

NTSC/PAL PATTERN GENERATOR



INSTRUCTION MANUAL

LEADER ELECTRONICS CORP.

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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. But an error message Amark and "warning" term in the error message which appears in PC display while running optional software and the message in the Figure of optional software explanation is displayed by the operating system, the following contents are not applied.

<symbol></symbol>	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. Be sure to refer to the safety precautions in this manual to safely use the part of the instrument where the symbol is marked.
<term></term>	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.
<term></term>	Caution statements identify warning conditions if disregarded or not correctly performed or adhered to, could result in personal injury or damage to the instrument.

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, turn off the power switch and disconnect the power plug from the socket. If you change the fuse while the cord is connected to the socket, it could cause a shock hazard. Only use the specified type and rated current and voltage fuses.

If the cause for melting fuse is unclear or if you suspect there is damage to the instrument or if you have no proper fuse at hand please contact your local Leader agent.





1. INTRODUCTIONS

Thank you for purchasing Leader's measuring instruments.

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

If you have any difficulties or questions on how to use the instrument after you have referred this manual, please feel free to contact your local Leader agent listed on the back cover.

1.1 Scope of Warranty

This Leader instrument is manufactured under strictest quality control guidelines. Leader shall not be obligated to furnish service during the warranty period under the following conditions:

- 1. Repair malfunction or damages resulting from fire, natural calamity, abnormal voltage cased by user.
- 2. Repair an instrument that has been improperly repaired, adjusted or modified by personnel other than a factory trained Leader representatives.
- 3. Repair malfunctions or damages resulting from improper use .
- 4. Repair malfunctions caused by devices other than this instrument.
- 5. Repair 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 line voltage is correct before connecting the power plug to the power cord.

The power requirements and fuse rating are indicated on the rear panel of the instrument.

The power line voltage must be within the specified value with a frequency of 50 or 60 Hz.

When you change the fuse make sure to switch off the instrument and unplug the power cord from the socket.

Voltage Range	Fuse Rating Time Lag	Spare Fuse Leader Parts Number
90 to 250 V	ET 1.25A	436 3570 010



1.2.2 RS-232C Connection

Do not connect other signal than RS-232C. Connection of other signal than RS-232C could cause damage to the instrument or any product connected to it.



CAUTION

1.2.3 Short and External Input to Output Terminal

Short on Output Terminal

Do not short the output terminal. To do so could cause damage to the instrument.

External Signal to Output Terminal

Do not apply an external signal to the output terminal. Addition of an external signal to the output terminal could cause damage to the instrument or any product connected to it.



1.2.4 Installation

Do not use the instrument in the following environments.

•Do not place the instrument under direct sunlight or near a heater or stove.

Avoid moving the instrument abruptly from cold to warm environments, as it may cause condensation.

Operating temperature range: 0 to 40°C

High Humidity Environments

Do not place or operate the instrument in high humidity environments such as a bathroom, or near a humidifier.

Operating humidity range: ≤ 90% RH

Dust Place

CAUTION

1.2.5 Mechanical Shock

Be careful not to drop the instrument or expose it to severe mechanical shock.

1.2.6 Calibration

The instrument is checked under strictest quality controls at the factory and proper operation is confirmed before shipping. Accuracy, however, might change slightly over time due to the age and general deterioration of the components.

Periodic calibration for the instrument is highly advisable. For more details on calibration, please contact your local Leader agent.

1.2.7 Routine Maintenance

2.2 FEATURES

Before cleaning procedure starts, power down the instrument and disconnect the plug from the socket.

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

Wipe cases, panels, knobs lightly with a soft cloth damped with neutral detergent. Do not drop water or detergent, or insert metal objects into the instrument while cleaning. To do so, could cause shock or fire hazard. End

inside the instrument when it is shipped from the factory is Leader's original still picture pattern. For NTSC, an iTE color matching chart(a lady with a carnation)is provided as a fixed color still pattern in addition to the rewritable color still picture pattern.

D S connector

Since S connector is used to output Y/C signals, this instrument can be used for adjusting and inspecting LCD TVs equipped with the S connector input.

Component signal output

Since Y, Pe, Pe and G. B. A can be output together with the composite signal, this instrument can be used for adjusting and inspecting LCD TVs equipped with the component signal input.

D Connector (for D1)

Two output systems (i.e., D connector, BNC connector) are provided to output Y. Ps, Ps component signals.

Various lest patierns

Since various patterns (e.g., monoscope pattern, 8-color raster, flash pattern, slant pattern, variable jurninance raster) are provided, this instrument is ideal for a varietv of adjustment and inspection applications.

2. SPECIFICATION

2.1 GENERAL

The LT 436NP Analog Pattern Generator applicable to NTSC and PAL systems is ideal for production line, inspection, and R&D applications of LCD TVs.

2.2 FEATURES

Monoscope pattern

The monoscope pattern with a resolution of 1000 TV lines is provided. Since color bar is superimposed on this pattern, resolution and color reproducibility can be tested simultaneously.

Color still picture pattern

A full-color still picture pattern can be stored inside the instrument. Users can transfer and use their original data for the still picture pattern. The sample pattern stored inside the instrument when it is shipped from the factory is Leader's original still picture pattern. For NTSC, an ITE color matching chart(a lady with a carnation) is provided as a fixed color still pattern in addition to the rewritable color still picture pattern.

S connector

Since S connector is used to output Y/C signals, this instrument can be used for adjusting and inspecting LCD TVs equipped with the S connector input.

Component signal output

Since Y, P_B, P_R and G, B, R can be output together with the composite signal, this instrument can be used for adjusting and inspecting LCD TVs equipped with the component signal input.

D Connector (for D1)

Two output systems (i.e., D connector, BNC connector) are provided to output Y, P_B, P_R component signals.

Various test patterns

Since various patterns (e.g., monoscope pattern, 8-color raster, flash pattern, slant pattern, variable luminance raster) are provided, this instrument is ideal for a variety of adjustment and inspection applications.

2.3 Specifications

*All specifications are common to both NTSC (525/60) and PAL (625/50) systems unless otherwise noted.

2.3.1 Video Signal

(1)Common Specifications for Video Signal Color Format : NTSC (525/60) PAL (625/50) Scanning Method 525 interlace scanning NTSC: PAL: 625 interlace scanning 624 non-interlace scanning Field Frequency NTSC : 59.94 Hz ± 25 ppm 50.00 Hz \pm 25 ppm (at interlace scanning) PAL: 50.08 Hz \pm 25 ppm (at non-interlace scanning) Line Frequency 15.734 kHz ± 25 ppm NTSC: 15.625 kHz ± 25 ppm PAL: Output Impedance: 75 Ω (2)Composite Video Signal Color System : NTSC, PAL Subcarrier Frequency 3.579545 MHz ± 25 ppm NTSC : 4.43361875 MHz ± 25 ppm PAL: **Output Level** Video Level 714 mV (100 % Level) ± 22 mV NTSC: 700 mV (100 % Level) \pm 21 mV PAL: Sync Level 286 mV ± 9 mV NTSC: $300 \text{ mV} \pm 9 \text{ mV}$ PAL: Color Burst Level NTSC : $286 \text{ mVp-p} \pm 9 \text{ mV}$ 300 mVp-p ± 9 mV PAL: $\pm 3^{\circ}$ Phase Error : **Output Connector** BNC (Always outputs NTSC signal) NTSC: BNC (Always outputs PAL signal) PAL: BNC, RCA pin jack (NTSC or PAL signal selectable) NTSC/PAL: Number of Outputs: 1 each (3)Y/C Separation Output Same as the composite signal specifications System : **Output Connector:** S type(NTSC/PAL, Selectable) 1 Number of Outputs :

