

LEADER

LT 4400 MULTIFORMAT VIDEO GENERATOR

LT 4400 OP70 FULL SIZE LOGO OPTION

INSTRUCTION MANUAL

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GENERAL SAFETY SUMMARY

■ To Avoid Personal Injury

It is recommended that only qualified personnel with technical knowledge use this instrument only after reading and fully understanding all functions of the instrument described this instruction manual.

This instrument is not designed and manufactured for consumers.

If you do not have enough knowledge on electricity, to avoid personal injury and prevent damage to this product, please be sure to use this product only under the supervision of an engineer who has sufficient knowledge about electronics.

■ Precautions on Contents

Should you find the contents in this manual and any of its technical terms confusing, please feel free to contact your local LEADER agent.

■ Symbols and Terms

Following terms and symbols indicate necessary warnings and cautions used in this manual and on the product are there for safe operation.

<p>< Symbol ></p> 	<p>The sections where this symbol is marked in this manual or instrument, if not correctly performed or practiced, could result in personal injury or cause serious danger to the instrument. Misuse could also produce unintentional movement to create an operational impediment on the instrument or other products that might be connected to it.</p> <p>Be sure to refer to the safety precautions in this manual to safely use the part of the instrument where the symbol is marked.</p>
<p>< Term ></p>  WARNING	<p>Warning statements identify warning conditions that if disregarded or not correctly performed or adhered to, could result in serious personal injury or even loss of life.</p>
<p>< Term ></p>  CAUTION	<p>Caution statements identify caution conditions that if disregarded or not correctly performed or adhered to, could result in personal injury or damage to the instrument.</p>

GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid operator's injury and loss of life and prevent damage and deterioration to this instrument. To avoid potential hazards, use this product as specified.



■ Warnings on the Cases and Panels of the Instrument

Operator should not remove any cases or panel for any reasons. If you touch inside the instrument it could result personal shock or fire hazard. Refrain from spilling any liquid on or inserting anything flammables or piece of metal into the ventilation of the instrument. Such actions could cause fire, shock, malfunction and be an accident hazard while the power is on.

■ Warnings on Power Line

Make sure to connect only to the rated power line voltage. Excess voltage may cause fire. Confirm the voltage of the commercial power line before connecting the AC power cord. The power frequency of the power line should be 50/60 Hz.

Warning on the Power Cord

Use only the optional power cord that is attached to this instrument. The use of the power cord other than that attached could cause fire hazard. If the attached cord is damaged, stop using it and contact your local LEADER agent. Should you use a damaged cord, it could cause a shock or create a fire hazard. When you pull out the cord be sure to hold it by plug and pull from the socket not by holding the cord wire.

■ Warning on Fuse

When the fuse is melted the instrument stops operation. If the fuse melted, please contact your local LEADER agent.

■ Warning on Installation Environment

● About the Operating Temperature Range

Operate the instrument between the temperature range of 0 to 40 °C. Operating the instrument at higher temperatures could cause a fire hazard. Be sure not to obstruct air circulation.

Rapid changes of temperatures from cold to warm can create internal moisture or condensation and could damage the instrument. If there is a possibility of moisture condensation, allows the instrument to sit for 30 minutes without the power on.

GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid operator's injury and loss of life and prevent damage and deterioration to this instrument. To avoid potential hazards, use this product as specified.



- About the Operating Humidity Range

Operating humidity range is $\leq 85\%$ RH. (without condensation)

Do not operate the instrument with wet hands. This could cause a shock and fire hazard.

- About the Operation in the Presence of Gasses

Operating the instrument in and near the presence or storage locations of flammable, explosive gasses or fumes could create an explosion and fire hazard. Do not operate the instrument anywhere near such environments.

- Avoid Insertions

Do not insert metals or flammable objects or drop liquid on or into the instrument. To do so could cause fire, shock, malfunction and create a dangerous accident hazard.

- Warning While Operating

While operating the instrument if smoke, fire, or a bad smell occurs, turn off the instrument at once for it could cause a fire hazard. When such a case occurs, turn off the power switch and pull the plug of the cord from the plug socket. Contact your local LEADER agent after confirming there is no fire.

- Warning About Ground

The instrument has a ground terminal to avoid electric shock hazard and to protect the instrument from damage. Ensure that the product is properly grounded for safe operation.

- Warnings Concerning the LCD Panel

Glass is used on the LCD panel. If you break the glass, the fragments may cause injury. Do not apply strong shock to the glass or damage the surface of the glass with sharp metal objects.

GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid operator's injury and loss of life and prevent damage and deterioration to this instrument. To avoid potential hazards, use this product as specified.



■ Caution on Input/Output Terminals

Input terminals are rated with a maximum input. Do not supply an input over the specified rating in the standard section of the instruction manual. Also, do not supply external power to Output terminal, this could cause the instrument to malfunction.

■ Caution on AC Adaptor

The instrument that uses the AC adaptor should use the thing surely specified. If things other than specification are used, there is danger of the instrument malfunction and a fire.

■ Caution When Not Using the Instrument For a Long Time

Make sure to disconnect the power cord from the socket when you do not use the instrument for a long time.

■ Caution on Connection of the Instrument and a Display

While the instrument is being connected with a ground terminal of the display, connect or disconnect the signal cable .

By connecting the ground of the display with the instrument, the output part of the instrument becomes difficult to break easily.

Be careful especially, when you connect the display under development.

Connect the ground by the following method.

- The ground terminal of the instrument connects with the ground of the display.

GENERAL SAFETY SUMMARY

■ Maintenance

This instrument is produced under the strictest quality controls at the factory, but accuracy may gradually deteriorate due to worn components.

Therefore, periodic calibration should be performed.

Moreover, if troubles etc. are found in operation, the repair is needed.

When service or calibration is required, contact your local LEADER agent.

■ Routine Maintenance

Remove the power cord plug from the socket when cleaning the instrument.

Avoid the use of thinner or benzene solvents for cleaning cases, panels and knobs since this might remove the paint or damage plastic surfaces.

Wipe cases, panels, and knobs lightly with a soft cloth dampened with neutral detergent.

Do not allow water, detergent, or other foreign objects to enter the instrument while cleaning.

If a liquid or metal object enters the instrument, it can cause electric shock or fire.

■ About the Mark by Directive of WEEE in Europe



The EU WEEE Directive applies to this product and its accessories. When disposing of this product or its accessories, follow the regulations in your country or region.

(WEEE Directive: Waste Electrical and Electronic Equipment)

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Please conform to the above warnings and cautions for safe operation. There are cautions in each area of this instruction manual, so please conform to each caution.

If you have any questions about this manual, please feel free to contact your local LEADER agent.

1. INTRODUCTION

Thank you for purchasing LEADER’s measuring instruments.

Please read this instruction manual carefully to ensure correct and safe operation.

If you have any difficulties or questions on how to use the instrument after you have read this manual, please feel free to contact your local LEADER agent.

After you have read the manual, keep the manual in a safe place for quick reference.

1.1 Scope of Warranty

This LEADER instrument has been manufactured under the strictest quality control guidelines. LEADER shall not be obligated to furnish free service during the warranty period under the following conditions.

- 1 Repair of malfunction or damages resulting from fire, natural calamity, or improper voltage applied by the user.
- 2 Repair of an instrument that has been improperly repaired, adjusted, or modified by personnel other than a factory-trained LEADER representative.
- 3 Repair of malfunctions or damages resulting from improper use.
- 4 Repair of malfunctions caused by devices other than this instrument.
- 5 Repair of malfunctions or damages without the presentation of a proof of purchase or receipt bill for the instrument.

1.2 Operating Precautions

1.2.1 Line Voltage and Fuse



Confirm that the power line voltage is correct before connecting the power cord.

Usable AC voltage range of an accessory AC adaptor is 100 V to 250 V. The power frequency of the power line should be 50/60 Hz.

If the fuse melted, please contact your local LEADER agent after confirming there is no fire. (A fuse is in the power supply circuit inside the instrument.)

The voltage range of the DC power supply is 10 V to 18 V. Do not apply voltage exceeding this range as it can cause a malfunction or fire.

1.2.2 Maximum Allowable Input Voltage



The maximum allowable input voltage to the input connectors is shown in the table 1-1 below. Do not apply excessive voltage to prevent damage to the instrument.

Table 1-1 Maximum allowable input voltage

Input Connector	Maximum Input Voltage
GENLOCK	$\pm 4.5V$ (DC + peak AC)

1. INTRODUCTION

1.2.3 Shorting the Output Connectors, Reverse Voltage

Do not short any output connectors to prevent damage the instrument. Do not supply external power to Output terminal, this could cause the instrument to malfunction. Otherwise, you may damage the instrument or other property.

1.2.4 Mechanical Shock

Please be careful not to expose the instrument to other forms of severe mechanical shock as this product contains shock sensitive precise parts.

1.2.5 Damage Caused by Static Electricity

Electronic parts are susceptible to damage from electrostatic discharge (ESD). The core wire of the coaxial cable may be charged with static electricity. If you are connecting a coaxial cable that is not connected on either end to an input/output connector of the instrument, short the cable's core wire and external conductor beforehand.

1.2.6 About the Mounting to the Rack

When you mount the instrument to the rack, be sure to prepare the mechanical parts supporting main body.

In addition, the rail supporting a main body is prepared as an option goods.

1.2.7 About the Electric Shock Hazard etc.

When you perform an examination and adjustment of a television, VTR, and other related devices, refer to the service manual of each device.

When you connect this instrument to the inside of a device to be measured, be sure to remove that power cord from a socket, and an electric shock hazard should not occur.

Especially when you connect this instrument to the device which contains high-voltage circuits, such as television, wears the glove which endures the high voltage and be careful of it not to get an electric shock.

1.2.8 About Preheating

To secure more accurate operation, turn on the power before about 30 minutes of use, and stabilize an internal temperature.

1.3 Trademark Acknowledgments

The company and product names in this document are trademarks or registered trademarks of their respective holders.

2. SPECIFICATIONS

2.1 General

The 1U half-rack sized compact LT 4400 Multiformat Video Generator applicable to both HD-SDI and SD-SDI systems outputs SDI video signals.

The various output capabilities are provided: color bar, SDI check field test pattern, ID characters, logomark in QVGA size(*1), safety-area marker, superimposing embedded audio, genlock mode to synchronize external reference signal, and three independent analog black signal systems.

*1 Up to 1920 dots x 1080 lines can be displayed when the Option (LT 4400-70) is installed.

2.2 Features

- **Applicable to both HD-SDI and SD-SDI systems**

Applicable to both HDTV (18 types of HDTV formats) and SDTV (525i/59.94, 625i/50) systems. The HDTV or SDTV can be selected.

- **Superimposing ID characters**

The ID characters can be superimposed at the arbitrary position on the screen. The character blinks to indicate the freeze status.

- **Superimposing logomark**

The logomark up to 320 dots x 240 lines in QVGA size (*1) can be superimposed at the arbitrary position on the screen. The logomark is converted from the bit map to four-grade monochrome data.

- **Safety-area marker**

The 90 % and 80 % safety-area markers can be superimposed on the screen. The 4:3 aspect-ratio marker can also be superimposed in HDTV format.

- **Superimposing embedded audio**

The 16 channels of embedded audio signals (4 channels x 4 groups) can be superimposed. The frequency and level can be respectively set to each channel.

- **Genlock mode**

This instrument can be locked by the NTSC/PAL black burst signals and HDTV tri-level sync signal for variable the timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC/PAL black burst signal with 10-field ID are also applicable.

- **Stay-in sync function**

This function ensures the stable operation in genlock mode even when the external reference signal is accidentally intermitted.

- **Analog black signal output**

Three independent analog black signal output systems are provided. The black burst signal with the same format as the SDI output, or HDTV tri-level sync signal with the same format of clock frequency can be selected for variable the timing. The NTSC/PAL black burst signals with field reference pulse signal, and NTSC black burst signal with 10-field ID are also applicable.

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- **Pattern scroll (Simple motion picture mode)**

The simple motion picture mode is provided to scroll the pattern.

- **Word clock output**

The 48 kHz word clock output is provided to synchronize the audio signal.

- **Applicable to SNMP**

The network system can easily be constructed since this instrument supports SNMP.

2.3 Specifications

2.3.1 SDI Video Output

SDI Characteristics

Bit Rate:	1.485Gbps, 1.485/1.001Gbps, or 270Mbps
Output Amplitude:	800mVp-p ± 10%
Overshoot:	≤10%
Rise and Fall Times:	≤270ps (between 20% and 80%) (HDTV) 0.4 to 1.5 ns (between 20 % and 80 %) ... (SDTV)
DC Offset:	0V ± 0.5V
Output Impedance:	75 Ω
Return Loss:	≥15dB(5MHz to 742.5MHz) ≥10 dB(742.5 MHz to 1.485 GHz)
Number of Outputs:	1 system, 2 outputs (HD-SDI/SD-SDI selectable)
Output Connector:	BNC
Conform To	
HDTV:	SMPTE 274M, SMPTE 296M, and SMPTE 292M (Except for Return Loss)
SDTV:	ITU-R BT 601, SMPTE 125M, ITU-R BT 656, and SMPTE 259M
Applicable Format	
HDTV:	1080i/60, 1080i/59.94, 1080i/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 1080PsF/24, 1080PsF/23.98, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25, 720p/24, 720p/23.98
SDTV:	525i/59.94-270MHz, 625i/50-270MHz
Variable Timing	
Variable Range:	Entire frame range
Setting	V: Settable in line steps H: Settable in clock steps (74.25MHz, 74.25/1.001MHz, 27MHz)
Test Patterns	
HDTV:	100%/75% COLOR BAR MULTIFORMAT COLOR BAR (ARIB STD-B28) (Pattern 2 Section: 100% White/ 75% White/ +1 selectable) CHECK FIELD

2. SPECIFICATIONS

SDTV:	100% COLOR BAR (applicable to both 525i/59.94, 625i/50) 75% COLOR BAR/ SMPTE COLOR BAR (applicable to 525i/59.94) EBU COLOR BAR/ BBC COLOR BAR (applicable to 625i/50) CHECK FIELD (applicable to both 525i/59.94, 625i/50)
Safety Area Marker	
HDTV:	Action safety area (90%) Title safety area (80%) 4:3 aspect ratio Selectable ON/OFF individually
SDTV:	Action safety area (90%) Title safety area (80%) Selectable ON/OFF individually
ID Characters	
Number of Characters:	Up to 20 characters
Size:	32x32/ 64x64/ 128x128 dots selectable
Display Position:	Displays at an arbitrary position on the screen Freeze Confirmation
Display:	Blinking OFF, 1 to 9 seconds
Logomark	
Logomark Data:	4-level monochrome data between 0 and 3
Maximum Size:	320 dots × 240 lines (QVGA size) (*1)
Display Position:	Displays at an arbitrary position on the screen
Display Level:	Set arbitrary levels for levels 0 to 3 Simultaneous Display with
the ID Character:	Simultaneous display with the ID character
File Format	
Before Conversion:	24-bit full-color bitmap data (.bmp) format
After Conversion:	LT 4400/ LT 443D dedicated (.lg) format
Conversion Color Matrix:	$Y = 0.212 *R + 0.701 *G + 0.087 *B$ Converts 256-level monochrome data (Y) to four levels (levels 0 to 3) using arbitrary threshold values.
Conversion Method:	Converted using the logo mark conversion application. Transferring the Logo Mark
Data:	Saves the data to a commercially sold Compact Flash card and inserts it to the LT 4400. (*2)
Pattern Scroll (SimpleMotion Picture Mode)	
Direction:	8 directions (vertical, horizontal, diagonal)
Speed (Range, Resolution)	
V:	0 to 255 lines in 1 line steps
H:	0 to 254 dots in 2 dot steps

2. SPECIFICATIONS

Embedded Audio (*3)

Number of Channels Embedded:	16 ch (4ch x 4group) Each group can be set ON/OFF
Sampling Frequency:	48 kHz (sync to video signal)
Resolution:	20 bits, or 24 bits, selectable (*4)
Pre-emphasis:	OFF, 50/15 μ s, or CCITT, selectable (CS bit can only be selected)
Frequency:	SILENCE/400Hz/ 800Hz/ 1kHz, selectable (sets to each channel)
Level:	-60 to 0 dBFS, in 1 dBFS steps (sets to each channel)
Audio Click:	1 sec/2 sec/3 sec/4 sec/OFF, selectable (sets to each channel)

*1 Up to 1920 dots x 1080 lines can be displayed when the Option (LT 4400-70) is installed.

*2 The data loaded from CF card to the LT 4400 cannot be held when the power is turned OFF.

*3 When the CHECK FIELD pattern is selected, no audio signal is embedded.

*4 The following limitations apply to the SDTV (525i/59.94) format.

- When the LT4400 uses 16 output channels, the resolution is 20 bits.
- The LT4400 can use up to 12 channels (3 groups) when the resolution is 24 bits.

2.3.2 Genlock Function

Reference Input Signal

Input Configuration:	BNC (75 Ω , loop through)
Signal Standards	
NTSC black burst signal:	SMPTE RP154, SMPTE 170M, SMPTE 318M
PAL black burst signal:	EBU N14, ITU-R BT.470-6
HDTV tri-level sync:	SMPTE 274M, SMPTE 296M
Sync Level	
NTSC black burst signal:	-286mV
PAL black burst signal:	-300mV
HDTV tri-level sync:	\pm 300mV
Maximum Allowable Input	Voltage: \pm 4.5V (DC + peak AC)
Operating Input Level Range:	\pm 6 dB
External Lock Range:	\pm 10 ppm
Jitter	
Burst Lock Mode:	\leq 0.5°
Sync Lock Mode:	\leq 1ns

Operation Modes

INTERNAL:	Internal reference signal is used for operation. (INT mode)
AUTO (GO INTERNAL):	The EXT is automatically selected when the external reference signal is applied to the GENLOCK input. The INT mode is automatically selected when the external reference signal is removed.

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MANUAL (GO INT):	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. The INT mode is automatically selected when no external reference signal is applied to the GENLOCK input or signal format does not match the specified format.
AUTO (STAYinSYNC):	The EXT mode is automatically selected when the external reference signal is applied to the GENLOCK input after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. After the external reference signal is recovered, the system is automatically locked.
MANUAL (STAYinSYNC):	The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after power is turned on. If the external reference signal is accidentally removed during operation, the instrument continues operation under the conditions immediately before the signal is removed since STAYinSYNC mode is provided. The STAYinSYNC mode will be held until the reset operation is performed via the front panel even after the external reference signal is recovered.

Genlock Timing

Variable Range

NTSC black burst signal:	± 5 frames
PAL black burst signal:	± 2 frames
HDTV tri-level sync:	1 frame (entire frame range)

Resolution

H:	0.0741 μ s steps (13.5 MHz clock steps)
V:	Variable in 1 line steps
F:	Variable in 1 frame steps

Reference Point at the time of the NTSC blackburst input:

The phase coincident point of line 4 of the NTSC and line 1 of the HDTV

Reference Point at the time of the PAL blackburst input:

The phase coincident point of line 1 of the PAL and line 1 of the HDTV

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2.3.3 Analog Sync Signal Output

Format

NTSC black burst signal: SMPTE RP154, SMPTE 170M, SMPTE 318M

PAL black burst signal: EBU N14, ITU-R BT.470-6

HDTV tri-level sync: SMPTE 274M, SMPTE 296M

Output Signal

Number of Outputs: 6 Outputs (three output systems which equip with two connectors each)

Setting Output Format: Settable

Output Connector

Output Impedance: 75 Ω

Output Connector: BNC

Output Timing

Setting: Three systems can be set individually.

Variable Range

NTSC black burst signal: ± 5 frames

PAL black burst signal: ± 2 frames

HDTV tri-level sync: 1 frame (entire frame range)

Setting Resolution

NTSC/PAL black burst signal: 0.0185 μ s steps (54 MHz clock steps)

HDTV tri-level sync: 0.0135 μ s steps (74.25/1.001MHz in clock steps or 74.25MHz in clock steps)

2.3.4 Word Clock Output

Frequency: 48kHz

Output Impedance: 75 Ω unbalanced (for 1 Vp-p output setting)

Output Amplitude: 1Vp-p \pm 0.1V (into 75 Ω) or 5V CMOS, selectable

Output Connector: BNC

Number of Outputs: 1

Timing Variable

Variable Range: ± 1 AES/EBU frame

Setting Resolution: 512 fs (24.576 MHz) steps

2.3.5 Memory Card Slot

Function: Storing/ reading preset data
Reading logo data

2.3.6 Ethernet Connector

Type: 10BASE-T/100BASE-TX, auto switching

Function: Transferring operation status (e.g., genlock status)
HTTP, TELNET, and SNMP remote control

2.3.7 LCD Panel

Number of Characters: 20 characters x 2 lines can be displayed (w/backlight).

2. SPECIFICATIONS

2.3.8 Internal Clock

Internal Reference Frequency:	27 MHz
Frequency Accuracy:	±2.5 ppm

2.3.9 General Specifications

Environmental Conditions

Operating Temperature:	0 to 40°C
Operating Humidity:	≤ 85% RH (without condensation)
Spec-Guaranteed Temperature:	10 to 35°C
Spec-Guaranteed Humidity:	≤ 85% RH (without condensation)
Operating Environment:	Indoor use
Overvoltage Category:	I
Pollution Degree:	2
Power Requirements:	DC12V (10 to 18V), 20Wmax.
Dimensions and Weight:	213 (W) x 44 (H) x 400 (D) mm (excluding projections) 1.8kg

Accessories

Instruction Manual	1
AC adapter	1

2.4 LT 4400-70 (OP70) Full Size Logo Option

2.4.1 General

LT 4400-70 is the option to extend the logomark size from 320 dots x 240 lines (QVGA) to the full screen size of 1920 dots x 1080 lines.

2.4.2 Features

- **Applicable to logo of full screen**

The logo of full screen size of up to 1920 dots x 1080 lines can be displayed.

2.4.3 Specifications

Logomark

Maximum Size:	1920 dots x 1080 lines
Environmental Conditions:	Other specifications apply to standard model.

3. PANEL DESCRIPTION

3.1 Front Panel

Figure 3-1 shows the LT 4400 front panel.

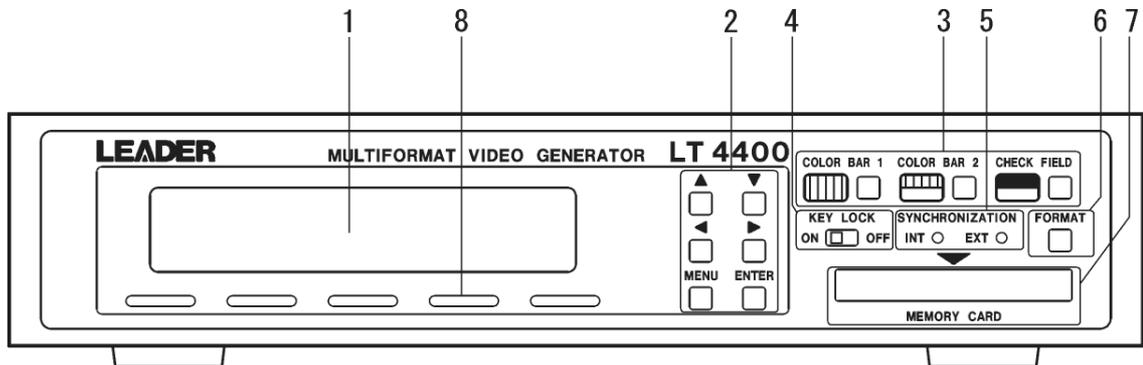


Figure 3-1 Front panel

1 LCD panel

20-character x 2-line LCD display

2 Menu keys

Sets the menu.

Refer to Section 4.3, "Menu Keys".

3 Pattern keys

Selects the output patterns.

Refer to Section 4.5, "Selecting Pattern Key".

4 Key lock switch (KEY LOCK)

Locks the FORMAT key.

Refer to Section 4.6, "KEY LOCK Switch".

5 Synchronization display (SYNCHRONIZATION)

The EXT lights when the instrument locks to the external reference signal (i.e., black burst, tri-level sync signal). The INT lights when the instrument locks to the internal sync signal.

6 Format key (FORMAT)

Selects the format of analog black signal and SDI signal.

Refer to Section 4.4, "Format Key".

7 Memory card slot (MEMORY CARD)

The MEMORY CARD slot is used to store the preset data and genlock log, transfer the logo data, and upgrade the version.

Notes on Operation

- Memory card: Manufactured by SanDisk is recommended.
- This instrument cannot recognize the memory card formatted in FAT32 mode; use the FAT mode for formatting the card. Especially, select the FAT mode since the card of larger capacity than 32 MB is formatted with the Windows XP, the FAT32 file system will be selected in default status. The FAT mode should be selected.
- A memory card operated with "Vcc=5 V" cannot be used.
- When the card cannot be inserted as far as it goes, remove it. Confirm the direction of the card, then insert the card again. Otherwise, you may damage the card.
- Do not remove the card or turn the power off while in access operation.

8 Ventilation Hole



Do not block airflow through the ventilation hole. Otherwise, you run the risk of fire or instrument damage.

3.2 Rear Panel

Figure 3-2 shows the LT 4400 rear panel.

