

# Advanced Audio Processing

DTS Neural Surround™ UpMix, DownMix and MultiMerge

DTS Neural Loudness Control



## Ease the Transition to 5.1 Audio in Today's Television Systems

Harris has integrated DTS Neural Surround™ and DTS Neural Loudness Control options into its market-leading audio and video processing products — providing a range of next-generation solutions that enable broadcasters to transition easily to 5.1 audio, manage today's advanced audio processes and enhance the overall consumer entertainment experience. DTS Neural Surround™ UpMix, DownMix and MultiMerge and the unique DTS Neural Loudness Control solution integrate easily with Harris signal processing products — including the X75™ all-in-one processor, the X85™ multiple application video and audio platform and the modular 6800+™ core processing and NEO® advanced processing platforms — to maintain proper video-to-audio timing for lip sync purposes and provide a more consistent, high-quality audio experience for the television viewer.

### Upmixing and Downmixing Audio

The video upconversion process has improved in quality and price to the point that SD signals are typically upconverted for HDTV systems and then downconverted when necessary. All editing/recording/playback can be done in the HD domain — eliminating the need for a completely separate SD editing/recording/playback system.

Audio can be treated in a similar fashion as video when it comes to upconversion. Today, it is possible to derive a natural-sounding surround sound signal from a stereo mix. The downmix process allows the carriage of a surround sound signal over a stereo path with inaudible surround sound information — a definite advantage for adding a surround sound mix into an existing stereo audio infrastructure. This stereo signal can be mixed, edited and monitored as a stereo signal. The upmix process recognizes the matrixed or “watermarked” surround sound information and uses it to reproduce the original signal.

### Upmixing Stereo to 5.1

Using patent-pending DTS Neural Surround technology, Neural Surround UpMix positions individual elements within the surround field, creating unparalleled image stability and granularity. This approach avoids taking “artistic license” with content by placing audio exactly where it would be heard in a professional Live End Dead End (LEDE) listening environment. Mono or panpot stereo will image in front of the listener, whereas stereo containing depth information will surround the listener.

The UpMix algorithm naturally surrounds the listener with the individual elements of the original stereo signal while minimizing distractions like dialog leakage. The result is an exciting surround experience that is often indistinguishable from original 5.1 content.

### Key Benefits

#### Economy

Enables you to move to 5.1 surround sound using your existing stereo audio infrastructure.

#### Proper Video-to-Audio Timing

Add an “upconvert” to your audio signal while upconverting your video signal to maintain proper video-to-audio timing.

#### Improved “Audio Experience”

Any audio signal can be processed to a pleasing 5.1 before compressing, and loudness control can be added for those annoying level changes that occur between differing programs and commercials.

#### Integrated, Efficient Signal Processing Workflow

DTS Neural Surround products have a fixed propagation delay with an additional user-settable delay. When integrated with Harris 6800+, NEO or X85/X75 products, a corresponding video delay can be easily added to maintain proper video-to-audio timing for correct lip sync.



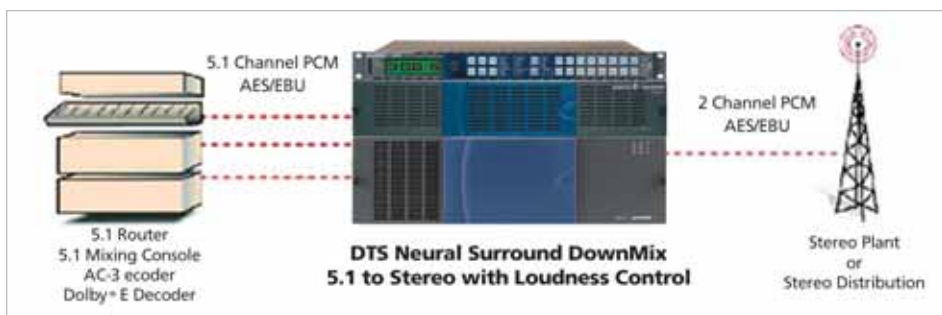
DTS Neural Surround UpMix is commonly used for audio monitoring, and in production studios and DTV facilities.

