



OWNER'S GUIDE

Adobe Media Encoder

1 Overview

SurCode for Dolby Digital converts your 5.1 surround soundfiles to the Dolby Digital (also known as AC-3) format within **Adobe Premiere Pro**. It can also convert your stereo soundfiles to the Dolby Digital format, as well as mono soundfiles. Audio files encoded with **SurCode for Dolby Digital** will accurately playback (decode) with any Dolby Digital-capable receivers, as well as software or stand-alone hardware decoders.

SurCode for Dolby Digital allows up to three trial encodes before purchase is necessary. To purchase, click on the "Options" button at the upper right-hand side of the Main Screen (Upper Section - see Figure 3-1), and then click on the "Purchase" tab. The Purchase Options will be displayed there (see [section 8, The Purchase Page](#)). The number of remaining trial encodes will be displayed in the top area of the Main Screen (see Figure 8-2).

There are two versions of **SurCode for Dolby Digital** in **Adobe Premiere Pro** - the Adobe Media Encoder (the version you are now using), which makes MPEG and AC-3 files at the same time, and the SurCode Custom Compiler version, which will make an AC-3 file independently (without also making an MPEG2 video file). Both versions are accessible by clicking on File>Export on the menu bar.

Note: Please keep in mind that audio AC-3 encoding, much like video MPEG2 encoding, requires attention to the encode parameters in order to optimize the quality of the process for the type of signal you are encoding. We have included guidelines from several Dolby Digital documents at the end of this Owner's Guide (see [section 10, Dolby Digital Guidelines](#)). The information contained in Section 10 is by no means complete, and we recommend that you visit www.dolby.com for more information on the Dolby Digital Option parameters and how to optimize them for the audio material you will be encoding.

2 Why Encode?

The PCM (Pulse Code Modulation) audio track of a DVD-Video consumes a large amount of disc space. For example, two hours of PCM audio (at 48kHz 16-bit stereo) uses nearly 1.4GB of the DVD's 4.3GB of space.

Dolby Digital encoding is an excellent option for the audio tracks on a DVD-Video disc because it reduces the size of the audio files typically by a ratio of 12:1, yet still achieves excellent sound quality. **SurCode for Dolby Digital** can free up a considerable amount of space on the disc to allow for more video, or a higher-quality MPEG2 video encode rate.

All surround audio content on DVD-Video must be encoded. A 5.1 surround track encoded in Dolby Digital will take up less space than a stereo PCM track, and all Downmix Parameters can be set in the Dolby Digital Options (see [section 6, The Options Pages](#) and [section 7, The Advanced Options Page](#)) so the consumer can listen to the 5.1 surround mix in stereo if their playback system is stereo-only.

3 The *SurCode for Dolby Digital* Main Screen (Upper Section)

Figure 3-1 shows the *SurCode for Dolby Digital* Main Screen (Upper Section)..

