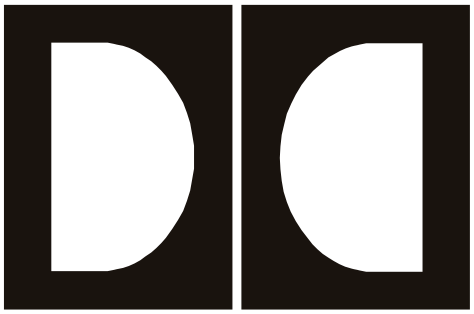

Dolby

Model DP570
Multichannel Audio Tool
User's Manual

Issue 2 Part Number 91753

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S01/13557/13905 Issue 2 Part Number 91753

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Regulatory Notices and Fusing Information

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Canada

This Class A digital apparatus complies with Canadian ICES-003.

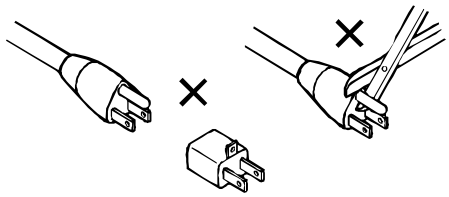
UL

WARNING: Troubleshooting must be performed by a trained technician. Do not attempt to service this equipment unless you are qualified to do so.

Check that the correct fuses have been installed. To reduce the risk of fire, replace only with fuses of the same type and rating.

Exposed portions of the power supply assembly are electrically "hot". In order to reduce the risk of electrical shock, the power cord MUST be disconnected when the power supply assembly is removed.

The ground terminal of the power plug is connected directly to the chassis of the unit. For continued protection against electric shock, a correctly wired and grounded (earthed) three-pin power outlet must be used. Do not use a ground-lifting adapter and never cut the ground pin on the three-prong plug.



UK

The power cord Dolby part 92021 supplied for use in Europe is not suitable for use in the UK. To use the cord in the UK cut off the CEE7/7 plug and replace with an approved BS 1363 13A plug:

- The core that is coloured green and yellow must be connected to the terminal in the plug identified by the letter E or by the earth symbol ⏚ or coloured green or green and yellow.
- The core that is coloured blue must be connected to the terminal that is marked with the letter N or coloured black.
- The core that is coloured brown must be connected to the terminal that is marked with the letter L or coloured red.
- This apparatus must be earthed.

EU

This equipment complies with the EMC requirements of EN55103-1 and EN55103-2 when operated in an E2 environment in accordance with this manual.

IMPORTANT SAFETY NOTICE

This unit complies with the safety standard EN60065. The unit shall not be exposed to dripping or splashing and no objects filled with liquids, such as coffee cups, shall be placed on the equipment. To ensure safe operation and to guard against potential shock hazard or risk of fire, the following **must** be observed:

GB

- Ensure that your mains supply is in the correct range for the input power requirement of the unit.
- Ensure **fuses** fitted are the **correct rating and type** as marked on the unit.
- The unit **must be earthed** by connecting to a correctly wired and **earthed** power outlet.
- The **power cord** supplied with this unit must be wired as follows:

Live—Brown Neutral—Blue Earth—Green/Yellow

IMPORTANT – NOTE DE SECURITE

Ce materiel est conforme à la norme EN60065. Ne pas exposer cet appareil aux éclaboussures ou aux gouttes de liquide. Ne pas poser d'objets remplis de liquide, tels que des tasses de café, sur l'appareil. Pour vous assurer d'un fonctionnement sans danger et de prévenir tout choc électrique ou tout risque d'incendie, veillez à observer les recommandations suivantes.

F

- Le selecteur de tension doit être placé sur la valeur correspondante à votre alimentation réseau.
- Les fusibles doivent correspondre à la valeur indiquée sur le materiel.
- Le materiel doit être correctement relié à la terre.
- Le cordon secteur livré avec le materiel doit être cablé de la manière suivante:

Phase—Brun Neutre—Bleu Terre—Vert/Jaune

WICHTIGER SICHERHEITSHINWEIS

Dieses Gerät entspricht der Sicherheitsnorm EN60065. Das Gerät darf nicht mit Flüssigkeiten (Spritzwasser usw.) in Berührung kommen; stellen Sie keine Gefäße, z.B. Kaffeetassen, auf das Gerät. Für das sichere Funktionieren des Gerätes und zur Unfallverhütung (elektrischer Schlag, Feuer) sind die folgenden Regeln unbedingt einzuhalten:

D

- Der Spannungswähler muß auf Ihre Netzspannung eingestellt sein.
- Die Sicherungen müssen in Typ und Stromwert mit den Angaben auf dem Gerät übereinstimmen.
- Die Erdung des Gerätes muß über eine geerdete Steckdose gewährleistet sein.
- Das mitgelieferte Netzkabel muß wie folgt verdrahtet werden:

Phase—braun Nulleiter—blau Erde—grün/gelb

NORME DI SICUREZZA – IMPORTANTE

Questa apparecchiatura è stata costruita in accordo alle norme di sicurezza EN60065. Il prodotto non deve essere sottoposto a schizzi, spruzzi e gocciolamenti, e nessun tipo di oggetto riempito con liquidi, come ad esempio tazze di caffè, deve essere appoggiato sul dispositivo. Per una perfetta sicurezza ed al fine di evitare eventuali rischi di scossa êlettrica o d'incendio vanno osservate le seguenti misure di sicurezza:

I

- Assicurarsi che il selettore di cambio tensione sia posizionato sul valore corretto.
- Assicurarsi che la portata ed il tipo di fusibili siano quelli prescritti dalla casa costruttrice.
- L'apparecchiatura deve avere un collegamento di messa a terra ben eseguito; anche la connessione rete deve avere un collegamento a terra.
- Il cavo di alimentazione a corredo dell'apparecchiatura deve essere collegato come segue:

Filo tensione—Marrone Neutro—Blu Massa—Verde/Giallo

AVISO IMPORTANTE DE SEGURIDAD

Esta unidad cumple con la norma de seguridad EN60065. La unidad no debe ser expuesta a goteos o salpicaduras y no deben colocarse sobre el equipo recipientes con liquidos, como tazas de cafe. Para asegurarse un funcionamiento seguro y prevenir cualquier posible peligro de descarga o riesgo de incendio, se han de observar las siguientes precauciones:

E

- Asegúrese que el selector de tensión esté ajustado a la tensión correcta para su alimentación.
- Asegúrese que los fusibles colocados son del tipo y valor correctos, tal como se marca en la unidad.
- La unidad debe ser puesta a tierra, conectándola a un conector de red correctamente cableado y puesto a tierra.
- El cable de red suministrado con esta unidad, debe ser cableado como sigue:

Vivo—Marrón Neutro—Azul Tierra—Verde/Amarillo

VIKTIGA SÄKERHETSÅTGÄRDER!

Denna enhet uppfyller säkerhetsstandard EN60065. Enheten får ej utsättas för yttre åverkan samt föremål innehållande vätska, såsom kaffemuggar, får ej placeras på utrustningen." För att garantera säkerheten och gardera mot eventuell elchock eller brandrisk, måste följande observeras:

S

- Kontrollera att spänningsväljaren är inställd på korrekt nätspänning.
- Konrollera att säkringarna är av rätt typ och för rätt strömstyrka så som anvisningarna på enheten föreskriver.
- Enheten måste vara jordad genom anslutning till ett korrekt kopplat och jordat el-uttag.
- El-sladden som medföljer denna enhet måste kopplas enligt foljande:

Fas—Brun Neutral—Blå Jord—Grön/Gul

BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:

Deze unit voldoet aan de EN60065 veiligheids-standaards. Dit apparaat mag niet worden blootgesteld aan vocht. Vanwege het risico dat er druppels in het apparaat vallen, dient u er geen vloeistoffen in bekers op te plaatsen. Voor een veilig gebruik en om het gevaar van electrische schokken en het risico van brand te vermijden, dienen de volgende regels in acht te worden genomen:

NL

- Controleer of de spanningscaroussel op het juiste Voltage staat.
- Gebruik alleen zekeringen van de aangegeven typen en waarden.
- Aansluiting van de unit alleen aan een geaarde wandcontactdoos.
- De netkabel die met de unit wordt geleverd, moet als volgt worden aangesloten:

Fase—Bruin Nul—Blauw Aarde—Groen/Geel

Fusing Information

WARNING: **To reduce the risk of fire, replace fuses only with the same type and rating.**

Both units use a universal switching power supply that handles the full range of nominal mains voltages between 90 and 264 VAC and any frequency between 50 Hz and 60 Hz.

Check Main Fuse

The Main fuse rating is:

T 1A L (1 Amp, 250 V, 20 mm, time-lag, low breaking capacity) for all operating voltages.

WARNING: **The power to the unit must be off when the following steps are performed. Ensure that the main power cable to the unit is not connected to a power source.**

1. Open the fuse compartment door in the AC power input housing with a small flat-blade screwdriver (Figure 1-1). Carefully pull out the fuse carrier.
2. Check that the fuse has the correct rating. The fuse carrier must be inserted into the compartment with the orientation shown in Figure 1-1. *Do not force the carrier into the compartment or both could be damaged.*
3. Snap the fuse compartment door closed.

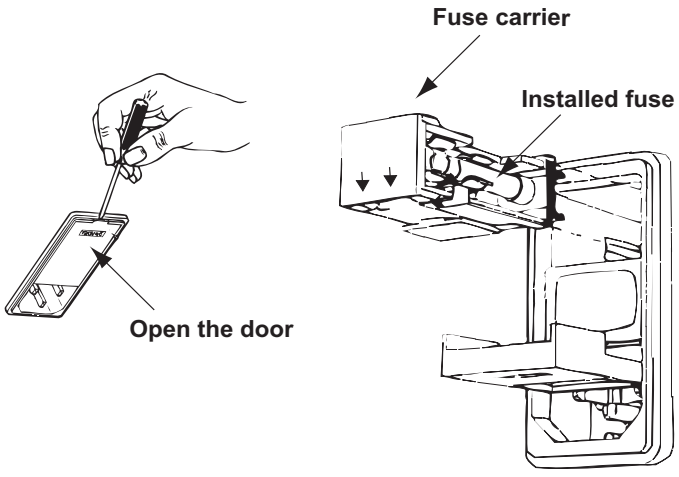


Figure 1 Checking the Main Fuse

Internal Fuse

The switching power supply contains a separate fuse. Most fault conditions should be protected by the main fuse.

If you find it necessary to replace the internal fuse, be certain to replace it with a fuse of the same type and rating as printed on the switching power supply board.

Chapter 1
Introduction

The DP570 Multichannel Audio Tool offers producers and engineers a significant improvement in control over the creation and ultimate delivery of multichannel audio when mastering Dolby data streams.

It enables a content producer to listen to a program's audio while monitoring the effect of metadata in real time. Used in either postproduction or live situations, metadata allows an engineer to optimize audio response for specific playback environments without altering source audio tracks or compromising artistic integrity.

When the producer is satisfied, the metadata settings are recorded. Metadata is carried along with the program as part of a Dolby coded audio data stream (Dolby E and/or Dolby Digital), the ultimate destination being decoding by the end-user, who then hears exactly what the producer set up for that program.

The DP570 provides a convenient interface to preview and select metadata parameters during the mastering of Dolby coded audio data streams.

Principles of Operation

Dolby Laboratories has produced or licensed several products that allow encoding of multichannel audio and accompanying metadata. A Dolby Digital (AC-3) encoder combines coded audio with metadata to produce a single-program data stream that is sent to a consumer decoder (usually an A/V receiver, DVD player, or set-top box). A Dolby E encoder can encode multiple program streams with individual metadata streams for each program. After decoding, the program audio, along with the metadata streams, can then be passed to multiple Dolby Digital encoders for mastering of Dolby Digital data streams.

Until now, the only way to hear the effect of metadata on audio during mastering was to pass the audio through the Dolby Digital encode/decode chain. This procedure could not be achieved in real time and offered an unwieldy interface. The DP570 provides this function in real time by applying metadata parameters to base-band PCM audio. This function, called "Emulation," affords a method to preview the effects of downmixing, setting dialogue level, Pro Logic decoding and other important monitoring functions that are controlled by metadata and experienced by consumers. Furthermore, the DP570 provides a convenient and user-friendly interface that simplifies the process of multichannel audio production and mastering.

In Figure 1-1, the audio path is broken into major functional blocks. In this diagram, features that control the operation of a block are connected to the block by a dotted line.

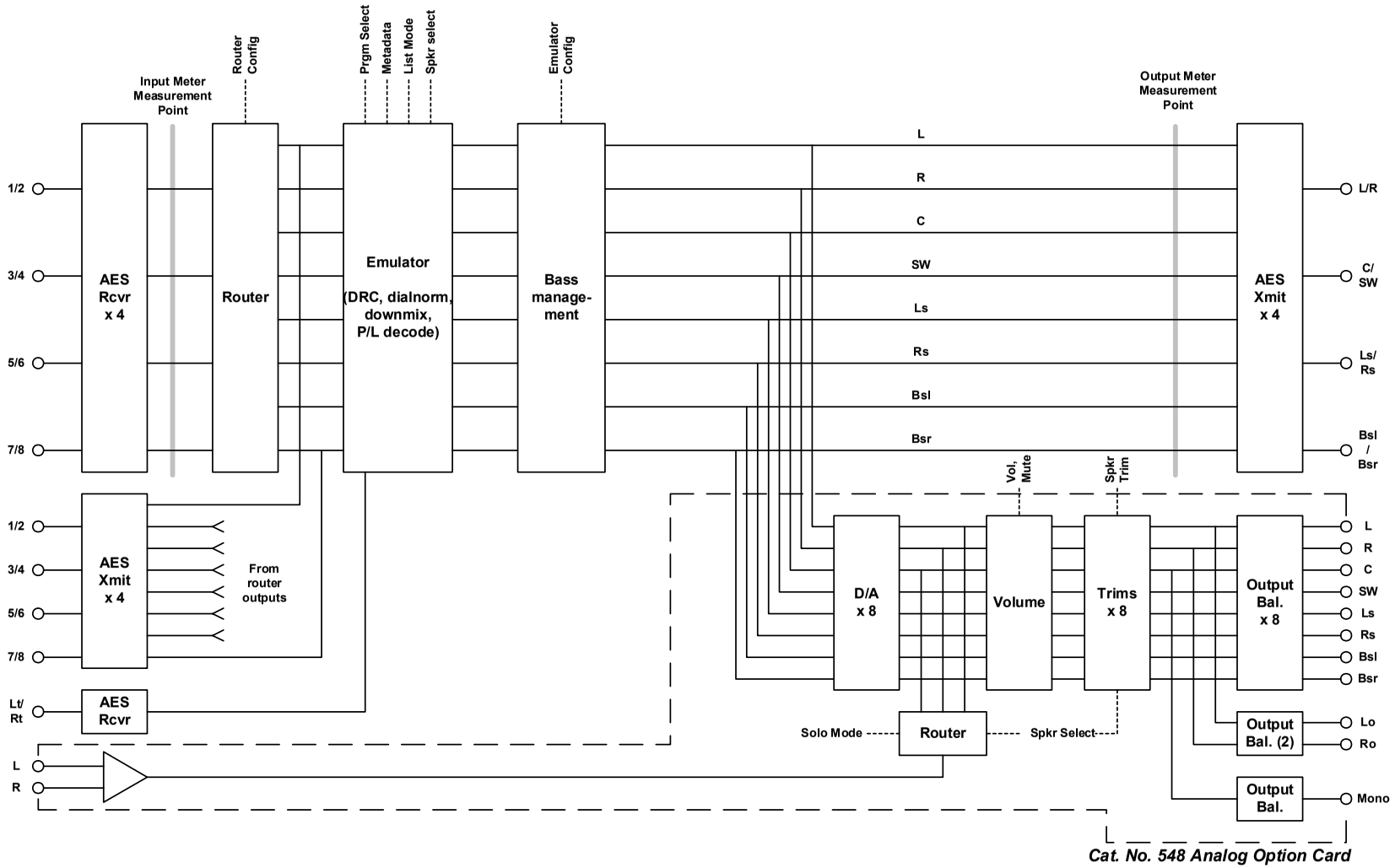


Figure 1-1 Audio Block Diagram

Digital audio input on the DP570 is via four female BNC connectors, allowing a total of eight channels. The emulator section of the DP570 (like the Dolby DP571) requires the input channel assignment to conform to a fixed definition based upon the program configuration selected (as designated in SMPTE 320M). Since previously recorded material may arrive in formats that do not match the chosen program configuration, the DP570 provides the ability to reroute the input channels to match the expected configuration, this allows other equipment to be sent the correct channel assignment.

The emulator section provides the bulk of the audio processing, including application of metadata, downmixing, and Pro Logic decoding. All possible listening options allowed by consumer decoders are provided in the emulator(from high-end home theaters to mono TV sets). Note that the inputs to the emulator section may be multiple, unrelated channels but the outputs are referred to as *speaker* channels and represent *only the active program*. Once the input channel configuration has been set, the selected active program will appear in the appropriate speaker channels irrespective of the program's appearance on the input channels, thus simplifying installation and integration into existing multichannel monitoring environments.

You can view or change metadata values for the active program only.

The emulator section is followed by the bass management section, which provides the ability to route low frequencies to the appropriate speaker channels. The output of the bass management section is sent to the digital audio outputs (emulator outputs) as well as the analog monitor section (if fitted).

The Cat. No. 548 Analog Option Card provides an analog monitor section and some additional features to ease interfacing to existing mixing and monitoring environments. This optional analog monitor section provides features including multiple speaker-configuration outputs, a master volume control, speaker trim controls, and an input for a console solo bus.

Chapter 2
Setting Up

This chapter covers all connection requirements for the DP570. To quickly begin using the DP570 in your system, see Section 2.4, Quick Start Guide.

2.1 Unpacking and Inspection

Before unpacking the unit, inspect the outer carton for shipping damage. If the carton shows damage, inspect the unit in those areas. The BNC connectors on the rear panel are covered with plastic caps.

Essential items are provided with the unit, including:

- A power cord.
- A floppy disk with the DolbyRemote 570 software for installation.
- A bag containing a video reference 75Ω terminator, rack-mount screws and washers, and a serial connection cable for the front-panel RS-232 port.
- Warranty information. Fill out the warranty card and return to Dolby Laboratories. For software upgrades, register your product on the software upgrades page at *www.dolby.com/pro.*

2.2 Installing

Installing a DP570 requires:

- Two standard rackspace units.
- A suitable monitoring system. If the Cat. No. 548 Analog Option Card is present then the outputs can feed directly into amplifiers and speakers. If not, then some form of monitoring control will be required to change listening level, operate speaker mutes, and so forth; this may be provided by your console. We recommend a multichannel listening environment with at least six speakers (for proper monitoring of a 5.1-channel signal).

- Cables. Use standard 75Ω BNC cables for digital signal connections. To connect to digital equipment with 110Ω XLR connectors, use impedance-matching transformers (readily available from Canare, Neutrik and other manufacturers). To connect the analog monitor outputs, a 25-pin male D-connector that converts to male XLR connectors is available from Tascam and other manufacturers. You can use the same cable type for the stereo/mono/solo connector by replacing an XLR connector (exchanging the male for a female) to account for the solo bus input to the DP570. Pinout information for this connector is in Section 8.11.
- A video reference (V Ref) input and terminator. The V Ref signal must be terminated with a 75Ω impedance on the last device in the signal chain. A terminator is provided in the packing kit.

A typical physical installation of a basic setup is shown in Figure 2-1.

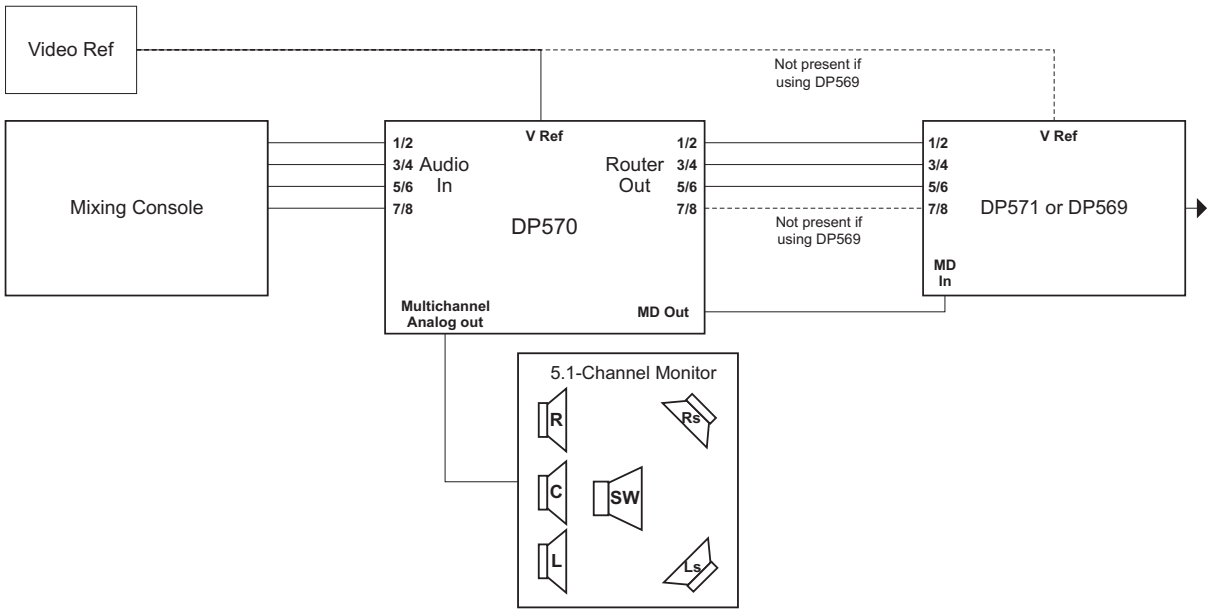


Figure 2-1 Connecting the DP570

The DP570 allows for a more complex setup, which can include two metadata inputs and separate speaker systems for multichannel, stereo, and mono monitoring as well as a discrete solo input. Figure 2-1 illustrates a basic signal flow.

2.3 The Back Panel

The Main fuse rating is:

T 1A L (1 Amp, 250 V, 20 mm, time-lag, low breaking capacity) for all operating voltages.

WARNING: **Before applying power, check the main fuse using the procedure on page *x*.**

Connection Ports

The following three figures show the connection ports. Definitions of each port follow each figure.

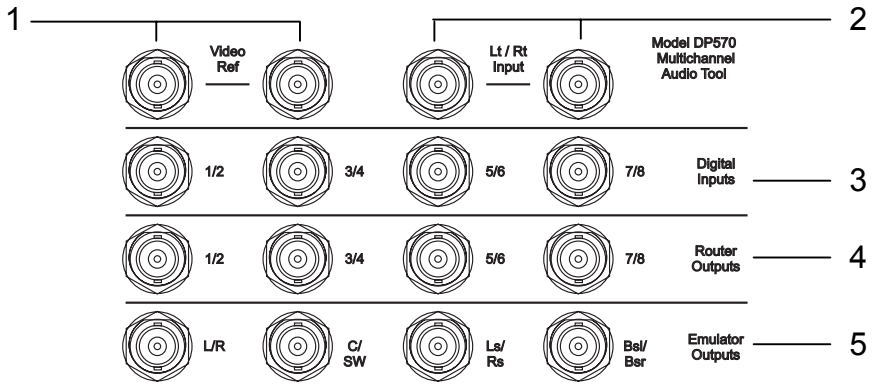


Figure 2-2 Connections: Signal In and Out

Figure 2-2 definitions:

1. **Video Ref**. Connect the V Ref signal to either jack, and use the second jack to pass the signal to the next device in the chain, or terminate. The V Ref signal must be terminated with a 75Ω impedance on the last device in the signal chain.
2. **Lt/Rt Input**. Connect a Dolby Surround encoded stereo PCM mix to either jack. You can use the second jack as a loop through, if not then it must be terminated with a 75Ω impedance.
3. **Digital Audio In**. Connect the multichannel PCM signals to these jacks.

Note: *A valid connection is required on the* **Digital Input** *channel 1/2 jack for the system to operate.*

4. **Router Out**. Sends re-routed PCM audio on to next device in chain. These outputs are not affected by metadata changes. Use for the main digital signal output (often called program), regardless of whether you are reassigning signals to different channels. For information on how to reassign signals from Audio In to different channels, see Router Config on page 6-6.
5. **Emulator Out**. Digital audio outputs for monitoring the effects of metadata and downmixing on the audio program. Connect to your own D/A converter if you are monitoring without using the Cat. No. 548 Analog Option Card. These outputs are affected by metadata changes and should only be used to send a signal to the monitoring system.

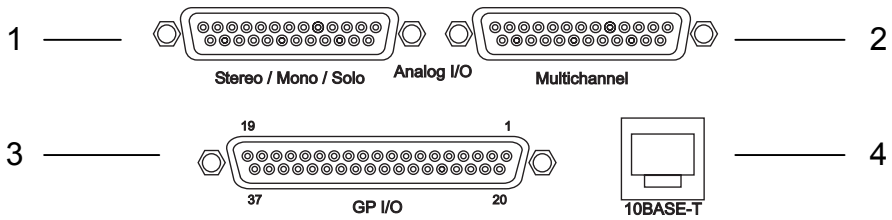


Figure 2-3 Connections: Analog Outputs, GPI/O, and Ethernet

Figure 2-3 definitions:

1. **Stereo/Mono/Solo**. Analog output—connect into the monitoring system or console, if stereo or mono listening modes or the solo function are required. For pinout information, see Section 8.11, Stereo/Mono/Solo Analog Output. *(Analog outputs are available only in units equipped with the Cat. No. 548 Analog Option Card.)*

2. **Multichannel**. Analog output—connect into the multichannel monitoring system, (requires at least 5 main channels and can support 2 additional outputs for Surround EX). This system can be used to monitor all listening modes. For pinout information, see Section 8.10, Multichannel Analog Output. *(Analog outputs are available only in units equipped with the Cat. No. 548 Analog Option Card.)*

3. **GPI/O**. Can connect to the **GPI/O** port on your console or to a dedicated **GPI/O** controller. See Section 4.7, Using the GPI/O Port, for details.

4. **10BASE-T**. Ethernet port for running the software interface on a network and status monitoring. *Not active in current release.*

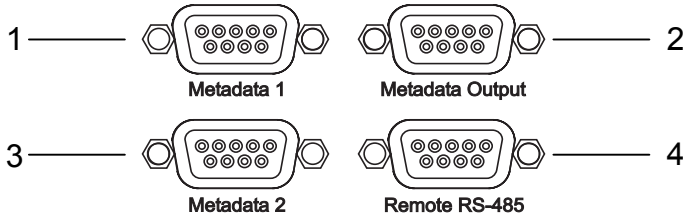


Figure 2-4 Connections: Metadata In and Out, Serial Remote

Figure 2-4 definitions:

1. **Metadata 1**. Input port for external metadata. This input source is identified as `Ext 1` on DP570 menus.

2. **Metadata Out**. Output port for metadata. Connect to a downstream Dolby E or Dolby Digital encoder.

3. **Metadata 2**. Input port for external metadata. This input source is identified as `Ext 2` on DP570 menus.

