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Preliminary

REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary version	Jan 06
0.2	Updated VistaLINK [®] description. Fixed Minor Typos	Feb 07
0.3	Updated format	May 09

Preliminary

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Preliminary

1. OVERVIEW

The 7720AD8-DD-HD audio and Dolby Metadata de-embedder and re-embedder extracts embedded audio from 4 specified groups as defined by SMPTE 299M from a 1.5 Gb/s serial HD input video signal or as defined by SMPTE 272M from a 270 Mb/s serial SD input video signal.

One selected channel is processed by the on-card Dolby Decoder. If the channel contains Dolby E or Dolby Digital (AC3), it will yield up to 8 additional discrete audio channels, 2 channels of stereo down mix and the associated Dolby E Metadata. Up to 16 selected channels may be optionally delayed up to the maximum video frame delay plus 1 frame and re-embedded into the output video and/or directed to AES outputs. Video output may be optionally delayed to help with lip sync. If PCM audio is embedded, the device acts as a simple 4 group audio de-embedder.

This module also handles Dolby E Metadata. Metadata is optionally embedded in the Vertical Ancillary data (VANC) and can be provided as an output for downstream devices (i.e. Dolby Encoders, Multichannel Audio Tool, etc.).

For lip sync cohesion and ease of editing, Dolby E data is organized in blocks with lengths matching the associated video frame. The decoder will match the beginning of each output block with the start of video, as provided with the genlock input. Users can also dial up an additional delay, up to maximum video delay plus 1 frame. The 8 AES inputs can be configured as a backup in the event the primary is lost, or as a voice-over source.

The 7720AD8-DD-HD occupies two card slots in the 3RU frame (7700FR-C), which will hold up to 15 1-slot modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7720AD8-DD-HD may also be used in a standalone unit (S7701FR).

VistaLINK[®] enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK[®] Pro, locally or remotely.

Features:

- Automatic switchover to backup audio source on loss of selected Dolby stream.
- Adjustable video delay to match Dolby decoder audio delay
- Headphone jack (on card edge) for monitoring stereo down mix or any input source
- Dolby Metadata is embedded in HD VANC for downstream device decoding
- 8 AES inputs for backup, voice-over, or Dolby E /AC3 content
- Flexible audio channel mixer
- Card edge display
- Card edges LED's for module status, video signal presence, selected audio group presence, Dolby Decoder status, Genlock health/compatibility, and AES signal presence
- VistaLINK[®] enabled for remote monitoring and control via SNMP (using VistaLINK[®] PRO) when installed in the 3RU 7700FR-C frame with the 7700FC VistaLINK[®] Frame Controller module in slot 1 of the frame.

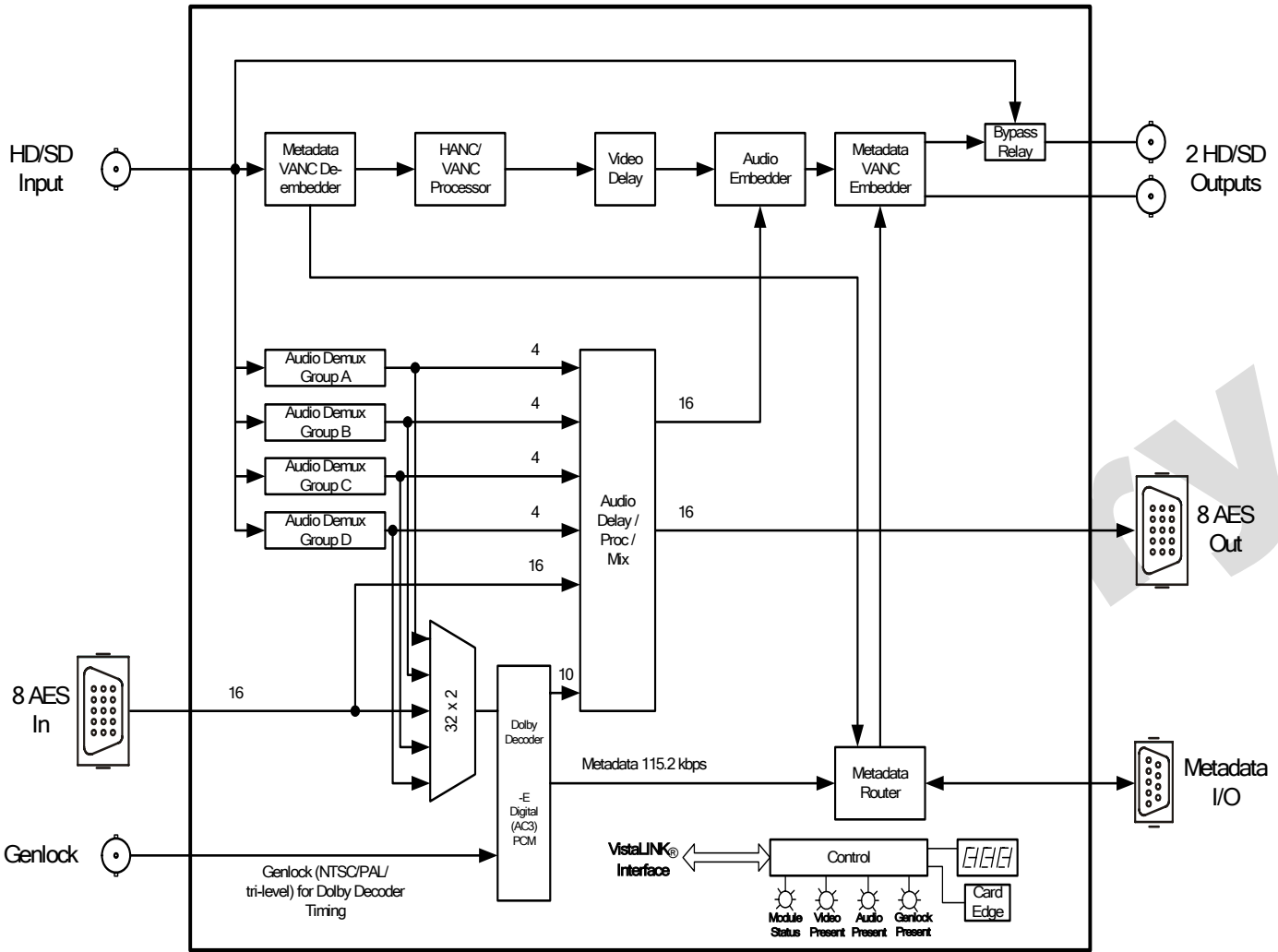


Figure 1-1: 7720AD8-DD-HD Block Diagram

2. INSTALLATION

The 7720AD8-DD-HD comes with a companion rear plate that occupies two slots in the frame. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

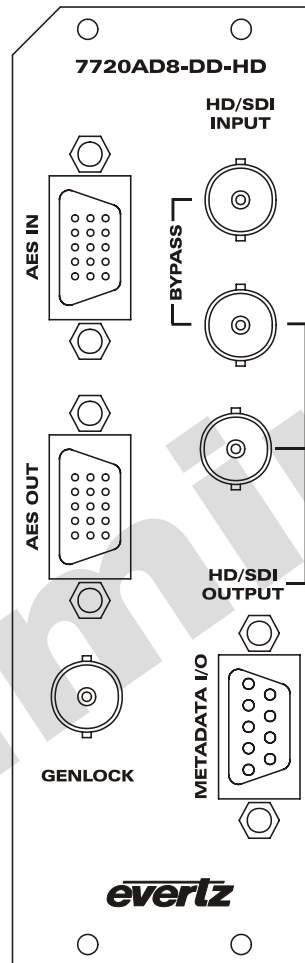


Figure 2-1: Rear Panel

2.1. VIDEO CONNECTIONS

HD/SDI IN: The input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 292M or SMPTE 259M-C standard. The module can be set to a specific video standard or set to automatically detect.

HD/SDI OUT: This BNC connector is used to output the video as serial component video, compatible with the SMPTE 292M or SMPTE 259M-C standard (same as input).

BYPASS: This BNC connector is used as program out bypass. The output signal is compatible with the SMPTE 292M or SMPTE 259M-C standard (same as input).

2.2. GENLOCK REFERENCE

For proper synchronization of the Dolby Decoder, the module must be locked to a genlock signal of the output video format.

GENLOCK: This BNC is for connecting a video or tri-level sync reference and is auto-detected by the module. Jumper J5 selects whether the reference input is terminated to 75 ohms or high impedance (default). (See section 7.3).

2.3. AES INPUT AND OUTPUT AUDIO CONNECTIONS

Eight unbalanced AES inputs and eight unbalanced AES outputs are provided on 8 BNC connectors on the two high density DB-15 connectors labelled **AES IN** and **AES OUT** on the 7720AD8-DD-HD. These inputs and outputs are for unbalanced AES signals conforming to SMPTE 276M. The eight AES input channels can be used as a backup or voice-over source. The de-embedded and processed audio can be output as eight AES channels. Table 2-1 and Table 2-2 show the DB-15 connector pin out.

Name	Description	DB-15 Pin
GPI2	Reserved for Future Use	1
	Reserved for Future Use	2
	Reserved for Future Use	3
	Reserved for Future Use	4
	Reserved for Future Use	5
	Reserved for Future Use	6
AES In 2	AES Input 2 - Unbalanced	7
GPI1	Reserved for Future Use	8
AES In 6	AES Input 6 – Unbalanced	9
AES In 5	AES Input 5 – Unbalanced	10
AES In 1	AES Input 1 - Unbalanced	11
AES In 8	AES Input 8 – Unbalanced	12
AES In 7	AES Input 7 – Unbalanced	13
AES In 4	AES Input 4 - Unbalanced	14
AES In 3	AES Input 3 - Unbalanced	15
GND	Ground	Shell

Table 2-1: AES IN Audio Connector Pin Out

Name	Description	DB-15 Pin
	Reserved for Future Use	1
	Reserved for Future Use	2
	Reserved for Future Use	3
	Reserved for Future Use	4
	Reserved for Future Use	5
	Reserved for Future Use	6
AES Out 2	AES Output 2 - Unbalanced	7
	Reserved for Future Use	8
AES Out 6	AES Output 6 – Unbalanced	9
AES Out 5	AES Output 5 – Unbalanced	10
AES Out 1	AES Output 1 - Unbalanced	11
AES Out 8	AES Output 8 – Unbalanced	12
AES Out 7	AES Output 7 – Unbalanced	13
AES Out 4	AES Output 4- Unbalanced	14
AES Out 3	AES Output 3- Unbalanced	15
GND	Ground	Shell

Table 2-2: AES OUT Audio Connector Pin Out

The 7720AD8-DD-HD is shipped with two breakout cables for the DB-15 connector (Evertz Part # WPAES8-BNCF-6F), which can be used to facilitate wiring the audio and GPI connections. The pin out of the cables is shown in Table 2-3.

DB-15 PIN	Wire	Ground/Shield Connection	Label Name	Connector Type	AES IN FUNCTION	AES OUT FUNCTION
1	Red		W1 RED	WIRE	GPI2	X
2	Green		W2 GREEN	WIRE	X	X
3	Blue		W3 BLUE	WIRE	X	X
4	(not used)		(not used)		X	X
5	(not used)		(not used)		X	X
6	White		W4 WHITE	WIRE	X	X
7	Coax	DB15 Shell	AES A2	BNC MALE	AES In 2	AES Out 2
8	Yellow		W5 YELLOW	WIRE	GPI1	X
9	Coax	DB15 Shell	AES B2	BNC MALE	AES In 6	AES Out 6
10	Coax	DB15 Shell	AES B1	BNC MALE	AES In 5	AES Out 5
11	Coax	DB15 Shell	AES A1	BNC MALE	AES In 1	AES Out 1
12	Coax	DB15 Shell	AES B4	BNC MALE	AES In 8	AES Out 8
13	Coax	DB15 Shell	AES B3	BNC MALE	AES In 7	AES Out 7
14	Coax	DB15 Shell	AES A4	BNC MALE	AES In 4	AES Out 4
15	Coax	DB15 Shell	AES A3	BNC MALE	AES In 3	AES Out 3
Shell	Black		GND	WIRE	GND	GND

Table 2-3: AES Audio Breakout Cable (Evertz Part # WPAES8-BNCF-6F)

2.4. METADATA I/O

The 7720AD8-DD-HD provides a 9-pin DB connector for the handling of Metadata. The 7720AD8-DD-HD can transmit Metadata; receive Metadata or both, depending on the application.