(4)Y, PB, PR Signal

(

Y Output Level	
Video Level :	700 mV ± 21 mV (100 % Level)
Sync Level :	$300 \text{ mV} \pm 9 \text{ mV}$
PB, PR Output Level	\pm 350 mV \pm 21 mV (100 % Level)
Output Connector :	BNC, D-connector (525/60 Always output)
Number of Outputs	
BNC :	2 each (Also used for R, G, B)
D-connector :	1
* The number of sc	anning lines is the same as the composite signal.
5)R, G, B Signal	
 Output by switching 	Y,P _B ,P _R
Sync Signal :	Superimposed on the G signal (ON/OFF selectable)
R, G, B Output Level	
Video Level :	700 mV 土 50 mV (100 % Level)
Sync Level :	300 mV \pm 15 mV(when sync signal is added)
Output Connector	:BNC
Number of Outputs	:2 each (Two connectors are also used for Y, P_B , P_R)
* The number of so	anning lines is the same as the composite signal.
 RGB dedicate output 	ıt.
sync signal	Superimposed on the G signal (ON/OFF seleclable)
R,G,B Output Level	
Varying Level	Output level varying by trimmer VR.
Video Level	0 V to 1 V \pm 50 mV(100 % Level,Max.output)
Sync Level	0 V to 429 mV \pm 30 mV(Max.output)
Output Connector	BNC
Number of Outputs	1each
* The number of so	canning lines is the same as the composite signal.

2.3.2 D Connector (for D1 Format) Output

* Signal in 525/60 form	at is always output. (Signal in 625/50 format is not output.)
Specifications : Conform to EIAJ CP-4120 standards	
Video Signal	
Signal Format :	Same as the Y, P _B , P _R signal.
Output :	Inserting a plug does not turn the output off.
Identification Signal	
Line 1, 2, 3 :	0 V
Output DC Impedance	e:10 k Ω
Auxiliary Lines	
Auxiliary 1, 2, 3 :	NC
Connector	
Connector :	D connector (conforms to EIAJ RC-5237 standards)

Pin Assignments

Pin Number	Signal Name	Pin Number	Signal Name
1	Y	8	Line 1
2	Y GND	9	Line 2
3	Рв	10	Auxiliary Lines 2
4	PB GND	11	Line 3
5	PR	12	Plug Detect GND
6	Pr GND	13	Auxiliary Lines 3
7	Auxiliary Lines 1	14	Plug Detect

2.3.3 Sync Signal Outputs

Sync Signal :	HS, VS, C.SYNC
Output Level :	0 V to 5 V \pm 250 mV (into open circuit)
Output Impedance :	75 Ω
Output Connector :	BNC
Number of Outputs :	1 each

2.3.4 Pattern

(1)Display Pattern Color Bar NTSC :

Full field color bar (100/0/100/0, 100/0/75/0 saturation.selectable)

SMPTE color bar (Setup 0 %,75/0/75/0 saturation) Split field color bar (75/0/75/0 saturation)

Full field color bar (100/0/100/0, 100/0/75/0

PAL:

saturation, selectable)

SMPTE color bar

(A ratio is the same the NTSC system.)

Split field color bar

(A ratio is the same the NTSC system.)

* For NTSC (525/60) and PAL (625/50) systems, the R, G, B connectors do not output the SMPTE color bar and split field color bar. (A black raster is output.)

Raster :

White, yellow, cyan, green, magenta, red, blue, black (100 %, 75 % saturation, selectable)

Demodulation NTSC :

The phase of R-Y and B-Y of the chroma signal, and I and Q are inverted every line.

PAL:

The phase of R-Y and B-Y in the chroma signal are inverted every line.

* For NTSC (525/60) and PAL (625/50) systems, the R, G, B connectors do not output this signal. (A black raster is output.)

The 0 % or 100 % monochrome pattern is alternately displayed every field.
Black line displayed from lower-left to upper-right corners at aspect ratio of 4:3 on a 100 % white back- ground
0.1 to 5.0 MHz Marker 0.5, 1, 2, 3, 3.58, 4.5 MHz
0.25 to 6.1 MHz Marker 1, 2, 3, 4, 5, 6 MHz
12.5T pulse, 2T pulse, 2T bar
20T pulse, 2T pulse, 2T bar
0 to 100 % ramp
Level of 0 to 700 mV is divided into 10 equal steps
Level of 0 to 100 % is divided into 10 equal steps for 11 levels.
The screen is split in ratio of 1:1 for top and bottom At top portion, level between 0 % and 100 % is divided into 15 equal steps for 16 levels. Bottom portion is a 100 % white pattern
Black/white reversible
Scale in units of %
Color bars can be superimposed(100/0/75/0 saturation) Chroma component ON/OFF function (including color burst)
17 (V) x 14 (H) lines
19 (V) x 15 (H) lines
47 (H) x 24 (V) alphanumeric characters
45 (H) x 24 (V) alphanumeric characters
superimposed in both NTSC and PAL systems.
755 dots (H) x 483 lines (V)
923 dots (H) x 574 lines (V)
: 24-bit full color only) : ITE color matching chart (a lady with a carnation) * This is the ITE digital standard image data (RGB data) that has been software-encoded by Leader. * The ITE color matching chart is not provided for

Rewritable pattern (NTSC/PAL)

: Original sample pattern

*The picture is different between NTSC and PAL.

Color still picture storage: Data can be changed by transferring bitmap data.

(Windows application program for transferring data is provided) * Note that when data is transferred, internal data is overwritten; the default sample data cannot be used after an arbitrary data transfer.

(2) Color Still Picture Transfer

Source data:	Windows bitmap data
Transfer method:	By using the transfer program provided. Transfer via the RS-232C connector.
Data transfer time:	When using a baud rate of 38.4 kbps
	NTSC: Approx.15 minutes, PAL: Approx. 20 minutes The transfer time depends on the personal computer operating environment.
Operating environm	ent of the LT436 Series Application Software:
	Windows 95, 98, NT, 2000.
	* Windows and other programs for the operating

* Windows and other programs for the operating environment are either trademarks or registered trademarks of Microsoft Corporation.

(3) Variable Active Picture Level

Patterns supported: Raster white, window Variable range: Raster white: Vary continuously between O and 100 % or 75 %. Window:Vary continuously between O and 100 % * % Signals otput from the NTSC and PAL connectors in the COMPOSITE OUTPUT group on the rear panel cannot be varied simultaneously.

2.3.5 Sound Output

Frequency :	1 kHz 土 150 Hz
Output Level:	1 Vp-p ± 0.1 V
Output Impedance :	$10 k \Omega \pm 2 k \Omega$
Output Connector :	RCA pin jack
Number of Outputs :	2
Contract the supervision of the second state o	

2.3.6 General Specifications

E	nvironmental Conditions	
	Operating : Temperature :	0 to 40 °C
	Operating : Humidity :	\leq 90 %RH (without condensation)
	Spec-Guaranteed : Temperature:	10 to 30 °C
	Spec-Guaranteed : Humidity:	\leq 85 %RH (without condensation)
	Operating Environment :	Indoor use

Operating Altitude : Overvoltage Category : Pollution Degree : Power Requirements :

Dimensions and Weight : Accessories :

Up to 2,000 m
I
2
90 to 250 VAC, universal, 50/60 Hz
40 Wmax.
426 (W) x 88 (H) x 400 (D) mm, 5.9 kg
Windows application software for sending date1
Fuse1
Power cord1
Instruction manual1

* "Windows" is a trademark of Microsoft Corporation, registered in the USA and other countries.

