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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Version	Feb 03
1.0	First release version Functions of J6 and J7 corrected (sections 6.2 and 6.4)	May 03
1.1	Fixed Diff Gain Spec, corrected feature description	Jun 03
1.2	Added section on Upgrading Firmware	Jul 03
1.3	Updated Delay table and menu structure, fixed typographical errors	Sep 03
1.3.1	Added into that most menus are not applicable in standard definition mode	Oct 03
1.4	Added support for 60 Hz video formats. Added VistaLINK® support	Feb 04
2.0	Added support for Caption Decoder	Jun 04
2.1	Added Markers menu, menu cleanup for released firmware version 2.0	Aug 04
2.2	Updated standard EIA608-EIA708 to CEA608-CEA708	Dec 06
3.0	Updated menu descriptions and VistaLINK® parameters (added Traps). Minor corrections throughout the manual.	Jul 07
3.1	Updated Jumpers on Figure 6-1	Oct 08

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1. OVERVIEW

The 500DCDA-HD is a superior multifaceted device used in down conversion and distribution amplification. More specifically, it is a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals. It can also function as a monitoring distribution amplifier for standard definition 270 Mb/s signals. The 500DCDA-HD can provide up to 5 reclocked DA outputs and 4 downconverted SDI or composite analog NTSC/PAL outputs (selectable). Furthermore, the 500DCDA-HD accepts all the popular international SMPTE 292M video formats. When the 500DCDA-HD downconverts 23.98/24 Hz video input to 525i/59.94 with a 3:2 pulldown, the 3:2 pulldown cadence can be free running or locked to embedded RP188 time code.

The 500DCDA-HD is an extremely flexible downconverter. It downconverts using various methods such as 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze. The 500DCDA-HD supports Wide-Screen signaling (WSS) on the output, which allows downstream equipment to properly respond to various aspect ratios of program material.

The user maintains exclusive control over the configuration of the video parameters via the video processing functions. Full 10 bit processing is provided throughout the signal path to achieve excellent downconversion quality. Furthermore, the module allows for selectable horizontal and vertical filters to control picture sharpness. It provides colour space conversion from ITU rec. 709 to ITU rec. 601. The 500DCDA-HD has a closed caption monitoring capability that decodes CEA-608 or CEA-708 captions that have been encoded into the VANC data space of the HD video input, or CEA-608 captions from a SD video input.

The 500DCDA-HD enables precise management of the audio parameters. The 500DCDA-HD also de-embeds two groups of audio and re-embeds the audio on the SDI output in time with the video. The parameters can be controlled through use of the On Screen display menu or through VistaLINK® PRO.

The 500DCDA-HD's design is superior in quality and functionality. The 500DCDA-HD provides card edge LEDs to indicate signal presence and audio group presence. The 500DCDA-HD occupies one card slot in the 3RU frame which will hold up to 15 modules, or the 1RU frame which will hold up to three modules.

Features:
- Serial digital 1.5 Gb/s HD input per SMPTE 292M
- Supports most international standards including 1080i/60, 1080i/59.94, 1080i/50, 1080p/24, 1080p/23.98, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 480p/60, and 480p/59.94
- Will also accept 270 Mb/s SD input SDI per SMPTE 259M-C in a pass through mode – auto senses HD or SD inputs
- 4 Reclocked DA outputs (HD if HD inputs applied, SD if SD inputs applied)
- DA output is turned off when there is no input (in Rev D only)
- 4 Jumper selectable SDI or Composite Outputs (downconverted from HD if HD input applied), (from reclocked SD if SD input applied)
- High quality monitoring HD -> SD down conversion
- Supports 16:9 letterbox, 14:9 letterbox, 13:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- 23.98/24 Hz video conversion to 525i/59.94 with 3:2 pulldown sequence
- HD to SD colour space conversion (SMPTE 240M and ITU rec. 709 to ITU rec. 601)
- On Screen display used to configure the operating modes
- De-embeds Audio from HD video and embeds into standard definition SDI video (2 groups)
- Moves ANC data (e.g. captioning, timecode) from HD video to standard definition SDI video

- Decodes and displays CEA-608 or CEA-708 captions from incoming video
- Support for Wide-Screen Signaling (WSS) on output
- On Screen aspect ratio markers
- Card Edge LEDs for signal presence, signal type, audio groups present and module status
- VistaLINK® enabled offering remote monitoring, control and configuration capabilities via SNMP. VistaLINK® control is available when modules are used with the 3RU 500FR frame with a 500FC VistaLINK® Frame Controller module in slot 1 of the frame. The module can be controlled using the model 9000NCP Network Control Panel, Evertz VistaLINK® PRO, or other third party SNMP manager software.
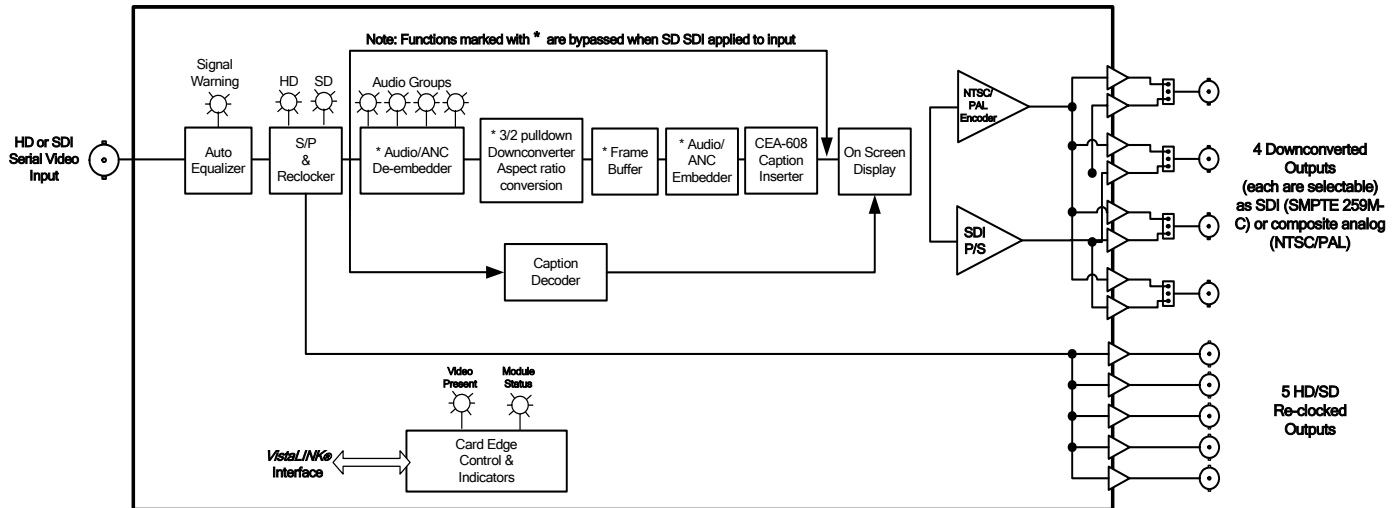
Figure 1-1: 500DCDA-HD Block Diagram

2.   INSTALLATION

The 500DCDA-HD comes with a companion rear panel overlay that can be placed over the rear panel BNC connectors to identify their function. For information on inserting the module into the frame see section 3 of the 500FR chapter.
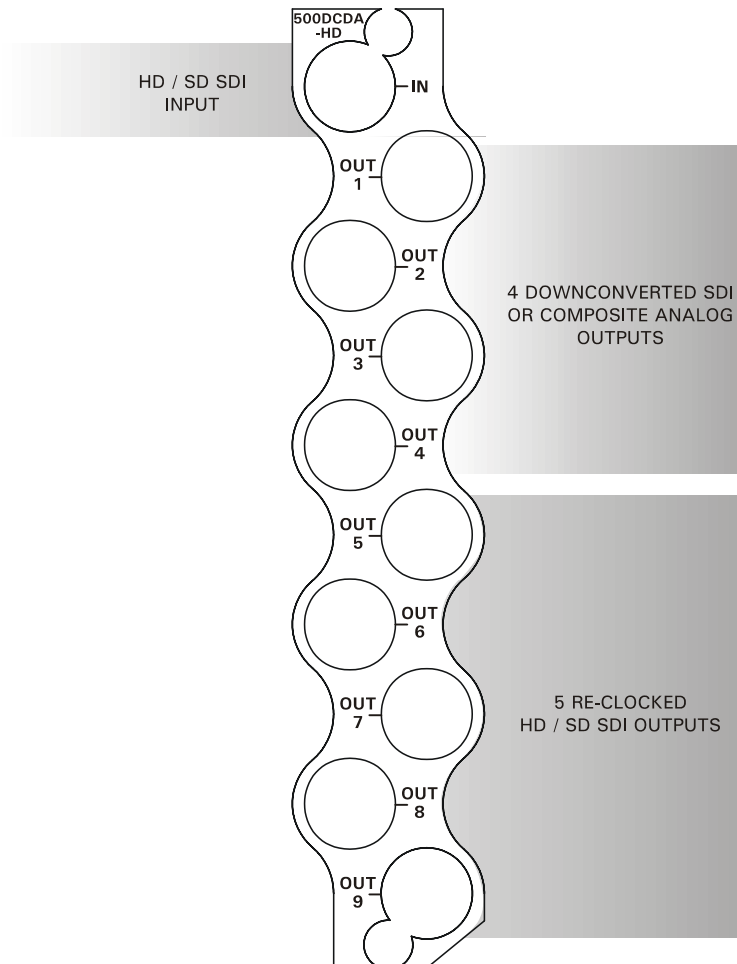
Figure 2-1: 500DCDA-HD Rear Panel Overlay

IN: Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 292M or SMPTE 259M-C standards.