For the cases where the module is either transmitting or receiving Metadata, a typical 9-pin serial cable (not provided) can be used to connect the modules to a Dolby device like the DP570. The pin out of the connector is shown in Table 2-4.

PIN Number on Connector	Module Operation (see section 6.10.2 for settings)	Module Operation (see section 6.10.2 for settings)
	7720AD8-DD-HD to DP570	DP570 to 7720AD8-DD-HD
1	Shield	Shield
2	TX A asynchronous out -	RX A asynchronous out -
3	RX B asynchronous out +	TX B asynchronous out +
4	Ground	Ground
5	NC	NC
6	Ground	Ground
7	TX B asynchronous out +	RX B asynchronous out +
8	RX A asynchronous out -	TX A asynchronous out -
9	Shield	Shield

Table 2-4: Metadata Transmit or Receive Connections

In applications where the Metadata I/O will both transmit AND receive, the module, and the transmitting and receiving DP570 will need to be wired as shown in Figure 2-2. The module will also have to be configured to operate in RXTX mode (see 6.10.2).

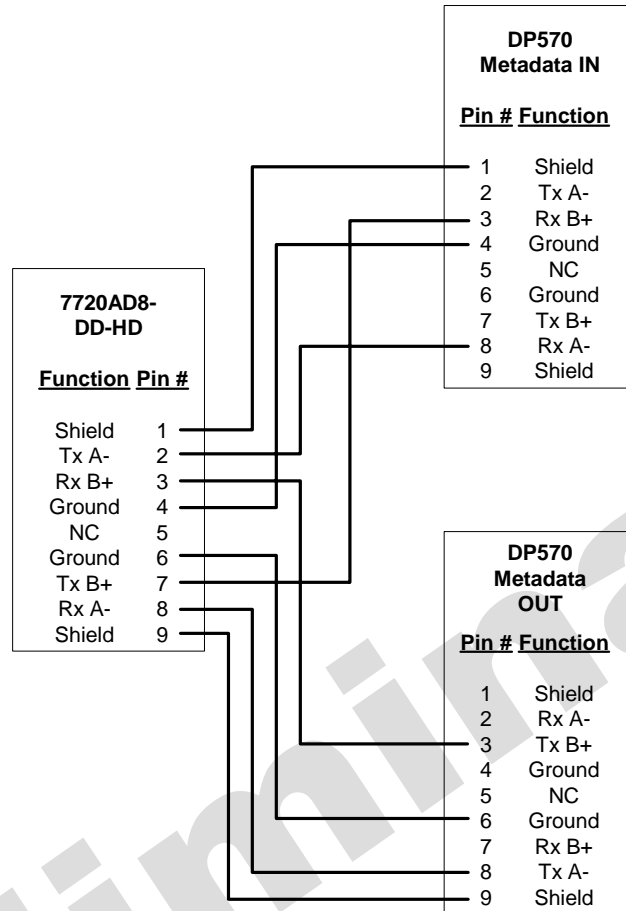


Figure 2-2: Metadata Transmit AND Receive

2.5. GENERAL PURPOSE INPUTS AND OUTPUTS

The 7720AD8-DD-HD has 2 GPI available on the **AES IN** port. Currently, the GPIs are not available and are reserved for future use. The 7720AD8-DD-HD does not have any GPOs.

3. SPECIFICATIONS

3.1. SERIAL DIGITAL VIDEO INPUTS

Standards: STMPE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/24sF, 1080p/23.94, 720p/60, 720p/59.95, 720p/50, 1035i/59.94, 1035i/60, or 480p/59.94)
SMPTE 259M-C (270 Mb/s) 525 or 625 line component
Auto detectable and user settable.

Number of Inputs: 1

Connector: BNC per IEC 61169-8 Annex A

Input Equalization: Automatic to 125m @ 1.5Gb/s with Belden 1694 or equivalent cable

Return Loss:

- SD Standards:** >15 dB up to 270Mb/s
- HD Standards:** >15 dB up to 1.5Gb/s

3.1. SERIAL DIGITAL VIDEO OUTPUTS

Standard: same as input

Number of Outputs: 2

Connector: BNC per IEC 61169-8 Annex A

Signal Level: 800mV nominal

DC Offset: 0V \pm 0.5V

Rise and Fall Time: Per standard

Overshoot: <10% of amplitude

Wide Band Jitter:

- HD Standards:** < 0.16UI
- SD Standards:** < 0.10UI

3.2. GENLOCK INPUT

Type: HD Tri-Level sync, NTSC or PAL Colour Black 1 V p-p (auto detect)

Connector: BNC per IEC 61169-8 Annex A

Termination: Hi-Z or 75 ohm (jumper selectable)

Return Loss: >40dB to 10 MHz

3.3. AES AUDIO INPUTS

Standard: SMPTE 276M, single ended synchronous or asynchronous AES

Number of Inputs: 8 unbalanced

Connectors: Female High Density DB-15, breakout cable to BNC connectors supplied

Input Level: 0.1 to 2.5 Vp-p (5Vp-p tolerant)

Input Impedance: 75 Ω

Return Loss: >25 dB 100 kHz to 6 MHz

Equalization: Automatic to 1000m with Belden 1694 or equivalent cable @ 48 kHz AES signal

Sampling Rate: 48 kHz \pm 100 ppm

3.4. AES AUDIO OUTPUTS

Standard: SMPTE 276M, single ended synchronous AES
Number of Outputs: 8 unbalanced
Connectors: Female High Density DB-15, breakout cable to BNC connectors supplied
Sampling Rate: 48 kHz
Impedance: 75 Ω
Resolution: Up to 24-bit

3.5. METADATA INPUT/OUTPUT

Type: Dolby E Metadata
Connectors: Female DB-9
Baud Rate: 115200 baud

3.6. HEADPHONE AUDIO OUTPUTS

Number of Outputs: 1
Type: Stereo 3.5mm jack
Output Load: 32 Ω +
Signal Level: 100 mW max, soft adjustable over 40 dB range
THD+N: 1 %
SNR: 90 dB RMS, "A" weighted

3.7. DELAY

AC3 Decode Delay: 32 ms nominal
Dolby E Decode Delay: 1 frame nominal
De-embedding Latency: 600 μ s nominal
Additional Audio Delay: 0 to maximum video delay plus 1 frame (user programmable)
Additional Video Delay: 0 to 12 frames (interlaced) or 0 to 28 (720p) (user programmable)

3.8. ELECTRICAL

Voltage: +12VDC
Power: 21 Watts
EMI/RFI: Complies with FCC regulations for class A devices
Complies with EU EMC directive

3.9. PHYSICAL

Number of slots:
350FR: 2
7700FR-C: 2
7800FR: 2

4. STATUS INDICATORS

The 7720AD8-DD-HD has 17 LED Status indicators on the front card edge to show operational status of the card at a glance. Figure 4-1 shows the location of the LEDs and card edge controls.

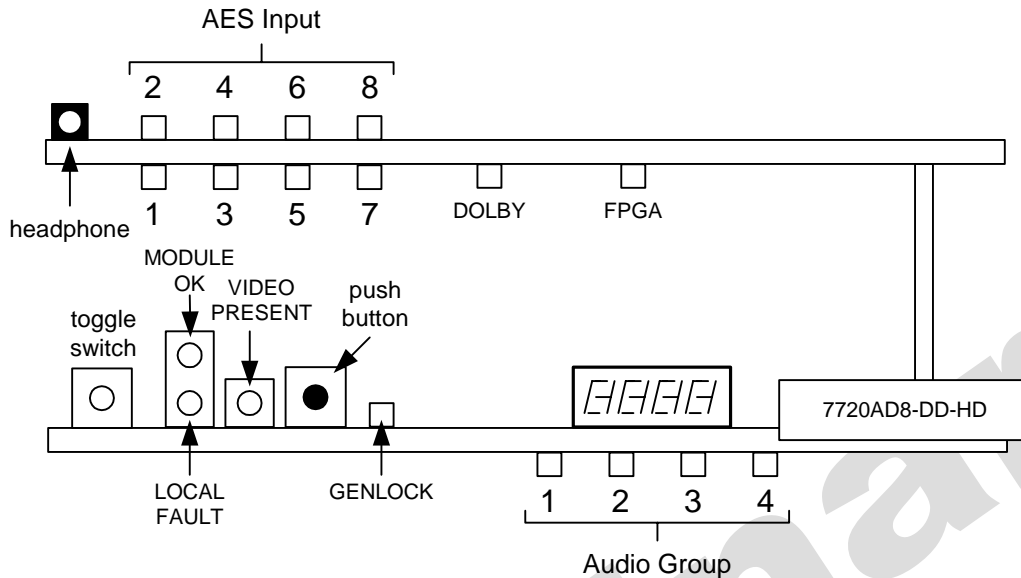


Figure 4-1: Status LED Locations

Three large LEDs on the front of the main board indicate the general health of the module:

LOCAL FAULT: This Red LED indicates poor module health and will be ON during the absence of a valid input signal, an invalid genlock, or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health. It will be ON when a valid input signal is present, and the board power is good.

VIDEO PRESENT: This Green LED will be ON when there is a valid video signal present at the module input.

Additional LEDs include:

GENLOCK: This Green LED will be ON when there is a signal present at the module genlock input.

DOLBY STATUS: This LED will be GREEN and ON when the Dolby Decoder is processing or active. The LED will be RED and ON if there is an error with the Dolby Decoder. The LED is off when the Dolby Decoder is not active.

FPGA CONFIG: This LED will be RED and ON when the FPGA is loading on power up. The LED is OFF during normal module operation.

4.1. EMBEDDED AUDIO STATUS LEDES

Four LEDs located on the lower end of the main board of the module (near the card extractor) indicate which embedded audio groups are present in the input video. Audio Group LED 1 is located closest to the center of the module.

Audio Group LED	Colour	Audio Group Status
1	Off	No group 1 present on input video.
	Green	Group 1 present on input video.
2	Off	No group 2 present on input video.
	Green	Group 2 present on input video.
3	Off	No group 3 present on input video.
	Green	Group 3 present on input video.
4	Off	No group 4 present on input video.
	Green	Group 4 present on input video.

Table 4-1: Audio Group Status LEDs

Eight LEDs, located on the sub-card of the module, indicate which AES input channels are present. AES input channel 1 is located top leftmost LED, and AES input channel 2 to the right.

AES Input Channel LED	Colour	AES Input Channel Status
1	Off	AES input channel 1 is not present
	Green	AES input channel 1 is present.
	Yellow	AES input channel 1 is present with encoded Dolby.
2	Off	AES input channel 2 is not present
	Green	AES input channel 2 is present.
	Yellow	AES input channel 2 is present with encoded Dolby.
3	Off	AES input channel 3 is not present
	Green	AES input channel 3 is present.
	Yellow	AES input channel 3 is present with encoded Dolby.
4	Off	AES input channel 4 is not present
	Green	AES input channel 4 is present.
	Yellow	AES input channel 4 is present with encoded Dolby.
5	Off	AES input channel 5 is not present
	Green	AES input channel 5 is present.
	Yellow	AES input channel 5 is present with encoded Dolby.
6	Off	AES input channel 6 is not present
	Green	AES input channel 6 is present.
	Yellow	AES input channel 6 is present with encoded Dolby.
7	Off	AES input channel 7 is not present
	Green	AES input channel 7 is present.
	Yellow	AES input channel 7 is present with encoded Dolby.
8	Off	AES input channel 8 is not present
	Green	AES input channel 8 is present.
	Yellow	AES input channel 8 is present with encoded Dolby.

Table 4-2: AES Input Channel Presence LEDs

5. CARD EDGE CONTROLS

The 7720AD8-DD-HD can be configured by the card edge controls. There are some key control components that can be found at the card edge:

1. Toggle Switch
2. 4 Character Dot Matrix Display
3. Push Button
4. 4 Audio LEDs

Toggle Switch: This component will become active once the card has completed booting. Its primary function is to navigate through the menu system.

