LEADER

LV 5770SER08 SDI INPUT

LV 5770SER09(A) SDI INPUT / EYE

FUNCTION MENU EXPLANATIONS

LEADER
ELECTRONIC MEASURING INSTRUMENTS

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1. INTRODUCTION

1.1 About This Manual

This manual explains the function menus for each display mode when an LV 5770SER08 (SDI INPUT) and LV 5770SER09A (SDI INPUT/EYE) are installed in the LV 5770A/7770. For details on how to operate the LV 5770A/7770, see the LV 5770A (MULTI MONITOR) or LV 7770 (MULTI RASTERIZER) Instruction Manual.

1.2 Differences between the LV 5770SER09A and LV 5770SER09

The LV 5770SER09A has the following additional features that are not available on the LV 5770SER09.

• Equivalent cable length measurement
• DC offset measurement

This manual explains the LV 5770SER09A. Note that if you are using the LV 5770SER09, some of the information in this manual will not apply.

1.3 About Terminology Used in this Manual

- **Single Input Mode**

  This refers to the mode in which the SIM key is off. Press the A and B keys to switch between measuring the signal that is being applied to SDI INPUT A and the signal that is being applied to SDI INPUT B, respectively.

- **Simul Mode**

  This refers to the mode in which the SIM key is on. The signals that are being applied to SDI INPUT A and SDI INPUT B are measured simultaneously.

- **3D Assist Mode**

  This refers to the mode that results when, on the picture menu, you press F•6 DISPLAY and then F•3 MODE to select 3D ASIST. The video signal for the left eye and the video signal for the right eye are measured at the same time.

- **1-Screen Display**

  This refers to the mode in which the MULTI key is off. Only the area that you select by pressing keys 1 to 4 is displayed.

- **Multi-Screen Display (2-screen multi display and 4-screen multi display)**

  This refers to the mode in which the MULTI key is on. You can set the number of screens that are displayed (two or four) in the system settings.
  On the 2-screen multi display, you can display areas 1 and 2 or areas 3 and 4.
  On the 4-screen multi display, you can display areas 1 to 4.

- **About the Input Format**

  With some exceptions, the input formats are written in this manual as shown below.

  Table 1-1 Input format

Name	Description
HD	HD-SDI
SD	SD-SDI
HD dual link	HD-SDI dual link
3G-A	3G-SDI level A
3G-B	3G-SDI level B
3G-B (2map)	3G-SDI level B 2mapping
3G	General term representing 3G-A, 3G-B, and 3G-B (2map)

- **Underline (_)**

  Underlined options indicate the default values.

- **VECT**

  To show the vector waveform display, you press VECT on the LV 5770A and VEC on the LV 7770. In this manual, both keys will be referred to as “VECT.” If you are using the LV 7770, press VEC instead of VECT.

2. VIDEO SIGNAL WAVEFORM DISPLAY

To display the video signal waveform, press WFM.

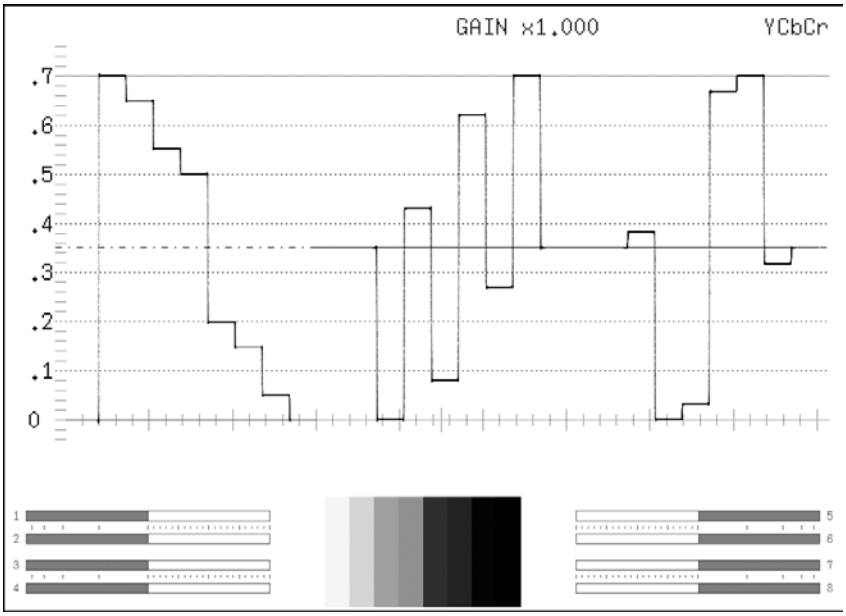


Figure 2-1 Video signal waveform display

- **Audio Thumbnail**

  On the LV 5770A, the audio thumbnail appears when the LV 5770SER41 or LV 5770SER43 is installed. The audio thumbnail always appears on the LV 7770. The channels that are displayed are the channels that have been selected on the Lissajous waveform channel mapping display.
  You can hide the thumbnails or switch to histogram thumbnails.
  See section 2.9.2, “Turning Thumbnails On and Off.”

- **Picture Thumbnail**

  This displays the picture. You can hide the thumbnails or switch to histogram thumbnails.
  See section 2.9.2, “Turning Thumbnails On and Off.”

- **Menu**

  Use the video signal waveform menu—which is displayed when you press the WFM key—to configure the video signal waveform display settings.

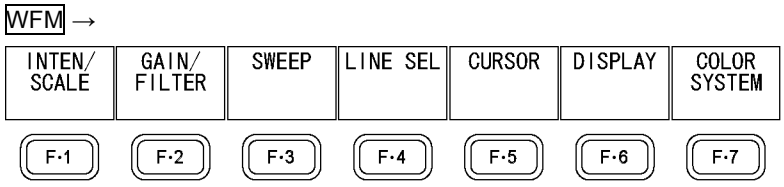


Figure 2-2 Video signal waveform menu

2.1 Setting the Waveform Display Position

Use the V POS and H POS knobs to adjust the display position of video signal waveforms.

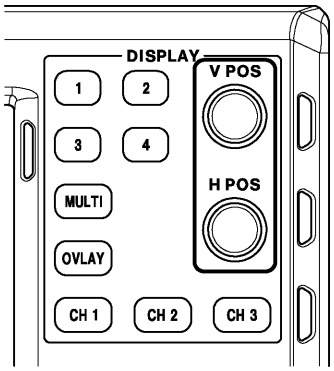


Figure 2-3 V POS and H POS knobs

- **V POS Knob**

  This knob adjusts the vertical position of the video signal waveform.
  Pressing the knob returns the waveform to its default position.

- **H POS Knob**

  This knob adjusts the horizontal position of the video signal waveform.
  Pressing the knob returns the waveform to its default position.

2.2 Setting the Display Mode

The video signal waveform display mode changes each time you press OVLAY.
When the OVLAY key's LED is lit, the display mode is overlay (waveforms are overlaid), when the OVLAY key's LED is not lit, the display mode is parade (waveforms are shown side by side).
The default value is parade mode.
This setting is invalid when COLOR MATRIX is set to COMPOSIT.
For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

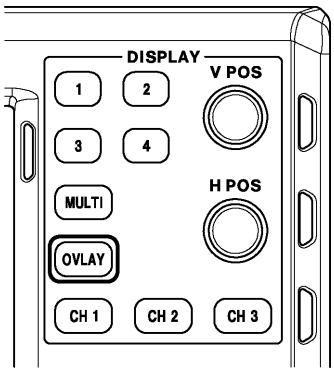
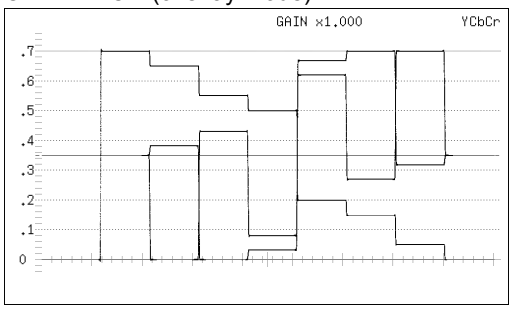


Figure 2-4 OVLAY key

OVLAY = ON (overlay mode)



OVLAY = OFF (parade mode)

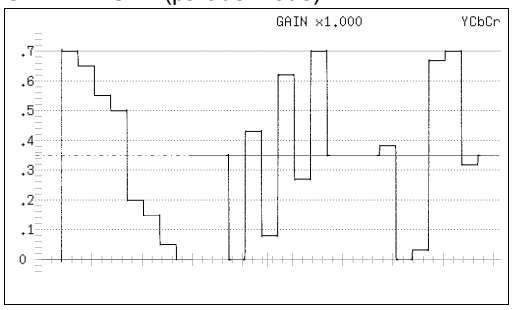


Figure 2-5 Overlay and parade displays

2.3 Setting Which Channels to Display

Pressing a key from CH1 to CH3 turns on and off the display of the video signal waveform assigned to that key. The video signal waveform display is on when a key's LED is lit and off when the key's LED is not lit. By default, all of the video signal waveform displays are on. This setting is invalid when COLOR MATRIX is set to COMPOSIT and when YGBR or YRGB is set to ON. You cannot turn the displays for all the channels off.

For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

For information on the YGBR and YRGB settings, see section 2.10.2, “Turning Luminance Signals On and Off.”

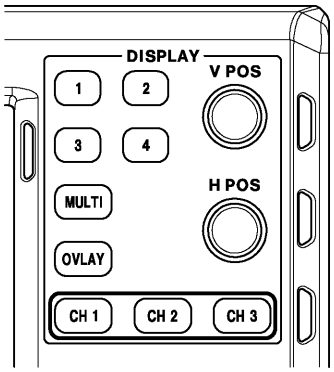


Figure 2-6 The CH1 to CH3 keys

Waveforms are assigned to the CH 1 to CH 3 keys as indicated below.

Table 2-1 Waveform assignments

COLOR MATRIX	CH 1	CH 2	CH 3
YCbCr	Y	Cb	Cr
GBR	G	B	R
RGB	R	G	B

2.4 Configuring the Intensity and Scale Settings

To configure the intensity and scale settings, press F•1 INTEN/SCALE on the video signal waveform menu.

WFM → F•1 INTEN/SCALE →

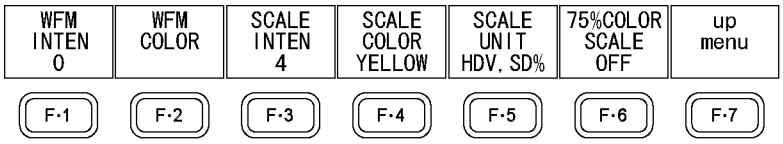


Figure 2-7 INTEN/SCALE menu

2.4.1 Adjusting the Waveform Intensity

To adjust the video signal waveform intensity, follow the procedure below. On the multi-screen display, this setting is also applied to the intensity of vectors.
Press the function dial (F•D) to return the setting to its default value (0).

Procedure (1-screen display)

WFM → F•1 INTEN/SCALE → F•1 WFM INTEN: -128 to 0 to 127

Procedure (Multi-screen display)

WFM → F•1 INTEN/SCALE → F•1 WFM/VECT INTEN: -128 to 0 to 127

2.4.2 Selecting the Waveform Color

To select the waveform color, press F•2 WFM COLOR on the INTEN/SCALE menu.

WFM → F•1 INTEN/SCALE → F•2 WFM COLOR →

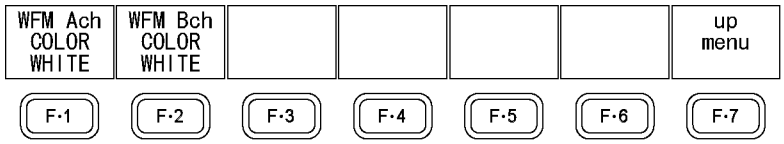


Figure 2-8 WFM COLOR menu

To select the video signal waveform color for each channel, follow the procedure below.
On the multi-screen display, the following colors are assigned to the video signal waveforms.
Y: White, Cb: Cyan, Cr: Magenta, G: Green, B: Blue, R: Red, and COMPOSIT: White.

Procedure (for SD, HD, 3G-A, and 3G-B)

WFM → F•1 INTEN/SCALE → F•2 WFM COLOR
→ F•1 WFM Ach COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI
→ F•2 WFM Bch COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

Procedure (for HD dual link)

WFM → F•1 INTEN/SCALE → F•2 WFM COLOR → F•1 WFM COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

Procedure (for 3G-B (2map))

WFM → F•1 INTEN/SCALE → F•2 WFM COLOR
→ F•1 WFM S1 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI
→ F•2 WFM S2 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

2.4.3 Adjusting the Scale Intensity

To adjust the scale intensity, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (4).

Procedure

WFM → F•1 INTEN/SCALE → F•3 SCALE INTEN: -8 to 4 to 7

2.4.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

WFM → F•1 INTEN/SCALE → F•4 SCALE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

2.4.5 Selecting the Scale Unit

To select the scale unit, follow the procedure below.

When COLOR MATRIX is set to COMPOSIT and the composite display format is NTSC, this is fixed to HD%,SD%. When the composite display format is PAL, this is fixed to HDV,SDV.

White 100 % on the video signal will fall on the 0.7 V or 100 % scale line.
Black 0 % on the video signal will fall on the 0 V or 0 % scale line.
For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

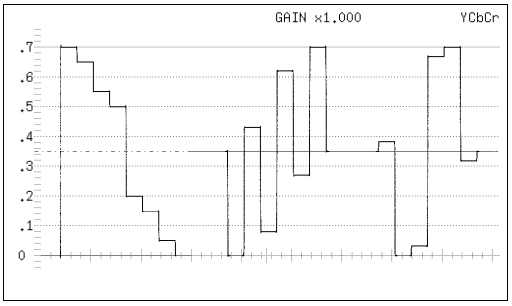
Procedure

WFM → F•1 INTEN/SCALE → F•5 SCALE UNIT: HDV,SD% / HDV,SDV / HD%,SD% / 150% / 1023 / 3FF / 1023,255

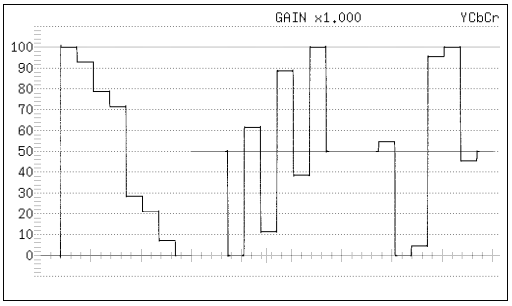
Settings

HDV,SD%:	The scale shows voltages when the input signal is not SD and percentages when the input signal is SD.
HDV,SDV:	The scale shows voltages.
HD%,SD%:	The scale shows percentages.
150%:	The scale shows percentages, and the display starts at -50 %.
1023:	0 to 100 % is displayed as 64 to 940 (for YGBR) or 64 to 960 (for CbCr).
3FF:	0 to 100 % is displayed as 040 to 3AC (for YGBR) or 040 to 3C0 (for CbCr).
1023,255:	0 to 100 % is displayed as 64 to 940 (for YGBR) or 16 to 235 (for YGBR).

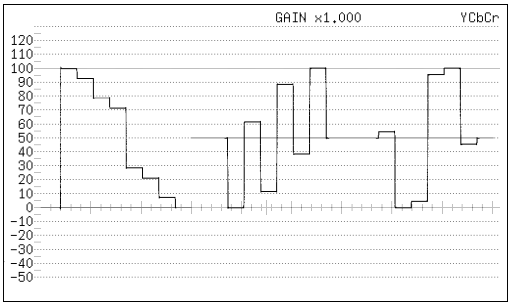
SCALE UNIT = HDV,SDV



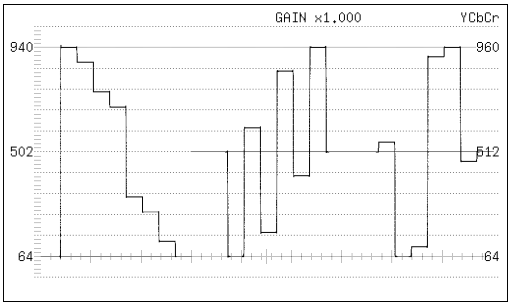
SCALE UNIT = HD%,SD%



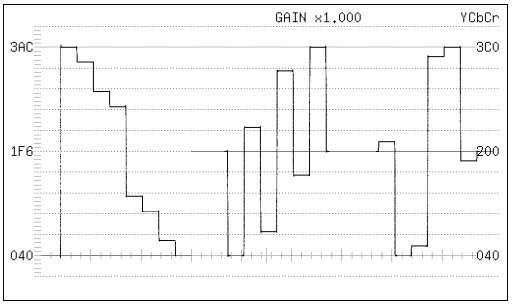
SCALE UNIT = 150%



SCALE UNIT = 1023



SCALE UNIT = 3FF



SCALE UNIT = 1023,255

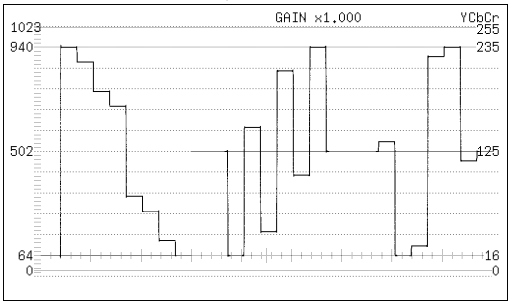


Figure 2-9　Selecting the scale unit

2.4.6 Displaying a Scale for 75 % Intensity Color Bars

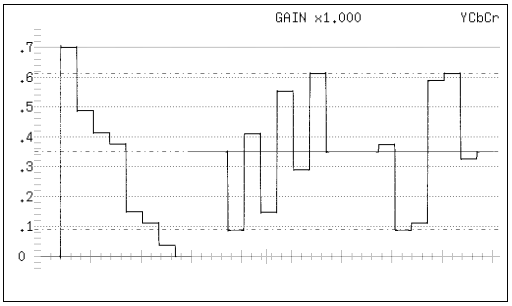
When COLOR MATRIX is set to YCbCr, to display a scale that matches the peak levels of the color difference signals for 75 % intensity color bars, follow the procedure below.

For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

Procedure

WFM → F•1 INTEN/SCALE → F•6 75%COLOR SCALE: ON / OFF

75%COLOR SCALE = ON



75%COLOR SCALE = OFF

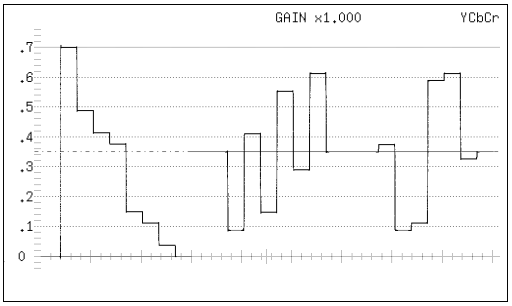


Figure 2-10 Displaying a scale for 75 % intensity color bars

2.5 Configuring the Gain and Filter Settings

To configure gain and sweep settings, press F•2 GAIN/FILTER on the video signal waveform menu.

WFM → F•2 GAIN/FILTER →

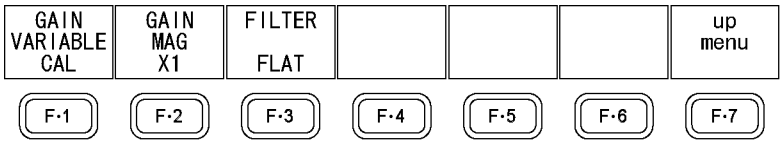


Figure 2-11 GAIN/FILTER menu

2.5.1 Selecting the Fixed Gain

To select the fixed video signal waveform gain, follow the procedure below.

Procedure

WFM → F•2 GAIN/FILTER → F•2 GAIN MAG: X1 / X5

2.5.2 Setting the Variable Gain

To set the variable video signal waveform gain, follow the procedure below.

Procedure

WFM → F•2 GAIN/FILTER → F•1 GAIN VARIABLE: CAL / VARIABLE

Settings

CAL:	The waveform gain is fixed.
VARIABLE:	You can adjust the waveform gain by turning the function dial (F•D). Press the function dial (F•D) to return the setting to its default value (1.000 or 5.000). The adjusted gain value (the combination of F•1 GAIN VARIABLE and F•2 GAIN MAG) appears in the upper right of the screen. 0.200 to 2.000 (when GAIN MAG = ×1) 1.000 to 10.000 (when GAIN MAG = ×5)

2.5.3 Selecting the Filter

To select the filter to apply to video signal waveforms, follow the procedure below.
The filters that you can select vary depending on the COLOR MATRIX setting.
For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

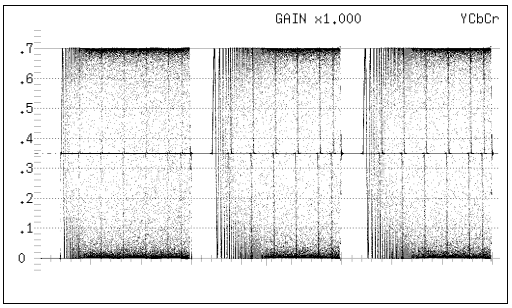
Procedure (When COLOR MATRIX is set to YCbCr, GBR, or RGB)

WFM → F•2 GAIN/FILTER → F•3 FILTER: FLAT / LOWPASS

Settings

FLAT:	A filter with a flat frequency response over the entire bandwidth of the input signal is applied.
LOWPASS:	A low-pass filter with the following characteristics is applied. Attenuation of 20 dB or more at 40 MHz (when the input signal is 1080p/60, 59.94, or 50) Attenuation of 20 dB or more at 20 MHz (when the input signal is HD or 3G/HD dual link that is not 1080p/60, 59.94, or 50) Attenuation of 20 dB or more at 3.8 MHz (when the input signal is SD)

FILTER = FLAT



FILTER = LOWPASS

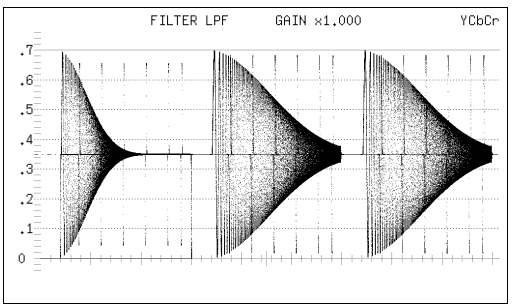


Figure 2-12 Selecting the filter (component)

Procedure (When COLOR MATRIX is set to COMPOSIT)

WFM → F•2 GAIN/FILTER → F•3 FILTER: FLAT / LUM / FLAT+LUM / LUM+CRMA

Settings

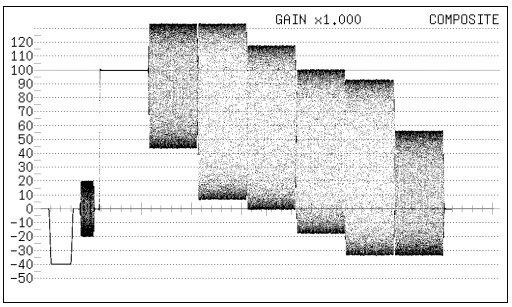
FLAT: Only the pseudo-composite signal is displayed.

LUM: Only the luminance signal is displayed.

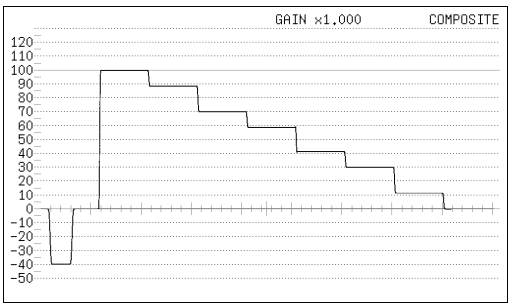
FLAT+LUM: The pseudo-composite and luminance signals are displayed side by side. A filter with an attenuation of 20 dB or more at 40 MHz is applied to the luminance signal.

LUM+CRMA: The luminance and chrominance signals are displayed side by side. A filter with an attenuation of 20 dB or more at 40 MHz is applied to the luminance signal.

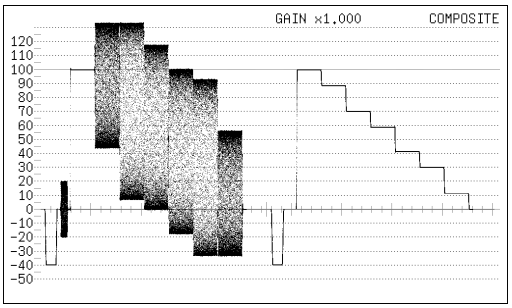
FILTER = FLAT



FILTER = LUM



FILTER = FLAT+LUM



FILTER = LUM+CRMA

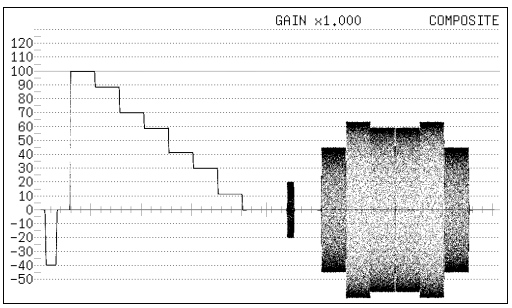


Figure 2-13 Selecting the filter (composite)

2.6 Configuring Sweep Settings

To configure the sweep settings, press F•3 SWEEP on the video signal waveform menu.

WFM → F•3 SWEEP →

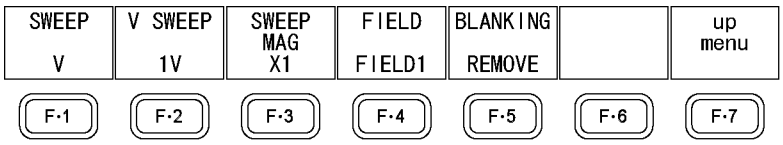


Figure 2-14 SWEEP menu

2.6.1 Selecting the Sweep Method

To select the video signal waveform sweep method, follow the procedure below.

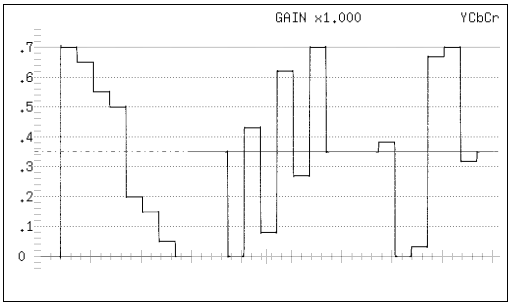
Procedure

WFM → F•3 SWEEP → F•1 SWEEP: H / V

Settings

H:	Lines are displayed.
V:	Fields or frames are displayed. Because the sampled data is downsampled, aliasing distortion occurs.

SWEEP = H



SWEEP = V

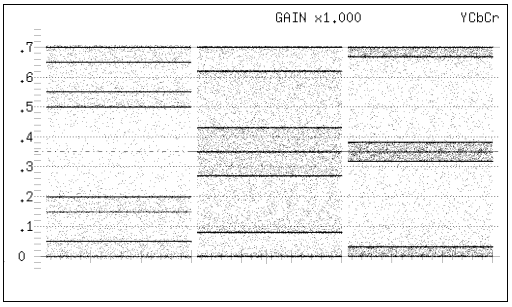


Figure 2-15 Selecting the sweep method

2.6.2 Selecting the Line Display Format

When F•1 SWEEP is set to H, to select the sweep time, follow the procedure below.

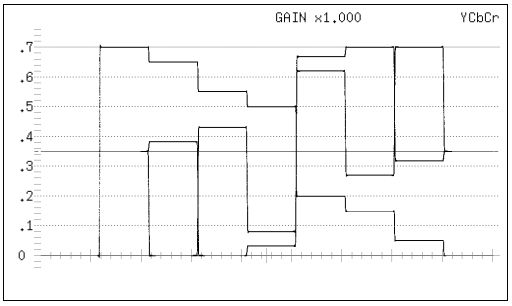
Procedure

WFM → F•3 SWEEP → F•2 H SWEEP: 1H / 2H

Settings

1H:	One line is displayed.
2H:	Two lines are displayed. This option cannot be selected when the parade display is in use or when the input signal is 3G's 1080p/60, 1080p/59.94, or 1080p/50 or 3G-A's 720p/30, 720p/29.97, 720p/25, 720p/24, or 720p/23.98.

H SWEEP = 1H



H SWEEP = 2H

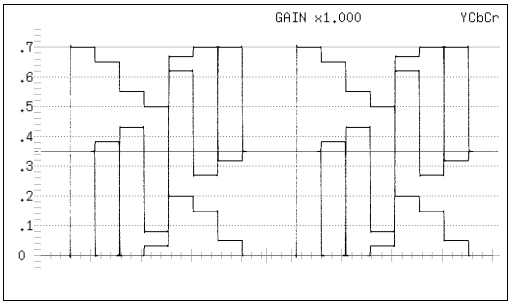


Figure 2-16 Selecting the line display format

2.6.3 Selecting the Field Display Format

When F•1 SWEEP is set to V, to select the sweep time, follow the procedure below.

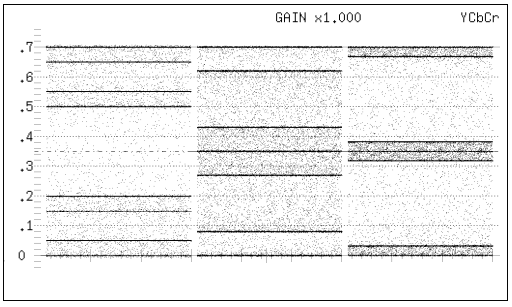
Procedure

WFM → F•3 SWEEP → F•2 V SWEEP: 1V / 2V

Settings

1V:	One field is displayed.
2V:	One frame is displayed. This option cannot be selected when the input single is progressive.

V SWEEP = 1V



V SWEEP = 2V

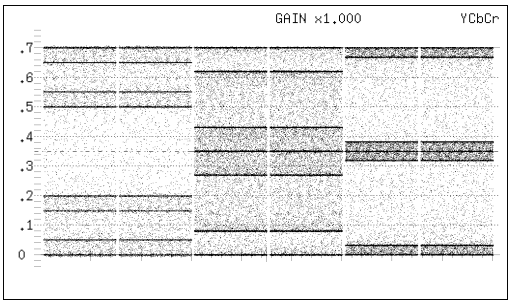


Figure 2-17 Selecting the field display format

In addition, when F•2 V SWEEP is set to 1V, to select which field is displayed, follow the procedure below.

Procedure

WFM → F•3 SWEEP → F•4 FIELD: FIELD1 / FIELD2

2.6.4 Selecting the Horizontal Magnification

To select the horizontal magnification, follow the procedure below. The magnifications that you can select vary as shown below depending on settings such as COLOR MATRIX.
For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

Table 2-2 Horizontal magnifications

F•1 SWEEP	COLOR MATRIX	F•2 H SWEEP	X1	X10	X20	X40	ACTIVE	BLANK
H	YCbCr, GBR, RGB	1H	Yes	Yes	Yes	No	Yes	Yes
		2H	Yes	Yes	Yes	No	No	Yes
	COMPOSIT	-	Yes	Yes	Yes	No	Yes	No
V	-	-	Yes	No	Yes	Yes	No	No

(Yes: Settable. No: Not settable.)

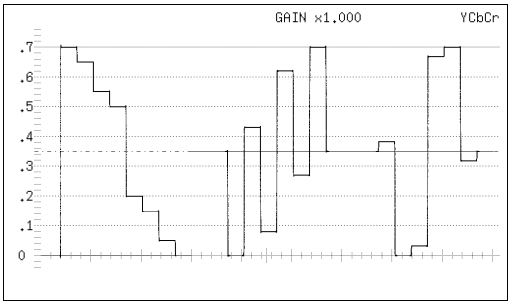
Procedure

WFM → F•3 SWEEP → F•3 SWEEP MAG: X1 / X10 / X20 / X40 / ACTIVE / BLANK

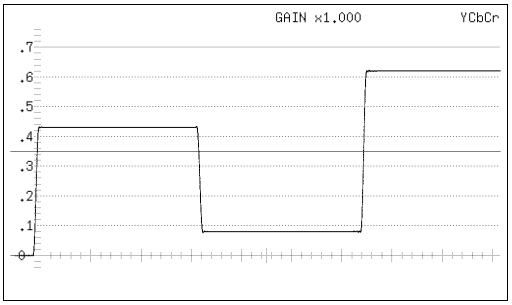
Settings

X1: The video signal waveforms are displayed so that they fit on the screen.
X10: The video signal waveforms are magnified from the center of the display to 10 times the size of X1.
X20: The video signal waveforms are magnified from the center of the display to 20 times the size of X1.
X40: The video signal waveforms are magnified from the center of the display to 40 times the size of X1.
ACTIVE: Everything but the video signal waveform blanking interval is magnified.
BLANK: The video signal waveform blanking interval is magnified.

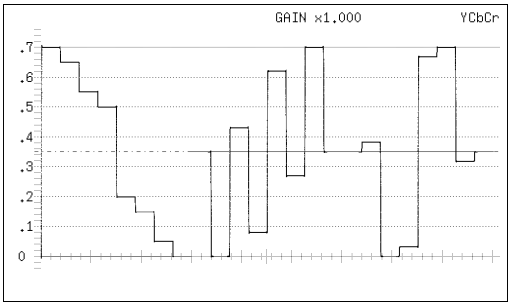
SWEEP MAG = X1



SWEEP MAG = X10



SWEEP MAG = ACTIVE



SWEEP MAG = BLANK

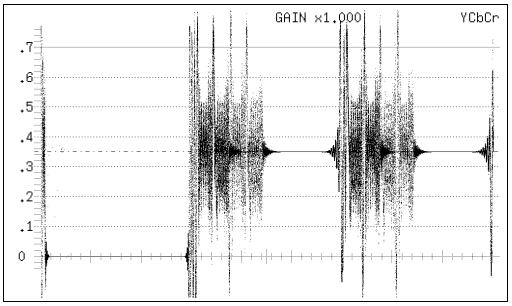


Figure 2-18 Horizontal magnifications

2.6.5 Displaying the Blanking Interval

To set how the waveforms in the blanking interval are displayed, follow the procedure below.

For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

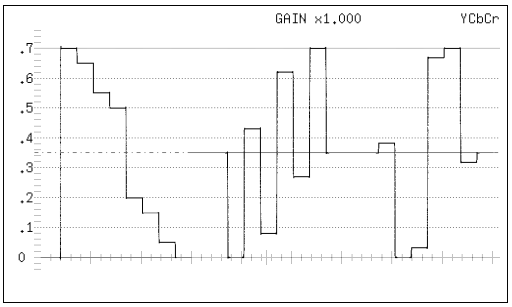
Procedure

WFM → F•3 SWEEP → F•5 BLANKING: REMOVE / V VIEW / H VIEW / ALL VIEW

Settings

REMOVE:	Only the active interval is displayed.
V VIEW:	The active interval and the vertical blanking interval are displayed.
H VIEW:	The active interval and the horizontal blanking interval are displayed. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.
ALL VIEW:	The entire input signal is displayed. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.

BLANKING = REMOVE



BLANKING = ALL VIEW

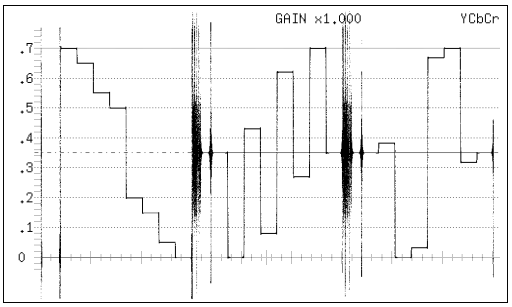


Figure 2-19 Displaying blanking intervals

2.7 Configuring Line Select Settings

To configure the line select settings, press F•4 LINE SEL on the video signal waveform menu.

WFM → F•3 LINE SEL →

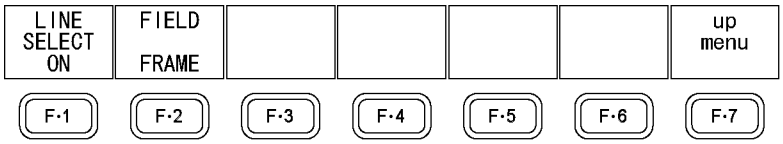


Figure 2-20 LINE SEL menu

2.7.1 Turning Line Select On and Off

To display the waveform of the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the lower left of the display. Press the function dial (F•D) to move to the first video line.

Changing this setting will also change the vector-display and picture-display line select settings.

This menu item does not appear when SWEEP is set to V.

For information on the SWEEP setting, see section 2.6.1, “Selecting the Sweep Method.”

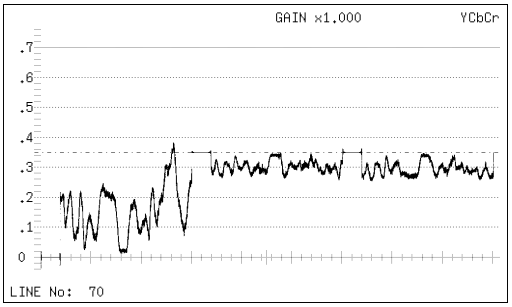
Procedure

WFM → F•4 LINE SEL → F•1 LINE SELECT: ON / ACH / BCH / STREAM1 / STREAM2 / BOTH / OFF / CINELITE

Settings

ON:	Line select is turned on. This option can be selected in single input mode when the input signal is not 3G-B (2map).
ACH:	Line select is turned on for channel A only. This option can be selected in simul mode.
BCH:	Line select is turned on for channel B only. This option can be selected in simul mode.
STREAM1:	Line select is turned on for stream 1 only. This option can be selected when the input signal is 3G-B (2map).
STREAM2:	Line select is turned on for stream 2 only. This option can be selected when the input signal is 3G-B (2map).
BOTH:	Line select is turned on for channels A and B or streams 1 and 2. This option can be selected in simul mode when the channel A format and channel B format are the same or when the input signal is 3G-B (2map).
OFF:	Line select is turned off.
CINELITE:	The waveform of the line selected on the CINELITE display is displayed. This option can be selected if any of the display areas is showing an f Stop screen or % DISPLAY screen.

LINE SEL = ON



LINE SEL = OFF

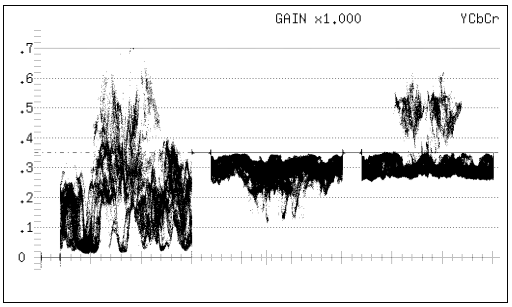


Figure 2-21 Turning line select on and off

2.7.2 Setting the Line Select Range

When the input signal is interlace or segmented frame, to set the line select range, follow the procedure below.

Procedure

WFM → F•4 LINE SEL → F•2 FIELD: FIELD1 / FIELD2 / FRAME

Settings

FIELD1:	A line from field 1 can be selected (example: 1 to 563).
FIELD2:	A line from field 2 can be selected (example: 564 to 1125).
FRAME:	All lines can be selected (example: 1 to 1125).

2.8 Configuring Cursor Settings

To configure cursor settings, press F•5 CURSOR on the video signal waveform menu.

WFM → F•5 CURSOR →

CURSOR	XY SEL	Y UNIT	FD VAR	REFSET		up menu
ON	Y	R%	REF			
F·1	F·2	F·3	F·4	F·5	F·6	F·7

Figure 2-22 CURSOR menu

2.8.1 Turning Cursors On and Off

To turn cursors on and off, follow the procedure below.
The REF cursor is displayed in blue, and the DELTA cursor is displayed in green. The value of DELTA - REF appears as a measured value in the lower right of the screen. (When F•3 Y UNIT is set to DEC or HEX, absolute values are displayed.)

Procedure

WFM → F•5 CURSOR → F•1 CURSOR: ON / OFF

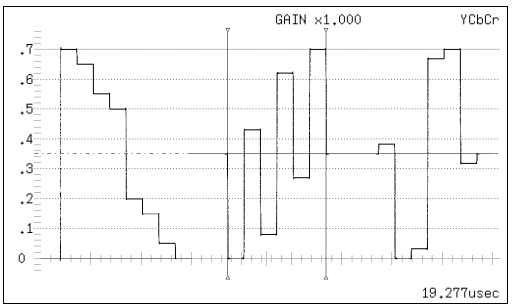
2.8.2 Selecting the Cursors

To select X (time measurement) or Y (amplitude measurement) cursors, follow the procedure below.

Procedure

WFM → F•5 CURSOR → F•2 XY SEL: X / Y

XY SEL = X



XY SEL = Y

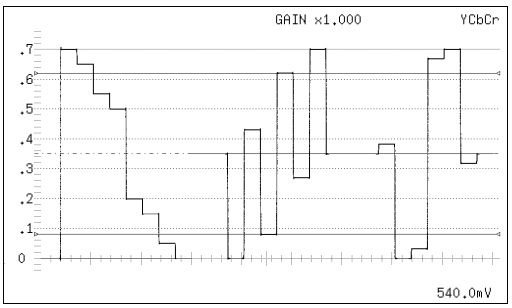


Figure 2-23 Selecting X or Y cursors

2.8.3 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

WFM → F•5 CURSOR → F•4 FD VAR: REF / DELTA / TRACK

2.8.4 Selecting the Y-Axis Measurement Unit

When F•2 XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

For information on the COLOR MATRIX setting, see section 2.10.1, “Selecting the Color Matrix.”

Procedure

WFM → F•5 CURSOR → F•3 Y UNIT: mV / % / R%

Settings

mV:	The measurement unit is volts.
%:	The measurement unit is percentage. When the composite display format is NTSC, 714 mV is 100 %. When the composite display format is PAL, 700 mV is 100 %.
R%:	The amplitude will be measured as a percentage of the amplitude at the time when you pressed F•5 REFSET.
DEC:	Values are displayed in decimal with 0 to 100 % expressed as 64 to 940. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.
HEX:	Values are displayed in hexadecimal with 0 to 100 % expressed as 040 to 3AC. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.

2.8.5 Selecting the X-Axis Measurement Unit

When F•2 XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

WFM → F•5 CURSOR → F•3 X UNIT: sec / Hz

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.

2.9 Configuring Display Settings

To configure the display settings, press F•6 DISPLAY on the video signal waveform menu.

WFM → F•6 DISPLAY →

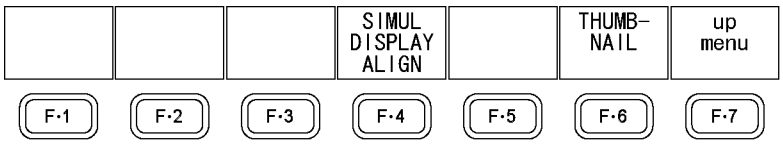


Figure 2-24 DISPLAY menu

2.9.1 Setting the Simul Display

When in simul mode, to select the display format, follow the procedure below.

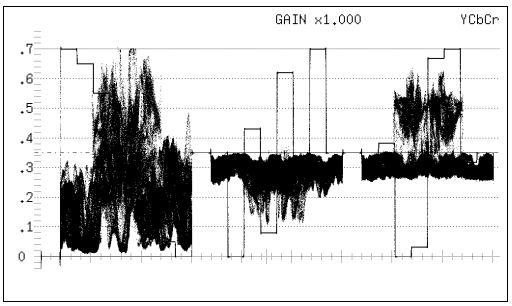
Procedure

WFM → F•6 DISPLAY → F•4 SIMUL DISPLAY: MIX / ALIGN

Settings

MIX:	The video signal waveforms are overlapped and displayed.
ALIGN:	The video signal waveforms are displayed side by side.

SIMUL DISPLAY = MIX



SIMUL DISPLAY = ALIGN

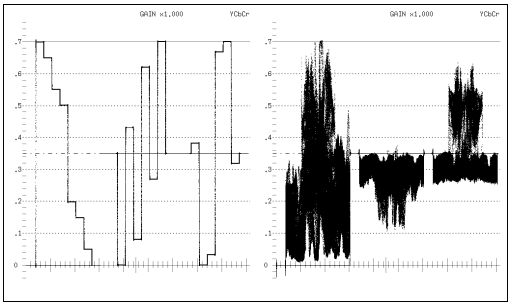


Figure 2-25 Setting the simul display

2.9.2 Setting the 3G-B (2map) Display

When the input signal is 3G-B (2map), to select the display format, follow the procedure below.

Procedure

WFM → F•6 DISPLAY → F•4 2MAPPING DISPLAY: STREAM1 / STREAM2 / MIX / ALIGN

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other.
ALIGN:	Streams 1 and 2 are displayed side by side.

2.9.3 Turning Thumbnails On and Off

To configure thumbnail settings, press F•6 THUMBNAIL on the DISPLAY menu.
This menu item does not appear when the multi-screen display is in use.

WFM → F•6 DISPLAY → F•6 THUMBNAIL →

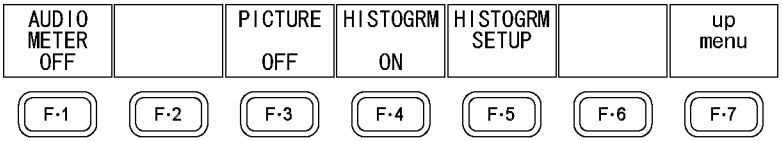


Figure 2-26 THUMBNAIL menu

To turn the thumbnail displays of the audio meter, picture, and histogram on and off separately, follow the procedure below.

- When an LV 5770SER41 or LV 5770SER43 is not installed in the LV 5770A or when the audio display mode is set to loudness, F•1 AUDIO METER is not displayed.
- If the input signal is 3G-B (2map), F•1 AUDIO METER cannot be turned on.
- You cannot display a histogram thumbnail at the same time as another thumbnail.

Procedure

WFM → F•6 DISPLAY → F•6 THUMBNAIL → F•1 AUDIO METER: ON / OFF
→ F•3 PICTURE: ON / OFF
→ F•4 HISTOGRM: ON / OFF

2.9.4 Configuring the Histogram Settings

To configure histogram settings, press F•5 HISTOGRM SETUP on the THUMBNAIL menu.
F•5 HISTOGRM SETUP appears when F•4 HISTOGRM is set to ON.

WFM → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP →

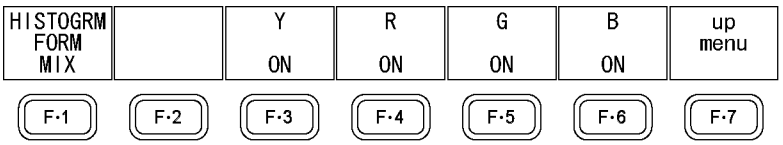


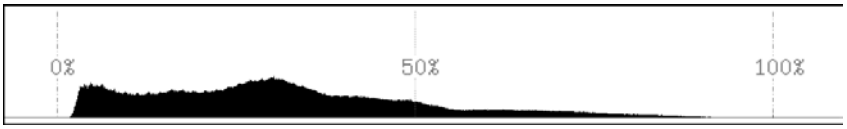
Figure 2-27 HISTOGRM SETUP menu

To select the histogram display format, follow the procedure below.

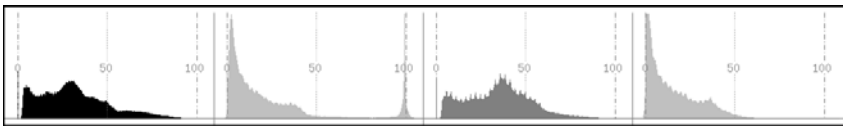
Procedure

WFM → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP → F•1 HISTOGRM FORM: LUMA / ALIGN / MIX

HISTOGRM FORM = LUMA



HISTOGRM FORM = ALIGN



HISTOGRM FORM = MIX

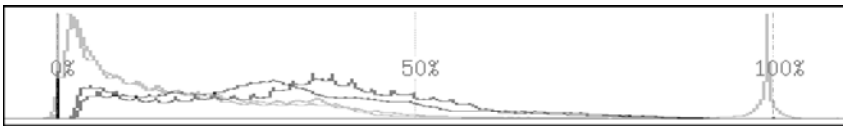


Figure 2-28 Configuring the histogram settings

In addition, when F•1 HISTOGRM FORM is set to MIX, follow the procedure below to turn Y, R, G, and B on and off separately.

Procedure

WFM → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP
→ F•3 Y: ON / OFF
→ F•4 R: ON / OFF
→ F•5 G: ON / OFF
→ F•6 B: ON / OFF

2.10 Configuring the Color System Settings

To configure the color system settings, press F•7 COLOR SYSTEM on the video signal waveform menu.

WFM → F•7 COLOR SYSTEM →

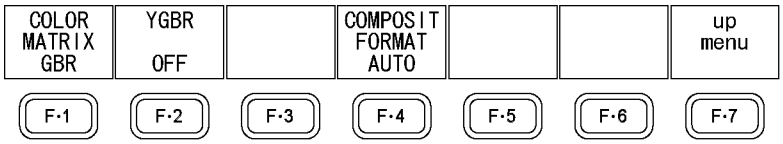


Figure 2-29 COLOR SYSTEM menu

2.10.1 Selecting the Color Matrix

The LV 5770SER08 or LV 5770SER09A performs a matrix conversion on a YC_BC_R signal to convert it into a GBR, RGB or pseudo-composite signal. To select the waveform display format, follow the procedure below. The selected display format is indicated in the upper right of the display.