OUT 1 to 4:   These four BNC connectors can be individually configured either as downconverted SDI video outputs, compatible with the SMPTE 259M-C standard, or as composite analog (NTSC/PAL) video outputs. See section 6.5 for information on selecting the output type.

OUT 5 to 9:   These five BNC connectors are used to output reclocked serial component video in the same standard as the video input. In Rev D or higher, these outputs turn off when there is no video present.

3. SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standards: 270 Mb/s SMPTE 259M-C (525i/59.94 or 625i/50) - pass through mode
1.485 Gb/sec SMPTE 292M – auto-detects standard
SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M – see Table 3-1 for
a list of supported HD video standards

Common Name	Pixels / Active Lines	Frame Rate	Progressive /Interlace	SMPTE Standard	Output Format
1080i/60	1920 x 1080	30	I	274M	525i/60
1080i/59.94	1920 x 1080	29.97 (30/1.001)	I	274M	525i/59.94 (NTSC)
1080i/50	1920 x 1080	25	I	274M	625i/50 (PAL)
1080p/29.97	1920 x 1080	29.97 (30/1.001)	P	274M	525i/59.94 (NTSC)
1080p/29.97sF	1920 x 1080	29.97 (30/1.001)	P (sF)	274M	525i/59.94 (NTSC)
1080p/30	1920 x 1080	30	P	274M	525i/60
1080p/30sF	1920 x 1080	30	P (sF)	274M	525i/60
1080p/25	1920 x 1080	25	P	274M	625i/50 (PAL)
1080p/25sF	1920 x 1080	25	P (sF)	274M	625i/50 (PAL)
1080p/24	1920 x 1080	24	P	274M	525i/60
1080p/23.98	1920 x 1080	23.98 (24/1.001)	P	274M	525i/59.94 (NTSC)
1080p/24sF	1920 x 1080	24	P (sF)	274M	525i/60
1080p/23.98sF	1920 x 1080	23.98 (24/1.001)	P (sF)	274M	525i/59.94 (NTSC)
1035i/60	1920 x 1035	30	I	260M	525i/60
1035i/59.94	1920 x 1035	29.97 (30/1.001)	I	260M	525i/59.94 (NTSC)
720p/60	1280 x 720	60	P	296M	525i/60
720p/59.94	1280 x 720	59.94 (60/1.001)	P	296M	525i/59.94 (NTSC)
720p/50	1280 x 720	50	P	296M	625i/50 (PAL)
480p/60	720 x 483	60	P	293M, 349M	525i/60
480p/59.94	720 x 483	59.94 (60/1.001)	P	293M, 349M	525i/59.94 (NTSC)

Table 3-1: Video Input Formats

Connector: BNC per IEC 60169-8 Amendment 2
Input Equalization: Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable
Return Loss: >15 dB up to 1.5GHz

3.2. RECLOCKED SERIAL VIDEO DA OUTPUTS

Standard: Same as input
Number of Outputs: 5 Per Card reclocked
Connector: BNC per IEC 60169-8 Amendment 2
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal for HD
750ps nominal for SD
Overshoot: <10% of amplitude
Return Loss: > 15 dB at 1.5 Gb/s
Jitter: < 0.2 UI

3.3. DOWNCONVERTED SERIAL VIDEO OUTPUTS

Standard: SMPTE 259M-C (270 Mb/s)
Number of Outputs: up to 3 Per Card (jumper selectable)
Connector: BNC per IEC 60169-8 Amendment 2.
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 750ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB at 270 Mb/s
Jitter: < 0.2 UI

3.4. DOWNCONVERTED COMPOSITE ANALOG VIDEO OUTPUTS

Standards: Analog composite NTSC (SMPTE 170M) or
                        Analog composite PAL (ITU-R BT.470)
Number of Outputs: up to 3 Per Card (jumper selectable)
Connectors: BNC per IEC 60169-8 Amendment 2.
Signal Level: 1 V p-p nominal
DC Offset: 0V ±0.1V
Return Loss: >35dB up to 5 MHz
Frequency Response: 0.2dB to 4MHz
Differential Phase: <0.5°(<0.3° typical)
Differential Gain: <0.8% (<0.5 % typical)
SNR: >78dB to 5 MHz (shallow ramp)
Impedance: 75 ohm

3.5. INPUT TO OUTPUT PROCESSING DELAY (HD INPUT VIDEO)

Video Delay: Approximately 1 to 3 frames depending on input video format, processing mode and phase setting – see Table 5-1.
Audio Delay: Audio is delayed and re-embedded in time with the output picture

3.6. ELECTRICAL

Voltage: +12VDC
Power: 10 Watts.
EMI/RFI: Complies with FCC regulations for class A devices.
                        Complies with EU EMC directive.

3.7. PHYSICAL

Number of slots: 1

4. STATUS INDICATORS

The 500DCDA-HD has 10 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. See Figure 6-1 for the location of the LEDs and card edge controls.

Two large LEDs on the front of the 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 or if a local 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 board power is good.

There are four small LEDs, near the upper edge of the board, that indicate the status of the equalizer and reclocker.

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

HD INPUT: This Green LED will be On when there is a valid high definition signal present at the module input.

SD INPUT: This Green LED will be On when there is a valid standard definition (525 or 625 line) SDI signal present at the module input.

SIGNAL WARNING: This Red LED will be On when the module cannot lock to the input serial digital signal.

4.1. AUDIO STATUS LEDs

Four LEDs, located on the lower edge of the module near the card extractor, indicate which audio groups are present in the input video. Audio group LED 1 is located closest to the center of the module. These LEDs are only valid when an HD input video signal is applied.

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

5.   ON SCREEN MENUS

5.1.   NAVIGATING THE ON SCREEN MENU SYSTEM

A toggle switch and pushbutton enables card edge navigation through a set of On Screen menus used to configure the card. 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 toggle switch 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 selecting. Once the arrow is on the desired item, press the pushbutton to select the next menu level.

On all of the 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 toggle switch 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 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.

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. The following section provides a brief description of the first level of menus that appear when you enter the OSD screens. Selecting one of these items will take you to the next menu level. Sections 5.3 to 5.9 provide detailed descriptions on each of the sub-menus. The tables in sections 5.3 to 5.9 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	Sets input and output video standards and timing for video output.
Output Picture	Configures the output picture parameters.
Scaler	Configures the scaler filters and parameters.
VANC Data Processing	Controls Vertical Ancillary Processing Parameters.
CC Setup	Configures the Closed Captions decoder.
Audio	Controls the Audio group selection.
Analog Output	Configures the analog video output parameters.
Marker	Configures the On Screen aspect ratio marker.
Utilities	Configures the Firmware and preset utilities.

5.3.   CONFIGURING THE VIDEO CONTROLS

The *Video* menus are used to configure parameters associated with the input and output video standards and output video timing. Other than the Video Type menu, these menu items are not applicable when a standard definition input video is connected. The chart below shows the items available in the *Video* menu. Sections 5.3.1 to 5.3.5 provide detailed information about each of the menu items.

Video Type	Sets the video input type to High Definition (HD) or Standard Definition (SD).
Std	Selects the video input and output standards.
Pulldown Reference	Selects reference source when 3:2 pulldown is being performed on the output.
A Frame Offset	Sets the A Frame Offset from the Pulldown Reference.
525 V Phase Offset	Sets the vertical phase of output 525/NTSC video with respect to input video.
525 H Phase Offset	Sets the horizontal phase of output 525/NTSC video with respect to input video.
625 V Phase Offset	Sets the vertical phase of output 625/PAL video with respect to input video.
625 H Phase Offset	Sets the horizontal phase of output 625/PAL video with respect to input video.
Set Minimum Delay	Configures output timing to achieve minimum delay.
Limiter	Enables or Disables the limit on the value of Active Picture samples.

