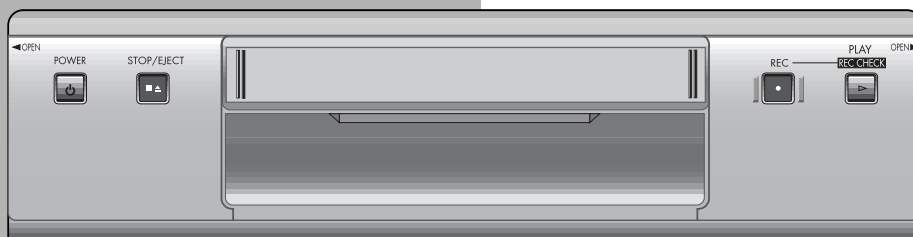


REAL TIME VCR

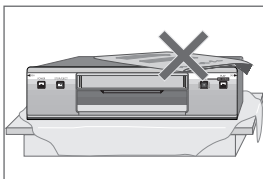
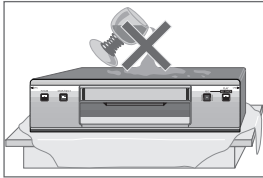
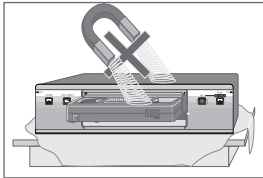
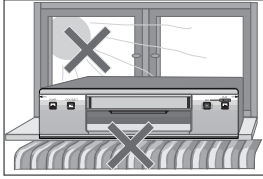
PAL SYSTEM



OPERATING INSTRUCTIONS

Before operating the unit, please read this manual thoroughly and retain it for future reference.

SAFETY INFORMATION



ON SAFETY

- Operate the unit on 110~240V AC (Free voltage).
- The nameplate indicating operating voltage, power consumption, etc., is located on the rear of the unit.
- Should any solid object or liquid fall into the cabinet, turn off the power, unplug the unit and contact your authorized dealer.
- Do not bend the power cord excessively. Do not place heavy object on the power cord. If the power cord is damaged, turn off the power immediately.
- Do not use several plugs from the same consent at a time.
- Disconnect the power cord from the wall AC outlet by grasping the plug, not by pulling the cord.

ON INSTALLATION

- Do not place a heavy object on the unit.
- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Place the unit to avoid direct sunlight. Do not install the unit in a location near heat sources such as radiators or air ducts.
- Do not install the unit in a place subject to mechanical vibration or shock. Do not put magnetic objects close to the unit and cassette tape. Magnetic fields may affect the color reproduction of the unit and cause distortion.
- The unit is designed for operation in a horizontal position. Do not install in an inclined position.

ON OPERATION

When the unit is not in use, turn the power off to conserve energy and to extend its life.

ON DISASSEMBLY

- Do not attempt to disassemble or service this unit yourself. Malfunction may cause fire, electric shock or other hazards.
- If you have any questions about this unit, contact your authorized dealer.

ON CLEANING

As a safety precaution, unplug the unit before cleaning it.

- To keep the unit looking brand-new, periodically clean it with a mild detergent solution. Never use strong solvents such as thinner or benzene, or abrasive cleaners since they will damage the cabinet.
- When cleaning, keep liquid away from electrical contacts and connector. When there is a build-up of dust on air vents, use a vacuum cleaner to remove it.

ON TRANSPORTATION

- When transporting the unit, protect it from vibration and impact.



Strong electromagnetic emission nearby can affect the screen.

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FEATURES

REAL TIME/TIME LAPSE FUNCTION

11 steps recording/playback from L6H to 000H is possible. At the longest interval setting, available recording time is a full 960 hours with E-180 tape.(960H MODEL ONLY)

AUDIO RECORDING/PLAYBACK IN L18H, L30H MODE

You can playback the audio information when you record it in L18H, L30H real time mode.

VARIOUS RECORDING FUNCTIONS

- Repeat recording : When the VCR reaches the end, the VCR rewinds the tape automatically and starts recording continuously from the beginning of the tape.(choice mode)
- Timer recording : You can set the timer for 9 programs timer recording and daily recording.
- Alarm recording : By connecting a 'FIELD SWITCHER' or 'ALARM SENSOR' that has an output function, this function records by the time/mode set when the alarm signal is inputted.
- Series recording : This function permits long - term continuous recording using two or more time lapse VCRs.
- One shot recording : Recording can be done basically on 1 field. (960H MODEL ONLY)

AUTO RECORD AFTER POWER FAILURE

Even if power failure happens during recording, its recording will start automatically after power is restored.

VIDEO LOSS FUNCTION

Without input signal, the buzzer will sound and "VIDEO LOSS" will be displayed on the screen .

THROUGH OUT FUNCTION

Even if power cord isn't connected, you can watch input video signal on monitor.

SECURITY LOCK FUNCTION

It prevents the tape from being robbed by outer invader.

MENU SETTING ON MONITOR SCREEN

All the menu setting can be done on monitor screen.

FEATURES

USED TIME INDICATOR

This VCR has a built-in microprocessor equipped with a calendar function and shows the used time of video head.

ALARM SCAN

It scans all the alarm recorded signal which is recorded in the tape and playbacks them for 5 seconds. Or it scans desired alarm signal.

BACKUP FUNCTION

When a power interruption occurs, the battery will provide backup power of the clock for one week at least.

RECORD LOCK

To guard against recording operation errors, this VCR locks all of the buttons.

CHECKING RECORD CONDITION

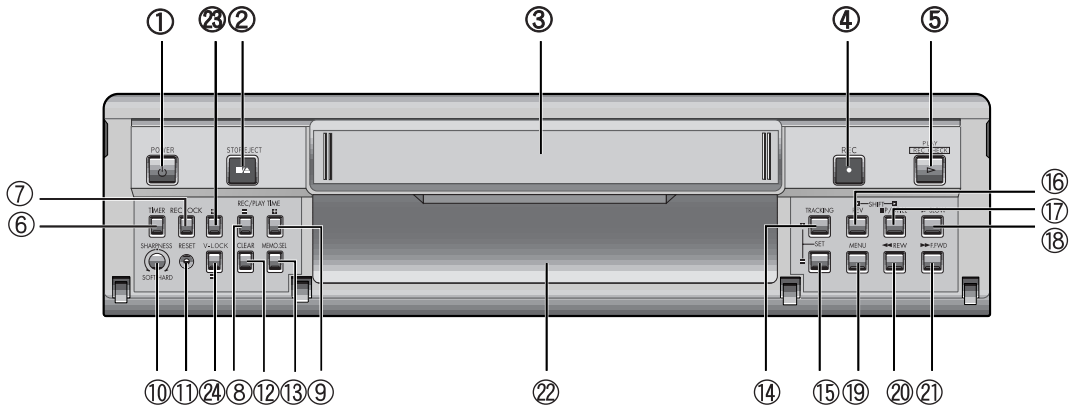
You can check the recorded image during recording by pressing a single button.

RS-232C FUNCTION (OPTION)

This is RS-232C interface, the VCR can be controlled by PC through it. (RS-232C parameter on 8 of 11,12,27 and 29page's <MAIN MENU> is useful for optional model only which has RS-232C function)

LOCATIONS OF PARTS AND CONTROLS

FRONT PANEL

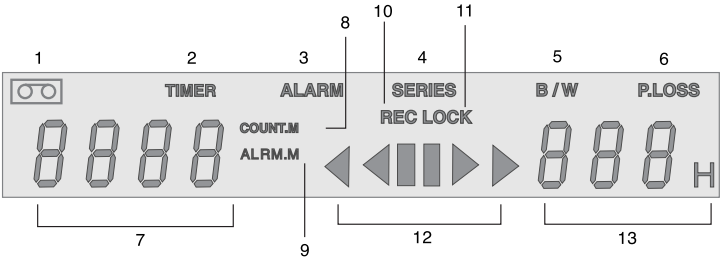


No.	Description
1	POWER button
2	STOP/EJECT button
3	Cassette compartment
4	REC button
5	PLAY (REC CHECK) button
6	TIMER button
7	REC LOCK button
8	REC/PLAY TIME- button
9	REC/PLAY TIME+ button
10	SHARPNESS VR
11	RESET button

No.	Description
12	CLEAR button
13	MEMORY SELECT button
14	TRACKING + (SET +) button
15	TRACKING - (SET -) button
16	REVERSE (SHIFT ▼) button
17	P/STILL (SHIFT ►) button
18	SLOW button
19	MENU button
20	REW button
21	FF button
22	Display Window
23	V-LOCK(+)
24	V-LOCK(-)

LOCATIONS OF PARTS AND CONTROLS

DISPLAY WINDOW



NOTE :

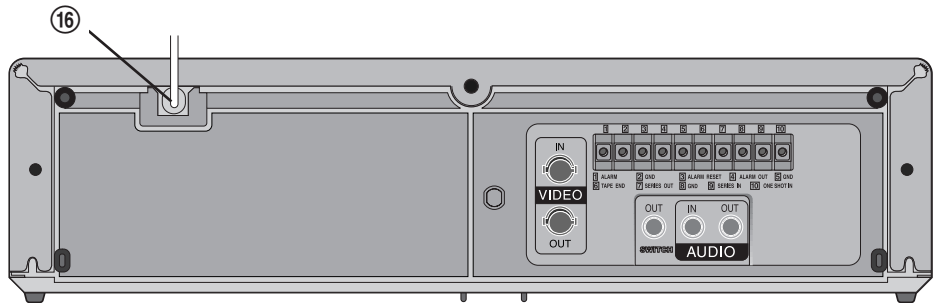
On display of operating condition, " " means flickering.