4 Character Dot Matrix Display: This component will become active once power is applied to the card. This component is used to relay text-based information to the user. It will be used to scroll build and card information, or display the menu options to the user.

Push Button: This component will become active once the card has completed booting. It is primarily used for navigating through the menu system.

4 Audio Group LEDs: These LEDs are primarily used to indicate what groups are embedded in the input video signal during normal operation. However, when navigating the card edge menu, these LEDs are used to indicate menu depth status. For example, when at the top-level menu, all the LEDs are OFF. When the user navigates into another menu (e.g. Video Control), Audio group 1 LED turns ON. Audio group LED 1 is located closest to the centre of the module. If the user enters a sub-menu (e.g. Video Control -> Video Standard Select), then both Audio Group LEDs 1 and 2 turn ON, indicating another depth within the menu system.



When navigating the card edge menu system, when all the Audio LEDs are OFF the user is at the Top Level menu.

The 7720AD8-DD-HD module is also equipped with an 8-position DIP switch. Currently, the DIP switch has no functionality and is reserved for future use.

6. CARD EDGE MENU SYSTEM

6.1. NAVIGATING THE MENU SYSTEM

You can use the toggle switch to move up and down the list of available parameters to adjust. To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. Using the toggle switch, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you lift the toggle switch and decrease if you push down on the toggle switch. If the parameter contains a list of choices, you can cycle through the list by pressing the toggle switch in either direction. The parameter values are changed as you cycle through the list.

When you have stopped at the desired value, depress the pushbutton. This will return to the parameter, select the menu item you are setting (the display shows the parameter name you were setting). To change another parameter, use the toggle switch to select other parameters. If neither the toggle switch nor pushbutton is operated for several seconds the card edge control will exit the menu system and return to an idle state.

On all menus, there is an extra selectable item: *BACK*. Selecting *BACK* will take the user to the previous menu (the one that was used to get into the current menu). On the main menu, *BACK* will take the user to the normal operating mode (indicated by the moving line on the card edge display).

6.2. TOP LEVEL MENU STRUCTURE

Table 6-1 provides a brief description of the top level of the menu tree that appears when you enter the card edge menu system. Selecting one of these items will take you down into the next menu level to set the value of that parameter. The details of each of the menu items are described in sections 6.3 to 6.12.

<i>VCTR</i>	Video Control	Sets the video standard that the module will operate in, timing offset of the video output, and loss of video mode.
<i>ACTR</i>	Audio Control	Sets audio controls for the module such as: Coarse and fine audio delays; Sample Rate Converter mode; C-bit control; Embedder Group enable; and Demux loss of video mode.
<i>VP</i>	Video Proc Control	Sets the black, luma, and chroma levels. Also, adjusts hue for SD video standards.
<i>AP</i>	Audio Proc Control	Sets the audio processor and router controls.
<i>HEAD</i>	Headphone Monitor	Sets the headphone volume level and selects the source for headphone monitoring.
<i>DLBY</i>	Dolby Decoder Control	Sets the controls for the Dolby Decoder A and B, and loss of signal mode.
<i>META</i>	Metadata	Sets the Metadata Mux and demux settings and configures the DB-9 Metadata I/O.
<i>STAT</i>	Status	Reports the status of the firmware, FPGA revisions, input video standard, operating standard, audio group detection, AES Input presence, and Dolby Status.
<i>MISC</i>	Miscellaneous	Enables VistaLINK®, sets display orientation, and performs factory reset.

Table 6-1: Top Level Menu Structure



The parameter adjustments are **REAL TIME ADJUSTMENTS** and will affect the output video/audio immediately. These settings should not be adjusted when the output video/audio is in the broadcast chain.

6.3. CONFIGURING THE VIDEO CONTROLS

The *Video Control* menus are used to configure parameters associated with the module's operating standards, output video timing and loss of video mode. The chart below shows the items available in the *Video Control* menus. Sections 6.3.1 to 6.3.5 provide detailed information about each of the menu items.

VSTD	Video Standard Select	Sets the video standard that the module will operate in.
VDLY	Vertical Phase	Sets the vertical delay of the output video.
HDLY	Horizontal Phase	Sets horizontal delay of the output video.
FDLY	Frame Phase	Sets frame delay of the output video.
LOVM	Freeze Mode	Sets module action when input video is lost.

Table 6-2: Video Controls Menu

6.3.1. Setting the Video Standard

Video Control	
VSTD	
<i>Auto detect</i>	AUTO
625i/50	PALB
525i/59.94	NTSC
1080i/50	1I50
1080i/59.94	1I59
1080i/60	1I60
720p/59.94	7P59
720p/60	7P60
1080p/23.98sF	1S23
1080p/24sF	1S24
1035i/59.94	3I59
1035i/60	3I60
720p/50	7P50

This control selects the operating standard that the module will operate in. The internal timing of the module will be based on this standard. If the operating standard is set to *Auto detect*, then the module will operate based on the input video standard.

If the operating standard is set to a specific value (e.g. 525i/59.94), then regardless of the input video standard, the module will operate in 525i/59.94.

The output video standard will always be the same as the operating standard. However, NO format or standard conversion will occur.



This control is **NOT** a **LIVE** control. The parameter will change once the pushbutton is pressed.

6.3.2. Setting the Vertical Phase

Video Control
VDLY
0 to Max
0

This control selects the vertical delay of the output video signal in respect to the input video. The range of values is based on the operating standard of the module.

6.3.3. Setting the Horizontal Phase

Video Control
HDLY
0 to Max
0

This control selects the horizontal delay of the output video signal in respect to the input video. The range of values is based on the operating standard of the module.

6.3.4. Setting the Frame Phase

Video Control
FDLY
0 to Max
1

This control selects the frame delay of the output video signal in respect to the input video. The range of values is based on the operating standard of the module. *Max* will be 12 for interlaced standards and 28 for progressive standards.

6.3.5. Setting the Action to Take when Input Video is Missing

Video Control	
LOVM	
<i>Frame</i>	<i>FRM</i>
<i>Black</i>	<i>BLK</i>
<i>Field 2</i>	<i>FLD2</i>
<i>Field 1</i>	<i>FLD1</i>
<i>Pass</i>	<i>PASS</i>

This control allows the user to set the action to take when the input video is missing: the output to go to black, freeze on the good frame only, freeze on field 1 of last good frame, freeze on field 2 of last good frame or pass the input with this control.

When set to *Black*, the output video will be black.

When set to *Frame*, the output video will show the last good frame.

When set to *Field 1*, the output video will show the first field of the last good frame.

When set to *Field 2*, the output video will show the second field of the last good frame.

When set to *Pass* the output video may be incoherent when the video input standard mismatches the video output standard. If input video is completely unlocked, video output is frozen.

6.4. CONFIGURING THE AUDIO CONTROLS

The *Audio Control* menus are used to configure the coarse and fine audio delay; the mode of the sample rate converter, C-bit control, which embedded group to enable, and the demux behaviour with a loss of video. The chart below shows the items available in the *Audio Control* menus. Sections 6.4.1 to 6.4.6 provide detailed information about each of the menu items.

<i>ADLY</i>	Coarse Audio Delay	Sets audio delay in frame of video increments (coarse).
<i>ASDL</i>	Fine Audio Delay	Sets audio delay in milliseconds (in 2048 μ s increments)
<i>SRC</i>	SRC Mode	Sets the audio sample rate converter bypass mode.
<i>CBIT</i>	C-Bit Control	Sets the AES channel status bit handling.
<i>EMB1</i>	Embedder Group 1 Enable	Enables audio embedder for group 1.
<i>EMB2</i>	Embedder Group 2 Enable	Enables audio embedder for group 2.
<i>EMB3</i>	Embedder Group 3 Enable	Enables audio embedder for group 3.
<i>EMB4</i>	Embedder Group 4 Enable	Enables audio embedder for group 4.
<i>DLVM</i>	Demux Loss of Video Mode	Sets the action of the audio demux in case of input video loss.

Table 6-3: Audio Controls Menu

6.4.1. Setting the Coarse Audio Delay

<i>Audio Control</i>
<i>ADLY</i>
<u>0</u> 0 to Max

This control adjusts the audio delay in terms of video frames (coarsely). The delay is respective of the input video. The range of the parameter is based on the operating standard of the module, since this parameter follows the video frame phase plus 1 frame.

6.4.2. Setting the Fine Audio Delay

<i>Audio Control</i>
<i>ASDL</i>
-33ms to +33ms <u>0</u>

This control adjusts the audio delay (finely). This parameter is displayed in milliseconds and adjusted in approximate sample increments (approximately 20.83 μ s).

If *ADLY* (see section 6.4.1) is set to 0, then the parameter range is 0 to 33ms.

Otherwise, fine audio delay ranges from -33ms to +33ms.

6.4.3. Setting the SRC Mode

Audio Control	
SRC	
Enable	ON
Bypass	BYPS
Automatic	AUTO

This sets the bypass mode of the audio sample rate converter.

When *Enabled*, audio is sample rate converted at 48 kHz that is synchronous to the input video. Audio can be either synchronous or asynchronous to the video source.

When in *Bypass* mode, the content of the audio is preserved without any loss, and directly embedded into the input video. Audio must be synchronous to the video source. If not, there may be samples that are dropped or repeated.

When set to *Automatic*, the sample rate converter will be automatically enabled when the module detects a PCM signal. It will also bypass the SRC, if Dolby E is detected.

6.4.4. Setting the C-bit Control

Audio Control	
CBIT	
Preserve	PRO
Replace	STMP

This control determines how the AES channel status bits are handled when being routed from input to output. When set to *preserve*, the module will preserve as many bits as possible, but always change to professional 48 kHz. When set to *replace*, all the C-bit will be replaced with a static channel status message that reads professional 48 kHz.

6.4.5. Enabling the Audio Embedders

There are four menu items used to enable embedder groups. The menu item for each embedder group component works in the same way; therefore, for simplicity, only the menu item for *Embedder Group 1* will be shown in the manual.

Audio Control	
EMB1	
Enable	ON
Disable	OFF

This control enables or disables audio embedder for group 1.

When *Enable* is selected, Group 1 will be embedded into the output video signal.

When *Disable* is selected, Group 1 will not be embedded into the output video signal.



The default setting for EMB2, EMB3, and EMB4 is *Disable*. Some legacy SD equipment does not function correctly with more than 1 embedded audio group. Therefore, by default ONLY EMB1 is enabled.

6.4.6. Setting the Demux Loss of Video Mode

Audio Control	
DLVM	
Mute	MUTE
Pass AES	AES

This sets the demux action in the event of input video loss.

When *Mute* is selected, the module will *mute* the outputs.

When *Pass AES* is selected, the module routes AES inputs as a backup.

6.5. CONFIGURING THE VIDEO PROCESSING FUNCTIONS

The *Video Processor* menus are used to configure parameters associated with the video processing functions. The chart below shows the items available in the *Video Processor* menu. Sections 6.5.1 to 6.5.4 provide detailed information about each of the menu items.

BLVL	Black Level Adjust	Sets the black level of the output video (brightness).
Y_GN	Luma Gain Adjust	Sets the luma gain of the output video (contrast).
C_GN	Chroma Gain Adjust	Sets the chroma gain of the output video (saturation).
HUE	Hue Control	Adjusts the hue of the output SD signal.

6.5.1. Setting the Black Level

Video Processor	
BLVL	
-7.3 to 7.3 IRE	
0	

With this control, the user can adjust the black level of the output video. For no offset of the black level, set the control to 0. The adjustment range is +/- 7 IRE with 1/2 IRE resolution.

6.5.2. Setting the Luma Gain

Video Processor	
Y_GN	
-6.02 to 5.99 dB	
0	

With this control, the user can adjust the gain of luminance channel of the output video (contrast). For unity gain, set this value to 0. The adjustment range is +/- 6 dB.

6.5.3. Setting the Chroma Gain

Video Processor	
C_GN	
-6.02 to 5.99 dB	
0	

With this control, the user can adjust the gain on the Cb and Cr channels of the output video (saturation). For unity gain, set this value to 0. The adjustment range is +/- 6 dB.