5.3.1. Setting the Video Input Type

Video
Video Type
Auto
SD
HD

This control enables the user to set whether the 500DCDA-HD will function as a reclocking high definition serial digital video distribution amplifier and a high quality downconverter for 1.5 Gb/s HDTV signals or function as a monitoring distribution amplifier for standard definition 270 Mb/s signals.

When set to *Auto,* the module will autodetect the input video type. You can also force it to either high definition mode (*HD)* or standard definition mode (*SD).*

When the input video is Standard Definition, the 500DCDA-HD operates as a monitoring distribution amplifier. In this mode it does not process the audio or vertical interval data but merely passes it through. Accordingly, the menu items that control these functions (as described in sections 5.3.2 to 5.7) have no effect when the 500DCDA-HD is operating with standard definition video.

5.3.2. Setting the Video Input and Output Standard

Video
Std
Auto
1080i/59.94 to 525i/59.94
720p/59.94 to 525i/59.94
1080i/50 to 625i/50
1080p/23.98sF to 525i/59.94
1080p/29.97sF to 525i/59.94
1080p/25sF to 625i/50
1035i/59.94 to 525i/59.94
480p/59.94 to 525i/59.94
1080p/24 to 525i/60
1080p/23.98 to 525i/59.94
1080i/60 to 525i/60
720p/60 to 525i/60
1035i/60 to 525i/60
480p/60 to 525i/60
1080p/30sF to 525i/60
1080p/24sF to 525i/60
720p/50 to 625i/50
1080p/29.97 to 525i/59.94
1080p/30 to 525i/60
1080p/25 to 625i/50

This control enables the user to input and output video standards. This menu item is not applicable when a standard definition input video is connected.

Note: When set to *Auto,* the module cannot distinguish between *1080i/59.94, 1080p/29.97sF and 480p/59.94*, so it will be treated as *1080i/59.94*. Similarly, *1080p/25sF* will be treated as *1080i/50,* and *1080p/30sF* and *480p/60* will both be detected as *1080i/60*.

When the input standard is *1080p/29.97sF, 1080p/30sF,* or *1080p/25sF* it is important to manually select the standard using this control so that the scaler knows to perform the proper down conversion.

5.3.3. 3:2 Pulldown Processing

When using a 1080i/60 or 1080i/59.94 input video feed containing 3:2 pulldown, the 500DCDA-HD downconverts each field of the incoming image to one field of the output image. Therefore, there will be no pulldown related de-interlacing artifacts on film originated material with 3:2 pulldown, or video originated material acquired at a nominal 24 frames per second.

When using a 720p/60, 720p/59.94, 480p/60, 1080p/25, 1080p/30 or 1080p/29.97 input video feed the 500DCDA-HD downconverts each frame of the incoming image to one field of the output image. Therefore, there will be no pulldown related artifacts on film originated material with 3:2 pulldown, or video originated material acquired at a nominal 24 frames per second.

When using a 1080p/24sF or 1080p/23.98sF input video feed the 500DCDA-HD combines each segment of the incoming image back to a progressive frame before down conversion. When using a 1080p/24 or 1080p/23.98 input video feed the 500DCDA-HD downconverts each frame of the incoming image. After down conversion, extra fields are inserted to create a 3:2 pulldown at the output. The *Pulldown Reference* and *A Frame Offset* controls are used to determine the cadence of the 3:2 output.

5.3.3.1. Selecting the 3:2 Pulldown Reference with 24 Fps and 23.98 Fps Input Video

> ✍ **This menu setting is only used when the input video is 1080p/24, 1080p/23.98, 1080p/24sF or 1080p/23.98sF. With other input video formats it is not applicable.**

Video
Pulldown Reference
Auto
RP188
Free Run

On 24 Fps and 23.98 Fps video input formats the *Pulldown Reference* control to identify the input frame that will become an A frame at the output. This frame is called the *A frame candidate* (see Figure 5-1). The output of the *A frame candidate* frame will be delayed by 2 frames, will consist of two video fields and will normally be in time with the input.   Additionally, an offset can be added to the A Frame reference using the *A Frame Offset* control to accommodate situations where the A frames are not in time with the A Frame reference. (See section 5.3.3.2)

When you select *Auto* the 500DCDA-HD will auto detect the pulldown reference according to the following priority:
• RP188 ancillary timecode if present
• Free Run pulldown if RP188 is not present

Select *RP188* when the embedded ancillary timecode present on the input video is used to determine the pulldown. The input frames with time code frame numbers divisible evenly by 4 will normally identify the input A frame candidates.

Select *Free Run* when you want a continuous 3:2 pulldown on the output but do not care if it matches specific frames of the input video.

5.3.3.2. Accommodating Non-Standard 3:2 Sequences

> ✎ **This menu setting is only used when the input video is 1080p/24, 1080p/23.98, 1080p/24sF or 1080p/23.98sF. With other input video formats it is not applicable.**

Video
A Frame Offset
0
1
2
3

This control allows the user to select other frames as the A Frame.

Figure 5-2 shows how this control defines the A frame when RP188 Ancillary data is used to control the 3:2 pulldown.
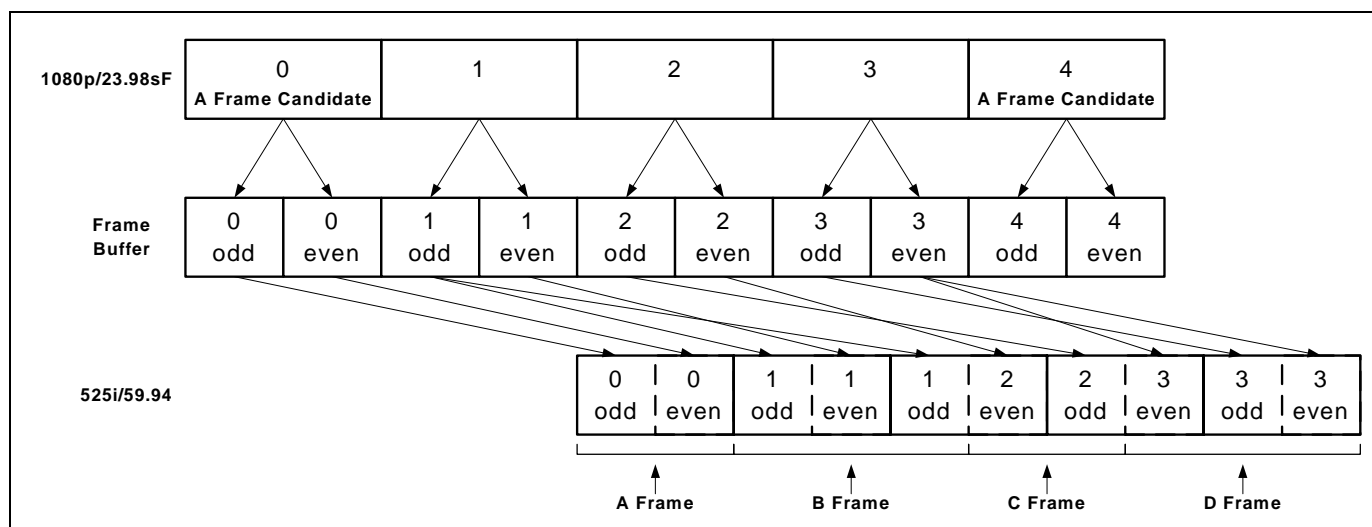
Figure 5-1: 3:2 Pulldown Sequence Insertion – 24 Fps and 23.98 Fps Input Video
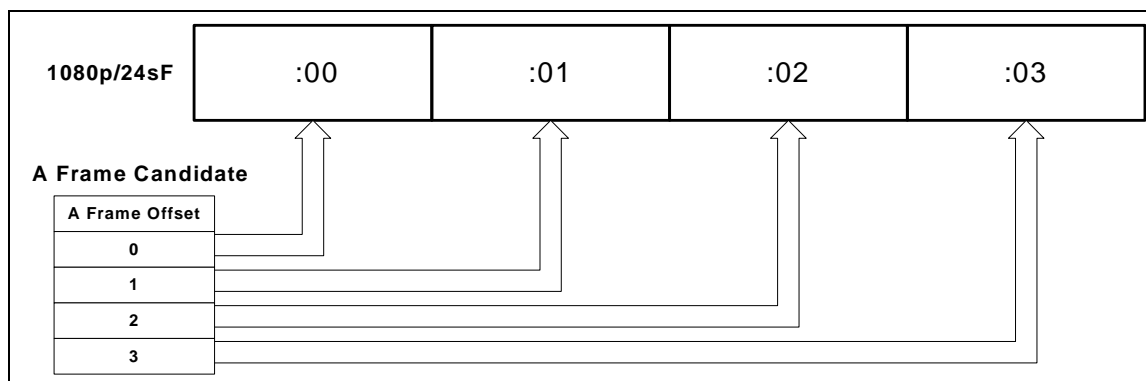
Figure 5-2: RP188 Pulldown Sequence A Frame Alignment – 24 Fps and 23.98 Fps Input Video

5.3.4. Setting Up the Video Output Timing

The output stage of the downconverter contains a frame buffer and a line buffer so that the output video can be timed with respect to the incoming HD Video.

