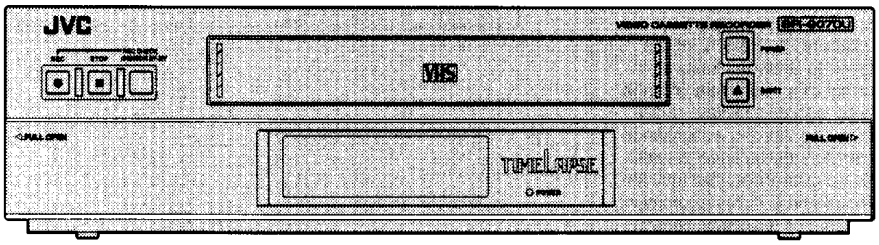
JVC®

VIDEO CASSETTE RECORDER

SR-9070U

INSTRUCTIONS



VHS

TIMELAPSE

For Customer Use:
Enter below the Serial No. which is located on the rear of cabinet. Retain this information for future reference.

Model No. SR-9070U

Serial No. _____

SL96048

SAFETY PRECAUTIONS

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INDIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

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.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This unit should be used with 120 V AC only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

NOTE:
The rating plate (serial number plate) is on the rear of the unit.

INFORMATION
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION
CHANGES OR MODIFICATIONS NOT APPROVED BY JVC COULD VOID USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

ATTENTION

RISQUE D'ELECTROCUTION
NE PAS OUVRIR

ATTENTION: POUR EVITER TOUT RISQUE D'ELECTROCUTION
NE PAS OUVRIR LE BOITER.
AUCUNE PIECE INTERIEURE N'EST
A REGLER PAR L'UTILISATEUR.
SE REFERER A UN AGENT QUALIFIE EN CAS DE PROBLEME

Le symbole de l'éclair à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'une "tension dangereuse" non isolée dans le boîtier du produit. Cette tension est suffisante pour provoquer l'électrocution de personnes.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'opérations d'entretien importantes au sujet desquelles des renseignements se trouvent dans le manuel d'instructions.

*Ces symboles ne sont utilisés qu'aux Etats-Unis.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.

Ce magnétoscope ne doit être utilisé que sur du courant alternatif en 120 V.

ATTENTION:
Afin d'éviter tout resque d'incendie ou d'électrocution, ne pas utiliser d'autres sources d'alimentation électrique.

REMARQUE:
La plaque d'identification (numéro de série) se trouve sur le panneau arrière de l'appareil.

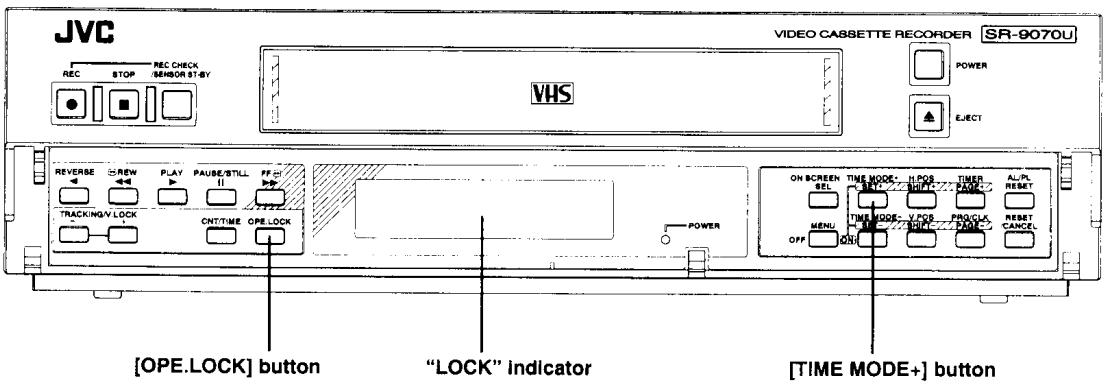
This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

OPERATION LOCK

By engaging the operation lock system [OPE.LOCK], you can prevent accidental or deliberate interference with recording operation or power supply.

When this function is activated, all operation buttons are disabled. However, you can still control the recorder with the remote control (with menu switch <REMOTE> set to "ON").



1 Engage the Rec or Play mode.

2 While pressing the [OPE.LOCK] button, press the [TIME MODE+] button. "LOCK" is shown on the display, indicating that the Operation Lock mode is engaged.

3 To unlock the VCR, press the [TIME MODE+] button while pressing the [OPE.LOCK] button. The "LOCK" indication on the display disappears and the unit can now be operated normally.

To prevent unauthorized use, detach this page and keep it in a safe place.

CONTENTS

1 INTRODUCTION

1-1 Major Features 6
1-2 Precautions 7
1-3 Daily Inspection 7

2 CONTROLS AND CONNECTORS

2-1 Front Panel 8
2-2 Display 10
2-3 Rear Panel 11
2-4 Battery Installation 12

3 CONNECTIONS

3-1 Connecting to a Camera With a Built-in SSG 13
3-2 System Using Sequential Switcher 14
3-3 Connecting the Rear Panel Input/Output Terminal Connections 15

4 ON-SCREEN/MENU SWITCHES

4-1 On-Screen Display 16
4-2 Hour Meter Display 17
4-3 Menu Switch Setting 18
4-4 Contents of Menu Switch 19

5 PREPARATION

5-1 Summer Time Compensation 22
5-2 Date and Time Setting 23
5-3 Cassette Loading/Unloading 24
5-4 Selection of Record/Play Mode 25

6 RECORDING

6-1 Preparation 26
6-2 Recording 27
6-3 Timer Recording 28
6-4 Alarm Recording 31
6-5 Sensor Recording 33
6-6 Series Recording 34
6-7 Repeat Recording 35
6-8 How to Restore Recording After Power Failure 35
6-9 External Timer Recording 35
6-10 Tape End Buzzer 35
6-11 Recording with External VCR Activation Signal 36

7 PLAYBACK AND SPECIAL-EFFECTS PLAYBACK

7-1 Preparation 37
7-2 Playback 37
7-3 Special-Effects Playback 38
7-4 Index Search 39
7-5 Repeat Playback 39
7-6 Counter Memory Function 39
7-7 Tracking/V Lock Adjustment 40
7-8 V. PULSE 40

8 TROUBLESHOOTING

8-1 Error Indication 41
8-2 No Error Indication 42

9 APPENDIXES

9-1 SA-K97 Optional RS-232C Interface Board 43
9-2 Rear Panel's Input/Output Terminal Signal 50
9-3 Specifications 51

1 INTRODUCTION

1-1 Major Features

- **Extended timelapse recording for up to 960 hours**
  Recording times are selectable from 2 hours (VHS SP mode), 6 hours (VHS EP mode) and 12/24/48/72/120/168/240/480/960 (Timelapse mode)
- **Alarm recording function**
  When an alarm signal is input in the Timelapse Record mode, the 2/6-hour mode is automatically engaged. Alarm recording time can be selected from 5, 10, 15, 30, 60, 120, or 180 sec., to tape end, or set manually.
  An index code is automatically recorded at the start point of the alarm recording for use as an alarm cue signal. Alarm recording points can be accessed quickly with the index search function.
- **Sensor recording**
  Whenever an alarm signal is input in the Sensor Record Standby mode or the Stop mode, the Record mode is automatically engaged.
- **Time/date generator**
  Superimposes year, month, date, minute and second on the image during recording. Also allows you to display the number of alarms, alarm time, and the number of the power failures on a monitor.
- **Timer-recording function**
  Daily, weekly, weekday (Monday to Friday/Monday to Saturday) timer-recording is possible for up to 8 programs.
- **Recording check function**
  Recording conditions (quality) can be checked at any time during recording by pressing the recording check button.
- **Operation lock system**
  The secret operation lock system prevents an accidental or deliberate interference with VCR operation.
- **Camera switching signal output terminal**
  When the SR-9070U is integrated in a multi-camera system with a sequential switcher, camera input can be switched automatically with a camera switching output signal.
- **Warning function**
  Error indications are shown on the front panel display. Error warnings include condensation and problems with cassette loading, cassette unloading, or the rotating system operation mode.
- **Power-off video throughput function**
  Even when the power is off, the camera's EE input can be output from the VCR.
- **Series recording function**
  Two or more SR-9070Us can be connected for extended, long-term series recording. As the tape in each VCR reaches the end, the next unit in the series will automatically start recording.
- **Automatic re-start of recording after a power failure**
  When power is restored after a power failure, the SR-9070U automatically resumes recording in the same mode.
- **Time adjust function**
  With the IN/OUT terminal for time adjustment, the time difference can be set to "0" with multiple SR-9070Us connected. (adjustment time: AM 12:00/PM 12:00)
- **Digital hour meter display**
- **Repeat playback/recording**
- **Alarm recording, tape end and warning electronic buzzer**
- **Recording control with external activation signal**
- **Counter end function**
- **External timer connection**
- **Summer time compensation function**
- **Wired remote control (optional)**

Used when an optional SA-K97 RS-232C interface board is installed.

- **RS-232C control**
  The SR-9070U can be controlled via a personal computer. Operation status can be monitored on the computer.

JVC is not liable for compensation for loss or damage to recordings in the event this unit fails to record or play back properly because the unit malfunctions or a defective video cassette tape is used.

VHS

The SR-9070U is a video cassette recorder able to execute timelapse recording with VHS cassettes.
Use only video cassettes bearing the VHS mark.

Please note that it may be unlawful to use any material recorded from TV broadcast programs or pre-recorded programs without the consent of the owner of copyright, except in cases where this material is recorded exclusively for personal use.

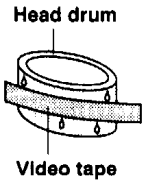
1-2 Precautions

Handling and storage place

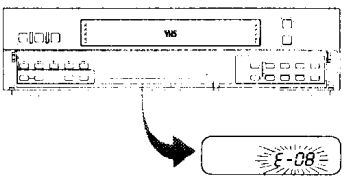
- **Avoid using the unit in places subject to the following conditions:**
  - extreme heat or cold
  - strong magnetic fields (do not use a transceiver within 2 meters of this unit)
  - high humidity
  - dust and soil
  - vibrations
  - variations in temperature
- **Use this unit in horizontal (flat position) only.**
- **Do not leave the unit in the Still or Record Pause mode for a long time as this may damage the tape.** After about 5 minutes 25 seconds, this unit automatically enters the Stop mode.
- **Handle the unit carefully**
  - Do not place anything heavy on the unit (a monitor, etc.). A malfunction may occur.
  - Do not put any foreign substance into the cassette loading slot.
  - Avoid violent shocks to the recording chassis during transportation. Remove the cassette tape from the unit for transportation.
- **Maintenance**
  Proper maintenance such as cleaning dust, adding oil, or replacing parts are necessary to obtain optimum performance and a longer service life. We recommend you do maintenance on a regular basis (once every 1000 hours). Total drum rotation hours can be checked via on-screen display or display(see page 17).

Condensation

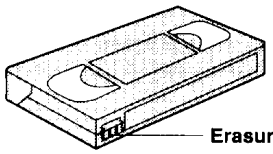
- **Condensation**
  When cold beer is poured into a glass, water drops appear on the glass's surface. This phenomenon is called "condensation". When condensation occurs on the VCR's head drum and tape guides it may damage the tape.
- **Condensation occurs in the following cases.**
  - When the VCR is moved from a cold place to a warm place.
  - In a room that has just been heated or in an area directly exposed to a cooler.
  - When there is excessive humidity



- **When condensation is expected to occur**
  Turn the power of the VCR on before use.
- **If condensation has occurred**
  The VCR automatically ejects the cassette and the error indication "E-08" blinks on the display. Operation is disabled until the "E-08" indication on the display goes out.



Video cassette



Timelapse recording is performed over very long periods of time which means that a durable tape is required. Do not use extended tapes of 130 minutes or more such as T-160 or T-180.

- Only use video cassette bearing the VHS mark.
- To prevent accidental erasure of a recorded tape, break the erasure prevention tab on the cassette. To use a cassette with a broken tab, place a piece of cellophane tape over the broken tab.
- Video cassettes cannot be used upside down.
- Leaving the tape in a partially wound condition for a long time may damage the tape. Rewind the tape to the beginning before storage.

1-3 Daily Inspection

Although this unit has been designed for reliable operation over a long period of time, a daily inspection is recommended to ensure optimum performance. In particular, be sure to check the repeat recording/playback function on a daily basis.

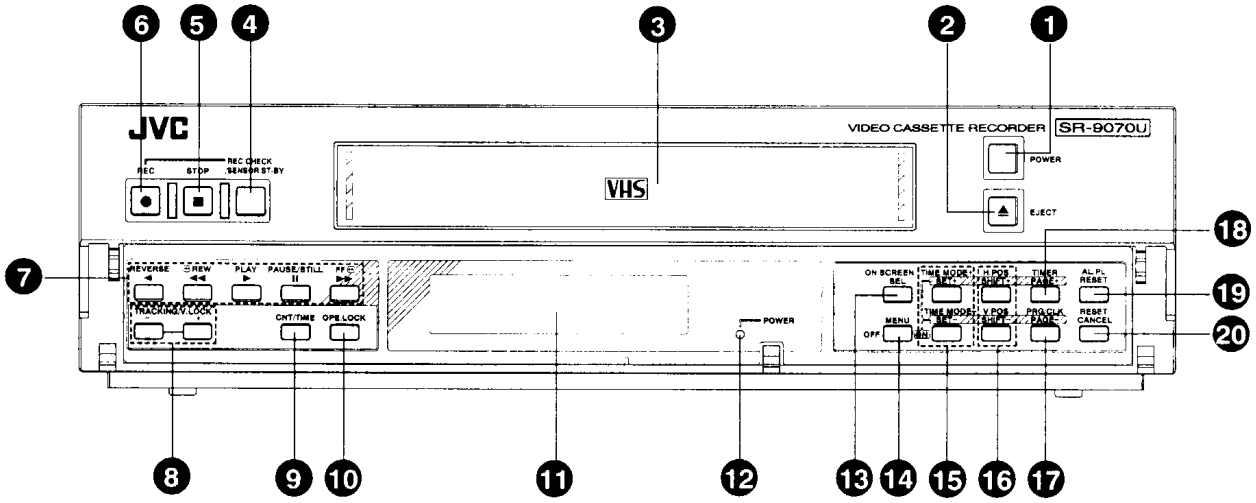
Inspection procedure

1. Turn on the power for all units connected to the surveillance system.
2. Check the quality of the image shown on the monitor.
3. Check that the date and time shown on the monitor are correct.
4. Rewind the tape recorded the previous day for several seconds.
5. Press the play button for playback.
6. Check that the playback picture is normal.
7. Check that the recorded date and time are correct.

If any problems are found after inspection, turn the power off, unplug the power plug from the AC outlet, and contact your JVC dealer.

2 CONTROLS AND CONNECTORS

2-1 Front Panel



❶ **[POWER] button**
Press to turn the power on or off. When power is supplied, the power indicator is lit. The power is automatically switched on when you insert a cassette.

❷ **[EJECT] button**
Press to eject the cassette.

❸ **Cassette loading slot**
For cassette loading and unloading. Use a VHS cassette.

❹ **[REC CHECK/SENSOR ST-BY] button**
Engages the Recording Check or Sensor Recording Standby mode.
- **Recording check**
  Press this button in the Record mode to check recording quality. The tape is played back in reverse for about two seconds, then recording automatically resumes.
- **Sensor recording**
  Press to set the unit to record only when an alarm signal is input.
  Set the on-screen menu switch <SENSOR REC> to "ON". Press this button in the Stop mode to activate the Sensor Recording Standby mode.
  For details, refer to "Sensor Recording" on page 34.

❺ **[STOP] button**
Press this button to stop the tape.

❻ **[REC] button**
Press this button in the Stop mode to engage the Record mode.

❼ **Operation buttons**

[FF] button
- Press to fast forward the tape.
- Starts fast-forward shuttle search when pressed in the Play mode.
- If the on-screen menu switch <INDEX SRCH> is set to ON and an alarm-recorded tape is loaded, Index (alarm) Search starts in the forward direction when this button is pressed in the Stop or Play mode.

[PAUSE/STILL] button
- Temporarily stops recording when pressed in the Record mode.
- Displays a still picture when pressed in the Play mode.
- Advances frame by frame when pressed in the Still mode.

[PLAY] button
Press to play back the tape.

[REW] button
- Press to rewind the cassette.
- Starts reverse shuttle search when pressed in the Play mode.
- If the on-screen menu switch <INDEX SRCH> is set to ON and an alarm-recorded tape is loaded, Index (alarm) Search starts in the reverse direction when this button is pressed in the Stop or Play mode.

[REVERSE] button
Starts reverse playback when pressed in the Play or Still mode.

2-1 Front Panel

❽ [TRACKING/V. LOCK +, –] buttons
For tracking adjustment in the Play mode and V.LOCK adjustment in the Still mode.
- Press to reduce noise in the Play mode.
- Press to reduce vertical jitter of picture in the Still mode.

❾ [CNT/TIME] button
Selects the display mode. Each time this button is pressed, the display changes from current time, to continuous recording time to tape counter.

❿ [OPE.LOCK] button
Press to activate the operation lock function.