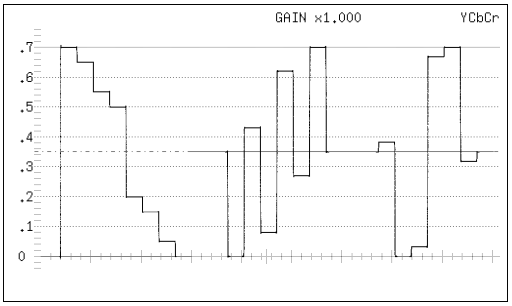
Procedure

WFM → F•7 COLOR SYSTEM → F•1 COLOR MATRIX: YCbCr / GBR / RGB / COMPOSIT

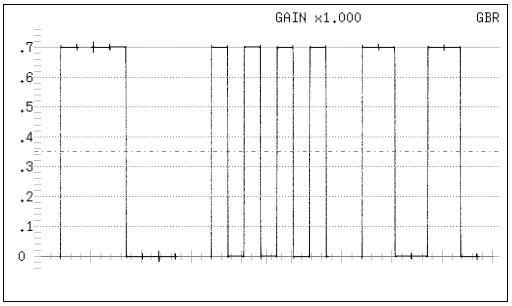
Settings

YCbCr:	The YC_BC_R signal is displayed without changes. This option cannot be selected when the input signal is RGB (4:4:4). (It can be selected in simul mode if the RGB signal is combined with the YCbCr signal.)
GBR:	The YC_BC_R signal is converted into a GBR signal and displayed.
RGB:	The YC_BC_R signal is converted into an RGB signal and displayed.
COMPOSIT:	The YC_BC_R signal is converted into a pseudo NTSC or PAL composite signal and displayed. • Color burst frequencies do not match those of PAL and NTSC. • Color burst and sync signal widths and locations are different from those of PAL and NTSC. • The signal bandwidth is that of the original signal.

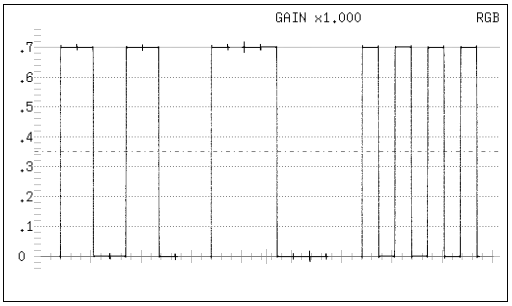
COLOR MATRIX = YCbCr



COLOR MATRIX = GBR



COLOR MATRIX = RGB



COLOR MATRIX = COMPOSIT

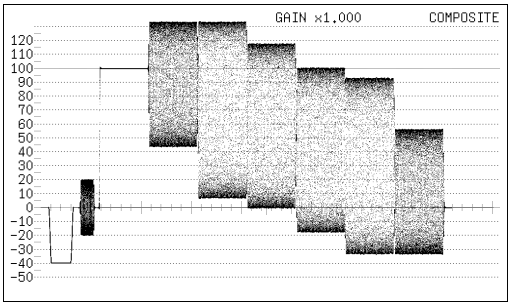


Figure 2-30 Selecting the color matrix

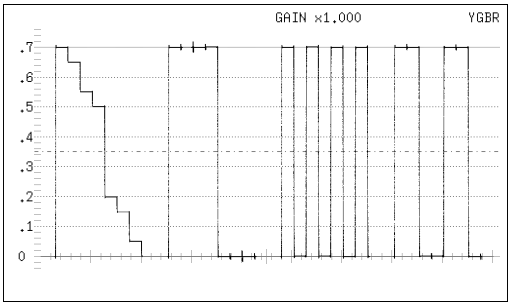
2.10.2 Turning the Luminance Signal On and Off

When F•1 COLOR MATRIX is set to GBR or RGB, to turn the luminance signal (Y) on and off, follow the procedure below. When the luminance signal is on, the keys from CH1 to CH3 are disabled.

Procedure

WFM → F•7 COLOR SYSTEM → F•2 YGBR: ON / OFF
→ F•2 YRGB: ON / OFF

YGBR = ON



YRGB = ON

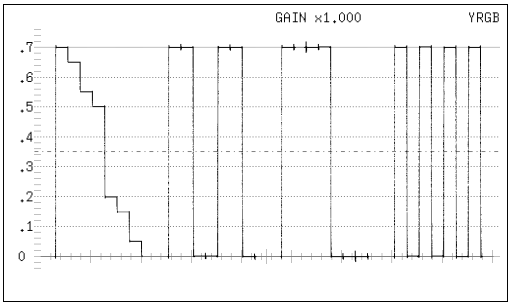


Figure 2-31 Turning the luminance signal on and off

2.10.3 Selecting the Composite Display Format

To select the composite display format, follow the procedure below.

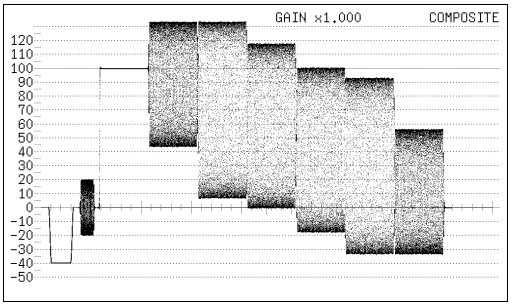
Procedure

WFM → F•7 COLOR SYSTEM → F•4 COMPOSIT FORMAT: AUTO / NTSC / PAL

Settings

AUTO:	When the input signal frame rate is 25 Hz or 50 Hz, the format is PAL. Otherwise, the format is NTSC.
NTSC:	The format is NTSC. The scale shows percentages.
PAL:	The format is PAL. The scale shows voltages.

COMPOSIT FORMAT = NTSC



COMPOSIT FORMAT = PAL

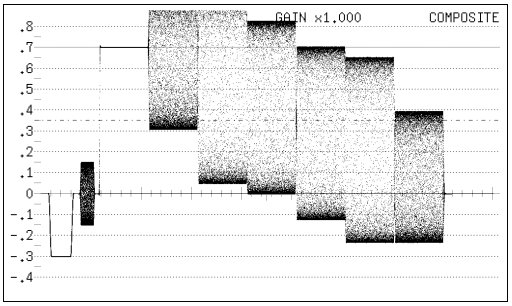


Figure 2-32 Selecting the composite display format

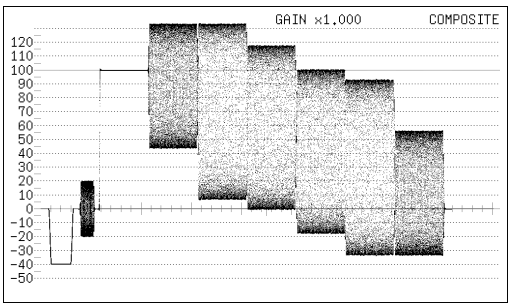
2.10.4 Selecting the Setup Level

When F•1 COLOR MATRIX is set to COMPOSIT, to select the setup level, follow the procedure below.
This menu item does not appear when the composite display format is PAL.

Procedure

WFM → F•7 COLOR SYSTEM → F•5 SETUP: 0% / 7.5%

SETUP = 0%



SETUP = 7.5%

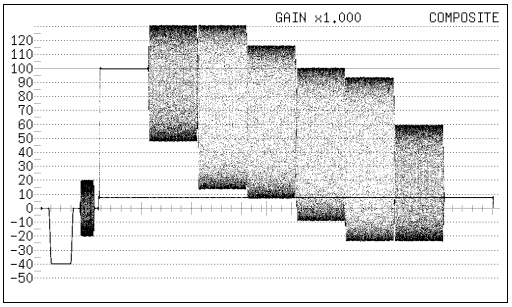


Figure 2-33 Selecting the setup level

3. VECTOR DISPLAY

To display vectors, press VECT.

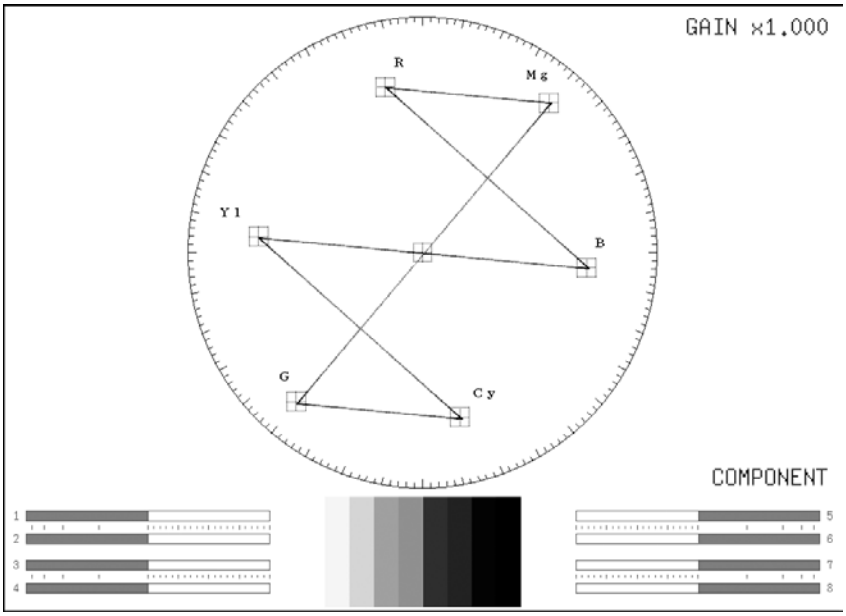


Figure 3-1 Vector display

- **Vectors**

  Component signal vector displays are X-Y displays based on C_B (horizontal) and C_R (vertical). The vector display scale has the following qualities.

  Frame: ±3 % of the full scale value of 0.7 V

  Circle: 20 % with respect to green

- **Audio Thumbnail**

  On the LV 5770A, the audio thumbnail appears when the LV 5770SER41 or LV 5770SER43 is installed. The audio thumbnail always appears on the LV 7770. The channels that are displayed are the channels that have been selected on the Lissajous waveform channel mapping display. You can hide the thumbnails or switch to histogram thumbnails.

  See section 3.6.4, “Turning Thumbnails On and Off.”

- **Picture Thumbnail**

  This displays the picture. You can hide the thumbnails or switch to histogram thumbnails.

  See section 3.6.4, “Turning Thumbnails On and Off.”

- **Menu**

  Use the vector menu—which is displayed when you press the VECT key—to configure the vector display settings.

VECT →

INTEN/ SCALE	GAIN MAG X1	GAIN VARIABLE CAL	LINE SEL	MARKER OFF	DISPLAY	COLOR SYSTEM
F-1	F-2	F-3	F-4	F-5	F-6	F-7

Figure 3-2 Vector menu

3.1 Configuring the Intensity and Scale Settings

To configure the intensity and scale settings, press F•1 INTEN / SCALE on the vector menu. This menu item does not appear when MODE is set to 5BAR.

For information on the MODE setting, see section 3.6.1, “Switching the Display Mode.”

VECT → F•1 INTEN/SCALE →

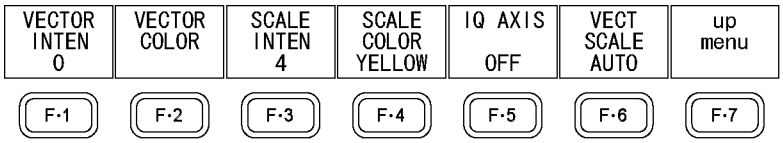


Figure 3-3 INTEN/SCALE menu

3.1.1 Adjusting the Vector Intensity

To adjust the vector intensity, follow the procedure below. On the multi-screen display, this setting is also applied to the intensity of video signal waveforms.
Press the function dial (F•D) to return the setting to its default value (0).

Procedure (1-screen display)

VECT → F•1 INTEN/SCALE → F•1 VECTOR INTEN: -128 to 0 to 127

Procedure (Multi-screen display)

VECT → F•1 INTEN/SCALE → F•1 VECT/WFM INTEN: -128 to 0 to 127

3.1.2 Selecting the Vector Color

To select the vector color, press F•2 VECTOR COLOR on the INTEN/SCALE menu.

VECT → F•1 INTEN/SCALE → F•2 VECTOR COLOR →

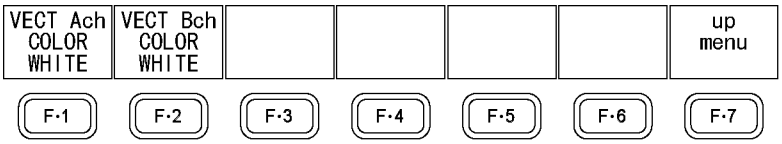


Figure 3-4 VECTOR COLOR menu

To select the vector color for each channel, follow the procedure shown below.

Procedure (for SD, HD, 3G-A, and 3G-B)

VECT → F•1 INTEN/SCALE → F•2 VECTOR COLOR
→ F•1 VECT Ach COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE
→ F•2 VECT Bch COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

Procedure (for HD dual link)

VECT → F•1 INTEN/SCALE → F•2 VECTOR COLOR → F•1 VECTOR COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

Procedure (for 3G-B (2map))

VECT → F•1 INTEN/SCALE → F•2 VECTOR COLOR
→ F•1 VECT S1 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE
→ F•2 VECT S2 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

3.1.3 Adjusting the Scale Intensity

To adjust the scale intensity, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (4).

Procedure

VECT → F•1 INTEN/SCALE → F•3 SCALE INTEN: -8 to 4 to 7

3.1.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

VECT → F•1 INTEN/SCALE → F•4 SCALE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

3.1.5 Turning the Display of the I and Q Axes On and Off

To turn the display of the I and Q axes on and off, follow the procedure below.
When the full scale value of 0.7 V is 100 %, the I and Q axes are displayed at the following values.

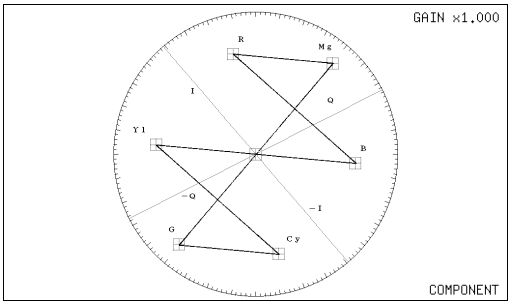
Table 3-1 Displaying the I and Q axes

	I Axis	Q Axis
G	44.559 %	37.056 %
B	27.865 %	84.085 %
R	69.120 %	62.417 %

Procedure

VECT → F•1 INTEN/SCALE → F•5 IQ AXIS: ON / OFF

IQ AXIS = ON



IQ AXIS = OFF

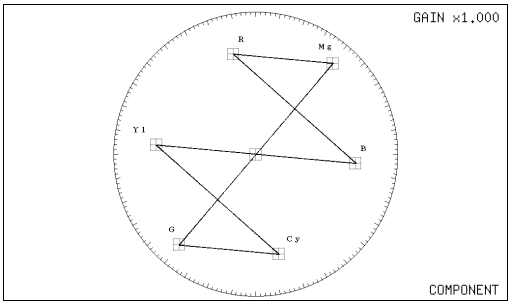


Figure 3-5 Turning the display of the I and Q axes on and off

3.1.6 Selecting the Scale

When COLOR MATRIX is set to COMPONEN, to select the scale type, follow the procedure below.

For information on the COLOR MATRIX setting, see section 3.7.1, “Selecting the Color Matrix.”

Procedure

VECT → F•1 INTEN/SCALE → F•6 VECT SCALE: AUTO / BT.601 / BT.709

Settings

AUTO:	When the input signal is SD, a BT.601 scale is displayed. Otherwise, a BT.709 scale is displayed.
BT.601:	A scale defined in ITU-R BT.601 is displayed. When the input signal is SD and a 100 % color bar signal is being applied, the peak levels match the ends of the scale.
BT.709:	A scale defined in ITU-R BT.709 is displayed. When the input signal is HD and a 100 % color bar signal is being applied, the peak levels match the ends of the scale.

3.2 Selecting the Fixed Gain

To select the fixed vector gain, follow the procedure below.
This menu item does not appear when MODE is set to 5BAR.

For information on the MODE setting, see section 3.6.1, “Switching the Display Mode.”

Procedure

VECT → F•2 GAIN MAG: X1 / X5 / IQ-MAG

Settings

X1:	Vectors are displayed at ×1 magnification.
X5:	Vectors are displayed at ×5 magnification.
IQ-MAG:	Waveforms are displayed using the following magnification. ×3.12 (for signals other than SD during component display; magnification that causes the I signal of the multiformat colorbar to lie on the circumference of the scale) ×2.85 (for signals other than SD during pseudo-composite display; magnification that causes the I signal of the multiformat colorbar, which has gone through pseudo-composite conversion, to lie on the circumference of the scale) ×2.92 (for SD signals during component display; magnification that causes the amplitude to lie on the circumference of the scale when the burst signal of the composite vector display is converted into component signals) ×2.63 (for SD signals during pseudo-composite display; magnification that causes the -I and Q signals of the SMPTE colorbar, which has gone through pseudo-composite conversion, to lie on the circumference of the scale)

3.3 Setting the Variable Gain

To set the variable vector gain, follow the procedure below.
This menu item does not appear when MODE is set to 5BAR.
For information on the MODE setting, see section 3.6.1, “Switching the Display Mode.”

Procedure

VECT → F•3 GAIN VARIABLE: CAL / VARIABLE

Settings

CAL: The vector gain is fixed.

VARIABLE: You can adjust the vector gain by turning the function dial (F•D). Press the function dial (F•D) to return the setting to its default value.
The adjusted gain value (the combination of F•2 GAIN MAG and F•3 GAIN VARIABLE) appears in the upper right of the screen.
0.200 to 1.000 to 2.000 (when F•2 GAIN MAG is set to X1)
1.000 to 5.000 to 10.000 (when F•2 GAIN MAG is set to X5)
0.620 to 3.120 to 6.240 (when F•2 GAIN MAG is set to IQ-MAG, the input signal is not SD, and component signals are displayed)
0.570 to 2.850 to 5.700 (when F•2 GAIN MAG is set to IQ-MAG, the input signal is not SD, and a pseudo-composite signals is displayed)
0.580 to 2.920 to 5.840 (when F•2 GAIN MAG is set to IQ-MAG, the input signal is SD, and component signals are displayed)
0.520 to 2.630 to 5.260 (when F•2 GAIN MAG is set to IQ-MAG, the input signal is SD, and a pseudo-composite signals is displayed)

3.4 Configuring Line Select Settings

To configure the line select settings, press F•4 LINE SEL on the vector menu.

VECT → F•4 LINE SEL →

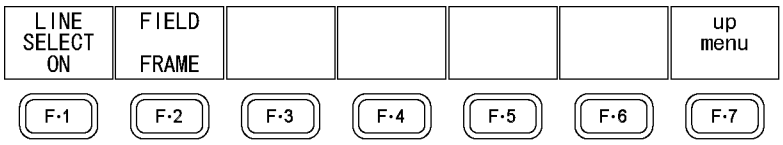


Figure 3-6 LINE SEL menu

3.4.1 Turning Line Select On and Off

To display the vector of the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the lower left of the display. Press the function dial (F•D) to move to the first video line.
Changing this setting will also change the video-signal-waveform-display and picture-display line select settings.
This menu item does not appear when SWEEP is set to V on the video signal waveform menu.
For information on the SWEEP setting, see section 2.6.1, “Selecting the Sweep Method.”

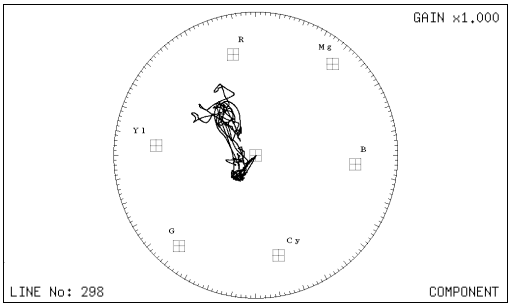
Procedure

VECT → F•4 LINE SEL → F•1 LINE SELECT: ON / ACH / BCH / STREAM1 / STREAM2 / BOTH / OFF / CINELITE

Settings

ON:	Line select is turned on. This option can be selected in single input mode when the input signal is not 3G-B (2map).
ACH:	Line select is turned on for channel A only. This option can be selected in simul mode.
BCH:	Line select is turned on for channel B only. This option can be selected in simul mode.
STREAM1:	Line select is turned on for stream 1 only. This option can be selected when the input signal is 3G-B (2map).
STREAM2:	Line select is turned on for stream 2 only. This option can be selected when the input signal is 3G-B (2map).
BOTH:	Line select is turned on for channels A and B or streams 1 and 2. This option can be selected in simul mode when the channel A format and channel B format are the same or when the input signal is 3G-B (2map).
OFF:	Line select is turned off.
CINELITE:	The vector of the line selected on the CINELITE display is displayed. This option can be selected if any of the display areas is showing an f Stop screen or % DISPLAY screen.

LINE SELECT = ON



LINE SELECT = OFF

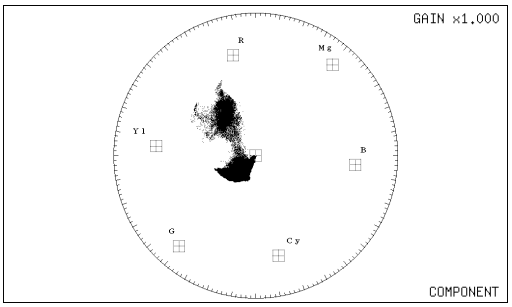


Figure 3-7 Turning line select on and off

3.4.2 Setting the Line Select Range

When the input signal is interlace or segmented frame, to set the line select range, follow the procedure below.

Procedure

VECT → F•4 LINE SEL → F•2 FIELD: FIELD1 / FIELD2 / FRAME

Settings

FIELD1:	A line from field 1 can be selected (example: 1 to 563).
FIELD2:	A line from field 2 can be selected (example: 564 to 1125).
FRAME:	All lines can be selected (example: 1 to 1125).

3.5 Displaying the Vector Marker

When the input signal is not 3G-B (2map) in single input mode, to display a marker on the vector waveform, follow the procedure below.

You can move the marker horizontally using the H POS knob and vertically using the V POS knob. The measured values are displayed in the lower right of the display. Press the H POS knob to move the marker to the Cb = 0.0% position. Press the V POS knob to move the marker to the Cr = 0.0% position.

Measured values are displayed using the following references: Cb at position B = 100.0% and Cr at position R = 100.0%. The distance from the center is expressed as “d,” and hue is expressed as “deg.”
Normally, the marker is displayed in green. When if falls outside the display, it blinks in red. If this occurs, “OVER” appears above the measured values.

Procedure

VECT → F•5 MARKER: ON / OFF

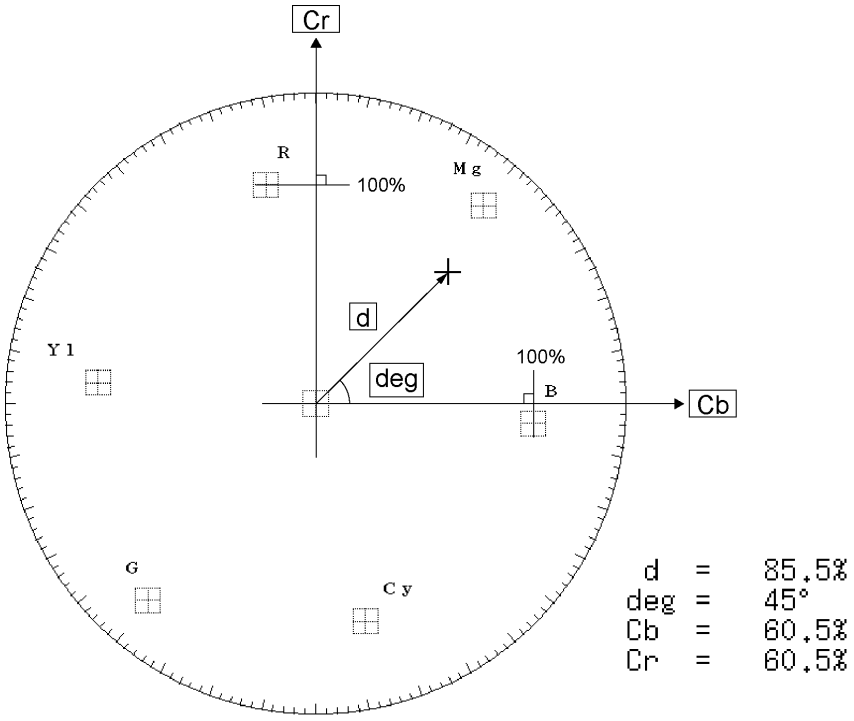


Figure 3-8 Displaying the vector marker

3.6 Configuring Display Settings

To configure the display settings, press F•6 DISPLAY on the vector menu.

VECT → F•6 DISPLAY →

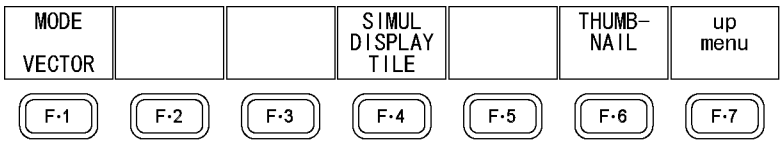


Figure 3-9 DISPLAY menu

3.6.1 Switching the Display Mode

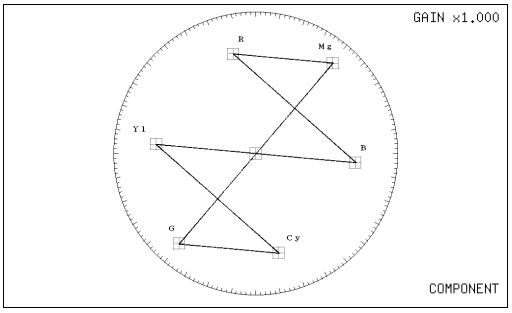
To switch between the vector and 5-bar displays, follow the procedure below.

For information on the 5-bar display, see section 3.8, “Configuring the 5-Bar Display.”

Procedure

VECT → F•6 DISPLAY → F•1 MODE: VECTOR / 5BAR

MODE = VECTOR



MODE = 5BAR

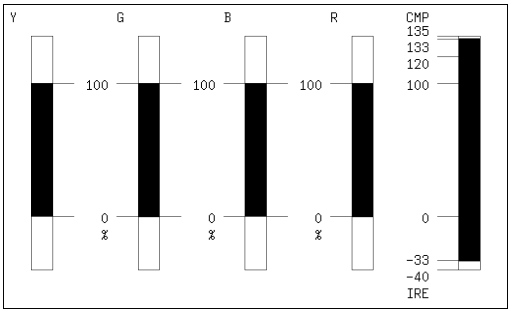


Figure 3-10 Switching the display mode

3.6.2 Setting the Simul Display

When in simul mode, to select the display format, follow the procedure below.

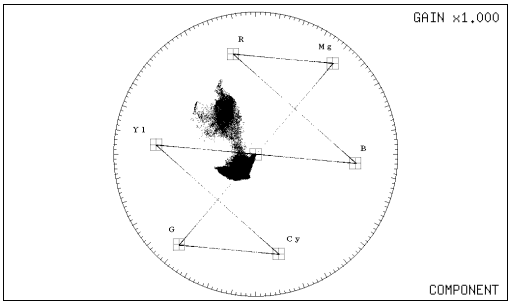
Procedure

VECT → F•6 DISPLAY → F•4 SIMUL DISPLAY: MIX / TILE

Settings

MIX:	The vectors are overlapped and displayed. This option cannot be selected when F•1 MODE is set to 5BAR.
TILE:	The vector or 5-bar displays are displayed side by side.

SIMUL DISPLAY = MIX



SIMUL DISPLAY = TILE

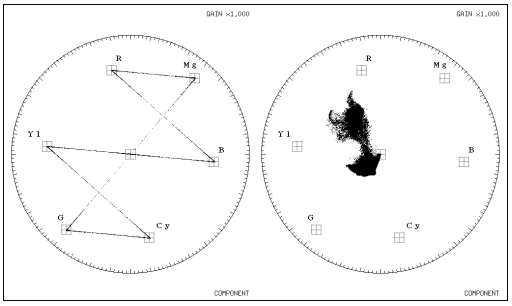


Figure 3-11 Setting the simul display

3.6.3 Setting the 3G-B (2map) Display

When the input signal is 3G-B (2map), to select the display format, follow the procedure below.

Procedure

VECT → F•6 DISPLAY → F•4 2MAPPING DISPLAY: STREAM1 / STREAM2 / MIX / TILE

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other. This option cannot be selected when F•1 MODE is set to 5BAR.
TILE:	Streams 1 and 2 are displayed side by side.

3.6.4 Turning Thumbnails On and Off

To configure thumbnail settings, press F•6 THUMBNAIL on the DISPLAY menu.
This menu item does not appear when the multi-screen display is in use.

VECT → F•6 DISPLAY → F•6 THUMBNAIL →

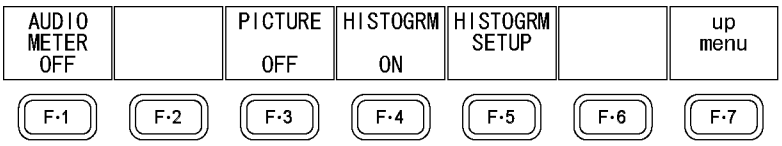


Figure 3-12 THUMBNAIL menu

To turn the thumbnail displays of the audio meter, picture, and histogram on and off separately, follow the procedure below.

- When an LV 5770SER41 or LV 5770SER43 is not installed in the LV 5770A or when the audio display mode is set to loudness, F•1 AUDIO METER is not displayed.
- If the input signal is 3G-B (2map), F•1 AUDIO METER cannot be turned on.
- You cannot display a histogram thumbnail at the same time as another thumbnail.

Procedure

VECT → F•6 DISPLAY → F•6 THUMBNAIL → F•1 AUDIO METER: ON / OFF
→ F•3 PICTURE: ON / OFF
→ F•4 HISTOGRM: ON / OFF

3.6.5 Configuring the Histogram Settings

To configure histogram settings, press F•5 HISTOGRM SETUP on the THUMBNAIL menu. F•5 HISTOGRM SETUP appears when F•4 HISTOGRM is set to ON.

VECT → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP →

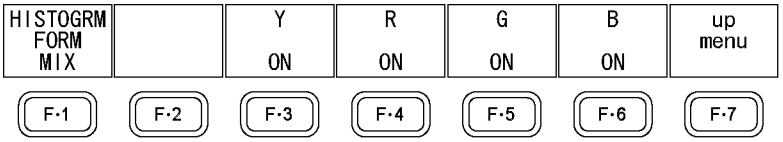


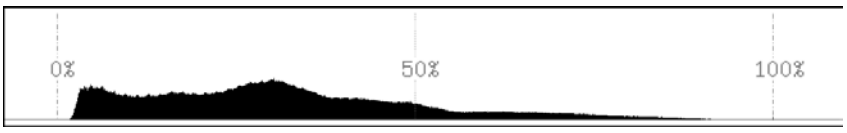
Figure 3-13 HISTOGRM SETUP menu

To select the histogram display format, follow the procedure below.

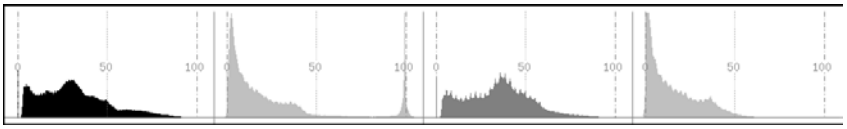
Procedure

VECT → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP → F•1 HISTOGRM FORM: LUMA / ALIGN / MIX

HISTOGRM FORM = LUMA



HISTOGRM FORM = ALIGN



HISTOGRM FORM = MIX

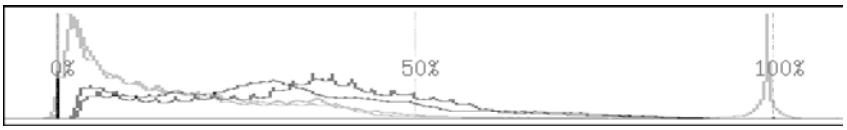


Figure 3-14 Configuring the histogram settings

In addition, when F•1 HISTOGRM FORM is set to MIX, follow the procedure below to turn Y, R, G, and B on and off separately.

Procedure

VECT → F•6 DISPLAY → F•6 THUMBNAIL → F•5 HISTOGRM SETUP
→ F•3 Y: ON / OFF
→ F•4 R: ON / OFF
→ F•5 G: ON / OFF
→ F•6 B: ON / OFF

3.7 Configuring the Color System Settings

To configure the color system settings, press F•7 COLOR SYSTEM on the vector menu. This menu item does not appear when MODE is set to 5BAR.

For information on the MODE setting, see section 3.6.1, “Switching the Display Mode.”

VECT → F•7 COLOR SYSTEM →

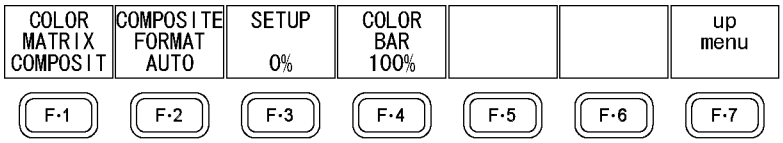


Figure 3-15 COLOR SYSTEM menu

3.7.1 Selecting the Color Matrix

To select the vector display format, follow the procedure below. The selected display format is indicated in the lower right of the display.

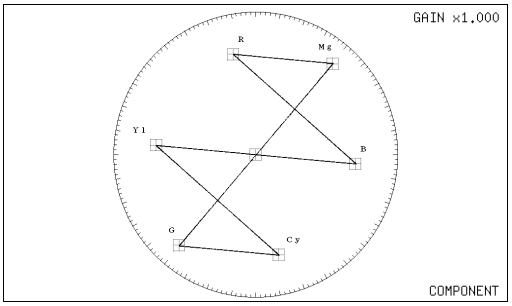
Procedure

VECT → F•7 COLOR SYSTEM → F•1 COLOR MATRIX: COMPONEN / COMPOSIT

Settings

COMPONEN:	The component chrominance signal is displayed on the X and Y axes.
COMPOSIT:	The component signal is converted into a pseudo-composite signal, and the pseudo-composite signal's chrominance signal is displayed on the X and Y axes.

COLOR MATRIX = COMPONEN



COLOR MATRIX = COMPOSIT

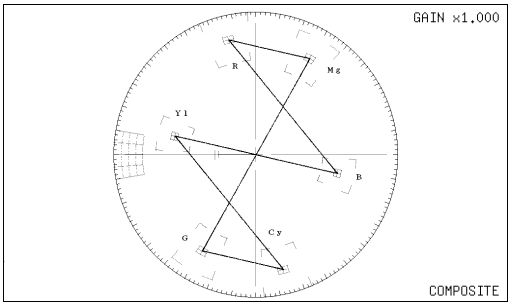


Figure 3-16 Selecting the color matrix

3.7.2 Selecting the Composite Display Format

To select the composite display format, follow the procedure below.

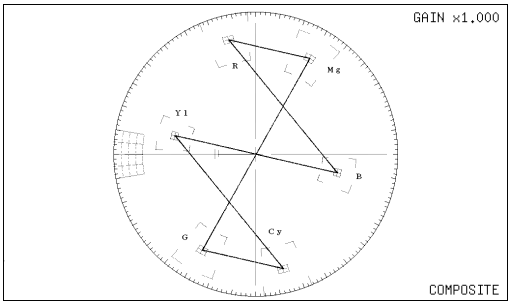
Procedure

VECT → F•7 COLOR SYSTEM → F•2 COMPOSITE FORMAT: AUTO / NTSC / PAL

Settings

AUTO:	When the input signal frame rate is 25 Hz or 50 Hz, the format is PAL. Otherwise, the format is NTSC.
NTSC:	The format is NTSC.
PAL:	The format is PAL.

COMPOSITE FORMAT = NTSC



COMPOSITE FORMAT = PAL

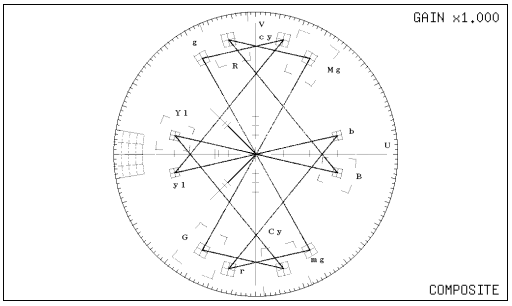


Figure 3-17 Selecting the composite display format

3.7.3 Selecting the Setup Level

When F•1 COLOR MATRIX is set to COMPOSIT, to select the setup level, follow the procedure below.
This menu item does not appear when the composite display format is PAL.

Procedure

VECT → F•7 COLOR SYSTEM → F•3 SETUP: 0% / 7.5%

3.7.4 Displaying a Scale for 75 % Intensity Color Bars

To display a scale for 75 % intensity color bars, follow the procedure below.

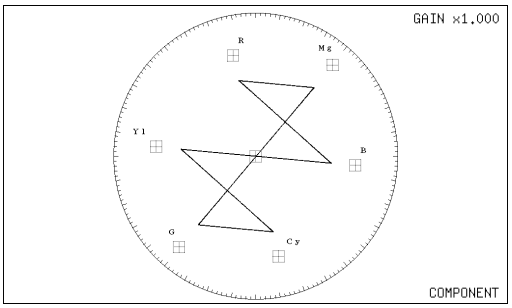
Procedure

VECT → F•7 COLOR SYSTEM → F•4 COLOR BAR: 100% / 75%

Settings

100%:	A scale that matches the peak levels of 100 % intensity color bars is displayed.
75%:	A scale that matches the peak levels of 75 % intensity color bars is displayed.

COLOR BAR = 100%



COLOR BAR = 75%

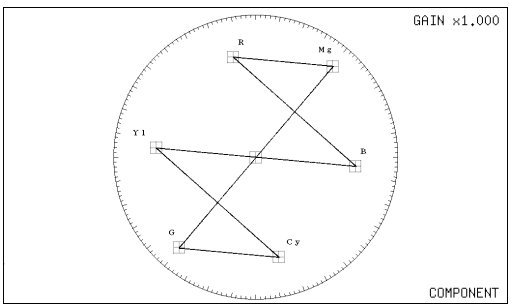


Figure 3-18 Displaying a scale for 75 % intensity color bars (when receiving a 75 % intensity color bar signal)

3.8 Configuring the 5-Bar Display

In the 5-bar display, the YC_BC_R signal is converted into a GBR or pseudo-composite signal, and the peak levels of the converted signal's Y, G, B, R, and CMP (composite) components are displayed simultaneously using five bars.

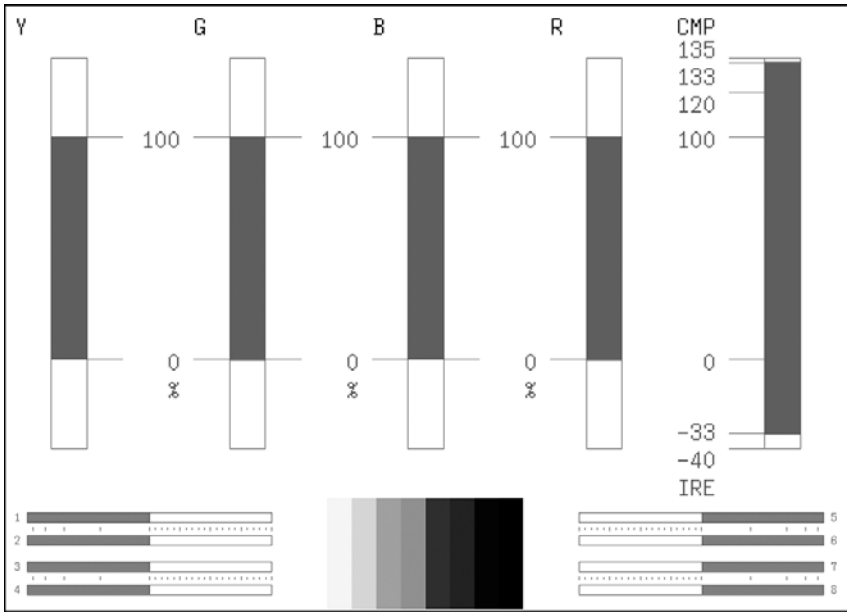


Figure 3-19 5-bar display

- **Y**

  Levels that fall outside of the range that you set using Luminance Upper and Luminance Lower on the status menu are displayed in red.

  For information on the Luminance Upper and Luminance Lower settings, see section 6.1.5, “Error Setup 5 (ERROR SETUP5).”

- **GBR**

  Levels that fall outside of the range that you set using Gamut Upper and Gamut Lower on the status menu are displayed in red.

  For information on the Gamut Upper and Gamut Lower settings, see section 6.1.3, “Error Setup 3 (ERROR SETUP3).”

- **CMP**

  Levels that fall outside of the range that you set using Composite Upper and Composite Lower on the status menu are displayed in red.

  For information on the Composite Upper and Composite Lower settings, see section 6.1.3, “Error Setup 3 (ERROR SETUP3).”

- **Menu**

  Use the vector menu to configure the 5-bar display settings.

VECT →

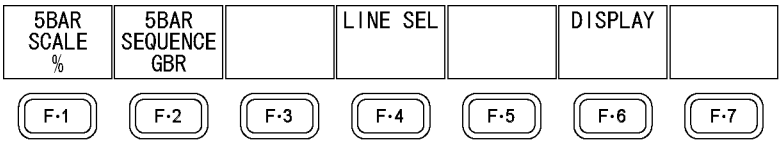


Figure 3-20 Vector menu

3.8.1 Selecting the Scale Unit

When MODE is set to 5BAR, to select the scale unit, follow the procedure below.

For information on the MODE setting, see section 3.6.1, “Switching the Display Mode” and section 3.7.2, “Selecting the Composite Display Format.”

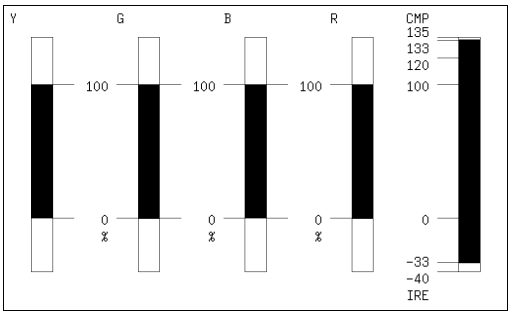
Procedure

VECT → F•1 5BAR SCALE: % / mV

Settings

%:	A percentage scale is displayed for YGBR, and an IRE scale is displayed for CMP.
mV:	A millivolt scale is displayed. Depending on the composite display format, the scale differs as follows: NTSC: 100 % = 700 mV (YGBR) and 100 IRE = 714 mV (CMP) PAL: 100 % (IRE) = 700 mV

5BAR SCALE = %



5BAR SCALE = mV

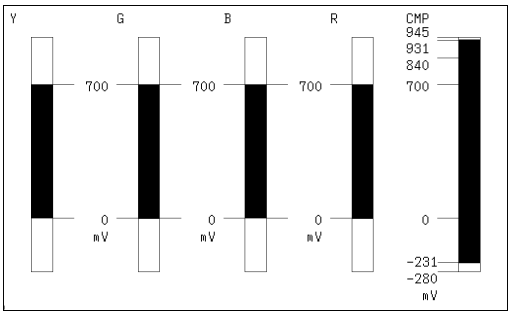


Figure 3-21 Selecting the scale unit

3.8.2 Selecting the Display Order

To select the 5-bar display order, follow the procedure shown below.

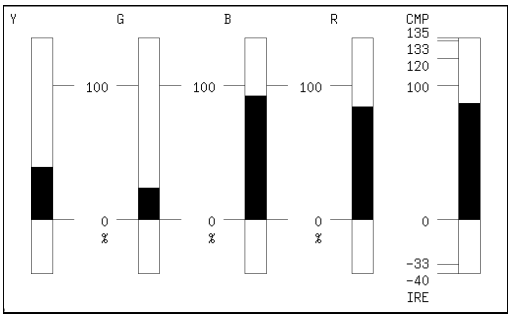
Procedure

VECT → F•2 5BAR SEQUENCE: GBR / RGB

Settings

GBR:	From the left, the signals are displayed in this order: Y, G, B, R, CMP.
RGB:	From the left, the signals are displayed in this order: Y, R, G, B, CMP.

5BAR SEQUENCE = GBR



5BAR SEQUENCE = RGB

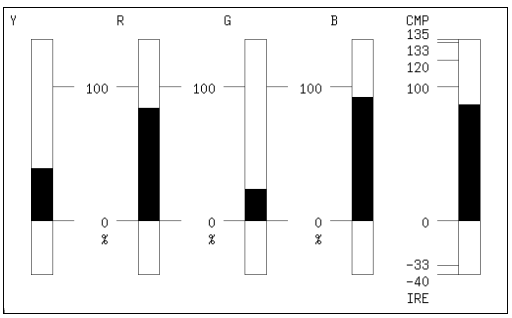


Figure 3-22 Selecting the display order

4. PICTURE DISPLAY

To display the picture, press PIC.

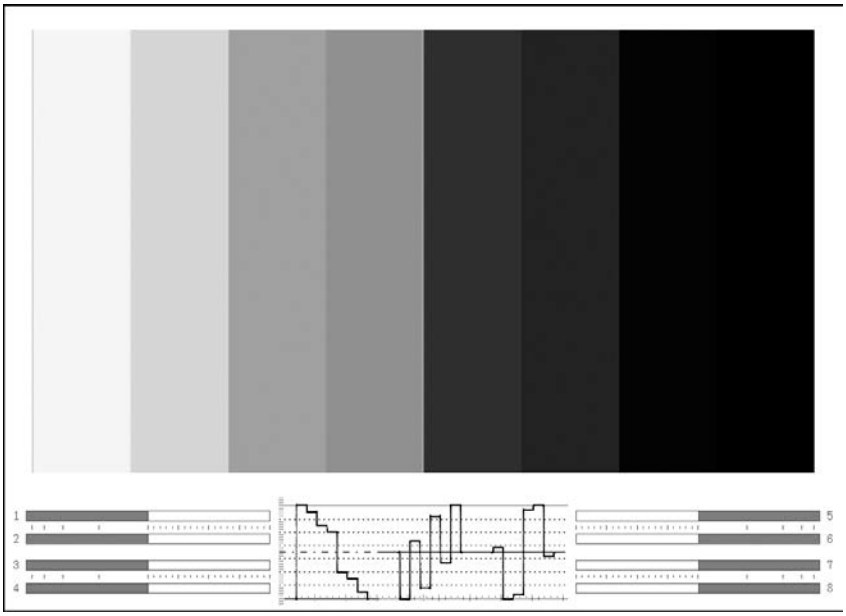


Figure 4-1 Picture display

- **Audio Thumbnail**

  On the LV 5770A, the audio thumbnail appears when the LV 5770SER41 or LV 5770SER43 is installed. The audio thumbnail always appears on the LV 7770. The channels that are displayed are the channels that have been selected on the Lissajous waveform channel mapping display.
  You can hide the thumbnails or switch to histogram thumbnails.
  See section 4.6.6, “Turning Thumbnails On and Off.”

- **Video Signal Waveform Thumbnail**

  This displays the video signal waveform. You can hide the thumbnails or switch to histogram thumbnails.
  See section 4.6.6, “Turning Thumbnails On and Off.”

- **Menu**

  Use the picture menu—which is displayed when you press the PIC key—to configure the picture display settings.

PIC →

ADJUST	MARKER		LINE SELECT	CINELITE	DISPLAY	SUPER IMPOSE
F-1	F-2	F-3	F-4	F-5	F-6	F-7

Figure 4-2 Picture menu

4.1 Adjusting the Picture

To adjust the picture, press F•1 ADJUST on the picture menu.

PIC → F•1 ADJUST →

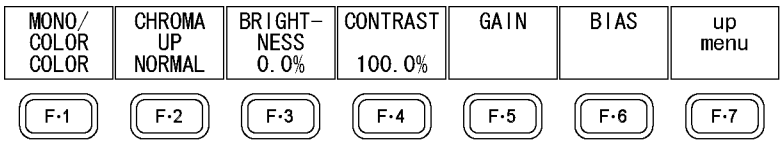


Figure 4-3 ADJUST menu

4.1.1 Switching between the Color and Monochrome Displays

To switch between the color and monochrome displays, follow the procedure below.
In 3D assist mode, this setting is fixed to COLOR. This setting does not appear.

Procedure

PIC → F•1 ADJUST → F•1 MONO/COLOR: COLOR / MONO

4.1.2 Setting the Chroma Gain

To switch the chroma gain, follow the procedure below.

Procedure

PIC → F•1 ADJUST → F•2 CHROMA UP: NORMAL / UP

Settings

NORMAL:	The chroma gain is set to the value that you have set using F•5 GAIN.
UP:	The chroma gain is set to 2 (200.0 %).

4.1.3 Adjusting the Brightness

To adjust the brightness, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (0.0 %).

Procedure

PIC → F•1 ADJUST → F•3 BRIGHTNESS: -50.0 % to 0.0 % to 50.0 %

4.1.4 Adjusting the Contrast

To adjust the contrast, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (100.0 %).

Procedure

PIC → F•1 ADJUST → F•4 CONTRAST: 0.0 % to 100.0 % to 200.0 %

4.1.5 Adjusting the Gain

To adjust the gain, press F•5 GAIN on the ADJUST menu.

PIC → F•1 ADJUST → F•5 GAIN →

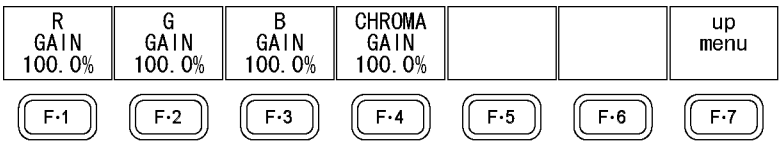


Figure 4-4 GAIN menu

To adjust the gain separately for the R, G, B, and chroma signals, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (100.0 %).
When F•2 CHROMA UP is set to UP, F•4 CHROMA GAIN does not appear, and the chroma gain is fixed at 200.0 %.

