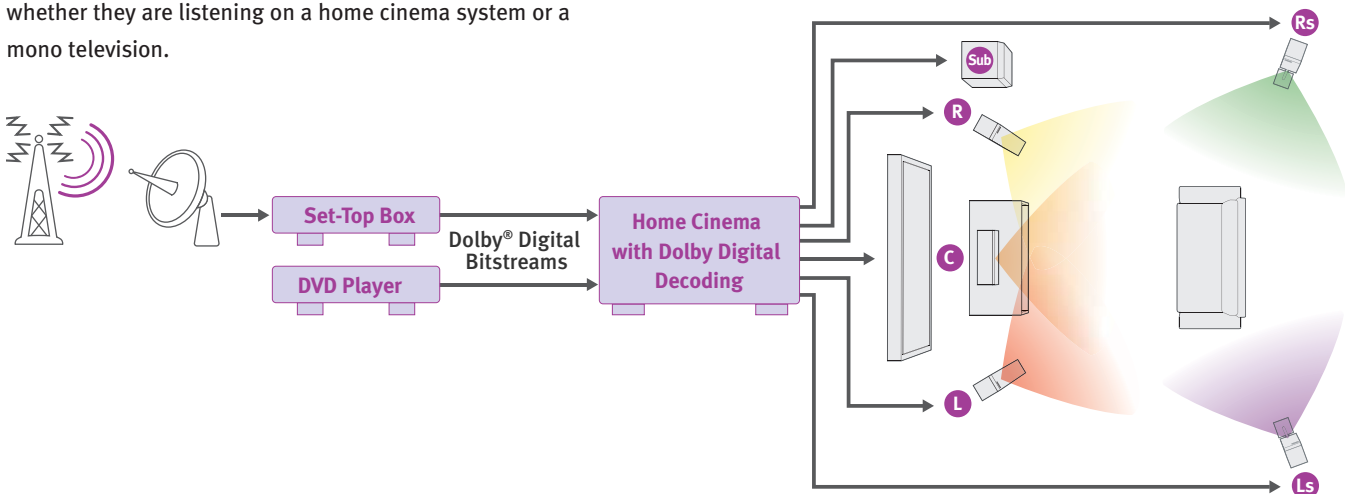
Dolby Digital surround sound offers clear dialogue and well defined positioning of sounds. Dolby Digital offers Left and Right Surround rear channels to immerse the viewer in atmospherics, and the 0.1 Low Frequency Effects (LFE) channel adds extra punch to action and special effects sequences. The technology can also deliver stereo- and mono-only soundtracks at extremely efficient data rates.

Metadata, which is information about the soundtrack, is combined with the audio signal into a single bitstream that can deliver high-quality audio for all listeners, regardless of whether they are listening on a home cinema system or a mono television.

Created when the programme is made, metadata controls how, for example, a set-top box will downmix a 5.1 soundtrack to stereo or mono for the analogue outputs. Metadata can also adapt the dynamic range of the audio stream to match the capabilities of the home equipment and adjust programme soundtracks to similar loudness levels without destroying the dynamics of the audio.

Simple to implement

In the broadcast facility, up to 5.1 channels of audio, including the accompanying metadata, are encoded as Dolby Digital just prior to multiplexing with the digital video.



Premium 5.1 surround sound for DVD and DTV



Dolby Digital Metadata

- › Optimizes audio for each individual home
- › Creates mono, stereo, and 5.1 versions from a single transmitted stream
- › Adjusts programmes to similar loudness levels without destroying dynamics
- › Adapts dynamic range for replay on large and small systems

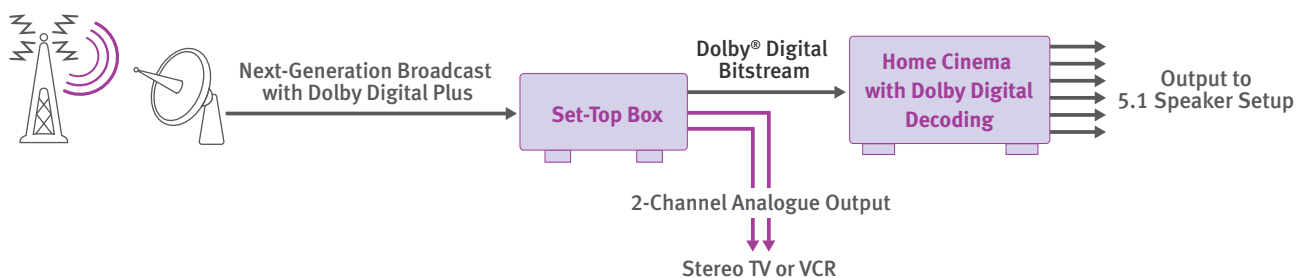
Encoding is available in dedicated Dolby broadcast products from leading broadcast manufacturers and, unlike simpler audio coding systems which require high data rates to ensure high quality, Dolby Digital gives outstanding quality 5.1 surround sound programming using as little as 384 kbps of bandwidth.

