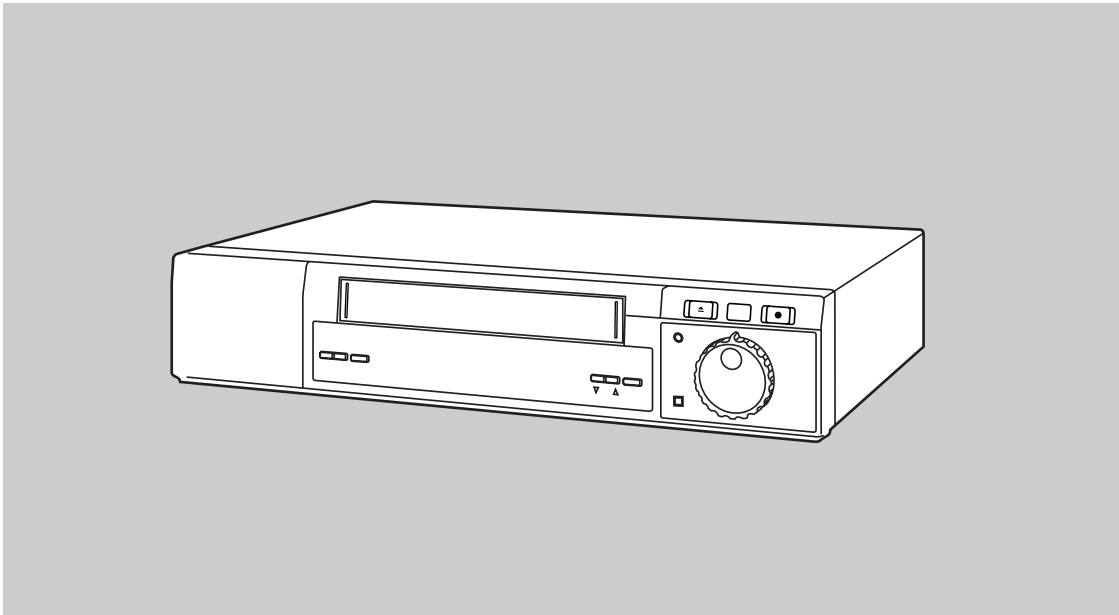


# Operating Instructions

Time Lapse Recorder

Model AG-**RT850**<sub>P</sub>



**Panasonic**<sup>®</sup>

Before attempting to connect, operate or adjust this product, please read these instructions completely.

## 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.”



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 (servicing) instructions in the literature accompanying the appliance.

### CAUTION:

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

### CAUTION:

**Do not install or place this unit in a bookcase, built-in cabinet or in another confined space in order to keep well ventilation condition. Ensure that curtains and any other materials do not obstruct the ventilation condition to prevent risk of electric shock or fire hazard due to overheating.**

### WARNING:

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

### 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.

### Lithium Battery

Replace battery with part No. VL2330/1HF 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.

 is the safety information.

- Do not insert fingers or any objects into the video cassette holder.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, protect it from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Color or Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to authorized service personnel.

# Contents

---

Features .....	4	Auto Repeat Recording/Auto Rewinding .....	18
Regular Maintenance Service Recommendation .....	4	Alarm Recording (Emergency Recording) .....	19
Routine & Regular Inspection Request .....	5	• Principle of Alarm Recording .....	19
Parts and Their Functions .....	6	• Alarm and Display Methods during Alarm Recording .....	19
Menu Screens .....	9	• Connecting the Alarm Input Connector .....	19
Date and Time Settings .....	12	• Alarm Recording Operation .....	20
Time/Date Display Position .....	13	• Alarm Recall .....	20
Time Mode Selection .....	14	Frame Switcher Connection and Recording .....	21
Recording Procedure .....	15	Playback Procedure .....	22
Tips For Better Recording .....	15	• Tracking .....	22
• Recording Mode Lock .....	15	• Vertical Hold Adjustment .....	22
• Recording Check .....	15	RS-232C Interface .....	23
• Restoration-of-Power-After-Failure Recording .....	15	Troubleshooting .....	28
Timer Recording .....	16	Specifications .....	30
• Internal Timer Recording .....	16		
• Daily Recording (Daily Timer)/ Weekly Recording (Weekly Timer) .....	17		
• External Timer Recording .....	18		

# Features

## Recording and playback up to 240-hour time modes with the T-120 tape

In addition to the 6-hour time mode, recording and playback can be performed in the time lapse modes (L18-, L24-, 48-, 72-, 96-, 120-, 168-, 180- and 240-hour modes).

## 24-Hour recording

When using T-160 tape, 20 fields per second can be recorded for 24 hours using L18 mode.

## Excellently defined still-picture images

More clearly defined still picture images can be produced during playback in color and black-and-white modes thanks to the horizontal resolution of more than 300 lines and 320 lines respectively.

## Full line-up of recording functions

Included in the wide range of recording functions are restoration-of-power-after-failure recording, recording every day and by the days of the week using the internal timer, external timer recording, alarm recording, emergency recording and repeat recording.

## Playback functions

Among the convenient playback functions are the recording review function for immediate viewing of recorded material, the handy search function for locating images promptly, and the forward/reverse field advance and still-picture functions for careful viewing of particular scenes.

## Repeat recording count display

The number of times a recording is to be repeated can be indicated on the counter display.

## Recording check

Recording check can be performed during normal operation by pressing REC REVIEW.

## Jog/shuttle

A jog or shuttle function for quickly locating playback sections using the search dial is incorporated.

## Auto tracking function

The tracking can be automatically adjusted by pressing the “-” and “+” tracking buttons together.

## Built-in time/date generator

This unit comes with a built-in microprocessor with a calendar function for displaying the time on the display or TV monitor and for controlling the time of the internal timer.

## Recording lock function

A double recording mode lock function is provided for safeguarding against operational errors during recording.

## Connection to frame switcher

Easy connection to a frame switcher is possible once the unit has been connected to the video input and camera SW connectors.

## Hour meter

The unit contains an hour meter which provides useful information for maintenance and inspections.

## Remote control

The unit can be operated from a distance of about 16 ft. if the AG-A11 remote controller, available as an optional accessory, is connected.

## RS-232C connector

With this connector, basic operations of the unit can be controlled using a personal computer (etc.).

# Regular Maintenance Service Recommendation

Although this unit is designed to withstand long-term use, the items listed below should be inspected regularly so that the unit is kept in perfect working order. Use the hour meter to know when to conduct the inspections.

The VTR is a piece of precision-made equipment and, as such, it is recommended that the user enter into a maintenance and inspection agreement to keep the unit operating free of trouble or failures. For further details, please consult with your dealer.

Inspection item	Cumulative operation time (hours)									
	500	1000	1500	2000	2500	3000	3500	4000	8000	12000
Transport system cleaning	●	●	●	●	●	●	●	●	●	●
Audio heads	●	●	●	●	●	●	●	●	●	◎
Video heads	●	●	●	●	●	●	●	◎	◎	◎
Cylinder unit	●	●	●	●	●	●	●	●	●	◎

◎ Service life inspection

● Cleaning

(L18-/L24-hour mode use)

The above table merely serves to lay down general guidelines for the inspection of typical parts involved in regular inspections. The timing of the inspections needs to be adjusted according to the VTR's operating environment.

# Routine & Regular Inspection Request

This unit is designed to withstand many hours of operation. Nevertheless, it is recommended that routine inspections be conducted to help ensure trouble-free operation.

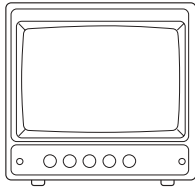
## CAUTION

Do not forget to conduct the routine inspection with auto repeat recording.

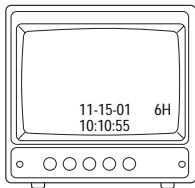
## Routine inspection procedure

1 Set the power switches on the unit, video cameras, TV monitor and other equipment connected in the monitoring system to the ON position.

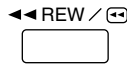
2 Is the picture on the TV monitor OK?



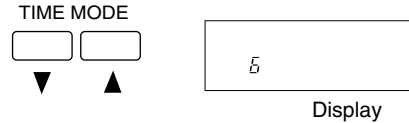
3 Are the date and time displayed on the TV monitor correct?



4 Rewind the cassette tape, which was recorded on the previous day, by an amount equivalent to a count on the counter of several figures.



5 Press the TIME MODE button to set to the mode to 6H (6 hours).



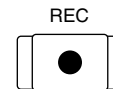
6 Press the PLAY button. The tape is played back by an amount equivalent to a count on the counter of several figures.



7 Is the playback image OK?

8 Is there any problem with the recorded date and time?

9 Press the REC button.



10 Check the playback images which were recorded in the 6-hour time mode.

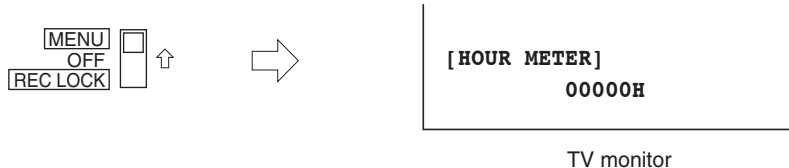
11 Upon completion of all the checks, set the unit to the desired mode.

## Action taken after routine inspections

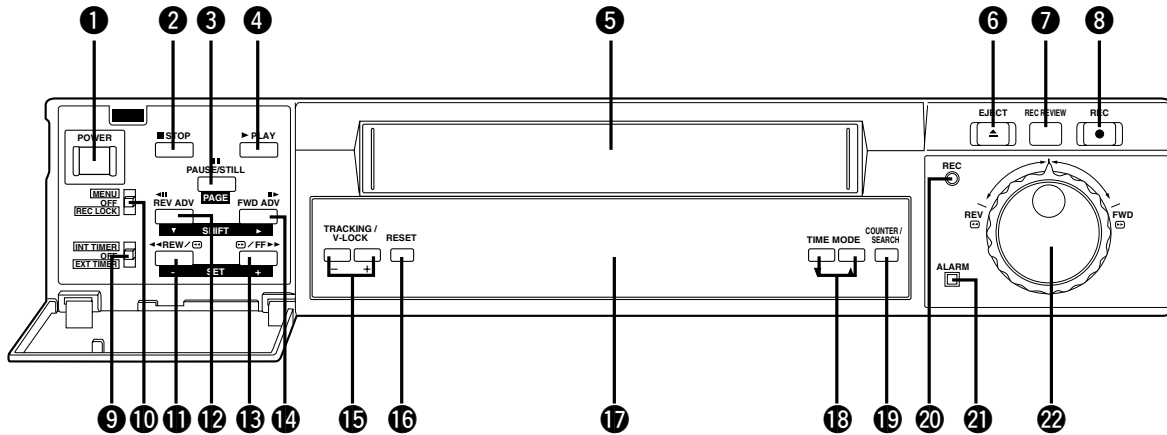
In the unlikely event of a problem with the unit, turn off the power, take hold of the power plug and disconnect it from the power outlet, and consult with the dealer from whom the unit was purchased.