Procedure

PIC → F•1 ADJUST → F•5 GAIN → F•1 R GAIN: 0.0 % to 100.0 % to 200.0 %
→ F•2 G GAIN: 0.0 % to 100.0 % to 200.0 %
→ F•3 B GAIN: 0.0 % to 100.0 % to 200.0 %
→ F•4 CHROMA GAIN: 0.0 % to 100.0 % to 200.0 %

4.1.6 Adjusting the Bias

To adjust the bias, press F•6 BIAS on the ADJUST menu.

PIC → F•1 ADJUST → F•6 BIAS →

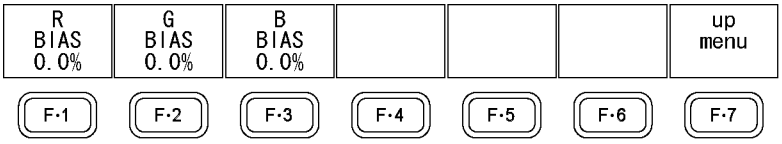


Figure 4-5 BIAS menu

To set the RGB signal bias separately for each color, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (0.0 %).

Procedure

PIC → F•1 ADJUST → F•6 BIAS → F•1 R BIAS: -50.0 % to 0.0 % to 50.0 %
→ F•2 G BIAS: -50.0 % to 0.0 % to 50.0 %
→ F•3 B BIAS: -50.0 % to 0.0 % to 50.0 %

4.2 Configuring Marker Settings

To configure marker settings, press F•2 MARKER on the picture menu.
This menu item does not appear when SIZE is set to a value other than FIT.
For information on the SIZE setting, see section 4.6.1, “Selecting the Display Size.”

PIC → F•2 MARKER →

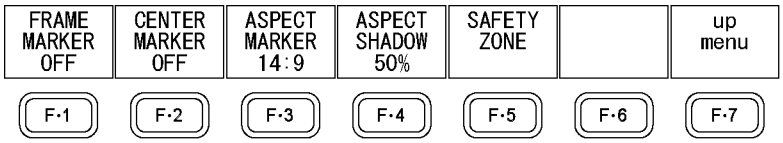


Figure 4-6 MARKER menu

4.2.1 Turning the Display of the Frame Marker On and Off

To turn the display of the frame marker on and off, follow the procedure below.

Procedure

PIC → F•2 MARKER → F•1 FRAME MARKER: ON / OFF

4.2.2 Turning the Display of the Center Marker On and Off

To turn the display of the center marker on and off, follow the procedure below.

Procedure

PIC → F•2 MARKER → F•2 CENTER MARKER: ON / OFF

4.2.3 Setting the Aspect Marker

To display the aspect marker, follow the procedure below.
In simul mode, the aspect marker is not displayed.
For information on the SD setting, see section 4.6.9, “Selecting the SD Display Format.”

Procedure

PIC → F•2 MARKER → F•3 ASPECT MARKER: OFF / 14:9 / 13:9 / 4:3 / 2.39:1 / 16:9 / AFD

Settings

OFF:	An aspect marker is not displayed.
14:9:	A 14:9 aspect marker is displayed.
13:9:	A 13:9 aspect marker is displayed.
4:3:	A 4:3 aspect marker is displayed. This setting cannot be selected when the input signal is SD and the SD display format is set to 4:3.
2.39:1:	A 2.39:1 aspect marker is displayed. This setting cannot be selected when the input signal is SD and the SD display format is set to 4:3.
16:9:	A 16:9 aspect marker is displayed. This setting can be selected when the input signal is SD and the SD display format is set to 4:3.
AFD:	The aspect marker included in the AFD (Active Format Description) packets is displayed. Also, abbreviations for SMPTE 2016-1-2007 standard AFD codes are displayed in the upper left of the screen. This setting cannot be selected when the input signal is HD dual link or 3G.

The AFD codes that are displayed in the upper left of the screen are displayed as shown below according to the coded frame and the AFD code. If there are no AFD packets embedded in the input signal, “---------” is displayed.

Table 4-1 Displaying AFD

Displayed AFD	Coded Frame	AFD Code	Explanation
0000- UNDEFINED	0 (4:3)	0000	Undefined
0001- RESERVED	0 (4:3)	0001	Reserved
0010- 16:9LBTop	0 (4:3)	0010	Letterbox 16:9 image, at top of the coded frame
0011- 14:9LBTop	0 (4:3)	0011	Letterbox 14:9 image, at top of the coded frame
0100- >16:9LBox	0 (4:3)	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101- RESERVED	0 (4:3)	0101	Reserved
0110- RESERVED	0 (4:3)	0110	Reserved
0111- RESERVED	0 (4:3)	0111	Reserved
1000- FullFrame	0 (4:3)	1000	Full frame 4:3 image, the same as the coded frame
1001- Full Frame	0 (4:3)	1001	Full frame 4:3 image, the same as the coded frame
1010- 16:9LBox	0 (4:3)	1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected
1011- 14:9LBox	0 (4:3)	1011	Letterbox 14:9 image, vertically centered in the coded frame
1100- RESERVED	0 (4:3)	1100	Reserved
1101-4:3Full14:9	0 (4:3)	1101	Full frame 4:3 image, with alternative 14:9 center
1110-16:9LB14:9	0 (4:3)	1110	Letterbox 16:9 image, with alternative 14:9 center
1111-16:9LB4:3	0 (4:3)	1111	Letterbox 16:9 image, with alternative 4:3 center
0000w UNDEFINED	1 (16:9)	0000	Undefined
0001w RESERVED	1 (16:9)	0001	Reserved
0010w Full Frame	1 (16:9)	0010	Full frame 16:9 image, the same as the coded frame
0011w 14:9Pillbox	1 (16:9)	0011	Pillarbox 14:9 image, horizontally centered in the coded frame
0100w >16:9LBox	1 (16:9)	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101w RESERVED	1 (16:9)	0101	Reserved
0110w RESERVED	1 (16:9)	0110	Reserved
0111w RESERVED	1 (16:9)	0111	Reserved
1000w FullFrame	1 (16:9)	1000	Full frame 16:9 image, the same as the coded frame
1001w 4:3Pillbox	1 (16:9)	1001	Pillarbox 4:3 image, horizontally centered in the coded frame
1010w FullNoCrop	1 (16:9)	1010	Full frame 16:9 image, with all image areas protected
1011w14:9Pillbox	1 (16:9)	1011	Pillarbox 14:9 image, horizontally centered in the coded frame
1100w RESERVED	1 (16:9)	1100	Reserved
1101w4:3PB14:9	1 (16:9)	1101	Pillarbox 4:3 image, with alternative 14:9 center
1110wFul14:9Safe	1 (16:9)	1110	Full frame 16:9 image, with alternative 14:9 center
1111wFull4:3Safe	1 (16:9)	1111	Full frame 16:9 image, with alternative 4:3 center

4.2.4 Setting the Aspect Shadow

When F•3 ASPECT MARKER is set to a value other than OFF, to adjust the darkness of the aspect marker shadow, follow the procedure below. The larger the number, the darker the shadow. If you specify 0 %, the aspect marker will be indicated with a line.
Press the function dial (F•D) to return the setting to its default value (50 %).

Procedure

PIC → F•2 MARKER → F•4 ASPECT SHADOW: 0 % to 50 % to 100 %

ASPECT SHADOW = 50 %

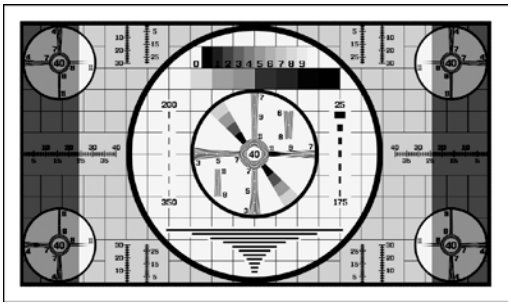


Figure 4-7 Setting the aspect shadow

4.2.5 Setting the Safe Action Marker

To configure safety marker settings, press F•5 SAFETY ZONE on the MARKER menu.
This menu item does not appear when F•3 ASPECT MARKER is set to AFD.

PIC → F•2 MARKER → F•5 SAFETY ZONE →

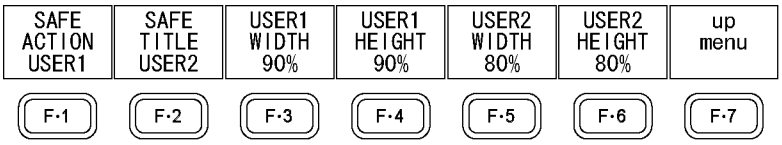


Figure 4-8 SAFETY ZONE menu

To display the safe action marker, follow the procedure below.
When an aspect marker is displayed, the safe action marker is displayed relative to the aspect marker.

Procedure

PIC → F•2 MARKER → F•5 SAFETY ZONE → F•1 SAFE ACTION: ARIB / SMPTE / USER1 / OFF

Settings

ARIB:	An ARIB TR-B4 safe action marker is displayed.
SMPTE:	An SMPTE RP-218 safe action marker is displayed.
USER1:	A marker that has been set with F•3 USER 1 WIDTH and F•4 USER1 HEIGHT is displayed.
OFF:	A safe action marker is not displayed.

4.2.6 Setting the Safe Title Marker

To display the safe title marker, follow the procedure below.
When an aspect marker is displayed, the safe title marker is displayed relative to the aspect marker.

Procedure

PIC → F•2 MARKER → F•5 SAFETY ZONE → F•2 SAFE TITLE: ARIB / SMPTE / USER2 / OFF

Settings

ARIB:	An ARIB TR-B4 safe title marker is displayed.
SMPTE:	An SMPTE RP-218 safe title marker is displayed.
USER2:	A marker that has been set with F•5 USER 2 WIDTH and F•6 USER2 HEIGHT is displayed.
OFF:	A safe title marker is not displayed.

4.2.7 Setting User Markers

By setting F•1 SAFE ACTION to USER1 and F•2 SAFE TITLE to USER2, you can display up to two user-defined markers.
To set the width and height of a user marker, follow one of the procedures below.

Procedure

PIC → F•2 MARKER → F•5 SAFETY ZONE
→ F•3 USER1 WIDTH: 0 % to 90 % to 100 %
→ F•4 USER1 HEIGHT: 0 % to 90 % to 100 %
→ F•5 USER2 WIDTH: 0 % to 80 % to 100 %
→ F•6 USER2 HEIGHT: 0 % to 80 % to 100 %

4.3 Configuring Line Select Settings

To configure line select settings, press F•4 LINE SEL on the picture menu.

PIC → F•4 LINE SEL →

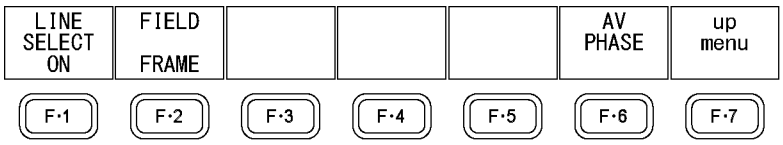


Figure 4-9 LINE SEL menu

4.3.1 Turning Line Select On and Off

To display a marker on the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the upper left of the display. Press the function dial (F•D) to move to the first video line.
Changing this setting will also change the video-signal-waveform-display and vector-display line select settings.
If SIZE is set to a value other than FIT, markers will not be displayed even if line select is turned on.
For information on the SIZE setting, see section 4.6.1, “Selecting the Display Size.”

Procedure

PIC → F•4 LINE SEL → F•1 LINE SELECT: ON / ACH / BCH / STREAM1 / STREAM2 / BOTH / OFF

Settings

ON:	Line select is turned on. This option can be selected in single input mode when the input signal is not 3G-B (2map).
ACH:	Line select is turned on for channel A only. This option can be selected in simul mode.
BCH:	Line select is turned on for channel B only. This option can be selected in simul mode.
STREAM1:	Line select is turned on for stream 1 only. This option can be selected when the input signal is 3G-B (2map).
STREAM2:	Line select is turned on for stream 2 only. This option can be selected when the input signal is 3G-B (2map).
BOTH:	Line select is turned on for channels A and B or streams 1 and 2. This option can be selected in simul mode when the channel A format and channel B format are the same or when the input signal is 3G-B (2map).
OFF:	Line select is turned off.

LINE SELECT = ON

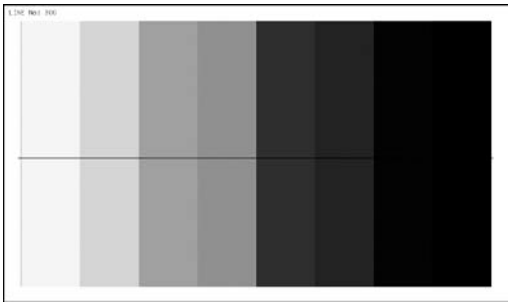


Figure 4-10 Turning line select on and off

4.3.2 Setting the Line Select Range

When the input signal is interlace or segmented frame, to set the line select range, follow the procedure below.

Procedure

PIC → F•4 LINE SEL → F•2 FIELD: FIELD1 / FIELD2 / FRAME

Settings

FIELD1:	A line from field 1 can be selected (example: 1 to 563).
FIELD2:	A line from field 2 can be selected (example: 564 to 1125).
FRAME:	All lines can be selected (example: 1 to 1125).

4.3.3 Setting the Lip Sync Measurement Range

To set the lip sync measurement range, press F•6 AV PHASE on the LINE SEL menu.
This menu item is available when the LV 5770SER41/LV 5770SER43 is installed.

PIC → F•4 LINE SEL → F•6 AV PHASE →

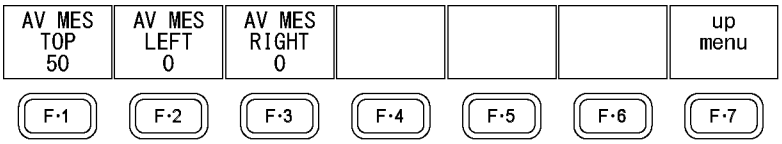


Figure 4-11 AV PHASE menu

To set the lip sync measurement range, follow the procedure below. Markers are displayed at the specified lines.
You can also set these using AV PHASE SETUP of the status display, but here you can set them while viewing the picture. For details on the settings, section 6.6.4, “Setting the Measurement Range.”

Procedure

PIC → F•4 LINE SEL → F•6 AV PHASE
→ F•1 AV MES TOP: 0 to 50 to 100
→ F•2 AV MES LEFT: 0 to 99
→ F•3 AV MES RIGHT: 0 to 99

4.4 Configuring CINELITE Settings

CINELITE consists of the CINELITE and CINEZONE features. This section will explain the CINELITE feature.

The CINELITE feature displays the luminance level of a video signal on the picture display. To configure its settings, from the picture menu, press F•5 CINELITE and then F•1 fStop DISPLAY, F•2 %DISPLAY, or F•4 CINELITE ADVANCE. Note that if you enable the CINELITE feature in the multi-screen display, the cursor response may slow down.

CINELITE is not available in simul mode or when the input signal is 3G-B (2map). This setting does not appear. Note that if SIZE is not set to FIT when you enable the CINELITE feature, it will change to FIT.

For information on the SIZE setting, see section 4.6.1, “Selecting the Display Size.”

4.4.1 f Stop Screen Explanation

To display the f Stop screen, follow the procedure below.

Procedure

PIC → F•5 CINELITE → F•1 fSTOP DISPLAY

On the f Stop screen, luminance levels are displayed using f-stop (exposure) values. The measured f Stop value for a group of measured points is typically displayed using white, but it will be displayed using yellow when it corresponds to a luminance level of 80 % or more. Additionally, f Stop values that correspond to luminance levels equal to or less than 0 % can not be measured. They are displayed in yellow as “****.”

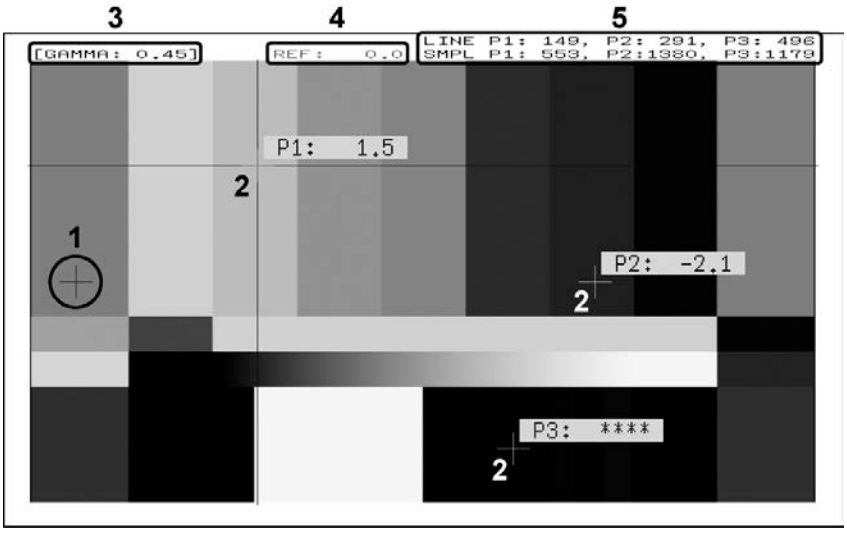


Figure 4-12 f Stop screen

1 Reference Position

The position where the cursors intersected when F•4 18% REF-SET was pressed is displayed in red. This is the reference position for f-stop measurement.

2 Cursor

You can set up to three measurement points. The f Stop value relative to the reference point is displayed at each point.

3 Gamma Correction Value

The gamma correction value that you selected using F•5 GAMMA SELECT appears here.

4 Reference Value

The f Stop value at the reference position appears here. The value immediately after you have pressed F•4 18% REF-SET is zero, but it will change when the picture changes.

5 Coordinates

The measurement point coordinates are indicated here with both line and sample numbers.

4.4.2 Procedure for Displaying the f Stop Screen

The following example shows how to display luminance levels as f Stop numbers relative to the luminance level of 18 % gray chart. Include an 18 % gray chart with the objects that you are filming.

1. **Press PIC.**
2. **Press F • 5 CINELITE.**
3. **Press F • 2 %DISPLAY.**
4. **Press F • 4 UNIT SELECT, and select Y%.**

   The luminance levels at the measurement points are displayed as percentages. The measured values of measurement points that are within the blanking interval are not displayed.

5. **Place the cursors over the 18 % gray chart.**

   Adjust the lighting so that the displayed luminance level is 45.0 % (for example).

6. **Press F • 7 up menu.**
7. **Press F • 1 fStop DISPLAY.**
8. **Press F • 5 GAMMA SELECT to select a gamma correction table.**

   The default gamma correction value is 0.45, but you can also use a user-defined gamma correction table that matches the gamma characteristics of the camera that you are using. For details, see section 4.4.6, “Configuring User-Defined Correction Tables.” The selected gamma correction value is indicated in the upper left of the display.

9. Make sure that the cursors are over the 18 % gray chart, and press F•4 18% REF-SET.

The f Stop value for 18 % gray chart becomes 0.0 and is displayed in the upper part of the screen next to “REF:.” The reference position is displayed with a red cursor.

10. Use the cursors to set the measurement points.

The f Stop value relative to 18 % gray chart appears next to each measurement point. You can set up to three measurement points.

4.4.3 % DISPLAY Screen Explanation

To display the % DISPLAY screen, follow the procedure below.

Procedure

PIC → F•5 CINELITE → F•2 % DISPLAY

On the % DISPLAY screen, you can display luminance levels as Y percentages, RGB percentages, or using 255 RGB levels. Use F•4 UNIT SELECT to select the display format. The measured values are typically displayed using white, but they are displayed using yellow when the luminance level is 80 % or more or 0 % or less.

- **Y% Display**

Luminance levels are indicated as percentages.

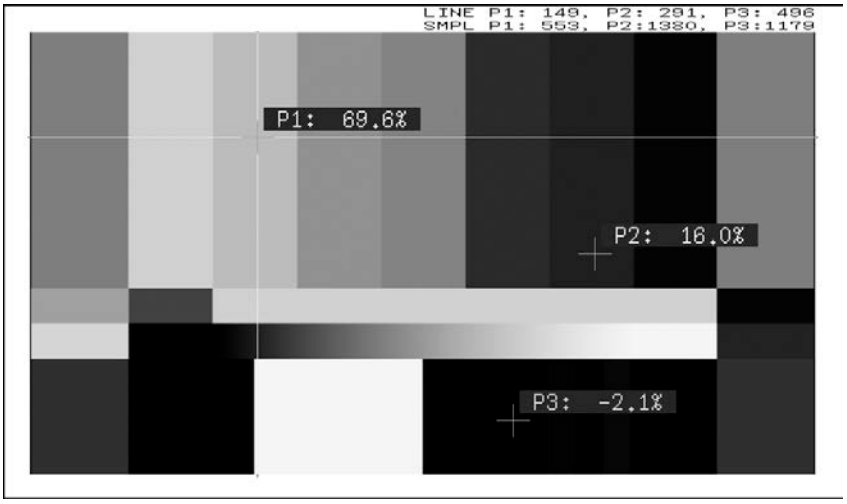


Figure 4-13 Y% display

- **RGB% Display**

Each R, G, and B level is indicated using a percentage. The levels are also indicated using bars on the left side of the display (the order is R, G, and then B).

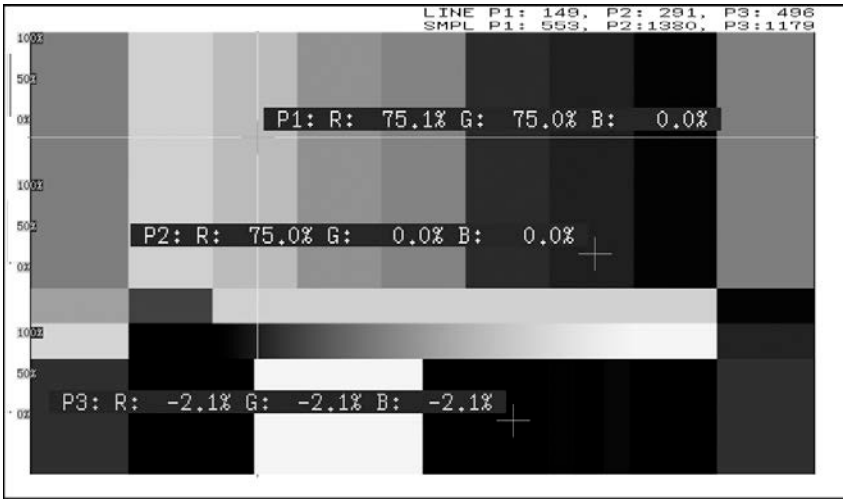


Figure 4-14 RGB% display

- **RGB255 Display**

Each R, G, and B level is indicated using 256 steps from 0 to 255. The levels are also indicated using bars on the left side of the display (the order is R, G, and then B).
The value of an RGB level that is 100 % or greater is 255. The value of an RGB level that is 0 % or less is 0.

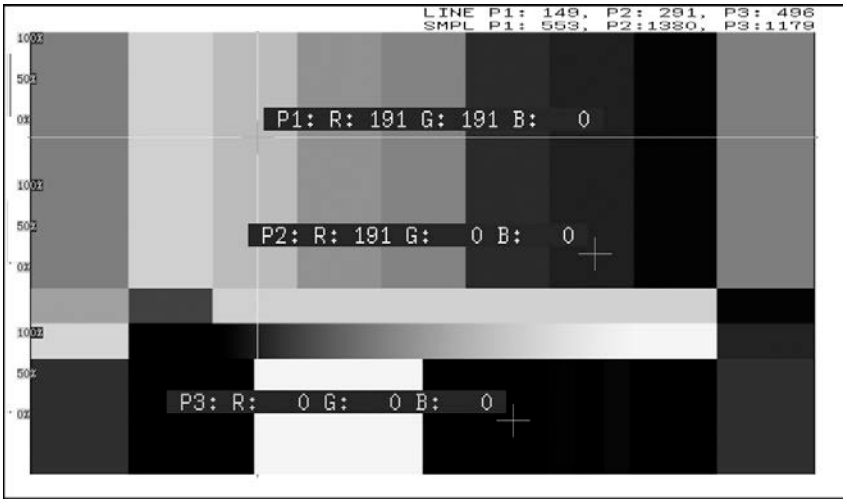


Figure 4-15 RGB255 display

4.4.4 Setting Measurement Points

You can set up to three measurement points. Follow the procedure below to select which measurement point to set with the cursors, and then move the X cursor by using the H POS knob and the Y cursor by using the V POS knob. Press the H POS and V POS knobs at the same time to move the cursors to the center of the picture. (You can also move the cursors by using the function dial (F•D). To switch cursors, press F•1 FD FUNCTION.)

The cursors are not displayed if they are within the blanking interval. To display cursors that do not appear, move them within the screen.
You cannot turn off one of the points from P1 to P3. To hide a cursor, move it outside of the screen.
The measurement point settings made on the menus accessed by pressing F•1 fStop DISPLAY and F•2 % DISPLAY are the same.

Procedure

PIC → F•5 CINELITE → F•1 fSTOP DISPLAY → F•2 MEASURE POS: P1 / P2 / P3
→ F•2 % DISPLAY → F•2 MEASURE POS: P1 / P2 / P3

4.4.5 Setting the Area of Luminance Measurement

To select the area of luminance measurement, follow the procedure below. This setting is applied to P1 to P3 and REF. The luminance measurement area settings made on the menus accessed by pressing F•1 fStop DISPLAY and F•2 % DISPLAY are the same.

Procedure

PIC → F•5 CINELITE → F•1 fSTOP DISPLAY → F•3 MEASURE SIZE: 1X1 / 3X3 / 9X9
→ F•2 % DISPLAY → F•3 MEASURE SIZE: 1X1 / 3X3 / 9X9

4.4.6 Configuring User-Defined Correction Tables

The default gamma correction value when measuring f Stop levels is 0.45, but you can also use a user-defined gamma correction table that matches the gamma characteristics of the camera that you are using.
There are two types of user-defined correction tables. The first type consists of tables that are created using the LV 5770A/7770 and is made up of the USER1 to USER3 tables. The second type consists of tables that have been created externally using a device such as a PC and is made up of the USER_A to USER_E tables. These tables are not deleted even if you initialize the LV 5770A/7770.

- **Creating User-Defined Correction Tables Using the LV 5770A/7770**

You can create and store up to three user-defined correction tables on the LV 5770A/7770. As an example, the following procedure shows how to create a user-defined correction table that matches a camera's gamma characteristics.
Set the camera's f Stop value to 5.6 beforehand, and put an 18 % gray chart in the area that you will film.

1. **Adjust the lighting so that the displayed luminance level of the 18 % gray chart is 45.0 % (for example) on a camera whose f Stop value is set to 5.6.**

   For details, see steps 1 through 5 in section 4.4.2, “Procedure for Displaying the f Stop Screen.”

2. **Press F•7 up menu.**
3. **Press F•1 fStop DISPLAY.**
4. **Press F•5 GAMMA SELECT, and select USER1.**

   In this example, the table for USER1 is created, but the tables for USER2 and USER3 can also be created in the same way.

5. **Press F•6 GAMMA CAL.**

   When you press F•6 GAMMA CAL, a user-defined correction table appears in the bottom left of the screen, and the luminance level appears as a 10-bit value (0 % is displayed as 64, and 100 % is displayed as 940) close to the cursor. This setting is available when F•5 GAMMA SELECT is set to an option from USER1 to USER3.

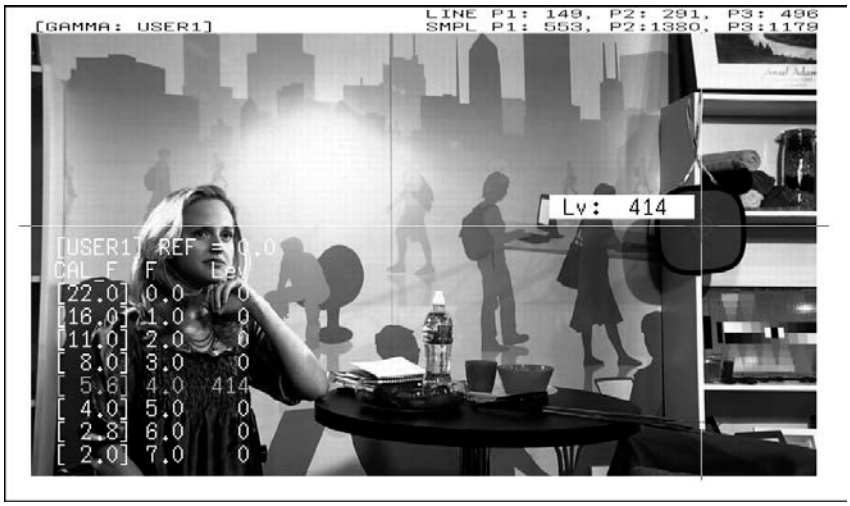


Figure 4-16 User-defined correction table creation screen

6. **Press F•2 TABLE CLEAR.**

   All the values in the user-defined correction table that is currently being edited are initialized. Be sure to initialize the values first when you create a new user-defined correction table.

7. **Press F•1 CLEAR YES.**

   To cancel the initialization of a user-defined correction table, press F•3 CLEAR NO.

8. **Place the cursors over the 18 % gray chart.**
9. **Press F•6 CAL F, and select 5.6.**
10. **Press F•5 CAL SET.**

    The luminance level when the camera f Stop value is 5.6 is input into Lev in the user-defined correction table. To delete a line of data, press F•3 1 DATA CLEAR.

11. Change F•6 CAL F and the camera f Stop value together in the following order: 4.0, 2.8, 2.0, 8.0, 11.0, 16.0, 22.0. Press F•5 CAL SET each time you change the value to input the luminance level for each value.

Do not change the lighting or the position of the 18 % gray chart.
Also, make sure that the Lev value for f Stop values 22.0 to 2.0 increases linearly.

The REF value in the user-defined correction table is entered when you press F•4 18% REF-SET on the f Stop display.

For example, if you use the left-hand table shown below and press F•4 18% REF-SET when the luminance value at the intersection of the cursors is 416 (10-bit value), the f Stop value at that point (3.0) is displayed as the REF value.

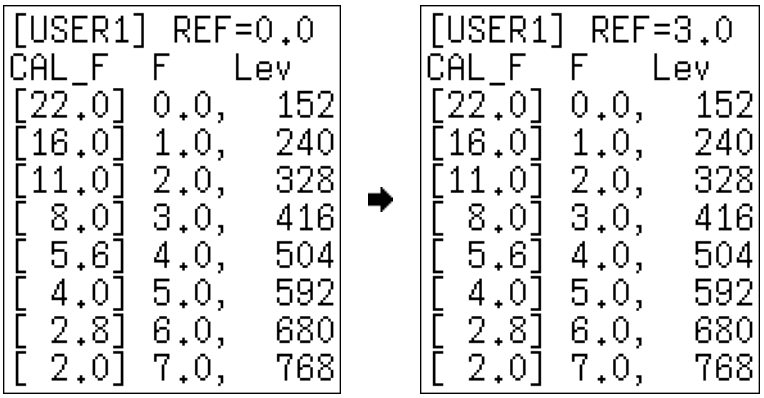


Figure 4-17 User-defined correction tables

When the above user-defined correction tables are used, f Stop values are indicated as shown below. The values between specified values are interpolated linearly.

When Lv = 152 f Stop = -3.0
When Lv = 240 f Stop = -2.0
When Lv = 328 f Stop = -1.0
When Lv = 416 f Stop = 0.0
When Lv = 504 f Stop = 1.0
When Lv = 592 f Stop = 2.0
When Lv = 680 f Stop = 3.0
When Lv = 768 f Stop = 4.0

- **Loading a User-Defined Correction Table into the LV 5770A/7770**

You can load up to five user-defined correction tables into the LV 5770A/7770.
To load a user-defined correction table into the LV 5770A/7770, follow the procedure below.

1. Create a user-defined correction table.

Example (TEST.CLT)

##################################			Comment
NAME:SAMPLE_1			Keyword
TYPE:0			Keyword
#Input	-7%	0	Comment
#	109%	4095	Comment
#Output	0%	0	Comment
#	1000%	65535	Comment
#Input	Output		Comment
##################################			Comment
0	0		Data
1	16		Data
2	32		Data
(Omitted)			
4093	65488		Data
4094	65504		Data
4095	65520		Data
# EOF			Comment

When you create a correction table, make sure that it conforms to the specifications listed below.

Overall File Specifications

File Type:	ASCII text file
Extension:	.CLT
End-of-Line Character:	CR+LF
Number of Lines:	5000 or less
Number of Characters per Line:	255 or less (including CR+LF)
File Name Length:	20 characters or less (excluding the extension)
Permitted File Name Characters:	Letters of the alphabet (A to Z; uppercase and lowercase), numerals (0 to 9), and underscores (_).

Comment Specifications

If you start a line with the number sign (#), the line is treated as a comment and does not affect operations. You can put comments anywhere.

Keyword Specifications

Be sure to put the keyword lines before the data lines and to enter a keyword without anything preceding it at the beginning of each keyword line.

NAME: The LV 5770A/7770 displays the eight characters that follow the separator (colon) as the name of the correction table. After the separator, enter the correction table name using letters of the alphabet (A to Z; uppercase and lowercase), numbers (0 to 9), and underscores (_). You can enter up to 10 characters.

TYPE: This is a code for identifying the file type. Enter a zero after the separator (colon).

Data Specifications

From the start of a line, enter the input value, a separator, and then the output value, in that order.

Input Value: Enter values from 0 to 4095 (12 bits), increasing the value by one for each line.
A luminance level of 100 % is defined as 940 (10 bits) × 4 = 3760 (12 bits).
A luminance level of 0 % is defined as 64 (10 bits) × 4 = 256 (12 bits).

Separator: Enter a single tab code.

Output Value: Enter a value from 0 to 65535 (16 bits).

2. **Save the user-defined correction table to USB memory, and connect the USB memory to the LV 5770A/7770.**

   Save the correction table in the following directory.

   USB memory
   └ LV5770A_USER (For the LV 5770, the directory is LV5770_USER)
   (For the LV 7770, the directory is LV7770_USER)
   └ CLT
   └ TEST.CLT (for example)

3. **Press PIC.**
4. **Press F•5 CINELITE.**
5. **Press F•1 fStop DISPLAY.**
6. **Press F•5 GAMMA SELECT, and select USER_A.**

   In this example, a user-defined correction table is copied to USER_A, but user-defined correction tables can be copied to USER_B through USER_E in the same way.

7. **Press F•6 GAMMA FILE.**

   This setting is available when F•5 GAMMA SELECT is set to an option from USER_A to USER_E.

8. **Press F•1 FILE LIST.**

   The file list screen appears. This setting appears when USB memory is connected.
   To clear the table that has been copied to USER_A, press F•2 TABLE CLEAR.

9. **Use function dial (F•D) to select the file to copy from the USB memory.**
10. **Press F•3 FILE LOAD.**

    The user-defined correction table that you selected is copied from the USB memory to USER_A. The copy operation is complete when the file list screen disappears and the display returns to the measurement screen.
    If a file has already been stored to USER_A, an overwrite confirmation prompt appears. If you want to overwrite the current file, press F•1 OVER WR YES. Otherwise, press F•3 OVER WR NO.

After you have copied a user-defined correction table, you can select it by pressing F•5 GAMMA SELECT on the CINELITE menu. A loaded correction table is displayed using the name determined by its NAME keyword.

4.4.7 Displaying Synchronized Markers

To synchronize the markers on the vector display and video signal waveform display to measurement points P1 to P3 and REF that you specify on the CINELITE display, follow the procedure below. Synchronized markers can be displayed only when an f Stop screen or % DISPLAY screen is shown in the same multi-screen display.

Markers cannot be displayed on the video signal waveform display under the following conditions.
• When SWEEP is set to V or H SWEEP is set to 2H in the video signal waveform menu
• When COLOR MATRIX in the video signal waveform menu is COMPOSIT
Marker display will not work properly when waveforms are being displayed using an external sync signal.

If P+V or P+V+W is selected, the measured values of the selected measurement point are displayed in the lower left of the vector display. For details on the measured values, see section 3.5, “Displaying the Vector Marker.”

Procedure

PIC → F•5 CINELITE → F•4 CINELITE ADVANCE: OFF / P+V / P+W / P+V+W

Settings

OFF:	P1 to P3 and REF are displayed only on the picture display.
P+V:	P1 to P3 and REF are displayed on the picture and vector displays.
P+W:	P1 to P3 and REF are displayed on the picture and video signal waveform displays.
P+V+W:	P1 to P3 and REF are displayed on the picture, vector, and video signal waveform displays.

CINELITE ADVANCE = P+V+W

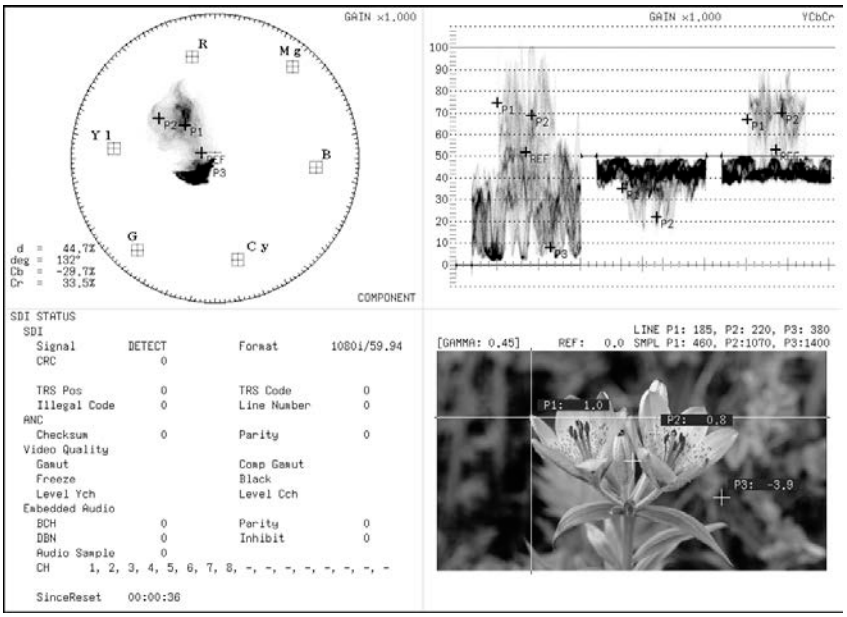


Figure 4-18 Displaying synchronized markers

4.5 Configuring CINEZONE Settings

CINELITE consists of the CINELITE and CINEZONE features. This section will explain the CINEZONE feature.

CINELITE is not available in 3D assist mode. This setting does not appear. Note that if SIZE is not set to FIT or SIMUL DISPLAY is set to MIX when you enable the CINELITE feature, SIZE will change to FIT, and SIMUL DISPLAY will change to TILE.

For information on the SIZE setting, see section 4.6.1, “Selecting the Display Size.”

For information on the SIMUL DISPLAY setting, see section 4.6.4, “Setting the Simul Display.”

4.5.1 Gradation Display Mode

To display picture luminance levels through color gradation, follow the procedure below. In the gradation display mode, luminance levels are displayed using 1024 colors.
The picture is displayed such that luminance levels above F•2 UPPER are displayed using white, and levels below F•3 LOWER are displayed using black.
You can see what colors correspond to what luminance levels by looking at the scale on the right of the display.

If F•2 UPPER is 1 % greater than F•3 LOWER and you lower the value of F•2 UPPER, the value of F•3 LOWER is automatically lowered to maintain a difference of 1 % between the two values. In the same way, if you raise the value of F•3 LOWER, the value of F•2 UPPER is automatically raised to maintain a difference of 1 % between the two values.

F•2 UPPER and F•3 LOWER appear when you set F•1 CINEZONE FORM to GRADATE or STEP.

Procedure

PIC → F•5 CINELITE → F•3 CINEZONE → use F•1 CINEZONE FORM to select GRADATE
→ F•2 UPPER: -6.3% to 100.0% to 109.4%
→ F•3 LOWER: -7.3% to 0.0% to 108.4%

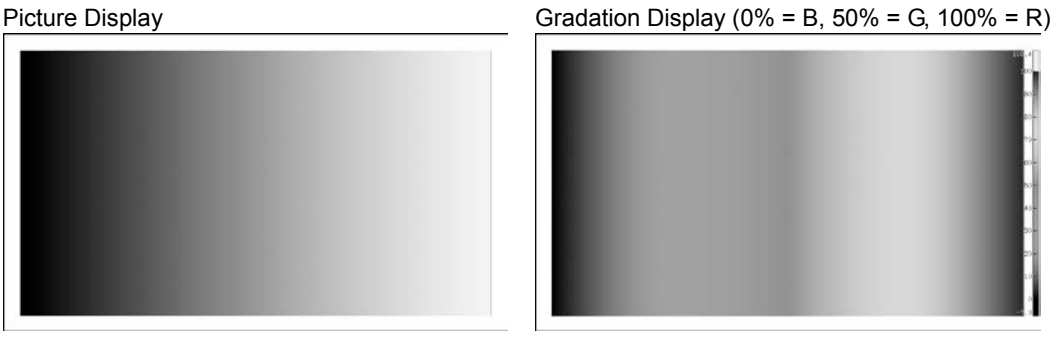


Figure 4-19 Gradation display

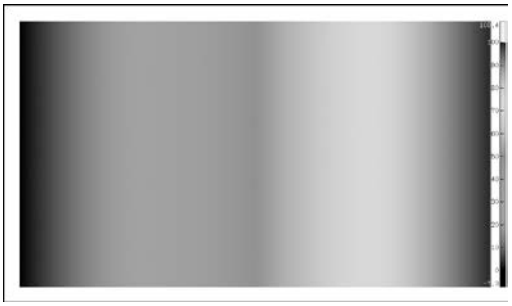
4.5.2 Step Display Mode

To display picture luminance levels in steps, follow the procedure below.
In the step display mode, luminance levels are divided into 10 % steps and assigned to 12 different colors. For information about F•2 UPPER and F•3 LOWER, see section 4.5.1, “Gradation Display Mode.”

Procedure

PIC → F•5 CINELITE → F•3 CINEZONE → use F•1 CINEZONE FORM to select STEP
→ F•2 UPPER
→ F•3 LOWER

CINEZONE FORM = GRADATE



CINEZONE FORM = STEP

Figure 4-20 Step display

4.5.3 Search Display Mode

In the search display mode, the specified luminance level ±0.5 % is displayed using green on an otherwise monochrome picture display.
The picture is displayed such that luminance levels at and above F•2 UPPER are displayed using red, and levels below F•3 LOWER are displayed using blue.

To set the level that is displayed using green, follow the procedure below.
F•2 LEVEL appears when F•1 CINEZONE FORM is set to SEARCH.

F•2 UPPER and F•3 LOWER appear when F•1 CINEZONE FORM is set to GRADATE or STEP. For details, see section 4.5.1, “Gradation Display Mode.”

Procedure

PIC → F•5 CINELITE → F•3 CINEZONE → use F•1 CINEZONE FORM to select SEARCH → F•2 LEVEL: -7.3% to 40.0% to 109.4%

CINEZONE FORM = SEARCH

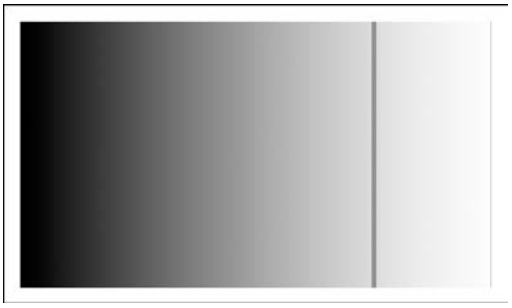


Figure 4-21 Search display

4.6 Configuring Display Settings

To configure the display settings, press F•6 DISPLAY on the picture menu.

PIC → F•6 DISPLAY →

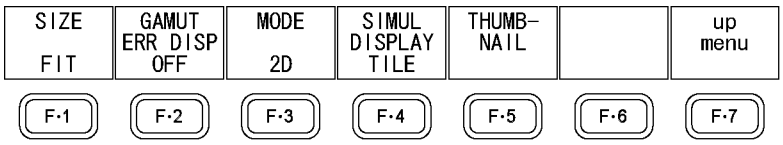


Figure 4-22 DISPLAY menu

4.6.1 Selecting the Display Size

To select the picture display size, follow the procedure below.
Regardless of this setting, the picture displayed in the thumbnail is displayed with the FIT setting.
When the 3D assist mode's display format is set to CHECKER or WIPE, this setting is fixed to FIT. This setting does not appear. When the display format is set to AGLPH CL, AGLPH MO, CNVRGNCE, or OVERLAY, you can select FIT or REAL.
The LV 5770SER08 or LV 5770SER09A uses simple filtering to enlarge and reduce the picture.

Procedure

PIC → F•6 DISPLAY → F•1 SIZE: FIT / REAL / X2 / FULL FRM

Settings

FIT:	The picture is displayed at the optimal size for the screen.
REAL:	A single sample of the video signal is displayed with a single pixel on the screen. Use the V POS and H POS knobs to adjust the display position of the picture. Press a knob to return the picture to the corresponding default location. This setting cannot be selected when the input signal is 1080p/60, 59.94, or 50. (This setting may be selectable in simul mode, but it is invalid.)
X2:	A single sample of the video signal is displayed with 4 pixels (2 horizontal and 2 vertical pixels) on the screen. Use the V POS and H POS knobs to adjust the display position of the picture. Press a knob to return the picture to the corresponding default location. This setting cannot be selected when the input signal is 1080p/60, 59.94, or 50. (This setting may be selectable in simul mode, but it is invalid.)
FULL FRM:	A single frame, including the blanking interval, is displayed.

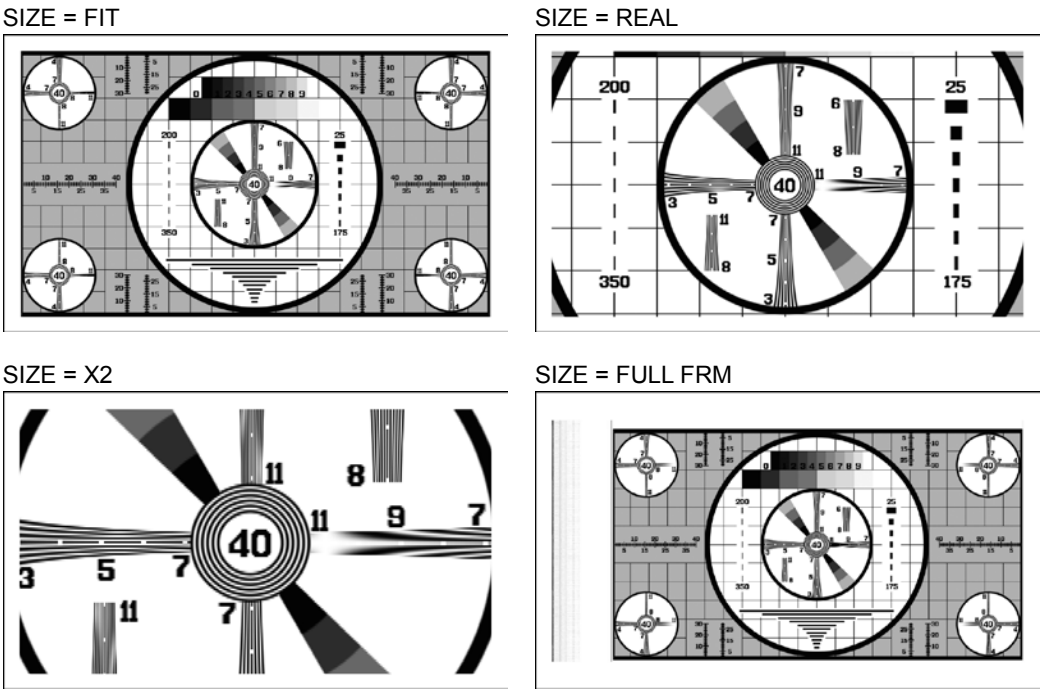


Figure 4-23 Selecting the display size

4.6.2 Displaying Gamut Errors

To display the locations of gamut errors and luminance errors on the picture, follow the procedure below.

These errors are defined by the ranges that you specify by setting Gamut Upper and Gamut Lower, Composite Upper and Composite Lower, and Luminance Upper and Luminance Lower on the unit setup display. If Gamut Error, Composite Gamut Error, or Level Error is set to OFF, the corresponding errors are not displayed.

For information on the Gamut Upper, Gamut Lower, Composite Upper, and Composite Lower settings, see section 6.1.3, “Error Setup 3 (ERROR SETUP3).”

For information on the Luminance Upper and Luminance Lower settings, see section 6.1.5, “Error Setup 5, (ERROR SETUP5).”

* The display of level errors is not supported when the input signal is 3G or HD dual link.

Procedure

PIC → F•6 DISPLAY → F•2 GAMUT ERR DISP: OFF / WHITE / RED / MESH

Settings

OFF:	Gamut errors are not displayed.
WHITE:	The picture intensity is halved, and gamut error are marked in white.
RED:	The picture intensity is halved, and gamut error are marked in red.
MESH:	Gamut errors are marked with a mesh pattern.

4.6.3 Configuring 3D Assist Display Settings

When in simul mode or when the input signal is 3G-B(2map), to measure 3D video signals, follow the procedure below. For details on the 3D assist display, see chapter 5, “3D ASSIST DISPLAY.”

Procedure

PIC → F•6 DISPLAY → F•3 MODE: 2D / 3D ASIST

Settings

2D:	Normal signals are measured.
3D ASIST:	3D video signals are measured. Apply the video signal for the left eye and the video signal for the right eye.

4.6.4 Setting the Simul Display

When in simul mode, to select the display format, follow the procedure below.

Procedure

PIC → F•6 DISPLAY → F•4 SIMUL DISPLAY: MIX / TILE

Settings

MIX:	The pictures are overlapped and displayed.
TILE:	The pictures are displayed side by side. This option cannot be selected when F•3 MODE is set to 3D ASIST.