4. **Remote RS-485**. Serial port for remote software interface. Connect to a RS-485 serial port on either a computer or your console.

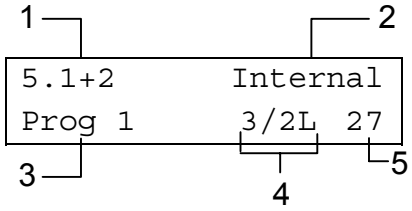
Once you make the physical connections, use the Quick Start Guide to get your system ready to use.

2.4 Quick Start Guide

After powering up, the DP570 displays the current status menu.

2.4.1 Viewing Current Status Menu

The factory default is:



The status menu shows you:

1. **Program Configuration**. In this example, 5.1+2 includes two programs—Program 1, a 5.1 mix; and Program 2, a two-channel mix. Individual metadata is transmitted for each program.
2. **Metadata source**. `Internal`, `Ext 1`, or `Ext 2`.
3. **Program selection**. Displays the text (which can be user-entered) describing the program that is selected for emulation and metadata authoring.
4. **Channel mode**. Displays for the current program selection, in this example a 5.1 mix. Here 3/2 is the channel mode (three front channels, two rear channels). The `L` indicates that the LFE channel is enabled. When the LFE channel is disabled, the `L` does not appear.
5. **Dialogue Level**. Displays the dialogue level value for the currently selected program. In this example, –27 is the selected value for the dialogue level parameter. See Section 3.1.2, Setting Dialogue Level for more information.

All the parameters shown can be adjusted using the front-panel setup menu or the remote software. For directions on menu navigation using the front-panel buttons, see Chapter 3, Front-Panel Interface.

Note: We strongly recommend installing and using the remote software to operate the DP570. While all functions are available through the front-panel navigation buttons, and steps to set up the unit using the front-panel buttons are provided in this Quick Start Guide, the remote software provides easiest access to features and a more comprehensive view of the DP570's capabilities.

To run the remote software, connect a computer to the DP570 via either the RS-485 port on the rear panel, or the RS-232 port on the front panel. For details on installing and using the remote software, see Chapter 7, DolbyRemote 570. To begin remote software operation, on the front panel press **Shift** once so that the button illuminates, then ←. (Do not hold down **Shift** while pressing ←.) To disable remote operation and resume using the front-panel interface, press **Shift**, ← again.

2.4.2 Setting Up Monitors

To prepare your listening environment:

1. Choose back surround speaker setting.
2. Set the delay values for different listening configurations.
3. Assign bass management settings.
4. Calibrate the speakers.

Note: All adjustments necessary in setting up a monitor system are available on a single screen in the DolbyRemote 570 software. To access this screen, click the **Setup** button and view the **Monitor** tab.

If you are using the DolbyRemote 570 software, proceed through all the following setup procedures without using the front-panel button instructions for each setting, instead setting each value using on-screen controls.

Back Surround Speaker

Choose the back surround speaker setting appropriate to your system:

Two surround speakers are used in standard 5.1-channel monitoring systems (setting: `none`). Three speakers are used in systems capable of Surround EX monitoring with a single back surround speaker (setting: `1`). Four speakers are used in systems monitoring Surround EX mixes with two speakers for the back surround channel (setting: `2`).

To enter the back surround speaker setting using the front-panel buttons:

1. Press the **Setup** button to display the Setup menu.
2. Press the → button to change the second-line display. When it displays `Configuration`, press **Enter**.

   The display changes to:

   ```
   Configuration
   Emulator Config
   ```

3. Press **Enter**.

4. Press the → button to change the second-line display to `Back Surround`, then press **Enter**.
5. Press the arrow buttons to select the appropriate setting, then press **Enter**.
6. Press **Esc** to return to the `Emulator Config` menu.

Speaker Delay Values

Adjusting speaker delay values is an essential step in configuring your system. Because Dolby Digital and Dolby Surround Pro Logic process signals differently, different calculations should be used to calculate delay settings.

To calculate the delay settings, measure and record the distance from the reference listening position to each of the five speakers:

- Left speaker (L)
- Center speaker (C)
- Right speaker (R)
- Left surround speaker (Ls)
- Right surround speaker (Rs)

Make all of these measurements in feet. (If measuring in meters, then multiply the metric measurements by three to get the approximate distance in feet.) No measurement is necessary for back surround speakers, as this value is automatically calculated as a function of Dolby Surround EX.

Note: Left and right speakers should be equidistant from the reference listening position. If they are not, adjust the speaker positions.

In the calculations that follow:
L= the distance from the left speaker to the reference listening position
C= the distance from the center speaker to the reference listening position
R= the distance from the right speaker to the reference listening position
S= *the shorter of the distances* from Ls *or* Rs to the reference listening position

Center Delay

To calculate the setting for center delay:
L – C= setting in ms for center delay

For example, if C is two feet less than L or R, set center delay to 2 ms. If C is three feet more than L or R, set center delay to –3 ms. If C=L=R, set center delay to 0 ms.

If you set a negative time value for center delay, the DP570 actually sets center delay to 0 and adds corresponding delay time to the left, right, and surround outputs.

To enter the center delay setting using the front-panel buttons:

1. From the `Emulator Config` menu, press the → button to change the second line to `Center Delay`, then press **Enter**.
2. Press the arrow buttons to change the value of the center delay to the setting you want, then press **Enter**.
3. Press **Esc** to return to the `Emulator Config` menu.

For complete instructions on using the front-panel buttons, see Chapter 3, Front-Panel Interface.

Surround Delay

To calculate the setting for surround delay:
C – S= setting in ms for surround delay.

To enter the surround delay setting using the front-panel buttons:

1. From the `Emulator Config` menu, press the → button to change the second-line display to `Surround Delay`, then press **Enter**.
2. Press the arrow buttons to change the value of the surround delay to the setting you want, then press **Enter**.
3. Press **Esc** to return to the `Emulator Config` menu.

Pro Logic Delay

To calculate the setting for Pro Logic delay:
C – S + 15= setting in ms for Pro Logic delay.

To enter the Pro Logic delay setting using the front-panel buttons:

1. From the `Emulator Config` menu, press the → button to change the second-line display to `Pro Logic Delay`, then press **Enter**.
2. Press the arrow buttons to change the value of the surround delay to the setting you want, then press **Enter**.
3. Press **Esc** to return to the `Emulator Config` menu.

Bass Management

If you have a 5.1-channel monitor system with full-range speakers at every channel and a subwoofer, you may not need to use bass management, and can leave this feature at the factory default, `none`. In `none` mode, only the LFE channel is sent to the subwoofer.

If you have any other configuration of speakers, you should choose the bass management setting appropriate to your system. Bass management involves selecting options from both the `Bass Management` and `SW Xover Freq` menus. For example:

- If your monitoring system consists of five satellite speakers and a subwoofer, you can redirect the low frequencies from the five main channels to the subwoofer output.
- If you have small Center and Surround speakers, direct the low frequencies from those channels to the Left, Right, or subwoofer outputs.
- If no subwoofer is available, redirect the LFE channel to the Left and Right channel decoder outputs.

The setting for the subwoofer crossover frequency depends on the capability of the speakers from which you are diverting low frequencies. If those speakers are particularly small, choose the highest frequency, 120 Hz. This not only produces better response from your system, but also protects small speakers from damage.

See Figure 2-5 for `Bass Management` menu options, and Figure 2-6 for `SW Xover Freq` menu options.

None
C/S/LFE→L/R
SRND/LFE→L/R
CNTR/LFE→L/R
CNTR/SRND→L/R
LFE→L/R
SURROUND→L/R
CENTER→L/R
L/C/R/S→SW
CNTR/SRND→SW
SURROUND→SW
CENTER→SW

Figure 2-5 Bass Management Menu Options

80 Hz
100 Hz
120 Hz

Figure 2-6 Subwoofer Crossover Frequency Menu Options

To adjust the bass management setting using the front-panel buttons:

1. From the `Emulator Config` menu, press the → button to change the second-line display to `Bass Management`, then press **Enter**.
2. Use the arrow buttons to scroll through the menu. When you find the setting you want to use, press **Enter**.
3. Press **Esc** to return to the `Emulator Config` menu.
4. Press the → button to change the second-line display to `SW Xover Freq`, then press **Enter**.
5. Use the arrow buttons to scroll through the menu. When you find the setting you want to use, press **Enter**.
6. Press **Esc** to return to the `Emulator Config` menu.

Calibration

Prior to mixing in a multichannel environment, the monitoring system must be calibrated to establish a balance between all channels and to ensure that all speakers play back at the correct level relative to the listening reference position.

To properly calibrate speaker levels, use a sound pressure level (SPL) meter. A suitable and relatively inexpensive meter is readily available from Radio Shack (Tandy Electronics outside of North America). Relative level between channels is more important than absolute level, so the accuracy of this meter is sufficient for channel balancing.

The most important thing is that each of the main channels are set to the same level—the absolute level is secondary to this. However, as a guide some examples follow:

For film work, test noise at reference level should produce an SPL of 85 dBc for each of the main channels (left, center, right, left surround and right surround).

For television work, test noise at reference level is typically set to produce an SPL ranging from 79 to 82 dBc for each of the main five channels. The lower reference level for television is due to the lower average listening levels used by the consumer (typically 70 to 75 dBc).

For music mixing, each speaker channel should be set to the same SPL (the same as television mixing). There is no standard practice for reference levels for music mixing. Some engineers prefer to mix louder than others do, but if the levels between channels are correct, the overall level is not as important.

When mixing for television or music in small mixing rooms (for example, remote recording trucks), the surround channel is generally set 2 dB lower than the front channels. This takes into account the short distance to the surround speakers. Experience has shown that this setting makes the sound in the home environment very close to the sound heard by the mixer.

WARNING: **Before you turn on a test noise, be sure that your playback system is set to a moderate listening level. Adjust your amplifiers, self-powered speakers, or mixer, not the DP570. Beware that if the playback level is very high, you may risk damaging your speakers or possibly your hearing. The default test noise level from the DP570 is –20 dBFS to the digital outputs (+4 dBu to the analog monitor outputs).**

Digital Reference Level

This value should be set to match your studio reference level before turning on a test noise when calibrating your speaker system. The level of the test noise, as measured by an average-responding meter, will be changed to match the digital reference level. This setting also properly calibrates the B-type section in the Pro Logic decoder.

To adjust the digital reference level:

1. From the `Emulator Config` menu, press the → button to change the second-line display to `Digital Ref`, then press **Enter**.
2. Use the arrow buttons to find the setting that matches your studio digital reference level. When you find the correct setting, press **Enter**.
3. Press **Esc** to return to the `Emulator Config` menu.

Measuring SPL

Before generating test noise, make sure that Master Volume is set to 0. To access Master Volume, press **Shift**, then **Enter**. (Do not hold down **Shift** when pressing **Enter**.) Press **Esc** to return to the previous menu. Master volume should remain at 0 while you set trim levels on your speakers.

If you are using the outputs from the Cat. No. 548 Analog Option Card for your monitor system, you can make adjustments using `Master Trim` and `Speaker Trim` in the `Monitor Config` menu. If you are instead using the emulator (digital) output for your monitor system, use the procedures on page 2-13.

To access the `Monitor Config` menu:

1. From the `Emulator Config` menu, press **Esc**.
2. Press the → button to change the second-line display to `Monitor Config` and press **Enter**.

Use the arrow keys to scroll among the options. Under `Speaker Select`, enter `Multichannel`, then choose `Speaker Trims` to set speaker trim levels for your multichannel system. Once you have set trim levels for your multichannel speakers, if you have separate speaker systems connected for stereo and mono listening, return to `Speaker Select` and choose each option to set levels for those speaker systems. `Speaker Select` controls which speaker system is accessed when you choose `Speaker Trims`.

To generate test noise to the analog outputs using the front-panel buttons:

1. From the `Monitor Config` menu, press the → button to change the second-line display to `Test Noise`, then press **Enter**.
2. Press the arrow buttons to select either `Pink` (if your bass management setting is `none`) or `Filtered` (if you are using any other bass management setting), then press **Enter**.

   The test noise cycles around the speakers: Left, Center, Right, Right Surround, Back Surround Right, Back Surround Left, Left Surround, and Subwoofer channels—remaining two seconds at each output before moving onto the next.
3. Press **Esc** to return to `Monitor Config`.
4. Press the arrow buttons to change the second-line display to `Speaker Trims` and press **Enter**.
5. Press **Enter** to enter an individual speaker trim adjustment menu.

   When you enter an individual speaker trim adjustment menu, the test noise remains at that speaker until you complete the adjustment and move to another speaker, allowing you to adjust the SPL according to the following procedure.

Note: If when you begin measuring SPL the overall level needs adjustment, press **Esc** to return to `Monitor Config` then press the arrow buttons to select the `Master Trim` menu. Adjust the master trim level before adjusting the levels for individual speakers.

To accurately measure SPL:

1. Sit in the reference listening position. Set the SPL meter to "C" weighting and "slow" response.
2. Facing the front speakers, hold the SPL meter at chest level, with the microphone facing up at an angle of approximately 45 degrees to the center speaker. Keep the meter at arm's length to prevent measuring audio that may reflect from your body.
3. Keep the SPL meter in this position. Make sure that the meter is aimed at the center speaker as you take readings for the left and right speakers.
4. To take the SPL readings for the left surround or right surround speakers, keep the meter at the same angle and position as you did for the front speakers. Turn your body 90 degrees from the center speaker towards the wall closest to the surround speaker you are measuring. This minimizes "shadowing," or obscuring the meter with your body.

To make adjustments from the `Speaker Trims` menu, use the arrow buttons to change the level setting for the current speaker. Press **Enter** to save a change in

setting, or press **Esc** to discard a change. Press **Esc** from active value reading to return to `Speaker Trims` menu.

Subwoofer Calibration

Ideally, the test noise used for subwoofer calibration should be band-limited pink noise, lowpass filtered at 120 Hz. To properly calibrate the subwoofer, a Real Time Analyzer (RTA) is required. If an RTA is not available, you can approximate the settings with an SPL meter.

When using an RTA, proper calibration requires setting the LFE channel signal sent to the subwoofer, within its typical bandwidth of 25–120 Hz, 10 dB higher than the main channels. See Figure 2-7 for an example of an RTA display of a properly calibrated subwoofer.

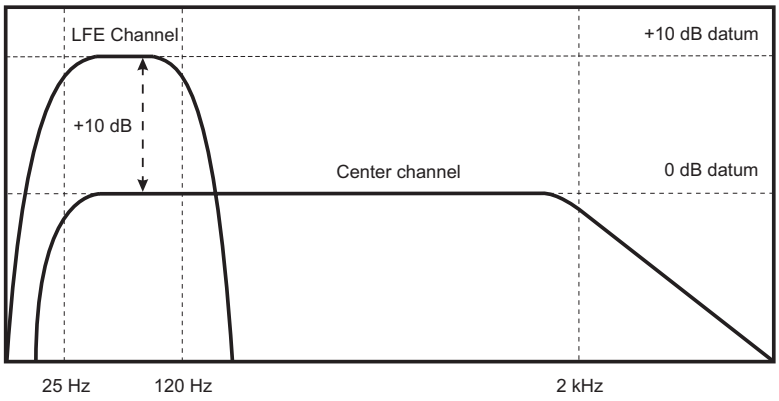


Figure 2-7 Real Time Analyzer (RTA) Display

If an RTA is not available, setting the LFE channel higher (e.g., 89 dBc for the subwoofer channel when the Center channel measures 85 dBc), can give an approximate level with an SPL meter. This level varies with the quality of the meter being used.

For future reference, if calibrating the subwoofer with an RTA, measure the level with an SPL meter and note the meter reading for the proper calibration. Use this measured value for quick checks of the system calibration in the future.

When you have set trim levels for all your speakers, return to the `Monitor Config` menu, scroll to `Test Noise`, select `Off`, and press **Enter**.

Calibrating Emulator Output

If your DP570 does not include the Cat. No. 548 Analog Option Card, you need to calibrate your speaker system using the emulator outputs.

To generate a test noise to the emulator outputs using the front-panel buttons:

1. From the `Emulator Config` menu, press the → button to change the second-line display to `Test Noise`, then press **Enter**.
2. Press the arrow buttons to select either `Pink` (if your bass management setting is `none`) or `Filtered` (if you are using any other bass management setting), then press **Enter**.
3. Follow earlier instructions for measuring SPL and calibrating the subwoofer.
4. When you have set trim levels for all your speakers, go to the `Test Noise` menu, select `Off`, and press **Enter**.

Chapter 3
Applications

The DP570 can be used in many environments. In this chapter we discuss specific examples for:

- Content creation
- Postproduction
- Live broadcast

We also provide a section on output signal information.

Each environment has unique requirements for control over the metadata authoring and monitoring functions. Some users need full control on a regular basis; some require full control during setup but then will want to recall presets for normal operation. Others will only want to access presets that may be defined by someone else. To accommodate the demands of users in different environments, the DP570 offers a variety of remote control options.

Figure 3-1 shows the control options for the DP570.

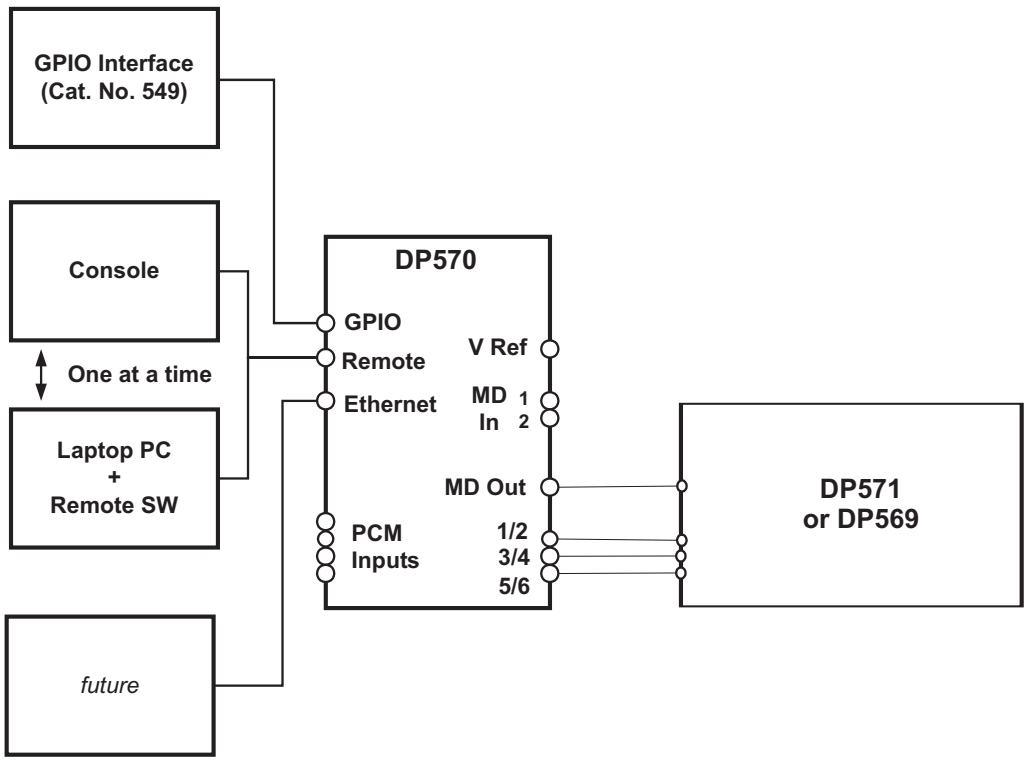


Figure 3-1 Control Options

The GPI/O provides a simple contact closure and tally interface that activates user-defined presets and other key features. Pin assignment information for the GPI/O is provided in Section 4.7, Using the GPI/O Port. A standalone remote control unit, the Cat. No. 549 GPIO Controller, is available to provide easy access to the features of the GPI/O port. For more information on the Cat. No. 549 GPIO Controller, please contact Dolby Laboratories.

The console interface involves a more complex serial interface that can functions as a full remote control using Dolby's remote protocol. It is up to console manufacturers to implement software that can run on their platform.

Dolby provides software, DolbyRemote 570, that runs on a standard PC clone using the serial interface. Note that this option cannot be used simultaneously with the console interface. Details on installing and operating the remote software are available in Chapter 7, DolbyRemote 570.

3.1 Content Creation

When creating content for television distribution, you can use the DP570 to:

- Downmix (describes a listening environment that has fewer speakers than channels in the audio program, such as a 5.1-channel movie playing on a stereo system)
- Set dialogue level
- Set dynamic range control

You can monitor various downmixes at any time during content production, but it is essential that dialogue level is set before you choose dynamic range control profiles.

3.1.1 Downmixing

The DP570 allows you to monitor various downmixes before finalizing the content. Previewing downmix conditions is essential in providing the best possible audio quality in listening environments with fewer speaker channels. Select a downmix mode and make adjustments to metadata (or if necessary, the source mix) accordingly.

If your monitor system uses the Cat. No. 548 Analog Option Card outputs, you can set up your system to include a separate set of speakers for monitoring downmixes under different conditions. For example, you can send a stereo downmix to the left and right speakers in your 5.1 listening environment, then send the same downmix to a different set of stereo speakers by changing your speaker selection setting. It is a good idea to have a low-grade alternate speaker configuration set up to monitor the stereo and mono downmixes to make sure program content translates appropriately in "fidelity challenged" listening environments.

Using Metadata to Improve a Downmix

One of the great advantages of the DP570 is that it allows you to monitor a downmix as you alter specific metadata parameter settings, so you can improve a downmix without altering your source multichannel mix.

Stereo

Select **Stereo** to monitor the stereo downmix of a multichannel program.

You can select a preferred stereo downmix as either a Pro Logic compatible Lt/Rt or a simple Lo/Ro (left only, right only). If adjustment is necessary, the stereo downmix can be optimized by adjusting Center Mix Level and Surround Mix Level for either Lo/Ro or Lt/Rt, depending on the preferred downmix selection. For more detail on metadata parameters, see Appendix A, Metadata.

Pro Logic

Select **Pro Logic** to monitor the effect of Pro Logic decoding. If adjustment is necessary, the metadata parameters to adjust are Surround 90-degree phase shift, Lt/Rt Center Mix Level, and Lt/Rt Surround Mix Level.

Checking Other Mixes

You can monitor the downmix for Mono, 3Stereo, Phantom Center, or EX at any time. These downmix modes do not have associated metadata parameters; it is advisable, however, to check these downmixes to be sure that the program content translates appropriately to these listening environments.

3.1.2 Setting Dialogue Level

Setting the dialogue level parameter, also known as *dialogue normalization* or *dialnorm*, is a vital element in audio content creation. Properly setting the dialogue level parameter ensures that the level at which the consumer hears the dialogue (or average level in programs without dialogue) matches between different programs. See Appendix A, Metadata for a detailed explanation of the dialogue level parameter.

To set the dialogue level parameter, the first and most important step is selecting an audio sample, or "clip," representative of the *average* loudness level of the program content. Remember that the dialogue level parameter establishes the level for *normal* dialogue in the program; quieter and louder scenes tend to show higher or lower measurements than the correct value. Using more than one clip can be worthwhile—for instance, samples of conversation involving featured characters with different vocal qualities. In programs without dialogue, such as a music concert, sections of average level need to be identified.

With representative audio clips identified, you can use the DP570 to set the dialogue level parameter. You can use either the software interface or the front-panel buttons; for this operation we describe using the software interface first.

Note: The *Measure* function used in the following procedures is designed to measure dialogue only. Programs without dialogue, such as an all-music program, still require a careful setting of the dialogue level parameter. When setting the parameter for such content, it is useful to compare the program to the level of other programs. The goal is to allow the consumer to switch to your program without having to adjust the volume control.

To measure dialogue level using the remote software:

1. Play the audio clip.
2. While the clip is playing, click **Measure**, next to the *Dialogue Level* slider.

   The DP570 begins measuring the level of the audio clip. The software display of the measured level varies widely at first, but the measurement is an average level over time (LeqA), so the display stabilizes as the clip continues.

   If the input audio level registers below –31 dBFS, the **Accept** button is disabled, as those values are not valid settings for the dialogue level parameter. Below –40 dBFS, the display reads **LOW**. In either case, it is best to raise the source audio level and re-measure the selected audio clip.
3. When an adequate amount of the clip has played, click **Measure** to stop the measurement.

   The software displays the level of the audio clip. This level displays until you start a new measurement.

Repeat these steps with each audio clip selected. The DP570 should return similar values for each of the clips. If the variation between the clips is 4 dB or less, select a value for the dialogue level parameter within that range that best indicates the average level of the program content. At any time, to use the measurement level displayed on the software, click **Accept**, and the dialogue level parameter is set at that level. To set the dialogue level parameter manually, click and drag the *Dialogue Level* slider to the setting you want.

If the DP570 measures more than a 4 dB difference in the audio clips, reconsider the clips you have chosen, recalling that these clips should represent normal speech level in your content.

To measure dialogue level using the front-panel interface:

1. On the main setup menu, use the arrow buttons to select `Operating Mode` and press **Enter**.
2. Press **Enter** again until the screen displays;

```
Input          -27 dB
Dialog Lev     -27 dB
```

3. Play the audio clip.

   The first line of the display changes to display the level of the clip. The reading does not change immediately—it may take up to 30 seconds before the display begins to register level changes. Unlike the software procedure, there is no start/stop function to the measurement, although changing the selected program resets the measurement. The display changes as the level of the clip changes.

   If the input level is below –31 dBFS, an asterisk (`*`) appears next to the input level value indicating that the audio level is too low to be represented by the Dialogue Level parameter. Below –40 dBFS, the display reads `Input too low *`. If the input level is higher than –1 dBFS, the display reads `Input too high *`. In these cases, it is best to adjust the source audio level and re-measure the selected audio clip.

4. Use the arrow keys to adjust the dialogue level setting, displayed on the lower line, to the average value displayed in the measurement of your clip.

As with the remote software-based procedure, if you have more than one audio clip, repeat these steps with the other clips. The DP570 should return similar values for each of the clips. If the variation between clips is 4 dB or less, select a value for the dialogue level parameter within that range that best indicates the average level of the program content.

If the DP570 measures more than a 4 dB difference between the audio clips, reconsider the clips used, recalling that these clips should represent the level of normal audio in the program content.

3.1.3 Setting Dynamic Range Control

You can choose dynamic range control (DRC) profiles for RF and Line modes. Use the emulator to monitor the effects of each profile setting on the program content and select the profile that best suits the material in each mode. Both RF and Line modes can be set to any of the following profiles: None, Film Standard, Film Light, Music Standard, Music Light, and Speech. Each profile represents a pre-packaged set of compression parameters such as ratio, attack, and release.

Note: Remember that it is essential to first set the dialogue level parameter properly before making judgments on the correct DRC profile.

For detailed information on DRC profiles, See Appendix A, Metadata.

The **Custom** adjustment on the emulator allows you to simulate a consumer decoder with the ability to vary the amount of DRC applied. This variation is to the Line mode profile you have selected. Like all emulator controls, it does not affect the metadata or router output streams.

3.2 Postproduction

The DP570 can be used in a variety of postproduction settings. We discuss some examples here.