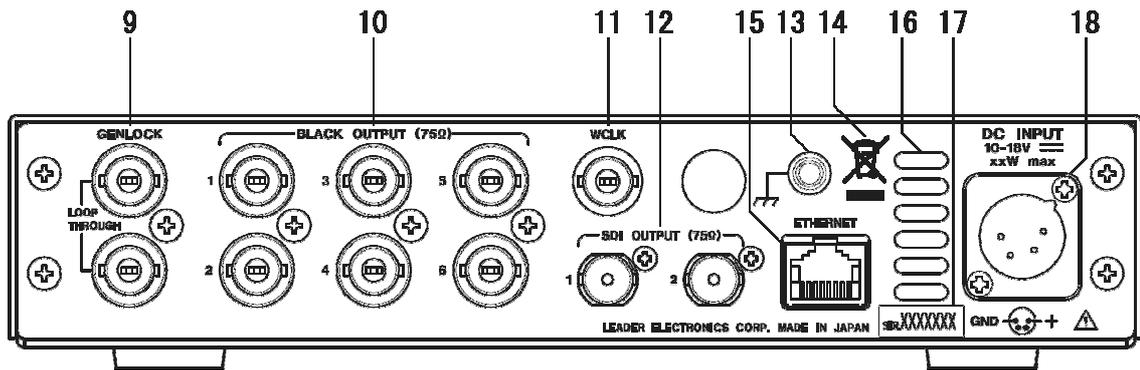


Figure 3-2 Rear panel

9 Genlock signal Input Connector (GENLOCK)

Loop-through input accepts the external reference signal.
Refer to Chapter 7, "GENLOCK SIGNAL SETTINGS (GL SETTING)".

10 Analog Black Signal Output Connector (BLACK OUTPUT)

Outputs the analog black burst signal and HDTV tri-level sync signal.
Refer to Chapter 8, "ANALOG BLACK SIGNAL SETTINGS (BLK SETTING)".

11 Word Clock Output (WCLK)

Outputs the 48 kHz word clock signals.
Refer to Chapter 10, "WORD CLOCK SETTING" (WCLK SETTING).

12 SDI Output Connector (SDI OUTPUT)

Outputs the serial digital signal. It is the switching system of the SD/ HD, and outputs the same signal.
Refer to Chapter 9, SDI SIGNAL SETTINGS (SDI SETTING)".

13 Grounding Terminal

Connected to the outside ground.

14 The Mark by Directive of WEEE

This product and accessories are object products of European WEEE directive. When you discard this product and accessories, please process according to the regulation system of each country and various places.

Refer to “About the Mark by Directive of WEEE in Europe” in “GENERAL SAFETY SUMMARY”.

15 Ethernet Connector (Ethernet)

Ethernet connector applicable to 100BASE-TX/10BASE-T.

You can use an Ethernet connector to control the LT 4400 remotely from a PC.

For details, see the LT 4400 instruction manual (Ethernet).

16 Vent Holes



WARNING

Vent holes for cooling the LT 4400. Smoke or fire may result if you use the LT 4400 with the vent holes blocked. Do not block the vent holes.

17 Serial Number

Provide this number when contacting LEADER.

18 DC Power Input Connector (DC INPUT)

Use to connect an accessory AC adaptor. Usable DC voltage range is 10 to 18 V.

4. OPERATING PROCEDURE

4.1 Turning Power On

There is no power switch on the LT 4400; connecting the accessory AC adaptor immediately supplies the power.

1 Initialization

Supplying the power initializes this instrument. The following message is displayed until initialization is completed. During initialization, incorrect signal is output and key operation is disabled.

```
LEADER LT4400
INITIALIZING...
```

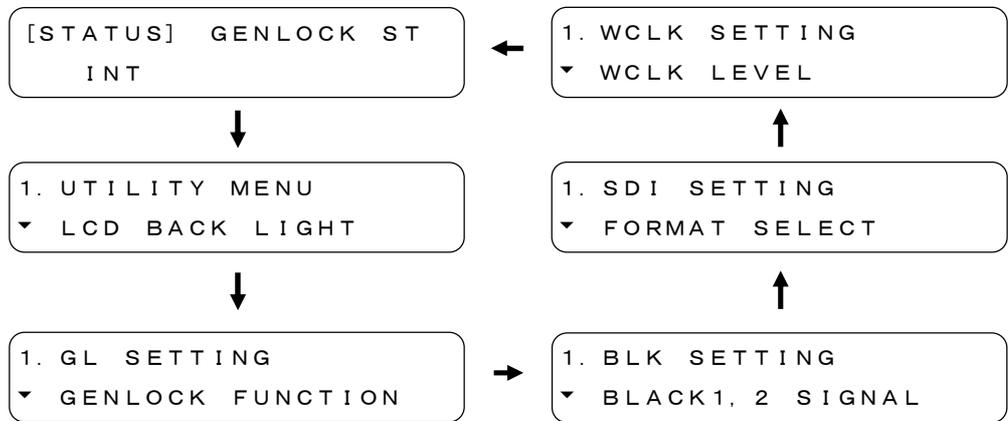
2 Status Display

When the initialization is complete, the current genlock status is displayed as shown below.

```
[STATUS] GENLOCK ST
INT
```

4.2 Main Menu

The menu consists of six groups in hierarchical structure. When the top menu is selected, pressing the MENU key sequentially selects the menus as shown in Figure below.



Each explanation is as follows.

1 STATUS

The STATUS menu is used to display the current setting status. This screen is only used for confirming the current status; not used for setting the operating conditions.

Refer to Chapter 5, "STATUS DISPLAY (STATUS)".

2 UTILITY MENU

The UTILITY MENU menu is used to set the main frame setting conditions (e.g., backlight, calendar).

Refer to Chapter 6, "MAINFRAME SETTING (UTILITY MENU)".

3 GL SETTING

The GL SETTING menu is used to set the genlock signals.

Refer to Chapter 7, "GENLOCK SIGNAL SETTINGS (GL SETTING)".

4 BLK SETTING

The BLK SETTING menu is used to set the analog black signals.

Refer to Chapter 8, "ANALOG BLACK SIGNAL SETTINGS (BLK SETTING)".

5 SDI SETTING

The SDI SETTING menu is used to set the SDI signals

Refer to Chapter 9, "SDI SIGNAL SETTINGS (SDI SETTING)".

6 WCLK SETTING

The WCLK SETTING menu is used to set the word clock.

Refer to Chapter 10, "WORD CLOCK SETTINGS (WCLK SETTING)".

4.3 Menu Keys

1 [▲] key and [▼] key

These keys are used to change the setting items or numeric values in the menu selected. The [▲] key is only enabled when the 「▲」 or 「◆」 is displayed at the lower-left corner of the screen.

The [▼] key is only enabled when the 「▼」 or 「◆」 is displayed at the lower-left corner of the screen.

1. UTILITY MENU
◆ KEY LOCK SET

2. DATE & TIME ADJUST
2007/01/01 12:38:28

2 [◀] key, [▶] key

These keys are used to select or move between items.

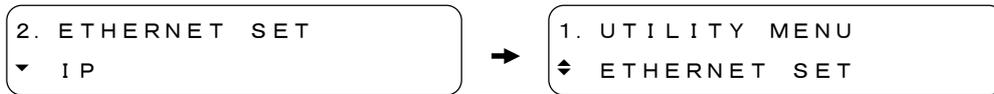
2. LCD BACK LIGHT
■ HIGH □ MID □ LOW □ OFF

2. DATE & TIME ADJUST
2007/01/01 12:38:28

3 [MENU] key

This key is used to display the upper hierarchical layer.

The current layer number is displayed at the upper-left corner of the screen.



While displaying the setting screen, pressing the MENU key does not enter the current settings; returns to the upper hierarchical layer by one.

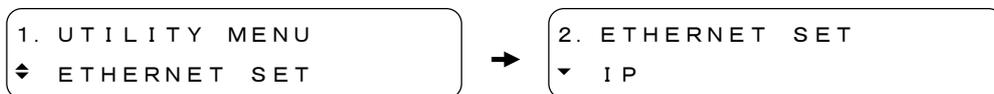
On the top menu screen, pressing the MENU key sequentially selects the main menu.

Refer to Section 4.2, "Main Menu".

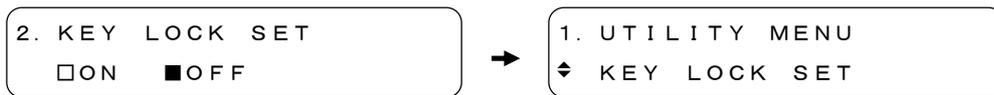
4 [ENTER] key

This key is used to display the next lower hierarchical layer.

The current layer number is displayed at the upper-left corner of the screen.



While displaying the setting screen, pressing the ENTER key enters the current data, then returns to the upper hierarchical layer by one. (*1)



1 In some cases, the current settings may not be entered and the setting item is marked with asterisk () even when this key is pressed.

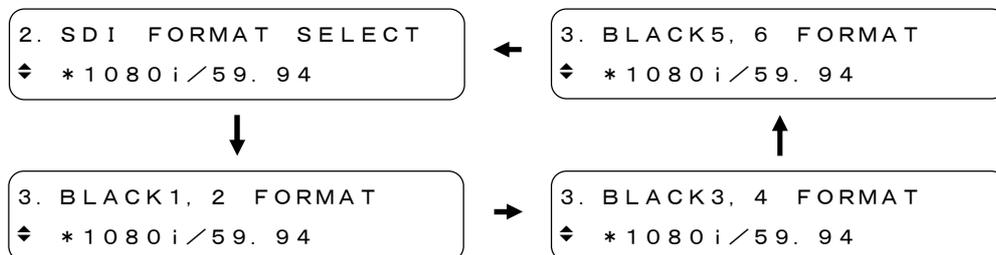
4.4 Format Key

The FORMAT key is a shortcut key used to select the format of SDI SETTING and BLK SETTING. Procedure is described below for selecting the format by using the FORMAT key.

1 Selecting Signal

Press the FORMAT key to select the desired signal: "SDI" (*1), "BLACK 1, 2", "BLACK 3, 4," and "BLACK 5, 6" (*2).

Pressing the FORMAT key sequentially selects the signals as shown in Figure below.



*1 The SDI signal format can also be selected. Proceed as follows:
"SDI SETTING - SDI FORMAT SELECT"

Refer to Section 9.1, "Setting Format".

*2 The analog black signal format can also be selected. Proceed as follows:
"BLK SETTING - BLACK SIGNAL - BLACK FORMAT"

Refer to Section 8.1, "Setting Format".

2 Selecting Format

Select the format by using the [▲] and [▼] keys. Table 4-1 lists the selectable format. Pressing the ENTER key enters the format. The format is marked with asterisk (*).

Table 4-1 Format list

SDI	BLACK
1080i/60	
1080i/59.94 (initial setting)	
1080i/50	
1080p/30	
1080p/29.97	
1080p/25	
1080p/24	
1080p/23.98	
1080PsF/24	
1080PsF/23.98	
720p/60	
720p/59.94	
720p/50	
720p/30	
720p/29.97	
720p/25	
720p/24	
720p/23.98	
525i/59.94	NTSC BB
625i/50	NTSC BB+REF(※1)
/	NTSC BB+ID(※2)
	NTSC BB+REF+ID
	NTSC BB+SETUP
	NTSC BB+S+REF
	NTSC BB+S+ID
	NTSC BB+S+R+ID
	525i/59.94
	525p/59.94
	PAL BB
	PAL BB+REF
	625i/50
625p/50	

- *1 "REF" denotes the identification signal containing the following signals.
 - The 714-mV reference signal is added to every 2 frames on the line 10. (NTSC)
 - The 700-mV reference signal is added to every 4 frames on the line 7. (PAL)
- *2 "ID" denotes the signal containing the ID signal conforming to SMPTE 318M standards.

4.5 Selecting Pattern Key

Press the Pattern selection key to select the pattern. (see Figure 4-1)



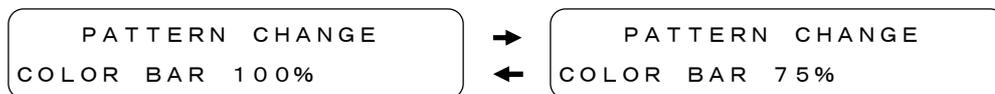
Figure 4-1 Pattern selection key

Table 4-2 lists the selectable patterns. In case of the multiple patterns are assigned to the single key, these patterns are sequentially selected by pressing the key.

Table 4-2 Pattern list

SDI FORMAT	COLOR BAR 1	COLOR BAR 2	CHECK FIELD
HD	COLOR BAR 100% COLOR BAR 75%	MULTI COLOR BAR 100% MULTI COLOR BAR 75% MULTI COLOR BAR (+I)	CHECK FIELD
SD(525i/59.94)	COLOR BAR 100% COLOR BAR 75%	SMPTE COLOR BAR	CHECK FIELD
SD(625i/50)	COLOR BAR 100%	EBU COLOR BAR BBC COLOR BAR	CHECK FIELD

For example, when SDI FORMAT is set to HD, pressing the COLOR BAR 1 key sequentially selects the patterns as shown in Figure below.



4.6 KEY LOCK Switch

Setting the KEY LOCK switch to ON only locks the FORMAT key (*1).

Use an insulated flat-head screwdriver to set the KEY LOCK switch to ON.

While the KEY LOCK switch is set to ON, pressing the FORMAT key displays the following screen.



All front panel keys will be locked when KEY LOCK SET in UTILITY MENU is set to ON. Refer to Section 6.2, "Setting the KEY LOCK Mode".

*1 The format can be selected from the SDI SETTING or BLK SETTING menu.

4.7 Alarm Display

If the LT 4400 fan stops, the following alarm message is displayed. When this happens, if you press a panel key, the display returns to normal, but if the fan is still stopped, the following message will appear again.

If this alarm message appears even though there are no problems with the operating environment, contact your local LEADER agent.



4.8 Initialization

The default settings can be made for all settings conditions.

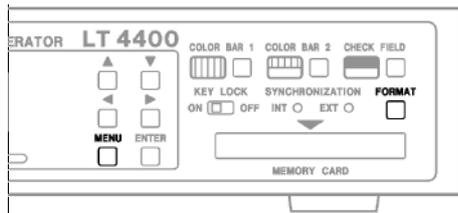
Store the preset data on the memory card since the preset data are deleted when initialized.

Refer to Section 6.3.3, "Storing Preset Data".

In addition, the logomark stored on the main frame is also deleted. Stores the logomark on the main frame again when using it after initialization.

Refer to Section 9.7.8, "Saving Logomark".

- **Initialization Procedure**



Turn the power off. Hold down the MENU and FORMAT keys simultaneously, then turn the power on.



After the screen is displayed as shown in Figure left, remove the MENU and FORMAT keys.



Select ON by using the [↑] key. To cancel the initialization, select CANCEL.



Press the ENTER key.



After initialization finishes, the INT and EXT LEDs in the SYNCHRONIZATION group blink simultaneously.



Press any front panel key.



Initialization will be started.

5. STATUS DISPLAY (STATUS)

The STATUS menu is used to display the current major setting status. This screen is only used for confirmation; not used for setting the operating conditions.

To display the STATUS menu, press the MENU key repeatedly until STATUS is displayed.

After the STATUS menu is displayed, select the item to be displayed by using the [▲] and [▼] keys.

5.1 Genlock Signal

5.1.1 Displaying Status

In "GENLOCK ST", the state of Genlock is displayed.

```
[STATUS]  GENLOCK ST
          INT
```

5.2 Analog Black Signal

5.2.1 Displaying Format

The "BLACK 1, 2", "BLACK 3, 4", and "BLACK 5, 6" screens display the analog black signal format.

Refer to Section 8.1, "Setting Format".

```
[STATUS]  BLACK 1, 2
◆ 1080i/59.94
```

```
[STATUS]  BLACK 3, 4
◆ 1080i/59.94
```

```
[STATUS]  BLACK 5, 6
◆ 1080i/59.94
```

5.3 SDI Signal

5.3.1 Displaying Format

The FORMAT screen displays the SDI signal format.

Refer to Section 9.1, "Setting Format".

```
[STATUS]  FORMAT
◆ 1080i/59.94
```

5.3.2 Displaying Vertical Timing

The TIMING-V-PHASE screen displays the vertical timing of SDI signal.

Refer to Section 9.2.1, "Vertical Timing"

```
[STATUS]  TIMING
◆ V-PHASE      5 LINE
```

5.3.3 Displaying Horizontal Timing

The TIMING-H-PHASE screen displays the horizontal timing of SDI signal in dots.

Refer to Section 9.2.2, "Horizontal Timing (dot)".

```
[STATUS]  TIMING
◆ H-PHASE      5 DOT
```

5.3.4 Displaying Embedded Audio Signal ON/OFF

The EMB. AUDIO screen displays the embedded signal on/off status of each group.

Refer to Section 9.3.3, "Audio Signal ON/OFF (in each group)"

```
[STATUS]  EMB. AUDIO
◆      ■G1 ■G2 ■G3 ■G4
```

5.3.5 Displaying ON/OFF of Y, Cb, and Cr

The SDI OUTPUT screen displays the on/off status of Y, Cb, and Cr respectively.

Refer to Section 9.4, "Setting ON/OFF of Y, Cb, Cr"

```
[STATUS]  SDI OUTPUT
◆      ■Y ■Cb ■Cr
```

5.3.6 Displaying Action Safety Area ON/OFF

The SAFETY AREA-90% AREA screen displays the action safety area on/off status.

Refer to Section 9.5.1, "Action Safety Area".

```
[STATUS]  SAFETY AREA
◆      90% AREA : OFF
```

5. STATUS DISPLAY (STATUS)

5.3.7 Displaying Title Safety Area ON/OFF

The SAFETY AREA-80% AREA screen displays the title safety area on/off status.
Refer to Section 9.5.2, "Title Safety Area".

```
[STATUS] SAFETY AREA  
◆      80% AREA : OFF
```

5.3.8 Displaying 4:3 Aspect Ratio Marker ON/OFF

The SAFETY AREA-4:3 AREA screen displays the 4:3 aspect-ratio marker on/off status.
Refer to Section 9.5.3, "4:3 Aspect-Ratio Marker".

```
[STATUS] SAFETY AREA  
◆      4 : 3 AREA : OFF
```

5.3.9 Displaying ID Character ON/OFF

The ID CHARA screen displays the ID character on/off status.
Refer to Section 9.6.7, "Displaying ID Character".

```
[STATUS] ID CHARA  
◆      ID CHARACTER : OFF
```

5.3.10 Displaying Logomark ON/OFF

The LOGO screen displays the logomark on/off status.
Refer to Section 9.7.4, "Displaying Logomark".

```
[STATUS] LOGO  
◆      LOGO : OFF
```

5.3.11 Displaying Pattern Scroll Mode ON/OFF

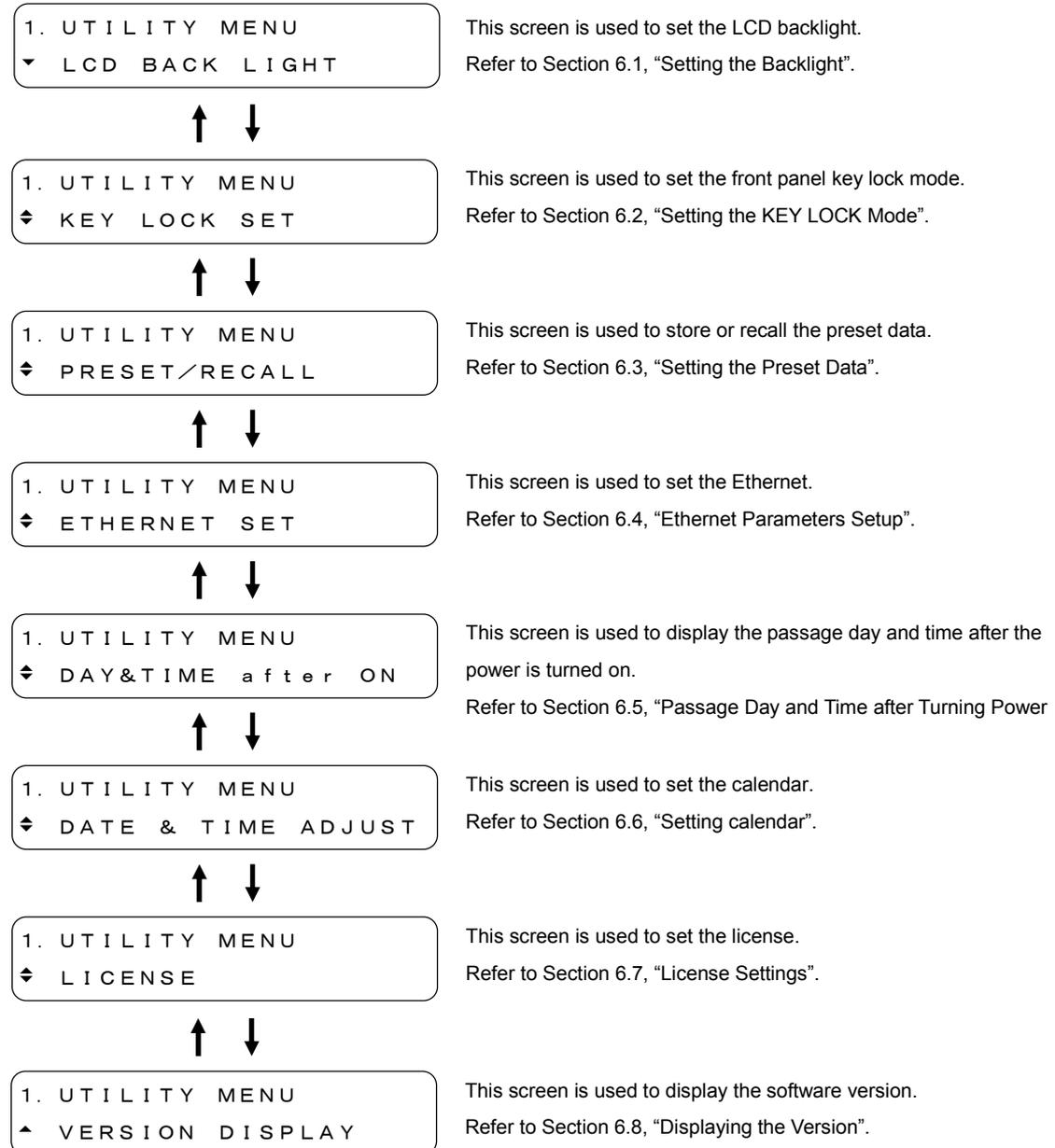
The PTN SCROLL screen displays pattern scroll mode on/off status.
Refer to Section 9.8.3, "Pattern Scroll Mode ON/OFF".

```
[STATUS] PTN SCROLL  
◆      PATTERN SCROLL : OFF
```

6. MAINFRAME SETTING (UTILITY MENU)

The UTILITY MENU menu is used to set the main frame setting conditions.

To display the UTILITY MENU menu, press the MENU key repeatedly until UTILITY MENU is displayed. After the UTILITY MENU menu is displayed, select the item to be displayed by using the [▲] and [▼] keys.



6.1 Setting the Backlight

The LCD BACK LIGHT item is used to set the brightness and lighting time of the backlight.

6.1.1 Brightness of the Backlight

The BRIGHTNESS item is used to select the brightness from four preset brightness levels.

- **Description of Setting Items**

HIGH, MID, LOW The brightness can be selected in the following order:

LOW - MID - HIGH

The initial setting is HIGH.

OFF

Backlight is powered off.

- **Setting Brightness of the Backlight**

```
1. UTILITY MENU
▼ LCD BACK LIGHT
```

Display LCD BACK LIGHT by using the [▲] and [▼] keys.

↓ Press enter key.

```
2. LCD BACK LIGHT
▼ BRIGHTNESS
```

Display BRIGHTNESS by using the [▲] and [▼] keys.

↓ Press enter key.

```
3. BRIGHTNESS
□HIGH ■MID □LOW □OFF
```

Select the backlight brightness by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. LCD BACK LIGHT
▼ BRIGHTNESS
```

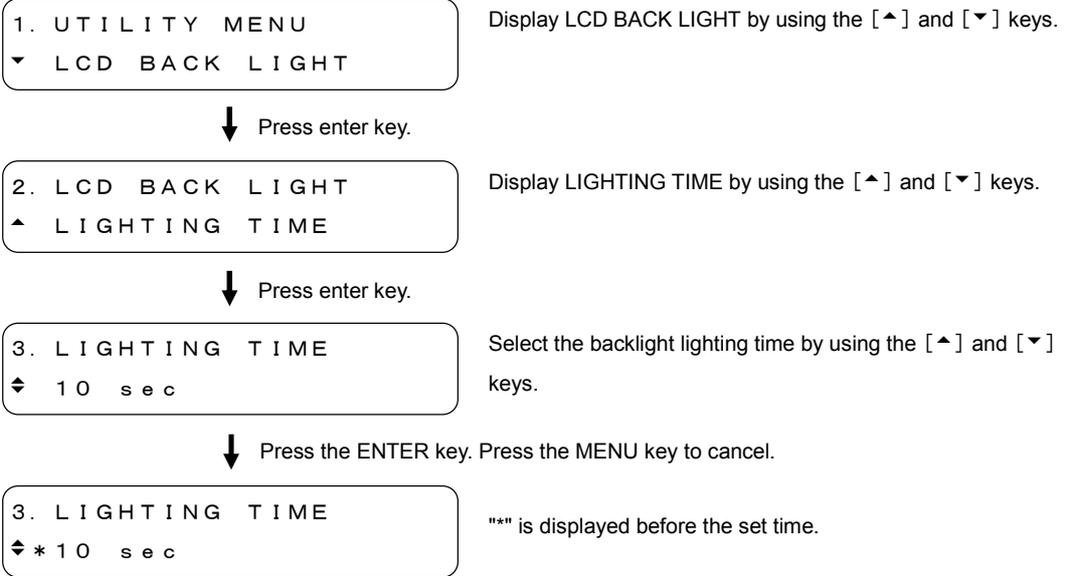
6.1.2 Lighting Time of the Backlight

The LIGHTING TIME item is used to select the lighting time of the backlight.

- **Description of Setting Items**

ALL: The backlight lights always (initial setting.)
 1 to 10 sec: The backlight lights during the time selected, then goes off.

- **Setting Lighting Time of the Backlight**



6.2 Setting the KEY LOCK Mode

The KEY LOCK SET item is used to set the front panel key lock mode. This capability is useful to prevent accidental key operation.

- **Description of Setting Items**

ON Enables the key lock mode.
 OFF Disables the key lock mode (initial setting).

- **Key Lock Setting Procedure**

```
1. UTILITY MENU
◆ KEY LOCK SET
```

Display KEY LOCK SET by using the [▲] and [▼] keys.

↓ Press enter key.

