TABLE OF CONTENTS

Figures

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Jun 2010

Information contained in this manual is believed to be accurate and reliable. However, Evertz assumes no responsibility for the use thereof nor for the rights of third parties, which may be effected in any way by the use thereof. Any representations in this document concerning performance of Evertz products are for informational use only and are not warranties of future performance, either express or implied. The only warranty offered by Evertz in relation to this product is the Evertz standard limited warranty, stated in the sales contract or order confirmation form.

Although every attempt has been made to accurately describe the features, installation and operation of this product in this manual, no warranty is granted nor liability assumed in relation to any errors or omissions unless specifically undertaken in the Evertz sales contract or order confirmation. Information contained in this manual is periodically updated and changes will be incorporated into subsequent editions. If you encounter an error, please notify Evertz Customer Service department. Evertz reserves the right, without notice or liability, to make changes in equipment design or specifications.

1. OVERVIEW

Any references to the 7837CD2 product line equally apply to the 7737CD2 respectfully. The 7837CD2 line of composite analog video to serial digital converters are dual broadcast quality video decoders. The 7837CD2-A4 and the 7837CD2-A8 versions offer four (two per decoded channel) or eight (four per decoded channel) high quality audio analog to digital converters. The decoder has a 3D temporal comb filter and a 5-line super adaptive 2D comb filter.

In addition, control of the module is performed via an On-Screen Display, or remotely via VistaLINK® SNMP.

Features:

- One input BNC per channel. 75 Ohms or high-Z, jumper configurable input impedance
- Two SDI 525 or 625, 270 Mb/s component digital video output per channel WITHOUT OSD text
- One composite analog video output with OSD text for module control
- One composite analog reference input (NTSC or PAL-B) on BNC. 75 Ohm or high-Z, jumper configurable input impedance. One time base for both channels
- Video frame synchronizer
- Infinitely variable output phase (27MHz clock increments)
- Loss of Video Modes: black, freeze
- Adjustable free running frequency
- A comprehensive On-Screen display is available to configure the various features of the module
- Thumbnail support through VistaLINK® Thumbnail server

The Features of the Decoding Process:

- 12-bit, 4X Over-sampling mode of input video
- Internal processing to maintain 10 bit digital video quality
- Adaptive 3D and 2D comb filtering technology
- Support of non-time base corrected signals
- User configurable luma and chroma detail enhancement
- User selectable noise reduction
- Video and Chroma levels: AGC or user adjustable
- User adjustable input video processing functions: black level, gain, hue, and saturation

The Features of "-A4" and "-A8" Options:

- 4 balanced analog audio inputs (two stereo pair) on a removable terminal strip (7837CD2-A4)
- 8 balanced analog audio inputs (four stereo pair) on a removable terminal strip (7837CD2-A8)
- High impedance inputs
- Analog audio input levels are adjustable
- Audio delay "tracks" video delay
- Additional audio delay of up to 2.5 seconds
- Audio advance of up to 1 frame less 2.5 microseconds
- 2 channels (1/2 group) of audio is multiplexed onto each of the outgoing digital video (7837CD2-A4)
- 4 channels (one full group) of audio is multiplexed onto each of the outgoing digital video (7837CD2-A8)
- 2 unbalanced AES audio outputs using BNC's (7837CD2-A4)
- 4 unbalanced AES audio outputs using BNC's (7837CD2-A8)
- Loss of video modes: pass audio, mute audio

1.1. FUNCTIONAL DESCRIPTION

Composite analog video is converted to 12 bit parallel data and decoded to 4:2:2 digital component. Various video processing functions (gain, saturation, noise reduction, etc) are performed during the decoding process.

In the 7837CD2-A4 version, the 4 channels of audio (2 channels per video path) are converted from balanced analog to digital PCM. In the 7837CD2-A8 version, 8 channels (4 channels per video path) of audio are converted from balanced analog to digital PCM. The digital audio is then delayed to match the delay in the video synchronizer. For the 7837CD2-A4 and –A8, analog audio is delivered as unbalanced 75 Ohm AES audio on the designated BNCs. The same audio is also embedded on the associated SDI output video.

Program video goes to a SDI parallel to serial converter.

For module edge control, the hardware mixes (keys) the on-screen display (OSD) control information onto the video streams currently being controlled, and passes it through a monitoring quality composite encoder for user viewing.

The following block diagram illustrates the processing blocks.