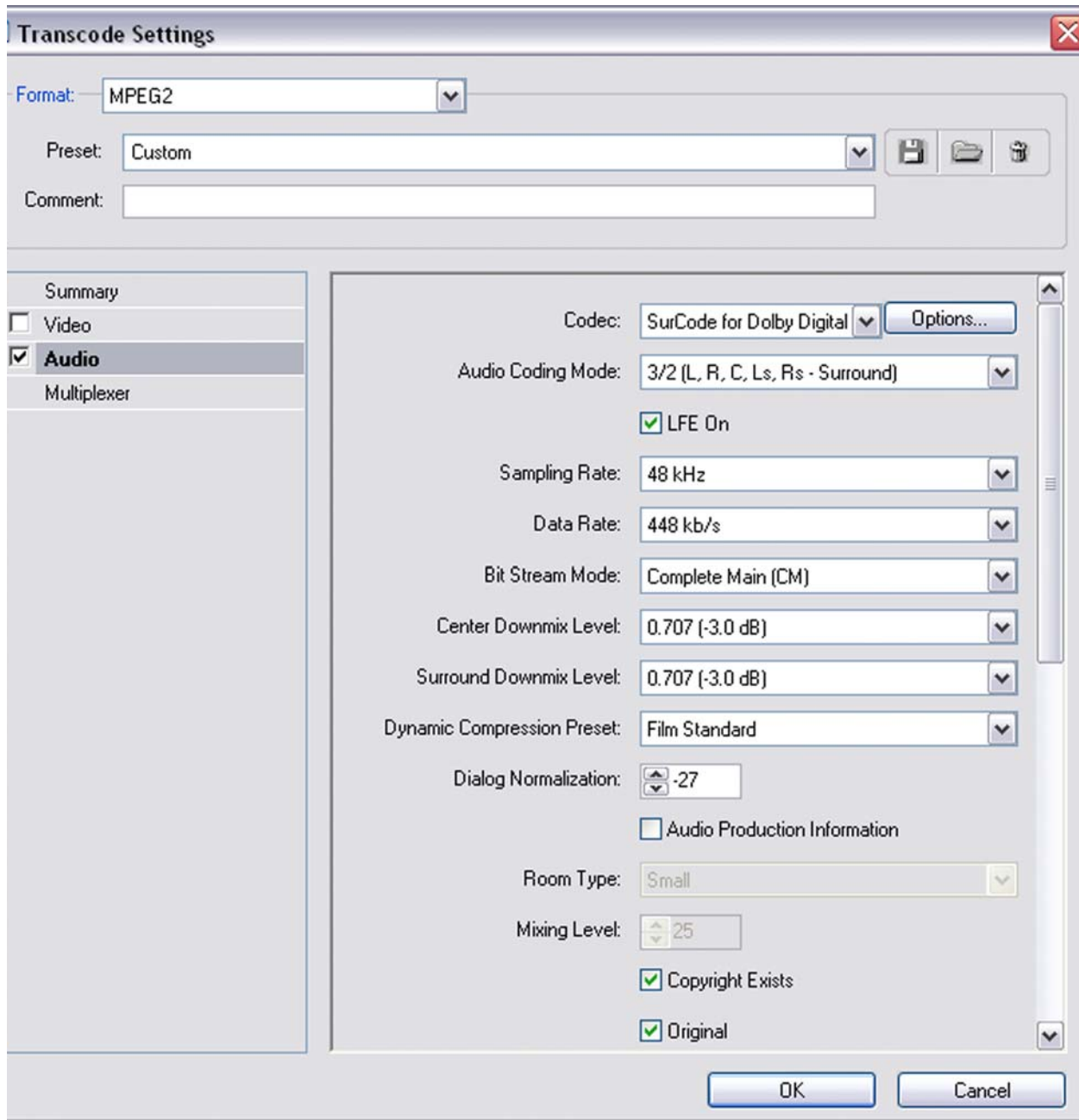


Figure 3-1

3.1 Codec

This pull-down window is where the type of codec is chosen, in this case **SurCode for Dolby Digital**.

3.2 Audio Coding Mode

This pull-down window selects the mono, stereo, or surround input soundfile mode (see Figure 3-2).

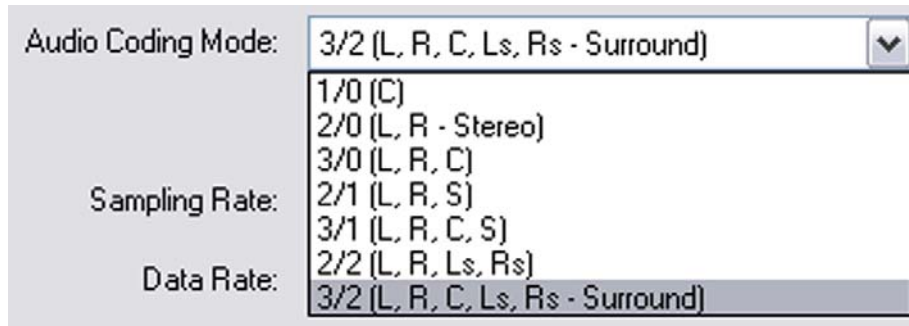


Figure 3-2

The available audio coding modes are:

1/0 = mono center channel

2/0 = left/right stereo

3/0 = left, center, right

2/1 = left, right, surround (mono surround)

3/1 = left, right, center, surround (mono surround)

2/2 = left, right, left surround, right surround

3/2 = left, right, center, left surround, right surround (5.1 surround mode when the “LFE” box is checked - see Figure 3-3).

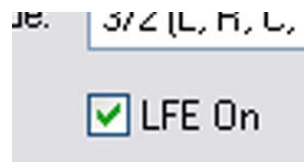


Figure 3-3

Figure 3.3 shows the “LFE On” box checked, which sets the audio mode to full 5.1 surround (the “.1” means that there is a Low Frequency Effect track, sometimes called the Subwoofer track). This should be checked only if there is an actual LFE track (see [section 10.8, LFE Channel](#)).

3.3 Sampling Rate

This window indicates/sets the soundfile sample rate (48, 44.1, or 32kHz). Note that DVD-Video accepts only the 48kHz sample rate (see [section 10.1, *Dolby Digital Encoding for DVD-Video*](#)).

3.4 Data Rate

This pull-down window sets the data rate for the encoded file. 448kb/s is the recommended rate for DVD-Video surround audio, and is the Default setting (see [section 10.1, *Dolby Digital Encoding for DVD-Video*](#)).

3.5 Bit Stream Mode

This pull-down window sets the bit stream mode for the type of content. The Default setting is “Complete Main” (CM)” (see [section 10.9, *Bitstream Mode*](#)).

3.6 Center Downmix Level

This pull-down window sets the amount of Center Channel attenuation by “-3dB”, “-4.5dB”, or “-6dB”. The Default setting is “-3dB” (see [section 10.12, *Center Downmix Level*](#)).

3.7 Surround Downmix Level

This pull-down window sets the amount of attenuation of the Surround Channels (Ls and Rs) by “-3dB”, “-4.5dB”, or “-6dB”. The Default setting is “-3dB” (see [section 10.13, *Surround Downmix Level*](#)).

3.8 Dynamic Compression Preset (also Dynamic Range Compression Preset)

This pull-down window sets the type of compression desired. The Default setting is “Film Standard” (see [section 10.7, *Dynamic Range Compression Profile*](#)).

3.9 Dialog Normalization

This up-down increment-button window sets the Dialog Normalization value (see [section 10.5, *Dialog Normalization Value \(dialnorm\)*](#)). The Default setting is “-27”.

3.10 Audio Production Information

This may also be included in the Bit Stream Information, if desired, by checking the box and choosing the appropriate mixing room sizes and mixing level. This is normally left unchecked.

3.11 Copyright Exists

When checked, this checkbox indicates that the encoded material is Copyrighted (see [section 10.10, *Copyright Bit*](#)).

3.12 Original

When checked, this checkbox indicates that the encoded material is original content (see section 10.11, *Original Bitstream*).

4 The *SurCode for Dolby Digital* Main Screen (Lower Section)

Figure 4-1 shows the **SurCode for Dolby Digital** Main Screen (Lower Section).

