LEADER

LV 58SER03

COMPOSITE VIDEO INPUT

INSTRUCTION MANUAL

LEADER
ELECTRONIC MEASURING INSTRUMENTS

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Maximum Allowable Input Voltage

The maximum allowable input voltage to the input connectors is shown in the table below.
Do not apply excessive voltage to prevent damage to the instrument.

Input Connector	Maximum Allowable Input Voltage
Composite Input A, B	±5 V (DC + peak AC)

1.2 Notations Used in This Manual

The key and other operations explained in this manual apply to the LV 5800, but you can also perform similar operations on the LV 7800.

2. SPECIFICATIONS

2.1 General

This unit is installed in the LV 5800 (MULTI MONITOR) or LV 7800 (MULTI RASTERIZER), and it is used to display and measure the analog NTSC or PAL video signals. The LV 5800's newest functions related to waveforms such as the waveform monitor, vectorscope, simple picture monitor, and EXT REF phase display function can be used on analog video signals of NTSC and PAL formats.
For a description of the specifications other than those of this newly added option, see the specifications of the standard model.
This unit in combination with the LV 58SER01A is suitable for monitoring in a mixed environment containing SDI and composite signals.

2.2 Features

- Input/Output

  There are two input connectors: INPUT A and INPUT B.
  The selected channel is output from the PIX OUT connector on the rear panel.

- Display

  Waveform display, vectorscope display, picture display, and EXT REF phase display function are available.
  In addition, the luminance component can be displayed using a low-pass filter.

- SCH Measurement Function

  You can perform SCH measurements which are essential when editing the composite signal.

- EXT REF Phase Display Function

  Compares the input signal to the V.H sync signal of the external reference signal and displays the phase difference numerically and graphically.
  This function makes synchronization phase management easy.

- Cursor Measurement

  Cursors can be used to measure the amplitude, time, and phase with high accuracy.

2.3 Specifications

2.3.1 Input Terminal

Composite Input

Input Signal	NTSC/PAL composite video signals
Supported Standards	SMPTE 170M and ITU-R BT.470
Input Connector	BNC connector 2 connectors
Input Impedance	75 Ω
Input Return Loss	≥ 30 dB (up to 6 MHz)
Maximum Input Voltage	±5 V (DC + peak AC)

EXT REF (*)

Input Signal	NTSC/PAL black burst signals

* Other specifications are the same as those of the LV 5800/7800.

2.3.2 Output Terminal

PIX Out

Output Signal	Active
Output Connector	BNC connector 1 connector
Output Impedance	75 Ω
Output Amplitude	1 Vp-p ± 5 %
Frequency Characteristics	±5 % (25 Hz to 5 MHz) -10 % to +5 % (5 MHz to 5.6 MHz)

2.3.3 Waveform Display

Vertical Axis

Sensitivity	
IRE Scale (NTSC)	−40 IRE to 100 IRE
V Scale (PAL)	−0.3 V to 0.7 V
Gain	×1 or ×5
Variable Gain	x0.2 to x2
Amplitude Accuracy	±1 %
Frequency Characteristics	±2 % (25 Hz to 5 MHz) -7 % to +3 % (5 MHz to 5.6 MHz)

Step Response (for 1 V full scale, flat, 2T pulse, and 2T bar)

Overshoot	±2 %
Preshoot	±1 %
Ringing	±2 %
Pulse/Bar Ratio	±1 %
Vertical Tilt	±1 %
Filter	Luminance filter
DC Restorer	Clamp to the back porch (fixed)

Horizontal Axis	
Operation Mode	Displays a single waveform or 4 waveforms (*).
Display Format	
Line Display	1H or 2H
Line Magnification	×1, ×10, or x20
Field Display	1V or 2V
Field Magnification	×1, ×20, or x40
Time Base Accuracy	±1 %

* 4 waveforms display Refer to Section 6.3, “4 Parade”

Line Select	Displays the selected line.
Cursor Measurement	
Horizontal Cursors	2 cursors (REF, DELTA)
Time Measurement	Displayed in [SEC]
Frequency Measurement	Displays the frequency in which the time between cursors is considered a cycle.
Vertical Cursors	2 cursors (REF, DELTA)
Amplitude Measurement	Measure in terms of [%] or [V].
Image Quality Adjustment	Brightness adjustment

2.3.4 Vectorscope Display

Scale	75 % or 100 % Using a color bar
Gain	×1, ×5, or IQ-MAG
Variable Gain	x0.2 to x2
Phase Accuracy	±2°
Amplitude Accuracy	±3 %
Phase Adjustment Range Display	360°
Setup (NTSC)	0 % or 7.5 %
NTSC Display (PAL)	NTSC or PAL display
IQ Axis	Select show or hide.
SCH Display	Displays the SCH value numerically.
Line Select	Displays the selected line.
Image Quality Adjustment	Brightness adjustment

2.3.5 Picture Display

Marker Display	16:9 marker display Safe action marker display Safe title marker display Center marker display
Display Size	Reduced display, full frame display, and actual size display
Line Select	Displays a marker for the selected line.
Image Quality Adjustment	Brightness adjustment, contrast adjustment, RGB level adjustment, and RGB bias adjustment

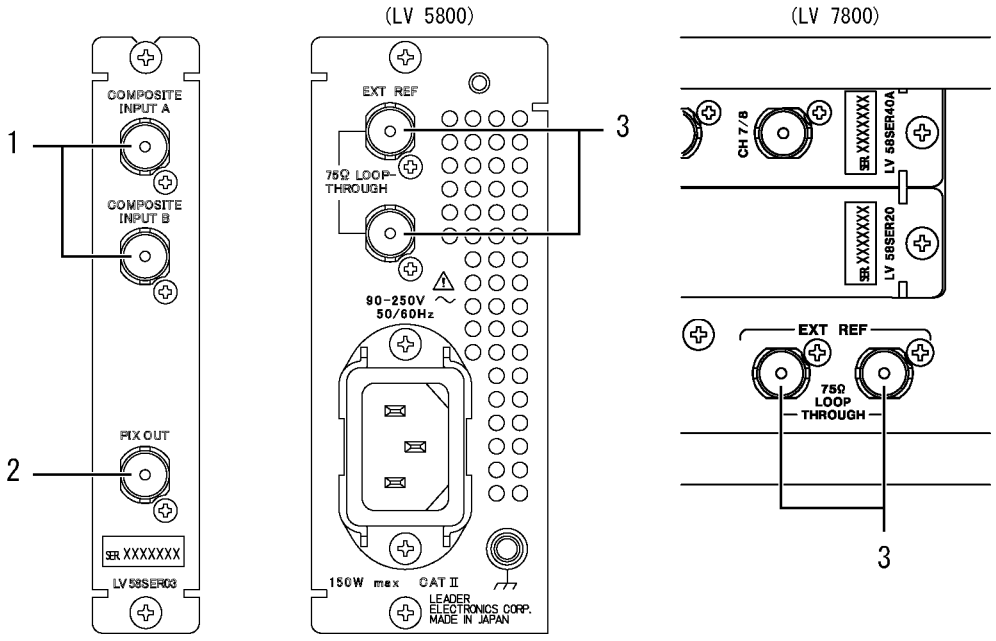
2.3.6 Status Display

Display	Displays the phase difference between the composite signal and external sync signal numerically and graphically. Holds and displays eight phase difference values being measured.
Display Range	
V direction	Approximately ±1/2 frame (see Chapter 9 “STATUS DISPLAY".)
H direction	±1 line
Synchronization Signal	NTSC/PAL black burst signals

2.3.7 General Specifications

Environmental Conditions	Same as the LV 5800/7800
Power Consumption	Supplied from the LV 5800/7800 9 W max.
Weight	0.25 kg
Accessories	Instruction manual 1

3. NAMES AND FUNCTIONS OF PARTS



1 COMPOSITE INPUT A, COMPOSITE INPUT B

NTSC/PAL analog composite video input connectors. Terminated at 75 Ω.

* Do not apply a voltage exceeding ±5 V (DC + peak AC) to the SDI signal input connector. If you do, the instrument may malfunction.

2 PIX OUT

NTSC/PAL analog composite video output connectors. Active output.
The signal selected using the A/B input channel selection key on the front panel is output.

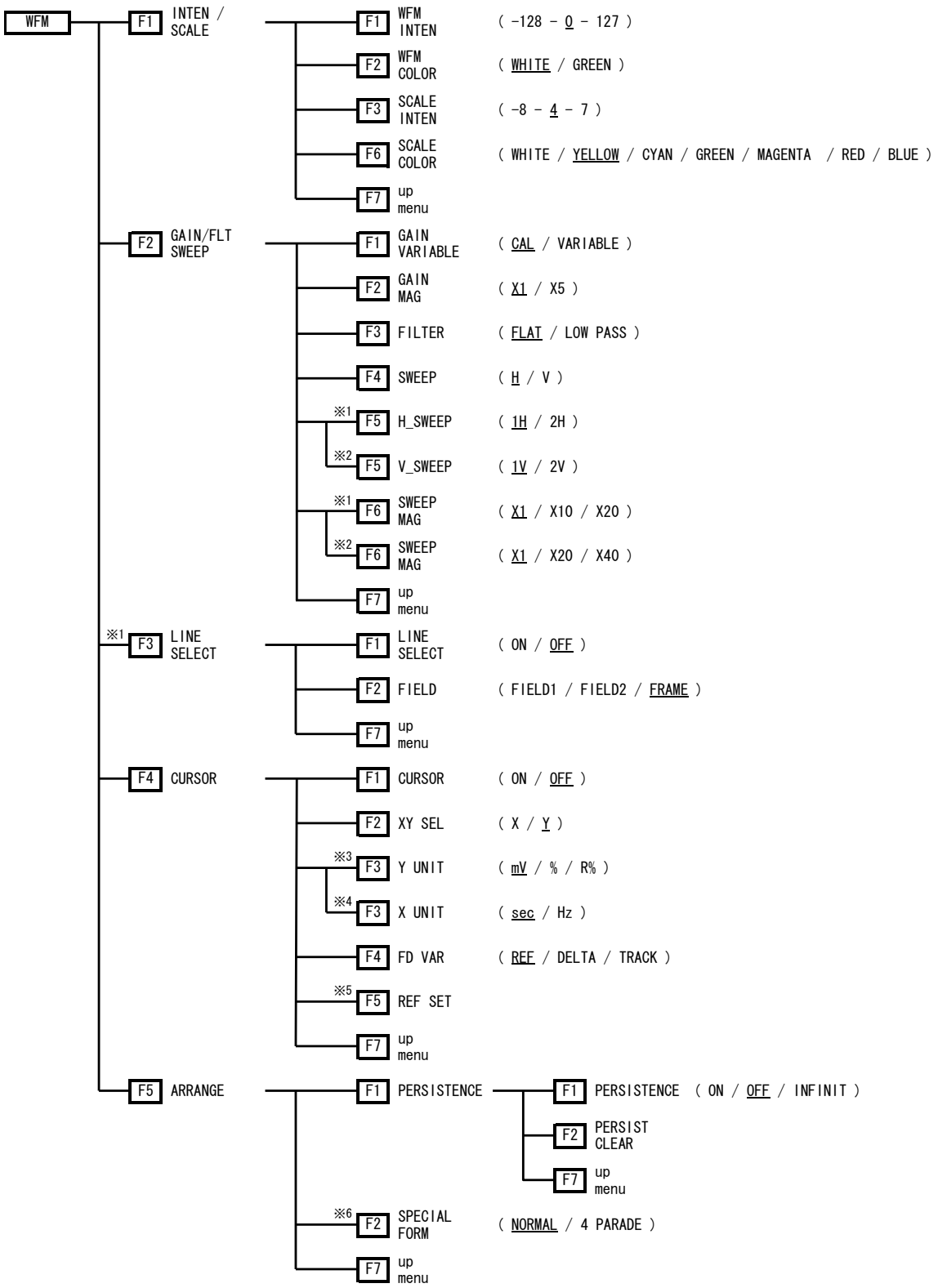
3 EXT REF（Rear panel of LV 5800/7800）

The external synchronization signal input connector for the video signal waveform display. The input configuration is loop-through. Terminate the end of the cascade connection at 75 Ω. HDTV tri-level sync signals and NTSC/PAL black burst signals are supported for the input signal.

