TOSHIBA

VHS Hi·Fi
Video Cassette Recorder
M-659

OWNER'S MANUAL

VCR *Plus®* C³
w/Cable Channel
Changer

70060805

20072080 SA

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

In the spaces provided below, record the Model and Serial No. located at the rear of your video cassette recorder.

Model No. _____ Serial No. _____

Retain this information for future reference.

IMPORTANT PRECAUTIONS

―――――――――――― **Save Original Packing Materials** ――――――――――――
The original shipping carton and packing materials will come in handy if you ever have to ship your VCR. For maximum protection, repack the set as it was originally packed at the factory.

―――――――――――――― **Avoid Volatile Liquid** ――――――――――――――
Do not use volatile liquids, such as an insect spray, near the unit.
Do not leave rubber or plastic products touching the unit for a long time. They will mar the finish.

―――――――――――――― **Moisture Condensation** ――――――――――――――
Never operate this unit immediately after moving it from a cold location to a warm location. When the VCR is exposed to such a change in temperature, moisture may condense on the cylinder inside, one of its most crucial internal parts. To prevent the VCR from possible damage, do not use the unit for at least 2 hours when there is an extreme or sudden change in temperature.

―――――――――――――――― **Compatibility** ――――――――――――――――
This video cassette recorder (VCR) is compatible with any other VCR bearing the **VHS** mark. HQ VHS equipment is also compatible with existing, non-HQ VHS equipment.

Accessories

Antenna cable (1)
Remote control unit (1)
Batteries (AAA) (2)

Table of Contents

IMPORTANT SAFEGUARDS

CAUTION: PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

This set has been designed and manufactured to assure personal safety. However, improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.
DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGES. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WIDE BLADE
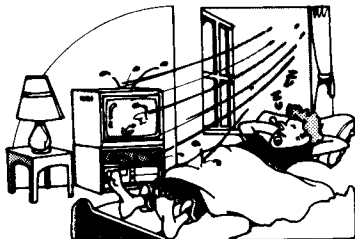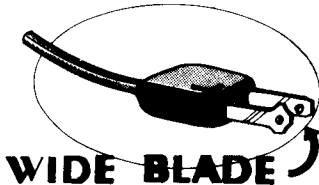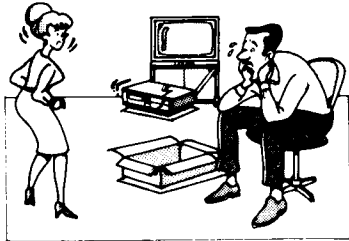
1. After unpacking this video product, read the owner's manual carefully, and follow all the operating and other instructions.

2. This video product should be operated only from the type of power source indicated on the marking labels. If you are not sure of the type of power supply to your home, consult your sales person or your local power company. For video products intended to operate from battery power, or other sources, refer to the operating instructions.

3. This video product is equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

4. Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the video product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the video product on a bed, sofa, rug or other similar surface. This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built- in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

5. Do not expose this video product to rain or use near water. For example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool and the like.

6. Unplug the video product from wall outlet before cleaning. Use only a soft damp cloth and never use benzine, thinner or other solvents for cleaning.
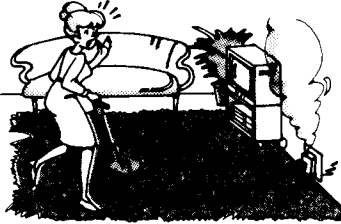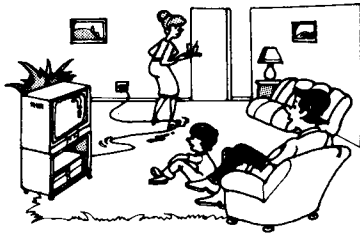
7. Do not allow anything to rest on the power cord. Do not locate this video product where the cord will be walked on.

8. Do not overload wall outlets and extension cords as this can result in fire or electric shock.

9. If an outside antenna or cable system is connected to the video product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
   a. Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) copper-clad steel or bronze wire, or larger, as a ground wire.
   b. Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4-6 feet (1.22-1.83m) apart.
   c. Mount antenna discharge unit as close as possible to where lead-in enters house.
   d. Use jumper wire not smaller than No. 6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used. See NEC section 810-21 (j).

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE

ANTENNA LEAD IN WIRE

GROUND CLAMP

ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)

ELECTRIC SERVICE EQUIPMENT

GROUNDING CONDUCTORS (NEC SECTION 810-21)

GROUND CLAMPS

POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)
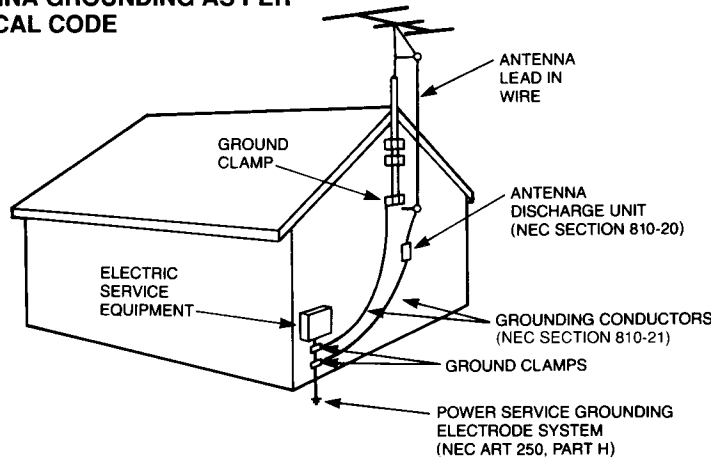
NEC — NATIONAL ELECTRICAL CODE

S2898A

10. An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
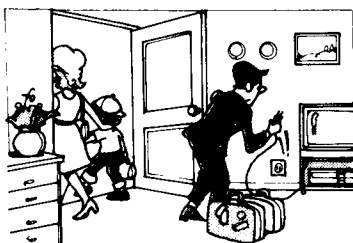
11. For added protection for this video product receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the video product due to lightning and power-line surges.

IMPORTANT SAFEGUARDS
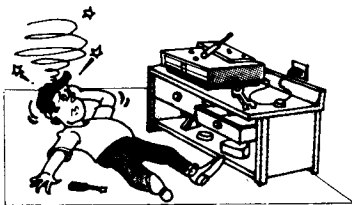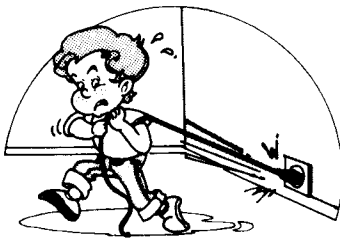
12. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

13. Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the video product.

14. Do not use attachments not recommended by the video product manufacturer as they may cause hazards.

15. Do not place this video product on an unstable cart, stand, tripod, bracket, or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product.

16. Unplug this video product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    A. When the power-supply cord or plug is damaged.
    B. If liquid has been spilled, or objects have fallen into the video product.
    C. If the video product has been exposed to rain or water.
    D. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
    E. If the video product has been dropped or the cabinet has been damaged.
    F. When the video product exhibits a distinct change in performance.

    Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

17. Upon completion of any service or repairs, request the service technicians assurance that only Factory Authorized Replacement Parts that have the same characteristics as the original parts were used, and that routine safety checks have been performed to determine that the video product is in safe operating condition. Unauthorized parts may result in fire, electrical shock, or other hazards.

