Figures

Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Original Version - preliminary	June 99
0.2	Table of video formats expanded Block Diagram added Figure added showing card edge controls and jumper locations	Aug 99
0.3	On Screen Menu descriptions added	Oct 99
1.0	Genlock Reference info added, test signals updated	Nov 99
1.1	Updated DIP Switch information, added Clock locking function on genlock	Dec 99
1.2	Added new test signals as per firmware version 1.1 Build 81	Jan 00
1.3	Added new test signals as per firmware version 1.2 Build 12 Added On Screen Message menu support	Jun 00
1.4	Added Audio level specification Added info on Free run oscillator trimpot	Aug 01
1.5	Changes to Genlock Operation, Figure 4 updated, Figure 5 and 6 added Test Signal table 5 updated, support for 480P test signals added	Jul 02
1.5.1	Minor Typographical changes and reformatting	Dec 02

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1. OVERVIEW

The 7750TG-HD Test Signal Generator provides a cost-effective method of generating 1.5 Gb/s HDTV test signals. The 7750TG-HD is ideal for checking signal path integrity, or to determine system performance over varying cable lengths. The 7750TG-HD generates test signals in a wide variety of SMPTE 292M video formats and offers four 1.5 Gb/s outputs.

The 7750TG-HD provides an analog genlock input that allows you to synchronize the test signals to your plant horizontal and vertical timing.

Separate audio tones can be embedded into each channel of one of the four embedded audio groups. The user can select which of the audio groups the tones will be embedded into. The Audio level is fixed at -20 dB full scale.

Features:

- Wide variety of 1080i, 1035I, 1080p, 480p and 720p output formats
- 8 position DIP switch selects output format
- Card edge toggle switch selects test signal
- Selectable gen lock input format – bi-level or tri-level sync, colour black
- 4 embedded audio tones, selectable audio group assignment
- 4 output drivers
- On screen display of test signal names
- On screen setup menu
- Tally output upon loss of gen lock
- Front panel LEDs indicate gen lock presence, module fault and audio signal presence on the output

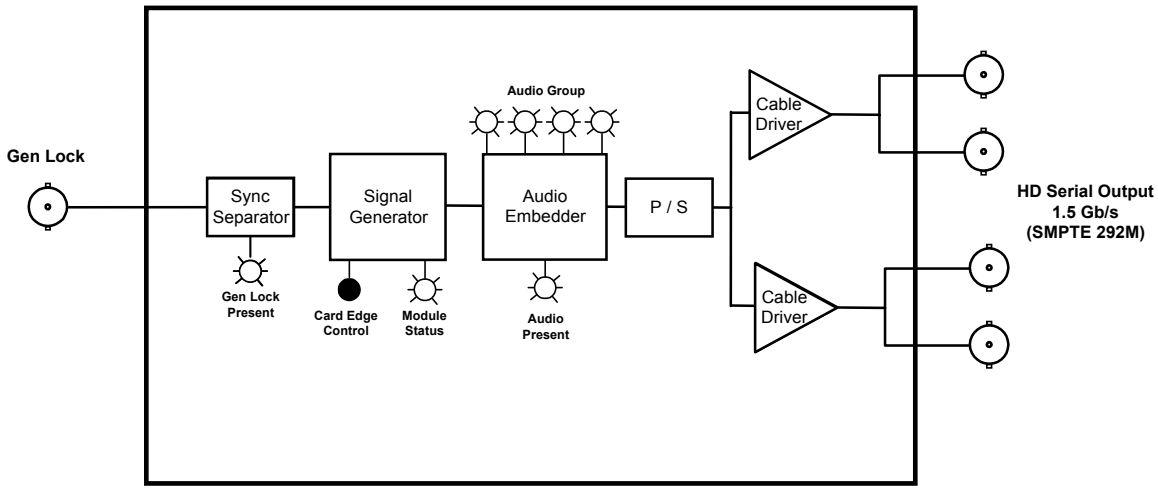

Figure 1: 7750TG-HD Block Diagram

2. INSTALLATION

The 7750TG-HD module comes with a companion rear plate that has 5 BNC connectors. For information on mounting the rear plate and inserting the module into the frame see the 7700FR chapter section 3.