4. MENU STRUCTURE

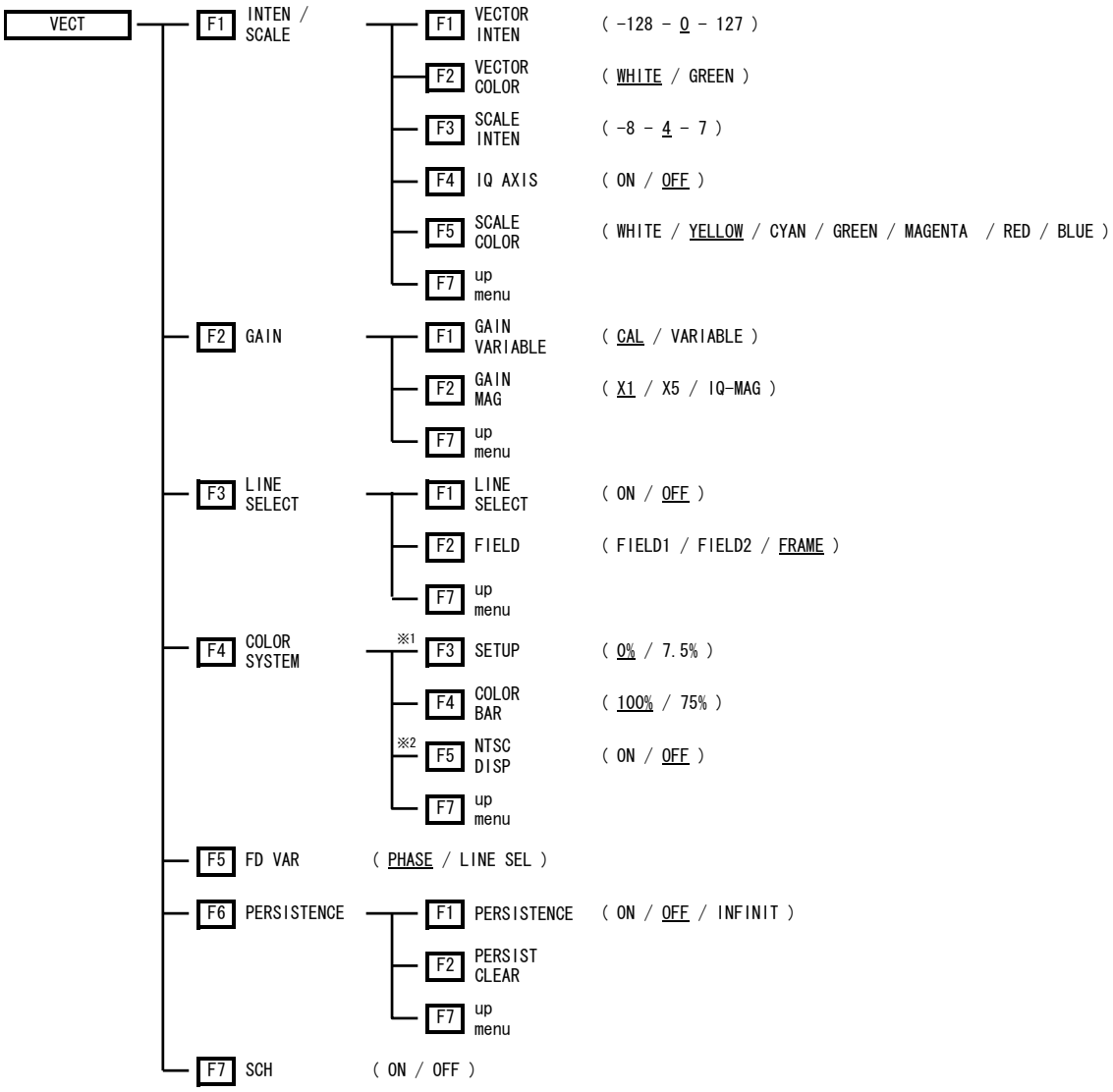
The structure of the menu of WFM, VECT, PIC, and STATUS is shown below.
Underlined sections indicate initial settings.

4.1 Waveform Display Menu



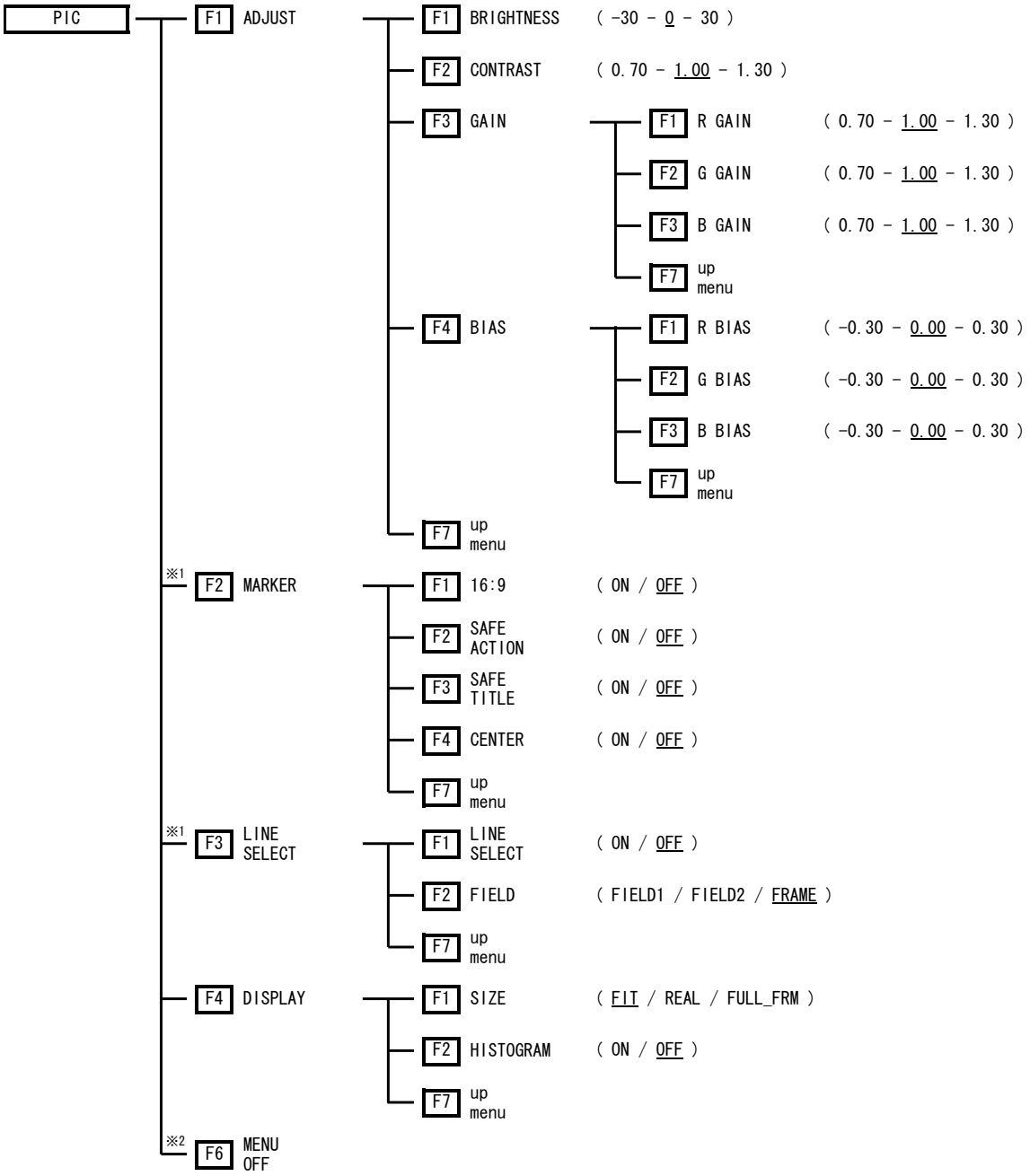
*1 Displayed if F·4 SWEEP is set to H.
*2 Displayed if F·4 SWEEP is set to V.
*3 Displayed if F·2 XY SEL is set to Y.
*4 Displayed if F·2 XY SEL is set to X.
*5 Displayed if F·3 Y UNIT is set to R%.
*6 Displayed if 1-screen display is enabled.

4.2 Vectorscope Display Menu



*1 Displayed if the input signal is NTSC.
*2 Displayed if the input signal is PAL.

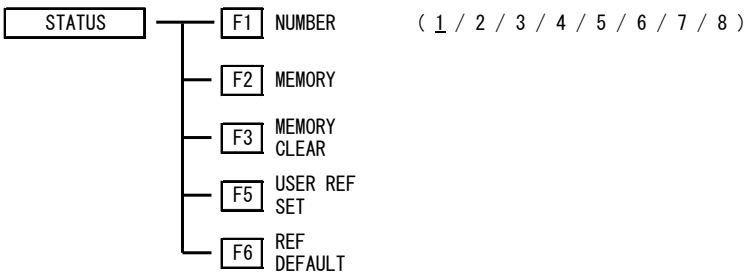
4.3 Picture Display Menu



*1 Displayed if the F・1 SIZE is set to FIT after pressing the F・4 DISPLAY.