SIMUL DISPLAY = MIX

SIMUL DISPLAY = TILE

Figure 4-24 Setting the simul display

4.6.5 Setting the 3G-B (2map) Display

When the input signal is 3G-B (2map), to select the display format, follow the procedure below.

Procedure

PIC → F•6 DISPLAY → F•4 2MAPPING DISPLAY: STREAM1 / STREAM2 / MIX / TILE

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other.
TILE:	Streams 1 and 2 are displayed side by side. This option cannot be selected when F•3 MODE is set to 3D ASIST.

4.6.6 Turning Thumbnails On and Off

To configure thumbnail settings, press F•5 THUMBNAIL on the DISPLAY menu.
This menu item does not appear when the multi-screen display is in use.

PIC → F•6 DISPLAY → F•5 THUMBNAIL →

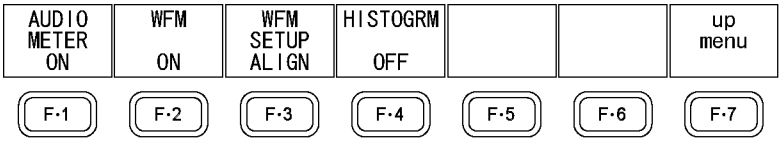


Figure 4-25 THUMBNAIL menu

To turn the thumbnail displays of the audio meter, video signal waveform, and histogram on and off separately, follow the procedure below.

- When an LV 5770SER41 or LV 5770SER43 is not installed in the LV 5770A or when the audio display mode is set to loudness, F•1 AUDIO METER is not displayed.
- If the input signal is 3G-B (2map), F•1 AUDIO METER cannot be turned on.
- When 3D assist mode is enabled and the measurement mode is set to DISPRTY; F•1 AUDIO METER, F•2 WFM, and F•4 HISTOGRM cannot be set to ON.
- You cannot display a histogram thumbnail at the same time as another thumbnail.

Procedure

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•1 AUDIO METER: ON / OFF
→ F•2 WFM: ON / OFF
→ F•4 HISTOGRM: ON / OFF

4.6.7 Setting the Video Signal Waveform Thumbnail

When F•2 WFM is set to ON in 3D assist mode, to select the video signal waveform thumbnail display format, follow the procedure below.

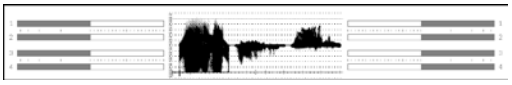
Procedure

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•3 WFM SETUP: MIX / ALIGN

Settings

MIX:	The video signal for the left eye and the video signal for the right eye are displayed on top of each other.
ALIGN:	The video signal for the left eye and the video signal for the right eye are displayed side by side.

WFM FORM = MIX



WFM FORM = ALIGN

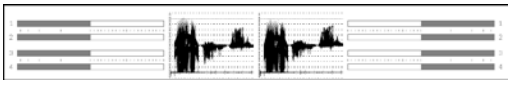


Figure 4-26 Setting the video signal waveform thumbnail

4.6.8 Configuring the Histogram Settings

To configure histogram settings, press F•5 HISTOGRM SETUP on the THUMBNAIL menu. F•5 HISTOGRM SETUP appears when F•4 HISTOGRM is set to ON.

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•5 HISTOGRM SETUP →

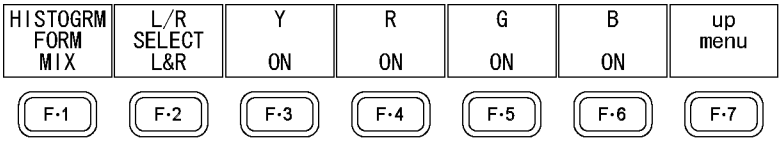


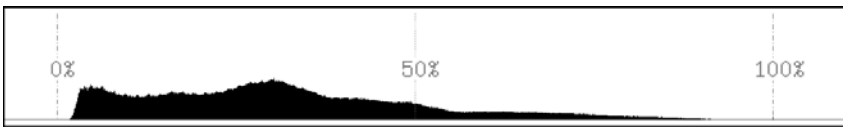
Figure 4-27 HISTOGRM SETUP menu

To select the histogram display format, follow the procedure below.

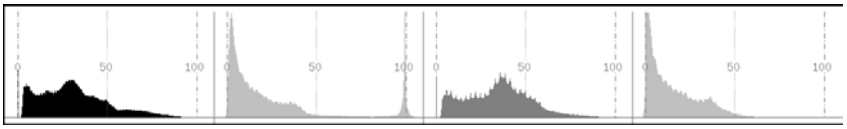
Procedure

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•5 HISTOGRM SETUP → F•1 HISTOGRM FORM: LUMA / ALIGN / MIX

HISTOGRM FORM = LUMA



HISTOGRM FORM = ALIGN



HISTOGRM FORM = MIX

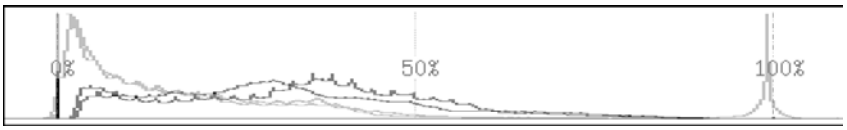


Figure 4-28 Configuring the histogram settings

In 3D assist mode, follow the procedure below to select the displayed signal.

Procedure

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•5 HISTOGRM SETUP → F•2 L/R SELECT: LEFT / RIGHT / L&R

When F•1 HISTOGRM FORM is set to MIX, follow the procedure below to turn Y, R, G, and B on and off separately.

Procedure

PIC → F•6 DISPLAY → F•5 THUMBNAIL → F•5 HISTOGRM SETUP
→ F•3 Y: ON / OFF
→ F•4 R: ON / OFF
→ F•5 G: ON / OFF
→ F•6 B: ON / OFF

4.6.9 Selecting the SD Display Format

When the input signal is SD in single input mode, to select the display format, follow the procedure below.

Procedure

PIC → F•6 DISPLAY → F•6 SD: 4:3 / 16:9

Settings

4:3:	The input signal is displayed as-is in 4:3 format.
16:9:	The input signal is stretched horizontally and displayed in 16:9 format. (Squeeze mode)

4.7 Configuring English Closed Caption Information Settings

To display the English closed caption information, press F•7 SUPER IMPOSE on the picture menu.

Note the following points about the English closed caption display.

- This is not supported when the input signal is HD dual link or 3G or when the LV 5770SER08 or LV 5770SER09A is in simul mode. This setting does not appear.
- If you leave the SUPER IMPOSE menu, English closed captions will not be displayed.
- The various markers and line select markers will not be displayed on the SUPER IMPOSE menu.

PIC → F•7 SUPER IMPOSE →

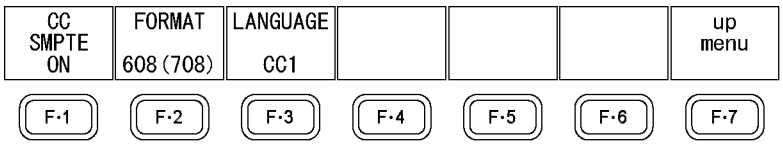


Figure 4-29 SUPER IMPOSE menu

4.7.1 Turning the Display of English Closed Captions On and Off

To turn SMPTE English closed captions on and off, follow the procedure below.

Procedure

PIC → F•7 SUPER IMPOSE → F•1 CC SMPTE: ON / OFF

4.7.2 Selecting the Format of English Closed Captions

When F•1 CC SMPTE is set to ON, to select the format of English closed captions, follow the procedure below.

Procedure

PIC → F•7 SUPER IMPOSE → F•2 FORMAT: 608(708) / 608(608) / VBI / 708

Settings

608(708):	CEA/EIA-608-B English closed caption information that is embedded in EIA-708-B CDP packets is displayed.
608(608):	CEA/EIA-608-B English closed caption information is displayed.
VBI:	CEA/EIA-608-B English closed caption information that is embedded in vertical blanking intervals is displayed.
708:	EIA-708 English closed caption information that is embedded in EIA-708-B CDP packets is displayed.

4.7.3 Selecting the English Closed Caption Content to Display

When F•2 FORMAT is set to a value other than 708, to select the English closed caption content to display, follow the procedure below.

Procedure

PIC → F•7 SUPER IMPOSE → F•3 LANGUAGE: CC1 / CC2 / CC3 / CC4 / TEXT1 / TEXT2 / TEXT3 / TEXT4

When F•2 FORMAT is set to 708, to select the English closed caption content to display, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (1).

Procedure

PIC → F•7 SUPER IMPOSE → F•4 SERVICE DATA: 1 to 63

5. 3D ASSIST DISPLAY

This chapter explains the 3D assist display feature, which is activated when you set MODE to 3D ASIST in the picture display feature. In the 3D assist display, you can evaluate 3D video signals by applying the video signal for the left eye and the video signal for the right eye.
For information on the MODE setting, see section 4.6.3, “Configuring 3D Assist Display Settings.”

Apply the video signal for the left eye to channel A and the video signal for the right eye to channel B. When the input signal is 3G-B(2map), use stream 1 as the video signal for the left eye and stream 2 as the video signal for the right eye.

You can configure most of the 3D assist display settings by using F•5 3D FUNCTION on the picture menu. This setting is available when MODE is set to 3D ASIST.

PIC → F•5 3D FUNCTION →

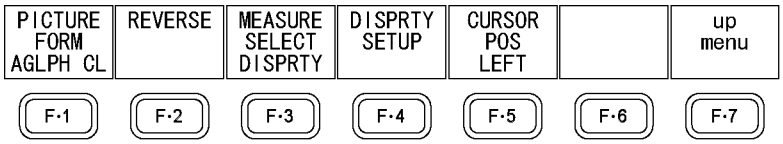


Figure 5-1 3D FUNCTION menu

5.1 Selecting the Display Format

To select the picture display format, follow the procedure below.
By using anaglyph glasses with the anaglyph displays (AGLPH CL and AGLPH MO), you can easily check 3D video signals.

Procedure

PIC → F•5 3D FUNCTION → F•1 PICTURE FORM: AGLPH CL / AGLPH MO / CNVRGNCE / OVERLAY / CHECKER / WIPE / FLICKER

Settings

AGLPH CL: Green and blue are masked from the video signal for the left eye, and red is masked from the video signal for the right eye. These signals are then combined and displayed.

AGLPH MO: Green and blue are masked from the monochrome video signal for the left eye, and red is masked from the monochrome video signal for the right eye. These signals are then combined and displayed. This is useful when you are measuring the amount of disparity because only the parts of the video that have disparity are colored.

CNVRGNCE: A 50 % offset is added to the difference between the monochrome the video signal for the left eye and the monochrome video signal for the right eye. The signals are then displayed. This is useful when you are performing convergence adjustment of two cameras.

OVERLAY: The levels of the video signal for the left eye and the video signal for the right eye are halved. These signals are then combined and displayed.

CHECKER: The video signal for the left eye and the video signal for the right eye are displayed in a checkerboard pattern. You can set the positions of the boundary lines. This is useful when you are matching the video level of two cameras.

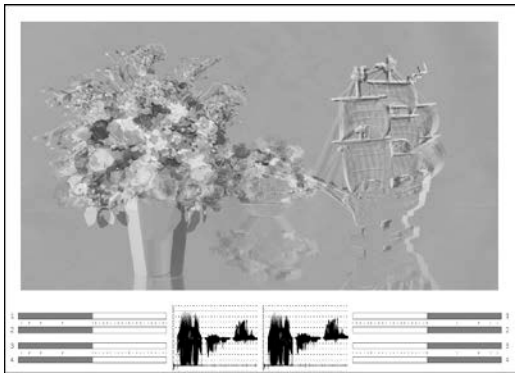
WIPE: The video signal for the left eye and the video signal for the right eye are divided

by boundary lines and displayed. You can set the positions of the boundary lines. This is useful when you are matching the video level of two cameras.

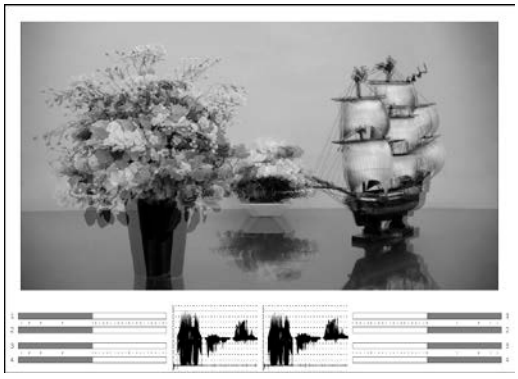
FLICKER: Displays the video signal for the left eye and the video signal for the right eye on a time sharing display.

PICTURE FORM = AGLPH CL / AGLPH MO

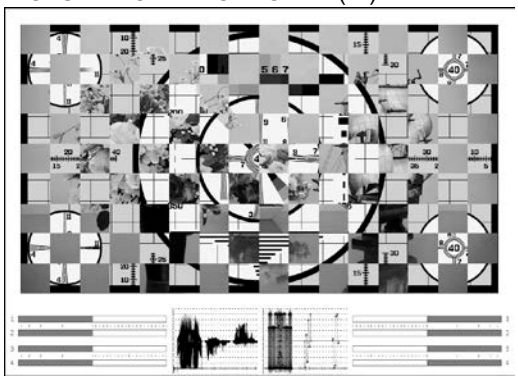
PICTURE FORM = CNVRGNCE



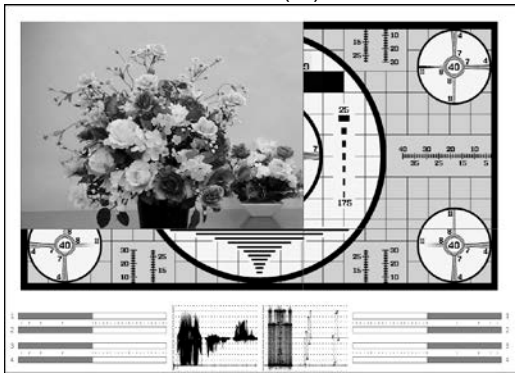
PICTURE FORM = OVERLAY



PICTURE FORM = CHECKER (*1)



PICTURE FORM = WIPE (*1)



PICTURE FORM = FLICKER

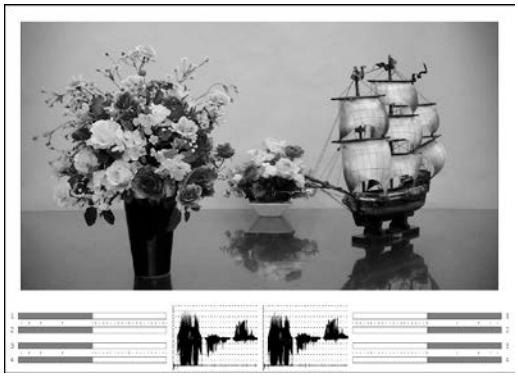


Figure 5-2 Selecting the display format

*1 To make this explanation clearer, the video signal for the right eye has been replaced with a different signal.

5.2 Configuring Checkerboard Display Settings

When F•1 PICTURE FORM is set to CHECKER, use the V POS knob to move the top-bottom boundary lines and the H POS knob to move the left-right boundary lines.
Press the V POS knob to move the top-bottom boundary lines and the H POS knob to move the left-right boundary lines in a way that makes each square the same size in the checkerboard pattern.

5.3 Configuring Wipe Display Settings

When F•1 PICTURE FORM is set to WIPE, use the V POS knob to move the top-bottom boundary lines and the H POS knob to move the left-right boundary lines.
Press the V POS knob to move the top-bottom boundary line to the bottom of the screen.
Press the H POS knob to move the left-right boundary line to the middle of the screen.
When WFM FORM is set to MIX, you can display the video signal waveforms separately on the left and right sides of the screen by turning the H POS knob.
For information on the WFM FORM setting, see section 4.6.7, “Setting the Video Signal Waveform Thumbnail.”

To show and hide the top-bottom and left-right boundary lines, follow the procedure below.

Procedure

PIC → F•5 3D FUNCTION → F•3 WIPE MARKER: ON / OFF

5.4 Setting the Inverted Display

To invert the display of the picture and the video signal waveform for each input signal, follow the procedure below. Use this feature when you are measuring video that is projected using half mirrors.

Procedure

PIC → F•5 3D FUNCTION → F•2 REVERSE
→ F•1 LEFT: OFF / VERTICAL / HORIZONT / H&V
→ F•2 RIGHT: OFF / VERTICAL / HORIZONT / H&V

Settings

OFF:	The display is not inverted.
VERTICAL:	Pictures are inverted vertically.
HORIZONT:	Pictures and video signal waveforms are inverted horizontally. (*1)
H&V:	Pictures are inverted vertically and horizontally, and video signal waveforms are inverted horizontally. (*1)

*1 Horizontal inversion of the video signal waveform occurs only during the video period.

5.5 Selecting the Measurement Mode

When F•1 PICTURE FORM is set to AGLPH CL, AGLPH MO, CNVRGNCE, OVERLAY, or FLICKER, you can use the grid or the cursors to measure disparity and check levelness. To select the disparity measurement mode, follow the procedure below.

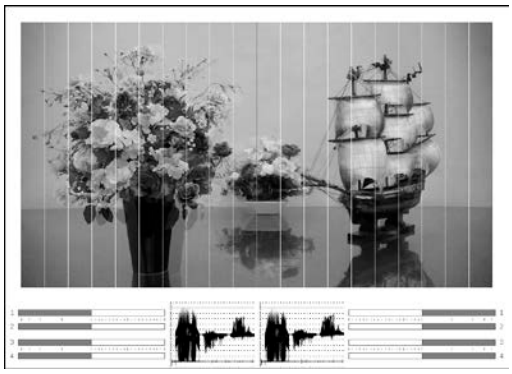
Procedure

PIC → F•5 3D FUNCTION → F•3 MEASURE SELECT: OFF / GRID / DISPRTY

Settings

OFF:	No grid lines or cursors are displayed.
GRID:	Grid lines are displayed. You can use the grid to measure disparity.
DISPRTY:	Cursors are displayed. You can perform detailed disparity measurements by setting the viewing environment.

MEASURE SELECT = GRID



MEASURE SELECT = DISPRTY

Figure 5-3 Selecting the measurement mode

5.6 Configuring Grid Display Settings

When F•3 MEASURE SELECT is set to GRID, press F•4 GRID SETUP to configure the grid settings.

PIC → F•5 3D FUNCTION → F•4 GRID SETUP →

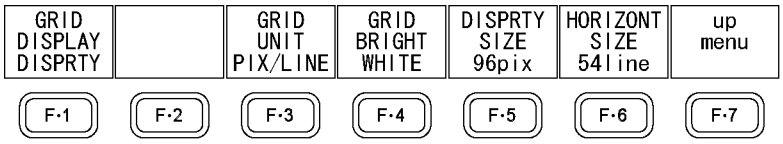


Figure 5-4 GRID SETUP menu

5.6.1 Selecting the Displayed Grid

To select the type of grid that is displayed, follow the procedure below. The reference grid lines for both the disparity and horizontal grid lines are displayed in yellow.

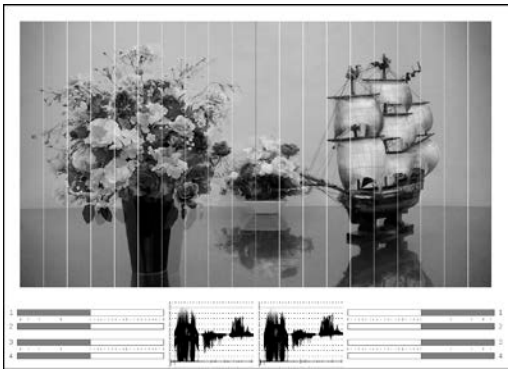
Procedure

PIC → F•5 3D FUNCTION → F•4 GRID SETUP → F•1 GRID DISPLAY: DISPRTY / HORIZONT / BOTH

Settings

DISPRTY:	Vertical grid lines are displayed. Use this option when you want to perform disparity measurements.
HORIZONT:	Horizontal grid lines are displayed. Use this option when you want to match the horizontal position of one camera or multiple cameras.
BOTH:	Both vertical and horizontal grid lines are displayed.

GRID DISPLAY = DISPRTY



GRID DISPLAY = HORIZONT

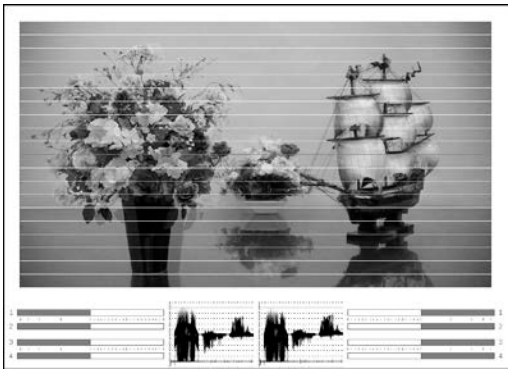


Figure 5-5 Selecting the displayed grid

5.6.2 Selecting the Grid Line Adjustment Unit

To select the grid adjustment unit, follow the procedure below.

Procedure

PIC → F•5 3D FUNCTION → F•4 GRID SETUP → F•3 GRID UNIT: PIX/LINE / %

Settings

PIX/LINE:	The disparity grid lines are adjusted with pixels as the unit. The horizontal grid lines are adjusted with lines as the unit.
%:	The disparity and horizontal grid lines are adjusted with percentage as the unit. Set the picture frame to 100 %.

5.6.3 Selecting the Grid Line Color

To select the grid line color, follow the procedure below.

Procedure

PIC → F•5 3D FUNCTION → F•4 GRID SETUP → F•4 GRID BRIGHT: WHITE / BLACK / GRAY1 / GRAY2

Settings

WHITE:	The grid lines are displayed in white.
BLACK:	The grid lines are displayed in black.
GRAY1:	The grid lines are displayed in dark gray.
GRAY2:	The grid lines are displayed in light gray.

5.6.4 Adjusting the Grid Line Spacing

To adjust the grid line spacing, follow the procedure below.
Use DISPRTY SIZE to adjust the disparity grid and HORIZONT SIZE to adjust the horizontal grid.
Press the function dial (F•D) to return the setting to its default value.

Procedure

PIC → F•5 3D FUNCTION → F•4 GRID SETUP
→ F•5 DISPRTY SIZE: 6pix to 96pix to 192pix (When F•3 GRID UNIT is set to PIX/LINE.)
→ F•6 HORIZONT SIZE: 6line to 54line to 108line (When F•3 GRID UNIT is set to PIX/LINE.)
→ F•5 DISPRTY SIZE: 0.3% to 5.0% to 10.0% (When F•3 GRID UNIT is set to %.)
→ F•6 HORIZONT SIZE: 0.6% to 5.0% to 10.0% (When F•3 GRID UNIT is set to %.)

* The selectable range varies depending on the input signal. The values shown here are for a 1080i/59.94 input signal.

5.6.5 Adjusting the Grid Line Positions

You can use the V POS knob to adjust the position of the horizontal grid and the H POS knob to adjust the position of the disparity grid.
The reference grid lines (displayed in yellow) can be moved from one side of the picture to the other. Press the knobs to center the respective reference grid lines.

5.7 Configuring Disparity Measurement Settings

When F•3 MEASURE SELECT is set to DISPRTY, press F•4 DISPRTY SETUP to measure disparity.

PIC → F•5 3D FUNCTION → F•4 DISPRTY SETUP →

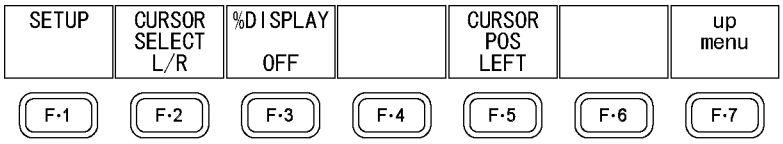


Figure 5-6 DISPRTY SETUP menu

5.7.1 Disparity Measurement Display Explanation

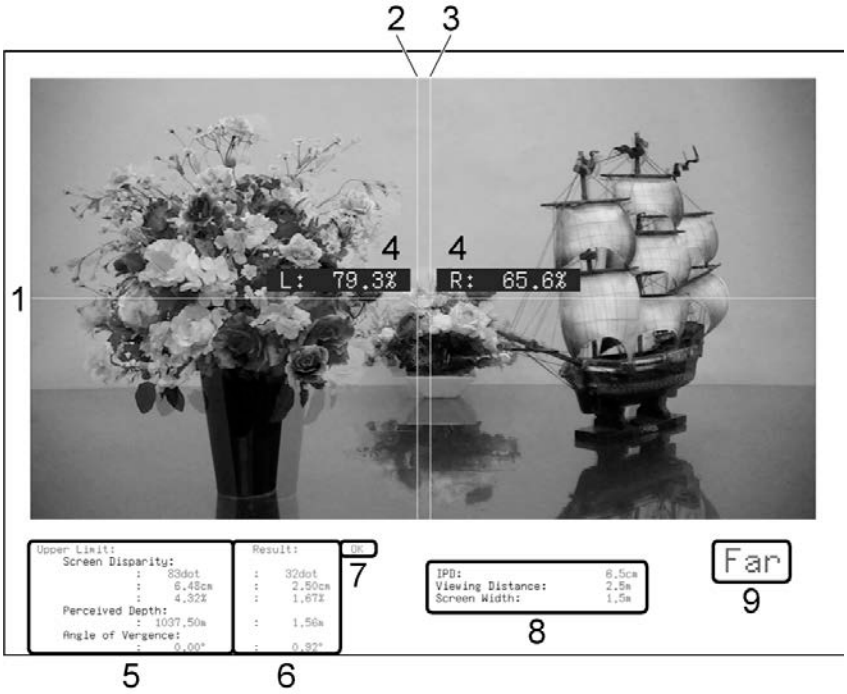


Figure 5-7 Disparity measurement display

1 V cursor

This is the vertical cursor.

2 L cursor

This is a disparity measurement cursor. Match this cursor with the video signal for the left eye.

3 R cursor

This is a disparity measurement cursor. Match this cursor with the video signal for the right eye.

4 Luminance level

If you set F•3 %DISPLAY to ON, the luminance levels at the cursor intersections are displayed. When a luminance level is 0.0 % or less or 80.0 % or greater, the measured value is displayed in yellow.

5 Upper Limit

This displays the upper disparity limits that were set on the PARAMETER display. Depending on the cursor position, these switch automatically between the Far upper limits and the Near upper limits.

6 Measured values

This displays the disparities that are measured by the cursors.

7 Result

When at least one measured value exceeds its upper limit, this displays “NG” in red. When all measured values are less than or equal to their upper limits, this displays “OK” in green.

8 Viewing environment

This displays the viewing environment that has been configured on the PARAMETER display.

9 Far or Near

When the L cursor is on the left side, this displays “Far.” When the L cursor is on the right side, this displays “Near.”

- **About the Names of Settings and Measurement Items**

The names of the settings and measurement items that are used with the LV 5770SER08 or LV 5770SER09A are shown below.

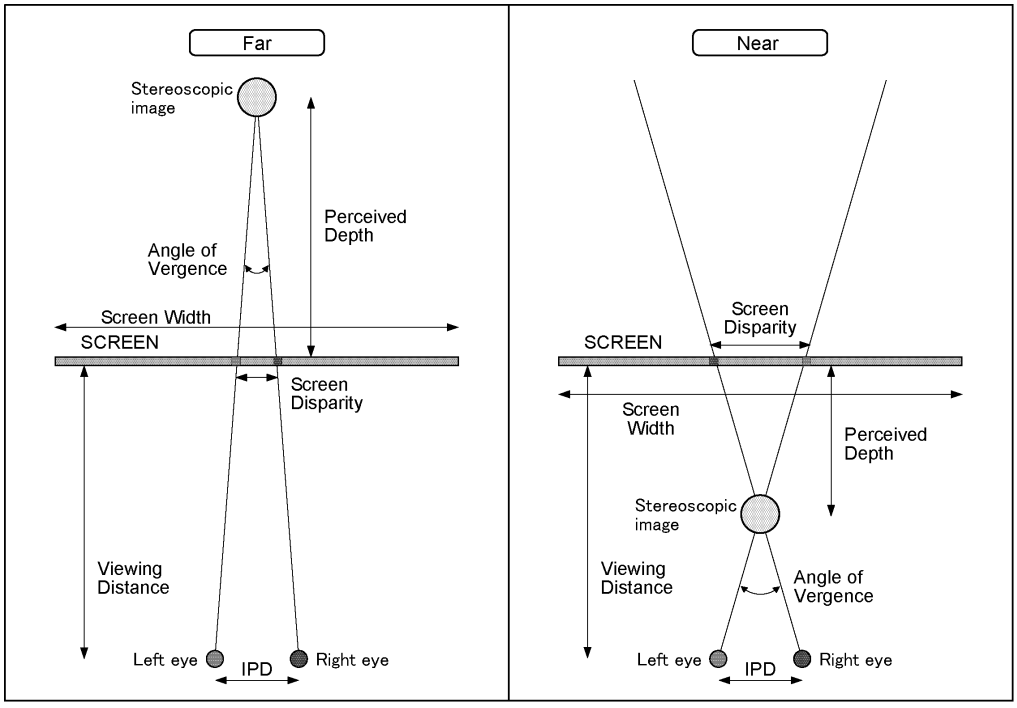


Figure 5-8 Setting and measurement item names

5.7.2 Disparity Measurement Procedure

To measure disparity, follow the procedure below.
Before you begin this procedure, set F•3 MEASURE SELECT to DISPRTY on the 3D FUNCTION menu.

1. Press F•4 DISPRTY SETUP and then F•1 SETUP.

The PARAMETER display appears.

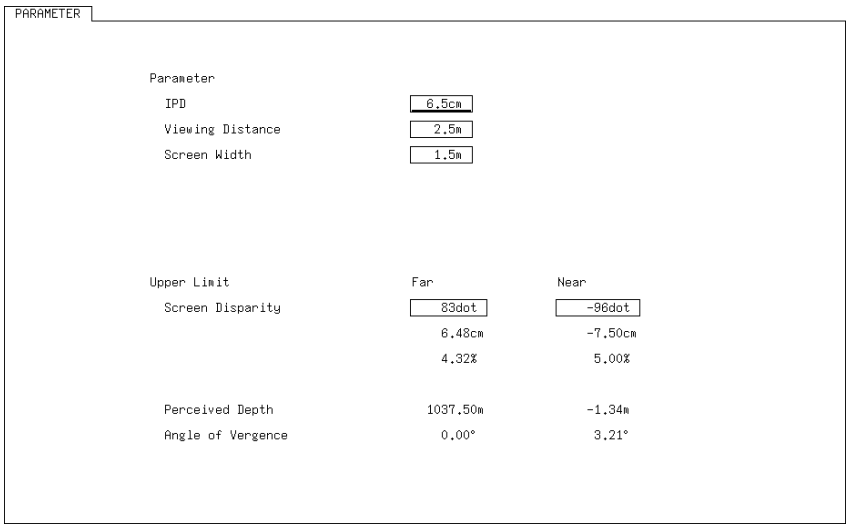


Figure 5-9 PARAMETER display

2. Under Parameter, enter the assumed viewing environment.

IPD	Enter the interpupillary distance. For adults, this is approximately 6.5 cm. For children, this is approximately 5.0 cm. (Setting range: 2.0 to 20.0 cm. The default setting is 6.5 cm.)
Viewing Distance	Enter the distance from the screen to the viewer. (Setting range: 0.1 to 99.9 m. The default setting is 2.5 m.)
Screen Width	Enter the screen width. (Setting range: 0.1 to 250.0 m. The default setting is 1.5 m.)

3. Under Upper Limit, enter the upper limits for the measured values.

If at least one measured value exceeds its limit that you enter here, “NG” is displayed on the disparity measurement display.

Screen Disparity	Enter the upper limit for the screen disparity. When you specify the value in units of dots, the cm, %, Perceived Depth, and Angle of Vergence values are set automatically. Enter a negative value under Near. (Setting range: ±1920 dots. The default Far setting is 83 dots. The default Near setting is -96 dots.)
Perceived Depth	This displays the near and far limits as distances from the screen.
Angle of Vergence	This displays the angle of vergence limit.

4. **Press F•1 COMPLETE.**

   The settings are confirmed, and the disparity measurement display appears. To cancel the settings, press F•7 CANCEL.

Figure 5-10 Disparity measurement display

5. **Set F•2 CURSOR SELECT to L/R.**
6. **Set F•5 CURSOR POS to LEFT and then turn the function dial (F•D) to align the L cursor with the video signal for the left eye.**

   Press the function dial (F•D) to move the cursor to approximately the center of the screen.

7. **Set F•5 CURSOR POS to RIGHT and then turn the function dial (F•D) to align the R cursor with the video signal for the right eye.**

   The measured disparity is displayed at the bottom of the screen.
   Press the function dial (F•D) to move the cursor to approximately the center of the screen.

- **To Move the V Cursor**

  It is useful to use the V cursor when you match the positions of the L and R cursors. Also, the luminance levels at the cursor intersections are displayed.
  To move the V cursor, turn the V POS knob. Alternatively, set F•2 CURSOR SELECT to V/TRACK, set F•5 CURSOR POS to VERTICAL, and then turn the function dial (F•D). If you press the V POS knob or the function dial (F•D), the cursor will move to the center of the screen.

- **To Move the L and R Cursors at the Same Time**

  Turn the H POS knob. Alternatively, set F•2 CURSOR SELECT to V/TRACK, set F•5 CURSOR POS to LR TRACK, and then turn the function dial (F•D).

6. STATUS DISPLAY

To display the status of the LV 5770SER08 or LV 5770SER09A, press STATUS.
Even in simul mode, channels A and B cannot be displayed simultaneously.

```
SDI STATUS
  SDI
    Signal        DETECT          Format        1080i/59.94
    CRC                0

    TRS Pos            0          TRS Code            0
    Illegal Code       0          Line Number         0
    Cable Length   <  5m
  ANC
    Checksum           0          Parity              0
  Video Quality
    Gamut                         Comp Gamut
    Freeze                        Black
    Level Ych                     Level Cch
  Embedded Audio
    BCH                0          Parity              0
    DBN                0          Inhibit             0
    Audio Sample       0
    CH      1, 2, 3, 4, 5, 6, 7, 8, 9,10,11,12,13,14,15,16

    SinceReset    00:01:36
```

Figure 6-1 Status display

- **Signal**

  If the LV 5770SER08 or LV 5770SER09A is receiving an SDI signal, “DETECT” is displayed. Otherwise, “NO SIGNAL” is displayed.

- **Error Counts**

  The counts of the errors that are being detected—which you specified by setting the detection items to ON with F•6 ERROR SETUP—are displayed here. Errors are counted once per second or once per field. The maximum number of errors that can be counted is 999999. Switching video formats or input channels may cause disturbances in the signal that will cause errors to be counted.

- **Cable Length**

  The input signal attenuation is converted into a cable length that you selected on the ERROR SETUP1 tab and displayed.
  When the input signal is HD dual link, the attenuation can be displayed for each link.
  For information on the ERROR SETUP1 setting, see section 6.1.1, “Error Setup 1 (ERROR SETUP1).”

  Normally the value is displayed in white, but if the value exceeds the Warning value specified on the ERROR SETUP1 tab, it will be displayed in yellow. If the value exceeds the Error value, it will be displayed in red.

  The cable length display range is shown below. The accuracy is ±20 m.

3G:	< 10 m, 10 to 105 m, > 105 m (5 m steps)
HD and HD dual link:	< 5 m, 5 to 130 m, > 130 m (5 m steps)
SD:	< 50 m, 50 to 300 m, > 300 m (5 m steps)

- **CH**

  The channels of the audio packets embedded in the input signal are displayed here.
  They can be displayed separately for each stream when the input signal is 3G-B (2map).

- **SinceReset**

  The time that has elapsed since F•7 ERROR CLEAR was pressed, the LV 5770SER08 or LV 57709SER09A was initialized, or the LV 5770SER08 or LV 57709SER09A was restarted is displayed here.

- **Menu**

  Use the status menu—which is displayed when you press the STATUS key—to configure the status display settings.

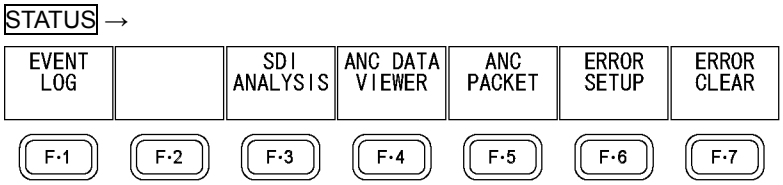


Figure 6-2 Status menu

6.1 Configuring Error Detection Settings

To configure the error detection settings, follow the procedure below. The error detection settings are configured on a tabbed menu.

Procedure

STATUS → F•6 ERROR SETUP

6.1.1 Error Setup 1 (ERROR SETUP1)

Use the ERROR SETUP1 tab to configure SDI error detection settings.

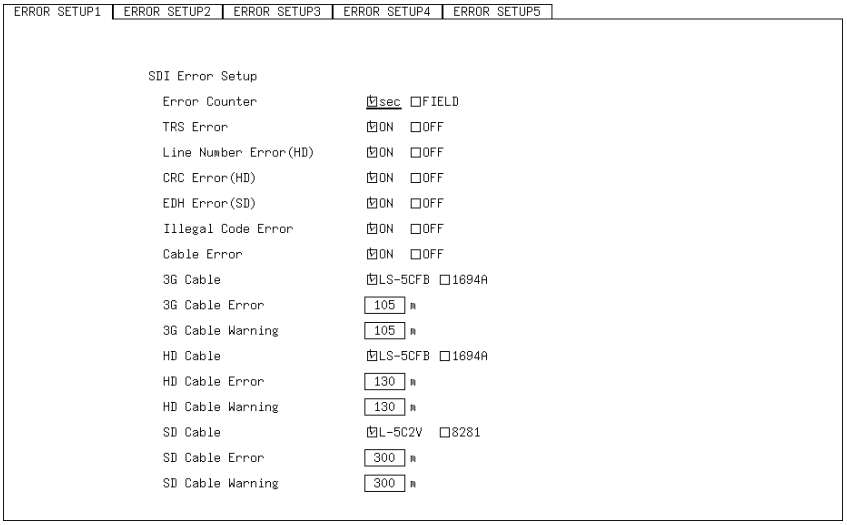


Figure 6-3 ERROR SETUP1 tab

- **Error Counter**

sec:	Errors are counted in units of seconds. Even if multiple errors occur within the same second, only a single error is counted.
FIELD:	Errors are counted in units of fields.The number of fields that have errors in them is displayed.

- **TRS Error**

Select whether to detect TRS Pos and TRS Code errors.

ON / OFF

- **Line Number Error(HD)**

Select whether to detect line number errors. This setting is valid when the input signal is not SD.

ON / OFF

- **CRC Error(HD)**

Select whether to detect CRC errors. This setting is valid when the input signal is not SD.

ON / OFF

- **EDH Error(SD)**

Select whether to detect EDH errors. This setting is valid when the input signal is SD.

ON / OFF

- **Illegal Code Error**

Select whether to detect illegal code errors.

ON / OFF

- **Cable Error**

Select whether to detect cable errors.

ON / OFF

- **3G Cable**

Select the cable to use for cable length measurements when the input signal is 3G.

LS-5CFB / 1694A

- **3G Cable Error**

Set the upper limit for the cable error when the input signal is 3G. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

10 to 105 m

- **3G Cable Warning**

Set the upper limit for the cable warning when the input signal is 3G. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

10 to 105 m

- **HD Cable**

Select the cable to use for cable length measurements when the input signal is HD or HD dual link.

LS-5CFB / 1694A

- **HD Cable Error**

Set the upper limit for the cable error when the input signal is HD or HD dual link. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

5 to 130 m

- **HD Cable Warning**

Set the upper limit for the cable warning when the input signal is HD or HD dual link. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

5 to 130 m

- **SD Cable**

Select the cable to use for cable length measurements when the input signal is SD.

L-5C2V / 8281

- **SD Cable Error**

Set the upper limit for the cable error when the input signal is SD. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

50 to 300 m

- **SD Cable Warning**

Set the upper limit for the cable warning when the input signal is SD. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

50 to 300 m

6.1.2 Error Setup 2 (ERROR SETUP2)

Use the ERROR SETUP2 tab to configure ancillary data and embedded audio error detection settings.

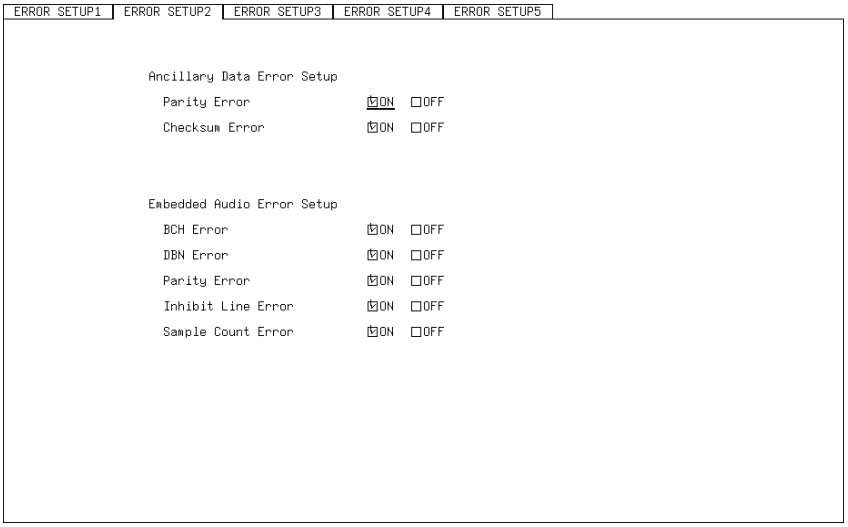


Figure 6-4 ERROR SETUP2 tab

- **Parity Error**

Select whether to detect parity errors in the ancillary data.

ON / OFF

- **Checksum Error**

Select whether to detect checksum errors in the ancillary data.

ON / OFF

- **BCH Error**

Select whether to detect BCH errors in the embedded audio. This setting is valid when the input signal is not SD.

ON / OFF

- **DBN Error**

Select whether to detect DBN errors in the embedded audio.

ON / OFF

- **Parity Error**

Select whether to detect parity errors in the embedded audio. This setting is valid when the input signal is not SD.

ON / OFF

- **Inhibit Line Error**

Select whether to detect sample number errors in the embedded audio. (The LV 5770SER08 or LV 5770SER09A detects asynchronous audio by measuring the number of samples.)

ON / OFF

- **Sample Count Error**

Select whether to detect sample number errors in the embedded audio. An error is counted when audio that is asynchronous to the video is embedded. If a certain number of audio data samples are not embedded in a certain number of video frames, it will be considered and error (as defined in SMPTE 299 and SMPTE 272M).

ON / OFF

6.1.3 Error Setup 3 (ERROR SETUP3)

Use the ERROR SETUP3 tab to configure gamut error settings.

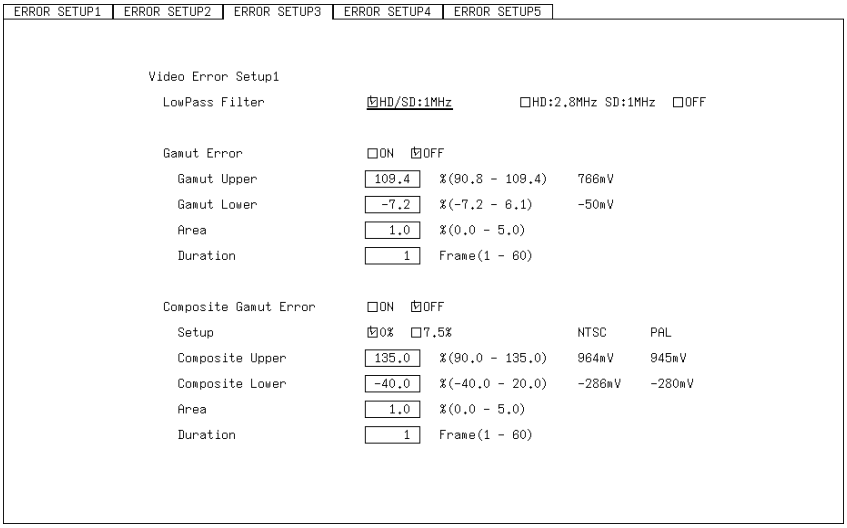


Figure 6-5 ERROR SETUP3 tab

- **LowPass Filter**

Select the frequency response of the low-pass filter used for gamut error and composite gamut error detection. Set this to remove transient errors caused by overshoot and other anomalies.

HD/SD:1MHz:	A 1 MHz low-pass filter is applied (IEEE STD 205).
HD:2.8MHz SD:1MHz:	When the input signal is SD, a 1 MHz low-pass filter is applied. For all other signals, a 2.8 MHz low-pass filter is applied.
OFF:	No low-pass filter is applied.

- **Gamut Error**

Select whether to detect gamut errors.

ON / OFF

- **Gamut Upper**

Set the gamut error upper limit. An error occurs when the input signal level exceeds the specified value.
In the 5-bar GBR display, levels that are greater than or equal to the specified value are displayed in red.

90.8 to 109.4 %

- **Gamut Lower**

Set the gamut error lower limit. An error occurs when the input signal level goes below the specified value.
In the 5-bar GBR display, levels that are less than or equal to the specified value are displayed in red.

-7.2 to 6.1 %

- **Area**

Specify the percentage of the active picture area over which errors must occur to be recognized as an error. You cannot configure this setting when Gamut Error is set to OFF.

0.0 to 1.0 to 5.0 %

- **Duration**

Set the number of consecutive video frames over which errors must occur to be recognized as an error. You cannot configure this setting when Gamut Error is set to OFF.

1 to 60 frames

- **Composite Gamut Error**

Select whether to detect composite gamut errors.

ON / OFF

- **Setup**

Select the setup level to add when converting component signals to composite signals.

0 %:	No setup level is added.
7.5 %:	A setup level of 7.5 % is added.

- **Composite Upper**

Set the composite gamut error upper limit. An error occurs when the input signal level exceeds the specified value.
In the 5-bar CMP display, levels that are greater than or equal to the specified value are displayed in red.

90.0 to 135.0 %

- **Composite Lower**

Set the composite gamut error lower limit. An error occurs when the input signal level goes below the specified value.
In the 5-bar CMP display, levels that are less than or equal to the specified value are displayed in red.

-40.0 to 20.0 %

- **Area**

Specify the percentage of the active picture area over which errors must occur to be recognized as an error. You cannot configure this setting when Composite Gamut Error is set to OFF.

0.0 to 1.0 to 5.0 %

- **Duration**

Set the number of consecutive video frames over which errors must occur to be recognized as an error. You cannot configure this setting when Composite Gamut Error is set to OFF.

1 to 60 frames

6.1.4 Error Setup 4 (ERROR SETUP4)

Use the ERROR SETUP4 tab to configure freeze error and black error settings.
The settings that you configure here are valid when the input signal is HD or SD.

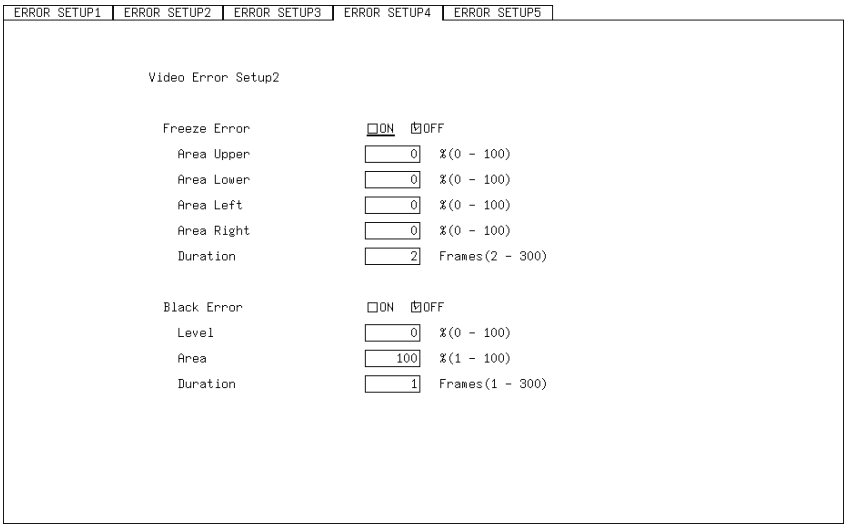


Figure 6-6 ERROR SETUP4 tab

- **Freeze Error**

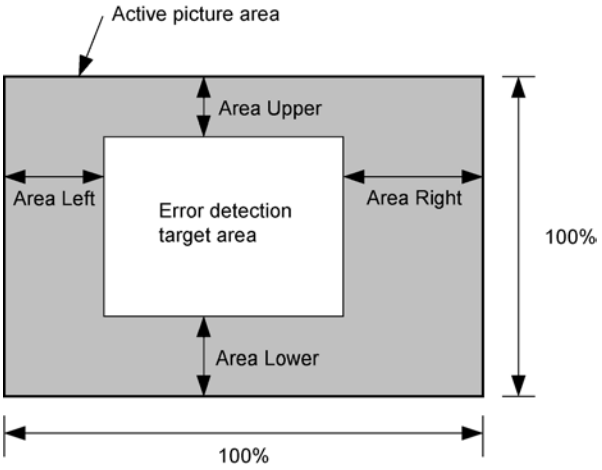
Select whether to detect freeze errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- **Area Upper, Area Lower, Area Left, Area Right**

Set what percent of each active picture area (the upper, lower, left, and right areas) will not be subject to error detection.

0 to 100 %



- **Duration**

Set the number of consecutive video frames over which errors must occur to be recognized as an error.

2 to 300 frames

- **Black Error**

Select whether to detect black errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- **Level**

Set the black error level. Any signals that are less than or equal to the specified value will be detected as errors.