3. PANEL DESCRIPTION

* The circled numbers are used for explanation in Chapter 4 and later.

3.1 Front Panel

The front panel is described corresponding to the numbers in Figure 3-1.



1) POWER

A mechanical toggle switch is used. Push this switch in to apply power; LED lights. Release this switch for turning power off.

2 Pattern Keys

Select the pattern. Refer to Section 4.4 for detail.

③ AP LEVEL

Continuously varies luminance level of the active picture from 0 to the rated value (i.e., 100%, 75%). Composite, Y,P_B,P_R, and RGB levels can be varied simultaneously. Applicable patterns are WINDOW (100% only) and white RASTER (all RGB keys ¹/₂ on).

The luminance level (i.e., 100%, 75%) is calibrated at the PRESET (detent) position. The luminance level can be set from 0% (immediately before the detent position) to the preset level

- * The signal output from the NTSC and PAL connectors in the COMPOS-ITE OUTPUT group (15) on the rear panel cannot be varied simultaneously. The system selected by using the SYSTEM key (9) can only be varied.
- Since this signal is only applicable to the 525/60 system, Y,P_B,P_R signal output from the D CONNECTOR (21) cannot be varied when the SYS-TEM key (9) is set to PAL

(4) COMPOSITE OUTPUT

Outputs composite signal selected by the SYSTEM key (9). BNC connector is used; output impedance is 75 Ω .

⑤ COMPONENT OUTPUT (Y/G PB/B PR/R)

The component signal is output in 525/60 system when the SYSTEM key (9) is set to NTSC. The component signal is output in 625/50 system when the SYSTEM is set to PAL.

RGB signal is output when the FORMAT \bigcirc is set to RGB. Y,P_B,P_R signal is output when the FORMAT \bigcirc is set to Y,P_B,P_R.

BNC connector is used; output impedance is 75Ω .

6 SYNC ON G

Adds and removes a sync signal to and from analog G signal.

The key operation is toggled. The key LED lights when a sync signal is added; it goes off when a sync signal is removed.

This key can control the G component output from the COMPONENT OUT-PUT connector (5) on the front panel, COMPONENT OUTPUT connector (4), and ANALOG RGB connector (7) on the rear panel.

This key can only control the COMPONENT OUTPUT connector 1 and ANA-LOG RGB connector 1 when the FORMAT 2 is set to RGB.

This key cannot respectively control these outputs.

⑦ FORMAT

Selects the component signal format: RGB or Y, PB, PR.

The key operation is toggled. The key LED lights when the RGB is selected; it goes off when the Y,P_B,P_R is selected.

This key can control the COMPONENT OUTPUT connector (5) on the front panel and COMPONENT OUTPUT connector (4) on the rear panel. This key cannot respectively control these outputs.

The ANALOG RGB connector D and D CONNECTOR D (D1) on the rear panel cannot be controlled.

⑧ SCANNING

Selects the scanning system when the SYSTEM key (9) is set to PAL.

The key LED lights when the NON-INTERLACE is selected; it goes off when the INTERLACE is selected.

When the SYSTEM key (9) is set to NTSC, the interlace scanning is only enabled.

The interlace scanning is selected when shipped from the factory.

9 SYSTEM

Selects the video system.

The key operation is toggled. The key LED lights when the PAL is selected; it goes off when the NTSC is selected.

The component and analog RGB output systems are the 625/50 for PAL and 525/60 for NTSC.

This key cannot control COMPOSITE OUTPUT connector (5) and D CON-

NECTOR 21. The NTSC is selected when shipped from the factory. Delog

10 INVERSION

Reverses the monochrome pattern. This key can only control the MONOSCOPE and WINDOW patterns.

When either pattern is selected, the INVERSION backlight lights to indicate ready status.

The key operation is toggled. The key LED goes off when normal video is selected; it lights when reverse video is selected.

The normal video (i.e., LED off) is selected when shipped from the factory.

1) CHROMA

Sets chrominance component of the monoscope pattern ON/OFF.

When MONOSCOPE in the Pattern key group ② is pressed, the INVERSION backlight lights to indicate ready status.

The key operation is toggled. The key LED lights when the chrominance is set ON; it goes off when the chrominance is set OFF.

The chrominance is set ON (i.e., LED ON) when shipped from the factory.

* Setting the chrominance OFF remove the color burst.

12 R, G, B

Set raster color.

When the RASTER in the Pattern key group ② is pressed, R, G, and B backlights light. Lit LED indicates the color selected. Eight colors can be set in combination with the keys pressed.

The R, G, and B keys are set on (i.e., white raster) when shipped from the factory.

The 100% or 75% saturation can be selected by setting the SATURATION ON key 13

When the FORMAT (7) is set to RGB, RGB signal is output. When the FOR

13 SATURATION

Selects color saturation for the full-field color bar and raster.

When the RASTER in the Pattern key group ② is pressed or full-field color bar is selected by using the COLOR BAR key, the SATURATION backlight ③ lights to indicate ready status.

The key operation is toggled. The key LED lights when the 75% is selected; it goes off when the 100% is selected.

The signal format is set to 100/0/75/0 when the 75% full-field color bar is se-

strument serial number. Provide this number when contacting us

VNALOG HGB OUTPUT (H. G. B. HS. VS. C.SYNC) Sometion and adjusters related to the analog RGB signals.

These output connectors and adjusters are related to 'R G R signals

lected.

The signal format is set to 100/0/100/0 when the 100% full-field color bar is selected.

"75%" is selected when shipped from the factory.

* This key cannot control other color bars and color bars superimposed on the monoscope pattern.

3.2 Rear Panel

The rear panel is described corresponding to the numbers in Figure 3-2.





OMPONENT OUTPUT (Y/G PB/B PR/R)

Outputs component signals. When the SYSTEM key (9) is set to NTSC, the signal is output in 525/60 system. When the SYSTEM key(9) is set to PAL, the signal is output in 625/50 system.

When the FORMAT O is set to RGB, RGB signal is output. When the FOR-MAT O is set to Y,P_B,P_R, Y,P_B,P_R signal is output. BNC connector is used; output impedance is 75 Ω .

BNO connector is used, output impedance is 75

(5) COMPOSITE OUTPUT (NTSC, PAL)

Outputs composite signal. The NTSC and PAL signals as indicated above the connector are always output regardless of the SYSTEM key (9) setting. The AP LEVEL control (3) can only control luminance level of the signal selected by using the SYSTEM key (9). BNC connector is used; output impedance is 75Ω .

16 Serial number

Instrument serial number. Provide this number when contacting us.

 ANALOG RGB OUTPUT (R, G, B, HS, VS, C.SYNC) Connectors and adjusters related to the analog RGB signals. R, G, B:

These output connectors and adjusters are related to R,G,B signals.

When the SYSTEM key (9) is set to NTSC, the RGB video signals are output in 525/60 system. When the SYSTEM key (9) is set to PAL, the RGB video signals are output in 625/50 system.

BNC connector is used; output impedance is 75 Ω.

The output level can be set from 0 to 1 Vp-p (active picture level, into 75Ω). HS, VS, C.SYNC:

These output connectors and adjusters are related to the horizontal sync (HS), vertical sync (VS), and composite sync (C.SYNC) signals.

The sync timing depends on the system selected by using the SYSTEM key (9).

BNC connector is used; output impedance is 75 Ω.