```
2. KEY LOCK SET
■ ON  □ OFF
```

Select ON to enable this mode by using the [◀] and [▶] keys.

To disable this mode, select OFF.

↓ Press the ENTER key. Press the MENU key to cancel.

```
1. UTILITY MENU
◆ KEY LOCK SET
```

- **Key Lock Canceling Procedure**

```
KEY LOCK ON
PUSH MENU KEY 3 s e c
```

When ON is selected, pressing any key displays the screen as shown in the left figure.

↓ Hold down the MENU key for at least three seconds.

```
KEY LOCK OFF
```

The key lock mode is canceled. After this mode is canceled, screen as shown in the left figure is displayed for about two seconds. No key operation is accepted while this screen is displayed.

The FORMAT key can only be locked when the KEY LOCK switch on the front panel is set to ON.

Refer to Section 4.6, "KEY LOCK Switch".

6.3 Setting the Preset Data

The PRESET/RECALL item is used to store/recall the preset data, and power-on recall function.

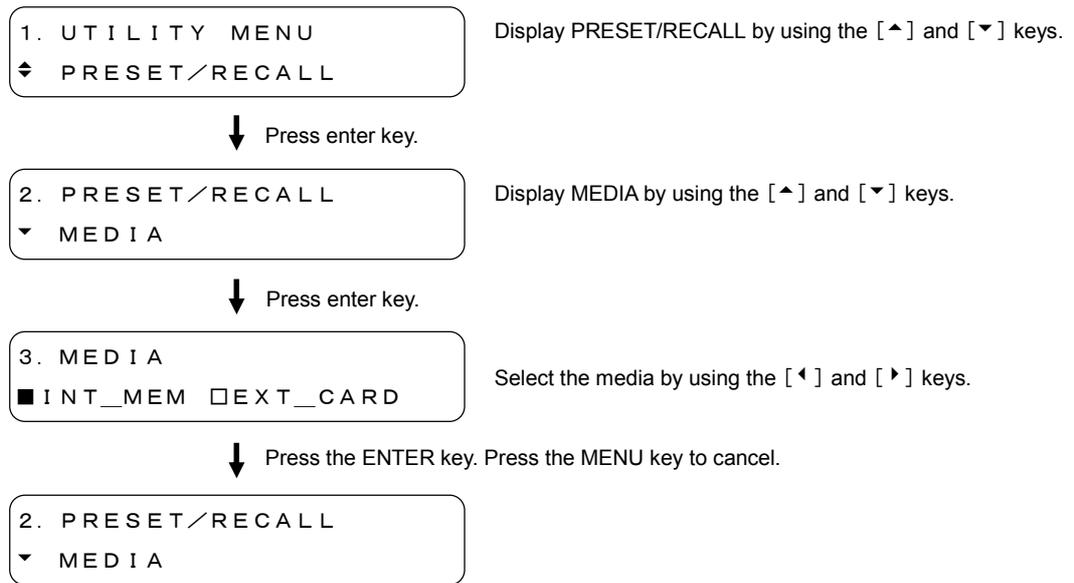
6.3.1 Selecting Media

The MEDIA item is used to select the media to store/recall the preset data.

- **Description of Setting Items**

- INT_MEM Selects the internal memory card (initial setting).
- EXT_CARD Selects the external memory card.

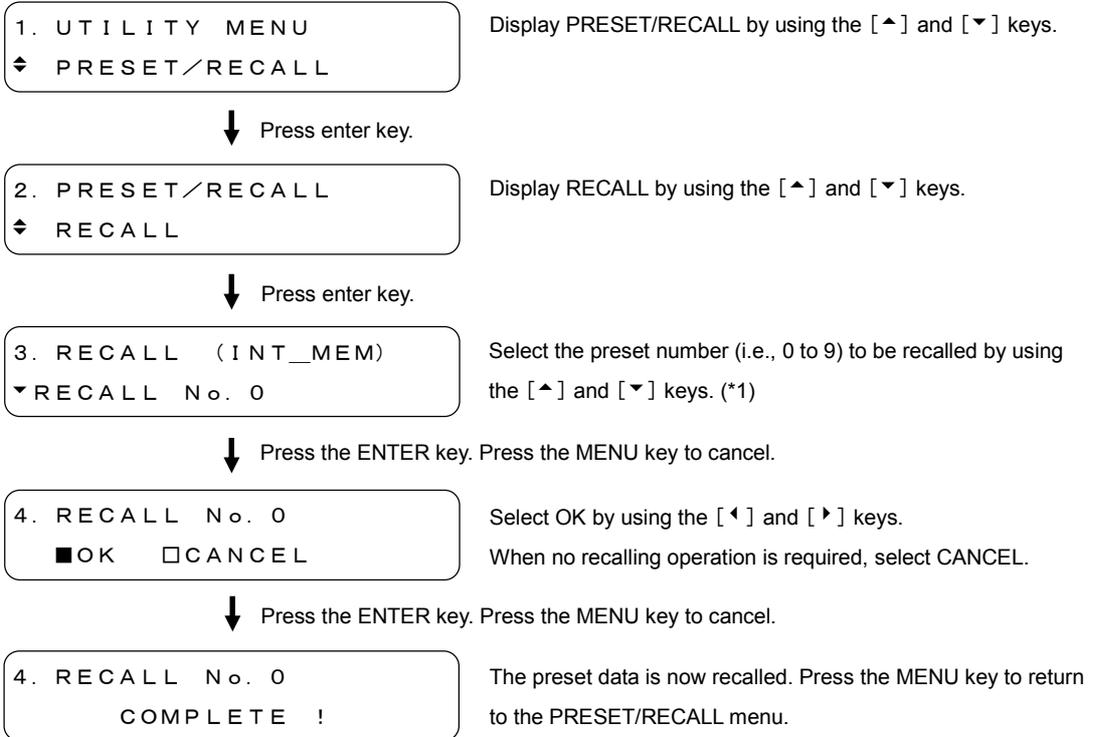
- **Media Selecting Procedure**



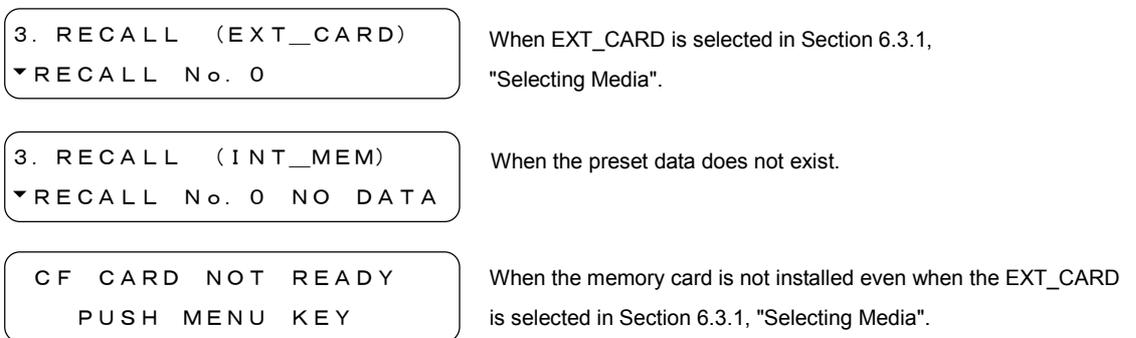
6.3.2 Recalling Preset Data

The RECALL item is used to recall the preset data stored in Section 6.3.3, "Storing Preset Data".

• **Recalling Procedure of Preset Data**



* Screens may be displayed as shown in Figures below.



6.3.3 Storing Preset Data

The PRESET item is used to store the preset data.

Up to ten preset data can respectively be stored in the internal memory and memory card.

• **Storing Procedure of Preset Data**

1. UTILITY MENU
 ◆ PRESET/RECALL

Display PRESET/RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PRESET/RECALL
 ◆ PRESET

Display PRESET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. PRESET (INT_MEM)
 ▼ PRESET No. 0 NO DATA

Select the preset number (i.e., 0 to 9) to be stored by using the [▲] and [▼] keys. (*1)

↓ Press the ENTER key. Press the MENU key to cancel.

4. PRESET No. 0
 ■ OK □ CANCEL

Select OK by using the [◀] and [▶] keys.
 When no store operation is required, select CANCEL.

↓ Press the ENTER key. Press the MENU key to cancel.

4. PRESET No. 0
 COMPLETE !

The preset data is now stored. Press the MENU key to return to the "2.PRESET/RECALL". (*2)

*1 Screens may be displayed as shown in Figures below.

3. PRESET (EXT_CARD)
 ▼ PRESET No. 0

When EXT_CARD is selected in Section 6.3.1, "Selecting Media".

3. PRESET (INT_MEM)
 ▼ PRESET No. 0

When the preset data is already stored

CF CARD NOT READY
 PUSH MENU KEY

When the memory card is not installed even when the EXT_CARD is selected in Section 6.3.1, "Selecting Media".

*2 When the preset data is already stored, it is displayed as shown in Figure below.

5. WARNING!! OVER WR?
 □ OK ■ CANCEL

6.3.4 POWER ON RECALL

In POWER ON RECALL, when the power supply is turned on, select whether the initialization is performed by the setting (except for a setting of the pattern selection key) of the last memory, or by after recalling the setting of the preset.

The setting of the preset can be select from both an internal memory and an external memory regardless of selection of Section 6.3.1, "Selection of Media".

When there is no data in the specified preset number, the initialization is performed by the setting (except for a setting of the pattern selection key) of the last memory.

- **Description of Setting Items**

- | | |
|-----|---|
| ON | The initialization will be performed after the preset data is recalled when the power is turned on. |
| OFF | The initialization will be performed by the setting (except for a setting of the pattern selection key) of the last memory. (initial setting) |

- **Setting Procedure of POWER ON RECALL**

1. UTILITY MENU
 ◆ PRESET/RECALL

Display PRESET/RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PRESET/RECALL
 ▲ POWER ON RECALL

Display POWER ON RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. POWER ON RECALL
 ▼ P-ON RECALL ON/OFF

Display P-ON RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. P-ON RECALL ON/OFF
 ■ ON □ OFF

Select the state to be initialized by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

3. POWER ON RECALL
 ▼ P-ON RECALL ON/OFF

6. MAINFRAME SETTING (UTILITY MENU)

• Selecting Procedure of Preset Data

1. UTILITY MENU
◆ PRESET/RECALL

Display PRESET/RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PRESET/RECALL
▲ POWER ON RECALL

Display POWER ON RECALL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. POWER ON RECALL
▲ RECALL NUMBER

Display RECALL NUMBER by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. RECALL NUMBER
▼ INT_MEM 0

Select the preset number from the "INT_MEM 0 to 9" or "EXT_MEM 0 to 9" by using the [▲] and [▼] keys. (*1)

↓ Press the ENTER key. Press the MENU key to cancel.

4. RECALL NUMBER
▼ * INT_MEM 0

*** is displayed before the preset number.

* When the preset data does not exist, screens may be displayed as shown in Figures below.

4. RECALL NUMBER
▼ INT_MEM 0 NO DATA

6.4 Ethernet Parameters Setup

The ETHERNET SET item is used to set the Ethernet. The remote control status and genlock status can be remotely monitored.

6.4.1 Setting IP Address

The IP ADDRESS is used to set the IP address. To enable the settings, turn the power off, then power on again.

- **Setting Procedure of IP Address**

```
1. UTILITY MENU
  ◆ ETHERNET SET
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ETHERNET SET
  ▼ IP ADDRESS
```

Display IP ADDRESS by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. IP ADDRESS
  IP : 19 2 . 16 8 . 20 . 63
```

Move the cursor by using the [◀] and [▶] keys to select the desired digit, then set the address by using the [▲] and [▼] keys. The settable range is 0 to 255.

↓ Press the ENTER key.

```
IP : 19 2 . 16 8 . 20 . 63
  ■ OK  □ CANCEL
```

Select OK by using the [◀] and [▶] keys. When canceling, select CANCEL.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. ETHERNET SET
  ▼ IP ADDRESS
```

6.4.2 SUBNET MASK

The SUBNET MASK item is used to set the subnet mask.

To enable the settings, turn the power off, then power on again.

- **Setting Procedure of SUBNET MASK**

```
1. UTILITY MENU
  ◆ ETHERNET SET
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ETHERNET SET
  ◆ SUBNET MASK
```

Display SUBNET MASK by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. SUBNET MASK
   SM : 2 5 5. 2 5 5. 2 5 5. 0
```

Move the cursor by using the [◀] and [▶] keys to select the desired digit, then set the value by using the [▲] and [▼] keys. The settable range is 0 to 255.

↓ Press the ENTER key.

```
SM : 2 5 5. 2 5 5. 2 5 5. 0
  ■ OK   □ CANCEL
```

Select OK by using the [◀] and [▶] keys.

When canceling, select CANCEL.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. ETHERNET SET
  ◆ SUBNET MASK
```

6.4.3 GATEWAY

The GATEWAY item is used to set the gateway.

To enable the settings, turn the power off, then power on again.

• **GATEWAY Setting Procedure**

```

1. UTILITY MENU
  ◆ ETHERNET SET
    
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```

2. ETHERNET SET
  ◆ GATEWAY
    
```

Display GATEWAY by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```

3. GATEWAY
   GW :  0.  0.  0.  0
    
```

Move the cursor by using the [◀] and [▶] keys to select the desired digit, then set the value by using the [▲] and [▼] keys. The settable range is 0 to 255.

↓ Press the ENTER key.

```

GW :  0.  0.  0.  0
  ■OK  □CANCEL
    
```

Select OK by using the [◀] and [▶] keys.

When canceling, select CANCEL.

↓ Press the ENTER key. Press the MENU key to cancel.

```

2. ETHERNET SET
  ◆ GATEWAY
    
```

6.4.4 HTTP Access Mode

The HTTP ACCESS MODE item is used to set the HTTP access mode. To use SNMP control, set this item to OFF.

- **Description of Setting Items**

READ ONLY You can use HTTP to check the LT 4400 settings.
 OFF You cannot use HTTP (initial setting).

- **Setting Procedure of HTTP ACCESS MODE**

```
1. UTILITY MENU
  ◆ ETHERNET SET
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ETHERNET SET
  ◆ HTTP ACCESS MODE
```

Display HTTP ACCESS MODE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. HTTP ACCESS MODE
  □ READ ONLY ■ OFF
```

Select HTTP ACCESS MODE by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. ETHERNET SET
  ◆ HTTP ACCESS MODE
```

6.4.5 TELNET Access Mode

The TELNET ACCESS MODE item is used to set the HTTP access mode. To use SNMP control or to prevent TELNET controls from being received while you are performing panel operations, set this item to OFF.

- **Description of Setting Items**

ON	You can use TELNET to configure the LT 4400 and check its settings.
READ ONLY	You can use TELNET to check the LT 4400 settings.
OFF	You cannot use TELNET (initial setting).

- **Setting Procedure of TELNET ACCESS MODE**

```
1. UTILITY MENU
◆ ETHERNET SET
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ETHERNET SET
◆ TELNET ACCESS MODE
```

Display TELNET ACCESS MODE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. TELNET ACCESS MODE
□ ON □ READ ONLY ■ OFF
```

Select TELNET ACCESS MODE by using the [←] and [→] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. ETHERNET SET
◆ TELNET ACCESS MODE
```

6.4.6 MAC Address

The MAC ADDRERSS item is used to display the LT 4400 MAC ADDRESS. This screen is only for viewing. You cannot set values in this screen.

- **Displaying MAC Address**

```
1. UTILITY MENU
◆ ETHERNET SET
```

Display ETHERNET SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ETHERNET SET
▲ MAC ADDRESS
```

Display MAC ADDRESS by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. MAC ADDRESS
00:00:00:00:00:00
```

MAC Address is displayed.

6.5 Passage Day and Time after Turning Power On

The DAY & TIME after ON item is used to display the passage day and time after the power is turned on.

- **Displaying Passage Time**

```
1. UTILITY MENU
  ◆ DAY&TIME a f t e r  O N
```

Display DAY & TIME after ON by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. DAY&TIME a f t e r  O N
   0 0 0 0 1 d a y s  1 2 : 3 8 : 2 8
```

Passage day and time after turning the power on is displayed.

6.6 Setting Calendar

The DATE & TIME ADJUST item is used to set the calendar. The calendar is retained while the instrument is powered on. When the power is turned off, the calendar returns to the initial settings (i.e., 2007/01/01 00:00:00).

When the calendar is set, the log time stamp displayed in Section 7.1.3, "Displaying Log" is changed from the passage day and time to calendar.

- **Calendar Setting Procedure**

```
1. UTILITY MENU
  ◆ DATE & TIME ADJUST
```

Display DATE & TIME ADJUST by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. DATE & TIME ADJUST
   2 0 0 7 / 0 1 / 0 1  1 2 : 3 8 : 2 8
```

Move the cursor by using the [◀] and [▶] keys to select the desired digit, then set the value by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
1. UTILITY MENU
  ◆ DATE & TIME ADJUST
```

6.7 License Settings

The LICENSE item is used to configure settings for using options that require licenses.

A license key is a key code that activates an option on the LT 4400. LEADER will send you a license key when you purchase an option. When purchasing an option, tell us the MAC address(*1) and the serial number(*2) of your LT 4400. Each LT 4400 requires a unique license key. You cannot use the same key for multiple instruments.

*1 To view the MAC address, refer to Section 6.4.6, "MAC Address".

*2 The serial number is printed on a label on the rear panel.

6.7.1 Entering a License Key

The LICENSE OPT SELECT item is used to enter license keys.

The option's features will be enabled the next time that you turn on the LT 4400. Turn off the power after you see the message "KEY CHECK PASSED."

You only need to use the license key once. Even when you turn the LT 4400 off, the license key remains valid.

- **License Key Entry Procedure**

```
1. UTILITY MENU
  ◆ LICENSE
```

Display LICENSE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. LICENSE
  ▼ LICENSE OPT SELECT
```

Display LICENSE OPT SELECT by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. LICENSE OPT SELECT
   LT4400SER01
```

Select the name of the option that you want to install.

↓ Press the ENTER key. Press the MENU key to cancel.

```
4. KEY SETTING
  0000000000
```

Move the cursor by using the [◀] and [▶] keys to select the desired digit, then set the license key by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
KEY CHECK PASSED
- PUSH ANY KEY -
```

The license key has been accepted. (*1)

*1 If the license key is invalid, the following screen appears.

```
KEY CHECK FAILED
- PUSH ANY KEY -
```

6.7.2 Viewing the Status of Licenses

The LICENSE STATUS item is used to display whether options are enabled or disabled. An option is enabled when its license key is accepted.

- **Description of Display Items**

- * The option is enabled.
- No symbol The option is disabled.

```
3. LICENSE STATUS
*LT4400SER01
```

As shown in the figure to the left, an asterisk indicates that the option is enabled.

- **License Status Confirmation Procedure**

```
1. UTILITY MENU
◆ LICENSE
```

Display LICENSE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. LICENSE
▲ LICENSE STATUS
```

Display LICENSE STATUS by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. LICENSE STATUS
*LT4400SER01
```

The option name and the license status are displayed.

6.8 Displaying the Version

The VERSION DISPLAY item is used to display the software version.

- **Displaying Procedure of Software Version**

```
1. UTILITY MENU
▲ VERSION DISPLAY
```

Display VERSION DISPLAY by using the [▲] and [▼] keys.

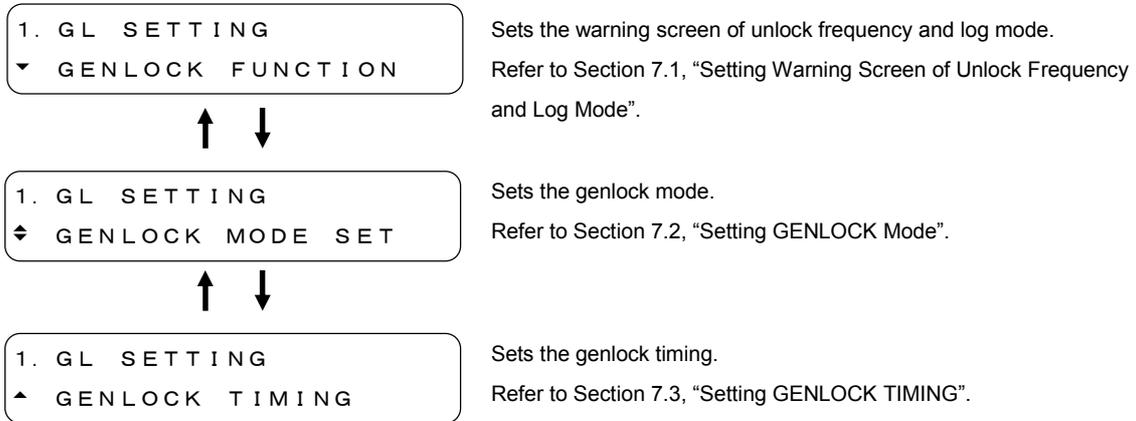
↓ Press the ENTER key.

```
2. VERSION DISPLAY
LT4400 Ver 1.00
```

Software version is displayed.

7. GENLOCK SIGNAL SETTINGS (GL SETTING)

The GL SETTING menu is used to set the genlock signal. To display the GL SETTING menu, press the MENU key repeatedly until GL SETTING is displayed. After the GL SETTING menu is displayed, select the item to be set by using the [▲] and [▼] keys.



7.1 Setting Warning Screen of Unlock Frequency and Log Mode.

The GENLOCK FUNCTION item is used to set the warning screen of unlock frequency and log mode.

7.1.1 Warning Screen Display

The WARNING ON/OFF item is used to select whether the warning screen displays or not if the lock frequency to be locked exceeds ± 10 ppm with respect to the internal reference frequency.

GENLOCK ST in the STATUS screen displays the warning screen as shown in Figure below. Refer to Section 5.1.1, "Displaying Status".



- **Description of Setting Items**

- | | |
|-----|--|
| ON | Displays the warning screen. |
| OFF | Does not display the warning screen. (initial setting) |

7. GENLOCK SIGNAL SETTINGS (GL SETTING)

• Setting Procedure of Warning Screen

1. GL SETTING
▼ GENLOCK FUNCTION

Display GENLOCK FUNCTION by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK FUNCTION
▼ WARNING ON/OFF

Display WARNING ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. WARNING ON/OFF
■ ON □ OFF

Select ON to display the warning screen by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

2. GENLOCK FUNCTION
▼ WARNING ON/OFF

7.1.2 Recording Log

The GENLOCK LOG ON/OFF item is used to determine whether to log the genlock status in the main frame. The log data is retained while the instrument is powered on: turning power off deletes data.

Refer to Section 7.1.3, "Displaying Log" to display the log being saved.

Refer to Section 7.1.4, "Saving Log" to save the log data.

• Description of Setting Items

- ON Records the log data in the main frame.
- OFF Does not record the log data in the main frame (initial setting).

• Log Recording Procedure

1. GL SETTING
▼ GENLOCK FUNCTION

Display GENLOCK FUNCTION by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK FUNCTION
◆ GENLOCK LOG ON/OFF

Display GENLOCK LOG ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. GENLOCK LOG ON/OFF
■ ON □ OFF

Select ON to record the log by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

2. GENLOCK FUNCTION
◆ GENLOCK LOG ON/OFF

7.1.3 Displaying Log

The GENLOCK LOG DISP item is used to display the data logged in Section 7.1.2, "Recording Log".

Up to 64 characters x 99 lines can be displayed. When the number of logs exceeds 99 lines, the oldest log will be deleted. Figure below shows an example.

3. GENLOCK LOG DISP 5 : 0 0 0 0 d a y s 0 0 : 0 0 : 2 7 ▶	The log number and time stamp are displayed. When the continued information exists, 「▶」 is displayed.
--	---

↓ To display the continued information, press the 「▶」 key.

3. GENLOCK LOG DISP 5 : 7 D A T E & T I M E A D ▶	The log number and the screen continued from the previous screen are displayed. The first letter is the same as the last letter on the previous screen.
--	---

↓ To display the continued information, press the 「▶」 key.

3. GENLOCK LOG DISP 5 : D J U S T

The logs are numbered from 1 to 99. To select the log number, press the [▲] key and [▼] keys.

3. GENLOCK LOG DISP 5 : 0 0 0 0 d a y s 0 0 : 0 0 : 2 7 ▶	[▼] key → ← [▲] key	3. GENLOCK LOG DISP 4 : 0 0 0 0 d a y s 0 0 : 0 0 : 2 3 ▶
--	------------------------------	--

The time stamp is displayed in passage day and time after the power is turned on. When the calendar is set in Section 6.6, "Setting Calendar", the calendar is displayed instead of the passage day and time.

3. GENLOCK LOG DISP 5 : 2 0 0 7 / 0 1 / 0 1 1 2 : 3 ▶
--

• **Log Displaying Procedure**

1. GL SETTING ▼ GENLOCK FUNCTION	Display GENLOCK FUNCTION by using the [▲] and [▼] keys.
-------------------------------------	---

↓ Press the ENTER key.

2. GENLOCK FUNCTION ◆ GENLOCK LOG DISP	Display GENLOCK LOG DISP by using the [▲] and [▼] keys.
---	---

↓ Press the ENTER key.

3. GENLOCK LOG DISP 5 : 0 0 0 0 d a y s 0 0 : 0 0 : 2 7 ▶	Confirm the log status by using the [▲], [▼], [◀], and [▶] keys.
--	--

↓ Press the ENTER key or MENU key to return.