6.5.4. Setting the Hue

Video Processor
HUE
-20 to +20 deg.
0

With this control the user can adjust the Hue or color of components. The hue adjustment is applied to SD output video signals only. For unity gain, set this value to 0. The adjustment range is +/- 20 degrees, in 0.1-degree steps.

6.6. UNDERSTANDING THE AUDIO PROCESSOR

In order to understand the parameters of the Audio Processor on the 7720AD8-DD-HD, this section provides a brief description of each of the major components that comprise the Audio Processor. This section is meant to aid the user when configuring the Audio Processor (sections 6.7 to 6.9).

6.6.1. Single Mixer

This is the basic building block of the Audio Processor. There are two mixers on the 7720AD8-DD-HD module. Each mixer has 16 output channels. Figure 6-1 describes one stage for a mixer output channel. The user can mix two sources, adjust the gain and inversion of each source, and output them.

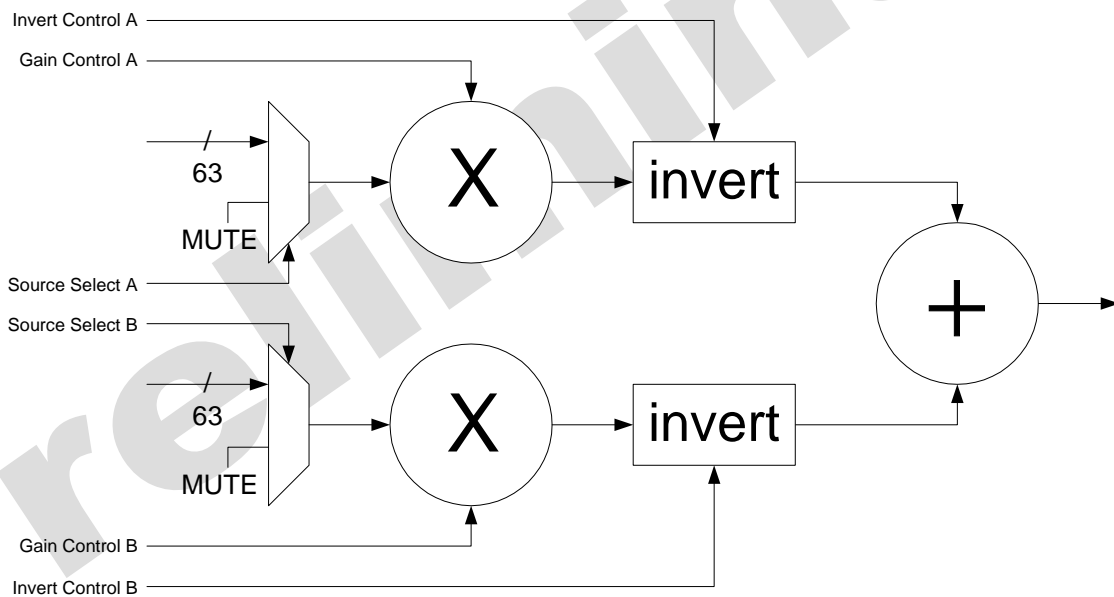


Figure 6-1: Single Mixer Stage

6.6.2. Full Mixer

Figure 6-2 shows all the mixer stages for one of the two mixers on the 7720AD8-DD-HD module. The figure shows how the user can map mix any input sources to the 16 output channels of the mixer.

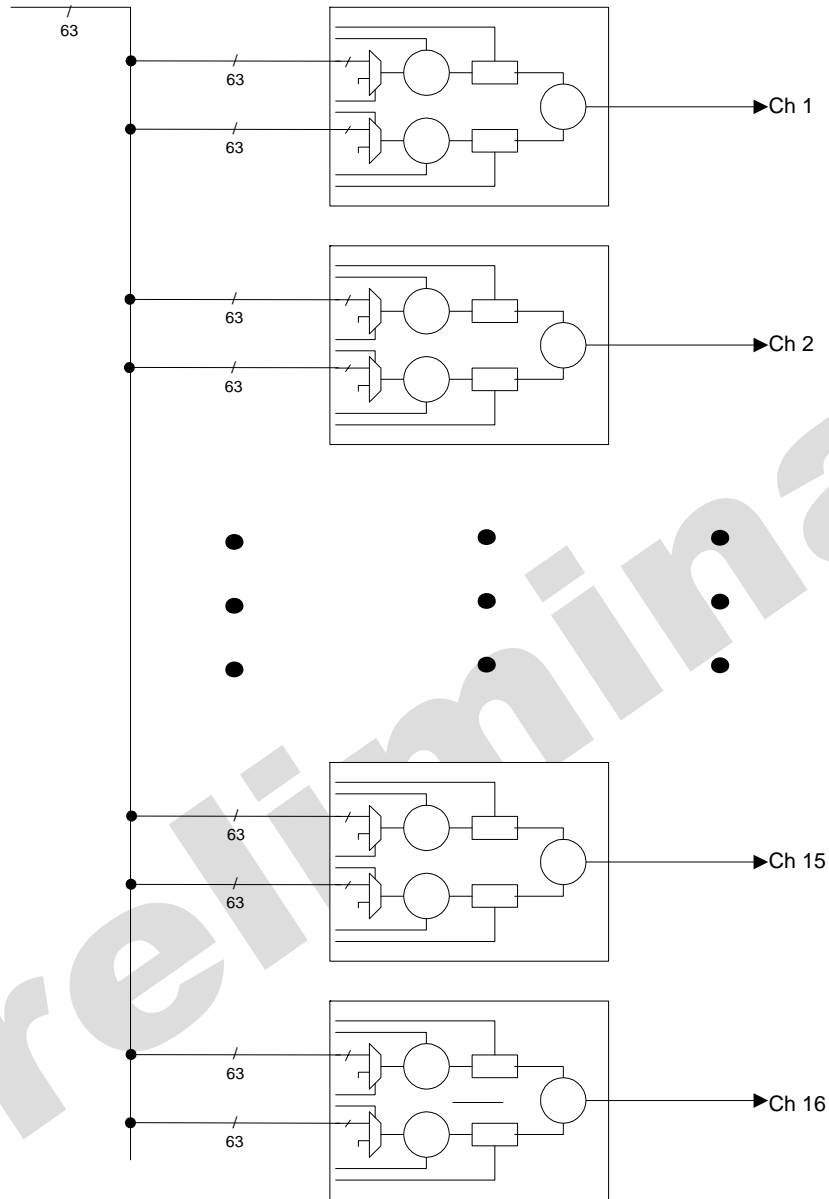


Figure 6-2: Full Mixer

6.6.3. Mixer A and B

Figure 6-3 shows how the two mixers on the 7720AD8-DD-HD are used to embed the output video and the external AES outputs.

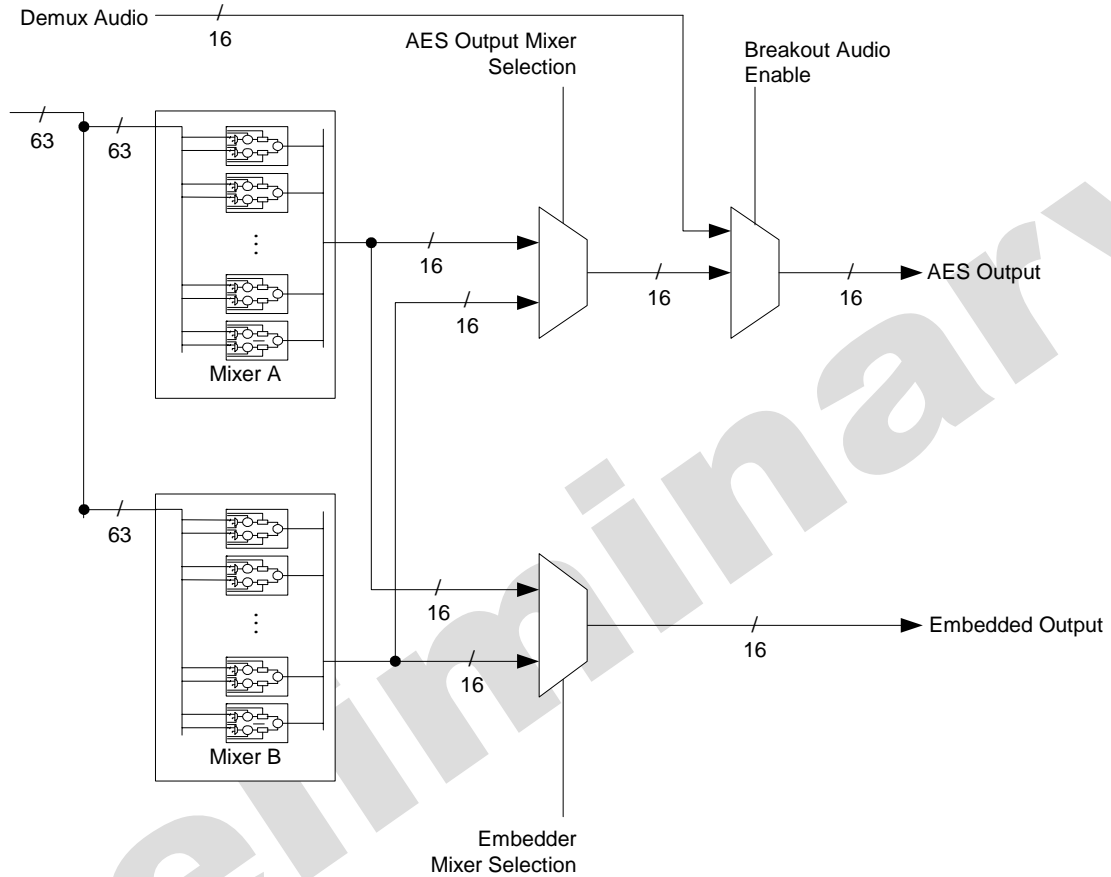


Figure 6-3: Mixer A and B

6.6.4. Mono Mixer

Figure 6-4 describes how the mono-mixers are used to provide mono down mixes as input sources for the two mixers.