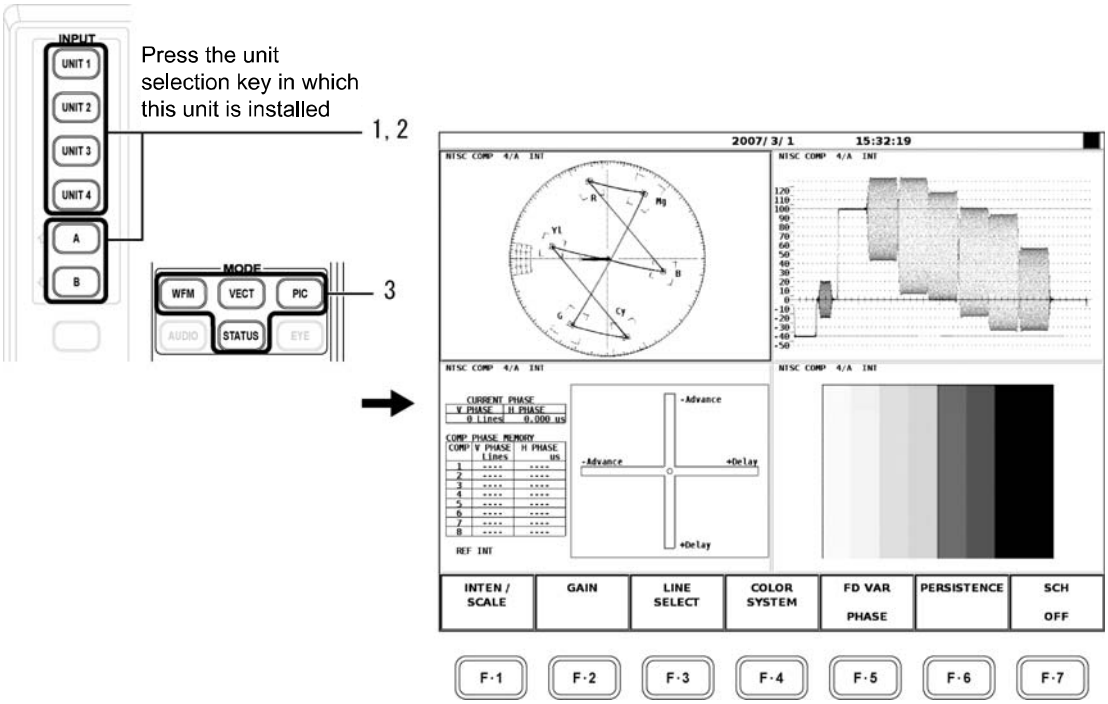
*2 Displayed if 1-screen display is enabled.

4.4 Status Display Menu



5. PROCEDURE

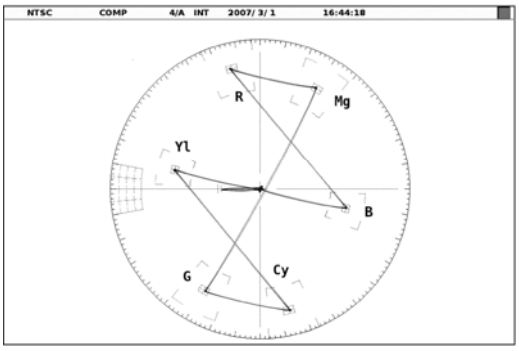
This unit displays and measures analog NTSC/PAL composite video signals.
To display the signal, press the key corresponding to this unit from the front panel, press the A or B channel key, and press the WFM, VICT, PIC, or STATUS mode selection key.



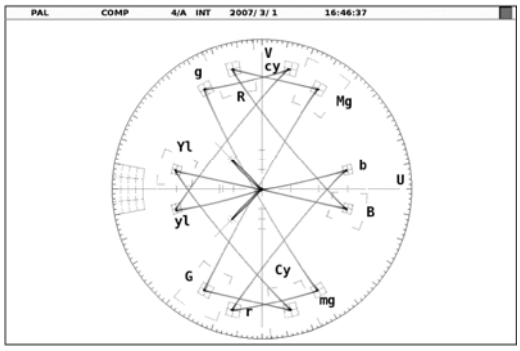
- Display

  The unit automatically detects NTSC or PAL. The detected format is displayed at the upper left of the screen.

NTSC



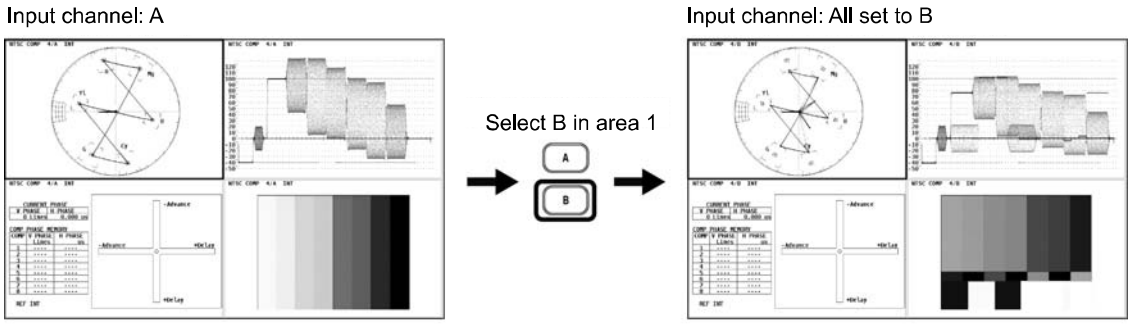
PAL

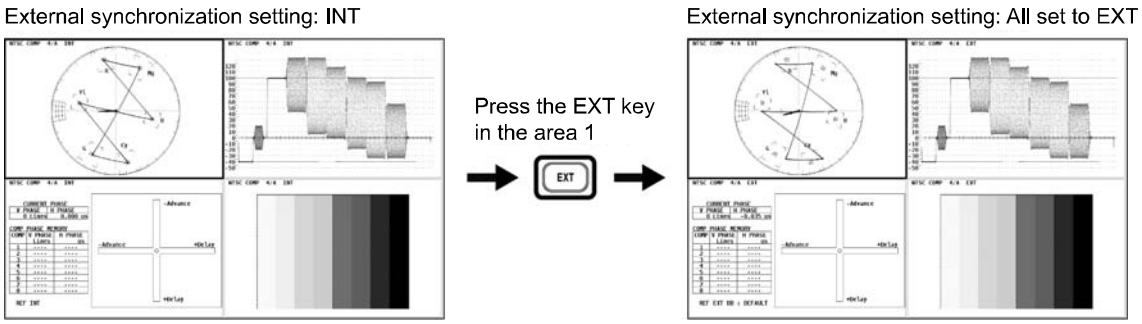


- Multi Screen Display

Setting the Input Channel and External Synchronization

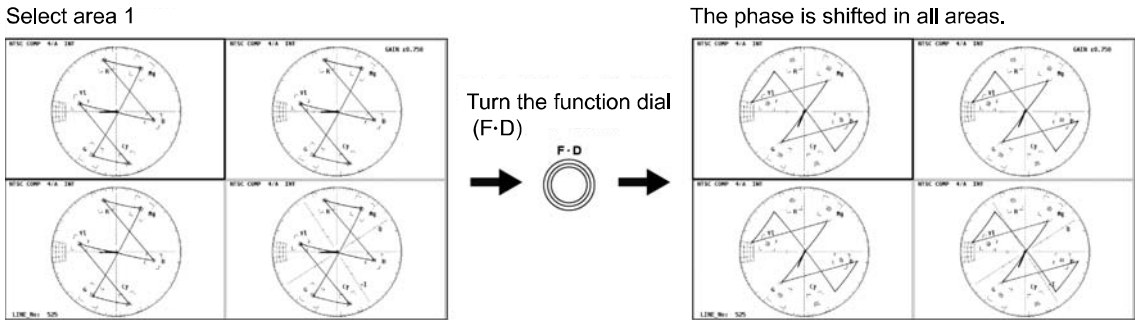
If the vectorscope screen of the same unit is shown in the multi screen display, the input channel and external synchronization (INT/EXT) settings apply to all screens. Therefore, if you change the input channel or external synchronization of a selected screen, the change is also applied to the other screens, and the display changes accordingly.





Phase Display

If multiple vectorscope screens of the same unit are displayed in the multi screen display, the phase is common to all screens. If you change the phase by turning the function dial (F•D) in a selected area, the phase also changes in the other areas.

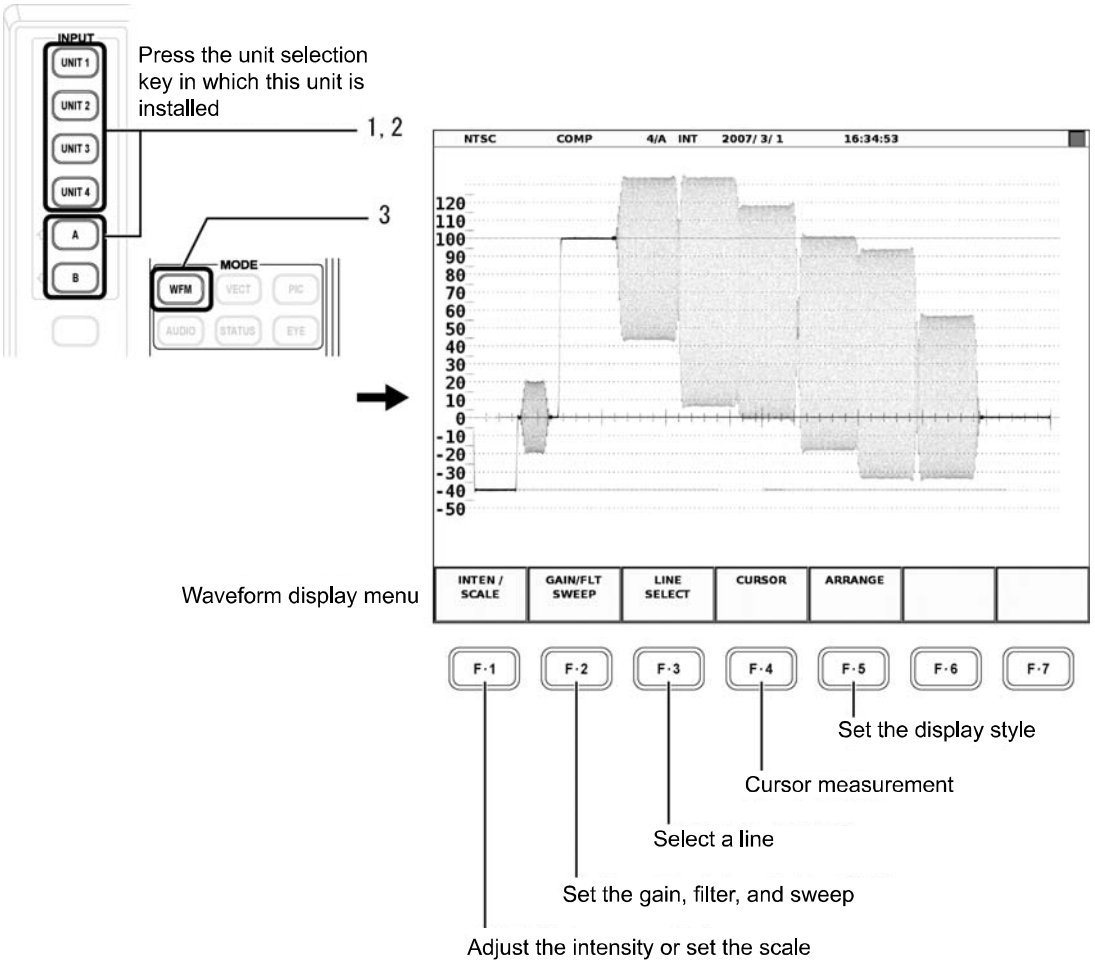


Note

You cannot display input channels A and B at the same time on the multi screen display. Therefore, to display four different input signals at the same time, you have to install four LV 58SER03 units into the LV 5800/7800.