In the home, the viewer can connect any set-top box with a Dolby Digital bitstream output to a Dolby Digital home cinema system in order to enjoy the full 5.1 surround experience. Many set-top boxes also feature integral two-channel Dolby Digital decoding, enabling viewers with mono, stereo, or earlier Dolby Surround systems to benefit from enhanced Dolby Digital sound. This two-channel output can also be used to feed improved sound to devices such as stereo video recorders.

Dolby Digital Plus

Dolby Digital Plus is an enhanced version of the Dolby Digital technology, designed for use with next-generation video codecs, such as MPEG 4. It is even more spectrum efficient than conventional Dolby Digital, allowing more bandwidth space for HD video, and is capable of mono, stereo, and multichannel audio delivery. For full surround sound playback, set-top boxes equipped with Dolby Digital Plus can be connected to viewers' existing Dolby Digital home cinema systems via a single digital connection.

Dolby Digital Plus, already part of the DVB specification, also has built-in future flexibility, with new extensions providing the potential for additional channels or delivery of multiple soundtrack versions. Advanced stream mixing capabilities enable additional features, such as director's commentaries, plus improved provision for the visually impaired and hearing impaired. Dolby Digital Plus is included in the DVB specification and has been selected for the forthcoming HD disc formats, such as Blu-ray and HD-DVD.



Dolby Digital Plus is compatible with millions of existing Dolby Digital 5.1 home cinema systems

Working with Dolby E



Dolby E is a professional audio format that helps broadcasters to work with surround and multiple-version audio prior to broadcast. It does so by enabling them to carry up to eight audio channels plus metadata via the stereo AES/EBU audio channel found on existing professional broadcast equipment. Dolby E multichannel audio can be carried through an existing broadcast infrastructure and even recorded on conventional digital video tapes.

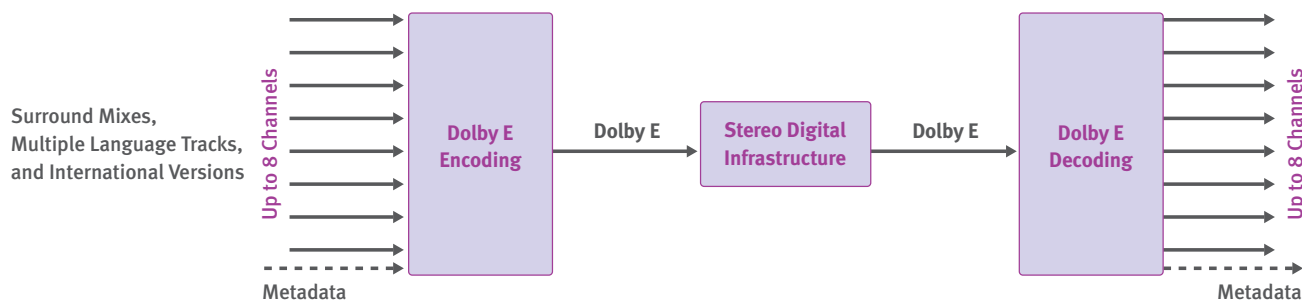
Easy to manage

Dolby E is exceptionally high quality and can be repeatedly encoded and decoded as required throughout the broadcast chain without any discernable loss of audio quality. It features audio frames that are synchronous with video frames, so that programmes can be switched and edited without having to decode the audio beforehand.

It also offers an easily quantifiable and manageable latency of exactly one frame per encode or decode, which makes it easy to keep audio and video in sync, regardless of the broadcast system's complexity.

Multiple versions

Dolby E carries metadata embedded within its bitstream and is designed to carry a 5.1 surround mix prior to transmission in Dolby Digital or Dolby Digital Plus. As it supports up to eight audio channels, a single Dolby E stream can carry a complete 5.1 surround soundtrack, as well as an alternative two-track version, all in the space previously used by a conventional stereo signal. The additional two tracks could be used for a stereo or Dolby Surround mix, a foreign language version, a specialised track for the hearing impaired, or even an international music and effects track.