## Regular inspections recommended

This unit has an hour meter which shows for how many hours the VTR has been used. When the MENU/REC LOCK switch is set to MENU, Menu Screen 1 appears on the TV monitor, and the hour meter can be checked. Use the hour meter as a rough guideline to cleaning or replacing the parts inside the unit. For further details, consult with your dealer.



# Parts and Their Functions



- 1 POWER switch**  
The power is turned on when this switch is pressed. When the switch is pressed again, the power is turned off.
- 2 STOP button**  
When this is pressed, the tape stops traveling.
- 3 PAUSE/STILL (page) button**  
When this is pressed during recording, the tape temporarily stops traveling. When pressed during playback, the tape temporarily stops traveling, and a still picture appears on the TV monitor. When pressed again, the tape travel resumes. The pages on the menu screen are advanced when the button is pressed while a menu screen is displayed.
- 4 PLAY button**  
Playback starts when this button is pressed.
- 5 Cassette holder**  
This is the loading slot for the video cassette.
- 6 EJECT button**  
This is used to eject the video cassette.
- 7 REC REVIEW button**  
When the button is pressed during recording, the tape runs temporarily in the reverse direction, and after the recorded section has been played back a few seconds, the unit is returned to the recording mode.
- 8 REC button**  
Recording starts when this button is pressed.
- 9 TIMER MODE switch**  
This is the operation switch for internal timer recording or external timer recording.  
**INT TIMER:** At the times set by the internal timer, the power is automatically turned on or off and recording starts or stops.  
**OFF:** When timer recording is not performed.  
**EXT TIMER:** When the external power is turned on, recording starts automatically.
- 10 MENU/REC LOCK switch**  
When this switch is set to REC LOCK, the time mode and operation buttons except for REC and REC REVIEW as well as the power switch cannot be operated while recording is in progress. When it is set to MENU, the menu screen appears.
- 11 REW (set -) button**  
When this button is pressed, the tape is rewound. When it is kept depressed during playback, the review mode is established. When a menu screen is displayed, it is used to change an item (decrement a value).
- 12 Field REV ADV (shift ▼) button**  
When this is kept depressed during still-picture playback, the picture is advanced field by field in the reverse direction. When it is released, the still picture reappears. When it is pressed while a menu screen is displayed, the setting items move downward.
- 13 FF (set +) button**  
When this is pressed, the tape is fast forwarded. When it is kept depressed during playback, the unit is placed in the cue mode. When a menu screen is displayed, it is used to change an item (increment a value).
- 14 Field FWD ADV (shift ►) button**  
When this is kept depressed during still-picture playback, the picture is advanced field by field in the forward direction. When it is released, the still picture reappears. When this is pressed during time lapse mode (L18H – 240H) playback, Quasi-V on/off can be selected.

Operation mode display



Quasi-V off on

Dancing can be reduced. When it is pressed while a menu screen is displayed, the setting items move toward the right.

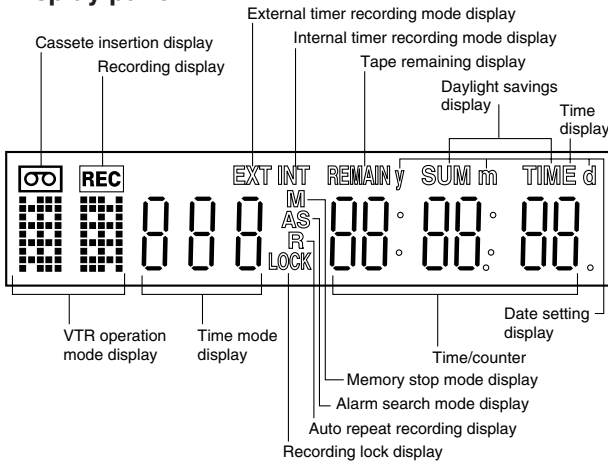
**15 Tracking (–, +)/V-LOCK button**

These buttons are used to adjust the tracking. If noise appears on the playback picture, press the buttons to adjust the tracking is such a way that the picture is made as clear as possible. When both buttons are pressed together during 6-hour mode playback, the tracking is adjusted automatically. If the image shakes slightly in the vertical direction during still picture, press V-LOCK buttons to reduce the dancing. Further, the time/date display position can be adjusted during STOP and EJECT (see page 13).

**16 RESET button**

When this button is pressed, the counter display is reset to 0:00:00.

**17 Display panel**



• Operation mode displays

Operation mode	Display
Playback	▷ (6H-240H) or ◁▷ (L18H-240H)
Recording	▷ REC lamp lights.
Still picture	◻◻
Recording pause	◻◻ REC lamp lights.
Recording check	▷ REC lamp lights.
Fast forwarding	▷▷
Rewinding	◁◁
Cue	▷▷
Review	◁◁
Forward field advance	◻◻ or ◻▷ (Flashing)
Reverse field advance	◻◻ or ◁◻ (Flashing)

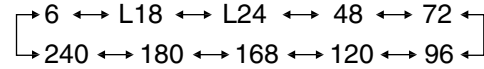
• Error messages

An error code appears when trouble has occurred during operation.

- E-2:** Trouble in video cassette insertion area
- E-3:** Trouble in video cassette tape loading area
- E-4:** Trouble in cylinder area
- E-5:** Trouble in tape transport area
- d:** Formation of condensation (dew)

**18 TIME MODE (▼, ▲) buttons**

These buttons are used to select the recording and playback time mode. Each time this is pressed, the time mode changes in the following sequence:



**19 COUNTER/SEARCH button**

When this button is pressed, the display on the display panel changes to time, counter, counter memory, alarm search and number of repeat recording display.

The “M” mark appears on the display panel in the counter memory mode. When the tape is fast forwarded or rewound in this mode, the counter will automatically stop when 0:00:00 is approached. The “AS” mark appears on the display panel in the alarm search mode. When the tape is fast forwarded or rewound in this mode, the unit is automatically set to still-picture playback at the alarm recording section. If the FF button or REW button is pressed during playback with alarm search, the search will lock. (If this button is pressed while the tape is being fast forwarded or rewound, counter memory and alarm search will not function.)

The “PAS.” mark appears in the display panel in the number of repeat recordings display mode. The number of repeat recordings is displayed only when TAPE END in Menu Screen 4 is set to REPEAT. The “\_\_PAS” mark is displayed for settings other than REPEAT.

**20 REC display lamp**

This lamp lights while recording, recording/pause or rec review is in progress. It goes off when recording has finished.

**21 ALARM display lamp**

This remains lighted while alarm recording is in progress. It flashes when alarm recording ends.

**22 Search dial/jog dial**

**Search (outside ring) dial**

When the outside ring of the search dial is turned, the search mode is established. The tape can now be reviewed or cued at up to 27 times the normal playback speed. When the search dial is set to the center click-stop position, the still-picture playback mode is established.

**Jog (inside ring) dial**

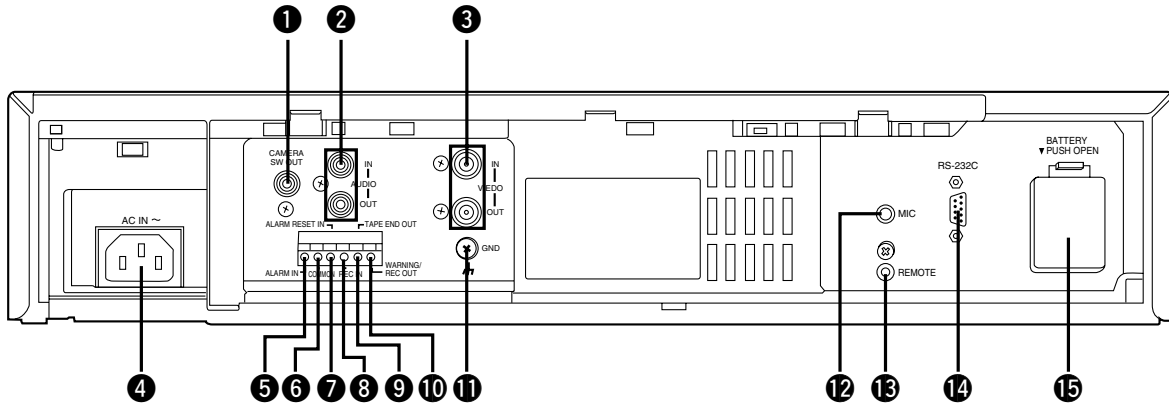
When the search dial is set to the center click-stop position, the jog mode is established.

When the inside ring is turned, the tape speed can be varied within a range of –1 to +1 times the normal playback speed. When the turning is stopped, the still-picture playback mode is established.

- During search or jog playback, the picture may appear in black and white or it may be distorted: this is normal and not indicative of malfunctioning.
- No sound is heard during search or jog playback.



# Parts and Their Functions



- 1 Camera switching output connector**  
Camera switching output connector; connect it to the sequential switcher.
- 2 Audio input/output connectors**  
Audio input/output connectors (phono jacks)
- 3 Video input/output connectors**  
Video input/output connectors (BNC); connect the input connector to the video camera, etc. and the output connector to the TV monitor, etc.
- 4 AC IN connector**  
Connect the supplied power cord to an AC outlet.
- 5 Alarm input connector**  
Alarm recording input connector; connect it to the external sensor.
- 6 COMMON terminal**
- 7 Alarm reset connector**  
Input connector for releasing alarm recording; a +4 to +14 V DC voltage is required.
- 8 REC IN connector**  
Input connector for recording.  
**Note:**  
Do not input the signal to this connector while the tape is rewinding automatically in the repeat mode.
- 9 Tape end output connector**  
When the cassette tape comes to its end during recording, the alarm device installed externally is activated.
- 10 WARNING/REC output connector**  
When trouble has occurred in the unit, the alarm device installed externally is activated. Error warning or recording low signal selected on the menu screen 3 is output.
- 11 GND terminal**  
This terminal is connected to the signal ground terminal of the connected unit in order to reduce noise. It is not connected to ground for safety purposes.
- 12 MIC input jack**  
Input jack (mini-jack) for an external microphone. This jack has precedence when signals are supplied simultaneously to this jack and the audio input connectors.
- 13 REMOTE control connector**  
For connecting the AG-A11 remote controller which is available as an optional accessory.
- 14 RS-232C connector**  
This connector enables basic operations of the unit using a personal computer (etc.)
- 15 Battery installation area**  
Install the battery in this area. See "Lithium Battery" on page 2.