⓫ Display section
For details, refer to page 10.

⓬ [POWER] indicator
Lights when power is supplied.

⓭ [ON SCREEN SEL] button
Selects whether or not on-screen data recording and display is performed. Also changes the on-screen display mode from time/date, to alarm data, power loss data or drum hour meter.
For details, refer to "On-Screen Display" on page 16.

⓮ [MENU ON/OFF] switch
Selects whether or not the on-screen menu switch setting screen is displayed on the monitor.
ON: Displays the on-screen menu switches.
OFF: Does not display the on-screen menu switches.

⓯ [TIME MODE+/SET+] button
[TIME MODE–/SET–] button
- These buttons are normally used for recording/playback time mode setting. Select the recording/playback time mode. The selected recording/playback time is shown on the display.

  2H ..... VHS SP mode recording/playback
  6H ..... VHS EP mode recording/playback
  12H ..... 12-hour timelapse recording/playback
  24H ..... 24-hour timelapse recording/playback
  48H ..... 48-hour timelapse recording/playback
  72H ..... 72-hour timelapse recording/playback
  120H .... 120-hour timelapse recording/playback
  168H .... 168-hour timelapse recording/playback
  240H .... 240-hour timelapse recording/playback
  480H .... 480-hour timelapse recording/playback
  960H .... 960-hour timelapse recording/playback
- When setting on-screen menu switches, use these buttons to perform the setting for the menu switch you want to set.

⓰ [H.POS/SHIFT+] button
[V.POS/SHIFT–] button
- These buttons are normally used to move the display position or recording position of on-screen information. The position can be moved horizontally with the [H.POS] button and vertically with the [V.POS] button.
- When setting the on-screen menu switches, use these buttons to select the menu switch item you want to set.

⓱ [PRG/CLK/PAGE–] button
- Normally switches the display section and on-screen display between time setting mode and timer recording set mode.
- When setting the on-screen menu switches, use this button to select the menu switch setting screen mode. Five menu switch setting screen modes are available. When this button is pressed, the last (previous) setting screen mode is engaged.

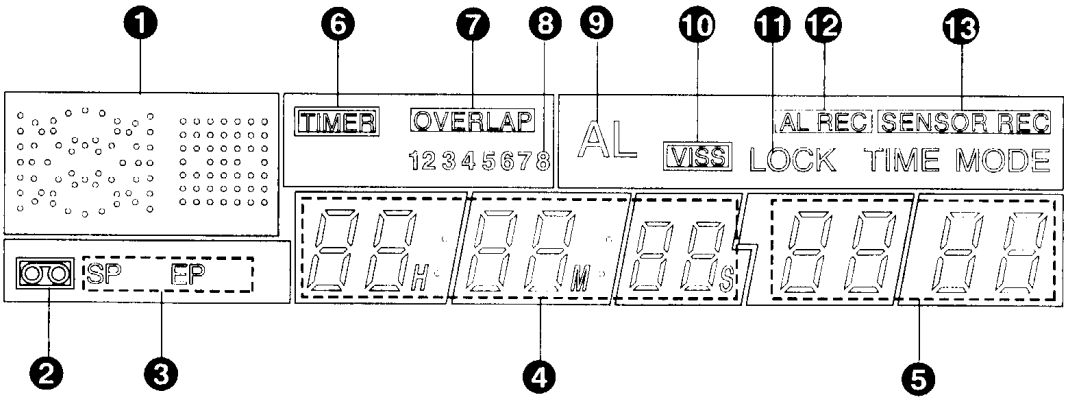
⓲ [TIMER/PAGE+] button
- Normally use this button for timer recording. For details, refer to "Timer Recording" on page 28.
- When setting the on-screen menu switches, use this button to select the menu-switch setting screen mode. Five menu switch setting screen modes are available. When this button is pressed, the next setting screen mode is engaged.

⓳ [AL/PL RESET] alarm/power loss reset button
Press this button to stop alarm recording or reset the alarm input data or power loss data. For details, refer to page 32.

⓴ [RESET/CANCEL] button
- Normally press this button to reset the tape counter to 0000.
- In the Timer Program Setting mode, press this button to cancel the program settings. For details, refer to "Timer Recording" on page 28.

2 CONTROLS AND CONNECTORS

2-2 Display



❶ Operation mode display
Shows the operation modes.

Playback	Recording	Rewind	Fast-forward	Timelapse playback
Still	Record-pause	Rewind search	Fast-forward search	Reverse playback

* ( ) mark in the Rec/Pause mode is shown in red.

❷ Cassette indication
Lights when a cassette is loaded. Blinks when a cassette is being ejected.

❸ SP/EP indication
Shows the VHS standard (SP) mode or EP mode during recording/playback.
During Timelapse Recording/Playback mode, the SP indicator is shown.

❹ Tape counter/time/data indication
- When the power is turned on, the tape counter, current time or continuos recording time are shown. The display can be selected with the [CNT/TIME] button.
- When the power is turned off, the present time (hour, minute, second) is shown.

❺ Recording/playback mode time display
- Shows the recording/playback mode set with the [TIME MODE+/–] buttons.
- When an problem occurs, the error indication "E-**" blinks. For details, refer to page 41.

❻ TIMER indication
Lights during timer recording programming/operation.

❼ OVERLAP indication
Blinks when programs scheduled for timer recording overlap.

❽ Timer program number
During timer recording, the number of program being recorded blinks.
When the timer recording ends, this number goes out.

❾ AL (alarm) indication
Shown during alarm recording or sensor recording.
Blinks when alarm recording or sensor recording ends.

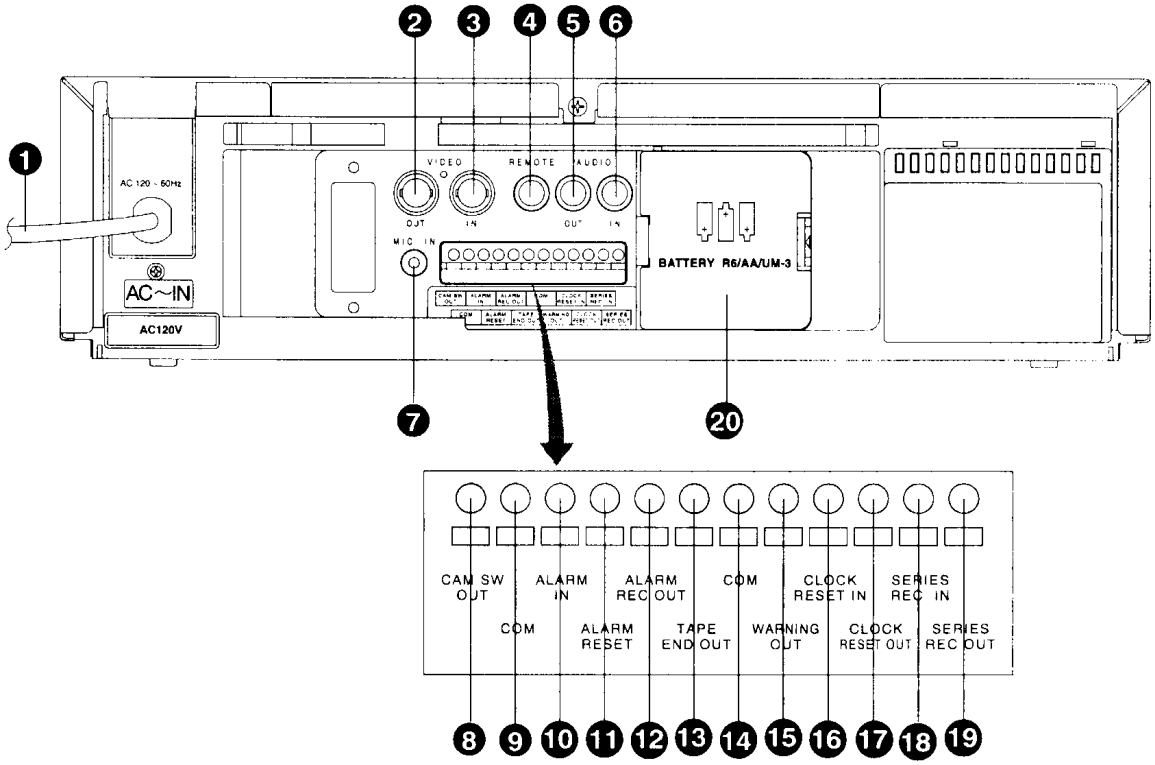
❿ VISS indication
Shown when the alarm recording start point is index-searched. For details, refer to "Index Search" on page 40.

⓫ LOCK indication
Lights when the operation lock function is activated.

⓬ AL REC (alarm recording) indication
Lights when menu switch <ALARM REC> is set to "ON".

⓭ SENSOR REC (sensor recording) indication
Lights when menu switch <SENSOR REC> is set to "ON".

2-3 Rear Panel



❶ **Power cable**
Connect the power plug to an AC 120 V, 60 Hz outlet.

❷ **[VIDEO OUT] video output connector (BNC)**
Outputs composite video signals. Even when the power is not supplied to this unit, input signals (composite video signals) from a camera can be output through this connector (Power-Off Video Throughput function).

❸ **[VIDEO IN] video input connector (BNC)**
Receives composite video signals from a connected camera or other video source.

❹ **[REMOTE] remote connector (RCA)**
Connect the optional RM-G30 remote control. When using the remote control, set menu switch <REMOTE> to "ON".

❺ **[AUDIO OUT] audio output connector (RCA)**
Outputs audio signals. No signal is output in the Timelapse Recording/Playback mode (except in the 12H/24H mode).

❻ **[AUDIO IN] audio input connector (RCA)**
Receives audio signals from a connected audio source.

❼ **[MIC IN] mic input connector**
Connect a microphone with 3.6-mm dia. plug. When signals are input from both the microphone connector and the audio input connector, audio signals are mixed and recorded.

❽ **[CAM SW OUT] camera switching signal output terminal**
When a sequential switcher is connected, this terminal outputs camera switching timing control signals. For details on these signals, refer to page 50.

❾ **[COM] common ground terminal**
Connect to the signal ground terminal of a connected unit.

❿ **[ALARM IN] alarm signal input terminal**
Receives signals to start alarm or sensor recording.

⓫ **[ALARM RESET] alarm signal reset input terminal**
Receives signals to cancel alarm recording.
* Alarm input data is not reset.

⓬ **[ALARM REC OUT] alarm recording mode signal output terminal**
Outputs +12 V signals during alarm recording.

2-3 Rear Panel

⑬ **[TAPE END OUT] tape end signal output terminal**
Outputs a Tape End signal when the tape ends during recording. If menu switch <CNT END> is set, the signal is output at the point where the specified counter value is passed.
- Outputs a +12 V signal during recording. When the tape ends or the specified counter value is passed, a 0 V (GND level) signal is output.
- When the tape ends during auto repeat recording, signals are output for about 2 seconds.
- Connect an external alarm lamp or buzzer via an external interface.
- To cancel the output, press the EJECT button, STOP button or REW button.

⑭ **[COM] common ground terminal**
Connect to the signal ground terminal of a connected unit.

⑮ **[WARNING OUT] warning signal output terminal**
Outputs warning signals (+12 V) when a tape running or mechanism problem occurs.

⑯ **[CLOCK RESET IN] clock reset input terminal**
Automatically synchronizes the clock with the reference SR-9070U. Connect to the preceding SR-9070U's [CLOCK RESET OUT] connector or the master clock.

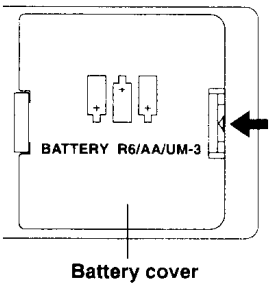
⑰ **[CLOCK RESET OUT] clock reset output terminal**
Connect to the succeeding SR-9070U's [CLOCK RESET IN] terminal. Once the master clock or initial VCR clock has been set, all connected VCR clocks are automatically set to the same time.
A signal is output at AM 12:00 or PM 12:00.

⑱ **[SERIES REC IN] series recording signal input terminal**
Receives series recording signals.
- Connect to the preceding VCR's series recording signal output terminal.
- When the tape in the preceding VCR ends, a signal is delivered to this terminal. Recording starts automatically. If menu switch <CNT END> is set for the preceding VCR, the signal is delivered when the specified counter value is reached. Recording starts automatically.

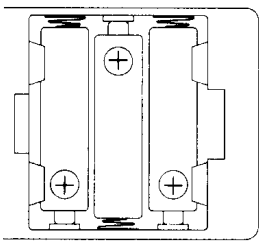
⑲ **[SERIES REC OUT] series recording signal output terminal**
Outputs series recording signals.
- Connect to the next VCR's series recording signal input terminal.
- Outputs a signal when the tape in this unit ends. Outputs a signal when the menu switch <CNT END> is set and the specified counter value is reached.

⑳ **Battery compartment**
Install three batteries (AA) for backup of time/date generator.

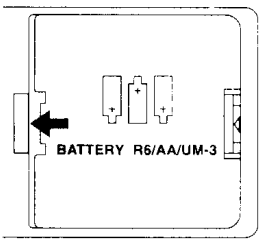
2-4 Battery Installation



1 Push the battery cover in the direction shown by the arrow and remove it.



2 Install the provided three batteries (AA). Position batteries as indicated to ensure correct polarity.

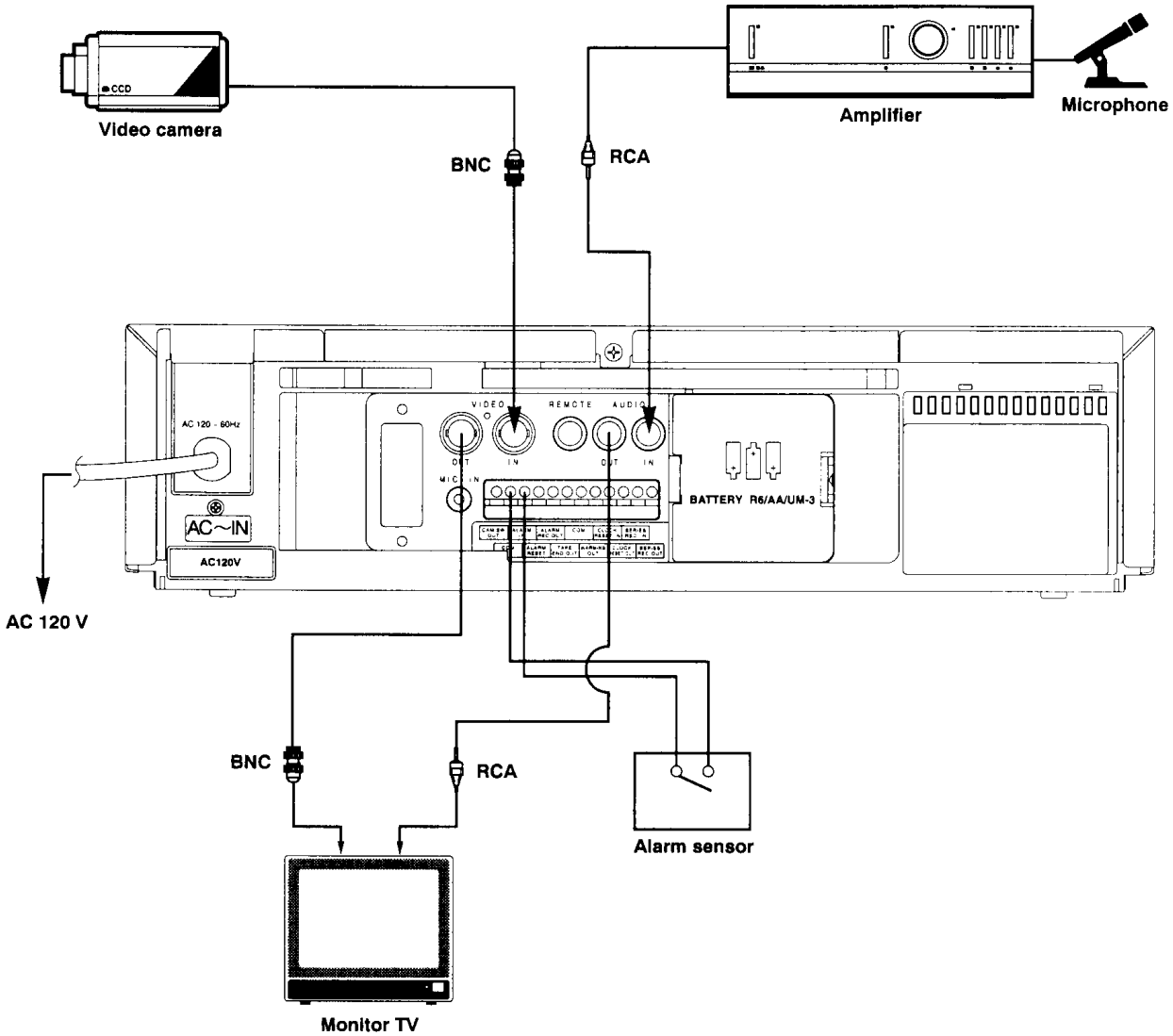


3 Insert the battery cover in the groove shown by the arrow and push to close.

Battery backup capability lasts for about 1 year. When battery capacity is insufficient and no battery is installed, the error indication "E-10" is shown on the display. (Only when the power is turned off.)
Replace the batteries with new ones and reset the date and time.