3.2.1 Surround-Compatible Postproduction Using Dolby E

Figure 3-2 shows metadata coming from three sources, the mixing console (which controls the DP570 via serial protocol), the dedicated remote, and a DP572 used for playback of a pre-recorded Dolby E stream.

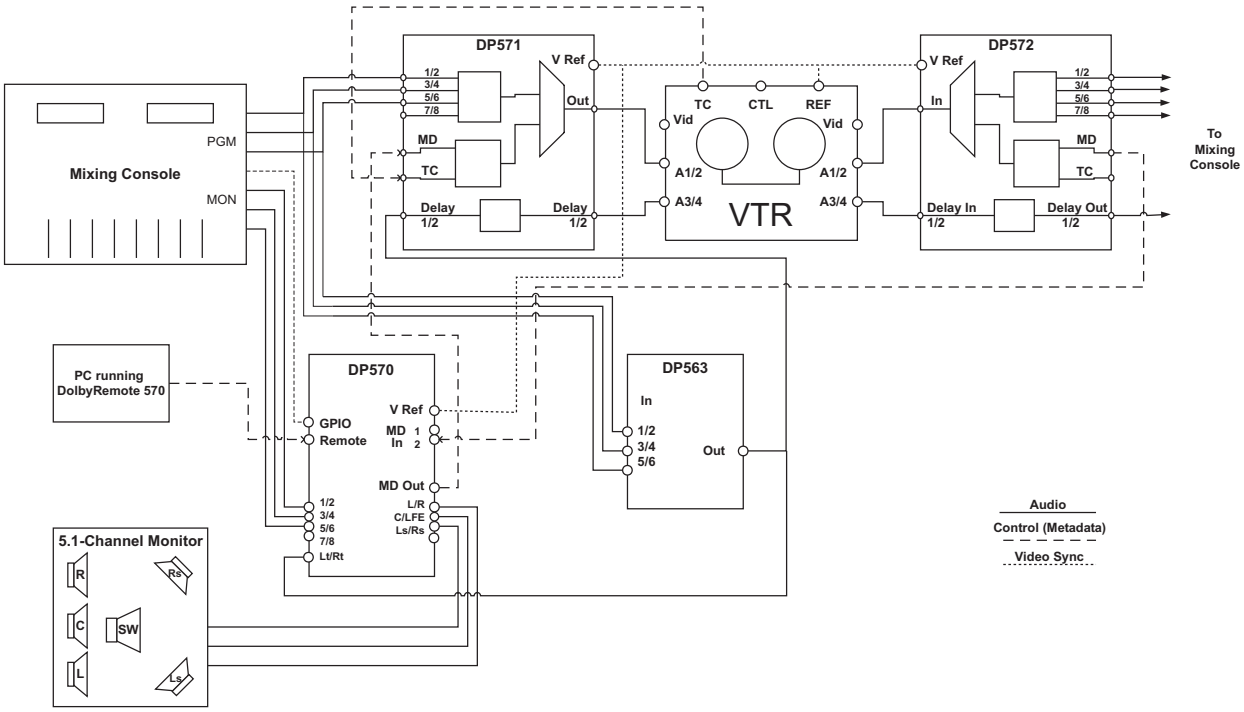


Figure 3-2 Postproduction Using Dolby E
(5.1- and Four-Channel)

In this example, the mixing console is used to create a six-channel mix, which is then fed to the DP571 and the DP570. The user selects dynamic range control and downmix parameters and auditions them in various monitor modes before starting to record the DP571 output. For playback of the recorded tape, the VTR audio outputs are fed to a DP572. The DP572 outputs are then fed to the DP570 for monitoring. This basic setup should work for creation and editing of Dolby E recorded media.

The user also desires to create a tape that is suitable for broadcast over standard analog transmission as well. This requires that an Lt/Rt encoded audio mix be created simultaneously with the 5.1-channel mix. The Lt/Rt signal is then fed to the PCM delay inputs of the DP571 for encoding (assuming a one-frame delay is needed). In order to do a good job of matrix encoding, the user must be able to audition the decoded signal as well. The Pro Logic decoding mode of the emulation block can provide this function.

3.2.2 Replacing One or More Values within a Metadata Stream

In postproduction, the DP570 lets you quickly assess key parameters to ensure that you are sending a consistent product to your audience. Because you can make metadata changes, you can deliver an improved product to the consumer without altering the master mix or content in any way.

Figure 3-3 shows the flow of audio and metadata using the DP570 for audio monitoring and parameter replacement.

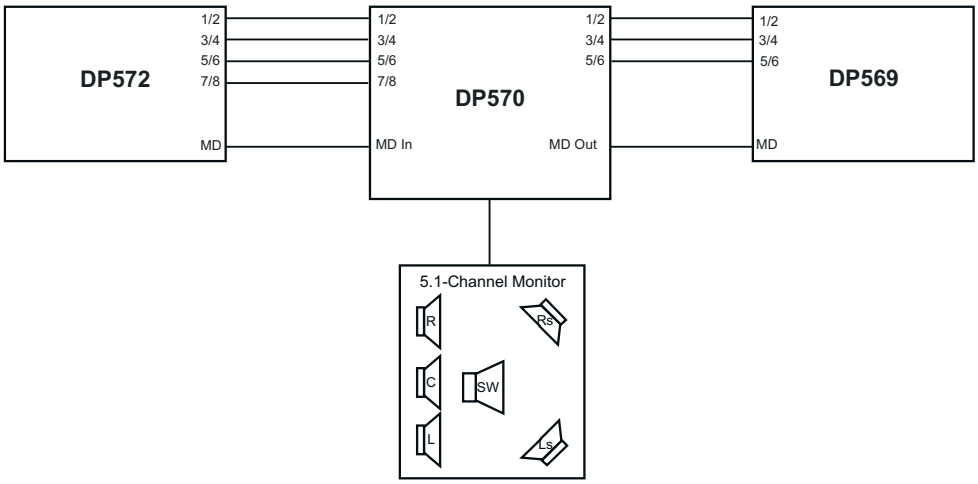


Figure 3-3 Parameter Replacement

3.2.3 Adjusting the Dialogue Level Parameter in Postproduction

In postproduction, the dialogue level parameter should not be an issue if the content producers have done their work well. However, changes to the dialogue level parameter are sometimes necessary to match levels between different program content, and the DP570 is the tool that provides this capability (see Section 3.1.2, Setting Dialogue Level).

3.2.4 Adjusting Other Parameters

Prior to broadcast of a program, it may be appropriate to check dynamic range control parameters. A content producer may deliver a program with no DRC profile, but if it is an action movie set for broadcast at midnight, you may want to make DRC available to the consumers who can choose to use it. If a program originated at a facility with less advanced monitoring facilities, the downmix parameters may not be maximized. Depending on the content producers and your relationship with them, resetting these parameters could improve the ultimate delivery of the program.

3.3 Live Broadcast

In a live broadcast situation, the ability to preview metadata parameters during broadcast is limited. However, the DP570 can be loaded with presets—for example, "News," "Sports," "Music," as well as other live events—providing the flexibility necessary for use during set-up, rehearsals, and final broadcast.

Developing these presets, of course, can only be a product of experience, but that experience can be passed on much more easily with the DP570. A seasoned engineer can save presets for the live events to be produced, and a DP570 with those presets can be sent out with a less-experienced engineer who has only to select the appropriate preset for the event, and is then free to focus on other issues. In this situation, the engineer at the live event can confirm the validity of the chosen metadata by monitoring the effects with the DP570.

Chapter 4
Unique Features

The DP570 provides features not found in other devices. In this chapter, we discuss:

- Using external metadata
- Internal metadata default settings
- User presets
- Using Lt/Rt input mode
- Channel mapping
- Input router settings
- Using the GPI/O port

4.1 Using External Metadata

The DP570 has two metadata input ports. These can derive metadata values from an external serial metadata stream. These input ports should connect to a valid metadata source, most likely a Dolby E decoder such as the Dolby DP572.

In order to properly monitor a decoded Dolby E stream, metadata must be applied to the digital audio. The DP570 can apply external metadata to the decoded audio to emulate how the audio program will sound when the metadata is applied in the home by a Dolby Digital decoder. It is also possible to go one step further and replace some (or all) of the metadata with parameter values you define using the DP570.

In order to properly use external metadata, it is important to understand some basic concepts regarding the nature of the metadata stream. The structure of the stream is shown in Figure 4-1.

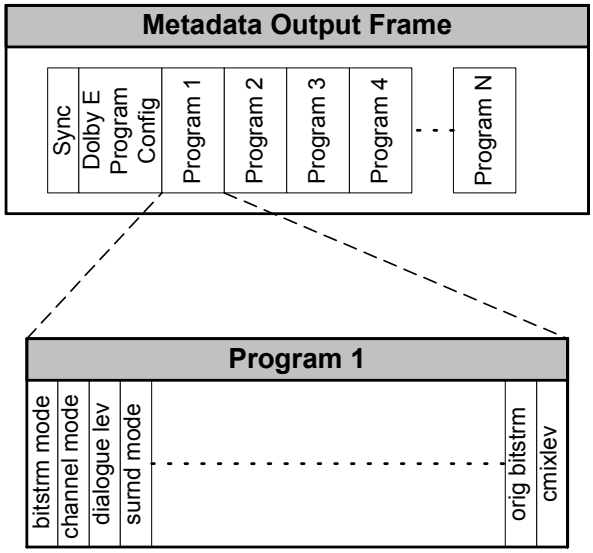


Figure 4-1 Serial Metadata Frame Structure

The complete metadata frame contains information about the Dolby E stream as well as metadata for each program in the stream. The frame rate for output metadata is set by the received video reference signal and is locked to the beginning of the video frame. If there is no video input, the DP570 generates a default frame based on 1,536 samples at the current audio clock rate, to match Dolby Digital frame rates. The structure imposes some restrictions regarding how external metadata can be used; for example, since the program configuration determines the number of programs, it determines the number of program metadata segments.

4.1.1 Choosing the Source

The metadata source can be either *internal* (chosen by the user or generated as a default by the DP570) or *external* (derived from the external metadata stream). Normally, if you use external metadata, you will use the entire stream, but there may be times when you want to alter the received value of an individual parameter or an entire program. You control this source choice at three levels: program configuration, program metadata, and individual parameter.

The highest-level source selection is whether to use the external program configuration. If an external metadata stream is available, this is the likely choice. When you select an external program configuration, the source for all metadata parameters is initially set to the same port. The source for other parameters can be changed to internal, however, either at the program metadata level, or by individual parameter. An example of this configuration is a QC environment, where the operator uses the entire metadata stream to monitor the overall audio quality.

Changing the program metadata source (an option available only when using the DolbyRemote 570 software) selects the source for the active program only; that is, the program you are currently monitoring. When you make a program metadata source selection, the individual parameters for that program are initially set to the same source. An example of this situation is shown in Example 2 on page 4-4.

You can, however, still change individual parameters. For example, at master control or presentation, the operator passes through all metadata to the station output under normal circumstances; if a fault occurs, however, individual parameters can be adjusted as necessary.

This system simplifies the task of selecting the metadata source. The higher-level choices change the lower-level source settings automatically, but the individual parameters can always be changed without affecting other parameters.

Note: When altering external metadata, make certain that the altered values are correct for the program. Particularly when you alter program configurations, it is important to correctly set the number of programs and the number of channels in each program. Monitoring with the DP570 should alert you to any problems.

Example 1—Overriding individual parameter values

Signal and metadata flow from this example are shown in Figure 4-2.

You are using an external metadata stream. The output of the DP570 is feeding a DP571 or DP569. You want to change the compression profile because none was originally included. To do so:

1. Select the program you wish to change.
2. Click the **Dynamic Range** metadata tab on the DolbyRemote 570.
3. Change the source of the Line Mode Compression Profile from external to internal.

You can now select one of the five compression profiles. In this case, let's say **Film Light** sounds best.

The source for this parameter stays internal until
a) You change it back to the external source, or
b) You receive a program with a different program configuration.

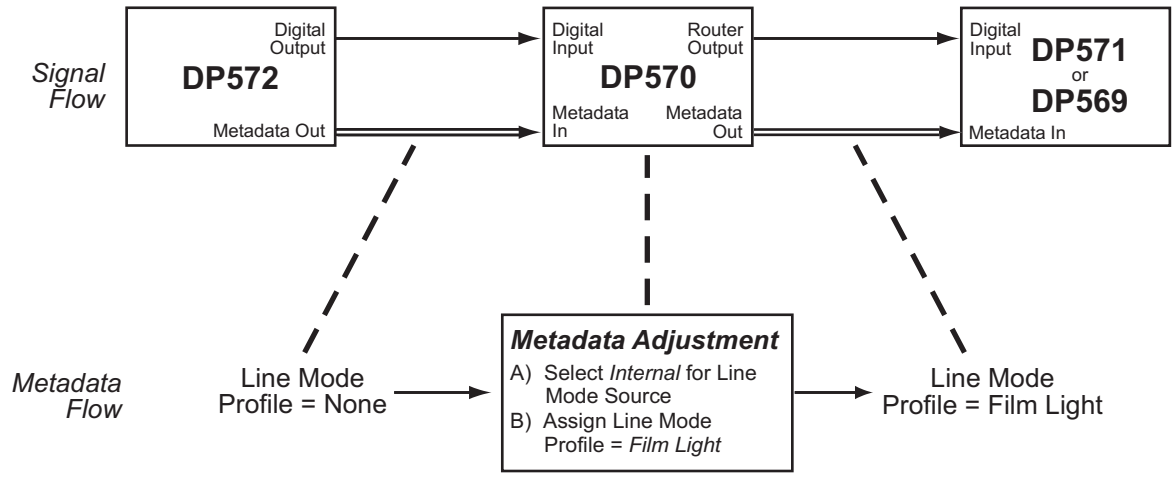


Figure 4-2 Overriding Individual Parameter Values

Example 2—Adding a second program (or changing a program)

Signal and metadata flow from this example are shown in Figure 4-3.

You receive a 5.1-channel program encoded in Dolby E, and you want to create a stereo-compatible mix for it and re-encode both onto another Dolby E master. In this case the metadata for the second program does not yet exist, but you want to retain the metadata from the first program. Furthermore, the program configuration from the original stream must be changed because it indicates a single 5.1 program instead of the 5.1 + 2 configuration you are creating.

After you create the stereo mix, you re-encode the 5.1-channel program along with the stereo program using a DP571. To do so:

1. Select internal for the program configuration source, and choose 5.1 + 2.
2. Select external for the program metadata source for Program 1.
3. Select internal for the program metadata source for Program 2, and select the metadata for the second program.

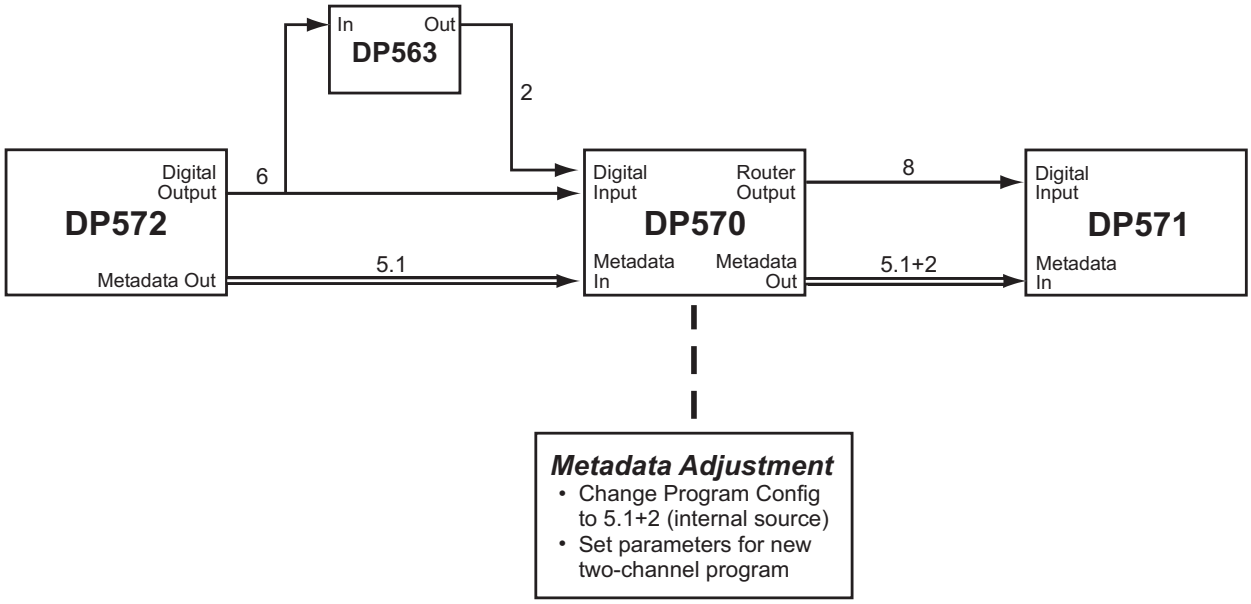


Figure 4-3 Adding a Second Program

4.1.2 Limitations When Using External Metadata

Due to the way the metadata stream is constructed and interrelationships of various types of metadata, there are limitations regarding how external metadata may be used.

1. Only one external port may be used at a time.
2. The metadata for program N will come from external program N. The external stream must have a matching program number.

Due to the first limitation, once any parameter source is set to an external port, the other external port is disabled as a choice for all parameters.

4.1.3 Troubleshooting Metadata Problems

The DP570 has several status indicators to help troubleshoot metadata-related problems:

- The front-panel status display shows the metadata source as `External` if any metadata source is set to external.
- Metadata Input indicators on both the DP570 front panel and in the DolbyRemote 570 software provide status information. The indicators turn green any time a valid metadata signal is present, whether or not it is being used. They turn red only if the external port is in use *and* there is a problem with the metadata signal.
- The `Metadata Params` submenu under either the `Setup` or `Status` menu on the front-panel display can also be used to determine the current source for a parameter and its current value.

Note: If the DP570 is using external metadata and there is a temporary error in the metadata stream, the unit continues to use the last valid metadata values. When the error clears, the DP570 resumes using the stream from the external port.

4.2 Internal Metadata Default Settings

The DP570 automatically generates metadata settings based on the number of channels indicated by the program configuration as shown in Table 4-1. You can, of course, change any metadata parameter, but these are the parameters the unit sets up to start with.

Note: Because the metadata parameters will change each time you change the program configuration, *make sure you set the proper program configuration first, before choosing metadata parameters!*

Table 4-1 Metadata Defaults

Metadata Parameter	Program Channels			
	5.1	4	2	1
Dialogue Level	–27	–27	–27	–27
Channel Mode	3/2	3/1	2/0	1/0
LFE Channel	On	Off	Off	Off
DC Highpass Filter	On	On	On	On
Lowpass Filter	On	On	On	On
LFE Filter	On	Off	Off	Off
Surround Phase Shift	On	On	Off	Off
Surround 3 dB Attenuation	On	On	Off	Off
Line Mode Compression	Film Light	Film Light	Film Standard	Film Standard
RF Mode Compression	Film Standard	Film Standard	Film Standard	Speech
RF Overmodulation Protection	Off	Off	Off	On
Bitstream Mode	Complete main	Complete main	Complete main	Complete main
Center Mix Level	–3	–3	–3	N/A
Surround Mix Level	–3	–3	–3	N/A
Dolby Surround Mode	Off	Off	On	N/A
Copyright Bit	Yes	Yes	Yes	Yes
Original Bitstream	Yes	Yes	Yes	Yes
Audio Production Info	No	No	No	No
Mix Level	85 dB SPL	85 dB SPL	85 dB SPL	85 dB SPL
Room Type	Not Indicated	Not Indicated	Not Indicated	Not Indicated
Preferred Stereo Downmix	Lt/Rt	Lt/Rt	Not Indicated	Not Indicated
Lt/Rt Center Mix Level	–3	–3	N/A	N/A
Lt/Rt Surround Mix Level	–3	–3	N/A	N/A
Lo/Ro Center Mix Level	–3	–3	N/A	N/A
Lo/Ro Surround Mix Level	–3	–3	N/A	N/A
Dolby Surround EX Mode	Not Indicated	N/A	N/A	N/A
Converter Type	Standard	Standard	Standard	Standard
Data Rate	Not Indicated	Not Indicated	Not Indicated	Not Indicated

4.3 User Presets

You can save system settings in up to 32 separate presets for quick recall. Since the DP570 combines both metadata authoring as well as decoder emulation functions, you may only want to store and recall a subset of the entire system settings for quick recall. The DP570 lets you store a subset of system settings as emulator-only, authoring-only, or combinations that recall both emulator and authoring settings at once.

Authoring presets include the Dolby E program configuration, all metadata parameters for each program, and the source for each parameter. *Emulator* presets include the DRC and downmix modes, speaker-system choice, bass management, router settings, and LFE monitor mode. The third type, *all*, includes both *authoring* and *emulator* settings.

4.3.1 Emulator-Only

You can save a listening environment setup for quick recall easily with the DP570. Once you select the listening parameters, choose a preset number under **User Presets**, and under *Type* choose **Emulator**.

Emulator presets display an *E* after the preset number, so you will be able to recognize them easily as emulator-only presets.

Emulator presets are particularly useful for checking specific combinations of downmix and compression mode, perhaps on a different speaker output. For example, you can audition current metadata settings for a 5.1-channel program in Full mode(no downmix) with no compression (the default for the **Custom** selection), then check the mono downmix in RF mode on the mono speaker output in one click without altering the metadata settings.

4.3.2 Authoring-Only

You can also save authoring-only settings as a preset. By doing so, you can test certain combinations of metadata settings you find useful without altering your emulator settings; alternatively, you can save settings for different program types, series, episodes, or even stadiums that you work in. Recalling authoring presets that apply metadata combinations you know well can save you time. Storing authoring presets lets you compare these combinations without affecting your emulation settings.

Authoring presets display an *A* after the preset number to allow easy recognition, and so you can name the preset according to content.

4.3.3 All

Just as you may find that there are certain combinations of authoring settings that you use frequently, and certain emulator configurations that you want to use to check different downmix conditions, you may discover that you also use certain combinations of authoring and emulator settings frequently. To save a combination of authoring and emulator settings as a preset, select **All** under *Type* when saving the preset.

Presets that include both authoring and emulator settings do not display any letter after the preset number on the display.

4.3.4 Using Different Preset Types to Audition Settings

If you are assigning metadata to a program, the different preset types can be used in sequence to speed your process.

Example

You set the emulator to Full mode (no downmix) with no compression (the default for the **Custom** selection). You then audition a few authoring presets until you find the combination that suits the program best. Next, you switch among the emulator presets to make sure the metadata you have selected works in a variety of downmix settings. Now you know you have settings that maximize the mixing capabilities for all your potential listeners.

By using presets, you both save time and increase the accuracy of your checking, since there are multiple variables in both the authoring and emulator sections.

4.4 Using Lt/Rt Input Mode

The DP570 provides a separate input (Lt/Rt) for a signal encoded in Dolby Surround. When you activate the Lt/Rt input mode, the emulator is fed only by the Lt/Rt input, and the DP570 sends a Pro Logic decoded signal to your monitor system. You cannot alter settings for the signal from the Lt/Rt input, but you can use the input to ensure that an Lt/Rt mix is performing as expected.

Caution: *Changes to metadata parameters may still be made while in Lt/Rt input mode, but you cannot hear the effect of these changes, because the emulator is dedicated to Lt/Rt input signal. Therefore, you should only change metadata values while not in Lt/Rt input mode.*

For an example of monitoring a Dolby Surround program while creating metadata for a 5.1-channel program, see Section 3.2.1, Surround-Compatible Postproduction Using Dolby E.

4.5 Channel Mapping

Table 4-2 shows how the DP570 routes input channels to emulator output channels. Channel mapping changes automatically according to the program configuration, and reflects how the channels will be connected to a Dolby Digital encoder.

The DP570 input router enables you to reroute input channels to conform to the automatically assigned channel mapping. See Section 4.6, Input Router Settings, for details.

Table 4-2 Channel Mapping according to Program Configuration
The program number (1–8) identifies the individual programs associated with each channel. So, the entry 2C/2S *means "Program 2, Center channel/Program 2, Surround channel."*

Program Configuration	1/2	3/4	5/6	7/8
5.1+2	1L/1R	1C/1LFE	1Ls/1Rs	2L/2R
5.1+2x1	1L/1R	1C/1LFE	1Ls/1Rs	2C/3C
4+4	1L/1R	1C/1S	2C/2S	2L/2R
4+2x2	1L/1R	1C/1S	3L/3R	2L/2R
4+2+2x1	1L/1R	1C/1S	3C/4C	2L/2R
4+4x1	1L/1R	1C/1S	4C/5C	2C/3C
4x2	1L/1R	3L/3R	4L/4R	2L/2R
3x2+2x1	1L/1R	3L/3R	4C/5C	2L/2R
2x2+4x1	1L/1R	3C/4C	5C/6C	2L/2R
2+6x1	1L/1R	4C/5C	6C/7C	2C/3C
8x1	1C/2C	3C/4C	5C/6C	7C/8C
5.1	1L/1R	1C/1LFE	1Ls/1Rs	None
4+2	1L/1R	1C/1S	None	2L/2R
4+2x1	1L/1R	1C/1S	None	2C/3C
3x2	1L/1R	3L/3R	None	2L/2R
2x2+2x1	1L/1R	3C/4C	None	2L/2R
2+4x1	1L/1R	4C/5C	None	2C/3C
6x1	1C/2C	3C/4C	5C/6C	None
4	1L/1R	1C/1S	None	None
2+2	1L/1R	None	None	2L/2R
2+2x1	1L/1R	None	None	2C/3C
4x1	1C/2C	3C/4C	None	None

Note that the only channel mode supported in four-channel channel-mapping settings is 3/1. If you wish to use 2/2 channel mode, we recommend setting the program configuration to 5.1 and muting the unnecessary channels.

4.6 Input Router Settings

The DP570 input router enables you to reroute input channels to conform to the automatically assigned channel mapping. The input router is active even when Emulator Bypass is enabled.

The *Setup Router* window in the DolbyRemote 570 shows the current router settings as well as how each output channel will be identified given the current program configuration. The window also lets you change the current input assignments.

You can save and name input router settings, or use the factory presets. The factory presets, shown in Table 4-3, are designed to match existing conventions for multichannel media channel order. Preset 1 works with a tape conforming to SMPTE Standards 320M and 320M-A. Preset 3 works with a tape conforming to SMPTE Standard 320M-B.

Table 4-3 Factory Preset Input Assignments

Digital Input	Router Output			
	Preset 1	Preset 2	Preset 3	Preset 4
1	1	1	1	1
2	2	3	5	2
3	3	2	3	5
4	4	6	6	6
5	5	5	2	3
6	6	4	4	4
7	7	7	7	7
8	8	8	8	8

4.7 Using the GPI/O Port

The GPI/O port is a female 37-pin D-connector. You can use this port to connect the DP570 to your studio console or existing control equipment. A standalone remote control unit, the Cat. No. 549 GPIO Controller, is available to provide easy access to the features of the GPI/O port. For more information on the Cat. No. 549 GPIO Controller, please contact Dolby Laboratories.