FEATURES

High Quality Picture

The HQ (High Quality) system produces superior VHS pictures.

High Quality Sound

- Hi-Fi sound with more than 90 dB dynamic range is produced by this VCR. You can also use this VCR as an audio deck.
- Stereo broadcast and MTS (Multichannel TV Sound) can be recorded on to a video tape.

Convenient Functions

VCR Plus+™* Programming

The new VCR Plus+ programming system allows you to easily set up to 8 TV or CATV programs for unattended recording. All you have to do is choose the program you want to record in your TV listings and enter one-to-eight digit PlusCode* number published next to the program title. PlusCode programs are available in most parts of the United States and Canada.

* VCR Plus+ and PlusCode are trademarks of Gemstar Development Corp. VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

Cable Box Compatiblity

If your cable box is remote-controllable, this VCR can automatically change your cable box channel in order to record from your CATV system if needed.

On-Screen Programming (OSP)

- The clock, timer recording programs or VCR Plus+ programs can be easily set by the on-screen programming, using the remote control unit and the on-screen display.
- Up to 8 programs within a year can be preset for normal timer recording or VCR Plus+ recording.
- The OTR (One Touch Recording) enables you to program the timer recording easily.
- The normal timer recording and VCR Plus+ programs can be checked on the TV screen.

Search Function (on-screen display)

You can easily locate a desired scene using the following functions.

Index search: Plays back the tape during fast-forward or rewind for about 5 seconds at each section where the index signal has been registered.

Skip search: Fast forward or rewind the tape to a point with the specified index signal to start playback from there automatically.

Counter Function (on-screen display)

The tape counter indicates the elapsed or remaining time on the tape.

Linear time counter function: Shows the elapsed time on the tape in real time during recording, playback, etc.

Zero return function: Rewind or fast forward a tape to the point where the counter reads "0H00M00S" and stops the tape near that reading.

Remaining time display function: Shows the remaining time on the tape in real time.

Auto Play

When a cassette without the safety tab is loaded, the following operations automatically start.

Auto playback: Plays back the tape automatically.

Auto rewind: Rewinds the tape automatically when the tape is played to the end.

Auto Repeat

Playback is repeated 10 times from the beginning to the end of the tape when this function is activated via the OSP.

Auto Speed Select

If the tape speed is set to AUTO in the timer program mode, the VCR checks the tape remaining time and the recording time that is programmed in the timer recording. If the tape remaining time is not long enough to record the program to the end, the VCR automatically changes the tape speed from the SP mode to the SLP mode.

Special Effects

Picture Search

Scans the programs in the fast forward or rewind mode, enabling you to monitor the picture.

Accel. Search

When the FF or REW button is held down during picture search, the search speed increases, enabling you to locate a desired scene much more quickly.

Still Frame

Freezes the picture temporarily during playback.

Frame Advance

Plays back the tape frame by frame.

Slow Playback

Plays back the tape at 1/7th or 1/15th of the normal playback speed.

Double-speed play back

Plays back the tape at twice the normal playback speed.

Simulcast Recording

Simultaneously records a TV program and its FM sound received through audio equipment connected to the VCR on the sound track of the tape.

Other Features

- **181 Channel Compatible FS (Frequency Synthesized) Tuner**
  The FS tuner automatically selects, with the highest accuracy, all receivable channels such as those for UHF, VHF and CATV.
- **Multi-Brand Compatible Remote Control Unit**
  The remote control supplied with your VCR is compatible with 16 TV brands (ex. RCA, Magnavox, etc.). You can easily operate your TV with this remote control. However, it may not be compatible with some models depending on models.
- **High Speed Rewind/Fast Forward**

6

TV ANTENNA AND VCR CONNECTIONS

To connect the VCR to a VHF or UHF antenna (Fig. A-1), follow the steps below.

Remove the VHF and/or UHF cables from your TV terminals and reconnect them to the VCR terminals as shown in the diagrams below.

| Note |

For VHF or UHF connections, follow procedure ① if you have a 75 Ω (ohm) coaxial cable, and follow procedure ② if you have a 300 Ω (ohm) twin lead connector (i.e. use the 300 – 75 Ω transformer).

[A-1] VHF or UHF Reception Areas

UHF Antenna   VHF Antenna

Procedure ①   75 ohm Coaxial Cable

OR

OR

IN   RF   OUT

Procedure ②   300 ohm Twin Lead   300-75 ohm Transformer (not supplied)
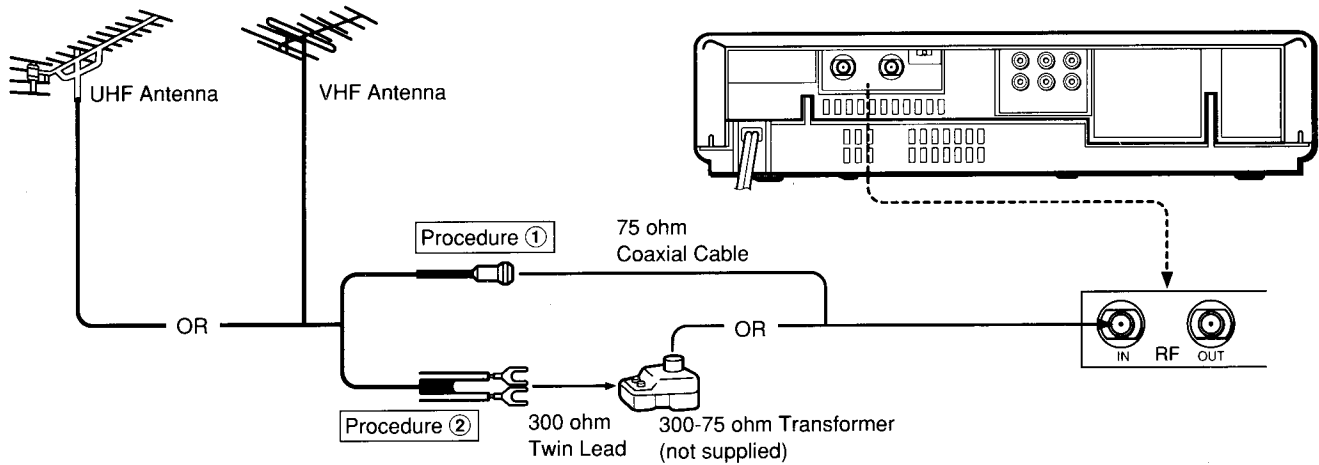
[A-2] Combined VHF/UHF Reception Areas

UHF Antenna   VHF Antenna

VHF/UHF combination Antenna

75 ohm Coaxial Cable

75 ohm Coaxial Cable

300 ohm Twin Lead

IN   RF   OUT

300 ohm Twin Lead   Antenna Mixer (not supplied)   OR

OR

Antenna Mixer (not supplied)