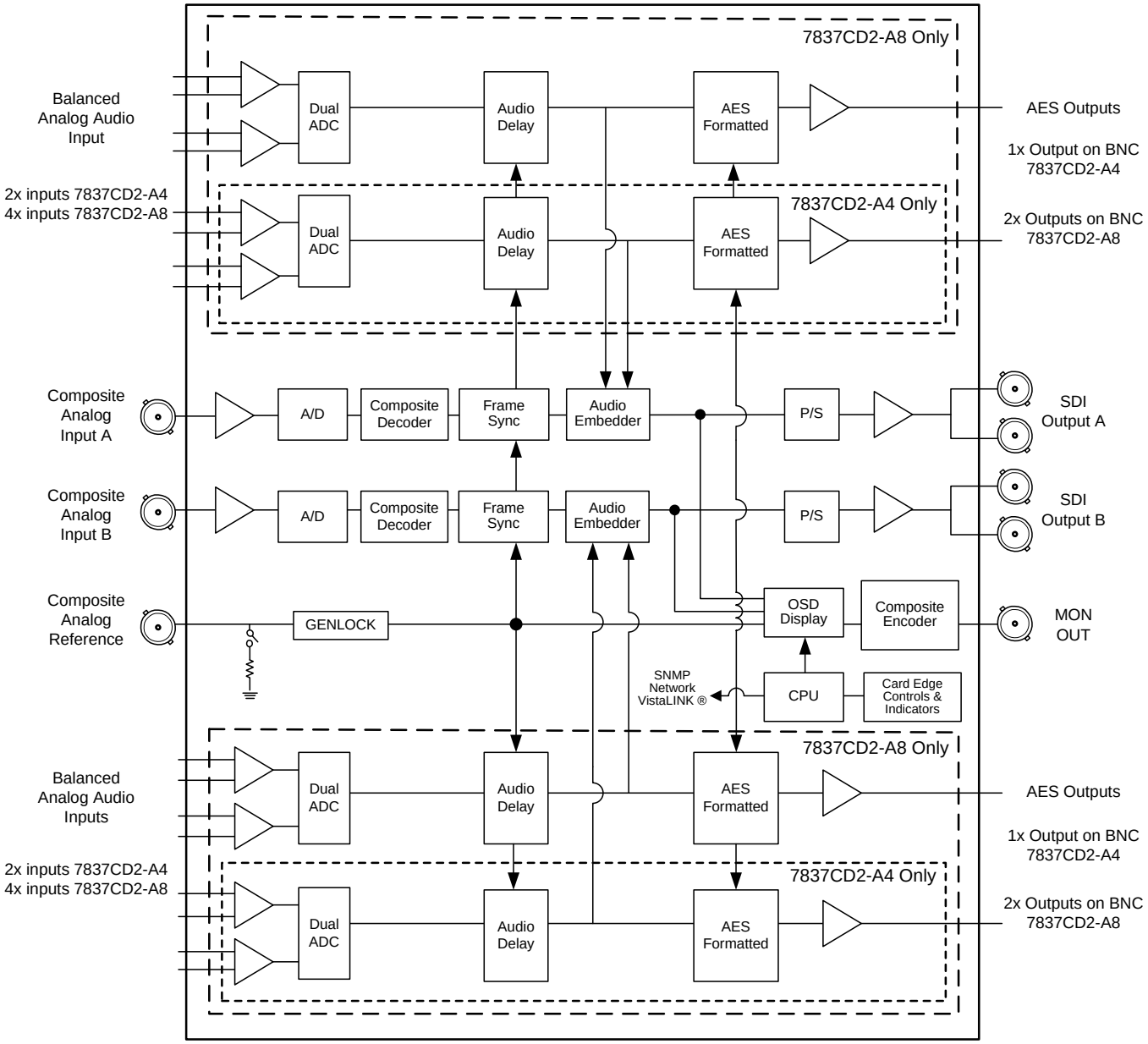


Figure 1-1: 7837CD2, 7837CD2-A4, 7837CD2-A8 Block Diagram

2. Installation

The 7837CD2 modules come with a companion rear plate and occupy one or two slots in the 7800FR or 7800FR frame. Figure 2-1 provides a drawing of each of the rear panels. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7800FR chapter.