Display of Operating Condition	
Playback	▶
Reverse Playback	◀
Slow	" ▶ "
Reverse Slow	" ▶ "
Still	
Record Pause	REC
Rewind	◀◀
Fast-Forward	▶▶
Recording	REC ▶
Alarm Recording	ALARM REC ▶
Timer Recording	TIMER REC ▶
Series Recording	SERIES REC ▶
Record Check	" REC ▶
Record Lock	REC LOCK ▶
Forward Search	" ▶▶ "
Reverse Search	" ◀◀ "

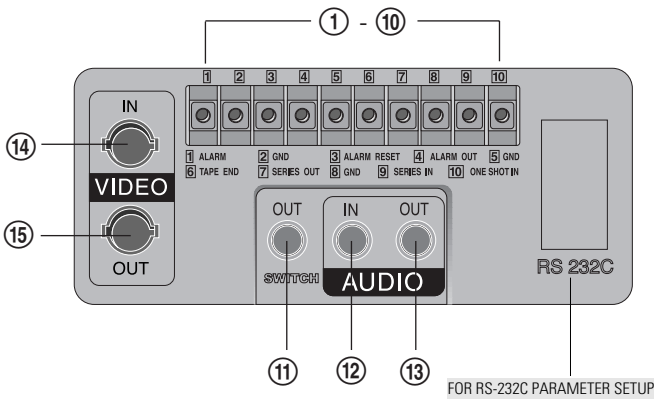
No.	Description
1	Cassette indicator
2	Timer recording indicator
3	Alarm recording indicator
4	Series recording indicator
5	Black/White indicator
6	Power loss indicator
7	Tape counter indicator
8	Count memory indicator
9	Alarm memory indicator
10	Basic recording indicator
11	Record lock indicator
12	Tape operation indicator
13	Recording/Playback time indicator

LOCATIONS OF PARTS AND CONTROLS

REAR PANEL



REAR PANEL FOR THE OPTION MODEL



No.	Description
1	ALARM terminal
2	GND
3	ALARM RESET terminal
4	ALARM OUT terminal
5	GND
6	TAPE END
7	SERIES OUT
8	GND
9	SERIES IN terminal
10	ONE SHOT IN (960H model)
11	CAMERA SWITCH OUT
12	AUDIO IN terminal
13	AUDIO OUT terminal
14	VIDEO IN terminal
15	VIDEO OUT terminal
16	AC IN

CONNECTIONS

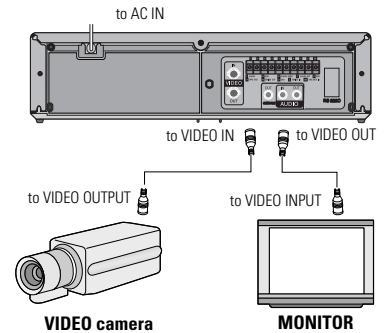
Turn all the power off before making connections. Connect the AC power cord last.

CONNECTING A CAMERA, MONITOR

NOTE :

To connect an alarm sensor, refer to page 21.

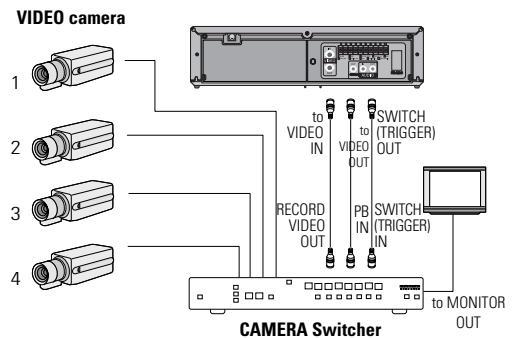
When you use a camera, directly connect a camera to a VCR.



NOTE :

This product was designed to be used by connecting to the peripheral equipment such as multiplexer. But according to the kind of peripheral equipment, the best picture quality could not be obtained. At this time, confirm the connection status of this product and peripheral equipment first. Then by using the TRACKING +/- key or V-LOCK +/- key, you can obtain the best picture quality.

When you connect several cameras to a switcher, synchronize the cameras.

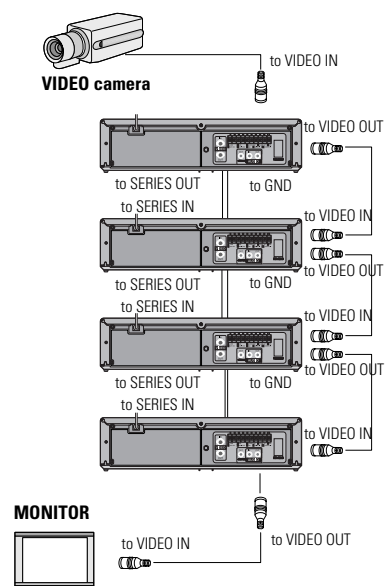


CONNECTING ANOTHER UNIT IN SERIES

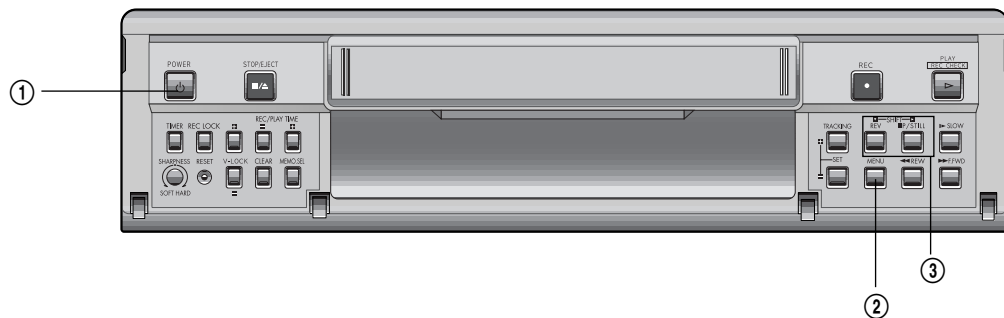
NOTE :

To operate the series recording, refer to page 18.

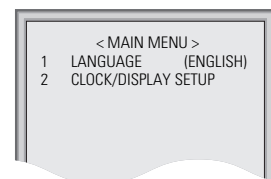
Connect several units for series recording.



SETTING THE LANGUAGE



1. Turn on the power.
2. Press the MENU button.
3. After checking the ► mark is at the LANGUAGE, Press the SHIFT ► to select the language which will be used.



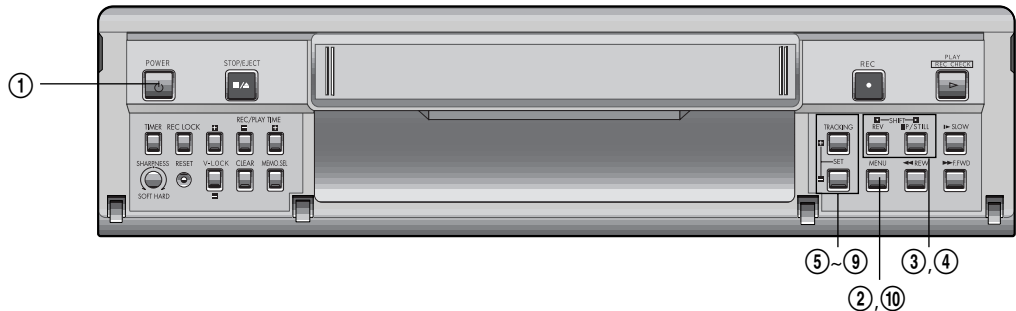
NOTE :

There are four languages,
English, Spanish,
German and French.
The selected language
will be displayed even
after reset.

SETTING THE TIME AND DATE

Set the clock to the current time and date on the monitor screen. Clock displays in 24 hours and 12:00 noon displays like "00:00".

SETTING THE CURRENT TIME



NOTE :

If you press the MENU button after the RESET operation, the TIME SETUP will be selected automatically.

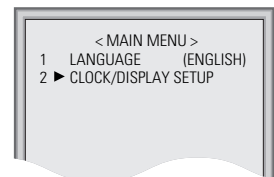
NOTE :

The MENU screen will not be displayed during the tape operation or before the current time is not set.

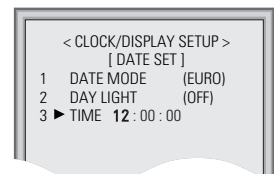
Example:

Set the date and time to 17:00 on May 3, 2000

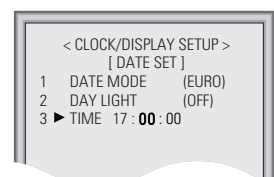
1. Turn on the power.
2. Press the MENU button.
3. Select the CLOCK/DISPLAY SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.



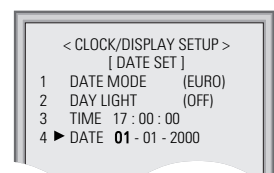
4. Select the TIME by pressing SHIFT ▼ .
The hour "12" will blink.