6. WAVEFORM DISPLAY

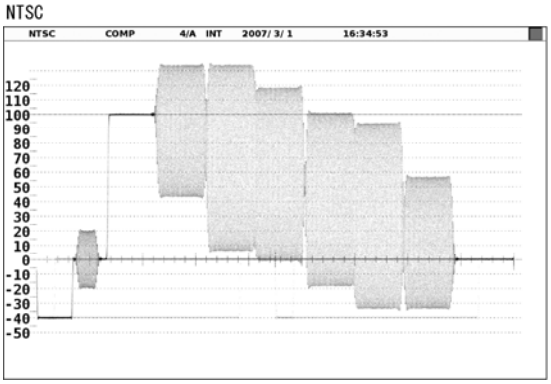
Press the WFM (video signal waveform display) key on the front panel to display the video signal waveform, scale, waveform display menu, and the like.



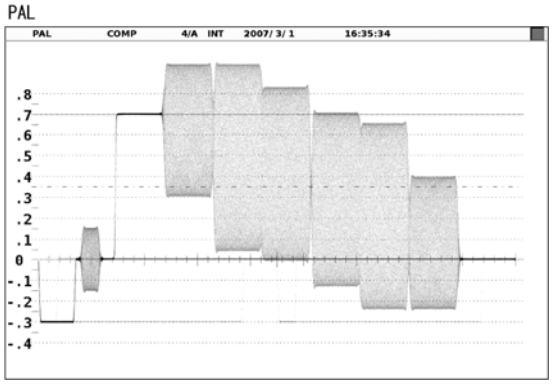
● Displayed Scale

The scale varies depending on the input signal format. The scale is IRE for NTSC and V for PAL.

NTSC

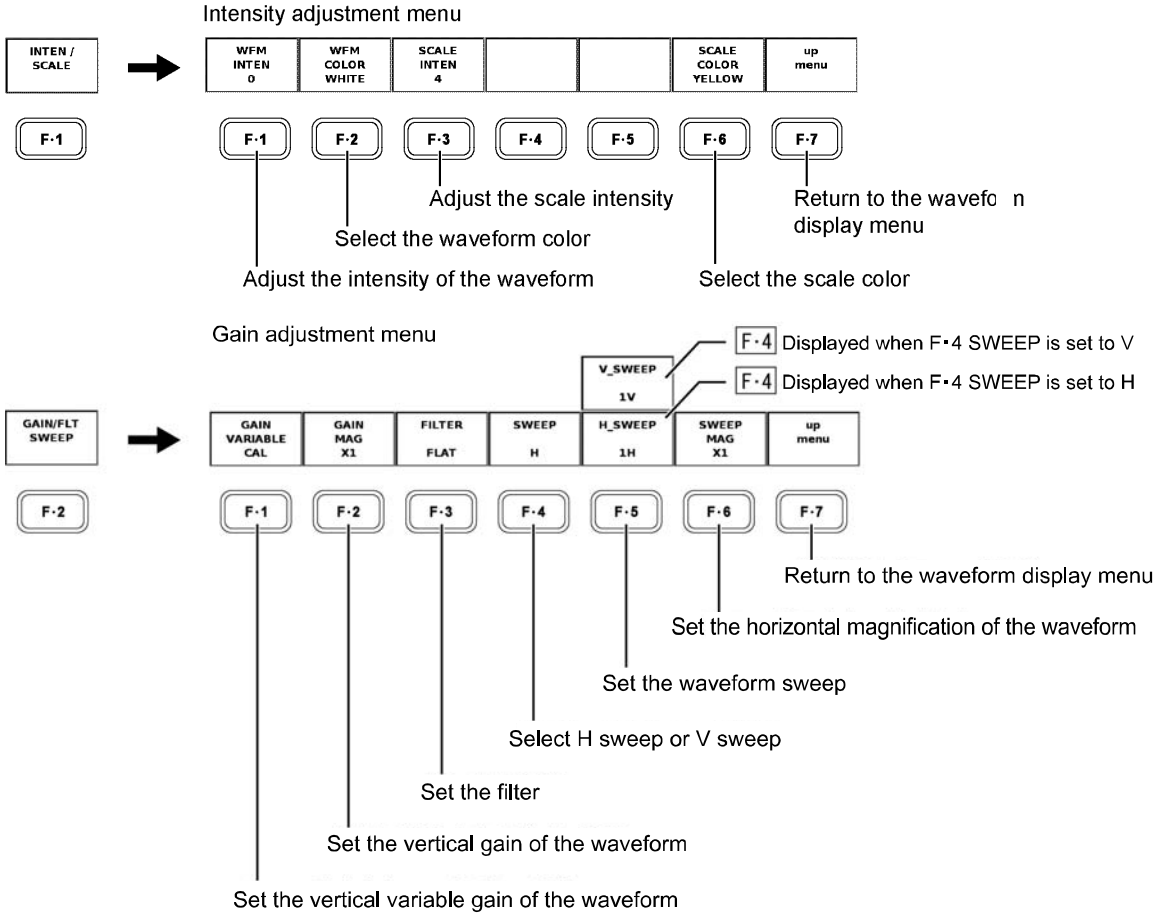


PAL

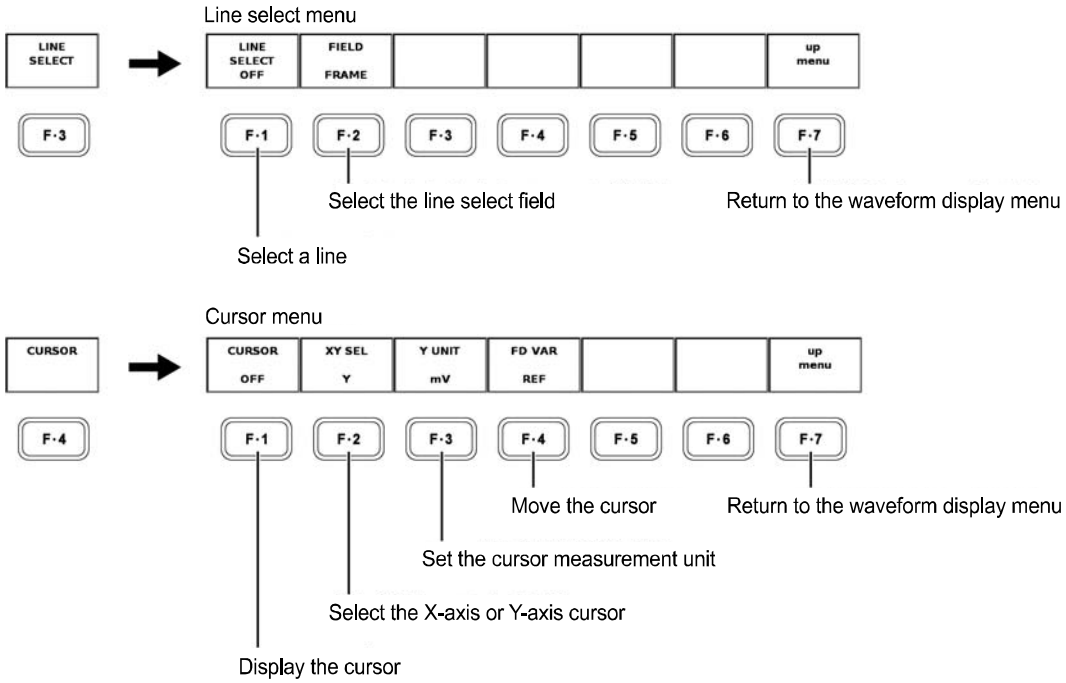


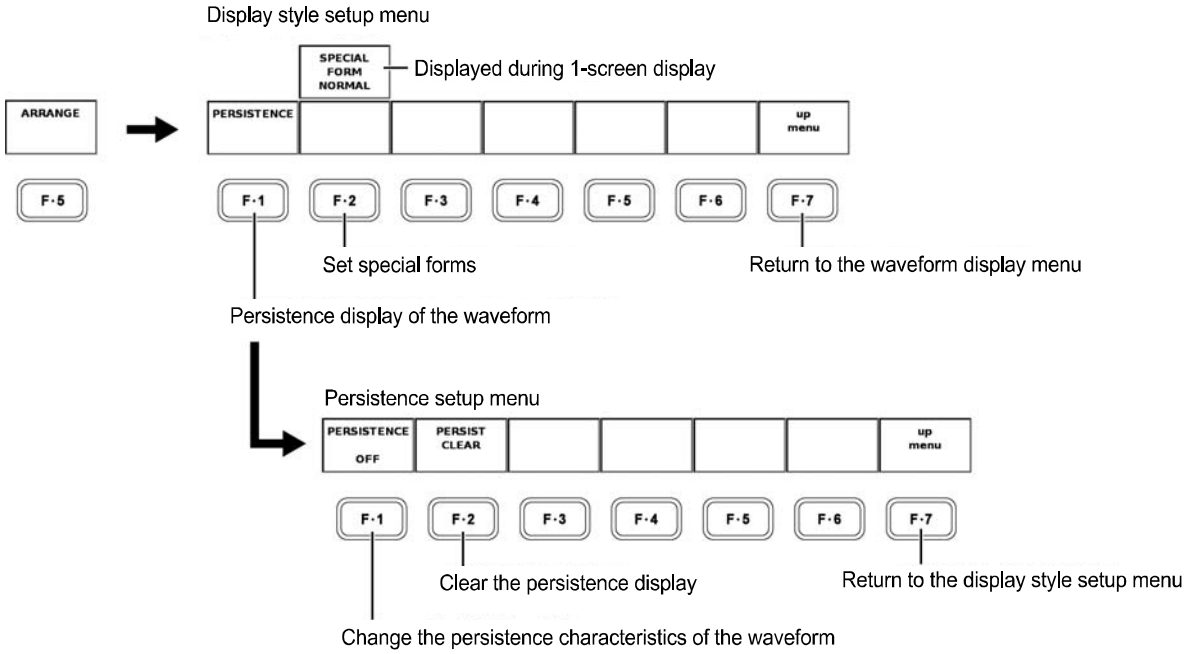
- Menu Hierarchy

This section describes the hierarchy and each menu of the waveform display menu.



[See also]
Setting the Filter → Section 6.2, “Setting the Filter”

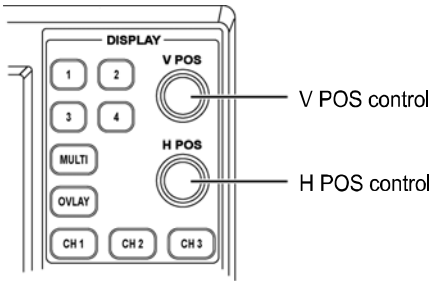




[See also]
4 waveform display of the special form setting → Section 6.3, “4 Parade”

6.1 Setting the Waveform Display Position

Use the V POS (vertical position adjustment) control and H POS (horizontal position adjustment) control on the front panel to adjust the position of the waveform display in the selected display area.