0 to 100 %

- **Area**

Specify the percentage of the active picture area over which errors must occur to be recognized as an error.

1 to 100 %

- **Duration**

Set the number of consecutive video frames over which errors must occur to be recognized as an error.

1 to 300 frames

6.1.5 Error Setup 5 (ERROR SETUP5)

Use the ERROR SETUP5 tab to configure level error settings.
The settings that you configure here are valid when the input signal is HD or SD.

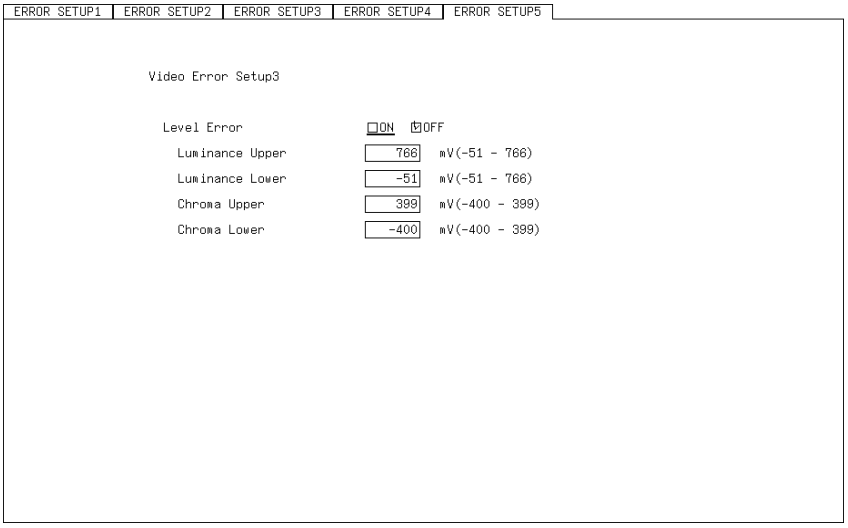


Figure 6-7 ERROR SETUP5 tab

- **Level Error**

Select whether to detect level errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- **Luminance Upper**

Set the luminance level error upper limit. An error occurs when the input signal level exceeds the specified value.
In the 5-bar Y display, levels that are greater than or equal to the specified value are displayed in red.

-51 to 766 mV

- **Luminance Lower**

Set the luminance level error lower limit. An error occurs when the input signal level goes below the specified value.
In the 5-bar Y display, levels that are less than or equal to the specified value are displayed in red.

-51 to 766 mV

- **Chroma Upper**

Set the chroma level error upper limit. An error occurs when the input signal level exceeds the specified value.

-400 to 399 mV

- **Chroma Lower**

Set the chroma level error lower limit. An error occurs when the input signal level goes below the specified value.

-400 to 399 mV

6.2 Clearing the Error Count

To clear the error counts and SinceReset, follow the procedure below.

Procedure
STATUS → F•7 ERROR CLEAR

6.3 Configuring Event Log Settings

To view the event log, follow the procedure below.
The event log displays a list of the events that have occurred.

Procedure
STATUS → F•1 EVENT LOG

```
EVENT LOG LIST   SAMPLE No.=   49   << NOW LOGGING >>

  49: 2011/08/23 15:54:46 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  48: 2011/08/23 15:54:46 A 1080i/59.94  FRZ,A_SMP,EYE_HD_A_J
  47: 2011/08/23 15:54:46 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  46: 2011/08/23 15:54:46 B 1080i/59.94  FRZ,
  45: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,A_SMP,EYE_HD_A_J
  44: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  43: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,A_SMP,EYE_HD_A_J
  42: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  41: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,A_SMP,EYE_HD_A_J
  40: 2011/08/23 15:54:45 B 1080i/59.94  FRZ,A_SMP,
  39: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  38: 2011/08/23 15:54:45 B 1080i/59.94  FRZ,
  37: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,A_SMP,EYE_HD_A_J
  36: 2011/08/23 15:54:45 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  35: 2011/08/23 15:54:44 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  34: 2011/08/23 15:54:44 A 1080i/59.94  A_SMP,EYE_HD_A_JIT,E
  33: 2011/08/23 15:54:44 B 1080i/59.94  FRZ,A_SMP,
  32: 2011/08/23 15:54:44 A 1080i/59.94  GMUT,CGMUT,A_SMP,EYE
  31: 2011/08/23 15:54:44 A 1080i/59.94  FRZ,EYE_HD_A_JIT,EYE
  30: 2011/08/23 15:54:44 A 1080i/60     FRZ,
  29: 2011/08/23 15:54:44 A 1080i/59.94  FRZ,A_SMP,
| LOG START | CLEAR | LOG MODE OVER WR | | | USB MEMORY | up menu |
```

Figure 6-8 Event log

6.3.1 Event Log Explanation

Events are listed in the event log in the order that they occur.
By turning the function dial (F•D) to the right, you can scroll the screen to view older events in the log. Also, by pressing the function dial (F•D), you can display the latest events.

Precautions

- When the same event occurs successively and when multiple events occur at the same time, they are treated as a single event.
- When multiple events occur at the same time, you may not be able to check all the events on the screen. When this happens, you can view all the events by saving them to a USB memory device.
- The event display is cleared when turn the power off.
- Switching video formats or input channels may cause disturbances in the signal that will cause errors to be displayed.
- Events that have occurred on other units are also displayed on the same screen.

Time

The time is displayed in the format specified by Time that you select by pressing SYS and then F•2 SYSTEM SETUP.

Event

The events that are displayed in the event log are listed below.
Of the events listed below, only the events whose detection has been set to ON as described in section 6.1, “Configuring Error Detection Settings,” and section 7.6, “Configuring Error Detection Settings,” are displayed.

Table 6-1 Events

Required Unit	Event Name	Description
LV 5770SER08 / LV 5770SER09A	NO_SIGNAL	No signal
	UnKnown	Unsupported input signal format or an input signal format that is different from the specified format
	CRC	CRC Error(HD)
	EDH	EDH Error(SD)
	SDI_DELAY	A/B Delay Error
	TRS_P	TRS Position Error
	TRS_C	TRS Code Error
	ILLEGAL	Illegal Code Error
	LINE	Line Number Error(HD)
	CHK	Ancillary Data Checksum Error
	PRTY	Ancillary Data Parity Error
	GMUT	Gamut Error
	CGMUT	Ccomposite Gamut Error
	FRZ	Freeze Error
	BLK	Black Error
	LVL_Y	Luminance Error
	LVL_C	Chroma Error
	A_BCH	Embedded Audio BCH Error

Required Unit	Event Name	Description
	A_PRTY	Embedded Audio Parity Error
	A_DBN	Embedded Audio DBN Error
	A_INH	Embedded Audio Inhibit Line Error
	A_SMP	Embedded Audio Sample Count Error
LV 5770SER09A	CABLE_ERR	Cable Error
	CABLE_WAR	Cable Warning
	EYE_3G_A_JIT	3G-SDI Current Jitter Error
	EYE_3G_T_JIT	3G-SDI Timing Jitter Error
	EYE_3G_TR_TF	3G-SDI Delta Time Error
	EYE_3G_TF	3G-SDI Fall Time Error
	EYE_3G_TR	3G-SDI Rise Time Error
	EYE_3G_AMP	3G-SDI Amplitude Error
	EYE_3G_OR	3G-SDI Overshoot Rising Error
	EYE_3G_OF	3G-SDI Overshoot Falling Error
	EYE_HD_A_JIT	HD-SDI Current Jitter Error
	EYE_HD_T_JIT	HD-SDI Timing Jitter Error
	EYE_HD_TR_TF	HD-SDI Delta Time Error
	EYE_HD_TF	HD-SDI Fall Time Error
	EYE_HD_TR	HD-SDI Rise Time Error
	EYE_HD_AMP	HD-SDI Amplitude Error
	EYE_HD_OR	HD-SDI Overshoot Rising Error
	EYE_HD_OF	HD-SDI Overshoot Falling Error
	EYE_SD_A_JIT	SD-SDI Current Jitter Error
	EYE_SD_T_JIT	SD-SDI Timing Jitter Error
	EYE_SD_TR_TF	SD-SDI Delta Time Error
	EYE_SD_TF	SD-SDI Fall Time Error
	EYE_SD_TR	SD-SDI Rise Time Error
	EYE_SD_AMP	SD-SDI Amplitude Error
	EYE_SD_OR	SD-SDI Overshoot Rising Error
	EYE_SD_OF	SD-SDI Overshoot Falling Error
	EYE_DCOFSET	DC OFFSET Error

6.3.2 Starting Event Logging

To start the event log, follow the procedure below.

Procedure

STATUS → F•1 EVENT LOG → F•1 LOG: START / STOP

Settings

START: Event logging is started. “NOW LOGGING” appears in the upper right of the event log.

STOP: Event logging is stopped. “LOGGING STOPPED” appears in the upper right of the event log.

6.3.3 Deleting the Event Log

To delete the event log, follow the procedure below.

Procedure

STATUS → F•1 EVENT LOG → F•2 CLEAR

6.3.4 Selecting the Overwrite Mode

Up to 1000 events can be displayed. To select the action to perform when more than 1000 events occur, follow the procedure below.

Procedure

STATUS → F•1 EVENT LOG → F•3 LOG MODE: OVER WR / STOP

Settings

OVER WR:	When more than 1000 events occur, the LV 5770SER08 or LV 5770SER09A writes over older events.
STOP:	When more than 1000 events occur, the LV 5770SER08 or LV 5770SER09A stops logging events.

6.3.5 Saving to a USB Memory Device

You can save the event log to a USB memory device as a text file.
To save a file with a name that you specify, follow the procedure below.

1. **Connect a USB memory device to the instrument.**
2. **Press F•6 USB MEMORY.**

   The file list display appears.
   This setting appears when a USB memory device is connected to the LV 5770A/7770.

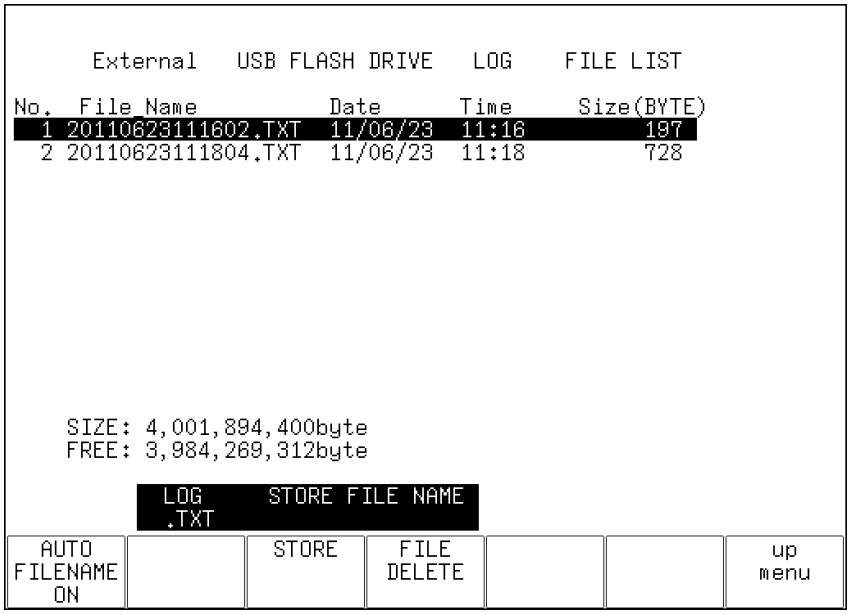


Figure 6-9 File list display

3. **Set F•1 AUTO FILENAME to OFF.**
4. **Press F•2 NAME INPUT.**

   The file name input display appears.

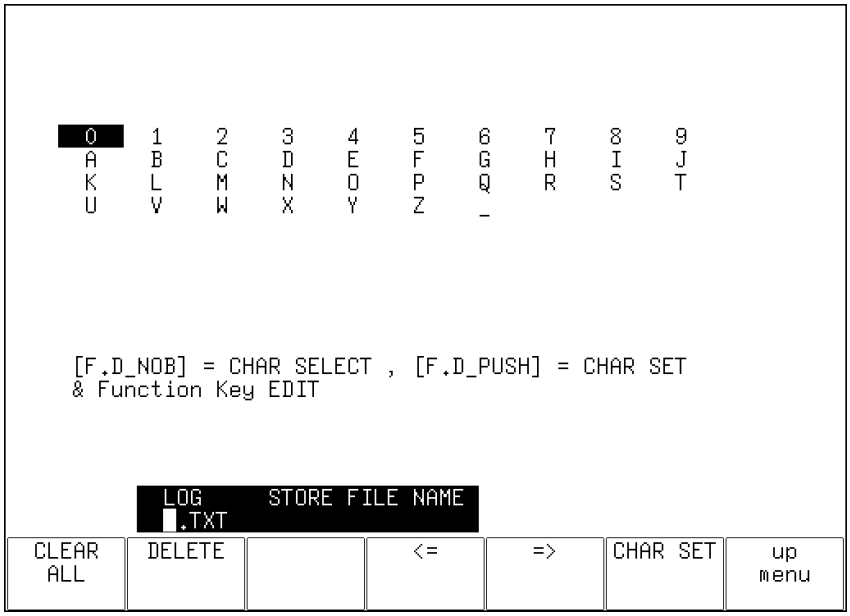


Figure 6-10 File name input display

5. **Enter a file name using up to 14 characters.**

   The key operations that you can perform on the file name input display are as follows:

F•1 CLEAR ALL:	Deletes all characters
F•2 DELETE:	Deletes the character at the cursor
F•4 <=:	Moves the cursor to the left
F•5 =>:	Moves the cursor to the right
F•6 CHAR SET:	Enters the character
F•D:	Turn to select a character, and press to enter the character.

   You can copy the file name of an already saved file. To copy a file name, move the cursor to the file in the file list whose name you want to copy, and then press the function dial (F•D).

6. **Press F•7 up menu.**

7. **Press F•3 STORE.**

   When the message “Saving file - Please wait.” disappears, the file has been successfully saved.
   If a file with the same name already exists on the USB memory device, an overwrite confirmation menu appears. To overwrite the current file, press F•1 OVER WR YES. To cancel the save operation, press F•3 OVER WR NO.

- **Deleting an Event Log**

  To delete an event log that has been saved to the USB memory device, select the log file on the file list display, and then press F•4 FILE DELETE. To delete the file, press F•1 DELETE YES. To cancel the delete operation, press F•3 DELETE NO.

- **Automatic File Name Generation**

  If you set F•1 AUTO FILENAME to ON, the file name will be generated automatically in the format “YYYYMMDDHHMMSS” when you save the file. In this situation, F•2 NAME INPUT is not displayed.

- **USB Memory Device Folder Structure**

  Event logs are saved in the LOG folder.

  USB memory device
  └ LV5770A_USER (For the LV 5770, the directory is LV5770_USER)
  | (For the LV 7770, the directory is LV7770_USER)
  └ LOG
  └ **********.txt

6.4 Configuring Data Dump Settings

To view the data dump, follow the procedure below.
In the data dump, the data of the line selected with the function dial (F•D) is listed. However, if LINE SELECT in the video signal waveform menu or vector menu is set to CINELITE, the data of the line selected in the CINELITE display is shown; you cannot change the line.

For information on the LINE SELECT setting, see section 2.7.1, “Turning Line Select On and Off,” and section 3.4.1, “Turning Line Select On and Off.”

Procedure

STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP

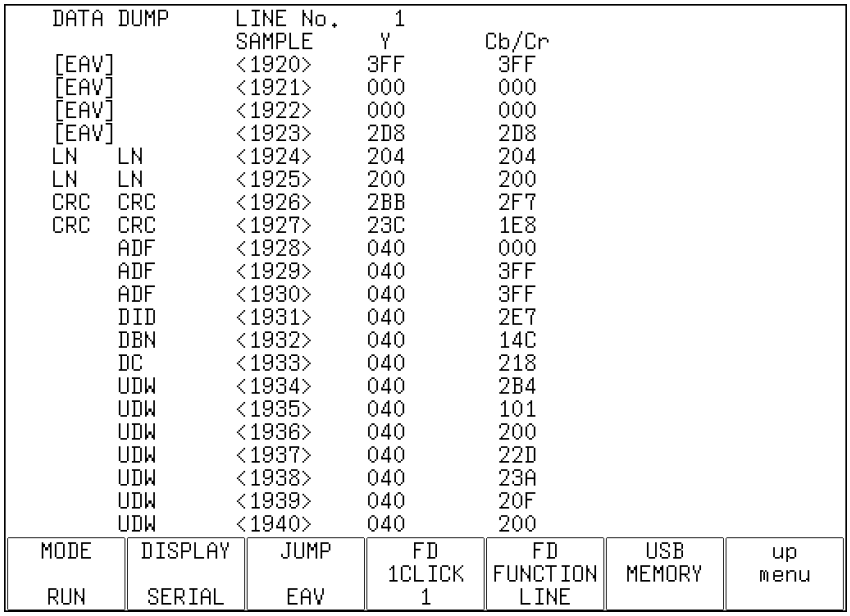


Figure 6-11 Data dump

6.4.1 Data Dump Explanation

In the data dump, the input signal's embedded ancillary data is detected, and the following detection codes are displayed.

Table 6-2 Detection code list

Detection Code	Display Color	Description
ADF	Cyan	Ancillary data flags (000h, 3FFh, and 3FFh)
DID	Cyan	Data identification (the data after ADF)
SDID	Cyan	Secondary data identification (the secondary format data when the DID is smaller than 80h)
DBN	Cyan	Data block numbers (the primary data format when the DID is larger than 80h)
DC	Cyan	Data count (the data after the SDID/DBN)
UDW	Cyan	User data words (the user data words of the data count length after ADF)
CS	Magenta	Checksum (the data immediately after UDW)
AP	Yellow	Active picture (the active picture from after the SAV to just before the EAV when the selected line is within the active video area)

6.4.2 Selecting the Display Mode

To select the data dump display mode, follow the procedure below.

Procedure

STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP → F•1 MODE: RUN / HOLD / FRM CAP

Settings

RUN: The input signal data is automatically updated and displayed.
This setting cannot be selected in frame capture mode.

HOLD: The input signal data is displayed statically.
This setting cannot be selected in frame capture mode.

FRM CAP: The frame data is displayed. If frame data has not been captured in the LV 5770A/7770, nothing is displayed. This setting can be selected in frame capture mode.

6.4.3 Selecting the Content to Display

To select the content to display in the data dump, follow the procedure below.

Procedure

STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP → F•2 DISPLAY

Settings (for HD, SD, and 3G-A)

SERIAL: The parallel converted data sequences are displayed (this is the default value).

COMPO: The parallel converted data sequences are divided into YCbCr or RGB and displayed.

BINARY: The parallel converted data sequences are displayed in binary.

Settings (for HD dual link)

LINK A:	The parallel converted data sequences of link A are displayed (this is the default value).
LINK B:	The parallel converted data sequences of link B are displayed.
LINK A/B:	Links A and B are combined, and the data sequences are divided into YCbCr or RGB and displayed.

Settings (for 3G-B)

STREAM1:	Stream 1 is displayed (this is the default value).
STREAM2:	Stream 2 is displayed.
STREAM12:	Streams 1 and 2 are combined and displayed.

Settings (for 3G-B (2map))

S1 SERIAL:	The parallel converted data sequences of stream 1 are displayed (this is the default value).
S1 COMPO:	The parallel converted data sequences of stream 1 are divided into YCbCr and displayed.
S1 BINARY:	The parallel converted data sequences of stream 1 are displayed in binary.
S2 SERIAL:	The parallel converted data sequences of stream 2 are displayed
S2 COMPO:	The parallel converted data sequences of stream 2 are divided into YCbCr and displayed.
S2 BINARY:	The parallel converted data sequences of stream 2 are displayed in binary.

6.4.4 Selecting the Display Start Position

To select the data dump display start position, follow the procedure below.

Procedure

STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP → F•3 JUMP: EAV / SAV

Settings

EAV:	The display starts with the EAV sample number.
SAV:	The display starts with the SAV sample number.

JUMP = EAV

```
DATA DUMP     LINE No.    1
              SAMPLE      Y        Cb/Cr
[EAV]         <1920>      3FF      3FF
[EAV]         <1921>      000      000
[EAV]         <1922>      000      000
[EAV]         <1923>      2D8      2D8
LN   LN       <1924>      204      204
LN   LN       <1925>      200      200
CRC  CRC      <1926>      2BB      2F7
CRC  CRC      <1927>      23C      1E8
     ADF      <1928>      040      000
     ADF      <1929>      040      3FF
     ADF      <1930>      040      3FF
     DID      <1931>      040      2E7
     DBN      <1932>      040      14C
     DC       <1933>      040      218
     UDW      <1934>      040      2B4
     UDW      <1935>      040      101
     UDW      <1936>      040      200
     UDW      <1937>      040      22D
     UDW      <1938>      040      23A
     UDW      <1939>      040      20F
     UDW      <1940>      040      200
```

JUMP = SAV

```
DATA DUMP     LINE No.    1
              SAMPLE      Y        Cb/Cr
[SAV]         <2196>      3FF      3FF
[SAV]         <2197>      000      000
[SAV]         <2198>      000      000
[SAV]         <2199>      2AC      2AC
              <   0>      040      200
              <   1>      040      200
              <   2>      040      200
              <   3>      040      200
              <   4>      040      200
              <   5>      040      200
              <   6>      040      200
              <   7>      040      200
              <   8>      040      200
              <   9>      040      200
              <  10>      040      200
              <  11>      040      200
              <  12>      040      200
              <  13>      040      200
              <  14>      040      200
              <  15>      040      200
              <  16>      040      200
```

Figure 6-12 Selecting the display start position

6.4.5 Selecting the Sample Number Adjustment Step Size

To select the sample number adjustment step size for when you turn the function dial (F•D), follow the procedure below.
This setting is valid when F•5 FD FUNCTION is set to SAMPLE.

Procedure

STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP → F•4 FD 1CLICK: 1 / 10 / 50

Settings

1:	The sample number is adjusted in steps of 1.
10:	The sample number is adjusted in steps of 10.
50:	The sample number is adjusted in steps of 50.

6.4.6 Selecting Lines and Samples

To select whether to set the line or sample number when you turn the function dial (F•D), follow the procedure below.

Procedure

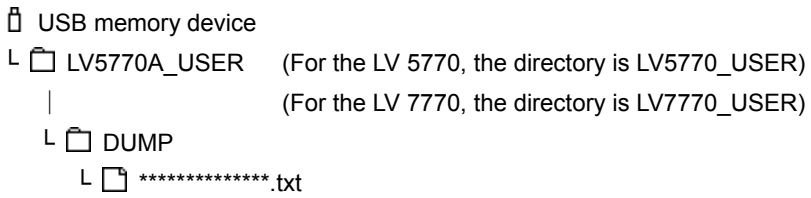
STATUS → F•3 SDI ANALYSIS → F•1 DATA DUMP → F•5 FD FUNCTION: LINE / SAMPLE

Settings

LINE:	Turning the function dial (F•D) changes the line number. Press the function dial (F•D) to display the data of the first video line.
SAMPLE:	Turning the function dial (F•D) changes the sample number. If you press the function dial (F•D), the data is displayed from the EAV sample number.

6.4.7 Saving to a USB Memory Device

You can save the data dump to a USB memory device as a text file. The procedure to follow to save data is the same as the procedure that was given for the event log. See section 6.3.5, “Saving to a USB Memory Device.”
Data dumps are saved in the DUMP folder.



6.5 Configuring Phase Difference Measurement Settings

To show the phase difference measurement display, follow the procedure below.
You can use the phase difference measurement display to measure the phase difference between an SDI signal and an external sync signal or the phase difference between a pair of channels.

Procedure

STATUS → F•3 SDI ANALYSIS → F•2 EXT REF PHASE

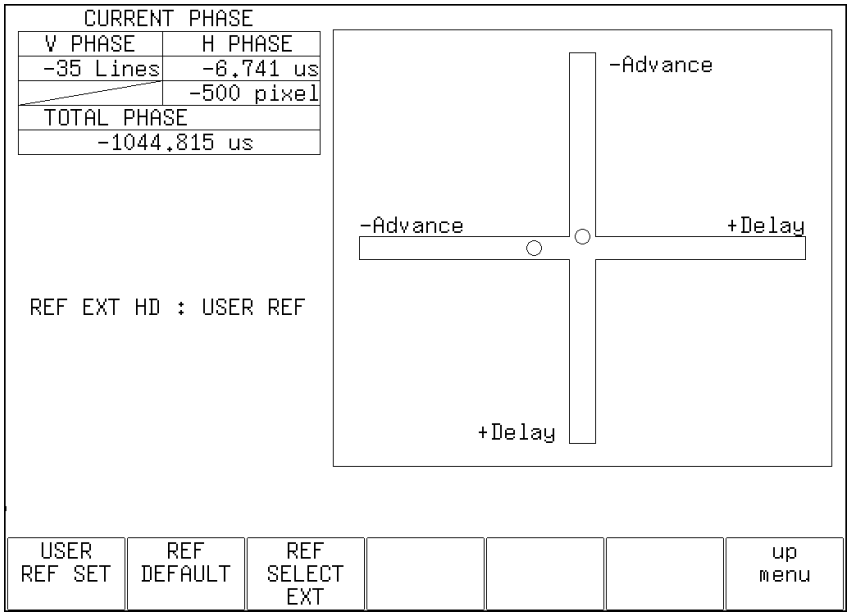


Figure 6-13 Phase difference measurement display

- **Measuring the Phase Difference between an SDI Signal and an External Sync Signal**

  Press EXT, and then apply an external sync signal. The external sync signal becomes the reference signal, and the phase difference between the external sync signal and the SDI signal is displayed.

  * The following formats can not be used in external sync mode.
  - HD dual link's 1080p/60, 1080p/59.94, and 1080p/50
  - 3G's 720p/30, 720p/29.97, 720p/25, 720p/24, and 720p/23.98

- **Measuring the Phase Difference between Channels A and B**

  Press B, and then set F•3 REF SELECT to SDI Ach. The reference signal is set to channel A, and the phase difference between channel A and channel B is displayed.
  You cannot set a user-defined phase difference reference.

- **Measuring the Phase Difference between Links A and B**

  Apply an HD dual link signal, and then set F•3 REF SELECT to LINK A. The reference signal is set to link A, and the phase difference between link A and link B is displayed.
  You cannot set a user-defined phase reference.

6.5.1 Phase Difference Measurement Display Explanation

- **CURRENT PHASE**

  V PHASE: The phase difference is displayed in units of lines.
  H PHASE: The phase difference is displayed in units of time and in units of pixels or dots. (*1)
  TOTAL PHASE: The total of the V PHASE and H PHASE differences is displayed here in units of time.

  *1 When the input signal is HD dual link 1080p/60, 1080p/59.94, or 1080p/50, the unit will be dots. Pixels are in units of the video's sampling frequency. Dots are in units of the parallel video's transmission clock frequency.

- **REF**

  This displays the reference signal as shown below.

  Table 6-3 REF indications

F•3 REF SELECT	Display Indication	Description
EXT	INT	Indicates that the internal sync mode is in use.
	EXT BB : DEFAULT	Indicates that the external sync signal is BB and the phase difference is the default value.
	EXT BB : USER REF	Indicates that the external sync signal is BB and a user-defined reference is being used.
	EXT HD : DEFAULT	Indicates that the external sync signal is an HD tri-level sync signal and the phase difference is the default value.
	EXT HD : USER REF	Indicates that the external sync signal is an HD tri-level sync signal and a user-defined reference is being used.
	NO SIGNAL	Indicates that no external sync signal is being applied.
SDI Ach	SDI A	Indicates that the phase difference between channels A and B is being measured.
LINK A	LINK A	Indicates that the phase difference between links A and B is being measured.
SDI Ach or LINK A	ACH NO SIGNAL	Indicates that channel A (or link A) is not being applied.
	BCH NO SIGNAL	Indicates that channel B (or link B) is not being applied.
	A,BCH NO SIGNAL	Indicates that channels A and B (or links A and B) are not being applied.

User-Defined References for the Phase Difference

By pressing F•1 USER REF SET, you can set the current phase difference to zero. You can change the reference to match the system that you are using.

To reset the phase difference to its default value, press F•2 REF DEFAULT. The default value is the value that makes the phase difference 0 between a LEADER signal generator's SDI output signal and BB signal without timing offsets when both signals are connected through cables of equal length.

- **Graphical Display**

The vertical axis indicates the V phase difference in lines. The horizontal axis represents the H phase difference in time. When the circles that represent V and H overlap with each other in the center, there is no phase difference.

The circles are normally displayed in white, but they will be displayed in green under the following circumstances.

Horizontal: When the circle is within ±3 clocks of the center.
Vertical: When the circle is within ±0 clocks of the center.

Circles do not appear when the LV 5770SER08 or LV 5770SER09A uses internal synchronization.

When the signal is behind the reference signal, the circle is displayed on the Delay (+) side. When the signal is ahead of the reference signal, the circle is displayed on the Advance (-) side. For both the V and H axes, differences of up to approximately +1/2 frames from the center are displayed on the Delay axis and differences of up to approximately -1/2 frames from the center are displayed on the Advance axis. (See the table below.)
The H axis phase difference may fluctuate within the range of ±1 clocks in cases such as when the signal is switched.

Table 6-4 Delay and Advance axis display ranges

Format	Displayed on the Advance Axis			Displayed on the Delay Axis				
	V PHASE (in lines)	H PHASE (in µs)		V PHASE (in lines)	H PHASE (in µs)		V PHASE (in lines)	H PHASE (in µs)
1080p/59.94	-562	-14.829	to	0	0	to	562	0
1080p/60	-562	-14.814	to	0	0	to	562	0
1080p/50	-532	-17.777	to	0	0	to	562	0
1080i/59.94, 1080p/29.97, 1080PsF/29.97	-562	-29.645	to	0	0	to	562	0
1080i/60, 1080p/30, 1080PsF/30	-562	-29.616	to	0	0	to	562	0
1080i/50, 1080p/25, 1080PsF/25	-562	-35.542	to	0	0	to	562	0
1080p/23.98, 1080PsF/23.98	-562	-37.060	to	0	0	to	562	0
1080p/24, 1080PsF/24	-562	-37.023	to	0	0	to	562	0
720p/59.94	-375	0	to	0	0	to	374	22.230
720p/60	-375	0	to	0	0	to	374	22.208
720p/50	-375	0	to	0	0	to	374	26.653
720p/29.97	-375	0	to	0	0	to	374	44.475
720p/30	-375	0	to	0	0	to	374	44.430
720p/25	-375	0	to	0	0	to	374	53.319
720p/23.98	-375	0	to	0	0	to	374	55.597
720p/24	-375	0	to	0	0	to	374	55.542
525i/59.94	-262	-63.518	to	0	0	to	262	0
625i/50	-312	-63.962	to	0	0	to	312	0

6.6 Configuring Lip Sync Measurement Settings

To show the lip sync measurement screen, follow the procedure below.
By combining a Leader signal generator that supports lip syncing with the LV 5770SER08 or LV 5770SER09A, you can use the lip sync measurement screen to measure the offset between the video signal and the audio signal that occurs in the transfer route.
Note that to measure lip sync with the LV 5770A, the LV 5770SER41/LV 5770SER43 is required.

Procedure

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE

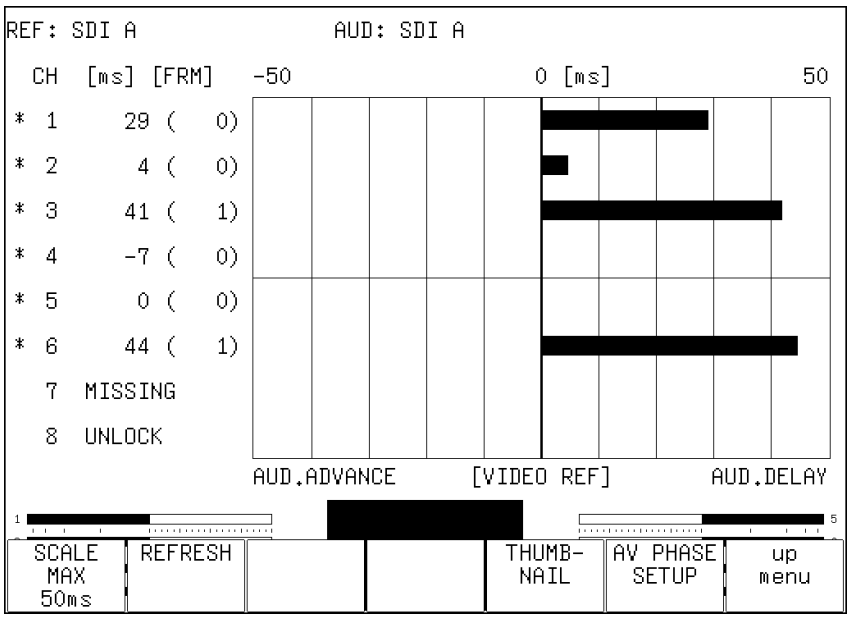


Figure 6-14 Lip sync measurement screen

As an example, we will show a procedure that uses the LT 4400 (that is, the LT 4400SER01) as the signal generator that supports lip syncing.

1. **Turn the LT 4400 lip sync feature on.**

   SDI SETTING → LIPSYNC to turn this feature on. For details, see the LT 4400 instruction manual.

2. **Send the signal generated from the LT 4400 SDI OUT connector to the transfer route. Apply the signal received from the transfer route to the LV 5770SER08 or LV 5770SER09A INPUT SDI connector.**

   If the output audio is external audio, apply the video signal to the SDI input connector and the audio signal to the digital audio input connector.

3. **Select the audio signal.**

   On the LV 5770A/7770's audio menu, press F•1 SOURCE SELECT and then F•1 INPUT SELECT to set the audio signal to SDI (for an embedded audio signal) or EXT DIGI (for an external audio signal).

4. The lip sync measurement screen is displayed.

The time difference when the luminance level of the video signal (the G signal level when the input signal is RGB) exceeds the specified value or when the audio level signal exceeds the specified value is measured, and the results are displayed numerically and graphically for each channel.

The measured value is displayed in units of time and frames. If the audio signal cannot be detected, "UNLOCK" is displayed. If the audio signal cannot be measured correctly, "MISSING" is displayed. Further, when the measured value is updated, an asterisk is displayed next to the channel.

Note that you can set the video signal measurement range, video signal luminance level, and audio signal level using F•6 AV PHASE SETUP.

6.6.1 Selecting the Measurement Range

To select the graph measurement range, follow the procedure below.

Procedure

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE → F•1 SCALE MAX: 50ms / 100ms / 500ms / 1.0s / 2.5s

6.6.2 Updating the Measurement Screen

To update the measurement screen, follow the procedure below.

Procedure

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE → F•2 REFRESH

6.6.3 Turning Thumbnails On and Off

To configure thumbnail settings, press F•5 THUMBNAIL on the AV PHASE menu.
This menu item does not appear when the multi-screen display is in use.

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE → F•5 THUMBNAIL →

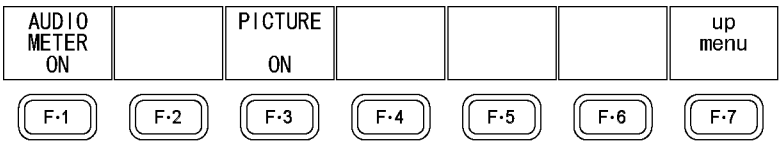


Figure 6-15 THUMBNAIL menu

To turn the thumbnail displays of the audio meter and picture on and off separately, follow the procedure below. When the audio display mode is set to loudness, F•1 AUDIO METER is not displayed. If the input signal is 3G-B (2map), F•1 AUDIO METER cannot be turned on.

Procedure

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE → F•5 THUMBNAIL
→ F•1 AUDIO METER: ON / OFF
→ F•3 PICTURE: ON / OFF

6.6.4 Setting the Measurement Range

To set the measurement range, follow the procedure below. These settings are configured on a tabbed menu.

Procedure

STATUS → F•3 SDI ANALYSIS → F•3 AV PHASE → F•6 AV PHASE SETUP

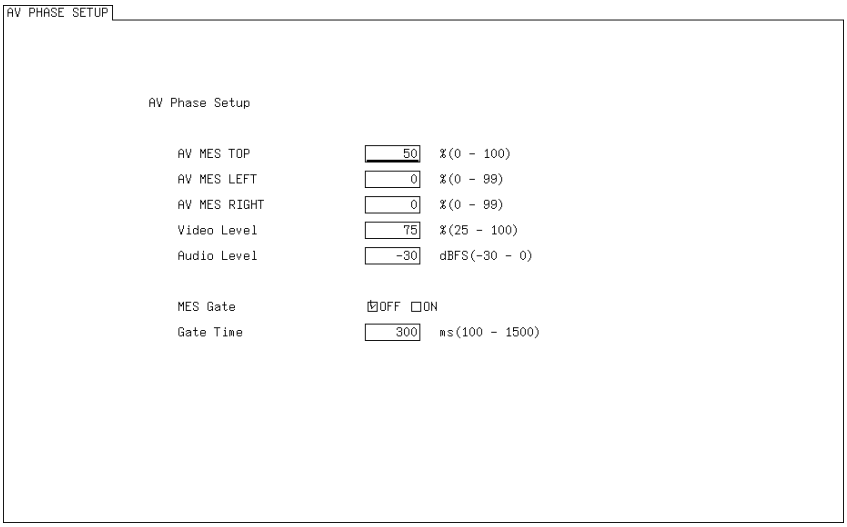


Figure 6-16 AV PHASE SETUP tab

- **AV MES TOP**

Set the video signal measurement line with the top edge of the picture taken to be 0 % and the bottom edge to be 100 %.
You can also set this using the LINE SEL menu of the picture display while viewing the picture.
See section 4.3.3, “Setting the Lip Sync Measurement Range”

0 to 50 to 100 %

- **AV MES LEFT**

Set the video signal measurement range (left side) with the left edge of the picture taken to be 0 % and the right edge to be 100 %. You cannot set this to the right of the line set with AV MES RIGHT.
You can also set this using the LINE SEL menu of the picture display while viewing the picture.

0 to 99 %

- **AV MES RIGHT**

Set the video signal measurement range (right side) with the right edge of the picture taken to be 0 % and the left edge to be 100 %. You cannot set this to the left of the line set with AV MES LEFT.
You can also set this using the LINE SEL menu of the picture display while viewing the picture.

0 to 99 %

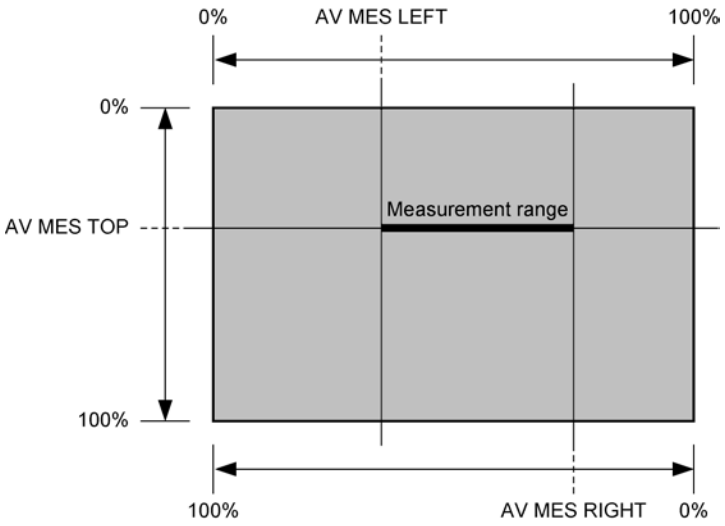


Figure 6-17 Setting the measurement range (Video signal)

- **Video Level**

Set the video signal luminance level. The time difference from the audio signal is measured when the luminance level of the measurement range specified with AV MES exceeds the level specified here.

25 to 75 to 100 %

- **Audio Level**

Set the audio signal level. The time difference from the video signal is measured when the audio signal level exceeds the level specified here.

-30 to 0 dBFS

- **MES Gate**

Select whether to specify the measurement range of the audio signal. Set this to ON such as when using a pattern containing multiple audio signals for a single video signal.

OFF / ON

- **Gate Time**

When MES Gate is set to ON, set the measurement range of the audio signal. The measurement range is “the rise time of the video signal ± the time set with Gate Time.”

100 to 300 to 1500 ms

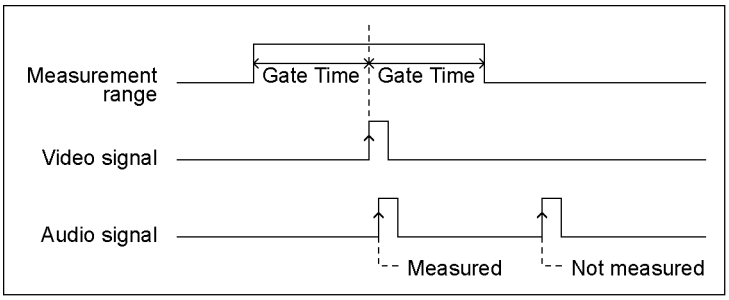


Figure 6-18 Setting the measurement range (Audio signal)

6.7 Displaying a List of Ancillary Data

To display a list of ancillary data, follow the procedure below.
This is not supported when the input signal is HD dual link or 3G. F•4 ANC DATA VIEWER is not displayed.

Procedure

STATUS → F•4 ANC DATA VIEWER

ANC DATA VIEWER 1/5

STANDARD	DID/SDID	STATUS	LINE No.	PACKET
S291M MARK DEL	80/--	MISSING		
S291M END PKT	84/--	MISSING		
S291M START PKT	88/--	MISSING		
ARIB B.27 CC	CF/--	MISSING		
S299M ctrl G4	E0/--	MISSING		
S299M ctrl G3	E1/--	DETECT	571/F2	2/FRAME
S299M ctrl G2	E2/--	DETECT	571/F2	2/FRAME
S299M ctrl G1	E3/--	DETECT	571/F2	2/FRAME
S299M aud G4	E4/--	MISSING		
S299M aud G3	E5/--	DETECT	524/F1	1601/FRAME
S299M aud G2	E6/--	DETECT	524/F1	1601/FRAME
S299M aud G1	E7/--	DETECT	524/F1	1601/FRAME
S272M ctrl G4	EC/--	MISSING		
S272M ctrl G3	ED/--	MISSING		
S272M ctrl G2	EE/--	MISSING		

ANC DUMP | | | | PAGE UP | PAGE DOWN | up menu

Figure 6-19 Ancillary data display

6.7.1 Ancillary Data Display Explanation

On the ancillary data display, data is displayed as a list for each standard. If data is detected, “DETECT” is displayed in the STATUS column. If data is not detected, “MISSING” is displayed in the STATUS column.

By turning the function dial (F•D) to the right, you can scroll the screen to view all the data. You can also press F•5 PAGE UP and F•6 PAGE DOWN to move between pages. In the upper right of the screen, the “page number/total number of pages” is displayed.
If you press the function dial (F•D), the cursor returns to the first data entry.

6.7.2 Displaying a Dump of Ancillary Data

To display a dump of the data that you have selected on the ancillary data display, follow the procedure below.
By turning the function dial (F•D) to the right, you can scroll the screen to view all the data. If you press the function dial (F•D), the cursor returns to the first data entry.

Procedure

STATUS → F•4 ANC DATA VIEWER → F•1 ANC DUMP

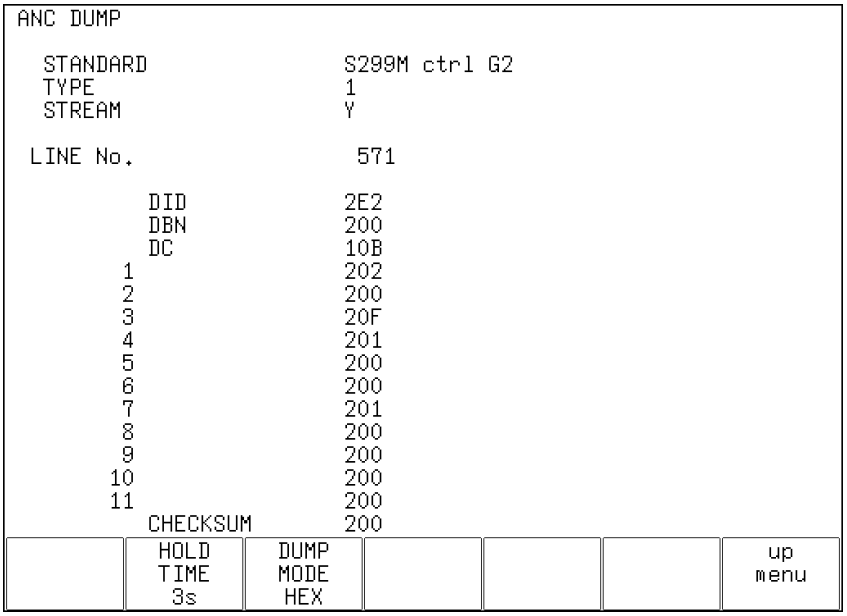


Figure 6-20 Ancillary dump display

6.7.3 Updating the Dump Display

When the selected data is embedded in multiple lines, the line number that is displayed on the ancillary dump display is switched at a regular interval. (However, the line numbers are switched at an irregular interval.)
To select the dump display update time, follow the procedure below.

Procedure

STATUS → F•4 ANC DATA VIEWER → F•1 ANC DUMP → F•2 HOLD TIME: HOLD / 1s / 3s

Settings

HOLD:	The screen is not updated.
1s:	The screen is updated once per second.
3s:	The screen is updated once every 3 seconds.

6.7.4 Selecting the Dump Mode

To select the dump mode, follow the procedure below.

Procedure

STATUS → F•4 ANC DATA VIEWER → F•1 ANC DUMP → F•3 DUMP MODE: HEX / BINARY

Settings

HEX:	Data is displayed in hexadecimal format.
BINARY:	Data is displayed in binary format.

DUMP MODE = HEX

```
ANC DUMP

  STANDARD              S299M ctrl G2
  TYPE                  1
  STREAM                Y

 LINE No.                571

         DID            2E2
         DBN            200
          DC            10B
       1                202
       2                200
       3                20F
       4                201
       5                200
       6                200
       7                201
       8                200
       9                200
      10                200
      11                200
    CHECKSUM            200
```

DUMP MODE = BINARY

```
ANC DUMP

  STANDARD              S299M ctrl G2
  TYPE                  1
  STREAM                Y

 LINE No.                571

         DID            1011100010
         DBN            1000000000
          DC            0100001011
       1                1000000001
       2                1000000000
       3                1000001111
       4                1000000001
       5                1000000000
       6                1000000000
       7                1000000001
       8                1000000000
       9                1000000000
      10                1000000000
      11                1000000000
    CHECKSUM            0111111111
```

Figure 6-21 Selecting the dump mode

6.8 Detecting Ancillary Packets

To display the ancillary packet display, follow the procedure below.
If an ancillary packet is detected, “DETECT” appears next to it. Otherwise, “MISSING” appears next to it.

Procedure

STATUS → F•5 ANC PACKET

```
ANC PACKET SUMMARY
 AUDIO CONTROL PACKET        DETECT
 EDH                         MISSING
 LTC                         MISSING
 VITC                        MISSING
 PAYLOAD ID                  MISSING
 V-ANC SMPTE   EIA-708
                   708CC             MISSING
                   608CC             MISSING
               EIA-608               MISSING
               PROGRAM               MISSING
               DATA BROADCAST        MISSING
               VBI                   MISSING
               AFD                   MISSING
 V-ANC ARIB    CLOSED CAPTION 1      MISSING
               CLOSED CAPTION 2      MISSING
               CLOSED CAPTION 3      MISSING
               NET-Q                 MISSING
               TRIGGER PACKET        MISSING
               USER DATA 1           MISSING
               USER DATA 2           MISSING
```

Figure 6-22 Ancillary packet display

6.8.1 Ancillary Packet Display Explanation

- **AUDIO CONTROL PACKET**

  The embedded audio consists of 4 groups that each contain 4 channels. This makes for a total of 16 channels. A single audio control packet is embedded in each group.
  When the input signal is HD dual link, only the data of link A is detected. When the input signal is 3G-B, only the data of stream 1 is detected.
  See section 6.8.4, “Displaying Audio Control Packets.”

- **EDH (Error detection and handling; when the input signal is SD)**

  This packet is used for detecting transmission errors. When multiple devices are connected, this packet can be used to determine which device caused an error. Both full-field and active picture errors are detected.
  See section 6.8.2, “Displaying EDH Packets.”

- **LTC (Linear/longitudinal timecode)**

  This is a type of timecode. One is embedded per frame.
  When the input signal is HD dual link, only the data of link A is detected. When the input signal is 3G-B or 3G-B (2map), only the data of stream 1 is detected.

- **VITC (Vertical interval timecode)**

  This is a type of timecode. One is embedded per field.
  When the input signal is HD dual link, only the data of link A is detected. When the input signal is 3G-B or 3G-B (2map), only the data of stream 1 is detected.

- **PAYLOAD ID**

  This is a packet that is used to identify the video format. It conforms to SMPTE ST 352.
  When the input signal is HD dual link, the data of links A and B is detected. When the input signal is 3G, the data of streams 1 and 2 is detected.
  See section 6.8.3, “Displaying Payload IDs.”

- **EIA-708 (When the input signal is HD or SD)**

  This is one of the closed caption specifications. This packet is embedded in the V-ANC area.
  This is used for digital video closed caption data. It only supports alphanumeric characters.
  See section 6.8.11, “Displaying EIA-708 Data.”

- **EIA-608 (When the input signal is HD or SD)**

  This is one of the closed caption specifications. This packet is embedded in the V-ANC area.
  This was previously used for analog composite (embedded in line number 21) closed caption data. It only supports alphanumeric characters.
  See section 6.8.12, “Displaying EIA-608 Data.”