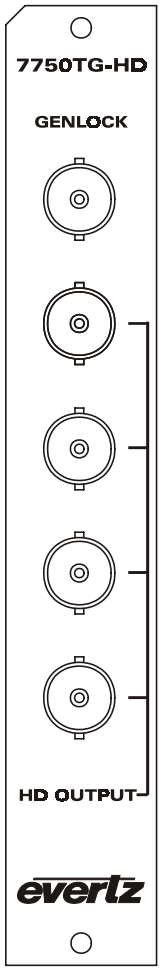

Figure 2: 7750TG-HD Rear Panel

GEN LOCK Input BNC connector for analog Gen Lock reference. The genlock signal may be a HD tri-level sync or a standard definition colour black video or 0.3 V bi-level sync. DIP switches 6 and 7 used to configure the Genlock type. Table 3gives a list of the valid reference signal types for the HD output video format you have selected. The *Reference Phase* On screen menu is used to set up the timing of the output signal with respect to the reference input. Jumper J2 on the A7700REF sub-module selects whether the reference input is terminated or high impedance. (See section 6.3)

HD OUTPUT There are four BNC connectors with serial component video outputs compatible with the SMPTE 292M standard. The output video format is selected using DIP switches 1 to 5. (See Table 3) The test signal output is selected using the toggle switch located on the card edge. The *Audio Setup* On screen menu is used to configure any embedded audio that will be present on the outputs.

3. SPECIFICATIONS

3.1. GEN LOCK INPUT

Type: DIP switch selectable - depends on output video format (see Table 1)
HD Tri-level Sync
NTSC or PAL Colour Black 1 V p-p
Composite Bi-level sync (525I or 625I) 300 mV
Connector: 1 BNC per IEC 169-8
Termination: 75 ohm (jumper selectable)

3.2. HD SERIAL VIDEO OUTPUTS

Number of Outputs: 4.
Standard: SMPTE 292M, Selectable as per Table 3
Embedded Audio: Up to 4 tones in one audio group as specified in SMPTE 299M. Selectable tone frequencies (from 60 Hz to 10 kHz) and audio group. Audio Level is set to -20 dB Full Scale.
Connectors: 4 BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal
Overshoot: <10% of amplitude
Wide Band Jitter: < 0.2 UI

3.3. ELECTRICAL

Voltage: + 12VDC
Power: 6 Watts.
EMI/RFI: Complies with FCC Part 15, class A and EU EMC directive.

3.4. PHYSICAL

7700 or 7701 frame mounting:
Number of slots: 1

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

The location of the status LEDs is shown in Figure 7.

MODULE OK This Green LED will be On when the module is operating properly.

LOCAL FAULT This Red LED will blink on and off if the microprocessor is not running. The LED will be on solid when there is a fault in the module power supply**.**

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

This LED does not necessarily indicate that the genlock signal is the correct frame rate for the selected output video format. For example, if a 59.94 Hz signal is required for the selected output video format, but a 60 Hz signal is present at the genlock input, the SIGNAL PRESENT LED will be On. In this case the output video will NOT be properly referenced but will constantly try to re-sync to the genlock frame reference.

AUDIO: This Green LED will be On when there is audio embedded into the outputs.

4.2. AUDIO GROUP STATUS LEDS

Four LEDs located on the lower end of the module (opposite the DIP switch) indicate the presence of embedded audio in the output video. The audio group LED 1 is located closest to the center of the module.

Audio Group LED	Color	Audio Group Status
1	Off	There is no group 1 audio on the video output.
	On	Group 1 audio is being embedded.
2	Off	There is no group 2 audio on the video output.
	On	Group 2 audio is being embedded.
3	Off	There is no group 3 audio on the video output.
	On	Group 3 audio is being embedded.
4	Off	There is no group 4 audio on the video output.
	On	Group 4 audio is being embedded.

Table 1: Audio Group Status LEDs

5. CARD EDGE CONTROLS

The 7750TG-HD is equipped with an 8 position DIP switch to allow the user to select various output video formats. The On position is down, or closest to the printed circuit board. Table 2 gives an overview of the DIP switch functions.

DIP Switch	Function
1	Video Output Format Selection
2	
3	
4	
5	
6	Gen Lock Format Selection
7	
8	

Table 2: DIP Switch Functions

A three position, return to center toggle switch is used to select the various test signal patterns and is also used in conjunction with a momentary pushbutton to operate the On screen Setup menu.

5.1. SELECTING THE OUTPUT VIDEO FORMAT

DIP switches 1 to 5 are used to select the output video format of the 7750TG-HD. The On position is down, or closest to the printed circuit board. Table 3 shows the settings of the DIP switches for selecting the video output formats, and the types of genlock signals that can be used with each.

For 480p/60 or 480p/59.94 format over SMPTE 292M interface use 1080i/60 or 1080i/59.94 respectively. Extra test signals for 480p are available only in these video formats.