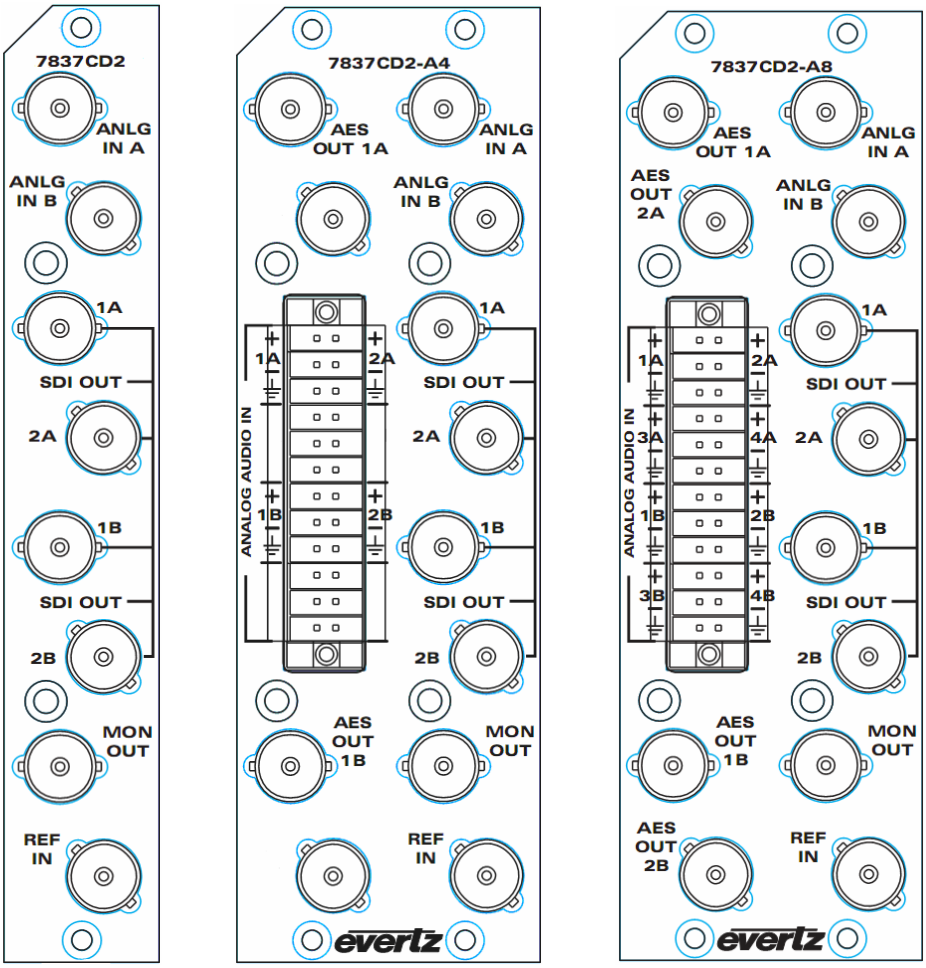


Figure 2-1: 7837CD2 Rear Panels

2.1. VIDEO IN AND OUT

Connect a source of composite analog (NTSC or PAL-B) video to either or both BNC's labeled ANLG A/ ANLG B. Connect a reference black signal to the REF IN BNC. Decoded video with embedded audio is available on the SDI OUT (1A/2A), (1B/2B) BNC's, two for each channel. Decoded and re-encoded analog video with control text is available on the MON OUT output BNC. If the module is not present or the power is off, there will be nothing on any of the outputs. The module is designed to support simultaneous decoding of two video signals of the same format.

2.2. AUDIO IN AND OUT

The audio versions of the CD2 (-A4 and –A8) have audio paths through the module that are delayed/synchronized with the video. The –A4 version performs A to D conversion on 4 balanced analog inputs (1 stereo pair per video channel), delays the audio to match the associated video, and outputs 1 AES channel that is synchronous to the associated video. One half group of delayed audio is embedded on the output video. The –A8 version performs A to D conversion on 8 balanced analog inputs (4 channels per video), delays the audio to match the associated video, and outputs 2 AES channels that are synchronous to the associated video. One full group of delayed audio is embedded on each video output.

The –A4 and –A8 versions of the CD2 use a removable terminal strip to connect audio. To connect audio, pull out the removable terminal strip and, with a small screw driver, connect bare wires following the connections on the rear panel. If the audio is unbalanced (single-ended), connect the ground to both the ground input and the –ve input while the signal is connected to the +ve input. Push the terminal strip back into the rear panel making sure there is enough slack in the cabling to not put pressure on the connector.

48kHz unbalanced 75 Ohm AES is available on the AES OUTPUT BNCs.

The AES outputs are always synchronous to the output video. This means that the AES is frequency/phase locked to the video with an exact relationship between the number of audio samples and the number of output video frames.

3. SPECIFICATIONS

3.1. ANALOG VIDEO INPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	2 (one per video channel)
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Frequency Lock Range:	±50ppm from nominal
Input Level Control Range:	> ±4dB
Black Level Control Range:	> ±5 IRE
Chroma Level Control Range:	> ±20%
Hue Control Range:	> ±20 deg.
Input Impedance:	75 Ohm or High impedance (jumper selectable, see section 7.1)
Return Loss:	>35dB to 5MHz

3.2. REFERENCE VIDEO INPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1 (same reference used for both decoding channels)
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Frequency Lock Range:	±50ppm from nominal
Input Impedance:	75 Ohm or High impedance (jumper selectable, see section 7.1)
Return Loss:	>35dB to 5MHz

3.3. ANALOG MONITORING VIDEO OUTPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Output Impedance:	75 Ohm
Return Loss:	>35dB to 5MHz

3.4. SERIAL VIDEO OUTPUT

Standard:	SMPTE 259M-C – 525 or 625 line component
Number of Outputs:	4 (2 per channel)
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	900ps nominal
Overshoot:	<10% of amplitude
Return Loss:	>15dB to 270MHz
Jitter	<0.2 UI (all outputs)
Embedded Audio:	SMPTE 272M-A

3.5. DECODER PERFORMANCE (SDI outputs only)

Frequency Response:	<±0.1dB (100kHz to 4.2MHz)
Differential Gain:	<±0.5% typical
Differential Phase:	<±0.5 deg. Typical
Noise Floor:	< -60dBrms (black video VBI Lines, 15kHz to 5MHz)
C/L Gain:	<±0.5%
C/L Delay:	<±9ns
Minimum Delay:	4.5 lines
Maximum Delay:	1 frame plus 4.5 lines
Inter-channel crosstalk:	Within noise floor measurement

