



DP571 Dolby® E Encoder User's Manual

Issue 1

Part Number 91961



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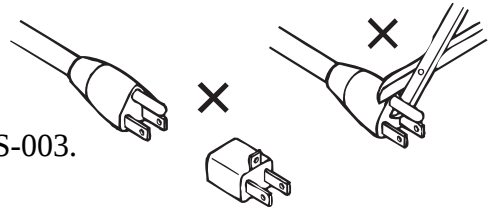
Regulatory Notices

USA

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 is required to correct the interference at his or her own expense.

Exposed portions of the power supply assembly are electrically “hot.” To reduce risk of electric 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.



Canada

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

UK

The power cord, Dolby Part No. 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, colored green and yellow, must be connected to the terminal in the plug that is marked with the letter **E** or by the ground symbol $\equiv$ or colored green or green and yellow.
- The core, colored blue, must be connected to the terminal that is marked with the letter **N** or colored black.
- The core, colored brown, must be connected to the terminal that is marked with the letter **L** or colored red.
- This apparatus must be earthed.

EU

This equipment complies with the EMC requirements of EN55103-1:1996 (Emission) and EN55103-2:1996 (Immunity) when operated in an E2 environment in accordance with this manual. The power cord with CEE7/7 plug, Dolby part no. 92021, supplied with this unit must be used with a polarized socket, or the socket must be supplied via a residual current breaker (RCD).



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. See page ix for fuse details.

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:

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

Live—Brown Neutral—Blue Earth—Green/Yellow

(GB)

IMPORTANT – NOTE DE SECURITE

Ce matériel 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, veuillez à observer les recommandations suivantes.

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

Phase—Brun Neutre—Bleu Terre—Vert/Jaune

(F)

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:

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

Phase—braun Nulleiter—blau Erde—grün/gelb

(D)

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 elettrica o d'incendio vanno osservate le seguenti misure di sicurezza:

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

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

(I)

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 líquidos, como tazas de café. Para asegurarse un funcionamiento seguro y prevenir cualquier posible peligro de descarga o riesgo de incendio, se han de observar las siguientes precauciones:

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

Vivo—Marrón Neutro—Azul Tierra—Verde/Amarillo

(E)

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:

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

Fas—Brun Neutral—Blå Jord—Grön/Gul

(S)

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 bekertjes op te plaatsen. Voor een veilig gebruik en om het gevaar van elektrische schokken en het risico van brand te vermijden, dienen de volgende regels in acht te worden genomen:

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

Fase—Bruin Nul—Blauw Aarde—Groen/Geel

(NL)



PRODUCT END-OF-LIFE INFORMATION

This product has been designed and built by Dolby Laboratories to give many years of service, and is backed by our commitment to provide high-quality support. When it eventually reaches the end of its serviceable life, it should be disposed of in accordance with local or national legislation.

For current information please visit our web site: <http://www.dolby.com/environment>

Fuse Information



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

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

Check Main Fuse

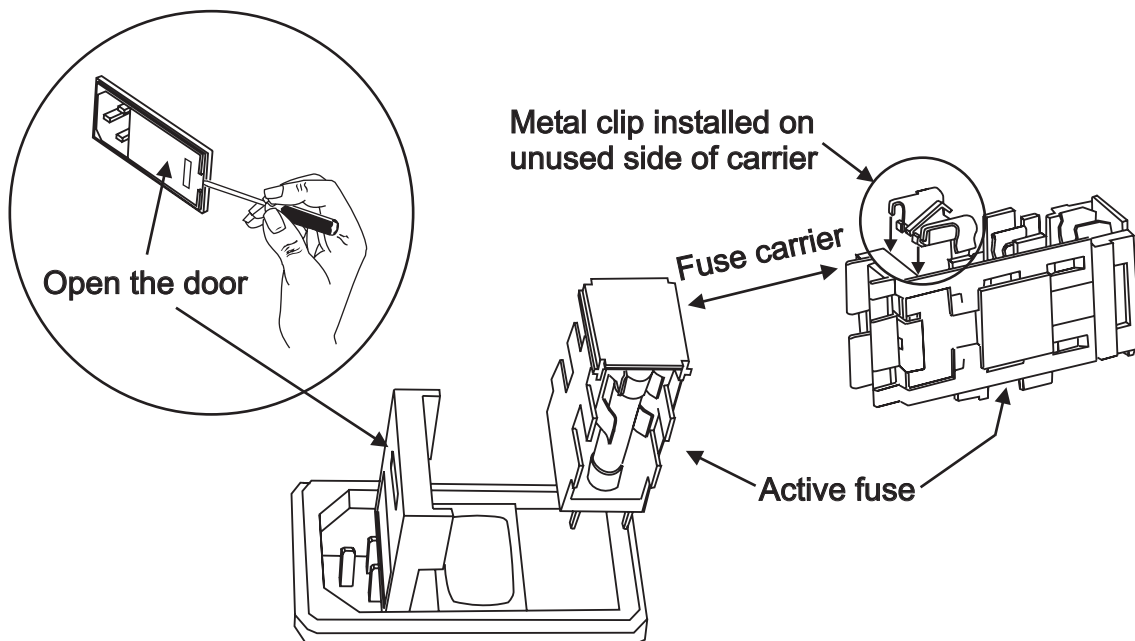
The main fuse rating is T 1A L (1 amp, 250 V, 20 mm, time-lag, low breaking capacity) for all operating voltages.



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.

To inspect or replace the main fuse:

1. Open the fuse compartment door in the AC power input housing with a small flat-blade screwdriver. (See the following figure.)
2. Check that the fuse in the active (lower) fuse carrier is the correct rating. The fuse carrier must be inserted into the compartment with the orientation shown in the following figure. Do not force the carrier into the compartment or both could be damaged.
3. Snap the fuse compartment door closed.



Internal Fuse

The switching power supply contains a separate fuse. Most fault conditions should be protected by the main fuse. The internal fuse rating is F 2A L (2 amp, 250 V, 20 mm, fast-acting, low breaking capacity) for all operating voltages.

Chapter 1

Introduction

1.1 Dolby E Technology Overview

Dolby® E is a professional audio data stream designed to carry up to eight channels of audio and metadata on stereo digital audio (PCM) systems, such as VTR's, servers, contribution and distribution links and within AES, SDI or HDSDI infrastructure.