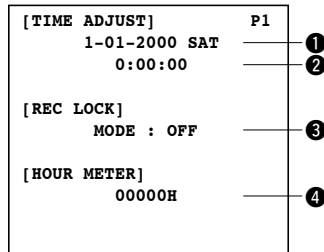


# Menu Screens

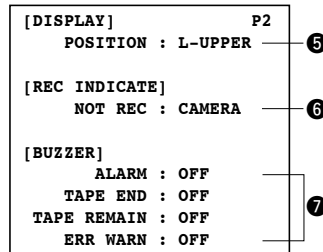
One of the menu screens appears on the TV monitor when the MENU/REC LOCK switch is set to MENU. The display returns to the regular screen when this switch is set to OFF.

- When a menu screen has appeared, the items are set using the page, shift and set buttons.
- Advance through the pages (“page up”) of the menu screen using the page button.
- Move the items (downward or toward the right) using the shift button.
- Change the items (increment or decrement the values) using the set button.

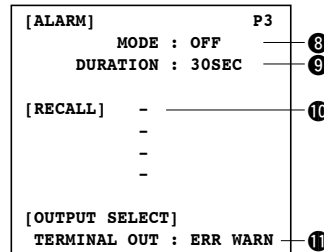
## MENU SCREEN 1



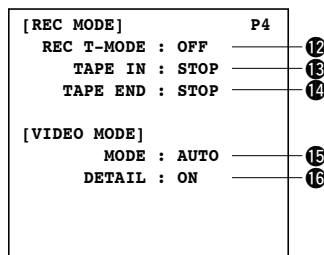
## MENU SCREEN 2



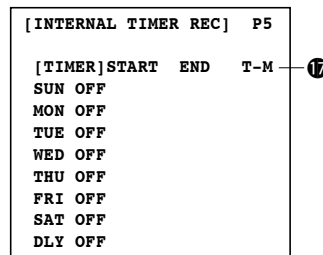
## MENU SCREEN 3



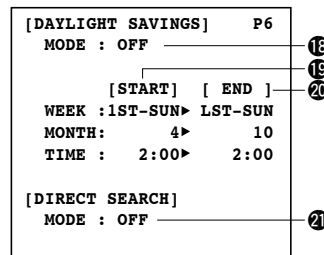
## MENU SCREEN 4



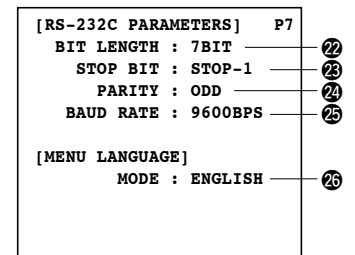
## MENU SCREEN 5



## MENU SCREEN 6



## MENU SCREEN 7



## MENU SCREEN 1

In addition to the date and time display and the recording mode lock setting which appear on the TV monitor, the hour meter is displayed on Menu Screen 1.

- 1 Date setting (see page 12)
- 2 Time setting (see page 12)
- 3 Recording mode lock

- 4 **Hour meter (see page 5)**  
This indicates the unit's total operation time (the cumulative total for the cylinder rotation time).

## MENU SCREEN 2

The time/date display position, monitor screen blue display and buzzer settings are performed on Menu Screen 2.

- 5 **Display position selection (see page 13)**  
This selects the position where the date and time are to be displayed on the TV monitor.  
(L-UPPER ↔ R-UPPER ↔ L-BOTTOM ↔ R-BOTTOM ↔ CENTER ↔ OFF ↔ L-UPPER...)
- 6 **Blue display**  
This sets a blue display on the monitor screen at all times except while recording or playback is in progress.  
**BLUE:** The display on the monitor screen is blue at all times except while recording or playback is in progress.  
**CAMERA:** The pictures from the video input connector are shown on the monitor screen at all times except while playback is in progress.
- 7 **Setting of the buzzer sound**  
**ALARM:** The buzzer sounds once alarm recording is performed.  
**TAPE END:** When the tape end is reached in the recording mode, the buzzer sounds while the tape is at the end.  
**TAPE REMAIN:** The buzzer sounds when there is only about 3% (with a T-120/T-160 tape) of the tape

remaining before the end is reached in the recording mode.

**ERR WARN:** The buzzer sounds when the unit is set to the warning status.

### To release the buzzer:

**ALARM:** Release alarm recording.

**TAPE END:** Transfer the mode from the tape end or press the STOP button.

**TAPE REMAIN:** Transfer the mode (but not to PAUSE or REC REVIEW) from the recording mode or press the REC button.

**ERR WARN:** Release the warning status.

- When TAPE END or TAPE REMAIN has been set to OFF, the buzzer will not sound; however, the REMAIN display will remain lit or flashing.
- When TAPE END or TAPE REMAIN has been set to ON, REMAIN lights or flashes on the display tube at the same time as buzzer sounds.  
They cease flashing when the buzzer is released.

### Note:

The remaining tape is displayed only with T-120 and T-160 tapes. It is not displayed when any other tapes are used.

# Menu Screens

---

## MENU SCREEN 3

The alarm recording mode and terminal output are set on Menu Screen 3.

### 8 Alarm recording mode selection (see page 20)

The recording mode in the event of an alarm input is selected. (OFF ↔ ALARM)

**ALARM:** When there is an alarm input during recording in the time lapse mode, the recording time mode is switched to 6H (alarm recording) and the details of the alarm status are recorded faithfully.

**OFF:** Alarm recording is not possible even when an alarm signal is input during recording.

### 9 Alarm recording duration setting

This sets the time elapsing from the start of alarm recording until its end. (30SEC ↔ 1MIN ↔ 2MIN ↔ 3MIN ↔ 5MIN ↔ 10MIN ↔ CONTINUE ↔ MANUAL ↔ 30SEC...)

**CONTINUE:** Alarm recording continues until the tape end.

**MANUAL:** Alarm recording is performed while the alarm input continues.

### 10 Alarm recall (see page 20)

This checks the date/time (up to 4) of the alarm signals.

### 11 Terminal connector output signal setting

**ERR WARN:** When trouble has occurred in the unit (AUTO OFF), the LOW signal is output.

**REC:** The LOW signal is output during recording.

## MENU SCREEN 4

Recording mode and video output are selected on Menu Screen 4.

### 12 Recording time mode selection (see page 14)

When recording starts, the set time mode is always established.

(OFF ↔ 6H ↔ L18H ↔ L24H ↔ 48H ↔ 72H ↔ 96H ↔ 120H ↔ 168H ↔ 180H ↔ 240H ↔ OFF...)

**OFF:** Any time mode can be set using the TIME MODE button on the front panel. It can be changed even while recording is in progress.

**6H:** 6-hour mode (compatible with the standard mode of ordinary VTR's).

**L18H/L24H:** L18-/L24-hour mode (linear slow recording).

**48H/72H/96H/120H/168H/180H/240H:** 48-/72-/96-/120-/168-/180-/240-hour mode (time lapse recording).

### 13 Selection of VTR operation when cassette is inserted

**STOP:** Stop mode

**REC:** Simply by inserting the cassette tape, recording is started automatically.

**REW▶REC:** When the cassette is inserted, it is first rewound to the start of the tape and then recording is started automatically.

### 14 Selection of operation when tape end is detected during recording (see page 18)

**STOP:** Stop mode

**REW:** The tape is automatically rewound to the start where it stops.

**REPEAT:** The tape is automatically rewound to the start, and recording is repeated.

**EJECT:** The tape is ejected.

### 15 Video signal mode

This selects the operation of the color/black-and-white automatic selector circuit.

**AUTO:** The circuit automatically identifies the type of video input or playback signals, and selects the color or black-and-white mode accordingly.

**COLOR:** The color mode is forcibly established.

**B\_W:** The black-and-white mode is forcibly established.

### 16 Playback picture quality selection

The detail of the playback images can be emphasized.

**OFF:** Regular mode

**ON:** The playback picture has emphasized outlines.

## MENU SCREEN 5

The internal timer recording modes are set on Menu Screen 5.

### 17 Internal timer recording mode setting (see page 16)

This sets the weekly timer or daily timer recording mode. (OFF/ON)

**OFF:** Internal timer recording is not set.

**ON:** Internal timer recording is set. (The start and stop times are set.)

### Note:

Internal timer recording does not operate when the date and time have not been set.

---

## MENU SCREEN 6

The daylight savings mode and search dial and jog dial operation mode are set on Menu Screen 6.

### 18 Selecting the daylight savings mode

Select the daylight savings mode.

**ON:** The daylight savings mode is selected.

**OFF:** The daylight savings mode is not selected.

### 19 Setting the start time for the daylight savings mode

Set the week, month and hour at which the daylight savings mode is to start.

**WEEK:** Select 1ST, 2ND, 3RD, 4TH or LST (last) and one of SUN through SAT.

**MONTH:** Select the starting month (1 – 12).

**TIME:** Select the start time (1:00 – 22:00)\*.

### 20 Setting the end time for the daylight savings mode

Set the week, month and hour at which the daylight savings mode is to end.

**WEEK:** Select 1ST, 2ND, 3RD, 4TH or LST (last) and one of SUN through SAT.

**MONTH:** Select the ending month (1 – 12).

**TIME:** Select the end time (1:00 – 22:00)\*.

### 21 Search dial and jog dial direct operation mode

Set the operation mode when the search dial or jog dial is to be used from another mode.

**ON:** The dial can be operated directly during STOP and STILL.

**OFF:** The dial can be operated after the STILL button is pressed.

Do not adjust the time setting between 23:00 and 1:00 during the daylight savings period.

\* Minutes are for reference only and cannot be adjusted.

## MENU SCREEN 7

The RS-232C parameters are set on Menu Screen 7.