3.6. ANALOG AUDIO INPUT (-A4 and –A8 versions only)

Number of Inputs:	4 (2 per video channel) for –A4 version 8 (4 per video channel) for –A8 version
Type:	Balanced analog audio
Connector:	Removable terminal strip (-A4 and –A8 version)
Input Impedance:	20kOhm minimum (differential)
Sampling Frequency:	48kHz
Signal Level:	0dBFS => 18 or 24dBu (user selectable)
Level Control Range:	+/- 10dB
Frequency Response:	+/- 0.1dB (20Hz to 20kHz) (broadcast quality)
SNR:	100dB with input at -0.5dBFS
THD+N:	<0.001% (>100dB) @ 1kHz, -0.5 dB FS <0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)
CMRR	>90dB @ 1kHz

3.7. AES AUDIO OUTPUTS

Number of Outputs:	2 for –A4 version (1 per video channel) 4 for –A8 version (2 per video channel)
Output Standard:	SMPTE 276M, single ended synchronous AES
Connectors:	BNC per IEC 61169-8 Annex A for –A4 and –A8 versions
Resolution:	24 bits
Sampling Rate:	synchronous 48kHz
Minimum I/O Delay:	2.9 msec
Maximum I/O Delay:	2.5 seconds

3.8. ELECTRICAL

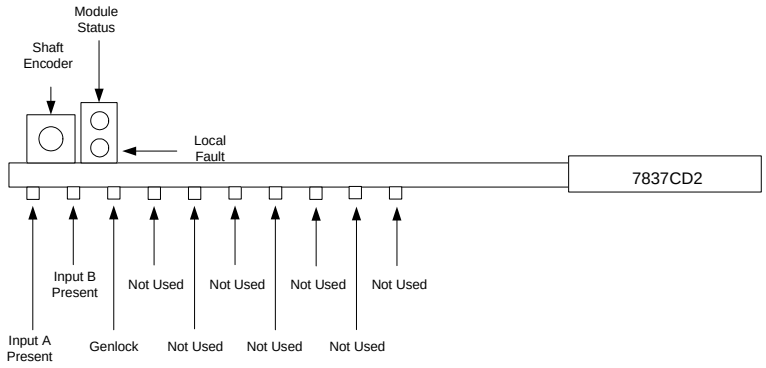
Voltage:	+ 12VDC
Power:	17 Watts CD2 version 21 Watts –A8 version
EMI/RFI:	Complies with FCC Part 15, class A and EU EMC directive

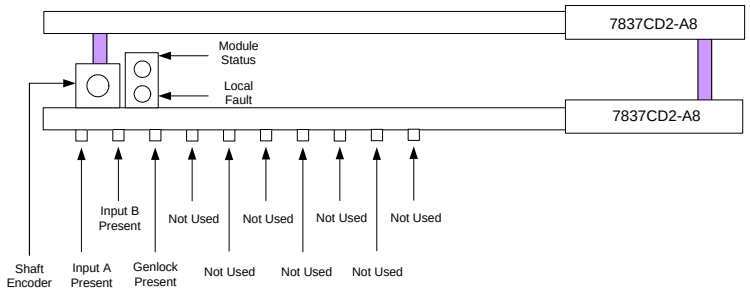
3.9. PHYSICAL

7800FR	2 (for 7837CD2-A4/A8)
Stand Alone Enclosure:	
Dimensions:	14 “ L x 4.5 “ W x 1.9 “ H (355 mm L x 114 mm W x 48 mm H)
Weight:	approx. 1.5 lbs. (0.7 Kg)

4. STATUS LEDs

4.1. MODULE STATUS LEDS





MODULE STATUS: This Green LED will be on when the module is operating properly.

LOCAL FAULT: This Red LED makes it easy to identify one module in a frame that is missing an essential input or has another fault.

The LED will be on when there is no valid video on either video path.

VIDEO A, VIDEO B: The VIDEO Red/Green LEDs (status for input A is the LED on the bottom of the PCB first on the Left, status for input B is second from the left). These LEDs will indicate the video presence of the composite analog inputs.

Red = Video not present Green = Valid Video Detected

GENLOCKED: This Green LED is on solid if the user selected genlock source (either external input or from the frame) is present and the user has turned on genlocking.

It is flashing if the user has turned on genlocking and the selected genlock source is not present.

It will be off if the user has turned genlocking off.

5. ON SCREEN MENUS

5.1. NAVIGATING THE ON SCREEN MENU SYSTEM

A rotary encoder allows card edge navigation on a set of On-Screen menus used to configure the module. On-Screen menus are available only on the MON OUT BNC for the 7837CD2 series of modules. This ensures that On-Screen menus are not accidentally put on-air.

To enter the On-Screen menu system, press the pushbutton once. This will bring you to the main setup menu where you can use the rotary knob to move up and down the list of available sub-menus. An arrow (>) moves up and down the left hand side of the menu items to indicate which item you are currently choosing. Once the arrow is on the desired item, press the pushbutton to select the next menu level.