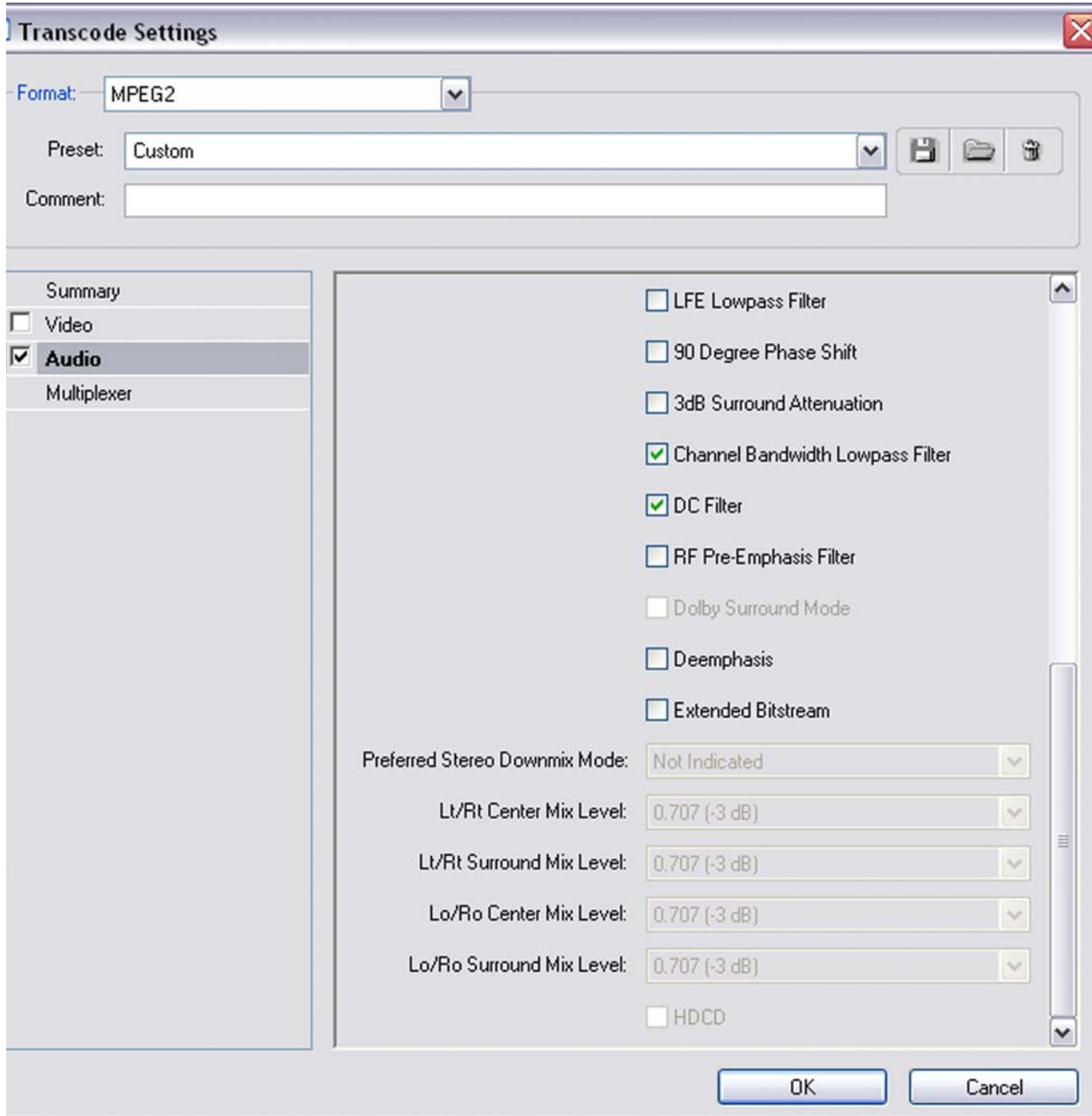


Figure 4-1

The checkboxes for “LFE Lowpass Filter”, “90 Degree Phase Shift”, “3dB Surround Attenuation”, “Channel Bandwidth Lowpass Filter”, “DC Filter”, “RF Pre-Emphasis Filter”, “Dolby

Surround Mode”, “Deemphasis”, and “Extended Bitstream” (with associated mode and level controls) shown in Figure 4-1 are part of the Dolby Advanced Options. Please refer to Dolby documentation for information on these parameters in order to set the checkboxes to other than default settings. Documentation is available at www.dolby.com, and <http://www.dolby.com/metadata/pa.st.0102.MDGuide.pdf>.

5 Encoding

Simply click on the "OK" button (see Figure 5-1).



Figure 5-1

6 The Options Pages

The "Options" pages can be accessed by clicking on the "Options" button at the upper right-hand side of the Main Screen (Upper Section - see Figure 3-1). The Options pages open first to the "Settings" page (see Figure 6-1).