There are separate controls to adjust the horizontal and vertical timing of the output video for both the 525 and 625 line video standards. The controls work in the same way for each video standard, except that the *V Phase Offset* control has valid values from 0 to the number of lines per frame in the respective video standard.

> **The *V Phase Offset* and *H Phase Offset* adjustments are REAL TIME ADJUSTMENTS and will affect the output video timing immediately. These settings should not be adjusted when the output video is in the broadcast chain.**

5.3.4.1. Calculating the Delay through the Downconverter

The delay through the downconverter is dependent on the video input format and the H and V phase settings. Table 5-1 shows the default for each video standard. Delays shown are expressed in the units of the output video.

The default delay occurs when the *V Phase Offset* and *H Phase Offset* parameters are set to zero. If increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer, the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a loss of one frame of throughput delay between the HD input and the video output. If when increasing the *H Phase Offset* value causes it to go beyond the limit of the line buffer, the *H Phase Offset* will wrap to the beginning of the line buffer. Thus, the minimum delay is achieved when both the *V Phase Offset* and *H Phase Offset* wrap to the beginning of the frame and line buffers. The maximum delay is achieved one line before the *V Phase Offset* wraps to the beginning of the frame buffer and one sample before the *H Phase Offset* wraps to the beginning of the line buffer.

	Default Delay
	Output Frames
1080i/60 1080i/59.94	2
1080i/50	2
1080p/24sF 1080p/23.98sF	2.5
1080p/24 1080p/23.98	2
1080p/30sF 1080p/29.97sF	2
1080p/25sF	2
1035i/60 1035i/59.94	1
720p/60 720p/59.94	1.5
480p/60 480p/59.94	1
1080p/29.97 1080p/30	2

Table 5-1: Video Delay

5.3.4.2. Setting the Vertical Phase of the Output Video – 525 Line Video

Video
525 V Phase Offset
0 to 524 *0*

This control enables the user to set the vertical timing of the output video with respect to the HD input when operating with a 525 line video output. Setting this control to 0 keeps the output video in time with the input video.

Increasing the value will delay the output video in one-line increments. In order to advance the vertical timing set the control to 525 minus the number of lines that you wish to advance the output video. (E.g. to advance the output video 5 lines set the value to 520.) If when increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer, the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a change of one frame of throughput delay between the HD input and the video output.

5.3.4.3. Setting the Horizontal Phase of the Output Video – 525 Line Video

```
Video
   525 H Phase Offset
      0 to 1715
      0
```

This control enables the user to set the horizontal timing of the output video with respect to the HD input when operating with a 525 line video output. Setting this control to 0 keeps the output video in time with the input video.

Increasing the value will delay the output video in one-sample increments. In order to advance the horizontal timing of the output video, set the control to 1716 minus the number of samples that you wish to advance the output video. (E.g. to advance the output video 5 samples set the value to 1711.) If when increasing the *H Phase Offset* value causes it to go beyond the limit of the line buffer, the *H Phase Offset* will wrap to the beginning of the line buffer, resulting in a change of one line of throughput delay between the HD input and the video output.

5.3.4.4.Setting the Vertical Phase of the Output Video – 625 Line Video

```
Video
   625 V Phase Offset
      0 to 624
      0
```

This control enables the user to set the vertical timing of the output video with respect to the HD input when operating in a 625 line video output. Setting this control to 0 keeps the output video in time with the input video.

Increasing the value will delay the output video in one-line increments. In order to advance the output video, set the control to 625 minus the number of lines that you wish to advance the output video. (E.g. to advance the output video 5 lines set the value to 620.) If when increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer, the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a change of one frame of throughput delay between the HD input and the video output.

5.3.4.5.Setting the Horizontal Phase of the Output Video – 625 Line Video

```
Video
   625 H phase Offset
      0 to 1727
      0
```

This control enables the user to set the horizontal timing of the output video with respect to the PAL input when operating with a 625 line video output. Setting this control to 0 keeps the output video in time with the input video.

Increasing the value will delay the output video in one-sample increments. In order to advance the horizontal timing of the output video, set the control to 1728 minus the number of samples that you wish to advance the output video. (E.g. to advance the output video 5 samples set the value to 1723.) If when increasing the *H Phase Offset* value causes it to go beyond the limit of the line buffer, the *H Phase Offset* will wrap to the beginning of the line buffer, resulting in a change of one line of throughput delay between the HD input and the video output.

5.3.4.6. Selecting Minimum Delay

Video
Set Minimum Delay
<u>*Cancel*</u>
<u>*Set*</u>

This control enables the user to set the timing of the output video with respect to the current input video so that the minimum delay is achieved through the module.

When you select *Set* and press the pushbutton, the *H Phase Offset* and *V Phase Offset* menu items for the current video standard will be adjusted to achieve the minimum delay through the card.

Any subsequent changes to the settings of the card may affect the delay through the card. You will have to perform the *minimum delay* setting again.

5.3.5. Limiting the Video Output to Legal Values

Video
Limiter
<u>*Disable*</u>
<u>*Enable*</u>

This control enables a limiter that will clip the video data to legal SDI values. This control affects both the SD and composite analog outputs.

5.4. CONFIGURING THE OUTPUT PICTURE

The *Output Picture* menu is used to configure parameters associated with the output picture. These menu items are not applicable when standard definition input video is connected. The chart below shows the items available in the *Output Picture* menu. Sections 5.4.1 to 5.4.3 provide detailed information about each of the menu items.

Aspect Ratio

Selects the aspect ratio of the output picture.

Loss of Video

Selects the action to take when the input video is missing.

Panel Colours

Sets the colour of the letterbox panels.

5.4.1. Setting the Aspect Ratio of the Output Picture

Output Picture
Aspect Ratio
<u>16:9 Letterbox</u>
4:3 Side Cut
4:3 Squeeze
14:9 Letterbox
13:9 Letterbox

SDTV monitors are usually 4:3, thus, there is a need for some simple aspect ratio conversion from the HDTV 16:9 format. This control enables you to set the aspect ratio of the output picture.

When we display a full 16:9 picture on a 4:3 (12:9) monitor, the picture becomes anamorphic (4:3 squeeze) resulting in tall thin people. To correct this problem, we have a choice of cropping the edges (4:3 side cut) or making the whole picture smaller (16:9 letter box). The 14:9 and 13:9 letterbox solutions are a compromise where the picture is larger than 16:9 letterbox and less of the edges are cropped than 4:3 side cut.

The anamorphic solution uses all the horizontal lines of the 4:3 raster. Clipping discards video information at the start and end of each line. For the letterbox solution, we have to re-map the picture to occupy fewer lines. The unused lines at the top and bottom of the picture can be set to different colours using the "Panel Colours" control. See section 5.4.3

Figure 5-3 shows the various output aspect ratios available.