3 CONNECTIONS

3-1 Connecting to a Camera With a Built-in SSG

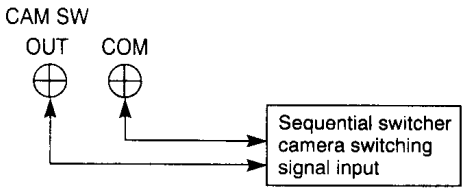


1. Connect the monitor's video/audio input connectors to the SR-9070U's video/audio output connectors.
2. Connect the video camera's video output connector to the SR-9070U's video input connector.
3. Input audio signals to the audio input connectors via an amplifier.
4. When connecting an alarm sensor, connect it to the SR-9070U's alarm input terminal.
5. When the connection is complete, connect the power plug to an AC 120 V,50/60 Hz outlet.

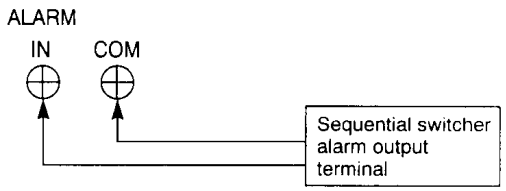
3 CONNECTIONS

3-3 Connection of the Rear Panel Input/Output Terminal Connections

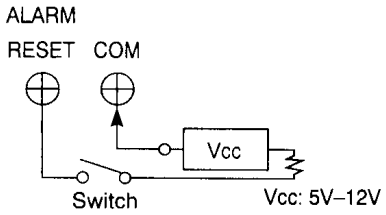
[CAM SW OUT] camera switching signal output terminal



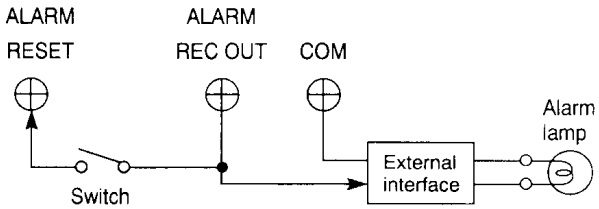
[ALARM IN] alarm signal input terminal



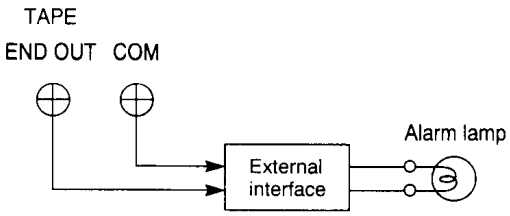
[ALARM RESET] alarm reset terminal



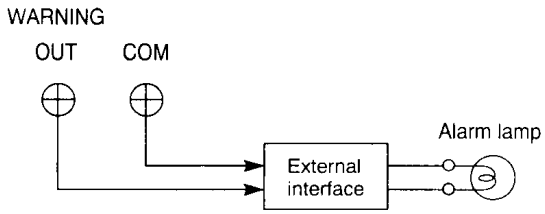
[ALARM REC OUT] alarm recording mode signal output terminal



[TAPE END OUT] tape end output terminal

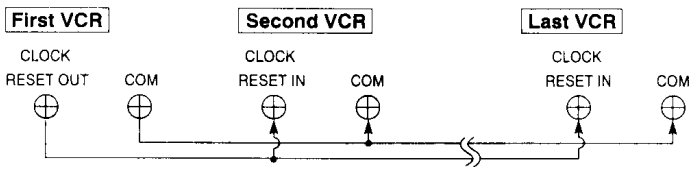


[WARNING OUT] warning signal output terminal

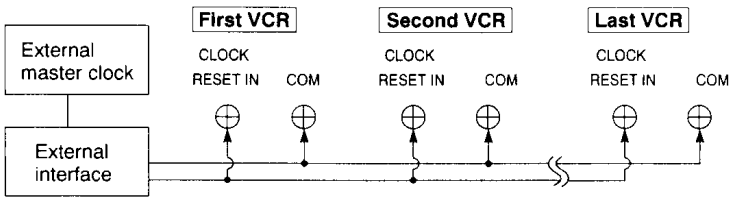


[CLOCK RESET] clock reset terminal

■ When setting the clock to the first VCR's clock

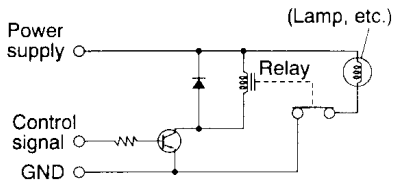


■ When setting the clock to the external master clock



External interface example

Example: Lamp lights with HIGH signal

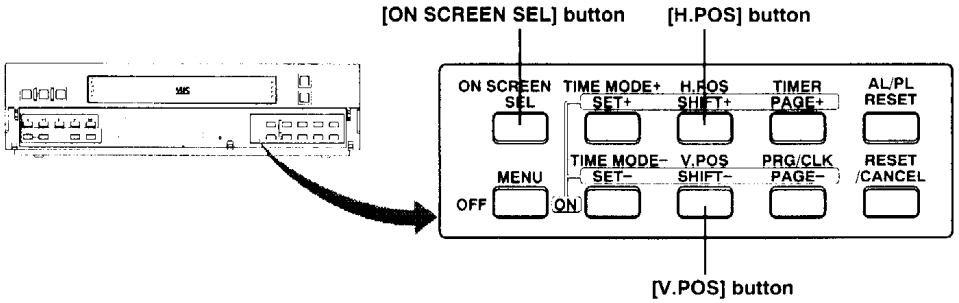


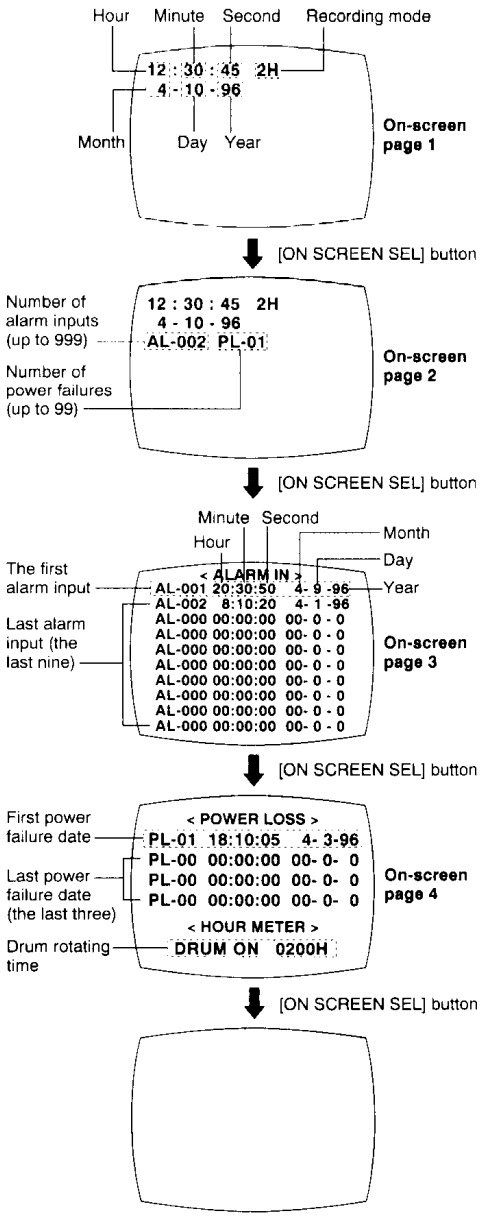
■ **Use appropriately rated devices.**

4 ON-SCREEN/MENU SWITCHES

4-1 On-screen Display

Time data (date, time), alarm and power loss (power failure) data, and hour meter (drum rotating time) data can be recorded and displayed on screen in the Stop, Record and Record Pause modes.





Preparation

- Connect the SR-9070U's video output connector to the monitor's video input.

1. Turn the power on (monitor and SR-9070U) and engage the Stop mode.
2. When a video signal is input to the video input connector, on-screen page 1 is superimposed on the picture.
   If no signal is input, on-screen page 1 is shown on a black background.

- If nothing appears on-screen, press the [ON SCREEN SEL] button.

3. Press the [ON SCREEN SEL] button.
   → On-screen page 2 is shown.
   On-screen page 2:
   In addition to time, date and recording mode (on-screen page 1), the number of alarm inputs and the number of power losses (power failures) are shown.
4. Press the [ON SCREEN SEL] button.
   → On-screen page 3 is shown.
   On-screen page 3:
   Alarm dates and times for the first alarm input and the last nine are shown.
5. Press the [ON SCREEN SEL] button.
   → On-screen page 4 is shown.
   On-screen page 4:
   Power failure dates and times for the first power failure and the last three are shown. Hour meter data (drum rotating time) is also shown.
6. Press the [ON SCREEN SEL] button.
   → The on-screen display is cleared.

4-1 On-screen Display

Changing the on-screen display position

The display position can be changed for on-screen pages 1 and 2.

- **To move the display position horizontally**
  Press the [H.POS] button.
  → The display position is moved to the right.
- **To move the display position vertically**
  Press the [V.POS] button.
  → The display position is moved down.

Changing the brightness and color of the on-screen display

Use the on-screen mode setting screen to make these changes.

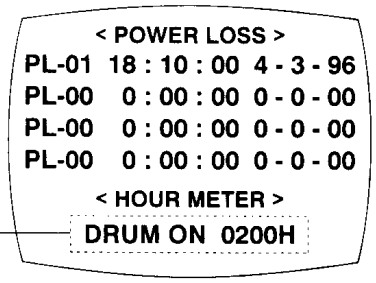
- **To change the brightness**
  Selects with menu switch <TONE>. Select the value from 0, 30, 70, 100 and IRE.
  The smaller the number, the darker the characters.
- **To change the color**
  Selects with menu switch <CHARACTER>.
  WHITE: White
  BLACK: Black background

For details on menu switch setting, refer to page 18.

If you don't want to record on-screen data, turn off the on-screen display before recording.

4-2 Hour Meter Display

Hour meter data (drum rotating time) up to 9999 hours is shown on the monitor's on-screen display.



On-screen page 4

Drum rotating time
(up to 9999H)

To show the hour meter display

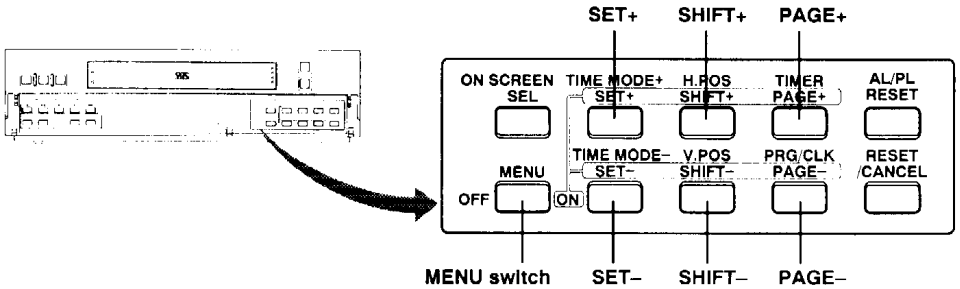
- Engage the Stop or Record Pause mode and press the [ON SCREEN SEL] button until on-screen page 4 is displayed.
  - Power loss (power failure) data is shown together with the drum hour meter.

To clear the hour meter display

- Press the [ON SCREEN SEL] button.

4 ON-SCREEN/MENU SWITCHES

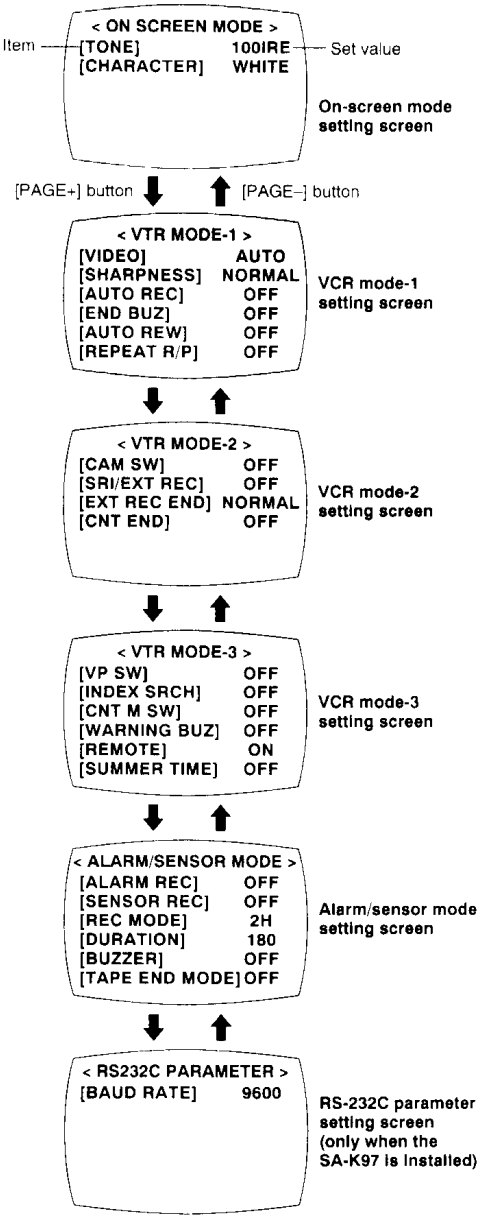
Use the on-screen display menu switches to adjust settings to suit your requirements.



The open characters show the functions of the menu switch operation buttons.

Menu switches are shown on five setting screens. (Six when the optional SA-K97U RS-232C board is installed.)
For details on menu switch setting screens, see below.

4-3 Menu Switch Setting



Preparation

- Connect the SR-9070U's video output connector to the monitor's video input connector.
- Turn on the power (monitor and SR-9070U) and engage the Stop mode.

1 Call up the on-screen mode setting screen.
- Set the MENU switch to ON.
  → Calls up the on-screen mode setting screen.
- Press the [SHIFT+] or the [SHIFT–] button until the item you want to set blinks.
- Press the [SET+] or the [SET–] button to set the desired value for the menu item.

2 Call up the VCR mode-1 setting screen.
- Press the [PAGE+] button.
  → Calls up the VCR mode-1 setting screen.
- Selects the settings as desired with the [SHIFT+/–] buttons and the [SET+/–] buttons.

3 Call up the VCR mode-2/3 setting screen and the alarm/sensor mode setting screen.
- Press the [PAGE+] button.
  → Pressing the [PAGE+] button cycles the display through the VCR mode-2 setting screen, the VCR mode-3 setting screen, and the alarm/sensor mode setting screen.
  If the optional SA-K97U RS-232C board is installed, the RS-232C parameter setting screen can also be accessed by pressing the [PAGE+] button.
- Use the [SHIFT+/–] buttons and the [SET+/–] buttons to select and selects settings as desired.

Pressing the [PAGE–] button displays the same setting screens in the opposite order.

4 End menu switch setting.
- Set the MENU switch to OFF.
  → The normal screen is restored.

Note:
When recording is performed with the MENU switch set to ON, the setting screen is recorded. Be sure to set the MENU switch to OFF when recording.

4-4 Contents of Menu Switches

Screens	Items	Set values	Function
ON-screen mode setting	TONE	0 IRE 30 IRE 70 IRE [100 IRE]	Sets the brightness of the on-screen characters and numerals. The higher the numeric value, the brighter the screen.
	CHARACTER	[WHITE] BLACK	Sets the color of the on-screen characters and numerals. WHITE : White characters BLACK : Open characters
VCR mode-1 setting	VIDEO	[AUTO] B/W	Use to avoid misoperation in the color/BW automatic switching circuit. AUTO : Normally set to this position. Automatically detects whether input/playback signals are color or black-and-white. B/W : Use this position when the S/N ratio of B/W signals is too low for the automatic switching circuit to operate correctly. Color pictures are recorded or played back in black-and-white.
	SHARPNESS	[NORMAL] SHARP	Selects the picture quality in the Play mode. NORMAL : Normal picture quality. SHARP : Picture contours are emphasized.
	AUTO REC	[OFF] ON	Enables or disables automatic external timer recording or automatic restart of recording after a power failure. OFF : External timer recording or automatic recording after power failure is disabled. ON : Recording starts automatically when power is turned on.
	END BUZ	[OFF] ON	Turns the Tape End buzzer on or off. OFF : The buzzer does not sound at tape end. ON : The buzzer sounds when the tape ends during recording. To stop the buzzer sound, press the [REW] button, [EJECT] button or [POWER] button. When the mode is changed, the buzzer sound stops.
	AUTO REW	[OFF] ON	Turns Auto Rewind at Tape End on or off. OFF : The VCR enters the Stop mode when the tape ends in the Record, Play or FF mode. ON : When the tape ends in the Record, Play or FF mode, it is automatically rewound to the beginning. When the tape is fully rewound, the VCR enters the Stop mode. If <REPEAT R/P> (see below) is set to "ON", repeat recording/playback is executed regardless of the setting of <AUTO REW>.
	REPEAT R/P	[OFF] ON	Turns Repeat recording/playback on or off. OFF : The repeat recording/playback function is disabled. ON : When the tape ends during recording/playback, it is automatically rewound and recording/playback is repeated from the beginning of the tape.