### 22 Setting the bit length (7BIT/8BIT)

### 23 Setting the stop bit (STOP-1/STOP-2)

### 24 Setting the parity bit (ODD/EVEN/NON)

### 25 Setting the baud rate (4800BPS/9600BPS)

### 26 Selection of the menu display language (ENGLISH/FRANCAIS)

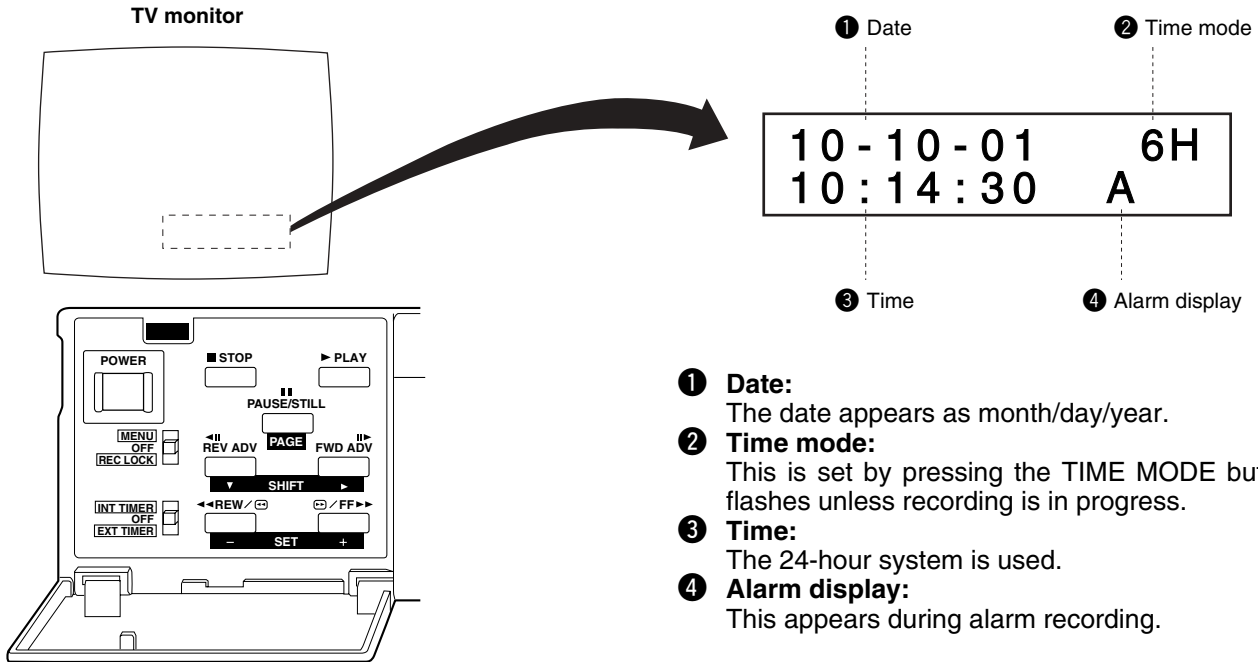
\* The underline denotes the factory setting.

#### CAUTIONS:

- The menu screens are not displayed while the unit is playing back a tape.
- While the unit is recording, the contents of Menu Screen 1 can be changed; however, Menu Screens 2 to 7 are for reference only and therefore cannot be changed.

# Date and Time Settings

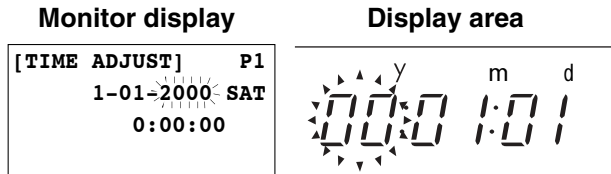
This unit comes with a time/date generator which enables the date and time to be superimposed on the recording. When the power is switched on, the date, time of the day and time mode are displayed (in the case of a regular screen).



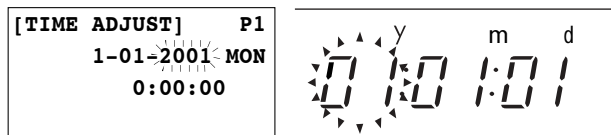
- 1 **Date:**  
The date appears as month/day/year.
- 2 **Time mode:**  
This is set by pressing the TIME MODE button. It flashes unless recording is in progress.
- 3 **Time:**  
The 24-hour system is used.
- 4 **Alarm display:**  
This appears during alarm recording.

**Example:** Setting the date and time to Saturday, March 3, 2001 at 3:25.  
The time mode is set to 48 hours.

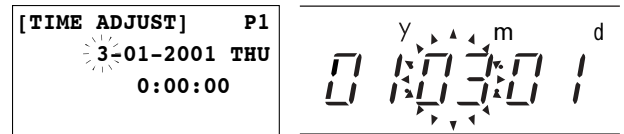
- 1 Set the MENU/REC LOCK switch to MENU. Menu Screen 1 appears, and the year digits flash.



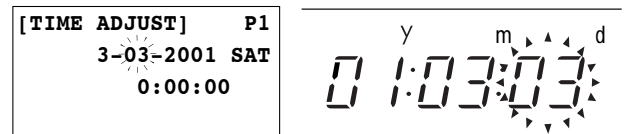
- 2 Press the SET (+, -) buttons to set the year to "2001".



- 3 When the shift (▶) button is pressed, the month digits flash. Press the SET (+, -) buttons to set the month to "3".

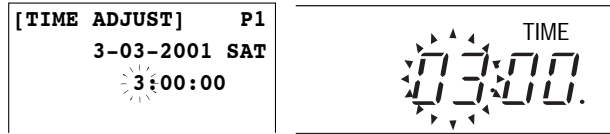


- 4 When the shift (▶) button is pressed, the day digits flash. Press the SET (+, -) buttons to set the day to "03".

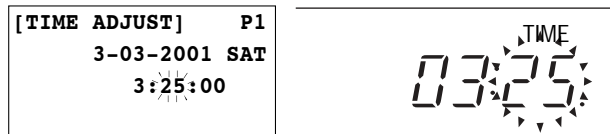


• The year can be set from 2000 to 2079.

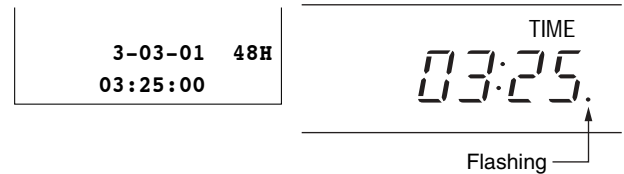
- 5 When the shift ( ▼ ) button is pressed, the hour digits flash.  
Press the SET (+, -) buttons to set the hour to "3".



- 6 When the shift ( ► ) button is pressed, minute digits flash.  
Press the SET (+, -) buttons to set the minutes to "25".

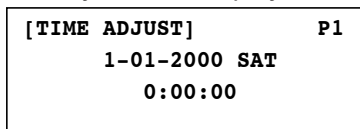


- 7 When the MENU/REC LOCK switch is set to OFF, the clock automatically starts running from time and date set.



For the seconds, "00" is set.  
Even when the switch is set to MENU, the time will keep advancing if it has not been changed.

- To clear the date and time display, set POSITION under (DISPLAY) on Menu Screen 2 to OFF.
- Even if the power should fail for a period of up to one week, the date, time and other display time mode data are stored in the memory (but only if power has been supplied continuously to the unit for 3 or more days).  
When the unit has just been purchased or when it has not been used for along time, the data is not stored in the memory and the display shown below appears.

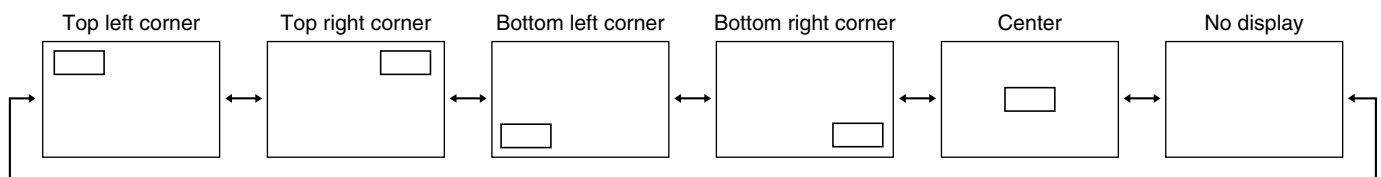


When the time is reset to "0:00:00" as described, check the menu settings. If any of the settings are incorrect, please set them again.

- For the date setting, the unit automatically adjusts for leap years.
- Due to temperature fluctuations and other factors, the clock time may run fast or slow with a monthly error of up to ±60 seconds. This is not indicative of malfunctioning. Reset the time at regular intervals.

## Time/Date Display Position

The position of the date and time displays on the TV monitor changes as shown below when (DISPLAY) on Menu Screen 2 is changed.



- 1 Set the MENU/REC LOCK switch to MENU to display to menu screens. Press the page button to display Menu Screen 2 on the TV monitor.  
□ POSITION : ~~L-UPPER~~

- 2 Press the set (+, -) buttons to position the display as desired.

□ POSITION : ~~L-BOTTOM~~

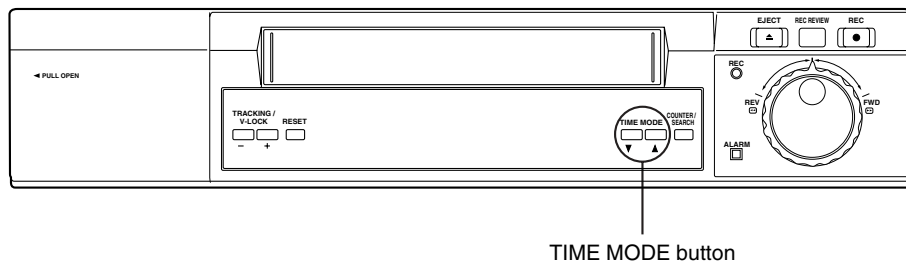
- 3 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored, and the date and time appear at the selected position.

### TIME/DATE display position adjustment function

When the unit is in STOP or EJECT mode, the position of the displayed time/date can be adjusted by pressing the TRACKING (-) or TRACKING (+) button.

- Pressing the TRACKING (-) button moves the position vertically. (Pressing the button 3 times will return the display to its original position.)
- Pressing the TRACKING (+) button moves the position horizontally. (Pressing the button 3 times will return the display to its original position.)
- Pressing the (-) and (+) buttons simultaneously will return the display to its original position (factory setting).

# Time Mode Selection



Refer to the table given below to select the mode that suits the intended purpose of use.

Tape type Mode	Recordable time (hours)		Video recording interval (sec.)	Pictures per second (fields)	Sound recording	Camera switching interval (sec.)	Tape replacement standard (recording times)
	T-160	T-120					
6 hours	8	6	1/60	60	Yes	1/30	—
L18 hours	24	18	0.05	20	Yes	0.05	50
L24 hours	40	24	0.083	12	Yes	0.083	50
48 hours	—*	48	0.150	6.67	No	0.150	25
72 hours	—*	72	0.217	4.62	No	0.217	20
96 hours	—*	96	0.283	3.53	No	0.283	20
120 hours	—*	120	0.350	2.86	No	0.35	15
168 hours	—*	168	0.483	2.07	No	0.483	10
180 hours	—*	180	0.517	1.94	No	0.517	10
240 hours	—*	240	0.683	1.46	No	0.683	10

\*: Avoid using 160-minute tapes with any of the modes from 48 hours to 240 hours.