4:3 Sidecut

4:3 Squeeze

16:9 Letterbox

14:9 Letterbox

13:9 Letterbox
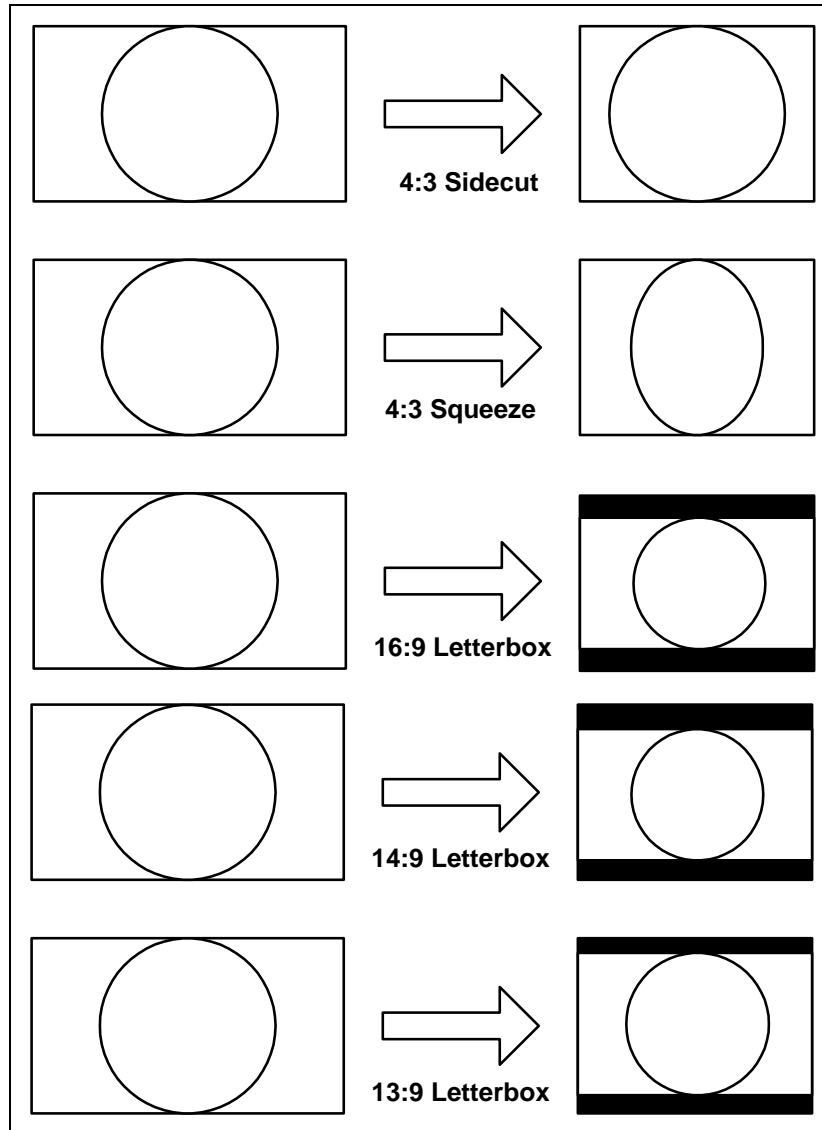
Figure 5-3: Aspect Ratio Conversions

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

Output Picture
Loss of Video
<u>*Black*</u>
Blue
Pass

The user can set the output to go to black, go to blue or pass the input with this control. When set to *Black* or *Blue* the video standard of the output is set by jumper J6. (See section 6.3)

When set to *Pass* the output video image will be incoherent when the video input is missing.

5.4.3. Set the Colour of the Letterbox Panels

Output Picture
Panel Colours
<u>*Black*</u>
Blue
Red
White

The user can set the colour of the letterbox panels with this control.

5.5.   CONFIGURING THE SCALER

The 500DCDA-HD scaler chip uses a process of filtering in order to reduce the resolution from 1920 x 1080 (or 1280 x 720) to 720 x 486 (or 720 x 576). The *Scaler* menu is used to configure the cut-off frequencies of the filters associated with the scaler hardware. These menu items are not applicable when a standard definition input video is connected. The chart below shows the items available in the *Scaler* menu. Sections 5.5.1 to 5.5.2 provide detailed information about each of the menu items.

H Filter Cutoff

Sets the cutoff frequency of the horizontal filter in the scaler.

V Filter Cutoff

Sets the cutoff frequency of the vertical filter in the scaler.

5.5.1. Setting the Scaler Horizontal Filter Sharpness

Scaler
H Filter Cutoff
<u>*0.35 Fs*</u>
0.15 to 0.5 Fs

This control enables the user to set the sharpness of the horizontal filter used during the downconversion process. A higher number value reflects a sharper picture.

5.5.2. Setting the Scaler Vertical Filter Sharpness

Scaler
V Filter Cutoff
<u>*0.35 Fs*</u>
0.15 to 0.5 Fs

This control enables the user to set the sharpness of the vertical filter used during the downconversion process. A higher number value reflects a sharper picture.

5.6.   CONFIGURING THE VERTICAL INTERVAL PROCESSING

The *VANC Data Processing* menu is used to configure how vertical interval signals such as closed captions and vertical interval time code (VITC) are processed. These menu items are not applicable when standard definition input video is connected. The chart below shows the items available in the *VANC Data Processing* menu. Sections 5.6.1 to 5.6.9 provide detailed information about each of the menu items.

Closed Captions En/Dis	Enables or Disables Closed Captioning on the output.
VITC Generator	Controls whether Vertical Interval Time Code (VITC) will be inserted on the program video outputs.
VITC UB	Controls whether the output VITC User Bits will contain the original time or original User Bits.
Dflt VITC Source	Selects the preferred type of ancillary time code to read from the HD input.
525 VITC Line	Sets VITC insertion line on 525/NTSC video outputs.
625 VITC Line	Sets VITC insertion line on 625/PAL video outputs.
WSS En/Dis	Enables or Disables Wide-Screen Signaling on the output.
525 WSS Line Num	Sets Wide-Screen Signaling insertion line on 525/NTSC video output.
625 WSS Line Num	Sets Wide-Screen Signaling insertion line on 625/PAL video output.

5.6.1. Generating Closed Captions on the Program Video Outputs

VANC Data Processing	This control determines whether closed captions will be encoded on line 21 according to CEA-608B on the SDI and analog outputs.
Closed Captions En/Dis	
Off	Set the control to *Off* to disable closed caption encoding.
On	Set the control to *On* to encode the CEA-608 closed captions that have been extracted from SMPTE 334M VANC data on the incoming HD video. When there is no incoming SMPTE 334M caption data, a null CEA-608B waveform is inserted on line 21 of the output video (Line 22 for 625/PAL outputs).

5.6.2. Generating VITC on the Program Video Outputs

VANC Data Processing
VITC Generator
Off
On

This control determines whether vertical interval time code (VITC) will be inserted on the program SDI and analog video outputs. 525 VITC Line and 625 VITC Line menu items set the insertion line for the VITC. The time bits will be converted from the RP188 ancillary time code on the HD video input. The User Bits can be set to the original time or User Bits by the *VITC User Bits* menu item.

5.6.3. Selecting the Contents of the VITC User Bits

VANC Data Processing
VITC UB
Original Time
Original UB

This control determines whether VITC User Bits will contain the original time numbers or the original User Bit numbers. The VITC generator must be enabled using the *VITC Generator* menu item.

When the incoming video is at a different frame rate than the downconverted video, it is often useful to pass the original time code information in the VITC User Bits.

For other applications it is necessary to carry the User Bits from the incoming time code into the VITC User Bits.

5.6.4. Selecting the Default Source for the VITC Inserter

VANC Data Processing
Dflt VITC Source
RP188: LTC
RP188: VITC

Select the default source for the VITC Inserter. The reader will automatically switch to a valid source if the preferred source is not present

5.6.5. Setting the VITC Line for 525 Line Video Outputs

VANC Data Processing
525 VITC Line
14
10 to 20

This control determines the line number that will be used to insert VITC into the 525 line video output when the *VITC Generator* control is set to *On*.

5.6.6. Setting the VITC Line for 625 Line Video Outputs

VANC Data Processing
625 VITC Line
19
6 to 22

This control determines the line number that will be used to insert VITC into the 625 line video output when the *VITC Generator* control is set to *On*.

5.6.7. Generating Wide-Screen Signaling on the Program Video Outputs

VANC Data Processing
WSS En/Dis
Off
On

This control determines whether Wide-Screen Signaling will be encoded on the SDI and analog outputs.

Set the control to *Off* to disable WSS encoding.

Set this control to *On* to encode WSS onto the line specified in sections 5.6.8 and 5.6.9 on the output video.

5.6.8. Setting the WSS Line for 525 Line Video Outputs

VANC Data Processing
525 WSS Line Num
22
10 to 22

This control determines the line number where WSS will be inserted in 525 line video when the *WSS Enable* control is set to *On*.

5.6.9. Setting the WSS Line for 625 Line Video Outputs

VANC Data Processing
625 WSS Line Num
23
6 to 23

This control determines the line number where WSS will be inserted in 625 line video when the *WSS Enable* control is set to *On*.

5.7. CONFIGURING THE CLOSED CAPTION DECODER

The *CC Setup* menu is used to configure the On Screen caption decoder of the 500DCDA-HD. The CEA-708 decoder is not applicable when standard definition input video is connected. SD 525 CC Input line and SD 625 CC Input line are not applicable when high definition input video is connected.

CEA-*608 Decoder*	Configures the CEA-608 decoder display.
CEA-*708 Decoder*	Configures the CEA-708 decoder display.
SD 525 CC Input Line	Sets closed caption decode line for SD 525 line video inputs.
SD 625 CC Input Line	Sets closed caption decode line for SD 625 line video inputs.