2. GENLOCK FUNCTION ◆ GENLOCK LOG DISP

7.1.4 Saving Log

The GENLOCK LOG SAVE item is used to save up to ten log data saved in Section 7.1.2, "Recording Log" on the memory card.

The logs are saved in the LOG folder named "LOG_0.TXT" to "LOG_9.TXT" in text file format.

• **Log Saving Procedure**

1. GL SETTING
▼ GENLOCK FUNCTION

Display GENLOCK FUNCTION by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK FUNCTION
▲ GENLOCK LOG SAVE

Display GENLOCK LOG SAVE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. GENLOCK LOG SAVE
▼ LOG No. 0 NO DATA

Select the LOG number from 0 to 9 by using the [▲] and [▼] keys. (*1)

↓ Press the ENTER key. Press the MENU key to cancel.

4. LOG No. 0
■OK □CANCEL

Select OK by using the [◀] and [▶] keys.
When no saving operation is required, select CANCEL.

↓ Press the ENTER key. Press the MENU key to cancel.

4. LOG No. 0
COMPLETE !

The log data is now saved. Press the MENU key to return to the "2. GENLOCK FUNCTION". (*2)

*1 Screens may be displayed as shown in Figures below.

3. GENLOCK LOG SAVE
▼ LOG No. 0

When the log data is already saved.

CF CARD NOT READY
PUSH MENU KEY

When the memory card is not connected.

*2 In case the log data is already saved, it is displayed as shown in Figure below.

5. WARNING!! OVER WR?
□OK ■CANCEL

7.2 Setting GENLOCK Mode

The GENLOCK MODE SET item is used to select the genlock mode.

- **Description of Setting Items**

INTERNAL The internal reference signal is used. Select this item when no need to lock the instrument to the external signal. (initial setting).

AUTO (GO INTERNAL)

The EXT mode is automatically selected when the external reference signal is applied to the GENLOCK input. The INT mode is automatically selected when the external reference signal is removed. The instrument is automatically genlocked to such signals as HD tri-level sync signal, NTSC, and PAL. When the external reference signal is used to lock the instrument, select this mode to immediately lock the instrument to the external reference signal even when ignoring any abnormal picture momentarily is displayed due to a transient in lock operation.

MANUAL (GO INTERNAL)

The instrument locks to the signal being set according to the GENLOCK FORMAT selected. The EXT mode is automatically selected when the external reference signal with the same format specified to the GENLOCK input is applied after the power is turned on. The INT mode is automatically selected when no external reference signal is applied to the GENLOCK input, or signal format not match to the specified format is applied. When the external reference signal is used to lock the instrument, select this mode to immediately lock this instrument to the external reference signal even when ignoring any abnormal picture momentarily is displayed due to a transient in lock operation.

AUTO (STAYinSYNC)

The EXT mode is automatically selected when the external reference signal is applied to the GENLOCK input after the power is turned on. If the external reference signal is accidentally intermitted during operation, the STAYinSYNC function retains the conditions immediately before trouble occurs to continue the operation. The EXT LED blinks in this case. After the external signal is recovered, the instrument automatically goes into lock status. It may take a time until the instrument locks. The transient may occur when locking the system.

MANUAL (STAYinSYNC)

This instrument locks to the signal being set according to the GENLOCK FORMAT selected. The EXT mode is automatically selected when the

7. GENLOCK SIGNAL SETTINGS (GL SETTING)

external reference signal with the same format specified to the GENLOCK input is applied after the power is turned on. If the external reference signal is accidentally intermitted during operation, the instrument continues the operation immediately before the signal intermittent since the STAYinSYNC mode is provided. The EXT LED blinks in this case. The STAYinSYNC mode will be held until the reset operation is performed via the front panel controls and pressing the ENTER key even after the external is recovered. If unlock status occurs when this instrument locks to the specified external signal, select this mode to lock the instrument after operation is completed. When the external reference signal in specified format is used to lock the instrument, select this mode to immediately lock this instrument to the external reference signal even when ignoring any abnormal picture momentarily is displayed due to a transient in lock operation.

- **Selecting Procedure of GENLOCK Mode (except MANUAL)**

1. GL SETTING
◆ GENLOCK MODE SET

Display GENLOCK MODE SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK MODE SET
◆ AUTO (GO INTERNAL)

Display GENLOCK MODE by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

2. GENLOCK MODE SET
◆ *AUTO (GO INTERNAL)

*** is displayed before the selected genlock mode.

7. GENLOCK SIGNAL SETTINGS (GL SETTING)

- **Selecting Procedure of GENLOCK Mode (MANUAL)**

When MANUAL (GO INT) or MANUAL (STAYinSYNC) is selected in the genlock mode, also the genlock format.

1. GL SETTING
 ◆ GENLOCK MODE SET

Display GENLOCK MODE SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK MODE SET
 ◆ MANUAL (GO INT)

Display GENLOCK MODE by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

3. MANUAL (GO INT)
 ◆ 525i/59.94

Display GENLOCK FORMAT by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

3. MANUAL (GO INT)
 ◆ *525i/59.94

*** is displayed before the selected genlock format.

Table 7-1 lists the selectable genlock formats. The genlock format is expressed in the number of total frame lines instead of the number of active picture lines.

Refer to Table 4-1, "Format list" for the REF.ID.

Table 7-1 List of Genlock format

1125i/60	750p/60	NTSC BB
1125i/59.94 (initial setting)	750p/59.94	NTSC BB+REF
1125i/50	750p/50	NTSC BB+ID
1125p/30	750p/30	NTSC BB+REF+ID
1125p/29.97	750p/29.97	525i/59.94
1125p/25	750p/25	525p/59.94
1125p/24	750p/24	PAL BB
1125p/23.98	750p/23.98	PAL BB+REF
1125PsF/24	/	625i/50
1125PsF/23.98		625p/50

7.3 Setting GENLOCK TIMING

The GENLOCK TIMING item is used to set the analog black signal timing with respect to the internal reference signal. There is a time lag to the output signal after the timing is set. The timing is updated in a period of the internal reference signal. There are two types of internal reference signals: 2.997 Hz and 0.250 Hz. The LT4400 selects the internal reference signal type automatically for each format. The genlock signal should be applied for this setting. If there is no usable genlock signal, the following screen is displayed.

```
REF. (=NO SIGNAL)
      NOT PRESENT
```

7.3.1 Timing in Frame Steps

The F-PHASE item is used to set the timing in frame steps. The timing can be set in NTSC and PAL formats. The settable range depends on the format.

- **Settable Range**

NTSC: ± 5 frames, in 1 frame steps

PAL: ± 2 frames, in 1 frame steps

- **Setting Procedure of Timing in Frame Steps**

```
1. GL SETTING
  ^ GENLOCK TIMING
```

Display GENLOCK TIMING by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
2. GENLOCK TIMING
  v F-PHASE
```

Display F-PHASE by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
3. F-PHASE   R : 2. 9 9 7 H z
GL.          0 FRAME
```

Sets the frame by using the [\blacktriangle] and [\blacktriangledown] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. GENLOCK MODE SET
  v F-PHASE
```

7.3.2 Vertical Timing.

The V-PHASE item is used to set the vertical timing.

The settable range depends on the format.

- **Settable Range**

1125i, 1125p, 1125PsF: ± 1125 lines, in 1 line steps

750p: ± 750 lines, in 1 line steps

525i, 525p for NTSC: ± 525 lines, in 1 line steps

625i, 625p for PAL: ± 625 lines, in 1 line steps

- **Setting Procedure of Vertical Timing**

```
1. GL SETTING
  ▲ GENLOCK TIMING
```

Display GENLOCK TIMING by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. GENLOCK TIMING
  ◆ V-PHASE
```

Display V-PHASE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. V-PHASE   R : 2. 9 9 7 H z
   GL.                + 5  L I N E
```

Sets the line by using the [▲] and [▼] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. GENLOCK MODE SET
  ▼ V-PHASE
```

7.3.3 Horizontal Timing (Course Adjustment)

The H-PHASE (COURSE) item is used to set the horizontal timing. The settable range depends on the format.

- **Settable Range**

Refer to Table 7-2. The step is about 0.0741 μ s.

Table 7-2 Horizontal timing settable range

Format	H-PHASE [μ s]
1125i/60	± 14.8148
1125i/59.94	± 14.8148
1125i/50	± 17.7778
1125p/30	± 14.8148
1125p/29.97	± 14.8148
1125p/25	± 17.7778
1125p/24	± 18.5185
1125p/23.98	± 18.5185
1125PsF/24	± 18.5185
1125PsF/23.98	± 18.5185
750p/60	± 11.1111
750p/59.94	± 11.1111
750p/50	± 13.3333
750p/30	± 22.2222
750p/29.97	± 22.2222
750p/25	± 26.6667
750p/24	± 27.7778
750p/23.98	± 27.7778
NTSC BB	± 31.7778
NTSC BB+REF	± 31.7778
NTSC BB+ID	± 31.7778
NTSC BB+REF+ID	± 31.7778
525i/59.94	± 31.7778
525p/59.94	± 15.8519
PAL BB	± 32.0000
PAL BB+REF	± 32.0000
625i/50	± 32.0000
625p/50	± 16.0000

7. GENLOCK SIGNAL SETTINGS (GL SETTING)

• Setting Procedure of Horizontal Timing

1. GL SETTING
▲ GENLOCK TIMING

Display GENLOCK TIMING by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK TIMING
◆ H-PHASE (COARSE)

Display H-PHASE (COARSE) by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. H (COARSE) R : 2. 9 9 7 H z
GL. +0. 0 7 4 1 μ s

Sets the timing by using the [▲] and [▼] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

2. GENLOCK TIMING
◆ H-PHASE (COARSE)

7.3.4 Horizontal Timing (Fine Adjustment)

The H-PHASE (FINE) item is used to set the horizontal timing.

• Settable Range

±100, in 1 steps

The one step (i.e., ±0.0741 μs) is divided into about ±100.

• Setting Procedure of Horizontal Timing

1. GL SETTING
▲ GENLOCK TIMING

Display GENLOCK TIMING by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. GENLOCK TIMING
▲ H-PHASE (FINE)

Display H-PHASE (FINE) by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. H (FINE) R : 2. 9 9 7 H z
GL. 0

Sets the timing by using the [▲] and [▼] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

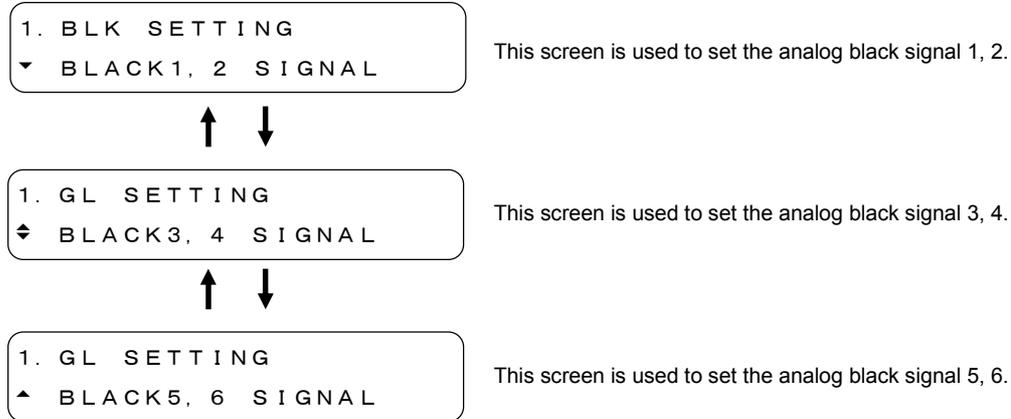
↓ Press the ENTER key. Press the MENU key to cancel.

2. GENLOCK TIMING
▲ H-PHASE (FINE)

8. ANALOG BLACK SIGNAL SETTINGS (BLK SETTING)

The BLK SETTING menu is used to set the analog black output signal.

To display the BLK SETTING menu, press the MENU key repeatedly until BLK SETTING is displayed. After the BLK SETTING menu is displayed, select the item to be set by using the [▲] and [▼] keys.



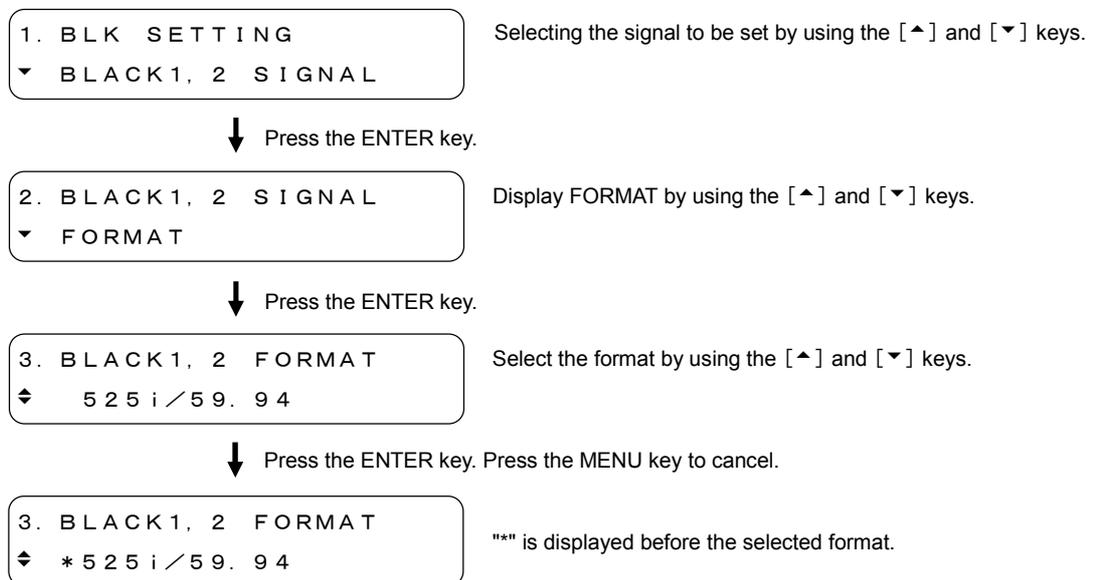
The following sections only describe the "BLACK 1, 2 SIGNAL", however, the same procedure can also be used for the "BLACK 3, 4 SIGNAL" and "BLACK 5, 6 SIGNAL".

8.1 Setting Format

The FORMAT item is used to select the analog black signal format.

Table 4-1, "Format list" lists the selectable formats.

- **Format Selecting Procedure**



This format can also be selected by using the FORMAT key.

Refer to Section 4.4, "Format Key".

8.2 Setting Timing

The TIMING item is used to set the analog black signal timing with respect to the internal reference signal.

Three internal reference frequencies (i.e., 2.997 MHz, 6.250 MHz, 3.000 MHz) are provided; each frequency is automatically selected depending on the format selected.

8.2.1 Timing in Frame Steps

The F-PHASE item is used to set the timing in frame steps. This menu is only displayed in NTSC and PAL formats. The settable range depends on the format.

- **Settable Range**

NTSC: ± 5 frames, in 1 frame steps

PAL: ± 2 frames, in 1 frame steps

- **Setting Procedure of Timing in Frame Steps**

1. BLK SETTING

▼ BLACK 1, 2 SIGNAL

Select the signal to be set by using the [▲] and [▼] keys.



Press the ENTER key.

2. BLACK 1, 2 SIGNAL

▲ TIMING

Display TIMING by using the [▲] and [▼] keys.



Press the ENTER key.

3. TIMING

▼ F-PHASE

Display F-PHASE by using the [▲] and [▼] keys.



Press the ENTER key.

4. F-PHASE R : 6.250 Hz

BLK 1, 2 +2 FRAME

Sets the frame by using the [▲] and [▼] keys. The internal reference signal is displayed at the upper-right corner of the screen.



Press the ENTER key. Press the MENU key to cancel.

3. TIMING

▼ F-PHASE

8.2.2 Vertical Timing

The V-PHASE item is used to set the vertical timing.
The settable range depends on the format.

- **Settable Range**

1080i, 1080p, 1080PsF:	±1124 lines, in 1 line steps
720p:	±749 lines, in 1 line steps
525i, 525p for NTSC:	±524 lines, in 1 line steps
625i, 625p for PAL:	±624 lines, in 1 line steps

- **Setting Procedure of Vertical Timing**

```
1. BLK SETTING
▼ BLACK 1, 2 SIGNAL
```

Display the signal to be set by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. BLACK 1, 2 SIGNAL
▲ TIMING
```

Display TIMING by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. TIMING
◆ V-PHASE
```

Display V-PHASE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
4. V-PHASE R : 6. 250Hz
   BLK 1, 2 +5 LINE
```

Sets the line by using the [▲] and [▼] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

```
3. TIMING
◆ V-PHASE
```

8.2.3 Horizontal Timing (Dot)

The H-PHASE (DOT) item is used to set the horizontal timing in dots. When the dot is changed, the time set in Section 8.2.4, "Horizontal Timing (Time)" is also changed. The settable range depends on the format.

- **Settable Range**

Refer to Table 8-1. The step is 1 dot.

Table 8-1 Horizontal timing settable range

Format	H-PHASE (DOT)	H-PHASE (μ s)
1080i/60	± 2199	± 29.6161
1080i/59.94	± 2199	± 29.6457
1080i/50	± 2639	± 35.5420
1080p/30	± 2199	± 29.6161
1080p/29.97	± 2199	± 29.6457
1080p/25	± 2639	± 35.5420
1080p/24	± 2749	± 37.0235
1080p/23.98	± 2749	± 37.0605
1080PsF/24	± 2749	± 37.0235
1080PsF/23.98	± 2749	± 37.0605
720p/60	± 1649	± 22.2087
720p/59.94	± 1649	± 22.2309
720p/50	± 1979	± 26.6531
720p/30	± 3299	± 44.4309
720p/29.97	± 3299	± 44.4754
720p/25	± 3959	± 53.3198
720p/24	± 4124	± 55.5420
720p/23.98	± 4124	± 55.5976
NTSC BB	± 3431	± 63.5370
NTSC BB+REF	± 3431	± 63.5370
NTSC BB+ID	± 3431	± 63.5370
NTSC BB+REF+ID	± 3431	± 63.5370
NTSC BB+SETUP	± 3431	± 63.5370
NTSC BB+S+REF	± 3431	± 63.5370
NTSC BB+S+ID	± 3431	± 63.5370
NTSC BB+S+R+ID	± 3431	± 63.5370
525i/59.94	± 3431	± 63.5370
525p/59.94	± 1715	± 31.7592
PAL BB	± 3455	± 63.9814
PAL BB+REF	± 3455	± 63.9814
625i/50	± 3455	± 63.9814
625p/50	± 1727	± 31.9814

8. ANALOG BLACK SIGNAL SETTINGS (BLK SETTING)

• Setting Procedure of Horizontal Timing

1. BLK SETTING
▼ BLACK 1, 2 SIGNAL

Display the signal to be set by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. BLACK 1, 2 SIGNAL
▲ TIMING

Display TIMING by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. TIMING
◆ H-PHASE [DOT]

Display H-PHASE (DOT) by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. H-PHASE R : 2. 997 Hz
BLK 1, 2 + 10 DOT

Sets the dot by using the [▲] and [▼] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

3. TIMING
◆ H-PHASE [DOT]

8.2.4 Horizontal Timing (Time)

The H-PHASE (μs) item is used to set the horizontal timing in second. When the time is changed, the horizontal timing set in Section 8.2.3, "Horizontal Timing (Dot)" is also changed. The settable range depends on the format.

- **Settable Range**

Refer to Table 8-1. The step is about 0.0135 μs in HD format, 0.0185 μs in SD format.

- **Setting Procedure of Horizontal Timing**

```
1. BLK SETTING
  ▼ BLACK 1, 2 SIGNAL
```

Display the signal to be set by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
2. BLACK 1, 2 SIGNAL
  ▲ TIMING
```

Display TIMING by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
3. TIMING
  ▲ H-PHASE [ $\mu\text{s}$ ]
```

Display H-PHASE (μs) by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
4. H-PHASE R : 6. 2 5 0 H z
   BLK 1, 2 + 0. 0 1 8 5  $\mu\text{s}$ 
```

Sets the time by using the [\blacktriangle] and [\blacktriangledown] keys.

The internal reference signal is displayed at the upper-right corner of the screen.

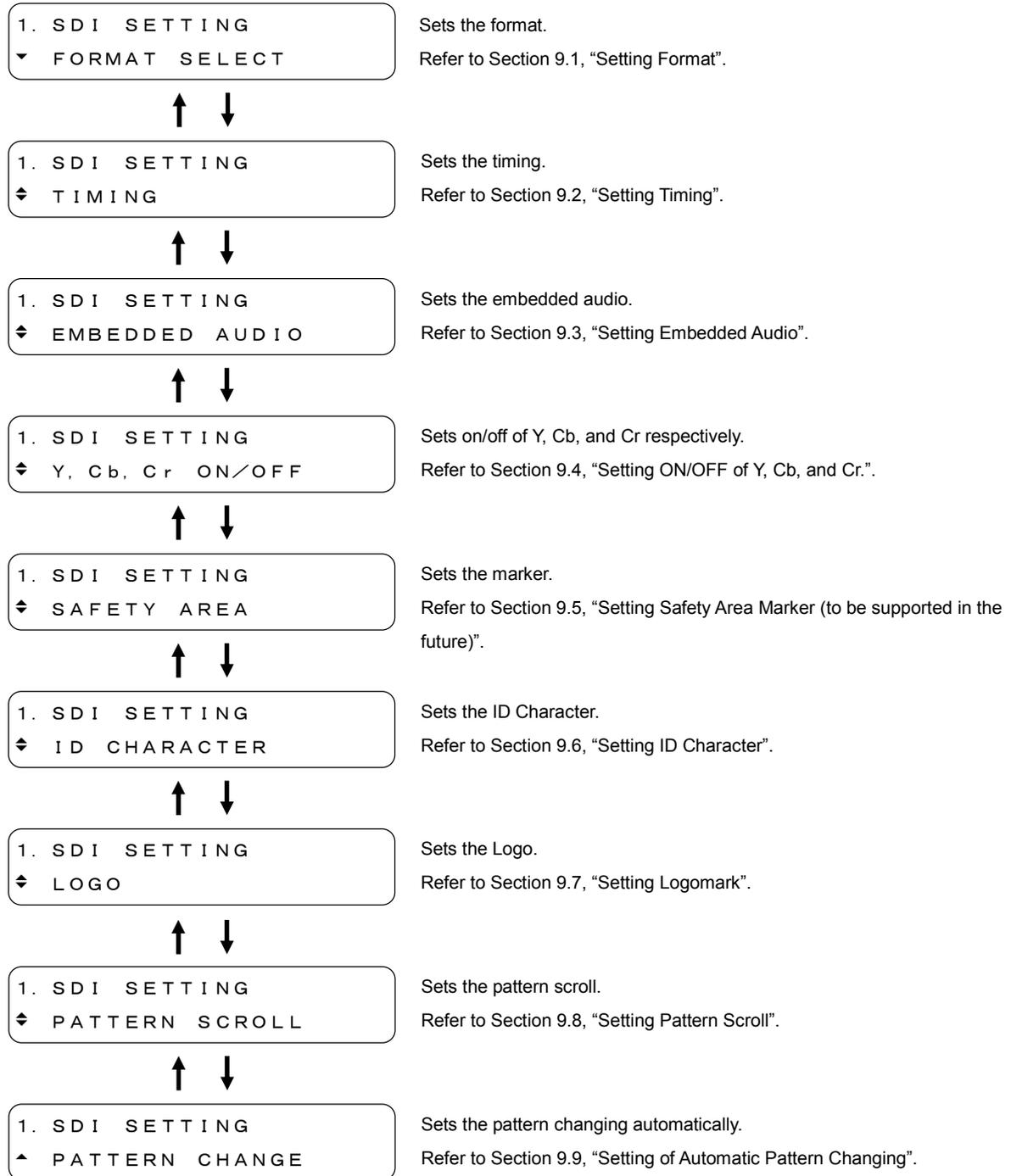
↓ Press the ENTER key. Press the MENU key to cancel.

```
3. TIMING
  ▲ H-PHASE [ $\mu\text{s}$ ]
```

9. SDI SIGNAL SETTINGS (SDI SETTING)

The SDI SETTING menu is used to set the SDI output signal.

To display the SDI SETTING menu, press the MENU key repeatedly until SDI SETTING is displayed. After the SDI SETTING menu is displayed, select the item to be set by using the [▲] and [▼] keys.



9.1 Setting Format

The FORMAT SELECT item is used to set the SDI signal format.
Refer to Table 4-1, "Format list" for the selectable formats.

- **Format Selecting Procedure**

1. SDI SETTING ▼ FORMAT SELECT	Display FORMAT SELECT by using the [▲] and [▼]
-----------------------------------	--

↓ Press the ENTER key.

2. SDI FORMAT SELECT ◆ 525i / 59.94	Select the format by using the [▲] and [▼] keys.
--	--

↓ Press the ENTER key. Press the MENU key to cancel.

2. SDI FORMAT SELECT ◆ *525i / 59.94	*** is displayed before the selected format.
---	--

This format can also be selected by using the FORMAT key.
Refer to Section 4.4, "Format Key".

9.2 Setting Timing

The TIMING item is used to set the SDI signal timing with respect to the internal reference signal.