- V POS Control

  Adjusts the vertical display position of the video signal waveform.
  Press the control to reset the vertical display position of the video signal waveform to the reference position.

- H POS Control

  Adjusts the horizontal display position of the video signal waveform.
  Press the control to reset the horizontal display position of the video signal waveform to the reference position.

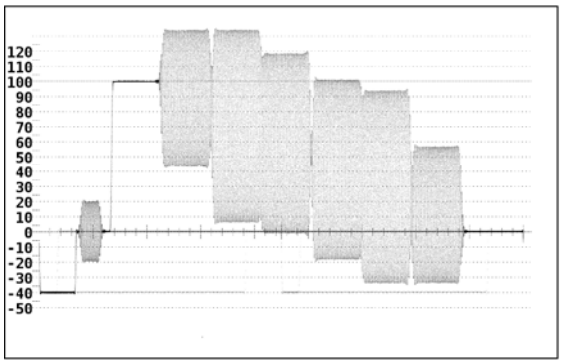
6.2 Setting the Filter

You can select the filter to be applied to the displayed video signal from the following list using F•3 FILTER in the gain adjustment menu.

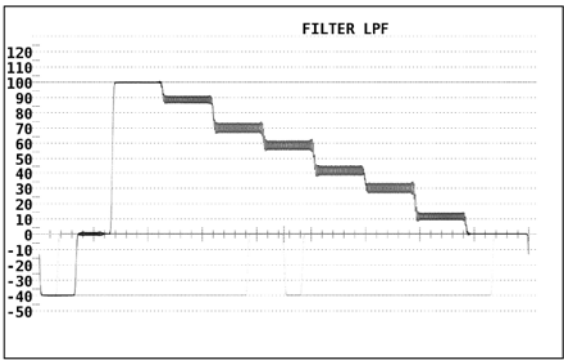
FLAT: Filter with flat frequency characteristics over the entire bandwidth of the input signal.

LOW PASS: Filter that displays the luminosity component of the input signal.

FLAT



LOW PASS



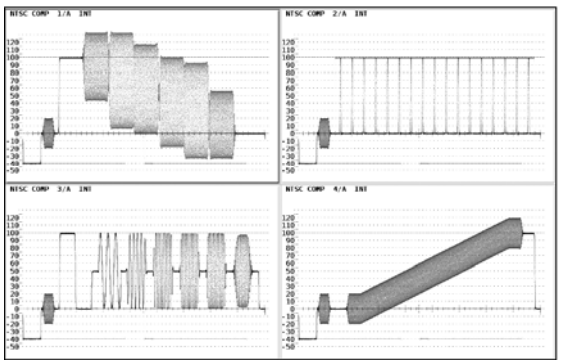
6.3 4 PARADE

If you set F•2 SPECIAL FORM in the display style setup menu to 4 PARADE, the WFM waveforms of different units are displayed side-by-side when multiple LV58SER03 units are installed.

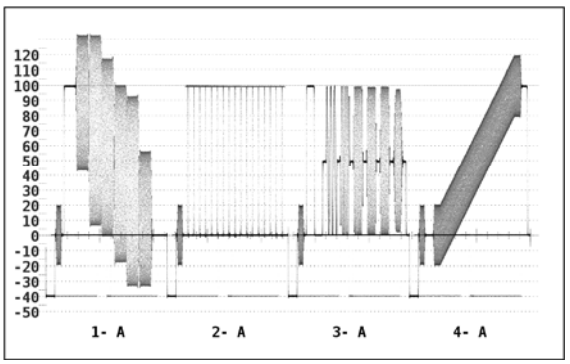
You can display the waveforms of up to 4 units in the 1-screen display by assigning each unit and INPUT A or B to areas 1 to 4 in the 4-screen multi display.

- All four inputs must be of the same format and must be synchronized.
- Valid only during 1-screen display. SPECIAL FORM is not displayed during multi screen display.
- If you set MODE to a mode other than WFM in areas 1 to 4, the waveform in the corresponding areas will not be displayed.
- Input channel A/B cannot be switched during 4 PARADE display.

NORMAL



4 PARADE

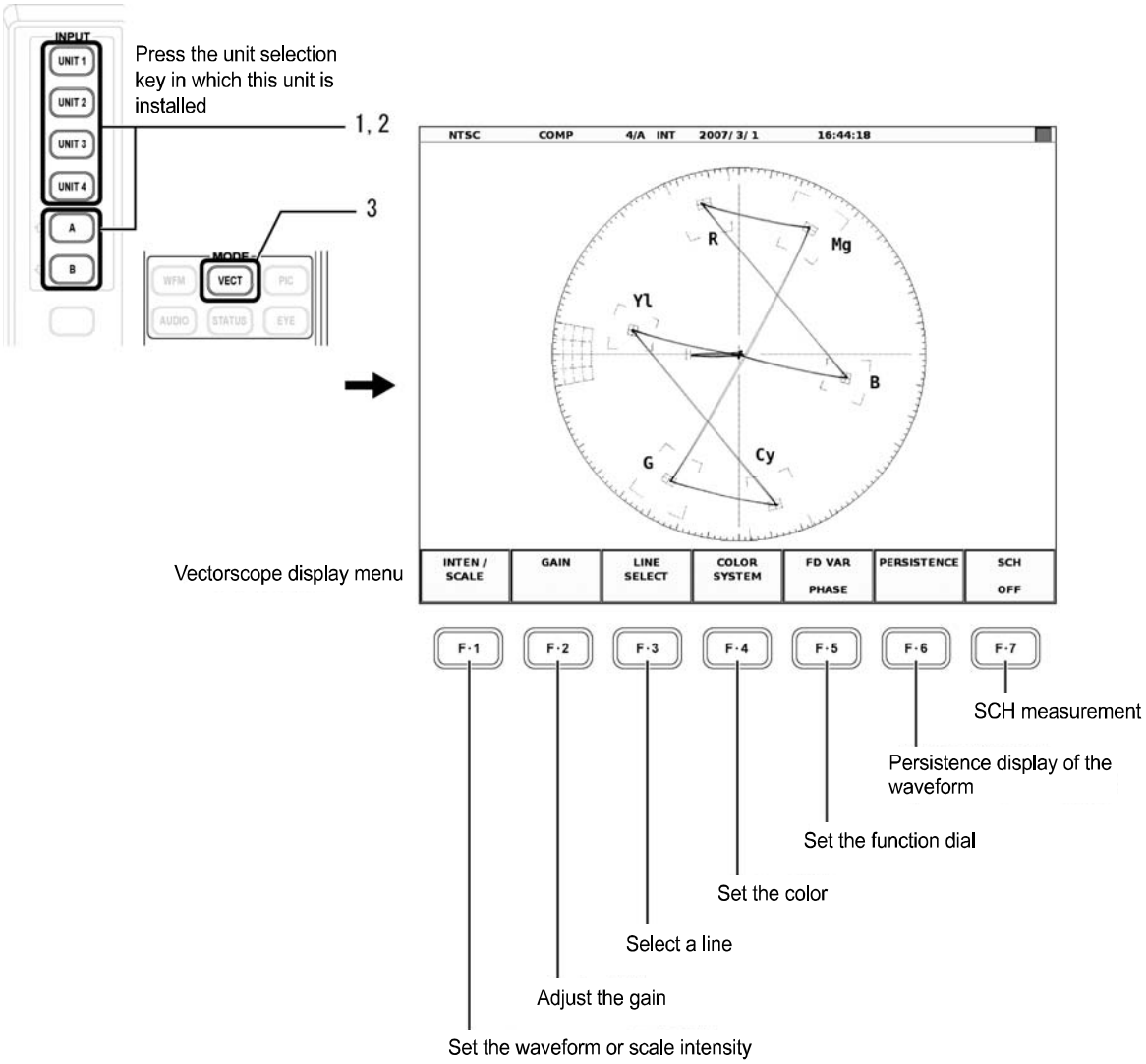


Note

You cannot display input channels A and B at the same time on the 4 PARADE screen. Therefore, to display four different input signals at the same time, you have to install four LV 58SER03 units into the LV 5800/7800.

7. VECTORSCOPE DISPLAY

Press the VECT (vector) key on the front panel to display the vector waveform, scale, vector display menu, and the like.

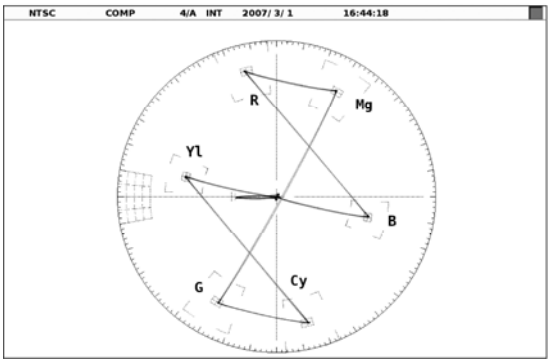


[See also]
Function dial setting → Section 7.3, “Setting the Function Dial”
SCH measurement → Section 7.4, “SCH Measurement”

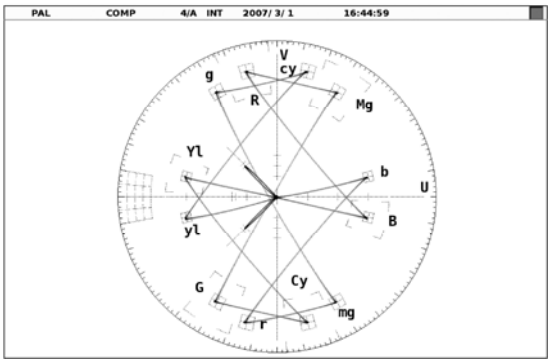
- Displayed Scale

  The scale varies depending on the input signal format.