- **PROGRAM (Program description; when the input signal is HD or SD)**

  A packet embedded in the V-ANC area.
  See section 6.8.13, “Displaying Program Data.”

- **DATA BROADCAST (When the input signal is HD or SD)**

  A packet embedded in the V-ANC area.

- **VBI (When the input signal is HD or SD)**

  A packet embedded in the V-ANC area.
  See section 6.8.14, “Displaying VBI Data.”

- **AFD (When the input signal is HD or SD)**

  A packet embedded in the V-ANC area.
  See section 6.8.15, “Displaying AFD Packets.”

- **CLOSED CAPTION 1 to 3 (When the input signal is HD or SD)**

  This is a closed caption information packet that is embedded in the V-ANC area. Up to three closed caption data entries can be embedded.
  See section 6.8.6, “Displaying Closed Caption Packets.”

- **NET-Q (When the input signal is HD or SD)**

  This is the inter-stationary control signal.
  See section 6.8.7, “Displaying the Inter-Stationary Control Signal.”

- **TRIGGER PACKET (When the input signal is HD or SD)**

  This is the data broadcast trigger signal.
  See section 6.8.8, “Displaying the Data Broadcast Trigger Signal.”

- **USER DATA 1 and 2 (When the input signal is HD or SD)**

  Up to two packets of user data.
  See section 6.8.9, “Displaying User Data.”

6.8.2 Displaying EDH Packets

When the input signal is SD, to display EDH packets, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•1 EDH

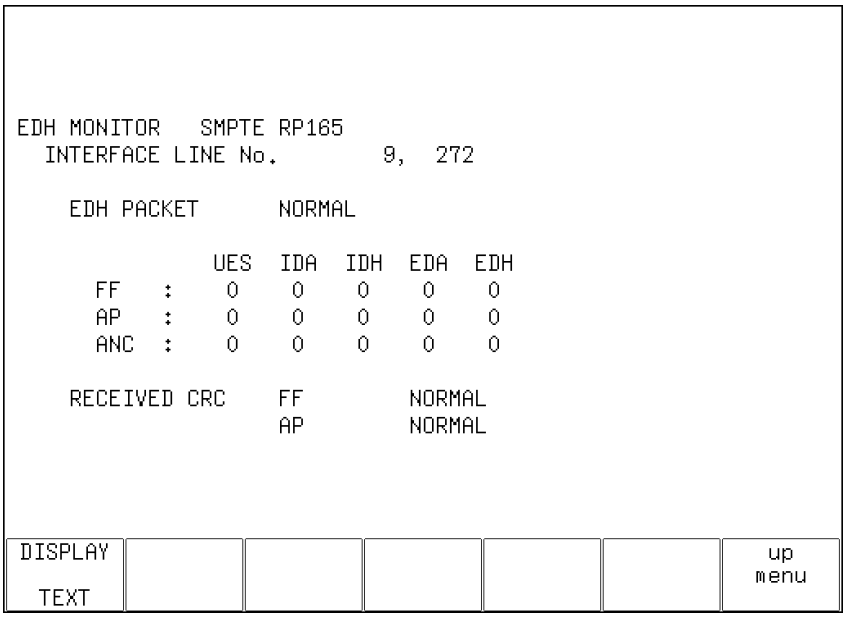


Figure 6-23 EDH packet display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.3 Displaying Payload IDs

To show the payload ID display, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•2 PAYLOAD ID

```
PAYLOAD ID DISPLAY          SMPTE 352M
   INTERFACE LINE No.         10,  572
BYTE1          10001010
   VERSION ID               SMPTE 352M-2002
   PAYLOAD ID               1125(1080) LINE
   DIGITAL INTERFACE        3Gb/s LEVEL-B
BYTE2          01001010
   TRANSPORT STRUCTURE      INTERLACED
   PICTURE STRUCTURE        PROGRESSIVE
   PICTURE RATE             60/1.001
BYTE3          00000000
   ASPECT RATIO             RESERVED
   H SAMPLING               1920

   SAMPLING STRUCTURE       4:2:2 YCbCr
BYTE4          00000001
   CHANNEL ASSIGNMENT       DUAL LINK A
   DYNAMIC RANGE            100%
   ASPECT RATIO             NOT USED
   MAPPING MODE             NOT USED
   BIT DEPTH                10BIT
```

Figure 6-24 Payload ID display

- **Selecting Which Link to Display**

  When the input signal is HD dual link, you can use F•1 LINK SELECT to set the data to display to LINK A or LINK B.

- **Selecting Which Stream to Display**

  When the input signal is 3G, you can use F•1 STREAM SELECT to set the data to display to STREAM1 or STREAM2.

6.8.4 Displaying Audio Control Packets

To display audio control packets, follow the procedure below.
When the input signal is HD dual link, only the data of link A is displayed. When the input signal is 3G-B, only the data of stream 1 is displayed.

Procedure

STATUS → F•5 ANC PACKET → F•3 CONTROL PACKET

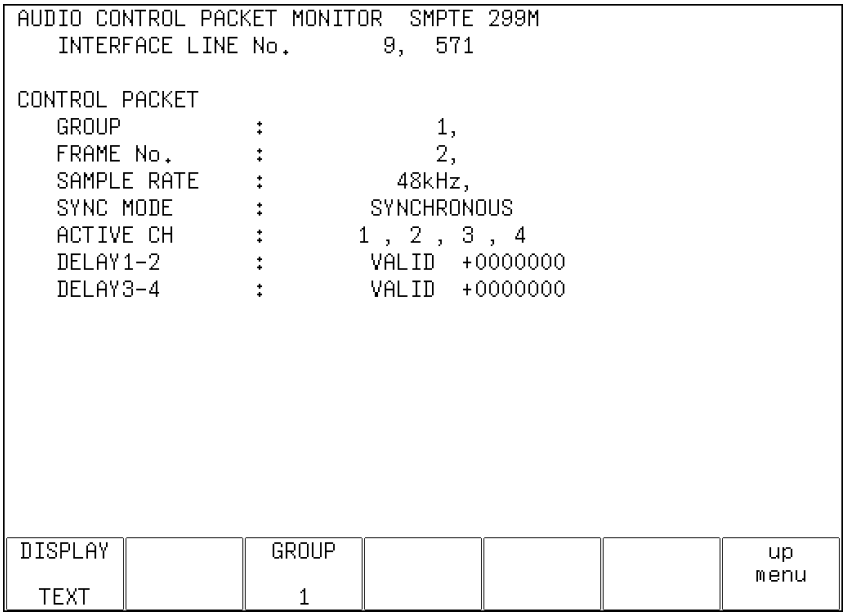


Figure 6-25 Audio control packet display

- **Selecting the Group to Display**

  You can use F•3 GROUP to set the group to display to a group from groups 1 to 4. A single group in the audio signal consists of four channels.

- **Selecting Which Stream to Display**

  When the input signal is 3G-B (2map), you can use F•6 STREAM SELECT to set the data to display to STREAM 1 or STREAM 2.

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.5 V-ANC ARIB Display

To display the V blanking ancillary packets specified by the ARIB standard, press F•4 V-ANC ARIB on the ANC PACKET menu.
This is not supported when the input signal is HD dual link or 3G. This setting does not appear.

STATUS → F•5 ANC PACKET → F•4 V-ANC ARIB →

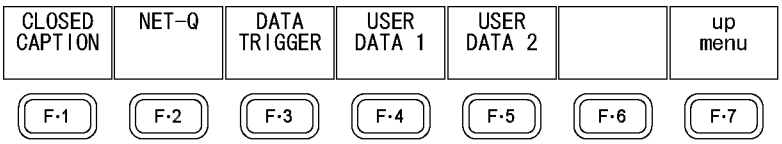


Figure 6-26 V-ANC ARIB menu

6.8.6 Displaying Closed Caption Packets

To display closed caption packets, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•4 V-ANC ARIB → F•1 CLOSED CAPTION

```
CLOSED CAPTION DISPLAY  ARIB STD B-37
  INTERFACE LINE No.       19,  582
 CLOSED CAPTION TYPE          HD

 HEADER WORD1:  10001110
  ERROR CORRECTION            YES
  CONTINUITY INDEX            14

 HEADER WORD2:  00000000

 HEADER WORD3:  00000001
  START PACKET FLAG           0
  END   PACKET FLAG           0
  TRANSMISSION MODE           SEQUENTIAL
  FORMAT ID                   HD

 HEADER WORD4:  00111111
  C.C. DATA ID                DUMMY DATA
  LANGUAGE ID                 LANGUAGE 8
```

Figure 6-27 Closed caption packet display

- **Selecting the Closed Caption Type**

  You can use F•2 TYPE to set the closed caption type to HD, SD, ANALOG, or CELLULAR.

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•3 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.7 Displaying the Inter-Stationary Control Signal

To display the inter-stationary control signal specified by the ARIB standard, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•4 V-ANC ARIB → F•2 NET-Q

```
INTER-STATIONARY CONTROL DATA  ARIB STD-B39
  INTERFACE LINE No.       20,  583
ERROR CORRECTION              YES
CONTINUITY INDEX              5
STATION CODE                  TX
DATE & TIME          2007/01/31  20:02:36
VIDEO CURRENT:1125i   /29.97 NEXT:RESERVED/      COUNTDOWN:255
AUDIO CURRENT:S               NEXT:NOT USED       COUNTDOWN:255
DOWN MIX CURRENT:NOT USED           NEXT:NOT USED

TRIGGER SIGNAL
  Q 1:0  Q 2:0  Q 3:0  Q 4:0  Q 5:0  Q 6:0  Q 7:0  Q 8:0
  Q 9:0  Q10:0  Q11:0  Q12:0  Q13:0  Q14:0  Q15:0  Q16:0
  Q17:0  Q18:0  Q19:0  Q20:0  Q21:0  Q22:0  Q23:0  Q24:0
  Q25:0  Q26:0  Q27:0  Q28:0  Q29:0  Q30:0  Q31:0  Q32:0
COUNTER          Q 1:1  Q 2:255Q 3:255Q 4:255
COUNTDOWN        Q 1:25 Q 2:25 Q 3:25 Q 4:25
STATUS SIGNAL
  S 1:0  S 2:0  S 3:0  S 4:0  S 5:0  S 6:0  S 7:0  S 8:0
  S 9:0  S10:0  S11:0  S12:0  S13:0  S14:0  S15:0  S16:0
```

Figure 6-28 Inter-stationary control signal display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display), DUMP (dump display), Q LOG (Q-signal log display), or FORMAT (format ID display).
  If you select DUMP, the dump display appears. If you select Q LOG, the log display appears. In either case, you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

DISPLAY = Q LOG

```
INTER-STATIONARY CONTROL DATA  ARIB STD-B39
 NETQ LOG LIST   SAMPLE No.=    1   << NOW LOGGING >>
                          Q32-------------------------------Q1

   1:     11:26:52       A -------- -------- -------- --------
```

DISPLAY = FORMAT

```
FORMAT ID DISPLAY           ARIB STD-B39
   INTERFACE LINE No.         20,  583
BYTE1          10000101
   VERSION ID               1
   FORMAT  ID               1125(1080) LINE
   DIGITAL INTERFACE        1.485Gb/s
BYTE2          00000110
   TRANSPORT STRUCTURE      INTERLACED
   PICTURE STRUCTURE        INTERLACED
   PICTURE RATE             30/1.001
BYTE3          10100000
   ASPECT RATIO             16:9
   H SAMPLING               RESERVED
   DISP ASPECT RATIO        16:9
   SAMPLING STRUCTURE       4:2:2 YCbCr
BYTE4          00000001
   CHANNEL ASSIGNMENT       RESERVED
   BIT DEPTH                10BIT
```

Figure 6-29 Selecting the display format

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- **Clearing the Q-Signal Log**

  When F•1 DISPLAY is set to Q LOG, press F•3 Q LOG CLEAR to clear the Q-signal log.

- **Setting the Bit Mask**

  When F•1 DISPLAY is set to TEXT or Q LOG, you can use F•4 BIT MASK to mask the Q and status signals independently.
  Press F•4 ALL ON to set all the bit mask entries to ON. Press F•5 ALL OFF to set all the bit mask entries to OFF.

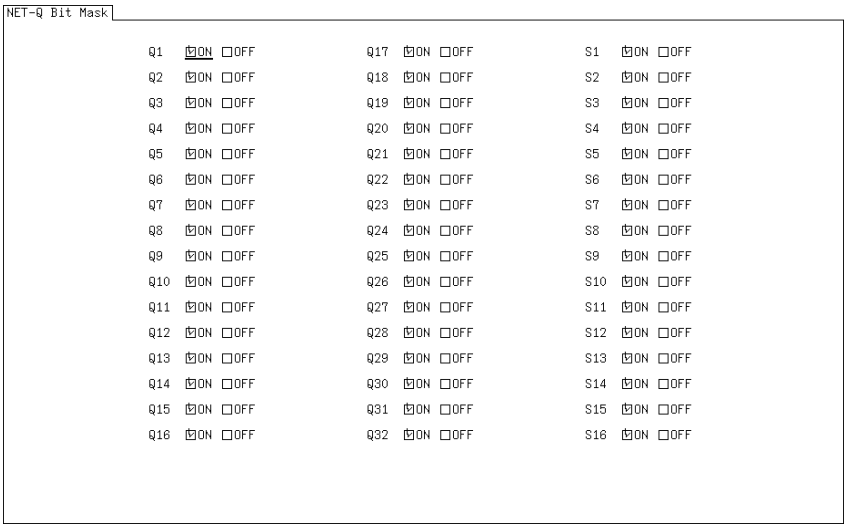


Figure 6-30 Setting the bit mask

6.8.8 Displaying the Data Broadcast Trigger Signal

To display the data broadcast trigger signal specified by the ARIB standard, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•4 V-ANC ARIB → F•3 DATA TRIGGER

```
DATA BROADCAST TRIGGER  ARIB STD-B35
  INTERFACE LINE No.

HEADER WORD1:
  ERROR CORRECTION
  CONTINUITY INDEX

HEADER WORD2:
  PACKET NUMBER

HEADER WORD3:
  LAST PACKET NUMBER

HEADER WORD4:
  TRIGGER ID
```

Figure 6-31 Data broadcast trigger signal display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.9 Displaying User Data

To display user data entries 1 and 2 that are specified by the ARIB standard, follow the procedure below.
You can use the function dial (F•D) to view all the data. If you press the function dial (F•D), the first data entry is displayed.

Procedure

STATUS → F•5 ANC PACKET → F•4 V-ANC ARIB → F•4 USER DATA1
→ F•5 USER DATA2

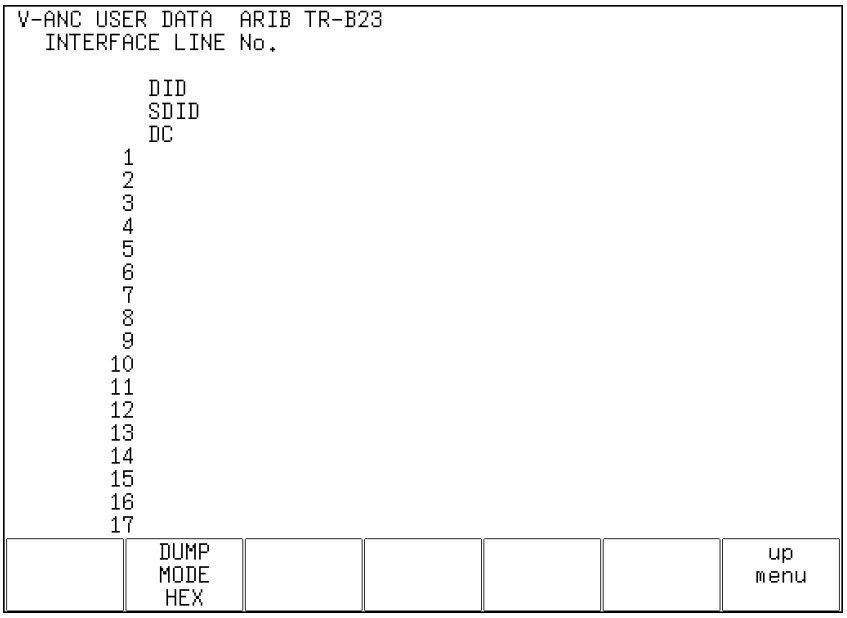


Figure 6-32 User data display

- **Selecting the Dump Mode**

  You can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.10 V-ANC SMPTE Display

To display the V blanking ancillary packets specified by the SMPTE standard, press F•5 V-ANC SMPTE on the ANC PACKET menu.
This is not supported when the input signal is HD dual link or 3G. This setting does not appear.

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE →

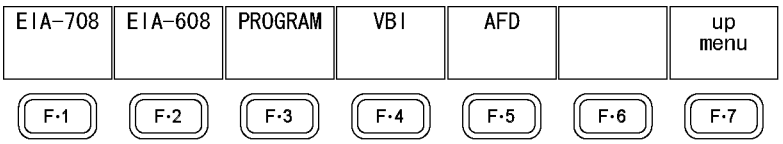


Figure 6-33 V-ANC SMPTE menu

6.8.11 Displaying EIA-708 Data

To display data that is specified by the EIA-708 standard, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE → F•1 EIA-708

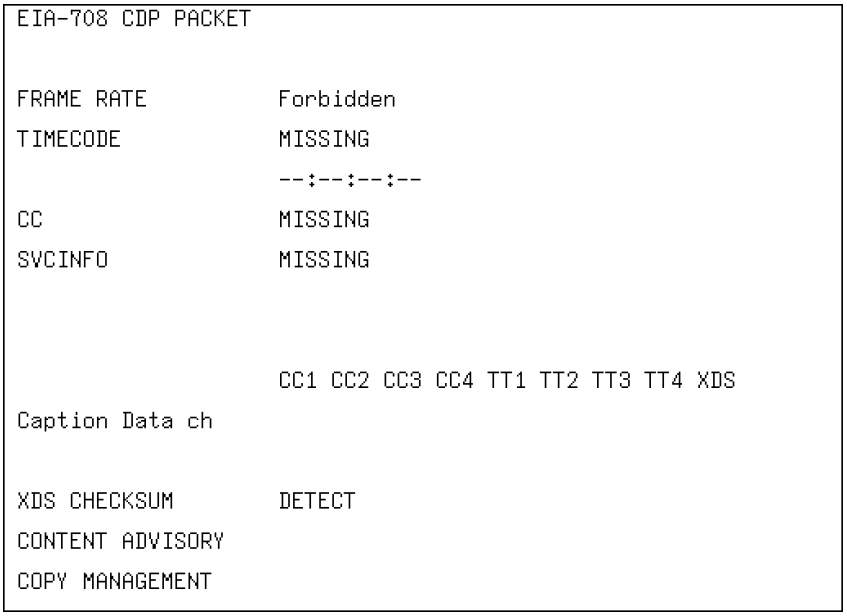


Figure 6-34 EIA-708 display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.12 Displaying EIA-608 Data

To display data that is specified by the EIA-608 standard, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE → F•2 EIA-608

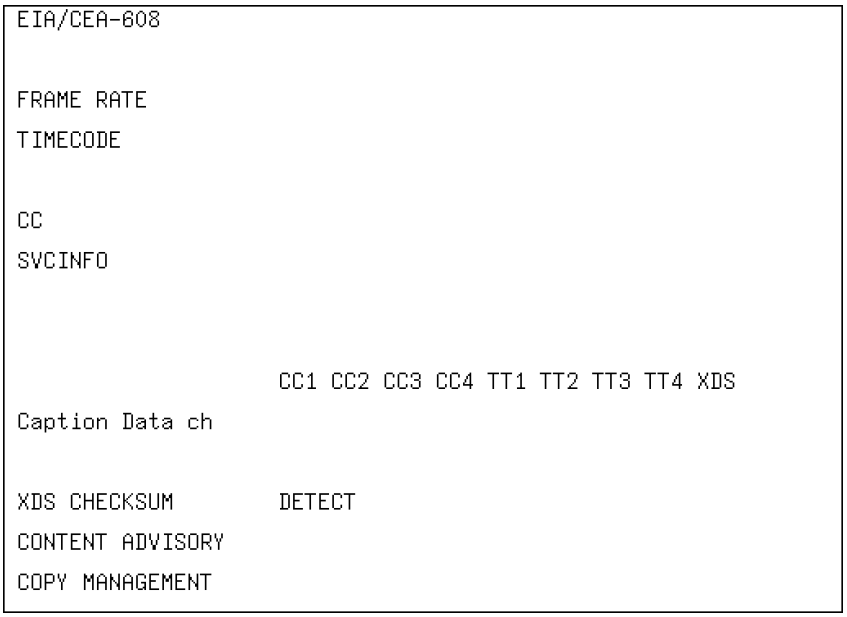


Figure 6-35 EIA-608 display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.13 Displaying Program Data

To display whether program description packets that are specified by the ATSC A/65 standard are present, follow the procedure below. For each descriptor, if its ID is present, “DETECT” is displayed; if its ID is not present, “MISSING” is displayed.

Procedure

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE → F•3 PROGRAM

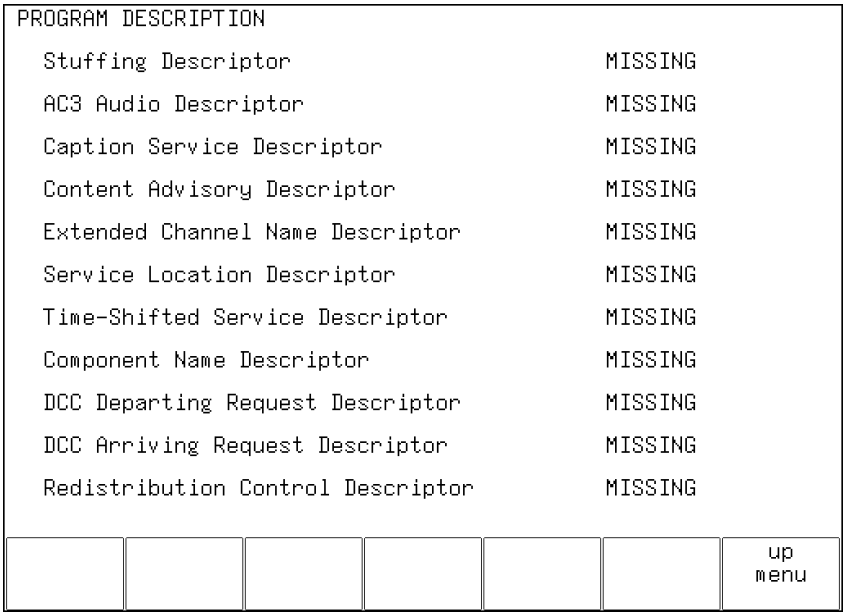


Figure 6-36 Program data display

6.8.14 Displaying VBI Data

To display VBI data, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE → F•4 VBI

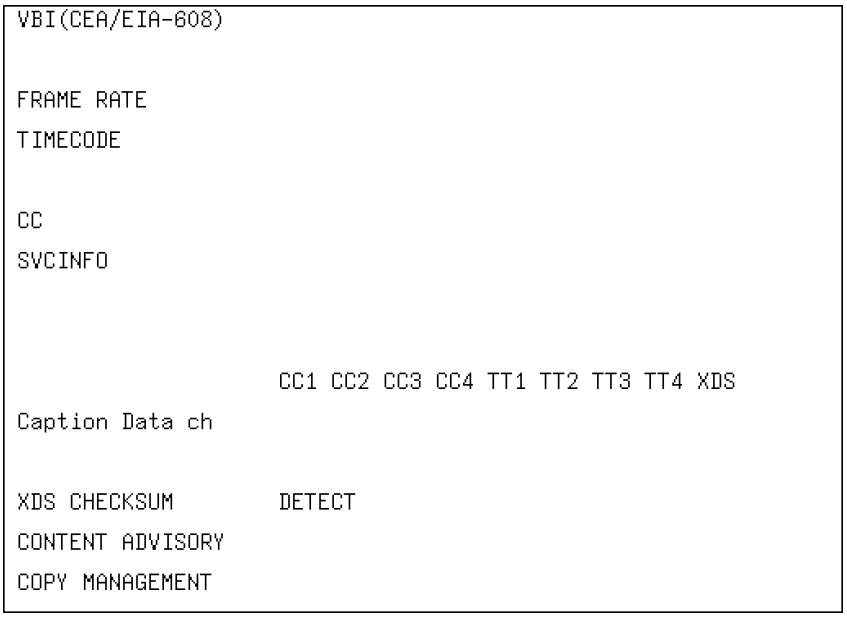


Figure 6-37 VBI data display

6.8.15 Displaying AFD Packets

To display AFD packets, follow the procedure below.

Procedure

STATUS → F•5 ANC PACKET → F•5 V-ANC SMPTE → F•5 AFD

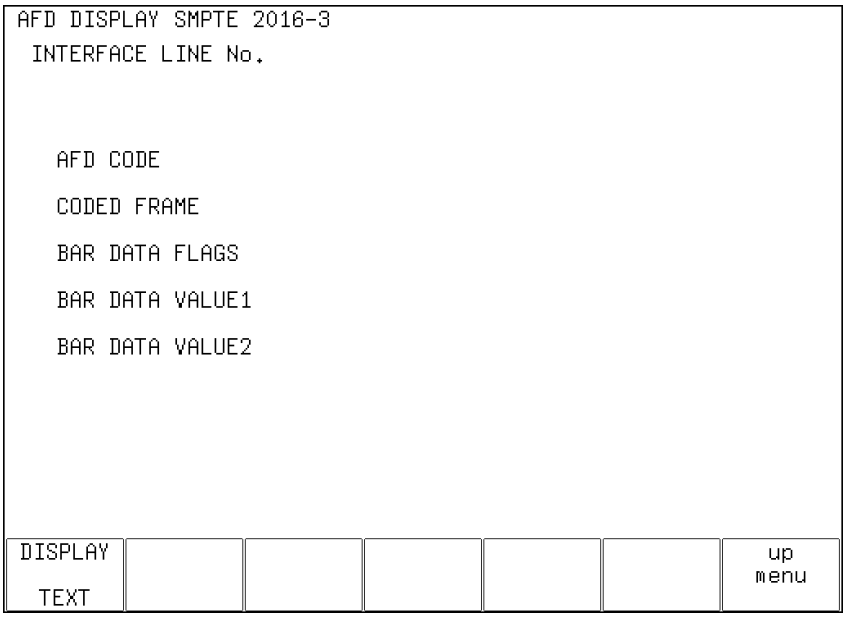


Figure 6-38 AFD packet display

- **Selecting the Display Format**

  You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).
  If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- **Selecting the Dump Mode**

  When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

6.8.16 Performing Custom Searches

To show the custom search screen, follow the procedure below.
You can use the function dial (F•D) to view all the data. If you press the function dial (F•D), the first data entry is displayed. If you press F•1 DID or F•2 SDID, you will no longer be able to scroll the screen. To enable the scroll feature, press F•3 SET.

Procedure

STATUS → F•5 ANC PACKET → F•6 CUSTOM SEARCH

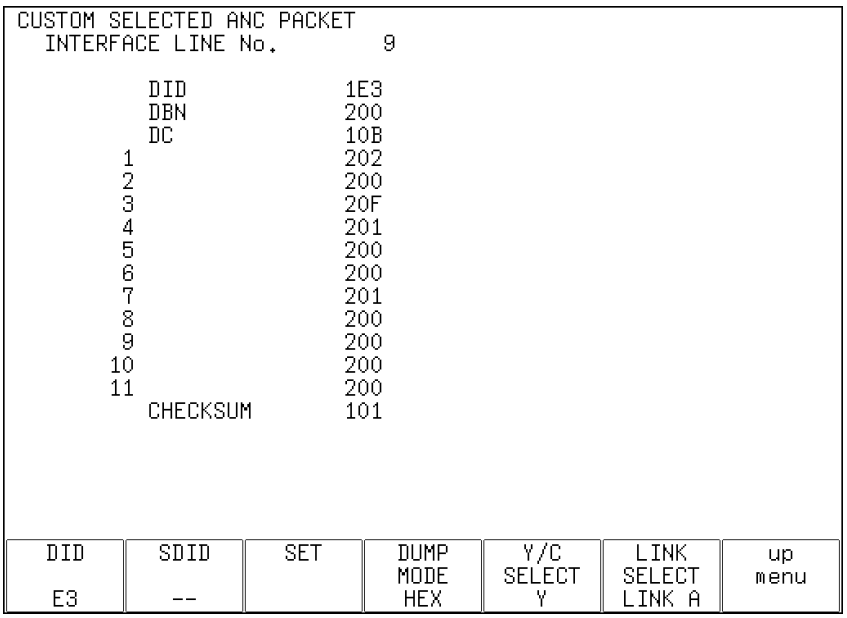


Figure 6-39 Custom search display

- **Selecting the Dump Mode**

  You can use F•4 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- **Selecting Which Signal to Display**

  When the input signal is not SD, you can use F•5 Y/C SELECT to set the data to display to that of the Y signal or the C signal.

- **Selecting Which Link to Display**

  When the input signal is HD dual link, you can use F•6 LINK SELECT to set the data to display to LINK A or LINK B.

- **Selecting Which Stream to Display**

  When the input signal is 3G-B or 3G-B (2map), you can use F•6 STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- **Detecting Ancillary Packets**

  To search for ancillary packets, follow the procedure below.

  1. **Set F•1 DID.**

     If ancillary packets with the specified DID are embedded in the video data, they will appear. If the SDID is also set, packets will appear if they have the specified DID and SDID.
     You can specify a value in the range of 00 to FF. Press the function dial (F•D) to return the setting to its default value (00).

  2. **If you also want to specify the SDID, set F•2 SDID.**

     If ancillary packets with the specified DID and SDID are embedded in the video data, they will appear.
     You can specify a value in the range of 00 to FF or select “--” to not specify a value. Press the function dial (F•D) to return the setting to its default value (--).

7. EYE PATTERN DISPLAY (LV 5770SER09A)

To display the eye pattern, press EYE.
The eye pattern of the selected channel, A or B, is displayed.
This is not supported in simul mode or on the multi-screen display of 3G-B(2map) signals.

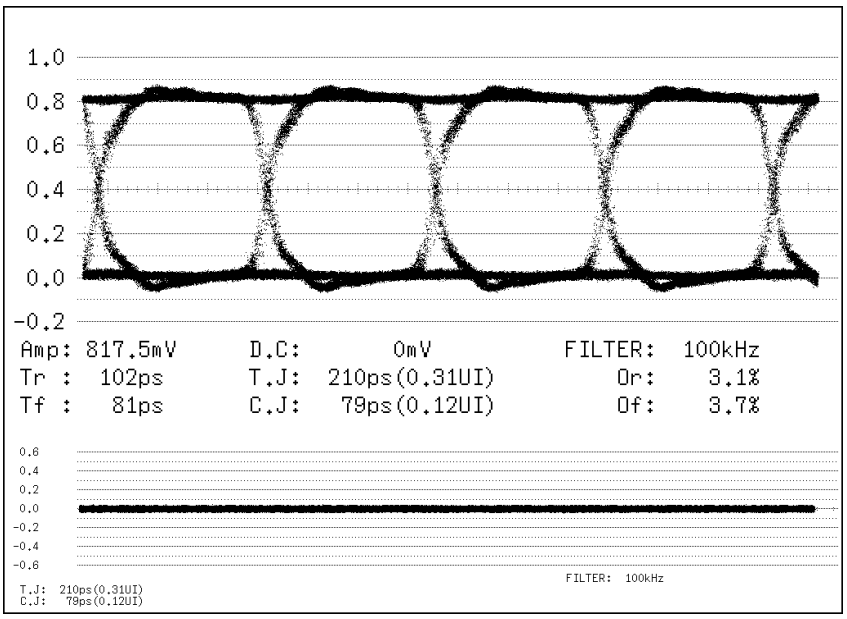


Figure 7-1 Eye pattern display

- **Menu**

  Use the eye pattern menu—which is displayed when you press the EYE key—to configure the eye pattern display settings.

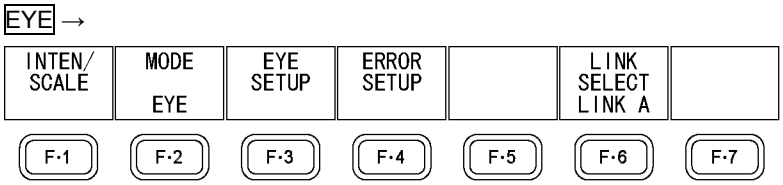


Figure 7-2 Eye pattern menu

7.1 Setting the Waveform Display Position

Use the V POS and H POS knobs to adjust the display position of the waveform.
Sub items, which are displayed at the bottom of the screen, are not affected.

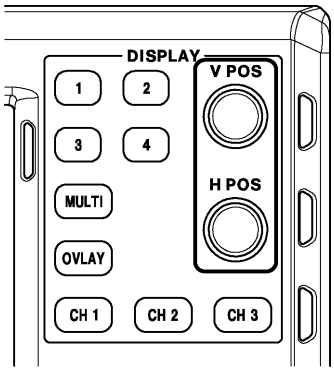


Figure 7-3 Setting the waveform display position

- **V POS Knob**

  This knob adjusts the vertical position of the waveform.
  Pressing the knob returns the waveform to its default vertical position.

- **H POS Knob**

  This knob adjusts the horizontal position of the video signal waveform.
  Pressing the knob returns the waveform to its default horizontal position.

7.2 Configuring the Intensity and Scale Settings

To configure the intensity and scale settings, press F•1 INTEN / SCALE on the eye pattern menu.
You can configure these settings separately for the eye pattern and jitter waveforms.

EYE → F•1 INTEN/SCALE →

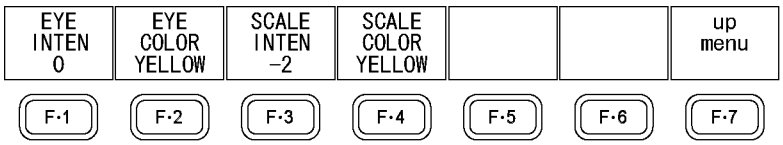


Figure 7-4 INTEN/SCALE menu

7.2.1 Adjusting the Waveform Intensity

To adjust the intensity of the eye-pattern waveform and jitter waveform, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (0).

Procedure

EYE → F•1 INTEN/SCALE → F•1 EYE INTEN: -128 to 0 to 127

7.2.2 Selecting the Waveform Color

To select the color of the eye-pattern waveform and jitter waveform, follow the procedure below.

Procedure

EYE → F•1 INTEN/SCALE → F•2 EYE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

7.2.3 Adjusting the Scale Intensity

To adjust the scale intensity, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (4).

Procedure

EYE → F•1 INTEN/SCALE → F•3 SCALE INTEN: -8 to 4 to 7

7.2.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

EYE → F•1 INTEN/SCALE → F•4 SCALE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

7.3 Selecting the Display Mode

To select the display mode, follow the procedure below.

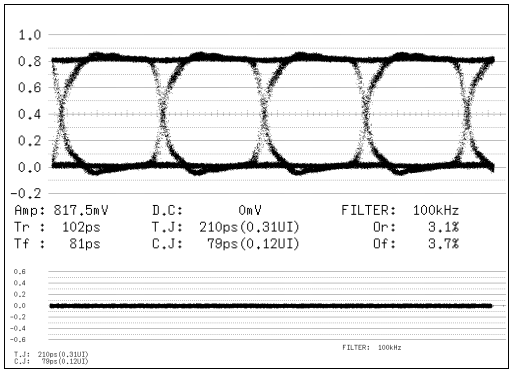
Procedure

EYE → F•2 MODE: EYE / JITTER

Settings

EYE:	The main display shows the eye pattern. The jitter waveform can be displayed as a sub item.
JITTER:	The main display shows the jitter waveform. The eye pattern can be displayed as a sub item.

MODE = EYE



MODE = JITTER

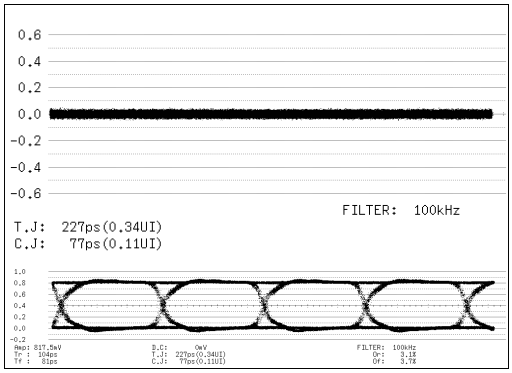


Figure 7-5 Selecting the display mode

7.3.1 Eye Pattern Display Explanation

- **Automatic Measurement**

  On the eye pattern display, values such as the amplitude of the eye pattern and the jitter are measured automatically and displayed. Measured values are normally displayed in white, but they are displayed in yellow until they stabilize and in red if they exceed the values that you have specified in the error setup. If automatic measurements cannot be performed, measured values are displayed as "----."

  See section 7.6, "Configuring Error Detection Settings."

  The timing jitter and current jitter measurement items show the values that were measured in jitter display mode. The instrument uses a phase demodulator to perform these measurements.
  Other measurement items show the measured values calculated from the eye pattern waveform. Therefore, if the waveform degrades significantly, the difference between the automatically measured values and the cursor-measured values may become large.

  To use automatic measurements, set FILTER to ALIGNMENT.

  For information on the FILTER setting, see section 7.4.3, "Selecting the Filter."

- **Measurement Items**

  The items that can be automatically measured are shown below.

Table 7-1 Measurement items

Symbol	Display Indication	Description
a	Amp	Eye-pattern amplitude
b	Tr	Rise time
c	Tf	Fall time (not shown in the following figure)
-	D.C	DC offset (*1)
d	T.J	Timing jitter
e	C.J	Current jitter (jitter value when the currently selected filter is applied)
f	Or	Overshoot of the rising edge
g	Of	Overshoot of the falling edge

*1 The average value of the waveform is displayed in the center even for signals with a DC offset.

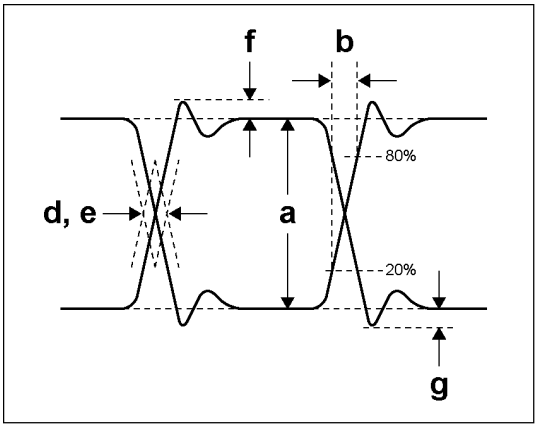


Figure 7-6 Explanation of measurement items

- **Unit Interval**

  This unit uses unit intervals (UI) as jitter measurement units.
  One cycle of the eye pattern is 1 UI. The time that corresponds to 1 UI varies depending on the input signal, as shown below.

Table 7-2 Time that corresponds to 1 UI

Input Signal	Bit Rate	Time That Corresponds to 1 UI
3G	2.970/1.001 Gbps	337.0 ps
	2.970 Gbps	336.7 ps
HD	1.485/1.001 Gbps	674.1 ps
	1.485 Gbps	673.4 ps
SD	270 Mbps	3.7 ns

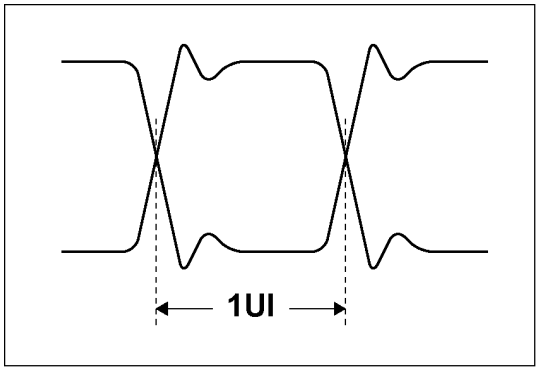


Figure 7-7 Unit interval

7.3.2 Jitter Display Explanation

- **Measurement**

  In the jitter display mode, the jitter component is extracted from the input signal and plotted on a graph in which time is assigned to the Y axis.

  The time (horizontal) axis can be displayed in different ways depending on the data interval of the lines, fields, or frames, which are being transmitted in the SDI signal.

- **Automatic Measurement**

  Timing jitter (T.J) and current jitter (C.J) are automatically measured and displayed on the jitter display screen.

  SMPTE defines two methods of measuring jitter. One method uses an eye pattern, and the other method uses a phase demodulator.
  The eye pattern method has disadvantages not only that measurements are difficult when the eye is not open but that measurements are prone to errors because the distinction between waveform distortion (such as noise and sags) and jitter is difficult.
  In contrast, the phase demodulator method makes jitter measurements with small errors possible even when the eye pattern is closed and even when the amount of jitter is 1 UI or more.
  The LV 5770SER09A uses the phase demodulator method.

Measured values are normally displayed in white, but they are displayed in red if they exceed the values that you have specified in the error setup.

See section 7.6, “Configuring Error Detection Settings.”

7.4 Configuring Eye Pattern Display Settings

To configure eye pattern display settings, press F•3 EYE SETUP on the eye pattern menu. F•4 EYE SETUP appears when F•2 MODE is set to EYE.

EYE → F•3 EYE SETUP →

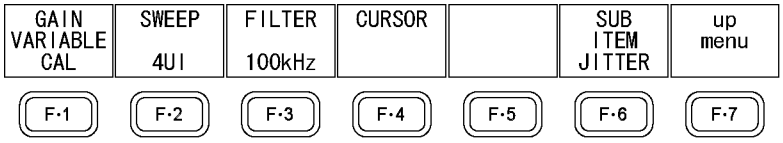


Figure 7-8 EYE SETUP menu

7.4.1 Adjusting the Gain

To adjust the eye pattern gain, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•1 GAIN VARIABLE: CAL / VARIABLE

Settings

CAL:	The eye pattern is shown without gain.
VARIABLE:	The eye pattern is shown with the specified gain (×0.50 to ×2.00). The gain value appears in the upper right of the screen. Turn the function dial (F•D) to adjust the gain. Press the function dial (F•D) to return the setting to its default value (×1.00).

7.4.2 Selecting the Sweep Time

To select the eye pattern sweep time, follow the procedure below.

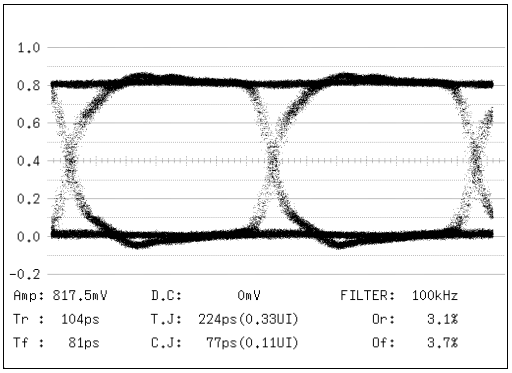
Procedure

EYE → F•3 EYE SETUP → F•2 SWEEP: 2UI / 4UI / 16UI

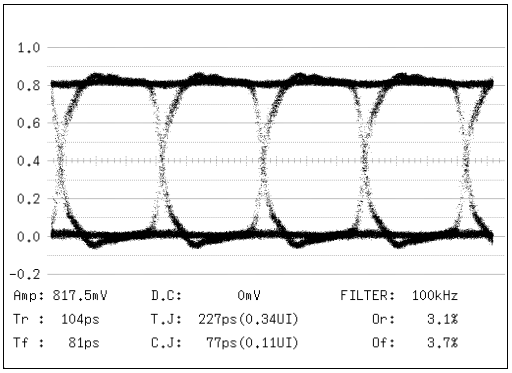
Settings

2UI:	Two cycles of the eye pattern are shown.
4UI:	Four cycles of the eye pattern are shown.
16UI:	Sixteen cycles of the eye pattern are shown.

SWEEP = 2UI



SWEEP = 4UI



SWEEP = 16UI

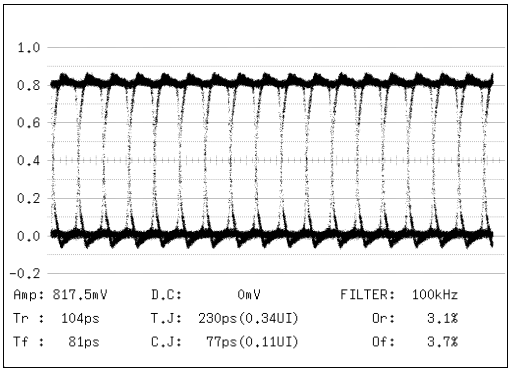


Figure 7-9 Selecting the sweep time

7.4.3 Selecting the Filter

To select the filter that is used during jitter measurement, follow the procedure below. The selected filter is indicated in the lower right of the display.
If you change this setting, the filter that you selected for the jitter display mode also changes.

See section 7.5.3, “Selecting the Filter.”

Procedure

EYE → F•3 EYE SETUP → F•3 FILTER: 100kHz / 1kHz / 100Hz / 10Hz / TIMING / ALIGNMENT

Settings

100kHz:	Jitter at 100 kHz or higher is measured.
1kHz:	Jitter at 1 kHz or higher is measured.
100Hz:	Jitter at 100 Hz or higher is measured.
10Hz:	Jitter at 10 Hz or higher is measured.
TIMING:	Timing jitter is measured. Jitter at 10 Hz or higher is measured.
ALIGNMENT:	Alignment jitter is measured. When the input signal is not SD, jitter at 100 kHz and higher is measured. When the input signal is SD, jitter at 1 kHz and higher is measured.

7.4.4 Turning Cursors On and Off

To configure cursor settings, press F•4 CURSOR on the EYE SETUP menu.

EYE → F•3 EYE SETUP → F•4 CURSOR →

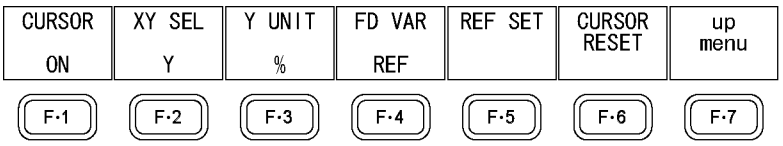


Figure 7-10 CURSOR menu

To turn cursors on and off, follow the procedure below.
When you set F•1 CURSOR to ON, the REF cursor is displayed in blue or yellow, and the DELTA cursor is displayed in green or purple. The value of DELTA-REF appears as a measured value in the upper part of the screen.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•1 CURSOR: ON / OFF

CURSOR = ON

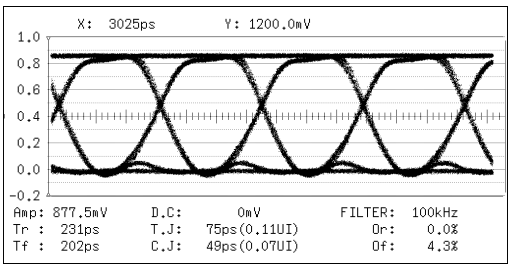


Figure 7-11 Cursor display

7.4.5 Selecting the Cursors

The X-axis and Y-axis cursors are displayed at the same time, but you can only use the function dial (F•D) to move one set of cursors at a time. To select which cursors are displayed, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•2 XY SEL: X / Y / Tr,Tf

If you select Tr,Tf, you can measure the rise time (Tr) and fall time (Tf). To select this value, follow the procedure below.

1. Set F•2 XY SEL to Tr,Tf.

This selects the Y-axis cursors.

2. Use the function dial (F•D) to align the cursors with the amplitude of the eye pattern.

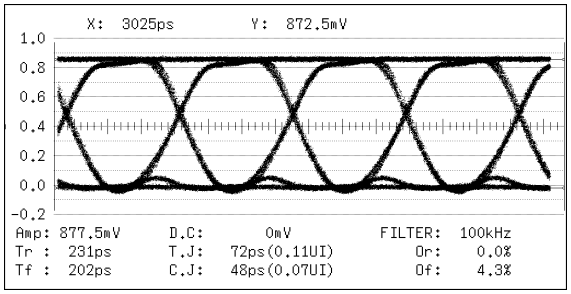


Figure 7-12 Tr,Tf measurement (1)

3. Press F•5 REF SET.

The Y-axis cursors move to the 20 % and 80 % positions of the amplitude, and then F•2 XY SEL is automatically set to X.

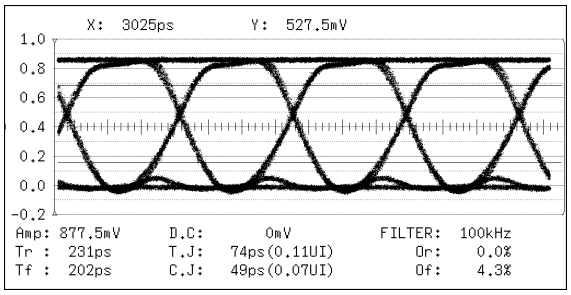


Figure 7-13 Tr,Tf measurement (2)

4. Align the X-axis cursors with the intersections of the Y-axis cursors and the eye pattern.

You can now measure the rise time and fall time. The measured value is displayed next to X in the upper part of the screen.

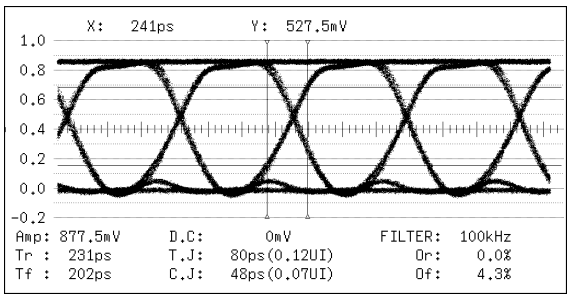


Figure 7-14 Tr,Tf measurement (3)

7.4.6 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•4 FD VAR: REF / DELTA / TRACK

Settings

REF:	The REF cursor (blue or yellow) is selected.
DELTA:	The DELTA cursor (green or purple) is selected.
TRACK:	The REF cursor and DELTA cursor are both selected.