1.2 Dolby E Characteristics

Dolby E encoding technology:

- Works with existing broadcast hardware and infrastructure.
- Transmits up to eight channels of high-quality audio within two PCM channels.
- Has native support for Dolby Digital emission metadata.
- Is synchronous with standard video frame rates.
- Maintains excellent sound quality after multiple encode/decode generations.
- Can be edited and manipulated in coded form.
- Provides frame-rate conversion capabilities.
- Encoding and decoding each take one video frame

Although the Dolby E bitstream is carried on a standard AES pair, it is not a conventional digital audio signal. The AES stream combines audio encoded in Dolby E with metadata and timecode into a data (rather than audio) stream.

Note: Because Dolby E is a data stream, it may appear to be clipped or distorted on standard VU or peak reading meters, but this is normal.

1.3 Equipment Required

Audio is encoded into a Dolby E stream by the DP571 as described in this manual. The bitstream can be decoded by the DP572 Dolby E Decoder or by a device containing a Dolby E decoding option.

1.4 Common Applications

The DP571 is most commonly used in three applications:

- Content creation
- Live remote transmission
- Digital television network rebroadcast

1.5 Content Creation

Figure 1-1 shows a typical postproduction configuration using Dolby E. A single VRef black burst signal locks all units. In this example, the mixing console is used to create a six-channel mix, which is then fed to the DP563 for surround encoding and the DP570 Multichannel Audio Tool for monitoring and metadata authoring. Metadata selections made while monitoring are sent from the DP570, to the DP571 encoder which adds this audio metadata to the 5.1 audio to make the Dolby E data stream which is recorded to the VTR. The DP572 Dolby E Decoder is used for confidence monitoring.

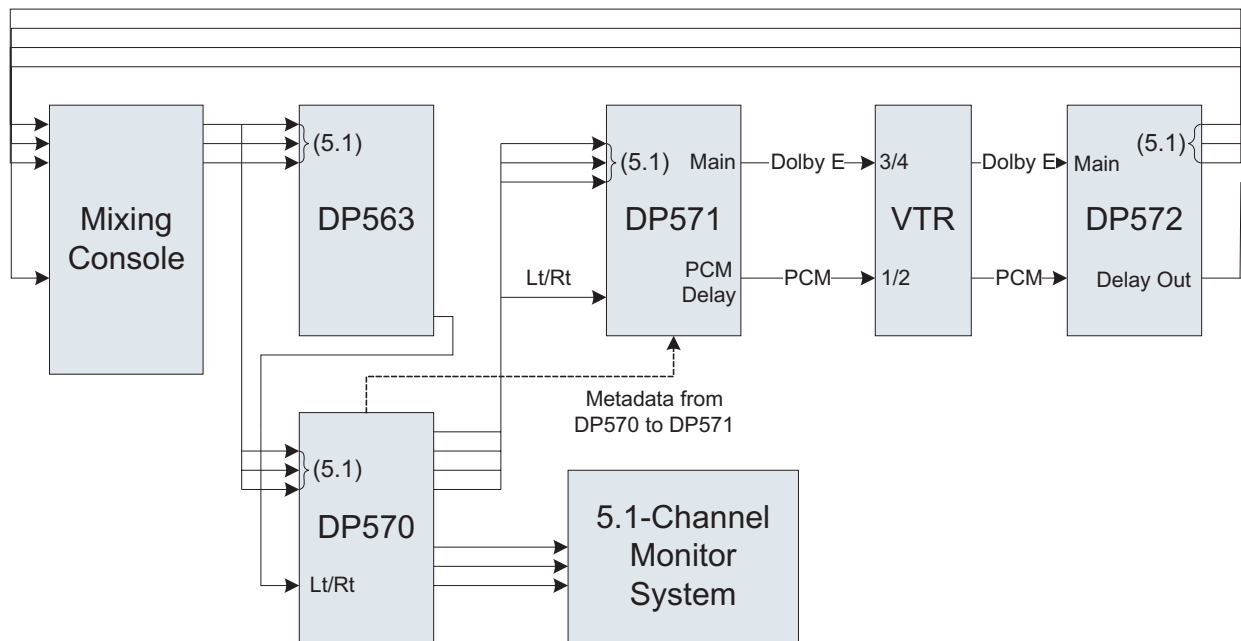


Figure 1-1 Typical Postproduction Dolby E System

1.6 Live Remote Transmission

Figure 1-2 shows a typical live remote setup. In this configuration, the multichannel output of the mixer is sent to the DP571, the DP570 and the DP563 Pro Logic II Encoder simultaneously. Metadata selections made while monitoring are sent from

the DP570, to the DP571 encoder which adds this audio metadata to the 5.1 audio to make the Dolby E data stream which is then encoded into the outgoing MPEG Transport Stream. The DP572 decoder is used for confidence monitoring.