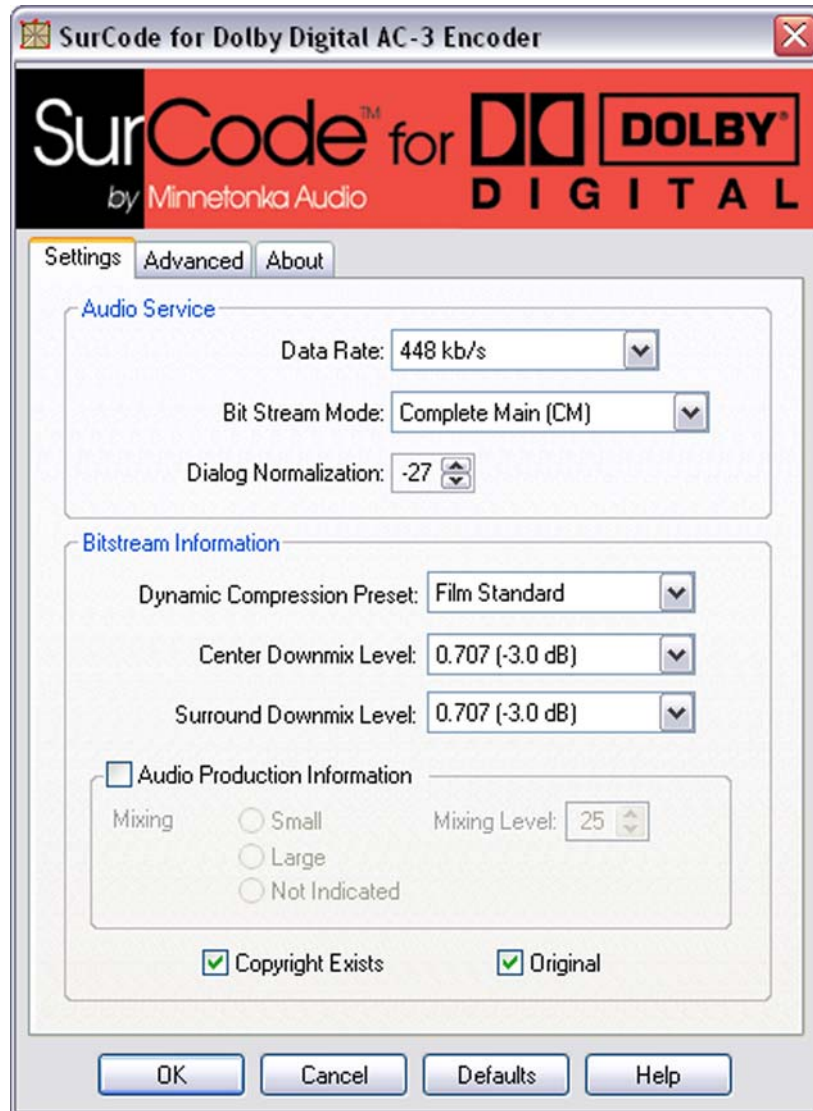


Figure 6-1

There are two sections on the Settings page: The "Audio Service" section; and the "Bitstream Information" section. There is an "Audio Production Information" area within the "Bitstream Information" section, and two checkboxes at the bottom of the page: "Copyright Exists" and "Original".

6.1 The Audio Service Section

There are three parameter windows in this Section:

- Data Rate: This pull-down window sets the data rate for the encoded file. 448kb/s is the recommended rate for DVD-Video surround audio, and is the Default setting (see [section 10.1, *Dolby Digital Encoding for DVD-Video*](#)).
- Bit Stream Mode: This pull-down window sets the bit stream mode for the type of content. The Default setting is “Complete Main” (CM)” (see [section 10.9, *Bitstream Mode*](#)).
- Dialog Normalization: This up-down increment-button window sets the Dialog Normalization value (see [section 10.5, *Dialog Normalization Value \(dialnorm\)*](#)). The Default setting is “-27”.

6.2 The Bitstream Information Section

There are three parameter windows in this section:

- Dynamic Compression Preset (also Dynamic Range Compression Preset): This pull-down window sets the type of compression desired. The Default setting is “Film Standard” (see [section 10.7, *Dynamic Range Compression Profile*](#)).
- Center Downmix Level: This pull-down window sets the amount of attenuation of the Center Channel by “-3dB”, “-4.5dB”, or “-6dB”. The Default setting is “-3dB” (see [section 10.12, *Center Downmix Level*](#)).
- Surround Downmix Level: This pull-down window sets the amount of attenuation of the Surround Channels (Ls and Rs) by “-3dB”, “-4.5dB”, or “-6dB”. The Default setting is “-3dB” (see [section 10.13, *Surround Downmix Level*](#)).

“Audio Production Information” may also be included in the Bit Stream Information, if desired, by checking the box and choosing the appropriate mixing room sizes and mixing level. This is normally left unchecked.

When checked, the “Copyright Exists” checkbox indicates that the encoded material is Copyrighted (see [section 10.10, *Copyright Bit*](#)). When checked, the “Original” checkbox indicates that the encoded material is original content (see [section 10.11, *Original Bitstream*](#)).

7 The Advanced Options Page

The “Advanced Options” page comes up when you click on the "Advanced" tab (see Figure 7-1).

