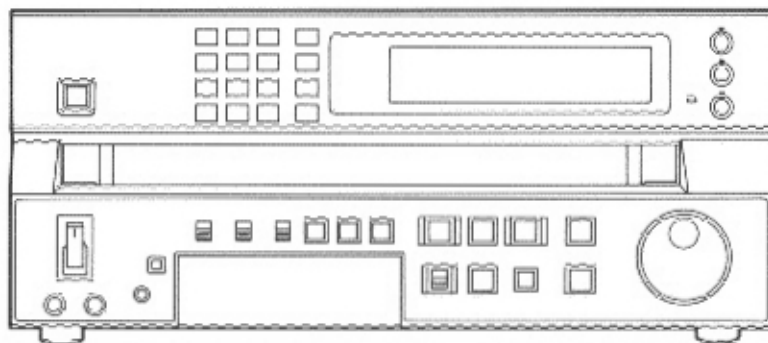


Panasonic®

Operating Instructions

LQ-D5500P

Digital Video Disc Recorder



In order to effect a complete power off, the machine must be disconnected from the power source. If it is only the OPERATION switch which has been set to the OFF position, the recorder will still continue to consume about 10 watts of power.

Operating Precautions

- Panasonic will not be liable for compensation in the event that this recorder fails to record properly due to trouble or malfunctioning in the main unit or disc cartridge.
- The designated disc and disc cartridge must be used with this unit.
- Copyright
The disc cartridges recorded using this unit may be used by the individual for personal purposes but, due to the copyright laws, they may not be used for other purposes without permission from the copyright holders.
- Consult with an authorized service engineer if this unit should malfunction or require maintenance. Note that the user will run the risk of injury from electric shock or exposure to the laser beam if the power is turned on with the covers removed.

Precautions for use

■ CLASS I LASER PRODUCT

This unit complies with DHHS Rule 21 CFR Chapter I, Subchapter J in effect as of date of manufacture. This unit contains an INVISIBLE LASER RADIATION SYSTEM which is classified as a Class I Level Laser Product with its required safety protection.

CAUTION:

Use of controls of adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

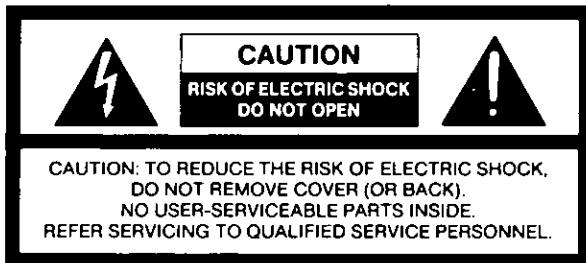
- Do not remove CASE COVER of this unit and never touch anything internal in order to avoid EXPOSURE TO LASER RADIATION.
- If the unit fails to operate properly, please follow the "Error messages" section of this manual which lists a few simple checks in order to determine the cause of failure.
- When the OPERATION switch is ON, do not put your eyes close to the front panel ejected opening to look inside the unit with the disc cartridge ejected.

LASER SPECIFICATION:

Class I Level Laser Product

Wave Length: 790 ± 15 nm

Laser Power: No hazardous radiation is emitted with safety protection.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

WARNING:

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION:

To reduce the risk of fire or shock hazard, refer change of switch setting inside the unit to qualified service personnel.

FCC NOTE:

This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION:

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

DISK DISPOSAL

Caution:

This Optical Disk contains tellurium which may be considered hazardous. Check and follow your local regulations before Disposal.

Lithium Battery

Refer replacement of battery to qualified service personnel.
Replace battery with part No. CR2354-1HF only.
Use of another battery may present a risk of fire or explosion.
Caution—Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

IMPORTANT

"Unauthorized recording of copyrighted television programs, films, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."

Operating Tips

Since this unit uses discs and employs digital compression, it is subject to operating restrictions which differ from those of existing products. The user should be thoroughly familiar with these restrictions before attempting to use the unit.

1. Handling the discs

Care must be taken to keep the discs free from dust and scratches since dimensions of less than one micron (1/1000 mm) are used for the signals recorded on them.

Dirt on the surface of the discs will give rise to error noise in the pictures and result in instability in search operations. Use the accessory tool LV-K001 to clean off the dirt.

Give consideration to installing the unit in conditions which will not attract dust.

For details on the actual cleaning method used, refer to "How to clean the discs" on page 55.

Discs are made of plastic (polycarbonate). As such, leaving a disc in conditions under which the ambient temperature exceeds the operating environment specifications given below may result in deforming the disc, thereby making it impossible to record or play it again.

- Temperature: 41°F to 104°F (storage of discs when housed in their cartridges: 32°F to 122°F)

- Humidity: 10% to 80% RH

- Maximum wet-bulb temperature: Less than 84°F

- Maximum temperature gradient: Less than 50°F/hour (when housed in cartridge: 59°F/hour)

- Maximum humidity gradient: Less than 10%/hour

Note that leaving a disc inserted in the unit may result in deformation of the disc, making it impossible to play it again if the power source is disconnected from the machine or the power board switch is turned off before the power switch on the panel section is turned off.

The disc is already housed inside the unit if the cartridge head is exposed, and the above precaution should be followed.

2. Time taken for the disc to start operating

It takes about 25 seconds for the disc to start operating. If "write enable" has been set for the cartridge's write protect switch, it will take a total of 60 seconds or so since recording power learning is performed after the disc is inserted. It also takes a few moments for a disc to be ejected since it must be stopped first.

3. Editing functions

Alongside the high editing accuracy of ± 0 frame, this unit offers a high-speed search performance and preroll-free start which are features unavailable with VTRs.

However, due to the time required to compress and expand the images, when automatic editing is performed using the editing controller, the timing at which the selections are made on the monitor will be delayed by 0.1 to 0.3 sec. (depending on the mode concerned) compared to the actual recording timing. This does not affect the editing results in any way.

Note for the following 3 points:

1) If sound is dubbed to match the playback images, the sound is actually recorded with a 0.17 sec. delay.

2) Even if split editing (different timings for image and sound recording) is performed with an editing controller, this does not affect the editing results in any way although operation is switched to the EE mode simultaneously on the monitor.

3) Editing is possible even in the V-FLOAT mode but it is not recommended since problems, such as a deterioration in the editing accuracy or a delay in the appearance of the image when operation is switched from EE to VV, may develop.

For further details, refer to "Editing precautions" on page 54.

4. Exercising control from the editing controller

This unit's RS-422A protocol employs the same commands as those used by Panasonic's VTRs. However, since the access speeds are much faster than those for the VTRs, depending on the editing controller model the editing accuracy may be poor and it may not be possible to use some of the functions of the controller.

When selecting a controller to be used in combination with this unit, consult with an authorized Panasonic representative or check out its functions in advance.

5. Function to prompt user to calibrate when the temperature has risen

When the ambient temperature has changed approx. 59°F while the unit is operating, "H_CAL" appears on the unit's display to prompt the user to calibrate the control system. To record error-free images, press the **[REC]** button and proceed with calibration. After completing calibration, perform the next operation.

6. Regarding vibration and impact during operation

Recording or playback may be suspended if the unit is subjected to vibration or impact from an external source while it is being operated. Note that if it is subjected to the vibration or shock during recording, noise may be recorded on the tracks already recorded or the recording may be interrupted. To prevent this kind of trouble, install the unit in a stable location where it will be free from vibration or shock.

7. Regarding operation at low temperatures

Immediately after turning on the unit's power in an environment with a low ambient temperature, the unit's operation may be unstable due to the formation of condensation, etc. When using the unit at a low temperature, wait about 10 minutes after turning on the OPERATION switch to insert the disc cartridge.

1. Features

This component digital recorder employs 12" (30 cm) phase-change rewritable discs. Its high picture and sound quality, system convenience and reliability are of a standard required by broadcast stations.

High picture quality

This unit employs component digital recording for the video signals to offer a high picture quality virtually free from deterioration.

High sound quality

This unit employs incompressible PCM recording for the audio signals to offer a high sound quality virtually free from deterioration.

Large-capacity, long-duration recording

The rewritable 12" discs used by this unit enable long-duration recording: up to 41 minutes for moving pictures and up to 74,773 frames for still pictures.

High-speed random access

Images can be accessed at high speed in an average of 0.5 sec.

Direct rerecordable

The phase-change recordable system used for recording makes direct rerecordable possible, it obviates the need for deletion and further simplifies the unit's construction.

Still picture recording

The number (1 to 15) of the still picture frames to be recorded can be selected on the menu or by operating the number keys pad. Unlike a VTR, preroll is not required. The recording work can therefore be achieved with a high degree of efficiency. The unit is also free from deterioration in picture quality caused by still standby.

Color framing control

Since this unit controls the color framing in units of 4 fields, ideal recording and editing of composite signals and playback images are achieved.

Wide-ranging variable and jog play functions

This unit alone is capable of providing variable play at 1× normal speed in the forward or reverse direction as well as jog play at -1× to +1× normal speed.

If the unit is controlled in the serial remote mode, variable play is possible at -1× to +3× normal speed.

The shuttle, variable and jog speed can be checked on the character display. (Refer to the section on the setup menu.)

Shuttle search at up to 40× normal speed

Using the search dial, images can be located by shuttle search at up to approx. 40× normal speed in both the forward and reverse directions. (Noise may appear on the images during high-speed search.)

Built-in time code reader/generator

Since the unit incorporates a time code reader/generator, operation is possible not only by address but by time code and user's bit as well.

Input/output connectors for giving priority to picture quality

In addition to the general standard video input and output connectors (for composite video signals), the unit comes with component input/output connectors, analog RGB input/output connectors, YC (S1 VIDEO) input/output connectors, and SMPTE 259M standard digital input/output connectors (optional).

Audio digital interface

AES/EBU standard connectors are provided as a standard accessory so that serial digital audio input and output signals can be used.

Superimposing

Disc addresses, time codes, deck operation modes and error information can be superimposed onto the TV screen. (COMPOSITE 3 output connector only)

Menu-driven setup settings

The settings for this unit's setup can be performed on the TV monitor screen by making menu selections. Ten groups of settings, each having different setting conditions from one another, can be entered so that by selecting a particular group, the unit can be operated under a different set of settings in a single step. The settings can also be monitored on the front panel display.

RS-422A serial remote control

The unit can be operated by a remote controller using the RS-422A serial connector (9P). Panasonic's VTR emulation is used for the protocol.

Computer-based control

The unit can be operated using the RS-232C connector which is the standard serial transmission interface for computers. (Standard accessory)

Using an optional RS-232C card, up to 100 decks can be controlled from a single personal computer.

Video control (encoder remote)

Using the video control connector (15P), the video levels, setup and other items can be controlled from an external source.

VBI (vertical blanking interval) data recording

The VBI data input/output connector (25P) enables the vertical blanking interval data to be written and read. This data area can also be used for other purposes. Closed captions need not use this section.

User data recording

By exercising control from a unit complying with the RS-232C standard, up to 128K bytes of data can be written into, and read from, the user data area.

Compatibility with existing equipment

In terms of the video/audio signals and control, this unit can be handled in exactly the same way as VTRs and other existing equipment.

Accommodation of special functions

Use of the optional RS-232C interface card enables time lapse and many other functions to be added by means of the accessory back-up RAM, GPI and optional ROM without using any external units.

Rack-mounting dimensions

The unit can be mounted in an EIA standard rack. (4U)

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2. Specifications

GENERAL

Power supply:	AC 120 V, 60 Hz
Power consumption:	180 W (10 W when OPERATION switch is at OFF)

Weight:	Approx. 55 lbs [25 kg]
Dimensions:	17 ³ / ₁₆ " (W) × 8" (H) (including feet) × 21 ¹ / ₁₆ " (D)/4U
Ambient operating temperature:	41°F to 104°F [+5°C to +40°C]
Ambient operating humidity:	30% to 80% (relative humidity), no condensation
Disc cartridge used:	LM-R13000 (12" diameter, polycarbonate)
Disc speed:	1800 rpm (1 frame/rev)
Recording system:	PCR (phase-change rewritable), double-sided 2-head MCAV system
Error correction method:	Reed-Solomon code
Recording time:	41 minutes/74,773 frames
Search time:	0.5 sec. (average)
VAR speed:	±1× normal speed; -1× to +3× normal speed with serial control
Shuttle speed:	Max. approx. ±40× normal speed
Return loss	Analog video input: Less than -40 dB Reference input: Less than -40 dB Analog video output: Less than -35 dB

VIDEO

TV system:	NTSC (60.0 Hz/V input possible)
Sampling frequency	Y: 13.5 MHz P _a , P _r : 3.375 MHz
Quantizing:	8 bits
Compression system:	Octal system in frame
Compression ratio:	1/5
Video band	Y: 30 Hz to 5 MHz +0.5/-3 dB P _a , P _r : 30 Hz to 1.3 MHz +0.5/-3 dB
S/N ratio	Y: Better than 54 dB P _a , P _r : Better than 54 dB AM: Better than 54 dB (composite IN/composite OUT) PM: Better than 54 dB (composite IN/composite OUT)
Differential gain:	Less than 3% (composite IN/composite OUT)
Differential phase:	Less than 3° (composite IN/composite OUT)
K factor:	Less than 2%
Linearity:	Less than 3% (RAMP)
Y/C delay:	Less than 20ns

AUDIO

No. of channels:	PCM 2 channels, non-compression
Sampling frequency:	48 kHz
Quantizing:	16 bits
Emphasis:	None
Frequency response:	20 Hz to 20 kHz ±1 dB
Dynamic range:	More than 85 dB ("A" weighted)
Headroom:	20 dB
Distortion:	Less than 0.08%
Crosstalk:	Less than -75 dB (1 kHz, between two channels)
Wow & flutter:	Below measurable limits

TIME COUNT

Modes:	Disc address (preset) Address time code (address replacement values, presetting possible) Time (equivalent to timer/CTL, zero reset possible) Time code
Recording TC source:	INT/EXT (VITC or TC IN selectable)
TC mode:	DF/NDF

USER'S BIT

Recording UB source:	INT/EXT (VITC or TC IN selectable)
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VIDEO IN

Component:	Y, P _a , P _r /R, G, B, SYNC switchable; BNC×4, 75Ω Y: 1 Vp-p; P _a , P _r : 0.525 Vp-p (75% color bar) RGB: 0.7 Vp-p; SYNC: 4 Vp-p (or G-SYNC) 1±0.3 Vp-p, BNC×2 loop through, 75Ω ON/OFF
Composite:	Y: 1 Vp-p, C: 0.286 Vp-p (burst), 4P, 75Ω
YC (S1 VIDEO):	Composite 1 Vp-p, BNC×2 loop through, 75Ω ON/OFF
REF video:	
Serial digital:	SMPTE 259M, BNC×2, active through; optional accessory

VIDEO OUT

Component:	Y, P _a , P _r /R, G, B, SYNC switchable; BNC×4, 75Ω Y: 1 Vp-p; P _a , P _r : 0.525 Vp-p (75% color bar) RGB: 0.7 Vp-p; SYNC: 4 Vp-p (G-SYNC ON/OFF)
Composite 1:	1 Vp-p, BNC, 75Ω
Composite 2:	1 Vp-p, BNC, 75Ω
Composite 3:	1 Vp-p, BNC, 75Ω/character superimpose ON/OFF
YC (S1 VIDEO):	Y: 1 Vp-p, C: 0.286 Vp-p (burst), 4P, 75Ω
Serial digital:	SMPTE 259M, BNC×2; optional accessory

VIDEO (ENCODER) CONTROL RANGE

Video level:	±2 dB
Chroma level:	±2 dB
Setup:	-5 to +15 IRE
Hue:	±15°
System SC phase:	360° p-p (COARSE/FINE)
System H phase:	±1.5 μs

AUDIO IN

Analog CH1, 2:	-20/0/+4 dBu switchable, XLR-3P×2 Balanced, 600Ω/high impedance (factory setting), internally switchable
Digital:	AES/EBU (CH1/2), XLR-3P
Time code:	1 Vp-p, BNC, unbalanced, high impedance Built-in time code reader

AUDIO OUT

Analog CH1, 2:	-20/0/+4 dBu switchable, XLR-3P×2 Balanced, low impedance
Digital:	AES/EBU (CH1/2), XLR-3P
Time code:	2.2 Vp-p, BNC, unbalanced, less than 50Ω Built-in time code generator
Monitor CH1, 2:	Phono×2, 0 dBv, unbalanced, low impedance (internally switchable to -8 dBv)
Headphones:	-∞ to -20 dBv variable, 1/4" stereo jack, 8Ω

DATA I/O

VBI data I/O:	D-SUB 25P×1, max. 1,560 bytes/frame
User data I/O:	RS-232C-based input/output, max. 128K bytes

REMOTE I/O

RS-422A:	D-SUB 9P×2 loop through, VTR emulation protocol
RS-232C	1) D-SUB 25P: MIS protocol (standard accessory) 2) D-SUB 25P×2: MIS or OMDR protocol (optional accessory) *Both 1) and 2) cannot be used at the same time.
GPI:	Half-pitch D-SUB 20P, 8 ports for I/O; provided for 2) above
Video control:	D-SUB 15P (shared with MII)
Remote control:	Mini-jack, wired remote control

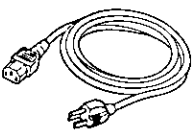
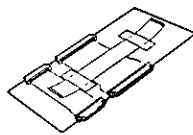
STANDARD ACCESSORIES

1) Power cable 2) Instruction Manual 3) Disc cleaning kit 4) Extension board and FPC extension cable (used by service engineer)

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

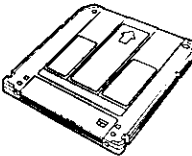
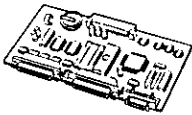

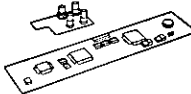
3. Accessories

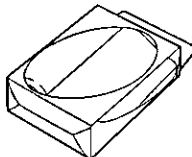
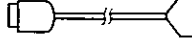
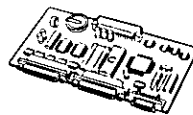
3-1. Standard accessories

 <p>Power cable</p>	 <p>Disc cleaning kit</p>	 <p>Extension board (incl. Extension FPC cable)</p>
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Do not use the extension board and extension FPC cable: they are to be used by the service engineer.

3-2. Optional accessories

<p>LM-R13000</p>  <p>Disc cartridge</p>	<p>LQ-YA232P</p>  <p>RS-232C interface card (with GPI)</p>	<p>LQ-RC550P</p>  <p>Wired remote controller</p>	<p>LQ-YA555P</p>  <p>SMPTE 259M component serial digital interface board</p>
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 <p>Disc cleaning kit LV-K001</p>	 <p>GPI connector cable LV-K003</p>	 <p>Time lapse card LQ-YA501P</p>
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*1. Use of the optional LQ-YA232P RS-232C card or LQ-YA501P time lapse card makes it impossible to use the RS-232C and RS-422A facilities provided as standard features.

*2. The LQ-YA501P equips the LQ-YA232P with ROM containing software.

*3. The LQ-YA501P card allows the unit to be used as a time lapse deck.

Main Functions

- Intermittent recording function (0.5 second-3 minutes/F)
- Recording start time and day and month/day/time settings
- Recording START/STOP controls through the GPI
- Time and date logging

8 STOP button

When this button is pressed, the lamp lights, and all the modes are stopped. The disc continues to rotate.

9 PLAY button

When this button is pressed, the lamp lights, and the normal play mode (forward direction, 1× normal speed) is established. When it is pressed after the play speed has been input using the number keys, play at up to 40× normal speed is possible. (Noise may appear on part of the screen during high-speed play.)

To release play, press the STOP, JOG/SHTL or JOG/VAR button.

10 REC button

When the PLAY button is pressed while the REC button is held down, both the REC and PLAY lamps light, and the recording mode is established. When the PLAY button is pressed while the REC button is held down after the number of recording frames has been input using the number keys, the specified number of frames will be recorded. To release the mode, press the STOP button.

- The unit will not establish the recording mode while the REC INHIBIT lamp is lit.
(See 11 REC INHIBIT lamp.)

11 REC INHIBIT lamp

This lights when the disc cartridge's write protect switch is on or when recording inhibit control (Rec Inhibit) on the setup menu is on. The recording or editing operation will not execute.

12 EDIT MODE buttons

Use these buttons to select the desired channel when conducting insert editing.

VIDEO: Video is selected.

CH 1: Audio channel 1 is selected.

CH 2: Audio channel 2 is selected.

*When all the lamps have lit, the unit functions in exactly the same way as for assemble editing. (There is no differentiation from insert editing.)

13 EDIT button

This is used for manual editing.

When the PLAY button is pressed while the EDIT is held down with the EDIT MODE lamp lit, both the EDIT and PLAY lamps light and the editing mode is established. When the PLAY button is pressed while the EDIT button is held down after the number of recording frames has been input using the number keys, the specified number of frames can be edited. To release the mode, press the STOP or PLAY button.

- The unit will not establish the recording mode while the REC INHIBIT lamp is lit.
(See 11 REC INHIBIT lamp.)