The output level can be set from 0 to 5 Vp-p (into open circuit). The output level becomes one-half the rated value when the output system is terminated by a 75Ω load.

18 Y/C OUTPUT

Outputs Y/C signal through the S connector. The video system can be selected by using the SYSTEM key (9).

S connector is used; output impedance is 75Ω .

19 COMPOSITE OUTPUT

Outputs composite signal. The video system can be selected by using the SYSTEM key (9).

RCA jack is used; output impedance is 75Ω .

20 AUDIO OUTPUT

Outputs 1 kHz audio signal.RCA jack is used; output impedance is $10 \text{ k}\Omega$.

1 D CONNECTOR (D1)

Applicable to D1 format.

The 525i/60 Y,P_B,P_R is always output regardless of SYSTEM key (9) and FORMAT \bigcirc settings.

Output impedance is 75Ω .

This instrument provides a fixed aspect ratio of 4:3. Refer to Section 4.6 for detail.

22 Ground A WARNING

The chassis must be grounded using this terminal to prevent noise and electric potential difference between equipment to be measured.

23 RS-232C

Use this connector when editing internal color still picture by using a personal computer.

Refer to Section 4.11 for detail.

WARNING

For safety, read the label before operating this instrument.

② FUSE RATING ▲ WARNING

Indicates the fuse rating. Use only the fuse of correct type and rating for replacement to prevent trouble.

26 FUSE A WARNING

Fuse holder. When replacing the fuse, refer to Section 1.2.1.

2 90 - 250 V (50-60 Hz) \Lambda WARNING

AC inlet.

Usable AC voltage range is 90 to 250 V, universal.

The appropriate power cord for your country or region should be used. When this instrument is to be used outside your country or region, be sure to use the appropriate power cord. If the cord is not available, contact your local Leader agent.

4. OPERATING PROCEDURE not enterime T S.S.A

4.1 Turning Power On

4.1.1 Connecting Power Plug A WARNING

Check the mains voltage for correct before connecting the instrument to the mains. The appropriate power cord should be used.

4.1.2 Turning Power On

Always confirm that the instrument is not in a volatile or flammable environment before turning the power on.

4.1.3 Warm-Up Time

You should allow the instrument to warm up for at least 30 minutes.

4.2 Connection

4.2.1 Cable

Table 4-1 lists the cables to be used.

CAUTION:Do not apply ±1 V (DC or AC peak) or higher voltage to the output connectors. Otherwise, this instrument and the units of equipment connected could be damaged.

GR. SPT 1	ConnectorName	Signal	Connector	Cable
(4) / (15)	COMPOSITE OUTPUT	Composite signal	BNC	75 Ω coaxial
5/14	COMPONENT OUTPUT	Component signal	BNC	75 Ω coaxial
D	ANALOG RGB OUTPUT RGB	Component signal/sync signal	BNC	75 Ω coaxial
(18)	Y/C OUTPUT	Y/C separation signal	S connector	S cable
(19)	COMPOSITE OUTPUT	Composite signal	RCA PIN	75 Ω coaxial
20	AUDIO OUTPUT	Audio signal	RCA PIN	Shielded wire
21)	D CONNECTOR	Component signal/Identification signal	D connector	D connector cable
23	RS232C	RS-232C communication signal	9-pin D-sub	Straight cable

Table 4-1 Output connector and cable

The component signal is output in 525/60 system when the SYSTEM key (9) is set to CTSC. The component signal is output in 525/60 system when the SYSTEM key (9) is set to PAL. The 0 CONNECTOR always output the component signal in 525/60 system; 625/50 system cannot, be selected. The NTSC (625/80 system) is estanted when shiresed from the former.

4.2.2 Termination

All output (except sync signals) should be terminated with appropriate impedance. Terminate the cable end as shown in Table 4-2. Correct termination ensures correct output voltage.

	Connector Name	Signal	Termination
(4) / (15)	COMPOSITE OUTPUT	Composite signal	75 Ω
5/14	COMPONENT OUTPUT	Component signal	75 Ω
1	ANALOG RGB OUTPUT RGB	Component signal/sync signal	75 Ω
18	Y/C OUTPUT	Y/C separation signal	75 Ω
19	COMPOSITE OUTPUT	Composite signa	75 Ω
20	AUDIO OUTPUT	Audio signal	High-impedance
21	D CONNECTOR	Component signal/Identification signal	75 Ω (video signal)

Table 4-2	Output	impedance,	termination
-----------	--------	------------	-------------

※ Output voltages of the ANALOG RGB OUTPUT connectors ⑦ (i.e., HS, VS, C.SYNC) are indicated in open circuit voltage. When the connector is terminated with a 75 \Omega terminator, output voltage range is reduced by one-half the rated value (i.e., 0 to 2.5 V).

4.3 Selecting Color System

4.3.1 Selecting Color System and Component Signal Format

Use the SYSTEM key (9) to select the color system. The key LED lights when the PAL is selected; it goes off when the NTSC is selected.

The NTSC and PAL connectors in the COMPOSITE OUTPUT group (15) always output the indicated signal; the color system cannot be selected.



Always outputs NTSC and PAL signals.

The component signal is output in 525/60 system when the SYSTEM key (9) is set to NTSC. The component signal is output in 625/50 system when the SYSTEM key (9) is set to PAL.

The D CONNECTOR always output the component signal in 525/60 system; 625/50 system cannot be selected.

The NTSC (525/60 system) is selected when shipped from the factory.

4.3.2 Interlace/Non-Interlace Scanning in PAL

The scanning system can be selected by using the SCANNING key (8) when the SYSTEM key (9) is set to PAL.

The key LED lights when the NON-INTERLACE is selected; it goes off when the INTERLACE is selected.

If the screen becomes difficult to watch due to flickering, select non-interlace scanning to reduce the amount of flicker.

There following restrictions apply when the NON-INTERLACE is selected:

- (1) Vertical resolution is reduced by one-half. Especially for monoscope pattern.
- (2) Horizontal lines are thinned for character pattern display.
- (3) Incorrect PAL signal is output.
- (4) The field frequency is 50.08 Hz.
 - * The SCANNING key (8) cannot be used when the SYSTEM key (9) is set to NTSC.

4.4 Output Patterns

4.4.1 Selecting Pattern

Use the Pattern key ② when selecting the pattern. Lit key LED indicates the pattern selected.

Keys listed in Table 4-3 provide multiple patterns.

See the following Sections for more information.



Figure 4-3

Patterns Selected	Contents	Keys Operation
COLOR BAR	Three color bars are selectable.	Repeat key operation
	Full-field color bar saturation is selectable.	SATURATION key (13)
RASTER	Eight colors are selectable.	R, G, B key12
LE O	Color saturation is selectable.	SATURATION key(13)
	Active picture level of white raster is variable.	AP LEVEL control ③
WINDOW	Reversible.	INVERSION key10
	Active picture level variable.	AP LEVEL control ③
MONOSCOPE	Reversible.	INVERSION key10
	ChrominanceON/OFF.	CHROMA key1
NATURAL PICTURE	Color matching chart or sample pattern is selectable.	Repeatkeyoperation

※ Color matching chart or sample pattern can only be selected in NTSC system.
Table 4-3 Keys providing multiple patterns and operation

Figure 4-2

4.4.2 Selecting Color Bar

This instrument provides three color bars. Pressing the COLOR BAR key (2) sequentially selects color bars in the following sequence:



* When SMPTE or split-field color bar is selected, ANALOG RGB OUTPUT connector ⑦ outputs the black signal.

When the FORMAT (7) is set to RGB, the COMPONENT OUTPUT connectors (5) (4) also output the black signal.