9.2.1 Vertical Timing.

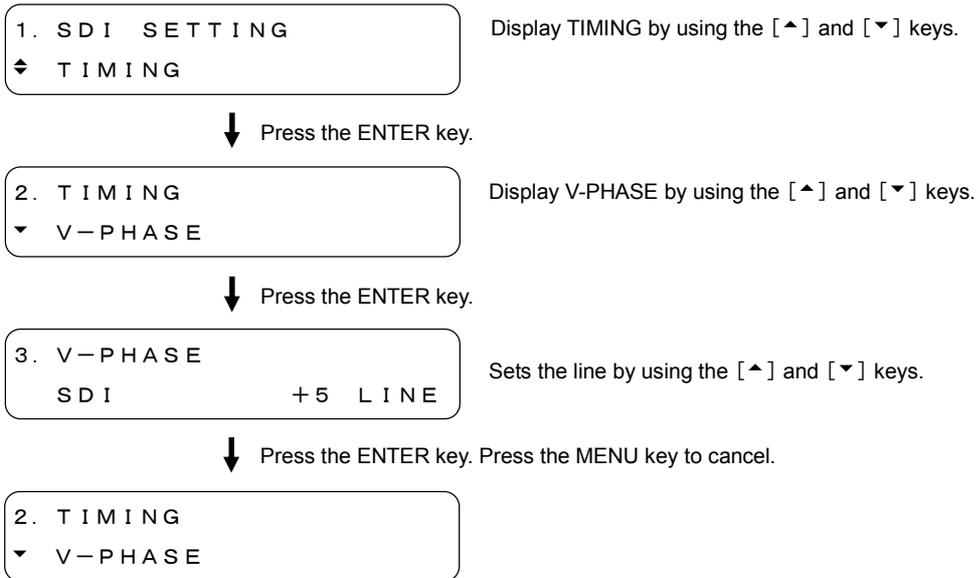
The V-PHASE item is used to set the vertical timing.
The settable range depends on the format.

- **Settable Range**

1080i, 1080p, 1080PsF:	±1124 lines, in 1 line steps
720p:	±749 lines, in 1 line steps
525i:	±524 lines, in 1 line steps
625i:	±624 lines, in 1 line steps

9. SDI SIGNAL SETTINGS (SDI SETTING)

- **Setting Vertical Timing**



9.2.2 Horizontal Timing (Dot)

The H-PHASE (DOT) item is used to set the horizontal timing in dots. When the dot is changed, the time set in Section 9.2.3, "Horizontal Timing (Time)" is also changed. The settable range depends on the format.

- **Settable Range**

Refer to Table 9-1. The step is 1 dot.

Table 9-1 Horizontal timing settable range

Format	H-PHASE (DOT)	H-PHASE (μ s)
1080i/60	± 2199	± 29.6161
1080i/59.94	± 2199	± 29.6457
1080i/50	± 2639	± 35.5420
1080p/30	± 2199	± 29.6161
1080p/29.97	± 2199	± 29.6457
1080p/25	± 2639	± 35.5420
1080p/24	± 2749	± 37.0235
1080p/23.98	± 2749	± 37.0605
1080PsF/24	± 2749	± 37.0235
1080PsF/23.98	± 2749	± 37.0605
720p/60	± 1649	± 22.2087
720p/59.94	± 1649	± 22.2309
720p/50	± 1979	± 26.6531
720p/30	± 3299	± 44.4309
720p/29.97	± 3299	± 44.4754
720p/25	± 3959	± 53.3198
720p/24	± 4124	± 55.5420
720p/23.98	± 4124	± 55.5976
525i/59.94	± 1715	± 63.5185
625i/50	± 1727	± 63.9629

9.3 Setting Embedded Audio

The EMBEDDED AUDIO item is used to set the embedded audio for CH 1 to CH 16.

Embedded audio is not used for check field patterns.

The embedded audio can be set for each group or for each channel.

- **Setting Each Group Respectively**

The CH 1 to CH 4 are assigned to GROUP 1. Also assign remaining channels to GROUP 2 to GROUP 4 as listed in Table 9-2.

Table 9-2 Relationship between the channel number and group number for Embedded Audio.

Channel Number	Group Number
CH 1~CH 4	GROUP1
CH 5~CH 8	GROUP2
CH 9~CH12	GROUP3
CH13~CH16	GROUP4

The same procedure used to equal the setting of GROUP 2 to GROUP 1 can also be applied to equal the setting of GROUP 4 to GROUP 3.

Refer to Section 9.3.1, "Sharing Settings Between Groups".

- **Setting Each Channel Respectively**

Set each channel, CH 1 to CH 16

The CH 2 to CH 4 can be set to equal the CH 1.

The CH 6 to CH 8 can be set to equal the CH 5.

The CH 10 to CH 12 can be set to equal the CH 9.

The CH 14 to CH 16 can be set to equal the CH 13.

Refer to Section 9.3.2, "Sharing Settings Between Channels".

9.3.1 Sharing Settings Between Groups

The EQUAL TO G1 item is used to equal the setting of GROUP 2 to GROUP 1.

The EQUAL TO G3 item is used to equal the setting of GROUP 4 to GROUP 3.

The settings described in Section 9.3.3, "Audio Signal ON/OFF (in each group)" cannot be applied to this setting.

This section only describes the setting procedure of EQUAL TO G1 used to equal the setting of GROUP 2 to GROUP 1. This procedure can also be applied to EQUAL TO G3.

- **Description of Setting Items**

ON Equals the setting of GROUP 2 to GROUP 1. The display contents of the GROUP 2 will not be changed; displayed as is.

OFF The GROUP 1 and GROUP 2 do not share the settings. (initial setting)

- **Sharing Procedure of Settings Between Groups**

1. SDI SETTING
 ◆ EMBEDDED AUDIO

Display EMBEDDED AUDIO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. EMBEDDED AUDIO
 ◆ GROUP 2 SET

Select the group to share the settings by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. GROUP 2 SET
 ▼ EQUAL TO G1

Display EQUAL TO G1 by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. EQUAL TO G1 (G2)
 ■ ON □ OFF

Select ON by using the [◀] and [▶] keys.
 Select OFF not to share the settings.

↓ Press the ENTER key. Press the MENU key to cancel.

3. GROUP 2 SET
 ▼ EQUAL TO G1

9.3.2 Sharing Settings Between Channels

The EQUAL TO CH 1 item is used to make the setting of CH 2 through CH 4, respectively, equal to the setting of CH 1. (The CH 2 through CH 4 should be set respectively.)

The EQUAL TO CH 5 item is used to equal the setting of CH 6 through CH 8 to CH 5.

The EQUAL TO CH 9 item is used to equal the setting of CH 10 through CH 12 to CH 9.

The EQUAL TO CH 13 item is used to equal the setting of CH 14 through CH 16 to CH 13.

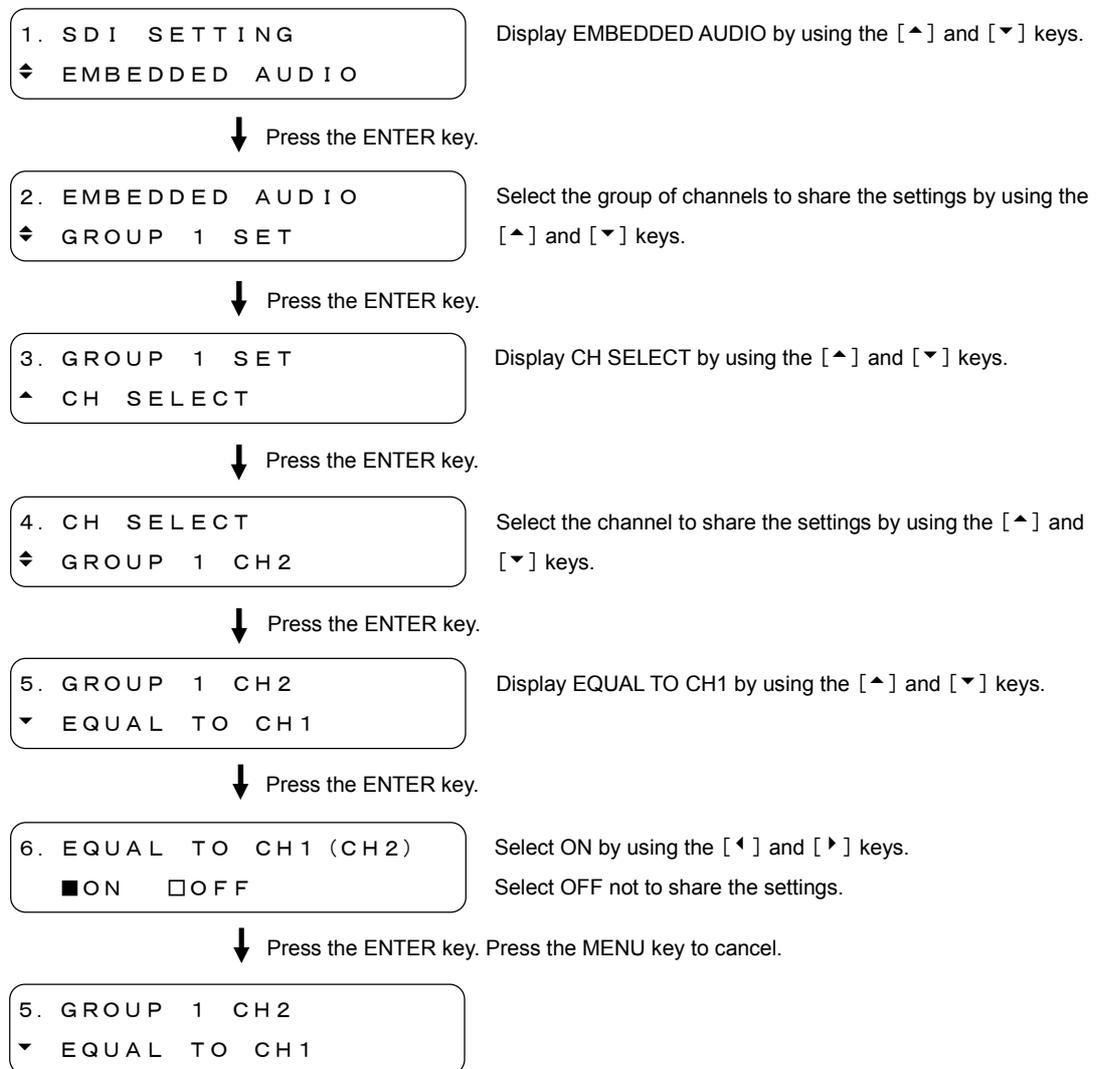
This section only describes the setting procedure of EQUAL TO CH 1 used to equal the setting of CH 2 to CH 1, however, the same procedure can also be applied to EQUAL TO CH 5, EQUAL TO CH 9, and EQUAL TO CH 13.

- **Description of Setting Items**

ON: Equals the setting of CH 2 to CH 1. The display contents of the CH 2 will not be changed; displayed as is.

OFF: The CH 1 and CH 2 do not share the settings. (initial setting)

- **Sharing Procedure of Settings Between Channels**



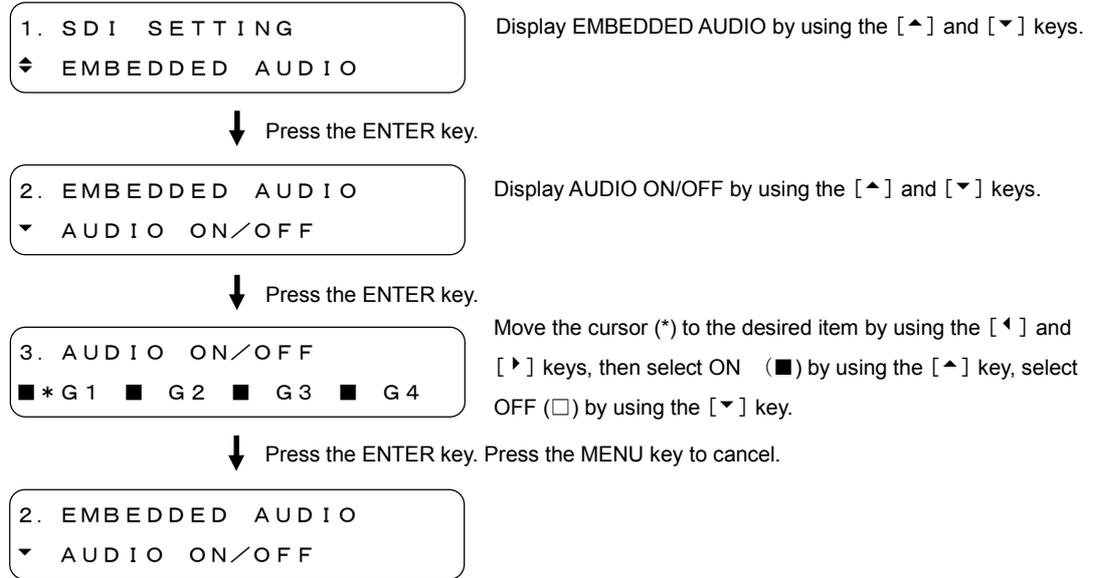
9.3.3 Audio Signal ON/OFF (in each group)

The AUDIO ON/OFF item is used to set the embedded audio signal output on/off.

• **Description of Setting Items**

- ON (■): Outputs the embedded audio signal. (initial setting)
- OFF (□): Does not output the embedded audio signal.

• **Setting Procedure of Output Signal**



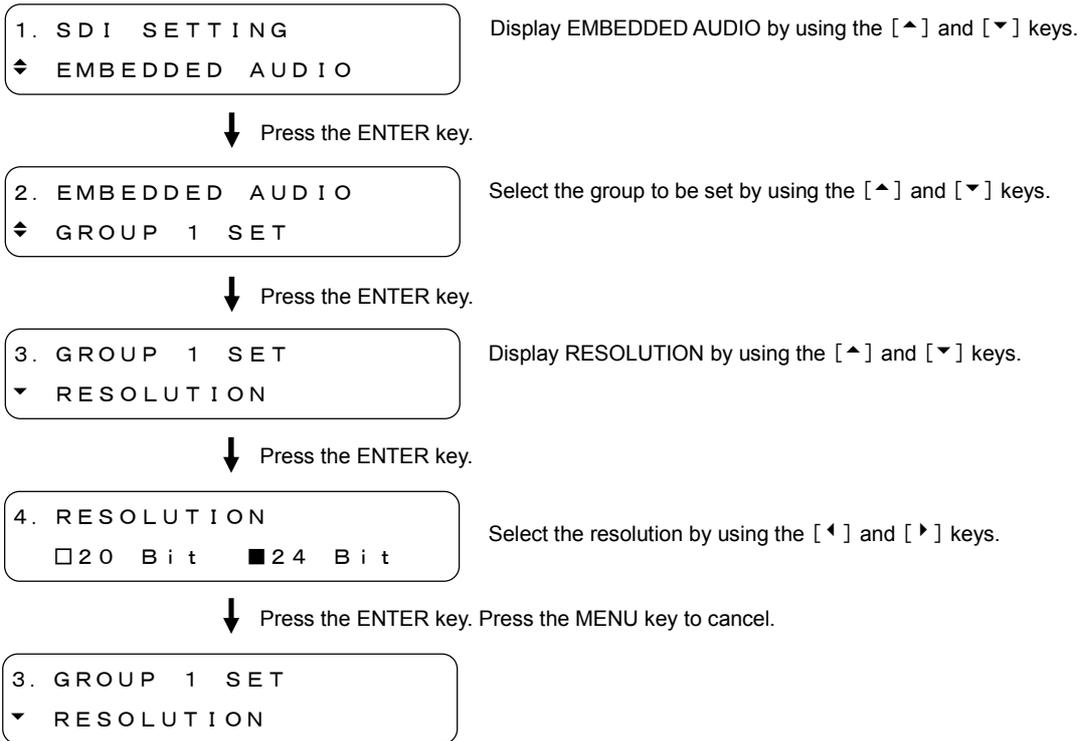
9.3.4 Setting Resolution (in each group)

The RESOLUTION item is used to set the resolution of the digital data for each group. This section only describes the setting procedure of GROUP 1, however, the same procedure can also be applied to the GROUP 2 to GROUP 4.

• **Description of Setting Items**

- 20 Bit: Sets the resolution to 20 bits (initial setting).
- 24 Bit: Sets the resolution to 24 bits.

• **Resolution Setting Procedure**



* When the output format is 525i/59.94, the LT4400 cannot produce 24-bit signals on all the groups (16 channels). The LT4400 can produce 24-bit signals on up to 3 groups (12 channels). If you try to set all of the groups to 24-bit resolution, the following message appears. When this happens, set the resolution to 20 bits, or turn one or more of the audio signal output groups off.

WARNING !
RESOLUTION MISMATCH

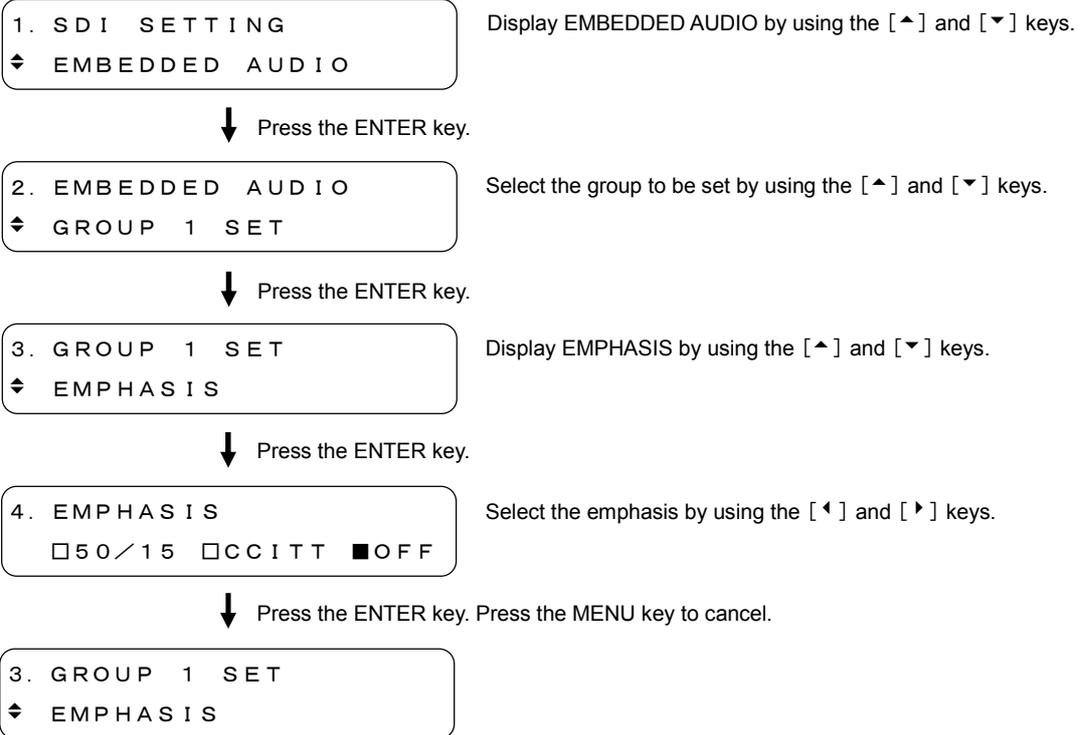
9.3.5 Setting Pre-Emphasis (in each group)

The EMPHASIS item is used to set the pre-emphasis mode for each group. This section only describes the setting procedure of GROUP 1, however, the same procedure can also be applied to GROUP 2 to GROUP 4.

- **Description of Setting Items**

- 50/15: Sets the pre-emphasis mode to 50/15.
- CCITT: Sets the pre-emphasis mode to CCITT.
- OFF: Sets the pre-emphasis mode to OFF (initial setting).

- **Setting Procedure of Pre-Emphasis**



9.3.6 Setting Frequency (in each group)

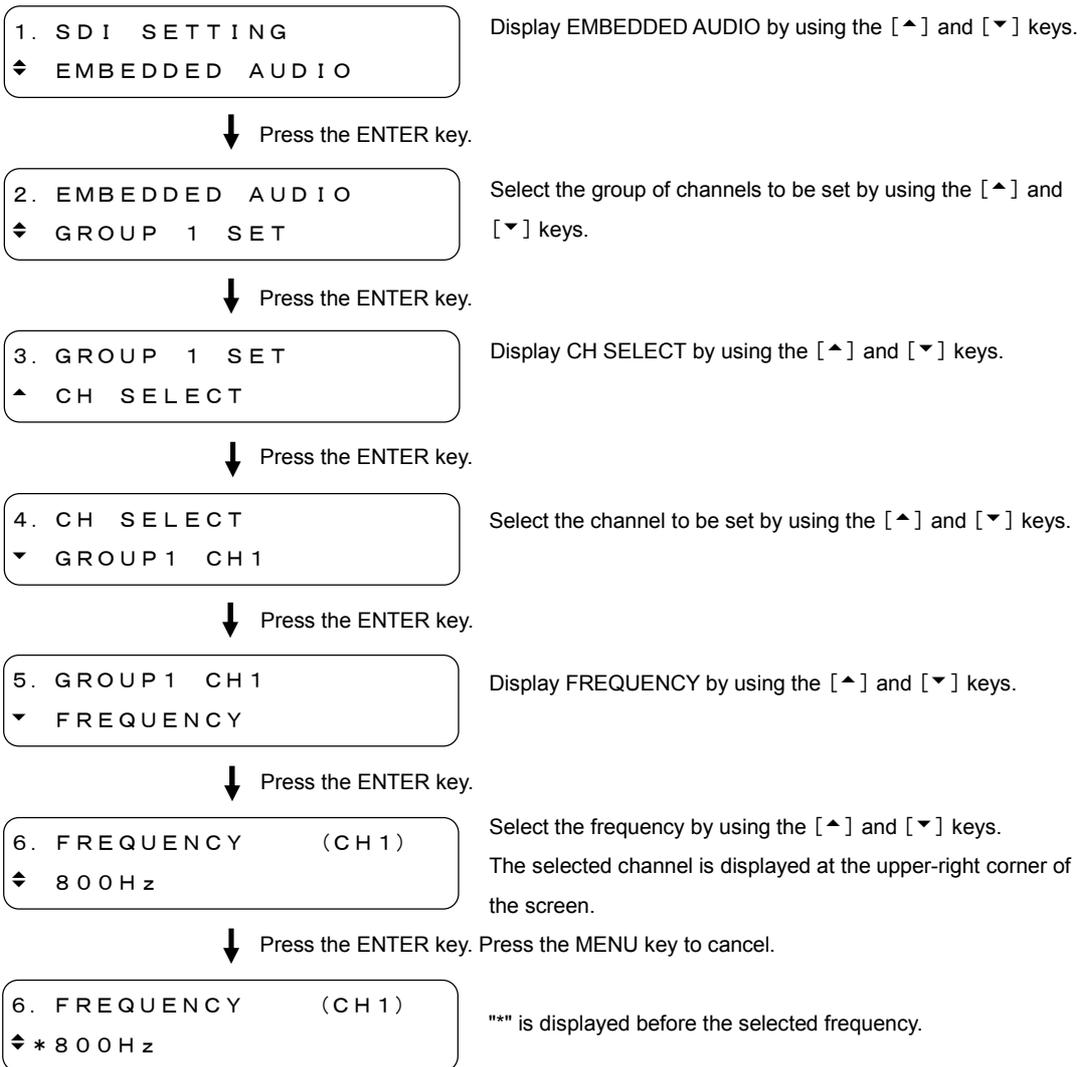
The FREQUENCY item is used to set the frequency for each channel.

This section only describes the setting procedure of CH 1, however, the same procedure can also be applied to CH 2 to CH 16.

- **Description of Setting Items**

- SILENCE: Does not set the frequency.
- 400Hz: Frequency is set to 400Hz.
- 800Hz: Frequency is set to 800Hz.
- 1kHz: Frequency is set to 1kHz (initial setting).

- **Frequency Setting Procedure**



9.3.7 Setting Level (in each channel)

The LEVEL item is used to set the level for each channel.

This section only describes the setting procedure of CH 1, however, the same procedure can also be applied to CH 2 to CH 16.

- **Settable Range**

-60 dBFS to 0 dBFS in 1 dBFS steps The initial setting is -20 dBFS

- **Level Setting Procedure**

1. SDI SETTING
 ◆ EMBEDDED AUDIO

Display EMBEDDED AUDIO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. EMBEDDED AUDIO
 ◆ GROUP 1 SET

Select the group of channels to be set by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. GROUP 1 SET
 ▲ CH SELECT

Display CH SELECT by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. CH SELECT
 ▼ GROUP 1 CH 1

Select the channel to be set by using the [▲] and [▼] keys.

↓ Press the ENTER key.

5. GROUP 1 CH 1
 ◆ LEVEL

Display LEVEL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

6. LEVEL (CH 1)
 -20 dBFS

Select the level by using the [▲] and [▼] keys.
 The selected channel is displayed at the upper-right corner of the screen.

↓ Press the ENTER key. Press the MENU key to cancel.