DIP Switch					Common Name	Pixels x Active Lines	Frame Rate	Progressive /Interlace	Valid Genlock Types	
1	2	3	4	5					Bi-Level	Tri-Level
Off	Off	Off	Off	Off	1080i/60	1920 x 1080	30	I	525/60	1080i/60 1035i/60 1080p/30 1080p/30sF
On	Off	Off	Off	Off	1080i/59.94	1920 x 1080	29.97 (30/1.001)	I	525/59.94	1080i/59.94 1035i/59.94 1080p/29.97 1080p/29.97sF
Off	On	Off	Off	Off	1080i/50	1920 x 1080	25	I	625/50	1080i/50 1080p/25 1080p/25sF
On	On	Off	Off	Off	1080p/30	1920 x 1080	30	P	525/60	1080i/60 1035i/60 1080p/30 1080p/30sF
Off	Off	On	Off	Off	1080p/30sF	1920 x 1080	30	P (sF)	525/60	1080i/60 1035i/60 1080p/30 1080p/30sF
On	Off	On	Off	Off	1080p/29.97	1920 x 1080	29.97 (30/1.001)	P	525/59.94	1080i/59.94 1035i/59.94 1080p/29.97 1080p/29.97sF
Off	On	On	Off	Off	1080p/29.97sF	1920 x 1080	29.97 (30/1.001)	P (sF)	525/59.94	1080i/59.94 1035i/59.94 1080p/29.97 1080p/29.97sF
On	On	On	Off	Off	1080p/25	1920 x 1080	25	P	625/50	1080i/50 1080p/25 1080p/25sF
Off	Off	Off	On	Off	1080p/25sF	1920 x 1080	25	P (sF)	625/50	1080i/50 1080p/25 1080p/25sF
On	Off	Off	On	Off	1080p/24	1920 x 1080	24	P	625/48	1080p/24 1080p/24sF
Off	On	Off	On	Off	1080p/24sF	1920 x 1080	24	P (sF)	625/48	1080p/24 1080p/24sF
On	On	Off	On	Off	1080p/23.98	1920 x 1080	23.98 (24/1.001)	P	625/47.95	1080p/23.98 1080p/23.98sF
Off	Off	On	On	Off	1080p/23.98sF	1920 x 1080	23.98 (24/1.001)	P (sF)	625/47.95	1080p/23.98 1080p/23.98sF
On	Off	On	On	Off	720p/60	1280 x 720	60	P	525/60	720p/60
Off	On	On	On	Off	720p/59.94	1280 x 720	59.94 (60/1.001)	P	525/59.94	720p/59.94
On	On	On	On	Off	1035i/60	1920 x 1035	30	I	525/60	1080i/60 1080p/30 1080p/30sF 1035i/60
Off	Off	Off	Off	On	1035i/59.94	1920 x 1035	29.97 (30/1.001)	I	525/59.94	1080i/59.94 1080p/29.97 1080p/29.97sF 1035i/59.94

Table 3: Video Format DIP Switch Settings

5.2. SELECTING THE GEN LOCK REFERENCE TYPE

The 7750TG-HD can free run on its internal crystal oscillator or be referenced to a genlock signal applied to the GEN LOCK input. The genlock signal may be a HD tri-level sync or a standard definition colour black video or 0.3 V bi-level sync. DIP switches 6, 7 and 8 used to configure the genlock type. Table 3 gives a list of the valid reference signal types for the HD output video format you have selected. DIP switch 6 selects if the 7750TG-HD will free run or be referenced to the genlock Reference video. DIP switch 7 selects the type of genlock reference being supplied. The *Reference Phase* On screen menu is used to set up the timing of the output signal with respect to the reference input. (See section 5.4.2) DIP switch 8 selects whether the genlock reference is used to phase the output video or just lock the clock rate.

DIP 8	DIP 7	DIP 6	Genlock Reference
Off	Off	Off	The 7750TG-HD will free run on its internal crystal oscillator. The internal oscillator frequency can be adjusted using the trimpot located near the DIP switch.
Off	On	Off	
On	Off	Off	
On	On	Off	
Off	Off	On	The genlock reference signal is a Standard Definition colour black video or bi-level sync. The output video will be phase locked to the bi-level genlock reference. See Table 2 for reference types supported.
Off	On	On	The genlock reference signal is a High Definition tri-level sync. The output video will be phase locked to the Tri-Level genlock reference. See Table 2 for reference types supported.
On	Off	On	The genlock reference signal is NTSC colour black video. The output video will be phase locked to the NTSC genlock reference if possible (See Table 2 for output video formats that can be phase locked to NTSC). Other output video formats will be clock locked only.
On	On	On	Reserved, do not use.

Table 4: Gen Lock Reference Switch Settings

5.3. SELECTING THE TEST SIGNAL

When the 7750TG-HD is not in the on screen setup menu, the toggle switch located on the front edge of the module is used to select test signal generated. Each time the toggle switch is pressed down the 7750TG-HD advances to the next test signal. Each time the toggle switch is pressed up the 7750TG-HD changes to the previous test signal. The name of the current test signal is shown momentarily on the lower left corner of the screen. Table 5 shows the test signals that are available. Most of the test signals are industry standard signals. Sections 5.3.1.1 to 5.3.1.3 describe the test signals that are unique to the 7750TG-HD.

Some test signals are not available on certain video formats.