[ ]: Factory setting

4-4 Contents of Menu Switches

Screens	Items	Set values	Function
VCR mode-2 setting	CAM SW	[OFF] 1 FIELD 2 FIELD	Sets the camera switching interval for output to an external sequential switcher during recording. OFF : No camera switching signal is output. 1 FIELD : Set to this position to switch cameras every 1 field.(Engaged to 2 fields with 6H mode.) 2 FIELD : Set to this position to switch cameras every two fields (1 frame).
	SRI/EXT REC	[OFF] SERIES EXT	Selects series recording or automatic recording with an external VCR activation signal. [OFF] : Series recording and external signal automatic recording are disabled. SERIES : The series recording function is enabled. EXT : The external signal automatic recording function is enabled.
	EXT REC END	[NORMAL] POWER OFF	Selects the mode engaged after completion of external signal automatic recording. NORMAL : The Stop mode is engaged. POWER OFF : The Stop mode is engaged and the power is turned off.
	CNT END	[OFF] 500 1000 : : 9000 9500	The VCR outputs a tape-end signal at the specified counter value during recording (counter end function). In series recording, the series recording signal is output at counter end. Using this function during series recording allows recording to continue virtually uninterrupted. OFF : The counter end function is disabled. 500 .... 9500 : When the specified counter value is reached during recording, the VCR outputs a tape-end signal. When menu switch <END BUZ> is ON, the buzzer sounds.
VCR mode-3 setting	VP SW	[OFF] ON	Selects whether or not V.PULSE is added to the signal in normal play back (in the 2/6H mode). OFF : V.PULSE is not added. Normally set to this position. ON : V.PULSE is added. • When switching cameras synchronized with the power supply, pictures may be distorted at the switching points. In this case, set to ON. The monitor is locked, preventing the pictures from being distorted (only in the 2/6H mode). • In the Still mode and Timelapse mode, V.PULSE is always output.
	INDEX SRCH	[OFF] ON	Enables or disables the Index Search function. OFF : The index search function is disabled. ON : When an alarm-recorded tape is put in the FF or REW Shuttle Search mode, the VCR searches for the nearest recorded index code (VISS signal) and engages playback at the indexed position. When an alarm-recorded tape is fast-forwarded or rewound, the VCR searches for the nearest index code and enters the Stop mode at the indexed position.

[ ]: Factory setting

4-4 Contents of Menu Switches

Screens	Items	Set values	Function
VCR mode-3 setting	CNT M SW	[OFF] ON	Enables or disables the counter memory function. OFF : The counter memory function is disabled. ON : The VCR automatically enters the Stop mode when the counter reaches 0000 in the FF or REW mode. * The counter memory function is automatically disabled if Repeat recording/playback, Auto Rewind or Index Search is engaged.
	WARNING BUZ	[OFF] ON	Turns the warning buzzer on or off. OFF : The buzzer does not sound. ON : The buzzer sounds.
	REMOTE	OFF [ON]	Sets whether or not VCR operation controlled by an external remote control or computer. OFF : The VCR can only be operated with the VCR operation buttons. ON : The VCR can be operated via a remote control (optional RM-G30) connected to the rear panel remote connector or via a computer connected to the optional SA-K97U RS-232C board. The VCR operation buttons can also be used.
	SUMMER TIME	[OFF] ON	Turns summer time compensation on or off. OFF : Clock is not adjusted for summer (daylight saving) time. ON : Clock is adjusted for summer (daylight saving) time.
Alarm/sensor mode settings	ALARM REC	[OFF] ON	Turns alarm recording on or off. Alarm recording is enabled only in the Timelapse Record mode. However, index codes (VISS signal) are also recorded in the VHS Standard (SP) and EP modes. OFF : Alarm recording is disabled. ON : The recorder automatically switches to the VHS Standard (SP) or EP mode when an alarm signal is input to the rear panel's [ALARM IN] terminal during timelapse recording.
	SENSOR REC	[OFF] ON	Turns the sensor recording function on or off. When an alarm signal is input to the rear panel's [ALARM IN] terminal in the Stop mode, the recorder automatically starts recording in the VHS Standard (SP) or EP mode. OFF : Sensor recording is disabled. ON : Sensor recording is enabled.
	REC MODE	[2H] 6H	Selects the recording mode for the alarm recording or sensor recording. 2H : Recording is executed in the VHS Standard (SP) mode. 6H : Recording is executed in the VHS EP mode.
	DURATION	5 10 15 30 60 120 [180] TAPE END MANUAL	Selects the recording duration for alarm recording or sensor recording. 5 .... 180 : Alarm or sensor recording is performed for the time specified (5 sec. to 180 sec.). TAPE END : Alarm or sensor recording continues to the end of the tape. MANUAL : Alarm or sensor recording continues for as long as alarm signals are input. Set to this position when specifying the alarm recording time with a switcher.

[ ]: Factory setting

4 ON-SCREEN/MENU SWITCHES

4-4 Contents of Menu Switches

Screens	Items	Set values	Function
Alarm/sensor mode settings	BUZZER	[OFF] ON	Selects whether or not the alarm buzzer sounds during alarm or sensor recording. OFF : The buzzer does not sound. ON : The buzzer sounds.
	TAPE END MODE	[OFF] STOP	Selects whether or not the Stop mode is forcibly engaged when the tape ends during alarm or sensor recording. When set to "STOP", the VCR automatically enters the Stop mode when the tape ends, regardless of the settings of <REPEAT R/P> and <AUTO REWIND>. OFF : The forced Stop mode is not engaged. STOP: The forced Stop mode is engaged.
RS-232C parameter settings	This screen is shown only when the optional SA-K97U RS-232C board is installed.		
	BAUD RATE	600 1200 2400 4800 [9600]	Selects the RS-232C data transfer rate (600 bps/1200 bps/2400 bps/4800 bps/9600 bps).

[ ]: Factory setting

5 PREPARATION

5-1 Summer Time Compensation

The setting of the "SUMMER TIME" menu switch on the on-screen menu VCR mode-3 determines whether or not the Summer Time mode is engaged.

When the "SUMMER TIME" switch is set to ON, the currently set time is advanced one hour.

- When setting the time, make sure the "SUMMER TIME" switch is set to OFF.
  When the unit is shipped, this switch is set to OFF.
- Clock setting is not possible during timer recording.

< VTR MODE-3 >

[VP SW]	OFF
[INDEX SRCH]	OFF
[CNT M SW]	OFF
[WARNING BUZ]	OFF
[REMOTE]	ON
[SUMMER TIME]	ON

VTR mode-3

During daylight savings time

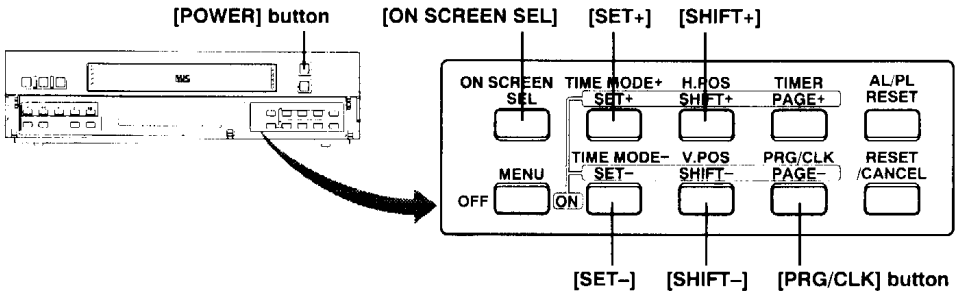
1. Set the time with one-hour delay.
2. After setting the time, set the "SUMMER TIME" switch to ON.
   - The set time advances one hour.
3. At the end of the daylight savings time season, set the "SUMMER TIME" switch to OFF.
   - The standard time instead of "Summer Time" is displayed.

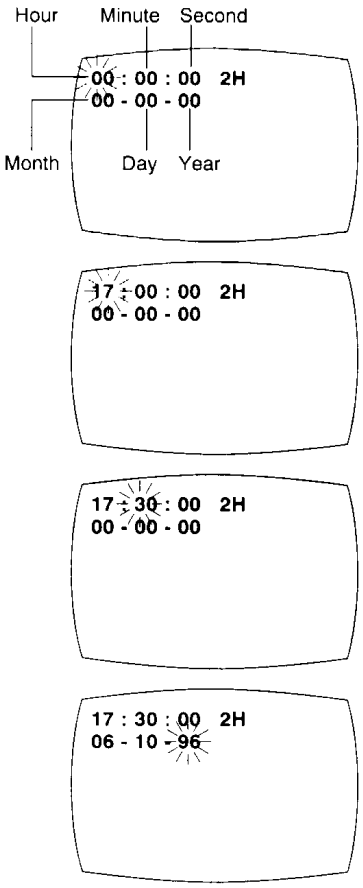
Standard time

1. Set the clock to the actual time.
2. When daylight savings starts, set the "SUMMER TIME" menu switch to ON.
   - The time advances one hour on the display.

5-2 Date and Time Setting

The time/date generator and timer recording will not function if the time and date are not set.





- The clock will continue to run for about one year without power.
- If the power plug has been disconnected from an AC outlet for a long time, make sure the set time is correct before using the unit. (Clock time may be affected by environmental factors.)

(Example) Setting to 17:30, Jun. 10, 1996.

Set the date and time on the on-screen display.

1 Turn on the SR-9070U and the monitor and engage the Stop mode.
- The clock can be set even when the power is turned off.

2 Press the [ON SCREEN SEL] button until the time and date are shown on screen.

3 Press the [PRG/CLK] button.
→ The Date/Time Setting mode is engaged and the hour digit of the time indication blinks.

- The Date/Time Setting mode will be released if the next operation (procedure 4) is not performed within about 10 seconds.
- To engage the Date/Time Setting mode when the date and time have already been set, press the [PRG/CLK] button twice.

4 Set "hour". This VCR's clock uses the 24-hour system.
- Press the [SET+/–] button to set "1" for the second digit of the "hour" indication.
- Press the [SHIFT+/–] button so that the first digit of the "hour" indication blinks. Press the [SET+/–] button to set "7".

5 Set "minutes".
Press the [SHIFT+/–] button so that the indication "minute" blinks. Set "30" with the [SET+/–] button.

"Seconds" cannot be set. When the date and time are set, counting starts from 00 second.

6 Set "month", "day" and "year" in the same way.
- Press the [SHIFT+/–] button until the value you want to set blinks. Then, set the "month", "day" and "year" with the [SET+/–] button.
- For year setting, set the last 2 digits only.
- When you want to change the setting, press the [SHIFT+/–] button so that the value you want to change blinks. Change the setting with the [SET+/–] button.

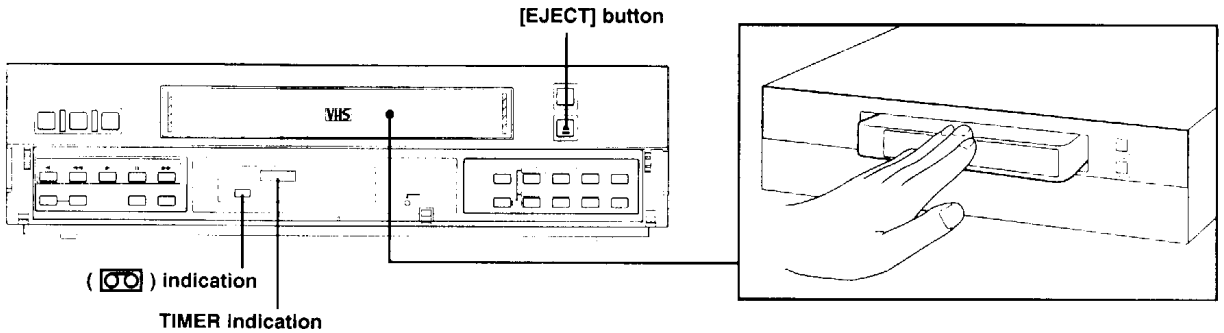
7 End date/time setting.
Press the [PROG/CLK] button.
→ The time/date indication stops blinking and the time count starts from 00 second.

Time indication on the SR-9070U display
- The time is shown when the power is switched off.
- When the power is turned on and the display is engaged in the Time Display mode with the [CNT/TIME] button, the current time is shown.
- When power is first supplied, the time indication "00:00" blinks.
- When backup battery capacity is no longer sufficient or no battery is installed, the error indication "E-10" is shown on the display. Replace the batteries with new ones and reset the time.

5-3 Cassette Loading/Unloading

Loading

Insert the cassette with its label side facing you.
Gently push the center of the cassette until the machine starts automatic loading.



Note:
To avoid damage or injury, do not insert your hand or other foreign objects into the cassette loading slot.

Auto power on

When a cassette is loaded, the power automatically turns on and the ( ) cassette indication appears.

Auto play

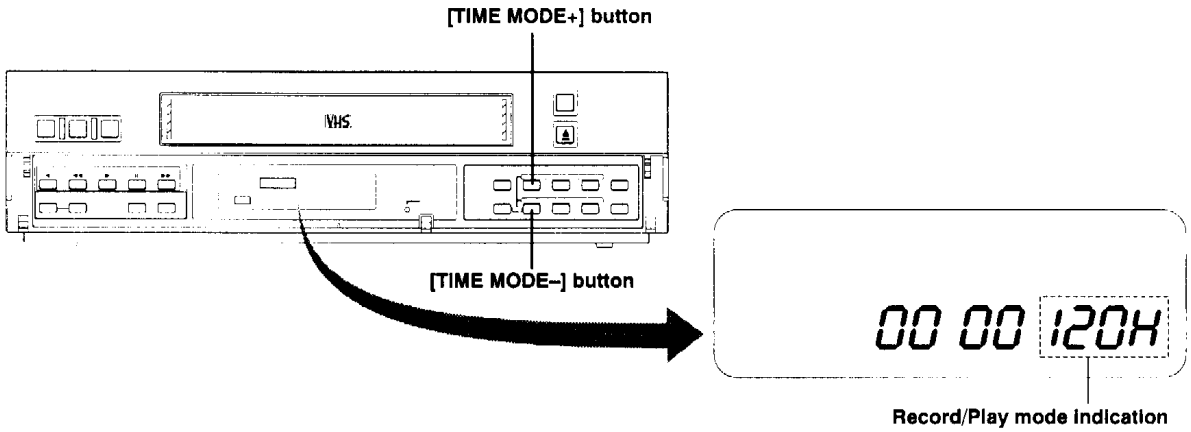
When a cassette with no erasure prevention tab is loaded, playback starts automatically.

Unloading

■ **Press the [EJECT] button.**
→ The cassette is ejected.
If the power is not on when the [EJECT] button is pressed, power is automatically switched on and the cassette is ejected. Once the cassette is unloaded, the power turns off again automatically.

If the Timer Recording Standby mode is engaged (TIMER indication is shown on the display), the cassette will not be ejected when the [EJECT] button is pressed.
To unload the cassette, press the [TIMER] button to release the Timer Recording Standby mode, then press the [EJECT] button.

5-4 Selection of Record/Play Mode



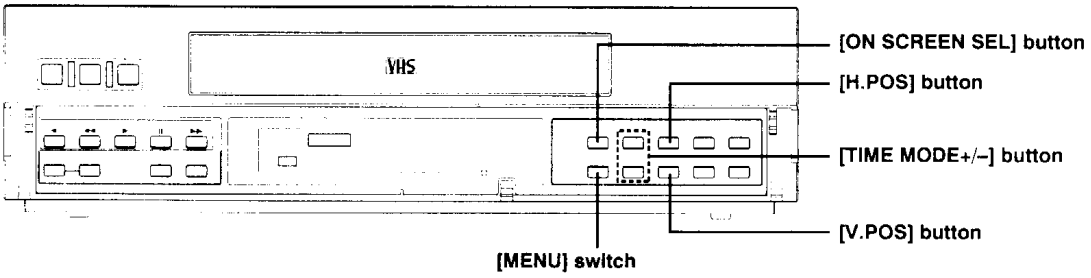
1 Press the [POWER] button to supply the power.

2 Select the Record or Play mode with the [TIME MODE+] or [TIME MODE–] button (see table below). The selected Record/Play mode is shown on the display.

Display	Mode	Available recording time (hour)				Record/playback interval (sec.)	Audio recording
		T-30	T60	T90	T120		
002H	VHS Standard (SP)	0.5	1	1.5	2	—	Possible
006H	VHS 3x (EP)	1.5	3	4.5	6	—	Possible
012H	Timelapse 12H	3	6	9	12	0.11	Possible
024H	Timelapse 24H	6	12	18	24	0.22	Possible
048H	Timelapse 48H	12	24	36	48	0.4	Impossible
072H	Timelapse 72H	18	36	54	72	0.6	Impossible
120H	Timelapse 120H	30	60	90	120	1.0	Impossible
168H	Timelapse 168H	42	84	126	168	1.4	Impossible
240H	Timelapse 240H	60	120	180	240	2	Impossible
480H	Timelapse 480H	120	240	360	480	4	Impossible
960H	Timelapse 960H	240	480	720	960	8	Impossible

* Available recording time may vary depending on the type of cassette used.
* For best results use a T-120 tape (or shorter).
* Replace the cassette at least once every 15 days when using the 2H-168H modes. In the 240H-960H modes, replace the cassette at the completion of recording.