See Figure 4-4 to identify pin numbers.

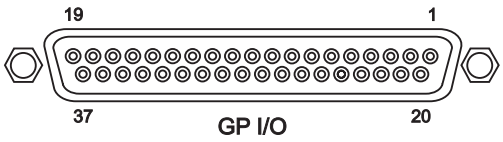


Figure 4-4 GPI/O Pin Numbers

Output pins 4 and 7–19 are user-defined, as shown in Table 4-4.

Table 4-4 GPI/O Pin Assignments

Pin	Function	Pin	Function
1	+5 V (150 mA)		
2	Fault output	20	Encoder A input
3	Error output	21	Encoder B input
4	User-defined output	22	Encoder present input
5	Solo tally output	23	User-defined input
6	Solo control input	24	User-defined input
7	User-defined output	25	User-defined input
8	User-defined output	26	User-defined input
9	User-defined output	27	User-defined input
10	User-defined output	28	User-defined input
11	User-defined output	29	User-defined input
12	User-defined output	30	User-defined input
13	User-defined output	31	User-defined input
14	User-defined output	32	User-defined input
15	User-defined output	33	User-defined input
16	User-defined output	34	User-defined input
17	User-defined output	35	User-defined input
18	User-defined output	36	User-defined input
19	User-defined output	37	Digital ground

By assigning specific functions to the user-definable pins, you can provide simple control of, or status display from, the DP570. Many functions also allow defining the type and polarity of the input or output logic, thereby allowing you to adapt the DP570 to your existing environment.

Table 4-5 provides a description for each function that can be assigned to GPO pins. Some functions have restrictions on the polarity or trigger type. If so, this is indicated in Table 4-5.

In Table 4-5, the **Active State** column indicates the DP570 state that causes the pin to be forced to the logic level indicated, if it is level-triggered.

Example:

Emulator Bypass: Polarity = High
Trigger = Level
Active State = Bypass

In this example, when the DP570 enters Emulator Bypass mode the GPO pin goes high. When the unit is no longer in Bypass mode, the pin goes to the low state.

Table 4-5 Functions available for GPO Pin Assignment

Function	Polarity	Trigger	Active State	Description
V Ref	Either	Either	V Ref error	No signal or invalid signal. (Check for proper termination.)
Metadata In 1	Either	Either	Metadata error	Invalid signal while unit is in external metadata mode.
Metadata In 2	Either	Either	Metadata error	Invalid signal while unit is in external metadata mode.
Emulator Bypass	Either	Either	Bypass	Indicates Bypass is active.
Delay LED	Either	Either	On	Not yet implemented.
Lt/Rt Input	Either	Either	Enabled	Indicates Lt/Rt input is active.
Dim/mute*	Either	Either	Enabled	Indicates Dim Gain setting is active.
Surround EX	Either	Either	EX on	Indicates Surround EX is active.
Pro Logic	Either	Either	Pro Logic on	Indicates Pro Logic is active.
L Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
R Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
C Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
SW Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
Ls Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
Rs Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
Bs Speaker Mute*	Either	Either	Mute	Indicates Mute is active.
Speaker Select* (Multi, Stereo, Mono)	Either	Either	Speaker selected	Indicates which speaker is selected.
Program Select (1–8)	Either	Either	Enabled	Indicates which program is selected.
Preset Select (1–32)	Either	Either	Enabled	Indicates which preset is selected.
Mixdown Mode (Full, Stereo, Mono, Phant, 3-Stereo)	Either	Either	Enabled	Indicates which mode is selected.
Dynamic Range Control Mode (Line, RF, Custom)	Either	Either	Enabled	Indicates which compression mode is selected.
Reference Level*	Either	Level	0 dB	Indicates Master Volume = 0 dB.

**Available only in units with the Cat. No. 548 Analog Option Card.*

Table 4-6 shows assigned GPO pin functions.

Table 4-6 Assigned GPO Pins (not user-definable)

Function	Polarity	Trigger	Active State	Pin
Error	High	Level	Error	3
Fault	Low	Level	Fault	2
Solo Mode*	High	Level	Enabled	5

**Available only in units with the Cat. No. 548 Analog Option Card.*

Input pins 23–36 are user-defined as shown in Table 4-7. See Figure 4-4 to identify pin numbers.

Table 4-7 provides a description for functions that can be assigned to GPI pins. Some functions have restrictions on the polarity or trigger type. If so, this is indicated in Table 4-7. GPI functions that are mutually exclusive are restricted to edge-triggering.

In Table 4-7, the **Active State** column indicates the DP570 state that results when the pin is forced to the logic level indicated, if it is level-triggered.

Example:

Emulator Bypass: Polarity = High
Trigger = Level
Active State = Bypass

In this example, when the pin is held high (for at least 100 ms), the unit is forced into the active state for this function, Bypass.

Table 4-7 Functions Available for GPI Pin Assignment

Function	Polarity	Trigger	Active State	Description
Emulator Bypass	Either	Either	Bypass	Activates emulator bypass
Router Delay	Either	Either	One frame	Not implemented
Lt/Rt Input	Either	Either	Enabled	Activates Lt/Rt input
Dim/Mute*	Either	Either	Enabled	Activates Dim Gain setting
Surround EX on/off	Either	Edge		Activates Surround EX mode
Pro Logic on/off	Either	Edge		Activates Pro Logic mode
L Speaker Mute*	Either	Either	Mute	Mutes L speaker
R Speaker Mute*	Either	Either	Mute	Mutes R speaker
C Speaker Mute*	Either	Either	Mute	Mutes C speaker
SW Speaker Mute*	Either	Either	Mute	Mutes SW speaker
Ls Speaker Mute*	Either	Either	Mute	Mutes Ls speaker
Rs Speaker Mute*	Either	Either	Mute	Mutes Rs speaker
Bs Speaker Mute*	Either	Either	Mute	Mutes Bs speaker
Speaker Select* (Multi, Stereo, Mono)	Either	Edge		Selects speaker system assigned to pin
Program Select (1–8)	Either	Edge		Selects program assigned to pin
Preset Select Group (1–32)	Either	Edge		Selects preset
Mixdown Mode (Full, Stereo, Mono, Phant, 3-Stereo)	Either	Edge		Selects mixdown mode assigned to pin
Dynamic Range Control (Line, RF, Custom)	Either	Edge		Selects DRC profile emulation assigned to pin
Reference Level*	Either	Edge		Forces Master Volume to 0 dB

**Available only in units with the Cat. No. 548 Analog Option Card.*

Table 4-8 shows assigned GPI pin functions. These functions are available only in units with the Cat. No. 548 Analog Option Card.

Table 4-8 Assigned GPI Pins (not user-definable)
These pins are active only in units with the Cat. No. 548 Analog Option Card.

Function	Polarity	Trigger	Active State	Pin
Shaft Encoder A	High	Edge		20
Shaft Encoder B	High	Edge		21
Shaft Encoder Present	Low	Level	Encoder Present	22
Solo Control In	High	Level	Solo Mode Enabled	6

4.7.1 Using an External Shaft Encoder to Control Master Volume

The master volume function is available on DP570s that have the Cat. No. 548 Analog Option Card installed. The **GPI/O** port has three pins that allow control of master volume remotely by using a shaft encoder. The interface is detailed in Table 4-9 and Table 4-10.

Table 4-9 Shaft Encoder Interface Description

Signal	Pin	Description
Shaft 1	21	Shaft encoder input. Two square waves in a quadrature phase relationship. Shaft 0 leads Shaft 1 by 90°: volume increases. Shaft 0 lags by 90°: volume decreases.
Shaft 0	20	
Shaft Present	22	Ground this pin to activate control via shaft encoder. Pulled high internally (10 k to +5 V).

Table 4-10 Shaft Encoder Interface Electrical Characteristics

Characteristic	Min	Max
V_{T+} Positive-going input threshold voltage	1.2 V	2.1 V
V_{T-} Negative-going input threshold voltage	0.5 V	1.4 V
V_H Hysteresis voltage	0.4 V	1.5 V

4.7.2 Solo Input Mode

On units with the Cat. No. 548 Analog Option Card installed, the DP570 provides a two-channel analog input that can be routed to the analog outputs. This input is called Solo because the feature was inspired by the need to provide a way to route a standard signal from a mixer (such as the Solo Bus output) into the monitor chain. The feature can also be useful as a general-purpose analog bypass.

Solo input mode bypasses the digital audio inputs, and only the solo inputs route to the Left and Right outputs. If the Mono speaker output is selected, the input signals are summed and fed to the Mono output.

The Solo input is available only by driving the Solo Control line on the GPI/O port. The Solo control line (pin 6) is level-triggered and is active in the high state. The status of the Solo input displays on the front-panel **Solo** LED and is indicated on the Solo Tally line (pin 5) on the GPI/O port.

Chapter 5
Front-Panel Interface

The front panel includes a menu LCD that shows the current function mode, and buttons that enable function selection, navigation, and editing.

The menu system has two independent structures: setup and status. The setup menu lets you configure the DP570 to suit environmental and program requirements, and the status menu displays information regarding the operating status. A complete menu tree is available in Appendix B, Front-Panel Menu Trees.

Navigation Buttons

The eight buttons closest to the display window control navigation through the menus and selection of parameters within menu screens.

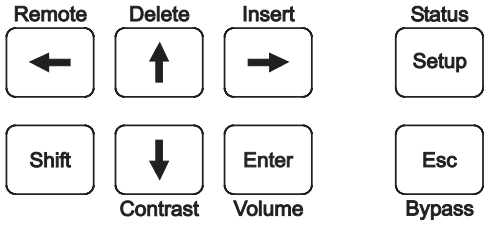


Figure 5-1 Front-Panel Navigation Buttons

To select the function listed above or below a button, first press **Shift**, then the associated button. For example, to select **Remote**, press **Shift**, ←. Do not hold down **Shift** while pressing the second button.

Insert and **Delete** have no impact except in text entry menus. For details on text entry, see Section 5.2.2, Entering Text.

5.1 Hot Button Menus

By pressing certain button combinations on the front panel, you can access the following menus:

- Contrast Adjust
- Master Volume

Any adjustment you make to these controls takes effect immediately.

Contrast Adjust

Press **Shift**, ↓ to access the contrast control.

Use the arrow buttons to adjust the contrast on the LCD. Press **Enter** or **Esc** to return to the previous menu.

Master Volume

Press **Shift**, **Enter** to access the master volume control.

Use the arrow buttons to adjust the volume. Master volume affects only the analog output levels. Press **Enter** to keep the current value and return to the previous menu, or press **Esc** to restore the initial value and return to the previous menu.

5.2 The Setup Menu

To navigate the setup menu, use the front-panel navigation buttons as shown in Table 5-1.

Table 5-1 Navigation Button Functions

Command	Result
← or ↑	Displays the previous menu item available on line 2 of the display.
↓ or →	Displays the next menu item available on line 2 of the display.
Enter	Enters the menu item on line 2 of the display; changes function status and menu display accordingly.
Esc	Displays the next higher menu level. If you have changed the display from the current parameter value without pressing **Enter**, returns display to current parameter value.

These commands and results remain constant throughout the setup menu except during text entry. For details on text entry, see Section 5.2.2, Entering Text.

At any time, the commands in Table 5-2 exit the setup menu.

Table 5-2 Commands that Exit the Setup Menu

Command	Result
Status	Displays current status menu.
Remote	Engages the remote control and displays the current status menu.

To return to the setup menu, press **Setup**. If you engage the remote, to use the front-panel status menu you must first disengage the remote by pressing **Shift**, ←, then **Setup**.

5.2.1 Selecting Parameters

When line 2 of the display includes a flashing cursor, the parameter displayed on that line is not active. Pressing **Enter** activates that parameter. Pressing **Esc** when the flashing cursor displays returns line 2 of the display to the active parameter for that menu.

Example:

```
Lt/Rt Input
  Enable
```

with flashing cursor

Press **Enter** to activate Lt/Rt Input. Press **Esc** to return the display to the active status:

```
Lt/Rt Input
  Disable
```

without cursor

If you press **Enter** from the active status display, there is no change. If you press **Esc**, the next higher menu level displays:

```
Operating Mode
 Lt/Rt Input
```

5.2.2 Entering Text

In certain situations you will be prompted to enter text. In the text entry window,

```
Enter Name
 PRESET 6
```

the first line prompts you to enter text. The second line displays the current text for the parameter or, if no text is yet defined, a default text string. An underline cursor appears under the first character in the string. Enter text by using the navigation buttons as described earlier in the Navigation Buttons section of this chapter.

Note: Do not use more than 12 characters, including spaces, for a preset name.

Button functions in text entry mode are described in Table 5-3.

Table 5-3 Navigation in Text Entry Menu

Command	Result
← or →	Moves the cursor to the left or right.
↑	Displays the previous character in the character set.
↓	Displays the next character in the character set.
Enter	Saves the text on line 2 temporarily, pending confirmation. Changes display to confirmation dialog.
Esc	Returns text on line 2 to initial display. If text is unmodified, displays the next higher menu level.
Insert	Places a blank space at the cursor location. If there are characters to the right of the cursor, moves all characters one space to the right.
Delete	Deletes the character at the cursor location.
Remote	Engages the remote control and displays the main status menu.

When you press **Enter**, a confirmation dialog displays:

```
Save Preset
ENTER=Yes ESC=No
```

Enter completes your text entry. **Esc** aborts the text entry.

5.3 Preset/Program Buttons

The center group of buttons allows you to quickly select existing presets and to choose among programs available. The three **Compression Mode** buttons are described in the next section.

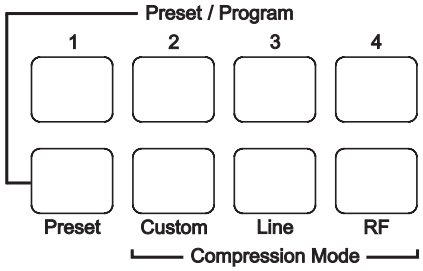


Figure 5-2 Preset and Program Buttons

To select a preset, press the **Preset** button so that it is illuminated, then button **1**, **2**, **3**, or **4**. To select presets 5–32, use the DolbyRemote 570 software interface or the menu display. The **Preset** button stays lit when in preset selection mode.

To select a program, press the **Preset** button if it is illuminated. When the **Preset** button is not illuminated, press button **1**, **2**, **3**, or **4** to select a program. For example,

in the program configuration 5.1+2×1, program 1 is 5.1, programs 2 and 3 are each mono, and program 4 is not available. In configurations with more than four programs available, use the menu display or the remote software to select programs 5–8. Table 4-2 shows a complete list of program configurations.

5.4 Listening Mode Selection Buttons

The front panel allows one-touch access to a range of listening mode options. All the listening mode options apply the active metadata settings to your chosen listening environment emulation. The DP570 enables you to monitor any listening mode while making adjustments to metadata settings. Listening mode selections have no effect on metadata settings, they simply allow you to choose the context in which you evaluate those settings.

Figure 5-2 shows the **Compression Mode** buttons:

- **RF**. Applies the active RF Mode dynamic range control (DRC) settings.
- **Line**. Applies the active Line Mode settings.
- **Custom**. Allows you to apply variable degrees of the Line Mode DRC profile. The amount of variation is controllable by using the DolbyRemote 570 software, or by holding down the custom key until the appropriate menu appears.

Only one compression mode at a time is active. Selecting one mode disables the others. Pressing the button for the active mode disables that mode and turns DRC off. The setting for dialogue level remains active at all times.

Figure 5-3 shows the rest of the listening mode selection buttons. If you have selected a speaker output other than multichannel, some selections are not available.

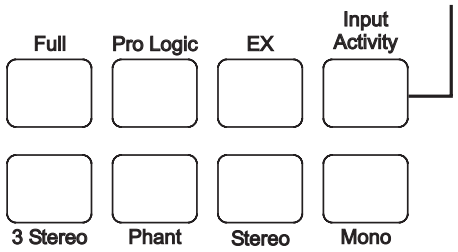


Figure 5-3 Listening Mode Selection Buttons

- **Full**. Sends all input channels to output channels without downmixing. For example, a 5.1 program has six output channels, a stereo program two.
- **Pro Logic**. Activates Pro Logic decoding. This is possible in all listening modes except for Surround EX.
- **EX**. Activates Surround EX decoding. This is only possible when monitoring a program with two surround channels.

- **3 Stereo**. Downmixes to left, center, and right speakers.
- **Phant**. Mixes center channel to left and right speakers.
- **Stereo**. Downmixes all input channels to left and right speakers.
- **Mono**. Downmixes to center channel only.

The **Input Activity** button is described in the next section.

5.5 LED Indicators

LED indicators at the top of the front panel provide information about the signal input and output. Indicators shown in Figure 5-4 display basic status information.

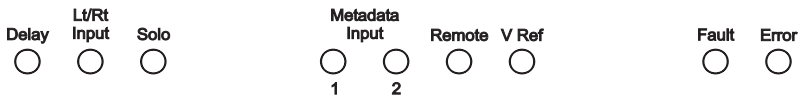


Figure 5-4 Basic LED Indicators

Basic LED indicator definitions:

- **Delay** Green: Router or metadata output is delayed.
  Off: No delay.
- **Lt/Rt Input** Green: Lt/Rt input mode is active.
  Off: Inactive.
- **Solo** Green: Solo input function is active.
  Off: Inactive.
- **Metadata Input** There are separate indicators for inputs 1 and 2.
  Green: Signal is locked and valid.
  Red: Invalid signal while unit is in external metadata mode.
  Off: Unit is not in external metadata mode.
- **Remote** Green: Remote is active.
  Red: Communication problem.
  Off: Remote is not activated.
- **V Ref** Green: Signal is locked.
  Red: No signal or invalid signal. (Check for proper termination.)

Note: The DP570 does not require a valid video reference signal in order to produce an output metadata stream. If there is no valid video reference, the output metadata frame rate locks to the audio sample rate at a period of 1536 audio samples, the equivalent to the frame rate of Dolby Digital (AC-3).

- **Fault** Red: A hardware-level fault.
  Off: No fault.
- **Error** Red: Error condition due to an input signal failure; suggests that the output is invalid (for example, loss of lock on required digital audio inputs, loss of lock on V Ref input, or loss of lock or invalid metadata input).
  Off: No errors.

Indicators in Figure 5-5 show channel activity for either input or output, depending on whether you press the **Input Activity** button.

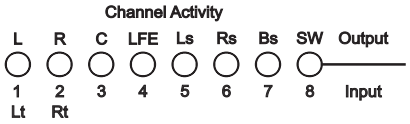


Figure 5-5 Channel Activity LED Indicators

Channel Activity LED indicators are detailed in Table 5-4.

Table 5-4 Channel Activity LED Display Definitions

LED Display	Signal Status
YELLOW	Peak signal level < –60 dBFS
GREEN	–60 dBFS ≤ peak signal level < –0.1 dBFS
RED	–0.1 dBFS ≤ peak signal level
Blinking YELLOW	(Input Activity only) Channel enabled but not locked
OFF	Input: Channel disabled by Dolby E program config Output: Channel disabled by downmix, speaker selection, or Channel Mode parameter setting

Chapter 6
Front-Panel Menus

This chapter provides information about terms and selections in the front-panel LCD window.

6.1 Setup Menu

Options in the top menu level are:

- Program Select
- User Presets
- Operating Mode
- Program Config
- Metadata Params
- Configuration
- System Settings

6.1.1 Program Select

In this menu you can select among programs available in the current setup. For example, a 4+2+2×1 program configuration includes four separate programs: Program 1 is four-channel, Program 2 is two-channel, and Program 3 and Program 4 are one-channel. For a complete list of program configurations, see Table 4-2.

6.1.2 User Presets

The DP570 has the capacity to save and recall 32 presets. When the DP570 is shipped from the factory, all the presets are occupied by the default configuration.

Creating and Saving Custom Presets

To create and save a preset, simply alter as many parameters as you wish from an existing configuration, then save and name your preset.

If you are saving a configuration with multiple programs, check the parameter settings for each program separately, as the programs you do not alter save the parameter settings from the previous configuration.

You can save three different types of presets. *Authoring* parameter presets include the Dolby E program configuration, all metadata parameters for each program, the external program configuration, and program and parameter source information for each program. *Emulator* parameter presets include the DRC and downmix modes, speaker-system choice, bass management, router settings, and LFE mode. The third type, *all*, includes both *authoring* and *emulator* settings.

To save a preset using the front-panel interface:

1. Press **Setup**, then **Esc** to view the top-level Setup menu.
2. Press the → button to change the second-line display to `User Presets` and press **Enter**.
3. Press the → button to change the second-line display to `Save Preset` and press **Enter**.
4. Use the arrow keys to select the preset number (`01-32`) you want to use to save the current parameters.
5. Use the arrow keys to select `All`, `Authoring`, or `Emulator`, then press **Enter**.
6. Enter the preset name using the commands in Table 5-3.

6.1.3 Operating Mode

In this menu you can set the dialogue level, enable and disable the Lt/Rt Input and Emulator Bypass modes by entering the available submenus. For more information on setting the dialogue level, see Section 3.1.2, Setting Dialogue Level, and Appendix A, Metadata.

Lt/Rt Input Mode

When you enable Lt/Rt input, the **Lt/Rt Input** LED is illuminated. In this mode, metadata is not used, but you can monitor the Lt/Rt signal or the Pro Logic decoded signal and check downmixes. Available downmix options are shown in Table 6-1.

Table 6-1 Lt/Rt Downmix Options

Listening Mode	Mix Output
Full	Pro Logic decode to L, C, R, and S
Stereo	Mix S and C to L and R
Mono	Mix all channels to C
3 Stereo	Mix Surround to L and R
Phantom Center	Mix Center to L and R

Emulator Bypass

When you enable Emulator Bypass, the front-panel **Esc** button is illuminated. In this mode, the only settings that affect the output are the router settings. Monitoring options are limited to program selection. If you are using the Lt/Rt input, that signal is sent, without decoding, to the Left and Right emulator outputs. Bass Management remains active while the unit is in Emulator Bypass.

6.1.4 Program Config

This menu lets you choose any of the possible program configurations. For a complete list of program configurations, see Table 4-2. If you choose an external source for the program configuration, that source provides the default value for all metadata parameters.

6.1.5 Metadata Params

This menu includes 25 parameter selection menus. Press Enter to view or change a parameter's setting. Each initially displays the current setting. Scroll through the options on line 2 of the display to view other settings available for the parameter displayed. Note that you can view or change metadata values for the current program only.

Table 6-2 provides a basic definition for each of the metadata parameters available, listed by the front-panel display for each parameter. See Appendix A, Metadata for more detailed information about metadata.

Table 6-2 Metadata Params Submenus

LCD	Parameter Description
Dialogue Lev	Controls dialogue level setting. See Section 3.1.2, Setting Dialogue Level, and Appendix A, Metadata, for detail.
Channel Mode	Designates the number of active channels. The first number is the number of front channels, the second the rear channels. Restricted by the number of channels available in the current program.
LFE Channel	Indicates whether LFE Channel is present. Available only in channel modes 3/2, 3/1, 3/0, 2/2, and 2/1.
Bitstrm Mode	Describes the audio service carried in the bitstream.
Line Mode Pro	Designates the Dynamic Range Control profile used in Line mode
RF Mode Pro	Designates the Dynamic Range Control profile used in RF mode
RF Ov Protect	If enabled, protects against overmodulation when a decoded signal is subsequently modulated onto an RF carrier.
Dolby Srnd	Indicates whether a two-channel encoded bitstream contains a Dolby Surround (Lt/Rt) program and requires Pro Logic decoding.
Audio Prod Info	Indicates whether the Mixing Level and Room Type parameter settings are carried in the bitstream.
Mixing Level	Indicates absolute acoustic SPL of main dialogue channel during final mixing session. Informational only.
Room Type	Indicates size and calibration of the mixing room used for the final mixing session. Informational only.
Copyright	Indicates whether the encoded bitstream is copyright protected. Informational only.
Original Bitstrm	Indicates whether the encoded Dolby Digital bitstream is the master version. Informational only.
Pref Downmix	Designates preference for Lt/Rt or Lo/Ro. Indicates if set by external input.
Lt/Rt C Dwnmix	When the stereo downmix is Lt/Rt, designates downmix level for the center channel.
Lt/Rt S Dwnmix	When the stereo downmix is Lt/Rt, designates downmix level for surround channels.
Lo/Ro C Dwnmx	*When the stereo downmix is Lo/Ro, designates downmix level for the center channel.
Lo/Ro S Dwnmx	*When the stereo downmix is Lo/Ro, designates downmix level for surround channels.
Dolby Srnd EX	Identifies if program is Surround EX encoded.
A/D Conv Type	Identifies the setting for type of A/D converter. Informational only.

**Lo/Ro downmix settings control the values for Center Downmix and Surround Downmix. The active* Metadata Params *status menu displays the derived values.*

LCD	Parameter Description
DC Filter	Determines if a DC-blocking 3 Hz highpass filter is applied before Dolby Digital encoding.
Lowpass Filt	Determines if a lowpass filter is applied to the main input channels before Dolby Digital encoding.
LFE Filter	Determines if a 120 Hz lowpass filter is applied to the LFE channel before Dolby Digital encoding.
Srnd 3dB Attn	Determines if the surround channels are attenuated by 3 dB before encoding.
Srnd Ph Shift	Determines if a 90 degree phase shift is applied to surround channels. This is necessary to create an Lt/Rt downmix that can be Pro Logic decoded to L, C, R, S.

6.1.6 Configuration

Configuration includes three submenus:

- Emulator config
- Router config
- Monitor config

Note: To properly configure your monitoring system using the Monitor Config or Emulator Config menu, follow the procedure in Section 2.4.2, Setting Up Monitors.

Emulator config

Emulator config settings affect both analog monitor and emulator outputs unless otherwise noted in Table 6-3.

Table 6-3 Emulator Config Submenus

Display	Select second-line parameter to:
Test Noise	Select type or disable.
Center Delay	Apply a value between –3 and +5 ms.
Surround Delay	Apply a value between 0 and 50 ms.
Pro Logic Delay	When in Pro Logic mixdown mode, apply an additional delay value between 10 and 100 ms for surround channels.
Bass Management	Select a mode or disable.
SW Xover Freq	Select the crossover frequency for the subwoofer channel.
LFE Monitor Mode	Select setting for use of LFE. Auto Select is adequate unless you have specific other needs.
Back Surround	Select the number of speakers available for back surround use.
Sticky Settings	Turn on or off whether the emulation setting is remembered for each program.
Extended BSI Params	Turn on or off the effect of Dolby Digital Extended BSI parameters on the monitor output. Does not affect the metadata output stream.
Digital Ref	Select system digital reference level for test noise and B-type decoder.

Router Config

Router configurations set the output of each audio channel for the Router Out jacks. Up to four complete router output settings can be saved in presets.

Table 6-4 Router Config Submenus

Display	Use Menu to:
Router (1–8)	Choose audio input channel assignments for each router output channel.
Router Presets	Recall saved presets, and name and save new presets. You can store up to four router configurations as presets.