7
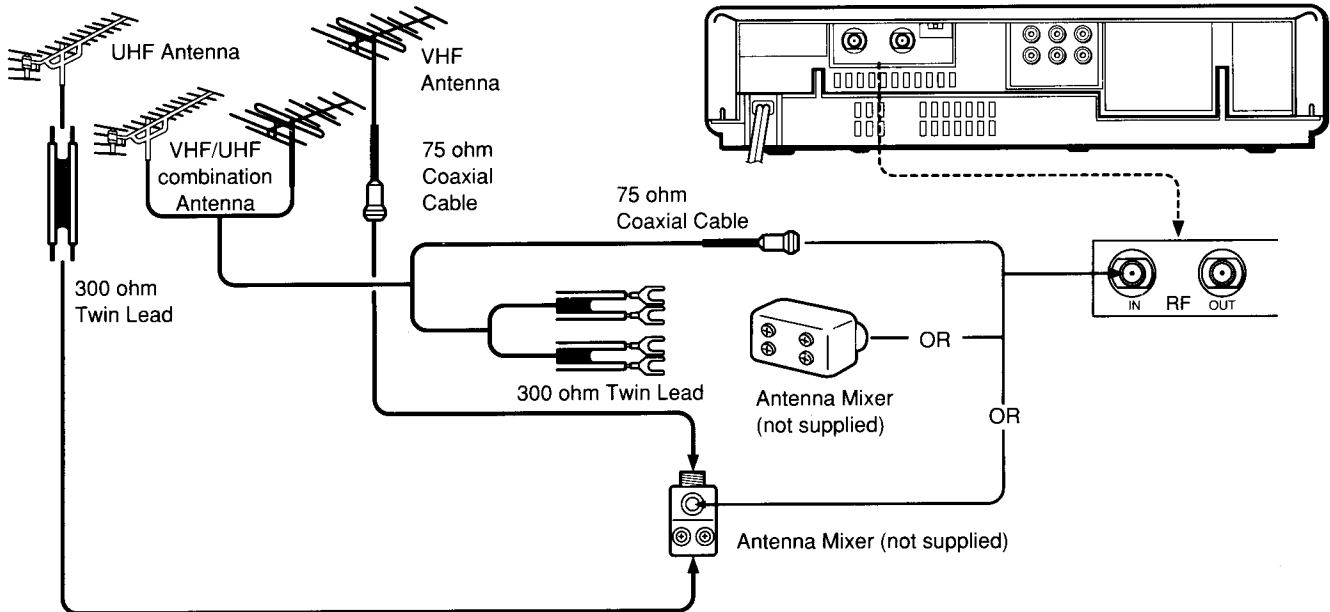
CABLE AND VCR CONNECTIONS

[B] When a Cable Box is not Required

[B-1] To record and watch the same unscrambled channel

You can connect a cable-compatible or normal TV.
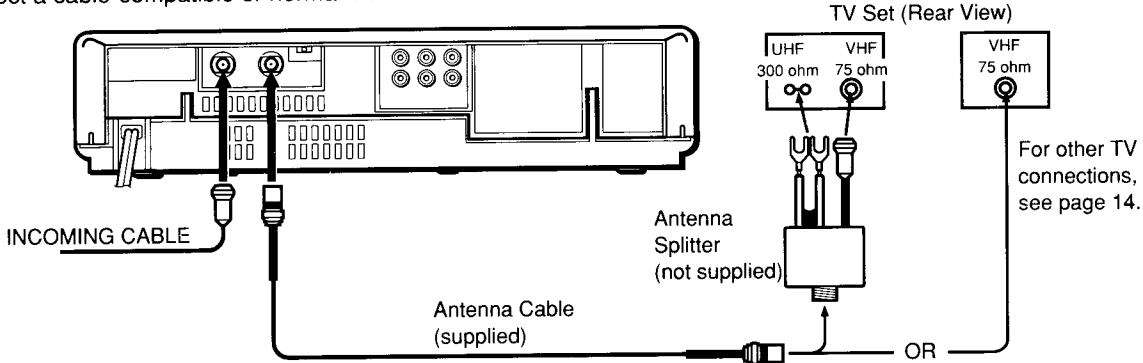
INCOMING CABLE

Antenna Cable
(supplied)

Antenna
Splitter
(not supplied)

TV Set (Rear View)

UHF 300 ohm VHF 75 ohm

VHF 75 ohm

For other TV
connections,
see page 14.

OR

This set-up will enable you to:
— record unscrambled cable channels
— record and watch the same unscrambled channel
— record an unscrambled channel while watching another (only when you connect a cable-compatible TV)

Notes

- Set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).
- To record one channel and watch another, press the TV/VCR button to turn off the VCR indicator and select the channel you want to watch on the TV (only when your TV is cable-compatible).

[B-2] To record an unscrambled channel and watch another channel (scrambled or unscrambled)

You need a cable box.
You can connect a cable-compatible or normal TV.
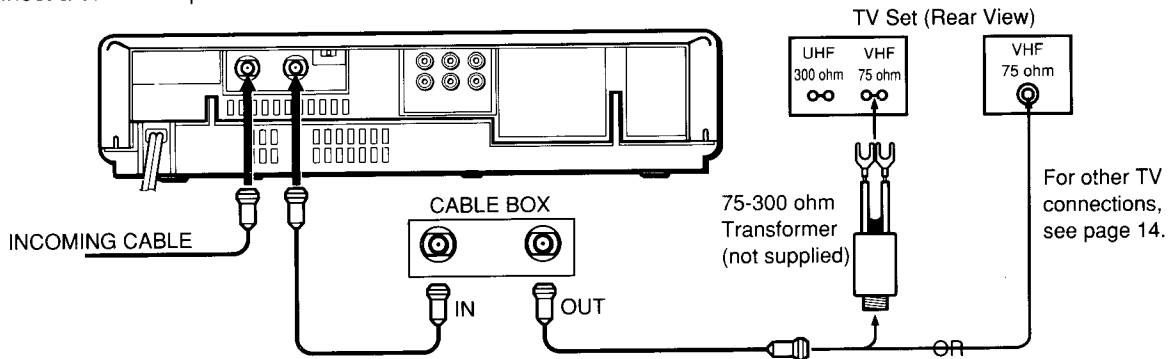
INCOMING CABLE

CABLE BOX

IN   OUT

75-300 ohm
Transformer
(not supplied)

TV Set (Rear View)

UHF 300 ohm VHF 75 ohm

VHF 75 ohm

For other TV
connections,
see page 14.

OR

This set-up will enable you to:
— record unscrambled cable channels
— record and watch the same unscrambled channel
— record an unscrambled channel while watching another channel (scrambled or unscrambled)

Important

- This set-up does not allow you to record scrambled channels.
- This connection is classified as B (without using a cable box) for the VCR Plus+ set-up. (See page 45.)

Notes

- The cable box must be ON and be set to the output channel of the VCR (channel 3 or 4).
- Set the channel selector on the TV to the output channel of the cable box.
- To record an unscrambled channel and watch another channel, press the TV/VCR button to turn off the VCR indicator and select the channel you want to watch on the cable box.

8

CABLE AND VCR CONNECTIONS

[C] When a Cable Box is Required for All Channels

Notes on using a cable box for all channels
- If you use a remote-controllable cable box, connection type C is recommended.
- For placing a remote-controllable cable box, see "Positioning of the Remote-controllable Cable Box" on page 13.
- Before operating, program the cable box set-up (see page 25).

[C-1] To record and watch the same channel (unscrambled or scrambled)

You can connect a cable-compatible or normal TV.