14 INPUT CHECK button

When this button is pressed during Play, the EE mode is established while it is kept depressed and input signals can be monitored. When the COUNTER SELECT mode has been set to the TC, ATC or TM display, the TCG (time code generator) value is displayed.

When it has been set to the UB display, the UB preset value is displayed.

Use this button to monitor the recording signals or adjust the recording signal level.

15 CONTROL switch/REMOTE lamp

REMOTE: Set to this position to operate the unit by remote control using a controller, etc. When this is done, the REMOTE lamp lights and only the STOP and EJECT buttons can be operated. (The STOP and EJECT functions can also be deactivated on the menu.)

LOCAL: Set to this position when operating the unit using the front panel controls. Also set to this position when using the wired remote controller (option).

16 Search dial/JOG, S/V lamps

This rotary dial is for varying the play speed. Each time it is pressed, the JOG or SHUTTLE/VARIABLE mode is established alternately.

The JOG mode is established when the dial is pushed in; the SHUTTLE/VARIABLE mode is established when it is released.

The lamp corresponding to the mode established lights.

17 JOG/SHTL button

When this button is pressed, its lamp lights, and the search dial establishes the JOG or SHUTTLE mode.

JOG mode: When the search dial at the pushed-in state (no clickstop) is turned clockwise or counterclockwise, the disc is played at the speed (−1 to +1× normal speed) corresponding to the speed at which the dial is turned. When the rotation is stopped, a still picture appears at that position.

SHUTTLE mode: When the search dial in the released state is turned clockwise or counterclockwise and then stopped at any position, the disc is played at the speed (approx. −40 to +40× normal speed) corresponding to that position. A still picture appears at the center position. The search dial has a clickstop at the still picture position.

18 JOG/VAR button

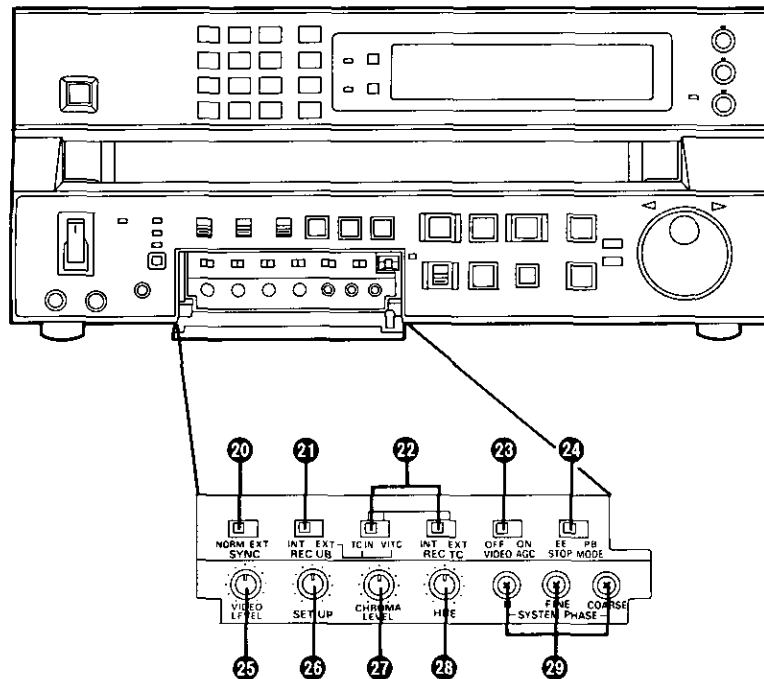
When this button is pressed, its lamp lights, and the JOG or SHUTTLE mode is established for the search dial.

VARIABLE mode: When the search dial in the released state is turned clockwise or counterclockwise and then stopped at any position, the disc is played at the speed (−1 to +1× normal speed) corresponding to that position.

19 FWD lamp/REV lamp

During play using the search dial, the FWD lamp lights when the disc is played in the forward direction and the REV lamp lights when it is played in the reverse direction.

4-2. Front bottom pocket section



20 SYNC switch

This selects the servo reference signal.

NORM: For synchronizing with the internal sync signal or input video signal.

EXT: For synchronizing with the REF input signal.

•For further details, refer to "7. Servo reference".

21 REC UB switch

This selects the signal source of the user's bit to be recorded.

INT: For recording the user's bit which has been set on this unit's menu.

EXT: For recording an external user's bit.

When EXT has been selected, use the TC IN/VITC switch (see page 38) to select whether the user's bit which is input from the rear panel TIME CODE IN connector or the VITC user's bit which has been added to the input video signal is to be recorded.

22 REC TC switch

This selects the signal source of the time code to be recorded.

INT: For recording the time code of the TCG inside this unit.

EXT: For recording an external time code. When EXT has been selected, use the TC IN/VITC switch (see page 38) to select whether the time code which is input from the rear panel TIME CODE IN connector or the VITC time code which has been added to the input video signal is to be recorded.

23 VIDEO AGC switch

This automatically adjusts the recording level of the luminance signal when the COMPOSITE signal or YC signal is being recorded.

ON: For automatically adjusting the level.

OFF: For manually adjusting the level. Adjust the level using the COMPOSITE VIDEO level control.

24 STOP MODE switch

This sets the signal output status when the unit's operation mode is STOP.

EE: EE pictures (input signals) are output.

PB: The play still pictures are output.

25 VIDEO LEVEL control

This adjusts the video output level.

It simultaneously adjusts the composite, component and Y/C outputs except for the sync and burst parts.

26 SETUP control

This adjusts the setup level.

It adjusts the composite, component and Y/C outputs simultaneously.

27 CHROMA LEVEL control

This adjusts the chroma output level.

It adjusts the composite level except for the burst part, Y/C output chroma part and component output P_B/P_R simultaneously.

28 HUE control

This control sets the output video hue. The setting is valid for the composite output and Y/C output only.

29 SYSTEM PHASE controls

These adjust (gen-lock) the phase of the signal from the internal sync generator with the reference signal supplied from an external source.

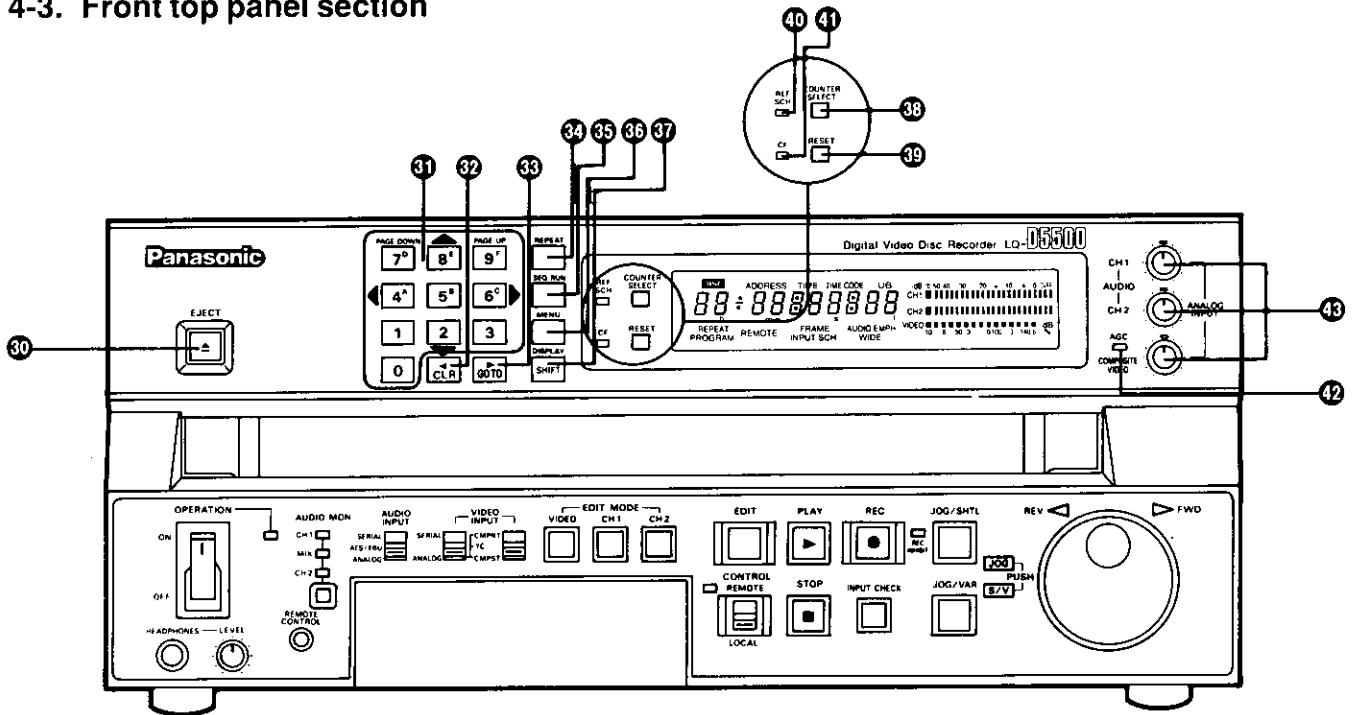
H control: For adjusting the H phase.

FINE/COARSE controls:

For adjusting the (SC) subcarrier phase. The COARSE control is a rotary switch which adjusts the phase in 4 steps of 90°; the FINE control has a continuous range of just over 90°, and together they cover 360°.

*A waveform monitor or vectorscope is required in order for these adjustments to be performed.

4-3. Front top panel section



30 EJECT button

The disc cartridge is ejected when this button is pressed. Since the disc must first spin down it takes approximately 15 seconds for it to be ejected.

31 Number (arrow) buttons

These are used to input data for assigning the search addresses, setting the play speed and performing the setup menu operations.

- When setup menu operations are performed, the number buttons serve as the selection and PAGE UP/DOWN buttons. For details on how to operate these buttons, refer to the setup menu (default setting) description (page 24).

32 CLR (cursor) button

This clears the figures for the time code, play speed, etc. which were input using the number buttons.

33 GO TO (cursor) button

When this button is pressed in the play mode after the target value has been assigned using the number buttons, the frame address reference will be reached in an average of 0.5 sec. after the GOTO button was pressed. Refer to "Search" (page 46).

It also serves as a cursor button during menu settings.

Note: When the GO TO button is pressed without an address having been designated, the first address of the disc is searched (track 0001).

34 REPEAT button

Repeat play for an internally stored program commences when this button is pressed. When it is pressed again, the operation is released.

"REPEAT" lights on the fluorescent display tube during repeat play.

• Setting the play block

The repeat play block can be set using setup menu "3 REPEAT".

• Automatic startup

Repeat play can be commenced automatically after the power has been switched on by setting "Auto Start" of setup menu "3 REPEAT" to "On". (See page 29.)

35 SEQ RUN button (the optional LQ-YA232P is required)

When this button is pressed, the program function is executed. When it is pressed again, the operation is released. "PROGRAM" lights on the fluorescent display tube while the program function is being executed.

• Automatic startup

The unit can be programmed to start up automatically after the power has been switched on by setting "Auto Start" of setup menu "2 PROGRAM" to "On".

<Program function>

This is the function which has already been stored in the ROM and RAM of the RS-232C interface card (option). For details on operation, refer to the LQ-YA232P function instructions.

36 Menu button

Press this to change the unit's operating conditions or other setup statuses. Pressing the button again returns it to its original setting.

For details on the items, refer to the description of the setup menu (page 24).

Note:

Composite 3 output connection to this display is essential.

37 DISPLAY (SHIFT) button

When this button is pressed, the deck operation status and other information appears on the monitor display. When it is pressed again, the display is cleared.

The display output is provided from the rear panel COMPOSITE 3 output connector. For details on what is displayed, refer to the superimpose displays (page 41).

- During setup menu operations, this button serves as the SHIFT button to input letters.

38 COUNTER SELECT button

This selects the counter mode indicated on the fluorescent display tube. Each time it is pressed, the counter mode changes in the following sequence: ADDRESS → TIME → TIME CODE → ADDRESS TIME CODE → UB.

For details on the significance of each display, refer to the description of the display section (page 14).

- The counter mode is retained even when the power is turned off.

39 RESET button

When this button is pressed while "TIME" has been selected as the counter mode, the counter value is cleared to zero.

40 REF SCH lamp

This lights when a standard (STD) signal is supplied whose reference (REF) video signal SCH (subcarrier and H) phase is within $\pm 60^\circ$.

41 CF lamp

This lights when the unit is in the color framing mode. Color framing is important when editing signals are produced from composite input or composite signals.

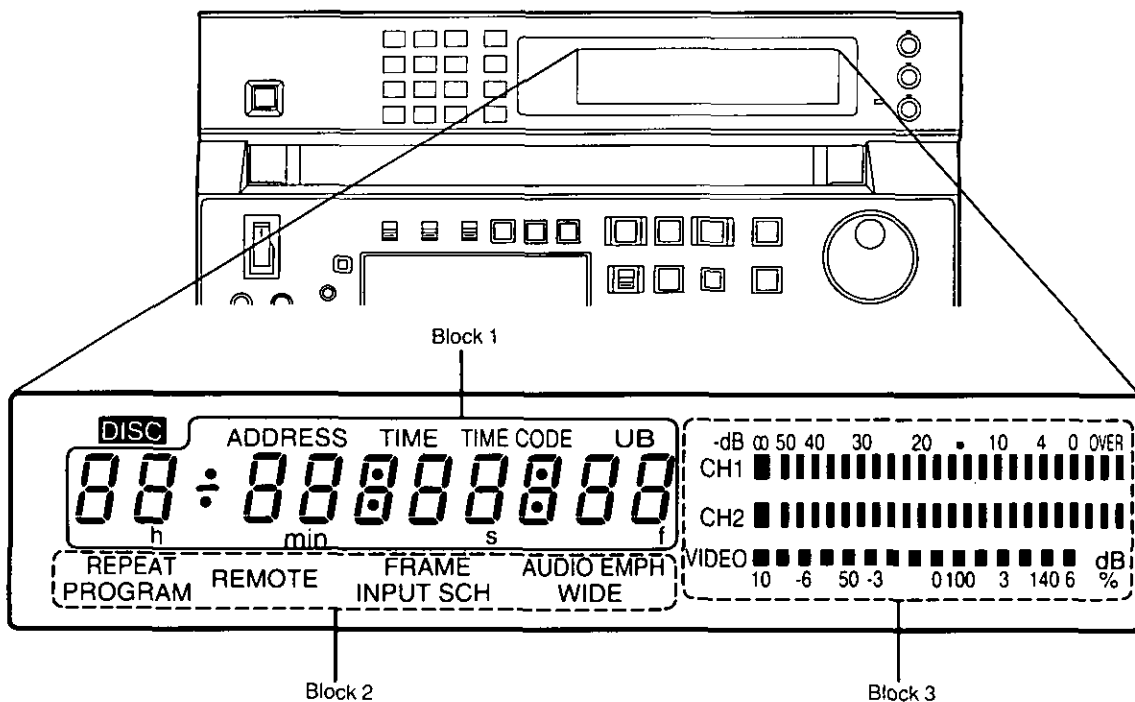
42 AGC lamp

This lights when the VIDEO AGC switch inside the pocket is at the ON position. It does not function when digital and component signals are input.

43 ANALOG INPUT level controls

- AUDIO CH1:** For adjusting the audio CH1 recording level.
- AUDIO CH2:** For adjusting the audio CH2 recording level.
- COMPOSITE VIDEO:** For adjusting the level of the luminance signals for recording the composite and Y/C signals. When adjusting these levels, set the VIDEO AGC switch inside the pocket to the OFF position.

4-4. Front top panel display section



44 FL (fluorescent tube display) section

Block 1

The counter value of the deck being played, standby and learning mode status, etc. are displayed in this block.

■ Counter mode displays

There are five counter modes: "ADDRESS", "TIME", "TIME CODE", "ADDRESS TIME CODE" and "UB". Each time the COUNTER SELECT button is pressed, the mode is toggled by one setting to the next mode.

ADDRESS

This displays the frame address number already recorded on the disc.

Ad	00001	~	74773
----	-------	---	-------

TIME

This is a counter with a 24-hour display which can be reset to 00h:00min:00s:00f using a button. It can be used in the same way as CTL is used with a VTR.

●Frame mode

The mode established corresponds to the drop frame (DF) or non-drop frame (NDF) setting in setup menu "TIME CODE 1".

Time	00H00M00S00F ~ 23H59M59S29F
------	-----------------------------

TIME CODE

This displays the INT and EXT time codes as well as the time code during play.

●Frame mode

Drop frame (DF) or non-drop frame (NDF) can be selected by "Frame Mode" on setup menu "TIME CODE 1".

Time Code	00H00M00S00F ~ 23H59M59S29F
-----------	-----------------------------

ADDRESS TIME CODE

This is a 24-hour display which starts with the number already recorded on the disc.

To change the start value, first set the new value at "ATC Pre." on setup menu "TIME CODE 2" and then set "ATC/ATCUB Write" to ON. For details on how to enter the setting, refer to the ATC description (page 39).

●Frame mode

The mode established corresponds to the drop frame (DF) or non-drop frame (NDF) setting in setup menu "TIME CODE 1".

Ad. T.C	00H00M00S00F ~ 23H59M59S29F
---------	-----------------------------

●The same frame mode is set for TIME, TIME CODE and ADDRESS TIME CODE.

UB

This displays the INT and EXT user's bit as well as the user's bit during play.

■ Error No. display

This displays the error code No. of the deck.
Refer to the list of error codes on pages 66 to 68.

■ Standby status display

After the disc has been inserted, the following display flashes while startup is in progress. About 25 seconds are required for this process.

LOAD

■ Learning display

When a disc is inserted in the record enable status, recording power learning takes place after startup. The following display flashes, and about 35 seconds are required for learning.

- - C A L - -

■ Calibration request display

When the ambient temperature has changed more than approx. 59°F during operation, the following display appears and calibration of the control system is requested. Press the REC button and proceed with the calibration.

- H _ C A L - -

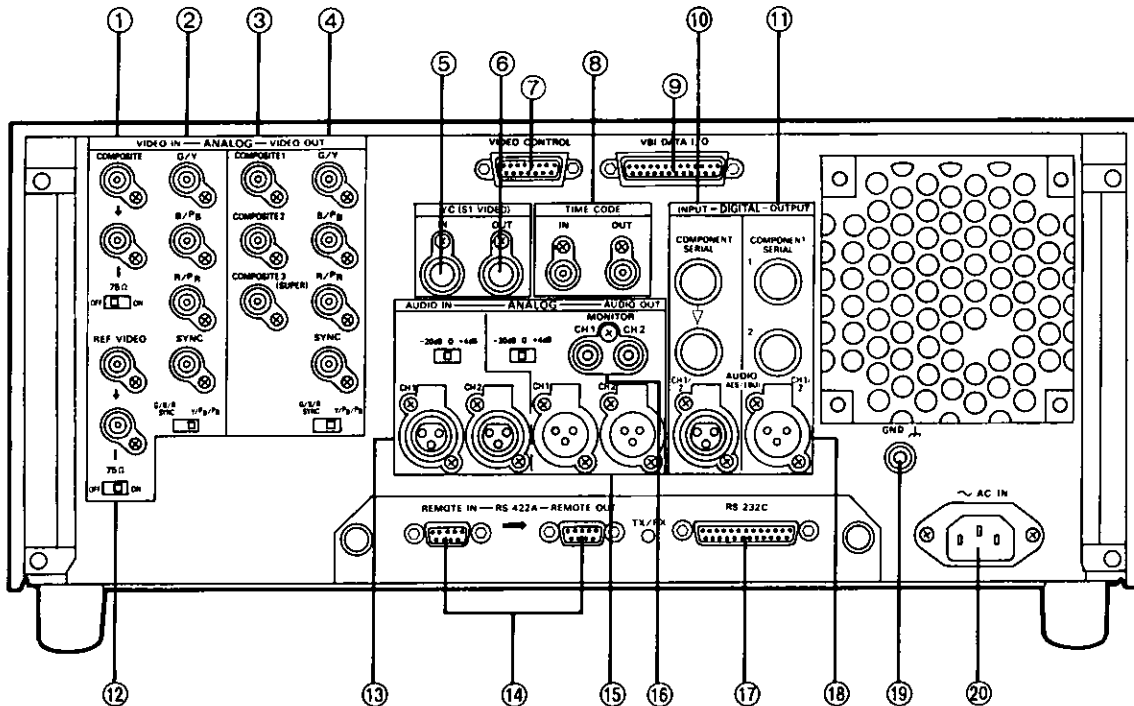
Block 2

- DISC:** This lights when a disc cartridge has been inserted.
The "DISC" display is not cleared even in the eject mode until the disc is taken out by hand.
- REPEAT:** This lights when the REPEAT button has been pressed and the repeat play mode established.
- PROGRAM:** This lights when the SEQ RUN button has been pressed and the program mode established.
Note:
The optional RS-232C card is required with the card programmed for this function to operate.
- REMOTE:** This lights when the CONTROL switch is set to the REMOTE position and the unit is operated by the remote controller or computer, etc.
- FRAME:** This lights when the framing servo is locked.
- INPUT SCH:** This lights when Y/C signals or standard (STD) composite signals are supplied whose input video signal SCH phase is within $\pm 70^\circ$.
- WIDE:** This lights when wide signals from the YC (S1 VIDEO) connector are recorded or when pre-recorded wide signals are reproduced.