5. Set the hour by pressing SET+/-, then press SHIFT ► .
The minute "00" will blink.



6. Set the minute by pressing SET+/-, then select the DATE by pressing SHIFT ▼ .
The day "01" will blink.

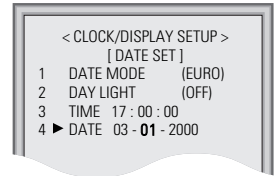


NOTE :

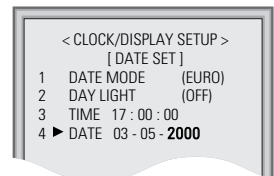
The order of day / month / year is changed according to area of date mode.

SETTING THE TIME AND DATE

7. Set the day by pressing SET+/-, then press SHIFT▶.
The month "01" will blink.

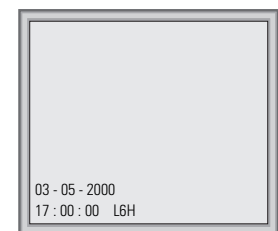


8. Set the month by pressing SET+/-, then press SHIFT▶.
The year "2000" will blink.



9. Set the year by pressing SET+/-.

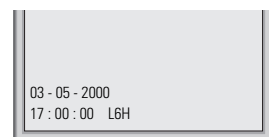
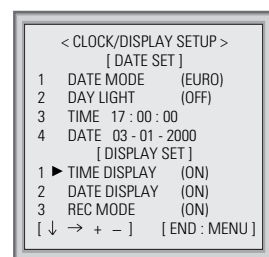
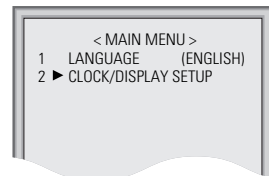
10. Confirm that the clock is set correctly and press the MENU button twice to return to the normal display.



SETTING THE TIME AND DATE

SETTING THE TIME/DATE DISPLAY

1. Turn on the POWER.
2. Press the MENU button.
3. Select the CLOCK/DISPLAY SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.
4. Move '►' to TIME DISPLAY by pressing SHIFT ▼.
5. Each time SHIFT ► (or SET+/- button) is pressed, the display will change as follows : ON → OFF → ON.
< Only time part of the normal screen is switched on and off repeatedly.>
6. Set the DATE DISPLAY and REC MODE as the same method.
7. Press the MENU button twice to return to the normal display.



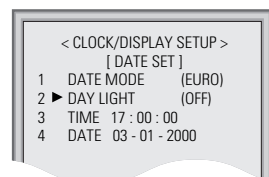
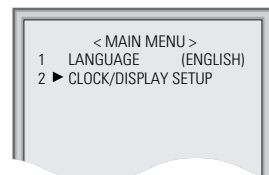
SETTING DISPLAY POSITION

To move the display downward on the monitor screen, press the SHIFT ▼ and to move the display rightward, press the SHIFT ►.

SETTING THE DAYLIGHT

After setting the time in Standard Time, you can adjust to Daylight Saving Time when the season changes.

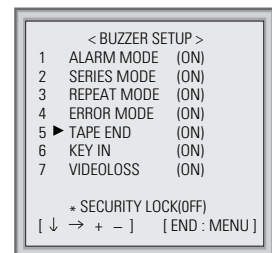
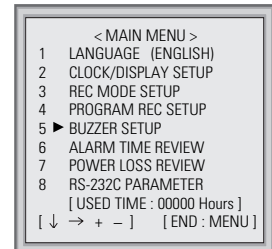
1. Turn on the power.
2. Press the MENU button.
3. Select the CLOCK/DISPLAY SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.
4. Move '►' to DAYLIGHT in [DATE SET] by pressing SHIFT ▼.
5. Set to ON by pressing SHIFT ►.
The clock moves forward one hour.
6. Press the MENU button twice to return to the normal display.



SETTING THE BUZZER

1. Turn on the POWER.
2. Press the MENU button.
3. Select the BUZZER SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.

No.	Function
1	BUZZER setting during ALARM REC
2	BUZZER setting during SERIES REC
3	BUZZER setting during REPEAT REC
4	BUZZER setting in ERROR MODE
5	BUZZER setting when the tape arrives at its end
6	BUZZER setting when the button is input
7	BUZZER setting when no video signal is input



4. Move '►' to the wanted BUZZER mode by pressing SHIFT ▼ and set the BUZZER to ON or OFF by pressing SHIFT ►.
5. Press the MENU button twice to return to the normal display.

BUZZER SOUNDS CASES

• The buzzer sounds 5 times

- only with a tape without a safety tab
 - when the alarm signal is entered.
 - when pressing the REC button.
 - when pressing the TIMER button.
- when pressing the TIMER button without timer recording programmed.
- when the alarm signal is entered during alarm recording.
- when the TIMER button is pressed without a tape inserted.
- when the other warning modes are occurred
- when the TIMER button is pressed during series recording



NOTE :

- If the warning alarm continues, the buzzer can be stopped by pressing any button. (note; pressing button is valid)
- If the buzzer is set 'OFF' it won't activate.

• The buzzer sounds continuously

- when the tape arrives at its end.
- when no video signal is input in the recording mode
- when the tape reaches to the end and it rewinds automatically during repeat recording.
- during the alarm REC
- when the error occurs
- when no video signal is input in POWER ON status
- when the series signal is input during timer recording
- when the series signal is entered

SETTING THE BUZZER



NOTE :

- If the security lock is 'ON' for anti theft function, the tape will eject only if the eject button is pressed for more than 5 seconds.
- Even in auto eject mode, the tape just stops when ended without ejecting. In this case, the tape does not record anything.(note; exception when on 'REPEAT REC' mode)
- When you reach SECURITY LOCK by pressing SHIFT ▼, '▶' mark will disappear and ON/OFF will flicker.

SECURITY LOCK

1. Turn on the POWER.
2. Press the MENU button.
3. Select the BUZZER SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.
4. Select SECURITY LOCK (OFF) by pressing SHIFT ▼ and set to ON by pressing SHIFT ► (or SET+/- button).
5. Press the MENU button twice to return to the normal display.

```

< MAIN MENU >
1 LANGUAGE      (ENGLISH)
2 CLOCK/DISPLAY SETUP
3 REC MODE SETUP
4 PROGRAM REC SETUP
5 ► BUZZER SETUP
6 ALARM TIME REVIEW
7 POWER LOSS REVIEW
8 RS-232C PARAMETER
  [ USED TIME : 00000 Hours ]
[ ↓ → + - ] [ END : MENU ]
    
```

```

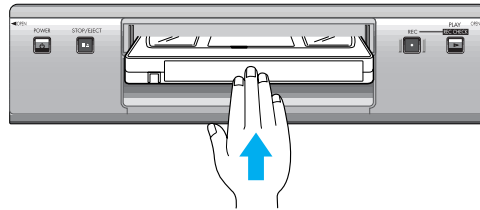
< BUZZER SETUP >
1 ALARM MODE  (ON)
2 SERIES MODE (ON)
3 REPEAT MODE (ON)
4 ERROR MODE  (ON)
5 TAPE END    (ON)
6 KEY IN      (ON)
7 VIDEOLOSS   (ON)

* SECURITY LOCK(OFF)
[ ↓ → + - ] [ END : MENU ]
    
```

HANDLING A VIDEO CASSETTE

INSERTING A VIDEO CASSETTE

Insert the cassette into the cassette compartment by slowly pressing its center with the arrow on the top. When the cassette is inserted, the VCR automatically turns on . If you insert the cassette without safety tab, the VCR plays the cassette automatically.

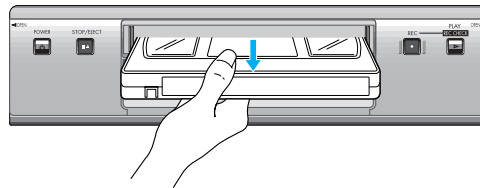


NOTE :

This VCR is designed and calibrated with E-180 tape. To ensure stable operation and optimum picture quality, we recommend that you use E-180 tape.

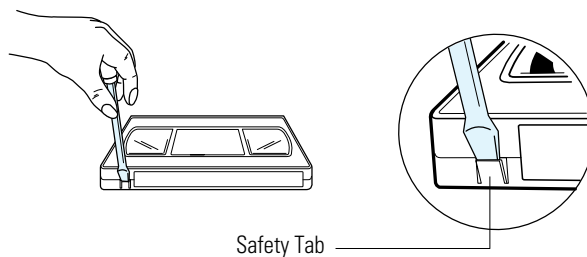
EJECTING A VIDEO CASSETTE

Press STOP/EJECT button on the VCR in STOP mode. You can eject the cassette pressing the button even when the power is off.