5. GROUP 1 CH 1
 ◆ LEVEL

9.3.8 Setting Click (in each channel)

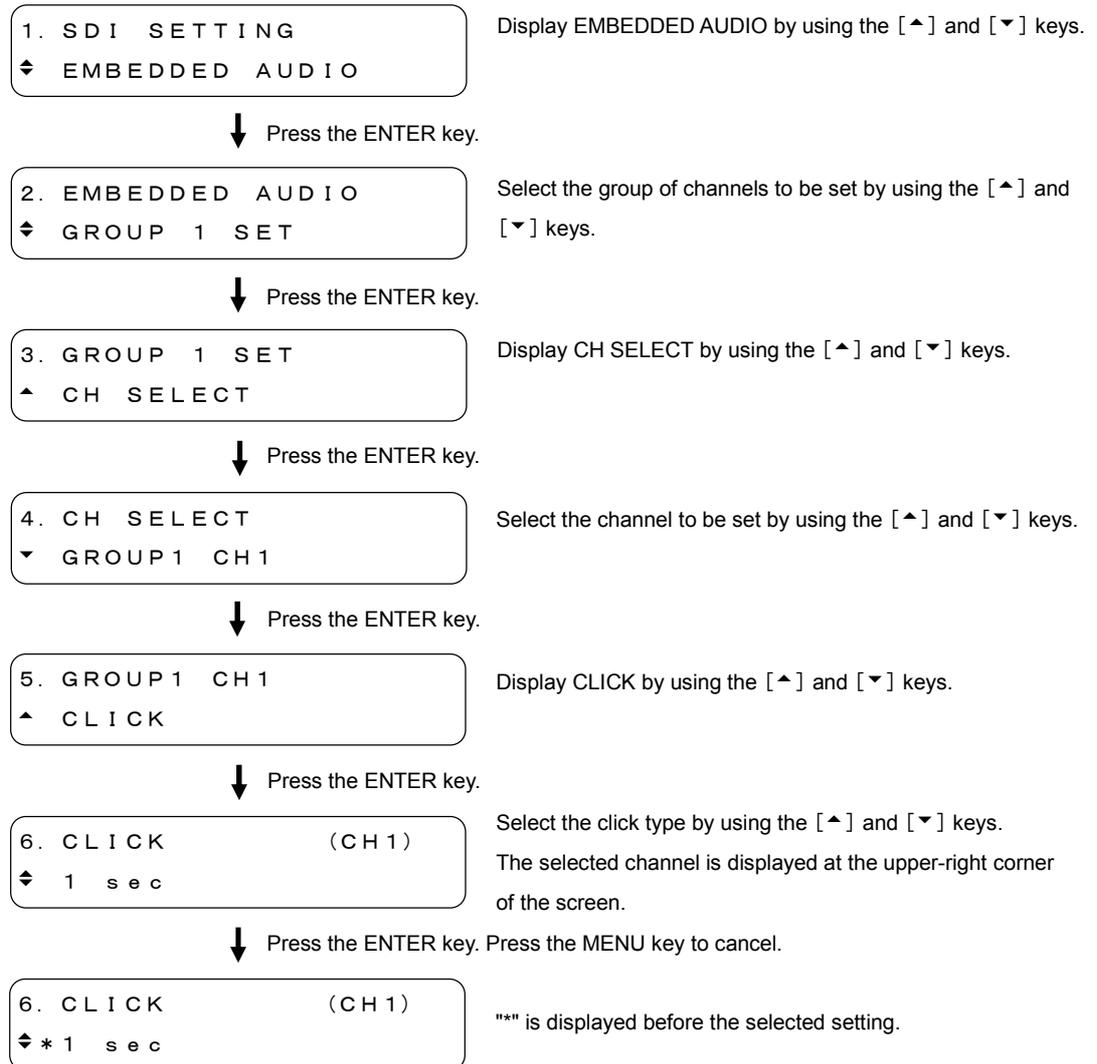
The CLICK item is used to set the click for each channel.

This section only describes the setting procedure of CH 1, however, the same procedure can also be applied to CH 2 to CH 16.

- **Description of Setting Items**

- OFF Does not insert the click (initial setting).
- 1 sec: Inserts the click in every 1 second.
- 2 sec: Inserts the click in every 2 seconds.
- 3 sec: Inserts the click in every 3 seconds.
- 4 sec: Inserts the click in every 4 seconds.

- **Click Setting Procedure**



9.4 Setting ON/OFF of Y, Cb, and Cr

The "Y, Cb, Cr, ON/OFF" item is used to set on/off for Y, Cb, and Cr respectively.

- **Description of Setting Items**

ON (■): Outputs the Y, Cb, or Cr signal selected (initial setting).
 OFF (□): Does not output the Y, Cb, or Cr signal selected.

- **Setting Procedure of Output Signal**

```
1. SDI SETTING
  ◆ Y, Cb, Cr ON/OFF
```

Display Y, Cb, Cr, ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. Y, Cb, Cr ON/OFF
   ■ * Y ■ Cb ■ Cr
```

Position the cursor (*) to the desired item by using the [◀] and [▶] keys, then select ON (■) by using the [▲] key, select OFF (□) by using the [▼] key.

↓ Press the ENTER key. Press the MENU key to cancel.

```
1. SDI SETTING
  ◆ Y, Cb, Cr ON/OFF
```

9.5 Setting Safety Area Marker

The SAFETY AREA item is used to set the safety area marker and 4:3 aspect-ratio marker. No markers are superimposed when the CHECK FIELD pattern is selected.

9.5.1 Action Safety Area

The 90% AREA is used to determine whether to superimpose the marker on the action safety area (90%). The marker is superimposed at the 90-% position on the 4:3 aspect-ratio marker when the ON is selected in Section 9.5.3, "4:3 Aspect-Ratio Marker".

- **Description of Setting Items**

- ON: Superimposes the marker at the action safety area (90%).
 OFF: Does not superimpose the marker at the action safety area (90%).
 (initial setting)

- **Displaying Procedure of Action Safety Area**

1. SDI SETTING
 ◆ SAFETY AREA

Display SAFETY AREA by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. SAFETY AREA
 ▼ 90% AREA

Display 90% AREA by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. 90% AREA MARKER
 ON OFF

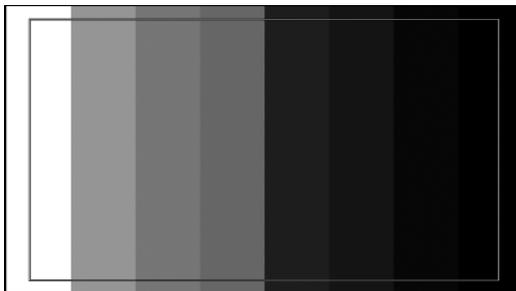
Select ON by using the [←] and [→] keys.
 Select OFF not to display the marker.

↓ Press the ENTER key. Press the MENU key to cancel.

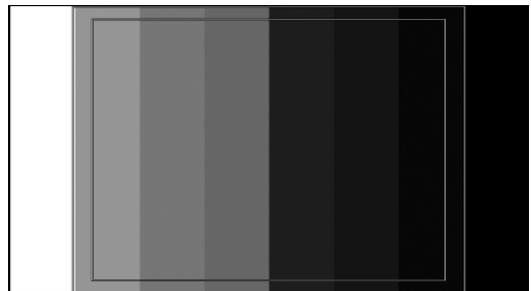
2. SAFETY AREA
 ▼ 90% AREA

- **Example of screen display**

90% AREA ON / 4:3 AREA OFF



90% AREA ON / 4:3 AREA ON



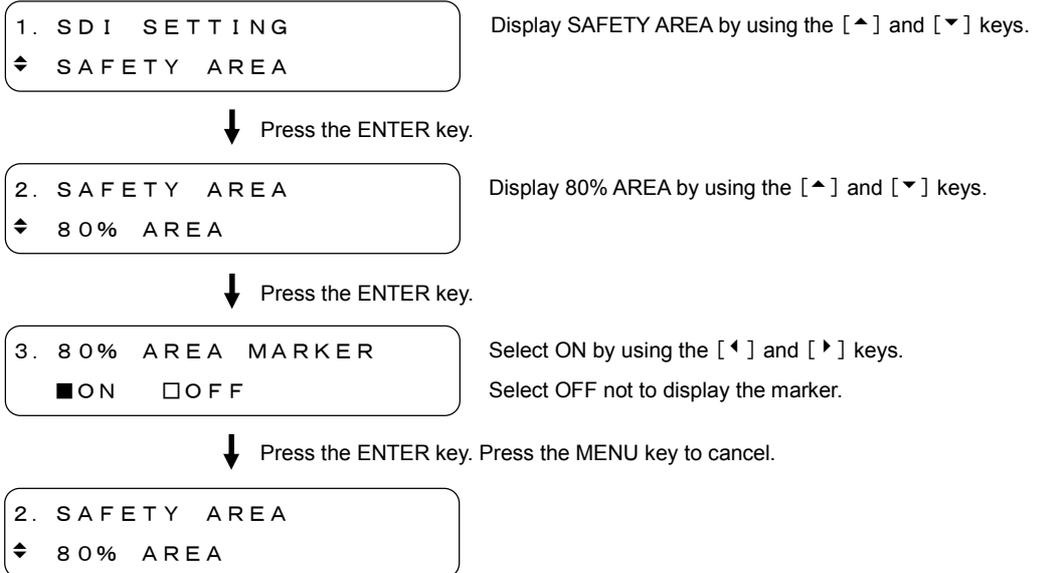
9.5.2 Title Safety Area

The 80% AREA item is used to determine whether to superimpose the marker on the action safety area (80%). The marker is superimposed at the 80-% position on the 4:3 aspect-ratio marker when the ON is selected in Section 9.5.3, "4:3 Aspect-Ratio Marker".

• **Description of Setting Items**

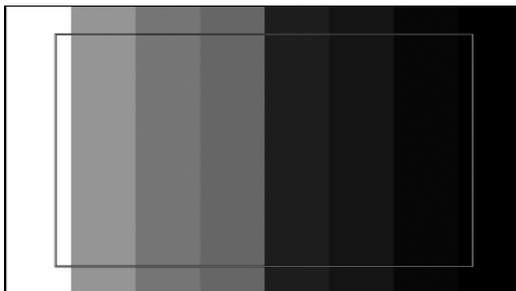
- ON: Superimposes the marker at the title safety area (80%).
- OFF: Does not superimpose the marker at the title safety area (80%).
(initial setting)

• **Displaying Procedure of Title Safety Area**

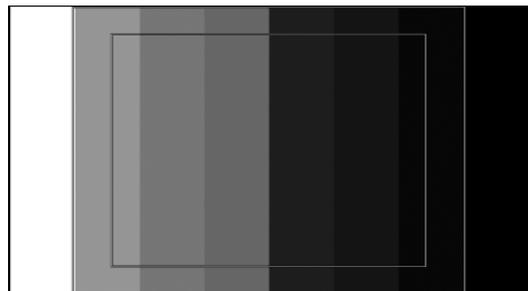


• **Example of screen display**

80% AREA ON / 4:3 AREA OFF



80% AREA ON / 4:3 AREA ON



9.5.3 4:3 Aspect-Ratio Marker

The 4:3 AREA item is used to determine whether to superimpose the 4:3 aspect-ratio marker.

This menu is only displayed in HD format.

- **Description of Setting Items**

ON: Superimposes the 4:3 aspect-ratio marker.

OFF: Does not superimpose the 4:3 aspect-ratio marker (initial setting).

- **Setting Procedure of 4:3 Aspect-Ratio Marker**

```
1. SDI SETTING
◆ SAFETY AREA
```

Display SAFETY AREA by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. SAFETY AREA
▲ 4 : 3 AREA
```

Display 4:3 AREA by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. 4 : 3 AREA MARKER
■ ON □ OFF
```

Select the ON by using the [◀] and [▶] keys.

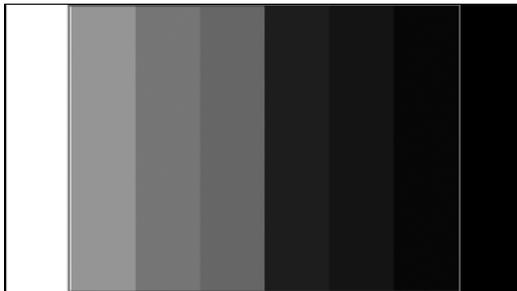
Select the OFF not to display the marker.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. SAFETY AREA
▲ 4 : 3 AREA
```

- **Example of screen display**

4:3 AREA ON



9.6 Setting ID Character

The ID CHARACTER item is used to set the ID character superimposed on the SDI signal. No ID is superimposed when the CHECK FIELD pattern is selected.

9.6.1 Creating ID Character

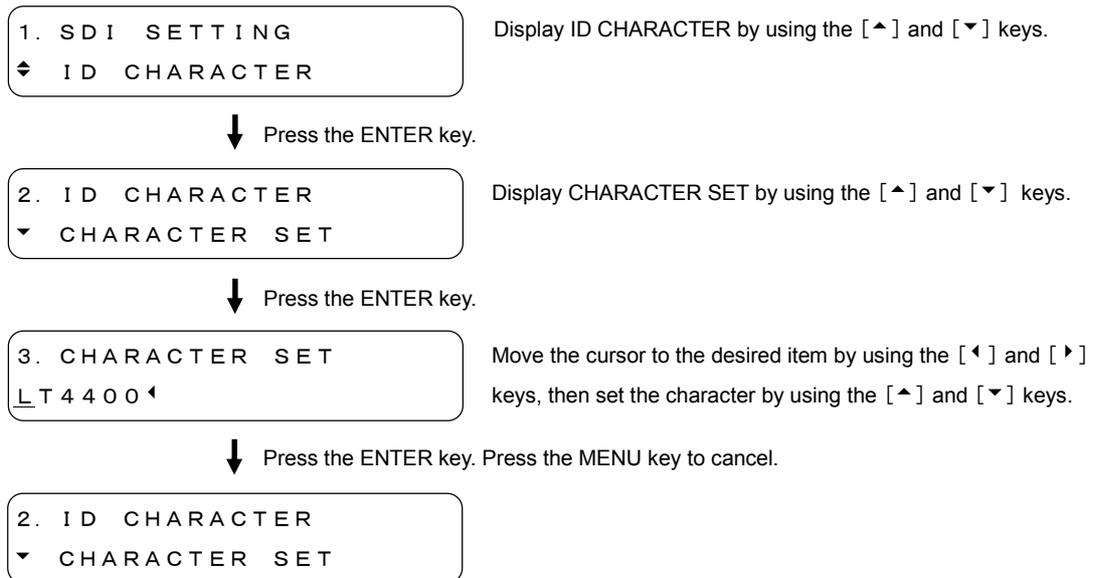
The CHARACTER SET item is used to create the ID character. Up to 20 alphanumeric characters can be used for the ID character. To display the ID character, refer to Section 9.6.7, "Displaying ID Character" to select ON.

- **Settable Range**

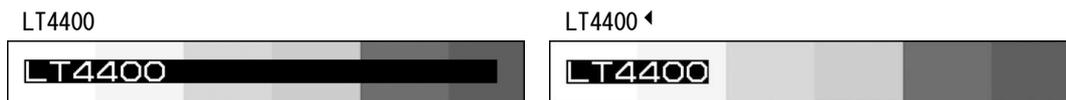
The characters selectable from the space by pressing the [▲] and [▼] keys are shown below. The initial setting is "LT 4400 ◀".

[▲] key !” # \$ % & ’ () * + , - . / 0 1 2 3 4 5 6 7 8 9
 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R
 S T U V W X Y Z [¥] ^ _ → ←
 [▼] key ◀ (*1)

- **Setting Procedure of ID Character**



*1 The background of 20-character area is displayed in black, however, the background of each character is displayed in black when the [◀] is entered at the end of the character. When the [◀] is entered between characters, the continued characters are deleted. When other character is entered instead, the display returns to the original conditions, however.



9.6.2 ID Character Position

The ID POSITION item is used to set the display position of ID character.
The settable range depends on the format.

- **Settable Range**

H (horizontal) The initial setting is 0 dot displayed at the left end of the screen.

1080i, 1080p, 1080PsF: 0 dot to 1919 dots, in 1 dot steps

720p: 0 dot to 1279 dots, in 1 dot steps

525i, 625i: 0 dot to 719 dots, in 1 dot steps

V (vertical) The initial setting is 0 dot displayed at the top of the screen.

1080i, 1080p, 1080PsF: 0 dot to 1079 dots, in 1 dot steps

720p: 0 dot to 719 dots, in 1 dot steps

525i: 0 dot to 486 dots, in 1 dot steps

625i: 0 dot to 575 dots, in 1 dot steps

- **Position Setting Procedure**



Display ID CHARACTER by using the [▲] and [▼] keys.

↓ Press the ENTER key.



Display ID POSITION by using the [▲] and [▼] keys.

↓ Press the ENTER key.



Move the cursor to the desired item by using the [◀] and [▶] keys, then set the position by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

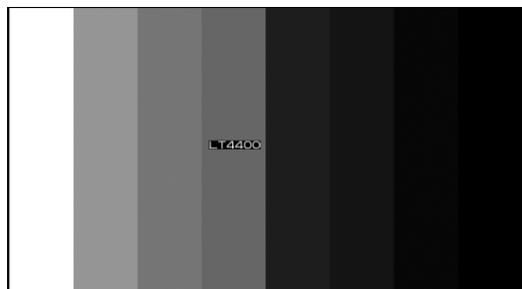


- **Example of screen display**

H : 0DOT / V : 0DOT



H : 750DOT / V : 500DOT



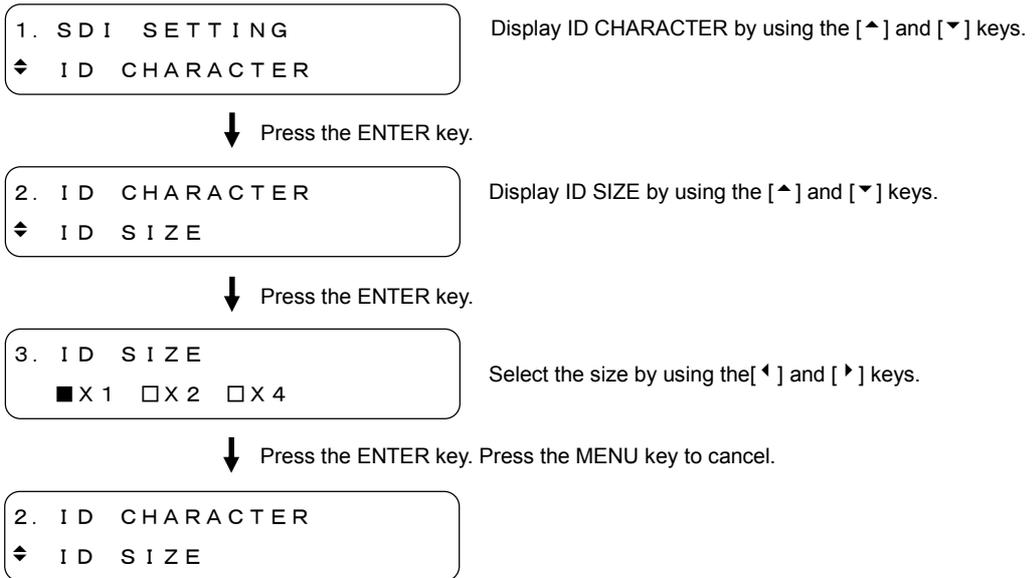
9.6.3 D Character Size

The ID SIZE item is used to set the ID character size in magnifying power with respect to the basic size. An ID character size is 32 x 32 dots.

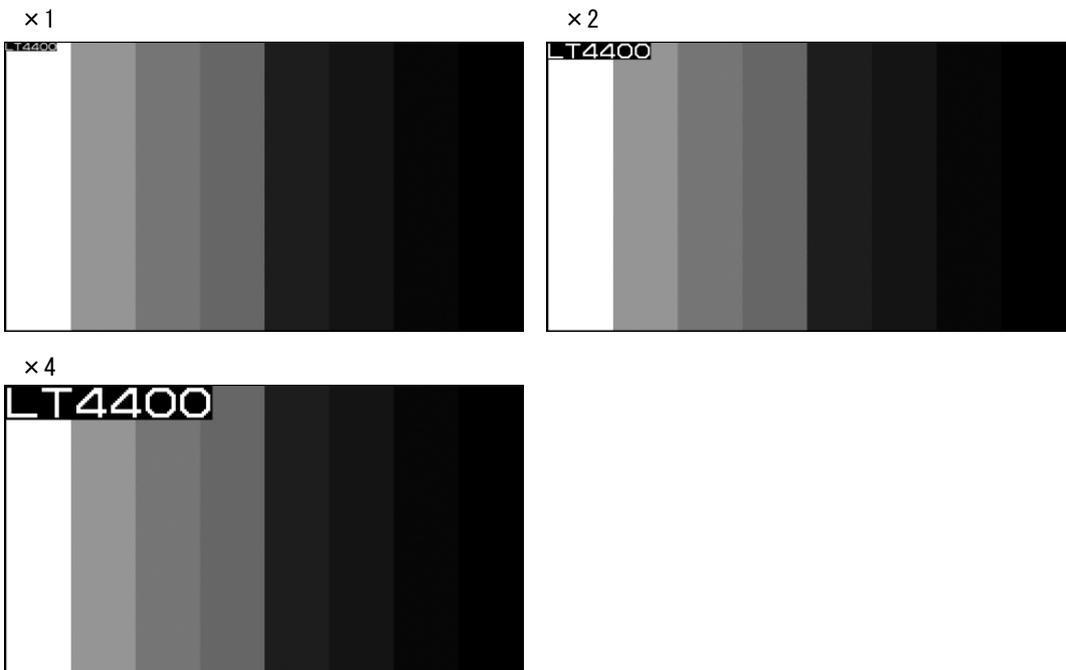
- **Settable Range**

- x1: 32 x 32 dots/ 1 character (initial setting)
- x2: 64 x 64 dots/ 1 character
- x4: 128 x 128 dots/ 1 character

- **Size Setting Procedure**



- **Example of screen display (in case of 1080i/59.94)**



9.6.4 ID Character Brightness

The ID LEVEL item is used to set the brightness of the ID character.

• **Description of Setting Items**

100%: Sets the brightness to 100%. A character color becomes white (initial setting).

75%: Sets the brightness to 75%. A character color becomes gray.

• **Brightness Setting Procedure**

1. SDI SETTING
 ◆ ID CHARACTER

Display ID CHARACTER by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. ID CHARACTER
 ◆ ID LEVEL

Display ID LEVEL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. ID LEVEL
 100% 75%

Select the brightness by using the [◀] and [▶] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

2. ID CHARACTER
 ◆ ID LEVEL

• **Example of screen display**



9.6.5 Blinking Time of ID Character

The ID BLINK TIME item is used to set the blink interval of ID character. The On and Off intervals can be set respectively. To blink the ID character, refer to Section 9.6.6, "Blinking ID Character" to select ON.

- **Description of Setting Items**

ON (blinking on time): 1 to 9second, in 1second steps (initial setting is 1sec)

OFF (blinking off time): 1 to 9second, in 1second steps (initial setting is 1sec)

- **Setting Procedure of Blinking Time**

1. SDI SETTING
 ◆ ID CHARACTER

Display ID CHARACTER by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. ID CHARACTER
 ◆ ID BLINK

Display ID BLINK by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. ID BLINK
 ▼ ID BLINK TIME

Display ID BLINK TIME by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. ID BLINK TIME
 ■ ON : 2 s □ OFF : 3 s

Move the cursor to the desired item by using the [◀] and [▶] keys, then set the time by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

3. ID BLINK
 ▲ ID BLINK TIME

9.6.6 Blinking ID Character

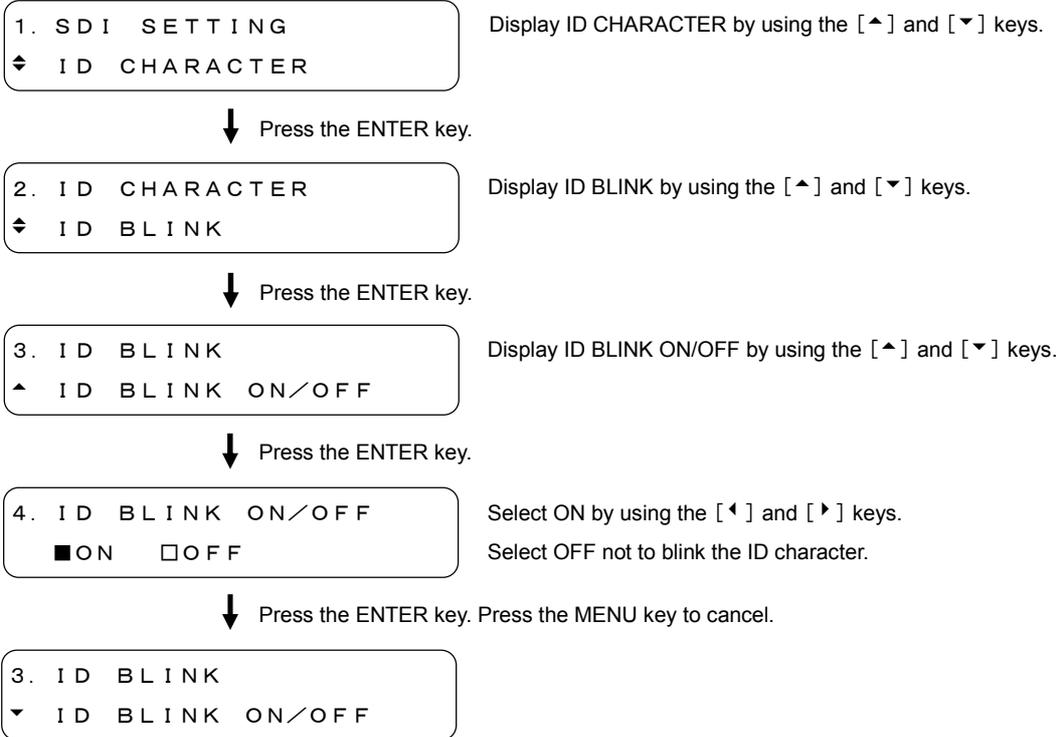
The ID BLINK ON/OFF item is used to determine whether the ID character blinks or not.

- **Description of Setting Items**

ON: Blinks the ID character

OFF: Does not blink the ID character (initial setting)

- **Blinking Setting Procedure**



9.6.7 Displaying ID Character

The ID ON/OFF item is used to determine whether the ID character displays.

- **Description of Setting Items**

ON: Displays the ID character

OFF: Does not display the ID character (initial setting)

- **Displaying Procedure of ID Character**

```
1. SDI SETTING
  ◆ ID CHARACTER
```

Display ID CHARACTER by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. ID CHARACTER
  ▲ ID ON/OFF
```

Display ID ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. ID ON/OFF
  ■ ON  □ OFF
```

Select ON by using the [◀] and [▶] keys.