Block 3

- CH1/CH2:** These are the analog audio CH1 and CH2 level meters. They display the recording level during EE/recording and the playback level during playback.
- VIDEO:** This is the video level meter which indicates the recording level. The display format can be set using "Level Meter" on setup menu <8 Video>, and either the sync level display or video level display can be selected.
This meter is effective only for composite and Y/C input signals.
- AUDIO:**
meter scale
(∞ -0 dB) The current head room setting of 20 dB appears -20 dB when entering the AUDIO standard level.
The 0 dB point is the 16 bit full scale.

4-5. Rear connector section



**① COMPOSITE VIDEO input connectors (BNC)
(loop through, with 75Ω termination switch)**

These input connectors are for the composite video signals.

Set the front panel VIDEO INPUT switch to the "ANALOG"—"CMPST" position. If the connections are not going to extend to other equipment beyond this unit, the 75Ω termination switch must be set to ON.

**② COMPONENT input connectors (BNC)
(with Y, P_B, P_R/G, B, R, SYNC selector switch)**

These input connectors are for the component signals (Y, P_B, P_R or G, B, R, SYNC).

Set the front panel VIDEO INPUT switch to the "ANALOG"—"CMPNT" position.

**③ COMPOSITE VIDEO output connectors 1, 2 and 3
(BNC)**

These output connectors are for the composite video signals.

The deck's counter value, operating status or other data can be superimposed onto the COMPOSITE 3 output.

Compared with the COMPOSITE 1 or 2 output, the output signal is delayed. Use the COMPOSITE 1 or COMPOSITE 2 output to align the phase accurately with the REF VIDEO signal phase.

**④ COMPONENT output connectors (BNC)
(with Y, P_B, P_R/G, B, R, SYNC selector switch)**

These output connectors are for the component signals (Y, P_B, P_R or G, B, R, SYNC).

⑤ YC (S1 VIDEO) input connector (4P)

This is the input connector for the Y/C signal which supports the wide screen. Set the front panel VIDEO INPUT switch to the "ANALOG"—"YC" position.

⑥ YC (S1 VIDEO) output connector (4P)

This is the output connector for the Y/C signal which supports the wide screen control.

⑦ VIDEO CONTROL connector (D-SUB, 15P)

This connector is for conducting the video output adjustments inside the front panel pocket from an external source.

It functions when REMOTE has been selected for "VIDEO CONTROL" on setup menu 7 "OPERATION".

⑧ TIME CODE input and output connectors (BNC)

These are the input and output connectors for the time code signals.

⑨ VBI DATA I/O connector (D-SUB, 25P)

This connector is for VBI (vertical blanking interval) data write and read control.

(For details, refer to page 59.)

**⑩ DIGITAL input connectors (BNC)
(active loop through) (option)**

These are the input connectors for the serial digital component (SMPTE 259M) signals.

Set the front panel VIDEO INPUT switch to the SERIAL position. When the audio signals are to be input from the same line, set the AUDIO INPUT switch to the SERIAL position as well.

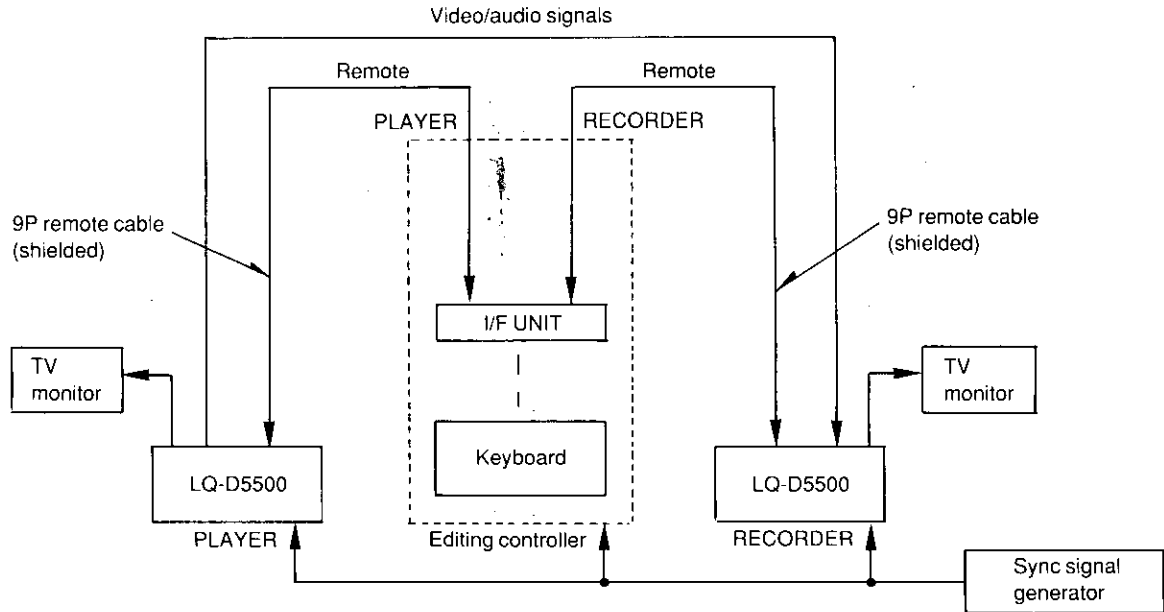
**⑪ DIGITAL output connectors (BNC) (two lines)
(option/paired with above input connectors)**

These are the output connectors for the serial digital component (SMPTE 259M) signals.

-
- ⑫ **REF VIDEO input connectors (BNC)**
(loop through, with 75Ω termination switch)
These input connectors are for the reference signals.
Use a composite signal such as a color bar or black burst complying with the RS-170A standard.
- ⑬ **AUDIO CH1/CH2 input connectors (XLR, 3P)**
(with input level selector switches)
These are the CH1 and CH2 audio input connectors.
The input level can be set to -20, 0 or +4 dBu by the selector switch.
- ⑭ **REMOTE IN/OUT connectors (9P) (loop through)**
This unit can be operated by remote control using serial data complying with the RS-422A standard. Use these connectors with the front panel CONTROL switch set to the REMOTE position.
- ⑮ **AUDIO CH1/CH2 output connectors (XLR, 3P)**
(with output level selector switches)
These are the CH1 and CH2 audio output connectors.
The output level can be set to -20, 0 or +4 dBu by the selector switch.
- ⑯ **AUDIO MONITOR output connector (PHONO)**
By setting the front panel AUDIO MONITOR switch, CH1, CH2, CH1/CH2 or MIX can be selected. However, the selection made simultaneously affects the sound heard through the headphones. Refer to monitoring (page 51).
- ⑰ **RS-232C connector**
This unit can be operated by remote control using serial data complying with the RS-232C standard. Use these connectors with the front panel CONTROL switch set to the REMOTE position.
- ⑱ **DIGITAL audio I/O connector (XLR, 3P)**
This connector complies with AES/EBU specifications.
Set the front panel AUDIO INPUT switch to AES/EBU.
- ⑲ **GND connector**
This is for reducing the noise generated when external peripheral units have connected.
- ⑳ **AC power socket**
Connect this to the AC outlet using the power cable provided with the unit.

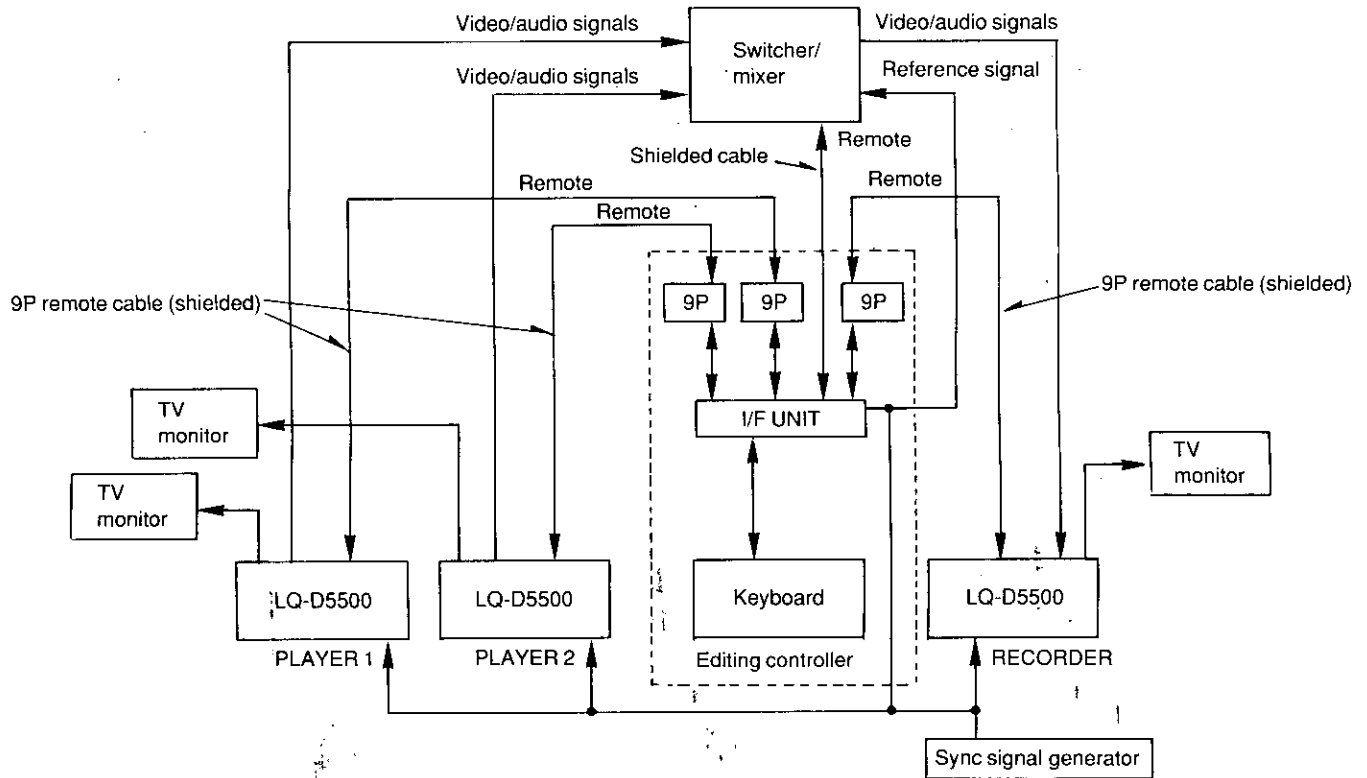
6. Example of system configuration using editing controller

Basic system



Note: Use the CONTROL switch at the REMOTE position.

AB roll system using two players

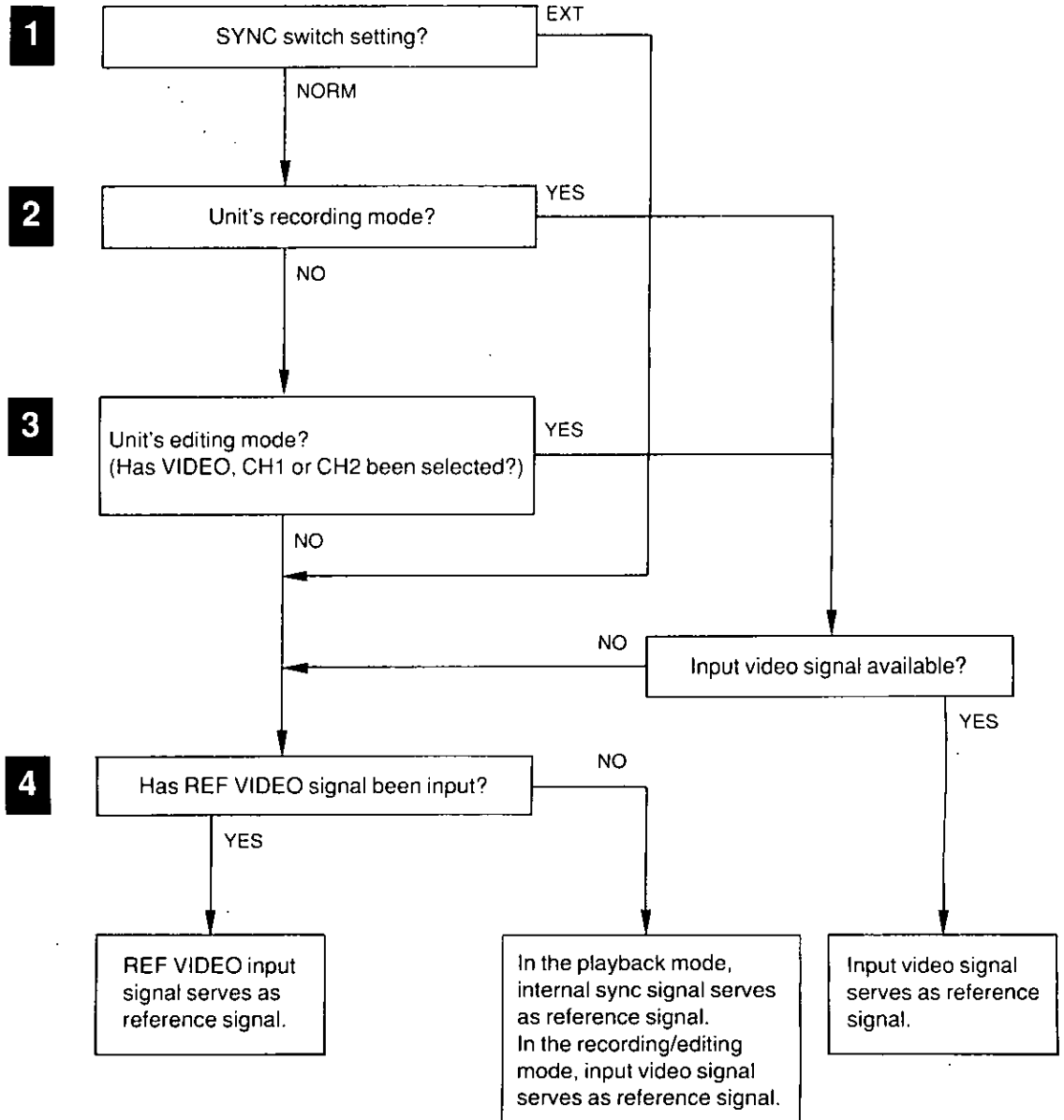


For details, refer to the operating instructions of the editing controller.

7. Servo reference

As the servo reference signal, this unit automatically selects the input video signal selected by the VIDEO INPUT switch, the reference video signal which is supplied from the REF VIDEO input connector or INT (internal sync signal).

The flowchart shown below shows the correlation between the unit's modes and SYNC switch settings during this selection.



Notes:

- If the input video signal and REF VIDEO signal are not synchronized, it will take some moments to transfer to the recording or play mode.
- Be absolutely sure to use a signal complying with the standard (RS-170A) for the REF IN signal.

Servo reference setting table

The servo reference signal is selected depending on the SYNC switch position, operation mode of the deck and whether input signals are supplied, as shown in the table below. Unless the reference signal for playback and recording is properly matched, the picture may be disturbed and a delay may occur when the mode is transferred to editing, recording or playback.

•During playback or special playback

SYNC SELECT switch position	Input signal status		Reference signal (servo reference)
	VIDEO IN signal	REF IN signal	
NORM	○	○	REF IN signal
	○	×	Internal sync signal
	×	○	REF IN signal
	×	×	Internal sync signal
EXT	○	○	REF IN signal
	○	×	Internal sync signal
	×	○	REF IN signal
	×	×	Internal sync signal

•During recording or editing

SYNC SELECT switch position	Input signal status		Reference signal (servo reference)
	VIDEO IN signal	REF IN signal	
NORM	○	○	VIDEO IN signal
	○	×	VIDEO IN signal
	×	○	REF IN signal
	×	×	Internal sync signal
EXT	○	○	REF IN signal
	○	×	VIDEO IN signal
	×	○	REF IN signal
	×	×	Internal sync signal

○: Signal is input; ×: signal is not input.

Notes:

- During editing, use the REF IN signal at both the player and editor.
- A synchronized REF IN signal is required even when only AES/EBU signals are input for recording and editing.

8. Color framing

In the case of NTSC signals, the correlation between the color subcarrier and horizontal sync signal is repeated in cycles with each cycle consisting of four fields
 In order to prevent a deterioration in picture quality when editing composite signals or component signals created on the basis of composite signals, color frame synchronization is provided in such a way that the continuity of the signals is maintained

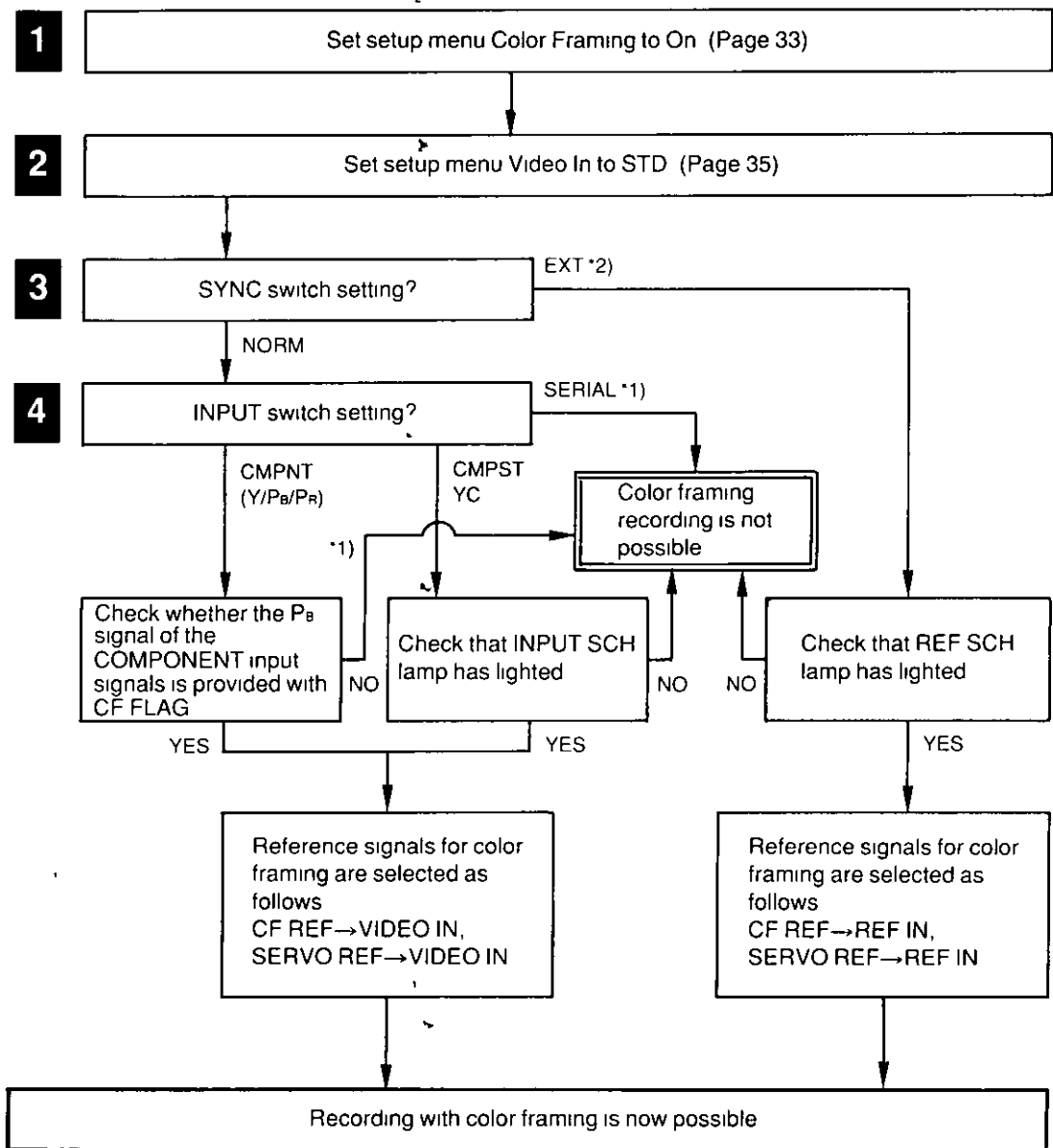
Recording and editing (editor side)

The flowchart shown below shows how color framing is applied during recording

1 When applying color framing with a COMPOSITE, Y/C or COMPONENT (Y/P_B/P_R) input

Note Connect standard signals to the REF VIDEO and video input connectors

*1) Check that the P_B signal is provided with CF FLAG in the case of COMPONENT input signals