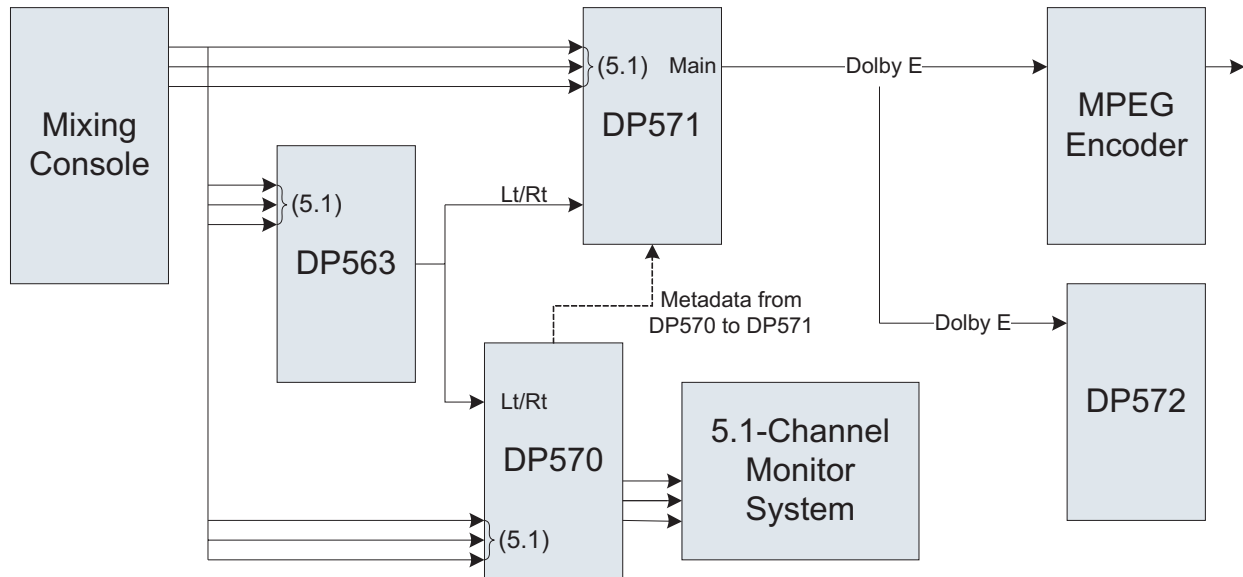
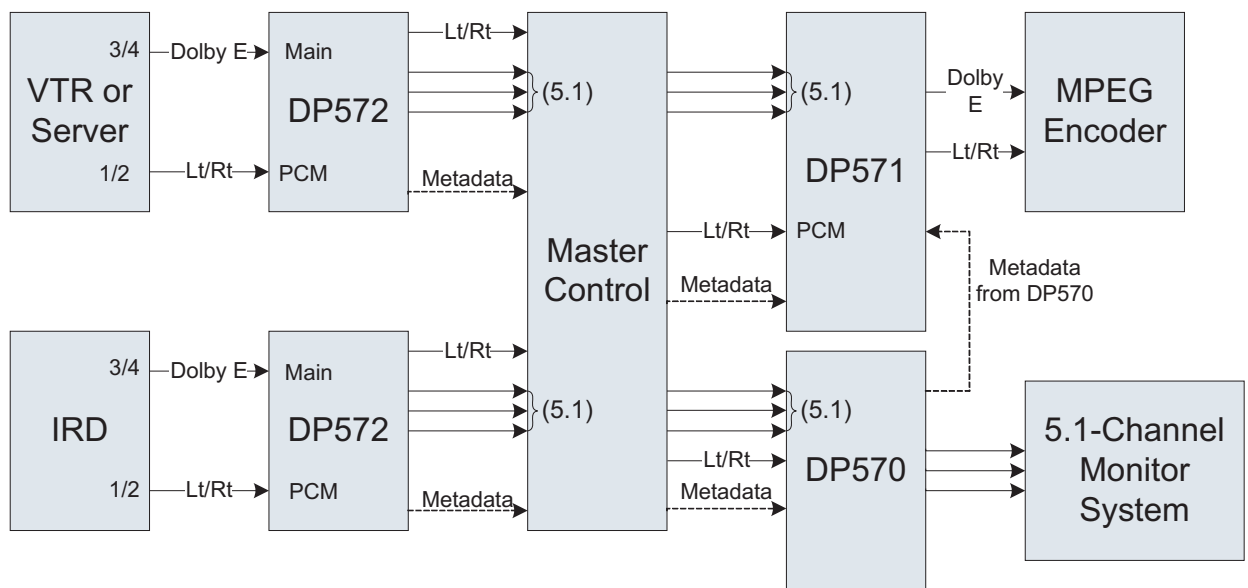


Figure 1-2 Live Remote Telecast Configuration

1.7 Digital Television Distribution

Dolby E encoding is commonly used to distribute multichannel audio from a network center to multiple affiliate stations, usually via satellite or fibre. Figure 1-3 illustrates a typical setup for this application, where master control requirements dictate that audio switching occurs discretely, and that the audio must be encoded into a Dolby E signal prior to transmission.

In Figure 1-3, the source audio is a Dolby E stream, either played out from a VTR or server, or received live through an IRD. In most situations, a separate Lt/Rt audio signal will also be present. Both the Dolby E and Lt/Rt streams are processed by the DP572, providing discrete signals to the master control switcher inputs. The switcher output is sent to the DP571 for Dolby E encoding, and also to the DP570 for monitoring and metadata modification (if required). Note that, in this example, the metadata outputs from both DP572 decoders are passed through the master control switcher via a serial layer (this is only one possible method). The “air” and “preview” serial outputs of the master control switcher are connected to the DP571 and the DP570 respectively. More than two metadata streams can be switched if necessary. The DP571 output then gets multiplexed with video in the MPEG transport stream and sent for distribution.

**Figure 1-3** Digital TV Network Dolby E Rebroadcast

Chapter 2

Hardware Installation

This chapter explains how to put the unit into service.

2.1 Unpacking

Before unpacking the unit, inspect the outer carton for shipping damage. If the carton shows damage, inspect the unit in those areas.

The following accessories are provided with the unit:

- Rack screws and washers
- Power cord
- BNC 75 Ω terminators for use on **Digital Audio** and **Video Ref** inputs (Part No. 79114)
- Spare fuse 1A (Part No. 56016)
- Hex wrench (to access inside of unit)
- Quick start guide
- Registration card

Carefully remove the unit from its carton, remove the plastic wrapping, and place on a flat surface. If there are no signs of damage, proceed to check the fuse as shown on page ix.

2.2 Placement Considerations

Dolby professional audio products are designed to operate within a temperature range of 5° to 45° C. They use natural convection cooling and therefore should not be mounted directly above any heat-generating equipment. The DP571 and DP572 units are vented on the left side of the top and bottom covers. The vent holes should not be blocked, although units can vent through one another if necessary. The number of units that can be vented in this way will depend on the conditions of the rack in which they will be installed.

2.3 Connecting Inputs and Outputs

After the unit is installed in its permanent location, connect its inputs and outputs. The DP571 accepts a variety of connections. See Section 6.2 for details.

1. Plug in a stable analog video reference signal to the rear of the unit, as described in Section 6.2.5.

Note: The DP571 will not function without a valid video reference input signal.

2. Connect the digital audio inputs to the DP571. These are AES-3id inputs (unbalanced, 75 Ω , 1 V peak-to-peak standard output) and are very similar to analog composite video.¹
3. Connect the **Main Out** of the DP571 to the VTR, MPEG Encoder, embedder to **Main In** of the DP572, (depending on your application) and terminate the input on the DP572 if necessary.

2.4 Terminate Unused Connections

The AES-3id-1995/SMPTE 276M standard dictates a 75 Ω unbalanced connection and requires proper termination. As with video, the termination should occur at the destination of the signal (that is, on the inputs to a device). If the loop-through BNC connectors are not feeding additional equipment, terminate each of these with a standard 75 Ω video terminator. Like other inputs, the video reference signal should be terminated.

When this step has been completed, the unit is ready to be powered up.

¹ We do not recommend using video equipment to distribute these AES signals. There is equipment available that is designed specifically for passing AES-3id signals.

Chapter 3

Setup and Status Checks

The DP571 has two distinct function sets, each with its own menus:

- Setup determines how audio is encoded during the current session.
- Status provides constant feedback on the state of the unit and its operation.

When the DP571 is powered up, the main status menu appears first. Press **Setup** to change to the setup menu.

To return to the main status menu, pres **Shift** then **Setup**.