4.4.3 Selecting Full-Field Color Bar Saturation

Use the SATURATION key (13) to select the full-field color bar saturation. When full-field color bar is selected by using the COLOR BAR key, the SATURATION backlight (13) lights to indicate ready status.

The signal format is set to 100/0/75/0 when the SATURATION key (13) is set to 75%. The signal format is set to 100/0/100/0 when the SATURATION key (13) is set to 100%. "75%" (100/0/75/0) is selected when shipped from the factory.

SATURATIO Backlight

Figure 4-4

4.4.4 Selecting Raster Color

Eight raster colors can be set in combination with the R-G-B keys.

When the raster is selected by using the RASTER key 2, the R-G-B backlights 2 light to indicate ready status.

The key operation is toggled. Lit LED indicates the color selected. Table 4-4 shows the relationship between colors and keys.

	White	Black	Red	Green	Blue	Yellow	Cyan	Magenta
R Key	ON	OFF	ON	OFF	OFF	ON	OFF	ON
G Key	ON	OFF	OFF	ON	OFF	ON	ΟN	OFF
B Key	ON	OFF	OFF	OFF	ON	OFF	ΟN	ON

*ON: Key LED on

OFF: Key LED off

RASTER

Table 4-4 Colors and keys

Backlight

Figure 4-5

4.4.5 Selecting Raster Color Saturation

Use the SATURATION key 13 to select the raster color saturation.

When the raster is selected by using the RASTER key2, the SATURATION backlight (3) lights to indicate ready status.

The key operation is toggled. The key LED lights when the 75% is selected; it goes off when the 100% is selected.



Figure 4-6

4.4.6 Varying White Raster Luminance Level

Use the AP LEVEL control ③ for setting active picture level of the white raster. When the white raster is selected by using the RASTER key ② and R-G-B keys ①, the AP LEVEL backlight ③ lights to indicate ready status.

At the PRESET (detent) position, the luminance level is set to 75% or 100% by using the SATURATION key (3).

The luminance level can be set from 0% (immediately before the detent position) to the preset level by rotating the AP LEVEL control ③.





- Luminance levels of the white raster and window patterns cannot be adjusted independently.
- * Luminance level of all video output except followings can be adjusted simultaneously.
- Since the Y,PB,PB signal format (output from the D CONNECTOR 21) is fixed to 525/60 system, the luminance level cannot be varied.
- Signals output from the NTSC and PAL connectors in the COMPOSITE OUTPUT group (5) cannot be varied simultaneously. The signal selected by using the SYSTEM key (9) can only be varied.

4.4.7 Varying Window Luminance Level

Use the AP LEVEL control ③ when setting active picture level of the window pattern. When the WINDOW in the Pattern key group ② is pressed, the AP LEVEL backlight ③ lights to indicate ready status.

The white level (i.e., 100%) is calibrated at the PRESET (detent) position.

The luminance level can be set from 0% (immediately before the detent position) to the preset level (100%) by rotating the AP LEVEL control ③.

- * Luminance levels of the white raster and window cannot be adjusted independently.
- Luminance level of all video output except followings can be adjusted simultaneously.
- Since the Y,P_B,P_R signal (output from the D CONNECTOR 2)) is fixed in 525/60 system, the luminance level cannot be varied.
- Signals output from the NTSC and PAL connectors in the COMPOSITE OUTPUT group (15) cannot be varied simultaneously. The signal selected by using the SYSTEM key (9) can only be varied.

4.4.8 Reversing Window Pattern

Use the INVERSION key 10 to display the window pattern in reverse video.

When the WINDOW in the Pattern key group 2 is pressed, the INVERSION backlight 10 lights to indicate ready status.

The key operation is toggled. The key LED goes off when the normal video is selected; window is displayed in white. The key LED lights when the reverse video is selected; window is displayed in black.



Figure 4-8

4.4.9 Reversing Monoscope Pattern

Use the INVERSION key 10 to display the monoscope pattern in reverse video. When the MONOSCOPE in the Pattern key group 2 is pressed, the INVERSION backlight 10 lights to indicate ready status.

The key operation is toggled. The key LED goes off when the normal video is selected; gray background. The key LED lights when the reverse video is selected; black back-ground.

4.4.10 Setting Monoscope Chrominance Component ON/OFF

Use the CHROMA key 1 to set the monoscope chrominance component ON/OFF. When the MONOSCOPE in the Pattern key group 2 is pressed, the CHROMA backlight 1 lights to indicate ready status.

The key operation is toggled. The key LED lights when the chrominance component is superimposed; color is displayed. The key LED goes off when the chrominance component is not superimposed; monochrome gradation is displayed. The color burst in the horizontal blanking period is also set off when the chrominance is set off.



Figure 4-9

4.4.11 Color Still Pictures

Rewritable Patterns

The color still picture is output when the NATURAL PICTURE in the Pattern key group ② is selected.

Users can create arbitrary color still picture by using a personal computer. Refer to Sections, 4.10, "Creating Color Still Pictures" and 4.11, "Transferring Color Still Picture Data" for detail.

The following sample data are transferred when shipped from the factory.

Color still picture default setting: Flowers (Leader's original pattern)

To obtain this data, pictures on reversal film are converted into digital data (bitmap data) by a film scanner, then converted into YPBPR. The colorimetry value is prescribed by TU-RRep.624.

Note pictures differ between the NTSC and PAL.

Note that when data is transferred, internal data is overwritten, and sample data cannot be used.

Fixed Patterns (NTSC only)

In addition to rewritable patterns, a color matching chart is provided as a fixed pattern.

Leader Electronics Corp. converts RGB digital data image (sold by The Institute of Image Information and Television Engineers) into bitmap data, then converts it into Y, PB, PB.

The colorimetry value conforms to SMPTE 170M standards.

The applicable ITE color matching chart (a girl with a carnation) is approved by The Institute of Image Information and Television Engineers, and copyrights belong to The Institute of Image Information and Television Engineers.

Use the NATURAL PICTURE key 2 when selecting the rewritable or fixed pattern. The rewritable pattern is only available in the PAL system (selected by using the SYSTEM key (9); the ITE color matching chart cannot be selected.



4.5 Using Component Signals

This instrument provides four component signal output systems as listed in Table 4-5. Refer to Section 4.6, "Varying White Raster Luminance Level" for the D CONNECTOR.

ConnectorName	Output Signal	Connector	Features, Restrictions
5 COMPONENT OUTPUT	Y P₅P _R or RGB	BNC	When RGB is selected, COLOR BAR can only output full-field color bar; DEM pattern is not output.
DANALOG RGB OUTPUT R,G,B	RGB	BNC	The level can be varied independently. Full-field color bar is only output; DEM pat- tern is not output.
DANALOG RGB OUTPUT HS、VS、C.SYNC	Sync signal	BNC	The level can be varied independently to 5 Vp- p into open circuit.
D CONNECTOR (D1)	Υ, Ρ _β , Ρ _β	D connector	Always outputs signal in 525/60 system; 625/ 50 system cannot be selected.

Table 4-5 Component output

4.5.1 COMPONENT OUTPUT (5) (4)

BNC connector is used.

The Y,P_B,P_R or RGB format can be selected by using the FORMAT key \bigcirc . The key operation is toggled. The key LED lights when the RGB is selected; it goes off when the Y,P_B,P_R is selected.

When RGB is selected, full-field color bar is only output.

When SMPTE or split-field color bar is selected, black signal is only output.

*DEM pattern is not output. The black signal is only output when the DEM pattern is selected.