On all menus, there are two extra selectable items: *Back* and *Exit*. Selecting *Back* will take you to the previous menu (the one that was used to get into the current menu) while *Exit* will return the display to its normal operating mode. On the main menu, BACK and EXIT will both take you to the normal operating mode.

Once in a sub-menu, there may be another menu layer, or there may be a list of parameters to adjust. If there is another set of menu options, use the toggle switch to select the desired menu item and press the pushbutton.

To adjust any parameter, use the rotary knob to move up or down to the desired parameter and press the pushbutton. The arrow will move to the right hand side of the line (<) indicating that you can now adjust the parameter. Using the rotary knob, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase or decrease by turning the rotay knob left or right. If the parameter contains a list of options, you can cycle through the list in the same fasion.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter to the selected value and move the arrow back to the left side of the parameter list (>). Continue selecting and adjusting other parameters or use the BACK or EXIT commands.

5.2. ON SCREEN DISPLAY – MAIN MENU

The OSD menu is arranged in a layered structure that groups similar configuration items together. Selecting one of these items will take you to the next menu level. The following sections provide detailed descriptions of each of the sub-menus. The tables are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

Video Path 1	Configuration of the parameters associated with channel 1 video and audio.
Video Path 2	Configuration of the parameters associated with channel 2 video and audio.
Genlock Reference	Configures genlocking items that are shared between channels.
Presets	Module preset management, allows the ability to set and recall user presets.

5.3. ON SCREEN DISPLAY – VIDEO PATH 1 MENU

The Video Path 1 and 2 menus, for each channel, are identical. For simplicity, only video path 1 is described.

Analog Video Proc	Controls composite output settings including NTSC Setup pedestal, Video level, Hue.
Output Video Settings	Controls the H and V phase and loss of video modes.
Audio Processing	Audio configuration (-A4 & -A8 only).
Thumbnail Settings	Controls thumbnail settings on the module.
Audio/Video Status	Provides audio and video timing and standards monitoring.

5.4. CONFIGURING THE ANALOG VIDEO PROCESSING CONTROLS

The *Analog Video Processing* menu is used to configure parameters associated with the composite decoder video processing. The chart below shows the items available in the *Analog Video Processing* menu.

NTSC setup pedestal	Selects whether the NTSC 7.5 IRE pedestal will be removed from the composite analog input video.
Line 21	Controls line 21 processing.
Black level	Controls the input video black level.
Video level	Controls the input video level.
Chroma level	Controls the input video saturation.
Hue	Controls the input video hue.
TBC mode	On/off mode control of processing of non Time Base Corrected video.
Detail enhancement threshold	Controls when the image enhancement is enabled.
Detail enhancement level	Controls the amount of image enhancement when the threshold is exceeded.
Noise reduction	Controls the amount of noise reduction.

5.4.1. Removing the NTSC Setup Pedestal

Video Path 1
- *Analog Video Processing*
  - *NTSC setup pedestal*
    - *Remove*
    - *Don't remove*

Composite NTSC analog video may have a 7.5 IRE pedestal while 4:2:2 SDI video does not. This control, when set to *remove*, will remove the pedestal and re-scale the video accordingly. The setup pedestal should not be present on composite video when operating in Japan.

5.4.2. Line 21 Processing

Video Path 1	Analog Video Processing	Line 21 setup	Remove setup, <u>Don't remove setup,</u> Blank

Closed captioning has been defined to NOT have a 7.5 IRE pedestal, but it is placed on the first active line of video where there may be a pedestal. This depends on the upstream closed captioning and/or composite encoder that generated the video. When decoding composite video with closed captioning, care must be taken to not remove a pedestal if it is not there.

This control, when set to *Don't remove setup*, will not remove 7.5 IRE pedestal from line 21. This is the default state for properly generated captioning.

When set to *Remove setup*, the 7.5 IRE pedestal will be removed from line 21. Note that this state is only valid if the preceding NTSC Setup Pedestal control is set to "Remove".

Blank is used to remove captioning from line 21. This is most useful for removing captioning when going into an up-converter.

5.4.3. Black Level

Video Path 1	Analog Video Processing	Black level	-60 - 60 <u>0</u>

The *black level* controls the black level of the decoding process. You have greater than +/- 5 IRE range on this control.

Note: Make sure to select the proper setup pedestal removal before setting this control. Don't set the video level control until after you have set this control properly.

5.4.4. Video Level

Video Path 1	Analog Video Processing	Video level	<u>Auto</u> <u>0.362 – 2.83</u>

The *video level* controls the input video level of the decoding process. You have greater than +/-4dB range on this control.

Note: Make sure to select the proper setup pedestal removal and calibrate the black level before setting this control.

5.4.5. Chroma Level

Video Path 1	Analog Video Processing	Chroma level	<u>Off</u>, 0.51 – 7.99

The default "*off*" position of this control will, in the decoding process, correctly scale the chroma as per SMPTE-170M/125M. If you need to adjust the chroma level, you have greater than +/- 20% (+/- 1.5dB) range with this control.

5.4.6. Hue

Video Path 1
Analog Video Processing
Hue
-512 - 511 *0*

The hue of the decoded signal can be adjusted with this control. You have greater than +/- 180 deg. range with this control.