Test Signal Name		Test Signal Name
Y Multipulse (5, 10, 15, 20, 25 MHz)		5 Step Staircase
Component Multipulse (5, 10, 15, 20, 25 MHz)		Valid 5 Step
100% Y Multiburst (20, 22, 24, 26, 28, 30 MHz)		Valid Ramp
100% Y Multiburst (10, 12, 14, 16, 18, 20 MHz)		Clean Aperture with Graticule
100% Y Multiburst (1, 2, 4, 6, 8, 10 MHz)		Circle with Center Cross
60% Y Multiburst (20, 22, 24, 26, 28, 30 MHz)		Clean Aperture with Center
60% Y Multiburst (10, 12, 14, 16, 18, 20 MHz)		Clean Aperture
60% Y Multiburst (1, 2, 4, 6, 8, 10 MHz)		Production Aperture
100% Component Multiburst (20, 22, 24, 26, 28, 30 MHz)		12% White Window
100% Component Multiburst (10, 12, 14, 16, 18, 20 MHz)		20% White Window
100% Component Multiburst (1, 2, 4, 6, 8, 10 MHz)		50% White Window
60% Component Multiburst (20, 22, 24, 26, 28, 30 MHz)		80% White Window
60% Component Multiburst (10, 12, 14, 16, 18, 20 MHz)		100% White Window
60% Component Multiburst (1, 2, 4, 6, 8, 10 MHz)		75% Split field reverse bars with pluge
60% Y Line Sweep (15-30 MHz) with 2 MHz Markers		SMPTE Color Bars
60% Y Line Sweep (1-30 MHz) with 5 MHz Markers		75% Color bars with pluge
60% Component Sweep (15-30 MHz) with 2 MHz Markers		100% Color bars with pluge
60% Component Sweep (1-30 MHz) with 5 MHz Markers		75% Color bars
Grey		100% Color bars
Grey (all data bits active)		White Field
SDI Checkfield		Black
Field ID		480P Black/White Frames
Frame ID		480P White Frame
Bowtie		480P Production Aperture
		480P SMPTE Color Bars

Table 5: Test Signal Selection

5.3.1. Description Of Unique Test Signals

This section describes features of some of the more unique test signals.

5.3.1.1. Clean Aperture with Graticule

This signal contains a number of key physical dimensions of the HDTV active picture area. It divides the 16x9 aspect ratio clean aperture area into an 8x6 graticule grid. The center 6x6 grid corresponds to a 4x3 aspect ratio rectangle that is concentric with the 16x9 clean aperture. The edges of the 4x3 area have different line patterns to help in identifying it. The clean aperture markers are placed so that the center of the lines is at the clean aperture. The production aperture markers are placed so that the outsides of the lines are at the production aperture (the extent of the total image). A center cross marker is also included to mark the middle of the image.

5.3.1.2. Production Aperture

Single horizontal lines and single pixel vertical borders around the active picture mark the production aperture. Single pixels and single horizontal lines are not legal for normal pictures but this test signal is designed to test equipment to make sure it is processing/passing the whole image area. If any side of the box is missing, then the device under test is not passing the whole production aperture.

5.3.1.3. The Grey Signals

These signals can be used as a 50% full field grey, and they are also designed to provide a best case and a worse case toggle rate on the test signal data bits. The regular *Grey* signal has both the luminance and the chrominance values set to 200hex, while the *Grey with all data bits active* signal has both the luminance and the chrominance bits alternating between 200hex and 1FFhex. The latter signal has every data bit toggling every video sample.

Most current digital logic designs use CMOS technology where the power consumed and the heat produced are proportional to the average toggle rate of all of the flip flops in the product. If a product performs a large amount of video processing (in proportion to all processing), and then there will be a power consumption difference between a “quiet” signal and a “very active” signal. The grey signals can be used as a best case and a worst case condition for checking such conditions.

5.4. CONFIGURING THE TEST GENERATOR USING THE ON SCREEN MENU

An On screen menu (OSD) is used to configure many of the test generator’s parameters. The three position, return to center, **toggle switch** and momentary **pushbutton** located on the front edge of the module are used to navigate the OSD setup menus and configure the cards various controls.

To enter the OSD menu system, press the push button 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 choosing. Once the arrow is on the desired item, press the **pushbutton** to select the next menu.

On all menus, there is a selectable item *Done*. Selecting *Done* will take you to the previous menu (the one that was used to get into the menu). If you are at the top level of the menu tree then selecting *Done* will exit the OSD menu and return the 7750TG-HD to the normal operating mode.

Once you are in a sub menu, there may be another menu level, or there may be a list of parameters to adjust. If there is another set of menu choices, use the toggle switch to select the next choice with the same procedure as in the main menu.

If there is a list of parameters to adjust, 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 (<) 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. If the parameter contains a list of choices, you can cycle through the list by pressing the toggle switch in either direction.