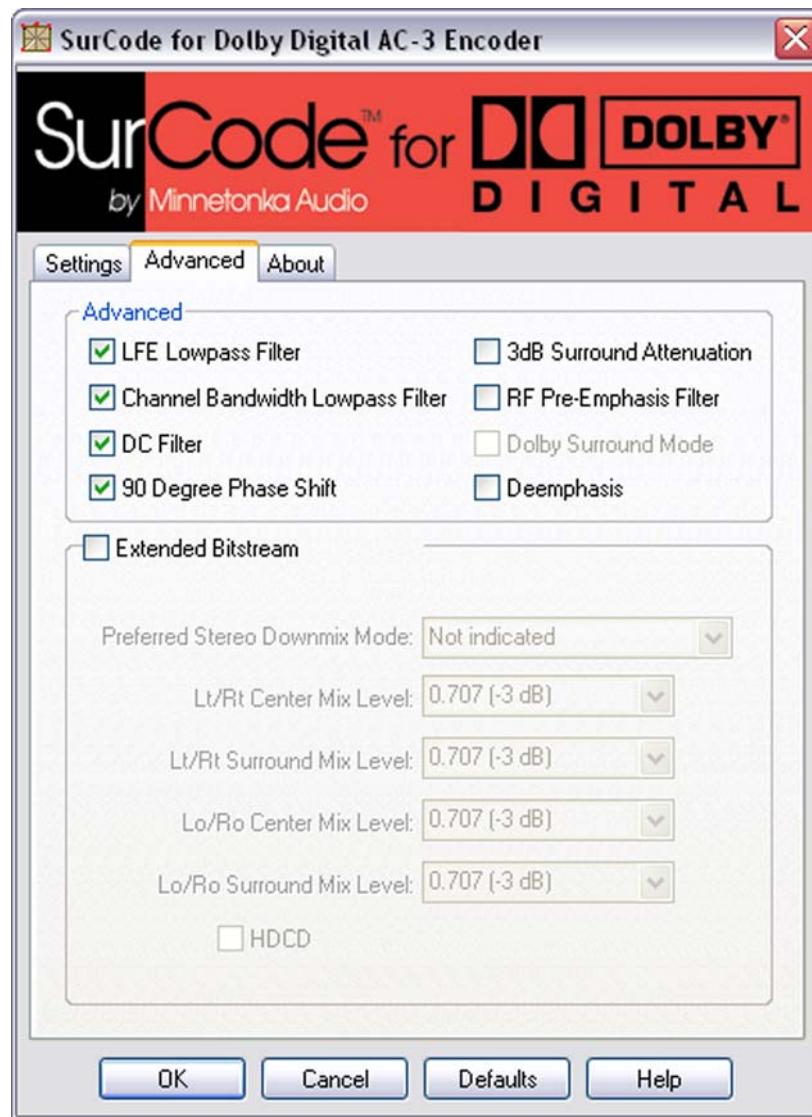


Figure 7-1

The use of these Advanced Options is explained in documents available as .pdf files on Dolby’s website at <http://www.dolby.com/metadata/pa.st.0102.MDGuide.pdf>.

Note: In the Adobe Media Encoder version (the one you are currently in), all Options selected become the Option Settings when a preset is saved (i.e. the Options selected have persistence). If the Audio Coding Mode changes between projects, the Settings will be reset to Default values for the selected Audio Coding Mode. **Be sure to check the Settings in each new project BEFORE you encode** (see [section 3.2, Audio Coding Mode](#)). Clicking on the “Defaults” Button will reset all Settings to their default values.

8 The Purchase Page

The “Purchase” tab is only visible if this program has not yet been purchased from Minnetonka Audio Software. This page shows the purchase options available for **SurCode for Dolby Digital** (see Figure 8-1)..

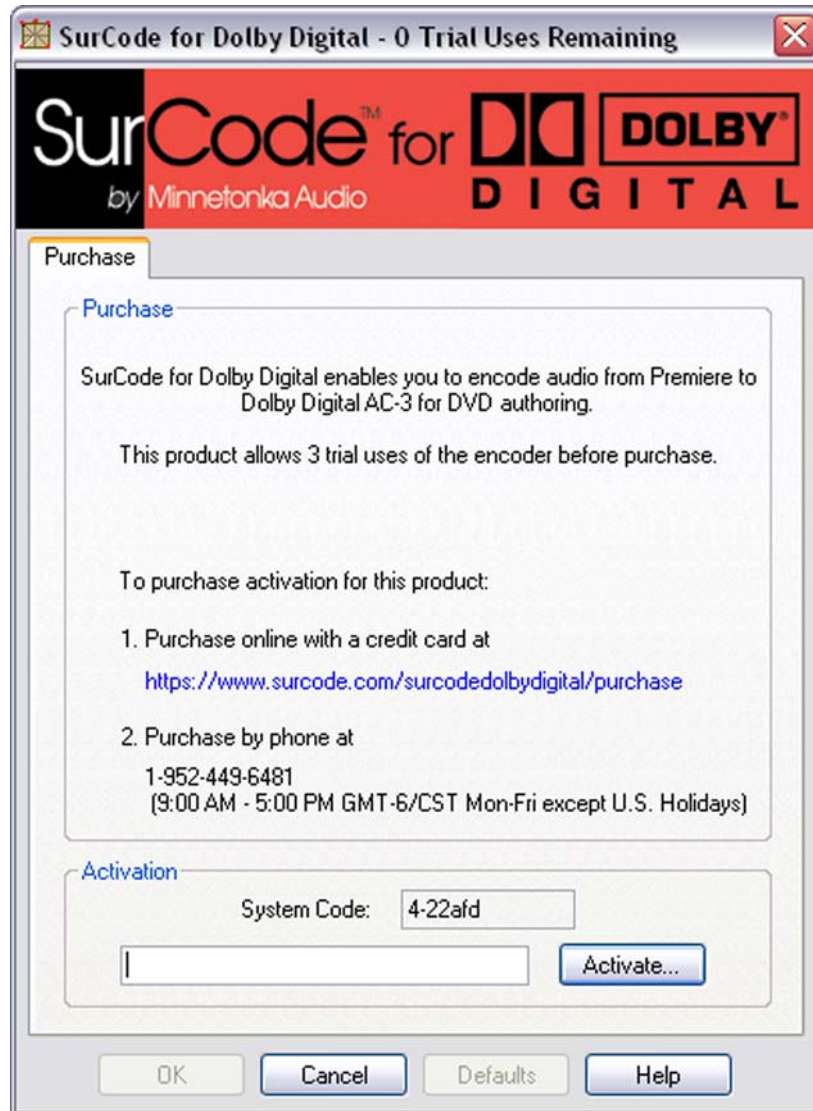


Figure 8-1

SurCode for Dolby Digital allows up to three trial encodes before requiring purchase. The number of trial encodes remaining is shown in the center of the “Purchase” section and in the top area of the Main Screen (Upper Section - see Figure 8-2).

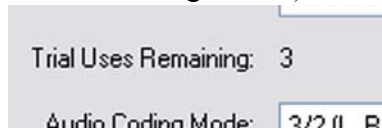


Figure 8-2

This page will no longer appear after you have entered the Authorization Code.

9 The About Page

This page shows information about the Version number, Copyrights, and Minnetonka Audio Software, Inc. Support, as well as the System Code number (see Figure 9-1).