6 RECORDING



6-1 Preparation

Connection

Connect the input and output connectors on the rear panel correctly. For connections, refer to "CONNECTIONS" on page 13.

Menu switch settings

Set the menu switches as required.

■ **[VIDEO] . . . Factory setting: AUTO**
- Normally set to "AUTO".
- Set to "B/W" when recording color pictures in black-and-white.

■ **[AUTO REC] . . . Factory setting: OFF**
- Set to "ON" to record with a commercially available external timer or to automatically resume recording after a power failure.
- For details, refer to "How to Restore Recording After Power Failure" on page 35.

■ **[END BUZ] . . . Factory setting: OFF**
Set to "ON" to sound the buzzer when the tape ends.

■ **[AUTO REW] . . . Factory setting: OFF**
Selects the operation mode engaged when the tape ends.
- "OFF": the Stop mode is engaged.
- "ON": the tape is rewound to the beginning.

> When [REPEAT R/P] is set to "ON", repeat recording is performed regardless of the setting of this menu switch.

■ **[REPEAT R/P] . . . Factory setting: OFF**
To perform repeat recording, set to "ON". For details, refer to "Repeat Recording" on page 35.

■ **[SPI/EXT REC] . . . Factory setting: OFF**
- To perform series recording, set to "SERIES". For details, refer to "Series Recording" on page 34.
- To perform automatic recording with an external VCR activation signal, set to "EXT".
  For details, refer to "External Timer Recording" on page 35.

■ **[CNT END] . . . Factory setting: OFF**
When a tape-end signal or series recording output signal is output at a specified counter value, specify the counter value.
With <END BUZ> ON, the buzzer sounds.

■ **[ALARM REC] . . . Factory setting: OFF**
To perform alarm recording, set to "ON".
For details, refer to "Alarm Recording" on page 32.

■ **[SENSOR REC] . . . Factory setting: OFF**
To perform sensor recording, set to "ON".
For details, refer to "Sensor Recording" on page 33.

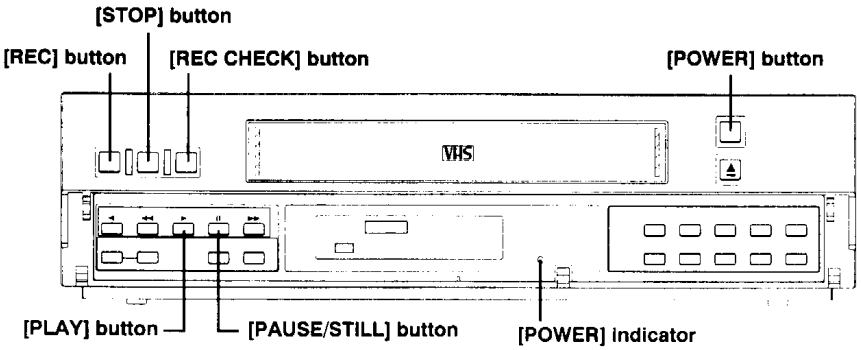
■ **[TAPE END MODE] . . . Factory setting: OFF**
Set to "STOP" to engage the forced Stop mode when the tape ends during recording.

> When set to "STOP", the repeat recording and auto REW functions are disabled. When the tape ends, the Stop mode is engaged.

Front panel settings

■ **Select the Record mode with the [TIME MODE+/–] button.**
For details, refer to "Selection of Record/Play Mode" on page 25.

■ **Select on-screen time/date recording with the [ON SCREEN SEL] button.**
- If the on-screen display is not on, the time and date are not recorded.
- The position of the on-screen data can be adjusted with the [H.POS] and [V.POS] buttons.
- The brightness and color of the on-screen characters and numerals can be selected with the menu switches [TONE] and [CHARACTER].



6-2 Recording

1 **Press the [POWER] button to turn the power on.**
→ The [POWER] indicator lights.

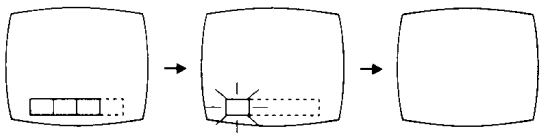
2 **Insert a cassette with safety tab in place.**
→ The ( ) cassette indicator lights on the display.
* If a cassette is loaded when the power is off, power is switched on automatically (auto power on function).

3 **Press the [REC] button to start recording.**
→ The recording indictor lights on the display, showing that the Record mode is engaged.
* No sound is recorded during Timelapse Recording (except in the 12H/24H mode).

To stop recording temporarily

4 **Press the [PAUSE/STILL] button.**
→ The record-pause indicator is shown on the display and the Pause mode is engaged.
* A horizontal band appears at the bottom of the monitor screen.

If the SR-9070U remains in the Pause mode for about 5 minutes 25 seconds, it enters the Stop mode automatically. The time until the Pause mode is automatically released is shown by the length of the horizontal band.



The length of the horizontal band is decreased in four steps.	After about 4 minutes 40 seconds pass, the band starts to blink.	When the band disappears, the Stop mode is engaged.

To start recording again

5 **Press the [PLAY] button.**
→ The recording indicator is shown on the display and the Recording mode is engaged.

To stop recording

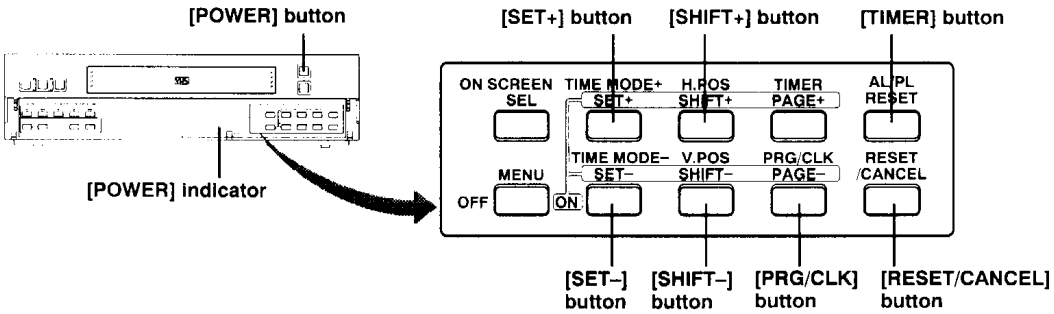
6 **Press the [STOP] button.**
→ The tape stops and the Stop mode is engaged.

To check the recording

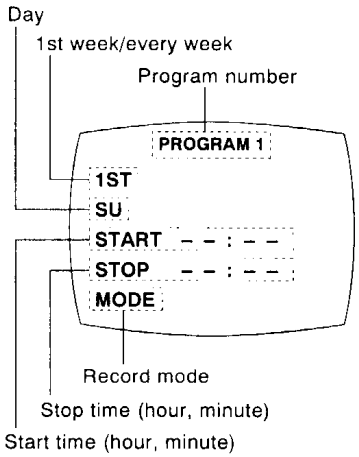
■ **Press the [REC CHECK/SENSOR ST-BY] button in the Record mode.**
→ The tape is played pack in reverse a few seconds, allowing you to check the last recorded segment. When reverse playback stops, the Record mode is engaged again.
• If dirty heads are interfering with the recording, the error indication "E-09" blinks on the display. The VCR automatically cleans the heads with the internal head cleaner. Press the [REC CHECK/SENSOR ST-BY] button again to check that the error indication "E-09" no longer appears.

6-3 Timer Recording

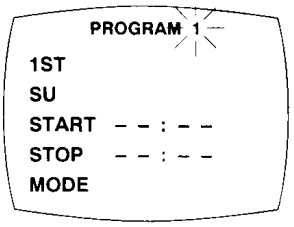
Programming must be done with the power on. You can preset up to eight programs using the on-screen display.
* Timer programming is not possible if the date and time are not set.



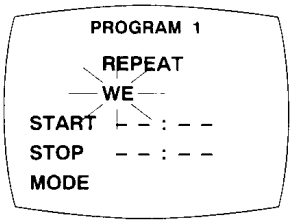
Timer-programming screen



3



4



- 1st week: If the current time is 14:00 on Monday, recording lasts until 13:59 the following Monday.
- When every week is set, the "REPEAT" indication is shown.

(Example)
Setting Program No. 1 in the 120-hour mode (Timelapse) from 17:15 to 8:30 every Wednesday.

Preparation

- Make sure all equipment is connected correctly.
- Check the current time.
- Load a cassette with a safety tab in place.
  If a cassette is loaded when the power is off, power is switched on automatically (auto power on function).

1 Turn on the SR-9070U and the monitor and engage the Stop mode.

2 Press the [PRG/CLK] button.
→ Call up the timer program setting screen on the monitor.

3 Set program number (1).
Press the [SET+/–] button to set the program number. If the program number is 1, continue to step 4.

> Each time the [SET+/–] button is pressed, the program number moves in sequence to the next number. If the [SET+] button is pressed when program number "8" is displayed, the Program Setting mode is released and the Clock Display mode is restored. Pressing the [SET–] button moves through the programs in reverse order.If the [SET–] button is pressed when program number "1" is displayed, the Program Setting mode is released.

4 Set "day" (every Wednesday).
① Press the [SHIFT+] button so that "day" blinks.
② Press the [SET+/–] button to set the day.

Each time the [SET+/–] button is pressed, the indication changes as follows. When the [SET–] button is pressed, the indication changes in the opposite direction.

(1st week) 1ST

SU (Sunday) → MON (Monday) → TU (Tuesday) → WE (Wednesday) → TH (Thursday) → FR (Friday) → SA (Saturday) →

(Every week) REPEAT

SU (Sunday) → MON (Monday) → TU (Tuesday) → WE (Wednesday) → TH (Thursday) → FR (Friday) → SA (Saturday) →

(Every week) REPEAT

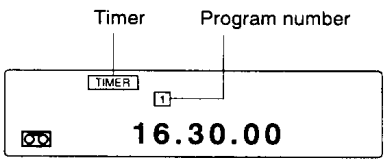
SU – SA (everyday) → MO – SA (every week except Sunday) → MO – FR (every week except Saturday and Sunday) → → →

6-3 Timer Recording

5
PROGRAM 1
REPEAT
WE
START 1 7 : 1 5
STOP – – : – –
MODE

6
PROGRAM 1
REPEAT
WE
START 1 7 : 1 5
STOP 1 8 : 3 0
MODE

7
PROGRAM 1
REPEAT
WE
START 1 7 : 1 5
STOP 0 8 : 3 0
MODE 1 2 0



SR-9070U's display

5 Set the start time (17:15).
① Press the [SHIFT+] button so that the "start time" blinks and set the second digit for "hour" with the [SET+/–] button.
Use two digits to set "hour/minutes" (e.g. 07:05 for 7:05 am).
② Press the [SHIFT+] button so that the first digit for "hour" blinks and input the value with the [SET+/–] button.
③ Set the "minutes" in the same way.

6 Set the stop time (08:30).
- Press the [SHIFT] button so that the "stop time" blinks and set the stop time (hour, minute) with the [SHIFT+/–] and [SET+/–] buttons.

* Use two digits to set "hour/minute" (e.g. 08:05 for 8:05 am).

> Once the start time is set, the stop time will blink. The time shown will be the same as the start time.

7 Engage the Record mode (120-hour mode).
- Press the [SHIFT+] button so that "Record mode" blinks. Select the Record mode with the [SET+/–] button.

8 To continue programming
Press the [SHIFT+] button so that the program number blinks. Select another program number with the [SET] button and repeat steps 4 to 7.

9 To end programming, press the [PRG/CLK] button.
→ The Clock Display mode is restored.

10 Press the [TIMER] button.
- The TIMER indication and the program number(s) will be lit on the display. Power turns off automatically and the VCR enters the Timer Record Standby mode.
- When timer recording starts, the program number being executed blinks.

Canceling preset timer programs

To stop timer programming in the middle

1 Press the [RESET/CANCEL] button.

2 Press the [PRG/CLK] button.
→ The Clock Display mode is restored.

To cancel preset timer programs

1 Press the [TIMER] button to turn off the TIMER indication.

2 Turn the power on for the SR-9070U and the monitor.

3 Press the [PRG/CLK] button to engage the Timer Program Setting mode.
→ Call the timer program setting screen on the monitor.

4 Press the [SET+/–] button to select the program number you want to cancel.

5 Press the [RESET/CANCEL] button.
→ The timer programmed data is deleted.

6 Press the [PRG/CLK] button twice.
→ The Clock Display mode is restored.

6-3 Timer Recording

Changing preset timer programs

1. Press the [TIMER] button so that the TIMER indication goes out.
2. Turn the power on for the SR-9070U and the monitor.
3. Press the [PRG/CLK] button to engage the Timer Program Setting mode.
   → Call the timer program setting screen on the monitor.
4. Press the [SET+/–] button to select the program number you want to change.
5. Press the [SHIFT+/–] key so that the contents you want to change blink.
6. Change the contents as required with the [SET+/–] button.
7. Press the [PRG/CLK] button.

Using the VCR in the Timer Record Standby mode

Press the [TIMER] button so that the TIMER indication goes out. Press the [POWER] button for normal use.

When the [TIMER] button is pressed again, the TIMER indication lights, showing that the VCR is engaged in the Timer Record Standby mode.

When all timer recordings are complete, the TIMER indication goes out.

Notes on timer recording

■ **If you make a mistake when programming**
The Program No. indication blinks for about 10 seconds, then goes off.
↓
Check the programmed contents.

■ **If no data is timer-programmed**
The TIMER indication blinks for about 10 seconds.
↓
Perform timer programming.

■ **If programmed data overlap**
The OVERLAP and TIMER indications blink for about 10 seconds.
↓
Check the programmed contents.

■ **During timer recording**
The PAUSE/STILL button has no effect.
↓
To operate the VCR, press the [TIMER] button to release the Timer Record mode.

■ **During timer programming**
If the next operation is not performed within about 1 minute, the clock display is restored.

■ **Timer recording**
The power is supplied about 20 seconds before recording starts and the Pause mode is engaged. Recording starts about 2 seconds before the start time.

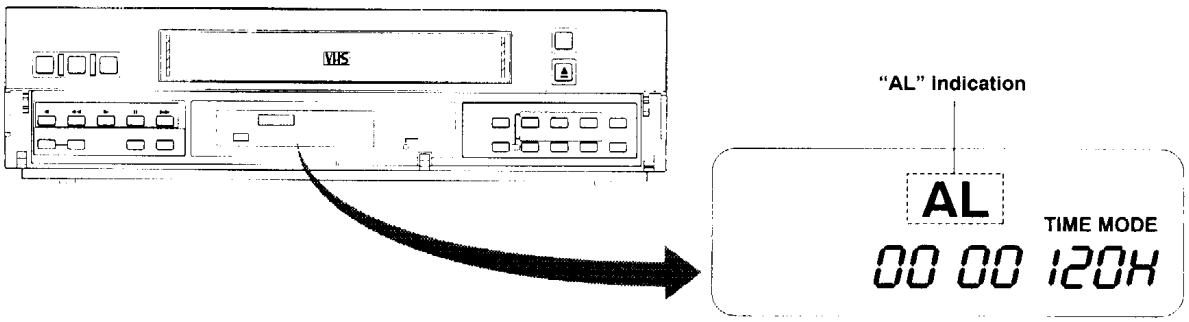
■ **When no cassette is loaded**
The TIMER and ( ) indications blink.
↓
Load a cassette with safety tab in place. Cassettes with no tab are ejected.

■ **When menu switch [REPEAT REC] is set to "OFF" and the tape ends during timer recording**
The cassette is ejected.
Load a cassette with safety tab in place and press the [REC] button. Recording starts according to the programmed data.

6-4 Alarm Recording

Alarm recording functions during timelapse recording. When an alarm signal is input to the rear panel's ALARM IN terminal, an index code is recorded on the tape and the VCR automatically switches to the pre-selected VHS Standard (SP) or VHS Extended (EP) mode for realtime recording of the alarm situation. Normal timelapse recording is restored after the preset alarm recording duration has passed.

* Alarm recording will not start from the Pause mode.



- Alarm Recording, Alarm Recording Duration, Buzzer Sound during alarm recording and Forced Stop mode can be enabled or disabled with menu switch settings.
- During alarm recording, the "AL" indication is lit on the VCR and the "ALARM" indication is lit on the monitor display. After alarm recording is complete, the "AL" indication blinks on the display to show that an alarm signal has been input.

On-screen "ALARM" indication	Extinguished	Shown	Extinguished	Shown	Extinguished
Display "AL" indication	Extinguished	Lit	Blinking	Lit	Blinking
Record mode	Timelapse mode	VHS Standard (SP)/ EP	Timelapse mode	VHS Standard (SP)/ EP	Timelapse mode
	Timelapse recording	**Alarm recording**	**Timelapse recording**	**Alarm recording**	**Timelapse recording**

Alarm signal input **Alarm signal input**

* An index code (VISS) is recorded at the start point of the alarm recording as an alarm cue signal.
* During alarm recording, a +12 V signal is output from the rear panel's ALARM REC OUT terminal.