## Notes on operation

- This unit is designed with the T-120 cassette tape as a reference.
- Recording is possible up to 240 hours with this unit when the T-120 cassette tape is used.
- Depending on the type of video cassette used, the recordable time will differ.
- Depending on the type of tape used, it may be possible to record for slightly longer than the times shown in the “Recordable time” column in the table above.  
For example, 30 hours of recording are possible when a 120-minute tape is used with L24-hour mode.
- Sound can be recorded in 6, L18 and L24 hour modes.
- The L18-hour to 240-hour modes are time lapse modes. Pictures are recorded with frames skipped to enable lengthy recording and playback.
- A tape recorded in a time lapse (L18-hour to 240-hour) mode can be played back in quick motion in the 6-hour mode.
- A tape recorded in the 6-hour mode can be played back in slow motion using the time lapse (L18-hour to 240-hour) mode.
- A tape recorded in the 2-hour mode on a different VTR can be played back in the 2-hour mode.
- Tapes recorded on this machine cannot be played back other VHS video recorder as they are not compatible.
- Recording and playback in the 6H, L18H and L24H time modes with this unit are in the same format as in the 8H, 24H and 40H time modes with the AG-RT650. The time mode display differs from the AG-RT650.

## Selecting the cassette tape

The unit is designed as a product required to exhibit high reliability in surveillance, security, monitoring, etc. In order to maintain its recording reliability, it is recommended that the video tapes listed below be used.

- <VHS tapes>
- T-160
  - T-120
  - T-90
  - T-60
  - T-30
  - Avoid using 180-minute tapes with this unit.

# Recording Procedure

---

- ① Switch on the power to the connected equipment.
- ② Adjust so that the images of the video cameras appear properly on the TV monitor.
- ③ Check that the date and time displayed on the TV monitor have been adjusted properly.
- ④ Insert a cassette tape into the unit after checking that the tab on the cassette is intact.
- ⑤ Set the timer recording, auto repeat recording, alarm recording, restoration-of-power-after-failure recording or other recording function.
- ⑥ Select the time mode for the recording.
- ⑦ Press the REC button.

## Notes on operation

- If the PAUSE/STILL button is pressed during recording, the unit is set to the pause mode, and after about 5 minutes in this mode it is transferred to the stop mode.
- Neat frame-to-frame continuity is not achieved if the recording mode is set again after the PAUSE/STILL button is pressed during recording.
- When the MENU/REC LOCK switch has been set to OFF, other operations can be performed during recording.
- When restoration-of-power-after-failure recording is performed, recording can be continued in the same time mode even if the power should fail provided that the power is restored within about one week. (This applies only if the power has been supplied continuously for 3 or more days.)
- When performing auto repeat recording or timer recording, do not neglect to conduct the routine inspections.
- When recording images from a black-and-white camera, set the video signal mode on Menu Screen 4 to B\_W.
- Remove the cassette tape if the unit is to be left standing for a prolonged period of time.
- When the power supply is interrupted during recording (with the power switch still ON), a non-recorded portion will be made in the beginning of the tape travel, or the tape will be over-recorded at its ending section. But this is not a malfunction.

# Tips For Better Recording

---

In order to ensure greater reliability in monitoring, surveillance and other continuous operations lasting many hours, this unit comes with some safety functions for recording. Read the following descriptions of these functions before proceeding to operate the unit.

## Recording Mode Lock

There are two ways, as described below, to maintain the recording mode during recording by disabling the operations of the power switch as well as the TIME MODE and operation buttons.

- ① Set the MENU/REC LOCK switch to REC LOCK.
- ② Set REC LOCK on Menu Screen 1 to ON. (See Note)

The following button and connectors are operational during recording even if the MENU/REC LOCK switch is set to REC LOCK.

- Alarm input connector, alarm reset connector
- REC REVIEW

## Recording Check

When the REC CHECK button is pressed during recording, the tape runs temporarily in the reverse direction, and the recorded section is played back. This function can be used to check the daily operation of the equipment in the system.

## Restoration-of-Power-After-Failure Recording

When a power failure has occurred during recording, the unit automatically starts recording if the power is restored within approximately one week.

- When the power fails, the tape “losing” safety protection function is activated to protect the video heads and video tape.

Before power is restored	After power is restored
• Stop, play, fast forward	Stop mode is established.
• Recording	Recording mode is established.
• Auto rewind • Auto rewind during auto repeat recording	Unit is returned to the mode applying before the power failed.

### Notes:

- When the power cord has come out of the socket or a power failure has occurred, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.
- Once the recording mode is established, recording cannot be released until REC LOCK on Menu Screen 1 is set OFF.



# Timer Recording

There are two methods of timer recording: one uses the internal timer and the other uses an external timer.

## Internal Timer Recording

### Start time and stop time

Bear in mind the following points when setting these times.

- **When the stop time is set later than the start time:**  
Recording will commence at the start time on the day concerned and stop at the end time on the same day.  
Example: 8:30 → 17:00
- **When the start time is set later than the stop time or the start time and stop time for weekly recording (weekly timer) are the same:**  
Recording starts at the start time on the day concerned and ends at the stop time on the following day.  
Example: 17:00 → 8:30
- **When the start time and stop time are the same (for weekly recording):**  
Recording starts at 8:30 on the day concerned and ends at 8:30 on the following day.  
Example: 8:30 → 8:30

To record for an entire day, set the start time and stop time to 0:00.

- Weekly recording (weekly timer) can be set by the day of the week.
- When (INTERNAL TIMER REC) on Menu Screen 5 is set to OFF for both the weekly timer and daily recording (daily timer), nothing appears for the start or stop time. Timer recording is considered not to be set.

### Internal timer recording operation

- 1 Check that a video cassette with its tab intact has been inserted.
- 2 Check that the TV monitor shows the correct present time.
- 3 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button so that the INTERNAL TIMER REC timer setting screen appears on the TV monitor.

```
[INTERNAL TIMER REC] P5  
  
[TIMER] START  END  T-M  
SUN OFF  
MON OFF  
TUE OFF  
WED OFF  
THU OFF  
FRI OFF  
SAT OFF  
DLY OFF
```

### VTR operations after the settings

- The unit's power is turned off, and even if other buttons are pressed, their operations are not accepted.
- When the start time and stop time have not been set, INT flashes on the display.

### Releasing the internal timer mode

Set the TIMER MODE switch to OFF to clear INT on the display.

#### Note:

- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

- 4 Set the operation times of the internal timer.
  - For details on the settings, refer to the sections on "Daily timer" or "Weekly timer." (See page 17.)
- 5 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.
- 6 Set the TIMER MODE switch to INT TIMER so that INT lights on the display.

When the time and date for Menu Screen 1 have not been set, a cassette has not been inserted, the timer has not been set, or when a cassette with a broken out tab has been inserted, the buzzer sounds and INT flashes on the display.

## Daily Recording (Daily Timer)/Weekly Recording (Weekly Timer)

**Example:** When recording from 8:30 to 12:00 from Sunday through Thursday and from 9:00 to 12:00 on Fridays and Saturdays

- 1 Check that OFF or ON for Sunday (SUN) is flashing. If the setting is OFF, press the set (+, -) buttons to display ON.

```
[INTERNAL TIMER REC] P5
[TIMER]START END T-M
SUN OFF
MON OFF
```

- 2 When the shift (▶) button is pressed, the setting moves to the start time and the "hour" digits flash.

SUN ON 0:00▶ 0:00

- 3 Press the set (+, -) buttons to display "8."

SUN ON 8:00▶ 0:00

- 4 When the shift (▶) button is pressed, the "minutes" digits flash.

SUN ON 8:00▶ 0:00

- 5 Press the set (+, -) buttons to display "30".

SUN ON 8:30▶ 0:00

- 6 When the shift (▶) button is pressed, the "hour" digits flash.

SUN ON 8:30▶ 0:00

- 7 Press the set (+, -) buttons to display "12".

SUN ON 8:30▶ 12:00

- 8 When the shift (▶) button is pressed, the "minutes" digits flash.

SUN ON 8:30▶ 12:00

- 9 Press the set (+, -) buttons to display "00".

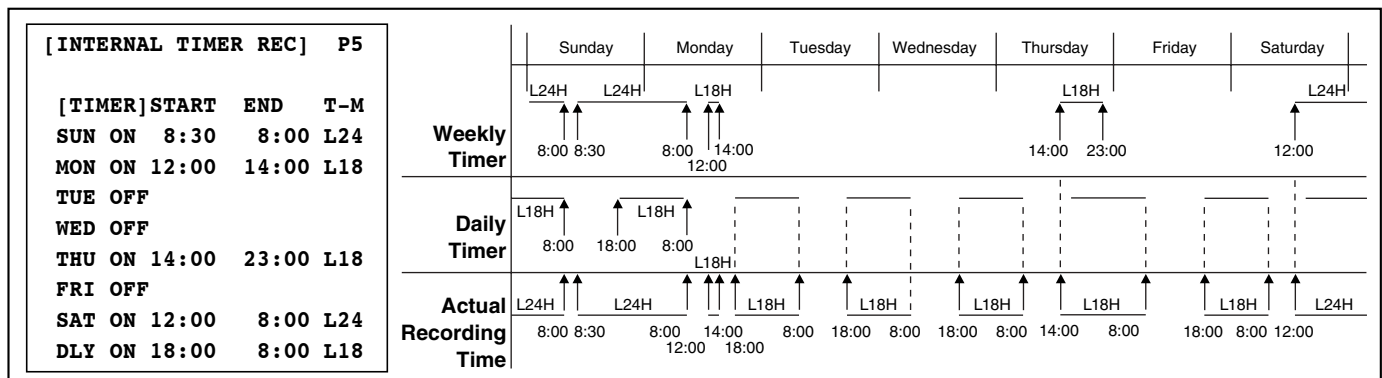
SUN ON 8:30▶ 12:00

- 10 Press the shift (▶) button to set the recording time mode (6, L18, L24, 48, 72, 96, 120, 168, 180 and 240 hour mode). When the shift (▼) button is pressed, the MON is flashing.

SUN ON 8:30▶ 12:00 24

- 11 Following the same procedure in steps 1 to 10, display the start time of "8:30" and stop time of "12:00" from Monday (MON) through Thursday (THU). Following the above procedure, set the times for Friday (FRI) and Saturday (SAT) as well. In this way, the timer operation times have been set for each day of the week. The settings for daily recording (daily timer) are also performed following the same steps 1 to 10.