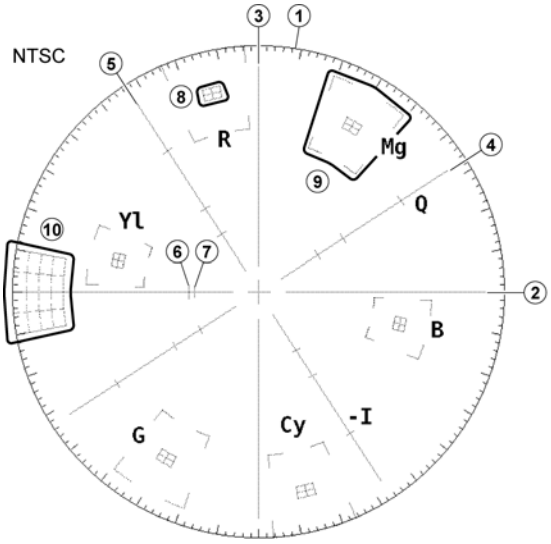
NTSC

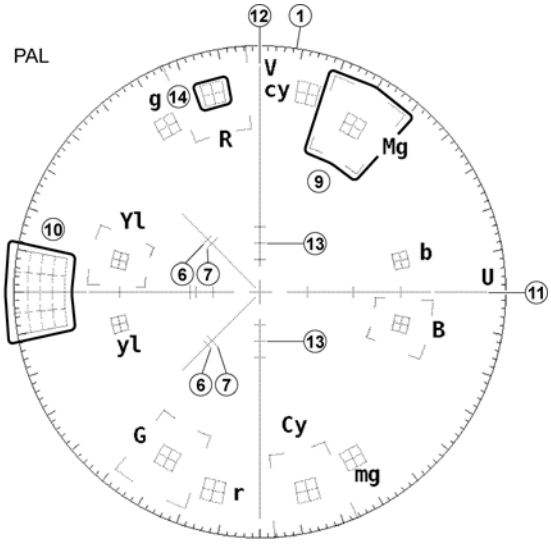


PAL



- Scale Explanation



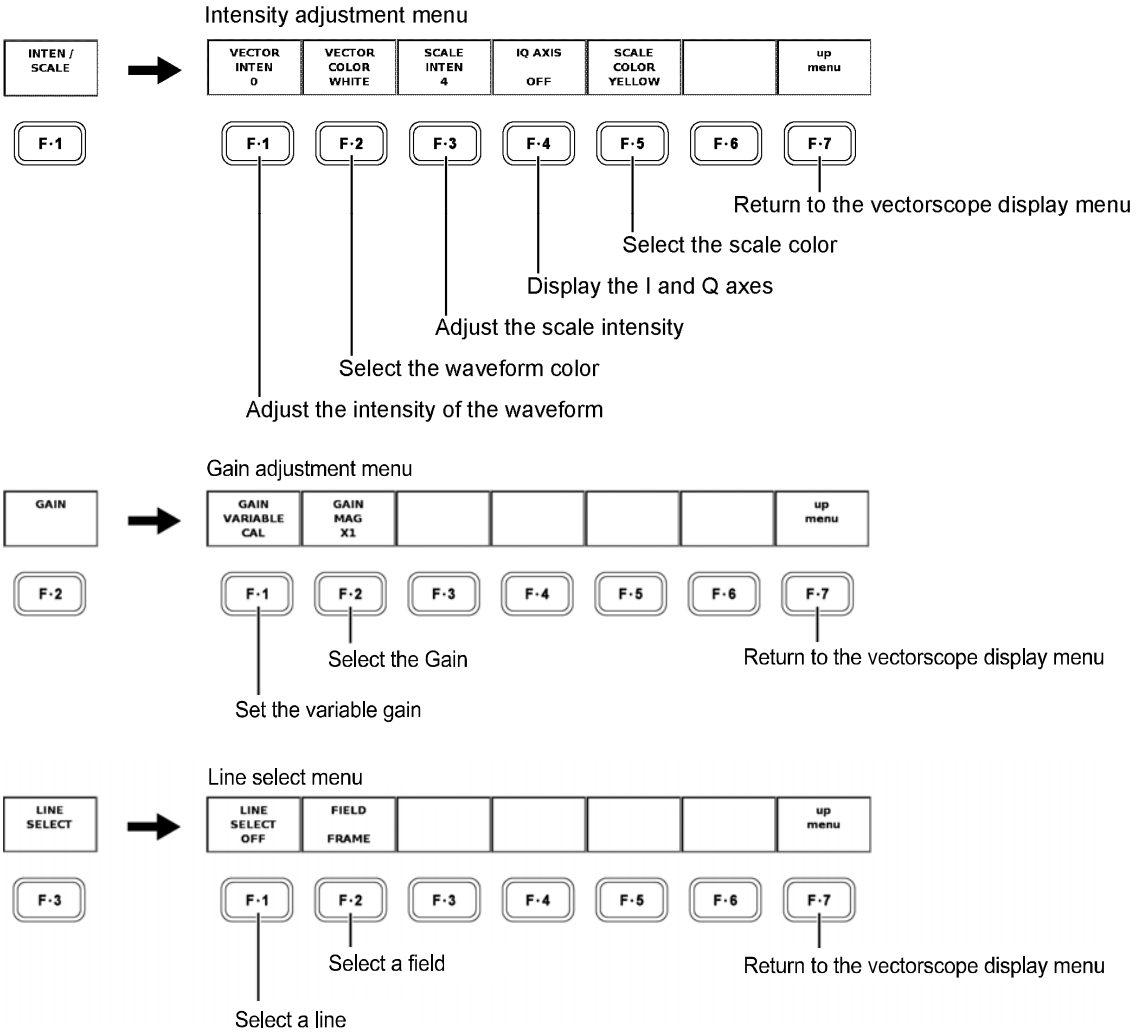


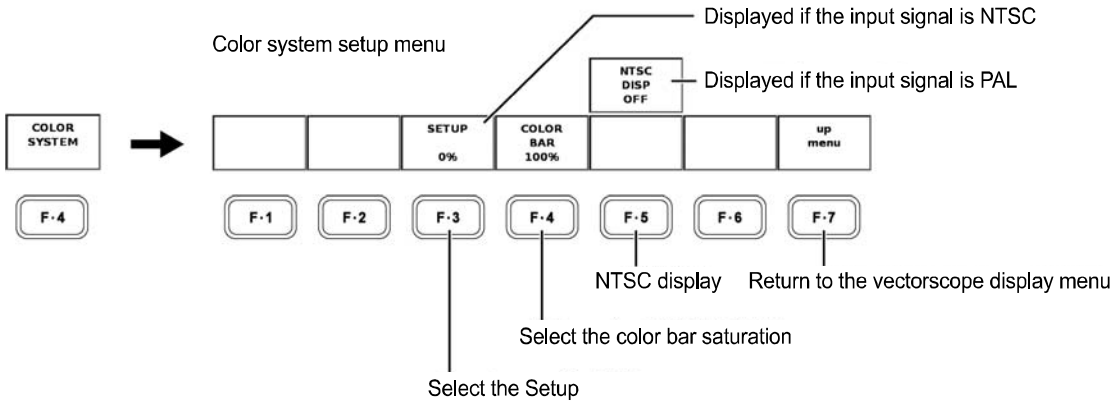
No.	Description
1	Fixed amplitude circle. This is the amplitude when the amplitude of the input chrominance signal is 0.883 Vp-p. Each major division is 10 °, and each minor division is 2 °. This is used during phase difference measurements.
2	The B-Y axis.
3	The R-Y axis.
4	The Q axis. Displayed when IQ AXIS on the intensity adjustment menu is set to ON. The scale on the axis represents vertical lines for each color.
5	The I axis. Displayed when IQ AXIS on the intensity adjustment menu is set to ON. The scale on the axis represents vertical lines for each color.
6	The burst level of a 100/7.5/100/7.5 color bar.
7	The burst level of a 100/0/100/0 color bar.
8	Tolerances of ±2.5 IRE units in amplitude and ±2.5 ° in phase are displayed for each color in the color bar. The phase of each color is as follows: Mg: 60.7 °. R: 103.5 °. Yl: 167.1 °. G: 240.7 °. Cy: 283.5 °. B: 347.1 °.
9	Tolerances of ±20 % in amplitude and ±10 ° in phase are displayed for each color in the color bar.

No.	Description
10	The scale used to measure differential gain (DG) and differential phase (DP). The differential gain and differential phase are measured using staircase signals that have chrominance signals superimposed. The scale is 0 to 20 % in the amplitude direction (the perimeter is 0%) and ±10 ° in the phase direction.
11	The U axis. The scale on the axis represents vertical lines for each color.
12	The V axis. The scale on the axis represents vertical lines for each color.
13	The vertical line for the burst level of a 100/0/100/0 color bar.
14	Tolerances of ±5 % in amplitude and ±3 ° in phase are displayed for each color in the color bar. The phase of each color is as follows: Mg: 60.7 °, R: 103.5 °, Yl: 167.1 °, G: 240.7 °, Cy: 283.5 °, and B: 347.1 °. mg: 299.3 °, r: 256.5 °, yl: 192.9 °, g: 119.3 °, cy: 76.5 °, and b: 12.9 °.

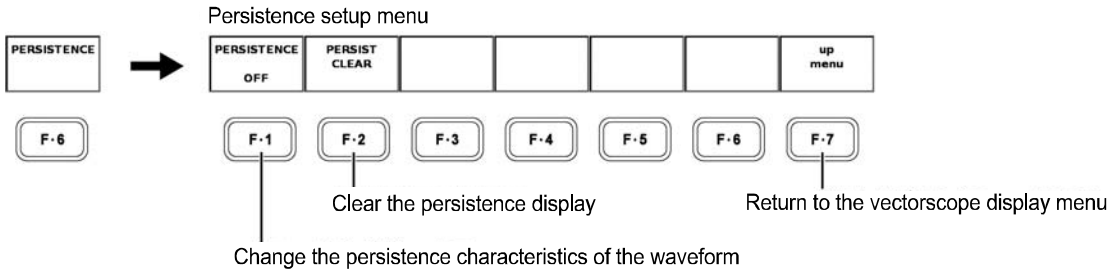
- Menu Hierarchy

This section describes the hierarchy and each menu of the vectorscope display menu.



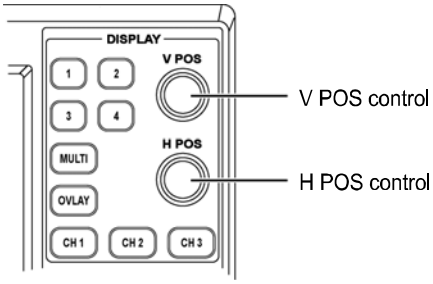


[See also]
NTSC display → Section 7.5, “NTSC Display”



7.1 Setting the Waveform Display Position

Use the V POS (vertical position adjustment) control and H POS (horizontal position adjustment) control on the front panel to adjust the position of the waveform in the selected display area.



- V POS Control

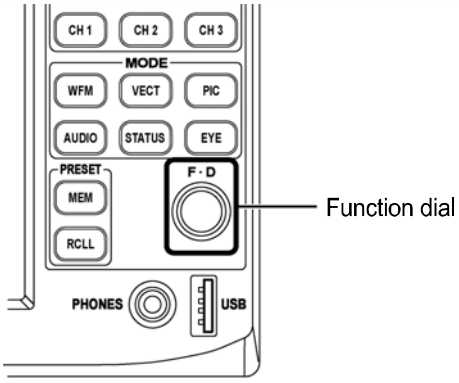
  Adjusts the vertical display position of the vector waveform.
  Press the control to reset the vertical display position of the vector waveform to the reference position.

- H POS Control

  Adjusts the horizontal display position of the vector waveform.
  Press the control to reset the horizontal display position of the vector waveform to the reference position.

7.2 Setting the Phase

You can adjust the phase of the vector waveform using the function dial (F•D) on the front panel.
Turn the function dial (F•D) to shift the phase or press it to reset the phase to the reference position.



When adjusting the phase, F·5 FD VAR in the vectorscope display menu must be set to PHASE.
If multiple vectorscope screens of the same unit are displayed in the multi screen display, the phase is common to all screens.