3.1 Important Operating Mode Parameters

Before you begin encoding, be sure to verify that these four settings are correct:

1. Program configuration—The default value is 5.1 + 2. All the possibilities are listed in Table 3-2.
2. Frame rate—The default is 29.97 fps.
3. Bit depth—The default is 20 bit.
4. Metadata source—The default source is internal.

A complete list of the user-adjustable operating mode parameters is available in Section 7.2.

3.2 Default Metadata Parameter Values

The default metadata settings shown in Table 3-1 are used only when the DP571 is generating metadata internally.

Table 3-1 Default Metadata Parameter Settings

Parameter	5.1 Channels	Four Channels	Two Channels	One Channel
Dialogue Level	−27 dB			
Channel Mode	3/2	3/1	2/0 (stereo)	1/0 (mono)
LFE Channel	Enabled	Disabled		
Bitstream Mode	Main complete			
Line Mode Pro	Film: Standard			
Program Description	Program N			
RF Mode Pro	Film: Standard			
Center Downmix Level	−0.707 dB (−3 dB)	N/A		N/A
Surround Downmix Level	−0.707 dB (−3 dB)	N/A		N/A
Dolby Surround Mode	Not Dolby Surround encoded			N/A
Audio Prod Info	No			
Mixing Level	80 dB			
Room Type	Not indicated			
Copyright	Yes	Yes	Yes	Yes
Original Bitstream	Yes	Yes	Yes	Yes
Preferred Stereo Downmix Mode	Lt/Rt	N/A		
Lt/Rt Center Mix Level	−0.707 dB (−3 dB)	N/A		
Lt/Rt Surround Mix Level	−0.707 dB (−3 dB)	N/A		
Lo/Ro Center Mix Level	−0.707 dB (−3 dB)	N/A		

Parameter	5.1 Channels	Four Channels	Two Channels	One Channel
Lo/Ro Surround Mix Level	−0.707 dB (−3 dB)	N/A		
Dolby Digital Surround EX™ Mode	Not Dolby Digital Surround EX encoded	N/A		
A/D Converter Type	Standard			
DC Filter	Enabled			
Lowpass Filter	Enabled			
LFE Lowpass Filter	Enabled	Disabled		
Srnd 3 dB Atten	Enabled	Disabled		
Srnd Phase Shift	Enabled	Disabled		

3.3 Required Channel Mappings

The channel mappings used by the DP571 are not user adjustable. You must use the mapping listed in Table 3-2 for the program configuration you are encoding.

Table 3-2 Input/Output Channel Assignments

Program Config	Connector Channel Map			
	1/2	3/4	5/6	7/8
5.1 + 2	1L/1R	1C/1LFE	1Ls/1Rs	2L/2R
5.1 + 2 × 1	1L/1R	1C/1LFE	1Ls/1Rs	2C/3C
4 + 4	1L/1R	1C/1S	2C/2S	2L/2R
4 + 2 × 2	1L/1R	1C/1S	3L/3R	2L/2R
4 + 2 + 2 × 1	1L/1R	1C/1S	3C/4C	2L/2R
4 + 4 × 1	1L/1R	1C/1S	4C/5C	2C/3C
4 × 2	1L/1R	3L/3R	4L/4R	2L/2R
3 × 2 + 2 × 1	1L/1R	3L/3R	4C/5C	2L/2R
2 × 2 + 4 × 1	1L/1R	3C/4C	5C/6C	2L/2R
2 + 6 × 1	1L/1R	4C/5C	6C/7C	2C/3C
8 × 1	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 + 2 × 1	1L/1R	1C/1S	None	2C/3C
3 × 2	1L/1R	3L/3R	None	2L/2R
2 × 2 + 2 × 1	1L/1R	3C/4C	None	2L/2R
2 + 4 × 1	1L/1R	4C/5C	None	2C/3C
6 × 1	1C/2C	3C/4C	5C/6C	None
4	1L/1R	1C/1S	None	None
2 + 2	1L/1R	None	None	2L/2R
2 + 2 × 1	1L/1R	None	None	2C/3C
4 × 1	1C/2C	3C/4C	None	None
7.1	1L/1R	1C/1LFE	1Ls/1Rs	1Bsl/1Bsr
7.1 Screen	1L/1R	1C/1LFE	1Ls/1Rs	1Le/1Re
PCM Bypass	1L/1R	1L/1R	1L/1R	1L/1R

3.4 Listening to the Output

You cannot listen to the output of a Dolby E Encoder. The output stream is data, not audio, and must be decoded before it is intelligible.

3.5 Watching VTR Meters

During recording or playback of a Dolby E stream, VTR meters will indicate a digital full-scale signal and the clip indicators may flash intermittently. This is normal

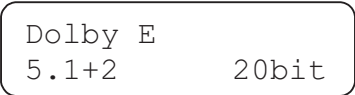
because Dolby E uses the entire audio payload of an AES pair, thereby creating the appearance of full-scale audio on the VTR.

Note: Do not adjust the input or output volume controls when recording or playing back Dolby E data, as this action will corrupt the data stream and render it undecodable.

3.6 Monitoring Status Using the Status Menu

The front-panel LCD provides detailed status information on a series of status screens. You can access the main status menu by pressing **Shift** then **Setup** at any time, and from there you can scroll through the remaining status screens using the right and left cursor buttons. The status screens display the device's current status and are not used to set values. Use the setup mode menus to set new values.

3.6.1 Main

A rectangular LCD screen with rounded corners. It displays the text "Dolby E" on the top line, "5.1+2" on the bottom left, and "20bit" on the bottom right.

Dolby E
5.1+2 20bit

The main screen displays the active program configuration and the bit depth. This is the standard display for most applications.

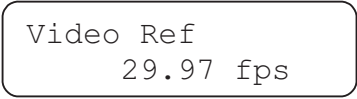
3.6.2 External Metadata

A rectangular LCD screen with rounded corners. It displays the text "Ext Metadata In" on the top line and "ENTER to View" on the bottom line.

Ext Metadata In
ENTER to View

From this status screen, pressing **Enter** displays the program configuration of external metadata, if one is present. Use the arrow keys and Enter to navigate through the individual metadata parameters of each program. Pressing **Esc** returns you to the External Metadata status screen. Use this screen to verify that the program configuration of incoming metadata matches the program configuration being used by the encoder.