TV Set (Rear View)

UHF VHF
300 ohm 300 ohm

VHF
75 ohm

CABLE BOX

75-300 ohm
Transformer
(not supplied)

IN   OUT
INCOMING
CABLE

Antenna Cable (supplied)

OR

For other TV connections,
see page 14.
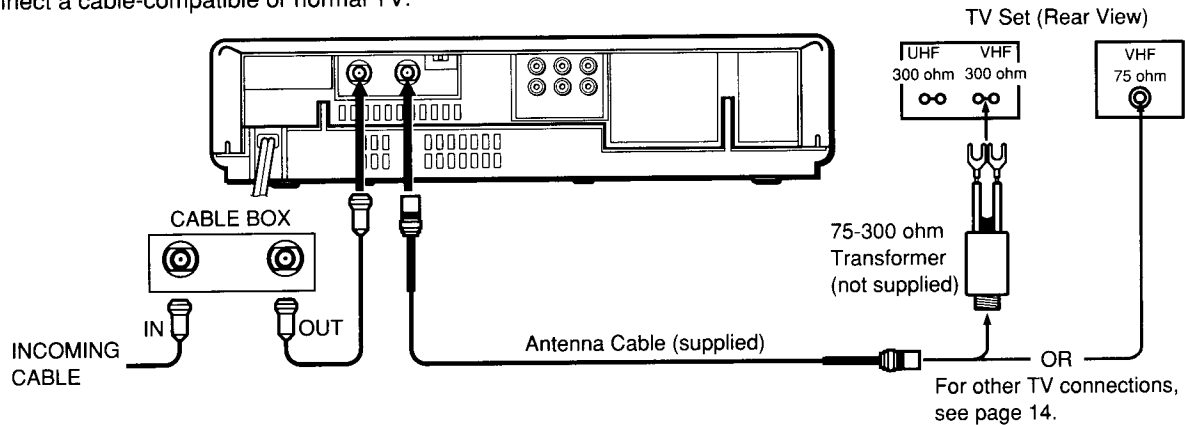
This set-up will enable you to:
— record and watch the same cable channel (unscrambled or scrambled)
— record all cable channels through the cable box

Notes

- Set the channel selector on the VCR to the output channel of the cable box and select channels on the cable box. Set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).
- When the VCR is turned off or the VCR indicator is not lit on the multidisplay, set the channel selector on the TV to the output channel of the cable box.

9

[C-2] To record a scrambled or unscrambled channel and watch another

You need two cable boxes, a splitter and an A/B switch.
You can connect a cable-compatible or normal TV.
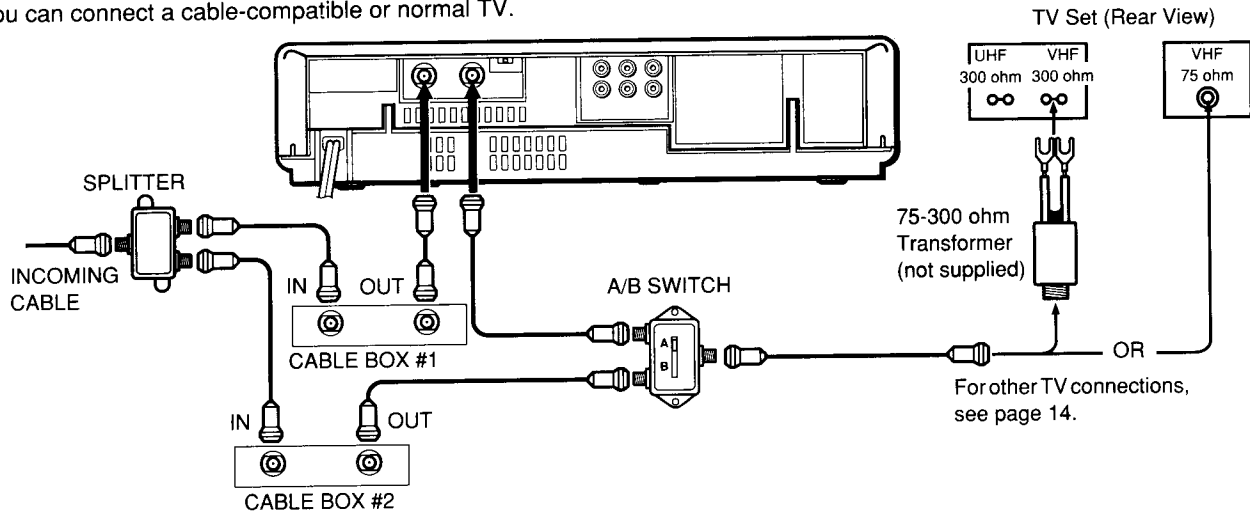
This set-up will enable you to:
— record all scrambled or unscrambled cable channels through the cable box
— record one channel while watching another channel (scrambled or unscrambled)

Important

This connection is classified as C (using a cable box, but without using an A/B switch) for the VCR Plus+ set-up.

Notes

- The cable boxes must be ON.
- To record, set the channel selector on the VCR to the output channel of cable box #1 and select the channel on cable box #1.
- To watch the same channel on the TV, set the A/B switch to A and set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).
- To record one channel and watch another, set the A/B switch to B and select the channel you want to watch on cable box #2. Set the channel selector on the TV to the output channel on cable box #2.
- When the VCR is turned off or the VCR indicator is not lit on the multidisplay, you can set the channel selector on the TV to the output channel of cable box #1.

10

CABLE AND VCR CONNECTIONS

[D] When a Cable Box is Required Only for Some Channels

[D-1] To record a scrambled or unscrambled channel and watch the same channel
To record an unscrambled channel and watch another

You need a cable box, a splitter and A/B switch.
You can connect a cable-compatible or normal TV.
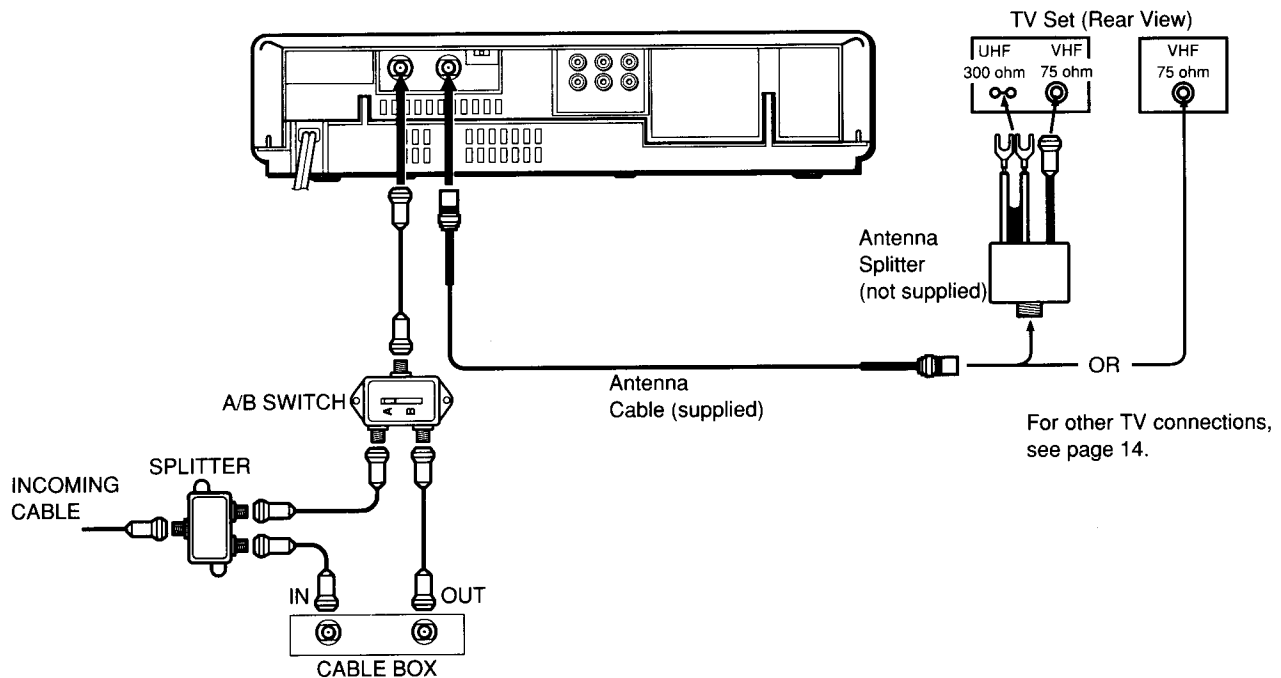
TV Set (Rear View)