6-4 Alarm Recording

Preparation **Connect an alarm sensor to the rear panel's alarm input terminal.**

1 Press the [POWER] button to turn the power on.

2 Set the MENU switch to ON. The menu switch setting screen is shown.

3 Press the [PAGE+/–] button. The alarm/sensor mode setting screen appears.

4 Press the [SHIFT+/–] button so that the item you want to set blinks. Press the [SET+/–] button to set the specified value.

- Set the [ALARM REC] button to ON to activate the alarm recording function.
- Select the Alarm Record mode.
  Set the [REC MODE] to VHS Standard (2H) or VHS Extended (6H).
- Set the alarm recording duration.
  Set duration to 5 sec., 10 sec., 15 sec., 30 sec., 60 sec., 120 sec., 180 sec., TAPE (to tape end) or MANUAL (for as long as alarm signals are input).

* When the alarm recording time is set to MANUAL, the alarm cue signal (index code) will not be recorded correctly if alarm input lasts for less than 30 seconds.

* When alarm recording duration is set with an external switcher, set the alarm recording duration to MANUAL.

- To sound the buzzer during alarm recording, set [BUZZER] to ON.
- Set the Forced Stop mode on or off.
  When [TAPE END MODE] is set to STOP, the Stop mode is engaged when the tape ends even if Repeat Record and Auto REW are set.
  When [TAPE END MODE] is set to OFF, the VCR operates according to the setting of Repeat Record and Auto REW.

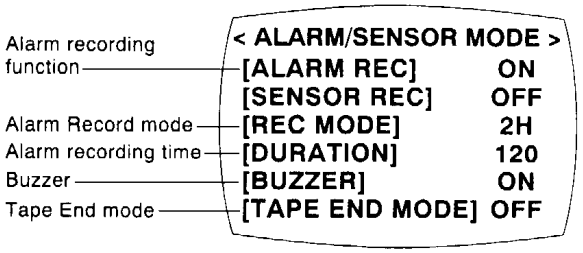
5 To end menu switch setting, set the MENU switch to OFF.

6 Press the [ON SCREEN SEL] button to set the on-screen display to the time/date display.
The position of the on-screen display can be adjusted with the [H.POS] and [V.POS] buttons.

7 Select the Timelapse Record mode with the [TIME MODE+/–] button. The selected recording/playback mode is shown on the display.

8 Follow the procedures for "Basic recording operations" on page 27.

9 When an alarm signal is input to the rear panel's ALARM IN terminal, the alarm recording is executed according as specified.



Alarm/sensor mode setting screen

10 To stop alarm recording and clear the alarm indication, press the [AL/PL RESET] button.

- When the "AL" indication is lit on the display (during alarm recording), press the [AL/PL RESET] button to stop alarm recording. Timelapse recording is resumed and the "AL" indication goes out.
- When the "AL" indication is blinking on the display, press the [AL/PL RESET] button. The "AL" indication goes out.

11 When the "AL" indication goes out, press the [AL/PL RESET] button again to reset the alarm input/power loss data.

* There may be some picture distortion at the start or end of an alarm recording. This is not a malfunction.

6-5 Sensor Recording

Sensor recording is executed only when the VCR is in the Stop mode (Stop, Sensor Recording Standby or Timer Record Standby mode) and an alarm signal is input to the rear panel's ALARM IN terminal.
Perform the settings for sensor recording in the same way as for "Alarm Recording" on page 32.

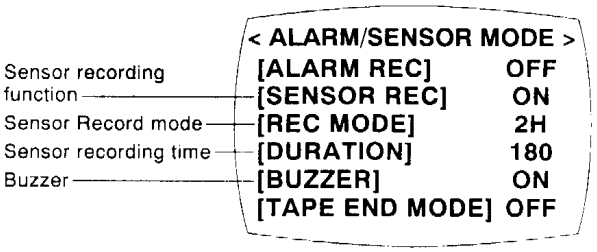
> The mechanism of the SR-9070U cannot be guaranteed if the sensor recording function is used frequently (100 times/day or more). If alarm inputs are frequent, use the alarm recording function instead and carry out regular maintenance/ inspection and parts replacement.

Preparation Connect an alarm sensor to the rear panel's alarm input terminal.

1. Turn on the power.
2. Load a cassette with safety tab in place.
3. Set the MENU switch to ON and call up the alarm/ sensor mode setting screen with the [PAGE+/–] button.
4. Set the menu switch items with the [SHIFT+/–] and [SET+/–] buttons.
   - Set [SENSOR REC] to ON to activate the sensor recording function.
   - Select the Sensor Record mode.
     Set [REC MODE] to VHS Standard (2H) or VHS Extended (6H).
   - Select the sensor recording duration.
     Set [DURATION] to 5 sec., 10 sec., 15 sec., 30 sec., 60 sec., 120 sec., 180 sec., TAPE END (to tape end) or MANUAL (for as long as alarm signals are input).
   - * As the sensor recording time will be shorter than the specified value, set it to 30 seconds or more.
   - To sound the buzzer during sensor recording, set [BUZZER] to ON.
5. After setting the menu switches, set the MENU switch to OFF.
6. Press the [ON SCREEN SEL] button to set the on-screen display to the time/date display. The position of the on-screen display can be adjusted with the [H.POS] and [V.POS] buttons.
7. Press the [REC CHECK/SENSOR ST-BY] button.
   → The Sensor Record Standby mode is engaged.

   > When an alarm input is received, the VCR switches even from the Stop mode to the Sensor Record mode without engaging the Sensor Record Standby mode. This takes about 5 seconds or more.

   - When an alarm signal is input to the rear panel's ALARM IN terminal, recording starts automatically in the specified Record mode and the "AL" indication is lit. "ALARM" indication is shown on screen.
   - After the specified recording duration expires, recording stops and the Sensor Record Standby mode is engaged.



Alarm/sensor mode setting screen

8. To stop sensor recording and clear the alarm indication, press the [AL/PL RESET] button.
9. To disable sensor recording, set menu switch <SENSOR REC> to OFF.

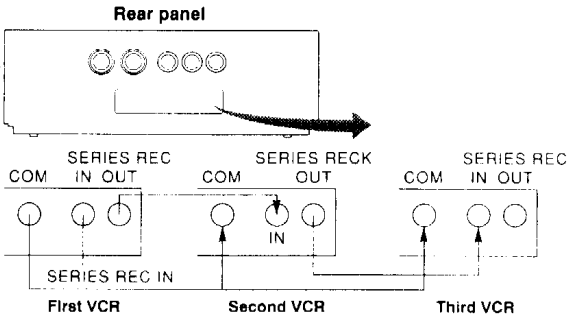
> During playback, there may be some noise or picture distortion at the point where one sensor recording stops and another starts. This is not a malfunction.

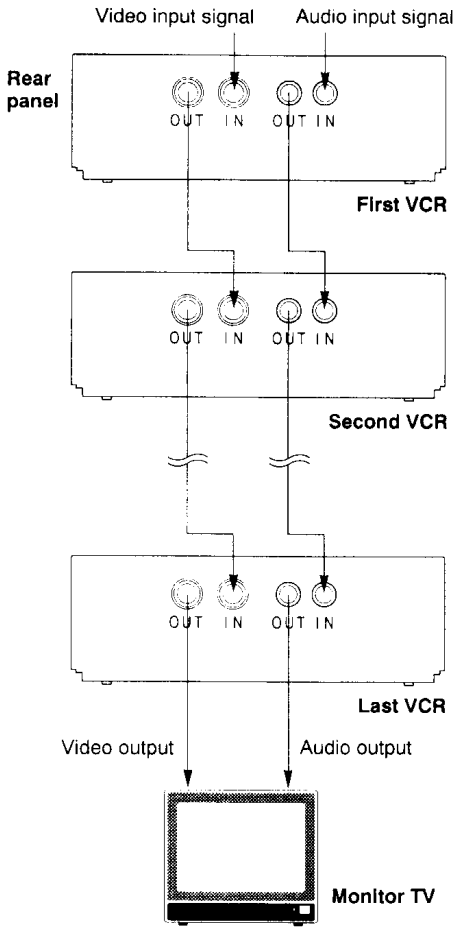
6-6 Series Recording

The series recording function facilitates recording over much longer periods using several connected SR-9070Us. As soon as the tape ends in one VCR, the next VCR in the series starts recording.

Connections

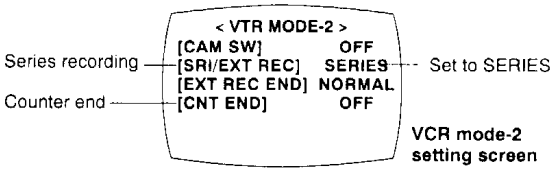
- Connect the first VCR's [SERIES REC OUT] terminal to the second VCR's [SERIES REC IN] terminal. Connect the second VCR's [SERIES REC OUT] terminal to the third VCR's [SERIES REC IN] terminal. Repeat for all connected VCRs. Connect the VCR's [COM] terminals as well.
- Connect a video camera and/or other source equipment to the first VCR's video and audio input connectors. Connect the first VCR's video and audio output connectors to the second VCR's video and audio input connectors. Connect the second VCR's video and audio output connectors to the third VCR's video and audio input connectors. Repeat for all connected VCRs. Connect the last VCR's video and audio output connectors to the monitor's video and audio input connectors.





Operations

1. Set the on-screen menu switch [SRI/EXT REC] to "SERIES" (series recording).



- Normally the next VCR starts recording when the tape ends. If the menu switch counter end function is on, a series recording signal is output when the selected counter value is passed, and the next VCR starts recording.
  Set menu switch [CNT END] to 500, 1000, ...9000 or 9500.

2. To end setting, set the MENU switch to OFF and set the on-screen display to the time/date display.
3. Load cassettes with safety tab in place in all connected VCRs.
4. Engage the Record mode on the first VCR.
   Turn on all connected VCRs and put them in the Standby mode. This allows you to check picture and sound on the monitor.
   When the recording is complete on the first VCR, the second VCR automatically starts recording. This is repeated for all connected VCRs.

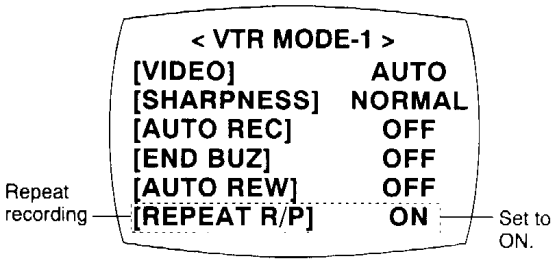
Notes:
- If a cassette has not been loaded in any VCR in the series, series recording will stop when that VCR is reached.

6-7 Repeat Recording

When the tape comes to the end during recording, it is automatically rewound and recording starts again from the beginning.

To execute Repeat Recording, set the Repeat Recording function to ON with the on-screen menu switch.

- Set menu switch [TAPE END MODE] to OFF. If it is set to STOP, the Forced Stop mode is engaged when the tape ends during alarm or sensor recording and repeat recording is not performed.
- When repeat recording is executed, any previously-executed alarm recordings are erased.



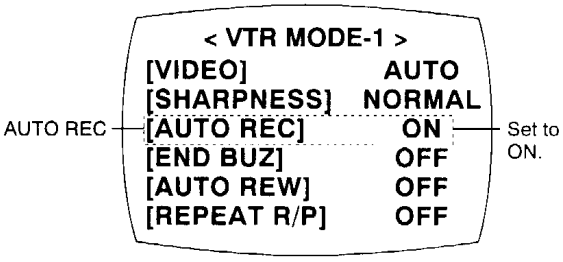
VCR mode-1 setting screen

6-8 How to Restore Recording After Power Failure

If a power failure occurs during recording, recording will restart in the same mode as soon as power is restored.

To use this function, set the on-screen menu switch <AUTO REC> to ON.

If this menu switch is set to ON and power is turned off and on again in the Stop mode, the VCR enters the Record mode automatically. Be careful.



VCR mode-1 setting screen

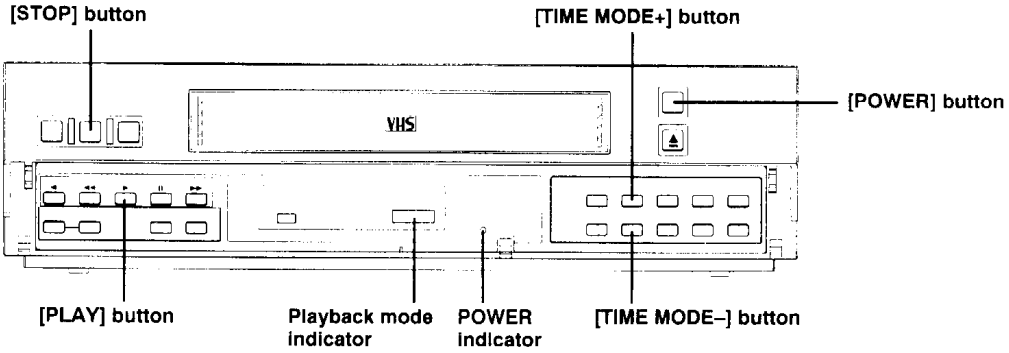
6-9 External Timer Recording

External timer recording can be performed by connecting the SR-9070U to an external timer.

1. Check that a cassette is loaded in the VCR.
   * If the cassette's safety tab has been removed, recording will not take place.
   * This function does not work when the Timer Record mode is engaged.
2. Set the menu switch [AUTO REC] to ON.
   Power is supplied from the external timer at the specified time and recording starts.

6-10 Tape End Buzzer

7 PLAYBACK AND SPECIAL-EFFECTS PLAYBACK



7-1 Preparation

Connection

Connect the output connectors on the rear panel correctly.

Menu switch settings

Set the menu switches as required.

■ **[SHARPNESS] . . . Factory setting: NORMAL**
Set to "SHARP" to record pictures with contours emphasized for greater sharpness.

■ **[AUTO REW] . . . Factory setting: OFF**
To enable or disable the auto rewind function.
- Set to "ON" to rewind the tape automatically when the tape ends.

■ **[REPEAT R/P] . . . Factory setting: OFF**
To enable or disable repeat playback.
- Set to ON to enable repeat playback.

■ **[INDEX SRCH] . . . Factory setting: OFF**
To enable or disable index search.
- Set to ON to search the alarm-recorded position (index code).

■ **[CNT M SW] . . . Factory setting: OFF**
To enable or disable the counter memory function.
- Set to "ON" to use the counter memory function.

7-2 Playback

1 Press the [POWER] button to turn the power on. The [POWER] indicator lights.

2 Press the [TIME MODE+/–] button to set the Play mode to the VHS Standard (2H) or VHS Extended (6H) mode. The "002H" or "006H" indicator is shown on the display.

- To use slow motion playback in the Timelapse Play mode, be sure to set the mode (012H, . . . 960H) to the same one used for the timelapse recording.
- Avoid using slow-motion playback continuously for long periods (more than several hours).

3 Load the recorded cassette correctly.

* If a cassette is loaded when the power is off, power is switched on automatically (auto power on function). If the cassette's safety tab has been removed, the power is turned on and play starts automatically (auto play function).

4 Press the [PLAY] button to start play.

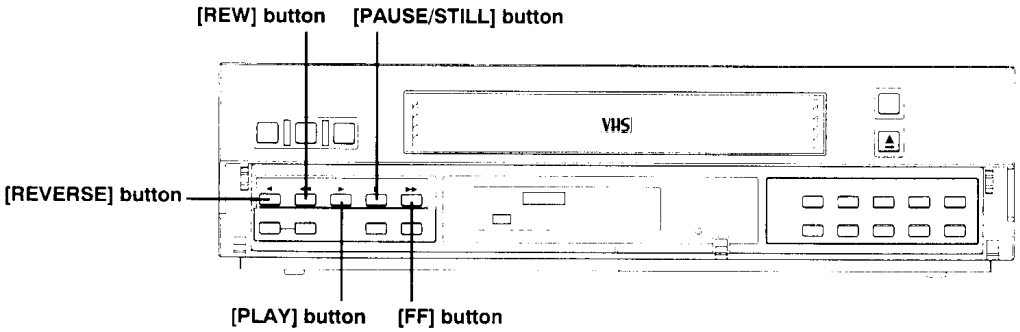
▷ The play indicator is shown on the display and the Play mode is engaged.

* No sound is output in the Timelapse Play mode (except for 12H and 24H modes).

When the Play mode is set to the VHS Standard (2H) or VHS Extended (6H) mode, playback operates as follows.
- Cassettes recorded in the VHS Standard or Timelapse mode are played back in the VHS Standard mode.
- Cassettes recorded in the VHS Extended mode are played back in the VHS Extended mode.

To stop playback

5 Press the [STOP] button.
The tape stops and the Stop mode is engaged.



7-3 Special-Effects Playback

Still and frame advance

1. Press the [PAUSE/STILL] button during playback.

   The still indicator is shown on the display and the still picture is shown.

2. Each time the [PAUSE/STILL] button is pressed in the Still mode, the picture is advanced frame by frame.

3. Press the [PLAY] button to restore the Normal Play mode.

> The Stop mode is automatically engaged if the VCR remains in the Still mode for 5 minutes and 25 seconds (approx.).

Reverse playback

1. Press the [REVERSE] button in the Play or Still mode.

   The reverse indicator is shown on the display and the Reverse mode is engaged.

   * No sound is output.