3.6.3 Video Ref

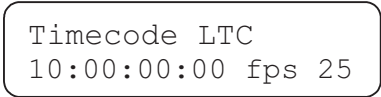


```
Video Ref
29.97 fps
```

This screen displays the video frame rate of the reference source. The options are 29.97 fps (NTSC), 25 fps (PAL), 23.98 fps, 24 fps (P or PsF), and 30 fps. The incoming video reference must match the Frame Rate parameter selected in the Operating Mode Setup Menu.

Note: A yellow VRef LED on the front panel indicates that there may be a mismatch between the selected frame rate and the incoming video reference.

3.6.4 Timecode



```
Timecode LTC
10:00:00:00 fps 25
```

This screen displays the value and frame rate of the incoming timecode present at the LTC connection on the rear panel. Timecode is displayed in hours:minutes:seconds:frames format.

3.6.5 Presets



```
User Preset
01-Preset Name
```

If a preset is loaded, the preset number and name are displayed; otherwise, **Disabled** is displayed.

3.6.6 PCM Input



```
PCM Channel
48 kHz
```

The sample rate of the signal present on the PCM Delay In connection is displayed if present; otherwise, **No Input** is displayed.

3.6.7 Metadata



```
Metadata
Internal
```

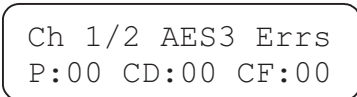
The source of metadata, **Internal** or **External**, is displayed.

Note: Metadata from an external source cannot be edited in the DP571. Use the internal source if you wish to create different metadata parameters.

3.6.8 Error



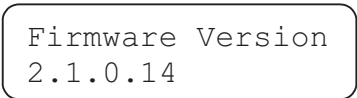
```
Error Status
ENTER to View
```



```
Ch 1/2 AES3 Errs
P:00 CD:00 CF:00
```

Use the arrow buttons to move between channels 1/2, 3/4, 5/6, 7/8, and PCM. The number of parity (**P**), coding (**CD**), and confidence (**CF**) errors on the AES inputs (up to 99) since the last power cycle are displayed. When displaying the error count, pressing the **Enter** button will reset the error counts to 00. Pressing the **Esc** button returns you to the Error Status screen.

3.6.9 Firmware Version



```
Firmware Version
2.1.0.14
```

The current firmware version is displayed. Periodic firmware upgrades are available at www.dolbysupport.com.

3.7 Checking Status Using the LEDs

Figure 3-1 shows all the LEDs on the DP571 front panel.

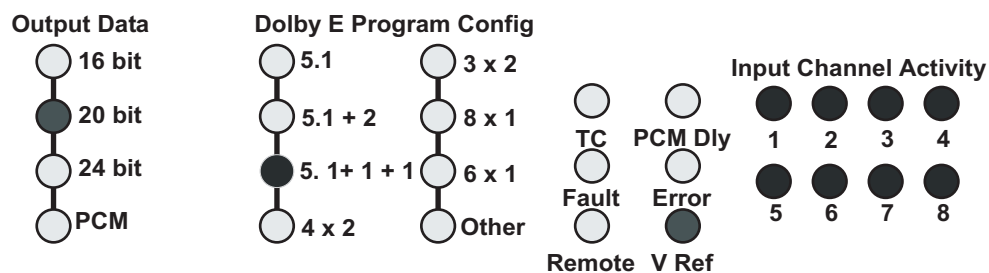


Figure 3-1 Front-Panel LEDs

3.7.1 Output Data LEDs

The DP571 lights the LED corresponding to the output data bit depth. The bit depth is selected in the Operating Mode setup menu. Currently, 24-bit output data is not supported and the corresponding LED is not used.

3.7.2 Program Configuration LEDs

The DP571 lights the LED that corresponds to the current encoding program configuration. In Figure 3-1 the seven most common program configurations have an individual LED. **Other** denotes any of the other program configurations. For a complete listing of supported program configurations, see Table 7-1.

3.7.3 TC, Fault, Remote, PCM Dly, Error, and VRef LEDs

The LED states and their indications are listed in Table 3-3.

Table 3-3 TC, Fault, Remote, PCM Dly, Error, and VRef LEDs

Name	Indication
TC	Green: Valid timecode signal. Yellow: Frame rate does not match video reference. Off: No TC signal detected.
Fault	Red: Hardware-related fault condition. Off: No fault condition.
Remote	Not used in this version of the software.
PCM Dly	Green: Valid PCM signal. Yellow: Non-48 kHz signal. Off: No PCM signal.
Error	Red: Input not valid for current settings. Off: No error condition.
VRef	Green: Lock with a valid analog composite video signal. Yellow: The video reference does not match the selected frame rate in the DP571. Flashing Red: The internal clock is not locked to the incoming reference.

3.7.4 Input Channel Activity

The DP571 input channel activity LEDs display the number of channels in the currently selected program configuration, as well as their status. An LED lights up for each channel in use, and its color indicates its status. Details are listed in Table 3-4.

Table 3-4 Channel Activity LEDs

State	Indication
Yellow	Channel enabled; level < -60 dBFS.
Green	Channel enabled; level ≥ -60 dBFS.
Red	Channel enabled; level ≥ -0.1 dBFS. This indication can be triggered by a single sample.
Off	Channel not used in the selected program configuration.
Flashing Yellow	Channel sample frequency out of range, or no input present.

3.8 Using the Status Connector

The **GPIO Status** connector on the rear panel is a standard 9-pin female D-connector. Signal details are given in Section 6.2.1.

Chapter 4

Using Presets

You can save setup time by saving and recalling up to eight presets. A preset is a snapshot of all device settings.

4.1 Saving a Preset

To save a preset, follow these steps:

1. At the main status display, press **Setup** to change to setup mode.
2. Press **↓** three times to reach **User Presets**. Press **Enter**.
3. Press **↓** to reach **Save Preset**. Press **Enter**.
4. Press **↓** to reach the desired preset number. Press **Enter**.
5. Use the panel arrows to enter a name for the new preset. See Table 6-1 for details about entering text. Press **Enter**.
6. Press **Enter** again to save the preset, or press **Esc** to cancel the operation.

4.2 Recalling a Preset

Presets can be recalled using nearly identical steps:

1. At the main status display, press **Setup** to change to setup mode.
2. Press **↓** three times to reach **User Presets**. Press **Enter**.
3. Press **Enter** again to **Recall Preset**.
4. Press **↓** to reach the number of the desired preset to recall.
5. Press **Enter**. The device automatically returns to the preset configurations.

4.3 Saving and Recalling Presets Using the Status Connector

Presets can be saved via the **Status** connector. See Section 6.2.1 for details.

Chapter 5

Important Key Sequences

5.1 Warm Reset

Pressing the **Shift**, **→**, and **Esc** keys simultaneously and then releasing them performs a warm reset of the DP571.