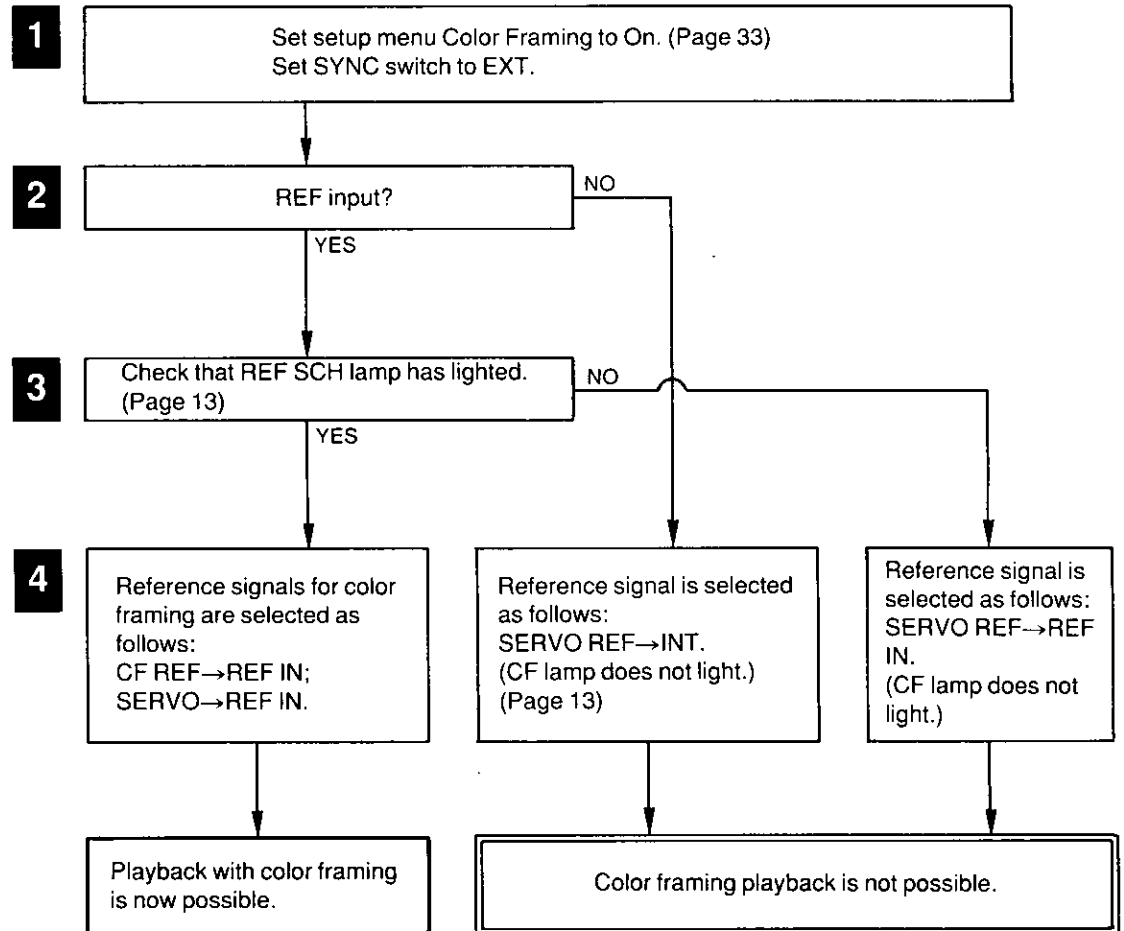
*1) There is no need to apply color framing for component input signals which have all been processed as component signals in the recording, dubbing, etc. of material

*2) The REF input signal and video input signals, including their SCH (subcarrier), must be synchronized

Playback (player side)

The flowchart shown below shows how to apply the color framing during playback.

Note: Play a disc which has been recorded in the color framing mode.



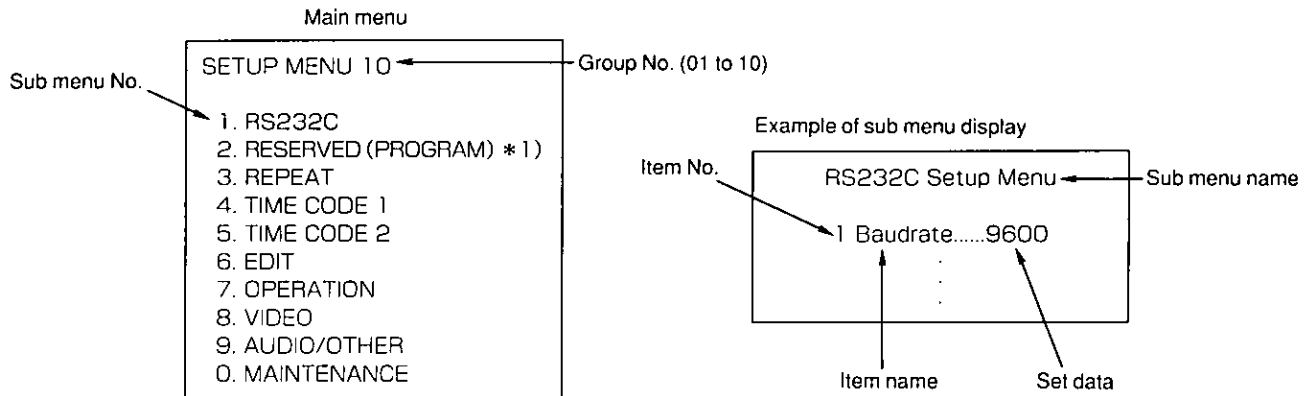
Note:

Apply color framing using the REF IN signal at both the player and editor for editing.

When it is applied using the VIDEO IN signal at the editor, some time may be taken to achieve phase synchronization and it may not be possible to edit the material properly.

9. Setup menu (default settings)

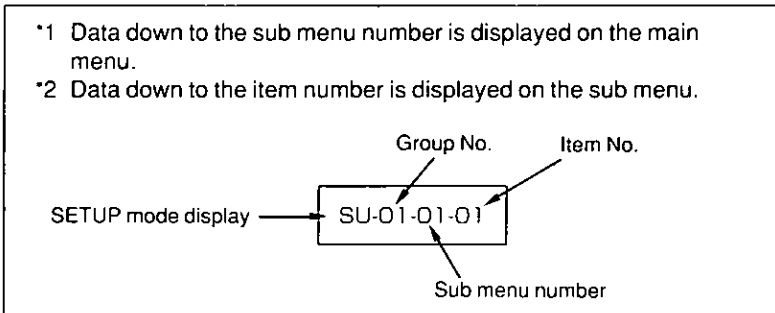
Before proceeding with recording or playback, the unit's settings are executed using the menu screens (COMPOSITE 3 output connector) on the TV monitor. The sub menus are selected from the main menu.



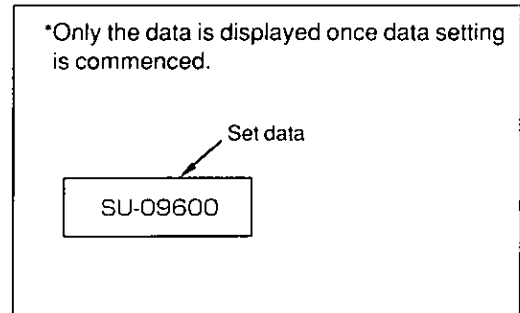
Fluorescent display tube (FL) display

The menu items can be set and checked on the front panel fluorescent display tube. Proceed while referring to the "List of setup menus" (pages 61 and 62). There are two types of displays: set item number displays and set data displays.

Set item number display



Set data display



(Refer to pages 61 and 62 for lists of the main and sub menus and to pages 28 to 38 for detailed descriptions of the sub menus.)

Assigning the set group

The setup menu consists of 10 pages of sub menus (including RESERVED); each setup menu constitutes a group, and there are 10 groups in all.

This unit operates under the conditions of the group stored in memory.

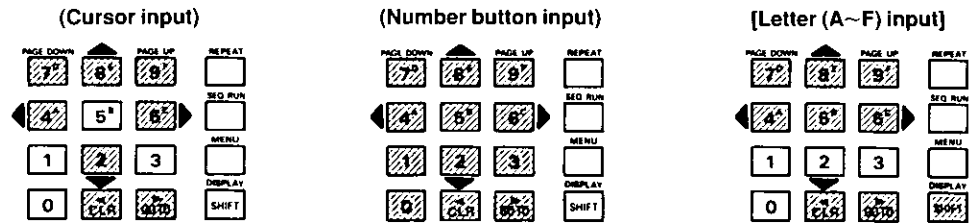
To assign a group, first input the number of the group concerned using the corresponding number buttons and then press the **[MENU]** button. The group assigned last is selected if only the **[MENU]** button is pressed without assigning the group number.

Group No. 01 is the factory setting. This group function comes in handy when setting different repeat blocks in groups (01), (02) and (03) or setting different frame recording numbers in each group is desired, for example.

*1) PROGRAM appears when the optional RS-232C card has been installed.

How the buttons function for each type of input during setup menu operations

*The button functions are switched automatically to correspond to the setup menu input item selected. The shading denotes the effective keys.



Screen movements

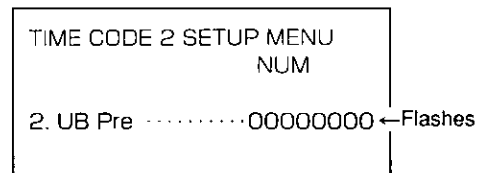
Screen movement	Operation
To move from the main menu to a sub menu	First press the ▲ (8) or ▼ (2) button to select the desired sub menu name flashing, and then press the ▶ (6) or ▷ (GO TO) button.
To return from a sub menu to the main menu	When the sub menu's item section is flashing, press the ◀ (4) or ◁ (CLR) button. (During input, press ◁ (CLR) input all the numbers until operation returns to the main menu.)
To return to the normal screen	Press the MENU button while the item section of the main menu or sub menu is lighted.
To move from a sub menu to the next sub menu	Press the PAGE UP (9) button while the item section is lighted.
To return to the previous sub menu	Press the PAGE DOWN (7) button while the item section is lighted.

*To assign a group, first input the assignment number using one or two number buttons, and then press the **MENU** button.

Inputting numerals

Inputting decimal and hexadecimal numbers

When inputting numerical data (example: UB Pre. data setting), the numerical input mode is automatically established, and "NUM" appears at the top right of the screen.



Inputting numerals from 0 to 9

Input the data using the number buttons **0** to **9**, digit movement button **▷ (GO TO)** and **◁ (CLR)**.
To change a number, input the new number. The old number will be overwritten and corrected.
Operation returns to item flashing when all the numbers have been input. Alternatively, press **◁ (CLR)** or **▷ (GO TO)** until an item starts flashing.

Inputting letters from A to F

The hexadecimal input mode is established when the **SHIFT** button is pressed in the number input mode, and data from A to F can be input.
Example: Press **SHIFT**+**4** together to input A.

Resetting the input data

The data is cleared when the **RESET** button is pressed at the item selection stage or during the data input.
(Example: Press the button when "UB Pre." is flashing.)

9-1. Changing the settings

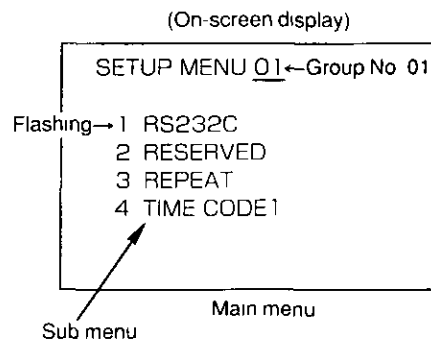
Follow the steps below when changing the factory settings or preparing new setting groups

1 Press the **[MENU]** button

The main menu appears on the screen

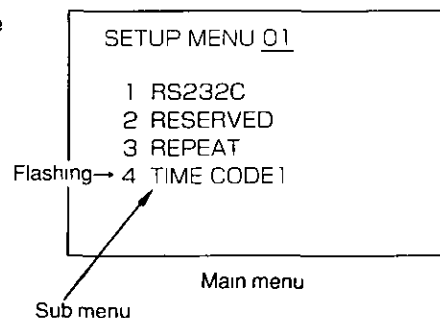
•The normal screen is returned when the **[MENU]** button is pressed again

*To select a particular group No , first input the number using the number keys and then press the **[MENU]** button



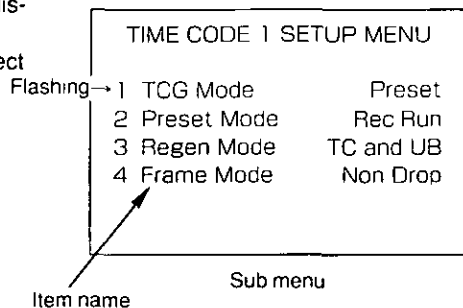
2 Press the **[▲(8)]** or **[▼(2)]** arrow button to select the sub menu

Example Selecting TIME CODE1



3 1 Press the **[▶(6)]** or **[▶(GO TO)]** arrow button to display the sub menu's set items

2 Press **[▲(8)]** or **[▼(2)]** to move flashing, and select the item



4

1. Press the **▶ (6)** or **▷ (GO TO)** arrow button to select the set mode. The set data now flashes so use **▲ (8)** or **▼ (2)** to set to the target value.

1. TCG MODE

▽△	Preset
▽△	Regen
▽△	Forced ATC

(Example of a set data change)

TIME CODE 1 SETUP MENU	
1. TCG Mode	Forced ATC
2. Preset Mode	Rec.Run
3. Regen Mode	TC and UB
4. Frame Mode	Non Drop

←Flashing

Sub menu

2. After changing the data, press **◀ (4)** or **◁ (CLR)** to return to item flashing.

*If the item involves inputting a numeral, use the number buttons as well as the digit movement button **▷ (GO TO)** and **◁ (CLR)** buttons for input. (See page 25.)
To move to the next item, input all the numerals or press the **◁ (CLR)** or **▷ (GO TO)** button until the item flashes.

5

Repeat steps **2** to **4** until all the items have been set to the desired modes.

*If the **PAGE UP (9)** or **PAGE DOWN (7)** button is pressed while an item on the sub menu is still flashing, the next sub menu can be selected directly.

6

After the settings have been changed, press the **MENU** button. The settings are now entered and stored in the unit.

9-2. Setup menu items

<<1 RS-232C>>

For setting the RS-232C communication conditions.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Baud rate (transmission/reception speed setting)	300 600 1200 2400 4800 9600 19200	300 600 1200 2400 4800 9600 19200	Selects the RS-232C interface communication speed.	9600
2	Parity (parity setting)	None Even Odd	0 1 2	Selects the parity.	None
3	Character Length (character length setting)	7 bits 8 bits	7 8	Selects the character length.	8 bits
4	Stop Bit (stop bit setting)	1 bit 2 bits	1 2	Selects the stop bit.	1 bit
5	Xon/Xoff (XON/XOFF protocol setting)	On (set) Off	1 0	Selects communication control function On/Off using the Xon/Xoff communication control protocol.	Off
6	Protocol Type (protocol type setting)	MIS *1) LQ-3000/4000 *2)	1 0	Selects the RS-232C on-line command protocol.	MIS
7	Online Mode (on-line mode setting when power is turned on)	0 to 15	0~15	Selects the on-line response mode when the power is turned on.	08
8	Deck No. (deck No. setting)	0 to 99	0~99	When a multiple number of units are used on-line, each unit can be allocated its own number. (This is effective only with the optional RS-232C card and MIS protocol.)	00

*1) "MIS" refers to the industrial standards of Matsushita Electric Industrial Co.

*2) LQ-3000/4000 cannot be selected if the optional RS-232C card (LQ-YA232P) is not installed.

<<2 RESERVED (PROGRAM)>>

For setting the execution conditions of the program in the ROM mounted on the optional RS-232C card and data in the back-up RAM.

These items cannot be selected if the optional RS-232C card (LQ-YA232P) is not installed.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Auto Start (automatic startup setting)	On (auto start) Off	1 0	Selects auto start when the power is turned on.	Off
2	Sequence (execution program selection)	1 to 5	1~5	Selects the number of the program to be started automatically.	1

*Use the SEQ RUN button at any time except with the automatic startup setting.

*When Auto Start is set to on for both repeat play and program play, repeat play takes precedence.

*Consult with Panasonic service personnel for program.

<<3 REPEAT>>

For setting the repeat play conditions.

No.	Setting item (screen display)		Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Auto Start (automatic startup setting)		On (auto start) Off	1 0	Selects auto start when the power is turned on.	Off
2	Sequence (repeat program setting)	Sequence setting	0 to 5 used for numerical values	0~5	Assigns the sequence of the numbers of the sequence operation programs (blocks) in which those programs are to be executed. Up to 5 blocks can be set (set "0" to skip the repeat operation). The blocks of the numbers of the programs which have been set are repeatedly played in sequence. Example: Sequence 0 1 3 5 4	00000
		Play speed setting	Play (regular play)	0	Selects the repeat play speed. Four play speeds can be set: Play, Step 1, Step 5 and Step 30.	Play
			Step 1 (frame feed at 1-sec. intervals)	1		
Step 5 (frame feed at 5-sec. intervals)	2					
	Play block setting	Start 00001 to 74773 End 00001 to 74773	Sets the repeat block (up to 5 blocks can be set). (The address values are input.) Start...00001 to 74773 End...00001 to 74773		Start 00001 End 00001	
FL Display S 00001~74773 E 00001~74773						

For details on repeat play, see section "18. Repeat play" (page 50).

<<4 TIME CODE Setting 1>> For setting the operation mode of the time code generator (TCG).

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	TCG Mode (operation mode setting)	Preset Regen Forced ATC	0 1 2	Sets the operation mode of the internal time code generator. Preset: The internal time code runs by its own numerical value rather than by alignment (regeneration) with the play time code or external time code. Regen: The internal time code is aligned (regenerated) with the play time code or external time code. Forced ATC: The internal time code is aligned (regenerated) with the address time code (ATC).	Preset
2	Preset Mode (preset mode setting)	Rec.Run Free Run	0 1	Sets the way in which the time code is counted when the internal TCG is in the preset mode. Rec.Run: The time code runs only during recording. Free Run: The time code runs in the same way as time regardless of the deck's mode. After the preset value has been changed, the count starts at the completion of the setup menu settings.	Rec.Run
3	Regen Mode (regen mode setting)	TC and UB TC UB	0 1 2	Selects the regeneration (alignment) mode of the internal TCG. TC and UB: The time code and user's bit are both regenerated. TC: Only the time code is regenerated. UB: Only the user's bit is regenerated.	TC and UB
4	Frame Mode (frame mode setting)	Drop *1) Non Drop	1 0	Selects the frame mode for the internal TCG, Time and Address Time Code mode.	Non Drop
5	UB Group (user's bit usage status setting)	Not Specified ISO Character Unassigned 1 Unassigned 2	0 1 2 3	Selects the usage status of the user's bit which is generated by the time code generator. Not Specified: Character sets are not assigned. ISO Character: Character sets complying with ISO646 and ISO2022 are used. Unassigned 1: Not defined Unassigned 2: Not defined	Not Specified

*1) "Drop frame" denotes a method of counting which, since the NTSC signal frequency is 59.94 Hz, skips specific frame values so as to maintain consistency with the accurate actual time.

*The time code is recorded together with the video signal.

<<4 TIME CODE Setting 1>> (Continued from previous page)

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
6	TCG CF Flag (CF bit setting)	On Off	1 0	Controls the TCG's CF flag. On: Sets the CF flag. Off: Does not set the CF flag. **"CF" is short for color frame.	On
7	VITC Pos.1 (VITC insertion line selection 1)	Line 10 to 19	10~19	Selects the line in which the VITC signal is inserted. The same line as VITC Pos.2 or an adjacent line cannot be selected.	Line 16
8	VITC Pos.2 (VITC insertion line selection 2)	Line 10 to 19	10~19	Selects the line in which the VITC signal is inserted. The same line as VITC Pos.1 or an adjacent line cannot be selected.	Line 18
9	VITC Output (VITC output selection)	On (output) Off	1 0	Selects whether the time code is to be output to VIDEO OUT as the VITC signal when playing a disc on which the time code has been recorded. Note: VITC OFF cannot be set for serial VIDEO.	On
10	Ext.TC CF Sel. (setting of CF reference on basis of external time code input)	On (set by TC) Off	1 0	Selects the color frame recording reference as the external time code input.	Off

<<5 TIME CODE Setting 2>>

For default setting of the time code generator and ATC (address time code).