PROTECTING YOUR CASSETTE FROM BEING ERASED

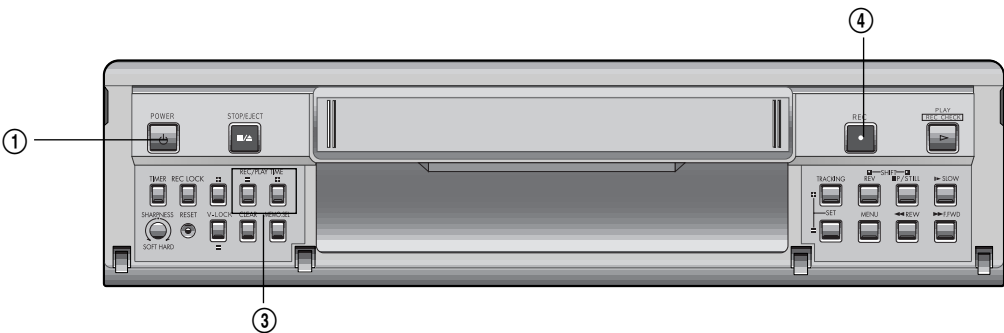
Remove the tab on the cassette with a screwdriver or a similar tool as shown below. This protects your cassette against an accidental recording.



If you want to record again on the cassette without its safety tab, simply cover the safety tab hole with a piece of plastic tape.

RECORDING

BASIC RECORDING



1. Turn on the power.
2. Insert the cassette with the safety tab.
3. Set the recording speed by pressing REC/PLAY TIME -/+.



NOTE :

If there is no input signal, the buzzer goes on with 'VIDEO LOSS' indicated on screen. In this case, the recording continues. If the signal is inputted again, the buzzer goes off and 'VIDEO LOSS' disappears on screen. In 'MENU' when setting the buzzer, the buzzer will not activate if 'VIDEO LOSS' is set 'OFF'.

Recording Speed	Maximum recording time (E-180 tape)		Interval (sec)	Audio recording	Tape motion
L6H	Standard	6	1/50	Possible	continuous
L18H	Real Time Mode	18	0.06		
L30H		30	0.1		
72H	Time Lapse Mode	72	0.24	Impossible	intermittent
120H		120	0.4		
168H		168	0.56		
240H		240	0.8		
480H		480	1.6		
720H		720	2.4		
960H		960	3.2		
000H		21,600	180		

4. Press REC. Recording starts.
If the safety tab is missing, the cassette stops, the buzzer beeps 5 times and the cassette is ejected.

- NORMAL REC SET -



NOTE :

In 'MENU' changing the 'REC TIME' will also change the indication of activating condition.
(L6H → L18H → L30H → ... → L6H → ...)

1. Turn on the power.
2. Insert the cassette with the safety tab.
3. Press the MENU button.
4. Select the REC MODE SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.
5. Select the REC TIME in [NORMAL REC SET] by pressing SHIFT ▼ and change the recording time by pressing the SHIFT ► (or SET+/- button).
(L6H → L18H → L30H → ... → L6H → ...)
6. Press the MENU button twice to return to the normal display.
7. Press REC. Recording starts.

- TO STOP RECORDING -

- Press the STOP button to cancel recording.
- Press the P/STILL button to stop the recording temporary and press the REC or P/STILL button to restart recording.

- When the tape reaches the end -

If REPEAT REC is not set, the tape will be ejected, the power of VCR will be turned off and the buzzer sounds continuously.

RECORDING

MONITORING THE RECORDING CONDITION

- You can check on the recording condition by pressing the REC CHECK while recording .
- Press REC CHECK button while recording. After the tape is rewound for about three seconds and played back for about two seconds, the unit returns to the original recording mode. While monitoring the recording condition, recording is interrupted.

LOCKING THE RECORD MODE

Locking the record mode is useful to guard against accidental recording interruptions when the VCR is used for surveillance or monitoring purposes.

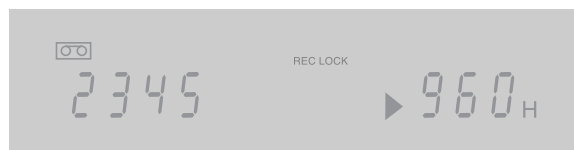
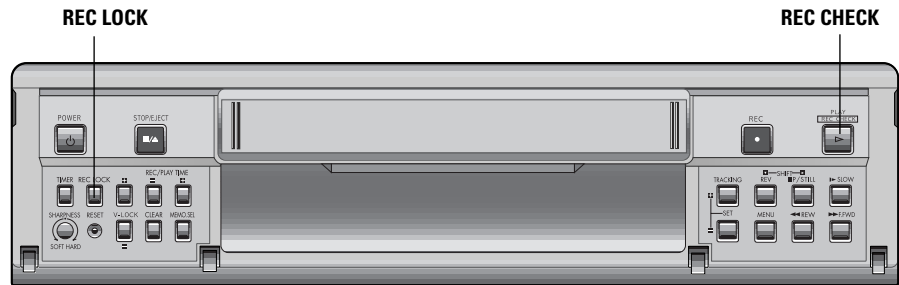


NOTE :

No button except RESET button will be accepted in the REC LOCK mode.

Set the record lock

- Press the REC LOCK button more than 1 sec.
- The record lock indicator "LOCK" lights on the display window. The security lock function also works in timer recording.

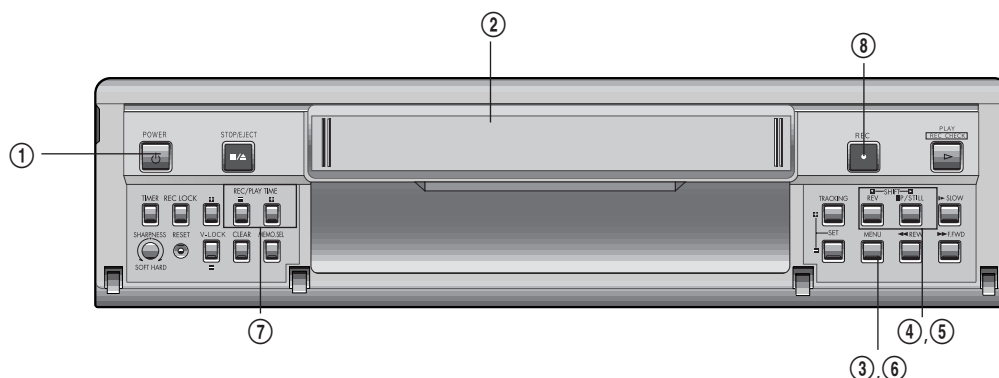


To release the record lock

- Press the REC LOCK button more than 1 sec.
- The record lock indicator " LOCK" turns off.

REPEAT RECORDING

You can record on the same cassette repeatedly.

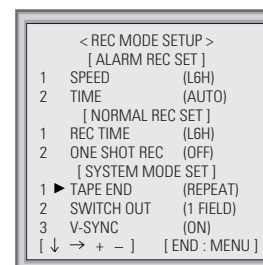
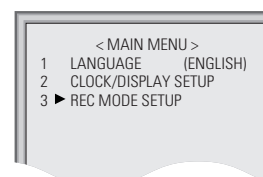


1. Turn on the power.
2. Insert the cassette with the safety tab.
3. Press the MENU button.
4. Select the REC MODE SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.
5. Select the TAPE END in [SYSTEM MODE SET] by pressing SHIFT ▼ and set to REPEAT by pressing SHIFT ►.
6. Press the MENU button twice to return to the normal display.
7. Set the recording speed by pressing REC/PLAY TIME +/-.
8. Press REC. REPEAT recording starts.
When the tape reaches the end, the tape is automatically rewound at the beginning and recording resumes.



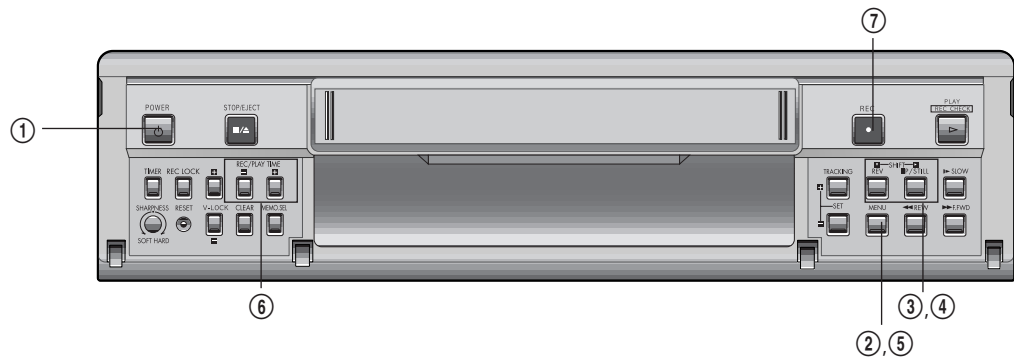
NOTE :

- If an alarm input is received during repeat-recording, the repeat-recording stops and the tape will be ejected.
- To release the repeat-recording, press the STOP button and set TAPE END to OFF mode in REC MODE SETUP .

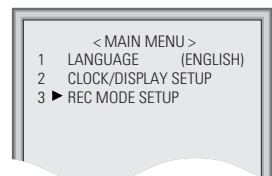


SERIES RECORDING

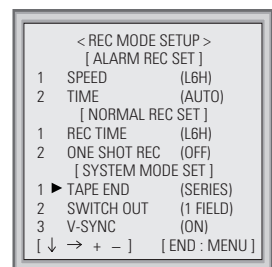
It is convenient way when the program is recorded to the end of tape in one VCR, the connected another VCR will automatically record the rest part of program.