When you have stopped at the desired value, depress the **pushbutton**. This will update the parameter with 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 *Done* commands to return to the next higher menu level.

5.4.1. Top Level Menu Structure

The following is a brief description of the top level of the menu tree that appears when you enter the On screen menu. Selecting one of these items will take you down into the next menu level.

Reference Phase	Sets the timing phase of the test signal to the Gen Lock reference input.
Audio Setup	Configure what audio tones will be embedded into the test signal, and which audio group will be used.
OSD	Configure the On screen message.
Done	Exit On Screen Menu System

5.4.2. Setting the Timing of the Output Video with Respect to the Gen Lock Input

The *Reference Phase* menu is used to set the timing of the output video to the Gen Lock Reference. The V and H parameters allow you to control the timing of the output video with respect to the beginning of the frame on the Gen Lock reference input. Phasing of the output is only possible when the frame rate of the gen lock reference is the same as the frame rate of the output video format, and DIP switch 8 is in the Off position. An internally generated digital video sync structure, locked to the analog genlock reference signal (0_H time of line 1 field 1 for PAL or HD Tri-level references or 0_H time of line 4 field 1 for NTSC references) is used to genlock the 7750TG-HD test generator. The EAV of line 1 of this digital reference sync is the point to which all the Reference phasing adjustments are made. The default timing relationship of the analog tri-level and bi-level inputs to the digital reference sync frame (when the *V Phase* and *H Phase* parameters are set to zero) are set according to SMPTE Recommended Practice RP168-2002 and are shown in Figure 3 and Figure 4.

The V parameter provides a coarse adjustment of timing and sets the delay in lines of line 1 of the test signal frame with respect to the beginning of the genlock reference frame. The H parameter provides a fine adjust of timing and sets the delay in pixels of the 0_H time of line 1 of the test signal frame with respect to the 0_H time of the beginning of the reference frame. If adjustments to the H parameter cause it roll through the pixel number at the start of a new line then the V parameter will change to the next higher or lower line.

The factory default is to align the 0_H time of Line 1 of the output video with the beginning of the genlock reference frame (0_H time of line 1 field 1 for PAL or HD Tri-level references or 0_H time of line 4 field 1 for NTSC references) according to SMPTE Recommended Practice RP168-2002. For example, in 59.94Hz frame rate systems, the horizontal reference points of Line 1 of 1125 line, Line 1 of 750 line and Line 4 of 525 line signals shall be coincident (see Figure 5). In 50Hz frame rate systems, the horizontal reference points of Line 1 of 1125 line, Line 1 of 750 line and Line 1 of 625 line signals shall be coincident (see Figure 6).