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	TCG Pre. (time code generator preset)	00h00min00s00f to 23h59min59s29f	Same as left	Sets the preset (default) value of the built-in time code generator.	00h00min 00s00f
2	UB Pre. (user's bit preset)	00000000 to FFFFFFFF	Same as left	Sets the preset value of the time code generator user's bit.	00000000
3	ATC Pre. (ATC preset data setting)	00:00:00:00 to 23:59:59:29	Same as left	Sets the default value of the frame address time code to be written on the disc. Note: The display is set to "00:00:00:00" before the deck starts operating or when there is no write data. The data written on the disc is displayed after the menu display appears again upon completion of the write operation.	00h00min 00s00f
4	ATCUB Pre. (ATC UB preset data setting)	00000000 to FFFFFFFF	Same as left	Sets the preset value of the ATC user's bit to be written on the disc. Note: The display is set to "00000000" before the deck starts operating or when there is no write data. The data written on the disc is displayed after the menu display appears again upon completion of the write operation.	00000000
5	ATC/ATCUB Write (ATC/ATCUB data write)	On (write) Off	1 0	The ATC/ATCUB preset data is written on the disc when the setup menu is exited. Notes: ● This item is automatically set to "Off" upon completion of the write operation. ● The data cannot be written while recording is inhibited.	Off
6	Timer Mode (timer mode selection)	CTL ATC	0 1	Selects the timer mode which is to be used for operations based on the RS-422A standard. CTL: The counter is used in the timer mode (TIME). ATC: The counter is used by the address time code.	CTL

*ATCs (address time codes) are produced by converting the disc addresses into time codes. Their start value can be set. However, these codes can be reflected only in the form of a timer with communication based on RS-422A. (One of the selections in No. 6 must be set.)

1) The ATC UB is written on the disc and can be used for disc control.

It can be written and read using the RS-232C facility but it cannot be controlled using the RS-422A (9P) facility.

<<6 EDIT>>

Sets the conditions for editing operations.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1 *1)	Auto Preroll Entry (automatic entry of IN point)	On (enter) Off	1 0	Selects whether the present position is to be automatically entered at the IN point using the preroll command when the IN point has not been entered.	On
2 *1)	Preroll time (preroll time setting)	0 to 10 sec	0~10	Selects the preroll time.	05 sec.
3 *1)	Play Delay (play delay time setting)	0 to 15 frames	0~15	Selects the startup delay time when a play operation is to be commenced.	00 frame
4 *1)	Edit Delay (edit delay time setting)	03 to 15 frames	3~15	Sets the delay time for recording operation start/end from the REC command.	03 frames
5	Color Framing (color framing operation setting)	On (control) Off	1 0	Selects whether color framing control is to be exercised.	Off
6 *2)	CF PB Sel. (color frame play lock mode selection)	Auto Forced	1 0	Selects the lock mode for color frame play. Auto: Sets the color frame all the time on the basis of the play signals on the disc. Forced: Locks the color frame on the basis of the information obtained after color frame play has stabilized for 3 seconds.	Forced
7 *2)	CF Rec.Sel. (color frame recording lock mode selection)	Auto Forced	1 0	Selects the lock mode for color frame recording. Auto: Always sets the color frame on the basis of the recording signals. Forced: Locks the color frame on the basis of the information obtained during the 5-second period after the recording start.	Forced
8	CF ID On (CF ID addition setting)	Auto On Off	2 1 0	Selects whether to add the CF ID to the component P _B output. Auto: Adds the CF ID when the CF LED is lighted. On: CF ID is forcibly added. Off: CF ID is not forcibly added.	On
9	Split (split mode selection)	On Off	1 0	Selects whether split editing is to be performed using the editing mode buttons on the front panel. On: The editing mode can be selected during editing. Parts other than the selected mode are also simultaneously switched to EE. Off: The editing mode cannot be selected during editing. Only the selected mode is switched to EE during editing.	Off
10 *1)	Device Type (device type setting)	LQ-D5500 (device type: A0A0h) Type 1 (device type: 2025h) Type 2 (device type: A000h)	0 1 2	Sets the device type. LQ-D5500: Connects the controller which supports the unit. Type 1: Connects the controller which supports the device for the VTR. Type 2: Connects the controller which supports the device for the VDR (Video Disc Recorder). Note: Set the preroll, play delay time, and edit delay time separately in accordance with the controller being used.	Type 1

*1) This setting is valid only when control is exercised using the RS-422A (9P) connectors.

*2) When the color frame is unstable, this prevents selection while recording or playback is in progress and it stabilizes the picture quality.

<<7 OPERATION>>

For setting the operating environment.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Rec.SW.Mode (recording key operation setting)	Frame (frame recording) Cont. (continuous)	0 1	Selects the recording operation for a recording whose number of frames was not designated. Frame: Only the set number of frames are recorded. Cont.: For continuous recording.	Cont.
2	Frame Rec.Mode (Frame recording number setting)	1 to 15 frames	1~15	Selects the number of frames to be recorded when "Frame" has been set for item 1.	1 frame
3	Rec.Inhibit (recording inhibit control)	On Off	1 0	Controls the inhibiting of recording and editing operations. On: Disables (inhibits) recording/editing operations. *1) Off: Enables recording/editing operations.	Off
4	Direct Search (direct search function setting)	On Off	1 0	Enables search operations to be conducted simply by turning the search dial without pressing any buttons.	Off
5	Eject/Stop Remote (setting of key operations in remote control mode)	On (operation enabled) Off	1 0	Selects whether the front panel EJECT and STOP buttons are to be operable when the remote has been selected.	On
6	Beep (beep tone setting)	On (beep) Off	1 0	Selects whether a "beep" feed back will sound each time a button is pressed.	On
7	Video Control (video control setting)	Local Remote	0 1	Selects the video output adjustment method. Local: The controls inside the front panel pocket are used for adjustment. Remote: Adjustment is made using the controls on the external controller.	Local
8	Play/Rec. Retry (playback/recording error retry settings)	On (will retry) Off	1 0	Selects whether automatic recovery takes place when a malfunction occurs during recording and playback and the unit stops. On: Automatic recovery takes place, and recording or playback resumes. Off: Automatic recovery does not take place, and the unit stops.	On

*1) Besides this setting, recording can also be inhibited using the write protect switch on the disc cartridge.

Notes for <<8 VIDEO>> on page 35

- *1) This setting is for controlling a TV monitor, which supports the 16:9 wide screen, from the S1 VIDEO connector. It does not serve to select the recording or playback system.
- *2) When a 60 Hz frame sync signal is input or during EE and recording, the screen flickers but the signal is recorded normally. The playback signal is a 59.94 Hz frame sync signal. Input a stable signal with no jitter as the input signal.
- *3) The V-FLOAT mode enables images to be displayed without deviation in the EE mode (input signal monitoring). When the player is set to this mode and a system which has a titler or other device connected to its input is added, the editor's input signals cannot be edited properly since a condition results in which the REF signal phase shifts out of position. In addition, switching from EE to playback may be delayed.

<<8 VIDEO>>

For video-related settings.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Burst (video output burst setting)	On Auto Off	1 2 0	Sets whether the burst signal is to be added to the video output. On: Burst is always present. Auto: No burst in the monochrome mode. Off: Burst is always absent.	Auto
2	Sync On G (sync signal selection in R/G/B mode)	On (G-Sync is used) Off (Sync is used)	1 0	Selects whether the sync signal on the G (green) signal is to be used. On: The Green On Sync signal is received and output.	Off
3	Still/Slow (still picture/slow mode setting)	Frame Field-1 Field-2 Field-1, 2	0 1 2 3	Sets the still/frame feed or slow play output mode. Frame: Frame picture is output. Field-1: Field 1 picture only is output. Field-2: Field 2 picture only is output. Field-1, 2: Field 1 and 2 pictures are output alternately.	Frame
4	Level Meter (video level meter display selection)	Sync Video	1 0	Selects which portion of the signals whose level is to be displayed by the level meter.	Sync
5 *1)	Wide (WIDE-supporting setting)	Auto Normal Wide	2 0 1	Sets the support for the 16:9 wide screen. Auto: Automatically identifies whether the screen is normal or wide. Normal: Forcibly sets the normal screen. Wide: Forcibly sets the wide screen.	Auto
6 *2)	Video In (video input signal mode selection)	STD 60 Hz	0 1	Selects whether the input video signal is a signal complying with the standard. STD: Set here when the input video signal is a standard signal conforming with RS-170A. 60 Hz: Set here when the input video signal is a 60 Hz B/W frame sync signal. • If a STD signal has been input, recording cannot take place.	STD
7 *3)	Float Mode (float mode setting)	V-FLOAT NO-V-FLOAT	1 0	V-FLOAT: The same signal as the input signal in the EE mode is output but its sync phase is shifted by 14H from that of the reference (REF) signal. • Do not perform editing operations in this mode. NO-V-FLOAT: The sync phase of the output in the EE mode matches REF but the picture drops by 14H.	NO-V-FLOAT

<<9 AUDIO/OTHER>>


For audio and other settings.

No.	Setting item (screen display)	Selection/setting (supplementary description)	FL Display	Actual details of setup	Factory setting
1	Audio Output (for setting audio output status in play mode)	All Play Play/VAR	0 1 2	Sets the status of the audio output. All: The sound is output during play in all modes. Play: The sound is output at +1× normal speed; in all other circumstances, it is muted (no sound). Play/VAR: The sound is output during play at +1× to -1× normal speed; in all other circumstances, it is muted.	Play
2	Audio Mute (audio mute setting)	On Off	1 0	Sets the muting during play with many errors. On: The sound is muted.	On
3	Char.Back (background selection with on-screen display)	Black Through	0 1	Selects the status of the background for the display which is output to the COMPOSITE 3 connector. Black: Sets the background to black. Through: Displays characters onto normal images.	Black
4	Char.Position (on-screen character position setting)	L Up L Down R Up R Down	0 1 2 3	Selects the on-screen display position of the characters. L Up: Displays the character at the top left of the screen. L Down: Displays the character at the bottom left of the screen. R Up: Displays the character at the top right of the screen. R Down: Displays the character at the bottom right of the screen.	L Up
5	Status Super (on-screen deck operation mode display setting)	On (display) Off	1 0	Sets whether the operation mode/error message is to be displayed on-screen in addition to the address display.	On
6	Closed Caption (closed caption setting)	On (output) Off	1 0	Sets whether to output or mute the closed caption signals. Even when this setting is "On", the signals are output only during normal play.	Off
7 *1)	Ext.Ctl.I/O [external control function (GPI) setting]	On (controlled) Off	1 0	Selects whether to control the mode already set (step recording, playback, etc.) from the GPI connector (half-pitch D-SUB 20P) of the optional RS-232C card (LQ-YA232P).	On

*1) This setting cannot be made if the optional RS-232C card is not available.

<<O MAINTENANCE>>

For displaying the maintenance and inspection information (the information is merely displayed; it is not set).

No.	Setting item (screen display)	Selection/setting (supplementary description)	Actual details of display
1	Disc Motor (disc motor drive time)		Displays the cumulative time during which the disc motor has been driven. 0 to 65535 hours
2	Load/Eject (loading frequency)		Displays the number of times a cartridge has been loaded. The count is incremented by 1 with each time a cartridge is loaded and ejected. 0 to 65535 times
3	Rec.Time (semiconductor laser drive time)		Displays the cumulative semiconductor laser recording time. The count is not incremented during play. 0 to 65535 hours
4	Error log. (error information)	E-** P-ON Load	Displays a record of the errors. The last five errors are displayed. Details of display E-**: Error No. P-ON: Power on Load: Disc load
5	Battery (back-up battery voltage drop)	Deck: OK *1) (I/F: OK) *2)	Indicates whether the back-up batteries for the deck and optional RS-232C card are running down. Deck: OK: Battery is still usable. Deck:  : Battery is running down.

*1) This monitors the back-up battery for the RAM inside the deck. The battery has a service life of about 5 years.

*2) "I/F: OK" is not displayed if the optional RS-232C card (LQ-YA232P) is not installed.

This battery is used for the back-up RAM on the card. It backs up the data for running the ROM programs when the power is off.

10. Time code (TIME CODE, T/C)

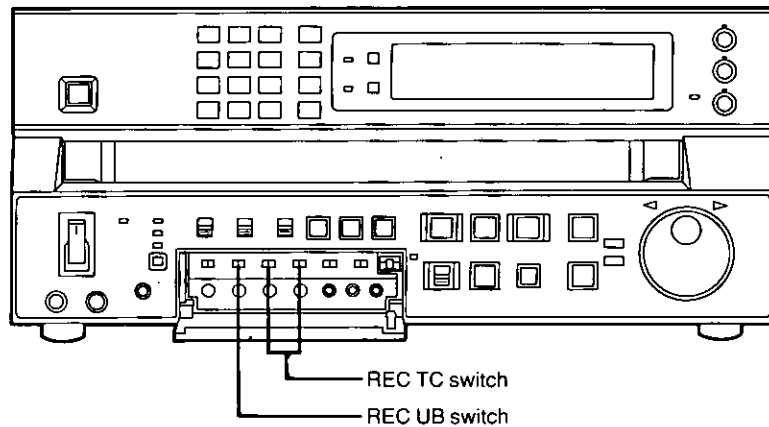
This unit comes with a time code generator (TCG)/reader (TCR) inside the deck. An external time code generator can also be used.

Time code signals (TC) are written on the disc when the unit is recording or when the VIDEO signal has been selected during editing.

Both the time code and user's bit are controlled internally only in the data area of one group which means that the LTC and VITC data cannot be handled separately.

When recording or editing, select the time code (internal or external) to be recorded, set the generator's operation mode on the menu, and proceed.

Setting the switches



Selecting the recording time code source

Select the signal source (INT/EXT) of the time code and user's bit to be recorded.

REC TC switch
INT: Set here when recording the value of the internal time code generator.
EXT: Set here when recording the value of the externally input time code.
REC UB switch
INT: Set here when recording the internal user's bit.
EXT: Set here when recording the externally input user's bit.
When EXT has been set, select the input signal source.
TC IN: Set here when recording the time code from the rear panel TIME CODE IN connector.
VITC: Set here when recording the input video VITC value.

*When EXT (external input) has been selected for both REC TC and REC UB, the same input signal source (TC IN/VITC) must be selected for both.

11. Address time code (ATC/Address Time Code)

- **ATC (Address Time Code)**

This is a 24-hour timer which uses the first address on the disc as the start value.
This start value can be entered.

- **ATC UB (Address Time Code User's Bit)**

One ATC UB can be entered per disc. These values are recorded on the disc and so this is a very convenient function for controlling a large number of discs.

However, only the general TC (time code) and UB can be handled by the editing controller (RS-422A). [ATC can be used only as a timer (CTL).] Operation for ATC and ATC UB is confined to the menu and the RS-232C only.

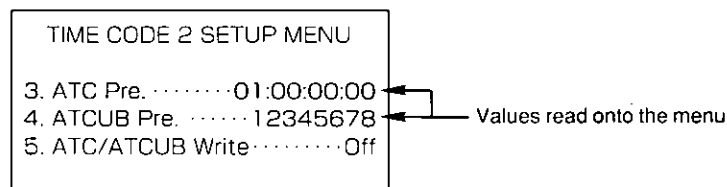
Time codes in general (TCG Pre, UB Pre) can also be set in the same way as outlined in this section (but they are not read onto the menu).

Checking (reading) the ATC preset value (ATC Pre) and UB entry value (ATCUB Pre)

The values entered in the disc can be checked by referring to ATC Pre. and ATCUB Pre., respectively, on setup menu "5 TIME CODE 2". (COMPOSITE 3 output)

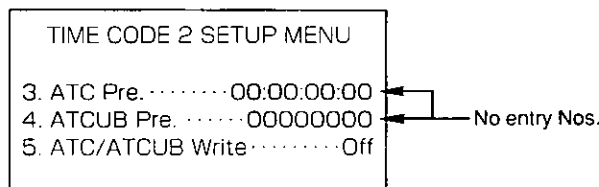
However, the values on the display are cleared to zero prior to deck startup (completion of loading) or if they have not been entered.

- When the entry Nos. are "01000000" (for ATC Pre.) and "12345678" (for ATCUB Pre.):



(On-screen display)

- When the values are not entered or prior to deck startup:



(On-screen display)

Notes:

1. Enter ATC Pre. and ATCUB Pre. after the deck has started up (loading is completed).
2. If an error has occurred during ATC Pre. or ATCUB Pre. entry, refer to 27 "Error messages" (Page 66) and take the appropriate action.

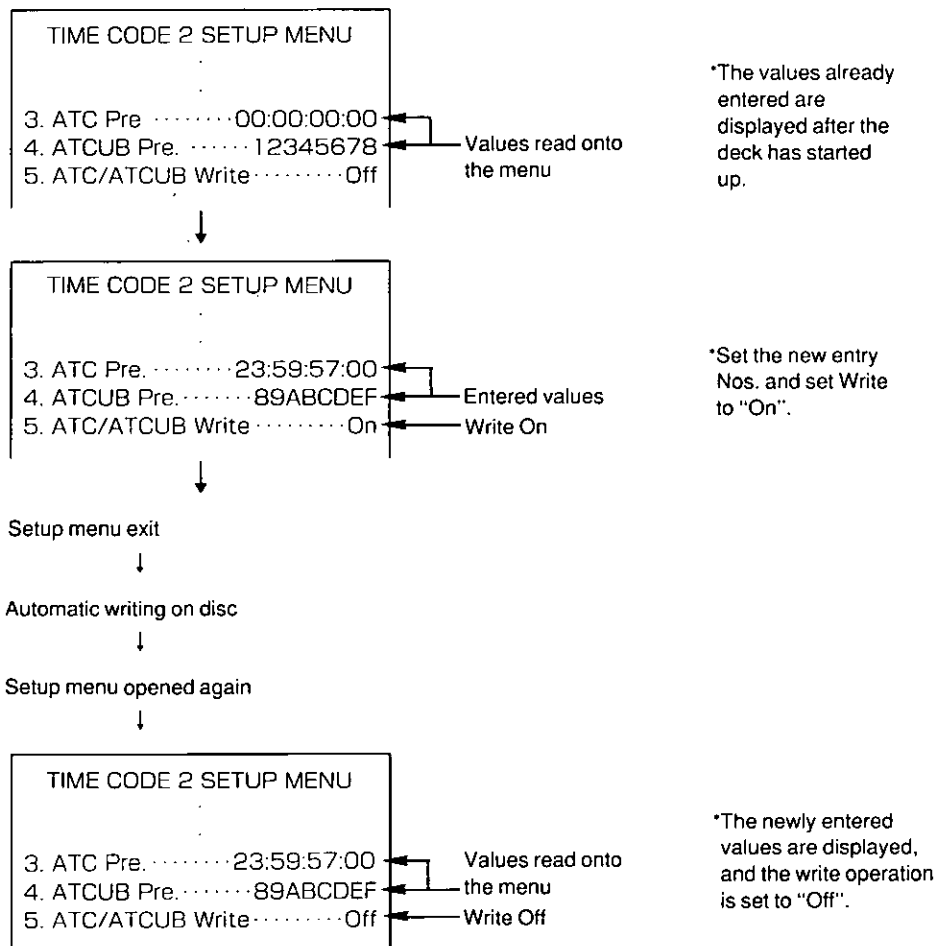
Entering/changing the ATC and ATCUB

Set the number to be entered in ATC Pre. and ATCUB Pre. on setup menu "5 TIME CODE 2". When ATC/ATCUB Write is then set to "On", the numbers will be written on the disc when exiting from the set-up menu. When the setup menu is opened again after the numbers have been written, the newly entered numbers will be indicated in ATC Pre. and ATCUB Pre. respectively, and ATC/ATCUB Write is automatically set to "Off".

However, the numbers are not written when a cartridge is set to READ ONLY or when Rec Inhibit is set to "On" on the menu and the front panel REC INHIBIT lamp has lighted.

Example of application:

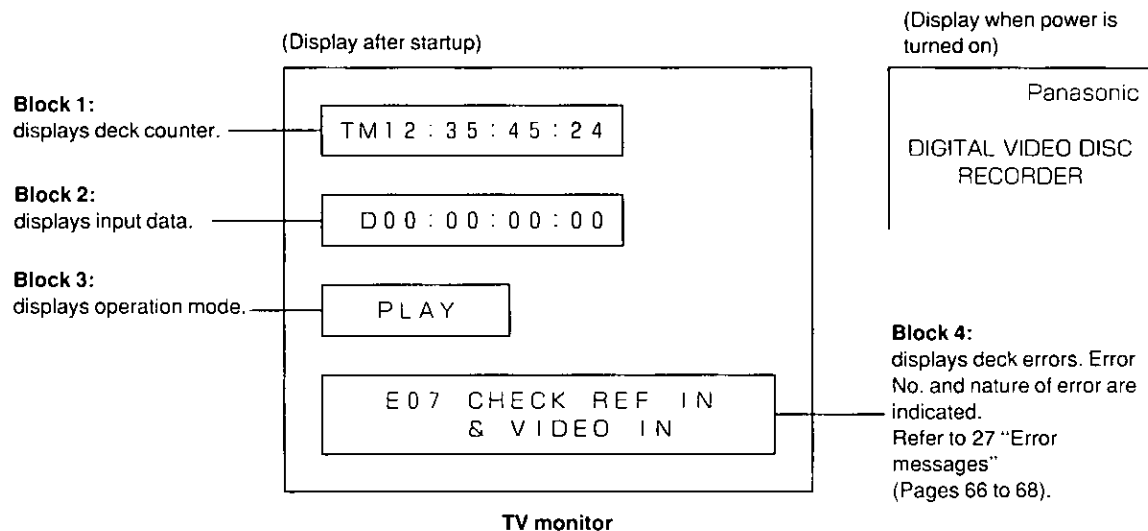
The currently entered values of "00:00:00:00" for ATC Pre. and "12345678" for ATCUB Pre. are to be changed to "23:59:57:00" and "89ABCDEF", respectively.