1. Turn on the power.
2. Press the MENU button.
3. Select the REC MODE SETUP by pressing SHIFT ▼ and press the SHIFT ► to proceed.



4. Select the TAPE END in [SYSTEM MODE SET] by pressing SHIFT ▼ and set to SERIES by pressing SHIFT ►.
5. Press the MENU button twice to return to the normal display.
6. Set the recording speed by pressing REC/PB TIME -/+.
7. Press REC.



NOTE :

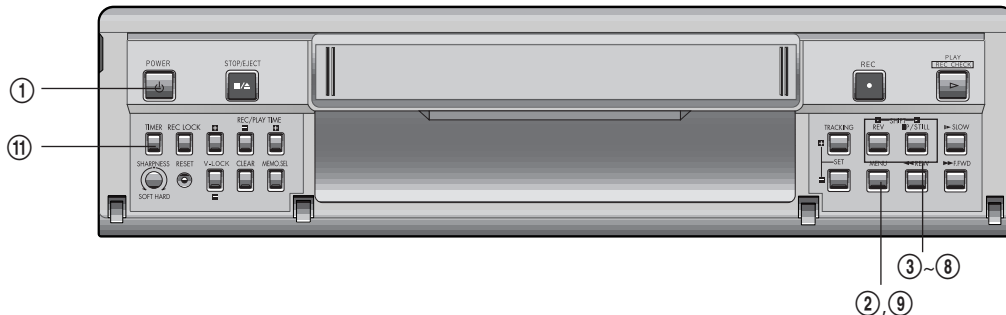
- When Buzzer is rang after video recording for Product 1 is completed, then the video recording for Product 2 is started with Buzzer sound. If there is no need for Buzzer sound, please set the Buzzer for Product off.

OPERATION CONDITION	UNIT 1	UNIT 2
TAPE END	SERIES	SERIES
TAPE (E-180)	Loaded	Loaded
VCR operating state	REC MODE	STOP MODE
TIMER REC	OFF	OFF
POWER	ON	ON or OFF

- When the setting as above stated is completed, the indication light of "SERIES" is shown in the front.
- When recording on unit 1 is complete, the power of unit 2 turns on and recording begins. At this time the unit 1 ejects its tape and its power turns off.
- When a E-180 tape is used and the tape in the unit 1 arrives at its end during recording, the unit 2 starts recording immediately.
- You should connect the SERIES OUT(NO. 7) terminal of unit 1 to the SERIES IN(NO. 9) terminal of unit 2.

TIMER RECORDING

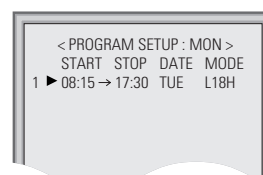
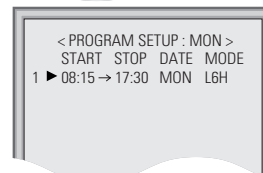
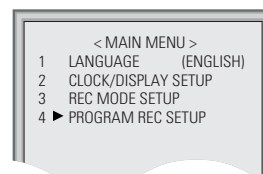
Example 1: Making a recording from 8:15 on Tuesday to 17:30 the same day with the recording speed set to L18H mode.



NOTE :

- Before starting, make sure that the time, date and day are set properly. The day will be displayed like [PROGRAM SETUP: MON].
- The buzzer sounds 5 times when pressing the TIMER button without tape in VCR.

1. Turn on the power.
2. Press the MENU button.
3. Select PROGRAM REC SETUP by pressing SHIFT ▼ and then press SHIFT ► to proceed.
4. Press SHIFT ► once more. The current time appears in No. 1. But if there is the program which is set before OFF, its time will appear.
5. Set the start hour & minute by pressing SET+/- or SHIFT ►.
6. Set the stop hour & minute by pressing SET+/- or SHIFT ►.
7. Select the date by pressing SHIFT ► and set a day of the week to tuesday by pressing SET+/- button.
8. Select the MODE by pressing SHIFT ► and set the mode to L18H by pressing SET+/- button.
9. Press the MENU button twice to return to the normal display.
10. Insert the cassette with the safety tab.



NOTE :

Without pressing TIMER button, timer recording won't be done.

11. Press the TIMER. The VCR enters into timer recording standby mode, and the "TIMER" indicator appears in the display window.

TIMER RECORDING

Example 2 : When making a recording from 11:50 on Saturday to 7:50 on Monday with the recording speed 72H mode, set the recording as shown on right side.

< PROGRAM SETUP : FRI >				
	START	STOP	DATE	MODE
1	11:50	→ 11:50	SAT	72H
2	11:50	→ 07:50	SUN	72H
3				
4				
5				
6				
7				
8				
9				
[↓ → + -] [END : MENU]				

Example 3 : When making a daily recording, set the date to DAILY with SET +/- button.

< PROGRAM SETUP : MON >				
	START	STOP	DATE	MODE
1	▶ 08:15	→ 17:30	DAILY	L18H



NOTE :

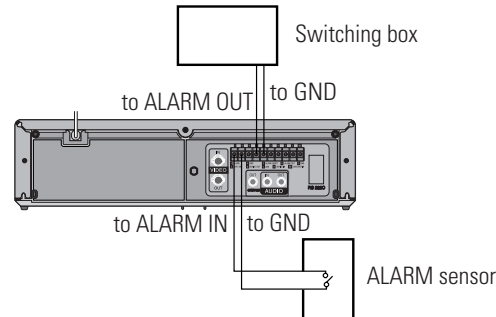
During the timer recording, no button except TIMER, RESET button will be accepted.

- 1. To cancel the timer recording during its operation**, press the TIMER button.
- 2. To cancel the timer setting**, move '▶' to the desired program and press CLEAR button.
- 3. To change the timer setting**, repeat steps 4 to 11 of the Example 1.

ALARM RECORDING

This function records by the time set in 'MENU' (AUTO → 4MIN → 6MIN → 9MIN → 12MIN → 15MIN → 20MIN → TAPE END → AUTO) when the alarm signal is inputted. It is done by connecting a 'FIELD SWITCHER', 'MULTIPLEXER' or 'ALARM SENSOR' that has an output function.

CONNECTING AN ALARM SENSOR

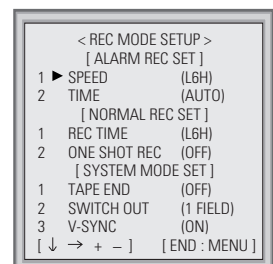
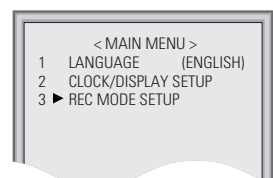


NOTE :

- While alarm recording is in progress, no other mode is operative (except reset button).
- After the alarm recording is completed, the VCR returns to the condition it was in before the alarm signal was received.
- If another alarm is received while alarm recording is in progress, the second alarm recording starts and the recording duration is extended. And also, when the indication "*" is lighted for five seconds, the Buzzer is sounded, five times, in the front of ALARM COUNTER on the monitor screen.
- If the power is interrupted while alarm recording is in progress and restored again, the operation before the alarm recording is made resumes.
- When alarm signal is received, the buzzer sounds and the indicator "ALARM" appears in the display window. It lights during alarm recording and it blinks when the alarm recording is finished. Its indicator will disappear when the tape is inserted.

SETTING THE ALARM MODE AND RECORDING TIME

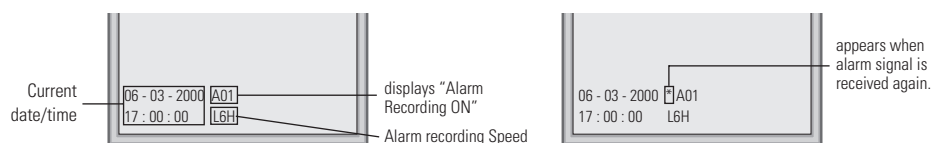
1. Turn on the power.
2. Press the MENU button.
3. Select REC MODE SETUP by pressing SHIFT ▼ and then press SHIFT ► to proceed.
4. Move '►' to SPEED and select the mode by pressing SET+/- (or SHIFT ► button) button.
 - L6H/L18H/L30H: for recording in L6H/L18H/L30H mode
 - NC: Currently setup recording time will be recorded regardless of alarm recording time setup, and this recorded part will not be checked during Alarm Search. But it will be recorded in L6H mode on 000H setup.
5. Move '►' to TIME by pressing SHIFT ▼ button and select the Alarm recording time by pressing SET+/- (or SHIFT ► button) button.
 - You can select the alarm recording time among AUTO → <4MIN/6MIN/9MIN/12MIN/15MIN/20MIN> → TAPE END.
6. Press the MENU button twice to return to the normal display.