2. To return to the Normal Play mode, press the [PLAY] button.

Shuttle search (reverse and fast-forward) playback

Reverse shuttle search
Press the [REW] button during play. The rewind search indicator is shown on the display and the Reverse Shuttle Search mode is engaged. * No sound is output.

Fast-forward shuttle search
Press the [FF] button. The fast-forward search indicator is shown on the display and the Fast-forward Shuttle Search mode is engaged. * No sound is output.

Different operations are carried out depending on how the [REW] or [FF] button is pressed. Refer to the table below for details.

Operation of the [REW] or [FF] button	Original Recording Mode	
	Tape recorded in the Standard mode or the Timelapse mode	**Tape recorded in the Extended mode**
Press the button once.	7 times normal speed (lock). Pressing the [PLAY] button restores the Normal Play mode.	21 times normal speed (lock). Pressing the [PLAY] button restores the Normal Play mode.
Hold the button pressed.	7 times normal speed. Releasing the finger restores the Normal Play mode.	13 times normal speed. Releasing the finger restores the Normal Play mode.

* Lock ..... Search continues when the finger is released.

7-4 Index Search

Searching the index code (VISS signal) recorded at the start of alarm recording helps you quickly locate alarm recordings (index search function).

- To use the index search function, set on-screen menu switch [INDEX SRCH] to "ON".

Set the index search function to ON.

< VTR MODE-3 >	
[VP SW]	OFF
[INDEX SRCH]	ON
[CNT M SW]	OFF
[WARNING BUZ]	OFF
[REMOTE]	ON
[SUMMER TIME]	OFF

VCR mode-3 setting screen

■ When reverse shuttle search or the fast-forward shuttle search is executed, the Index Search mode is engaged. When index code is located, playback starts automatically.

> To engage the Reverse Shuttle Search mode or the Fast-forward Shuttle Search mode, press the [REW] or [FF] button once.

■ When an index code is searched in the Fast-forward mode or the Rewind mode, the Stop mode is automatically engaged when the code is located.

- The VISS indicator is shown on the display whenever the Index Search mode is engaged.

> Index Search does not function in the Repeat Play or Auto Rewind mode.

7-5 Repeat Playback

The tape is automatically rewound and played back repeatedly.

- To engage repeat playback, set on-screen menu switch [REPEAT R/P] to "ON".

Auto REW "ON"

Repeat play "ON"

< VTR MODE-1 >	
[VIDEO]	AUTO
[SHARPNESS]	NORMAL
[AUTO REC]	OFF
[END BUZ]	OFF
[AUTO REW]	ON
[REPEAT R/P]	ON

VCR mode-1 setting screen

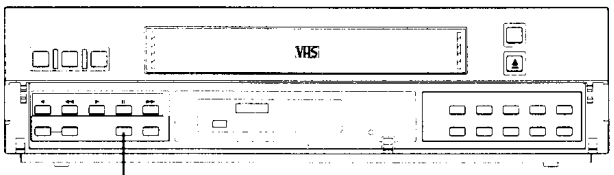
Auto rewind

When the tape ends during recording, playback, or forward search, the VCR automatically rewinds the tape to the start and enters the Stop mode.

- To engage the auto rewind function, set on-screen menu switch [AUTO REW] to "ON".

* When on-screen menu switch [REPEAT R/P] is set to "ON", repeat recording or repeat playback is performed after the tape is rewound.

7-6 Counter Memory Function



[CNT/TIME] button

> The Repeat Record/Play mode and the Index Search modes have priority over the counter memory function. When either of these modes is engaged, counter memory is disabled.

When this function is ON, the Stop mode is automatically engaged when the tape counter reaches "0000" in the FF or REW mode.

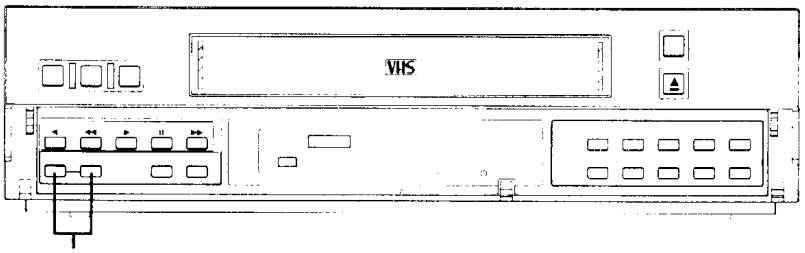
- To activate the counter memory function, set on-screen menu switch [CNT M SW] to "ON".

Set the counter memory function to "ON"

< VTR MODE-3 >	
[VP SW]	OFF
[INDEX SRCH]	OFF
[CNT M SW]	ON
[WARNING BUZ]	OFF
[REMOTE]	ON
[SUMMER TIME]	OFF

VCR mode-3 setting screen

- Set the counter display with the front panel's [CNT/TIME] button.



[TRACKING/V.LOCK+/–] buttons

7-7 Tracking/V Lock Adjustment

When noise appears in the picture in the Play/Timelapse Play mode

Press either the [TRACKING +/–] button until picture noise is eliminated or minimized.

To return to the Tracking Preset mode, press the + and – buttons simultaneously.

When a picture moves up and down in the Still mode

Press either the [V.LOCK+/–] button to minimize vertical jitter.

7-8 V. PULSE

When the picture is distorted, set on-screen menu switch [VP SW] to "ON". This menu switch is effective only in the Play mode. Normally set to "OFF".

Set the V.PULSE switch to "ON"

< VTR MODE-3 >	
[VP SW]	ON
[INDEX SRCH]	OFF
[CNT M SW]	OFF
[WARNING BUZ]	OFF
[REMOTE]	ON
[SUMMER TIME]	OFF

VCR mode-3 setting screen

- When cameras synchronized with a power supply are switched with a switcher, the pictures may be distorted at the switching point. This switch locks the monitor to prevent distortion of the displayed picture.
  (Only operates in the Normal Play [SP/EP] mode)
- In the Still or Timelapse Play mode, V pulses are always output.

8 TROUBLESHOOTING

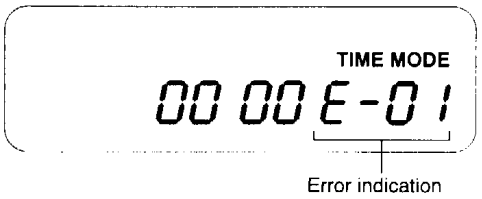
8-1 Error Indication

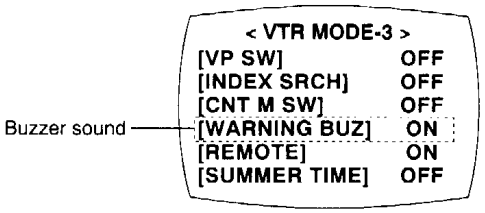
Error indications are shown on the display whenever condensation occurs or there are problems with cassette loading, unloading or mechanism operation.

- When a problem occurs, the error indication "E-_ _" blinks.
- When any one of error indications (E01 - E09) is shown, a 12 V warning signal is output from the rear panel's WARNING OUT connector.In the case, Eject is not available.
- When on-screen menu switch [WARNING BUZ] is set to "ON", the buzzer sounds whenever a problem occurs (when error indications (E01 -E09) are shown).

When an error indication appears or the buzzer sounds, turn the power on again to clear the error indication and buzzer sound.
When the error indication "E-_ _" is shown, turning the power on again may not clear the problem. Refer to section 8.3.1.(5) warning signal detection on page 8-6 of Service Manual.

Display section





VCR mode-3 setting screen

Error indication	Contents	VCR operation	Measures
E-01	Problem with loading operation	The power is turned off.	Turn the power on again.
E-02	Problem with unloading operation	The power is turned off.	Turn the power on again.
E-03	Problem with supply reel rotation	The power is turned off.	Turn the power on again.
E-04	Problem with drum rotation	The power is turned off.	Turn the power on again.
E-05	Problem with take-up reel rotation	The power is turned off.	Turn the power on again.
E-06	Problem with capstan rotation	The power is turned off.	Turn the power on again.
E-07	Problem with eject operation	The power is turned off.	Turn the power on again.
E-08	Condensation	The cassette is ejected and the power is turned off.	Wait until the error indication goes out.
E-09	Error with recording check (recording defect)	The head cleaner in the VCR cleans the heads.	Perform the recording check again.
E-10	Insufficient capacity of the battery for backup	—	Replace the batteries and set the date and time.
E-11	No video signals input to the [VIDEO IN] connector	—	Input video signals.

This unit uses a microprocessor and may not function properly if there is external noise or interference. In this case, turn the power off and unplug the power cord from the AC outlet. Then plug the power cord in again and check operation.

8-2 No Error Indication

Symptoms	Causes	Remedies
No power is supplied.	● Is the power cord disconnected? ● Is the TIMER indication shown? ● Is the Operation Lock mode engaged?	● Connect the power cord to an AC outlet. ● Press the TIMER button so that the TIMER indication goes out. ● Release the Operation Lock mode.
Operation buttons have no effect during recording and playback.	Is the Operation Lock mode engaged?	Release the Operation Lock mode.
No picture is shown during playback.	Is the monitor connected correctly?	Connect the monitor correctly.
Noise appears in the picture in the Shuttle Search mode and Still mode.	This is not a malfunction.	—
Noise appears in part of the playback picture.	Is the tracking adjusted properly?	Adjust the tracking with the [TRACKING+/–] button.
When the cassette is played back, the picture becomes rough or disappears.	Dust may have accumulated on the video heads.	Clean the video heads. Consult your nearest JVC dealer.
No sound is heard during playback.	No sound is recorded on tapes recorded in the Timelapse mode (except in the 12H/24H mode).	Use a tape on which sound is recorded.
Recording is impossible.	Has the cassette safety tab been removed?	Paste a piece of cellophane tape over the hole.
Timer recording is working.	● Is the clock set correctly? Is the timer properly programmed? ● Is the TIMER indication lit?	● Check again. ● Check it again.
The clock cannot be set.	Is the TIMER indication lit?	Press the TIMER button so that the TIMER indication goes out.
Tape running sound is heard in the Record, Play, FF and REW modes.	This is normal.	If you feel it is too noisy, install the VCR in a rack.
The time/date is not shown.	● Is the clock set? ● Is the [ON SCREEN] button set to OFF?	● Set the clock. ● Set the [ON SCREEN] button to ON.
Auto REW and repeat recording are not possible during recording.	Is the menu switch [TAPE END MODE] set to "STOP" (forced stop)?	Set the menu switch [TAPE END MODE] to "OFF".
Camera image is not switched.	Is the menu switch [CAM SW] set to "OFF"?	When setting the camera switching timing on this unit, set it to "1 FIELD" or "2 FIELD".

9 APPENDIXES

9-1 SA-K97U Optional RS-232C Interface Board

Functions that can be controlled with front panel buttons and switches can also be controlled from a personal computer when the optional SA-K97U RS-232C interface board is installed. Operation status can also be monitored on the computer.

9-pin connector specifications

Pin NO.	Signals	Operations	Direction of signals
2	RXD	Receive data	VTR ← CPU
3	TXD	Transmit data	VTR → CPU
4	DTR	Data terminal ready	VTR → CPU
5	GND	Signal ground	
6	DSR	Data set ready	VTR ← CPU

Output level
ON: +5 V or more
OFF: –5 V or less

Data format

- **Mode** Non-synchronized
- **Character length** 8 bits
- **Data rate** 600, 1200, 2400, 4800, 9600 bps
  (switched with on-screen menu switch, set to 9600 bps before shipment)
- **Parity check** No
- **Stop bit** 1 bit

9-1 SA-K97U Optional RS-232C Interface Board

RS-232C protocol

JVC base table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				Data "0"	ENTER											
1	COMPLE-TION			Data "1"	CLEAR ERROR											
2	ERROR			Data "2"											COUNT RESET	
3	CASSETTE OUT			Data "3"							EJECT					
4				Data "4"												
5	NOT TARGET			Data "5"												
6				Data "6"		CLEAR										JVC TABLE1 ON
7				Data "7"										STATUS SENSE		JVC TABLE1 OFF
8				Data "8"												
9				Data "9"												
A	ACK			PLAY	REV PLAY								REC			REC REQUEST
B	NAK										FF		REC PAUSE			VTR INQ
C											REW					
D											F-FIELD STEP					
E																
F				STOP	STILL											

JVC table-1

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				Data "0"	ENTER		TIMER ON	ON SCREEN ON				VISS FWD		FRAME CODE (COUNT)		
1	COMPLE-TION			Data "1"	CLEAR ERROR		TIMER OFF	ON SCREEN OFF				VISS REV	REC CHECK	DEVICE TYPE	AL . PL RESET	
2	ERROR			Data "2"			PRG/CLK	ROM VER						HOUR METER SENSE	COUNT RESET	
3	CASSETTE OUT			Data "3"			SHFT+	POS V+			EJECT	SEARCH (VISS)				
4				Data "4"			SHFT−	ON SCREEN SELECT								
5	NOT TARGET			Data "5"			SET+	POS H+						PL .AL COUNT SENSE		
6	ALARM INPUT			Data "6"		CLEAR	SET−							TL STATUS SENSE		JVC TABLE1 ON
7				Data "7"			CANCEL							STATUS SENSE		JVC TABLE1 OFF
8				Data "8"			REPEAT									
9				Data "9"			OPE LOCK ON									
A	ACK			PLAY	REV PLAY		OPE LOCK OFF						REC			REC REQUEST
B	NAK							POWER ON			FF		REC PAUSE			VTR INQ
C								POWER OFF			REW					
D								MODE SHIFT			F-FIELD STEP					
E								MODE				DATE S				
F				STOP	STILL							TIME S				

9 APPENDIXES

9-1 SA-K97U Optional RS-232C Interface Board

This section provides technical data for programmers.

Command description

To use the commands described in the following pages, prepare the VCR for communications as follows:

Transmit the command "JVC TABLE 1 ON" (F6H) to the VCR. The VCR will return "ACK" (0AH).
The VCR can now receive any command described in this section. To cancel the communications mode, transmit the command "JVC TABLE 1 OFF" (F7H).

2-1 VCR control commands

Keep in mind that RS-232C control of the VCR is not possible if the VCR's Menu switch <REMOTE> is set to OFF.

Commands (1) through (12) are 1-byte commands. The VCR will return "ACK" (0AH) when the command is received. Confirm that "ACK" (0AH) has been returned before transmitting the next command.

(1)	POWER ON (7BH)	: VCR power is turned "ON".
	POWER OFF (7CH)	: VCR power is turned "OFF".
(2)	PLAY (3AH)	: Playback
(3)	STILL (4FH)	: Pause/Still
(4)	STOP (3FH)	: Stop
(5)	FF (ABH)	: FF/Forward search in the Play mode. (INDEX Search when Menu switch <INDEX SRCH> is set to ON.)
(6)	REW (ACH)	: REW/Reverse search in the Play mode. (INDEX Search when Menu switch <INDEX SRCH> is set to ON.)
(7)	REV PLAY (4AH)	: Reverse playback at normal speed
(8)	TIMER ON (60H)	: Timer "ON"
	TIMER OFF (61H)	: Timer "OFF"
(9)	OPE LOCK ON (69H)	: Operation lock "ON"
	OPE LOCK OFF (6AH)	: Operation lock "OFF"
(10)	EJECT (A3H)	: Cassette ejection VCR returns "ACK", and then returns CASSETT OUT (03H) after cassette has been ejected.
(11)	F-FIELD STEP (ADH)	: Engages frame/field advance when the VCR is in the Still mode. The tape is advanced by one field in the 2H/Timelapse mode, and by one frame in the 6H mode. If the VCR is in any other mode, the Still mode is engaged.
(12)	REC CHECK (C1H)	: Engages REC CHECK. (function is the same as when locally controlled on the VCR.)

Before transmitting either of the following commands ((13) or (14)), first transmit REC/DUB REQUEST (FAH), and confirm that "ACK" is returned by the VCR.

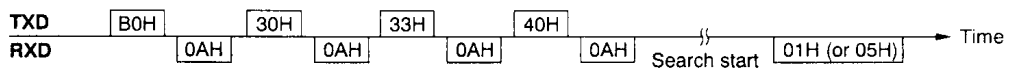
(13)	REC (CAH)	: Starts recording. The VCR returns "ACK".
(14)	REC PAUSE (CBH)	: Engages Record-Pause mode. The VCR returns "ACK". • To re-start recording, transmit PLAY(3AH). • To cancel Record-Pause, transmit STOP (3FH). The VCR will enter the Stop mode.

However, if the loaded cassette's safety tab has been removed, recording is not possible regardless of the fact that "ACK" has been returned. Use the STATUS SENSE (D7H) command to confirm tape status. (See Section 2-3 (9)).

After transmitting commands VISS FWD (15) or VISS REV (16), transmit the appropriate numeric data (1-byte ASCII codes from 30H to 39H) and the data input command (40H).
ASCII codes "30H – 39H" correspond with the numbers "0 – 9" (ie.: 0: 30H, 1: 31H, ... 9: 39H).
Each byte of numeric data and the data input command should be transmitted separately with "ACK" (0AH) confirmation from the VCR after each transmission. The VCR's Menu switch <INDEX SRCH> is set to OFF.