• For details on the actual input method, refer to the setup menu (page 24).

12. Superimpose display

(The data is output to the COMPOSITE 3 output connector when the DISPLAY button is pressed.)



Block	Description of display									
Block 1	<ul style="list-style-type: none"> • ADDRESS mode Example: AD 01234 • TIME, TIME CODE, ADDRESS TIME CODE mode Example: <u>TM</u> 12:35:45:24. <ul style="list-style-type: none"> TIME mode: TM TIME CODE mode: TCR (play value) TCG (internal generator value) ETCG (external generator value) ADDRESS TIME CODE mode: ATC • UB mode Example: <u>UBR</u> 00000000 <ul style="list-style-type: none"> UBR (play value) UBG (internal generator value) EUBG (external generator value) <p> <ul style="list-style-type: none"> ○ = Odd field ● = Even field ○ = Non-drop frame ● = Drop frame ○ = Time code read disabled </p>									
Block 2	<ul style="list-style-type: none"> • Normal display The play speed during play and the data input for the number of frames to be recorded (recording time) during recording or editing are displayed. Data display Example: D 00100 • Display during recording/editing The remaining number of frames (time) to be recorded is displayed during recording or editing for which the recording frame (time) range has been specified. The Rec status is displayed. Example: R 00100 									
Block 3 *1)	<table border="0"> <tr> <td>PLAY (play)</td> <td>JOG (jog)</td> <td>VAR (variable)</td> </tr> <tr> <td>REC IN (recording)</td> <td>STOP (stop)</td> <td>EJECT (eject)</td> </tr> <tr> <td>EDIT IN (editing)</td> <td>SHTL (shuttle)</td> <td>LOAD (loading)</td> </tr> </table>	PLAY (play)	JOG (jog)	VAR (variable)	REC IN (recording)	STOP (stop)	EJECT (eject)	EDIT IN (editing)	SHTL (shuttle)	LOAD (loading)
PLAY (play)	JOG (jog)	VAR (variable)								
REC IN (recording)	STOP (stop)	EJECT (eject)								
EDIT IN (editing)	SHTL (shuttle)	LOAD (loading)								

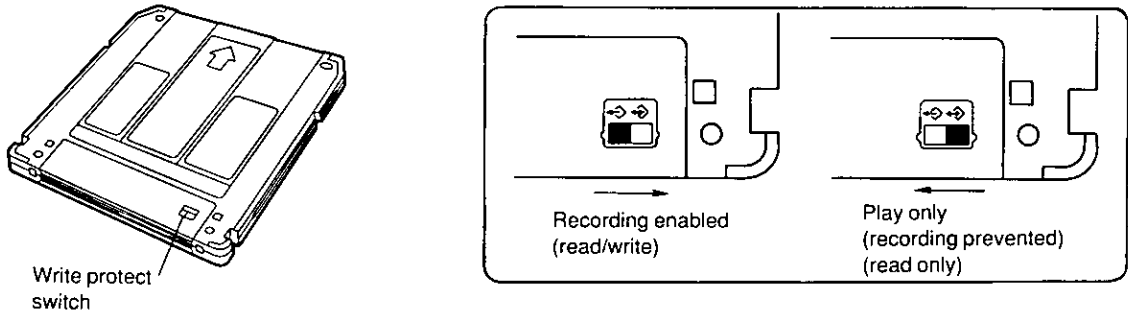
*1) This is displayed only when "Status Super On" has been set on setup menu 9 "AUDIO/OTHER".

13. Disc cartridges

Disc cartridges are optional accessories.
Only the LM-R13000 disc cartridge can be used with this unit.

How to set recording prevention

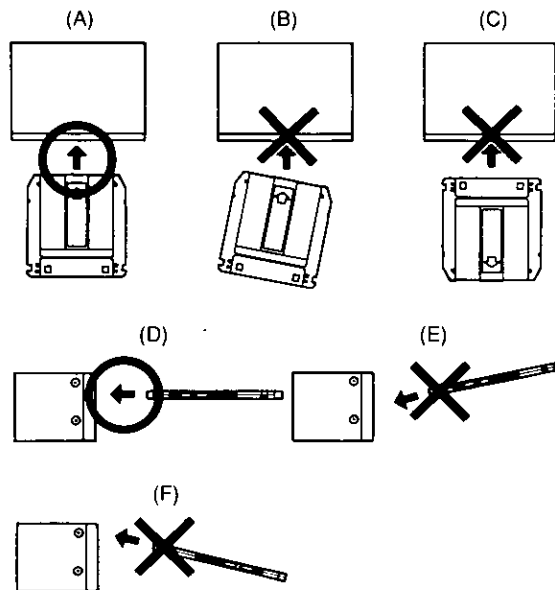
The disc cartridges have a write protect switch to prevent what has been recorded over it in error.
When the switch is slid to the left, as shown in the figure below, recording/erasure can be prevented.
When it is slid to the right, recordings can be erased.



*The front panel REC INHIBIT lamp lights when the write protect switch is set to Read Only.
(The same lamp lights when Rec Inhibit On is set on the menu.)

Precautions for inserting the disc cartridge

Insert the disc cartridge slowly and properly as shown in figures (A) and (D).
Inserting it as in (B), (C), (E) or (F) may cause the unit to malfunction and damage the disc cartridge.
As regards the handling of disc cartridges, read through the handling precautions on the cartridges.



Disc cartridge insertion/ejection operations

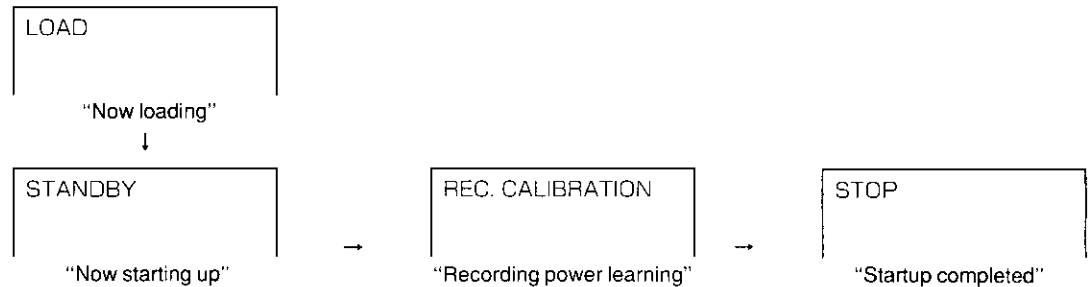
When a disc cartridge is inserted into or ejected from the deck, the on-screen display and fluorescent display tube (FL) display will be as shown below.

When the disc cartridge is inserted

● On-screen display

The on-screen display for the COMPOSITE 3 output is set to ON, "LOAD" appears while the disc cartridge is being loaded, and then "STANDBY" appears as the deck proceeds to start up. (When Rec. Inhibit is set to OFF, "REC. CALIBRATION" appears.)

After the deck has started up, "STOP" appears.



● Fluorescent display tube display

"LOAD" flashes while the disc cartridge is being loaded, and "--CAL--" flashes for recording power learning.

When the disc cartridge is ejected

● "EJECT" appears on both the screen and fluorescent display tube while the disc cartridge is being ejected.

Recording power inspection (learning)

In order to maintain the optimum picture quality, the optimum recording power for each disc is learned. This is why it takes about 60 seconds for startup.

However, this operation is omitted when the write protect switch on the disc cartridge is at Read Only (in which case, the startup time is about 25 seconds).

● "REC. CALIBRATION" appears on the on-screen display and "--CAL--" appears on the front fluorescent display tube.

Inspect the recording power in the following circumstances.

1. When a disc is inserted

The inspection is not performed even when inserting a disc if the disc is not first removed from the insertion slot after it was ejected and then re-inserted. ("DISC" on the display section is lighted.)

2. When the OPERATION (power supply section) switch is set to ON from the disc loading status

● The learning result is cleared by setting the OPERATION switch to OFF.

Operations while OPERATION switch is at OFF

When the OPERATION switch is set to OFF, the cartridge is automatically ejected in order to protect both the disc and deck.

NOTE:

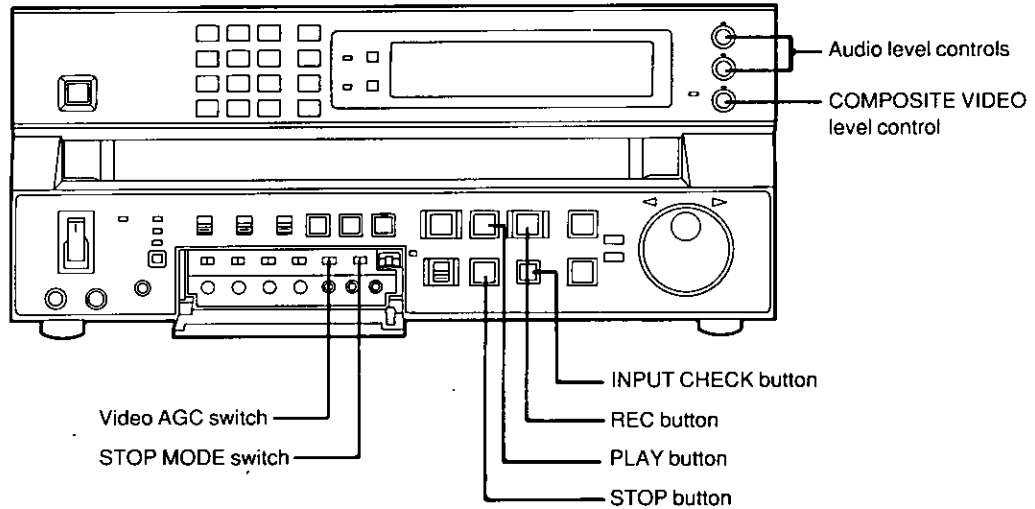
If the power plug is disconnected or the power switch circuit breaker is set off before this switch is set to OFF, the disc will remain loaded inside the unit and it may warp.

There is no problem if part of the cartridge protrudes from the deck since this status means that the disc is already housed inside the cartridge.

14. Recording

This section describes the basic operations during recording.

For details on still-picture recording and recording the specified number of frames, refer to the next page.



1. Insert the disc cartridge.

(Refer to 13 "Disc cartridges" on page 42.)

Check that the write protect switch on the disc cartridge for recording is at the "off" (Read/Write) position.

Recording is not possible when the REC INHIBIT lamp is lighted. Set "Rec Inhibit" on setup menu 7 "OPERATION" to "OFF".

2. Adjust the recording level.

Set the STOP MODE switch to "EE" or press the INPUT CHECK button in the play mode to establish the EE (input monitor) mode for the deck.

Video level adjustment (composite video input)

1 Automatic adjustment

Set the VIDEO AGC switch to the ON position.

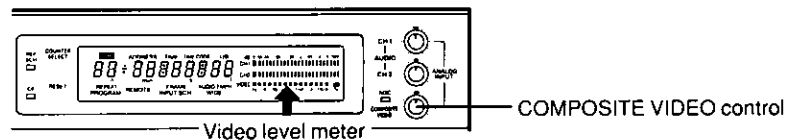
The recording level is automatically adjusted.

2 Adjustment to the desired level

Set the VIDEO AGC switch to the OFF position.

Set "Level Meter" on setup menu 8 "VIDEO" to "VIDEO".

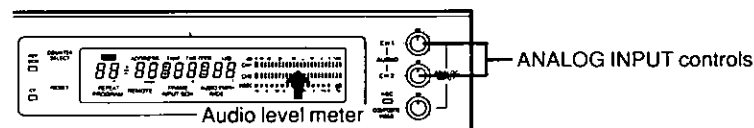
Adjust the level using the COMPOSITE VIDEO control in such a way that the meter reading does not exceed 110%.



Audio level adjustment (analog audio input)

Adjust to the maximum value in a range where the meter reading does not exceed "0" dB.

When the audio level is not adjusted smoothly over the variable range using the audio level control for each channel, check the rear panel input level switch.



3. Press the PLAY button while holding down the REC button.

Recording now commences. The PLAY and REC lamps light.

*Recording commences after the stability of the servo is automatically checked. If the servo reference (see pages 20 and 21) is not suitable, it may take several seconds for recording to commence.

4. Stopping the recording

Press the STOP button.

Recording a predetermined number of frames

The same number of frames can be recorded each time.

1. Set "Rec Sw Mode" in setup menu 7 "OPERATION" to "Frame". Since this establishes the fixed frame recording mode, set the desired number of frames (1 to 15) for "Frame Rec Mode" on the menu.
2. Press the PLAY button while holding down the REC button. The deck now starts recording, and it stops after the designated number of frames have been recorded.

Recording by designating the number of frames

Recording can be executed for the designated number of frames or duration by conducting recording after the desired value has been input using the number buttons.

1. Setting the recording duration

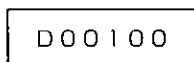
1) Setting the duration using a frame value

- 1 Press the COUNTER SELECT button to set the deck's counter mode to ADDRESS.
- 2 Input the number of frames to be recorded by pressing the number buttons.

Example: When recording 100 frames

(Use the number buttons to input the numbers in the following sequence: "1"→"0"→"0".)

•On-screen display



•Counter display



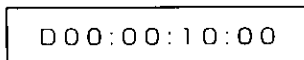
2) Setting the duration in time units

- 1 Press the COUNTER SELECT button to set the deck's counter mode to TIME, TIME CODE or ADDRESS TIME CODE.
- 2 Input the duration to be recorded by pressing the number buttons.

Example: When recording for 10 seconds

(Use the number buttons to input the numbers in the following sequence: "1"→"0"→"0"→"0".)

•On-screen display



•Counter display



2. Press the PLAY button while holding down the REC button.

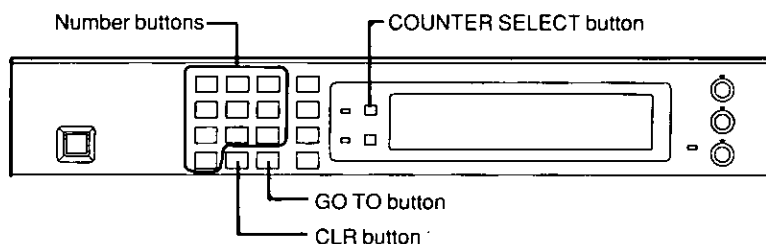
The deck now starts recording, and it stops after the designated number of frames or time duration has been recorded.

Interrupting a recording operation

Press the STOP button to interrupt recording.

15. Search by designating addresses

Images can be searched by address or by time depending on the deck's counter selected mode.



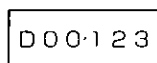
Search in the ADDRESS mode

1. Press the **COUNTER SELECT** button to set the deck's counter mode to **ADDRESS**.
2. Set the frame address to be searched by pressing the number buttons.

Example: Searching address 123

(Use the number buttons to input the numbers in the following sequence: "1"→"2"→"3".)

•On-screen display



•Counter display



3. When the **GO TO** button is pressed, the address is searched and the pre-search mode remains established.

*"ADDRESS" refers to the frame addresses already written on the disc.

Search in the TIME or ADDRESS TIME CODE (ATC) mode

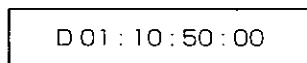
1. Press the **COUNTER SELECT** button to set the deck's counter mode to **TIME** or **ADDRESS TIME CODE**.

2. Set the time of the location to be searched by pressing the number buttons.

Example: Searching 1 hour 10 minutes 50 seconds

(Use the number buttons to input the numbers in the following sequence: "1"→"1"→"0"→"5"→"0"→"0"→"0".)

•On-screen display (TIME mode)



•Counter display (TIME mode)



3. When the **GO TO** button is pressed, the location is searched and the pre-search mode remains established.

Search in the TIME CODE mode

The search steps are the same as for the TIME mode.

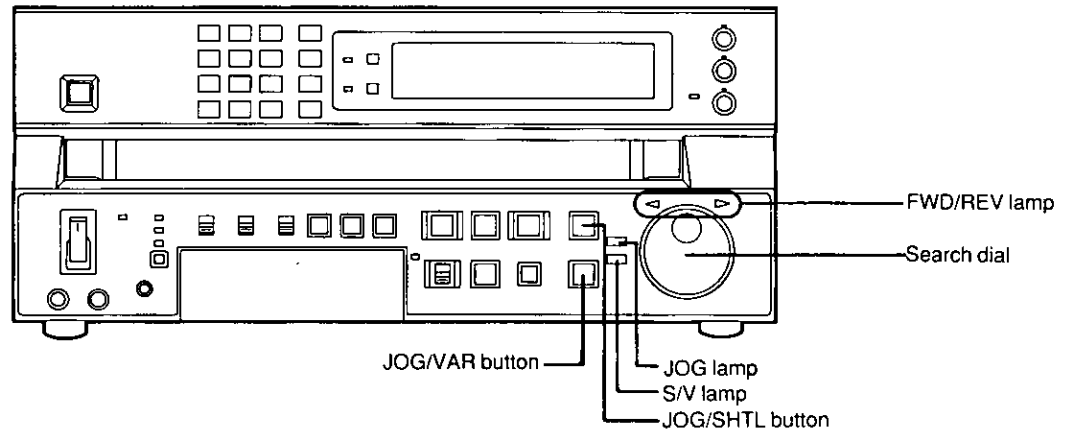
Note: When a search is conducted in the time code mode, the search address is calculated on the basis of the value written in the current frame. Care should be exercised since this means that when there is no continuity in the time code, the value arrived at upon completion of the search will not necessarily match the designated value.

*Searches can be conducted in any mode, even during play, so long as the mode is not recording or editing.

*The first address (00001) is searched if the GO TO button is pressed without an address having been designated.

16. Search in the JOG/VARIABLE/SHUTTLE modes

This section describes the search methods using the search dial.
 Any of these modes can be established provided that the deck is not in the recording or editing mode.



1. JOG mode

Press the JOG/SHTL or JOG/VAR button with the search dial in the pushed-in state.
 The JOG/SHTL or JOG/VAR lamp lights, and the jog mode is established.

- The play speed is varied from still picture to $\pm 1\times$ normal speed according to the speed at which the dial is turned.
- FWD/REV lamp
 Reflecting the direction of play, the FWD lamp lights during play in the forward direction, and the REV lamp lights during play in the reverse direction.
- The still picture frame mode can be set on setup menu 8 "VIDEO".

2. VARIABLE mode

Press the JOG/VAR button with the search dial in the released state.
 The JOG/VAR lamp lights, and the variable mode is established.

- The play speed is varied according to the angle to which the dial is turned. The clickstop point is the STILL (still picture) position.
 *If the search dial is pressed in this state, the JOG mode is established.
- The disc speed in the variable mode is set to the following steps in the $-1\times$ to $+1\times$ normal speed range.

Play in reverse direction									Still picture
-1.00	-0.80	-0.50	-0.34	-0.22	-0.13	-0.09	-0.06	-0.03	0

Play in forward direction								
+0.03	+0.06	+0.09	+0.13	+0.22	+0.34	+0.50	+0.80	+1.00

3. SHUTTLE mode

Press the JOG/SHTL button with the search dial in the released state.

The S/V lamp lights, and the shuttle mode is established.

- The play speed is varied according to the angle to which the dial is turned.

The clickstop point is the STILL (still picture) position.

*If the search dial is pressed in this state, the JOG mode is established.

- The play speed in the shuttle mode is set to the following steps in the approx. $-40\times$ to $+40\times$ normal speed range.

Play in reverse direction									Still picture
-40	-10	-5	-2	-1	-0.50	-0.25	-0.12	-0.03	0

Play in forward direction								
+0.03	+0.12	+0.25	+0.50	+1	+2	+5	+10	+40

*Block noise may appear when the shuttle is operated at high speed.

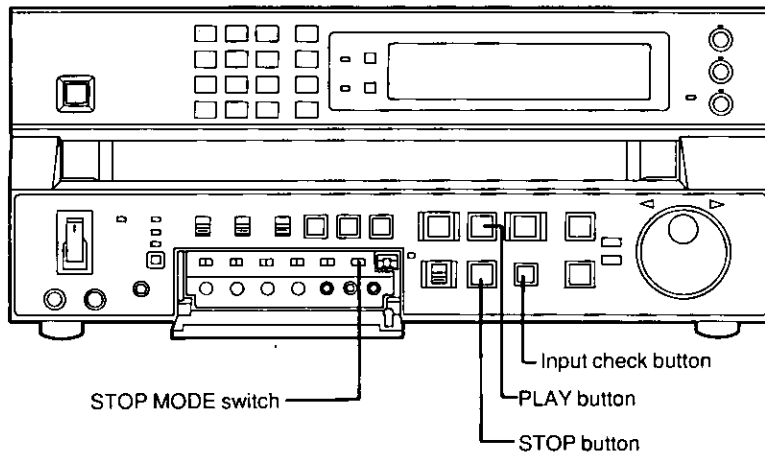
*In terms of the play picture quality, this disc recorder does not differentiate between variable play and shuttle search, as a VTR does. It provides continuous still picture play.