5.7.1. Configuring the CEA-608 Decoder

There are 7 menu items that are used to configure various aspects relating to the CEA-608 closed caption decoder.

> ✎ **The On Screen display must be configured to display the CEA-608 decoder in the Utilities menu before captions will be visible on the screen. See section 5.11.1.**

5.7.1.1.Configuring the CEA-608 Decoder Closed Caption Channel

CC Setup
CEA-608 Decoder
CC Channel
Off
CC1 to CC4

This control selects the CEA-608 caption channel that will be decoded. Channels 1 through 4 can be selected or the CEA-608 caption decoder can be turned off.

5.7.1.2. Configuring the CEA-608 Decoder Text Channel

CC Setup
CEA-608 Decoder
Text Channel
Off
T1 to T4

This control selects the CEA-608 text channel that will be decoded. Channels 1 through 4 can be selected or the CEA-608 text decoder can be turned off.

5.7.1.3. Configuring the CEA-608 Decoder Text Window Position

CC Setup
CEA-608 Decoder
Text Window Top Row
6
1 to 15

This control allows the user to set the position of the Text Window displayed on the On Screen display.

5.7.1.4. Configuring the CEA-608 Decoder Text Window Height

CC Setup
CEA-608 Decoder
Text Window Height
4
2 to 15

This control allows the user to select the height of the Text Window displaying the Text Channel information on the OSD.

5.7.1.5. Configuring the CEA-608 Decoder XDS Window Display Type

CC Setup
CEA-608 Decoder
XDS Display
Off
Fixed Position
Scrolling Display

This control allows the user to configure the information display of the Extended Data Services window.

When set to *Off* the XDS decoder is disabled.

When set to *Fixed position* the window will be a constant height and will display the XDS information within the selected area.

When set to *Scrolling Display* the XDS information will scroll up through the window as it is received by the 500DCDA-HD.

5.7.1.6. Configuring the CEA-608 Decoder XDS Window Position

CC Setup
CEA-608 Decoder
XDS Window Top Row
1
1 to 15

This control allows the user to set the position of the XDS window displayed on the On Screen display.

5.7.1.7. Configuring the CEA-608 Decoder XDS Window Height

CC Setup
CEA-608 Decoder
XDS Window Height
4
2 to 15

This control allows the user to select the height of the XDS window displaying the XDS information on the OSD.

5.7.2. Configuring the CEA-708 Decoder

The CEA-708 decoder is not applicable when standard definition input video is connected.

> **The On Screen display must be configured to display the CEA-708 decoder in the Utilities menu before captions will be visible on the screen. See section 5.11.1.**

CC Setup
CEA-708 Decoder
Service Number
1
1 to 63

This control allows the user to select the CEA-708 CC service to be decoded. Services 1 through 63 can be selected.

5.7.3. Setting the Closed Caption Decode Line for 525 Line Video Inputs

CC Setup
SD 525 CC Input Line
<u>21</u>
10 to 21

This control determines the line number where CEA-608 closed captions will be decoded from when the input is SD 525 line video.

5.7.4. Setting the Closed Caption Decode Line for 625 Line Video Inputs

CC Setup
SD 625 CC Input Line
<u>22</u>
6 to 22

This control determines the line number where CEA-608 closed captions will be decoded from when the input is SD 625 line video

5.8. CONFIGURING THE AUDIO PROCESSING

The SMPTE 299M standard permits up to 4 groups of 4 audio channels to be embedded into the 1.5 Gb/s video bit stream. The 500DCDA-HD de-embeds two groups of audio that are the source for re-embedding on the SD output video. The *Audio* menu is used to configure the De-embedder and Embedder groups. These menu items are not applicable when a standard definition input video is connected. The chart below shows the items available in the *Audio* menu. Sections 5.8.1 to 5.8.2 provide detailed information about each of the menu items.

De-embedder A	Sets the audio group source for De-embedder A.
De-embedder B	Sets the audio group source for De-embedder B.
Embedder A	Sets the audio group destination for Embedder A (must be different than Embedder B group).
Embedder B	Sets the audio group destination for Embedder B (must be different than Embedder A group).

5.8.1. Selecting The Audio Groups That Will Be De-Embedded

There are two controls that set the source groups for the two De-embedders. For simplicity, only one control will be shown in the manual.

Audio
De-embedder A
<u>Group 1</u>
Group 2
Group 3
Group 4

This control enables the user to set the source group for De-embedder A and B. Under normal conditions the settings for De-embedder A and B should be different otherwise the audio will be repeated on the SDI output.

The default group for De-embedder A is group 1 and the default group for De-embedder B is group 2.

5.8.2. Selecting the Audio Groups that Will Be Embedded

The model 500DCDA-HD has two Embedders that each insert one group of audio on the SDI output. The source for Embedder A is the audio being extracted by De-embedder A. The source for Embedder B is the audio being extracted by De-embedder B. There are two controls that set the audio groups where the Embedders will put the audio on the SDI output. For simplicity, only one control will be shown in the manual.

Audio
Embedder A
Off
<u>*Follow A*</u>
Group 1
Group 2
Group 3
Group 4

This control enables the user to set the destination group for Embedder A and B.

When set to *Off*, the Embedder will be disabled.

When set to *Follow A*, or *Follow B*, the Embedder destination will follow the setting of the respective De-embedder (See section 5.8.1).

Otherwise, the Embedder destination can be set to a specific group.

The group for Embedder A must be different from Embedder B. If the user sets them the same then the next higher group number will be used for Embedder B.

5.9. SETTING UP THE ANALOG OUTPUT PARAMETERS

The *Analog Output* menu is used to configure parameters associated with the analog output. The chart below shows the items available in the *Analog Output* menu. Sections 5.9.1 to 5.9.7 provide detailed information about each of the parameters.

Composite Display	Sets whether the analog video output will be colour or monochrome.
Output Level	Sets the analog video output level.
Hue	Sets the analog video hue level.
Saturation	Sets the analog video saturation level.
Contrast	Sets the analog video contrast level.
Brightness	Sets the analog video brightness level.
NTSC Setup Pedestal	Controls the NTSC Setup Pedestal on the analog output.
Line 21 Setup Pedestal	Sets whether the NTSC Setup Pedestal will be on line 21 or analog video output.

5.9.1. Setting the Composite Display Mode – Colour or Monochrome

Analog Output
Composite display
<u>*Colour*</u>
B/W

If monochrome operation is desired on the composite output, colour may be turned off with this control.

5.9.2. Setting the Analog Video Output Level

Analog Output
Output level
-120 to 56
<u>*0*</u>

This control allows the user to adjust the output level of the analog video. When set to 0, the nominal output video level will be 100 IRE.

5.9.3. Setting the Hue

Analog Output
Hue
-17.5 to 17.5
<u>*0.0*</u>

This control allows the user to adjust the Hue of the analog video in increments of 0.5 degrees.

5.9.4. Setting the Saturation

Analog Output
Saturation
-10 to 10
<u>*0*</u>

This control allows the user to adjust the saturation level of the analog video in increments of 1%.

5.9.5. Setting the Contrast

Analog Output
Contrast
0 to 20
<u>*0*</u>

This control allows the user to adjust the contrast of the analog video in increments of 1%.

5.9.6. Setting the Brightness

Analog Output
Brightness
-7.5 to 15.0
<u>*0.0*</u>

This control allows the user to adjust the brightness of the analog video in increments of 0.1 IRE.

5.9.7. Setting the NTSC Setup Pedestal on the Analog Video Output

Analog Output
NTSC Setup
Pedestal
On
Off

This control determines whether the 7.5 IRE NTSC Setup Pedestal will be applied on the analog video output. The NTSC Setup Pedestal should not be present when operating in Japan.

Set the control to *On* to apply the Setup Pedestal to the active picture lines.

Set the control to *Off* to remove the Setup Pedestal from the active picture.

5.9.8. Setting the NTSC Setup Pedestal on Line 21 of the Analog Video Output

Analog Output
Line 21 Setup
Pedestal
Auto
Off

This control determines how the NTSC Setup Pedestal will be applied on line 21 of the analog video output. The NTSC setup pedestal should not be present when there is a CEA-608 closed caption waveform on line 21.

When the control is set to *Auto,* the Setup Pedestal will be added to line 21 when captions are not being encoded (The *Captions* item in the *VANC Data Processing* menu is set to *Off*, see section 5.6*).* If captions are being encoded, NTSC setup will not be added to line 21.

When the control is set to *Off,* the NTSC Setup Pedestal will not be added to line 21.