7.4.7 Selecting the X-Axis Measurement Unit

When F•2 XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•3 X UNIT: sec / Hz / UIp-p

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.
UIp-p:	The measurement unit is UIp-p, with one UIp-p set to one cycle of the eye pattern.

7.4.8 Selecting the Y-Axis Measurement Unit

When F•2 XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•3 Y UNIT: V / %

Settings

V:	The measurement unit is volts.
%:	The amplitude will be measured as a percentage of the amplitude at the time when you pressed F•5 REF SET.

7.4.9 Resetting Cursors

When F•1 CURSOR is set to ON, to reset the cursor positions, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•4 CURSOR → F•6 CURSOR RESET

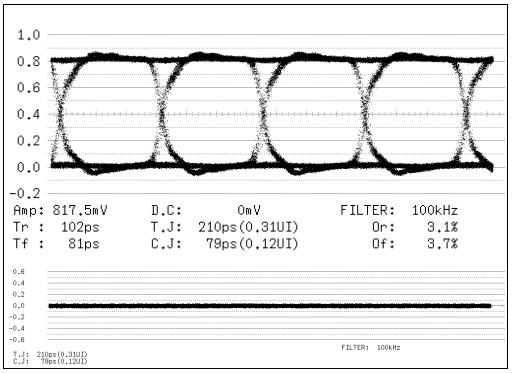
7.4.10 Setting the Sub Item

On the 1-screen display, to turn the jitter display at the bottom of the screen on and off, follow the procedure below.

Procedure

EYE → F•3 EYE SETUP → F•6 SUB ITEM: JITTER / OFF

SUB ITEM = JITTER



SUB ITEM = OFF

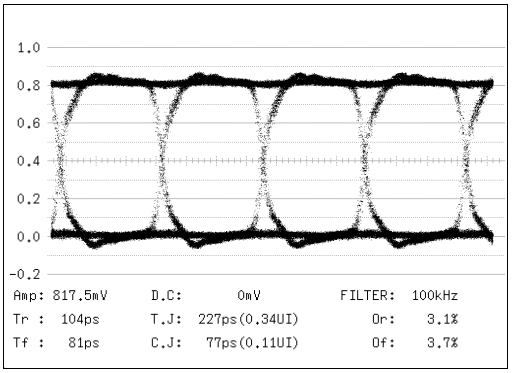


Figure 7-15 Setting the sub item

7.5 Configuring the Jitter Display Settings

To configure jitter display settings, press F•3 JITTER SETUP on the eye pattern menu. This setting appears when F•2 MODE is set to JITTER.

EYE → F•3 JITTER SETUP →

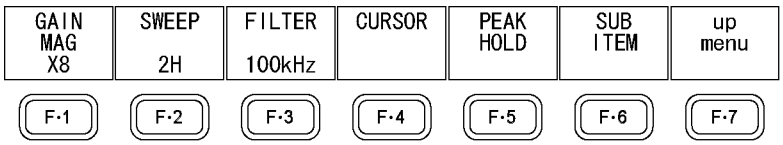


Figure 7-16 JITTER SETUP menu

7.5.1 Selecting the Gain

To select the jitter waveform gain, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•1 GAIN MAG: ×1 / ×2 / ×8

- **Measurement Range**

  The measurement range and the various display conditions for each gain setting are shown below. Select an appropriate gain that matches the measured value that you want to obtain.

  Table 7-3 Measurement range

F•1 GAIN MAG	Measurement Range	*UNDER RANGE* Appears	OVER Appears
×1	4.80 to 9.60 UI	0.60 UI or less	10.01 UI or more
×2	1.20 to 4.80 UI	0.60 UI or less	5.21 UI or more
×8	0.00 to 1.20 UI	Does not appear	1.31 UI or more

- **UNDER RANGE Indication**

  When F•1 GAIN MAG is set to ×1 or ×2 and the measured jitter value is 0.60 UI or less, the measured value becomes yellow, and "*UNDER RANGE*" appears in the lower left of the screen. If this happens, set F•1 GAIN MAG to ×8.

- **OVER Indication**

  If the measured jitter value exceeds its limit, "OVER" will appear in red as the measured value in the lower left of the screen. If this happens, set F•1 GAIN MAG to ×8, ×2, and then ×1, in that order.

7.5.2 Selecting the Sweep Time

To select the sweep time, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•2 SWEEP: 1H / 2H / 1V / 2V

Settings

1H:	The jitter from a period of one line is shown.
2H:	The jitter from a period of two lines is shown.
1V:	When the input signal is interlace or segmented frame, the jitter from a period of one field is shown. When the input signal is progressive, the jitter from a period of one frame is shown.
2V:	When the input signal is interlace or segmented frame, the jitter from a period of one frame is shown. When the input signal is progressive, the jitter from a period of two frames is shown.

7.5.3 Selecting the Filter

To select the filter that is used during jitter measurement, follow the procedure below. The selected filter is indicated in the lower right of the display.
If you change this setting, the filter that you selected for eye-pattern-display mode also changes.

See section 7.4.3, “Selecting the Filter.”

Procedure

EYE → F•3 JITTER SETUP → F•3 FILTER: 100kHz / 1kHz / 100Hz / 10Hz / TIMING / ALIGNMENT

Settings

100kHz:	Jitter at 100 kHz or higher is measured.
1kHz:	Jitter at 1 kHz or higher is measured.
100Hz:	Jitter at 100 Hz or higher is measured.
10Hz:	Jitter at 10 Hz or higher is measured.
TIMING:	Timing jitter is measured. Jitter at 10 Hz or higher is measured.
ALIGNMENT:	Alignment jitter is measured. When the input signal is not SD, jitter at 100 kHz and higher is measured. When the input signal is SD, jitter at 1 kHz and higher is measured.

7.5.4 Turning Cursors On and Off

To configure cursor settings, press F•4 CURSOR on the JITTER SETUP menu.

EYE → F•3 JITTER SETUP → F•4 CURSOR →

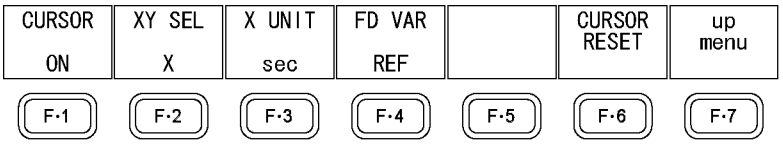


Figure 7-17 CURSOR menu

To turn cursors on and off, follow the procedure below.
When you set F•1 CURSOR to ON, the REF cursor is displayed in blue or yellow, and the DELTA cursor is displayed in green or purple. The value of DELTA-REF appears as a measured value in the lower right of the screen.

Procedure

EYE → F•3 JITTER SETUP → F•5 CURSOR → F•1 CURSOR: ON / OFF

CURSOR = ON

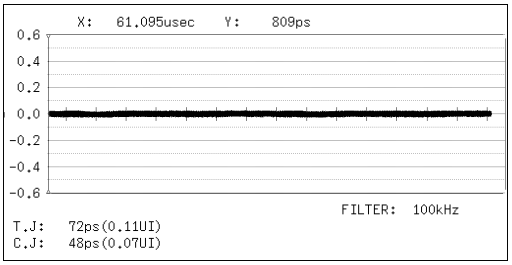


Figure 7-18 Cursor display

7.5.5 Selecting the Cursors

The X-axis and Y-axis cursors are displayed at the same time, but you can only use the function dial (F•D) to move one set of cursors at a time. To select which cursors you want to move, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•4 CURSOR → F•2 XY SEL: X / Y

7.5.6 Selecting the X-Axis Measurement Unit

When F•2 XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•4 CURSOR → F•3 X UNIT: sec / Hz

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.

7.5.7 Selecting the Y-Axis Measurement Unit

When F•2 XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•4 CURSOR → F•3 Y UNIT: sec / UIp-p

Settings

sec:	The measurement unit is seconds.
UIp-p:	The measurement unit is UIp-p, with one UIp-p set to one cycle of the eye pattern.

7.5.8 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

EYE → F•3 JITTER SETUP → F•4 CURSOR → F•4 FD VAR: REF / DELTA / TRACK

Settings

REF:	The REF cursor (blue or yellow) is selected.
DELTA:	The DELTA cursor (green or purple) is selected.
TRACK:	The REF cursor and DELTA cursor are both selected.

7.5.9 Resetting Cursors

When F•1 CURSOR is set to ON, to reset the cursor positions, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•4 CURSOR → F•6 CURSOR RESET

7.5.10 Turning the Peak Hold On and Off

To configure the peak hold settings, press F•5 PEAK HOLD on the JITTER SETUP menu.

EYE → F•3 JITTER SETUP → F•5 PEAK HOLD →

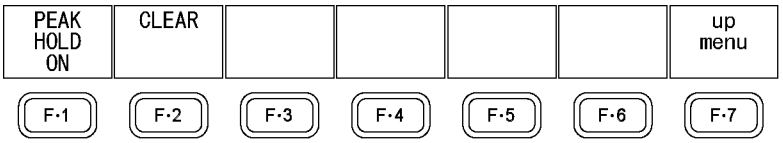


Figure 7-19 PEAK HOLD menu

To measure the peak values of the timing jitter (T.J) and the current jitter (C.J), follow the procedure below.
When you set F•1 PEAK HOLD to ON, the peak values are displayed in the lower part of the screen next to “PEAK.” The peak values are retained until you press F•2 CLEAR. If a peak value exceeds a limit, “OVER” is displayed.
For information on the “OVER” indication, see section 7.5.1, “Selecting the Gain.”

Procedure

EYE → F•3 JITTER SETUP → F•5 PEAK HOLD → F•1 PEAK HOLD: ON / OFF

PEAK HOLD = ON

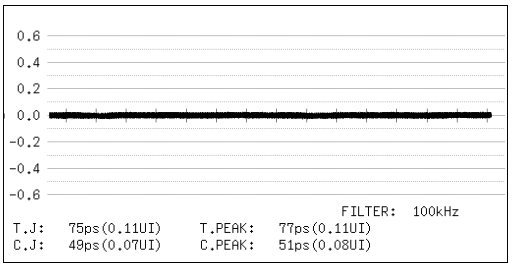


Figure 7-20 Peak hold display

7.5.11 Clearing the Peak Hold

When F•1 PEAK HOLD is set to ON, to clear the peak hold, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•5 PEAK HOLD → F•2 CLEAR

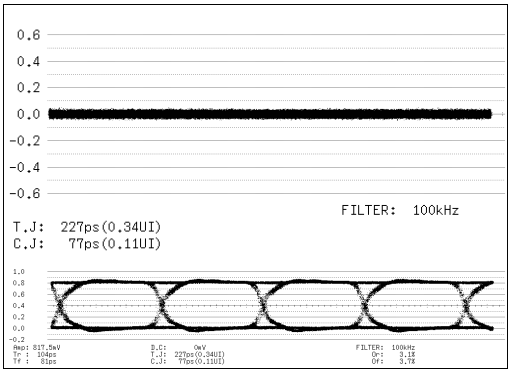
7.5.12 Setting the Sub Item

On the 1-screen display, to turn the eye pattern display at the bottom of the screen on and off, follow the procedure below.

Procedure

EYE → F•3 JITTER SETUP → F•6 SUB ITEM: EYE / OFF

SUB ITEM = EYE



SUB ITEM = OFF

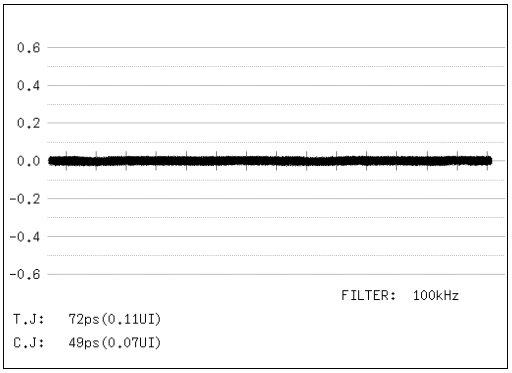


Figure 7-21 Setting the sub item

7.6 Configuring Error Detection Settings

To configure the error detection settings, follow the procedure below. The error detection settings are configured on a tabbed menu.
If one of the errors whose detection has been set to ON occurs, the corresponding measured value is displayed in red on the eye pattern and jitter displays. The error is also displayed on the status display's event log screen. The detection for all errors is initially set to OFF.
See section 6.3.1, “Event Log Explanation.”

Procedure

EYE → F•4 ERROR SETUP

7.6.1 Configuring 3G-SDI Error Settings

Use the 3G-SDI ERR SETUP tab to configure error detection settings for 3G signals.

You can set the threshold values when you set the error detection to ON. Measured values specified by the SMPTE ST 424 standard are used as 100 %.

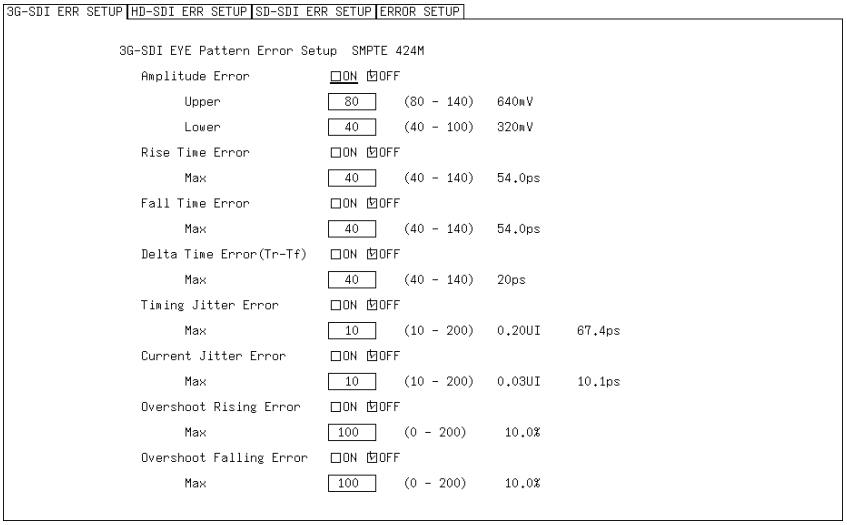


Figure 7-22 3D-SDI ERR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 424 is given below.

Table 7-4 3G-SDI ERR SETUP configuration example

Item		Value	Corresponding Value
Amplitude Error	Upper	110 %	880 mV
	Lower	90 %	720 mV
Rise Time Error	Max	100 %	135.0 ps
Fall Time Error	Max	100 %	135.0 ps
Delta Time Error(Tr-Tf)	Max	100 %	50 ps
Timing Jitter Error	Max	100 %	2.00 UI (674.0 ps)
Current Jitter Error	Max	100 %	0.30 UI (101.2 ps)
Overshoot Rising Error	Max	100 %	10.0 %
Overshoot Falling Error	Max	100 %	10.0 %

- **Amplitude Error**

  Turns the eye pattern's amplitude error detection on and off.
  You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	80 to 140 % (640 to 1120 mV)
Lower:	40 to 100 % (320 to 800 mV)

- **Rise Time Error**

  Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max:	40 to 140 % (54.0 to 189.0 ps)

- **Fall Time Error**

  Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max:	40 to 140 % (54.0 to 189.0 ps)

- **Delta Time Error**

  Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max:	40 to 140 % (20 to 70 ps)

- **Timing Jitter Error**

  Turns the eye pattern and jitter waveform's timing jitter error detection on and off.

Max:	10 to 200 % (0.20 to 4.00 UI, 67.4 to 1348.0 ps)

- **Current Jitter Error**

  Turns the eye pattern and jitter waveform's current jitter error detection on and off.

Max:	10 to 200 % (0.03 to 0.60 UI, 10.1 to 202.5 ps)

- **Overshoot Rising Error**

  Turns the overshoot of the rising edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

- **Overshoot Falling Error**

  Turns the overshoot of the falling edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

7.6.2 Configuring HD-SDI Error Settings

Use the HD-SDI ERR SETUP tab to configure error detection settings for HD signals.

You can set the threshold values when you set the error detection to ON. Measured values specified by the SMPTE ST 292 standard are used as 100 %.

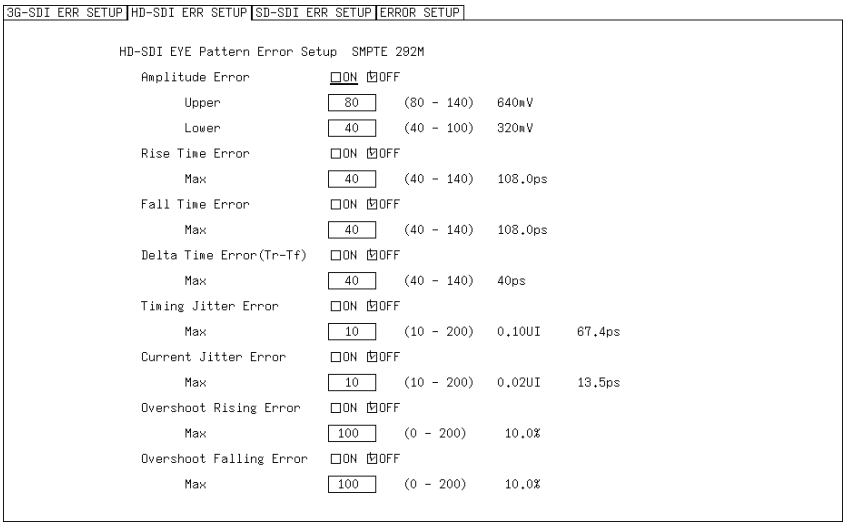


Figure 7-23 HD-SDI ERR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 292 is given below.

Table 7-5 HD-SDI ERR SETUP configuration example

Item		Value	Corresponding Value
Amplitude Error	Upper	110 %	880 mV
	Lower	90 %	720 mV
Rise Time Error	Max	100 %	270.0 ps
Fall Time Error	Max	100 %	270.0 ps
Delta Time Error(Tr-Tf)	Max	100 %	100 ps
Timing Jitter Error	Max	100 %	1.00 UI (674.0 ps)
Current Jitter Error	Max	100 %	0.20 UI (135.0 ps)
Overshoot Rising Error	Max	100 %	10.0 %
Overshoot Falling Error	Max	100 %	10.0 %

- **Amplitude Error**

  Turns the eye pattern's amplitude error detection on and off.
  You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	80 to 140 % (640 to 1120 mV)
Lower:	40 to 100 % (320 to 800 mV)

- **Rise Time Error**

  Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max:	40 to 140 % (108.0 to 378.0 ps)

- **Fall Time Error**

  Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max:	40 to 140 % (108.0 to 378.0 ps)

- **Delta Time Error**

  Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max:	40 to 140 % (40 to 140 ps)

- **Timing Jitter Error**

  Turns the eye pattern and jitter waveform's timing jitter error detection on and off.

Max:	10 to 200 % (0.10 to 2.00 UI, 67.4 to 1348.0 ps)

- **Current Jitter Error**

  Turns the eye pattern and jitter waveform's current jitter error detection on and off.

Max:	10 to 200 % (0.02 to 0.40 UI, 13.5 to 270.0 ps)

- **Overshoot Rising Error**

  Turns the overshoot of the rising edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

- **Overshoot Falling Error**

  Turns the overshoot of the falling edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

7.6.3 Configuring SD-SDI Error Settings

Use the SD-SDI ERR SETUP tab to configure error detection settings for SD signals.

You can set the threshold values when you set the error detection to ON. Measured values specified by the SMPTE ST 259 standard are used as 100 %.

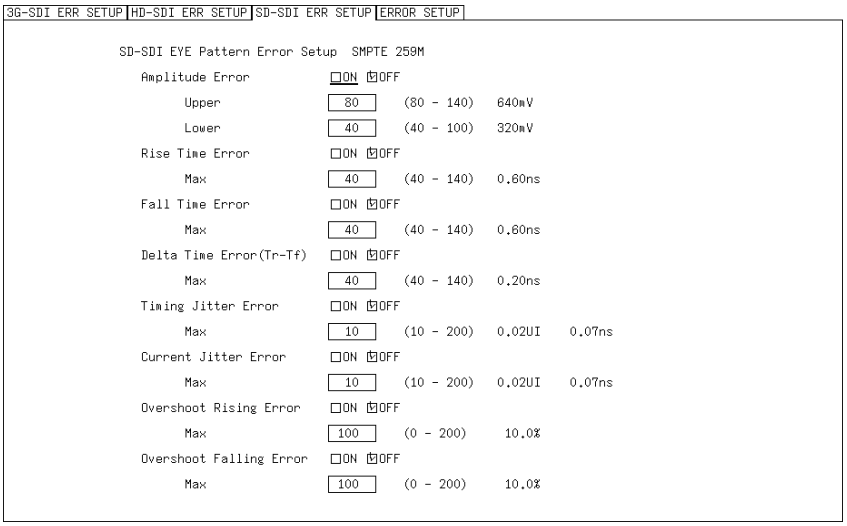


Figure 7-24 SD-SDI ERR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 259 is given below.

Table 7-6 SD-SDI ERR SETUP configuration example

Item		Value	Corresponding Value
Amplitude Error	Upper	110 %	880 mV
	Lower	90 %	720 mV
Rise Time Error	Max	100 %	1.50 ns
Fall Time Error	Max	100 %	1.50 ns
Delta Time Error(Tr-Tf)	Max	100 %	0.50 ns
Timing Jitter Error	Max	100 %	0.20 UI (0.74 ns)
Current Jitter Error	Max	100 %	0.20 UI (0.74 ns)
Overshoot Rising Error	Max	100 %	10.0 %
Overshoot Falling Error	Max	100 %	10.0 %

- **Amplitude Error**

  Turns the eye pattern's amplitude error detection on and off.
  You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	80 to 140 % (640 to 1120 mV)
Lower:	40 to 100 % (320 to 800 mV)

- **Rise Time Error**

  Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max:	40 to 140 % (0.60 to 2.10 ns)

- **Fall Time Error**

  Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max:	40 to 140 % (0.60 to 2.10 ns)

- **Delta Time Error**

  Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max:	40 to 140 % (0.20 to 0.70 ns)

- **Timing Jitter Error**

  Turns the eye pattern and jitter waveform's timing jitter error detection on and off.

Max:	10 to 200 % (0.02 to 0.40 UI, 0.07 to 1.48 ns)

- **Current Jitter Error**

  Turns the eye pattern and jitter waveform's current jitter error detection on and off.

Max:	10 to 200 % (0.02 to 0.40 UI, 0.07 to 1.48 ns)

- **Overshoot Rising Error**

  Turns the overshoot of the rising edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

- **Overshoot Falling Error**

  Turns the overshoot of the falling edge error detection on and off.

Max:	0 to 100 to 200 % (0.0 to 20.0 %)

7.6.4 Configuring DC Offset Error Settings

Use the ERROR SETUP tab to configure DC offset error detection settings.

You can set the threshold values when you set the error detection to ON. Measured values given in SMPTE ST 424, SMPTE ST 292, and SMPTE ST 259 are used as 100 %.

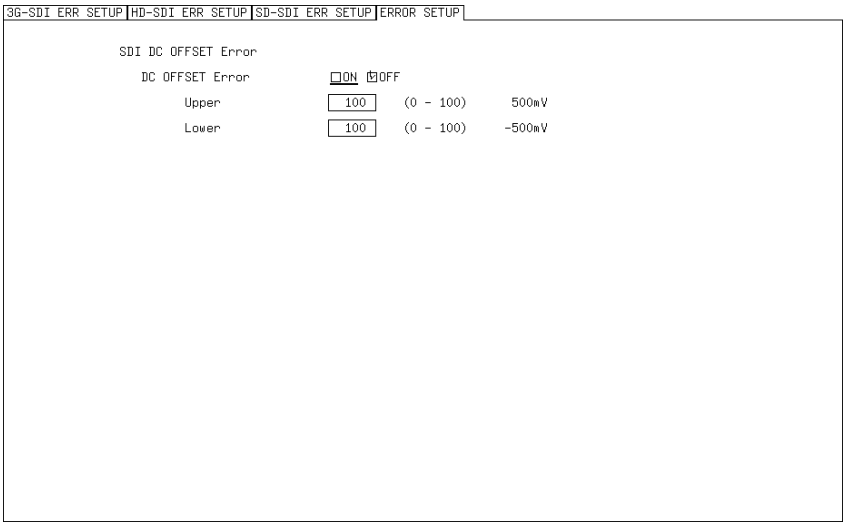


Figure 7-25 ERROR SETUP tab

- **DC OFFSET Error**

  Turns the DC offset error detection on and off.

Upper:	0 to 100 % (0 to 500 mV)
Lower:	0 to 100 % (0 to -500 mV)

7.7 Selecting Which Link to Display

When an HD dual link signal is being applied, you cannot display the link A and link B signals simultaneously. To select which waveform is displayed, follow the procedure below.

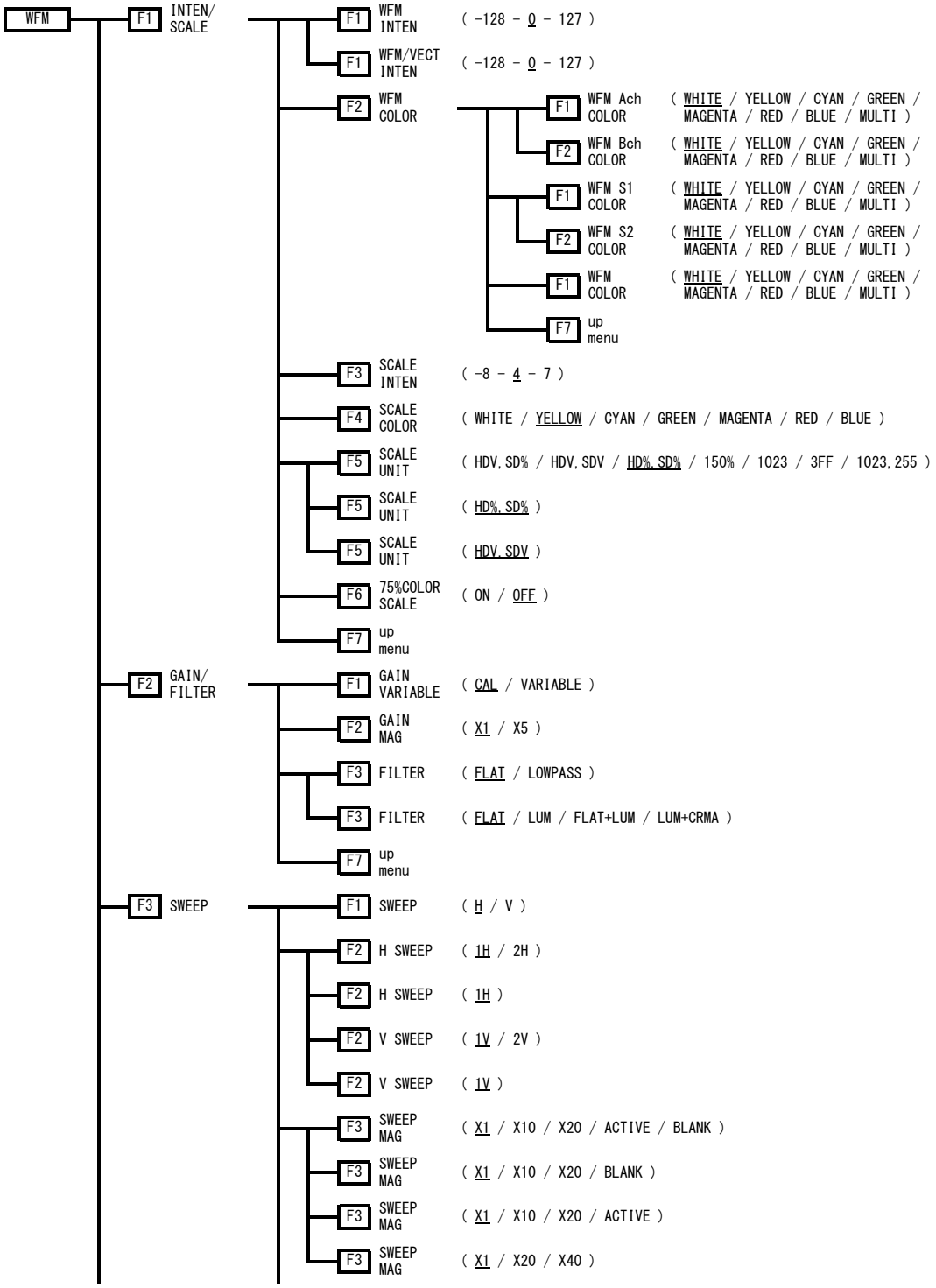
Procedure

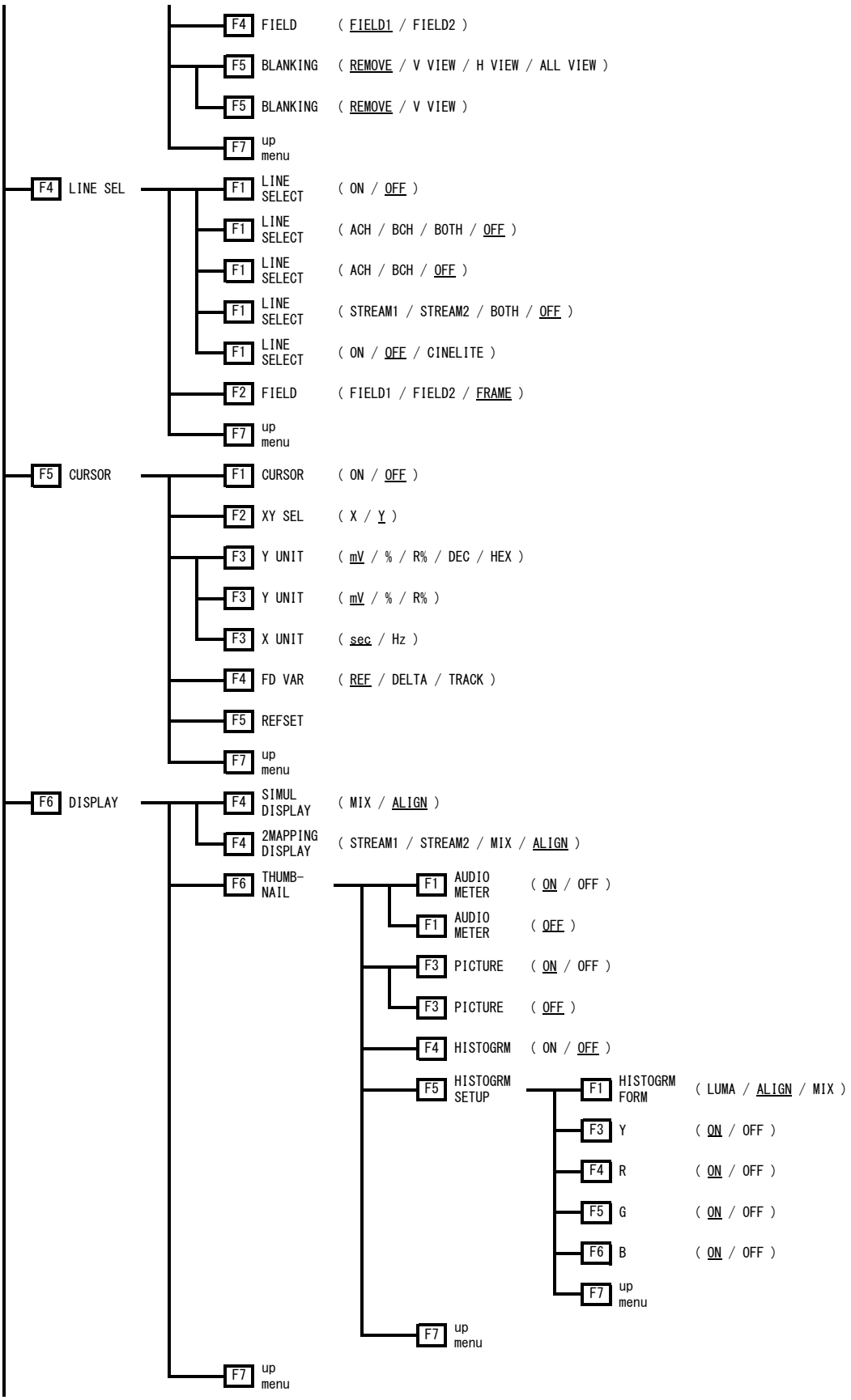
EYE → F•6 LINK SELECT: LINK A / LINK B

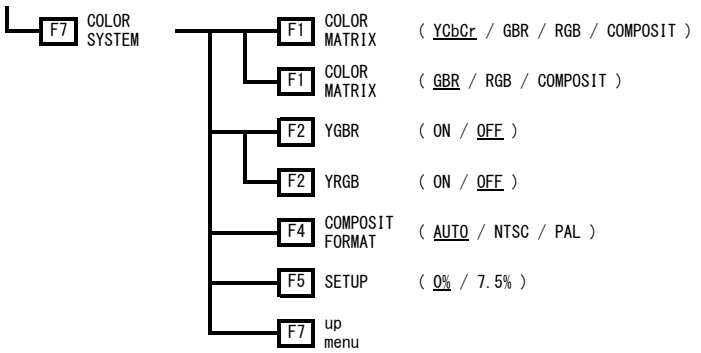
8. MENU TREES

This chapter shows the menu trees that correspond to each display mode key.
The default settings are underlined. The settings selected in the tab menu displays are also default settings.
The menus that are displayed vary depending on the LV 5770A/7770 settings and whether a USB memory device is connected to the LV 5770A/7770.

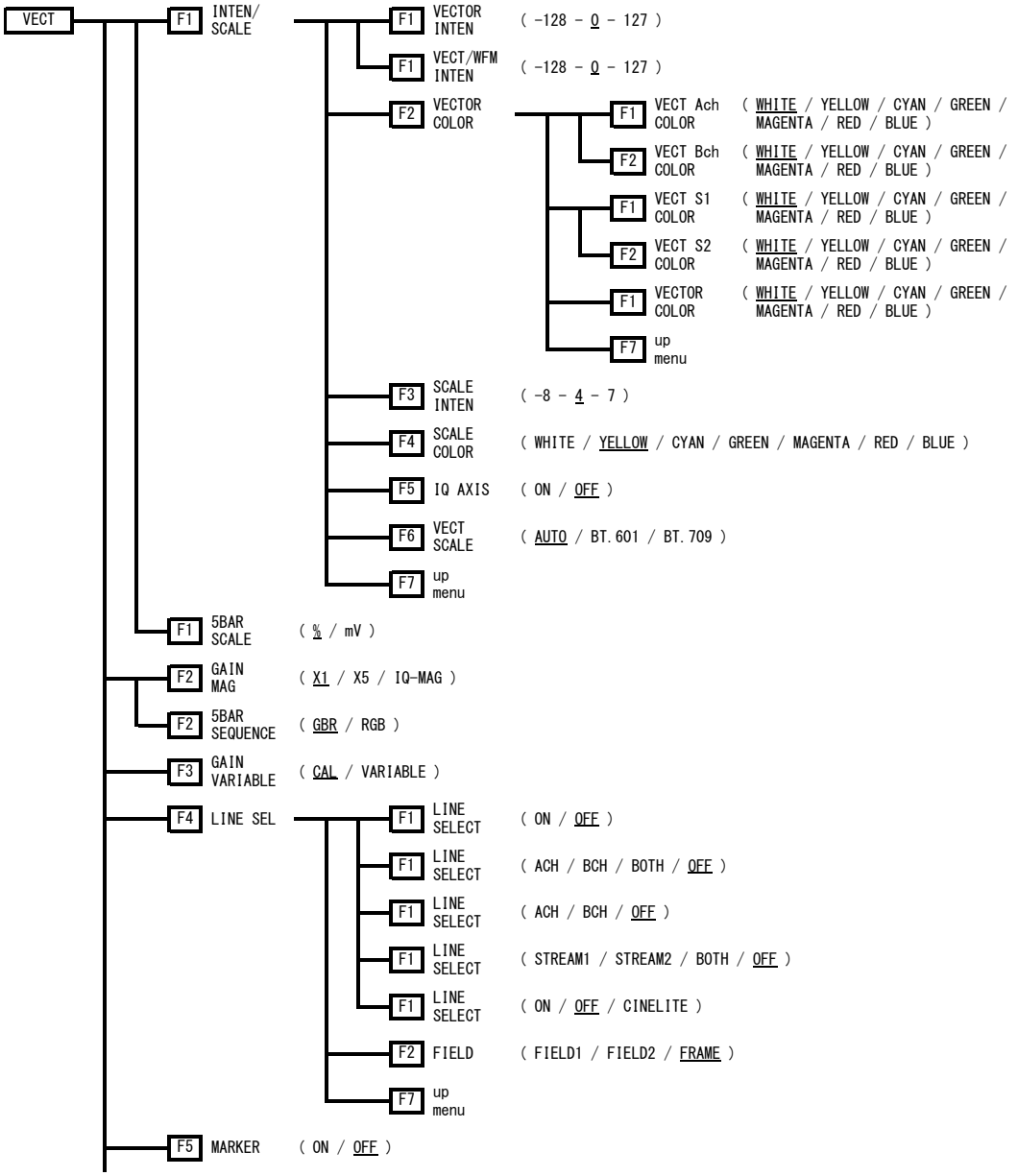
8.1 Video Signal Waveform Menu

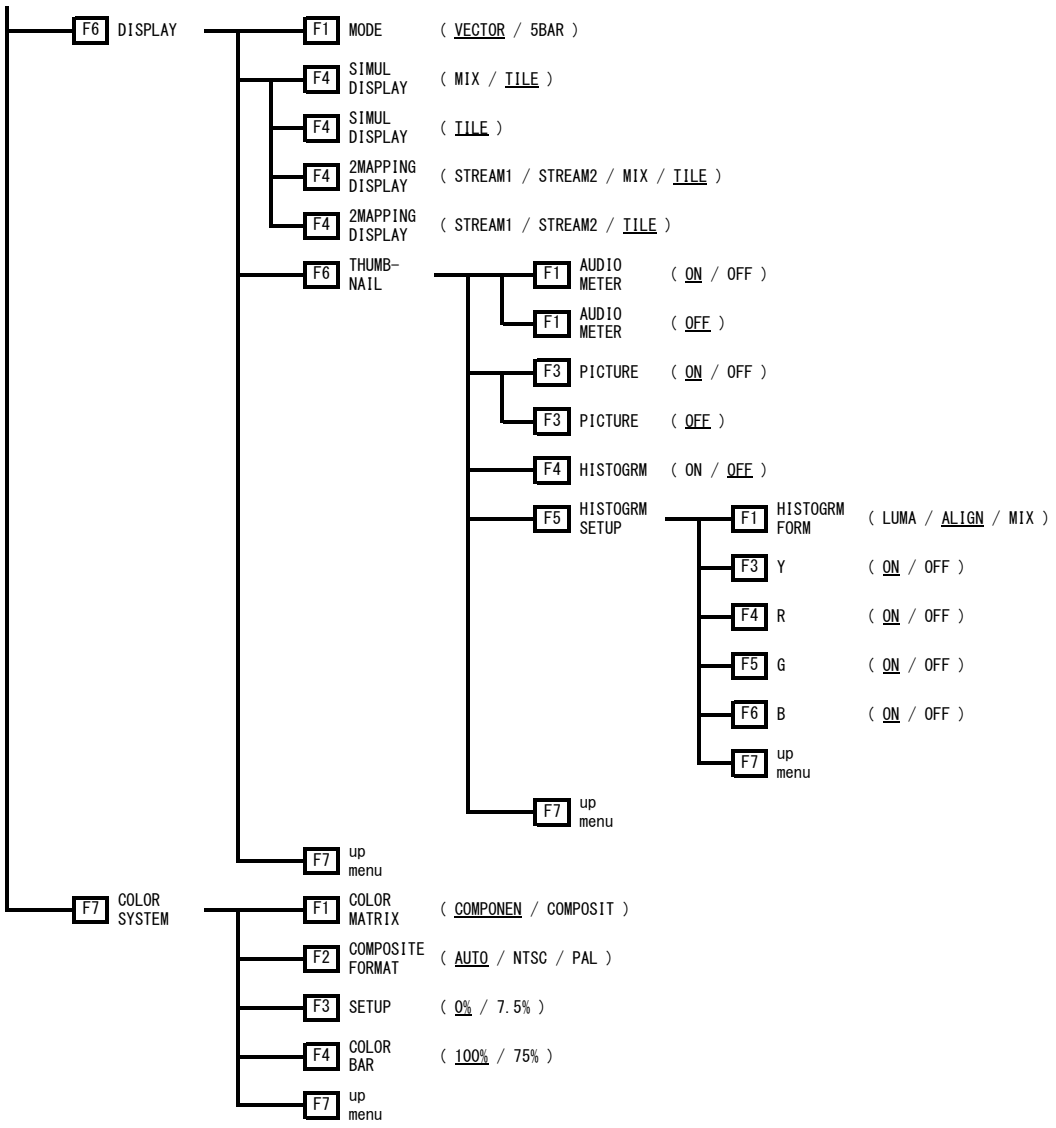



F4 FIELD (FIELD1 / FIELD2)
F5 BLANKING (REMOVE / V VIEW / H VIEW / ALL VIEW)
F5 BLANKING (REMOVE / V VIEW)
F7 up menu
F4 LINE SEL
F1 LINE SELECT (ON / OFF)
F1 LINE SELECT (ACH / BCH / BOTH / OFF)
F1 LINE SELECT (ACH / BCH / OFF)
F1 LINE SELECT (STREAM1 / STREAM2 / BOTH / OFF)
F1 LINE SELECT (ON / OFF / CINELITE)
F2 FIELD (FIELD1 / FIELD2 / FRAME)
F7 up menu
F5 CURSOR
F1 CURSOR (ON / OFF)
F2 XY SEL (X / Y)
F3 Y UNIT (mV / % / R% / DEC / HEX)
F3 Y UNIT (mV / % / R%)
F3 X UNIT (sec / Hz)
F4 FD VAR (REF / DELTA / TRACK)
F5 REFSET
F7 up menu
F6 DISPLAY
F4 SIMUL DISPLAY (MIX / ALIGN)
F4 2MAPPING DISPLAY (STREAM1 / STREAM2 / MIX / ALIGN)
F6 THUMB-NAIL
F1 AUDIO METER (ON / OFF)
F1 AUDIO METER (OFF)
F3 PICTURE (ON / OFF)
F3 PICTURE (OFF)
F4 HISTOGRM (ON / OFF)
F5 HISTOGRM SETUP
F1 HISTOGRM FORM (LUMA / ALIGN / MIX)
F3 Y (ON / OFF)
F4 R (ON / OFF)
F5 G (ON / OFF)
F6 B (ON / OFF)
F7 up menu
F7 up menu
F7 up menu