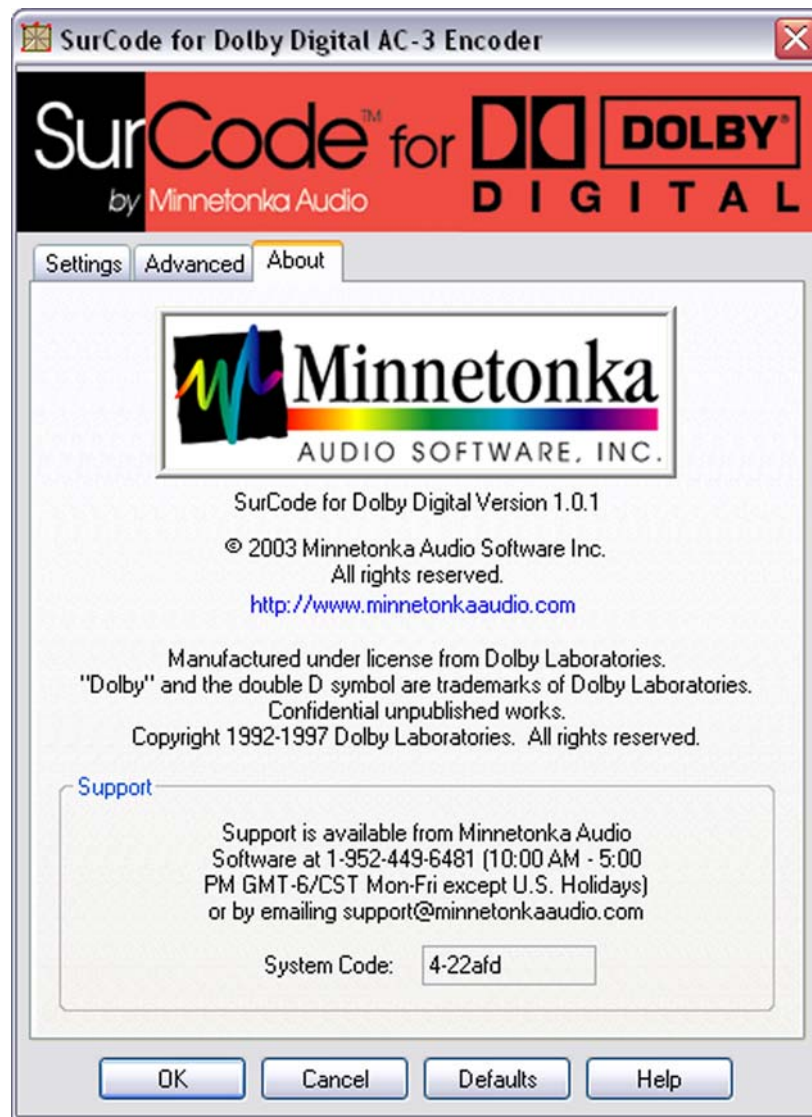


Figure 9-1

Support is available from:
Minnetonka Audio Software, Inc.
17113 Minnetonka Blvd. Suite 300
Minnetonka, MN 55345
phone 952-449-6481
fax 952-449-0318
tech@minnetonkaaudio.com
www.minnetonkaaudio.com
www.surcode.com

Copyright 2003

10 Dolby Digital Guidelines

This section contains guidelines from several Dolby Laboratories publications (available at www.dolby.com).

10.1 Dolby Digital Encoding for DVD-Video

When encoding audio content for DVD-Video authoring a few guidelines must be kept in mind:

- Always have at least two seconds of digital black silence at the beginning of the bitstream. This gives the large amount of digital circuitry in playback systems time to lock and start decoding before the real material starts playing. It is not necessary to leave digital black at the end of the file.
- Always encode at 448 kb/s data rate for multichannel material and at 192 kb/s for two-channel stereo material.
- Make sure the source material has a sample rate of 48 kHz, otherwise the sample rate of the material must be converted before the encoding begins. This is a necessary step since the specifications for the DVD-Video format allow only a 48 kHz sample rate.
- Start with the best quality material possible. Dolby Digital encoders can accommodate up to 24-bit audio.
- Select the most appropriate Dialog Normalization value and Dynamic Range Compression profile for the material. This is crucial since each type of material requires a different setting of these parameters.
- Select the appropriate values for each of the parameters. If the original material is Dolby Surround encoded, then enable the Dolby Surround flag. If mixing information exists fill-in the appropriate parameters. Many decoders react to these parameters so the correct values must be set.
- Do not enable the LFE Channel unless there is dedicated Low-Frequency Effects (LFE) material in the original audio source.
- Always monitor the encoded output with a professional reference decoder. Monitoring is the only way to check the integrity and accuracy of the encoded audio.

10.2 Music on DVD-Video

One exploding area in the DVD-Video format is the music disc. Since the introduction of DVD-Video there have been many titles authored exclusively with music content. The purpose of these discs is to provide the consumer with high quality multichannel audio without the need to watch the video or maneuver with software menus and buttons. The main goal is to have these discs behave as audio compact discs from an authoring standpoint. The user can insert the disc in the player without turning on the TV to listen to the content. There are many video options the authoring engineer can choose from. Some discs have been authored to display one video slide throughout an entire song, some display rolling credits and lyrics, and some display a live or studio produced music video.

10.3 Supported Data Rates

When encoding audio for DVD-Video one of the key parameters in the Dolby Digital encoder is the Data Rate. The DVD-Video specification requires every DVD-Video player to be able to decode Dolby Digital bitstreams up to and including 448 kb/s. Through its rigorous licensing program, Dolby Laboratories guarantees that every DVD-Video player on the market is capable of decoding a Dolby Digital bitstream at 448 kb/s.

Dolby Laboratories recommends that all multichannel (more than two-channel) material is encoded at 448 kb/s and that all two-channel stereo content is encoded at 192 kb/s.