Monitor config

Monitor configuration settings only operate if the Cat. No. 548 Analog Option Card is installed. Monitor settings adjust speaker outputs and affect your listening environment, but have no effect on metadata output. Available trim level settings for both master trim and individual speakers range from +6 to –20 dB. For master trim, the increments are 0.5 dB; for individual speakers, 0.125 dB.

Table 6-5 Monitor Config Submenus

Display	Use parameter to:
`Master Trim`	Set the master trim level for the current speaker outputs.
`Dim Gain`	Set an alternate overall speaker volume level to be available at one touch on DolbyRemote or GPI/O interface. Set to `off` if you want that function to mute the speakers.
`Speaker Select`	Choose speaker system: Multichannel, Stereo, or Mono.
`Speaker Trims`	Set individual speaker trim levels. First choose a speaker, then set its level.
`Test Noise`	Choose type of test noise, or set to `off` to cancel test noise.

6.1.7 System Settings

This menu gives you access to submenus controlling the setup for communication with other devices, and for upgrading software.

The submenus are:

- Unit Name
- Communications
- GPO Setup
- GPI Setup

Unit Name

Enter any name you wish for your DP570 using the commands in Table 5-3. The unit name can include any combination of characters and spaces up to 16 characters long

Communications

Communications includes a submenu for `Remote Setup`.

The `Remote Setup` submenu lets you set the baud rate and the unit address. These settings must match the settings on the **Open Device** window in the DolbyRemote 570 software for successful communication between the remote software and the DP570.

Setting the Unit Address

The unit address is four characters long. The first character is limited to the numbers 8–F, and the other characters are restricted to 0–F.

Note: In the Communications menu, pressing **Enter** saves the current value without any confirmation dialog.

GPO Setup

For details on the GPI/O port functions, see Section 4.7, Using the GPI/O Port. Output pins 4 and 7–19 are user-defined, as shown in Table 4-4. See Figure 4-4 to identify pin numbers.

To define a function for an output pin, enter the `GPO Setup` menu, use the arrow buttons to select the pin number you wish to define, and press **Enter**. Three submenus are available: `Trigger`, `Polarity`, and `Function`. `Trigger` defines the type of signal the pin produces and can be set to `Level` or `Edge`. If set to `Level`, the pin produces a constant level, if set to `Edge`, the pin produces a pulse of about 200 ms duration (185 ms minimum). `Polarity` can be set to `Positive/High` or `Negative/Low`. Positive/Negative refers to edge-triggered signals. High/Low is for level-triggered signals.

The `Function` menu lets you assign a function to the pin you have selected. Table 4-5 provides a description for each function that can be assigned to GPO pins.

GPI Setup

Input pins 23–36 are user-defined as shown in Table 4-4. See Figure 4-4 to identify pin numbers.

To define a function for an input pin, enter the `GPI Setup` menu, use the arrow buttons to select the pin number you wish to define, and press **Enter**. Three submenus are available: `Trigger`, `Polarity`, and `Function`. `Trigger` defines the type of signal the pin requires and can be set to `Level` or `Edge`. If set to `Level`, the pin is triggered by level, if set to `Edge`, the pin is edge-triggered and requires a pulse of 100 ms minimum duration. `Polarity` can be set to `Positive/High` or `Negative/Low`. Positive/Negative refers to edge-triggered signals. High/Low is for level-triggered signals.

The `Function` menu lets you assign a function to the pin you have selected. Table 4-7 provides a description for functions that can be assigned to GPI pins.

6.2 Status Menu

The main Status menu appears when you turn the power on, when you press the **Status** button combination (**Shift, Setup**), and when you activate the remote control. At power-up, the status returns to the active configuration at the preceding power-down.

Example:

```
5.1+2x1     Internal
Prog 1       3/2L 27
```

The top line shows the current program configuration (`5.1+2×1`) and the metadata source (`Internal`). The bottom line shows the active program (`Prog 1`), channel mode (`3/2`), LFE mode (`L` indicates LFE is on, blank indicates LFE is off), and the dialogue level value (`27`). If Lt/Rt input or Solo mode is enabled, the bottom line displays `Lt/Rt Input Mode` or `Solo Mode`.

In the status menu, you can view more information about the current program by using the arrow buttons. Informational menus display for `Metadata Params`, `Preset Status`, `Video Ref`, `Audio Input`, `Delay Status`, `Error Status`, and `Firmware Version`. In categories where more menus are available, the second line displays `ENTER to View`, and you can view the available information by pressing **Enter**. At any time, press **Esc** to return to the next higher menu level.

Settings cannot be changed or altered from the Status or Informational menus. To change settings, use the remote software or the Setup menu on the front panel.

Chapter 7
DolbyRemote 570

DolbyRemote 570 provides quick access to virtually all of the DP570's functions. In addition, the application provides access to some features not available from the DP570 front-panel interface.

Use of DolbyRemote 570 allows the DP570 to be located in another room or at a distance from the operator. While DolbyRemote 570 is in operation, the **Remote** LED on the front panel of the DP570 is lit and access to the setup menu via the front-panel buttons is disabled.

7.1 System Requirements

DolbyRemote 570 can be run on a PC that meets these minimum requirements:

- 166 MHz Pentium processor
- 32 MB RAM
- 10 MB available hard drive storage
- Super VGA video card with 800 × 600 resolution

7.2 Hardware Connection

To connect the DP570 to its remote control device, use a serial cable from your computer to either the front-panel Remote RS-232 port, or the rear-panel Remote RS-485 port. For connector and pin descriptions for these ports, see Sections 8.2 and 8.8.

7.3 Installing the Software

DolbyRemote 570 software is provided on a floppy diskette.

Diskette Installation

1. Place the diskette in the PC and run `Setup.exe`.
2. Use the default destination or select an alternate location for the software installation.
3. Follow screen prompts until installation is complete.

7.4 Launching the Application

Configure the DP570 communications parameters from the front panel prior to launching the DolbyRemote 570 software. Upon launching the application, the **Open Device** window is displayed. The PC communications parameters should be set to reflect the DP570 communications settings.

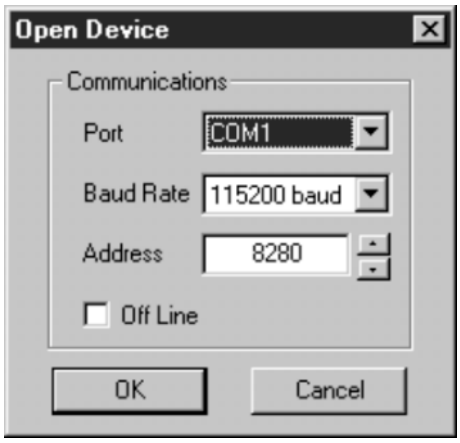


Figure 7-1 Communications Configuration

Table 7-1 Communications Parameters
Default values are in bold.

Parameter	Values
Port	**Com1** through Com10
Baud Rate	9600, 19200, 38400, or **115200**
Address	**8280** to 82fe, even numbers

Before you click OK to begin remote software operation of the DP570, on the DP570 front panel press the **Shift** button once so that the button illuminates, then ←. (Do not hold down **Shift** while pressing ←.) To disable remote operation and resume using the front-panel interface, press **Shift**, ← again.

7.5 Display Overview

DolbyRemote 570 uses menus and commands familiar to users of Microsoft Windows. Menus and commands unique to DolbyRemote 570 are described in this chapter.

Main

Metadata

Monitor

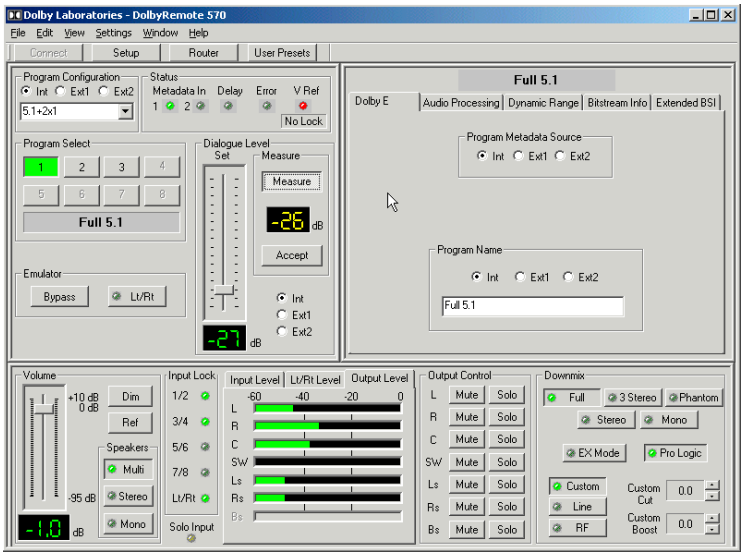


Figure 7-2 DolbyRemote 570 Windows

The application display consists of three windows: Main, Metadata and Monitor. All three windows open when the program launches; you can use the View menu to open or close various combinations of the windows.

The four buttons (**Connect**, **Setup**, **Router**, and **User Presets**) above the Main window provide access to essential DP570 functions.

7.5.1 Connect

The **Connect** button is only available if the **Off Line** check box was enabled when the application launched (See Figure 7-1). If you are using the DolbyRemote 570 application off line and wish to connect to the DP570, click **Connect**, click the **Off Line** box to disable that selection, and click **OK**. If the device and software do not recognize each other, check the communications menu on the front panel of the DP570 and make sure the parameters match those on the screen.

7.5.2 Setup

Click **Setup** to use DolbyRemote 570 to set up your listening environment. It is very important that you follow the procedure in Section 2.4, Quick Start Guide to set up your listening environment properly using the controls on the **Monitor** tab.

Monitor Tab

In addition to the controls involved in the essential steps in the Quick Start Guide, the **Monitor** tab is where you can choose settings for *Dim Gain*, and enable or disable *Sticky Settings* and *Extended BSI* parameters. All settings on the **Monitor** tab affect your monitoring system only.

Dim Gain

The *Dim Gain* slider sets an alternate level for all speaker outputs. This level is activated when you enable the **Dim** button in the Monitor window in the opening display shown in Figure 7-2. This setting enables you to change your monitor level in one click (for instance, if a client walks in or you have to take a phone call), then return to your master level setting by clicking **Dim** again.

If you select "Off" for the *Dim Gain* setting, then activating the **Dim** level mutes the speakers.

Note: **Dim** level activation is not available on the front-panel interface, although you can change the *Dim Gain* setting using the front-panel controls.

Digital Reference Level

This level should be set to match your studio's digital reference level before turning on a test noise when calibrating your speaker system, as described in Section 2.4.2, Setting Up Monitors. This level also properly calibrates the B-type section in the Pro Logic decoder.

Extended BSI

When you enable *Extended BSI*, your monitoring system responds to the extended BSI metadata parameter settings. When you disable the check box, your monitor ignores those parameters. See Section A.5.2, Extended Bitstream Information Parameters for a more detailed explanation of these parameters.

Sticky Settings

When you enable *Sticky Settings*, your last settings for Dynamic Range Control profiles, downmix, speaker selection, LFE monitor, master volume, and emulator bypass for your listening environment remain with each program when you leave one program to monitor another. This allows you to switch to another program, monitor that program, then return to the original program without losing the settings you had chosen for the original program.

When you disable *Sticky Settings*, settings for these monitoring modes do not change when you leave one program to monitor another.

GPI/O Tab

You can use the **GPI/O** tab to configure the DP570 for control by simple contact closures and for providing tally signals to monitor operation. The **GPI/O** setup tab enables you to select the following on a pin-by-pin basis:

- Input and output trigger type as Edge or Level
- Input and output logic polarity as Negative Low or Positive High
- Input and output function assignments

Input and output pin assignments are detailed in Section 4.2, Internal Metadata Default Settings.

7.5.3 Router

The DP570 router enables you to reassign input channels as necessary. The router remains active even when the DP570 is in Emulator Bypass mode, so you can make sure your channel assignments match downstream requirements even if you are not using the DP570 for monitoring or metadata evaluation.

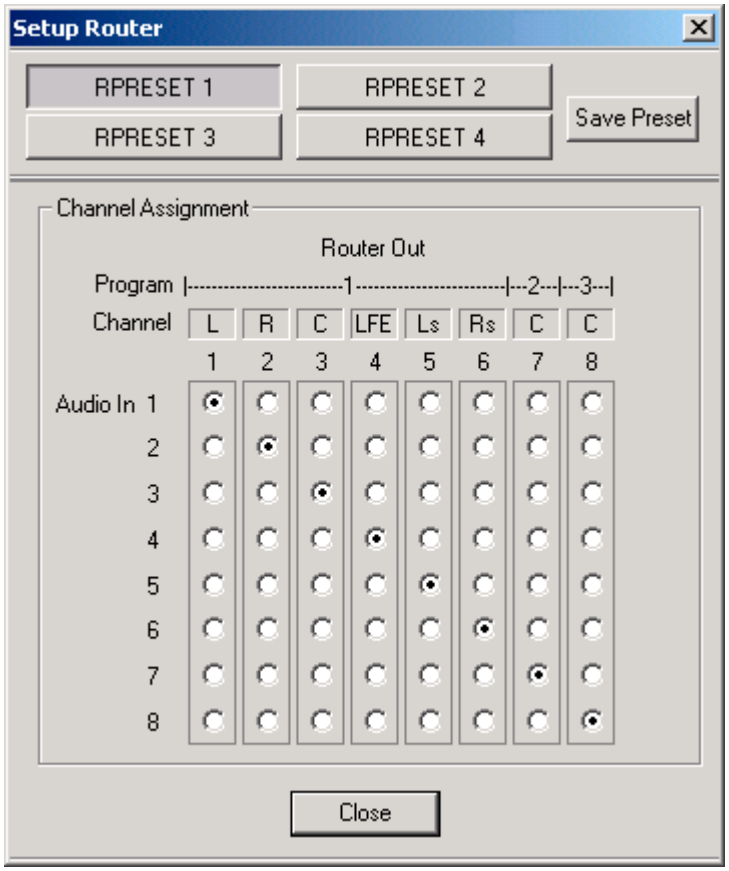


Figure 7-3 Setup Router Window

The *Setup Router* window shows how the current program configuration is mapped. It also lets you change the current input assignments.

The audio input channels are identified next to each row of option buttons. The router output assignments are identified above each column. The *Program* display line shows which output channels are associated with each program in the current program configuration. The *Channel* display line shows how audio channels within each program are assigned to the output channels. For a complete list of channel assignments associated with different program configurations, see Table 4-2.

Four router-preset configurations can be saved for subsequent recall. The preset name may have a maximum of 12 characters. For more information on the input router, see Section 4.6, Input Router Settings.

7.5.4 User Presets

You can save up to 32 presets.

You can save three different types of presets. *Authoring* presets include the Dolby E program configuration, all metadata parameters for each program, and the source for each parameter. *Emulator* presets include the DRC and downmix modes, speaker-system choice, bass management, router settings, and LFE monitor mode. The third type, *all*, includes both *authoring* and *emulator* settings. See Section 4.3, User Presets, for details.

To save a preset:

1. Click **User Presets.**
2. Click **Save.**
3. Select a preset number.
4. Select the type of preset: **All, Authoring,** or **Emulator.**
5. Name the preset, using no more than 12 characters, then click **OK.**

   The preset name appears with the number on the button for the preset number you chose.

To recall any preset:

1. Click **User Presets.**
2. Choose a preset number and click that button, then click **OK.**

7.6 Main Window

Figure 7-4 shows the **Main** window. The feature groups are:

- Program Configuration
- Status
- Program Select

- Dialogue Level
- Emulator

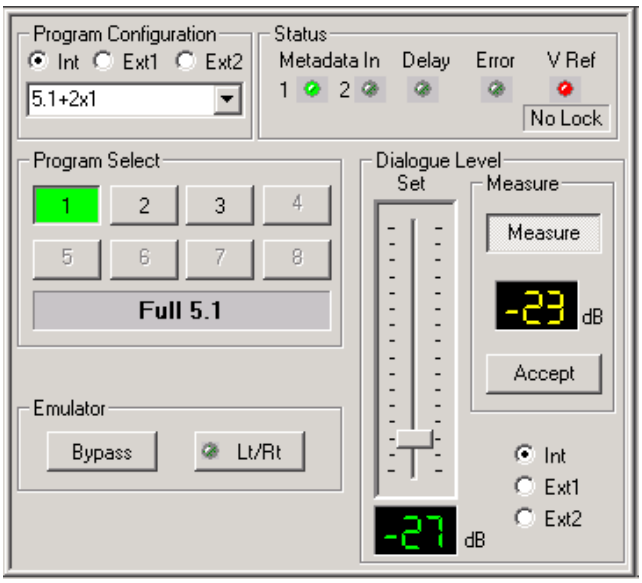


Figure 7-4 Main Window

7.6.1 Program Configuration

Click one of the three available option buttons to select the *Program Configuration* source as **Internal, External 1,** or **External 2.**

If you select an external source, that source controls the metadata settings. You can still replace metadata settings with internally generated selections if you choose to, using individual parameter selections in the Metadata window. When you select an external source, the other external source is unavailable.

If you select **Internal,** the configuration can be selected from the drop-down list. If you select an external source, the configuration is displayed but no user selection is possible. For a complete list of program configurations, see Table 4-2.

7.6.2 Status

Status indicators display in the same manner as the LEDs on the front panel of the DP570.

- *Metadata Input* — There are separate indicators for inputs 1 and 2.
  Green: Signal is locked and valid.
  Red: Invalid signal while unit is in external metadata mode.
  Off: Unit is not in external metadata mode.
- *Delay* — Green: Router or metadata output is delayed.
  Off: No delay.

- *Error* Red: Loss of lock of required digital audio input; or while using external metadata, loss of lock of V Ref input; loss of lock or invalid metadata input.
  Off: No errors.

- *V Ref* Green: Signal is locked.
  Red: No signal or invalid signal. (Check for proper termination.)

A box below the *V Ref* indicator displays the current video frame rate.

7.6.3 Program Select

The number of programs available is determined by the *Program Configuration*. The selected program button appears green, and the active program name is displayed below the buttons. Program selection defines both what you hear and the metadata adjustments available. You can adjust metadata parameters only for the active program selection; if the active program configuration includes multiple programs, you should review the metadata settings for each program.

7.6.4 Dialogue Level

Dialogue level is a crucial setting when producing content. The controls available for this setting are prominently placed on the DolbyRemote 570, although the setting is actually a metadata parameter adjustment. See Appendix A, Metadata, for a more detailed explanation of the parameter. Like all metadata parameters, the source for dialogue level can be either external or internal. The dialogue level parameter source must be internal to adjust the value using the DP570.

To set the dialogue level parameter, the first and most important step is selecting an audio sample, or "clip," representative of the *average* loudness level of the program content. Remember that the dialogue level parameter establishes the level for *normal* dialogue in the program; quieter and louder scenes tend to show higher or lower measurements than the correct value. Using more than one clip can be worthwhile—for instance, samples of conversation involving featured characters with different vocal qualities. In programs without dialogue, such as a music concert, you need to identify sections of average loudness. With representative audio clips identified, you can use the DP570 to set the dialogue level parameter.

Note: The *Measure* function used in the following procedure is designed to measure dialogue only. Programs without dialogue, such as an all-music program, still require a careful setting of the dialogue level parameter. When setting the parameter for such content, it is useful to compare the program to the level of other programs. The goal is to allow the consumer to switch to your program without having to adjust the volume control.

To measure dialogue level:

1. Play the audio clip.
2. While the clip is playing, click **Measure,** next to the *Dialogue Level* slider.

   The DP570 begins measuring the level of the audio clip. The software display of the measured level varies widely at first, but the measurement is an average level over time (LeqA), so the display stabilizes as the clip continues.

   If the input audio level registers below –31 dBFS, the **Accept** button is disabled, as those values are not valid settings for the dialogue level parameter. Below –40 dBFS, the display reads **LOW.** In either case, it is best to bring the input audio level to operating level and remeasure the selected audio clip.
3. When an adequate amount of the clip has played, click **Measure** to stop the measurement.

   The software displays the level of the audio clip. This level displays until you start a new measurement.

Repeat these steps with each audio clip selected. The DP570 should return similar values for each of the clips. If the variation between the clips is 4 dB or less, select a value for the dialogue level parameter within that range that best indicates the average level of the program content. At any time, to use the measurement level displayed on the software, click **Accept,** and the dialogue level parameter is set at that level. To set the dialogue level parameter manually, click and drag the *Dialogue Level* slider to the setting you want.

If the DP570 measures more than a 4 dB difference in your dialogue samples, reconsider the clips you have chosen, recalling that these clips should represent normal speech level in your content.

7.6.5 Emulator

Click **Bypass** to send the input signal directly to the router outputs. When enabled, the **Bypass** button flashes yellow. Routing remains available in Bypass mode, but no other DP570 features are operative.

Click **Lt/Rt** to select Lt/Rt input mode. See Section 4.4, Using Lt/Rt Input Mode, for details.

Caution: *Changes to metadata parameters may still be made while in Lt/Rt input mode, but you cannot hear the effect of these changes, because the emulator is dedicated to Lt/Rt input signal. Therefore, you should only change metadata values while not in Lt/Rt input mode.*

7.7 Metadata Window

The Metadata window includes five tabs: **Dolby E**, **Audio Processing**, **Dynamic Range**, **Bitstream Info**, and **Extended BSI**. Each tab displays a group of parameter settings.

Option buttons for **Internal**, **External 1**, and **External 2** appear next to each parameter. If the program metadata source is internal, the option buttons for **External 1** and **External 2** are available. When you select one external source for a parameter, the other external source is unavailable for all parameters. If the current program metadata source is external, the metadata value for each parameter is defined by that external source and the other external source is unavailable. You can select the **Internal** option button for an individual parameter to override that value from the external source with a parameter value from the DP570.

For a list of metadata parameters with basic definitions, see Table 6-2. For more detailed information on metadata, see Appendix A, Metadata.

7.7.1 Dolby E

The **Dolby E** tab displays the program metadata source and the program name for the current program. To change the program name, select **Int** under Program Name, select the text in the text box, type the new name, and click out of the text box.

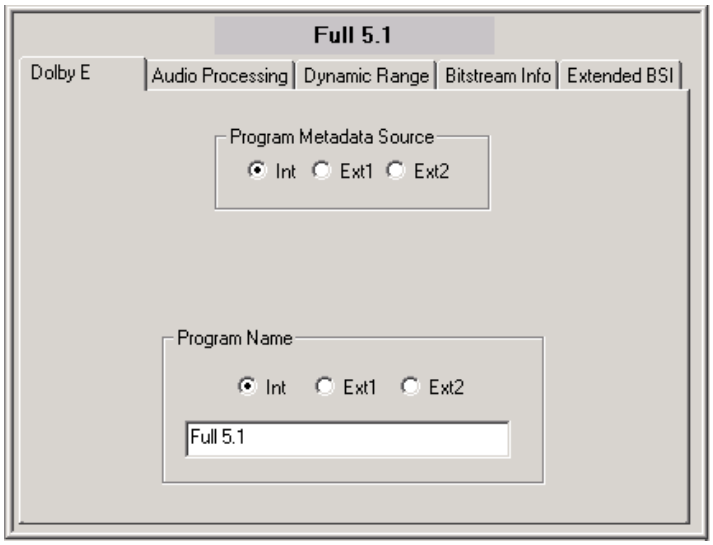


Figure 7-5 Dolby E Metadata Tab

7.7.2 Audio Processing

Parameters on the **Audio Processing** tab are enabled and disabled by clicking the check box next to the parameter name, except *Channel Mode*. The availability of modes in the *Channel Mode* drop-down list box is controlled by the program configuration.

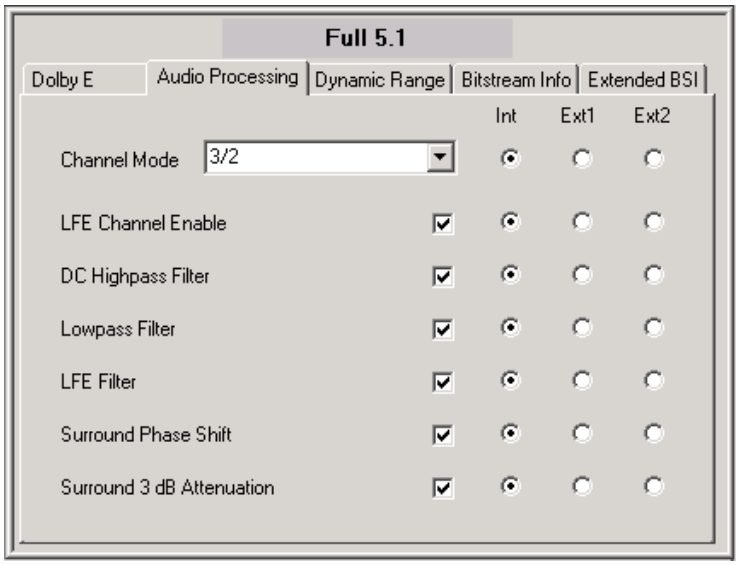


Figure 7-6 Audio Processing Tab

7.7.3 Dynamic Range

Dynamic Range Control (DRC) profiles are particularly important because the profiles you select are implemented at the consumer level when the consumer chooses to apply DRC. Before you listen to different profiles, it is essential that *Dialogue Level* is set accurately. See Appendix A, Metadata for details on selecting DRC profiles.

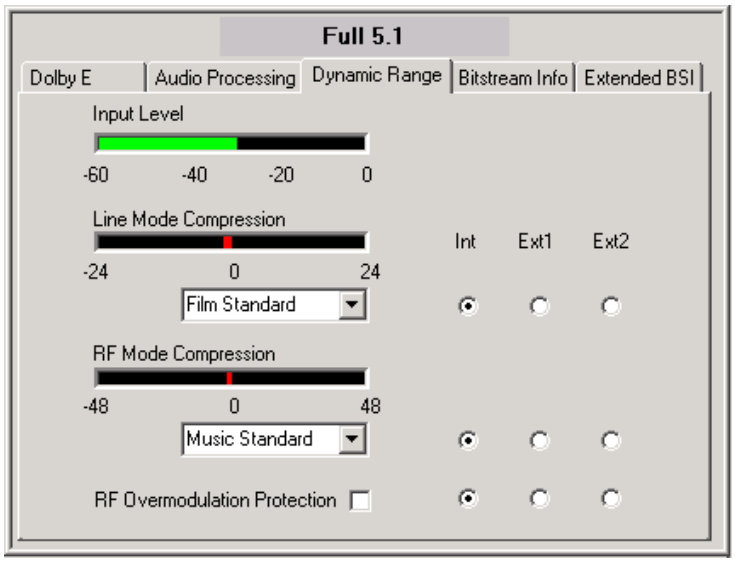


Figure 7-7 Dynamic Range Tab

7.7.4 Bitstream Info

Choices are available via drop-down lists and check boxes. Note that for **Mix Level** and **Room Type** information to be carried downstream, **Audio Production Info** must be enabled.