You can also reset the unit by unplugging it, and plugging it back in.

5.2 Firmware Update Mode

To put the unit into firmware update mode, follow these steps:

1. Reset the DP571 either by removing and restoring power, or by the method described above.
2. During the reset, press and hold the **Setup** button until **Ready to Load** is displayed on the LCD.

5.3 Factory Reset

To reset the unit to factory default settings, follow these steps:

1. Reset the DP571 either by removing and restoring power, or by the method described above.
2. During the reset, press and hold the **Enter** key until **Factory Defaults** is displayed on the LCD.

Chapter 6

Hardware Description

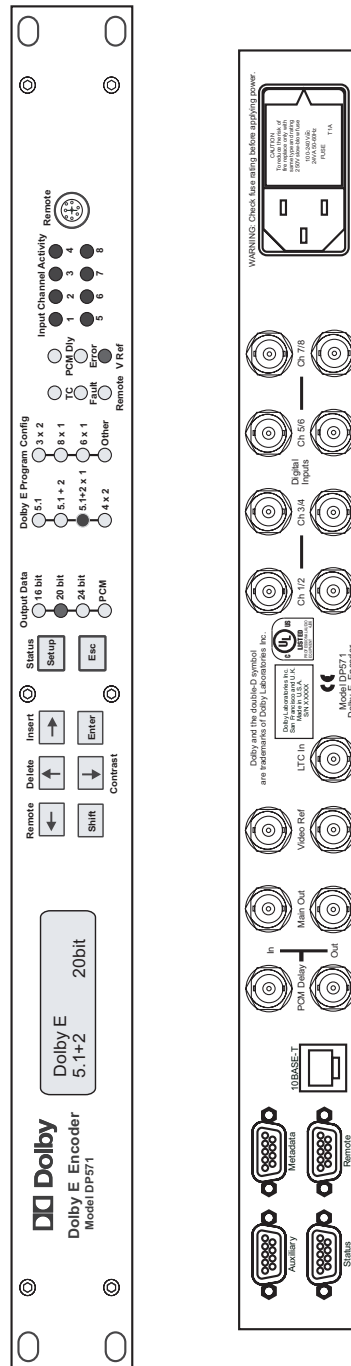


Figure 6-1 DP571 Front and Back Panels

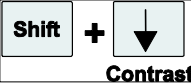
6.1 Front Panel

Following is a description of the front-panel components shown in Figure 6-1.

6.1.1 Buttons

The primary function of each button is printed on it. Some buttons have alternate functions (printed above or below the button). To access a button's alternate function, press the **Shift** button, and then press the desired button. The **Shift** button stays lit until you press another button, or press **Shift** again to disable the alternate-function mode. Table 6-1 explains all the button functions.

Table 6-1 DP571 Front-Panel Buttons

Buttons	Function
	Press Shift ↓, and then press ↑ to increase the LCD contrast or ↓ to decrease the LCD contrast.
	Press Setup to enter setup mode from any mode or menu. The LCD displays DP571 Unit Setup Program Config . To navigate and set values in this mode, use the other buttons, as explained below. To display the device status, press Shift + Setup to enter status mode.
	Press these arrow buttons to move to the next menu or parameter value. When editing text, the buttons have different behaviors: → moves to the next letter, ↓ changes the current character to the next alphanumeric character.
	Press these arrow buttons to return to the previous menu or parameter value. When editing text, the buttons have different behaviors: ← moves to the previous letter in the name, ↑ changes the current character to the previous alphanumeric character. Note: The remote function is not yet supported.
	Press Enter to set the currently displayed selection, or to descend one level in the menu hierarchy.
	Press Esc to abort the current operation, or to ascend one level in the menu hierarchy. Note: In Setup mode, a blinking cursor indicates a new selection. Press Enter to activate the selection, or Esc to restore the current value. Press Esc again to ascend one level in the menu hierarchy.

6.1.2 LEDs

The LEDs on the front panel are discussed in Section 3.7.

6.1.3 Remote Connector

The front panel Remote connector, used for software upgrades, is an 8-pin female mini-DIN EIA RS-232 connector. Software upgrades for the DP571 can be achieved via a remote cable connected to a standard 9-pin RS-232 PC COM port. To request an upgrade cable from Dolby Laboratories visit www.dolbysupport.com and click *Got Upgrade Cable?*. The connector pinout is shown in Table 6-2.

Note: The DP571 is DCE as defined in the RS232 specification. The RX connection is outbound, and the TX connection is inbound.

Table 6-2 Remote Connector Pin Functions

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

6.2 Rear-Panel Connectors

The following sections describe the rear-panel connectors.

Note: The DP571 does not support auxiliary, remote, and Ethernet functions, and the corresponding rear-panel connectors are not functional.

6.2.1 Status Connector

The DP571 status port provides general purpose input/output (GPI/O) signals through a 9-pin female D-connector. The input and output signals are 0–5 V TTL. The pin configuration is defined in Table 6-3.

Table 6-3 DP571 Status Port Pin Functions

Pin	Connection	Explanation
1	Preset tally A	Preset tally output
2	Reference video valid	1: Valid; 0: Ref video error
3	Dolby® E encoding valid	1: Valid; 0: Encoding error
4	System operational	1: Functional; 0: Failed
5	Fault	1: Functional; 0: Hardware fault
6	Preset tally B	Preset tally output
7	Preset control A	Preset control input
8	Preset control B	Preset control input
9	Ground	

The two inputs on pins 7 and 8 select among the first three (of eight) presets stored in the DP571. The inputs are normally high (internal pull up) and trigger a preset recall by sensing a momentary high-to-low transition. A momentary contact closure between pins 7 and 9 (ground) or pins 8 and 9 is sufficient to activate a function, but a held closure also works. A low-to-high transition (that is, a switch release) is ignored. Table 6-4 summarizes the operation of the two inputs.

Table 6-4 Status Port Preset Selection

Pin 7 Transition	Pin 8 Transition	Preset
High to low	None or low to high	1
None or low to high	High to low	2
High to low	High to low	3

Choosing presets 1–3 also generates corresponding output on the status port that can be used to specify a preset through the status port or front panel. A high level for both outputs indicates a preset selection other than 1–3 (or no preset). Table 6-5 summarizes the two outputs.