Direct search

The direct search mode is established by setting "Direct Search" on setup menu 7 "OPERATION" to "On".

When the dial is turned, the JOG, VARIABLE or SHUTTLE mode is automatically established. Whether the shuttle or variable mode is established depends on the setting established when the button was last pressed.

17. Play



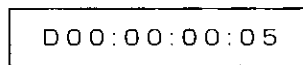
- 1. Press the PLAY button.**
Normal play is executed.
The PLAY lamp lights.
Input signal (video/audio) EE check
- 2. To conclude play, press the STOP button.**
When the STOP MODE switch is at PB, still pictures are played; when it is at EE, the input signal picture appears.
*“EE” denotes the input signal monitoring state.

Designating the play speed

Play can be performed at the designated speed by setting the unit to the play operation after inputting the desired value using the number buttons. (Noise may appear on the screen during high-speed play.)

- 1. Set the play speed.**
Any speed from 1× to 40× normal play speed can be set.
Input an integer as the play speed.
*Press the COUNTER SELECT button to set the deck to a counter mode other than UB.
Example: For play at 5× normal speed (150 FPS)
(Input “5” using the number button.)

●On-screen display



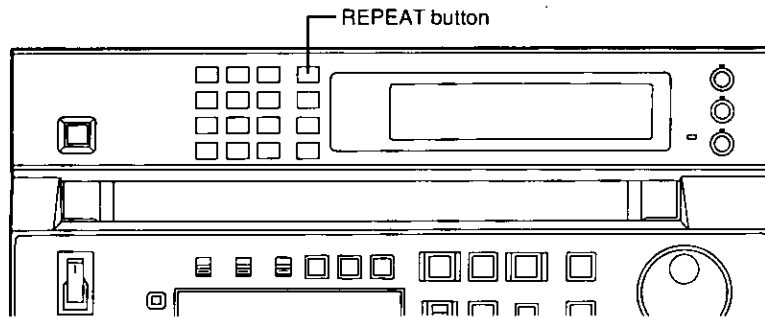
●Counter display



- 2. Press the PLAY button.**
The deck now plays at the designated speed.
- 3. To conclude play, press the STOP button.**

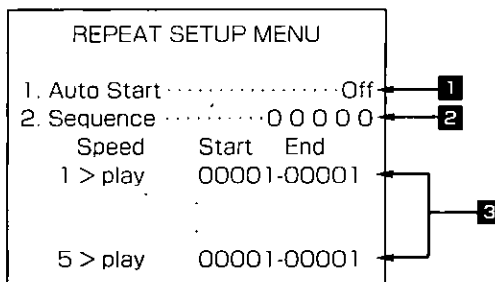
18. Repeat play

Repeat play is enabled by entering the repeat play range and play speed on setup menu 3 "REPEAT".



1. Setting repeat play

Set the "REPEAT SETUP" menu.



1 Auto Start

ON: Repeat play is established automatically when the front panel OPERATION switch is set to the ON position.

2 Sequence

Repeat play is possible for up to 5 programs. Set the programs in the sequence in which they are to be repeatedly played.

- Settings of "0" are ignored.
- The same number may be used more than once.

Example: For the repeat play at the speed and range designated by No. 1, 2, and 3.

Sequence... 12300

3 Repeat speed and range

Designate the repeat play range and play speed.

- **Speed**... Set the play speed here.

Setting range: Four settings can be selected: normal play (Play), frame feed play at 1-second intervals (Step 1), frame feed play at 5-second intervals (Step 5), and frame feed play at 30-second intervals (Step 30).

- **Start/End**... The start and end points of the repeat range are set here.

Address values are used for the settings.

*Reverse play results if the end point is set for the start point and vice versa.

*Still picture playback results when the same point is used for the start and end points.

2. Executing repeat play

When the REPEAT button is pressed, "REPEAT" on the display lights, and repeat play is commenced in the mode which has been set on the setup menu.

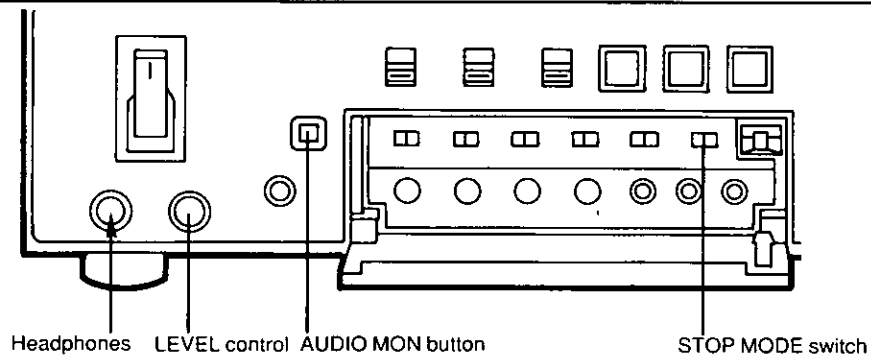
3. Stopping repeat play

Repeat play is stopped by pressing the REPEAT or STOP button again.

Single-action entry of play point

The current play address can be entered as the start or end point by pressing the REPEAT button while the play range is designated. The repeat point can be set while monitoring the images using the search dial.

19. Monitoring



Video/audio

The mode changes as shown below depending on the STOP MODE switch position.

Switch position \ Mode	STOP	Record	Edit	Play	JOG/SHTL, JOG VAR	Eject
PB	Still picture	EE	EE*	Play	Play picture	—
EE	EE	EE	EE*	Play	Play picture	EE

EE=Input images and sound

*The EE mode is established only for the channel selected by the EDIT MODE switch.

Audio

The output at the HEADPHONES jack and rear panel AUDIO MONITOR connector is switched as shown below depending on the front panel AUDIO MON button position.

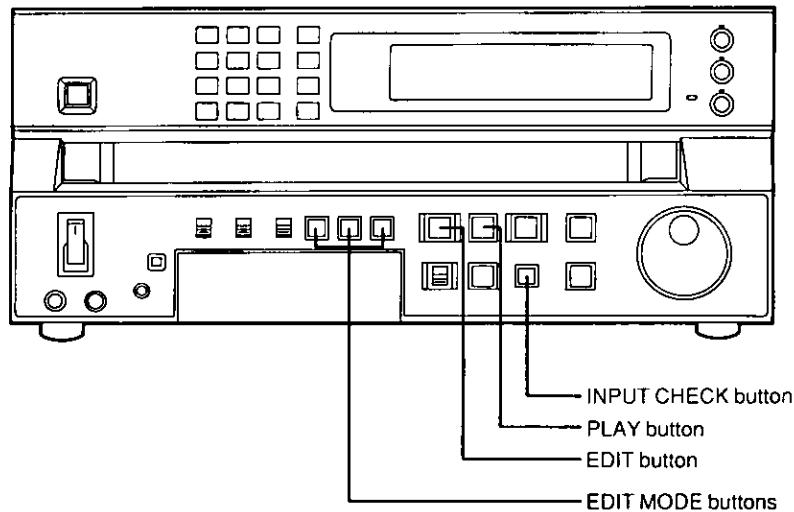
Mode	Front panel lamp display			Output signal	
	CH1	MIX	CH2	CH1 output connector	CH2 output connector
STEREO	○	×	○	CH1	CH2
CH1	○	×	×	CH1	CH1
CH2	×	×	○	CH2	CH2
MIX	×	○	×	CH1/CH2 mixed	CH1/CH2 mixed

*The mode is retained even if the power is turned off.

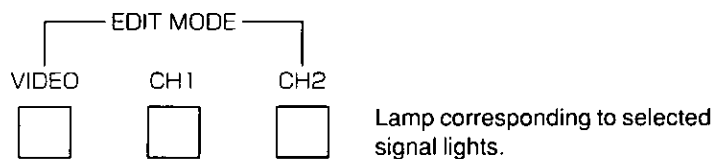
○: On; ×: Off

20. Editing

Editing operations include adding recordings of new programs or inserting them at any point on a disc with prerecorded pictures and sound. The unit does not differentiate between assemble and insert editing as a VTR does: all editing is insert editing.



1. Press the **EDIT MODE** button corresponding to the channel to be edited so that its lamp lights.



VIDEO: VIDEO signal is selected.

CH1: AUDIO CH1 signal is selected

CH2: AUDIO CH2 signal is selected

*When the button is pressed again, its lamp goes off.

2. Press the **PLAY** button. The play mode is established for the deck.
3. To start the editing, keep watching the TV monitor and press the **PLAY** button while holding down the **EDIT** button at the position where editing is to commence (**IN** point). The EDIT and PLAY lamps light, and editing commences.
 - The picture will not be disturbed even when editing is commenced by pressing the EDIT and PLAY buttons in the stop mode.
4. To end the editing, keep watching the TV monitor and press the **STOP** or **PLAY** button at the position where editing is to be concluded (**OUT** point). The stop or play mode is established for the deck, and editing is concluded.

Input signal (video/audio) EE checking

All the input signals can be monitored in the EE mode by pressing the INPUT CHECK button during play or search (JOG, SHTL or VAR).

Editing a predetermined number of frames

The same number of frames can be edited each time.

1. Set "Rec Sw Mode" in setup menu 7 "OPERATION" to "Frame". Since this establishes the fixed frame editing mode, set the desired number of frames (1 to 15) for "Frame Rec Mode" on the menu.
2. Press the PLAY button while holding down the EDIT button. The deck now starts editing, and it stops after the designated number of frames have been recorded.

Block editing by inputting numbers

Editing can be executed for the designated block by conducting editing after the desired value has been input using the number buttons.

1. Set the number of frames (edit duration) to be edited. This can be set as a number of frames or duration.

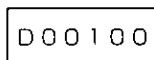
1) Setting the block as a number of frames

- 1 Press the COUNTER SELECT button to set the deck's counter mode to ADDRESS.
- 2 Input the number of frames to be edited by pressing the number buttons.

Example: When editing 100 frames

(Use the number buttons to input the numbers in the following sequence: "1"→"0"→"0".)

•On-screen display



•Counter display



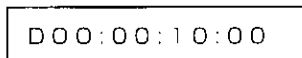
2) Setting the block as the editing duration

- 1 Press the COUNTER SELECT button to set the deck's counter mode to TIME, TIME CODE or ADDRESS TIME CODE.
- 2 Input the duration to be edited by pressing the number buttons.

Example: When editing for 10 seconds

(Use the number buttons to input the numbers in the following sequence: "1"→"0"→"0"→"0".)

•On-screen display



•Counter display



2. Press the PLAY button while holding down the EDIT button.

The deck now starts editing, and it stops after the designated number of frames (duration) have been recorded.

Interrupting an editing operation

Press the STOP button to interrupt editing.

Editing precautions

The LQ-D5500 compresses and expands the signals during recording and play. During editing operations, care must be taken since the picture and sound are monitored at a timing which differs from the actual results due to a delay in the signals caused by the compression and expansion. This problem is compensated for during preview but some restrictions apply.

1. On-the-fly (as needed) editing

Even when the STOP button is pressed to complete recording after editing has commenced, approx. 10 frames (approx. 0.3 sec.) will continue to appear on the EE (recording signal) monitor screen.

The length of the recorded video and audio blocks is the same but the timing is delayed by approx. 5 frames (approx. 0.17 sec.) at both the IN and OUT points from the base picture and sound.

2. Recording only the sound to match the picture

When editing only the sound to match the picture being played, the sound is delayed by 5 or so frames (approx. 0.17 sec.) in the recording result.

3. Editing using an editing controller

- As mentioned above in 1, the EE picture and sound will continue for approx. 10 frames upon completion of the recording. However, there will be no misalignment in the recorded picture and sound. To prevent the occurrence of this phenomenon at the preview stage, the delay is compensated for internally.

- In sound-only editing, the monitored sound will be 5 frames ahead of the monitored picture during editing. Due to the delay compensation, the play picture will pause near the editing point. However, there will be no misalignment in the recorded picture and sound.

- During the preview of picture-only editing, the play sound is muted for 5 frames at the IN and OUT points.

- With split editing, both the sound or picture are set to the EE mode at the IN point at the timing of the sound and picture, whichever comes first. However, this does not affect the editing results.

- Inserts based on time codes alone are not performed even if they are assigned.

4. EE screen

NON V-FLOAT: The V-SYNC position on the EE screen and REF input signal match but the start line of the picture is delayed due to the delay occurring in the signal processing circuit (with the result that the picture drops by 14H).

V-FLOAT: The V-SYNC position on the EE screen and REF input signal do not match but the start line of the picture and V-SYNC are properly correlated.

In the V-FLOAT mode, the EE screen may move slightly in the vertical direction. It may take several seconds to switch from the EE screen to VV screen. Editing is still possible but it is not recommended since the IN point is delayed by 2 frames and other such problems occur.

5. Other

- Input standards signals to serve as the reference.

Features of this disc recorder compared with VTRs

This unit is designed to be capable of replacing a VTR. Since it is a disc recorder, however, it has features which are not provided by a VTR.

1. The unit does not need time to start up as a VTR does, and the pictures are not disturbed even when recording or editing is conducted from the stop mode with a preroll time of zero.

The same result as with assemble editing is achieved when the REC and PLAY buttons are pressed simultaneously.

2. The signal equivalent to the VTR's CTL (control) signal is already recorded as addresses in the tracks on the disc.

For this reason, the unit does not differentiate between assemble and insert editing as a VTR does: all editing is insert editing.

21. How to clean the discs

During prolonged use dust may adhere to the disc surfaces, causing difficulty in maintaining normal operation. When a regular inspection reveals that dust has collected, clean the disc by following the procedure below.

The cleaning frequency depends to some degree on the operating environment but a general rule of thumb is once every 1 to 4 months.

Be absolutely sure to use the designated cleaning materials. Use of any other materials may damage the discs irreparably.

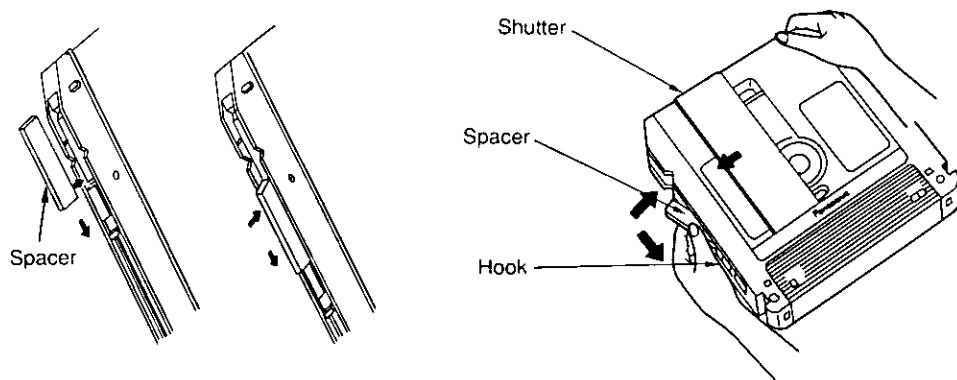
Materials required for cleaning

(These are provided with the unit and can also be purchased as optional accessory LV-K001.)

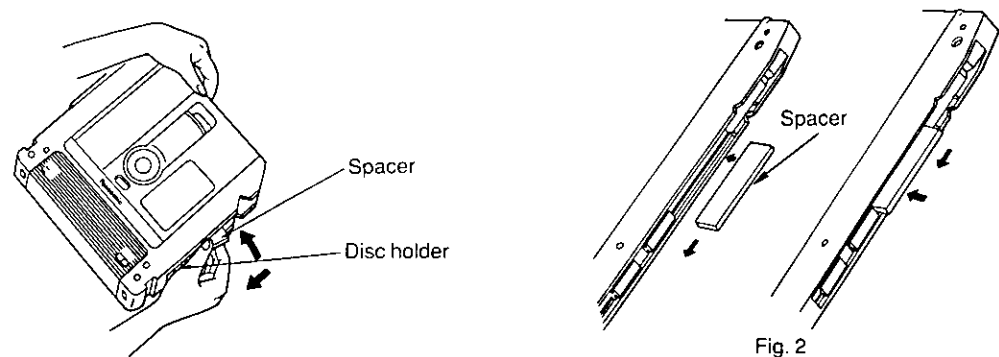
- (1) Cleaning cloth
- (2) Cleaning fluid
- (3) Spacers (JEE0102)×2

Cleaning preparations

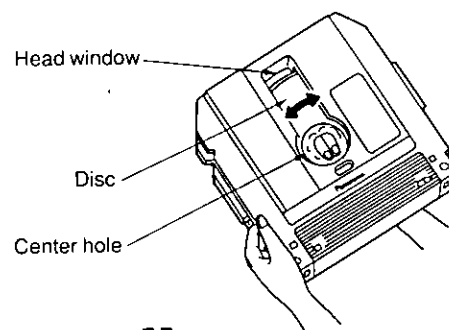
- (1) Hold the cartridge as shown in the figure below, fit one of the two spacers onto the hook on the cartridge's left side panel, pull the spacer with the shutter open so that it fits into the groove, and secure it. (Fig. 1)



- (2) With the cartridge's right side disc holder pulled, fit the other spacer into the groove and secure it. (Fig. 2)



- (3) Rotate the disc by holding onto the disc's center hole, and bring the dirty area to the cartridge's head window. (Fig. 3)



Cleaning

- (1) Pour some drops of the cleaning fluid onto the cleaning cloth. (Fig. 4)

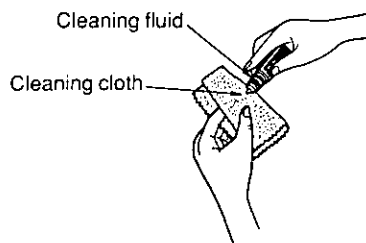


Fig. 4

- (2) Wipe off the dirt on the disc gently in the diametrical direction (from the center to the edges of the disc or vice versa). (Fig. 5)
Clean the disc on both the front and back sides.

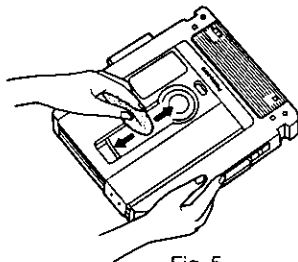


Fig. 5

Precautions

- Use a cleaning cloth from which all dirt and dust have first been removed.
- Do not rub the cleaning cloth against the disc more forcefully than necessary. This can leave scratches.
- Do not wipe the disc in the circumferential direction (at right angles to the diametrical direction).
- To prevent charging the disc with static, the cleaning fluid must be used with the cleaning cloth to wipe the disc.
- Use the top side of the cleaning cloth with the thinner layer of nap.
- Do not allow the cleaning fluid to drip directly onto the disc. If too much fluid is poured, it can be hard to wipe up.

22. RS-232C interface and optional card functions

Functions

Command category	Description of control	Control	
		Standard	Optional *1)
Recording/play	Range-designated recording, speed-designated recording, editing, standard play, special play, range-designated play, search, repeat play, etc.	○	○
ID/data	Disc ID No. recording, user data recording, etc.	○	○
Monitoring	Operation mode monitoring, setup menu setting monitoring, counter value monitoring, etc.	○	○
Video/audio	Video/audio input/output control, video/audio muting, etc.	○	○
Captions	Caption data display, display control, etc.		○
RTC (real-time clock)	Calendar/clock data read/display, etc.		○
Input/output	External I/O port control, etc.		○
Command execution	Temporary stop of command execution, etc.	○	○
Other	Counter mode selection, counter resetting, buzzer and user/recording area setting, setup menu changes	○	○
Program	System control using above command without a personal computer.		○
Multiple connections	Supports level 2 Panasonic standard interfaces and controls up to 100 drives with one personal computer. The system can be upgraded with products made by Panasonic such as VCRs.		○
LQ-3000 protocol	Controls the unit with the same commands as the Panasonic analog video disc recorder. (As there are marginal differences in function, you may not be able to operate it with the same software.)		○

*1) Standard: Control from unit's rear panel RS-232C connector
 Optional: Control using RS-232C interface card (LQ-YA232P) available as an optional accessory
 RS-422A cannot be used with an optional card inserted.
 Consult your dealer or Panasonic sales representative concerning command specifications or program development tools.

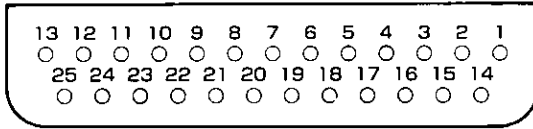
*2) The optional LQ-YA501P card has basic functions such as time lapse and timed recording start built-in.

23. How to use the VBI DATA I/O connector

1. General

The VBI (vertical blanking interval) DATA I/O connector is for recording and reading the VBI data: 1560 bytes of VBI data can be recorded on, and read from, one frame on the disc. For instance, recording is possible for two lines with data of 720 bytes per line, and the connector can also be used for recording signals other than the VBI.