Figure 4-10

4.5.2 ANALOG RGB OUTPUT: R, G, B:1

These output connectors are dedicated for RGB; BNC connectors are used. Output level can be adjusted. Rotating the adjuster fully counterclockwise sets the output voltage to 0 V. Rotating the adjuster fully clockwise sets the output voltage to the maximum value.

RGB video signal level variable range:

0 V to 1 V($\leq \pm 50$ mVp-p)

(No sync signal on the G signal, 100% active picture level, into 75 Ω)

0 V to 1.4 V (≤±63 mVp-p)

(Sync signal added to the G signal, 100% active picture level, into 75Ω)

When RGB is selected, full-field color bar is only output.

When SMPTE or split-field color bar is selected, black signal is only output.

DEM pattern is not output. The black signal is only output when the DEM pattern is selected.



4.5.3 ANALOG RGB OUTPUT: HS, VS, C.SYNC D

These connectors output the horizontal sync (HS), vertical sync (VS), and composite sync (C.SYNC) signals. BNC connectors are used.

Output level can be adjusted. Rotating the adjuster fully counterclockwise sets the output voltage to 0 V. Rotating the adjuster fully clockwise sets the output voltage to the maximum value.

HS, VS, C.SYNC level variable range: 0 V to 5 V (≤±250 mV) (into open circuit)

% The output level is reduced by one-half the rated value when the output system is terminated by a 75 Ω load.

The sync signal can also be used as the oscilloscope external trigger signal.

4.5.4 Using SYNC ON GREEN

To add a sync signal to the G signal output from the COMPONENT OUTPUT connectors (5) (A (RGB selected) and ANALOG RGB OUTPUT connector (1), use the SYNC ON G key (6).

The key operation is toggled. The key LED lights when the sync signal is added; it goes when the sync signal is removed.



Figure 4-12

4.6 Using D CONNECTOR

Based on Electronic Industries Association of Japan (EIAJ) standards, the D CON-NECTOR is used to output the component signal of digital broadcasts. This D1dedicated connector is applicable to the 480i/60 system. This instrument provides a fixed aspect ratio of 4:3.

4.6.1 D Connector Cable and Pin Assignments

Procure a D connector cable when using the D CONNECTOR. There are two types of cables: D to D, D to BNC. Select as required.

Table 4-6 shows pin assignments.

Note:When the dedicated cable is not used, pins marked with NC in the Table 4-6 should be opened.

Pin No.	Signal	Internal Connection	Pin No	Signal Name	Internal Connection
1	Y	Signal output	8	Line 1	GND
2	Y_GND	GND	9	Line 2	GND
3	Рв	Signal output	10	Auxiliary line 1	NC
4	PB_GND	GND	11	Line 3	GND
5	PR	Signal output	12	Detects plug connection. GND	NC
6	Pr_GND	GND	13	Auxiliary line 3	NC
7	Auxiliary line 1	NC	14	Detects plug connection.	NC

%NC: No connection

Table 4-6 D CONNECTOR pin assignments

4.6.2 Video Signal Output from D CONNECTOR

The Y,PB,PR signal is output from the D CONNECTOR (2). Since the D CONNEC-TOR conforms EIAJ standards, the 525/60 system is always output regardless of SYSTEM key (9) settings. The 625/50 system is not output.

Signal specifications and functions are the same as the Y,PB,PR output from the COMPONENT OUTPUT connectors (5) (4).

4.6.3 D CONNECTOR Identification Signal

Based on EIAJ standards, the D CONNECTOR should output the signal to identify the digital broadcast tuner output format as shown in Table 4-7.

Pins 8, 9, and 11 output the identification signal.

Specifications of this instrument are as follows:

Number of active scanning lines: 480 (actually 483)

Interlacescanning

Aspect ratio: 4:3

Therefore, all control lines are set to 0 V; internally grounded through a 10 k Ω resistor.

	Line 1	Line 2	Line 3
en is selected in a SYSTEM ke	Number of active scanning lines	Scanning system	Aspect ratio
5V	1080	Non-interlace	16:9
2.2V	720	HUIL Composite -	4:3 letter box
٥V	480	Interlace	4:3

Table 4-7 D CONNECTOR identification signal output

4.6.4 Detecting D CONNECTOR

Based on EIAJ standards, pins 12 and 14 are used to detect cable connection. Pin 12 is grounded; pin 14 is pulled up through a resistor.

Since this model is test equipment, however, both pins are internally opened (NC); do not detect cable connection.

(This poses no problem for equipment connected to this model.)

4.7 Using Composite Output, Y/C Output

This instrument provides three composite signal output systems and one Y/C output system. See Table 4-8 for detail.

Connector Name	Output Signal	Connector	Features, Restrictions
<pre>④COMPOSITE OUTPUT</pre>	Composite	BNC	Signal system is selected by using the SYSTEM key ⑨.
19COMPOSITE OUTPUT	Composite	RCA Jack	Signal system is selected by using the SYSTEM key ⑨.
15COMPOSITE OUTPUT NTSC/PAL	Composite	BNC	The NTSC and PAL sig- nals (indicated above the connectors) are always output regardless of the SYSTEM key (9) setting.
18Y/C OUTPUT	Y/C	SConnector	Signal system is selected by using the SYSTEM key ⑨.

Table 4-8 Composite, Y/C output

4.7.1 Cable for COMPOSITE OUTPUT (9)

RCA jack is used for the COMPOSITE OUTPUT connector (9). Procure a 75 Ω cable with RCA pin plug or an RCA pin cable applicable to video signals. Using a pin cable used for audio products may reduce signal quality.

4.7.2 Cable for Y/C OUTPUT (B)

Procure an S connector cable to connect the Y/C OUTPUT connector 18.

4.8 Audio Signal

4.8.1 AUDIO OUTPUT 1, 2 🕲

Procure an RCA pin cable. These connectors output 1 kHz, 1 V p-p (into open circuit) sine wave. Note that when low-impedance equipment is connected, output level is reduced since the output impedance is $10 \text{ k}\Omega$.

4.9 Pattern Usage

* Usages marked with an asterisk are applicable to visual test monitor displays.

4.9.1 COLOR BAR

- (1) General inspection such as level and hue
- (2) *Adjusting and inspecting hue, saturation, luminance, contrast of monitors

4.9.2 DEM

- (1) Used for PAL only; not for NTSC
- (2) Adjusting and inspecting a chroma demodulator of color monitor or TV
- (3) Adjusting and inspecting Y/C separation circuit using a delay line
- (4) *Bars on the both edges of the pattern are displayed in gray when proper adjustment is made; colored when improper adjustment is made.

4.9.3 RASTER

- (1) *Adjusting and inspecting purity of monitors
- (2) *Inspecting uneven color
- (3) *Background signal for characters, etc
- (4) *Finding LCD panel defect
- (5) *Finding a defect by varying white raster luminance level

4.9.4 FLASHING

(1) *Inspecting a display response
 ※When display response is slow, four center bars are displayed in gray.