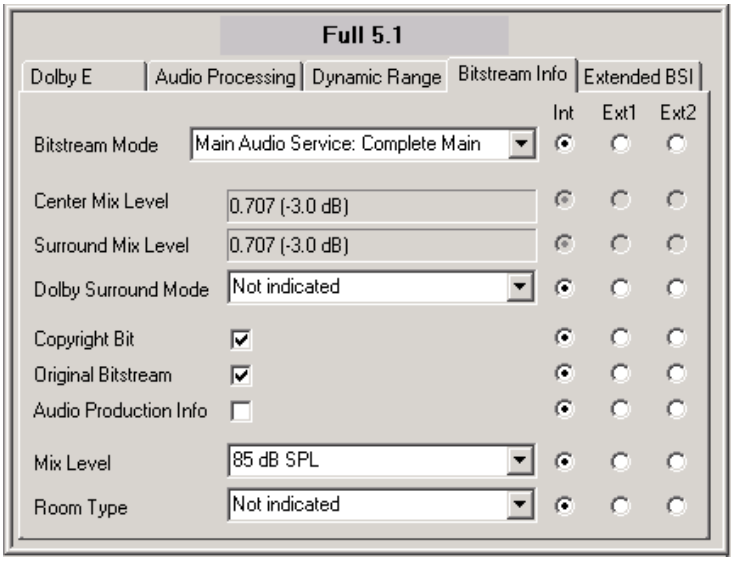


Figure 7-8 Bitstream Info Tab

The values for **Center Mix Level** and **Surround Mix Level** display on this tab but cannot be set. Instead, these values are derived from the equivalent Extended BSI values, **Lo/Ro Center Mix Level** and **Lo/Ro Surround Mix Level.** This arrangement allows you to set the Lo/Ro mix levels using the additional options of the Extended BSI while the more restricted mix level values, shown on this tab, are set automatically to be as close to the desired values as possible. Table 7-2 shows the values assigned Center Mix and Surround Mix according to the Lo/Ro mix level settings. See Section A.5.2, Extended Bitstream Information Parameters, for a more detailed explanation of the Lo/Ro parameters.

Table 7-2 Derived Mix Level Values from Extended BSI Lo/Ro Settings

Lo/Ro Setting	Center Mix Level	Surround Mix Level
3 dB	–3.0 dB	–3.0 dB
1.5 dB	–3.0 dB	–3.0 dB
0.0 dB	–3.0 dB	–3.0 dB
–1.5 dB	–3.0 dB	–3.0 dB
–3.0 dB	–3.0 dB	–3.0 dB
–4.5 dB	–4.5 dB	–6.0 dB
–6.0 dB	–6.0 dB	–6.0 dB
Off	–6.0 dB	Off

7.7.5 Extended BSI

The setting for **Preferred Stereo Downmix** designates whether an Lt/Rt or a Lo/Ro downmix is sent to the output of a stereo decoder. **Lo/Ro Center Mix Level** and **Lo/Ro Surround Mix Level** control the stereo downmix values in a compliant decoder. **Lt/Rt Center Mix Level** and **Lt/Rt Surround Mix Level** control the Lt/Rt (a.k.a. surround-encoded) downmix values in a compliant decoder. See Section A.5.2, Extended Bitstream Information Parameters, for a more detailed explanation of these parameters.

Surround mix level parameters are active only if the **Channel Mode** setting is 2/1, 3/1, 2/2, or 3/2. Center mix level parameters are active only if the **Channel Mode** is 3/0, 3/1, or 3/2.

The effect of the downmix parameters on the Extended BSI tab will not be heard unless the Emulator is set in the Extended BSI mode on the Emulator Setup window.

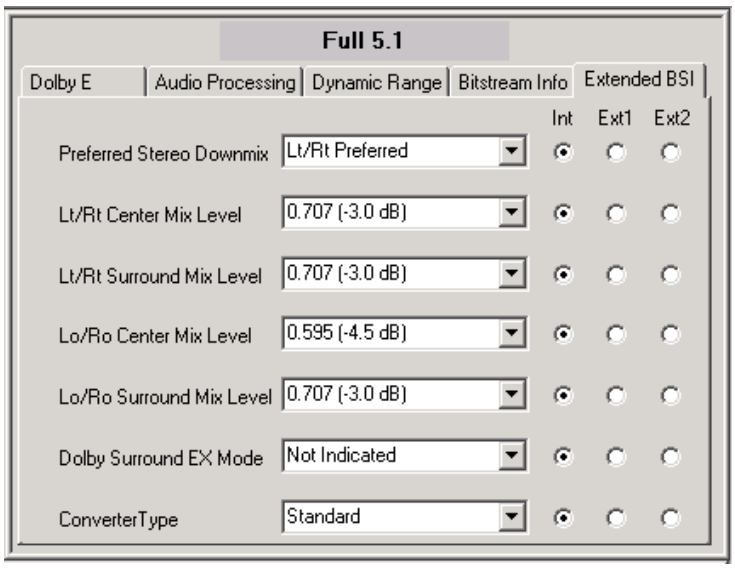


Figure 7-9 Extended BSI Tab

7.8 Monitor Window

Figure 7-10 shows the Monitor window. This window displays controls for your listening environment. Controls in this window do not affect the metadata stream or the router output in any way—they adjust signal output to your listening environment so you can make adjustments to those output streams if necessary.

If your DP570 does not include the Cat. No. 548 Analog Option Card, some of the features in the Monitor Window are not available and are grayed out.

The feature groups are:

- Volume
- Speakers
- Input Lock
- Level Meters
- Output Control
- Downmix

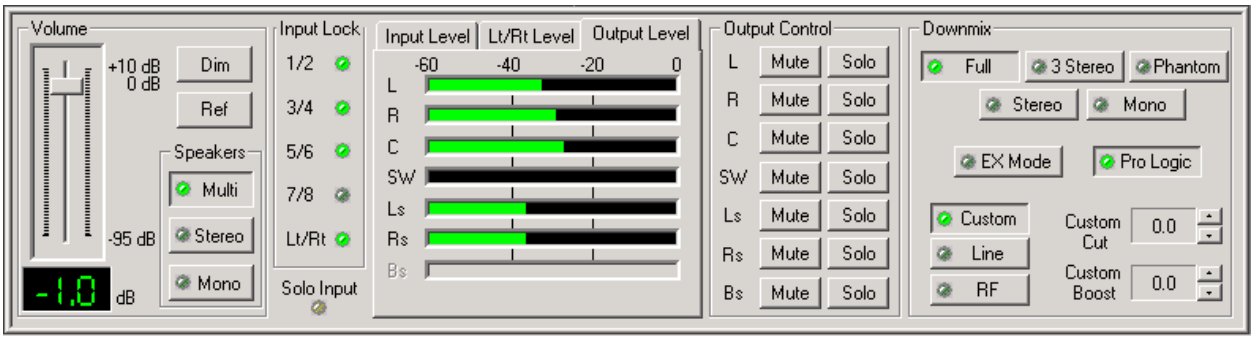


Figure 7-10 The Monitor Window

7.8.1 Volume

The *Volume* group controls only affect the output from the Cat. No. 548 Analog Option Card. Features are:

- Master volume slider—click and drag the slider to set master volume output to your speakers.
- **Dim** button—click to activate and deactivate the Dim setting. This setting cannot be activated or deactivated from the front panel of the DP570.

  To adjust the level of the **Dim** setting, click the **Setup** button, then on the **Monitor** tab click and drag the *Dim Gain* slider. See Section 7.5.2, Setup for more information on the *Dim Gain* setting.
- **Ref** button—sets the volume slider to 0 dB.

7.8.2 Speakers

The **Multi**, **Stereo**, and **Mono** buttons allow selection of the desired speaker system. All downmix modes are available when using the multichannel speaker system. When using stereo or mono speaker systems, the downmix choices are restricted to be compatible with those systems.

7.9 Input Lock

A display light is provided for each PCM input to indicate the present status of the input signal.

Green: Locked
Red: Invalid

7.10 Level Meters

Meters display the levels for all input and output channels. Click the **Input Level** tab to view PCM input levels, **Lt/Rt Level** to view Lt/Rt input levels, or **Output Level** to view output levels.

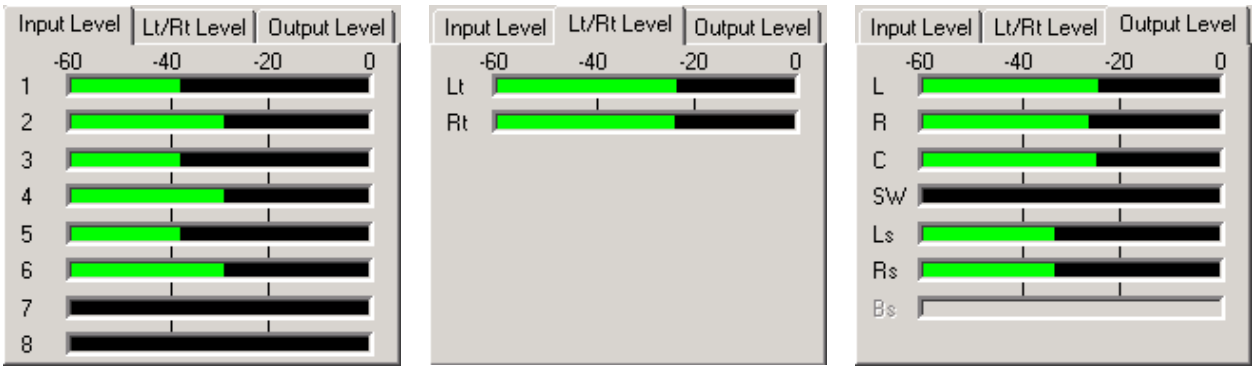


Figure 7-11 Level Meter Tabs

7.11 Output Control

You can mute any individual channel or combination of channels by clicking the **Mute** button associated with each speaker output. Click the **Solo** button to mute all but the selected solo channel. The mute and solo functions are not available on the front panel of the DP570.

7.12 Downmix

Click any of the available buttons to monitor a downmix or to monitor the full multichannel mix. As with all controls in the Monitor window, selections in this group of controls do not affect the metadata stream or the router output in any way—they only affect signal output to your listening environment.

Dynamic Range Control

Click **Line** or **RF** to monitor the effects of the dynamic range control (DRC) profile for each of these modes. To change the profile in the metadata stream, click the **Dynamic Range** tab in the Metadata window. For more information on DRC, see Appendix A, Metadata.

Custom Cut/Boost

The **Custom** setting lets you adjust the amount of boost or cut in the Line Mode profile. This control provides a range of 0 (no application of the profile) to 1 (full application) in 0.1 increments. A few consumer decoders allow the consumer to apply a variable amount of the Line Mode profile, and this feature allows you to emulate what they are able to hear, given that control.

Chapter 8
Specifications

8.1 Electrical Specifications

Sampling Rate	48 kHz (±0.1 %), 44.1 kHz (±0.1 %), 32 kHz
Video Frame Rate	30, 29.97, 25, 24, and 23.98 fps
Router Output Delay	16 samples (min.), optional one frame
Emulator Output Delay	11.6 ms (min.), 25 ms, or one frame
Metadata Processing Delay	2 ms (min.), optional one frame
Audio Word Length	Up to 24 bits
Digital Audio In	Five BNC female connectors, AES-3ID-1995/SMPTE 276M
Digital Audio Out	Eight BNC female connectors, AES-3ID-1995/SMPTE 276M
Remote Input (front)	RS-232, 8-pin female mini DIN
Remote Input (rear)	RS-485, 9-pin female D-connector on the rear panel
Metadata Inputs	Two RS-485, 9-pin female D-connectors on rear panel
Metadata Output	RS-485, 9-pin female D-connector on rear panel
GPI/O Port	TTL level, 37-pin female D-connector on rear panel
Ethernet Port	RJ-45 female jack connector on the rear panel.

Analog Outputs	
Frequency Response	20 Hz–20 kHz, ±0.5 dB
Distortion	Less than 0.01% at 1 kHz Less than 0.02%, 20 Hz–20 kHz
Dynamic Range	Greater than 106 dB
Output Connectors	Two 25-pin female D-connectors on rear panel

8.2 Front-Panel RS-232 Remote Connector

Pin	Connection
1	NC
2	NC
3	RX asynchronous data out
4	Ground
5	TX asynchronous data in
6	NC
7	NC
8	Sense select front panel

8.3 Digital Audio Inputs (5)

BNC unbalanced female connectors compliant with AES-3ID-1995/SMPTE 276M specifications. Two connectors are provided in parallel for the Lt/Rt input to provide loop-through capability.

8.4 Digital Audio Outputs (8)

BNC unbalanced female connectors compliant with AES-3ID-1995/SMPTE 276M specifications.

8.5 V Ref Input

BNC unbalanced female connector that receives NTSC composite program or color black video. Signal levels are compliant with SMPTE 154 specifications. Two connectors are provided in parallel to provide loop-through capability.

8.6 Metadata Input Ports (2)

9-pin female D-connector with full-duplex RS-485 protocol running at 115 kbps. Pinout is SMPTE 207M compatible.

Pin	Connection
1	Shield
2	TX A asynchronous data out –
3	RX B asynchronous data in +
4	Ground
5	NC
6	Ground
7	TX B asynchronous data out +
8	RX A asynchronous data in –
9	Shield

8.7 Metadata Output Port

9-pin female, RS-485, full-duplex, 115 kbps. Pinout is SMPTE 207M compatible.

Pin	Connection
1	Shield
2	RX A asynchronous data in –
3	TX B asynchronous data out +
4	Ground
5	NC
6	Ground
7	RX B asynchronous data in +
8	TX A asynchronous data out –
9	Shield

8.8 Rear-Panel Remote Port

9-pin female D-connector with RS-485 protocol. Pinout is SMPTE 207M electrical/mechanical specification compatible

Pin	Connection
1	Shield
2	TX B asynchronous data out –
3	RX A asynchronous data in +
4	Ground
5	NC
6	Ground
7	TX A asynchronous data out +
8	RX B asynchronous data in –
9	Shield

8.9 10BASE-T Port (Ethernet)

The Ethernet port is a standard RJ-45 female jack.

8.10 Multichannel Analog Output

25-pin female D-connector. Uses similar pinout as DA-88 connector except that output channels are referred to speakers instead of channel numbers.

Pin	Connection	Pin	Connection
1	Bsr + Out	14	Bsr – Out
2	Bsr Ground	15	Bsl + Out
3	Bsl – Out	16	Bsl Ground
4	Rs + Out	17	Rs – Out
5	Rs Ground	18	Ls + Out
6	Ls – Out	19	Ls Ground
7	Subwoofer + Out	20	Subwoofer – Out
8	SW Ground	21	Center + Out
9	Center – Out	22	C Ground
10	Right + Out	23	Right – Out
11	R Ground	24	Left + Out
12	Left – Out	25	L Ground
13	No Connection		

8.11 Stereo/Mono/Solo Analog Output

25-pin female D-connector.

Pin	Connection	Pin	Connection
1	Digital Ground	14	NC
2	NC	15	NC
3	NC	16	NC
4	NC	17	NC
5	NC	18	Solo In R +
6	Solo In R –	19	SR Ground
7	Solo In L +	20	Solo In L –
8	SL Ground	21	Mono + Out
9	Mono – Out	22	M Ground
10	Right Stereo + Out	23	Right Stereo – Out
11	R Ground	24	Left Stereo + Out
12	Left Stereo – Out	25	L Ground
13	NC		

8.12 Mechanical Specifications

Dimensions	8.8 × 48.3 × 33 cm (3.5 × 19 × 13 inches)
Net Weight	4 kg (8.5 lb) approx.
Shipping Weight	6 kg (13 lb) approx.
Power Requirements	90–264 VAC, 50–60 Hz
Power Consumption	40 W maximum

8.13 Environmental Specifications

Temperature	
Operating	0°C to 50°C, natural convection cooling
Non Operating (Storage)	–20°C to +70°C

Humidity	Up to 98% relative humidity, non-condensing

EMC Limits	
Radiated	Per EN 55103-1, FCC Part 15 Class A, ICES-003
Immunity	Per EN 55103-2

Appendix A
Metadata

Metadata provides unprecedented capability for content producers to deliver the highest quality audio to consumers in a range of listening environments. It also provides choices that allow consumers to adjust their settings to best suit their listening environments.

In this appendix, we first discuss the concept of metadata:

- Metadata overview

We then discuss the three factors controlled by metadata that most directly affect the consumer's experience:

- Dialogue level
- Dynamic range control (DRC)
- Downmixing

We then define each of the adjustable parameters, and provide sample combinations:

- Individual parameters
- Metadata combinations

A.1 Metadata Overview

Dolby Digital and Dolby E are both bit-rate reduction technologies that use metadata to describe the encoded multichannel audio. In normal operation the encoded audio and metadata are carried together as a data stream on two regular digital audio channels (AES/EBU or S/PDIF). Metadata is carried in the Dolby Digital or Dolby E bitstream, describing the encoded audio and conveying information that precisely controls downstream encoders and decoders. Metadata allows content providers unprecedented control over how original program material is reproduced in the home.

Dolby Digital is a *transmission bitstream* (sometimes called an *emission bitstream*) intended for delivery to the consumer. It consists of a single encoded program of up to six channels described by one metadata stream. The consumer's Dolby Digital decoder processes the metadata stream according to parameters set by the program creator, as well as certain settings for bass management and dynamic range that are chosen by the consumer to reflect their specific home theater equipment and environmental conditions.

Dolby E is a *distribution bitstream* capable of carrying up to eight channels of encoded audio and metadata. The number of programs ranges from one single program (Program Config: 5.1) to eight individual programs on a single Dolby E stream (Program Config: 8 × 1). Each program is discrete with its own metadata in the Dolby E stream. Some control metadata parameters in a Dolby E stream automatically configure a Dolby Digital encoder while others are passed through to the consumer's Dolby Digital decoder.

Dolby E is a professional technology used for broadcast applications such as program origination and distribution; the Dolby E bitstream carries the entire metadata parameter set. Dolby Digital, used for consumer applications such as transmission to the home or for DVD authoring, employs a subset of the entire metadata parameter set called *Dolby Digital metadata*; the Dolby Digital bitstream carries only those parameters necessary for proper decoding by the consumer.

Metadata is first inserted during program creation or mastering, and is carried through transmission in a broadcast application or directly onto a DVD. The metadata provides control over how the encoded bitstream is treated at each step on the way to the consumer's decoder.

For example:

In a broadcast truck parked outside a football stadium, the program mixer chooses the appropriate metadata for the audio program being created. The resulting audio program, together with metadata, is encoded as Dolby E and sent to the television station via fiber, microwave, or other transmission link. At the receiving end of this transmission, the Dolby E stream is decoded back to baseband audio and metadata. The audio program is monitored and the metadata is altered or re-created as other elements of the program are added in preparation for broadcast. This new audio program/metadata pair is re-encoded as Dolby E, leaves the postproduction studio and is passed through the television station to Master Control, where many incoming Dolby E streams are once again decoded back to their individual baseband digital audio/metadata programs. The audio program/metadata pair that is selected to air is sent to the transmission Dolby Digital encoder, which encodes the incoming audio program according to the metadata stream associated with it, thereby simplifying the transmission process. Finally, the Dolby Digital signal is decoded in the consumer's home, with metadata providing the information for that decoding process. Through the use of metadata, the mixer in the truck has been able to control the home decoder for the sporting event, while news breaks, commercials, station IDs, and the like are similarly appropriately decoded.

This control, however, requires the producer to correctly set the metadata parameters because they affect important aspects of the audio—and can seriously compromise the final product if set improperly. Although most metadata parameters are transparent to consumers, certain parameters affect the output of a home decoder, like when downmixing for a specific speaker configuration, or when the consumer chooses Dynamic Range Control to avoid disturbing family and neighbors.

Figure A-1 shows a 5.1 + 2 Program Config consisting of a 5.1-channel program and a two-channel Secondary Audio Program (SAP).

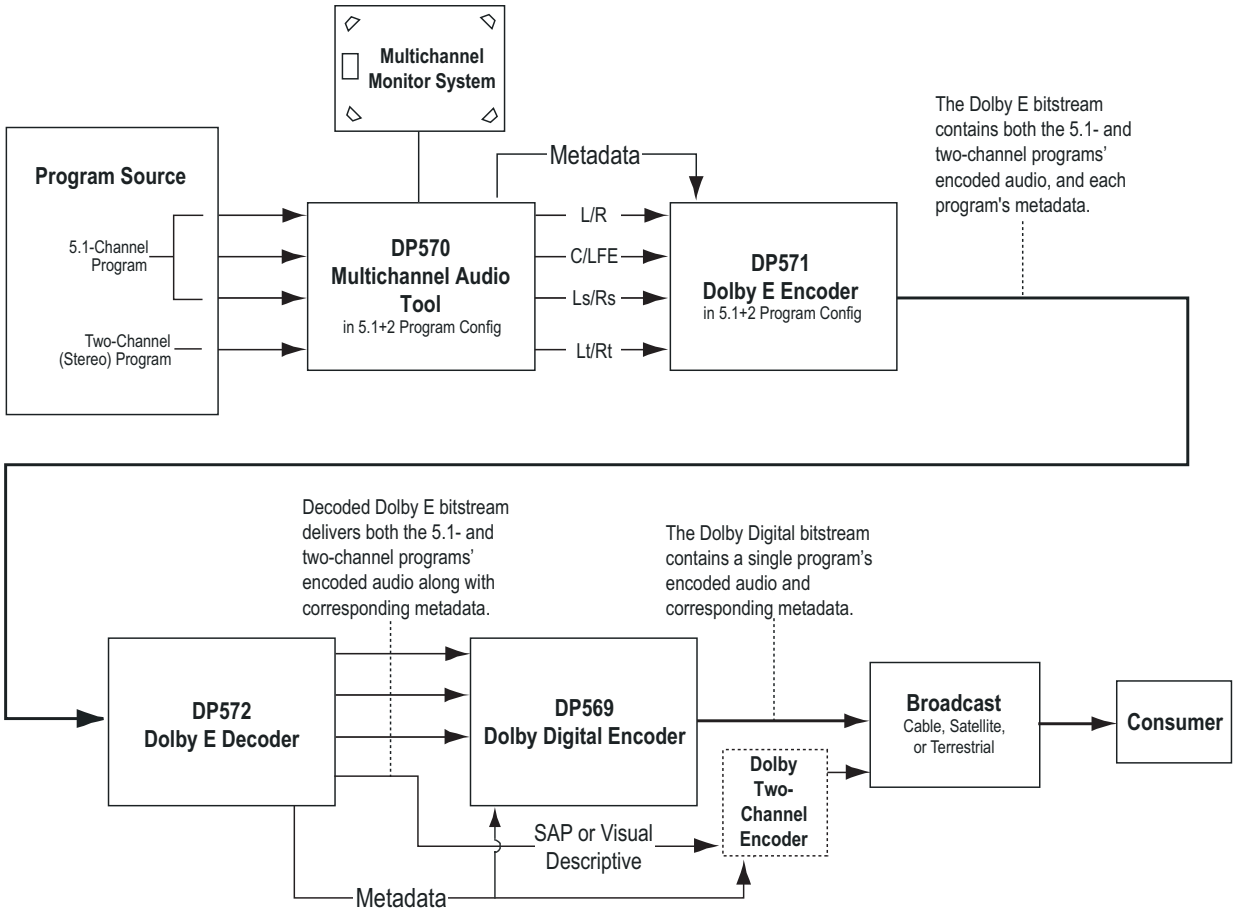


Figure A-1 Metadata Flow from Production to Consumer

In the simplest terms, there are two functional classifications of metadata:

Informational: These parameters convey information but do not affect either the encoded bitstream or the decoding process. For example, the Bitstream Mode parameter describes the audio service provided in the bitstream according to the ATSC specification. This information may be used by certain components in the audio system.

Control: These parameters direct how the decoder, encoder, or both process the audio when certain modes are applied to the encoder or decoder. For example, the Lowpass Filter parameter determines whether a lowpass filter is applied to the main inputs of a Dolby Digital encoder, and the Surround Downmix Level parameter instructs the Dolby Digital decoder how to mix the surround channels during downmixing.

Both types of metadata can be examined, modified, or passed through during encoding. Table A-1 lists the active metadata parameters and indicates if each parameter is informational or control.

Table A-1 Metadata Parameters
Extended Bitstream Information parameters are in italics.

Metadata Parameter	Informational	Control
Dialogue Level		✕
Channel Mode		✕
LFE Channel		✕
Bitstream Mode	✕	
Line Mode Compression		✕
RF Mode Compression		✕
RF Overmodulation Protection		✕
Center Downmix Level		✕
Surround Downmix Level		✕
Dolby Surround Mode		✕
Audio Production Information	✕	
Mix Level	✕	
Room type	✕	
Copyright Bit	✕	
Original Bitstream	✕	
Preferred Stereo Downmix		✕
Lt/Rt Center Downmix Level		✕
Lt/Rt Surround Downmix Level		✕
Lo/Ro Center Downmix Level		✕
Lo/Ro Surround Downmix Level		✕
Dolby Surround EX Mode		✕
A/D Converter Type	✕	
DC Filter		✕
Lowpass Filter		✕
LFE Lowpass Filter		✕
Surround 3 dB Attenuation		✕
Surround Phase Shift		✕

A.2 Dialogue Level

Dialogue level (also known as *dialogue normalization* or *dialnorm*) is perhaps the single most important metadata parameter. The dialogue level setting represents the average loudness of dialogue in a presentation.

When received at the consumer's Dolby Digital decoder, this parameter setting determines the level shift in the decoder that sets, or *normalizes,* the average audio

output of the decoder to a preset level. This aids in matching audio volume between program sources.

The proper setting of the dialogue level parameter enables the Dynamic Range Control profiles chosen by the content producer to work as intended in less-than-optimal listening environments, and is essential in any content production, whether it is for transmission in a broadcast stream or for direct distribution to consumers, as in DVDs.

In broadcast transmission, standard setting of dialogue level ensures that the consumer can switch channels or watch a television program without having to adjust the volume control during commercial breaks. Using that standard for all content, whether conveyed by broadcast television, DVD, or other media, enables the consumer to switch between sources and programs while maintaining a comfortable listening level.

Note: Programs without dialogue, such as an all-music program, still require a careful setting of the dialogue level parameter. When setting the parameter for such content, it is useful to compare the program to the level of other programs. The goal is to allow the consumer to switch to your program without having to adjust the volume control.

The Scale

The scale used in the dialogue level setting is from –1 to –31 dB in 1 dB steps. Contrary to what you might assume at first, a setting of –31 represents no level shift in the consumer's decoder, and –1 represents the maximum level shift. Here's why:

Dolby Digital consumer decoders standardize the average loudness (averaged over time by the formula LeqA) to –31 dBFS (31 dB below 0 dB full-scale digital output) by applying a shift in level based on the dialogue level parameter setting. When a decoder receives an input signal with a dialogue level setting of –31, it applies no level shift to the signal because this indicates to the decoder that the signal already matches the target level and therefore requires no shift. In contrast, a louder program requires a shift to match the –31 dB standard. When the dialogue level parameter setting is –21, the decoder applies a 10 dB level shift to the signal. When the setting is –11, it applies a 20 dB level shift, and so on.

A Simple Rule:

31 + (dialogue level value) = Shift applied

Example:

31 + (–21) = 10 dB

The most important point to remember is that in setting the dialogue level parameter, you are providing your listener with an essential service. For your listeners, setting this level properly means:

- The volume level is consistent with other programs.
- The DRC profiles you make available to them work as you intend.