10.4 Trademark Usage

Dolby Laboratories encourages use of the Dolby Digital trademark to identify soundtracks and other audio programs that are Dolby Digital encoded. This is an effective way to inform listeners of the audio format, and the use of a standard logo promotes easy recognition in the marketplace. As with any trademark, the Dolby Digital logo may not be used without permission. Dolby Laboratories provides a royalty-free Trademark and Standardization Agreement (TSA) for companies who wish to use Dolby trademarks. The company that owns the program material being produced must sign this agreement. Recording studios or production facilities that provide audio production, encoding, or manufacturing services for outside clients generally do not require a trademark license.

[For further information, please contact Dolby Laboratories at www.dolby.com.]

10.5 Dialog Normalization Value (dialnorm)

The Dialog Normalization value is a Dolby Digital parameter that describes the long-term average dialog level of the associated program. It may also describe the long-term average level of programs that do not contain dialog, such as music. The Dialog Normalization value indicates how far the average dialog level of the encoded program is below digital 100% full scale (0 dBFS). This level is specified on an absolute scale ranging from -1 dBFS to -31 dBFS. Dolby Digital decoders attenuate programs based on the Dialog Normalization value in order to achieve uniform playback level. This parameter determines the audio reproduction level and affects other parameters and decoder operation.

[For further information, please contact Dolby Laboratories at www.dolby.com.]

10.6 Dynamic Range Control (DRC)

An important feature of Dolby Digital is that it conveys audio unaltered in dynamics. Unlike almost any previous broadcast medium, it therefore gives the listener the option to hear the program as the mixer intended, even if that means that it goes from scarcely audible to extremely loud.

Present analog broadcast processors force the program level towards full modulation of the transmitter for a substantial portion of the time, eliminating most of the dynamic range; an incidental benefit being an approximate normalization of listening level. In other words, the same device that reduces the dynamic range determines the average volume. With Dolby Digital there are no technical pressures to reduce dynamic range, and mean or average volume is addressed by

dialog normalization. Thus in Dolby Digital, the need for dynamic range compression can be considered independently of average listening levels.

After discrepancies in absolute or average volume have been reduced by the application of dialog normalization, many program items require no further processing for non-ideal listening conditions. Some program items, however, have too great a dynamic range for some listeners. An obvious example is the movie soundtrack; if the volume is set for satisfactory intelligibility of dialog, sounds such as explosions may be unacceptably loud when reproduced in the home. Another example is symphonic music; if the volume is set for comfort in loud passages, very quiet ones may be lost in the background noise. In contrast, news bulletins or rock music have little inherent dynamic range, and provided their absolute levels have been set appropriately there is no reason to apply dynamic range compression.

Dynamic Range Control incorporates both selectable dynamic range compression and automatic overload protection limiting. Dolby Digital encoders generate control words, `dynrng` and `compr`, which can be used in the decoder to compress and limit the dynamic range of a program. The Dynamic Range Compression profile algorithm is based on a simple audio loudness measurement. In contrast, overload protection limiting is based on the peak levels.

10.7 Dynamic Range Compression Profile

The Dynamic Range Compression profile (also referred to as a preset) determines the characteristic curve of the dynamic range compression algorithm. Dynamic Range Control generates `dynrng` and `compr` gain words during the encoding process. A Dolby Digital decoder uses these gain words to reduce the dynamic range of the audio program during playback. This feature can be disabled on the decoder (except when downmixing) by the user who desires program reproduction with the original dynamic range. Dynamic Range Compression can be set by selecting one of several built-in profiles. Six preset DRC profiles are available to content producers: Film Light, Film Standard, Music Light, Music Standard, Speech, and None. Each is applied in the pattern shown in Figure 10-1. In each case, the center of the null band is assigned to the dialogue level parameter setting, and the DRC profile is applied in relation to that level. Here are the details of the range for each profile.

Film Light

- Max Boost: 6 dB (below -53 dB)
- Boost Range: -53 to -41 dB (2:1 ratio)
- Null Band Width: 20 dB (-41 to -21 dB)
- Early Cut Range: -26 to -11 dB (2:1 ratio)
- Cut Range: -11 to +4 dB (20:1 ratio)

Film Standard

- Max Boost: 6 dB (below -43 dB)
- Boost Range: -43 to -31 dB (2:1 ratio)
- Null Band Width: 5 dB (-31 to -26 dB)
- Early Cut Range: -26 to -16 dB (2:1 ratio)

- Cut Range: -16 to +4 dB (20:1 ratio)

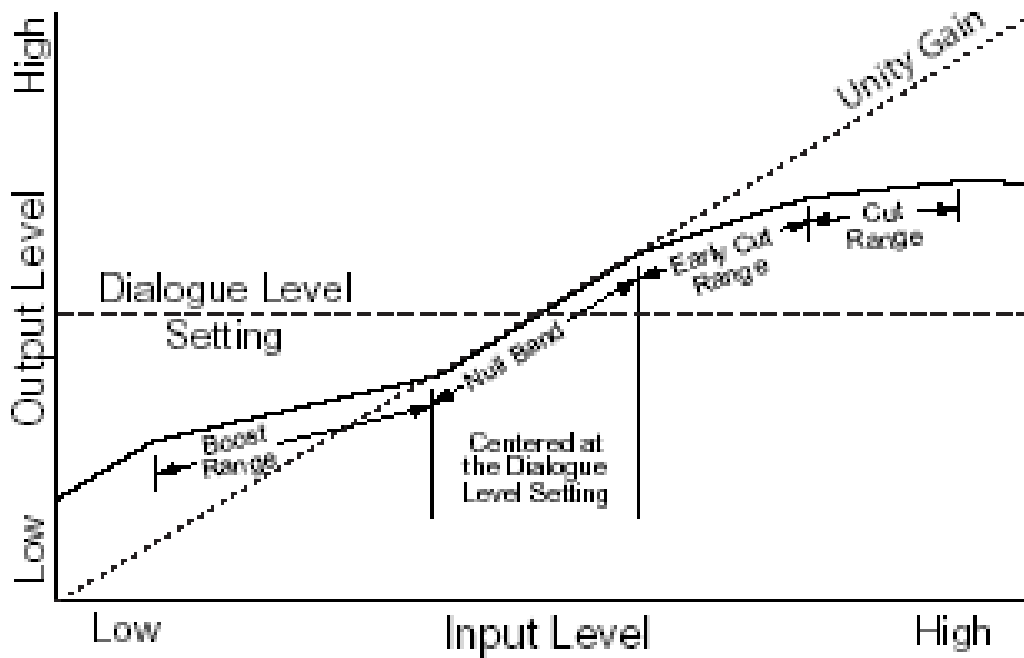


Figure 2 DRC Profile

Figure 10-1

Music Light (No early cut range)