4.9.5 SLANT

- (1) *Finding LCD panel defect
- (2) Inspecting gain linearity

4.9.6 LINE SWEEP

- (1) Inspecting frequency characteristics of video equipment and transmission line
- (2) *Checking monitor resolution

4.9.7 PULSE BAR

(1) Phase characteristics, frequency response

4.9.8 RAMP

- (1) Adjusting and inspecting linearity
- (2) *Adjusting gradation

4.9.9 STEP

- (1) 10-step (11-level) gradation signal
- (2) Inspecting linearity of transmission line
- (3) *Adjusting gradation

4.9.10 SPLIT GRAY SCALE

- (1) 15-step (16-level) gradation signal
- (2) *Adjusting gradation
- (3) *Inspecting luminance response

4.9.11 WINDOW

- (1) Adjusting and inspecting video circuit
- (2) *Inspecting high voltage regulation
- (3) *Inspecting streaking
- (4) *Adjusting and inspecting LED panel by varying luminance level

4.9.12 CONVERGENCE

- (1) *Inspecting convergence
- (2) *Inspecting uneven color (especially along screen margins)

4.9.13 CHARACTER

- (1) *Inspecting linearity
- (2) *Adjusting and inspecting focus
- (3) *Inspecting crispy display by observing character edges

4.9.14 MONOSCOPE

(1) Resolution, Focus



Figure 4-13

Position	Number of	Resolution	Number of Markers
Carrier and Carrier and	wedges	(No. of T V Lines)	(No of T V-Line Interval)
A-1	epied 7	150~350	5(50)
A-2	lieme 11	300~500	5(50)
B-1	11	300~500	5(50)
B-2	00) [11	500~700	3(100)
B-3	(IV) C1 11	700~1000	4(100)
B-4	7	150~350	5(50)
С	Color	275~475	
D	- 7	50~250	
E-1	bised 5	150~300	4(50)
E-2	moO 5	250~400	4(50)
00F-1	BIOS 5	150~300	4(50)
F-2	5	250~400	4(50)
H	6 (Circle)	300	Alugia
1	3 (Circle)	300	

Table 4-9 Monoscope resolution

Focus

Position	Number of wedges	Resolution (No. of TV Lines)	Number of markers (TV-Line interval)
Н	6 (Circle)	300	
I	3 (Circle)	300	

Table 4-10 Focus

(2) Gradation, Screen Center



Figure 4-14

•Gradation ① Staircase: 10 steps 0 to 100% ② Staircase: 4 steps 0 to 75% ③ Background 100% (-1), 75% (-2)

•Screencenter ④Cross-hair pattern

(3) Display Linearity, Color Reproducibility, Streaking



Figure 4-15

- Display linearity
 S Circle
 - Large (-1), middle (-2), small (-3)
- 6 Crosshatch 11 (horizontal), 15 (vertical)
- Color reproducibility ⑦ Color bar
- Streaking
- 8 Corresponding to horizontal resolution <TV lines>
 1.5, 2.1, 3, 4.2, 6, 8.5, 12, 17, 24, 34, 48, 69

(4) ScreenSize



Figure 4-16

- (9) Horizontal size marker Displayed in % with respect to one-half the horizontal screen width of 100%.
- Wertical size marker Displayed in % with respect to one-half the vertical screen height of 100%.

4.9.15 Monoscope Pattern Timing

Figure 4-17 shows the monoscope pattern position based on the horizontal sync signal (50% level) and vertical sync signal. (Calculated values are used in the Figure.)



Figure 4-17

4.9.16 NATURAL PICTURE

ITE Chart (NTSC)

- (1) *Subjective evaluation on entire screen
- (2) *Color reproducibility

Original Chart (NTSC, PAL)

* Using preset sample data

(1) *Subjective evaluation on entire screen

4.10 Creating Color Still Pictures

NATURAL PICTURE in the Pattern key group 2 can be used to display arbitrary patterns by using bitmap data on a personal computer running under Windows.

4.10.1 Creating Color Still Pictures

When creating data, use a graphic data processing software (e.g., Windows "Paint"). The data format should be as follows:

A picture data taken with a digital camera should also be converted into the following format.

- (1) Data format: Bitmap data (BMP data for extension)
- (2) Data resolution: 24 bits full color/pixel

(3) Number of pixels

•NTSC 755 (H) x 483 (V)

•PAL 923 (H) x 574 (V)

* The aspect ratio of a personal computer monitor and TV is the same (i.e., 4:3), although, the aspect ratio of pixels is different. Therefore, a true circle displayed on the TV is displayed with an oval shape on the monitor.

4.10.2 Gamma Characteristics

This instrument does not provide a function to add gamma characteristics to data transferred. When gamma characteristics are required to display color still picture, use gamma characteristics data or process the addition of gamma characteristics before creating data.

4.11 Transferring Color Still Picture Data

Data crated in Section 4.10 can be transferred to this instrument by using the "LT436 Series Application Software" supplied as standard.

* Note that when data is transferred, internal data is overwritten; the default sample data cannot be used.

4.11.1 LT436 Series Application Software Operation

This instrument provides color still picture data in Y,P_B,P_R format. The "LT436 Series Application Software" converts bitmap data into Y,P_B,P_R data for each unit of preset data, then convert Y,P_B,P_R data into the format applicable to this instrument. Since the folder storing original bitmap data is used as a work area, a work file used for transfer Y,P_B,P_R is temporarily created in the folder. Note that this work file is automatically deleted, however, after data is transferred.

If data transfer is stopped for some reason, the temporary work file may be retained in the folder. In such case, manually delete the file.

When a file on floppy disk is directly specified, data cannot be converted due to insufficient work area. Copy data to the hard disk before using data.

4.11.2 Usable Personal Computer

A personal computer should satisfy the following specifications to install the LT436 Series Application Software.

Pentium or equivalent, CPU clock: \geq 150 MHz Applicable to 1.4 M
1 Mbyte (Required to install LT436 Series Applica- tion Software
1 Mbyte (Drive work area containing data file)
One of the followings (Japanese or English ver- sion should be installed.)
Windows 95
Windows 98
Windows NT
Windows 2000

COM Port :RS-232C, usable for 38400 bps 400 and 32 % Use the COM 1 when there are multiple COM ports.

X Windows is a registered trademark of Microsoft Corporation.

4.11.3 Setting COM Port Communication Parameters

Set the COM port to Windows standard settings. Set the baud rate to 38.4 kbps regardless of the standard settings when the LT436 Series Application Software is operating.

4.11.4 RS-232C Connector Pin Assignments and Cable

Pin No. Signal Name 1 NC 2 SD (TXD) 3 RD (RXD) 4 DR (DSR) 5 SG (GND) 6 ER (DTR) 7 CS (CTS) RS (RTS) 8 9 NC

Table 4-11 shows RS232C connector pin assignments.

Table 4-11 RS-232C connector

Procure a straight cable to connect this instrument and personal computer. Note that the number of pins depends on the personal computer COM port.

•9-pin COM port (IBM PC/AT compatible)

LT 436NP	IBM PC/AT computer
9-pin D-sub connector (male)	9-pin D-sub connector (female)
(NC) 1	
(DTR) 6	6 (DSR)
(TXD)2	2 (RXD)
(CTS) 7	7_(RTS)
(RXD)3	3(TXD)
(RTS) 8	8 (CTS)
(DSR) 4	4 (DTR)
(NC) 9	
(GND) 5	5 (GND)

Figure 4-18

•25-pin COM port (NEC PC-9821 compatible)



4.11.5 Installing LT436 Series Application Software

- (1) Start up the personal computer. Quit when other software being run.
- (2) Select the floppy disk as prescribed by the personal computer operating system. Insert the disk into the disk drive.
- (3) Click "My Computer" to display the disk contents.



(4) Double-clicking "Setup.exe" starts program installation.



Figure 4-21

(5) "Welcome" is displayed. Check the contents for correct, then click <u>Next</u>.
 Enter user information, then click "<u>Next</u>."
 ※ User information must be entered.





(6) Select the drive and folder on the "Choose Destination Location" screen. Default setting is "D:\..\leader\LT436 Series Application." When using the default settings, click "Next." A "Leader" folder is automatically created.