5.4.7. TBC Mode

Video Path 1
Analog Video Processing
TBC Mode
Off, *On*

On/off mode control of processing of non-Time Base Corrected video input signals is affected by this menu item.

When set to *"On",* the input video processing is modified to be more tolerant of non-time base corrected signals.

5.4.8. Detail Enhancement Threshold

Video Path 1
Analog Video Processing
Detail Threshold
very low, *low,* *medium,* *high*

Experimentally, set this to a level that will apply detail/edge enhancement without enhancing the input noise.

Lower thresholds will apply enhancement to smaller edge transitions thus bringing out smaller details. Unfortunately, if the threshold is set too low, input noise will eventually be enhanced making the picture look noisier.

5.4.9. Detail Enhancement Level

Video Path 1
Analog Video Processing
Detail Enhancement Level
Off, *0..127*

When an edge passes the threshold set with the previous control (Detail Enhancement Threshold), the amount of enhancement is selected with this control. The higher the number, the more enhancement is applied.

5.4.10. Noise Reduction

Video Path 1
Analog Video Processing
Noise Reduction
Off *On*

When turned on, a small amount of wideband noise reduction is applied to the signal.

5.5. CONFIGURING THE OUTPUT VIDEO SETTINGS

The Output *Video Settings* menus are used to configure parameters associated with the output video processing functions. The chart below shows the items available in the *Video* menu. The following sections provide detailed information about each of the parameters.

Loss of video	Selects the action to take when the input video is missing.
525 H phase	Sets the horizontal phase of the output signal to a NTSC Genlock reference input.
625 H phase	Sets the horizontal phase of the output signal to a PAL Genlock reference input.
525 V phase	Sets the vertical phase of the output signal to a NTSC Genlock reference input.
625 V phase	Sets the vertical phase of the output signal to a PAL Genlock reference input.

5.5.1. Selects the Action to Take when Input Video is Missing

Video Path 1
- *Output Video Settings*
  - *Loss of video*
    - *Freeze*
    - *Black*

The user can either have the output video go to black, or freeze the last good video picture at the input with this control.

5.5.2. Setting the Horizontal Phase of the Output Video – NTSC/525 Video

Video Path 1
- *Output Video Settings*
  - *525 H phase*
    - *0 to 1715*
    - *0*

With this control, you can set the horizontal timing of the output video with respect to the Genlock reference input when operating in NTSC/525 video mode. Setting this control to 0, keeps the monitoring output video in time with the Genlock reference. The SDI output will be a couple of microseconds advanced to the Genlock reference. Increasing the value will delay the output video in one-sample increments.

5.5.3. Setting the Horizontal Phase of the Output Video – PAL-B/625 Video

Video Path 1
- *Output Video Settings*
  - *625 H phase*
    - *0 to 1727*
    - *0*

With this control, you can set the horizontal timing of the output video with respect to the Genlock reference input when operating in PAL/625 video mode. Setting this control to 0, keeps the monitoring output video in time with the Genlock reference. The SDI output will be a couple of microseconds advanced to the Genlock reference. Increasing the value will delay the output video in one-sample increments.

5.5.4. Setting the Vertical Phase of the Output Video – NTSC/525 Video

Video Path 1
Output Video Settings
525 V phase
0 to 524
0

With this control, you can set the vertical timing of the output video with respect to the Genlock reference input when operating in 525 video mode. Setting this control to 0 keeps the output video in time with the Genlock reference. Increasing the value will delay the output video in one-line increments.

5.5.5. Setting the Vertical Phase of the Output Video – PAL-B/625 Video

Video Path 1
Output Video Settings
625 V phase
0 to 624
0

With this control, you can set the vertical timing of the output video with respect to the Genlock reference input when operating in 625 video mode. Setting this control to 0, keeps the output video in time with the Genlock reference. Increasing the value will delay the output video in one-line increments.

5.6. CONFIGURING THE AUDIO PROCESSING CONTROLS (-A4 and -A8)

The *Audio Processing* menu is used to configure parameters associated with the audio inputs and the audio multiplexing. The chart below shows the items available in the *Audio* menu. The following sections provide detailed information about each of the parameters.

Audio destination	Selects the destination group of audio.
Audio delay	Additional, user desired, delay may be added to the audio.
Mute Audio	Enables the user to pass or mute the audio on the output.
ADC Clip Level	Allows the user to select whether to use + 18 dBu or +24 dBu to be set to 0 dBFS
Ch1/ch2 Swap	Controls whether channel 1 and 2 (L/R) inputs will be swapped.
Ch3/Ch4 Swap	Controls whether channel 3 and 4 (L/R) inputs will be swapped. (-A8 Version Only)
Channel 1 Gain	Channel 1 level control.
Channel 2 Gain	Channel 2 level control.
Channel 3 Gain	Channel 3 level control. (-A8 Version Only)
Channel 4 Gain	Channel 4 level control. (-A8 Version Only)

5.6.1. Selecting the Audio Destination Group

- *Video Path 1*
  - *Audio Processing*
    - *Audio destination*
      - *Group 1*
      - *Group 2*
      - *Group 3*
      - *Group 4*

Up to 4 groups of audio may be embedded on SDI video. This control selects the group ID of the multiplexed output audio. The input audio will be put in this group.