To stop the Alarm Recording

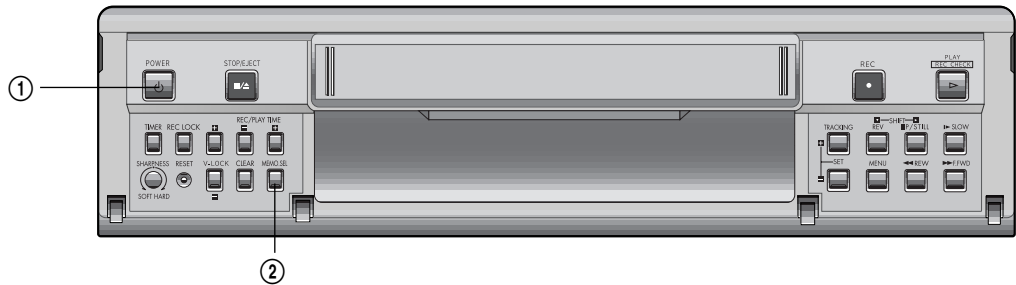
When connecting the ALARM RESET to GND terminals of the rear panel for more than 0.5 second or the alarm release signal is received, the alarm recording will be released. (But alarm recording can't be released for 3 minutes from its start.)

MONITOR DISPLAY during the Alarm Recording



ALARM RECORDING

ALARM RECORDING SEARCH



1. Turn on the power.
2. Press the MEMO. SEL button in the stop mode.



	DISPLAY WINDOW	OSD	FUNCTION
1X	8888 COUNT.M	NO DISPLAY	Press FF or REW button. It stops in the COUNT '0000'.
2X	A - 5C ALRM. M	ALARM SCAN	Press FF or REW button. From the current position, the machine will scan and playback on the L6H mode all the 'ALARM REC' which is recorded before and after in the tape.
3X	A - 5E ALRM. M 01	ALARM SEARCH 01	Set the number by pressing SET +/- button. (The number indicates forward or 'n'th in the current tape position.) After setting, press FF or REW button. From the current position the machine scans the 'n'th 'ALARM REC' automatically reproduces the tape to the end to look for the recorded. (But, the reproducing works in the previous mode.)

NOTE :

If the tape reaches the end while scanning for the alarm recorded section(A-SC or A-SE), the machine will automatically rewind the tape to the beginning and stop.

NOTE :

The alarm time recording records from No.1 followed by the most recent record.

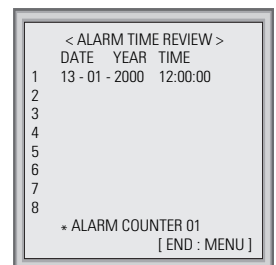
NOTE :

The alarm signal input during the Alarm video recording is not countered and indicated as '*', and the corresponding alarm time is extended in reviewing the alarm time.

ALARM TIME REVIEW

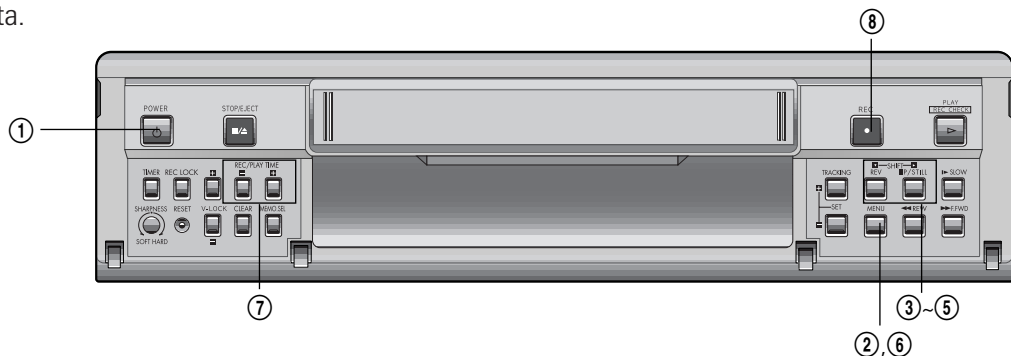
The date and time of the ALARM RECORD are displayed up to recent eight times.

1. Press the MENU button.
2. Select ALARM TIME REVIEW by pressing SHIFT ▼ and then press SHIFT ► to proceed.
3. The alarm count, date and time are displayed. The most recent alarm recording event is listed first and up to 8 programs are kept in store.
4. The alarm input signal number appears in the lower position of ALARM TIME REVIEW screen. (for example, *ALARM COUNTER01)
5. ALARM TIME REVIEW screen is displayed though you eject the tape and it is disappeared when you insert the tape again.
6. The total ALARM COUNTER RESET (ALARM COUNTER 00) is displayed even if you eject the tape and it resets to "00" when you insert the tape again.

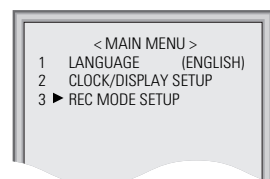


ONE SHOT RECORDING (960H MODEL ONLY)

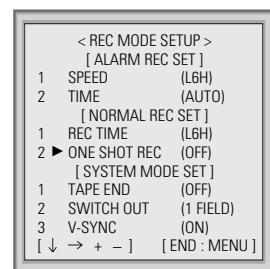
Aside from long term recording in time lapse mode, this unit is capable of one shot recording, which has applications with data.



1. Turn on the power.
2. Press the MENU button.
3. Select REC MODE SETUP by pressing SHIFT ▼, then press SHIFT ► to proceed.



4. Move "►" to ONE SHOT REC by pressing SHIFT ▼.



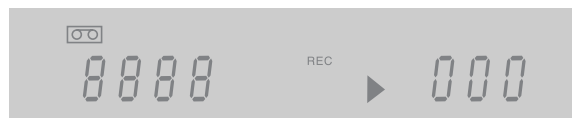
5. Set the ONE SHOT REC INTERVAL by pressing SHIFT ► button.

OFF	Records one field when the external signal is inputted or the REC button is pressed once.
10 SEC	Records one field on 10 secs intervals when the external signal is inputted or without re-pressing the REC
30 SEC	Records one field on 30 secs intervals when the external signal is inputted or without re-pressing the REC
1 MIN	Records one field on 1 min intervals when the external signal is inputted or without re-pressing the REC
1.5 MIN	Records one field on 1.5 mins intervals when the external signal is inputted or without re-pressing the REC
2 MIN	Records one field on 2 mins intervals when the external signal is inputted or without re-pressing the REC
3 MIN	Records one field on 3 mins intervals when the external signal is inputted or without re-pressing the REC

6. Press the MENU button twice to return to the normal display.
7. Set the TIME MODE of display window to 000H by pressing REC/PLAY SPEED -/+
8. Press the REC to begin the standby of ONE SHOT REC.

NOTE :

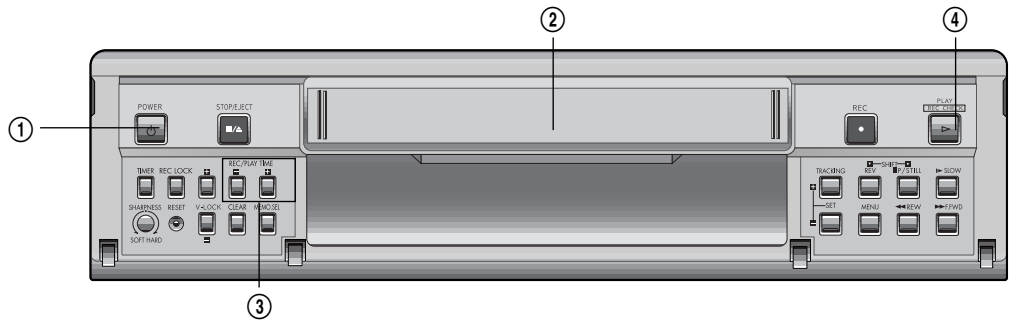
During the standby of one shot recording, the indicator () REC PAUSE appears on the display window.



To stop the one shot recording

Press STOP button

PLAY BACK



NOTE :

- To stop playback, Press STOP button.
- To rewind the tape, Press STOP button and then REW button.
- To fast-forward the tape, Press STOP button and then FF button.
- The tape counter in the display window helps you to locate a certain scene after playback.
– Press CLEAR button to set the counter to "0000" (counter zero) position before recording or playing back the tape and press MEMO. SEL button to memorize its position then the tape stops at the "0000" position by rewinding after recording or playback.

CAUTION :

It may have a problem when this VCR playback the tapes recorded on other time lapse VCR.

1. Turn on the power.
2. Insert the cassette.
3. Select the playback speed by pressing REC/PB TIME +/- button.
The selected playback speed is displayed in the display window.
4. Press PLAY.
Playback starts.

Playback speed

You can view the playback picture at one of the following speeds.

PLAY REC	3	6	18	30	72	120	168	240	480	720	960
6	-	1	1/3	1/5	1/12	1/20	1/28	1/40	1/80	1/120	1/160
18	-	3	1	3/5	1/4	3/20	3/28	3/40	3/80	1/40	3/160
30	-	5	5/3	1	5/12	1/4	5/28	1/8	1/16	1/24	1/32
72	-	12	4	12/5	1	3/5	3/7	3/10	1/5	1/10	3/40
120	-	20	20/3	4	5/3	1	5/7	1/2	1/4	1/6	1/8
168	-	28	28/3	28/5	7/3	7/5	1	7/10	7/20	7/30	7/40
240	-	40	40/3	8	10/3	2	10/7	1	1/2	1/3	1/4
480	-	80	80/3	16	5	4	20/7	2	1	2/3	1/2
720	-	120	40	24	10	6	30/7	3	3/2	1	3/4
960	-	160	160/3	32	40/3	8	40/7	4	2	4/3	1

AUDIO PLAYBACK

You can playback the sound with the picture if a tape is recorded in L6H,L18H,L30H mode.