Figure 4-23

When installing the LT436 Series Application Software in a folder other than the default folder, click "Browse," select the destination on the "Choose Destination Location" screen, then click "OK."

Screen display returns to "Choose Destination Location." Click "Next."

(7) Select the destination on the "Select Program Folder" screen.

The default setting is "LT436 Application."

To use the default settings, click "Next." The "Choose Destination Location" folder is automatically created. To use another name, write the name in "Program Folder," then click "Next."



The software is now installed. The execution file "LT436BMP.exe" and associated lifes are installed in the "LT436 Application" folder (for default settings).

(8) Check "Target folder" and "User Information" on the "Start Copy File" screen for correct, then click "Next." If not, click "Back," then correct the contents. Clicking "Next" starts installation.



Figure 4-26 Decompressing file screen

(9) After the software is installed, "Setup Complete" screen is displayed. Click "Finish."





The software is now installed. The execution file "LT436BMP.exe" and associated files are installed in the "LT436 Application" folder (for default settings)

The "LT436 Application" folder is created in "Program" in the start menu, then shortcut menu "LT436 Application" is created in the folder. Create the short-cut menu on the desk top as required.





4.11.6 Preparation for Transferring Data

(1) Set the COM port (RS-232C connector) applicable to Windows standards by using the Device Manager on the corresponding Windows system control panel. The baud rate of 38.4 kbps (provided as standard) can be used regardless of Device Manager settings.

※ Use the COM 1 when there are multiple COM ports.



- (2) Turn the instrument off, then connect the COM 1 (RS-232C connector) of personal computer. Turn the power on.
- (3) Start the menu, then execute "LT436BMP" in the "LT436 Application" folder of the "Program."

When the shortcut menu is created, execute the shortcut menu first.



Figure 4-30

The key LEDs sequentially light to indicate communication in progress. All LEDs (except POWER) go off to indicate ready status for data transfer. The personal computer displays the screen below.



Automatically recognizes the model.

Figure 4-31

※ If "LT436BMP" is executed when the cable is not connected to the COM port or power is turned off, the screen shown in Figure 4-32 appears and software cannot berun.



Click the 😹 button, check the cable and power supply, then retry.

Figure 4-32

4.11.7 Reading and Transferring File

 Select the NTSC or PAL radio button corresponding to the data system to

be transferred.

- LT436NP • NTSC (755 x 483) • PAL (923 x 574) Figure 4-33 Figure 4-34
- (2) Clicking "File" button displays "Open"dialog box.
 Select the folder at the "Look in," then select data to be transferred from the folder.



Figure 4-35

Progress of transfer is displayed at the lower-left comer of the screen in units of %. The RASTER, FLASHING, SLANT, and LINE SWEEP pattern key LEDs sequen itally light to indicate receiving data. (3) After data is selected, click "Open" to read data. After data is read, the "Transration" button becomes active.



"Transration" button



If the screen size to be read is incorrect, the following message is displayed and data is not read.



(4) Pressing the "Transration" button displays the "Confirm" screen as shown below, click "OK."

To cancel data transfer, click "Cancel."



(5) Progress of transfer is displayed at the lower-left corner of the screen in units of %. The RASTER, FLASHING, SLANT, and LINE SWEEP pattern key LEDs sequentially light to indicate receiving data.

- Note: Do not operate this instrument or the personal computer when data is being transferred. Be careful not to turn the power off when data is being transferred.
- (6) After data is transferred, the "Complete Transration" screen is displayed as shown below. Click "OK."



(7) When transferring color still picture data created in the other system, repeat from Step (1).

Click 📉 button to stop transferring data.

The key LEDs light to indicates completion of transferring data, then this instrument returns to the previous conditions.

4.11.8 Error Message



This error message is displayed if this instrument is failed (memory writing failure).

Contact your local Leader agent.

Figure 4-40



Figure 4-41

This error message is displayed when a cable is disconnected or power is turned off.

When the cable is disconnected, the key LEDs blink. Verify and correct any problems, then turn power on. If the cable is disconnected, turn power off, connect the cable, then turn power on.

This error message is displayed to indicate RS-232C com-

Communication error may be caused by poor cable con-

tact or very short-time power off. This error message is



(3)

also displayed when troubles described as in Step (2) occur.

munication error.

If this error message is displayed, turn power off, turn the power back on, then transfer data again.



(4) Other error messages

The following error messages are rarely displayed.

"Process Exception"

This error message is displayed to indicate exceptional error or LT436 Series Application Software processing error.

Close the software, then restart it. If the software is not closed even when the button is pressed, press the CTL, ALT and DEL simultaneously to close the software.

When a file on floppy disk is directly specified, this message is displayed due to insufficient work area. Copy the file to the hard disk before operation.

"Select File"/"Select Bitmap File"

This error message is displayed to indicate an error in the bitmap file read. Check the bitmap file for correct.

"Invalid Bitmap Type"

This error message is displayed to indicate an error in the bitmap file read. (Incorrect internal header)

"Not Support Color Type"

This error message is displayed when reading the file containing number of colors other than 4, 8, 24 bits.

"Compress File is not support"

This error message is displayed when the compressed bitmap file is read.

4.11.9 Corrective Action

If any error message described in Section 4.11.8, "Error Message" is displayed when data is being transferred, the data area cannot be rewritten. Therefore, the correct pattern is not displayed. Transfer data again if an error occurs when data is being transferred.

4.11.10 Uninstalling LT436 Series Application Software

(1) Click "Settings" control panel in the Start menu.



Figure 4-43



(2) Click "Add/Remove Programs" in the control panel.

"Add/Remove Programs"

(3) Select "LT436 Series Application," then click "Add/Remove."



Figure 4-45

4.12 Default Settings

Table 4-12 shows the setting conditions when shipped from the factory. If the battery backup function is disabled due to a depleted battery, the default settings (except AP LEVEL control (1) and ANALOG EGB level control (2) are set when power is turned on. (4) "Confirm File Deletion" dialog box is displayed. Click "Yes."



Figure 4-46

(5) The uninstall software is started to delete the software. After the software is deleted, "Unistall successfully completed" is displayed. Click "OK." Uninstallation is now completed.



Figure 4-47

4.12 Default Settings

Table 4-12 shows the setting conditions when shipped from the factory. If the battery backup function is disabled due to a depleted battery, the default settings (except AP LEVEL control ③ and ANALOG RGB level control ⑦) are set when power is turned on.

Key Name	Settings
2 Pattern keys	Full-field color bar
③AP LEVEL	PRESET
©SYNC ON G	OFF CONTRACTOR OFF
()FORMAT	YPBPR
8SCANING	INTERLACE
<pre> ⑨SYSTEM </pre>	NTSC
10 INVERSION	NORMAL
1)CHROMA	ON
©R,G,B	All ON (White when RASTER is selected.)
13SATURATION	75 %
DANALOG RGB OUTPUT Level	adihiyas
R,G,B	700 mV (into 75 Ω)
HS,VS,C.SYNC	5 V (into open circuit)

Table 4-12 Default settings

5. BATTERY BACKUP

5.1 Primary Battery

This instrument retains the front panel settings in effect before power was turned off. Since Manganese-Lithium primary battery (unrechargeable) is used, battery life lasts longer than a rechargeable battery.

5.2 Battery Life

Battery life is about three years, however, it depends on storage time and operating conditions. When the battery is depleted and cannot backup, this instrument is set to the default settings.

5.3 Replacing Battery

Contact your local Leader agent.



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