Dolby E makes it possible to carry discrete digital multichannel audio via a standard stereo infrastructure



Dolby E makes it easy to carry multichannel audio before transmission

Moreover, Dolby E supports all common video frame rates (including 24P), which makes it the perfect format for creating master and archive versions.

Dedicated or integrated solutions

In addition to the Dolby range of dedicated Dolby E coder products, Dolby E encoding, decoding, and monitoring features are available as integrated features in many professional products from leading broadcast manufacturers. The Dolby E Partner Program supports OEM manufacturers in making products that are compatible with Dolby E and provides information about compatibility to broadcast users.

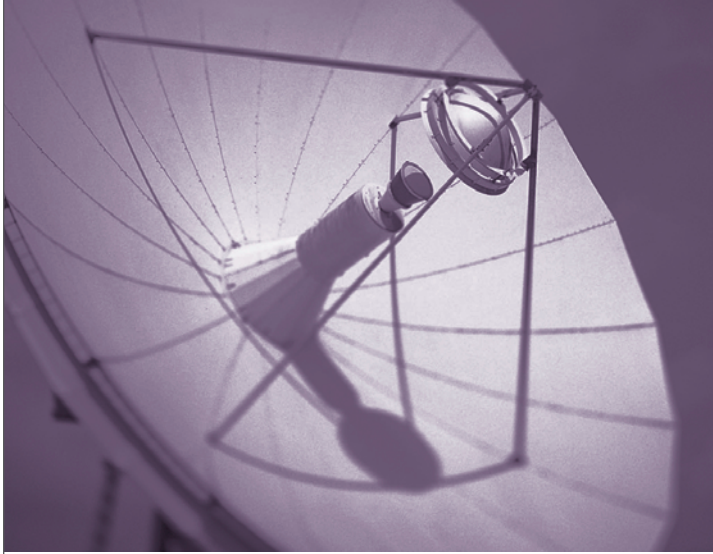
Dolby E Partners

Compatible products from Dolby E

Partners include:

- › Audio Mixing Consoles
- › Audio Delays
- › Editing Systems
- › Fibre Transport Systems
- › Servers
- › Routers
- › Switchers
- › SDI Embedders/Disembedders
- › Master Control Solutions
- › VTRs
- › Audio Monitoring Products
- › MPEG Encoders/Decoders

Dolby Pro Logic II and Dolby Surround Pro Logic



Immersive Dolby sound for two-channel media

Dolby Pro Logic II

Dolby Pro Logic II is the latest evolution of Dolby's original matrix surround technology, and is included as an extra feature in nearly all new Dolby Digital home cinema systems.

By enabling any two-track medium to carry convincing and compelling surround sound, broadcasters can complement Dolby Digital on digital services by using Dolby Pro Logic II to give a high-quality surround experience on their stereo-only services. Front Left, Centre, and Right channels, full-bandwidth stereo surrounds, improved steering matrix, and an exceptionally stable soundfield add realism and involvement. As a matrix technology, Dolby Pro Logic II enables the surround sound mix to be encoded during production on to two tracks, often called Left total/Right total or Lt/Rt. This encoded mix is then treated as stereo all the way through the broadcast chain, until it is decoded again in the home decoder. Encoded material is compatible with playback on Dolby Surround Pro Logic, stereo, and mono systems.

Dolby Pro Logic II encoding and monitoring tools are available as part of the Dolby professional product range. Integral downmixing features mean that only one surround mix needs to be made – to be used for Pro Logic II broadcast now, as well as for full Dolby Digital 5.1 tracks for DVD and broadcast, either now or in the future. Encoding and decoding plug-ins are also available for easy integration with audio workstations.

Dolby Surround Pro Logic

Dolby Surround Pro Logic is the original Dolby home matrix surround sound technology, and is featured in millions of home A/V receivers. Decoders with this technology offer Front Left, Centre, and Right channels plus a single band-limited 100Hz-7KHz surround channel, and thousands of feature films and hundreds of TV shows are available in the Dolby Surround format.



Dolby Laboratories, Inc.

Wootton Bassett, Wiltshire SN4 8QJ, England
Telephone (44) 1793-842100 Fax (44) 1793-842101
info@dolby.co.uk

100 Potrero Avenue, San Francisco, CA 94103-4813
Telephone (1) 415-558-0200 Fax (1) 415-863-1373
tvaudio@dolby.com

www.dolby.com

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