Antenna
Splitter
(not supplied)

Antenna
Cable (supplied)

OR

For other TV connections,
see page 14.

A/B SWITCH

SPLITTER

INCOMING
CABLE

IN   OUT

CABLE BOX

This set-up will enable you to:
— record and watch scrambled or unscrambled cable channels
— record an unscrambled channel while watching another unscrambled channel (only when you connect a cable-compatible TV)

To record and watch scrambled or unscrambled channels through the cable box
• Turn on the cable box and set the A/B switch to B.
• Set the channel selector on the VCR to the output channel of the cable box and select channels on the cable box.
• To watch the same channel on the TV, set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).

To record and watch unscrambled channels without passing through the cable box
• Set the A/B switch to A and select channels on the VCR.
• Set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).
• To record one channel and watch another, press the TV/VCR button to turn off the VCR indicator and select the channel you want to watch on the TV (only when your TV is cable-compatible).

[D-2] To record a scrambled or unscrambled channel and watch the same channel
To record an unscrambled channel and watch another scrambled or unscrambled channel

You need a cable box, two splitters and two A/B switches.
You can connect a cable-compatible or normal TV.
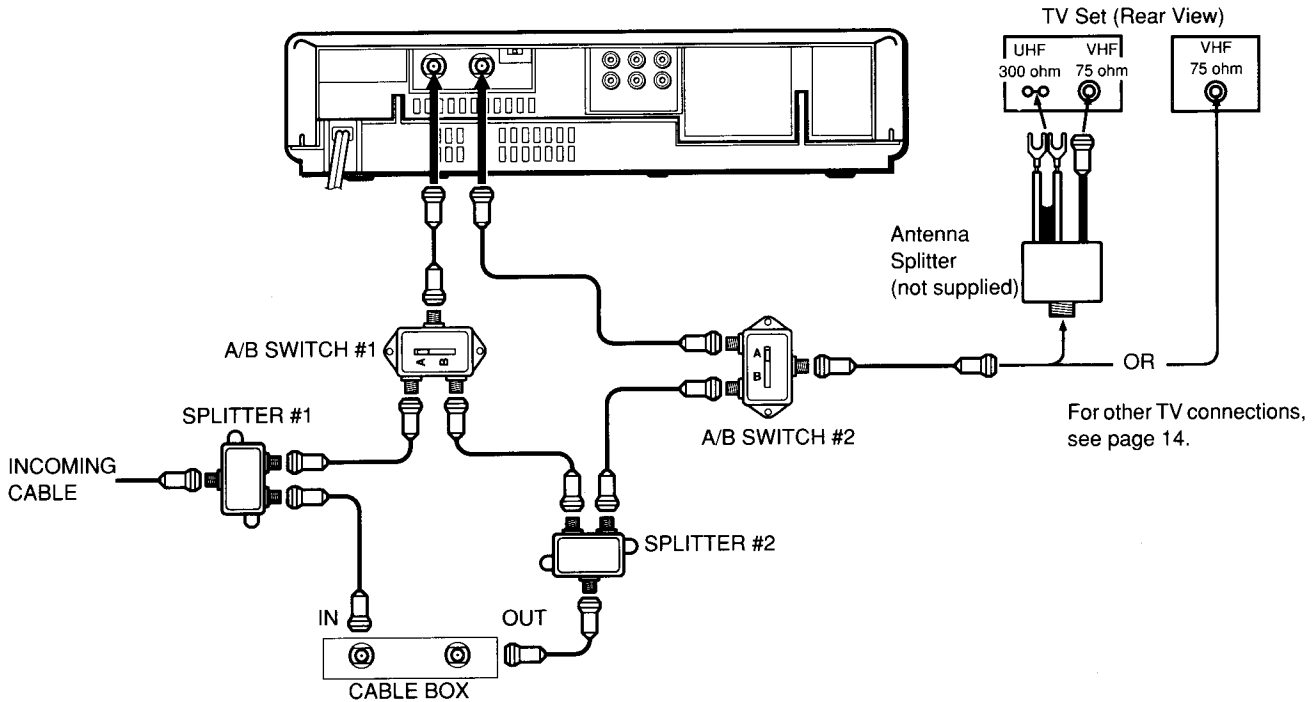
TV Set (Rear View)

Antenna
Splitter
(not supplied)

A/B SWITCH #1

SPLITTER #1

INCOMING
CABLE

A/B SWITCH #2

For other TV connections,
see page 14.

SPLITTER #2

IN   OUT

CABLE BOX

This set-up will enable you to:
— record and watch scrambled or unscrambled cable channels
— record an unscrambled channel while watching another scrambled or unscrambled channel

To record and watch scrambled or unscrambled channels through the cable box
• Turn on the cable box and set the A/B switch #1 to B.
• Set the channel selector on the VCR to the output channel of the cable box and select channels on the cable box.
• To watch the same channel on the TV, set A/B switch #2 to A and set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).

To record and watch unscrambled channels without passing through the cable box
• Set A/B switch #1 to A and select channels on the VCR.
• To watch the same channel on the TV, set A/B switch #2 to A and set the channel selector on the TV to the output channel of the VCR (channel 3 or 4).
• To record one channel and watch another, press the TV/VCR button to turn off the VCR indicator, set A/B switch #2 to A and select the channel you want to watch on the TV (only when your TV is cable-compatible).

To record an unscrambled channel while watching another scrambled or unscrambled channel
• Set A/B switch #1 to A and select the channel you want to record on the VCR.
• To watch another channel on the TV, set A/B switch #2 to B and select the channel you want to watch on the cable box. Set the channel selector on the TV to the output channel of the cable box.

CABLE AND VCR CONNECTIONS

Positioning of the Remote-controllable Cable Box

If your cable box is remote-controllable, put it on top of the VCR as shown below. Don't block the sensor window on top of the VCR. Once the cable box set-up is completed (see page 25), the VCR sends out infrared signals to control your cable box during timer or VCR Plus+ recording.