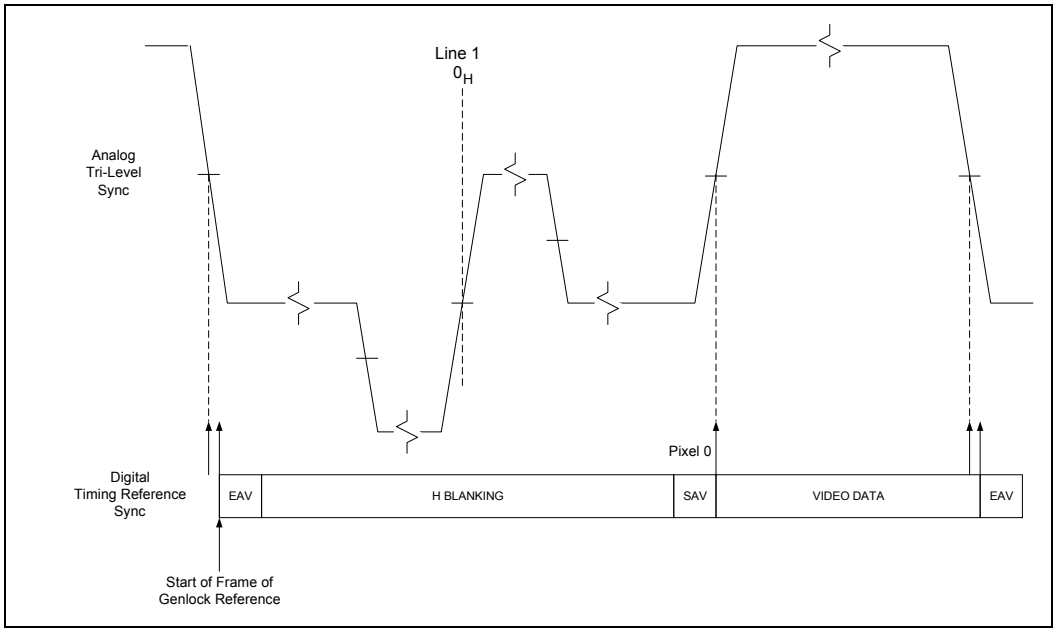

Figure 3: Default Tri-Level Reference Timing

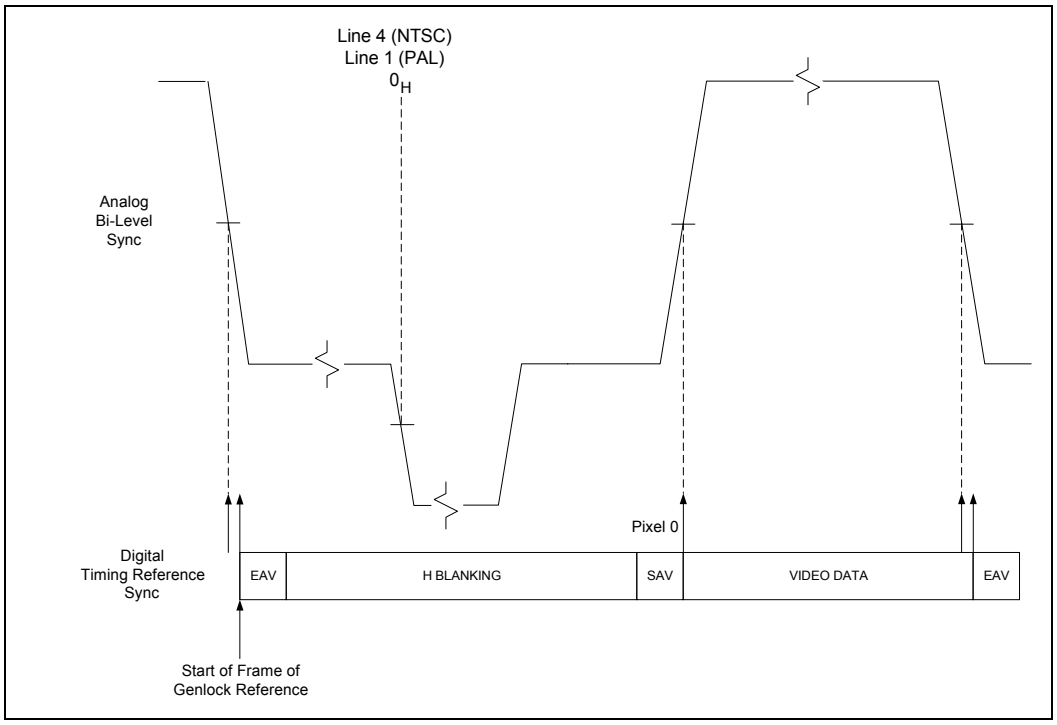

Figure 4: Default Bi-Level Reference Timing

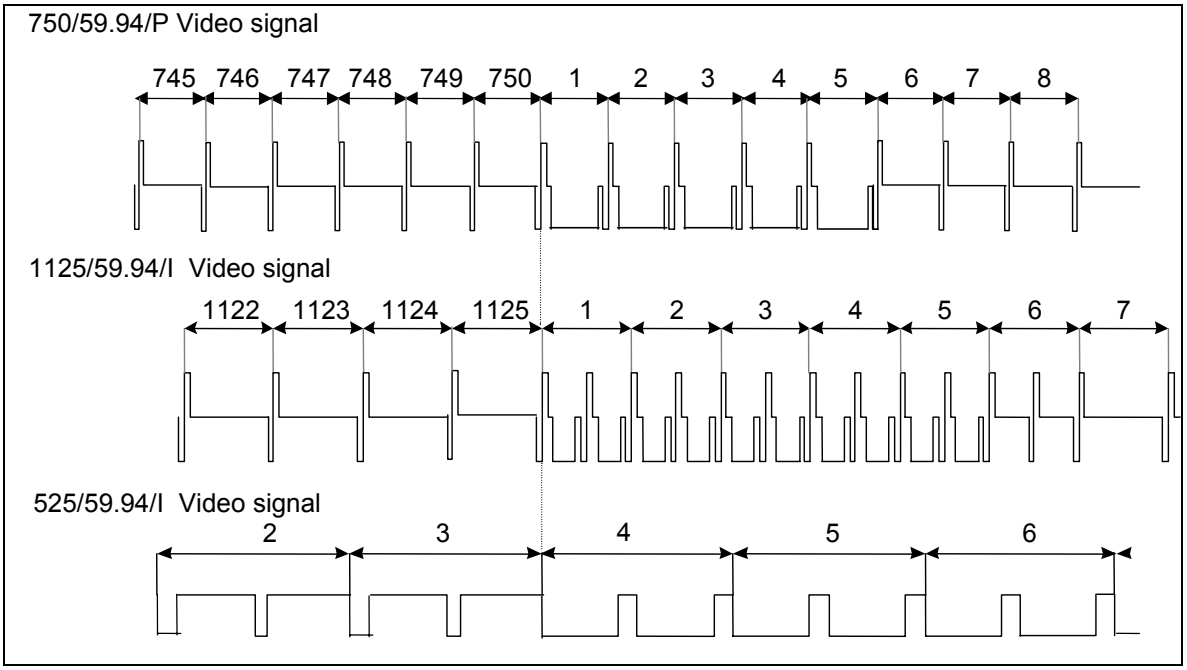

Figure 5: Default Signal Alignment in 59.94 Hz Field Rate Systems

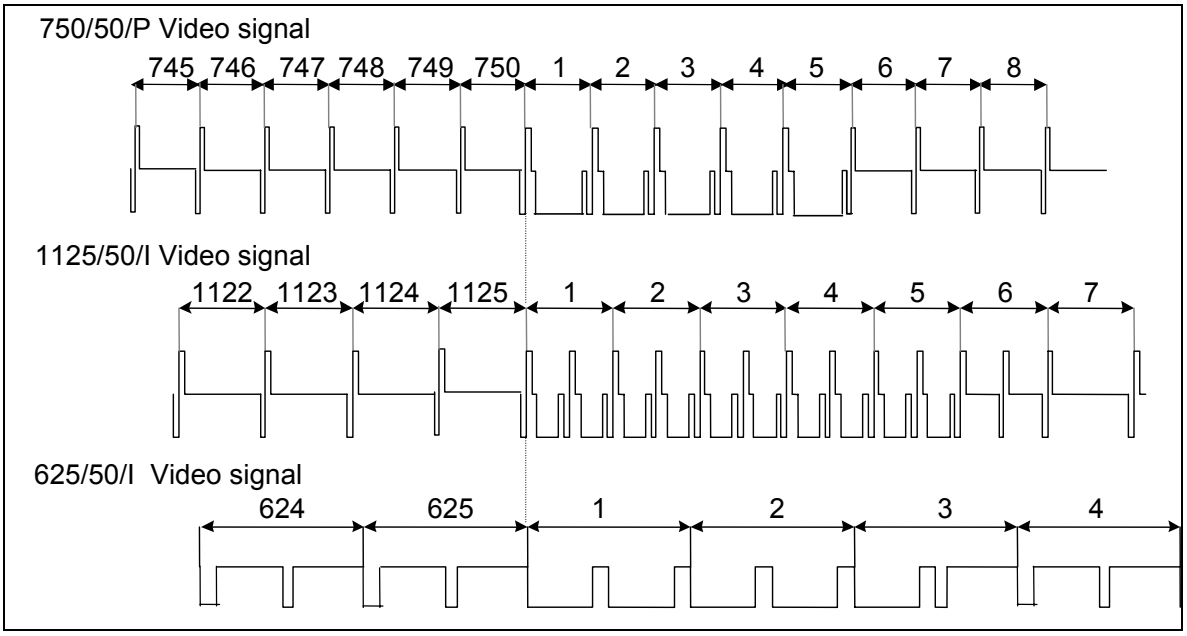

Figure 6: Default Signal Alignment in 50 Hz Field Rate Systems

5.4.3. Configuring 7750TG-HD Embedded Audio Parameters

The Audio Setup menu is used to select the audio group where embedded audio will be placed, and the frequency of the tones that will be put into each of the 4 embedded audio channels.

Group:	Selects the Audio Group where embedded audio will be placed.
Ch. 1:	Selects the audio signal for Audio Channel 1.
Ch. 2:	Selects the audio signal for Audio Channel 2.
Ch. 3:	Selects the audio signal for Audio Channel 3.
Ch. 4:	Selects the audio signal for Audio Channel 4.
Done	Return to main menu

5.4.3.1. Audio Group Selection

The *Group* parameter selects the Audio Group where embedded audio will be placed.

AUDIO
GROUP:

Off	No audio will be embedded in the video output.
1, 2, 3, 4	Up to 4 groups of audio may be embedded in the output video. Audio will be embedded into the selected group. There are four green LED's under the DIP switches that indicate which of the four groups audio is being embedded into.

5.4.3.2. Audio Channel Selection

Each Audio Group has four audio channels. The *Ch 1, Ch 2, Ch 3,* and *Ch 4* parameters select the Audio signal that will be embedded into each of the 4 channels of the audio group selected by the *Audio Group* parameter.

AUDIO		
Ch 1		
	Mute	Embedded audio in this channel will be silent.
	60 Hz *100 Hz* *200 Hz* *400 Hz* *800 Hz* *1.0 kHz* *1.6 kHz* *2.0 kHz* *3.2 kHz* *4.0 kHz* *5.0 kHz* *6.4 kHz* *8.0 kHz* *10 kHz*	Selecting one of these signals will set the frequency of the tone that is embedded into this channel.