- Max Boost: 12 dB (below -65 dB)
- Boost Range: -65 to -41 dB (2:1 ratio)
- Null Band Width: 20 dB (-41 to -21 dB)
- Cut Range: -21 to +9 dB (2:1 ratio)
- Dolby Laboratories, Inc. Metadata Guide

Music Standard

- Max Boost: 12 dB (below -55 dB)
- Boost Range: -55 to -31 dB (2:1 ratio)
- Null Band Width: 5 dB (-31 to -26 dB)
- Early Cut Range: -26 to -16 dB (2:1 ratio)
- Cut Range: -16 to +4 dB (20:1 ratio)

Speech

- Max Boost: 15 dB (below -50 dB)
- Boost Range: -50 to -31 dB (5:1 ratio)

- Null Band Width: 5 dB (-31 to -26 dB)
- Early Cut Range: -26 to -16 dB (2:1 ratio)
- Cut Range: -16 to +4 dB (20:1 ratio)

None

- No DRC profile selected. The dialogue level parameter (dialnorm) is still applied.

The content producer chooses which of these profiles to assign to each mode; when the consumer or decoder selects a DRC mode, the profile chosen by the producer is applied.

In addition to the DRC profile, metadata can limit signal peaks to prevent clipping during downmixing. This metadata, known as overload protection, is inserted by the encoder only if necessary. For example, consider a 5.1-channel program with signals at digital full scale on all channels being played through a stereo, downmixed linelevel output. Without some form of attenuation or limiting, the output signal would obviously clip. Correct setting of the dialogue level and DRC profiles normally prevents clipping and unnecessary application of automatic overload protection.

Note: DRC profile settings are dependent on an accurate dialogue level setting. Improper setting of the dialogue level parameter may result in excessive and audible application of overload-protection limiting.

10.8 LFE Channel

The status of the LFE Channel parameter indicates to a Dolby Digital encoder whether an LFE Channel is present within the bitstream. Channel mode determines whether the LFE Channel parameter can be set. You must have at least three channels to be able to add an LFE channel.

10.9 Bitstream Mode

- **Complete Main(CM):** CM flags the bitstream as the main audio service for the program and indicates that all elements are present to form a complete audio program. Currently, this is the most common setting. The CM service may contain from one (mono) to six (5.1) channels.
- **Main M&E (ME):** The bitstream is the main audio service for the program, minus a dialogue channel. The dialogue channel, if any, is intended to be carried by an associated dialogue service. Different dialogue services can be associated with a single ME service to support multiple languages.
- **Assc. Visual Imp.(VI):** This is typically a single-channel program intended to provide a narrative description of the picture content to be decoded along with the main audio service. The VI service may also be a complete mix of all program channels, comprising up to six channels.
- **Assc. Hear Imp. (HI):** This is typically a single-channel program intended to convey audio that has been processed for increased intelligibility and decoded along with the main audio service. The HI service may also be a complete mix of all program channels, comprising up to six channels.

- **Assc. Dialogue (D):** This is typically a single-channel program intended to provide a dialogue channel for an ME service. If the ME service contains more than two channels, the D service is limited to only one channel; if the ME service is two channels, the D service can be a stereo pair. The appropriate channels of each service are mixed together (requires special decoders).
- **Assc. Commentary (C):** This is typically a single-channel program intended to convey additional commentary that can be optionally decoded along with the main audio service. This service differs from a dialogue service because it contains an optional, rather than a required, dialogue channel. The C service may also be a complete mix of all program channels, comprising up to six channels.
- **Assc. Emergency (E):** This is a single-channel service that is given priority in reproduction. When the E service appears in the bitstream, it is given priority in the decoder and the main service is muted.
- **Assc. Voice Over (VO):** This is a single-channel service intended to be decoded and mixed to the Center channel (requires special decoders).
- **Main Sv Karaoke (K):** The bitstream is a special service for karaoke playback. In this case, the Left and Right channels contain music, the Center channel has a guide melody, and the Left and Right Surround channels carry optional backing.

10.10 Copyright Bit

This parameter indicates whether the encoded Dolby Digital bitstream is copyright protected. It has no effect on Dolby Digital decoders and its purpose is purely to provide information.

10.11 Original Bitstream

This parameter indicates whether the encoded Dolby Digital bitstream is the master version or a copy. It has no effect on Dolby Digital decoders and its purpose is purely to provide information.

10.12 Center Downmix Level

When the encoded audio has three front channels (L, C, R), but the consumer has only two front speakers (left and right), this parameter indicates the nominal downmix level for the Center channel with respect to the Left and Right channels. Dolby Digital decoders use this parameter during downmixing in Lo/Ro mode when Extended Bitstream Information parameters are not active.

10.13 Surround Downmix Level

When the encoded audio has one or more Surround channels, but the consumer does not have surround speakers, this parameter indicates the nominal downmix level for the Surround channel(s) with respect to the Left and Right front channels. Dolby Digital decoders use this parameter during downmixing in Lo/Ro mode when Extended Bitstream Information parameters are not active.