Table 6-5 Preset Mode Rally Indication on the Status Port

Preset Tally A	Preset Tally B	Preset
Low	High	1
High	Low	2
Low	Low	3

6.2.2 Metadata Connector

Audio metadata from an upstream device, like a DP570 Multichannel Audio Tool or a DP572 Dolby E Decoder, can be connected to the DP571 here. The audio metadata stream, which includes important information to properly format the audio when received and decoded in the home, will be incorporated into and carried by the encoded Dolby E data stream created by the DP571. For information on metadata parameters that may need to be explicitly set or checked, see Section 7.2.8.

This is a 9-pin full-duplex RS-485 female D-connector running at 115 kbps. The pinout, shown in Table 6-6 is SMPTE 207M compatible.

Table 6-6 Metadata Connector Pinout

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

6.2.3 PCM Delay In/Out Connectors

When sending both encoded and nonencoded channel pairs to a digital recorder, the nonencoded pair can be delayed to remain synchronized with the encoded signal. The DP571 encoder contains a one video frame PCM utility delay that allows the PCM input signal to be transported in–sync with the digital inputs. One frame of delay is added to the PCM signal transmitted from the **PCM Delay Out** connector to match the Dolby E encoding delay.

6.2.4 Main Out Connectors

The encoded Dolby E bitstream is output from the rear-panel **Main Out** connector as an AES3 coaxial digital signal. Two connectors are available for transmission of Dolby E data to multiple decoders or monitoring units.

Note: The two **Main Out** connectors are electrically separate, not passive loop-through connections, so there is no need to terminate an unused output.

6.2.5 Video Ref Connectors

The DP571 requires a video reference signal to lock the audio and video at frame boundaries.

The DP571 supports the following frame rates:

- 29.97 Hz
- 25 Hz
- 23.98 Hz
- 24 Hz (P or PsF)
- 30 Hz

For the 29.97 and 25 Hz frame rates, standard black burst or color bars locked to the plant reference can be used as a video reference. All other frame rates require a Dolby DP579 Tri-Level Sync Interface to convert tri-level reference signals into Dolby Black (a signal similar to standard black burst that is compatible with the DP571). In addition, vertical interval timecode (VITC) information can be extracted from a 25 or 29.97 fps composite video reference signal sent to the DP571. The video reference can be either terminated at the loop-through connection, or passed on to additional devices.

Note: The reference signal must be terminated with a 75 Ω impedance on the last device in the signal chain.

If a suitable video reference signal is not present or invalid, the:

- DP571 does not encode a Dolby E bitstream.
- Dolby E output on the Main Output and PCM Output are muted.
- VRef LED is yellow if the wrong frame rate reference is present, and red if no valid reference is present.

6.2.6 LTC In Connector

The DP571 accepts a SMPTE linear timecode (LTC) signal. The timecode information is multiplexed into the Dolby E bitstream.

6.2.7 Digital Input Connectors

The digital input connections on the DP571 encoder are BNC connectors, compliant with the AES-3id standard. A maximum of eight PCM channels can be sent to the digital inputs, each with a loop-through connection.

Note: These signals must be properly terminated with a 75Ω impedance at one point only. We recommend a standard video terminator.

Chapter 7

Setup Menus

This chapter describes the DP571 setup menus and related functions. You can find menu trees in the *DP571/DP572 Dolby® E Professional Encoder/Decoder Quick Start Guide*.

7.1 Program Config

In the **Program Config** menu, you can select any program configuration shown in Table 7-1. The + symbol separates programs within a configuration. For example, 5.1 + 2 represents one 5.1-channel and one stereo program. The × symbol indicates that the configuration consists of multiple programs all with the same number of channels. For example, 4 × 2 represents four two-channel programs. One configuration has three different formats: 4 + 2 + 2 × 1, which represents one four-channel, one two-channel, and two mono programs.

Table 7-1 lists the program configuration options and explains the corresponding channel information. Asterisks identify the program configurations that are not available in 16-bit mode.

Note: Selecting a program configuration assigns the default metadata values identified in Section 7.2.8 for the selected configuration. If these values are not appropriate, they can be modified using the setup menu.

Table 7-1 Supported Program Configurations

Program Config	Program and Channel Explanation
5.1 + 2*	One 5.1-channel and one two-channel program. One of the most common configurations. Two-channel could be stereo, Dolby Surround (Lt/Rt), or even stereo SAP.
5.1 + 2 × 1*	One 5.1-channel and two mono programs. May be used for a 5.1-channel and two mono SAPs.
4 + 4*	Two four-channel programs.
4 + 2 × 2*	One four-channel and two stereo programs.
4 + 2 + 2 × 1*	One four-channel, one stereo, and two mono programs.
4 + 4 × 1*	One four-channel and four mono programs.
4 × 2*	Four stereo programs.

Program Config	Program and Channel Explanation
$3 \times 2 + 2 \times 1^*$	Three stereo and two mono programs.
$2 \times 2 + 4 \times 1^*$	Two stereo and four mono programs.
$2 + 6 \times 1^*$	One stereo and six mono programs.
$8 \times 1^*$	Eight mono programs.
5.1	One 5.1-channel program.
$4 + 2$	One four-channel program and one two-channel program (that is, L, C, R, S, and Lt/Rt for archiving Dolby Surround soundtracks).
$4 + 2 \times 1$	One four-channel and two mono programs.
3×2	Three stereo programs.
$2 \times 2 + 2 \times 1$	Two stereo and two mono programs.
$2 + 4 \times 1$	One stereo and four mono programs.
6×1	Six mono programs.
4	One four-channel program (L, C, R, S).
$2 + 2$	Two stereo programs.
$2 + 2 \times 1$	One stereo and two mono programs.
4×1	Four mono programs.
7.1*	One 7.1-channel program comprising of L, C, R, Ls, Bsl, Bsr, Rs, and LFE channels.
7.1 Screen*	One 7.1-channel program comprising of L, Le, C, Re, R, Ls, Rs, and LFE channels.

* Not available in 16-bit mode

7.2 Operating Mode

The following sections describe operating mode parameters.

7.2.1 Output Clock

The Main Out of the DP571 can be selectively locked to either the video reference or the main AES input. Video Ref Input must be selected for normal operation. The Main AES Input mode can be used only if the main AES input has been locked to video elsewhere. In either mode a valid video reference is required for operation.

7.2.2 Timecode Input

The DP571 can create Dolby E bitstreams that carry timecode information in hours:minutes:seconds:frames format. This parameter specifies the type of timecode used and the connector that provides the DP571 timecode information.

- LTC—The **LTC In** connector provides linear timecode.
- VITC—The **Video Ref In** connector provides vertical interval timecode.

7.2.3 Reversion Mode

This parameter specifies how the DP571 responds to an interruption in the external metadata it is using. This settings is active only if the metadata source is set to External.