[See also]
Notes concerning the phase display → Chapter 5, “PROCEDURE”
Setting the phase → Section 7.3, “Setting the Function Dial”

7.3 Setting the Function Dial

You can set how the unit operates when the function dial (F·D) is turned using F·5 FD VAR in the vectorscope display menu.

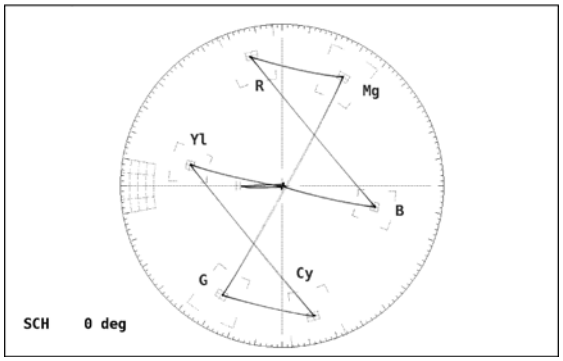
PHASE : Shift the vector phase.
LINE SEL : Select a line.

To select a line using F·1 LINE SELECT in the line select menu, F·5 FD VAR in the vectorscope display menu must be set to LINE SEL. If F·5 FD VAR is set to PHASE, you will not be able to select a line when you turn the function dial even if you press F·1 LINE SELECT to select ON. The phase will be shifted instead.

7.4 SCH Measurement

You can measure the phase difference between the horizontal sync signal and color burst signal by pressing F·7 SCH in the vectorscope display menu to select ON.
The measured value is displayed at the lower left of the screen.

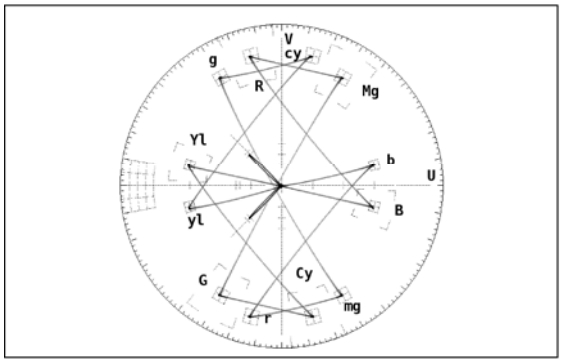
ON



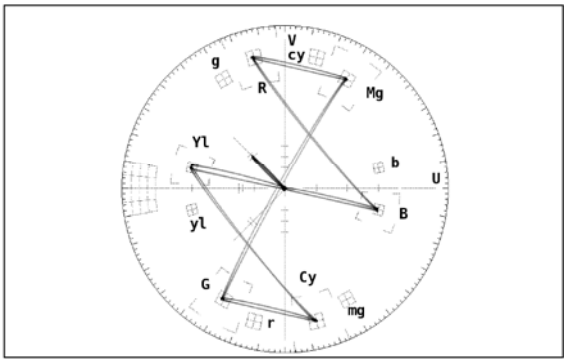
7.5 NTSC Display

If you press F·5 NTSC DISP in the color system setup menu to select ON when the input signal is PAL, the V-axis polarity is inverted every other line to produce NTSC display that does not alternate every other line.

OFF

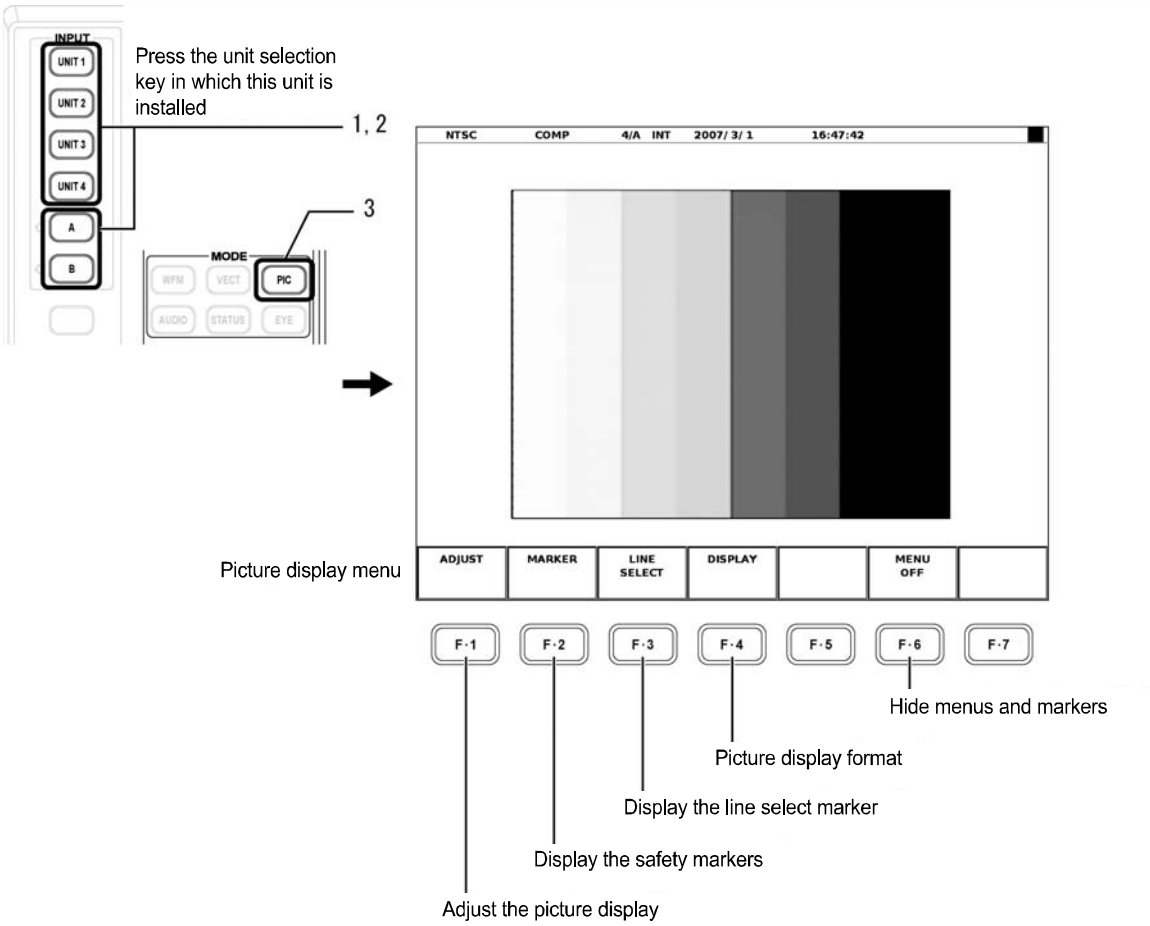


ON



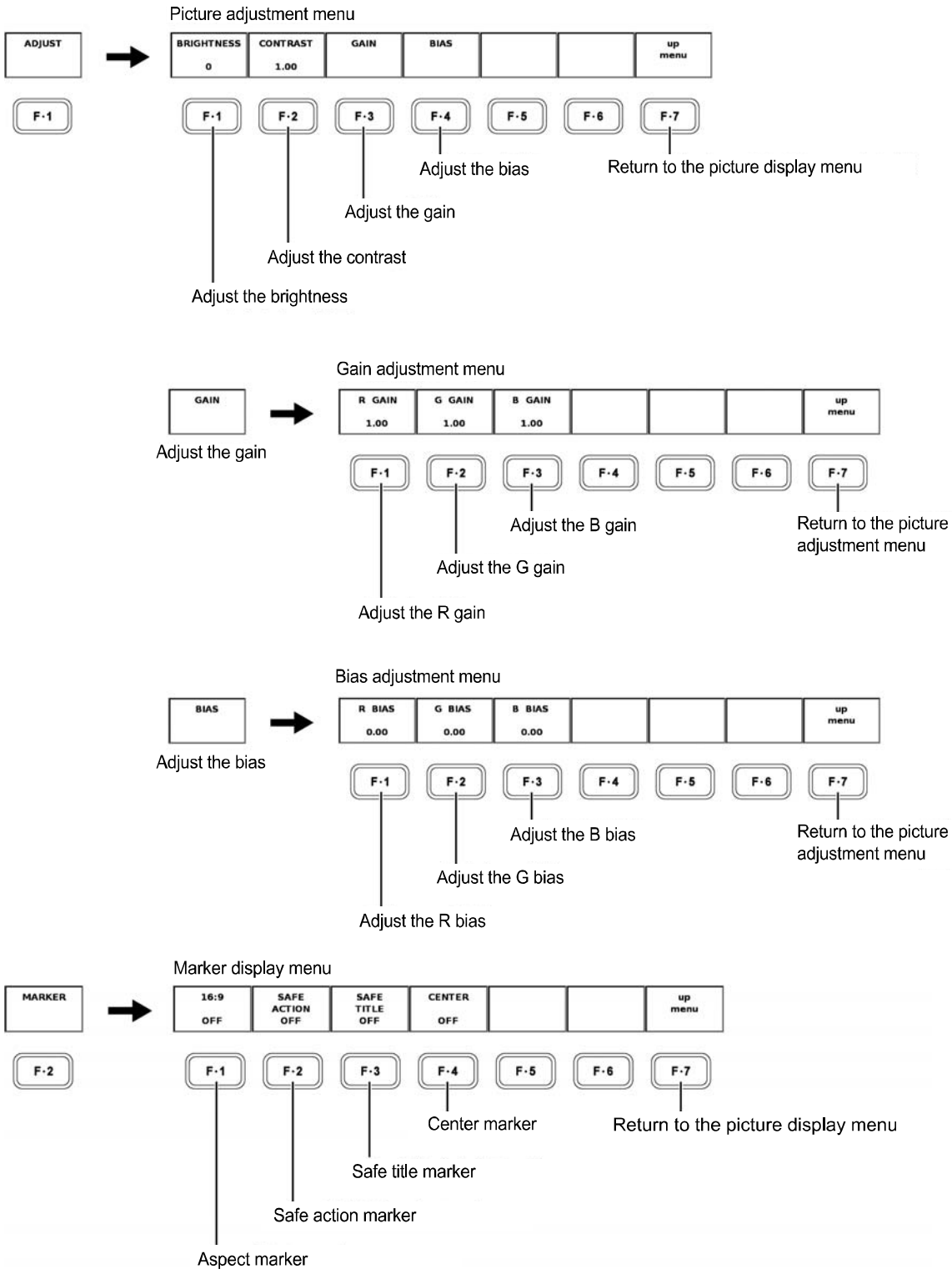
8. PICTURE DISPLAY

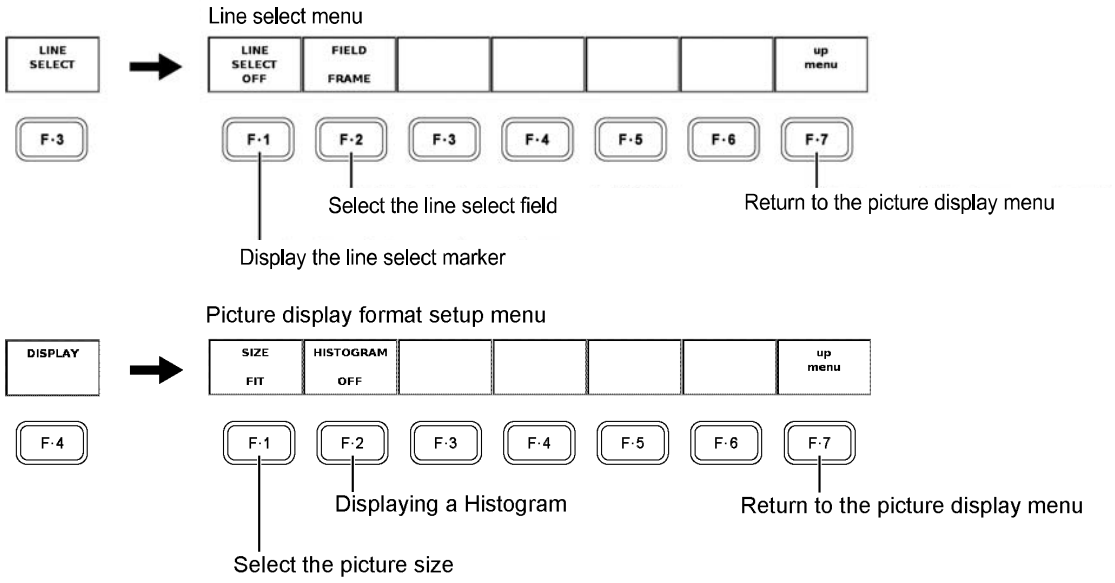
Press the PIC (picture display) key on the front panel to display the picture, picture display menu, and the like.