Once dialogue level is set, you can set up DRC profiles to further benefit the consumer.

A.3 Dynamic Range Control

Different home listening environments present a wide range of requirements regarding dynamic range. Rather than simply compressing the audio program to work well in the poorest listening environments, Dolby Digital encoders calculate and send Dynamic Range Control (DRC) metadata with the signal. This metadata can be applied to the signal by the decoder to reduce the signal's dynamic range.

Through the proper setting of DRC profiles during the mastering process, the content producer can provide the best possible presentation of program content in virtually any listening environment, regardless of the quality of the equipment, number of channels, or ambient noise level in the consumer's home.

Many Dolby Digital decoders offer the consumer the option of defeating the Dynamic Range Control metadata, but some do not. Decoders with six discrete channel outputs (full 5.1-channel capability) typically offer this option. Decoders with stereo, mono, or RF-remodulated outputs, such as those found on DVD players and set-top boxes, often do not. In these cases the decoder automatically applies the DRC metadata associated with the decoder's selected operating mode.

The Dolby Digital stream carries metadata for the two possible operating modes of the decoder. The operating modes are known as Line Mode and RF Mode due to the type of output they are typically associated with. Line Mode is typically used on decoders with six- or two-channel line-level outputs and RF Mode is used on decoders that have an RF-remodulated output. Full-featured decoders allow the consumer to select whether to use DRC and if so, which operating mode to use. The consumer sees options such as Off, Light Compression, and Heavy Compression instead of None, Line Mode, and RF Mode. Advanced decoders may also allow custom scaling of the DRC metadata.

All that needs to be done during encoding is selection of the dynamic range control profiles for Line Mode and RF Mode. The profiles are described in the following sections.

Note: While the use of DRC modes during decoding is a consumer-selectable feature, the dialogue level parameter setting is not. Therefore, the proper setting of the dialogue level parameter is essential before previewing a DRC profile.

Line Mode

Line Mode offers these features:

- Low-level boost compression scaling is allowed.
- High-level cut compression scaling is allowed when not downmixing.
- Dialogue, as set by the dialogue level parameter, is reproduced at a constant level of –31 dBFS LAeq.

All line-level or power-amplified outputs from two-channel set-top decoders, two-channel digital televisions, 5.1-channel digital televisions, Dolby Digital A/V surround decoders, and outboard Dolby Digital adapters use Line mode.

Consumer control of the dynamic range is limited when downmixing. Products with stereo or mono outputs do not usually allow consumer scaling of Line Mode. This is because these devices are usually downmixing, (for example, when receiving a 5.1-channel signal.) However, in these products the consumer may have a choice between Line Mode and RF Mode.

RF Mode

RF Mode offers these features:

- High- and low-level compression scaling is not allowed (when active, always fully applied).
- +11 dB gain shift raises overall program level.
- Dialogue, as set by the dialogue level parameter and combined with the +11 dB gain shift, is reproduced at a constant level of –20 dBFS LAeq.

RF Mode is designed for products (such as set-top boxes) that generate a downmixed signal for connection to the RF/Antenna input of a television set; however, it is also useful in situations where heavy DRC is required—for example, when small PC speakers are used for DVD playback. In RF Mode, the overall program level is raised 11 dB, while the peaks are limited to prevent signal overload in the D/A converter. By limiting headroom, severe overmodulation of television receivers is prevented. The 11 dB gain provides an RF modulation level that compares well with analog television broadcasts and premium movie channels.

In some situations it may be necessary to further constrain signal peaks above the average dialogue level so that there is less than 20 dB headroom. The selection of a suitable RF Mode profile achieves this.

Dynamic Range Control 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 A-2. All DRC profiles are encoded using a modified B-weighted curve.

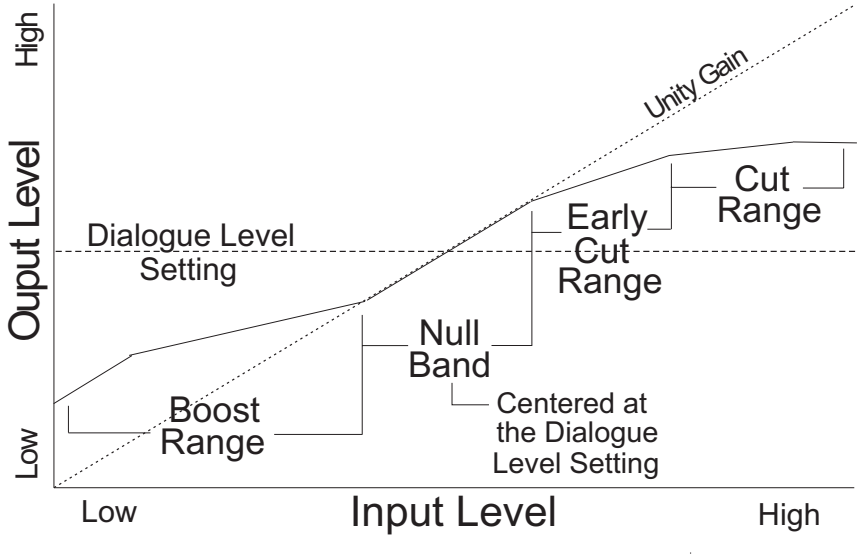


Figure A-2 DRC Profile Pattern

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.

- **Film Light**
  Max Boost: 6 dB (below –53 dB)
  Boost Range: –53 dB to –41 dB (2:1 ratio)
  Null Band Width: 20 dB (–41 dB to –21 dB)
  Early Cut Range: –26 dB to –11 dB (2:1 ratio)
  Cut Range: –11 dB to +4 dB (20:1 ratio)
- **Film Standard**
  Max Boost: 6 dB (below –43 dB)
  Boost Range: –43 dB to –31 dB (2:1 ratio)
  Null Band Width: 5 dB (–31 dB to –26 dB)
  Early Cut Range: –26 dB to –16 dB (2:1 ratio)
  Cut Range: –16 dB to +4 dB (20:1 ratio)
- **Music Light** (No early cut range)
  Max Boost: 12 dB (below –65 dB)
  Boost Range: –65 dB to –41 dB (2:1 ratio)
  Null Band Width: 20 dB (–41 dB to –21 dB)
  Cut Range: –21 dB to +9 dB (2:1 ratio)

- **Music Standard**
  Max Boost: 12 dB (below –55 dB)
  Boost Range: –55 dB to –31 dB (2:1 ratio)
  Null Band Width: 5 dB (–31 dB to –26 dB)
  Early Cut Range: –26 dB to –16 dB (2:1 ratio)
  Cut Range: –16 dB to +4 dB (20:1 ratio)
- **Speech**
  Max Boost: 15 dB (below –50 dB)
  Boost Range: –50 dB to –31 dB (5:1 ratio)
  Null Band Width: 5 dB (–31 dB to –26 dB)
  Early Cut Range: –26 dB to –16 dB (2:1 ratio)
  Cut Range: –16 dB to +4 dB (20:1 ratio)

- **None**
  No DRC profile selected. The dialogue level parameter *(dialnorm)* is still applied.

These choices are available to the content producer for both Line Mode and RF Mode. 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 line-level 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 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.

A.4 Downmixing

Downmixing is a function of Dolby Digital that allows a multichannel program to be reproduced over fewer speaker channels than for which the program is optimally intended. Simply put, downmixing allows consumers to enjoy a DVD or digital television broadcast without requiring a full-blown home theater setup.

As with stereo mixing where the mix is monitored in mono on occasion to maintain compatibility, multichannel audio mixing requires the engineer to reference the mix to fewer speaker channels to ensure compatibility in downmixing situations. In this way, Dolby Digital, using the metadata parameters that control downmixing, is an "equal opportunity technology" in that every consumer who receives the Dolby Digital data stream can enjoy the best audio reproduction possible, regardless of the playback system.

It is important to consider the output signals from each piece of equipment that can receive a Dolby Digital program in the home. Table A-2 shows the output types from different equipment.

Table A-2 Outputs from Various Dolby Digital Signal Processing Equipment

Equipment	Output			
	Digital	**5.1-Channel Analog**	**Two-Channel Analog**	**RF Remodulated**
5.1-channel amplifier The standard home theater A/V amp	✕	✕		
5.1-channel decoder	✕	✕		
Hi-end DVD player	✕	✕	✕	
DVD player	✕		✕	
PC Includes games consoles	✕	(some units)	✕	
High-end set-top box Often HDTV	✕	✕	✕	✕
Set-top box Usually SDTV	✕		✕	✕
IDTV TV set with an integrated digital TV tuner	✕		✕	
High-end TV Large screen TV with a 5.1-channel speaker system	✕	✕		

Set-top boxes, used for the reception of terrestrial, cable, or satellite Digital Television, typically offer an analog mono signal modulated on the RF/Antenna output, a line-level analog stereo signal, and an optical or coaxial digital output. DVD players offer an analog stereo and a digital output, and some offer a six-channel analog output (for a 5.1-channel presentation). Portable DVD players offer analog stereo, headphone, and digital outputs. DVD players in computers and game consoles offer a digital output as well as analog stereo, headphone, and possibly six-channel analog outputs. 5.1-channel amplifiers, decoders and receivers have six-channel analog outputs and possibly six speaker-level outputs.

In all of these cases, a Dolby Digital decoder creates the analog audio output signal.

In the case of the set-top box or DVD player, the analog stereo output is a downmixed version of the Dolby Digital data stream. The digital output delivers the Dolby Digital data stream to either a downstream decoder or a Dolby Digital capable integrated amplifier.

In each of these devices, the analog stereo output is one of two different stereo downmixes. One type is a stereo-compatible Dolby Surround downmix (also called

Pro Logic, left-total/right-total, or Lt/Rt) of the multichannel source program that is suitable for Dolby Surround Pro Logic decoding. The other type is a simple stereo representation (called a left-only/right-only, or Lo/Ro) suitable for playback on a stereo hi-fi or on headphones, and from which a mono signal is derived for use on an RF/Antenna output. The difference between the downmixes is how the surround channels are handled. The Lt/Rt downmix sums the surround channels and adds them, in-phase to the left channel and out-of-phase to the right channel. This allows a Dolby Surround Pro Logic decoder to reconstruct the L/C/R/S channels for a Pro Logic home theater. The Lo/Ro downmix adds the right and left surround channels discretely to the left and right speaker channels. This preserves the stereo separation for stereo-only monitoring and produces a mono-compatible signal. In all downmixes, the LFE channel is not included.

On most home equipment, the consumer can use the product's user interface to choose the appropriate stereo output for their playback system. The mono signal feeding the RF/Antenna output is always derived from the Lo/Ro downmix.

There are separate metadata parameters for the adjustment of the Lo/Ro and Lt/Rt downmix conditions. Certain metadata parameters allow the engineer to select how the stereo downmix is constructed and which stereo analog signal is preferred, but Lt/Rt is the default selection in all consumer decoders. See Section A.5, Parameter Definitions, for more information on individual parameters.

During downmixing, as we have seen, the adjustment of dynamic range control parameters is limited. Broadly speaking, the stereo outputs use the Line Mode compression profile and the mono signal uses RF Mode compression. As with dynamic range control, downmixing is ultimately dependent upon each consumer's unique listening environment.

While the engineer must optimize the multichannel mix for reproduction in an ideal listening environment, it is also important to preview the mix in downmixing conditions to ensure compatibility with different playback systems when selecting the downmixing metadata parameters. These previews can be achieved in real time using the DP570 Multichannel Audio Tool.

A.5 Parameter Definitions

Metadata parameters include:

- Universal parameters
- Extended Bitstream Information (Extended BSI) parameters

Extended BSI parameters are active only when the consumer's decoder is capable of reading them *and* when the producer chooses to use them. All decoders can successfully decode a metadata stream without Extended BSI parameters, and Extended BSI parameters translate seamlessly to decoders that read only universal parameters.

A.5.1 Universal Parameters

Universal parameters are present in all Dolby Digital encoders and decoders.

Dialogue Level

The dialogue level parameter is discussed in Section A.2, Dialogue Level.

Channel Mode

This parameter (also known as *audio coding mode*) indicates the active channels within the encoded bitstream and affects both the encoder and consumer decoder. This parameter instructs the encoder as to which inputs to use for this particular program; it tells the decoder what channels are present in this program so the decoder can deliver the audio to the correct speakers.

The setting is described as X/Y, where X is the number of front channels (Left, Center, Right) and Y the number of rear (surround) channels.

The availability of certain channel modes depends on the data rate and whether the LFE Channel is present. For example, you can't have a mono stream with an LFE channel (1.1!) or a 3/2 stream at 96 kbps. Appropriate data rates are shown in the definition of each setting.

Note: The presence of the LFE channel is indicated through a different metadata parameter (see LFE Channel).

Channel Mode Setting	Definition and Data Rate
1+1	Dual mono (not valid for DTV broadcast or DVD production)
1/0 Mono	From 96 kbps, usually 96kpbs
2/0 Stereo	From 192 kbps, usually 192 kbps
3/0	From 256 kbps
2/1	From 256 kbps
3/1	From 320 kbps
2/2	From 320 kbps
3/2	From 384 kbps, often 448 kbps

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 in order to be able to add an LFE channel.

LFE Channel Setting
Enable
Disable

Bitstream Mode

This parameter describes the audio service contained within the Dolby Digital bitstream. A complete audio program may consist of a main audio service (a complete mix of all the program audio), an associated audio service comprising a complete mix, or one main service combined with an associated service. To form a complete audio program, it may be (but rarely is) necessary to decode both a main service and an associated service using a maximum total bit rate of 512 kbps. Refer to the *Guide to the Use of the ATSC Digital Television Standard*, Document A/54 (*www.atsc.org*) for further information. Although a detailed description of each option follows, in practice most programming uses the default setting, Complete Main. An example of an exception to this rule is a special karaoke DVD, or an emergency service within digital television.

Bitstream Mode Setting	Definition
Complete Main (CM)	CM flags the bitstream as the Main Audio Service for the program and 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	This is a single channel service that is given priority in reproduction.

Bitstream Mode Setting	Definition
(E)	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.

Line Mode Compression Profile

Line Mode is discussed in Section A.3, Dynamic Range Control.

RF Mode Compression Profile

RF Mode is discussed in Section A.3, Dynamic Range Control.

RF Overmodulation Protection

This parameter is designed to protect against overmodulation when a decoded Dolby Digital bitstream is RF modulated. When enabled the Dolby Digital encoder includes pre-emphasis in its calculations for RF Mode compression. The parameter has no effect when decoding using Line Mode compression. *Except in rare cases, this parameter should be disabled.*

RF Overmodulation Protection Setting
Enable
Disable

Center Downmix Level

When the encoded audio has three front channels (L, C, R), but the consumer has only left and right front speakers, 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 BSI parameters are not active.

Center Downmix Level Setting	Definition
0.707 (–3 dB) *default*	The center channel is attenuated 3 dB and sent to the left and right channels.
0.596 (–4.5 dB)	The center channel is attenuated 4.5 dB and sent to the left and right channels.
0.500 (–6 dB)	The center channel is attenuated 6 dB and sent to the left and right channels.

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 BSI parameters are not active.

Surround Downmix Level Setting	Definition
0.707 (–3 dB) *default*	The left and right surround channels are each attenuated 3 dB and sent to the left and right front channels, respectively.
0.5 (–6dB)	Same as above, but the signal is attenuated 6 dB.
0 (–999dB)	The surround channel(s) are discarded.

Dolby Surround Mode

This parameter indicates to a Dolby Digital decoding product that also contains a Dolby Pro Logic decoder (for example a 5.1-channel amplifier) whether the two-channel encoded bitstream contains a Dolby Surround (Lt/Rt) program that requires Pro Logic decoding. Decoders can use this flag to automatically switch on Pro Logic decoding as required.

Dolby Surround Mode Setting	Definition
Not Dolby Surround	The bitstream contains information that was not Dolby Surround encoded.
Dolby Surround	The bitstream contains information that was Dolby Surround encoded. After Dolby Digital decoding, the bitstream is Pro Logic decoded.
Not Indicated	There is no indication either way

Audio Production Information

This parameter indicates whether the mixing level and room type values are valid. If *Yes*, then a receiver or amplifier could use these values as described below. If *No*, then the values in these fields are invalid. In practice only high-end consumer equipment implements these features.

Audio Production Information Setting	Definition
Yes	**Mixing Level** and **Room Type** parameters are valid.
No	**Mixing Level** and **Room Type** parameters are invalid and should be ignored.

Mixing Level

The Mixing Level parameter describes the peak sound pressure level (SPL) as experienced during the final mixing session at the studio or on the dubbing stage. The parameter allows an amplifier to set its volume control such that the SPL in the replay environment matches that of the mixing room. This control operates in addition to the dialogue level control, and is best thought of as the final volume setting on the consumer's equipment. This value can be determined by measuring the SPL of pink noise at studio reference level and then adding the amount of digital headroom above that level. For example, 85dB equates to a reference level of –20dBFS; the mixing level is 85+20, or 105 dB.

Mixing Level Setting
80 to 111 dB in 1 dB increments

Room Type

The Room Type parameter describes the equalization used during the final mixing session at the studio or on the dubbing stage. A *Large* room is a dubbing stage with the industry standard X-curve equalization; a *Small* room has flat equalization. This parameter allows an amplifier to set the same equalization as heard in the final mixing environment.

Room Type Setting
Not Indicated
Large
Small

Copyright Bit

This parameter indicates whether the encoded Dolby Digital bitstream is copyright protected. It has no affect on Dolby Digital decoders and is purely for information.

Copyright Bit Setting
Yes
No

Original Bitstream

This parameter indicates whether the encoded Dolby Digital bitstream is the master version or a copy. It has no affect on Dolby Digital decoders and is purely for information.

Original Bitstream Setting
Yes
No

Note: The parameters *DC Filter*, *Lowpass Filter*, *LFE Lowpass Filter*, *Surround 3 dB Attenuation*, and *Surround Phase Shift* appear *after* the Extended BSI parameters on Dolby E and Dolby Digital equipment menus.

DC Filter

This parameter determines whether a DC blocking 3 Hz highpass filter is applied to the main input channels of a Dolby Digital encoder prior to encoding. This parameter is not carried to the consumer decoder. It is used to remove DC offsets in the program audio and would only be switched off in exceptional circumstances.

DC Filter Setting
Enable
Disable

Lowpass Filter

This parameter determines whether a lowpass filter is applied to the main input channels of a Dolby Digital encoder prior to encoding. This filter removes high-frequency signals that are not encoded. At the suitable data rates this filter operates above 20 kHz. In all cases it prevents aliasing on decoding and is normally switched on. This parameter is not passed to the consumer decoder.

Lowpass Filter Setting
Enable
Disable

LFE Lowpass Filter

This parameter determines whether a 120 Hz 8th order lowpass filter is applied to the LFE channel input of a Dolby Digital encoder prior to encoding. It is ignored if the LFE channel is disabled. This parameter is not sent to the consumer decoder. The filter removes frequencies above 120 Hz that would cause aliasing when decoded. This filter should only be switched off if the audio to be encoded is known to have no signal above 120 Hz.

LFE Lowpass Filter Setting
Enable
Disable

Surround 3 dB Attenuation

The Surround 3 dB Attenuation parameter determines whether the surround channel(s) are attenuated 3 dB before encoding. The attenuation actually takes place inside the Dolby Digital encoder. It balances the signal levels between theatrical

mixing rooms (dubbing stages) and consumer mixing rooms (DVD or TV studios). Consumer mixing rooms are calibrated so that all five main channels are at the same sound pressure level (SPL). For compatibility reasons with older film formats, theatrical mixing rooms calibrate the surround channels 3 dB lower in SPL than the front channels. The consequence is that signal levels on tape are 3 dB louder. Therefore, to convert to a consumer mix from a theatrical calibration it is necessary to reduce the surround levels by 3 dB by enabling this parameter.

Surround 3 dB Attenuation Setting
Enable
Disable

Surround Phase Shift

This parameter causes the Dolby Digital encoder to apply a 90-degree phase shift to the surround channels. This allows a Dolby Digital decoder to create an Lt/Rt downmix simply. For most material the phase shift has a minimal impact when the Dolby Digital program is decoded to 5.1 channels, but provides an Lt/Rt output that can be Pro Logic decoded to L, C, R, S, if desired. However, for some phase-critical material (such as music) this phase shift is audible when listening in 5.1 channels. Likewise some material downmixes to a satisfactory Lt/Rt signal without needing this phase shift. It is therefore important to balance the needs of the 5.1 mix and the Lt/Rt downmix for each program. The default setting is *Enable*.

Surround Phase Shift Setting
Enable
Disable

A.5.2 Extended Bitstream Information Parameters

In response to requests from content producers, Dolby Laboratories recently modified the definitions of several metadata parameters from their original definition as described in ATSC document A/52. The original parameters were rarely, if ever used. The revised definitions allow more information to be carried about the audio program and allow more choices for stereo downmixing. When the metadata parameters carried in Dolby Digital were first described, they were generically called *Bitstream Information* or BSI. We refer to the alternate parameter definitions as *Extended BSI*.

Because the revised definitions affect metadata parameters that were not used by the consumer decoders, all decoders will be compatible with the revised bitstream. Newer decoders that are programmed to detect and decode the new parameters will be able to implement the new features the Extended BSI provides.

Products that allow emulation of the effects of metadata, such as the DP570, normally have a feature that allows emulation of a new (or compliant) decoder or a legacy decoder.

Preferred Stereo Downmix Mode

This parameter allows the producer to select either the Lt/ Rt or the Lo/Ro downmix in a consumer decoder that has stereo outputs. Consumer receivers are able to override this selection, but this parameter provides the opportunity for a 5.1-channel soundtrack to play in Lo/Ro mode without user intervention. This is especially useful on music material.

Preferred Stereo Downmix Mode Setting
Not Indicated
Lt/Rt Preferred
Lo/Ro Preferred

Lt/Rt Center Mix Level

This parameter indicates the level shift applied to the center channel when adding to the left and right outputs when downmixing to an Lt/Rt output. Its operation is similar to the center downmix level in the universal metadata.

Lt/Rt Center Mix Level Setting
1.414 (**+3.0 dB**)
1.189 (**+1.5 dB**)
1.000 (**0.0 dB**)
0.841 (**–1.5 dB**)
0.707 (**–3.0 dB**)
0.595 (**–4.5 dB**)
0.500 (**–6.0 dB**)
0.000 (**–999 dB**)

Lt/Rt Surround Mix Level

This parameter indicates the level shift applied to the surround channels when downmixing to an Lt/Rt output. Its operation is similar to the surround downmix level in the universal metadata.

Lt/Rt Surround Mix Level Setting
1.414 (**+3.0 dB**)
1.189 (**+1.5 dB**)
1.000 (**0.0 dB**)
0.841 (**–1.5 dB**)
0.707 (**–3.0 dB**)
0.595 (**–4.5 dB**)
0.500 (**–6.0 dB**)
0.000 (**–999 dB**)

Lo/Ro Center Mix Level

This parameter indicates the level shift applied to the center channel when adding to the left and right outputs when downmixing to a Lo/Ro output. When Extended BSI parameters are active, this parameter is used and the Center Mix Level parameter in the universal parameters is not.

Lo/Ro Center Mix Level Setting
1.414 (**+3.0 dB**)
1.189 (**+1.5 dB**)
1.000 (**0.0 dB**)
0.841 (**–1.5 dB**)
0.707 (**–3.0 dB**)
0.595 (**–4.5 dB**)
0.500 (**–6.0 dB**)
0.000 (**–999 dB**)

Lo/Ro Surround Mix Level

This parameter indicates the level shift applied to the surround channels when downmixing to a Lo/Ro output. When Extended BSI parameters are active, this parameter is used, and the Surround Mix Level parameter in the universal parameters is not.

Lo/Ro Surround Mix Level Setting
1.414 (**+3.0 dB**)
1.189 (**+1.5 dB**)
1.000 (**0.0 dB**)
0.841 (**–1.5 dB**)
0.707 (**–3.0 dB**)
0.595 (**–4.5 dB**)
0.500 (**–6.0 dB**)
0.000 (**–999 dB**)

Surround EX Mode

This parameter is used to identify the encoded audio as Surround EX encoded material. This parameter is only used if the encoded audio has two surround channels. An amplifier or receiver with Dolby Digital Surround EX decoding can use this parameter as a flag to switch the decoding on or off automatically. The behavior is similar to the Dolby Surround Mode parameter.

Surround EX Setting
Not Indicated
Not Surround EX
Dolby Surround EX

A/D Converter Type

This parameter allows audio that has passed through a particular A/D conversion stage to be marked as such so that a decoder may apply the complementary D/A process.

A/D Converter Type Setting
Standard
HDCD

A.6 Metadata Combinations

Table A-3 provides examples of combinations of parameters that could be used as a preset.

Note: These parameter settings are provided as examples to demonstrate that different settings can be saved, named, and brought up as needed for quick use in different situations. The settings are not recommendations, but could provide a baseline starting point from which to create your own metadata values.

Table A-3 Examples of Possible Metadata Settings
Extended Bitstream Information parameters are in italics.