5.10. CONFIGURING THE ON SCREEN MARKERS

The *Marker* menu is used to configure the On Screen aspect ratio markers. The chart below shows the items available in the *Marker* menu. These menu items are not applicable when a standard-definition video input is connected. Sections 5.10.1 to 5.10.3 provide detailed information about each of the parameters.

Type
Opacity
Output Enable

Sets the type of On Screen marker.

Sets the opacity of the On Screen markers.

Controls which output the On Screen marker is displayed on.

5.10.1. Setting the On Screen Marker Type

Marker
Type
<u>*4:3 Lines*</u>
4:3 Shaded
4:3 Lines with center

This control determines the type of On Screen markers.

Select *4:3 Lines* to display On Screen marker with vertical lines at the 4:3 aspect ratio of the original image.

Select *4:3 Shaded* to display On Screen markers with areas outside the 4:3 aspect ratio of the original image shaded.

Select *4:3 Lines with center* to display On Screen markers with vertical lines at the 4:3 aspect ratio and a cross at the center of the original image.

5.10.2. Setting the On Screen Marker Opacity

Marker
Opacity
25 percent
<u>*50 percent*</u>
75 percent
100 percent

This control selects the opacity of the On Screen markers.

5.10.3. Selecting the Outputs that have the On Screen Marker

Marker
Output Enable
<u>*Off*</u>
NTSC/PAL & SDI
NTSC/PAL
SDI

This control selects which outputs the On Screen markers are displayed on.

Select *Off* to disable the On Screen markers.

Select *NTSC/PAL & SDI* to display the On Screen markers on both the NTSC/PAL composite analog and SDI outputs.

Select *NTSC/PAL* to display the On Screen markers only on the NTSC/PAL composite analog outputs.

Select *SDI* to display the On Screen markers only on the SDI outputs.

5.11. UTILITIES

The *Utilities* menu is used to list the module firmware version, upgrade the firmware, and manage the user presets. The chart below shows the items available in the *Utilities* menu. Sections 5.11.1 to 5.11.5 provide detailed information about each of the parameters.

On Screen Display	Configures the On Screen display options.
Recall Preset	Recalls the current module configuration from the factory preset or one of the user presets.
Store Preset	Stores the current module configuration to one of the user presets.
Upgrade	Used to upgrade the firmware in the module.
About…	Displays product information.

5.11.1. Selecting the On Screen Display

Utilities
On Screen Display
<u>*Off*</u>
Status Window
CEA-608 Decoder
CEA-708 Decoder

This control enables the user to select what information the On Screen display windows will display. For more information refer to section 6.6.

Select *Off* to disable the On Screen display windows.

Select *Status Window* to show module status at a glance. See section 6.6.

Select *CEA-608 Decoder* to show various windows that are configured using the *CEA-608 Decoder* menu described in section 5.7.1.

Select *CEA-708 Decoder* to show various windows that are configured using the *CEA-708 Decoder* menu described in section 5.7.2.

5.11.2. Recalling Configurations from the User Presets or the Factory Preset

The 500DCDA-HD module provides ten user preset areas to store the complete set of controls from the On Screen display.

Utilities
Recall preset
<u>*Cancel*</u>
Factory
1 to 10

This control is used to initiate a recall of the entire card configuration from one of the user presets or from the factory preset.

Use the toggle switch to select the preset you wish to recall. After selecting the preset, you must press the pushbutton before the recall will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

✎ | **The current state of the card will be forgotten if it has not been saved to a preset before a recall is performed.**

✎ | **There will be a slight disturbance in the operation of the card and the On Screen display while the new preset is being recalled.**

5.11.3. Saving Configurations to the User Presets

The 500DCDA-HD module provides ten user preset areas to store the complete set of controls from the On Screen menu.

Utilities
Store Preset
<u>*Cancel*</u>
1 to 10

This control is used to initiate the storing of the current card configuration into one of the user presets

Use the toggle switch to select the preset location where you want to store the module configuration. After selecting the preset, you must press the pushbutton before the store will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

5.11.4. Initiating a Software Upgrade

Utilities
Upgrade
<u>*Cancel*</u>
Upgrade

This control is used to initiate an upgrade of the module software.

In addition to the software upgrade support detailed in the *Upgrading Firmware* chapter in the front of the binder, you can initiate an upgrade with this control. This will allow you to upgrade the software without unplugging the card and changing the upgrade jumper.

After selecting the upgrade menu item, you must change the command to *Upgrade* and press the pushbutton before the upgrade can take place. Follow the remainder of the instructions in the *Upgrading Firmware* chapter. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

After the upgrade has finished, the unit will automatically restart and run in normal operating mode.

5.11.5. Accessing Information About the Module and its Firmware

Utilities
About…

This control lists the particulars about this module and the firmware residing within it. It provides quick access to information about revisions that can be used to determine when upgrades are required.
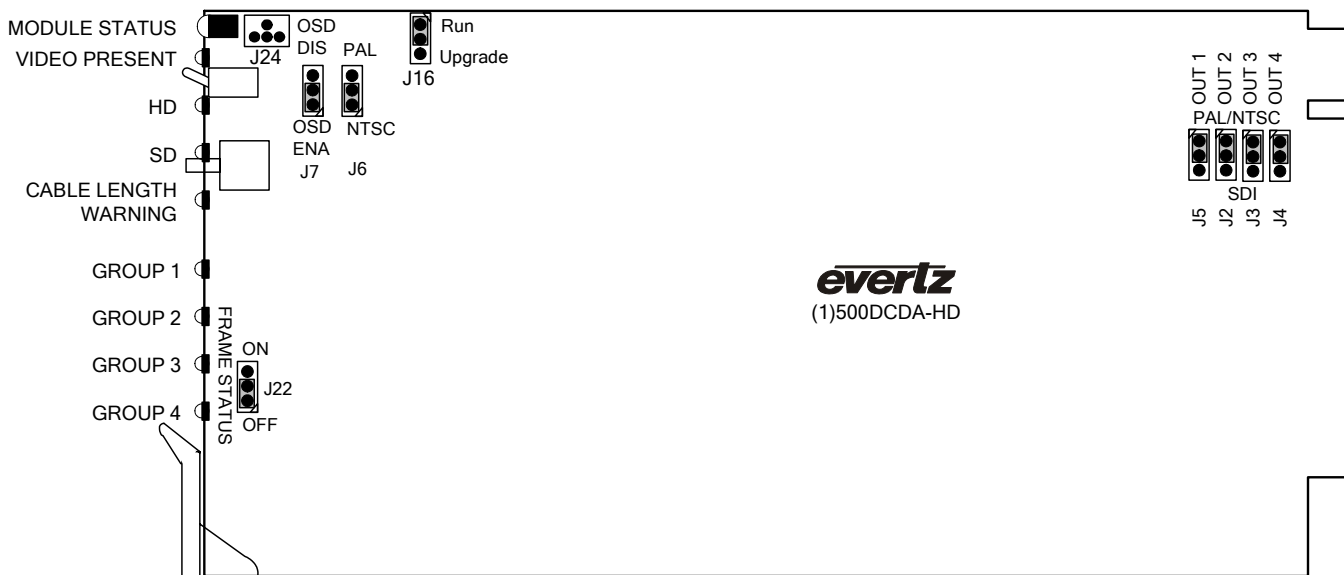
6. LOCATION OF LEDs AND JUMPERS

Figure 6-1: LED and Jumper Locations

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

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

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

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

6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE The UPGRADE jumper J16, located at the front of the module near the pushbutton, is used when firmware upgrades are being performed on the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module 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. Re-install the module into the frame. Perform the upgrade as described in the *Upgrading Firmware* section in the front of the binder. Once the upgrade is complete, 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.

6.3.   CONTROLLING THE OUTPUT VIDEO STANDARD ON LOSS OF VIDEO

Jumper J6, located near the toggle switch at the front of the module, controls the behaviour of the down converter outputs when there is no input video.

J6:   To output 525i/59.94 (NTSC) video on loss of input video on the downconverted video outputs, install this jumper in the position closest to the center.

To output 625i/50 (PAL) on loss of input video on the downconverted video outputs, install this jumper in the position closest to the card edge.

6.4.   DISABLING THE ON SCREEN DISPLAY ON THE PROGRAM VIDEO OUTPUTS

Jumper J7, located directly above the pushbutton at the front of the module, determines whether the On Screen display will be shown on the downconverted SDI and analog outputs.

J7:   To enable the On Screen display on the downconverted video outputs install this jumper in the position closest to the front of the module.

To disable the On Screen display on the downconverted video outputs install this jumper in the position closest to the center of the module.