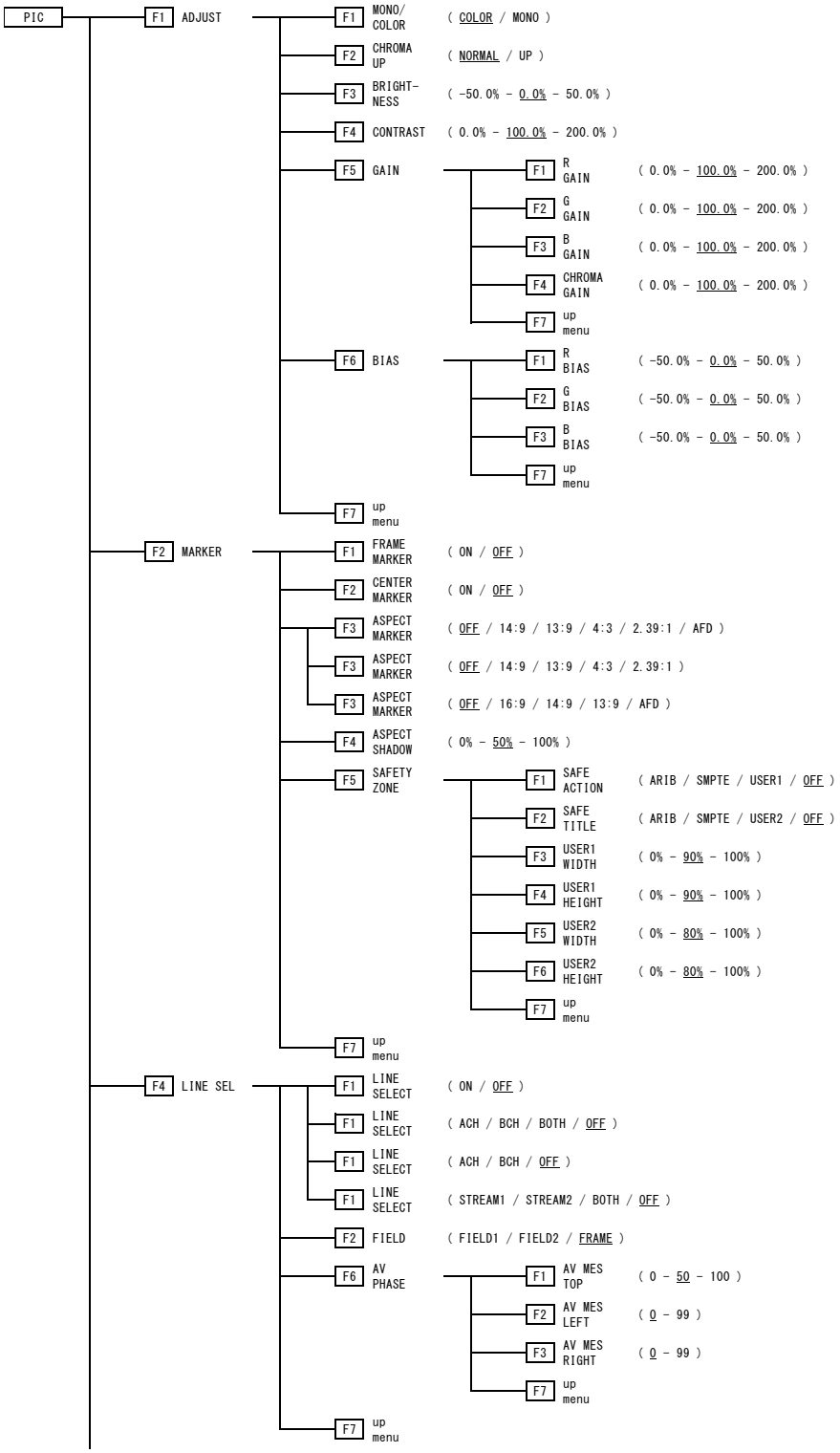


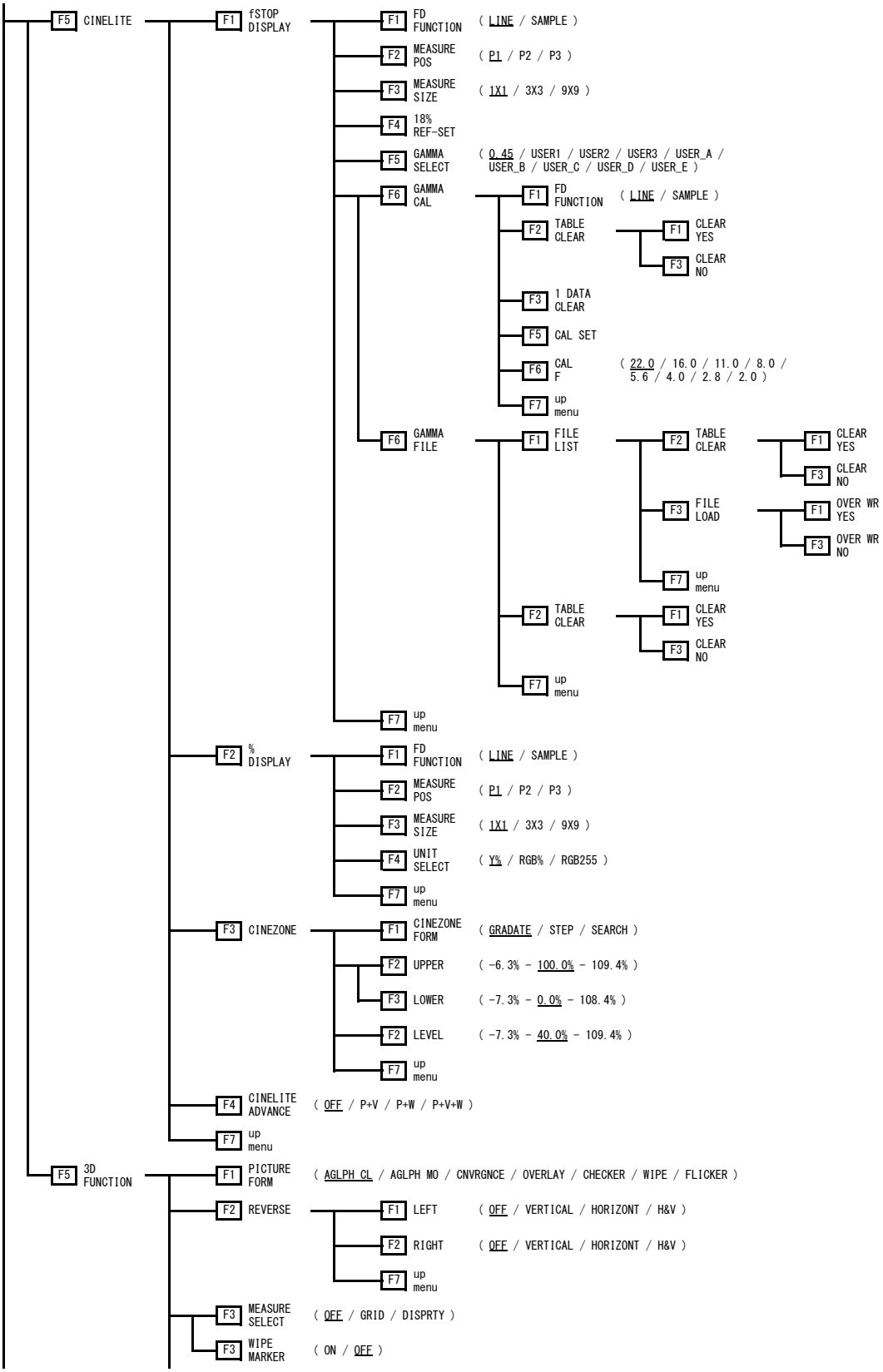
8.2 Vector Menu

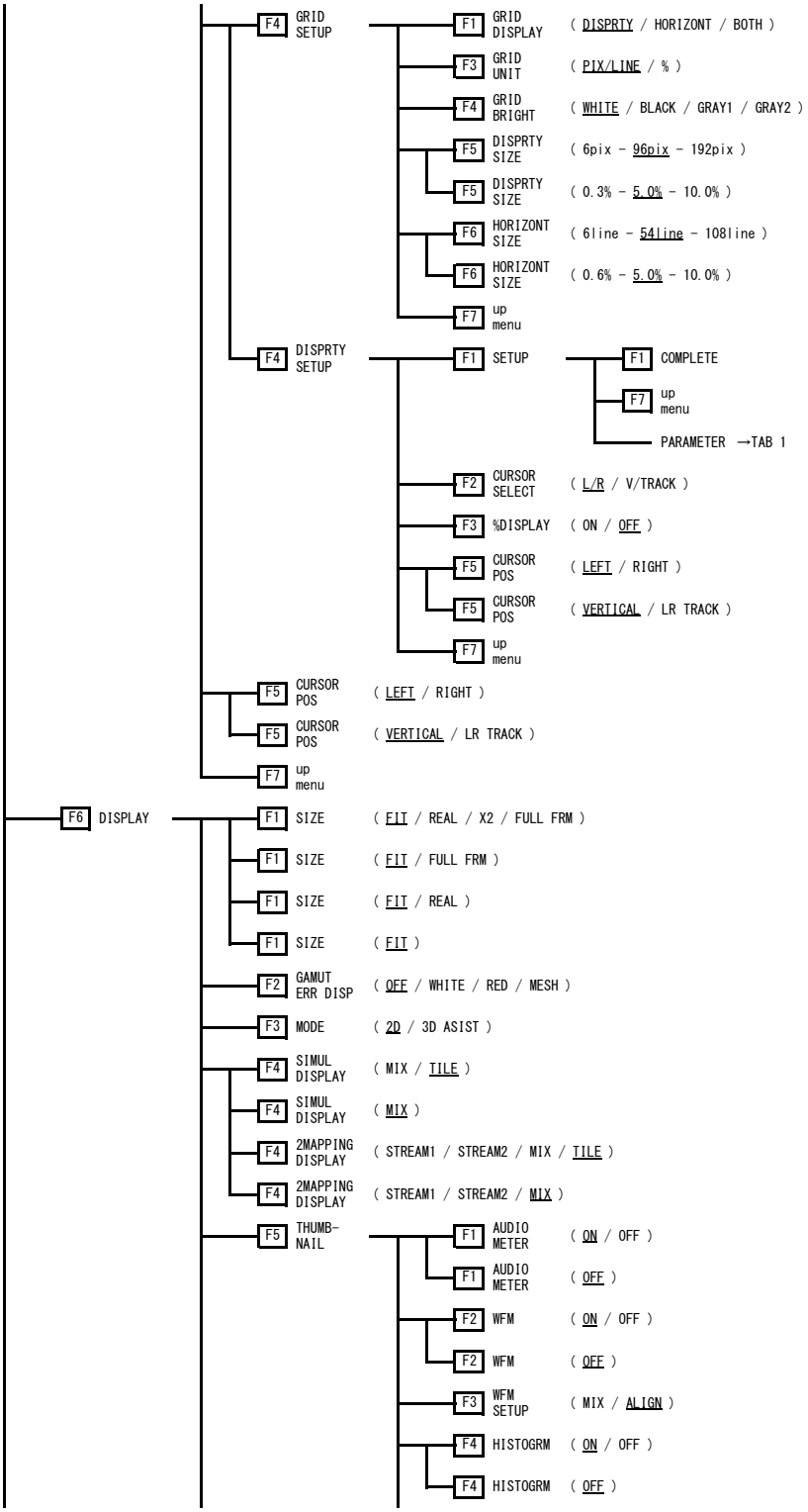


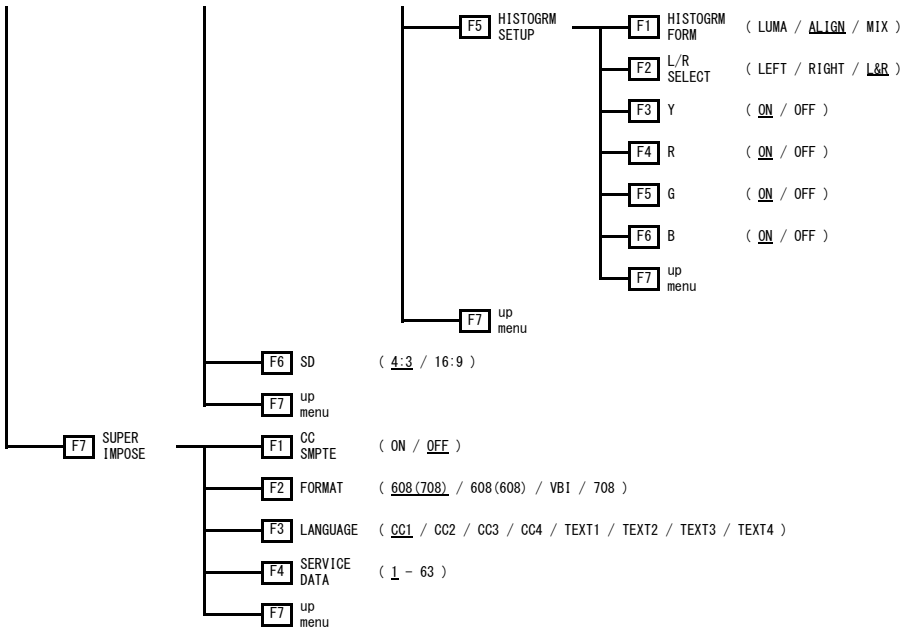

F6 DISPLAY
F1 MODE (VECTOR / 5BAR)
F4 SIMUL DISPLAY (MIX / TILE)
F4 SIMUL DISPLAY (TILE)
F4 2MAPPING DISPLAY (STREAM1 / STREAM2 / MIX / TILE)
F4 2MAPPING DISPLAY (STREAM1 / STREAM2 / TILE)
F6 THUMB-NAIL
F1 AUDIO METER (ON / OFF)
F1 AUDIO METER (OFF)
F3 PICTURE (ON / OFF)
F3 PICTURE (OFF)
F4 HISTOGRM (ON / OFF)
F5 HISTOGRM SETUP
F1 HISTOGRM FORM (LUMA / ALIGN / MIX)
F3 Y (ON / OFF)
F4 R (ON / OFF)
F5 G (ON / OFF)
F6 B (ON / OFF)
F7 up menu
F7 up menu
F7 up menu
F7 COLOR SYSTEM
F1 COLOR MATRIX (COMPONEN / COMPOSIT)
F2 COMPOSITE FORMAT (AUTO / NTSC / PAL)
F3 SETUP (0% / 7.5%)
F4 COLOR BAR (100% / 75%)
F7 up menu

8.3 Picture Menu

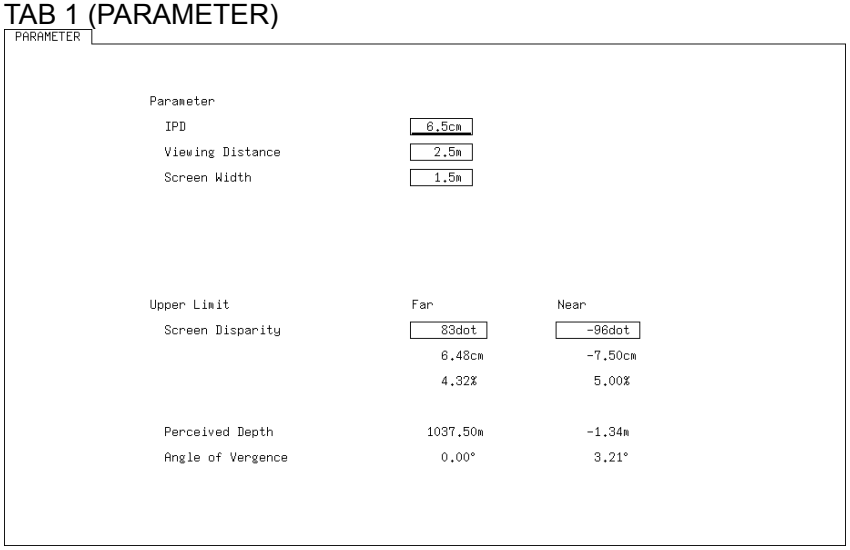



F5 CINELITE
F1 fSTOP DISPLAY
F1 FD FUNCTION (LINE / SAMPLE)
F2 MEASURE POS (P1 / P2 / P3)
F3 MEASURE SIZE (1X1 / 3X3 / 9X9)
F4 18% REF-SET
F5 GAMMA SELECT (0.45 / USER1 / USER2 / USER3 / USER_A / USER_B / USER_C / USER_D / USER_E)
F6 GAMMA CAL
F1 FD FUNCTION (LINE / SAMPLE)
F2 TABLE CLEAR
F1 CLEAR YES
F3 CLEAR NO
F3 1 DATA CLEAR
F5 CAL SET
F6 CAL F (22.0 / 16.0 / 11.0 / 8.0 / 5.6 / 4.0 / 2.8 / 2.0)
F7 up menu
F6 GAMMA FILE
F1 FILE LIST
F2 TABLE CLEAR
F1 CLEAR YES
F3 CLEAR NO
F3 FILE LOAD
F1 OVER WR YES
F3 OVER WR NO
F7 up menu
F2 TABLE CLEAR
F1 CLEAR YES
F3 CLEAR NO
F7 up menu
F7 up menu
F2 % DISPLAY
F1 FD FUNCTION (LINE / SAMPLE)
F2 MEASURE POS (P1 / P2 / P3)
F3 MEASURE SIZE (1X1 / 3X3 / 9X9)
F4 UNIT SELECT (Y% / RGB% / RGB255)
F7 up menu
F3 CINEZONE
F1 CINEZONE FORM (GRADATE / STEP / SEARCH)
F2 UPPER (-6.3% - 100.0% - 109.4%)
F3 LOWER (-7.3% - 0.0% - 108.4%)
F2 LEVEL (-7.3% - 40.0% - 109.4%)
F7 up menu
F4 CINELITE ADVANCE (OFF / P+V / P+W / P+V+W)
F7 up menu
F5 3D FUNCTION
F1 PICTURE FORM (AGLPH CL / AGLPH MO / CNVRGNCE / OVERLAY / CHECKER / WIPE / FLICKER)
F2 REVERSE
F1 LEFT (OFF / VERTICAL / HORIZONT / H&V)
F2 RIGHT (OFF / VERTICAL / HORIZONT / H&V)
F7 up menu
F3 MEASURE SELECT (OFF / GRID / DISPRTY)
F3 WIPE MARKER (ON / OFF)

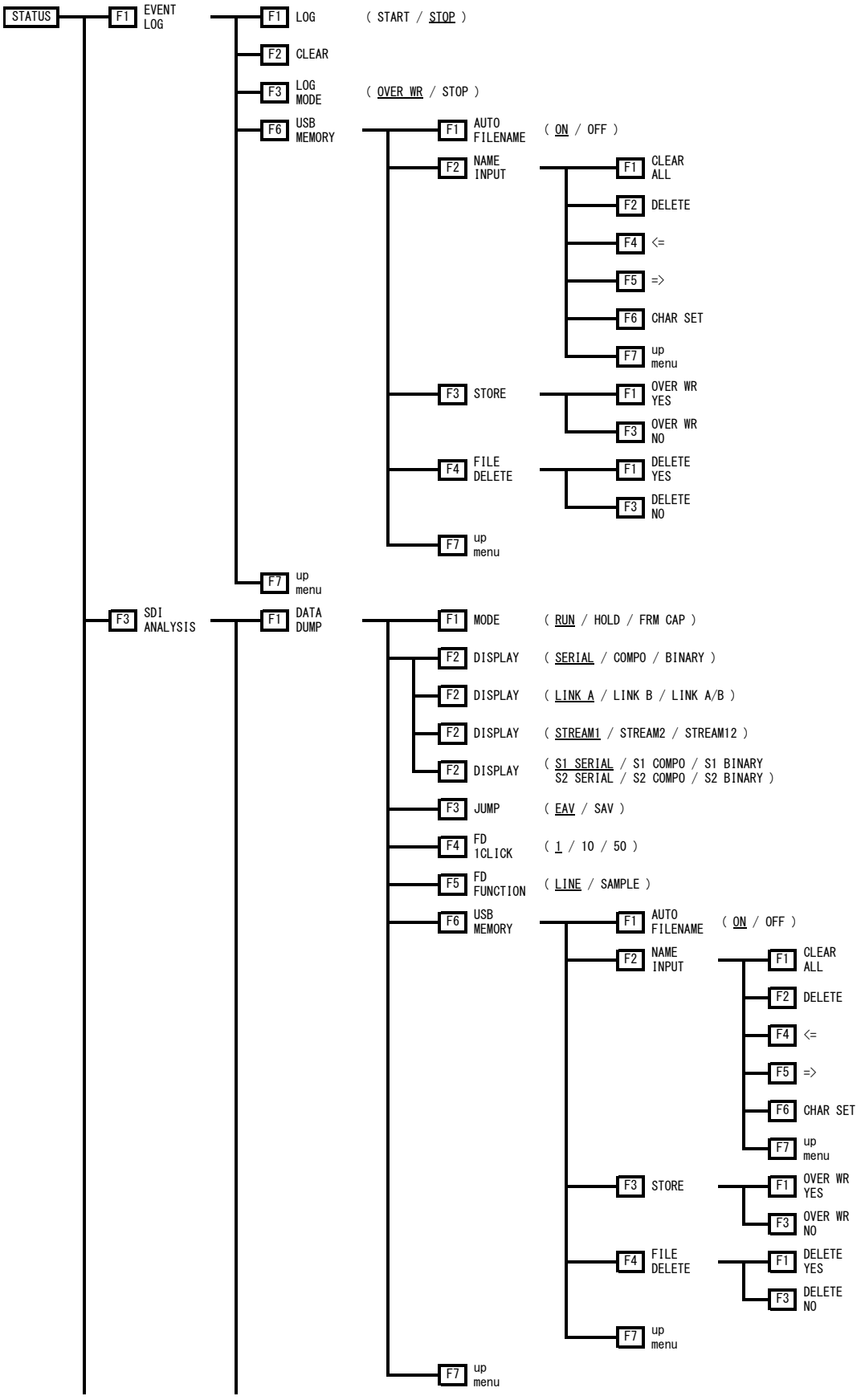

F6 DISPLAY
F4 GRID SETUP
F1 GRID DISPLAY (DISPRTY / HORIZONT / BOTH)
F3 GRID UNIT (PIX/LINE / %)
F4 GRID BRIGHT (WHITE / BLACK / GRAY1 / GRAY2)
F5 DISPRTY SIZE (6pix - 96pix - 192pix)
F5 DISPRTY SIZE (0.3% - 5.0% - 10.0%)
F6 HORIZONT SIZE (6line - 54line - 108line)
F6 HORIZONT SIZE (0.6% - 5.0% - 10.0%)
F7 up menu
F4 DISPRTY SETUP
F1 SETUP
F1 COMPLETE
F7 up menu
PARAMETER →TAB 1
F2 CURSOR SELECT (L/R / V/TRACK)
F3 %DISPLAY (ON / OFF)
F5 CURSOR POS (LEFT / RIGHT)
F5 CURSOR POS (VERTICAL / LR TRACK)
F7 up menu
F5 CURSOR POS (LEFT / RIGHT)
F5 CURSOR POS (VERTICAL / LR TRACK)
F7 up menu
F1 SIZE (FIT / REAL / X2 / FULL FRM)
F1 SIZE (FIT / FULL FRM)
F1 SIZE (FIT / REAL)
F1 SIZE (FIT)
F2 GAMUT ERR DISP (OFF / WHITE / RED / MESH)
F3 MODE (2D / 3D ASIST)
F4 SIMUL DISPLAY (MIX / TILE)
F4 SIMUL DISPLAY (MIX)
F4 2MAPPING DISPLAY (STREAM1 / STREAM2 / MIX / TILE)
F4 2MAPPING DISPLAY (STREAM1 / STREAM2 / MIX)
F5 THUMB-NAIL
F1 AUDIO METER (ON / OFF)
F1 AUDIO METER (OFF)
F2 WFM (ON / OFF)
F2 WFM (OFF)
F3 WFM SETUP (MIX / ALIGN)
F4 HISTOGRM (ON / OFF)
F4 HISTOGRM (OFF)

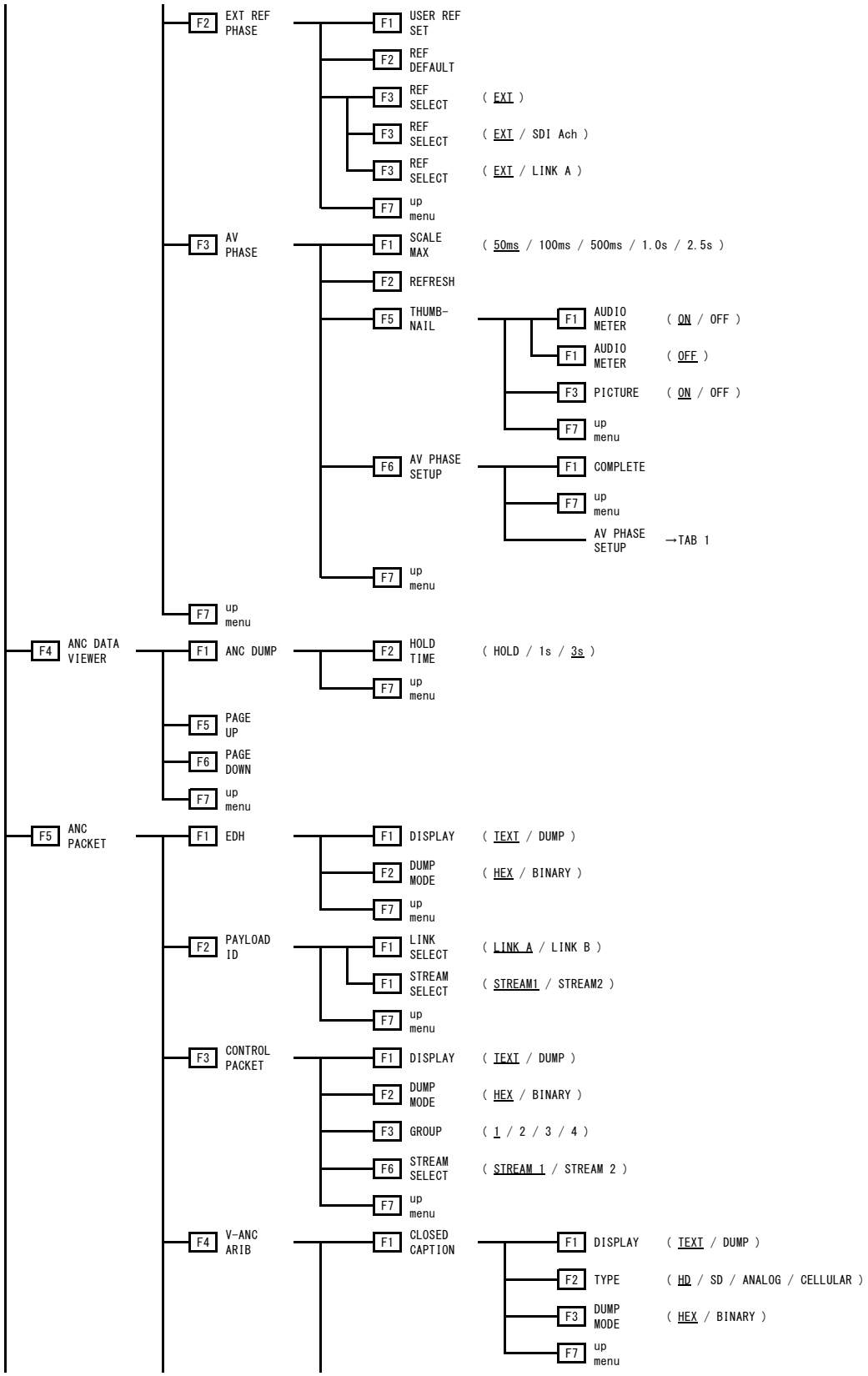


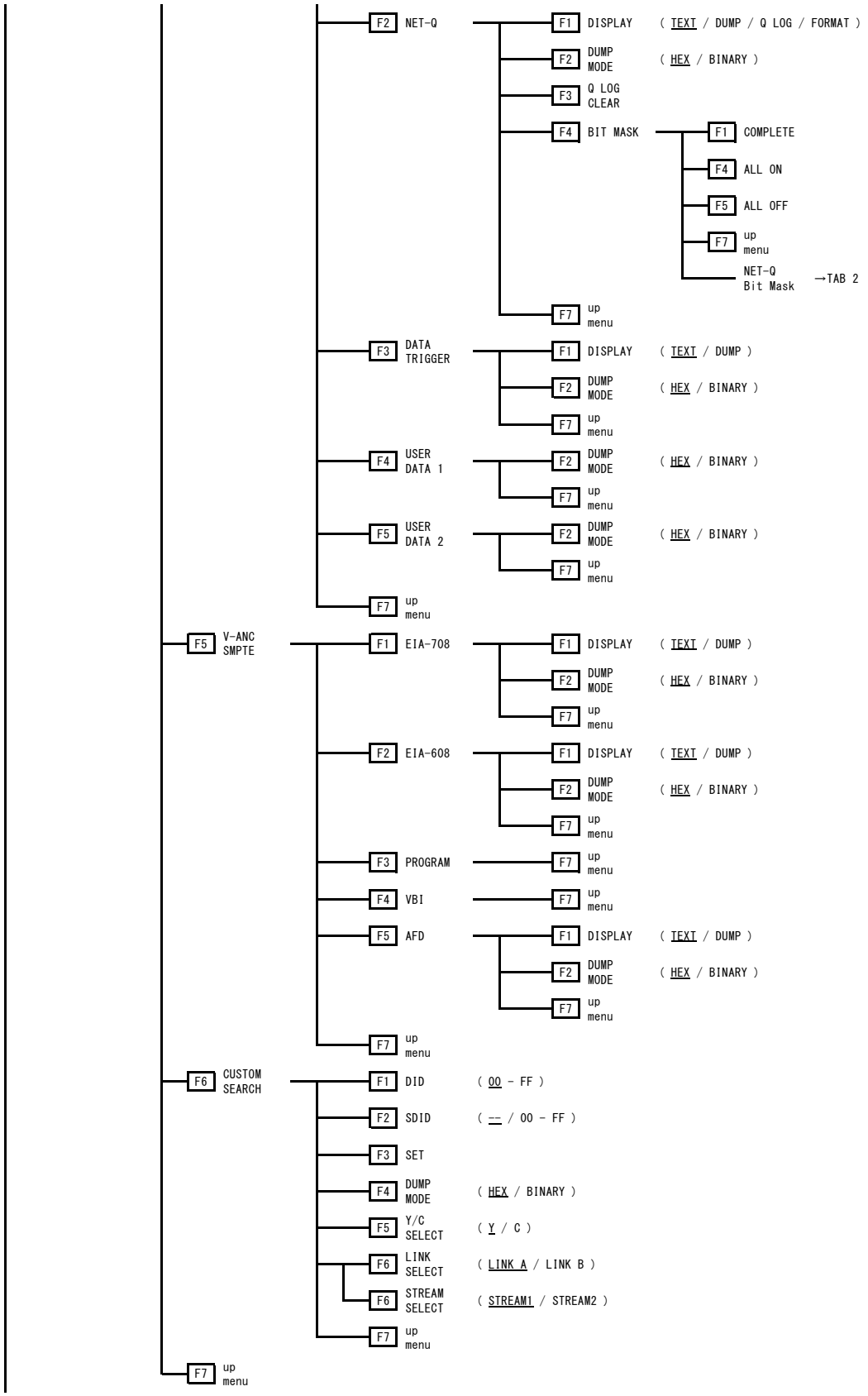
TAB 1 (PARAMETER)

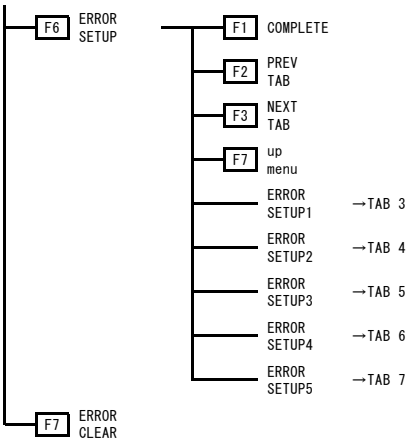


8.4 Status Menu

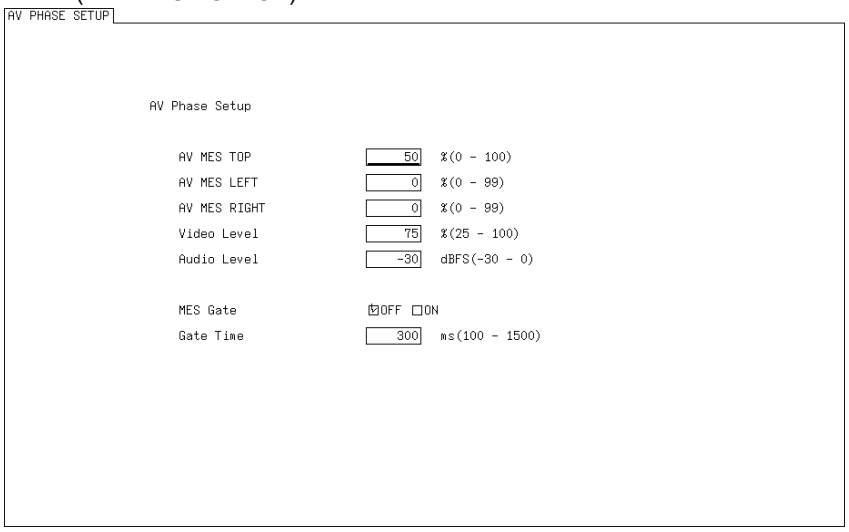



F2 EXT REF PHASE
F1 USER REF SET
F2 REF DEFAULT
F3 REF SELECT (EXT)
F3 REF SELECT (EXT / SDI Ach)
F3 REF SELECT (EXT / LINK A)
F7 up menu
F3 AV PHASE
F1 SCALE MAX (50ms / 100ms / 500ms / 1.0s / 2.5s)
F2 REFRESH
F5 THUMB-NAIL
F1 AUDIO METER (ON / OFF)
F1 AUDIO METER (OFF)
F3 PICTURE (ON / OFF)
F7 up menu
F6 AV PHASE SETUP
F1 COMPLETE
F7 up menu
AV PHASE SETUP →TAB 1
F7 up menu
F7 up menu
F4 ANC DATA VIEWER
F1 ANC DUMP
F2 HOLD TIME (HOLD / 1s / 3s)
F7 up menu
F5 PAGE UP
F6 PAGE DOWN
F7 up menu
F5 ANC PACKET
F1 EDH
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F2 PAYLOAD ID
F1 LINK SELECT (LINK A / LINK B)
F1 STREAM SELECT (STREAM1 / STREAM2)
F7 up menu
F3 CONTROL PACKET
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F3 GROUP (1 / 2 / 3 / 4)
F6 STREAM SELECT (STREAM 1 / STREAM 2)
F7 up menu
F4 V-ANC ARIB
F1 CLOSED CAPTION
F1 DISPLAY (TEXT / DUMP)
F2 TYPE (HD / SD / ANALOG / CELLULAR)
F3 DUMP MODE (HEX / BINARY)
F7 up menu

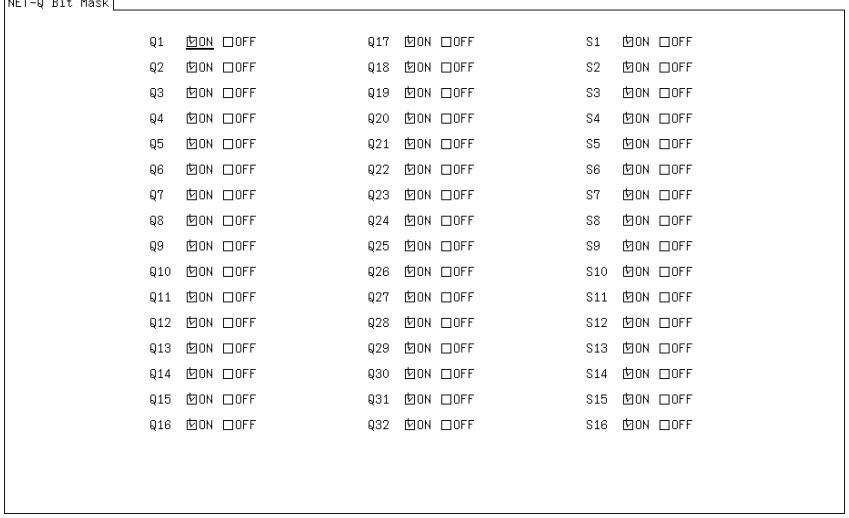

F2 NET-Q
F1 DISPLAY (TEXT / DUMP / Q LOG / FORMAT)
F2 DUMP MODE (HEX / BINARY)
F3 Q LOG CLEAR
F4 BIT MASK
F1 COMPLETE
F4 ALL ON
F5 ALL OFF
F7 up menu
NET-Q Bit Mask →TAB 2
F7 up menu
F3 DATA TRIGGER
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F4 USER DATA 1
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F5 USER DATA 2
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F7 up menu
F5 V-ANC SMPTE
F1 EIA-708
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F2 EIA-608
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F3 PROGRAM
F7 up menu
F4 VBI
F7 up menu
F5 AFD
F1 DISPLAY (TEXT / DUMP)
F2 DUMP MODE (HEX / BINARY)
F7 up menu
F7 up menu
F6 CUSTOM SEARCH
F1 DID (00 - FF)
F2 SDID (-- / 00 - FF)
F3 SET
F4 DUMP MODE (HEX / BINARY)
F5 Y/C SELECT (Y / C)
F6 LINK SELECT (LINK A / LINK B)
F6 STREAM SELECT (STREAM1 / STREAM2)
F7 up menu
F7 up menu



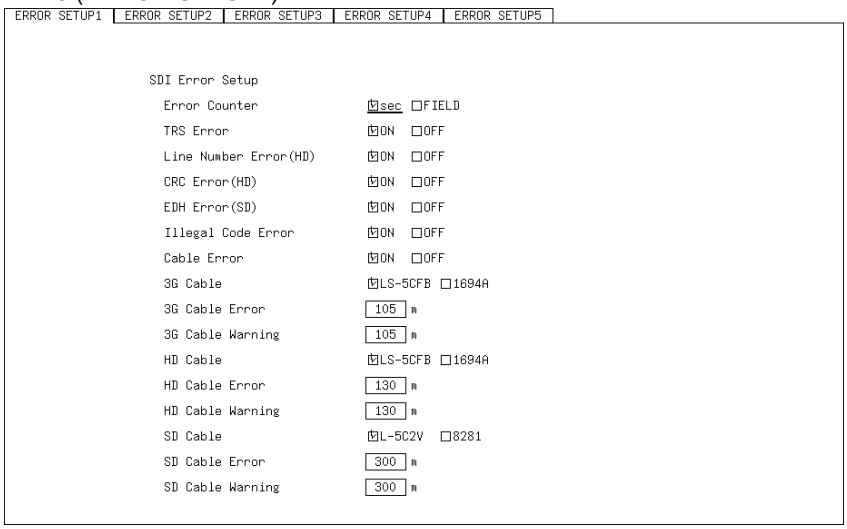
TAB 1 (AV PHASE SETUP)



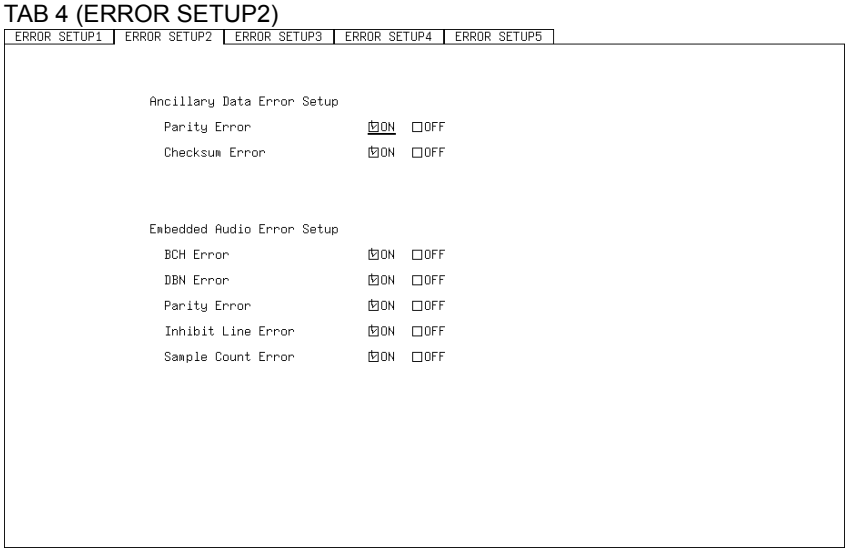
TAB 2 (NET-Q Bit Mask)



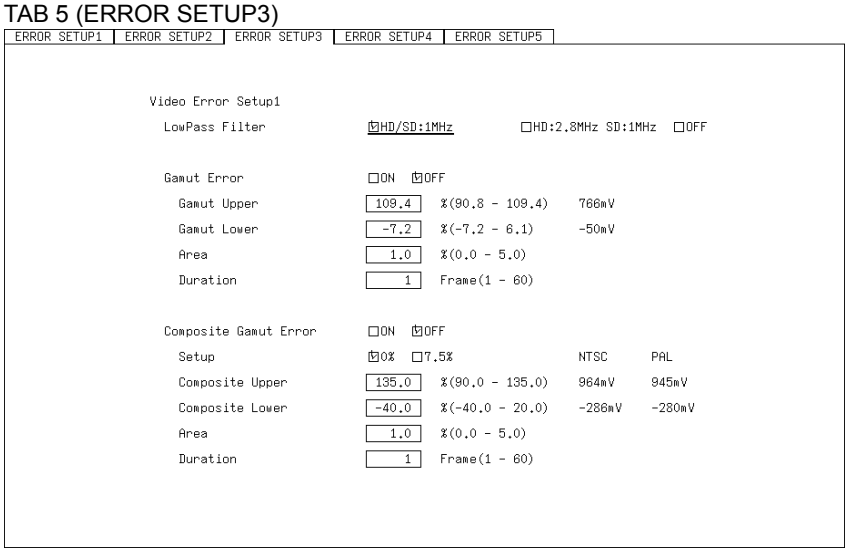
TAB 3 (ERROR SETUP1)



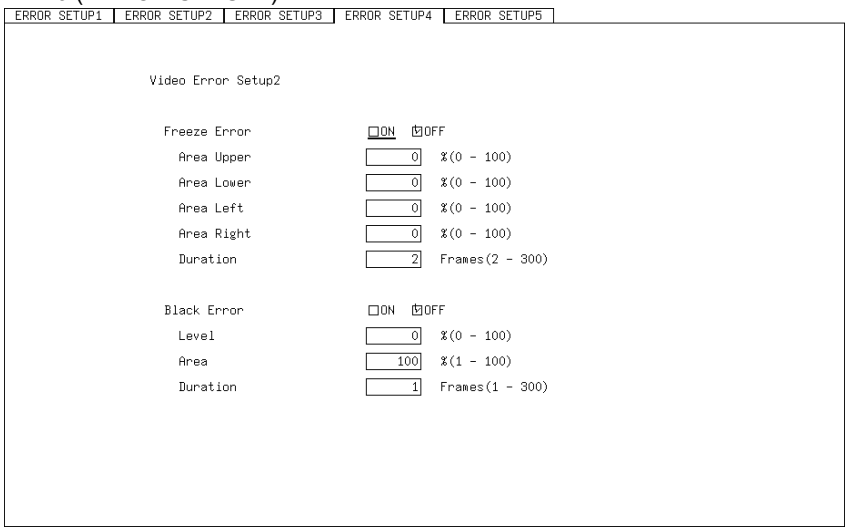
TAB 4 (ERROR SETUP2)



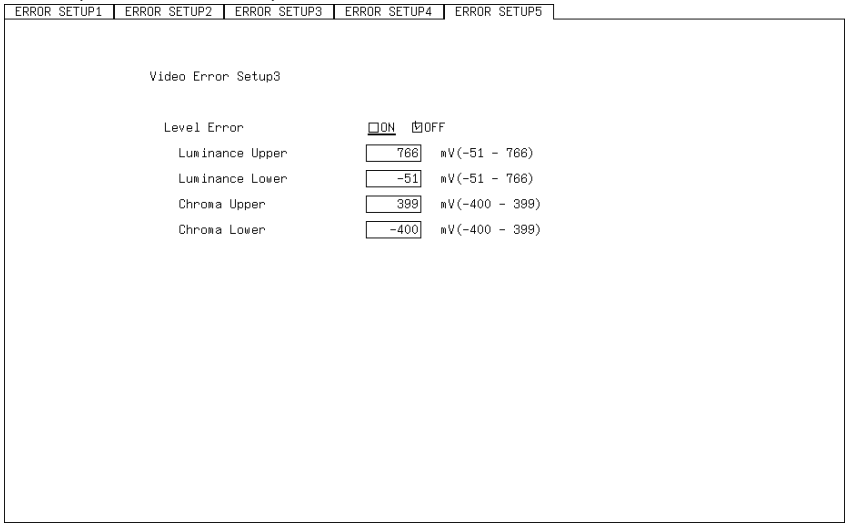
TAB 5 (ERROR SETUP3)



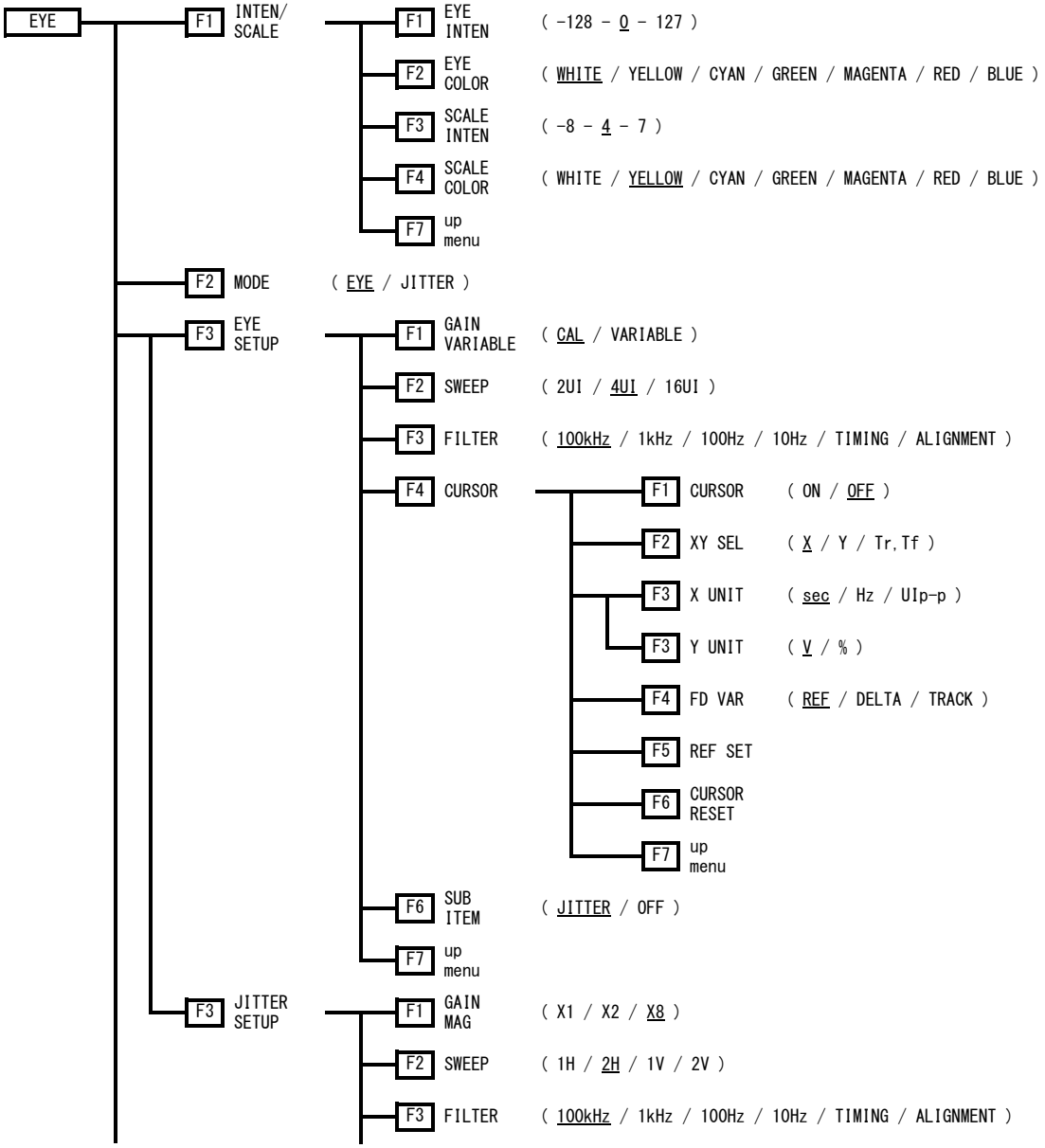
TAB 6 (ERROR SETUP4)

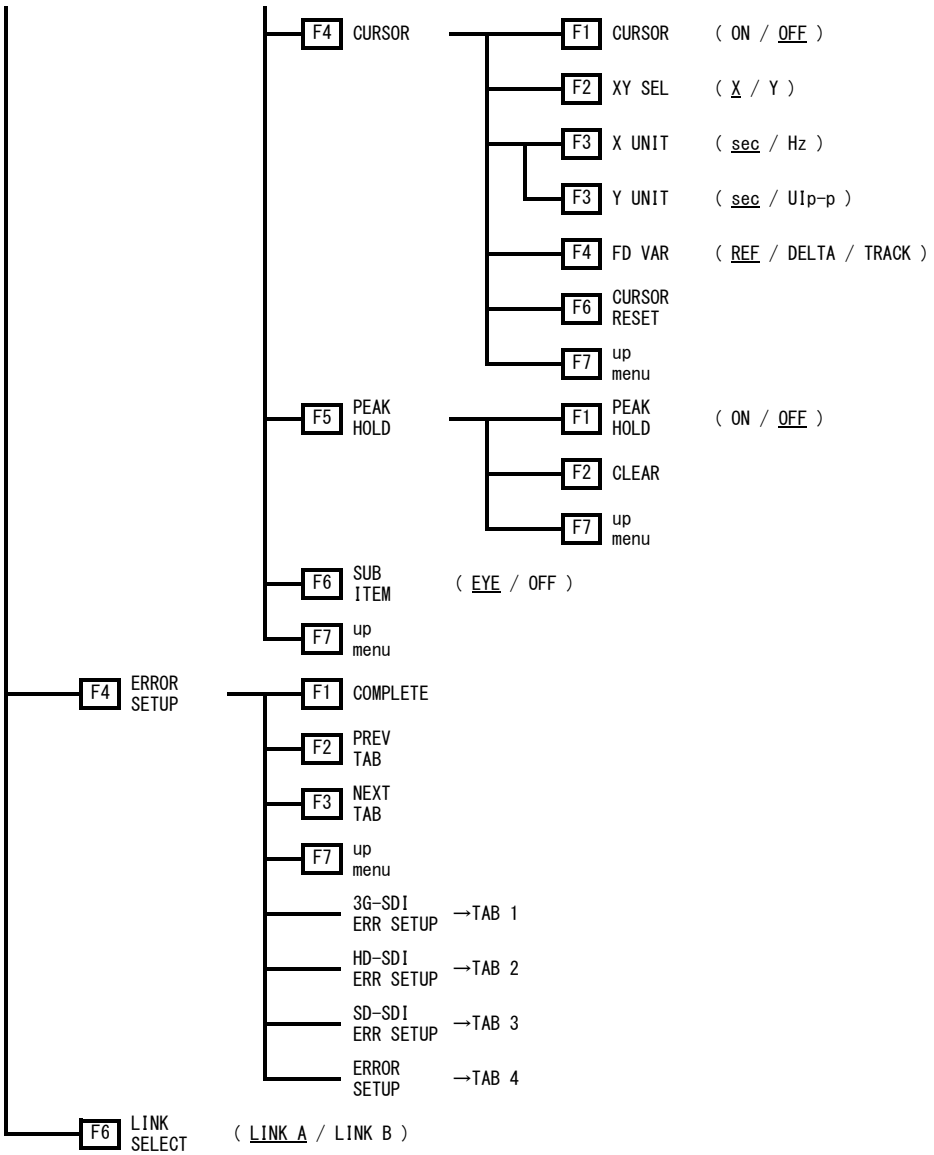


TAB 7 (ERROR SETUP5)

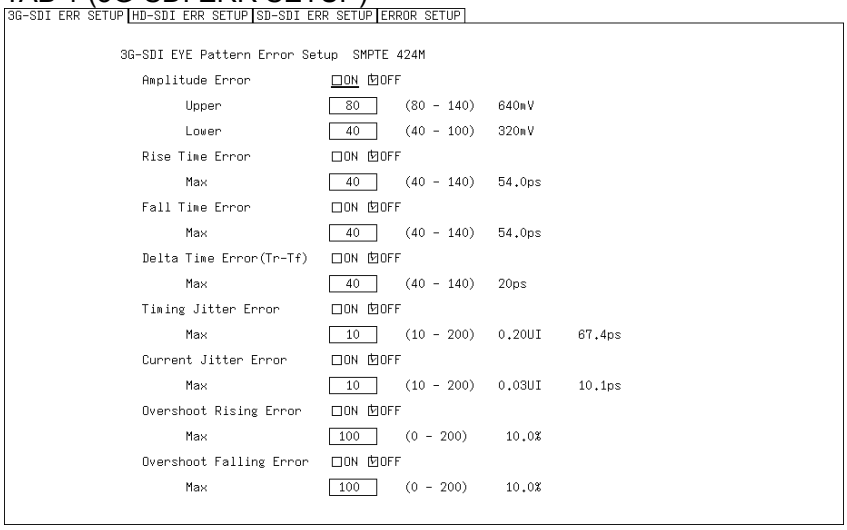


8.5 Eye Pattern Menu (LV 5770SER09A)





TAB 1 (3G-SDI ERR SETUP)



TAB 2 (HD-SDI ERR SETUP)

3G-SDI ERR SETUP | HD-SDI ERR SETUP | SD-SDI ERR SETUP | ERROR SETUP

HD-SDI EYE Pattern Error Setup SMPTE 292M

Amplitude Error	☐ON ☑OFF			
Upper	80	(80 - 140)	640mV	
Lower	40	(40 - 100)	320mV	
Rise Time Error	☐ON ☑OFF			
Max	40	(40 - 140)	108.0ps	
Fall Time Error	☐ON ☑OFF			
Max	40	(40 - 140)	108.0ps	
Delta Time Error(Tr-Tf)	☐ON ☑OFF			
Max	40	(40 - 140)	40ps	
Timing Jitter Error	☐ON ☑OFF			
Max	10	(10 - 200)	0.10UI	67.4ps
Current Jitter Error	☐ON ☑OFF			
Max	10	(10 - 200)	0.02UI	13.5ps
Overshoot Rising Error	☐ON ☑OFF			
Max	100	(0 - 200)	10.0%	
Overshoot Falling Error	☐ON ☑OFF			
Max	100	(0 - 200)	10.0%	

TAB 3 (SD-SDI ERR SETUP)

3G-SDI ERR SETUP | HD-SDI ERR SETUP | SD-SDI ERR SETUP | ERROR SETUP

SD-SDI EYE Pattern Error Setup SMPTE 259M

Amplitude Error	☐ON ☑OFF			
Upper	80	(80 - 140)	640mV	
Lower	40	(40 - 100)	320mV	
Rise Time Error	☐ON ☑OFF			
Max	40	(40 - 140)	0.60ns	
Fall Time Error	☐ON ☑OFF			
Max	40	(40 - 140)	0.60ns	
Delta Time Error(Tr-Tf)	☐ON ☑OFF			
Max	40	(40 - 140)	0.20ns	
Timing Jitter Error	☐ON ☑OFF			
Max	10	(10 - 200)	0.02UI	0.07ns
Current Jitter Error	☐ON ☑OFF			
Max	10	(10 - 200)	0.02UI	0.07ns
Overshoot Rising Error	☐ON ☑OFF			
Max	100	(0 - 200)	10.0%	
Overshoot Falling Error	☐ON ☑OFF			
Max	100	(0 - 200)	10.0%	

TAB 4 (ERROR SETUP)

3G-SDI ERR SETUP | HD-SDI ERR SETUP | SD-SDI ERR SETUP | ERROR SETUP

SDI DC OFFSET Error

DC OFFSET Error	☐ON ☑OFF		
Upper	100	(0 - 100)	500mV
Lower	100	(0 - 100)	-500mV

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