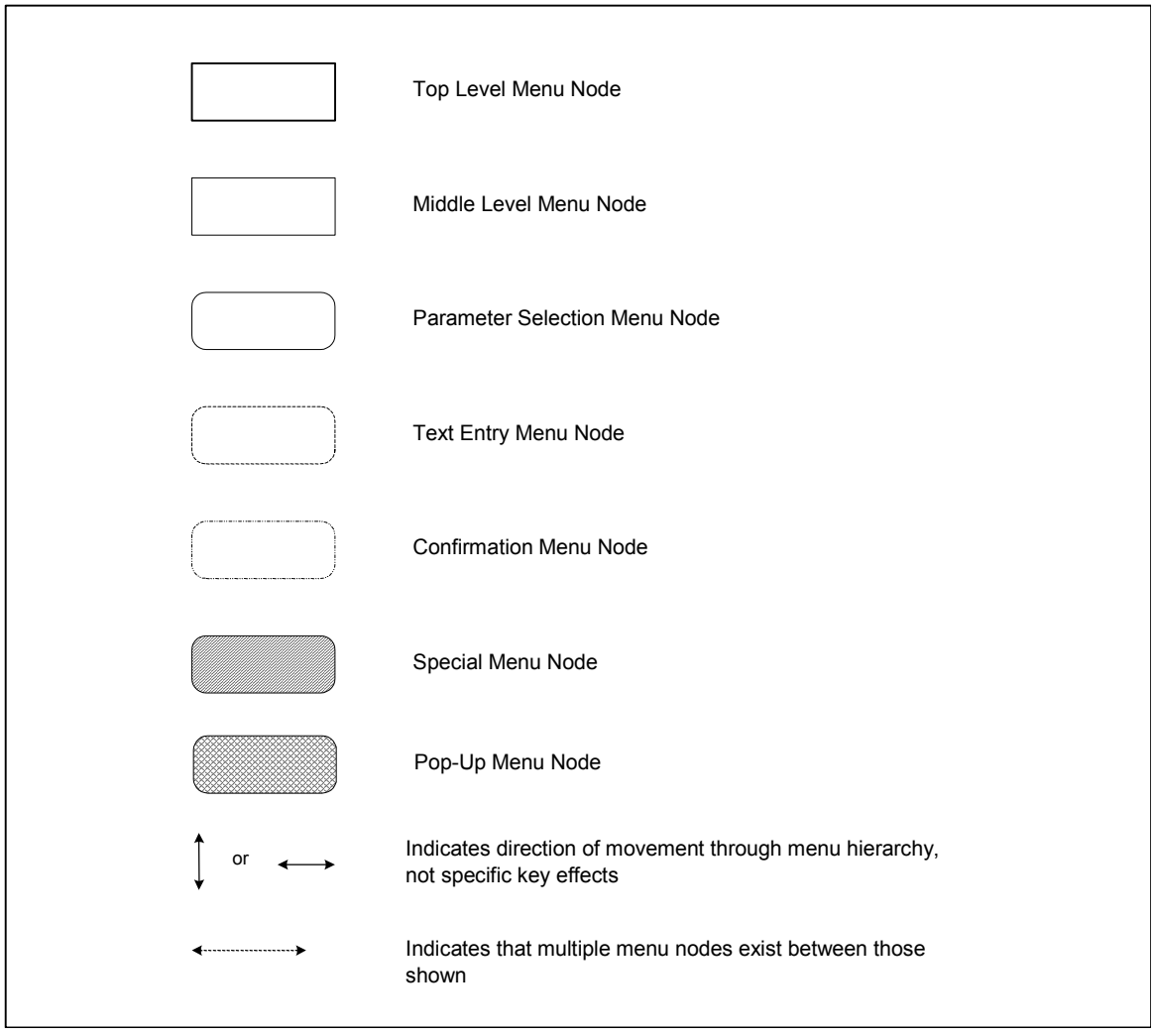
Parameter	Action Film (5.1)	Drama (Lt/Rt)	Local News (Mono)	Music (5.0)	Live Sporting Events (5.0)
Dialogue Level	–27 dB	–27 dB	–20 dB	–15 dB	–18 dB
Channel Mode	3/2L	2/0	1/0	3/2	3/2
LFE Channel	Enable	N/A	N/A	Disable	Disable
Bitstream Mode	Main Complete	Main Complete	Main Complete	Main Complete	Main Complete
Line Mode Pro	Film Standard	Film Light	Speech	Music Standard	Film Standard
RF Mode Pro	Film Standard	Film Light	Speech	Music Standard	Film Standard
RF Ovrmd Protect	Disable	Disable	Disable	Disable	Disable
Center Dwnmix Lev	0.707 dB (–3 dB)	N/A	N/A	0.707dB (–3 dB)	0.707 dB (–3 dB)
Srnd Dwnmix Lev	0.707 dB (–3 dB)	N/A	N/A	0.707 dB (–3 dB)	0.707 dB (–3 dB)
Dolby Srnd Mode	N/A	Dolby Surround	N/A	N/A	N/A
Audio Prod Info	Yes	Yes	No	Yes	No
Mix Level	101 dB	90 dB	N/A	95 dB	N/A
Room type	Large	Small	N/A	Large	N/A
Copyright	Yes	Yes	Yes	Yes	Yes
Original Bitstream	Yes	Yes	Yes	Yes	Yes
Preferred Stereo Downmix	Lt/Rt	Lt/Rt	N/A	Lo/Ro	Lt/Rt
Lt/Rt Center Downmix Level	0.707 (–3 dB)	1.0 (0.0 dB)	N/A	0.707 (–3 dB)	N/A
Lt/Rt Surround Downmix Level	0.707 (–3 dB)	0.595 (–4.5 dB)	N/A	0.707 (–3 dB)	N/A
Lo/Ro Center Downmix Level	N/A	N/A	N/A	N/A	0.707 (–3 dB)
Lo/Ro Surround Downmix Level	N/A	N/A	N/A	N/A	0.595 (–4.5 dB)
Dolby Surround EX Mode	Dolby Surround EX	N/A	N/A	N/A	N/A

Extended Bitstream Information parameters are in italics.

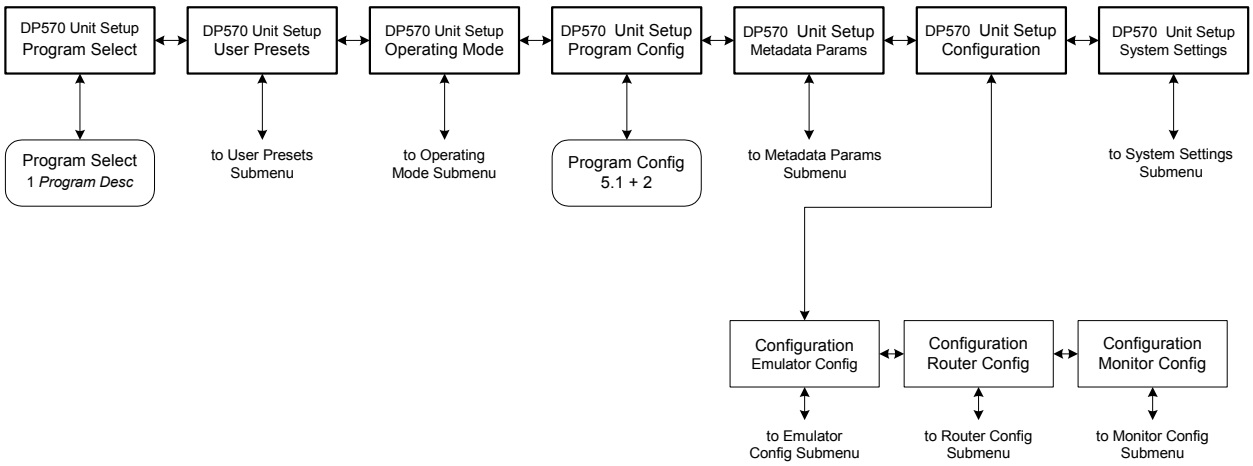
Parameter	Action Film (5.1)	Drama (Lt/Rt)	Local News (Mono)	Music (5.0)	Live Sporting Events (5.0)
A/D Converter Type	Standard	Standard	Standard	Standard	Standard
DC Filter	Enable	Enable	Enable	Enable	Enable
Lowpass Filter	Enable	Enable	Enable	Enable	Enable
LFE Lowpass Filter	Enable	N/A	N/A	N/A	N/A
Srnd 3 dB Atten	Enable	N/A	N/A	Disable	Disable
Srnd Phase Shift	Enable	N/A	N/A	Enable	Enable

Appendix B
Front-Panel Menu Trees

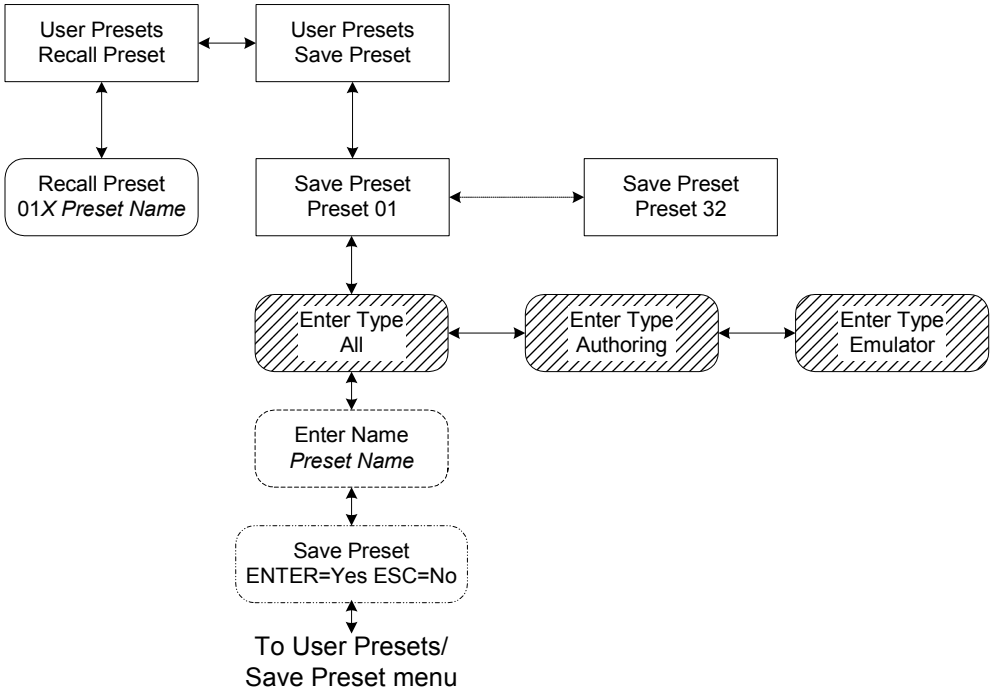
Setup Menu Structure



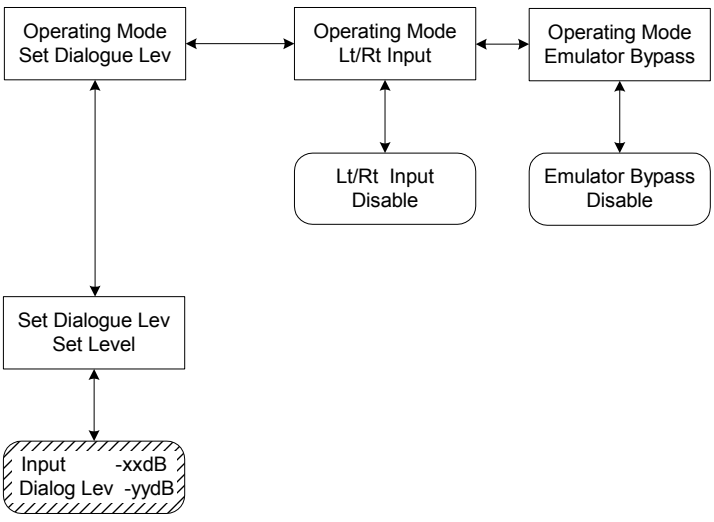
DP570 Unit Setup Menu



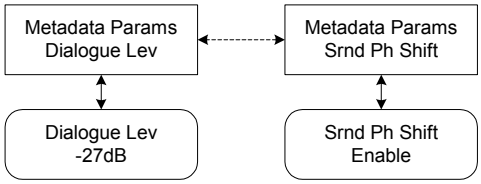
User Presets Menu



Operating Mode Menu



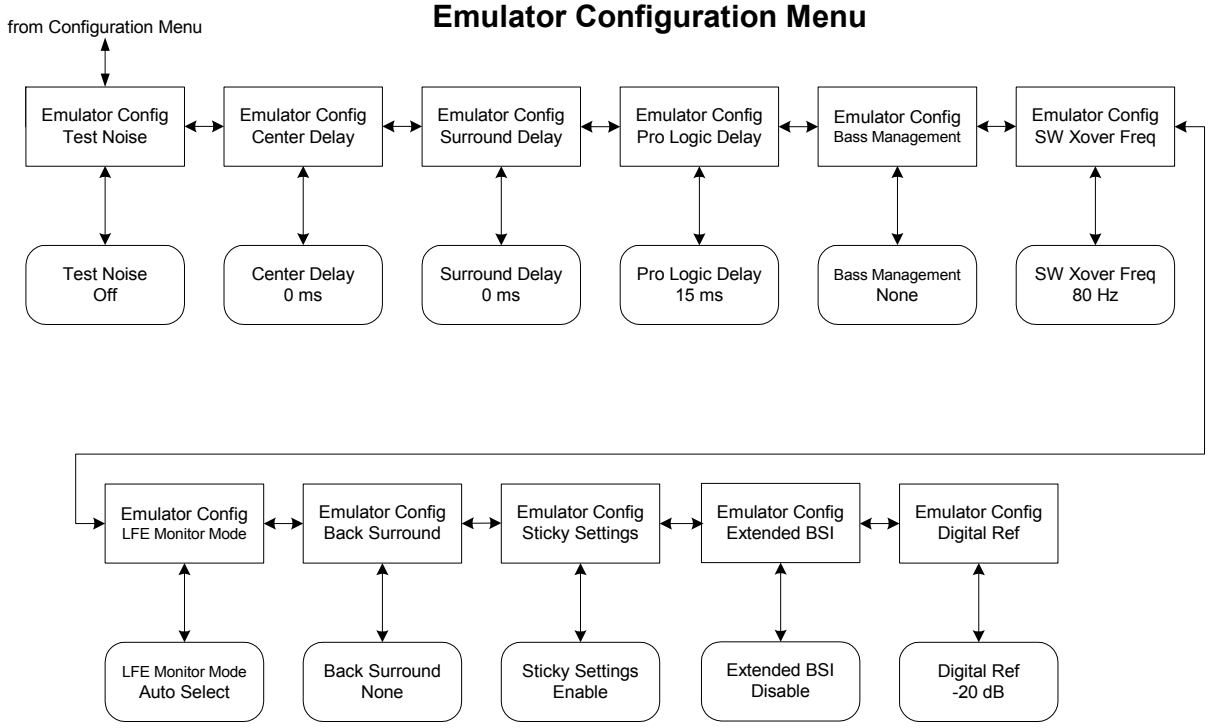
Metadata Params Setup Menu



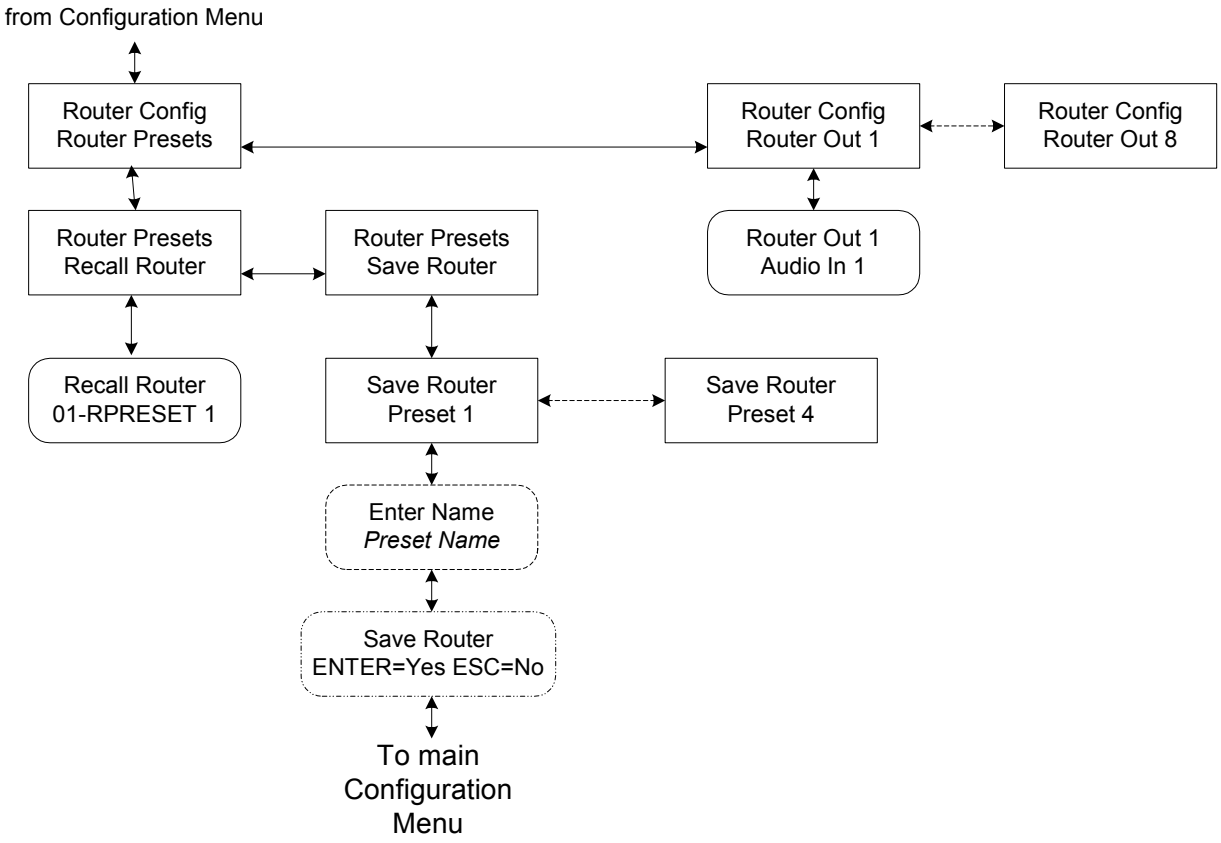
Parameter Select Submenu Order

- Dialogue Lev
- Channel Mode
- LFE Channel
- Bitstrm Mode
- Line Mode Pro
- RF Mode Pro
- RF Ov Protect
- Dolby Srnd
- Audio Prod Info
- Mixing Level
- Room Type
- Copyright
- Original Bitstrm
- Pref Dwnmx
- Lt/Rt C Dwnmx
- Lt/Rt S Dwnmx
- Lo/Ro C Dwnmx
- Lo/Ro S Dwnmx
- Dolby Srnd EX
- A/D Conv Type
- DC Filter
- Lowpass Filt
- LFE Filter
- Srnd 3dB Attn
- Srnd Ph Shift

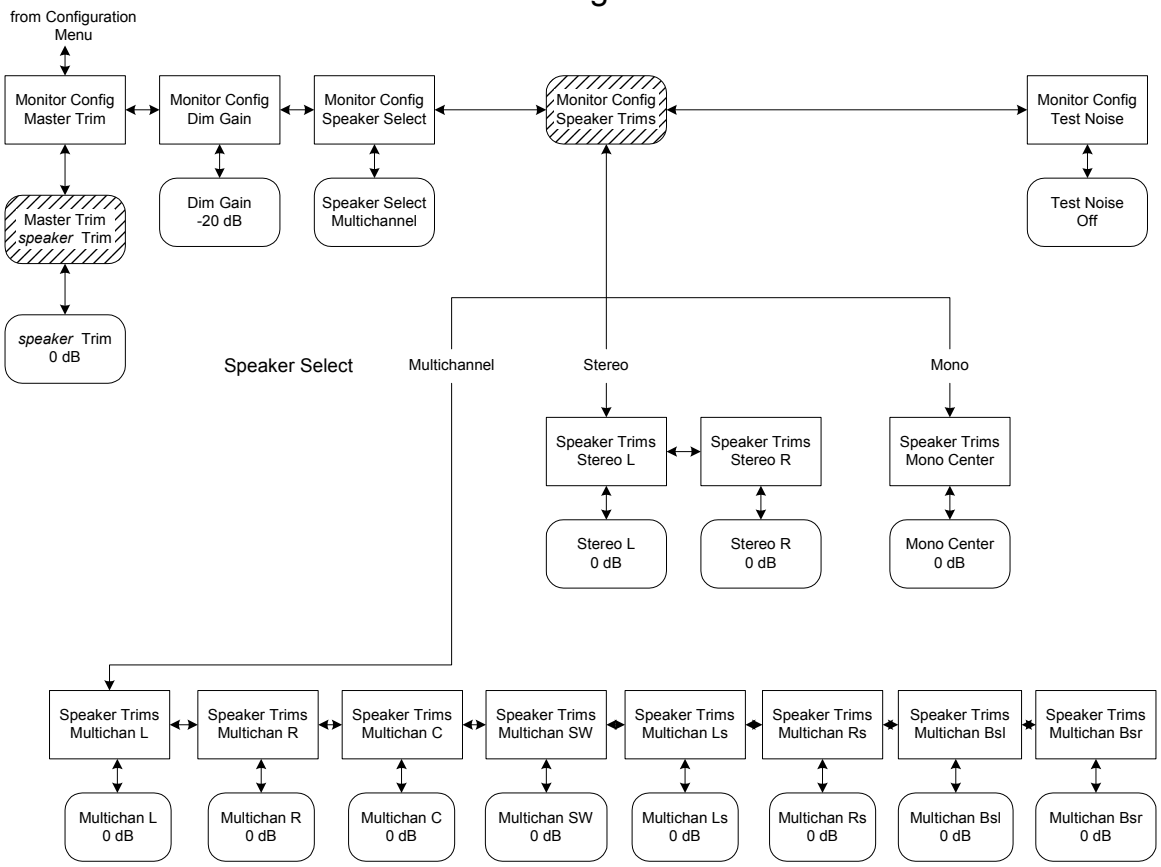
Emulator Configuration Menu



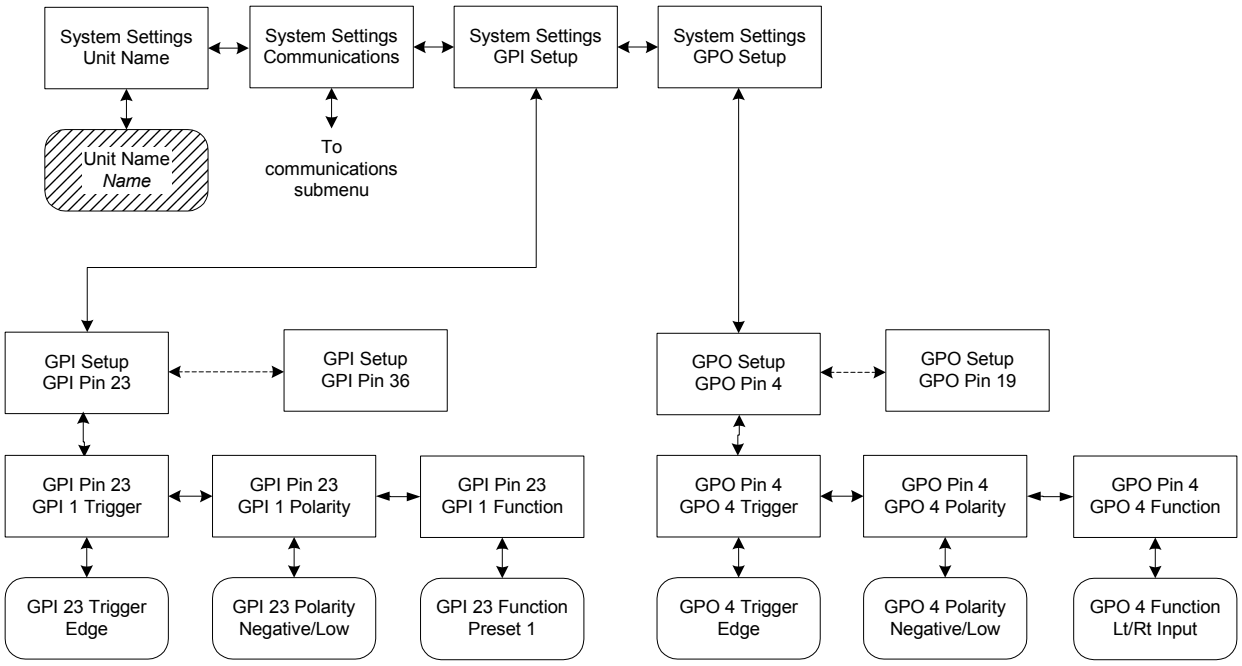
Router Configuration Menu



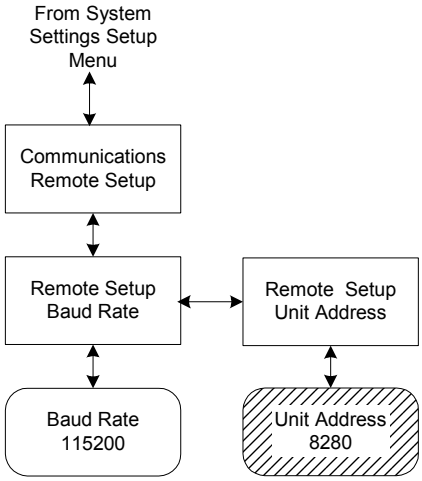
Monitor Configuration Menu



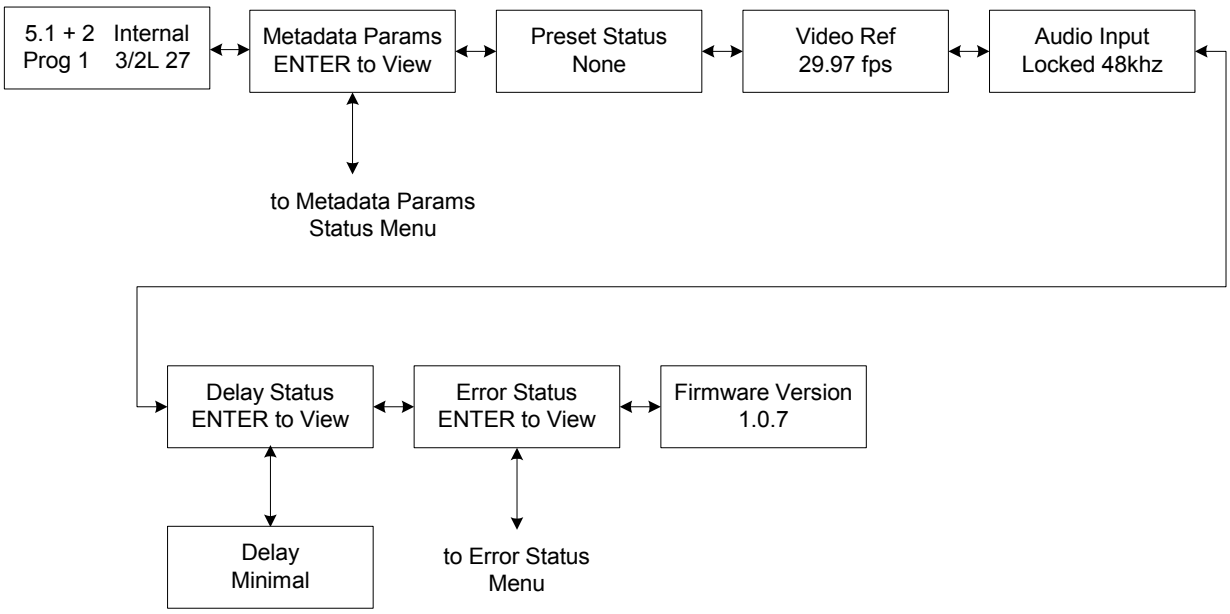
System Settings Setup Menu



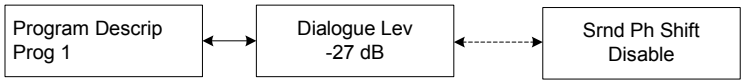
Communications Menu



DP570 Status Menu



Metadata Params Status Menu



Metadata Params Status Menu Order

- Program Descrip
- Dialogue Lev
- Channel Mode
- LFE Channel
- Bitstrm Mode
- Line Mode Pro
- RF Mode Pro
- RF Ov Protect
- Center Dwnmx
- Srnd Dwnmx
- Dolby Srnd
- Audio Prod Info
- Mixing Level
- Room Type
- Copyright
- Original Bitstrm
- Pref Dwnmx
- Lt/Rt C Dwnmx
- Lt/Rt S Dwnmx
- Lo/Ro C Dwnmx
- Lo/Ro S Dwnmx
- Dolby Srnd EX
- A/D Conv Type
- DC Filter
- Lowpass Filt
- LFE Filter
- Srnd 3dB Attn
- Srnd Ph Shift

Error Status Menu