✎ | **Installing jumper J7 closest to the center of the module will disable menus, CC decoders and the status window.**

6.5.   SELECTING THE FUNCTION OF THE COMP/SDI OUTPUTS 1 TO 4

OUTPUT SELECT: Four jumpers J5, J2, J3 and J4, located near the rear of the module, are used to select whether the COMP/SDI outputs 1 to 4 will contain SDI video or composite analog (NTSC/PAL) video.

To select SDI on the output, install the respective jumper in the SDI position (closest to the bottom edge of the card).

To select composite analog on the output install the respective jumper in the COMP position (closest to the top edge of the card).

6.6. STATUS WINDOW DISPLAY

When the On Screen menus are not being displayed, the Status Window can be used to display the video parameters over top of the video. Table 6-1 describes the Status Window items that will be output on the OSD. Refer to section 5.11.1 for information on how to configure the OSD to display the Status Window. The VistaLINK® interface also enables the monitoring of these parameters (see section 7.2).

Status Window Item	Function
Video	Indicates the video standard of the input signal.
Video Delay (ms)	Indicates the video delay in milliseconds.
Video Delay (F,L,S)	Indicates the video delay in output video frames, lines, samples.
Audio Group 1	Indicates the presence of embedded audio in Group 1. (the state of the Group 1 present LED)
Audio Group 2	Indicates the presence of embedded audio in Group 2. (the state of the Group 2 present LED)
Audio Group 3	Indicates the presence of embedded audio in Group 3. (the state of the Group 3 present LED)
Audio Group 4	Indicates the presence of embedded audio in Group 4. (the state of the Group 4 present LED)
CEA-708	Indicates that CEA-708 type captions are present in the input video.
CEA-608	Indicates that CEA-608 type captions are present in the input video. If the CEA-608 type captions are present then the status window will display which data field(s) are present. (Field 1, Field 2 or Fields 1&2)
RP188	Indicates that the RP188 time code is present in the input video. If the time code is present, the status window displays the value it read. NOTE: The number displayed is an approximate value of the ouput time code and is not intended to be used as an accurate account of the current output time code value.

Table 6-1: Status Window Display

7.   VistaLINK® REMOTE MONITORING/CONTROL

7.1.   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 500DCDA-HD), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 500 series modules reside in the 3RU 500FR MultiFrame and communicate with the manager via the 500FC 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 500FC Frame Controller chapter.

7.2. VistaLINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface.

Parameter	Description
Detected Input Video Type	Indicates the video type (SD or HD)
Detected Input Video Standard	Indicates the video standard of the input signal
CEA-608 Captions	Indicates that CEA-608 type captions are present on the input video
CEA-708 Captions	Indicates that CEA-708 type captions are present on the input video
Video Delay (μs)	Indicates the video delay in micro seconds
Video Delay (F/L/S)	Indicates the video delay units of frames, lines, samples

Table 7-1: VistaLINK® Monitored Parameters

7.3. VistaLINK® TRAPS

The following parameters can be configured as VistaLink® Traps.

Trap	Description
Module	Triggers when Module fault LED is on
Carrier	Triggers when Carrier is not present
Audio Group 1	Triggers when Audio Gr 1 is not present
Audio Group 2	Triggers when Audio Gr 2 is not present
Audio Group 3	Triggers when Audio Gr 3 is not present
Audio Group 4	Triggers when Audio Gr 4 is not present
Time Code	Triggers when Time Code is not present
Captions	Triggers when captions are not present
CEA-608 Captions	Triggers when CEA-608 captions are not present
CEA-708 Captions	Triggers when CEA-708 captions are not present
HD	Triggers when HD is not present
SD	Triggers when SD is not present

Table 7-2: VistaLINK® Traps

7.4. VistaLINK® CONTROLLED PARAMETERS

Parameter	Description
Video Type	Sets the video input to High Definition (HD) or Standard Definition (SD)
Video Standard	Selects the video input and output standards
Pulldown Reference	Sets reference source when 3:2 pulldown is being performed on output
A Frame Offset	Sets the A Frame Offset from the Pulldown Reference
525 Vertical Phase Offset	Sets the vertical phase of output 525/NTSC video with respect to input
525 Horizontal Phase Offset	Sets the horizontal phase of output 525/NTSC video with respect to input
625 Vertical Phase Offset	Sets the vertical phase of output 625/PAL video with respect to input
625 Horizontal Phase Offset	Sets the horizontal phase of output 625/PAL video with respect to input
Set Minimum Delay	Configures output timing to achieve minimum delay
Limiter	Enables or Disables the limit on the value of Active Picture samples
Output Aspect Ratio	Sets the aspect ratio of the output picture
Video Loss Output	Sets the action to take when the input video is missing
Panel Colours	Sets the colour of the letterbox panels
Horizontal Filter Cutoff	Sets the cutoff frequency of the horizontal filter in the scaler
Vertical Filter Cutoff	Sets the cutoff frequency of the vertical filter in the scaler
Closed Captions Enable	Controls whether closed captions will be encoded on the output
VITC Generator	Controls whether VITC will be inserted on the program video outputs
VITC User Bits	Controls whether VITC time will be original time or User Bits
Default VITC Source	Sets the preferred type of ancillary time code to read from the HD output
525 VITC Line	Sets VITC insertion line on 525/NTSC video outputs
625 VITC Line	Sets VITC insertion line on 625/PAL video outputs
WSS Enable	Controls whether Wide-Screen signaling will be encoded on the output
525 WSS Line	Sets Wide Screen Signaling insertion line on 525/NTSC video output
625 WSS Line	Sets Wide Screen Signaling insertion line on 625/PAL video output
CEA-608 Decoder	Configures the CEA-608 decoder display
CEA-708 Decoder	Configures the CEA-708 decoder display
SD 525 CC Input Line	Sets closed caption decode line for SD 525 line video inputs
SD 625 CC Input Line	Sets closed caption decode line for SD 625 line video inputs
De-embedder A	Sets the audio group source for De-embedder A
De-embedder B	Sets the audio group source for De-embedder B
Embedder A	Sets the audio group destination for Embedder A (must be different than Embedder B group)
Embedder B	Sets the audio group destination for Embedder B (must be different than Embedder A group)
Composite Display	Sets whether the analog video output will be colour or monochrome
Output Level	Sets the analog video output level
Hue	Sets the analog video hue level
Saturation	Sets the analog video saturation level
Contrast	Sets the analog video contrast level
Brightness	Sets the analog video brightness level
NTSC Setup Pedestal	Controls NTSC Setup Pedestal on the analog output
Line 21 Setup Pedestal	Sets whether the NTSC Setup Pedestal will be on line 21 or analog video output
Marker Type	Sets the type of On Screen markers
Marker Opacity	Sets the opacity of the On Screen markers
Marker Output Enable	Controls which output the On Screen marker is displayed on
On Screen Display	Configures the On Screen display options
Recall Preset	Recalls the current module configuration from one of the user or factory presets
Store Preset	Stores the current module configuration to one of the user presets

Table 7-3: VistaLINK® Controlled Parameters

8.   MENU QUICK REFERENCE

Video
– **Video Type**
– **Std**
– **Pulldown Reference**
– **A Frame Offset**
– **525 V Phase Offset**
– **525 H Phase Offset**
– **625 V Phase Offset**
– **625 H Phase Offset**
– **Set Minimum Delay**
– **Limiter**

Output Picture
– **Aspect Ratio**
– **Loss of Video**
– **Panel Colours**

Scaler
– **H Filter Cutoff**
– **V Filter Cutoff**

VANC Data Processing
– **Closed Captions En/Dis**
– **VITC Generator**
– **VITC UB**
– **Dflt VITC Source**
– **525 VITC Line**
– **625 VITC Line**
– **WSS En/Dis**
– **525 WSS Line Num**
– **625 WSS Line Num**

CC Setup
– **CEA-608 Decoder**
  – **CC Channel**
  – **Text Channel**
  – **Text Window Top Row**
  – **Text Window Height**
  – **XDS Display**
  – **XDS Window Top Row**
  – **XDS Window Height**
– **CEA-708 Decoder**
  – **Service Number**
– **SD 525 CC Input Line**
– **SD 625 CC Input Line**

Utilities
– **On Screen Display**
– **Recall Preset**
– **Store Preset**
– **Upgrade**
– **About…**

Audio
– **De-embedder A**
– **De-embedder B**
– **Embedder A**
– **Embedder B**

Analog Output
– **Composite Display**
– **Output Level**
– **Hue**
– **Saturation**
– **Contrast**
– **Brightness**
– **NTSC Setup Pedestal**
– **Line 21 Setup Pedestal**

Marker
– **Type**
– **Opacity**
– **Output Enable**

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