RECORDED TAPE	PLAYBACK SPEED	AUDIO
L6H tape	L6H	Normal
	L18H/L30H	Slow
L18H tape	L6H	Rapid
	L18H	Normal
	L30H	Slow
L30H tape	L6H/L18H	Rapid
	L30H	Normal

Audio playback of L18H or L30H record tape

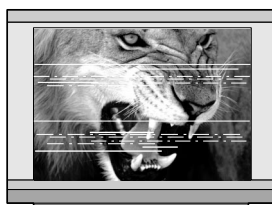
- Proper sound effect can be heard when the tape is played in the same speed when recorded.



CAUTION :

It may have some noise on the picture in L18H or L30H mode.

ADJUSTING PICTURES



V-LOCK +/-

TRACKING +/-

If streaks or noise bands appears on the playback picture, adjust the tracking condition by pressing TRACKING +/-.

If try picture is trembling sercrely during playback, adjust to get good picture. (L18H~960H playback, slow and still modes only)

VARIOUS PLAYBACK MODES

You can play back picture at various modes ; reverse playback, still and field by field pictures, and high-speed playback in both forward and reverse directions.

NOTE :

During reverse playback, reverse slow playback, slow playback and still picture, sound can't be heard. If no button is pressed during reverse slow playback, slow playback and still picture, it enters into STOP mode after 5 minutes.

NOTE :

If the picture shakes while in the still mode – adjust the picture with V-LOCK +/-.

NOTE :

If you press P/STILL button in REVERSE PLAYBACK or REVERSE SLOW PLAYBACK mode, still picture will be playback in reverse direction.

NOTE :

During picture search, streaks or noise band appear on the monitor screen.

NOTE :

To watch the desired slow picture by controlling the time of playback of the tape recorded in L6H mode, press the REC/PB TIME +/- during playback.

REVERSE PLAYBACK

- During normal playback, reverse playback can be used by pressing REV. During reverse playback, sound cannot be heard.
- The reverse playback can be operated only in L6H playback mode.
- The picture may shake or noise may appear in the reverse playback mode.

STILL PICTURE

- You can not hear the sound.
- To resume normal playback, press PLAY.
- When the still mode lasts off more than about five minutes, the VCR will automatically enter the stop mode.
- If you keep the still picture for a long time, video head and tape can be damaged.

FIELD BY FIELD PICTURE

- In the playback mode, press P/STILL.
- When you press P/STILL button in still mode, one FIELD is playback and it enters again into still mode.
- Each time you press the P/STILL button in the still mode, the picture advances by one FIELD.

PICTURE SEARCH

- During playback, press FF(forward direction) or REW(reverse direction)
- If you press FF or REW once more, picture search speed will be faster. (about 7 or 9 times faster than the normal speed)



- To resume normal playback, press PLAY.

SLOW PLAYBACK

- During playback, press SLOW button to catch the low-speed picture.
- When the slow mode lasts off more than 5 minutes, the VCR automatically enters the STOP mode.
- If the picture shakes while in the slow mode, press P/STILL button and adjust the picture with TRACKING+/-.

REVERSE SLOW PLAYBACK

- During slow playback mode, press REV button to catch the reverse low-speed picture.
- The picture may shake or noise may appear in the reverse slow mode.

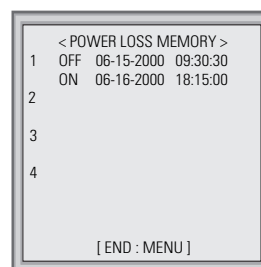
OTHER FUNCTIONS

POWER LOSS MEMORY

- After memorizing the power failure time, it is displayed later.
- If a power interruption occurs, The "P.LOSS" indicator lights in the display window.
- The internal batteries provide backup power of memory for at least 1 week.
- If the power is interrupted during recording, the recording starts automatically after power is restored.
- The screen displays the 5 most recent events.
The most recent power failure is listed first.

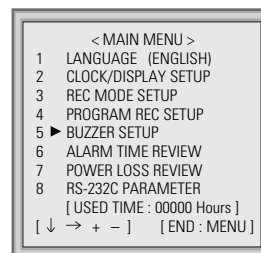
Example : If there was a power failure on 09:30:30, 15 June, 2000,
and a power restore on 18:15:00, 16 June, 2000.

1. Turn on the power.
2. Press MENU button.
3. Select POWER LOSS REVIEW by pressing SHIFT ▼, then press SHIFT ► to proceed.
4. Press MENU twice to return to the normal display.



CHECKING THE USED TIME

1. Turn on the power.
2. Press MENU button. The used time display appears as shown [USED TIME: 00000 Hours].
3. Press MENU twice to return to the normal display.



ADJUSTING SHARPNESS

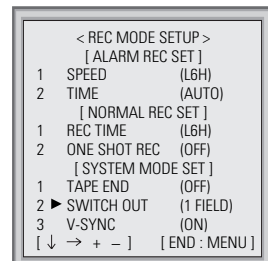
In adjusting sharpness, SOFT makes the screen soft and HARD makes it clear.

SYSTEM MODE SETUP

CAMERA SWITCH

In case of connecting the external equipment (Field switcher, Multiplexer etc) , you can set the switching time of camera by 1 Frame or 1 Field.

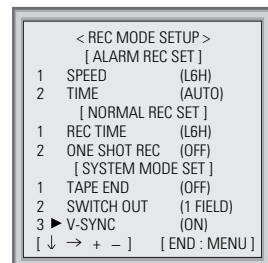
1. Turn on the power.
2. Press MENU button.
3. Select REC MODE SETUP by pressing SHIFT ▼ and then press SHIFT ► to proceed.
4. Select SWITCH OUT in [SYSTEM MODE SET] by pressing SHIFT ▼ and set it to 1 FRAME or 1FIELD by pressing SHIFT ►.
5. Press MENU button twice to return to the normal picture.



V-SYNC SETUP

The image can be shaky when connected to a particular 'FRAME SWITCHER'. Please adjust by variation of 'ON/OFF'.

1. Turn on the power.
2. Press MENU button.
3. Select REC MODE SETUP by pressing SHIFT ▼ and then press SHIFT ► to proceed.
4. Move '►' to select V-SYNC in [SYSTEM MODE SET] and set it to ON or OFF by pressing SHIFT ► (or SET +/- button).
5. Press MENU button twice to return to the normal picture.



RS-232C PARAMETER SETUP (Option)

As the Interface which equals to RS-232C EiA specifications, it can control this machine by PC. It is possible only for model that has the function of RS-232C. (For connector used in SERIAL PORT, employ 9 PIN CROSS TYPE of D-SUB.)

NOTE :

BAUD RATE

- It sets the transmission speed.
- Setup will be done in sequence : 9600 (9600 bit transmission by second) → 1200 → 2400 → 4800 → 9600

BIT LENGTH

- It sets the number of data bits.
- Setup will be done in sequence : 8BIT → 7BIT

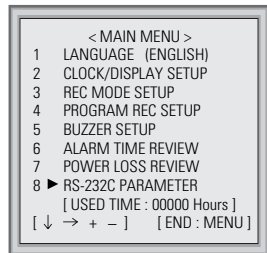
PARITY

- Bit setup for detecting the transmission error.
- Setup will be done in sequence : NONE → ODD(odd number) → EVEN(even number) → NONE

STOP BIT

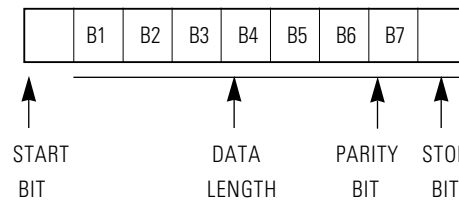
- It sets the STOP BIT.
- Start Bit will be added to indicate the data start part and Stop Bit to data end part.
- Start bit is always 1 bit. For Stop bit, select between 1 bit or 2 bits.

- Turn on the power.
- Press MENU button.
- Select RS-232C PARAMETER by pressing SHIFT ▼ and then press SHIFT ► to proceed.
- Select BAUD RATE, BIT LENGTH, PARITY and STOP BIT by pressing SHIFT ► and then press SHIFT ► to proceed.
- When you completed it, press MENU to return to the normal display.