- The setting shown on the screen at the left translates into the weekly and daily timer recording combinations shown below which, in turn, means that the actual recording time on the tape is shown at the bottom.

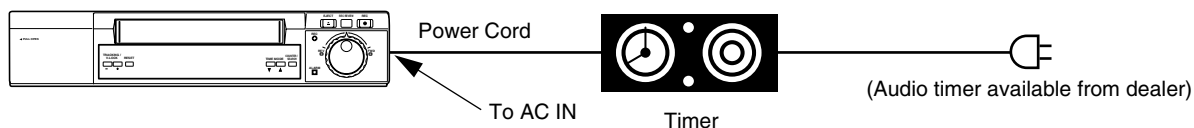


- The day of the week time settings are displayed, enabling the settings to be checked for each day of the week.
- Proceed with the setting with due consideration given to the total recording time since a 120-minute tape is long enough to provide recording for up to 240 hours only.

# Timer Recording

## External Timer Recording

The unit can be made to record using an external timer to turn on its power.



## External timer recording operations

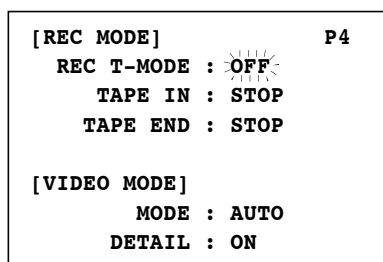
- 1 Check that a video cassette with its tab intact has been inserted.
  - 2 Set the TIMER MODE switch to EXT TIMER so that EXT lights on the display. At the set time, power is supplied from the external timer and the unit is set to the recording mode.
- If the video cassette tape has not been inserted or if its accidental erasure prevention tab has been broken, EXT will flash on the display, and external timer recording cannot be conducted.
  - Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.
  - Depending on the tape position, some of the images at the start of the external timer recording may not be recorded or may record over the images at the end of the previous external timer recording.

# Auto Repeat Recording/Auto Rewinding

**Auto repeat recording:** This function automatically rewinds the cassette tape when its end is detected in the recording mode, and it repeats recording from the start of the tape.

**Auto rewinding:** This function automatically rewinds the tape to the start when the tape end is detected in the recording mode.

- 1 Check that a video cassette with its tab intact has been inserted.
- 2 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display Menu Screen 4 on the TV monitor.
- 3 Press the shift ( ▼ ) button to move the flashing to TAPE END. Press the set (+ or -) button to display REPEAT for auto repeat recording or REW for auto rewinding.
- 4 "R" lights on the display.
  - If auto rewinding has been selected, "R" is cleared.
- 5 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.



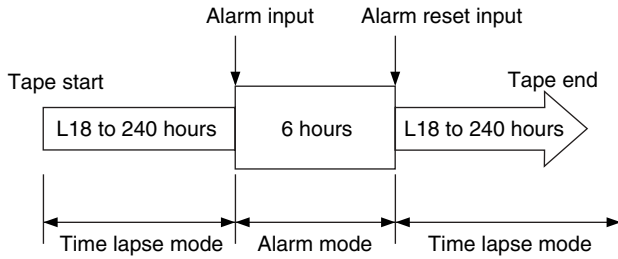
## Notes of operation

- When auto repeat recording is to be performed, do not neglect the routine inspections. Since the image deteriorates when the same tape is used over and over again for auto repeat recording, replace the tape with a new one after about 50 recordings. When the tape is removed and then reinserted, the number changes to 01.
- Alarm signals are not accepted during auto rewinding, and so alarm recording is not performed.
- If an alarm signal is supplied during auto repeat recording, the alarm recording mode is established. If the tape then reaches its end, auto repeat recording is performed but alarm recording is released.
- If TAPE END on Menu Screen 4 has been set to REPEAT, use a DURATION other than MANUAL.
- When the power cord has come out of the socket or a power failure has occurred, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.

# Alarm Recording (Emergency Recording)

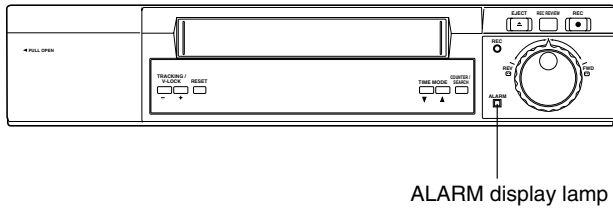
When an emergency occurs at the monitoring site during prolonged monitoring and recording, the alarm function is automatically triggered, and alarm recording is performed.

## Principle of Alarm Recording

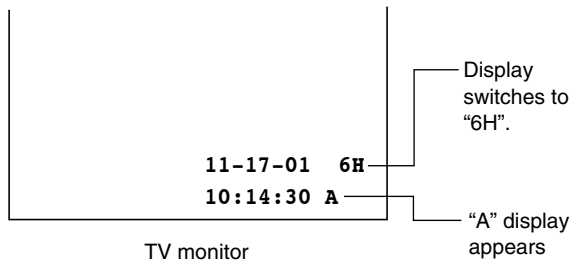
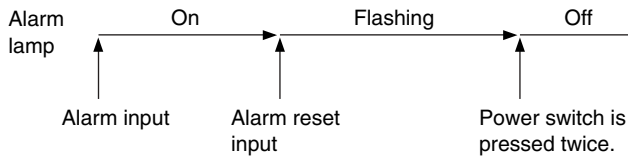


- When an alarm signal is supplied by an alarm sensor (door or intercom switch, etc.) during recording in a time lapse mode, the recording speed is switched to the 6-hour mode and the details of the state of emergency are faithfully recorded.

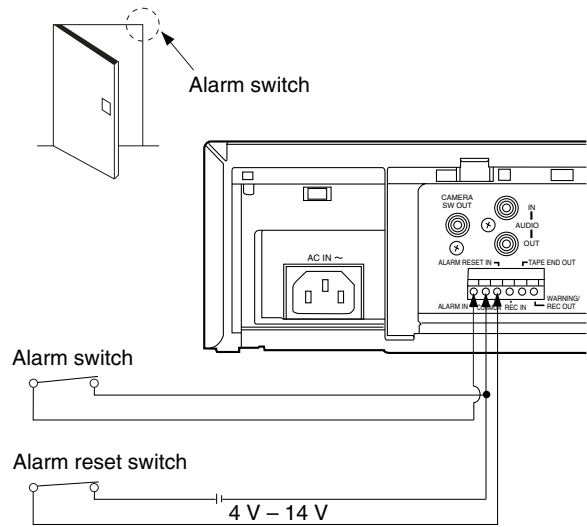
## Alarm and Display Methods during Alarm Recording



- When an alarm signal is supplied, the alarm display lamp functions as follows.



## Connecting the Alarm Input Connector



- Alarm recording starts when the alarm switch is set on. When the alarm reset switch is set ON after recording has started, alarm recording is released and operation is returned to the original time lapse recording mode.
- Alarm recording can be released by pressing the STOP button during alarm recording. However, it cannot be released even by pressing the STOP button if the MENU/REC LOCK switch is at REC LOCK or INT is lighted on the display.
- Alarm recording can be automatically reset without supplying the alarm reset input signal. The reset time can be set for 0.5, 1, 2, 3, 5 or 10 minutes.
- Another option is alarm recording only while the alarm input signal is supplied.
- Alarm recording is also possible as far as the end of the tape.
- When the alarm mode is OFF, alarm recording is not possible even if the alarm switch is set to ON.

# Alarm Recording (Emergency Recording)

## Alarm Recording Operation

- 1 Check that a video cassette with its tab intact has been inserted.
- 2 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor.

```
[ALARM] P3
      MODE : OFF
      DURATION : 30SEC

[RECALL] -
          -
          -
```

- 3 Press the set (+ or -) button to display ALARM for MODE.

```
MODE : ALARM
```

- If TAPE END on Menu Screen 4 has been set to REPEAT, the auto repeat recording mode is established when the tape comes to the end. When auto repeat recording is to be performed, use an alarm recording interval setting other than MANUAL.
- With emergency recording, set the unit to the POWER OFF or STOP mode.

- 4 Press the shift (▼) button to move the flashing to DURATION. Press the set (+ or -) button to set the recording duration.

```
DURATION : 30SEC
```

- 5 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.

If an alarm input signal is subsequently supplied, the time mode set to 6H, and alarm recording continues until the alarm is released.

## Alarm Recall

The date and time when the alarm signal was input can be ascertained on the TV monitor by checking the alarm input time in the RECALL item on Menu Screen 3.

- 1 Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor.
- 2 Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.

```
[ALARM] P3
      MODE : ALARM
      DURATION : 30SEC

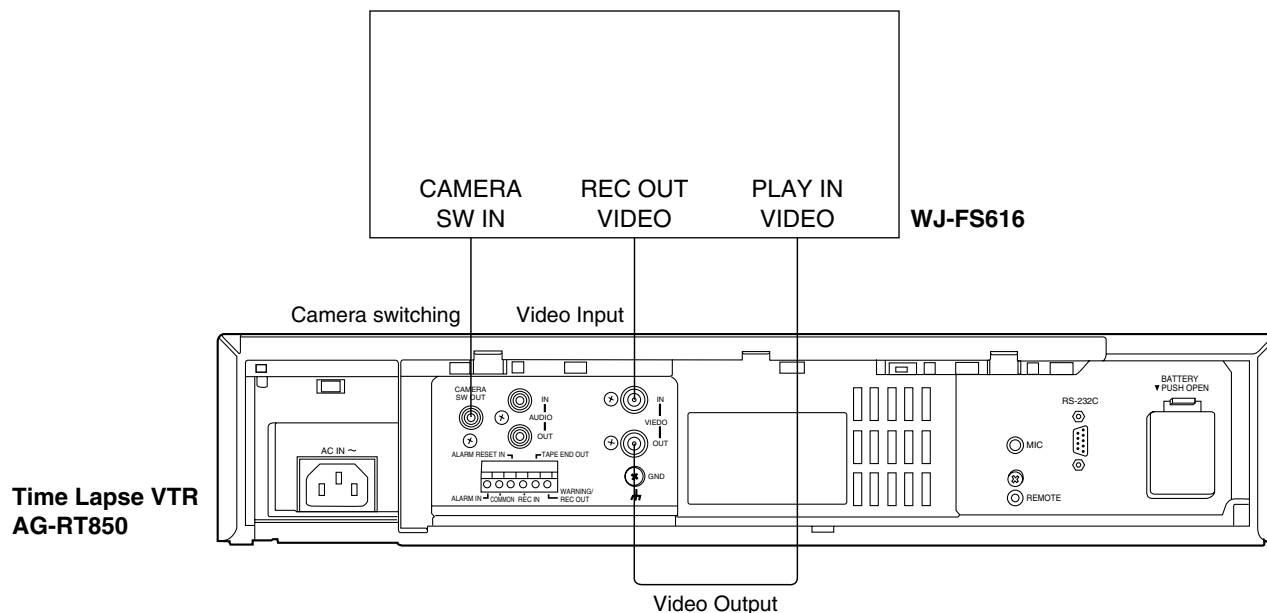
[RECALL] 10-10-01 20:19
          9-14-01 12:05
          8-30-01 08:40
          6-25-01 04:14

[OUTPUT SELECT]
      TERMINAL OUT : ERR WARN
```

- The alarm recall function stores up to 4 alarm input times in the memory and displays them on the screen. If there have been more than 4 inputs, they will be deleted from the screen in sequence starting with the oldest data.
- When the RESET button is pressed while Menu Screen 3 is on the display, the alarm recall memory can be cleared.