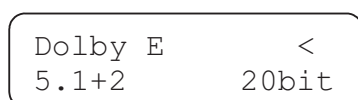
- **Last Used**—Continues encoding using the last values set by the external source. Most likely used for broadcast distribution.
- **Preset**—If metadata parameters are missing from the external-source stream, they are filled in by the DP571 using the **Rev Prog Config** selected in **Metadata Params: Reversion Preset**.
- **Stop Encoding**—Stops encoding and displays the error status on the front-panel **Error** LED. Most likely used in postproduction.
- **Adaptive**—Behaves in the same way as **Last Used** if the metadata disappears completely. Behaves in the same way as **Preset** if any metadata parameters are missing.

7.2.4 Metadata Source

- **Internal**—Assigns internally generated metadata values based on each program within a program configuration. These values can be modified.
- **External**—Uses external-source metadata that cannot be modified in the DP571.

7.2.5 48 kHz Pull Down

- **Disabled**—This is the default setting; it is appropriate for most common VTRs.
- **Enabled**—This setting allows a DP571 encoder to be used with a 30 Hz VTR operating at 29.97 Hz. When enabled, the LCD displays a < instead of the frame rate.



7.2.6 Frame Rate

The DP571 supports multiple frame rates: 29.97 Hz (NTSC), 25 Hz (PAL), 23.98 Hz, 24 Hz (P or PsF), and 30 Hz.

Note: All rates other than 25 and 29.97 Hz require the use of a Dolby DP579 Tri-Level Sync Interface.

The VRef input rate must match the selected frame rate. For example, if the incoming VRef signal is 29.97 Hz/NTSC/black burst, the frame rate must be 29.97 fps; otherwise, the VRef LED turns from green to yellow and encoding is stopped.

The frame rates are for use as follows:

- 29.97 fps—For Dolby E output used with NTSC equipment (default value)
- 25 fps—For Dolby E output used with PAL equipment
- 23.98, 24, 30 fps—For Dolby E output when used with HD equipment and tri-level sync

7.2.7 Bit Depth

The DP571 can encode both 16- and 20-bit Dolby E bitstreams.

Note: Sixteen-bit mode affects only the space the Dolby E bitstream occupies in the main AES output, not the resolution of the underlying PCM audio.

A 16-bit/48 kHz AES channel has a data rate of 1.5 Mbps, which is 400 kbps less than a 20-bit/48 kHz channel. To compensate for this lower data rate and to maintain the highest audio quality over the maximum number of encode/decode generations, only six audio channels can be encoded in 16-bit mode. As a DP572 automatically switches from 16- to 20-bit decoding in response to the input stream, it seamlessly enables decoding the two additional channels.

Sixteen-bit mode is only available when the current program configuration uses no more than six channels. For example, while the 5.1 + 2 program configuration is selected, 16-bit mode is not visible and cannot be selected.

When 16-bit mode is selected, program configurations with more than six channels are not available and are therefore not displayed.

7.2.8 Metadata Parameters

This section defines the DP571 metadata parameters and their default settings. For a full discussion of metadata, see the *Dolby Metadata Guide*.

Table 7-2 Metadata Parameter Definitions

Parameter Display	Description
Dialogue Lev	Controls dialogue normalization.
Channel Mode	Designates the number of active channels.
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. Informational only.
Line Mode Pro	Designates preset compression configuration for line-mode decoding.
RF Mode Pro	Designates preset compression configuration for RF-mode decoding.
Center Dwnmx	Designates downmix level for the C channel when end user has no center speaker. Default is 0.707 (–3 dB).
Srnd Dwnmx	Designates downmix level for surround channels when end user has no surround speakers. Note that the 0 (–999 dB) setting discards the surround channels. Default is 0.707 (–3 dB).
Dolby Srnd	Indicates whether a two-channel encoded bitstream contains a Dolby Surround (Lt/Rt) program and requires Dolby Pro Logic® decoding. Default is Not Dolby Srnd.
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.
Orig Bitstrm	Indicates whether the encoded Dolby Digital bitstream is the master version. Informational only.
Pref Dwnmx	Designates preference for Lt/Rt or Lo/Ro stereo downmix.

Parameter Display	Description
Lt/Rt C Dwnmx	When the stereo downmix is Lt/Rt, designates downmix level for the C channel when end user has no center speaker.
Lt/Rt S Dwnmx	When the stereo downmix is Lt/Rt, designates downmix level for surround channels when end user has no surround speakers.
Lo/Ro C Dwnmx	When the stereo downmix is Lo/Ro, designates downmix level for the C channel when end user has no center speaker.
Lo/Ro S Dwnmx	When the stereo downmix is Lo/Ro, designates downmix level for surround channels when end user has no surround speakers.
Dolby Srnd EX	Identifies if audio is encoded as a Dolby Digital Surround EX™ stream and requires Surround EX decoding.
A/D Conv Type	Identifies the setting for type of A/D converter. Informational only.
DC Filter	Applies a DC-blocking 3 Hz highpass filter before Dolby Digital encoding.
Lowpass Filt	Applies a lowpass filter to the main input channels before Dolby Digital encoding.
LFE Filter	Applies a 120 Hz lowpass filter to LFE channel before Dolby Digital encoding.
Srnd 3dB Attn	Attenuates surround channels 3 dB before encoding.
Srnd Ph Shift	Before encoding, creates the phase-shifted surround channels necessary to create an Lt/Rt output in a decoder that can be decoded using Dolby Pro Logic to L, C, R, S.

7.2.9 System Settings

This menu is used only to set parameters used in the firmware upgrade process.

Unit Address

The unit address may be set to a value between 8,280 (default) and FFFE.

Unit Name

Enter a unit name up to 16 characters in length. The ← → buttons move to the previous/next letter in the name, and the ↓ ↑ buttons change to the next/previous alphanumeric character.

Appendix A

Dolby Operating Specification

	Description	Specification
Environmental	Power Input Requirements	90–264 VAC, 50–60 Hz
	Altitude	Operating: –60 to +3,000 meters (–197 to +10,000 ft) Derate max temp by 10% for every 1,000 meters
	Dimensions	Meets EIA 19" rack standard, 1-U rackmount
	Humidity	Operating, noncondensing: 0% to 98% Nonoperating, noncondensing: 0% to 98%
	Temperature	Operating: 5°C to 45°C continuous Nonoperating: –20°C to +70°C (–4°F to +158°F)
	Weight	Net: 2.7 kg (5.9 lb)
Recommended Product Clearances	Minimum Side Clearance	75 mm (3 in)
	Minimum Front Panel Clearance	305 mm (12 in)