The infrared signals come out from the sensor window and the front of the VCR, and they bounce off walls and objects in the room and are received by the cable box.
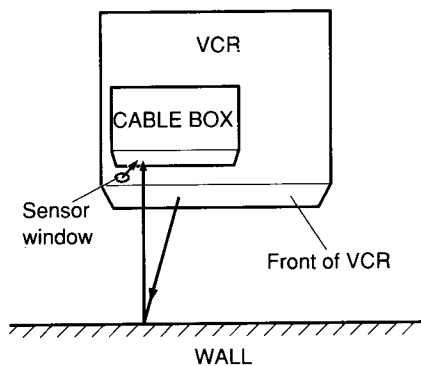
Power On/Off of a Cable Box

All cable box users have to leave the power of a cable box ON. Especially a remote-controllable cable box user should remember to do so before recordings, timer recordings, and VCR Plus+ recordings. The remote control unit supplied with this VCR cannot turn on a cable box.

| Note |

From this point on when the manual refers to "remote-controllable", this is for a cable box that has an infrared wireless remote control. If your cable box has a "wired" remote control, please use "non remote-controllable" instructions for set-ups.

Technical Terms

"Unscrambled" Cable Channels
Cable companies usually include "Unscrambled" channels in their basic subscription service. Depending on the tuning capability of your TV (how many cable channels your TV is capable of tuning to) you may not need a cable box (supplied by the cable company) to view "unscrambled" cable channels on your TV set.

"Scrambled" Channels
Extra (optional) pay cable channels, like HBO and Cinemax in some localities, are often "scrambled" by the cable company. To view these channels on your TV, you must use the cable (decoder) box supplied by the cable company.

Cable Box (supplied by Cable Company)
Until recently, all television and VCR receivers were equipped with 68 channel tuners capable of tuning in the 12 standard VHF channels (2-13) and the 56 UHF channels (14-69). Since cable television systems do not use the UHF band, once they began expanding beyond 12 channel capacity (some cable companies transmit up to 100 channels) some form of cable box became necessary to enable their subscribers to tune in the additional channels. This "cable box" rebroadcasts the programs to your TV set or VCR on one designated channel, usually Channel 2, 3, or 4. If your cable box is remote-controllable, you can change channels with the remote control unit supplied with this VCR. If the box cannot be controlled by remote control unit, change channels using the channel selector on the box. Some cable boxes have built-in decoders that translate "scrambled" pay TV channels (i.e.HBO) so they can be used by your TV set.

Cable Compatible
Either the TV or VCR, when the cable is connected, can tune to unscrambled cable channels, without the use of a cable box. There are limitations to the tuning mechanism of TV and VCR. These are usually 105 channel tuning, 117 channel tuning, and 133 channel tuning.

Frequency Conversion
This simply means the ability to change one frequency to another (e.g. when Channel 7 is selected, the cable box takes the Channel 7 information and outputs this on the Channel 3 frequency; when channel 11 is selelcted, channel 11 information is output on the Channel 3 frequency.) The cable box and the VCR both use this principle of frequency conversion.

VCR AND TV CONNECTIONS

Connection to TV antenna terminals

Fig.1 VHF (75 ohm or 300 ohm) terminal connection

TV Set (Rear View)

VHF 300 ohm

VHF 75 ohm

75-300 ohm Transformer (not supplied)

OR

IN RF OUT

Antenna Cable (supplied)
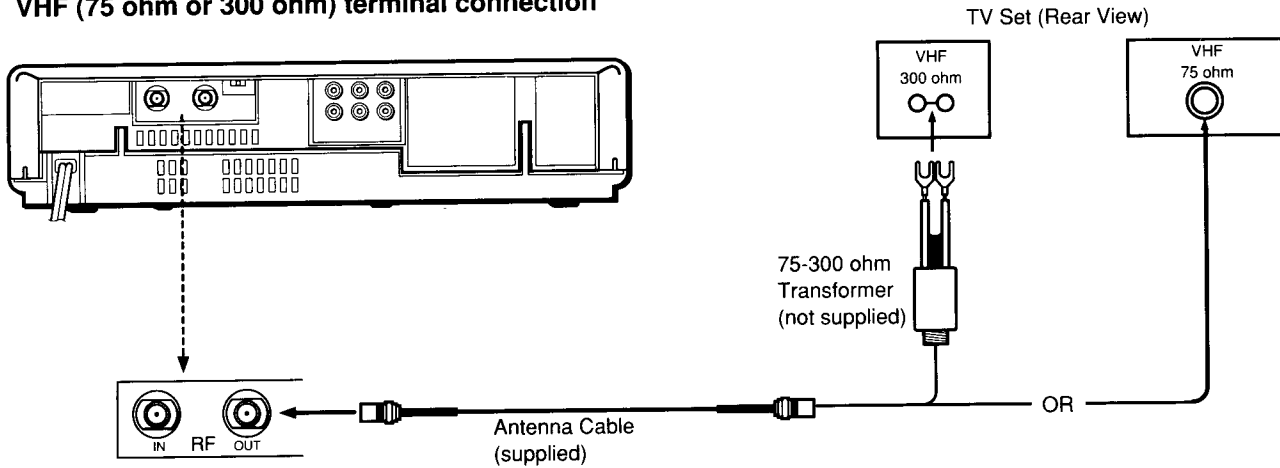
Fig.2 VHF/UHF (75 ohm/300 ohm or 300 ohm/300 ohm) or VHF/UHF (75 ohm) terminal connection

TV Set (Rear View)

UHF 300 ohm VHF 300 ohm

UHF 300 ohm VHF 75 ohm

UHF 75 ohm VHF 75 ohm

UHF/VHF 75 ohm

Antenna Splitter (not supplied)

IN RF OUT

Antenna Cable (supplied)

OR   OR   OR
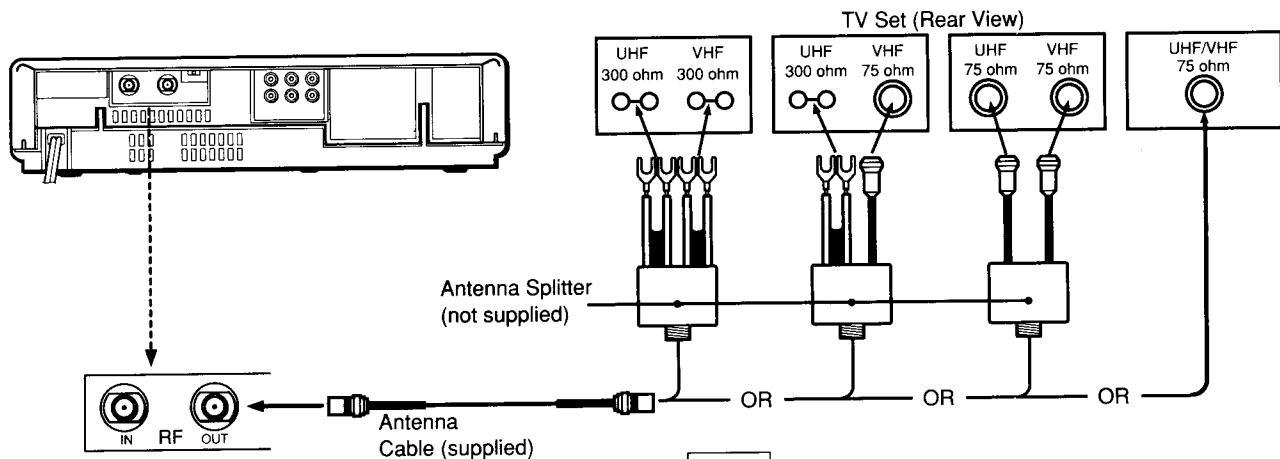
Note

An antenna splitter/mixer (VHF/UHF) is available from your local electronics store.