## Downmixing 5.1 to Stereo

The downmix process is based upon the principle that both natural stereo and 5.1 content are two-dimensional — both contain width and depth spatial attributes. DTS Neural Surround DownMix can represent six channels of discrete audio sources in a stereo downmix by transforming the source positions into pure intensity and coherence. By transforming signal sources, intensity, time, coherence, polarity and phase

into pure intensity and coherence before the six channels are combined, DownMix ameliorates problems suffered in traditional matrix encode systems (comb filtering, spatial distortion, etc.). This proprietary DTS Neural Surround process guarantees that surround information is faithfully reproduced when later rendered by UpMix. The stereo mix can be monitored, mixed, stored, edited and played back using a stereo audio

infrastructure. In brief, DTS Neural Surround DownMix produces a stereo downmix that accurately represents the original content — whether monitored in mono, stereo, matrix or 5.1 surround sound.

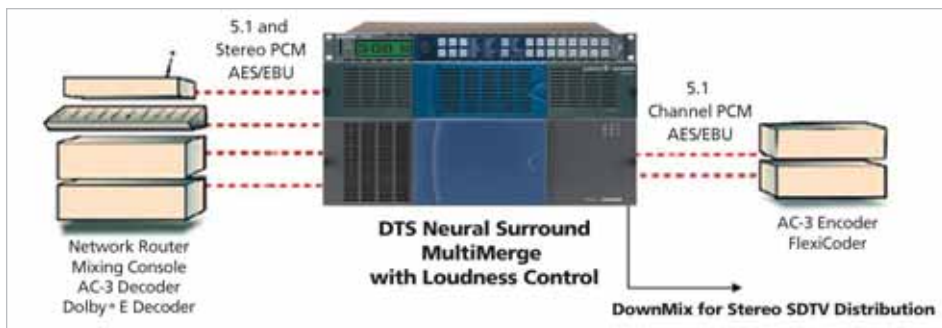


DTS Neural Surround DownMix is commonly used for audio monitoring, and in production studios and DTV facilities.

## MultiMerge 5.1 DTV Production Solution

DTS Neural Surround MultiMerge provides a 5.1 mix no matter what audio signal is provided at the input. The output provides seamless transitions between mono, stereo (LR), stereo matrix (LtRt), watermarked (LwRw) and true 5.1 mixes. This process provides viewers with a 24/7 surround broadcast. With

MultiMerge inline, 5.1 original content is passed unaffected within the broadcast plant, while original stereo content is rendered using an upmix process to a 5.1 surround sound image. The result is a consistent surround experience for the viewer.



DTS Neural Surround MultiMerge is commonly used in front of STL paths, Dolby E or AC-3 encoders.

## DTS Neural Loudness Control

DTS Neural Loudness Control provides a solution to TV broadcasters and network operators needing to manage perceived loudness levels within a specific desired volume range. Unlike traditional volume management solutions, this innovative solution uses a perceptual loudness measurement tool to model how the human ear will perceive the loudness of the audio content. This process accounts for many variables that can affect how audio is perceived, including spectral and density differences and temporal overlaps. By accounting for the human experience of listening, the solution's loudness measurement accommodates both stereo and multichannel audio equally well.

DTS Neural Loudness Control can be provided as an audio processing device on the 6800+ and NEO modular platforms or can be integrated into the UpMix, DownMix and MultiMerge — enabling users to solve audio problems using less equipment and rack space.

For more information, please visit: [www.dts.com](http://www.dts.com)

### **ONE Company for Workflow Solutions Throughout the Media Chain**

Harris is the ONE company delivering interoperable workflow solutions across the entire media delivery chain — providing today's broadcaster with a single, integrated approach to capitalize on the benefits of IT and mobile applications. By providing unparalleled interoperability across our product portfolio, Harris is able to offer customers integrated solutions that improve workflows, save money, enable new revenue streams and provide a migration path to emerging media business models. To meet the evolving needs of broadcast, distribution, government agencies and entertainment businesses, Harris is the ONE answer for change.

### **Service And Support**

At Harris, we are committed to customer service excellence. It is our goal to provide the highest level of support by applying a simple rule: We take ownership of helping our customers succeed. Our support teams consist of innovative technical experts who support all situations regarding product performance, integration and operational processing. We are adept at providing proven solutions, making workflows better and ensuring reliability of the product and system. At Harris, our experienced and dedicated teams stand ready to help you meet your goals for premium product performance, 100% up-time and reduced maintenance investment.

### **Warranty**

Because we want to assure you that Harris stands beside its products and system solutions, our products carry a standard set of warranty services, which are competitive with — and in some cases outperform — others in the industry.

### **Service Packages**

We offer value-add services that allow you to customize the level of services you need in meeting mission-critical performance levels. Our service package options offer many ways to upgrade your standard warranty by choosing the All-Inclusive OnePak, or by selecting individual services from our extensive portfolio. Our service and support advisors can assist in the selection of the individual services that best suit your requirements.

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