2. Pin connections



Pin No.	Signal		
	Name	I/O	Description
1	SDI0	ECL input	VBI input data bit 0
2	SDI1	ECL input	VBI input data bit 1
3	SDI2	ECL input	VBI input data bit 2
4	SDI3	ECL input	VBI input data bit 3
5	GND	—	Signal ground
6	CK18	ECL output	VBI clock
7	SDO0	ECL output	VBI output data bit 0
8	SDO1	ECL output	VBI output data bit 1
9	SDO2	ECL output	VBI output data bit 2
10	SDO3	ECL output	VBI output data bit 3
11	REC	TTL output	Record/play selection signal (high level for recording)
12	SASEN	TTL output	Reference signal for VBI data bus transfer start
13	GND	—	Signal ground

Pin No.	Signal		
	Name	I/O	Description
14	SDI0R	ECL input	VBI input data bit 0 (reverse)
15	SDI1R	ECL input	VBI input data bit 1 (reverse)
16	SDI2R	ECL input	VBI input data bit 2 (reverse)
17	SDI3R	ECL input	VBI input data bit 3 (reverse)
18	GND	—	Signal ground
19	CK18R	ECL output	VBI clock (reverse)
20	SDO0R	ECL output	VBI output data bit 0 (reverse)
21	SDO1R	ECL output	VBI output data bit 1 (reverse)
22	SDO2R	ECL output	VBI output data bit 2 (reverse)
23	SDO3R	ECL output	VBI output data bit 3 (reverse)
24	FRP	TTL output	Frame signal
25	VBIPKGT	TTL input	VBI data record/play gate signal

3. VBI data recording area/recording capacity

One frame consists of 10 tracks, and each track is composed of 45 packs.

Of the 45 packs, 39 packs from pack 0 through pack 38 for the even-numbered tracks (0, 2, 4, 6 and 8) and 39 packs from pack 6 through pack 44 for the odd-numbered tracks (1, 3, 5, 7 and 9) configure the VBI data recordable area.

Since the recording capacity consists of 10 tracks per frame, 39 packs per track and 4 bytes per pack, the number of bytes per frame is 1560 (39×10×4) bytes.

4. Control specifications

The VBI data is transferred using a total of the 18 signal lines listed below.

SASEN: VBI data bus transfer start reference signal×1

VBIPKGT: VBI data record/play gate signal×1

SDI0-3 (R): VBI recording data (4-bit configuration)×8

SDO0-3 (R): VBI play data (4-bit configuration)×8

① For recording

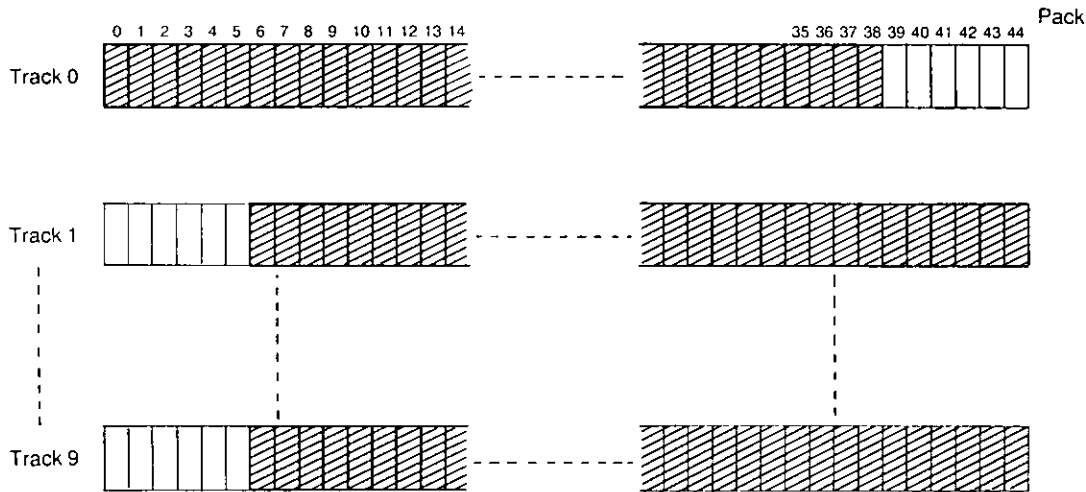
The VBI data record gate signal (VBIPKGT) for the VBI data recordable area is produced from the VBI data bus transfer start reference signal (SASEN) and VBI clock (CK18). The VBI record data [SDI0-3 (R)] in the interval during which VBIPKGT is high is recorded on the disc.

Thirty-nine packs from pack 0 through pack 38 are used for the even-numbered tracks and 39 packs from pack 6 through pack 44 are used for the odd-numbered tracks in the VBI data recordable area.

The figure "67" denoting the VBI data is recorded in the 2-clock interval at the beginning of the pack.

When recording VBI data continuously, the data is recorded starting from pack 0 of track 0 or from pack 6 with the previous packs padded.

VBI recordable area (indicated by slant lines)



② For play

VBIPKGT is set high in the interval during which the data is recorded in the data recordable area, and VBI play data SDO0 to 3 (R) is read at this time.

24. List of setup menu displays

Main menu																			
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">SETUP MENU 10</p> <ol style="list-style-type: none"> 1. RS232C 2. RESERVED (PROGRAM) 3. REPEAT 4. TIME CODE 1 5. TIME CODE 2 6. EDIT 7. OPERATION 8. VIDEO 9. AUDIO/OTHER 0. MAINTENANCE </div>																			
Sub menus																			
1 RS-232C	2 RESERVED (PROGRAM)																		
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">RS232C SETUP MENU</p> <ol style="list-style-type: none"> 1 Baudrate9600 2 Parity None 3 Character Length8bit 4 Stop Bit 1bit 5 Xon/XoffOff 6 Protocol Type MIS 7 Online Mode08 8 Deck No00 </div>	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">PROGRAM SETUP MENU</p> <ol style="list-style-type: none"> 1 Auto StartOff 2 Run Program 1 <ol style="list-style-type: none"> 1:Play Back Test 2:VIDEO GUIDE 3:I/O Checker 4:Program 3 5:Program 4 </div> <p style="text-align: right; margin-top: 10px;">*Only when the optional RS-232C card is used.</p>																		
3 REPEAT	4 TIME CODE 1																		
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">REPEAT SETUP MENU</p> <ol style="list-style-type: none"> 1 Auto StartOff 2 Sequence 1 2 3 4 5 <table style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Speed</th> <th style="text-align: left;">Start</th> <th style="text-align: left;">End</th> </tr> </thead> <tbody> <tr> <td>1>Play</td> <td>00001-74773</td> <td></td> </tr> <tr> <td>2>Step 30</td> <td>00001-74773</td> <td></td> </tr> <tr> <td>3>Step 1</td> <td>00001-74773</td> <td></td> </tr> <tr> <td>4>Step 5</td> <td>00001-74773</td> <td></td> </tr> <tr> <td>5>Play</td> <td>00001-74773</td> <td></td> </tr> </tbody> </table> </div>	Speed	Start	End	1>Play	00001-74773		2>Step 30	00001-74773		3>Step 1	00001-74773		4>Step 5	00001-74773		5>Play	00001-74773		<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">TIME CODE 1 SETUP MENU</p> <ol style="list-style-type: none"> 1 TCG ModePreset 2 Preset ModeRec.Run 3 Regen ModeTC and UB 4 Frame ModeNon Drop 5 UB GroupNot Specified 6 TCG CF FlagOn 7 VITC Pos.116Line 8 VITC Pos.218Line 9 VITC OutputOff 0 Ext.TC CF SelOff </div>
Speed	Start	End																	
1>Play	00001-74773																		
2>Step 30	00001-74773																		
3>Step 1	00001-74773																		
4>Step 5	00001-74773																		
5>Play	00001-74773																		

Example of display

5 TIME CODE 2

TIME CODE 2 SETUP MENU

- 1 TCG Pre00:00:00:00
- 2 UB Pre00000000
- 3 ATC Pre00:00:00:00
- 4 ATCUB Pre00000000
- 5 ATC/ATCUB WriteOff
- 6 Timer ModeCTL

6 EDIT

EDIT SETUP MENU

- 1 Auto Preroll EntryOn
- 2 Preroll Time05sec
- 3 Play Delay00f
- 4 Edit Delay05f
- 5 Color FramingOff
- 6 CF PB Sel.Forced
- 7 CF Rec. Sel.Forced
- 8 CF ID OnOn
- 9 SplitOff
- 0 Device Type.Type1

7 OPERATION

OPERATION SETUP MENU

- 1 Rec. SW. ModeCont.
- 2 Frame Rec.Mode01f
- 3 Rec.InhibitOff
- 4 Direct SearchOff
- 5 Eject/Stop RemoteOn
- 6 BeepOn
- 7 Video ControlLocal
- 8 Play/Rec. RetryOn

8 VIDEO

VIDEO SETUP MENU

- 1 BurstAuto
- 2 Sync On GOff
- 3 Still/SlowFrame
- 4 Level MeterSync
- 5 WideAuto
- 6 Video InSTD
- 7 Float ModeNO-V-FLOAT

9 AUDIO/OTHER

AUDIO/OTHER SETUP MENU

- 1 Audio OutputPlay/Var
- 2 Audio MuteOn
- 3 Char. BackBlack
- 4 Char. PositionL Up
- 5 Status SuperOff
- 6 Closed CaptionOff
- 7 Ext. Ctl. I/OOn

The 7 "Ext.Ctl.I/O" item is available only when the optional RS-232C card is used.

0 MAINTENANCE

MAINTENANCE

- 1 Disc Motor 65535h
- 2 Load/Eject 65535
- 3 Rec.Time 65535h
- 4 Error Log. Load
- E-02
- E-07
- Load
- P-ON
- 5 Battery Deck:OK I/F:OK

The "I/F: ok" item is available only when the optional RS-232C card is used.

25. Connector signals

AUDIO input/output connectors (XLR-3P)

Pin No.	Input/output signal
1	GND
2	HOT
3	COLD

YC (S1 VIDEO) input/output connectors (4P)

Pin No.	Signal
1	Y GND
2	C GND
3	Y signal input/output
4	C signal input/output

AUDIO AES/EBU input/output connectors (XLR-3P)

Pin No.	Input/output signal
1	GND
2	HOT
3	COLD

RS-422 connector (9P)

Pin No.	Signal
1	GND
2	TRANSMIT A
3	RECEIVE B
4	RECEIVE COMMON
5	SPARE
6	TRANSMIT COMMON
7	TRANSMIT B
8	RECEIVE A
9	GND

*The REMOTE IN and REMOTE OUT connectors have a loop-through configuration.

*If the units are connected vertically on a multiple number of levels, the termination resistance will be connected in parallel, with the possible result that the drive force will be reduced and communication disabled.

ENCODER REMOTE connector (15P)

Pin No.	Signal
1	—
2	SET UP
3	C LEVEL
4	GND
5	+12 V
6	SYSTEM HØ
7	SYS. SC COARSE (2)
8	-12 V
9	HUE
10	VIDEO LEVEL
11	RET GND
12	—
13	—
14	SYS. SC FINE
15	SYS. SC COARSE (1)

RS-232C connector (25P DCE type)

Pin No.	Signal
1	FG (frame ground)
2	SD (send data: data receive port)
3	RD (receive data: data send port)
4	RS (request to send) *1
5	CS (clear to send) *1
6	DR (data set ready)
7	SG (signal ground)
8-25	— *1: Pins 4 and 5 shorted.

●Use a straight cable for connection with a computer (DTE type).

See page 58 for the VBI DATA I/O connector.

26. Installation

26-1. Installing the deck

When installing the deck, give due consideration to the operating environment, clearance spaces, etc. mentioned below.

This will help to ensure that the unit's excellent quality is maintained and that its superb operating ease and serviceability are exhibited to the full.

(1) Operating environment

1. Operating temperature: 41°F to 104°F

(In order to prevent temperature rises inside the unit, do NOT block or cover the ventilation holes on the top of the unit or the fan area installed in its rear panel.)

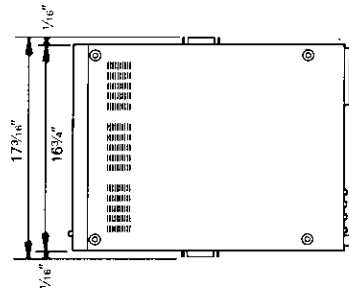
2. Storage temperature: -4°F to 140°F

3. Installation locations to avoid

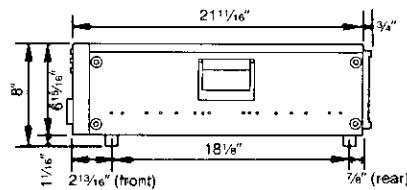
- Location where the unit is exposed to direct sunlight or other intense lights
- Locations which are susceptible to dust or vibration
In particular, remember that dust is liable to be sucked inside the unit if it is installed in the very bottom part of a rack.
- Locations exposed to strong electrical or magnetic fields
- Locations near sources of heat

(2) Installation

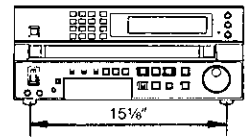
The figures below show the unit's external dimensions. For ventilation and servicing purposes, leave clearances of at least 16" from a wall, etc. behind the unit.



Top view



Right panel view



Front view

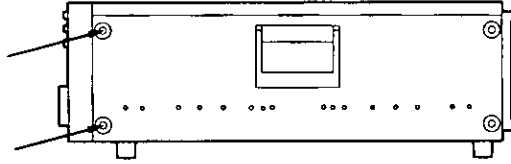
26-2. Rack-mounting

The unit can be mounted in a 19-inch standard rack using the AJ-MA34 (optional) rack-mounting adapters.

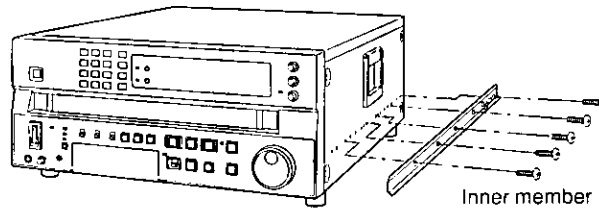
The mounting rails made by Accuride (Parts No. C2038-22) or CHASSIS TRAK (Parts No. 3001-99-0191) are recommended. For details, consult your dealer.

Mounting

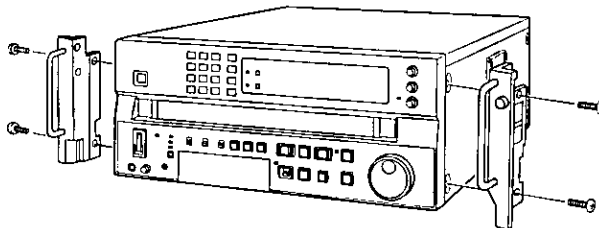
1. Remove the screws at the left and right of the unit.



2. Attach the inner members of the slide rails using the screws included in the bracket.



3. Remove the unit's feet.
4. Attach the outer member brackets to the rack.
5. Attach the AJ-MA34 rack-mounting adapters.



6. Mount the unit in the rack.
After having mounted the unit, check that it slides smoothly along the rails.

Notes:

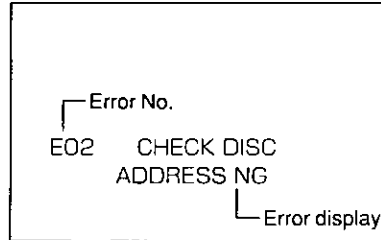
- Keep the temperature inside the rack between 41°F and 104°F.
- Bolt the rack to the floor to prevent it from toppling over when the unit is slid out.
- If the balance between the slide rails is not maintained, the unit may be bent out of shape which may cause trouble.

27. Error messages

On-screen display of errors

This unit can be displayed the error information on the TV monitor when the unit malfunctions due to a mistake made in its operation or for other reasons.

This information is output only to the COMPOSITE3 output connector and displayed when the DISPLAY button is pressed.



TV monitor

Error displays, causes and remedial action

Error No.	On-screen display	Error	Cause	Remedy
E01	INVALID KEY	Invalid command input	Operation	Input the correct command.
E01	OVERFLOW	Input data overflow	Operation	Input the correct numerical value.
E02	CHECK DISC ADDRESS NG	Disk error	Operation Disc Equipment	Use the correct disc for the unit again from the first step.
E02	CHECK DISC DISK TYPE?	Disc error	Operation	① Disc cartridge has been inserted upside down; insert it correctly. ② Clean the disc. ③ Request maintenance.
E03	NO DISC	Disc not loaded	Operation	Insert the disc cartridge and operate again.
E04	TIMEOUT RETRY SEARCH	Search timeout error	Equipment Disc	① Search again. ② Clean the disc. ③ Request maintenance.
E05	CHECK LASER	Semiconductor laser trouble	Equipment	Consult dealer for repair information or contact Panasonic service personnel.
E06	FOCUS CHECK DISC	Focus servo trouble	Equipment Disc	① Operate again. ② Request maintenance. ③ Clean the disc. ● An error message appears during recording and playback, however, automatic recovery takes place.

Error No.	On-screen display	Error	Cause	Remedy
E07	DISC MOTOR SPEED CHECK DISC	Disc motor speed error	Equipment	Re-insert the disc cartridge, and operate again.
E07	CHECK REF.IN & VIDEO IN	Disc rotation sync trouble	Equipment Operation Disc	① Check that the correct external input signal is supplied. ② Clean the disc. ③ Request maintenance. *If recording is in progress, stop the recording and resume it automatically after the error has been remedied.
E08	HEAD IS LOCKED RETRY PLAY	Start/end locking	Equipment	Operate again.
E11	WRITE PROTECTED	Write protect error	Operation	Remove the disc cartridge, release the write protect, and operate again.
E12	DEW	Condensation	Equipment	Leave standing until the condensation has dried up.
E14	SERVO ADJ.NG CHECK DISC	Servo adjustment error	Disc	Replace the disc cartridge and operate again from the first step.
E16	OFF TRACK RETRY REC.	Address skipped	Operation Disc	If recording is in progress, stop the recording and resume it automatically after the error has been remedied.
E17	LOADER STOP	Disc loading error	Operation Equipment	Remove the foreign matter.
E17	SHUTTER OPEN	Foreign matter in disc insertion slot	Operation	Remove the foreign matter.
E18	TILT CHECK DISC	Disc tilt error	Disc Equipment	Replace the disc cartridge and operate again from the first step.
E20	TOO MANY COMMAND	Receive buffer overflow	Operation	Set number of characters between STX and ETX to less than 255. (RS-232C)
E21	TRANSMISSION ERR	RS-232C transmission error	External device Operation	Set the transmission mode to the same as the host.
E30	BATTERY CHANGE	Replace battery indication	Equipment	Ask your dealer to conduct repairs. Back-up battery must be replaced.
E32	NESTING ERROR	Nesting error	Operation	After correcting the program properly, operate again.

Error No.	On-screen display	Error	Cause	Remedy
E33	PROGRAM ERROR	Program format error	Operation Software program	<ul style="list-style-type: none"> ● Load the program into the unit and operate again. ● Set the repeat program on the menu and operate again.
E34	TOO LARGE PROG.	Program memory overflow	Operation	Reduce the program size and reload. The overflowed data is invalid.
E36	BACKUP ERROR	Memory back-up error	I/F card	Reload the program. (Option)
E41	WRITE ERROR	Write error	Equipment Disc	Write the disc ID number again.
E45	READ ERROR	Disc ID write error	Equipment Disc	Operate again.
E50	No display	Instantaneous power failure	Power supply	Restart and stop at the first address (usually address 1) in the user area. If AUTO START has been set for REPEAT or PROGRAM, REPEAT or PROGRAM starts up. ● Entry is made in error log only.
E51	CLEAN THE DISC	Dirty disc	Disc	Clean the disc and operate again.
E60	FAN STOP	Fan stop		Remove foreign matter from the fan. If left standing, the power will be turned off after 10 minutes or so.
E61	BACKUP ERROR	Memory back-up error	Equipment	SETUP settings are returned to factory default settings.
E80	H_CALIBRATION PUSH REC. BUTTON (front display: H_CAL)	Temperature calibration requested	Changing in ambient temperature	Press the [REC] button. The unit now calibrates the control system. Resume recording afterwards.
E99	SYSTEM ERROR	System error	Equipment	Re-start, and if STOP or Auto Start—the latter for REPEAT or PROGRAM—at the first address of the user area has been set, proceed accordingly.
E91 E92 E93 E94 E95	SELF CHECK E □□□□□ SELF CHECK □E□□□□ SELF CHECK □□E□□□ SELF CHECK □□□E□□ SELF CHECK □□□□E□	System error	Equipment	If this error occurs frequently, consult to your Panasonic service personnel.
E96	SELF CHECK □□□□□E		I/F	

● If the error continues to be displayed even though the remedial action outlined above has been taken, consult with your dealer.

*Note: If the unit will not record, check out the following points.

1. Is "Rec. SW. Mode" in setup menu 7 "OPERATION" at "Cont."?
2. Is "Rec. Inhibit" in setup menu 7 "OPERATION" at "Off"?
3. Has a standard signal been input for the "60 Hz" "Video In" setting in setup menu 8 "VIDEO"?
4. Is the disc's write protect switch at "READ/WRITE"?
5. Is the front panel REMOTE/LOCAL switch at "LOCAL"?

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