(15)	VISS FWD (B0H)	: To advance the tape in the forward search mode to the designated alarm-input point. The alarm point's 2-byte numeric data should be input after transmission of this command.
(16)	VISS REV (B1H)	: To reverse the tape in the reverse search mode to the designated alarm-input point. The alarm point's 2-byte numeric data should be input after transmission of this command.

Eg: To search for the 3rd alarm-input point from the current position.



The VCR starts INDEX search after returning "ACK". When the specified point is reached, the VCR returns COMPLETION (01H). If the end or beginning of the tape is reached before the specified point, the VCR returns NOT TARGET (05H). (Sending either the 30H,30H or 30H,31H command will cause the VCR to search for the 1st alarm-input point).

After transmitting the VISS SEARCH command (17), transmit the appropriate 2-byte numeric data (from 30H to 39H), the data input command (40H), and either FF (ABH) or REW (ACH). All commands should be transmitted separately one byte at a time with "ACK" (0AH) confirmation from the VCR after each transmission.

(17) VISS SEARCH (B3H)	: To search for a designated INDEX point on the tape.

The VCR starts INDEX search after returning "ACK". When the specified point is reached, the VCR returns COMPLETION (01H). If the end or beginning of the tape is reached before the specified point, the VCR returns NOT TARGET (05H).
This command differs from commands (15) and (16) only in that the FF (ABH) or REW (ACH) command is included separately.

2-2 VCR setting commands

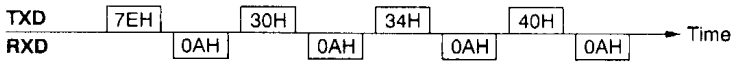
Keep in mind that RS-232C control of the VCR is not possible if the VCR's Menu switch <REMOTE> is set to OFF.

Commands available include control of recording/playback mode setting, clock setting/timer programming, on-screen setting, and others.

■ Recording/playback mode setting commands
Two commands are available. One allows you to rotate through recording/playback modes, the other permits you to directly select the mode.

(1) MODE SHIFT (7DH)	: Switches from one recording/playback mode to the next each time the command is transmitted. Use the TL STATUS SENSE (D6H) command to check the current mode. (See section 2-3 (8).) Transmit 1 byte at a time with "ACK" (0AH) confirmation from the VCR after each transmission.
(2) MODE (7EH)	: Sets recording/playback mode directly. After transmitting this command, transmit the appropriate 2-byte ASCII codes (from 30H to 39H) and the data input command (40H). Correspondence of ASCII codes with recording/playback modes is as shown below.

Eg: To set to "48H".



Mode	1st byte	2nd byte
SP	30H	30H
EP	30H	31H
12H	30H	32H
24H	30H	33H
48H	30H	34H
72H	30H	35H
120H	30H	37H
168H	30H	38H
240H	30H	39H
480H	31H	31H
960H	31H	33H

■ Clock setting/Timer programming commands

(1) PRG/CLK (62H)	: Engages clock setting mode and timer programming mode.
(2) SHIFT → (–) (64H)	: Selects setting items. (–)
SHIFT ← (+) (63H)	: Selects setting items. (+)
(3) SET – (66H)	: Sets data selected with SHIFT.
SET + (65H)	: Sets data selected with SHIFT.
(4) CANCEL (67H)	: Cancels program data in timer programming.
(5) REPEAT (68H)	: Selects daily or weekly repeat in timer programming.

Setting procedure is the same as when using the VCR controls. Be sure to transmit commands 1 byte at a time with "ACK" (0AH) confirmation from the VCR after each transmission.

■ On-screen setting command

(1) ON SCREEN ON (70H)	: Activates time/date on-screen indication.
ON SCREEN OFF (71H)	: Deactivates on-screen indication.

Setting procedure for the following commands (2) and (3) is the same as when using the CAR controls. Be sure to transmit commands 1 byte at a time with "ACK" (0AH) confirmation from the VCR after each transmission.

(2) ON SCREEN SELECT (74H)	: Selects on-screen setup page.
(3) POS V+ (73H)	: Moves on-screen indication vertically.
POS H+ (75H)	: Moves on-screen indication horizontally.

■ Other commands

(1) AL/PL RESET (E1H)	: When transmitted during alarm recording, the recording mode switches back to the previous mode. The VCR's "AL" indication goes off. Transmit again after "AL" indicator goes off to reset the alarm/power loss memory.
(2) COUNT RESET (E2H)	: Resets the tape counter to "0000".

9 APPENDIXES

2-3 Commands for VCR status verification

The following commands are effective regardless of the setting of the VCR's Menu switch <REMOTE>. When one of these commands is transmitted, the VCR will return the corresponding information.

(1)	DATE SENSE (BEH)	: The VCR returns the currently set month, day and year as 6 bytes. Each byte has a value of 30H to 39H. 30H corresponds to 0 and 39H to 9. (Example: For June 14, 1996, the VCR returns 30H, 36H, 31H, 34H, 39H and 36H.)
(2)	TIME SENSE (BFH)	: The VCR returns the currently set hour, minute and second as 6 bytes. Each byte has a value of 30H to 39H. 30H corresponds to 0 and 39H to 9. (Example: For 15:30:45, the VCR returns 31H, 35H, 33H, 30H, 34H and 35H.)
(3)	COUNT CODE (D0H)	: VCR returns the counter data beginning with the 4th digit from the right in 4 bytes. ASCII codes "30H – 39H" correspond with the numbers "0 – 9" (eg: 1234: 31H, 32H, 33H, 34H).
(4)	DEVICE TYPE (D1H)	: VCR returns the last 4 characters of the CR-2070 model [illegible]

(9) STATUS SENSE (D7H) : The VCR will return current status information in 5 bytes.

1st byte

BIT	Status when BIT is "1".
0 Error	Indicates that an illegal command has been received. No further commands will be accepted. To restore to normal operation, transmit CLEAR ERROR (41H) to the VCR.
1 Not defined	Always 0.
2 Not defined	Always 0.
3 Cassette out	The tape has not been loaded.
4 REC inhibit	A tape with no safety tab has been loaded. In this case, no recording and audio dubbing commands will be accepted.
5 Not defined	Always 0.
6 Not defined	Always 0.
7 Not defined	Always 1.

2nd byte

BIT	Status when BIT is "1".
0 Tape End	Tape end sensor is detected.
1 Tape Begin	Tape begin sensor is detected.
2 Not defined	Always 0.
3 Warning	VCR malfunction.
4 Not defined	Always 0.
5 Not defined	Always 0.
6 A EE Mode	An externally-input audio signal is being output.
7 V EE Mode	An externally-input video signal is being output.

3rd byte

BIT	Status when BIT is "1".
0 Not defined	Always 0.
1 Search Mode	Search is in progress. (VISS)
2 Repeat Mode	Repeat recording/playback is in progress.
3 Not defined	Always 0.
4 Repeat	VCR's REPEAT REC/PLAY switch is set to ON.
5 Counter Search	VCR's COUNTER MEMORY switch is set to ON.
6 Timer REC ON	VCR's TIMER button is set to ON.
7 Not defined	Always 0.

4th byte

BIT	Status when BIT is "1".
0 Not defined	Always 0.
1 REC Mode	VCR is in the Record mode.
2 Eject	A cassette is being ejected.
3 Not defined	Always 1.
4 Stop Mode	VCR is in the Stop mode.
5 REW Mode	VCR is in the Rewind mode.
6 FF Mode	VCR is in the Fast-Forward mode.
7 Play Mode	VCR is in the Play mode.

5th byte

BIT	Status when BIT is "1".
0 Speed Code 0	VCR's current tape running mode. See below.
1 Speed Code 1	VCR's current tape running mode. See below.
2 Speed Code 2	VCR's current tape running mode. See below.
3 Speed Code 3	VCR's current tape running mode. See below.
4 Shuttle REV	Reverse search is in progress.
5 Shuttle FWD	Forward search is in progress.
6 Not defined	Always 0.
7 Pause Mode	VCR is in the Pause mode.

Contents of 5th byte BIT 0/1/2/3 "Speed Code"

Speed Code	3	2	1	0	
BIT	0	0	0	0	Still
	0	0	0	1	Timelapse playback
	0	1	0	1	Timelapse recording/1X playback
	0	1	1	0	Double-speed playback
	1	0	0	0	7X search
	1	0	0	1	21X search (6H mode only)

(10) ALARM INPUT (06H) : SR-9070U return code
This is returned when an alarm signal is input during recording.

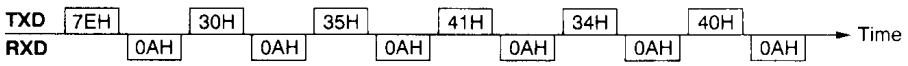
2-4 Others (Input data correction/Error cancellation)

These are return codes from the SR-9070U. (Error-related codes only)

(1) ERROR (02H) : This is returned when commands of more than 1 byte are transmitted to the VCR and an illegal command is received in the 2nd byte (or later) of the transmitted command.
In this status, no command can be accepted and only STATUS SENSE will be returned.
To restore normal operation, transmit CLEAR ERROR (41H) or CLEAR (56H) to the VCR.

CLEAR ERROR (41H)	: Used to cancel previously-transmitted 1-byte numeric data when inputting numeric data such as an Index search point. Also used to cancel error status.
CLEAR (56H)	: Clears the whole command. Cancels the current status and stops the VCR. Also cancels the error status.

Eg : After setting the recording/playback mode to "48H", 35H is mistakenly transmitted . Cancel 35H with "41H" and input "34H" instead.



(2) NAK (0BH) : VCR will return this code when non-defined or non-functional command is received in the 1st byte of the transmitted command. In this case, it is not necessary to input CLEAR. Check whether the transmitted command is acceptable to the VCR or not.

3 Commands reference chart

VCR control commands	Page
POWER ON/OFF	45
PLAY/REV PLAY	45
STOP	45
FF/REW	45
TIMER ON/OFF	45
OPE ON/OFF	45
EJECT	45
F-FIELD STEP	45
1-SHOT INPUT	45
REC/REC PAUSE	45
VISS FWD/REV	45
VISS SEARCH	46

VCR setting commands	Page
■ Recording/playback mode	46
MODE SHIFT	46
MODE	46
■ Clock setting/timer programming	46
PRG/CLK	46
SHIFT –/+	46
SET –/+	46
CANCEL	46
REPEAT	46
■ On-screen setting	46
ON SCREEN ON/OFF	46
ON SCREEN SELECT	46
POS V+/H+	46
■ Others4	46
AL/PL RESET	46
COUNT RESET	46

Commands for VCR status verification	Page	Byte returned from VCR
COUNT CODE	47	4 bytes
DEVICE TYPE	47	4 bytes
VTR INQ	47	1 byte
PL/AL COUNT SENSE	47	5 bytes
HOUR METER SENSE	47	4 bytes
TL STATUS SENSE	47	6 bytes
STATUS SENSE	48	5 bytes
DATA SENSE	47	6 bytes
TIME SENSE	47	6 bytes

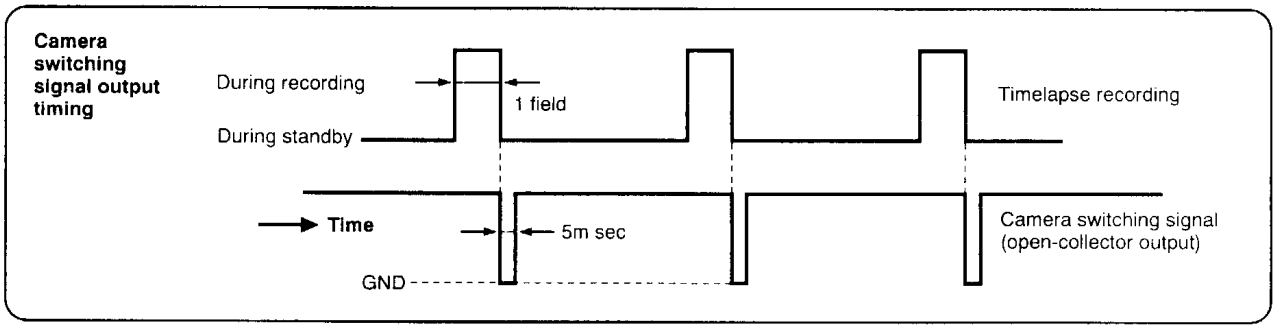
Return codes from VCR	Page
ACK	45
NAK	49
ERROR	49
CASSETTE OUT	45
COMPLETION	45
NOT TARGET	45
ALARM INPUT	48

Others	Page
JVC TABLE 1 ON/OFF	45

9-2 Rear Panel Input/Output Terminal Signal

[CAM SW OUT] camera switching signal output

The CAM SW OUT terminal outputs a camera switching timing signal to the connected sequential switcher. The switching interval can be set with the [CAM SW] on the VCR mode-2 setting screen. The camera switching signal is output at ground level.



Other input/output terminal signal levels

Terminals	Signal levels	Remarks
ALARM IN Alarm signal input	LV: 0 V Min. 400 ms	Input at ground level
ALARM RST IN Alarm signal reset input	HV: 5 V ~ 12 V Min. 400 ms	Input at high level
ALARM REC OUT Alarm recording mode signal output	HV:12 V (output impedance: 4.7 kohms) Alarm Record mode	Input at high level
TAPE END OUT Tape end signal output	Record mode: repeat recording ON/auto rewind ON LV: 0 V Max. 10 mA About 2 seconds Record mode: repeat recording OFF/auto rewind OFF Tape end Manual operation	Input at ground level
WARNING OUT Warning signal output	HV: 12 V (output impedance: 4.7 kohms) Warning Warning reset	Input at high level
CLOCK RESET IN Clock reset input	LV: 0 V Min. 100 ms	Input at ground level
CLOCK RESET OUT Clock reset output	LV: 0 V Min. 100 ms	Input at ground level

9-3 Specifications

■ **Recording system**	Luminance: FM recording Color: down-converted direct recording
■ **Signal system**	NTSC-type color signal/NTSC-type Y/C signal, EIA monochrome signal, 525 lines/60 fields
■ **Tape speed**	33.35 mm/sec., VHS Standard mode (SP) 11.12 mm/sec., VHS Extended mode (EP)
■ **Recording and playback time**	2 hours (VHS Standard (SP) mode) 6 hours (VHS Extended (EP) mode) 12, 24, 48, 72, 120, 168, 240, 480, 960 hours (Timelapse mode: field recording) (with T-120 cassette)
■ **Fast-forward/ rewind time**	Approx. 4 minutes (with T-120 cassette)
■ **Power supply**	AC 120 V, 50/60 Hz
■ **Power consumption**	18 watts
■ **Dimensions**	360 (W) x 94 (H) x 336 (D) mm
■ **Weight**	Approx. 5 kg
■ **Operating temperature**	5°C — 40°C
■ **Operating humidity**	30%RH or more, 80%RH or less
■ **Storage temperature**	–20°C — 60°C

[Video System]

■ **Signal input**	0.5 — 2.0 Vp-p, 75 ohms, unbalanced BNC
■ **Signal output**	Signal output 1.0 Vp-p, 75 ohms, unbalanced BNC
■ **Horizontal resolution**	BW mode: 300 lines or more Color mode: 240 lines or more
■ **Video S/N**	45 dB or more (SP mode)

[Audio system]

■ **Number of tracks**	1 (normal)
■ **Line input**	–8 dBs, 50 kohms, unbalanced RCA
■ **Mic input**	–67 dBs, 600 ohms, unbalanced
■ **Line output**	–8 dBs, 1 kohm, unbalanced RCA
■ **Frequency response**	100 Hz — 10 kHz (SP mode)
■ **Audio S/N**	40 dB or more (SP mode at 3% distortion level)
■ **Wow and flutter**	0.15% WRMS or less (SP mode)

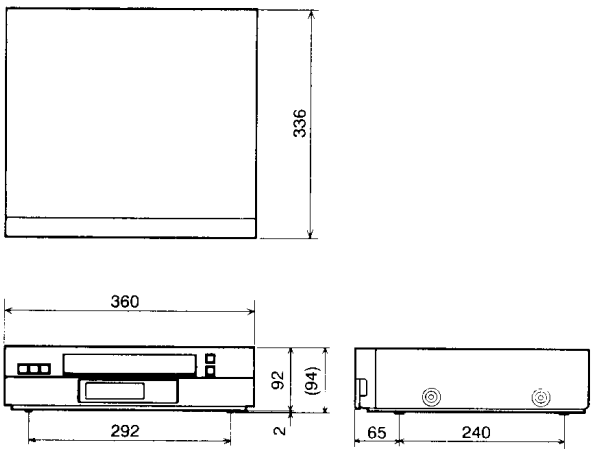
[Time/date]

■ **Display**	Month, day, year, hours, minutes, seconds, recording mode, alarm input data, power loss data
■ **Display position**	Variable
■ **Character size**	16H
■ **Power backup**	Approx. one year

[Alarm]

■ **Alarm input**	Input at ground level
■ **Camera switching output**	Negative pulse output (5 msec.) Open-collector output
■ **Accessories**	"AA" battery x 3 for power backup

Outer dimensions



Unit: mm

* Design and specifications subject to change without notice.

SR-9070U VIDEO CASSETTE RECORDER

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