# Frame Switcher Connection and Recording

## Connections (using the WJ-FS616)



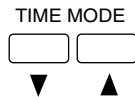
- Do not supply signals from color cameras and black-and-white cameras simultaneously to the camera input connectors since this may disturb the synchronization on the monitor screen or generate noise.
- During playback, turn the Quasi-V insertion to ON or OFF with the FWD ADV button. This enables the appearance of the pictures of other cameras to be reduced.

# Playback Procedure

Before operating the unit, check that the internal/external timer recording displays (INT/EXT) have been cleared from the display. (If INT or EXT is displayed, use the TIMER MODE switch to clear it.)

- ① Switch on the power to the unit and TV monitor.
- ② Insert the recorded cassette tape into the unit.
- ③ Select the time mode.

- ④ Press the PLAY button.

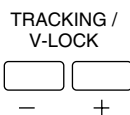


## Notes on operation

1. Bear in mind the following points when playing back parts of a tape recorded in a time lapse (L18 to 240 hour) mode.
  - When the tape is played back in the same mode, noise resembling dropouts will appear on the screen: this is not indicative of malfunctioning.
  - The picture may oscillate in the vertical direction: this is not indicative of malfunctioning.
  - When a tape is played back in the same time mode, the picture may shake slightly sideways: this is not indicative of malfunctioning.
  - Turn Quasi-V insertion ON (◻▶) or OFF (▶) with the FWD ADV button. Dancing can be minimized when a tape is played back in a time lapse (L18 to 240 hour) mode. Moreover, playing back a tape in a system featuring a frame switcher enables the appearance of the pictures of other cameras to be reduced.
2. Bear in mind the following points when playing back parts of a tape recorded in a VHS mode (6 hours).
  - When a tape is played back in a time lapse mode, slight noise may appear at the top and bottom of the screen: this is not indicative of malfunctioning.
3. When noise has occurred during still-picture playback, press the FWD ADV button to play it out. (It may not always be possible to play out the noise.)
4. Bear in mind that if the power cable is disconnected and then re-connected or if the power has been restored after it has failed when the tape was played with EXT indicated on the display by the TIMER MODE button, the unit will automatically be set from playback to the recording mode.
5. When the PAUSE/STILL button is pressed during playback, the unit is set to the pause mode, and a still picture PLAY button. If the unit is kept in the pause mode for more than 5 minutes, it will be set to the stop mode.
6. If the horizontal AFC on the TV monitor is too long or when a video camera with random interlace scanning has been used, the top area of the TV monitor may be distorted: this is not indicative of malfunctioning.
7. A tape recorded in the 2-hour mode on a different deck can be played back in the 2-hour mode. However, it cannot be played back in time lapse (L18 to 240 hour) mode.
  - “6H” appears when a tape is played back which was recorded for 6 hours using another VTR.
8. Tapes recorded on this machine cannot be played back other VHS video recorder as they are not compatible.
9. When the power cord has come out of the socket or a power failure has occurred during fast forwarding or rewinding, no operations will be acknowledged for about 30 seconds after the power has been restored: this is to protect the tape.

## Tracking

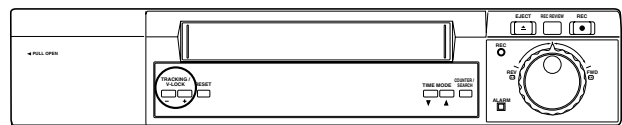
When noise such as that shown below appears on the playback image in the 6-hour time mode, press the tracking (+ or -) button to minimize the noise.



- For the tracking default setting, press the “+” and “-” buttons together (in the 6-hour time mode only).
- In the L18 or L24 hour mode, press the “+” or “-” button to adjust the tracking.

## Vertical Hold Adjustment

If the image shakes slightly in the vertical direction during still-picture playback, press the V-LOCK buttons (-, +) to reduce the dancing.



- If the TV monitor has a vertical hold control, adjust that control also.



# RS-232C Interface

## 1. Outline of RS-232C interface

This interface is for enabling the basic functions of the VTR to be operated using a personal computer.

- The D-SUB 9P connector is used to connect the VTR with the personal computer.

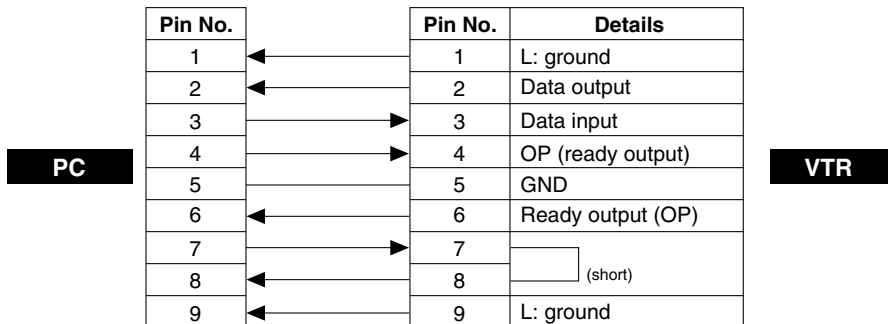
## 2. Hardware specifications

### ■ D-DUB 9-pin connector specifications

- Connector: D-DUB 9P, female
- Compatible cable: Straight cable

### D-SUB 9P input signals

Pin No.	Abbreviation	Circuit name	Details
1	CD (DCD)	Carrier detection	PC receives this signal.
2	RD (RXD)	Received data	PC receives data.
3	SD (TXD)	Transmitted data	PC sends data.
4	ER (DTR)	Data terminal ready	PC sends this signal.
5	SG (-)	Signal ground	Signal ground
6	DR (DSR)	Data set ready	PC receives this signal.
7	RS (RTS)	Request to send	PC sends this signal.
8	CS (CTS)	Clear to send	PC receives this signal.
9	CI (RI)	Ring indicator	PC receives this signal.



# RS-232C Interface

---

## 3. Protocol

### ■ Receiving format (personal computer → VTR)

General format: stx command [:data] [;command [:data]] etx

stx: 02h (HEX)  
; (semicolon): 3Bh command delimiter  
command: ccc  
ccc: command (3 ASCII characters)  
: (colon): 3Ah parameter delimiter  
data: parameter (any number: based on command)  
etx: 03H

In some cases, the format does not contain what is enclosed in the square brackets.

### ■ Example

stxO S Petx (stop command)  
02,4F,53,50,03 (stop command in HEX notation)

### ■ Sending format (personal computer ← VTR)

#### • Command receive verification

ack (with error-free receipt of command)  
nak e (when communication error has occurred)  
e: error code  
1: parity error  
3: framing error  
4: overrun error

#### • Response message

General format: stx message [:data] etx

#### • Error message (when error has occurred in protocol or command)

General format: stx error message etx

ack: 06h  
nak: 15h  
stx: 02h  
message: mmmm  
mmmm: message (any number of ASCII characters)  
: (colon): 3Ah parameter delimiter  
data: parameter (any number)  
error message: ERnnn (error code)  
nnn: 3-digit number  
001: Invalid command (not supported)  
002: Invalid parameter  
003: Receive buffer overflow  
004: Defective connection  
etx: 03h

### ■ Explanatory description

- As soon as the receive buffer becomes full, receive buffer overflow is returned, and subsequent commands are canceled.
- The ACK or NAK response must commence within 20ms.
- When a new command has been received during the processing of a non-interruptible command, the receive verification code is returned within 20ms, after which the applicable ERROR code is returned, and the processing of the previous command is resumed.
- When it takes time for execution to be completed, it is to be possible for the next command to be processed (in principle, after the ACK response) without waiting for the completion of the said execution. (This applies only to commands whose processing can be interrupted.)
- When a command which does not entail a transfer of the deck mode is received, the message of having completed the received command is returned regardless of the deck mode.

## ■ Table of commands

Command	Command parameter	Completion message	Interruptible ○: Yes ×: No
Counter reset	CRT	CRT	×
Eject	OEJ	OEJ	×
Fast forward	OFF	OFF	×
Pause/still	OPA	OPA	×
Play	OPL	OPL	×
Record	ORC	ORC	×
Rewind	ORW	ORW	×
Stop	OSP	OSP	×
Field advance (+)	OAF	OAF	×
Field advance (-)	OAR	OAR	×
Power ON	PON	PON	×
Power OFF	POF	POF	×
Recording check	ORR	ORR	×
Tracking (+)	ZTU	ZTU	×
Tracking (-)	ZTD	ZTD	×
Auto tracking	ZTA	ZTA	×
Time setting	LTJ	LTJ	×
Time mode switching	LTM: *	LTM	×
Key lock setting	RML: **	RML	×
Display switching	LFI: *	LFI	×
Version request	QRV	VER a. ee date	×
Communication check	RCK	RCK	×
Counter data request	QCD	QCD fwghmmss	×
ID request	QID	AG-RT ****	×
Status request	QOP	***	×
All status request	QOS	OPS ddddd	×
Time mode request	QLT	LTM*	×
Display status request	QFI	LFI*	×
Key lock request	QRM	RML*	×
ACK return ON	RAN	RAN	×
ACK return OFF	RAF	RAF	×
ACK return status request	QRA	RA*	×
Automatic send setting command	OCS: *	OCS	×
Automatic sent setting request	QSC	OCS*	×
Search forward	OSF: *	OSF	×
Search reverse	OSR: *	OSR	×

### Notes:

- With ACK return ON, [ACK] is returned from the VTR with the LTM and QID commands only.
- \* denotes parameters.