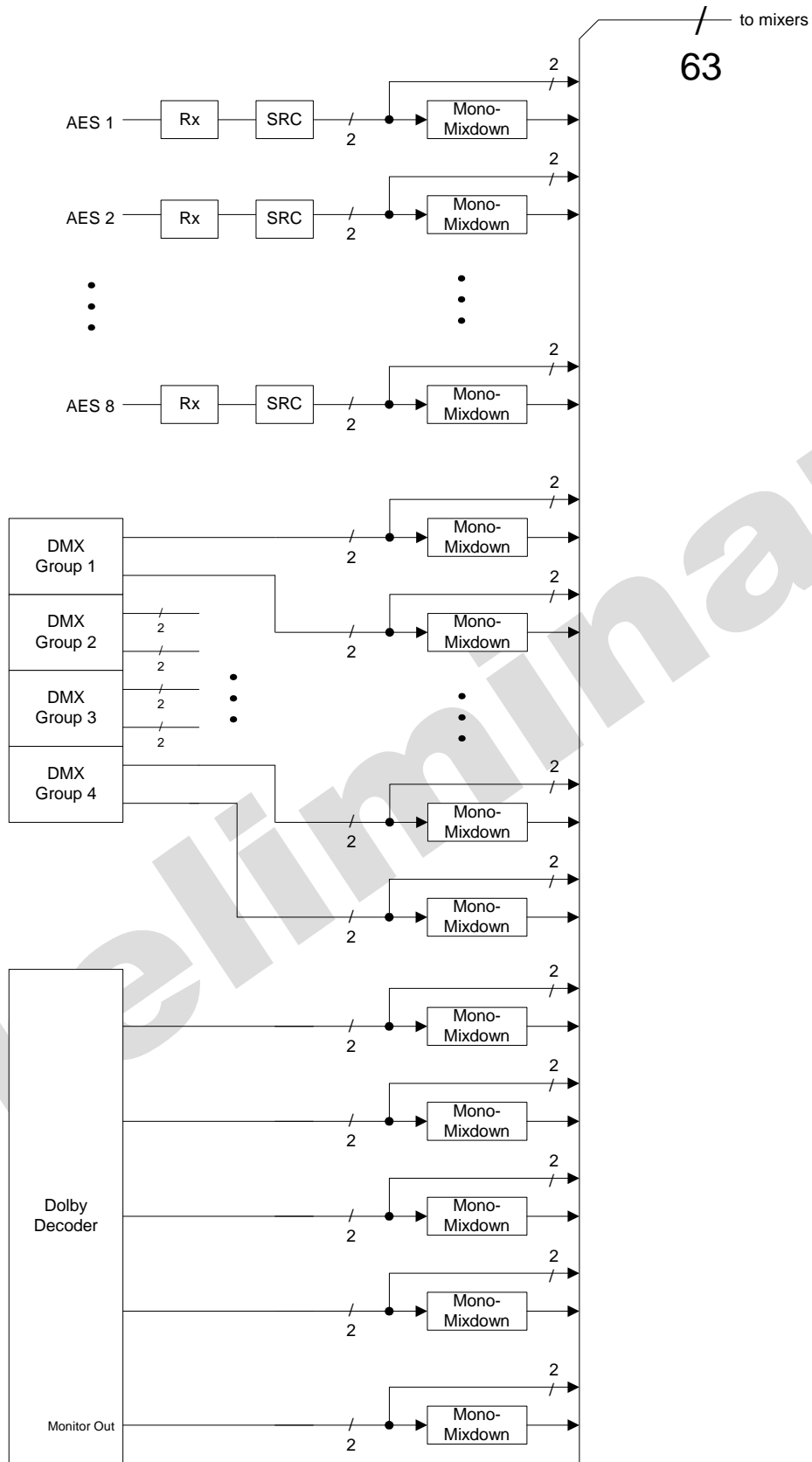


Figure 6-4: Mono-Mixers

6.6.5. Dolby Decoder

On the 7720AD8-DD-HD, there is a Dolby Decoder available. Figure 6-5 describes how the Dolby Decoder can be used to provide decoded Dolby E as input sources for the two mixers.

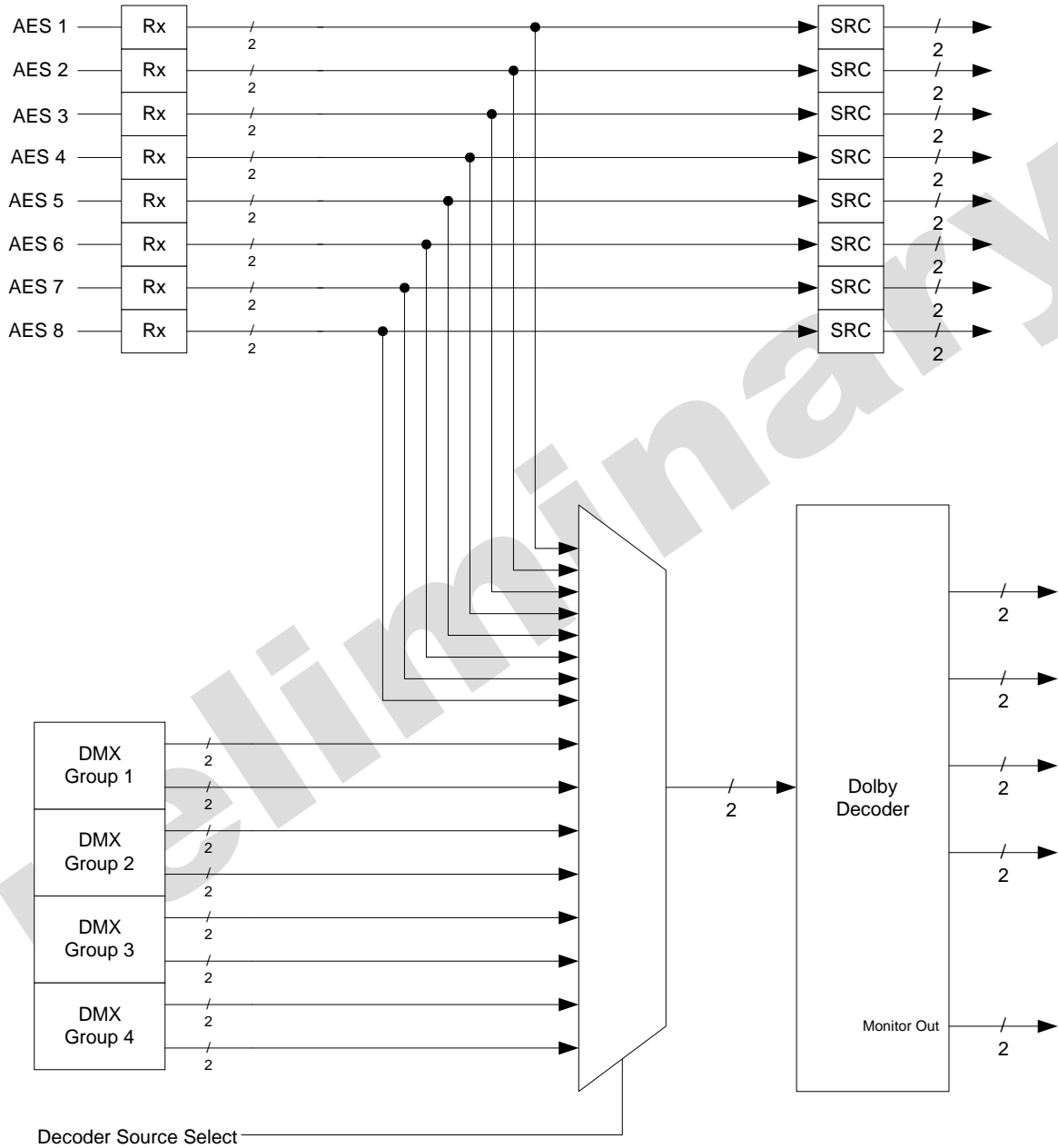


Figure 6-5: Dolby Decoder

6.6.6. Headphone Monitoring

Figure 6-6 describes which sources are available to the user for monitoring through the card edge headphone jack.

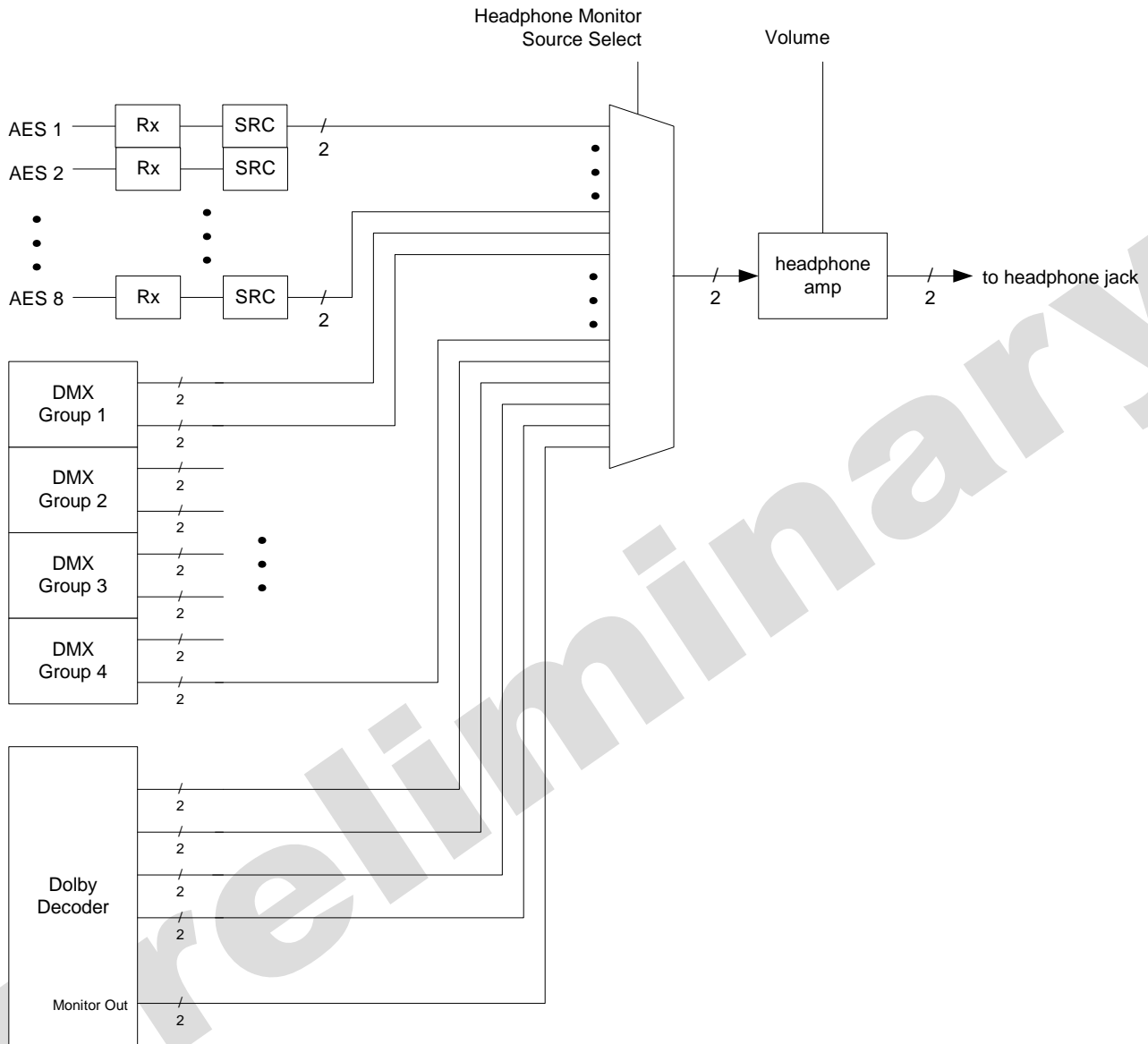


Figure 6-6: Headphone Monitoring

6.7. CONFIGURING THE AUDIO PROCESSING FUNCTIONS

The *Audio Processor* menus are used to configure parameters associated with the audio processing and routing functions of the 7720AD8-DD-HD. The chart below shows the items available in the *Audio Processor* menu. Sections 6.7.1 to 6.7.5 provide detailed information about each of the menu items.

<i>MASS</i>	Mixer A Source Select	Selects the input source for Mixer A.
<i>MAGC</i>	Mixer A Gain Control	Sets the gain of the inputs for Mixer A.
<i>MAIV</i>	Mixer A Inversion Control	Sets the inversion control for the inputs for Mixer A.
<i>MBSS</i>	Mixer B Source Select	Selects the input source for Mixer B.
<i>MBGC</i>	Mixer B Gain Control	Sets the gain of the inputs for Mixer B.
<i>MBIV</i>	Mixer B Inversion Control	Sets the inversion control for the inputs for Mixer B.
<i>EMBM</i>	Embedder Mixer Selection	Selects which mixer to output to the embedder.
<i>AESO</i>	AES Output Selection	Selects which mixer to output to AES.

6.7.1. Selecting Input Source for Mixer A

The parameters for both Mixer A and B are the same. For the sake of simplicity in the manual only the menus for Mixer A will be described.

Audio Processor

MASS

Ch1 A Source Select	1AS
Ch1 B Source Select	1BS
Ch2 A Source Select	2AS
Ch2 B Source Select	2BS
Ch3 A Source Select	3AS
Ch3 B Source Select	3BS
Ch4 A Source Select	4AS
Ch4 B Source Select	4BS
Ch5 A Source Select	5AS
Ch5 B Source Select	5BS
Ch6 A Source Select	6AS
Ch6 B Source Select	6BS
Ch7 A Source Select	7AS
Ch7 B Source Select	7BS
Ch8 A Source Select	8AS
Ch8 B Source Select	8BS
Ch9 A Source Select	9AS
Ch9 B Source Select	9BS
Ch10 A Source Select	AAS
Ch10 B Source Select	ABS
Ch11 A Source Select	BAS
Ch11 B Source Select	BBS
Ch12 A Source Select	CAS
Ch12 B Source Select	CBS
Ch13 A Source Select	DAS
Ch13 B Source Select	DBS
Ch14 A Source Select	EAS
Ch14 B Source Select	EBS
Ch15 A Source Select	FAS
Ch15 B Source Select	FBS
Ch16 A Source Select	GAS
Ch16 B Source Select	GBS

This control allows the user to specify what is the input source for each pair (A and B) of the 16 channels of Mixer A.