Select OFF not to display the ID character.

↓ Press the ENTER key. Press the MENU key to cancel.

```
2. ID CHARACTER
  ▲ ID ON/OFF
```

9.7 Setting Logomark

The LOGO item is used to set the logomark.

The logomark up to 320 (dot) x 240 (line) in QVGA (*1) size can be superimposed to the SDI signal (*2). The logomark is converted from the 24-bit full color bit map to four-grade monochrome data. No logomark is superimposed when the CHECK FIELD pattern is selected. When converting the data into four-grade monochrome data, procure the application software.

To display the logomark, transfer the data from the memory card to the main frame. Create the "logo" folder on the memory card, then enter the file with arbitrary name (*.lg) underneath. Refer to Figure 9-1.

The logomark created with the LEADER LT 443D can also be used for the LT 4000.

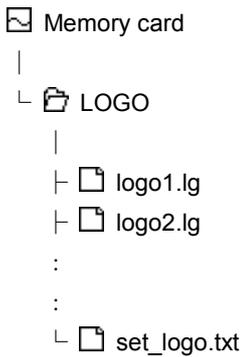


Figure 9-1 Structure of logomark file

*1 Up to 1920 dots x 1080 lines can be displayed when the Option (LT 4400-70) is installed

*2 Logomark cannot be superimposed when the CHECK FIELD pattern is selected.

9.7.1 Logomark Position

The LOGO POSITION item is used to set the logomark position on the screen.

The settable range depends on the format.

- **Settable Range**

H (horizontal): The initial setting is 0 dot displayed at the left end of the screen.

1080i, 1080p, 1080PsF: 0 dot to 1919 dots, in 1 dot steps

720p: 0 dot to 1279 dots, in 1 dot steps

525i, 625i: 0 dot to 719 dots, in 1 dot steps

V (vertical): The initial setting is 0 dot displayed at the top of the screen.

1080i, 1080p, 1080PsF: 0 dot to 1079 dots, in 1 dot steps

720p: 0 dot to 719 dots, in 1 dot steps

525i: 0 dot to 486 dots, in 1 dot steps

625i: 0 dot to 575 dots, in 1 dot steps

9. SDI SIGNAL SETTINGS (SDI SETTING)

• Position Setting Procedure

1. SDI SETTING
 ◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
 ▼ LOGO POSITION

Display LOGO POSITION by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO POSITION
 ■ H : 1 0 D O T □ V : 1 0 D O T

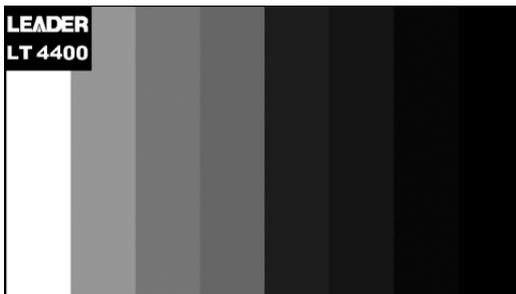
Move the cursor to the desired item by using the [←] and [→] keys, then set the position by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

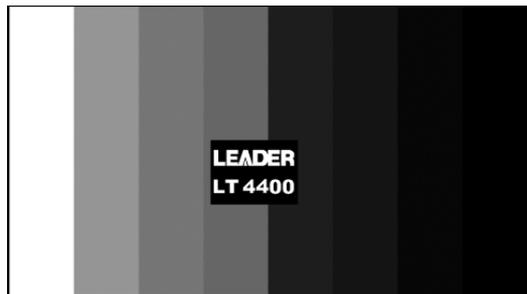
2. LOGO
 ▼ LOGO POSITION

• Example of screen display

H : 0DOT / V : 0DOT



H : 750DOT / V : 500DOT



9.7.2 Logomark Brightness

The LOGO LEVEL item is used to set the brightness of logomark.

The logomark can be displayed in four-grade monochrome data (LEVEL 3, LEVEL 2, LEVEL 1, LEVEL 0 - in high to low). The brightness can be set for each grade.

This section only describes the setting procedure of LEVEL 3, however, the same procedure can also be applied to LEVEL 2 to LEVEL 0.

• Settable Range

LEVEL 3:	040H (0%) to 3ACH (100%), 877 grades The initial setting is 3ACH (100%).
LEVEL 2:	040H (0%) to 3ACH (100%), 877 grades The initial setting is 288H (66%).
LEVEL 1:	040H (0%) to 3ACH (100%), 877 grades The initial setting is 164H (33%).
LEVEL 0:	040H (0%) to 3ACH (100%), 877 grades The initial setting is 040H (0%).

9. SDI SIGNAL SETTINGS (SDI SETTING)

• Brightness Setting Procedure

1. SDI SETTING
◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
◆ LOGO LEVEL

Display LOGO LEVEL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO LEVEL
▼ LEVEL 3 3ACH (100%)

Select the grade to be set by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. LOGO LEVEL
LEVEL 3 ◆ 3ABH (99%)

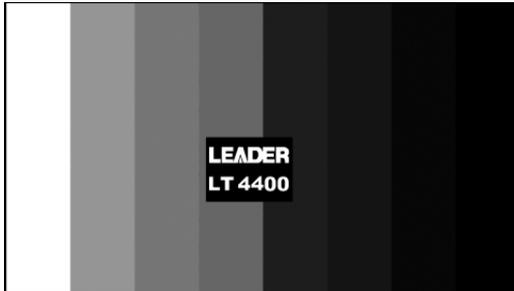
Set the brightness by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

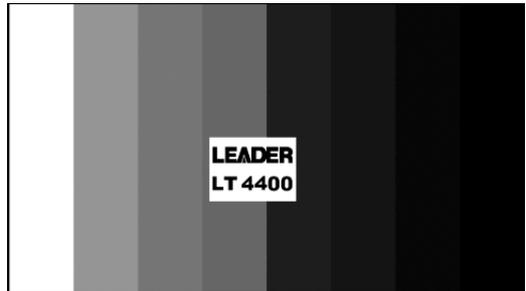
3. LOGO LEVEL
▼ LEVEL 3 3ABH (99%)

• Example of screen display

LEVEL 3 3ACH (100%) / LEVEL 0 040H (0%)



LEVEL 3 040H (0%) / LEVEL 0 3ACH (100%)



9.7.3 Penetrating Logomark

The LOGO BACKGROUND item is used to select whether to display the LEVEL-0 logomark set in Section 9.7.2, "Logomark Brightness".

If this function set to ON, the background of the portion of LEVEL 0 penetrates and can be seen.

- **Settable Range**

ON: Does not display LEVEL 0. Therefore, the background can be seen.

OFF: Displays LEVEL 0. Therefore, the background can not be seen.
(initial setting)

- **Setting Procedure of Penetrating Logomark**

1. SDI SETTING
 ◆ LOGO Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
 ◆ LOGO BACKGROUND Display LOGO BACKGROUND by using the [▲] and [▼] keys.

↓ Press the ENTER key.

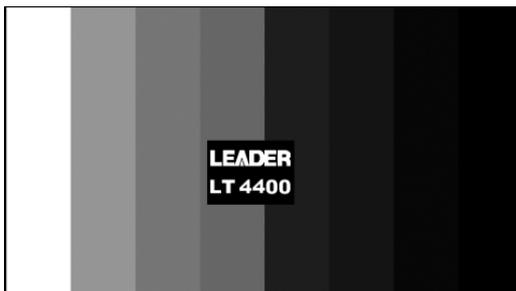
3. LOGO BACKGROUND
 ■ ON □ OFF Select ON by using the [←] and [→] keys.
 Select OFF to display the LEVEL 0.

↓ Press the ENTER key. Press the MENU key to cancel.

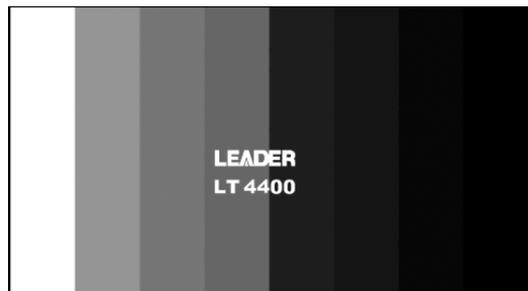
2. LOGO
 ◆ LOGO BACKGROUND

- **Example of screen display**

BACKGROUND OFF



BACKGROUND ON



9.7.4 Displaying Logomark

The LOGO ON/OFF item is used to select whether to display the logomark.

- **Description of Setting Items**

ON: Displays the logomark.

OFF: Does not display the logomark (initial setting).

- **Displaying Procedure of Logomark**

1. SDI SETTING
◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
◆ LOGO ON/OFF

Display LOGO ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO ON/OFF
■ ON □ OFF

Select ON by using the [◀] and [▶] keys.

Select OFF not to display the ID character.

↓ Press the ENTER key. Press the MENU key to cancel.

2. LOGO
◆ LOGO ON/OFF

9.7.5 Selecting Logomark

The SELECT LOGO item is used to select the logomark to be transferred from the memory card to the main frame set in Section 9.7.6, "Transferring Logomark".

The logomark can be selected from the main frame or memory card.

To save the logomark, refer to Section 9.7.8, "Saving Logomark".

• **Logomark Selecting Procedure**

1. SDI SETTING
 ◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
 ◆ LOGO SET

Display LOGO SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO SET
 ▼ SELECT LOGO

Display SELECT LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. SELECT LOGO
 ▼ LOGO. LG INT_MEM

Select the file from main frame or memory card by using the [▲] and [▼] keys. (*1)

↓ Press the ENTER key. Press the MENU key to cancel.

4. SELECT LOGO
 ▼ *LOGO. LG INT_MEM

*** is displayed before the selected file.

*1 The screen below is displayed when no logomark is saved in the main frame.

4. SELECT LOGO
 ▼ NO DATA!! INT_MEM

9.7.6 Transferring Logomark

The FILE TRANSFER item is used to transfer the logomark selected in Section 9.7.5, "Selecting Logomark" to the main frame. To display the selected logomark, select ON in Section 9.7.4, "Displaying Logomark". The transferred logomark is retained while the instrument is powered on; turning power off deletes the logomark.

• **Logomark Transferring Procedure**

1. SDI SETTING
 ◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
 ◆ LOGO SET

Display LOGO SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO SET
 ◆ FILE TRANSFER

Display FILTER TRANSFER by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. FILE TRANSFER
 OK CANCEL

Select OK by using the [←] and [→] keys.

Select CANCEL not to transfer the logomark.

↓ Press the ENTER key. Press the MENU key to cancel.

4. FILE TRANSFER
 ■■■■■ COMPLETE !

The logomark is now transferred. Press the MENU key to return to LOGO SET.

9.7.7 Automatic Transferring Logomark

The SET TO CF CARD item is used to set the automatic logomark transfer mode when power is turned on. The logomark selected in Section 9.7.5, "Selecting Logomark" is automatically transferred. The setting condition is saved on the memory card named "set_logo.txt". (See Figure 9-1) If "set_logo.txt" already exists on the memory card, it will be overwritten.

• **Automatic Transferring Procedure of Logomark**

1. SDI SETTING
◆ LOGO

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. LOGO
◆ LOGO SET

Display LOGO SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. LOGO SET
▲ SET TO CF CARD

Display SET TO CF CARD by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. SET TO CF CARD
■OK □CANCEL

Select OK by using the [←] and [→] keys.

Select CANCEL not to set.

↓ Press the ENTER key. Press the MENU key to cancel.

4. SET TO CF CARD
■■■■■■ COMPLETE !

The logomark is now transferred. Press the MENU key to return to "3.LOGO SET". (*1)

*1 In case the transfer setting is already saved, it is displayed as shown in Figure below.

5. WARNING!! OVER WR?
□OK ■CANCEL

9.7.8 Saving Logomark

The "LOGO SAVE (CF ▶ INT)" item is used to save the logomark transferred from the memory card to the main frame.

The saved logomark is retained even when the power is turned off.

- **Savable Contents**

Number of Savable Items: 1 Overwritten with new data
 Capacity: 512 k bytes, max (Version 1.30 and later)
 Size: 1920 dots x 1080 lines (Version 1.30 and later) (*1)

*1 Displayable size is up to 320 dots x 240 lines (QVGA). However, up to 1920 dots x 1080 lines can be displayed when Option (LT4400-70) is installed.

- **Logomark Saving Procedure**

```
1. SDI SETTING
◆ LOGO
```

Display LOGO by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
2. LOGO
▲ LOGO SAVE (CF ▶ INT)
```

Display LOGO SAVE (CF ▶ INT) by using the [▲] and [▼] keys.

↓ Press the ENTER key.

```
3. LOGO SAVE (CF ▶ INT)
◆ LOGO.LG 2 / 3
```

Select the file to save by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel.

```
3. LOGO SAVE (CF ▶ INT)
■■■■■ COMPLETE !
```

The logomark has been saved now. Press the MENU key to return to "2.LOGO". (*2)

*2 In case the logomark is already saved, it is displayed as shown in Figure below.

```
4. WARNING!! OVER WR?
□OK ■CANCEL
```

9.8 Setting Pattern Scroll

The PATTERN SCROLL item is used to set the pattern scroll mode.
The pattern scroll mode is disabled when the CHECK FIELD pattern is selected.

9.8.1 Pattern Scroll Direction

The DIRECTION is used to set the pattern scroll direction.

- **Description of Setting Items**

UP & RIGHT:	The pattern is scrolled up and right (initial setting).
UP:	The pattern is scrolled up.
UP & LEFT:	The pattern is scrolled up and left.
LEFT	The pattern is scrolled left.
DOWN & LEFT:	The pattern is scrolled down and left.
DOWN:	The pattern is scrolled down.
DOWN & RIGHT:	The pattern is scrolled down and right.
RIGHT:	The pattern is scrolled right.

- **Direction Setting Procedure**

1. SDI SETTING
◆ PATTERN SCROLL

Display PATTERN SCROLL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PATTERN SCROLL
▼ SCROLL PARAM SET

Display SCROLL PARAM SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. SCROLL PARAM SET
▼ DIRECTION

Display DIRECTION by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. DIRECTION
◆ DOWN & LEFT

Set the direction by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel

4. DIRECTION
◆ *DOWN & LEFT

"" is displayed before the setting direction.

9.8.2 Pattern Scroll Speed

The SPEED item is used to set the pattern scroll speed.

- **Settable Range**

H (horizontal): 0 to 254 dots in 2 dots steps. The initial setting is 0 dot.

V (vertical): 0 to 255 dots in 1 dot steps. The initial setting is 0 dot.

- **Speed Setting Procedure**

1. SDI SETTING
◆ PATTERN SCROLL

Display PATTERN SCROLL by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PATTERN SCROLL
▼ SCROLL PARAM SET

Display SCROLL PARAM SET by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. SCROLL PARAM SET
▲ SPEED

Display SPEED by using the [▲] and [▼] keys.

↓ Press the ENTER key.

4. SPEED
■ H : 1 0 DOT □ V : 1 0 DOT

Move the cursor to the desired item by using the [◀] and [▶] keys, then set the speed by using the [▲] and [▼] keys.

↓ Press the ENTER key. Press the MENU key to cancel

3. SCROLL PARAM SET
▲ SPEED

9.8.3 Pattern Scroll Mode ON/OFF

The SCROLL ON/OFF item is used to determine whether the pattern scrolls or not.

- **Description of Setting Items**

ON: The pattern scroll mode is enabled.

OFF: The pattern scroll mode is disabled (initial setting).

- **Setting Procedure of Pattern Scroll**

1. SDI SETTING

◆ PATTERN SCROLL

Display PATTERN SCROLL by using the [▲] and [▼] keys.



Press the ENTER key.

2. PATTERN SCROLL

▲ SCROLL ON/OFF

Display SCROLL ON/OFF by using the [▲] and [▼] keys.



Press the ENTER key.

3. SCROLL ON/OFF

ON OFF

Select ON by using the [◀] and [▶] keys.

Select OFF to disable the pattern scroll mode.



Press the ENTER key. Press the MENU key to cancel.

2. PATTERN SCROLL

▲ SCROLL ON/OFF

9.9 Setting of Automatic Pattern Changing

The PATTERN CHANGE item is used to set the automatic pattern change mode. When ON is selected in Section 9.9.2, "Automatic Pattern Changing ON/OFF", patterns listed in Table 4-2 is automatically changed from the left.

9.9.1 Setting of Changing Time

The SPEED item is used to set the pattern change speed in seconds.

- **Settable Range**

1 to 255 seconds, in 1 second steps. The initial setting is 1 second.

- **Setting Procedure of Changing Time**

```
1. SDI SETTING
  ^ PATTERN CHANGE
```

Display PATTERN CHANGE by using the [^] and [v] keys.

↓ Press the ENTER key.

```
2. PATTERN CHANGE
  v SPEED
```

Display the by using the [^] and [v] keys.

↓ Press the ENTER key.

```
3. SPEED
   1 s e c
```

Set the time by using the [^] and [v] keys.

↓ Press the ENTER key. Press the MENU key to cancel

```
2. PATTERN CHANGE
  v SPEED
```

9.9.2 Automatic Pattern Changing ON/OFF

The CHANGE ON/OFF item is used to determine whether to change the patterns automatically.

- **Description of Setting Items**

ON: Automatically changes the patterns.

OFF: Does not change automatically the patterns (initial setting).

- **Setting Procedure of Automatic Pattern Changing**

1. SDI SETTING
 ▲ PATTERN CHANGE

Display PATTERN CHANGE by using the [▲] and [▼] keys.

↓ Press the ENTER key.

2. PATTERN CHANGE
 ▲ CHANGE ON/OFF

Display CHANGE ON/OFF by using the [▲] and [▼] keys.

↓ Press the ENTER key.

3. CHANGE ON/OFF
 ON OFF

Select ON by using the [◀] and [▶] keys.

Select OFF to disable the automatic pattern change mode.

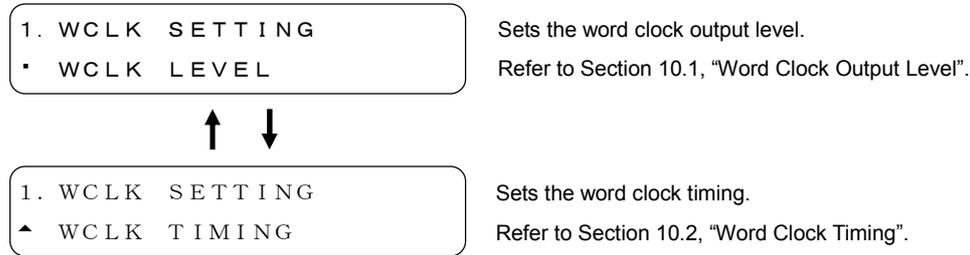
↓ Press the ENTER key. Press the MENU key to cancel.

2. PATTERN CHANGE
 ▲ CHANGE ON/OFF

10. WORD CLOCK SETTINGS (WCLK SETTING)

The WCLK SETTING menus used to set the 48-kHz word clock output. To display the WCLK SETTING menu, press the MENU key repeatedly until WCLK SETTING is displayed.

After the WCLK SETTING menu is displayed, select the item to be set by using the [▲] and [▼] keys.



10.1 Word Clock Output Level

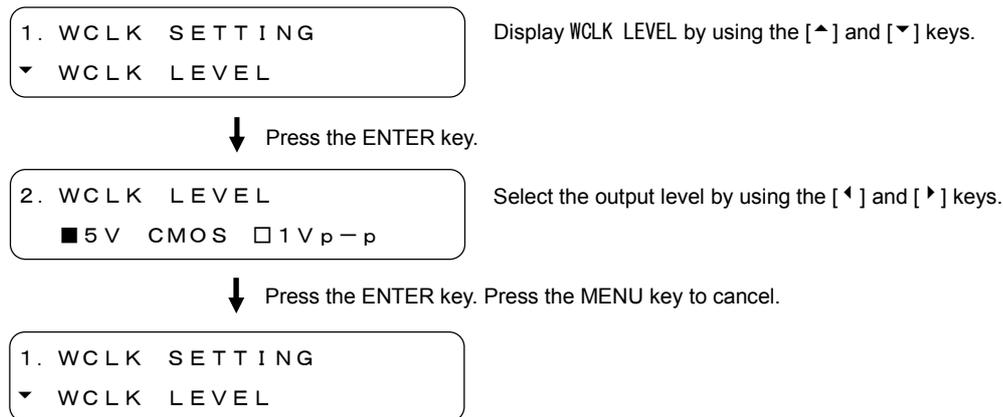
The WCLK LEVEL item is used to set the word clock output level.

- **Description of Setting Items**

5V CMOS: The output level is 5 V. (initial setting)

1Vp-p: The output level is 1 V.

- **Setting Procedure of Output Level**



10.2 Word Clock Timing

The WCLK TIMING item is used to set the word clock timing.

- **Settable Range**

± 511 (± 1 AES/EBU frame), in 1 steps. The initial setting is 0.

- **Timing Setting Procedure**

```
1. WCLK SETTING
^ WCLK TIMING
```

Display WCLK TIMING by using the [\blacktriangle] and [\blacktriangledown] keys.

↓ Press the ENTER key.

```
2. WCLK TIMING
   10 (512 f s)
```

Sets the timing by using the [\blacktriangle] and [\blacktriangledown] keys.

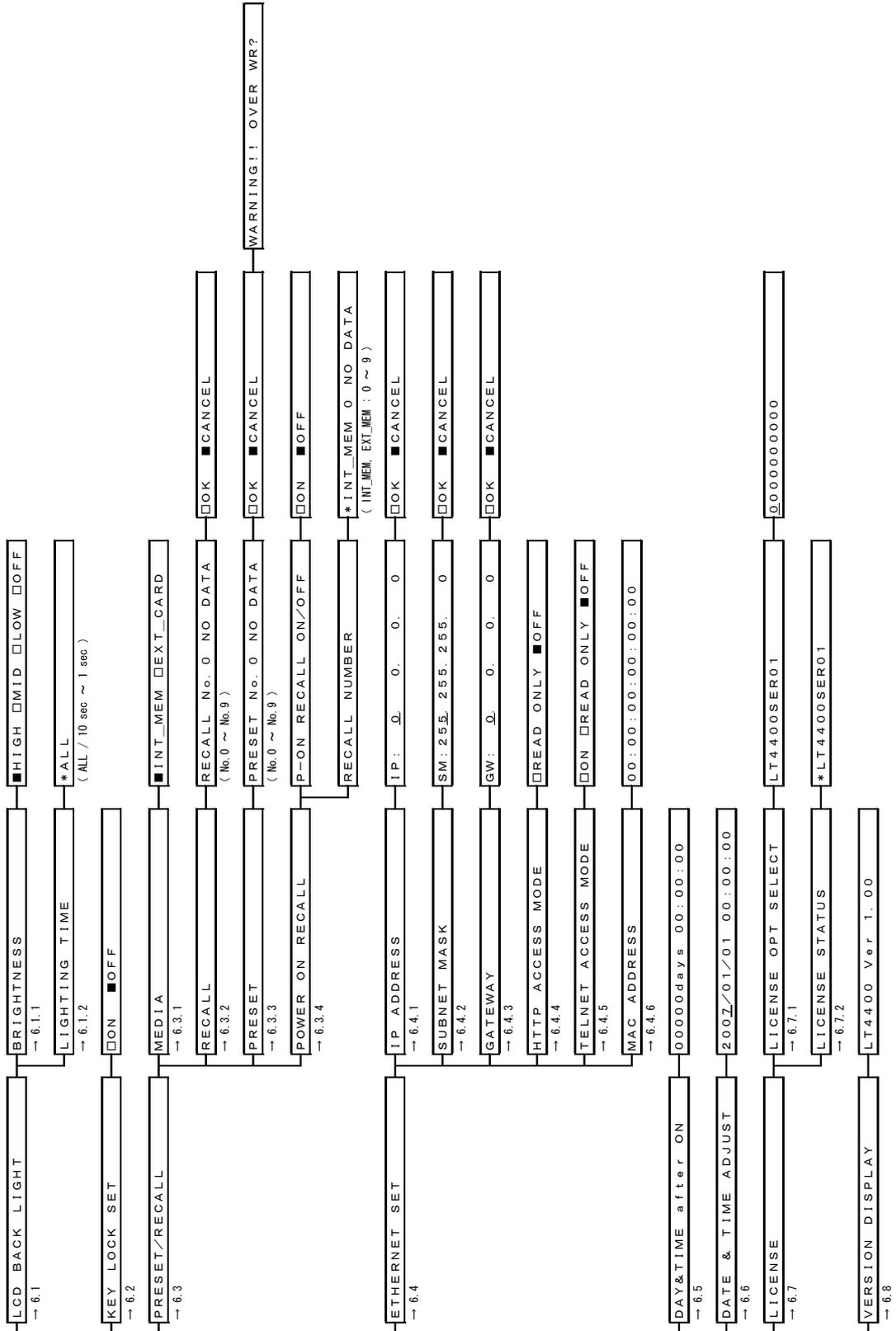
↓ Press the ENTER key. Press the MENU key to cancel.