- Menu Hierarchy

  This section describes the hierarchy and each menu of the picture display menu.




Line select menu
LINE SELECT
LINE SELECT OFF
FIELD FRAME
up menu
F·3
F·1
F·2
F·3
F·4
F·5
F·6
F·7
Select the line select field
Return to the picture display menu
Display the line select marker
Picture display format setup menu
DISPLAY
SIZE FIT
HISTOGRAM OFF
up menu
F·4
F·1
F·2
F·3
F·4
F·5
F·6
F·7
Displaying a Histogram
Return to the picture display menu
Select the picture size

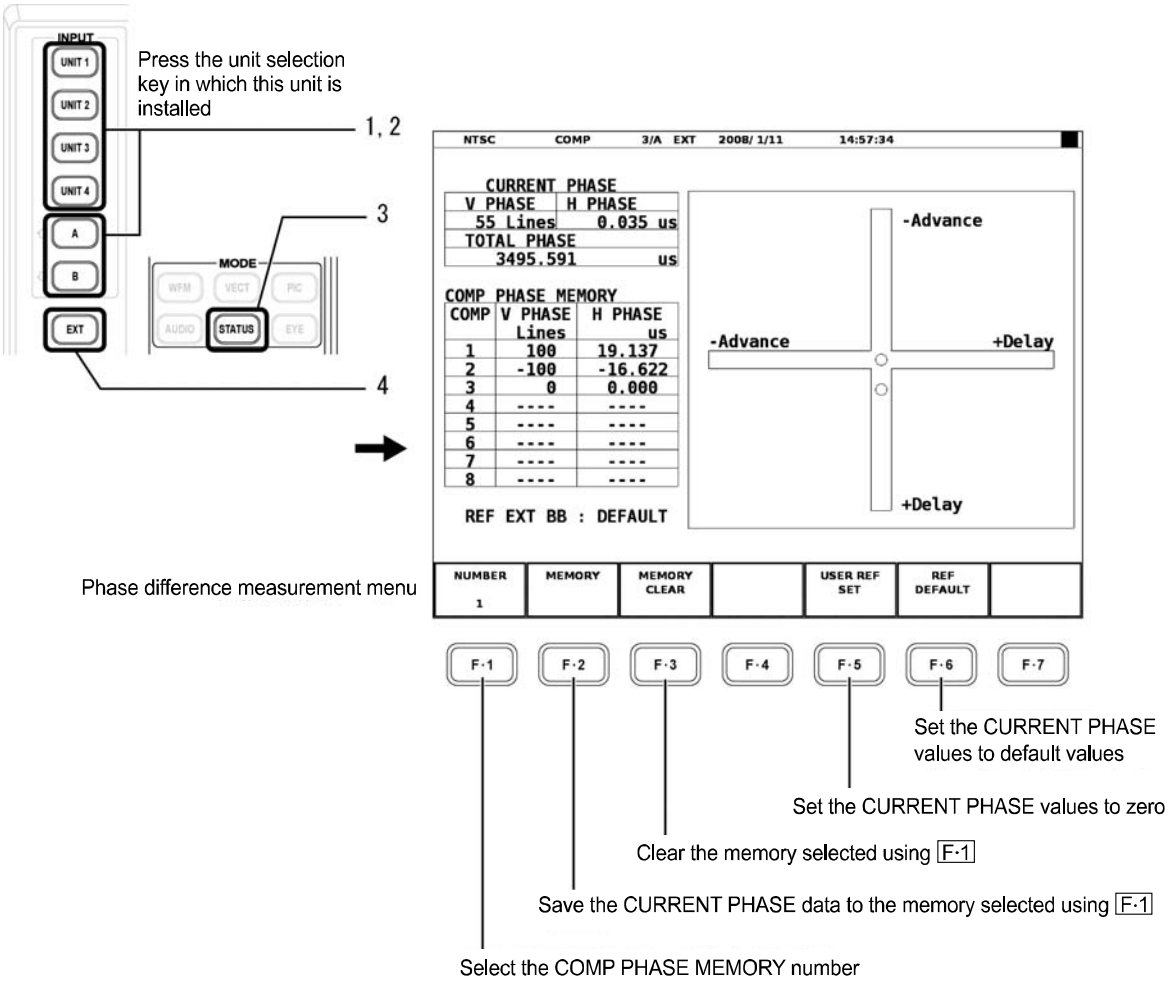
9. STATUS DISPLAY

Carry out the procedure below to measure the phase difference between the composite video signal and external sync signal.

1. Apply an NTSC/PAL composite video signal to COMPOSITE INPUT A or B on the rear panel of this unit.
2. Apply an NTSC/PAL black burst signal to EXT REF on the rear panel of the LV 5800/7800.

   Make sure the format of the composite video signal and external sync signal is the same.

Press the STATUS key followed by the EXT (external synchronization) key to display the phase difference measurement screen and phase difference measurement menu used to measure the phase difference between the composite video signal and external sync signal.



* If you press the EXT key in the multi screen display, all the other screens will also be set to external synchronization.

● Screen Description

・CURRENT PHASE

Displays the phase difference between the current composite video signal and external sync signal.

V PHASE:	The phase difference is displayed in unit of lines.
H PHASE:	The phase difference is displayed in unit of time (us).
TOTAL PHASE:	The phase difference sum total of V PHASE and H PHASE is displayed in unit of time (us).

・COMP PHASE MEMORY

Up to eight points of the phase difference measured using CURRENT PHASE can be stored. This feature is used such as when synchronizing the phase while changing the system using a switcher or the like.

Press F•2 MEMORY to store the current measured value to the number selected by F•1 NUMBER.
Press F•3 CLEAR to clear the measured value that is stored to the number selected by F•1 NUMBER.

・REF

Displays the status of the sync signal.

REF INT:	Internal synchronization.
REF EXT BB:DEFAULT:	External synchronization with the phase difference set to default (*1)
REF EXT BB:USER REF:	External synchronization with the phase difference set to user defined (*2)
REF NO SIGNAL:	External synchronization without an external sync signal.

*1 Press F•6 REF DEFAULT to set the phase difference (CURRENT PHASE) to the default setting. The default setting is defined as the setting in which the phase difference is assumed to be zero when NTSC/PAL black burst signal is applied and cables of the same length are connected to COMPOSITE INPUT and EXT REF.

*2 Press F•5 USER REF SET to set the phase difference (CURRENT PHASE) to the zero. This function allows the reference to be set arbitrarily to match your system environment.

・Phase Difference Graphical Display

The phase difference is displayed graphically at the right of the screen. The vertical and horizontal axes represent V PHASE and H PHASE, respectively. If the composite video signal lags the external sync signal, +Delay is indicated. If the composite video signal is ahead of the external sync signal, -Advance is indicated.

In both the V direction and H direction, approximately up to +1/2 frame with respect to the center is shown by a Delay axis, on the other hand approximately up to -1/2 frame with respect to the center is shown by an Advance axis.
The display range of a Delay axis and an Advance axis is as follows.

Format	Displayed with an Advance axis			Displayed with a Delay axis				
	V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]
NTSC	-262	-63.518	~	0	0	~	262	0
PAL	-312	-63.962	~	0	0	~	312	0

The phase difference is indicated using two circles. If the circle is at the center, this indicates no phase difference. The circle is displayed in green in this case. If there is a phase difference, the circle is displayed in white.
The conditions in which the circle becomes green (indicating no phase difference) are as follows:

V PHASE: 0 line
H PHASE: ±3 clocks (8 Fsc clock reference)
(±0.105 us (for NTSC), ±0.085 us (for PAL))

10. FIRMWARE REVISION HISTORY

This manual was written for the following firmware versions:
• Ver. 6.2 on the LV 5800
• Ver. 1.1 on the LV 7800
To confirm the version, press a key in order of SYS → F･5 SYSTEM INFORMATION.

- Ver. 5.9 on the LV 5800 / Ver. 1.1 on the LV 7800
  ・A histogram display feature has been added to the picture display of the LV 58SER03.
- Ver. 4.7 on the LV 5800
  ・The video signal waveform and vectorscope displays were changed for the LV 58SER03. WHITE and GREEN are now selectable for the display color.
- Ver. 3.7 on the LV 5800
  ・The phase difference display function is improved for the LV 58SER03. The horizontal sweep rate is changed to ±1H.
- Ver. 1.7 on the LV 5800
  ・The LV 58SER03 can be used.

Following information is for Chinese RoHS only

所含有毒有害物质信息

部件号码：LV 58SER03

此标志适用于在中国销售的电子信息产品,依据2006年2月28日公布的《电子信息产品污染控制管理办法》以及SJ/T11364-2006《电子信息产品污染控制标识要求》，表示该产品在使用完结后可再利用。数字表示的是环境保护使用期限，只要遵守与本产品有关的安全和使用上的注意事项，从制造日算起在数字所表示的年限内，产品不会产生环境污染和对人体、财产的影响。
产品适当使用后报废的方法请遵从电子信息产品的回收、再利用相关法令。
详细请咨询各级政府主管部门。

产品中有毒有害物质或元素的名称及含量

部件名称 Parts	有毒有害物质或元素 Hazardous Substances in each Part					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
实装基板	×	○	○	○	○	○
主体部	×	○	○	○	○	○
附件	○	○	○	○	○	○
包装材	○	○	○	○	○	○

备注）

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 规定的限量要求以下。

×：表示该有毒有害物质或元素至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。

Ver.5

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Nov. 24, 2009 Ver.4 (FW Ver.6.2)