The following are the default values for each of the input sources (same for MBSS):

1AS = CH1
 1BS = MUTE
 2AS = CH2
 2BS = MUTE
 3AS = CH3
 3BS = MUTE
 4AS = CH4
 4BS = MUTE
 5AS = CH5
 5BS = MUTE
 6AS = CH6
 6BS = MUTE
 7AS = CH7
 7BS = MUTE
 8AS = CH8
 8BS = MUTE
 9AS = CH9
 9BS = MUTE
 AAS = CHA
 ABS = MUTE
 BAS = CHB
 BBS = MUTE
 CAS = CHC
 CBS = MUTE
 DAS = CHD
 DBS = MUTE
 EAS = CHE
 EBS = MUTE
 FAS = CHF
 FBS = MUTE
 GAS = CHG
 GBS = MUTE

6.7.1.1. Selecting the Source for Channel 1 A of Mixer A

The parameters for each pair (A and B) for all 16 channels are the same. For the sake of simplicity in the manual only the menus for Channel 1 A for Mixer A will be described.

<i>Audio Processor</i>	
<i>MASS</i>	
<i>1AS</i>	
<i>AES 1A (Ch. 1)</i>	<i>AE1A</i>
<i>AES 1B (Ch. 2)</i>	<i>AE1B</i>
<i>AES 2A (Ch. 3)</i>	<i>AE2A</i>
<i>AES 2B (Ch. 4)</i>	<i>AE2B</i>
<i>AES 3A (Ch. 5)</i>	<i>AE3A</i>
<i>AES 3B (Ch. 6)</i>	<i>AE3B</i>
<i>AES 4A (Ch. 7)</i>	<i>AE4A</i>
<i>AES 4B (Ch. 8)</i>	<i>AE4B</i>
<i>AES 5A (Ch. 9)</i>	<i>AE5A</i>
<i>AES 5B (Ch. 10)</i>	<i>AE5B</i>
<i>AES 6A (Ch. 11)</i>	<i>AE6A</i>
<i>AES 6B (Ch. 12)</i>	<i>AE6B</i>
<i>AES 7A (Ch. 13)</i>	<i>AE7A</i>
<i>AES 7B (Ch. 14)</i>	<i>AE7B</i>
<i>AES 8A (Ch. 15)</i>	<i>AE8A</i>
<i>AES 8B (Ch. 16)</i>	<i>AE8B</i>
<i>DMX Ch. 1</i>	<i>DMX1</i>
<i>DMX Ch. 2</i>	<i>DMX2</i>
...	...
<i>DMX Ch. 15</i>	<i>DMXF</i>
<i>DMX Ch. 16</i>	<i>DMXG</i>
<i>Dolby Decoder A Ch. 1</i>	<i>DDA1</i>
<i>Dolby Decoder A Ch. 2</i>	<i>DDA2</i>
...	...
<i>Dolby Decoder A Ch. 8</i>	<i>DDA8</i>
<i>Dolby Decoder A Mon. 1</i>	<i>DDAA</i>
<i>Dolby Decoder A Mon. 2</i>	<i>DDAB</i>
<i>Mono Mix Ch. 1 & 2</i>	<i>MM12</i>
<i>Mono Mix Ch. 3 & 4</i>	<i>MM34</i>
...	...
<i>Mono Mix Ch. 13 & 14</i>	<i>MMDE</i>
<i>Mono Mix Ch. 15 & 16</i>	<i>MMFG</i>
<i>Mono Mix DMX Ch. 1 & 2</i>	<i>MD12</i>
<i>Mono Mix DMX Ch. 3 & 4</i>	<i>MD34</i>
...	...
<i>Mono Mix DMX Ch. 13 & 14</i>	<i>MDDE</i>
<i>Mono Mix DMX Ch. 15 & 16</i>	<i>MDFG</i>
<i>Mono Mix DD A Ch. 1 & 2</i>	<i>MA12</i>
<i>Mono Mix DD A Ch. 3 & 4</i>	<i>MA34</i>
<i>Mono Mix DD A Ch. 5 & 6</i>	<i>MA56</i>
<i>Mono Mix DD A Ch. 7 & 8</i>	<i>MA78</i>
<i>Mono Mix DD A M1 & M2</i>	<i>MAMM</i>
<i>MUTE</i>	<i>MUTE</i>

This parameter selects the source for Channel 1 A of Mixer A.

6.7.2. Setting the Gain of the Input Sources for Mixer A

Audio Processor	
MAGC	
Ch1 A Gain Control	1AGC
Ch1 B Gain Control	1BGC
Ch2 A Gain Control	2AGC
Ch2 B Gain Control	2BGC
Ch3 A Gain Control	3AGC
Ch3 B Gain Control	3BGC
Ch4 A Gain Control	4AGC
Ch4 B Gain Control	4BGC
Ch5 A Gain Control	5AGC
Ch5 B Gain Control	5BGC
Ch6 A Gain Control	6AGC
Ch6 B Gain Control	6BGC
Ch7 A Gain Control	7AGC
Ch7 B Gain Control	7BGC
Ch8 A Gain Control	8AGC
Ch8 B Gain Control	8BGC
Ch9 A Gain Control	9AGC
Ch9 B Gain Control	9BGC
Ch10 A Gain Control	AAGC
Ch10 B Gain Control	ABGC
Ch11 A Gain Control	BAGC
Ch11 B Gain Control	BBGC
Ch12 A Gain Control	CAGC
Ch12 B Gain Control	CBGC
Ch13 A Gain Control	DAGC
Ch13 B Gain Control	DBGC
Ch14 A Gain Control	EAGC
Ch14 B Gain Control	EBGC
Ch15 A Gain Control	FAGC
Ch15 B Gain Control	FBGC
Ch16 A Gain Control	GAGC
Ch16 B Gain Control	GBGC

This control allows the user to adjust the gain of the input sources for each pair (A and B) of the 16 channels of Mixer A.

6.7.2.1. Setting the Gain for Channel 1 A of Mixer A

The parameters for each pair (A and B) for all 16 channels are the same. For the sake of simplicity in the manual only the menus for Channel 1 Input A for Mixer A will be described.

Audio Processor	
MAGC	
1AGC	
-24 to +24 dB	
0	

This parameter sets the gain for Channel 1 A of Mixer A. For unity gain, set the parameter to 0. The adjustment range is +/- 24 dB, in increments of 0.1 dB.

6.7.3. Setting the Inversion Control of the Input Sources for Mixer A

<i>Audio Processor</i>	
<i>MAIV</i>	
<i>Ch1 A Invert</i>	<i>1AIV</i>
<i>Ch1 B Invert</i>	<i>1BIV</i>
<i>Ch2 A Invert</i>	<i>2AIV</i>
<i>Ch2 B Invert</i>	<i>2BIV</i>
<i>Ch3 A Invert</i>	<i>3AIV</i>
<i>Ch3 B Invert</i>	<i>3BIV</i>
<i>Ch4 A Invert</i>	<i>4AIV</i>
<i>Ch4 B Invert</i>	<i>4BIV</i>
<i>Ch5 A Invert</i>	<i>5AIV</i>
<i>Ch5 B Invert</i>	<i>5BIV</i>
<i>Ch6 A Invert</i>	<i>6AIV</i>
<i>Ch6 B Invert</i>	<i>6BIV</i>
<i>Ch7 A Invert</i>	<i>7AIV</i>
<i>Ch7 B Invert</i>	<i>7BIV</i>
<i>Ch8 A Invert</i>	<i>8AIV</i>
<i>Ch8 B Invert</i>	<i>8BIV</i>
<i>Ch9 A Invert</i>	<i>9AIV</i>
<i>Ch9 B Invert</i>	<i>9BIV</i>
<i>Ch10 A Invert</i>	<i>AAIV</i>
<i>Ch10 B Invert</i>	<i>ABIV</i>
<i>Ch11 A Invert</i>	<i>BAIV</i>
<i>Ch11 B Invert</i>	<i>BBIV</i>
<i>Ch12 A Invert</i>	<i>CAIV</i>
<i>Ch12 B Invert</i>	<i>CBIV</i>
<i>Ch13 A Invert</i>	<i>DAIV</i>
<i>Ch13 B Invert</i>	<i>DBIV</i>
<i>Ch14 A Invert</i>	<i>EAIV</i>
<i>Ch14 B Invert</i>	<i>EBIV</i>
<i>Ch15 A Invert</i>	<i>FAIV</i>
<i>Ch15 B Invert</i>	<i>FBIV</i>
<i>Ch16 A Invert</i>	<i>GAIV</i>
<i>Ch16 B Invert</i>	<i>GBIV</i>

This control allows the user to set the inversion control of the input sources for each pair (A and B) of the 16 channels of Mixer A.

This allows the user to invert audio pairs if desired. This control is useful in cases of wiring errors, etc.

6.7.3.1. Setting the Inversion Control for Channel 1 A of Mixer A

The parameters for each pair (A and B) for all 16 channels are the same. For the sake of simplicity in the manual only the menus for Channel 1 Input A for Mixer A will be described.

<i>Audio Processor</i>	
<i>MAIV</i>	
<i>1AIV</i>	
<i>Normal</i>	<i>NRML</i>
<i>Invert</i>	<i>INVT</i>

This parameter sets the inversion control for Channel 1 Input A of Mixer A. When set to *Normal*, the pairs will remain as is. When set to *Invert*, the pairs will be inverted.

6.7.4. Setting which Mixer will output to Embedders A and B

Audio Processor
EMBM
Mixer A
Mixer B

This parameter selects which mixer (A or B) will output as embedded audio in output video.

6.7.5. Setting which Mixer will output to AES

Audio Processor
AESO
Mixer A
Mixer B

This parameter selects which mixer (A or B) will output to external AES.

6.8. CONFIGURING THE HEADPHONE MONITOR

The *Headphone Monitor* menus are used to configure parameters associated with the headphone jack on the module. The chart below shows the items available in the *Headphone Monitor* menu. Sections 6.8.1 to 6.8.2 provide detailed information about each of the menu items.

HVOL	Headphone volume	Sets the volume for the headphone.
HSRC	Headphone source	Selects the source for the headphone monitoring

6.8.1. Setting the Headphone Volume

Headphone Monitor
HVOL
HV00 to HV15

With this control you can set the headphone volume to one of 16 levels.

Total adjustment range is over 50 dB. Level 00 is the lowest volume and is effectively mute.



Please be aware that if the headphone source is compressed Dolby E/AC3, the output will be full scale. Adjust headphone volume controls accordingly.

6.8.2. Selecting the Source for the Headphone Monitoring

<i>Headphone Monitor</i>	
<i>HSRC</i>	
<i>Channel 1 & 2</i>	<i>AES1</i>
<i>Channel 3 & 4</i>	<i>AES2</i>
<i>Channel 5 & 6</i>	<i>AES3</i>
<i>Channel 7 & 8</i>	<i>AES4</i>
<i>Channel 9 & 10</i>	<i>AES5</i>
<i>Channel 11 & 12</i>	<i>AES6</i>
<i>Channel 13 & 14</i>	<i>AES7</i>
<i>Channel 15 & 16</i>	<i>AES8</i>
<i>DMX Ch. 1 & 2</i>	<i>DMX1</i>
<i>DMX Ch. 3 & 4</i>	<i>DMX2</i>
<i>DMX Ch. 5 & 6</i>	<i>DMX3</i>
<i>DMX Ch. 7 & 8</i>	<i>DMX4</i>
<i>DMX Ch. 9 & 10</i>	<i>DMX5</i>
<i>DMX Ch. 11 & 12</i>	<i>DMX6</i>
<i>DMX Ch. 13 & 14</i>	<i>DMX7</i>
<i>DMX Ch. 15 & 16</i>	<i>DMX8</i>
<i>Dolby Decoder A Ch. 1 & 2</i>	<i>DA12</i>
<i>Dolby Decoder A Ch. 3 & 2</i>	<i>DA34</i>
<i>Dolby Decoder A Ch. 5 & 2</i>	<i>DA56</i>
<i>Dolby Decoder A Ch. 7 & 2</i>	<i>DA78</i>
<i>Dolby Decoder A M1 & M2</i>	<i>DAAB</i>

This selects the audio source for the headphone monitoring.