```
1. WCLK SETTING
^ WCLK TIMING
```

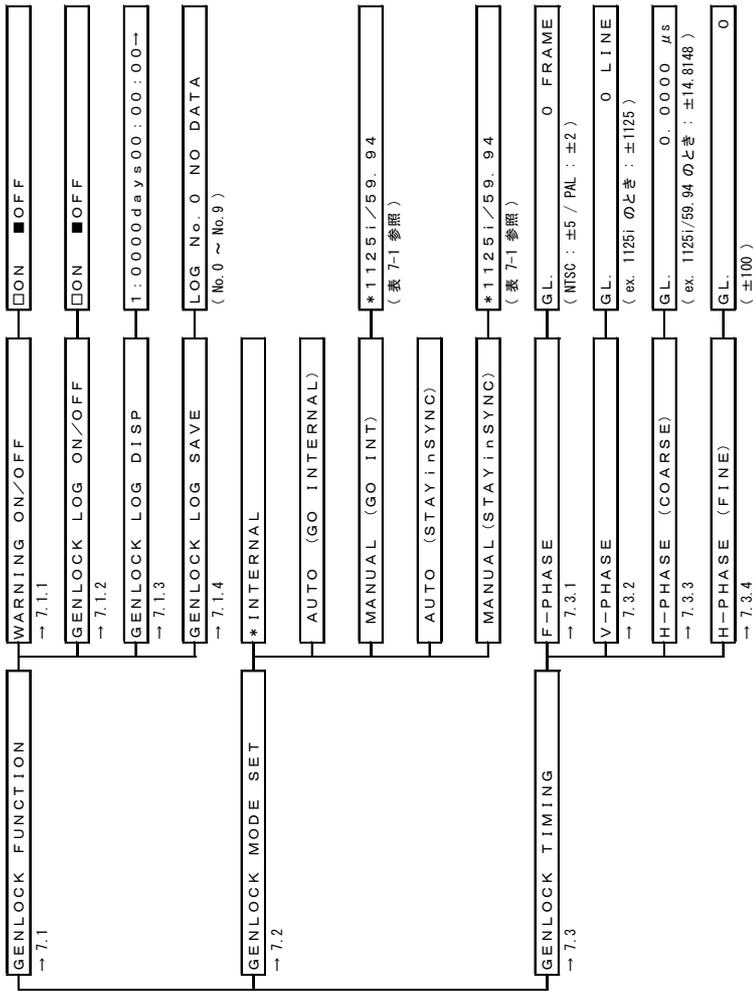
11. MENU TREE

The screen shows the initial settings.

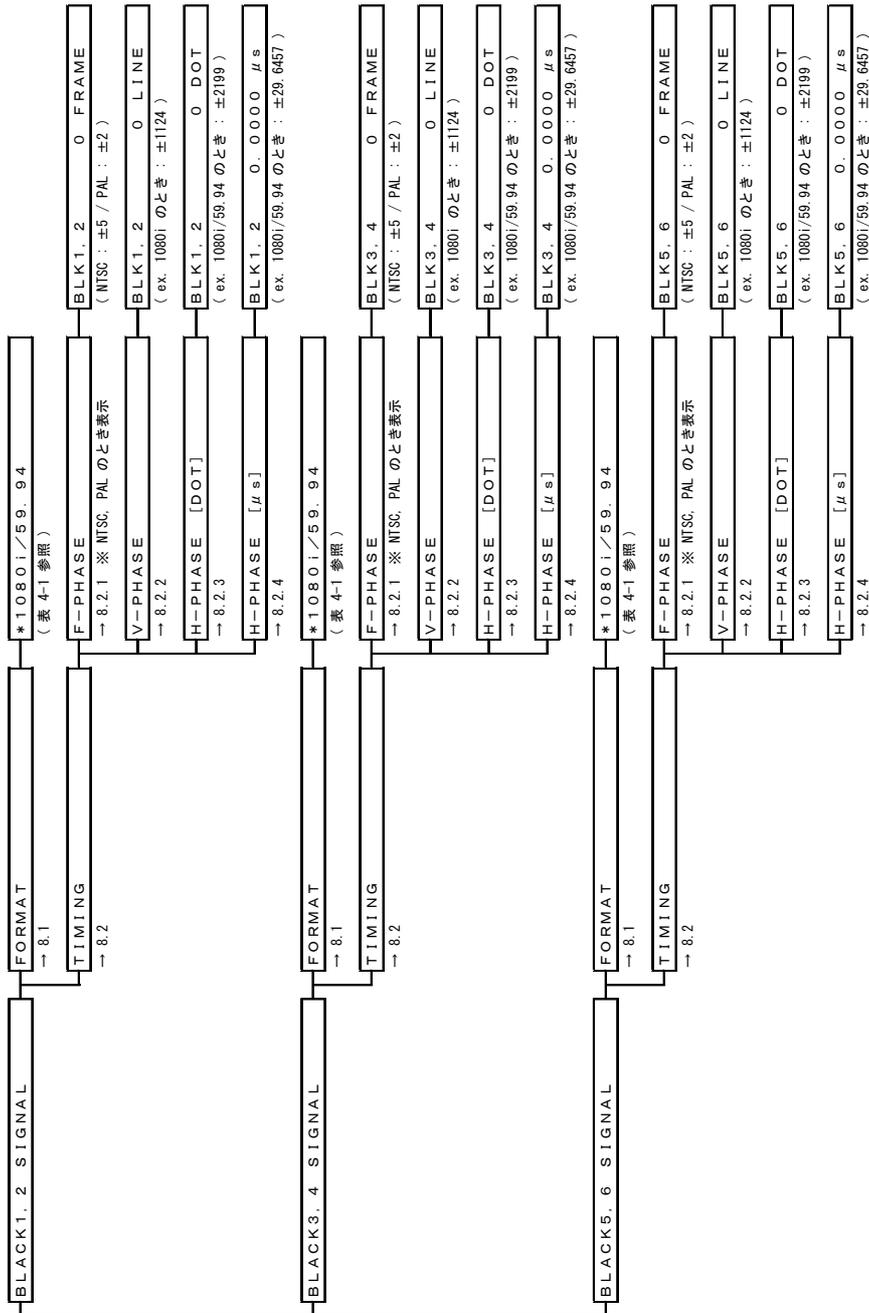
11.1 Utility Menu



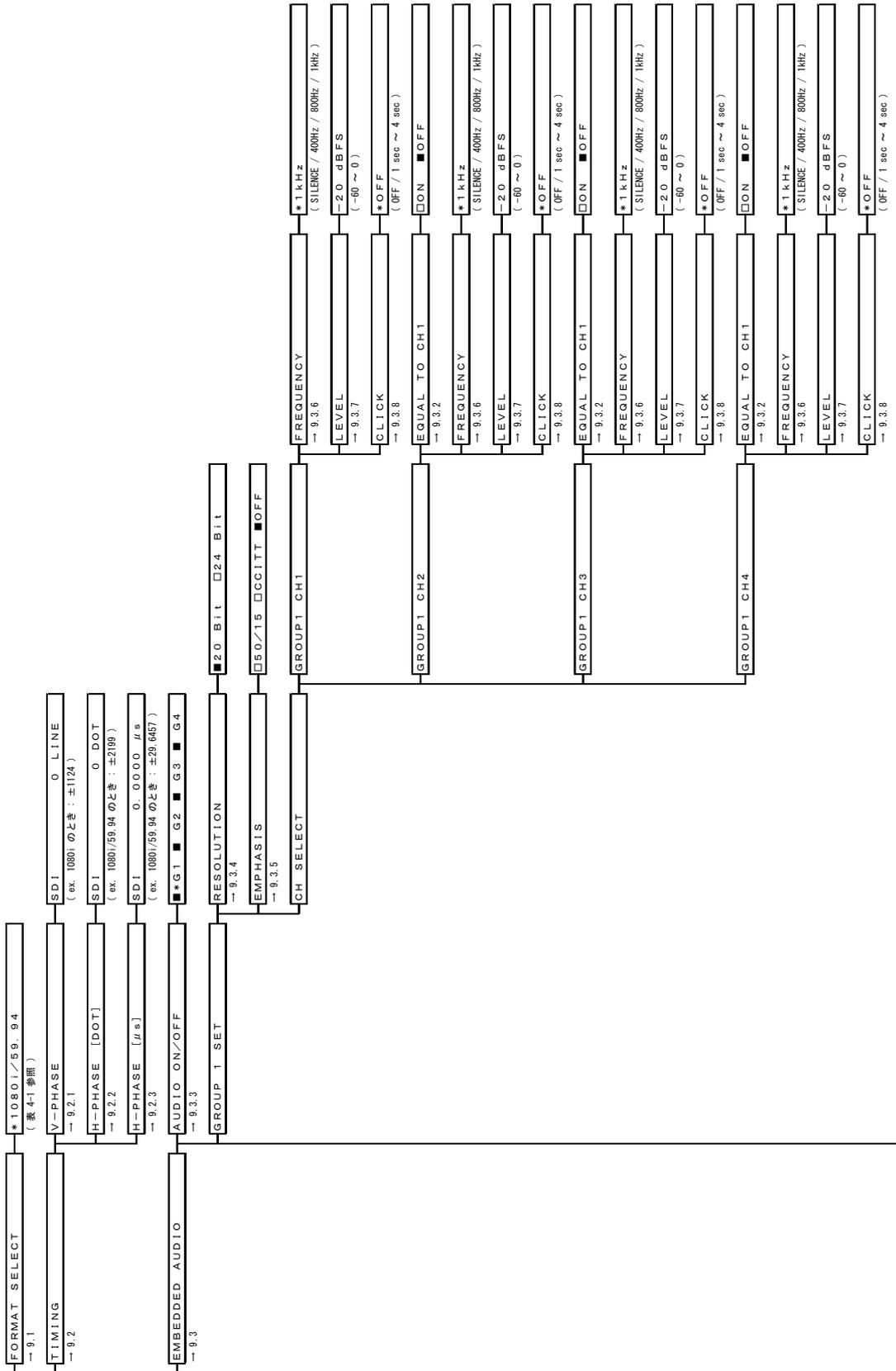
11.2 GL Setting



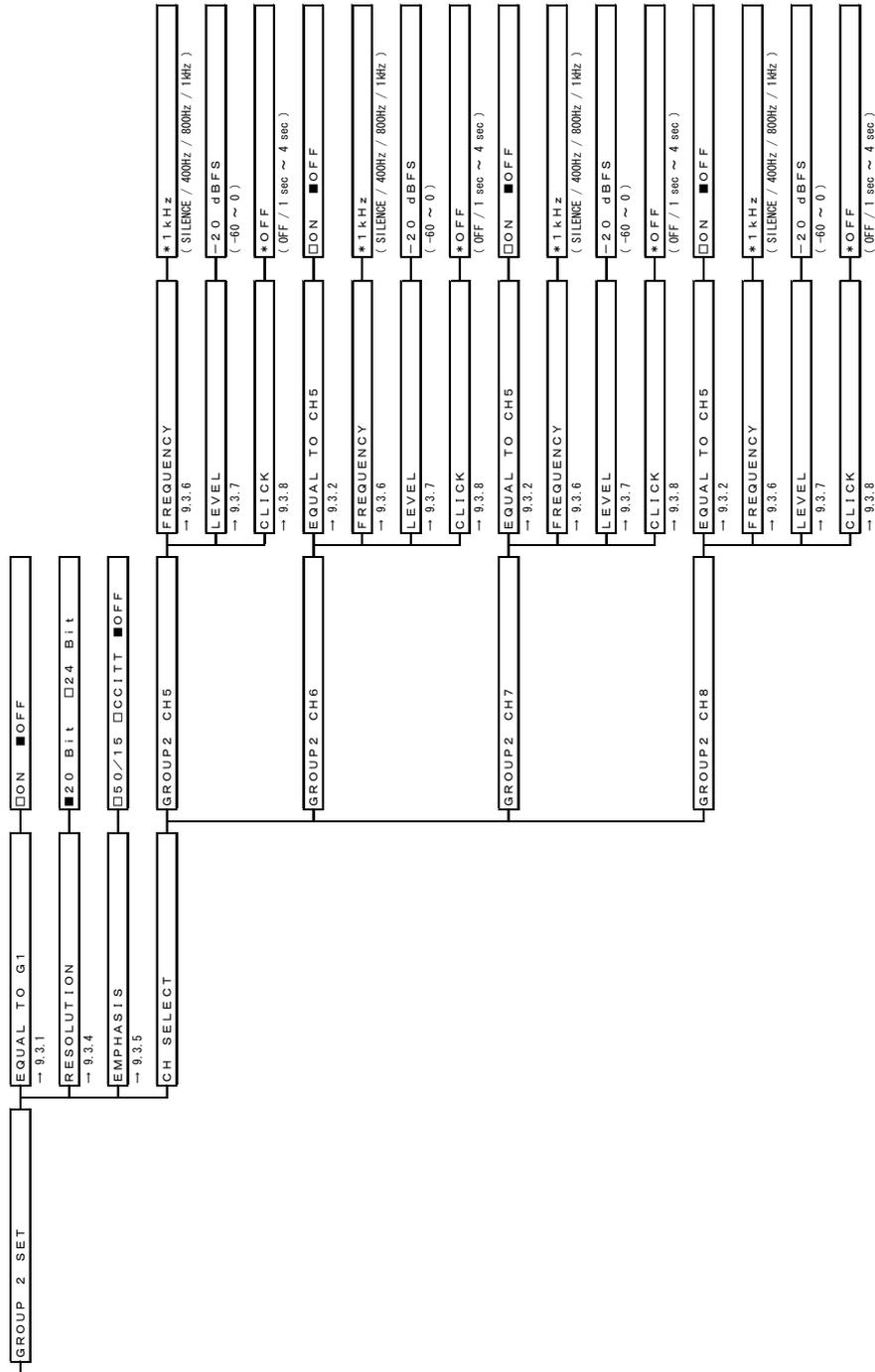
11.3 BLK Setting



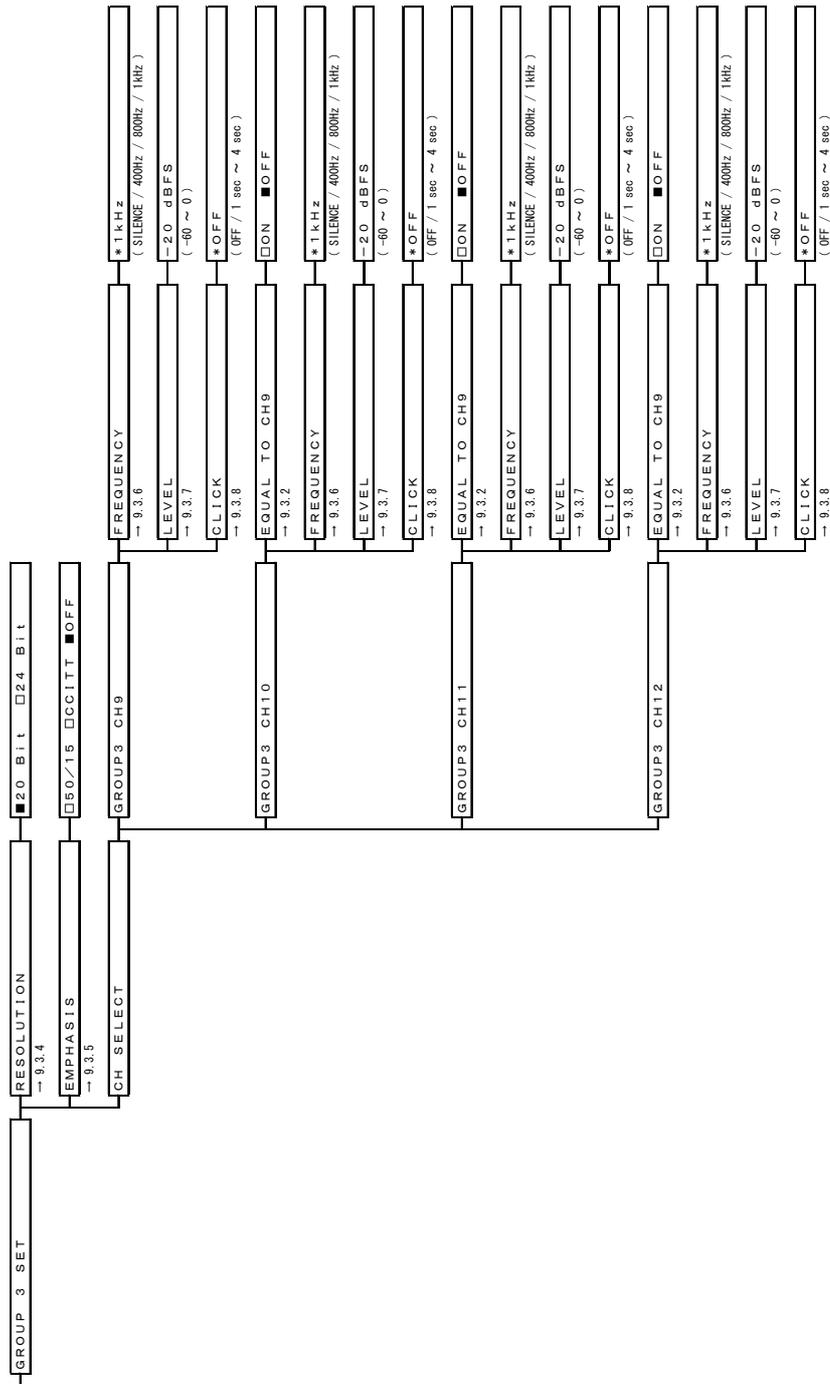
11.4 SDI Setting



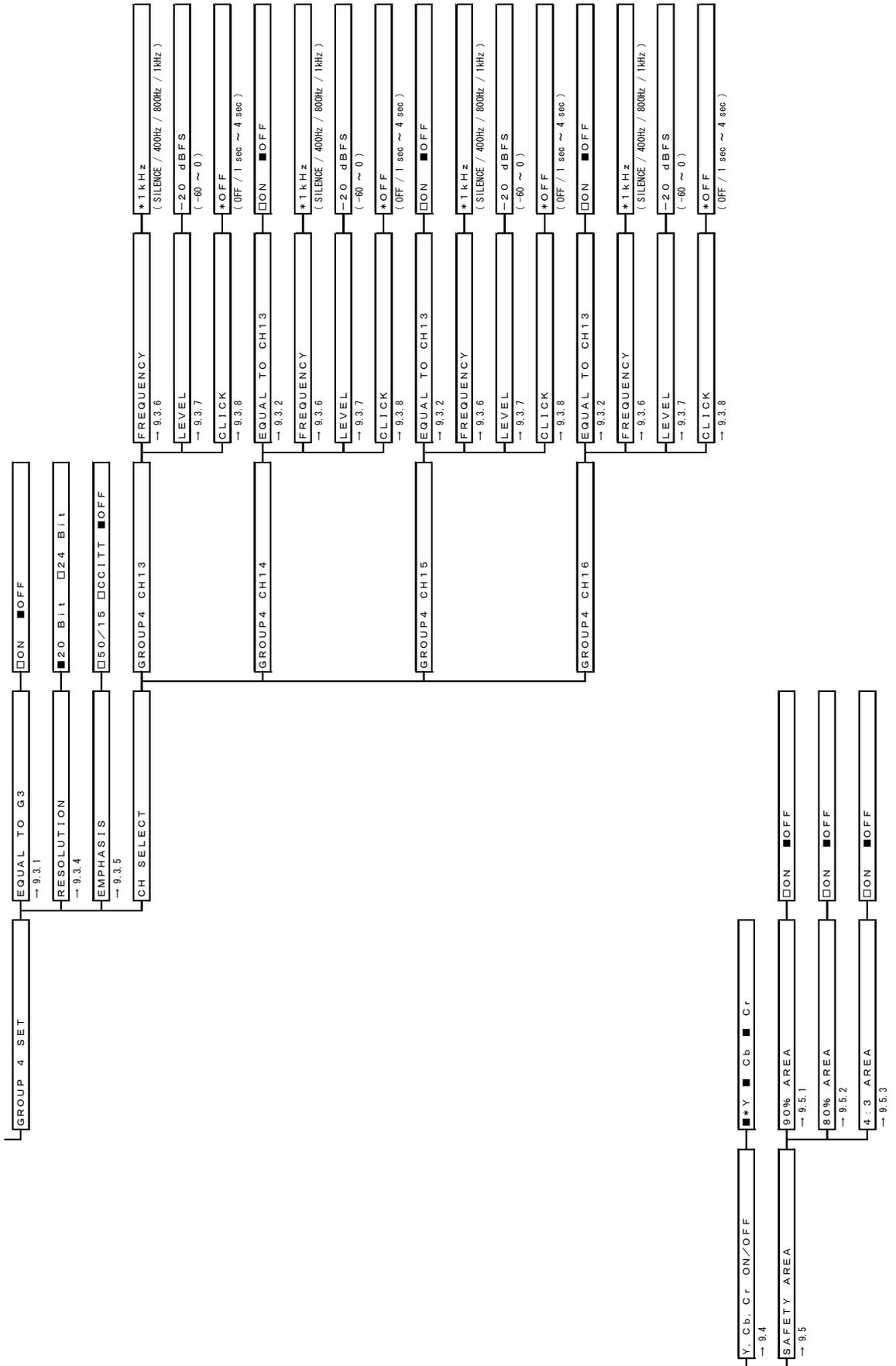
11. MENU TREE



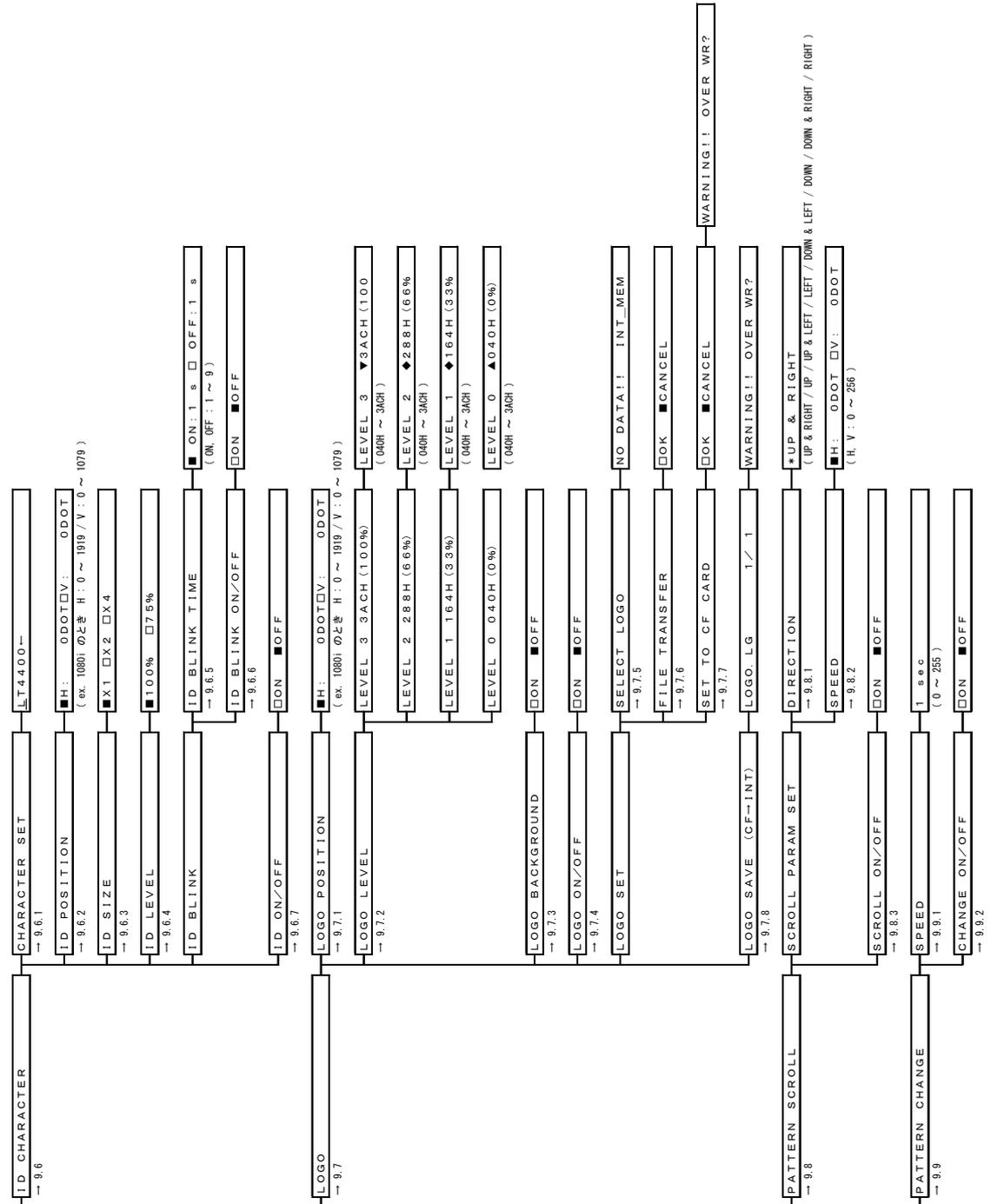
11. MENU TREE



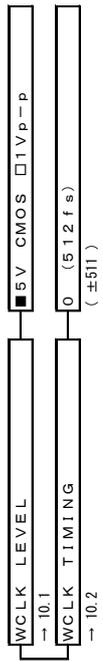
11. MENU TREE



11. MENU TREE



11.5 WCLK Setting



12. FIRMWARE REVISION HISTORY

This manual was written for firmware version 3.90.

To view the firmware version, select VERSION DISPLAY on the UTILITY MENU.

- **Ver 3.90**

- Support has been added for the LT 4400SER01 option (LIPSYNC; sold separately).
- A feature for making a timestamp (the LT 4400's internal time) when a TRAP is generated in SNMP has been added.
- A MAC address display feature has been added.

- **Ver 3.58**

- Support for TELNET has been added.

- **Ver 3.19**

- Support for SNMP and HTTP has been added.

- **Ver 2.02**

- Support has been added for simultaneously updating the software and hardware through the use of a CF card.

- **Ver 1.45**

- A SAFETY AREA MARKER feature has been added.
- Support has been added for saving a logo data file whose size is up to 512 KB to the LT 4400.

Following information is for Chinese RoHS only

所含有毒有害物质信息

部件号码: LT 4400



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	×	○	○	○	○	○
液晶显示模组	○	○	○	○	○	○
风扇	×	○	○	○	○	○
线材料一套	○	○	○	○	○	○
外筐	○	○	○	○	○	○
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。

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