The –A4 has only one stereo pair per group. A copy of this stereo pair is placed in audio positions 3 and 4 within the group.

5.6.2. Additional Audio Delay

- *Video Path 1*
  - *Audio Processing*
    - *Audio delay*
      - *0*
      - *-37ms to 2.5sec in 0.5ms increments*

In addition to delaying the audio the same amount that the video is being delayed (in the video frame synchronizer), additional user requested delay may be added or removed with this control.

WARNING: Both the embedded audio AND the external AES audio are delayed by this amount.

5.6.3. Audio Muting

- *Video Path 1*
  - *Audio Processing*
    - *Audio Mute*
      - *Disable*
      - *Enable*

This option allows the user to pass or mute all the audio outputs during loss of video.

5.6.4. ADC Clip Level

- *Video Path 1*
  - *Audio Processing*
    - *ADC Clip Level*
      - *+18 dBu*
      - *+24 dBu*

The ADC Clip Level can be set to either + 18dBu or +24 dBu.
When the ADC Clip is set to +24dBu the input range is optimized for peak audio levels up to +24dBu. (Default)

When the ADC Clip Level is set to +18 dBu, best performance is achieved when input peak levels are below +18dBu.

5.6.5. Audio Channels 1 and 2 Processing (-A4) and Audio Channels3/4 Processing (-A8 version only)

- *Video Path 1*
  - *Audio Processing*
    - *Ch1/Ch2 Swap*
      - *Pass*
      - *Swap*

Basic audio channel manipulation is possible with this control.

When set to *Pass,* both input channels are routed straight through. When set to *Swap,* the two channels are routed to the opposite channel output of the pair.

Video Path 1 *Audio Processing* *Ch3/ch4 Swap* *Pass* *Swap*	Basic audio channel manipulation is possible with this control. When set to *Pass,* both input channels are routed straight through. When set to *Swap,* the two channels are routed to the opposite channel output of the pair.

5.6.6. Setting the Analog Levels

There are 4 menu items to adjust the levels of each of the analog audio inputs. For simplicity only the menu for channel 1 will be shown in the manual.

Video Path 1 *Audio Processing* *Channel 1 Gain* *-10.0 – 10.0 dB* *0*	The channel input level is adjusted with this control. It has a range of approximately +/- 10 dB with 1/2dB resolution.

5.7. THUMBNAIL SETTINGS – CONTROL OF THUMBNAIL TRANSMIT

The 7837CD2 module can be setup to work with the VistaLINK® thumbnail server in order to send video images of the output picture using the Simple Network Management Protocol (SNMP). Images can be sent to VistaLINK® for easy monitoring of both video paths on the 7837CD2.

5.7.1. Enabling Thumbnail Transfers

Video Path 1 *Thumbnail Settings* *Thumbnail Transfer* *Disable* *Enable*	This option allows the user to Enable/Disable the transfer of thumbnails.

5.7.2. Setting the Thumbnail Size

Video Path 1 *Thumbnail Settings* *Thumbnail Size* *1/32* *1/16* *1/8* *1/4*	The size of the image sent to the VistaLINK® Thumbnail sever can be selected with this option. This will enable the user to send either 1/32, 1/16, 1/8, or 1/4 of the original video size to the thumbnail server.

5.8. AUDIO/VIDEO STATUS MENU

The *Audio/Video Status* menu is used to monitor parameters associated with both audio and video. The chart below shows the items available in the *Audio/Video Status* menu. The following sections provide detailed information about each of the parameters.

Input Video Standard	Displays the paths input video standard.
Video Delay	Reports video delay.
H Phase Delay	Reports current horizontal input to output delay.
V Phase Delay	Reports current vertical input to output delay.
Audio Delay	Reports Audio delay

5.8.1. Monitoring the Input Standard

Video Path 1
- *Audio/Video Status*
  - *Input Video Standard*

This option allows the user to see what video input standard the module has on the input.

5.8.2. Monitoring the Video Delay between the Input and Output Video

Video Path 1
- *Audio/Video Status*
  - *Video Delay*

This item displays the Video delay between the input and output video.

5.8.3. Monitoring the Horizontal Delay between the Input and Output Video

Video Path 1
- *Audio/Video Status*
  - *H Delay*

This item displays the horizontal delay between the input and output video. This value is useful to monitor while you are adjusting the H phase parameters and debugging system issues. One count is equivalent to 8 clocks of 27Mhz video.

5.8.4. Monitoring the Vertical Delay between the Input and Output Video

Video Path 1
- *Audio/Video Status*
  - *V Delay*

This item displays the vertical delay, measured in lines, between the input and output video. This value is useful to monitor while you are adjusting the V phase parameters and debugging system issues.

5.8.5. Monitoring the Audio Delay between the Input and Output Video

Video Path 1
- *Audio/Video Status*
  - *Audio Delay*

This item displays the Audio delay, measured in ms, between the input and output video.