If the parameter is set to *AES1* to *AES8*, then the headphone will be monitoring the external discrete AES inputs.

If the parameter is set to *DMX1* to *DMX8*, then the headphone will be monitoring the incoming embedded audio.

If the parameter is set to *DA12* to *DAAB*, then the headphone will be monitoring the Dolby Decoded channels

Note: Due to hardware resource limitations, occasional drop/repeat of samples MAY occur when using the headphones to monitor AES outputs.

6.9. CONFIGURING THE DOLBY DECODER

The *Dolby Decoder* menus are used to configure parameters associated with the Dolby Decoders on the module and its behaviour with a loss of signal. The chart below shows the items available in the *Dolby Decoder* menu. Sections 6.9.1 to 6.9.2 provide detailed information about each of the menu items.

<i>DD_A</i>	Dolby Decoder A Control	Sets the controls for Dolby Decoder A.
<i>DDLS</i>	Dolby Decoder Loss of Signal	Sets the response of the Dolby Decoder to a loss of signal

6.9.1. Setting the Controls for Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DD_A</i>	
<i>Decoder Source Select</i>	<i>DDSS</i>
<i>Video Sync Source Select</i>	<i>DDVS</i>
<i>Decoder Mode</i>	<i>DDMO</i>
<i>Output Latency</i>	<i>DDOL</i>
<i>Program Play Feature</i>	<i>DDPP</i>
<i>Dynamic Range Processing</i>	<i>DDDR</i>
<i>Monitor Channel Map</i>	<i>DDMM</i>

This sets the controls for the Dolby Decoder A. These controls will determine what the decoder's inputs are, its sync source, its mode, and its output latency.

This will also control the program play feature, dynamic range processing, and the monitor channel map.

6.9.1.1. Selecting the Source for Dolby Decoder A

Dolby Decoder	
DD_A	
DDSS	
AES 1	AES1
AES 2	AES2
AES 3	AES3
AES 4	AES4
AES 5	AES5
AES 6	AES6
AES 7	AES7
AES 8	AES8
DMX Ch. 1 & 2	DMX1
DMX Ch. 3 & 4	DMX2
DMX Ch. 5 & 6	DMX3
DMX Ch. 7 & 8	DMX4
DMX Ch. 9 & 10	DMX5
DMX Ch. 11 & 12	DMX6
DMX Ch. 13 & 14	DMX7
DMX Ch. 15 & 16	DMX8

This selects the input source for Dolby Decoder A. The sources can be any one of the external discrete AES channels or one of the 8 pairs of de-embedded audio.

6.9.1.2. Selecting the Sync Source for Dolby Decoder A

Dolby Decoder	
DD_A	
DDVS	
Input Video	VIN
Genlock	GL

With this control you can select the source of sync for the Dolby Decoder.

Select *GL* to use the genlock input as the source of sync.

Select *VIN* to use the video input as the source of sync.

6.9.1.3. Selecting the Mode for Dolby Decoder A

Dolby Decoder	
DD_A	
DDMO	
Mute	MUTE
Only Dolby Digital	D-D
Only Dolby E	D-E
Decode All	ALL

With this control you can select the Dolby Decoder mode.

When the control is set to *Mute*, then the Dolby Decoder outputs Mute, regardless of the input contents.

When the control is set to *Only Dolby Digital*, then only Dolby Digital is decoded.

When the control is set to *Only Dolby E*, then only Dolby E is decoded.

When the control is set to *Decode All*, the Dolby Decoder will decode all Dolby formats and pass PCM inputs through.

6.9.1.4. Selecting the Output Latency for Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DD_A</i>	
<i>DDOL</i>	
<u><i>Minimum</i></u>	<u><i>MIN</i></u>
<i>1 Video Frame</i>	<i>1FRM</i>

With this control you can setup the Dolby Decoder decoded outputs latency.

Select *MIN* to configure the Dolby Decoder for the minimum possible decoding delay.

Select *1FRM* to configure the Dolby Decoder for a decoding delay equivalent to 1 frame of video.

6.9.1.5. Setting the Program Play Feature for Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DD_A</i>	
<i>DDPP</i>	
<u><i>No</i></u>	<u><i>NO</i></u>
<i>Yes</i>	<i>YES</i>

With this control you can setup the Dolby Decoder "Program Play" feature for Dolby E.

Select *No* to configure the Dolby Decoder Program Play for normal (synchronous) operation.

Select *Yes* to configure the Dolby Decoder Program Play to enable proper decoding of Dolby-E stream coming off of a VTR that has been sped up by up to 15%. Additional pitch-shift processing is applied and output latency is forced to min. NOTE: The Dolby-E stream has to be input via the external ("backup") AES input.

6.9.1.6. Setting the Dynamic Range Processing of Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DD_A</i>	
<i>DDDR</i>	
<u><i>Bypass</i></u>	<u><i>BYPS</i></u>
<i>RF</i>	<i>DRF</i>
<i>LINE</i>	<i>LINE</i>

With this control you can setup the Dolby Decoder dynamic range compression for AC3 (Dolby Digital only).

Select *BYPS* to configure the Dolby Decoder to bypass dynamic range processing. Program levels are unaltered.

Select *RF* to configure the Dolby Decoder to adjust the dynamic range using a RF (or "strong") dynamic range compression profile.

Select *LINE* to configure the Dolby Decoder to adjust the dynamic range using a LINE (or "light") dynamic range compression profile.

6.9.1.7. Selecting the Monitor Channel Map of Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DD_A</i>	
<i>DDMM</i>	
<i>Mono</i>	<i>MONO</i>
<i>Stereo</i>	<i>STRO</i>
<i>Pro-Logic</i>	<i>PROL</i>

This controls the format of the monitored down-mix output of the Dolby Decoder.

When the control is set to *Mono*, then the format of the down-mixed output will be mono.

When the control is set to *Stereo*, then the format of the down-mixed output will be a stereo pair.

When the control is set to *Pro-Logic*, then the format of the down-mixed output will be Pro-Logic.

6.9.2. Setting the Action on Loss of Signal from the Dolby Decoder A

<i>Dolby Decoder</i>	
<i>DDLS</i>	
<i>Demux</i>	<i>DMX</i>
<i>Dolby Decoder</i>	<i>DLBY</i>
<i>AES</i>	<i>AES</i>

With this control you can select the audio source to use when the input for the Dolby Decoder is not a Dolby encoded stream. This control affects all the sources that are set to take their inputs from the Dolby Decoder.

Select *DMUX* to automatically switch the input sources to the de-embedder outputs

Select *DOLB* to always keep the input sources as the Dolby Decoder. When the Dolby Decoder is given a PCM stream, its output will be the PCM audio on pair 1 and silence on the remaining pairs.

Select *AES* to automatically switch the input sources to the AES inputs.

6.10. CONFIGURING THE METADATA

The *Metadata* menu is used to configure the parameters related to the Dolby Metadata. The chart below shows the items available in the *Metadata* menu. Sections 6.10.1 to 6.10.2 provide detailed information about each of the menu items.

<i>MD_A</i>	Decoder A	Sets the controls for Metadata Decoder A.
<i>DB9C</i>	DB-9 Configuration	Sets the behaviour of the DB-9 Metadata I/O.

6.10.1. Setting the Controls for Metadata Decoder A

<i>Metadata</i>	
<i>MD_A</i>	
<i>Output Source Select</i>	<i>METO</i>
<i>Embed Source Select</i>	<i>METV</i>
<i>De-embed Line</i>	<i>VADL</i>
<i>De-embed DID</i>	<i>VADI</i>
<i>De-embed SID</i>	<i>VADS</i>
<i>Pass Existing Metadata</i>	<i>VAKL</i>
<i>Embed Line</i>	<i>VAEL</i>
<i>Embed DID</i>	<i>VAEI</i>
<i>Embed SID</i>	<i>VAES</i>
<i>Embed Enable</i>	<i>VAEN</i>

This sets the controls for the Metadata Decoder A.

METO specifies the output of the Metadata.

METV specifies the type of Metadata that is inserted in VANC.

VADL selects the input VANC line for de-embedding.

VADI selects the VANC Data ID.

VADS selects the VANC Secondary Data ID.

VAKL selects whether to delete specified VANC packets.

VAEL selects the output VANC for embedding.

VAEI selects the output VANC Data ID.

VAES selects the output VANC Secondary Data ID.

VAEN selects whether VANC will be embedding on the output video

6.10.1.1. Selecting the Type of Metadata that is Output from Metadata Decoder A

<i>Metadata</i>	
<i>MD_A</i>	
<i>METO</i>	
<i>Dolby Decoder A</i>	<i>DLBA</i>
<i>VANC A</i>	<i>VNCA</i>
<i>External A</i>	<i>EXTA</i>

With this control you can set the type of Metadata output.

Select *DLBA* to output Metadata from the Dolby Decoder A.

Select *VNCA* to output Metadata from the input VANC packets.

Select *EXTA* to output Metadata from the external META input.

6.10.1.2. Selecting the Type of Metadata that is inserted into VANC

Metadata	
MD_A	
METV	
Dolby Decoder A	DLBA
VANC A	VNCA
External A	EXTA

With this control you can set the type of Metadata that is inserted into VANC data by the embedder when *VAEN* menu item is set to *ON*.

Select *DLBA* to insert Metadata from the Dolby Decoder A.

Select *VNCA* to insert Metadata from the input VANC packets.

Select *EXTA* to insert Metadata from the external META input.

6.10.1.3. Configuring the VANC Metadata De-Embedder

There are four menu items used to configure the input VANC de-embedder.

Metadata	
MD_A	
VADL	
2 to 31	
10	

With this control you can set the line for de-embedding VANC Metadata packets from the input video.

Metadata	
MD_A	
VADI	
0x45	
0x50 to 0x5F	
0xC0 to 0xCF (hex)	

With this control you can set the Data ID for de-embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers.

The default value of data ID 45 corresponds to the latest proposals of SMPTE RP291.

Metadata	
MD_A	
VADS	
0x01	
0x0 to 0xFF (hex)	

With this control you can set the Secondary Data ID for de-embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers. When the *VADI* menu item is set to values in the range of *C0* to *CF*, type 1 Metadata packets will be de-embedded and the *VADS* menu item is not relevant as dictated by SMPTE 291M.

Metadata	
MD_A	
VAKL	
Clean	KILL
Pass	PASS

With this control you can set whether the VANC packets matching the *VADI* and *VADS* menu item values will be removed from the video or passed through to the output.

Select *KILL* to remove the VANC packets.

Select *PASS* to pass the packets through to the output video.

6.10.1.4. Configuring the VANC Metadata Embedder

There are four menu items used to configure the input VANC embedder.

<i>Metadata</i>
<i>MD_A</i>
<i>VAEL</i>
<i>2 to 31</i>
<i>10</i>

With this control you can set the line for embedding VANC Metadata packets onto the output video.

<i>Metadata</i>
<i>MD_A</i>
<i>VAEI</i>
<i>0x45</i>
<i>0x50 to 0x5F</i>
<i>0xC0 to 0xCF (hex)</i>

With this control you can set the Data ID for embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers.

<i>Metadata</i>
<i>MD_A</i>
<i>VAES</i>
<i>0x01</i>
<i>0x0 to 0xFF (hex)</i>

With this control you can set the Secondary Data ID for embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers. When the *VAEI* menu item is set to values in the range of *C0* to *CF*, type 1 metadata packets will be generated and the *VADS* menu item is not relevant as dictated by SMPTE 291M.

<i>Metadata</i>
<i>MD_A</i>
<i>VAEN</i>
<i>On</i> <i>ON</i>
<i>Off</i> <i>OFF</i>

With this control you can select whether the VANC packets will be embedded onto the output video or not.

Select *ON* to insert VANC Metadata packets on the output video. The input source of Metadata for the VANC packets is set by the *METV* menu item. See 6.10.1.2.

Select *OFF* to disable VANC insertion.