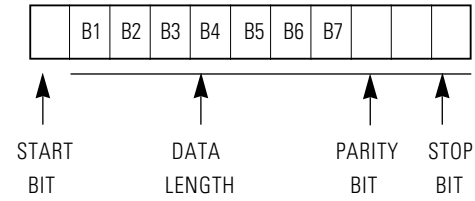


CODE TYPE:

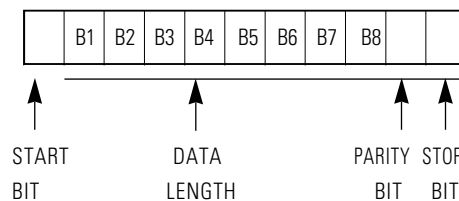
BIT LENGTH : 7BIT
STOP BIT : 1BIT
PARITY : EVEN



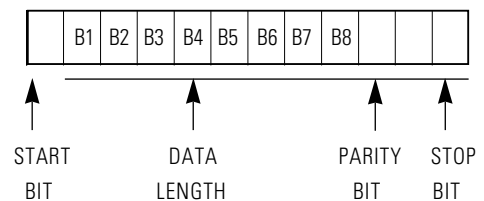
BIT LENGTH : 7BIT
STOP BIT : 2BIT
PARITY : ODD



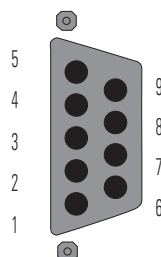
BIT LENGTH : 8BIT
STOP BIT : 1BIT
PARITY : EVEN



BIT LENGTH : 8BIT
STOP BIT : 2BIT
PARITY : ODD



RS-232C TERMINAL

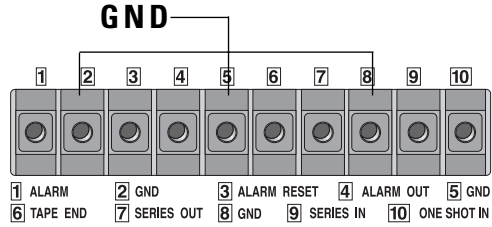


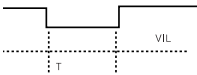
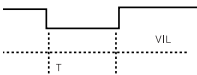
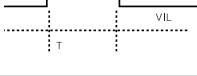
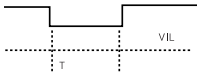
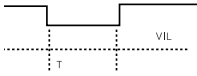
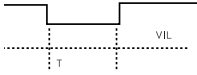
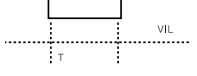
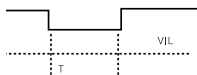
RS-232C SIGNAL CONTENTS

PIN NO.	SIGNAL CONTENTS		PIN NO.	SIGNAL CONTENTS	
1	DCD	NC	6	DSR	NC
2	RxD	DATA IN	7	RTS	NC
3	TxD	DATA OUT	8	CTS	NC
4	DTR	NC	9	RI	NC
5	GND	GND			

TERMINALS

EXTERNAL TERMINAL INFORMATION



TERMINAL NAME		SPECIFICATION	NOTE
1	ALARM IN		Alarm will be executed when the pulse is inputted
2	GND		
3	ALARM RESET		Alarm REC will be released when the pulse is inputted. (But, ignore it when it is within 3mins.)
4	ALARM OUT		Pulse will be outputted while Alarm REC
5	GND		
6	TAPE END		Pulse will be outputted when the tape reaches end part (But, low pulse should be maintained until any button is pressed.)
7	SERIES OUT		Pulse will be outputted when the tape reaches end part during REC. (But, it is outputted only when Series sets on)
8	GND		
9	SERIES IN		Series REC will be executed when the pulse is inputted (But, it is outputted only when Series sets on)
10	ONE SHOT REC		One shot REC will be executed when the pulse is inputted
RCA JACK	SWITCH OUT		Pulse will be outputted during linear or inter REC (Pulse for switching of Camera) * No output in L6H mode.

MAINTENANCE

BEFORE STARTING TO RECORD

We recommend you check the VCR daily to confirm that the VCR works correctly. When the record lock is in effect, release it before operating.

• Perform the following checks before starting to record.

1. Turn on the camera, monitor, and this VCR.
2. Confirm that the picture from the camera appears on the monitor screen.
3. Confirm that the time and date display on the monitor is correct.
4. To check the recording condition of the previous day, rewind the tape for a few seconds and play back the tape.
5. Confirm that playback is normal.
6. Confirm that recorded time and date information is correct.



NOTE :

If you find any malfunction, switch all equipment off, unplug the VCR from the AC outlet, and consult your dealer.

CLEANING VIDEO HEAD

After prolonged use, the video heads may become contaminated, which results in impaired picture quality(snow) or loss of picture. To avoid this, clean the video heads regularly.

REPLACING VIDEO HEAD

If optimum picture quality is not restored even after you have cleaned the video heads, head replacement may be necessary. (For replacement, consult your dealer)

MAINTAINING MECHANICAL PARTS

When not used for long periods, the VCR should be switched on now and then set to the playback mode for about three minutes. This helps to prevent mechanical deterioration.

CHECKING THE VIDEO HEAD EVERY 1000 HOURS

A VCR is a high-precision piece of equipment because it records or plays back the picture on a magnetic tape.

In particular, the video head and other mechanical parts become dirty or worn.

- To maintain a clean picture, we recommend maintenance every 1000 hours.
- To identify the service time, check the USED TIME display in the lower part of MAIN MENU.

MAINTENANCE

SERVICING PERIODICALLY

To maintain optimum operating conditions and picture quality, periodic servicing (cleaning, lubrication, parts replacement) is necessary.

If the VCR is to be used for critical monitoring purposes, it may be preferable to perform servicing at shorter intervals.

★ : CHECK
⊙ : REPLACE

NAME (Part No.)	SERVICING PERIODICALLY				
	1000	2000	3000	4000	5000
DRUM TOTAL ASS' Y (N8699R9602)	★	⊙	★	⊙	★
CAPSTAN MOTOR (N8699T9603)	★	⊙	★	⊙	★
L/C BRKT TOTAL ASS' Y (N8699T9614)		⊙		⊙	
REEL BELT (N8699T9611)		⊙		⊙	
IDLER PLATE TOTAL ASS' Y (N8699T9615)		⊙		⊙	
REEL TABLE (N8699T9616)			⊙		
S SUB BRAKE ASS' Y (N8699T9607)		⊙		⊙	
T SUB BRAKE ASS' Y (N8699T9608)		⊙		⊙	
TENSION BAND ASS' Y (N8699T9606)		⊙		⊙	
S MAIN BRAKE ASS' Y (N8699T9609)		⊙		⊙	
T MAIN BRAKE ASS' Y (N8699T9619)		⊙		⊙	
PINCH ROLLER ASS' Y (N8699T9605)		★	⊙	⊙	
AC HEAD ASS' Y (N8699T9604)			⊙		
FE HEAD (N8699T9610)					⊙
REEL GEAR TOTAL ASS' Y (N8699T9617)		⊙		⊙	

Should the problem happen, contact your dealer.

TROUBLE SHOOTING

This section may help you isolate the problem. Should the problem persist,unplug the power cord and contact your dealer.

Trouble	Checks	Adjustments
The picture does not appear on the monitor screen.	•Wrong connection.	•Check the connection.
	•No power is provided to video camera and monitor TV.	•Turn on the power.
The VCR does not respond when you press any button.	•The VCR is in the alarm recording	•Wait for the alarm recording to finish.
	•The record lock function is working.	•Release the record lock.
	•The VCR is in timer-recording standby mode or during timer recording	•Release timer recording by pressing TIMER.
Recording cannot be done.	•The safety tab on the cassette has been removed.	•Cover the tab hole with plastic tape.
Repeat recording cannot be done.	•Alarm recording was made during repeat recording.	•This is normal.
	•REPEAT REC is set to OFF.	•Set REPEAT REC to ON.
Timer recording was not made.	•Clock is not set.	•Set the clock correctly.
	•TIMER button is not pressed.	•Press the TIMER button.
Playback picture flickers or blurs.	•Video heads are dirty.	•Clean the video heads.
Time and date were not recorded.	•The Time/date display is not displayed.	•Set the TIME/DATE DISPLAY to ON.
The tape does not eject.	•System trouble.	•Please contact your dealer.
The VCR does not function except playback.	•The power of the equipment to be used is not turned on.	•Please contact your dealer.
The error display "ERR" appears on the window.	•There is a problem with unit. ERR1: TAPE Load/Unload error ERR2: TAPE In/Out error ERR3: TAPE Transportation error ERR4: Drum error ERR5: TAKE – UP Reel error ERR6: Supply reel error ERR7: Tape may be cut	•Please contact your dealer •Release the error mode by pressing RESET (or POWER) button .

SPECIFICATIONS

GENERAL

Recording method	Rotate-head azimuth recording system
Audio recording	Possible in L6H,L18H,L30H modes
Tape speed	11.695mm/SEC (L6H mode)
Specified video cassette tape	VHS 1/2inch,video cassette tape.(E-180 Tape)
Recording/playback time	L6,L18,L30,72,120,168,240,480,720 and 960H
	(when using E-180 Tape) 3H (PB ONLY)
Rewinding time	Within 3minutes (when using E-180 Tape)
Signal system	PAL

VIDEO

Recording method	Luminance signal	FM method
	Color signal	Down converted subcarrier direct recording
Input	BNC;1Vp-p,75 Ω (unbalanced)	
Output	BNC;1Vp-p,75 Ω (unbalanced)	
Horizontal resolution	Black & White mode	350 TV lines (L6H REC)
	Color mode	300 TV lines (L6H REC)

AUDIO

Input	-8dBm, phone jack, 47k Ω (unbalanced)
Output	-7dBm, phone jack, 600 Ω (unbalanced)

OTHER SPECIFICATIONS

Operating temperature range	5°C ~ 40°C(41°F~104°F)
Operating humidity range	80% or less
Power supply	110~240V AC, 50Hz (free voltage)
Power consumption	Approx. 14W
External dimensions	360 x 90 x 312 (W/H/D) (mm)
Weight	Approx. 4.5Kg

- Design and specification are subject to change without notice.