Connection to TV with "VIDEO IN" and "AUDIO IN" connectors

to VIDEO OUT to AUDIO OUT
yellow   white
                red

to AUDIO IN
red   white

Audio Cable (not supplied)

Video Cable (not supplied)   yellow

to VIDEO IN
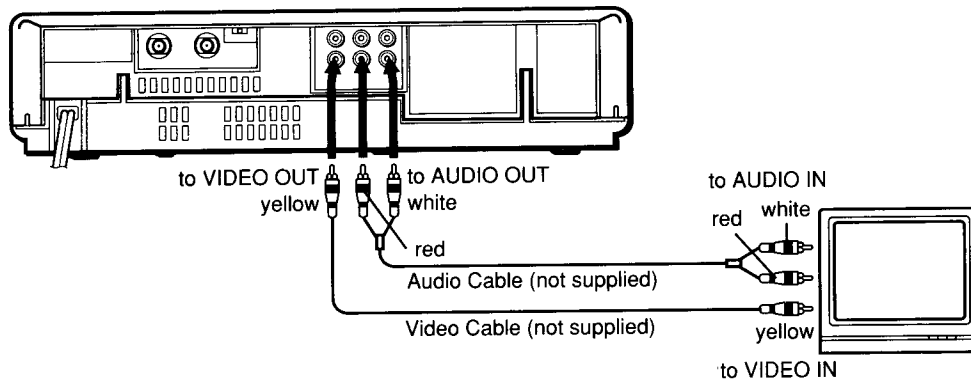
FRONT PANEL
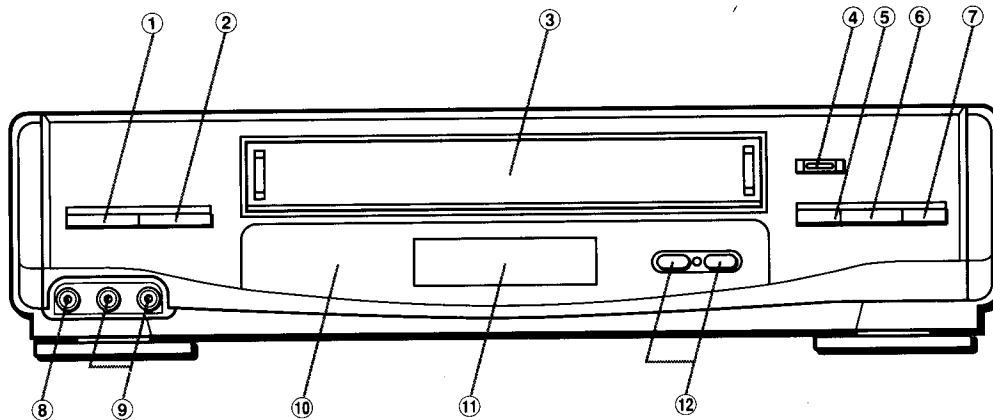
(1) POWER button and indicator
To turn the unit on/off.
The power is automatically turned on when a cassette is inserted into the compartment (Auto Power On).

(2) EJECT/STOP button (▲/■)
Press this button to stop the tape.
To eject the cassette, press this button in the stop mode.

(3) Cassette compartment
When a cassette is loaded, the power is automatically turned on.
When a pre-recorded cassette (without safety tab) is loaded, the power is automatically turned on to start playback (Auto Play function).

(4) REC button
To start recording.

(5) REW button (◀◀)
- To rewind the tape during the stop, fast-forward or reverse picture search mode.
- To operate the reverse picture search during the playback slow, still, frame advance or forward picture search mode.

(6) PLAY button (▶)
- To start playback.
- To move the picture at twice the normal speed during playback.

(7) FF button (▶▶)
- To fast forward the tape during the stop, rewind or forward picture search mode.
- To operate the forward picture search during the playback, slow, still, frame advance or reverse picture search mode.

(8) VIDEO IN jack
To record from an external video source, connect to the video output jack of an external video source such as a VCP, VCR or camcorder.

(9) AUDIO IN jacks (L, R)
To record from an external audio source, connect to the audio output jacks of an external audio source such as audio equipment, or a VCR, VCP, or camcorder.

(10) Infrared remote control receiver
Picks up infrared light commands from the remote control unit.

(11) Multidisplay

(12) CHANNEL buttons (∨/∧)
Press the ∨ button for sequential selection in the lower direction.
Press the ∧ button for sequential selection in the upper direction.

15

REAR PANEL
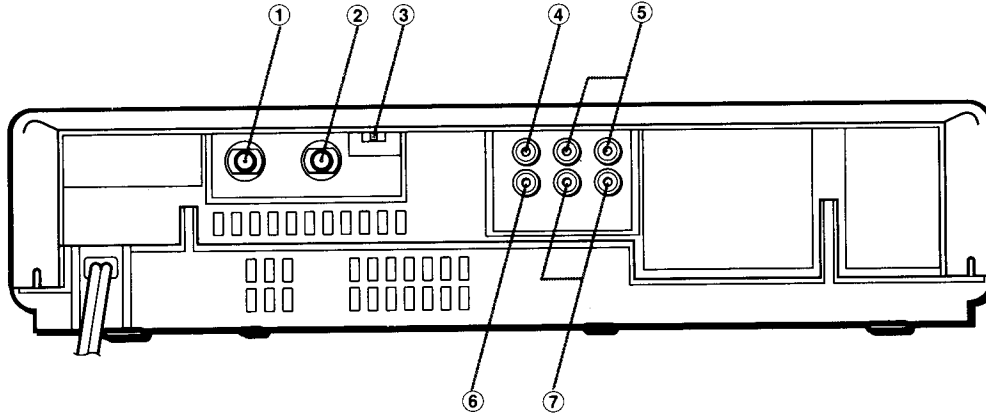
(1) RF IN terminal
Connect to the VHF antenna, UHF antenna or cable TV terminal.

(2) RF OUT terminal
Connect to the VHF or VHF/UHF input terminal of a TV.

(3) Output channel selector
Select 3CH or 4CH, whichever is unused in your area, to transmit the signal from the VCR to the TV.

(4) VIDEO IN jack
This jack has the same function as the VIDEO IN jack on the front panel. If plugs are connected to both jacks, the VIDEO IN jack on the front panel has priority.

(5) AUDIO IN jack
These jacks have the same function as the AUDIO IN jacks on the front panel. If plugs are connected to both jacks, the AUDIO IN jacks on the front panel have priority.

(6) VIDEO OUT jack
Connect to the video input jack of a VCR or TV set.

(7) AUDIO OUT jacks (R, L)
Connect to the audio input jacks of a TV or external audio equipment.