6.10.2. Configuring the External Metadata I/O

<i>Metadata</i>	
<i>DB9C</i>	
<i>Tx Primary/ Rx Secondary</i>	<i>TXRX</i>
<i>Rx Primary/Tx Secondary</i>	<i>RXTX</i>

This configures the external Metadata I/O DB-9 connection.

TXRX configures the Metadata I/O to receive from a Dolby DP570 unit with the following pin out:

Pin	Function
2	Rx A-
3	Tx B+
7	Rx B+
8	Tx A-

RXTX configures the Metadata I/O to transmit to a Dolby DP570 unit with the following pin out:

Pin	Function
2	Tx A-
3	Rx B+
7	Tx B+
8	Rx A-

6.11. DISPLAYING THE MODULE STATUS

The *Status* menus are used to show the status of various parameters of the 7720AD8-DD-HD. The chart below shows the items available in the *Status* menu. Sections 6.11.1 to 6.11.5 provide detailed information about each of the menu items.

<i>UPRV</i>	Module Firmware	Displays the firmware revision of the module.
<i>F1RV</i>	FPGA1 Revision	Displays the FPGA revision of the module's main board.
<i>F2RV</i>	FPGA2 Revision	Displays the FPGA revision of the module's sub board.
<i>IVSD</i>	Input Video Standard	Displays the detected input video standard.
<i>OVSD</i>	Operating Standard	Displays the operating standard of the module.

6.11.1. Checking the Module Firmware

<i>Status</i>
<i>UPRV</i>
<i>Eg. "V1.0 BUILD 100"</i>

The status parameter will report the firmware version that is operating on the module.

6.11.2. Checking FPGA 1 revision

Status
F1RV
Eg. "7"

The status parameter will report the revision of FPGA 1 on the module.

6.11.3. Checking FPGA 2 revision

Status
F2RV
Eg. "8"

The status parameter will report the revision of FPGA 2 on the module.

6.11.4. Checking the Input Video Standard

Status
IVSD
Eg. "1159"

The status parameter will report the input video standard. See section 6.3.1 for supported standards.

6.11.5. Checking the Output Video Standard

Status
OVSD
Eg. "1159"

The status parameter will report the output video standard. See section 6.3.1 for supported standards.

6.12. CONFIGURING MISCELLANEOUS PARAMETERS

The *Miscellaneous* menu is used to configure miscellaneous parameters to enable VistaLINK[®] control, display orientation, and to perform a factory reset. The chart below shows the items available in the *Closed Captioning* menu. Sections 6.12.1 to 6.12.3 provide detailed information about each of the parameters.

<i>VLNK</i>	VistaLINK [®] control enable	Enables the ability to control the module through VistaLINK [®] .
<i>DISO</i>	Display Orientation	Sets the orientation of the card edge dot matrix display.
<i>FRST</i>	Factory Resets	Resets various components of the module to their factory settings.

6.12.1. Enabling VistaLINK® control of the module

Miscellaneous	
VLNK	
Enable	RMTE
Disable	LCAL

This configures the VistaLINK® control of the module.

RMTE enables VistaLINK® control of the module. The user is able to use VistaLINK® to monitor and configure the module in addition to the card edge controls.

LCAL disables VistaLINK® control of the module. The user is only able to monitor and configure the module from the card edge controls.

6.12.2. Setting Card Edge Display Orientation

Miscellaneous	
DISO	
Horizontal	HORZ
Vertical	VERT

With this control you can select a horizontal or vertical orientation for the displays to accommodate mounting the module in the 3RU or 1RU frames.

6.12.3. Resetting the Module to Factory Defaults

Miscellaneous	
FRST	
Reset All	ALL
Video Control Reset	VCR
Audio Control Reset	ACR
Video Proc Reset	VPR
Audio Proc Reset	APR
Mixer A Reset	MAR
Mixer B Reset	MBR
Dolby Decoder & Met A Reset	DAR

With this control you can reset the entire module or certain functional blocks to its factory default condition.

ALL will reset the entire module to the factory settings.

VCR will reset the Video Control only to factory settings. All the other module settings will remain the same.

ACR will reset the Audio Control only to factory settings. All the other module settings will remain the same.

VPR will reset the Video Proc only to factory settings. All the other module settings will remain the same.

APR will reset the Audio Proc only to factory settings. All the other module settings will remain the same.

MAR will reset the Mixer A only to factory settings. All the other module settings will remain the same.

MBR will reset the Mixer B only to factory settings. All the other module settings will remain the same.

DAR will reset the Dolby Decoder A and Metadata A only to factory settings. All the other module settings will remain the same.

6.12.3.1. Resetting the Module to Factory Settings

The resetting of the module and its components to factory settings behave the same way. For the sake of simplicity in the manual, only the reset menu for the *Reset All* will be described.

<i>Miscellaneous</i>	
<i>FRST</i>	
<i>ALL</i>	
Yes	YES
No	NO

With this control you can reset the entire module to the factory settings.

YES will reset the module to the factory settings.

NO will not reset the module to factory settings.

Preliminary

7. JUMPERS

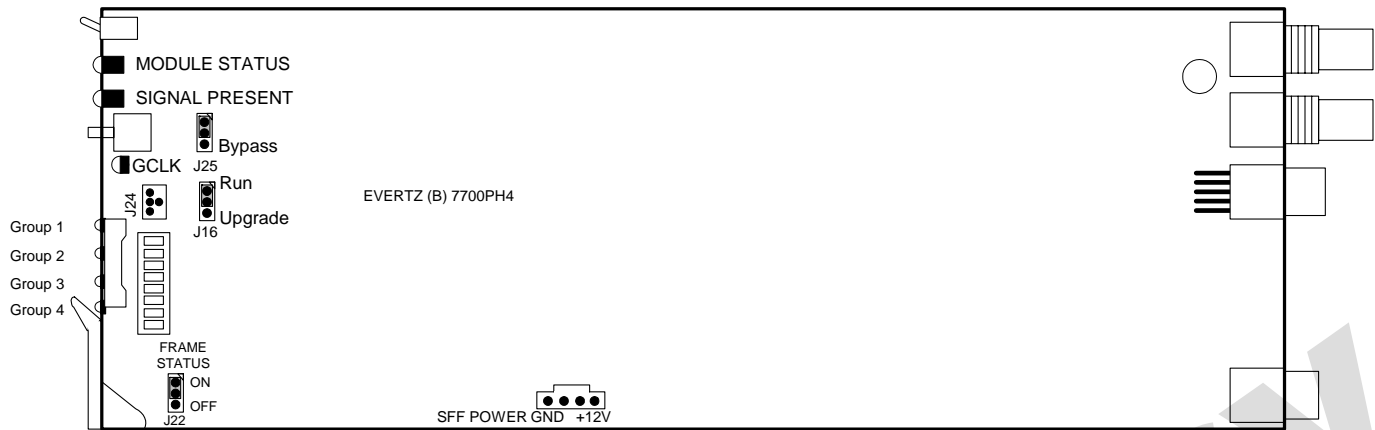


Figure 7-1: Location of Jumpers – Rev B Main Board

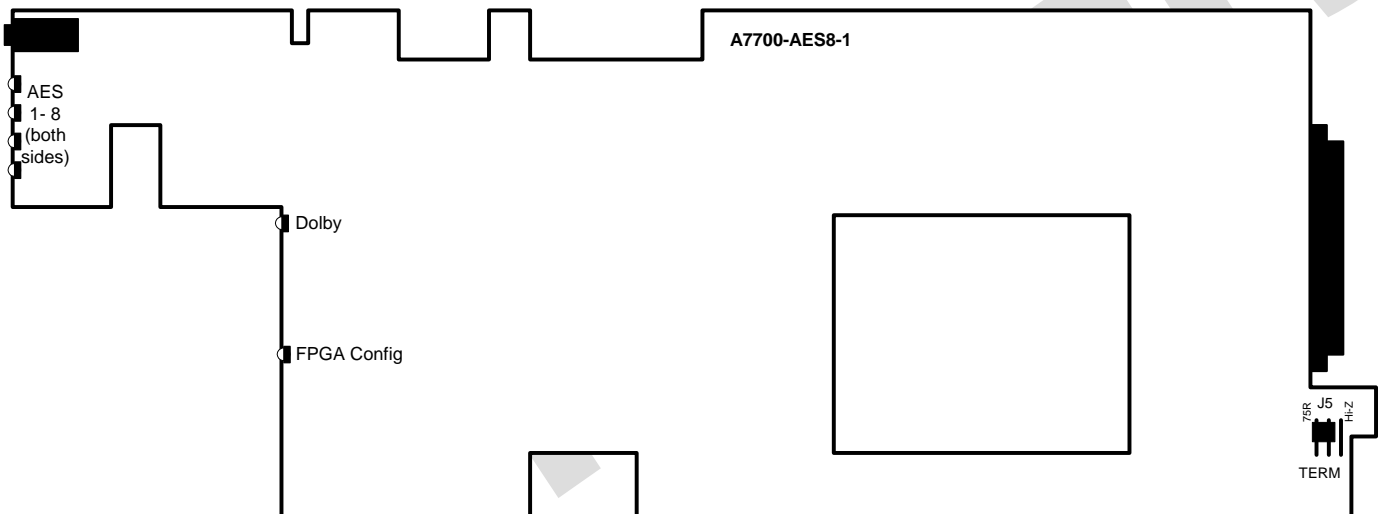


Figure 7-2: Location of Jumpers/LEDs – Rev. 1 Sub Board

7.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

FRAME STATUS: The FRAME STATUS jumper J22 located at the front of the main module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. (Default)

When this jumper is installed in the Off position, local faults on this module will not be monitored.

7.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

Firmware updates can be performed using the **UPGRADE** jumper.

UPGRADE: The UPGRADE jumper is located at J16 jumper location on the front side of the main module and is used when firmware upgrades are being done to the module. For normal operation it should be switched to the *RUN* position as shown in the diagrams above. See the *Upgrading Firmware* chapter in the front of the binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J16 into the *UPGRADE* position. (Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J24 at the card edge. Re-install the module into the frame. Run the upgrade as described in *Upgrading Firmware* chapter. Once the upgrade is completed, remove the module from the frame, move J16 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



The Upgrade baud rate for the 7720AD8-DD-HD module is 115,200 baud.

7.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

TERM: The TERM jumper J5 located at the rear of the sub board is used to terminate the genlock loop input. When it is in the 75R position, a 75 ohm terminating resistor will connect the input to ground. When it is in the HI-Z position, the genlock input will be high impedance.

7.4. SELECTING WHETHER THE INPUT VIDEO IS BYPASS

BYPASS: The BYPASS jumper J25 located at the front of the module.

8. VistaLINK® REMOTE MONITORING/CONTROL

8.1. WHAT IS VISTALINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VistaLINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK® enabled products.
2. Managed devices (such as 7720AD8-DD-HD), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.
3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the VistaLINK® network, see the 7700FC Frame Controller chapter.

9. MENU QUICK REFERENCE

Video Control (VCTR)

- Video Standard Select
- Vertical Phase
- Horizontal Phase
- Frame Phase
- Freeze Mode

Video Proc Control (VP)

- Black Level Adjust
- Luma Gain Adjust
- Chroma Gain Adjust
- Hue Control

Headphone Monitor (HEAD)

- Headphone Volume
- Headphone Source

Status (STAT)

- Module Firmware
- FPGA1 Version
- FPGA2 Version
- Input Video Standard
- Operating Standard

Audio Control (ACTR)

- Coarse Audio Delay
- Fine Audio Delay
- SRC Mode
- C-Bit Control
- Embedded Group 1 Enable
- Embedded Group 2 Enable
- Embedded Group 3 Enable
- Embedded Group 4 Enable
- Demux Loss of Video Mode

Dolby Decoder Control (DLBY)

- Dolby Decoder A Control
- Dolby Decoder Loss of Signal

Miscellaneous (MISC)

- VistaLINK[®] Control Enable
- Display Orientation
- Factory Resets

Metadata (META)

- Metadata Decoder A
- DB-9 Configuration

Audio Proc Control (AP)

- Mixer A Source Select
- Mixer A Gain Control
- Mixer A Inversion Control
- Mixer B Source Select
- Mixer B Gain Control
- Mixer B Inversion Control
- Embedder Mixer Selection
- AES Output Selection

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