5.9. CONFIGURING THE GENLOCK CONTROLS

The *Genlock* menus are used to configure parameters associated with both video processing channels. The chart below shows the items available in the *Genlock* menu. The following sections provide detailed information about each of the parameters.

Video standard	Selects the module operating video standard.
Genlock source	Selects the input source for the reference signal.
Free-run freq	Sets the VCXO free-running frequency.

5.9.1. Video Standard Selection

Genlock	
Video standard	
NTSC/525 *PAL-B/625*	

The video standard is selected with this control.

Note: *Auto* mode is not available. It would cause inter-channel standard selection arbitration issues.

5.9.2. Genlock Source Selection

Genlock	
Genlock source	
Ref. 1, *Ref. 2,* *Card ref,* *None*	

The *Genlock Source* control allows you to select the reference video input to the frame synchronizer. The reference must be an externally supplied colour black. Optionally, the synchronizer can be free-run if the "none" option is selected.

There are three possible sources of reference video; the *card ref*erence input BNC and two frame reference inputs (*Ref. 1* and *Ref. 2*) on the frame.

Make sure to adjust the video H and V output phase controls to calibrate the output phase of each of the videos as described.

5.9.3. Free-Run Frequency Adjustment

Genlock	
Free-run freq	
-256 to 256 *0*	

This control allows you to calibrate the free-running frequency of the on-board Voltage Controlled Crystal Oscillator (VCXO). This oscillator provides the time-base when either operating without a reference input (free-running) or when running with a reference and the reference video is removed.

To calibrate the free-running frequency, use this or a similar procedure:

- Turn off genlocking with the "Genlock source" control or remove reference video from the reference input. Wait for the VCXO to stabilize at its free-running frequency.
- Apply the composite analog monitoring output video to a scope that is externally referenced to the signal (usually plant reference black) that you are trying to frequency match.
- Adjust this control until the scrolling stops.
- Turn genlocking back on or apply reference video.

5.10. PRESETS

5.10.1. Saving and Recalling Configurations

The CD2 modules provide 10 user preset areas to save the complete set of control from the On-Screen menu. The *Store preset* and *Recall preset* menu items are used to save and recall these configurations.

For simplicity the following sections of the manual show how to store and recall from Preset 1 only.

5.10.1.1. Storing Configurations to the User Presets

- *Presets*
  - *Store preset 1*
    - *None*
    - *User 1 to 10*

This control is used to initiate a store of the current module configuration into one of the user presets. The current configuration can be saved by selecting one of the 10 user selectable presets and then depressing the push button.

5.10.1.2. Recalling Configurations from the User Presets

- *Presets*
  - *Recall preset 1*
    - *None,*
    - *Default*
    - *User 1 to 10*
    - *Cancel*

This control is used to initiate a recall of the current module configuration from one of the user presets. The user can either select the factory default configuration of the module or pre-assigned user presets 1 through 10.

To select a configuration, scroll to the desired configuration and depress the push button.

Warning: There will be a slight disturbance in the operation of the module and the On-Screen display while the new preset is being recalled.

Warning: The current state of the module will be forgotten if it has not been saved to a preset before a recall is performed.

6. JUMPERS

6.1. TERMINATION JUMPERS

REF TERM: The REF TERM jumper J20 located on the rear of the 7837CD2 board near the white multi-pin connector selects the reference video termination impedance. Either 75Ω or a high-Z (27kΩ) termination impedance can be selected by placing the jumper in the "75" (top justified) or "HI-Z" (bottom justified) positions, respectively.

CH1, 2 TERM: The CH1 (J21) and CH2 (J22) TERM jumpers located on the rear of the 7837CD2 board near the white multi-pin connector, selects the video input termination impedance. Either 75Ω or a high-Z (27kΩ) termination impedance can be selected by placing the jumper in the "75" (top justified) or "HI-Z" (bottom justified) positions, respectively.

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

FRAME STATUS: The FRAME STATUS jumper J4, located near the module extractor on the 7837CD2 board, determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7800FR 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. (Default) When this jumper is moved to the OFF position, local faults on this module will not be monitored.

6.3. CONFIGURING THE MODULE FOR FIRMWARE UPGRADE PROCEDURES

The following method can be used to upgrade the firmware in the module.

UPGRADE: The UPGRADE jumper J5, located at the front edge of the 7837CD2 board above the module extractor, is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position.

To upgrade the firmware in the module unit, pull it out of the frame. Move Jumper J5 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J10 at the module edge. Re-install the module into the frame. Once the upgrade is complete, remove the module from the frame, move J5 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

7. *Vista*LINK® REMOTE MONITORING/CONTROL

7.1. WHAT IS *Vista*LINK®?

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. Module configuration through VistaLINK® PRO can be performed on an individual or multi-module 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 *Vista*LINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled products.

2. Managed devices (such as 7837CD2), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7800FR 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 *Vista*LINK® network, see the 7700FC Frame Controller chapter.

7.2. *Vista*LINK® TRAPS

The 7837CD2 contains video traps that indicate whether or not the input paths are receiving valid video.