# Troubleshooting

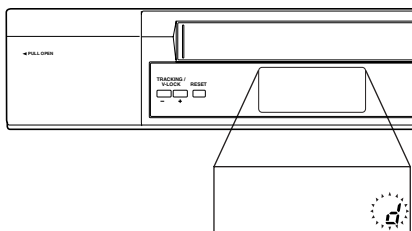
## Trouble with installation

- |                     |   |
|---------------------|---|
| No power.           | <ul style="list-style-type: none"> <li>• Is the power plug inserted properly into the AC outlet?</li> </ul>   |
| No picture.         | <ul style="list-style-type: none"> <li>• Is the unit connected properly with the TV, video cameras, etc.?</li> <li>• Are any of the connecting cables making faulty contact?</li> </ul> |
| Indistinct picture. | <ul style="list-style-type: none"> <li>• Has the focus on the video cameras been adjusted correctly?</li> </ul>   |


## Trouble with functions or operation

- |  |   |
|--|---|
| Nothing happens even when operation buttons are pressed. | <ul style="list-style-type: none"> <li>• Is the video cassette loaded?</li> <li>• Is the MENU/REC LOCK switch at OFF?</li> <li>• Has the video cassette been inserted properly? Press the EJECT button to eject the cassette and insert properly.</li> <li>• Has INT lighted on the display?</li> <li>• Has the mode lock been applied through control exercised by the RS-232C interface?</li> </ul> |
|--|---|

- |   |  |
|---|--|
| "  mark is flashing. | <ul style="list-style-type: none"> <li>• The unit will not operate because its safety protection function has been triggered. Wait until the flashing disappears.</li> </ul> |
|---|--|




### In case of moisture detection:

The " mark at display section flashes.



Ejection will remain incomplete when a video cassette has been inserted.



Wait until the " mark goes out with POWER switch turned "ON". It may take a few hours, although it depends upon conditions.

- |   |  |
|---|--|
| Date and time display data has not been stored in memory when the power failed. | <ul style="list-style-type: none"> <li>• Has the unit's power plug been disconnected from the power outlet for a long time?<br/>Insert the unit's power plug into the power outlet and supply power continuously for at least 3 days to the unit.</li> </ul> |
|---|--|

## Trouble with recording

- |   |  |
|---|--|
| Tape can be played, fast forwarded or rewind but not recording results. | <ul style="list-style-type: none"> <li>• Is the tab on the video cassette broken?</li> </ul>   |
| Recording has stopped.  | <ul style="list-style-type: none"> <li>• Is the video cassette tape at its end?</li> <li>• Have more than 5 minutes elapsed since the PAUSE/STILL button was pressed during recording?</li> <li>• Are the routine inspections being carried out? If this phenomenon keeps recurring, it means that some failure or other is to blame. Consult with your dealer.</li> </ul> |

The power has been restored after a power failure but recording does not automatically resume.	<ul style="list-style-type: none"> <li>• Has the power failure lasted a long time (more than 1 week)? Set the timer recording switch to EXT to ensure that the unit is set to the recording mode even after a prolonged power failure.</li> </ul>
Recording cannot be stopped.	<ul style="list-style-type: none"> <li>• First set the MENU/REC LOCK switch to OFF and then operate.</li> <li>• Is REC LOCK on Menu Screen 1 at OFF?</li> <li>• Has the mode lock been applied through control exercised by the RS-232C interface?</li> </ul>
1-week programmed timer recording cannot be conducted properly.	<ul style="list-style-type: none"> <li>• Are the date and time on the regular displays correct? (See page 12)</li> </ul>
One or more cameras do not record when a multiple number of cameras are used.	<ul style="list-style-type: none"> <li>• Turn the time adjustment control on the frame switcher, and adjust it to a setting which is longer than the video recording duration in the recording time mode.</li> <li>• Connect a camera switching cable between the unit and frame switcher. (See page 21)</li> </ul>
No auto repeat recording.	<ul style="list-style-type: none"> <li>• Has the stop button been pressed during auto rewinding?</li> </ul>
No timer recording.	<ul style="list-style-type: none"> <li>• Are the present time and start/stop times for the timer recording correct?</li> <li>• Has INT or EXT lighted on the display?</li> </ul>
No alarm recording.	<ul style="list-style-type: none"> <li>• Have the alarm sensors and alarm input connectors been connected properly?</li> <li>• Has the alarm recording mode been selected on Menu Screen 3?</li> </ul>

### Trouble with playback

Noise sometimes appears on the playback pictures.	<ul style="list-style-type: none"> <li>• Adjust the tracking buttons. (See page 22)</li> </ul>
Dirty playback picture.	<ul style="list-style-type: none"> <li>• The video heads may be dirty or clogged or they may have reached the end of their service life. Consult with your dealer.</li> </ul>
“Snow” on playback picture.	<ul style="list-style-type: none"> <li>• The video heads may be dirty or clogged. Consult with your dealer.</li> </ul>
While a multiple number of cameras are being used, two scenes appear as the playback picture when the cameras are switched.	<ul style="list-style-type: none"> <li>• Has the camera switching signal cable been connected properly?</li> </ul>
Recording starts when the unit’s power plug is connected to or disconnected from the power outlet.	<ul style="list-style-type: none"> <li>• Has INT or EXT lighted on the display?</li> </ul>
No playback because recording starts when the main power for the connected equipment is set to ON.	<ul style="list-style-type: none"> <li>• Has INT or EXT lighted on the display?</li> </ul>



# Specifications

**Power Source:** 120 V AC, 50 – 60 Hz  
**Power Consumption:** 21 W

 is the safety information.

## Video Recording

**System:** 4 rotary heads, helical scanning  
**Tape Speed:** 11.12 mm/s (6-hour mode)  
**Tape Format:** Tape width 12.7 mm (1/2 inch),  
**VHS** tape  
**Recording Time:** 6 hours (with T-120, 6H mode)  
 8 hours (with T-160, 6H mode)  
**FF/REW Time:** Less than 2.5 min. (with T-120)

## VIDEO

**Television System:** EIA Standard (525 lines, 60 fields)  
 NTSC color signal  
**Modulation System:** Luminance; Frequency modulation  
 recording  
 Color Signal; Converted subcarrier  
 phase shift recording  
**Input:** Video Input (BNC); 1.0 Vp-p,  
 75 ohms  
**Output:** Video Output (BNC); 1.0 Vp-p,  
 75 ohms  
**Horizontal Resolution:** Color; More than 300 lines  
 B/W; More than 320 lines  
**S/N:** B/W; 45 dB (6-hour mode, SC TRAP  
 OFF)  
 Color; 43 dB (6-hour mode, SC TRAP  
 ON)

## AUDIO

**Input:** Audio Input (Phono);  
 –10 dBV, 47 kohms, unbalanced  
 Mic (Mini-jack);  
 –60 dBV, 600 ohms, unbalanced  
**Output:** Audio Output (Phono);  
 –8 dBV, 1 kohm, unbalanced  
**Track:** 1 track (Normal)

## Recording/Playback Time

**Modes:** 6H/L18H/L24H mode

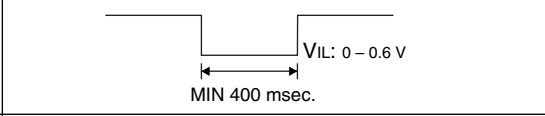
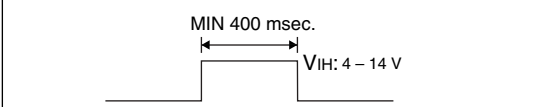
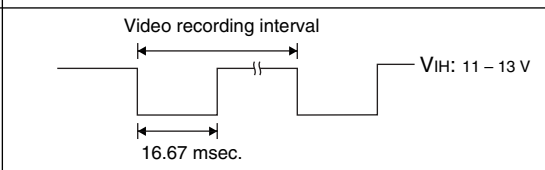
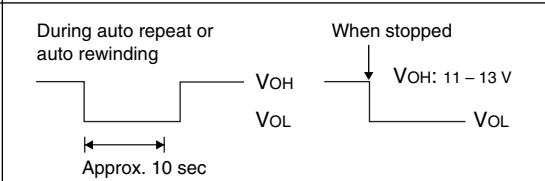
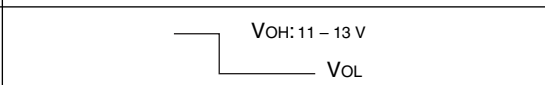
## CONNECTORS

**Alarm Input/REC IN:** Contact closure  
**Alarm Reset Input:** +4 V – +14 V

**Operating Temperature:** 41°F – 104°F (5°C – 40°C)  
**Operating Humidity:** 35% – 80%  
**Weight:** 8.47 lbs (3.85 kg)  
**Dimensions:** 16-15/16"(W) × 3-1/2"(H) × 11-9/16"(D)  
 430 × 86.5 × 293.5 mm (excluding  
 rubber grip and knobs)

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

## Input/Output Terminal Signal Level

Terminal	Signal Level	Note
Alarm Input/REC IN		LOW Input
Alarm Reset Input		HIGH Input
Camera Switching Output		$V_{OH} = 11 - 13 \text{ V}$ (5.6 k $\Omega$ ) $V_{OL} = 0 - 0.6 \text{ V}$ (max. 3 mA)
Tape end output		$V_{OH} = 11 - 13 \text{ V}$ (4.7 k $\Omega$ ) $V_{OL} = 0 - 0.6 \text{ V}$ (max. 3 mA)
Warning output		$V_{OH} = 11 - 13 \text{ V}$ (4.7 k $\Omega$ ) $V_{OL} = 0 - 0.6 \text{ V}$ (max. 3 mA)



---

# Panasonic

## **SECURITY & DIGITAL IMAGING COMPANY**

A Division of Matsushita Electric Corporation of America

### **Security Systems Group**

**Executive Office:** One Panasonic Way, Panazip 3E-7, Secaucus, New Jersey 07094

#### **Eastern Zone Office:**

One Panasonic Way, Panazip 4E-7, Secaucus, NJ 07094 (201) 348-7303, Fax (201) 348-7372

#### **Western Zone Office:**

6550 Katella Ave., Panazip 17A-5, Cypress, CA 90630 (714) 373-7840, Fax (714) 373-7242

### **Industrial Medical Group**

**Executive Office:** One Panasonic Way, Panazip 4D-4, Secaucus, New Jersey 07094

### **Panasonic Canada Inc.**

5770 Ambler Drive, Mississauga, Ontario L4W 2T3 (905) 624-5010

### **Panasonic Sales Company**

#### **Division of Matsushita Electric of Puerto Rico Inc.**

San Gabriel Industrial Park, 65th Infantry Ave., Km. 9.5, Carolina, Puerto Rico 00630 (787) 750-4300