5.4.4. Configuring the On Screen Message Display

The 7750TG has a programmable 16-character text message that may be used to display a source identification message or any other information on the screen. The *On Screen Display* menu is used to enter the text message, to turn it on and off and set the position on the screen. The *On Screen Display* menu is also used to set the length of time that signal name display is on after the user changes the test signal.

Message Display	Turns the message display on and off.
Message	Edit the On screen message.
Set Message Position	Sets horizontal and vertical position of the message on the screen.
Signal Name Duration	Set the duration that the signal name display is on after test signal changes.
Done	Exit On Screen Menu System

5.4.4.1. Editing the On Screen Message Display

The *Message* submenu is used to edit the text message. When you enter the *message* submenu, the actual text message is displayed on the top line.

TEXT MESSAGE	Edit the message.
Clear	Clears the complete message to space characters
Justify	Used to move the message within the 16 char text message block
Done	Exit On Screen Display Menu System

To edit the message, press the pushbutton when the > indicator is on the left of the message. The ^ indicator will appear under the left character of the message. Use the toggle switch to change the character indicated by the ^ or press the pushbutton to advance to the next character. When you have finished editing the message the > will automatically appear to the left of the message. Use the toggle switch to select the *Clear*, *Justify* or *Done* menu items and press the pushbutton to exit the *Message* submenu.

5.4.4.2. Positioning the On Screen Message Display

The *Position Message* submenu is used to position the text message on the character raster. When you enter the *Position Message* submenu, a box the size of the maximum length message will appear on the screen. Use the toggle switch to move the box horizontally. When you press the pushbutton you will be able to move the box vertically on the screen using the toggle switch. Press the pushbutton quickly twice to exit the *Position Message* submenu.

Messages that are shorter than 16 characters can be moved within the 16-character text box using the *Justify* submenu item. This allows shorter messages to be positioned all the way to the left or right side of the screen

5.4.4.3. Setting the Display Time for the Signal Name Display

The *Signal Name Display* menu item is used to set the length of time the On screen signal name is displayed after the user selects a new signal. Use the toggle switch to select a duration in seconds. The Signal name display can also be turned permanently *On* or *Off*.

6. JUMPERS

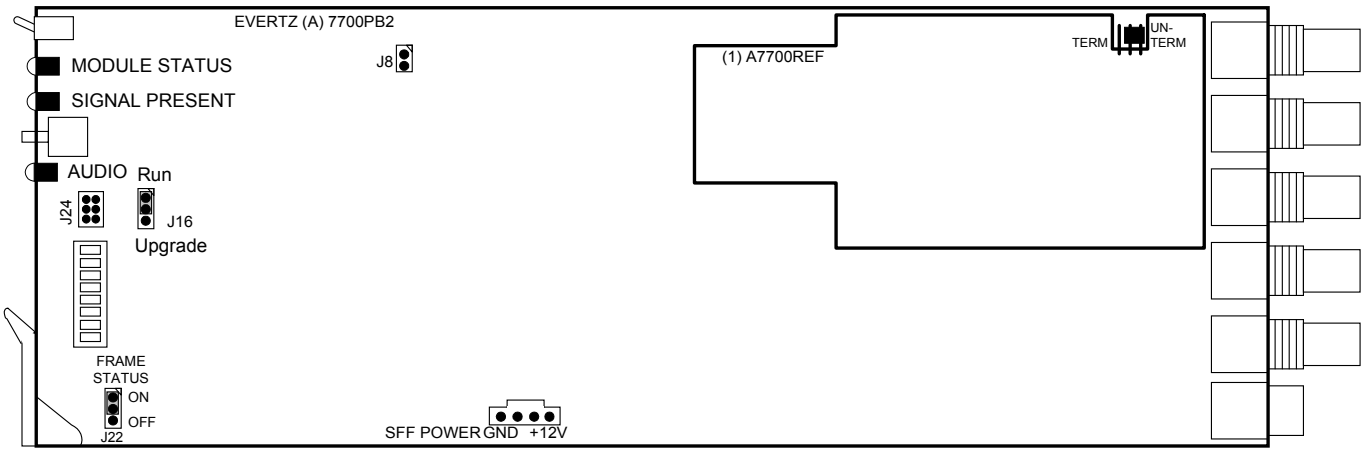

Figure 7: Location of Jumpers

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

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

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

When this jumper is removed, local faults on this module will not be monitored. For convenience you may re-install the jumper so that only one side is connected.

6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE The UPGRADE jumper J16 located at the front of the module is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. On Rev 1 versions of this board the upgrade jumper is located in another location. See the *Upgrading Firmware* section of this manual for more information.

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

6.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

TERM/UNTERM The TERM/UNTERM jumper J2 located on the A7700REF gen lock submodule is used to terminate the gen lock input. Then it is in the TERM position a 75 ohm terminating resistor will be connect the input to ground. When it is in the UNTERM position the gen lock input will be high impedance.

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