16

MULTIDISPLAY
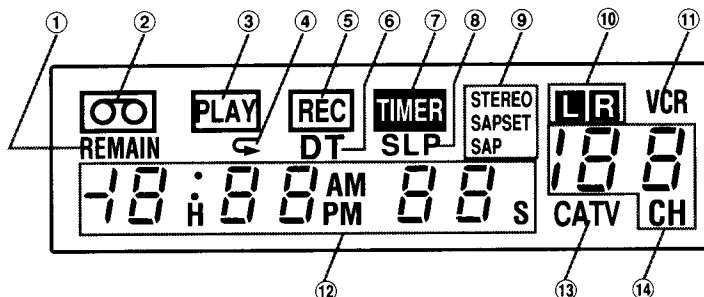
1 **REMAIN indicator**
Blinks or lights when the tape remaining time is displayed.

2 **Cassette indicator**
Lights when a cassette is loaded, even when the power is off.
Blinks when a cassette is being inserted or ejected.

3 **PLAY indicator**
Lights in the playback mode.

4 **Repeat indicator**
Lights when AUTO REPEAT is selected on the SETUP screen.

5 **REC indicator**
Lights in the recording mode.

6 **DT (digital tracking) indicator**
Lights when the auto tracking mode is selected with the DIGITAL TRACKING button on the remote control unit.

7 **TIMER indicator**
Lights when the TIMER buttons on the remote control unit are pressed.

8 **Tape speed indicator (SP/SLP)**
SP: Lights in the SP mode.
SLP: Lights in the SLP mode.

9 **STEREO/SAPSET/SAP indicators**
STEREO: Lights when stereo broadcasting is received.
SAPSET: Lights when SAP (Second Audio Program) SET is set to ON on the SETUP screen. (See page 51.)
SAP: Lights when SAP broadcasting is received.

10 **L/R (left/right channel) indicator**
Lights when the AUDIO SELECT button on the remote control unit is pressed.

11 **VCR indicator**
Lights when the VCR mode is selected with the TV/VCR button on the remote control unit.

12 **Multifunctional indicator**
Indicates the clock, tape remaining time and linear counter display.

13 **CATV indicator**
Lights when the CATV mode is selected on screen display. (See page 28.)

14 **Channel indicator**
Indicates the channel number currently being watched or recorded.

REMOTE CONTROL UNIT

The buttons that are not followed by explanations have the same functions as the buttons similarly marked on the VCR.
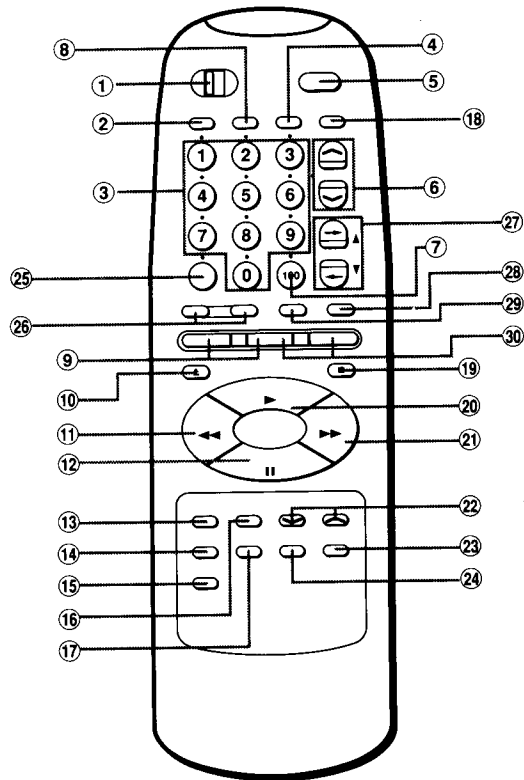
VCR Control Buttons

To operate this VCR, be sure to set the VCR/TV selector ① to VCR.

Preparation Controls

① VCR/TV selector

To select the equipment to be controlled by this remote control unit.
- Set to VCR to control this VCR.
- Set to TV to control a TV (see page 21).

② INPUT SELECT button

To select the source to be recorded.

③ Number buttons (0 – 9)
- To select the channels.
  When selecting channels 1 through 9, press the 0 button and then the desired channel number button.
- Used for setting the clock or the programs in the OSP mode.
- Used for skip searching.
- Used to select one of the 16 TV brand remote control codes (see page 21).

④ TV/VCR button

To select the VCR tuner or TV tuner for reception.
Set to VCR (the VCR indicator on the multidisplay lit) to watch the program being recorded.
Set to TV (the VCR indicator not lit) to watch normal TV programs or to watch a TV program while recording another program with the VCR.

⑤ POWER button

⑥ CHANNEL (∧/∨) buttons

Used for sequential channel selection in the upper or lower direction.

⑦ 100 button

To select channel 100 or higher (see page 28).

18

REMOTE CONTROL UNIT

Playback and Recording Controls

⑧ **AUDIO SELECT button**
To select an audio source.

⑨ **REC buttons (●)**

⑩ **EJECT button**
To eject a cassette.

⑪ **REW button (◄◄)**

⑫ **PAUSE/STILL button (II)**

⑬ **FRAME button (II ►)**
- Press the button once in the still mode to operate the frame advance function.
- Keep the button pressed in the still mode to operate the 1/30 times slow-motion playback.

⑭ **COUNTER RESET button**
To reset the tape counter to zero.

⑮ **INDEX button**
- To activate index search or skip search.
- To mark an index signal.

⑯ **SLOW button**
To slow the picture to 1/7th or 1/15th of its normal playback speed. The two speeds alternate each time the button is pressed.

⑰ **ZERO RETURN button**
To return the tape to the desired point (0H00M00S) assigned by pressing the RESET button.

⑱ **SP/SLP button**
To select the recording tape speed, SP or SLP.

⑲ **STOP button (■)**

⑳ **PLAY button (►)**
- To playback.
- To move the picture at twice the normal speed during playback.

㉑ **FF button (►►)**

㉒ **TRACKING buttons (∨/∧)**
To adjust the tracking manually.

㉓ **DIGITAL TRACKING button**
To adjust the tracking automatically.

㉔ **REMAIN/COUNTER button**
To select the clock, tape counter or tape remaining time indicator.

OSP and VCR Plus+ Controls

㉕ **DISPLAY button**
To turn on/off the on-screen display (tape operation mode, clock, counter, channel number, etc.).

㉖ **OTR ON/OFF buttons**
To set the recording ON/OFF times for one touch timer recording.
The OTR OFF button is also used to clear the guide channel number for VCR Plus+.

㉗ **SHIFT/VOL buttons**
To shift the blinking cursor to the item you want to set when setting the channel, date, tape speed or recording ON/OFF time.

㉘ **PROG. button**
- To switch the OSP mode on and off.
- Used to select one of the 16 TV brand remote control codes. (See page 21.)

㉙ **VCR PLUS button**
Used for VCR Plus+ programming.

㉚ **TIMER buttons**
Used for the last step when setting programs using the timer.

Battery Installation

1 Remove the battery compartment lid on the rear of the unit.
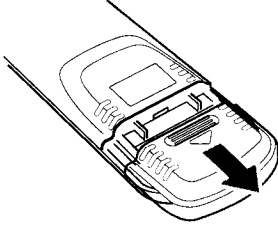
2 Install 2 batteries ("AAA" size) into the unit.
Carefully install the batteries to match the polarity diagrams.
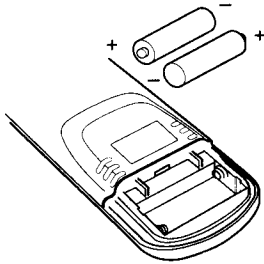
3 Close the battery compartment lid.
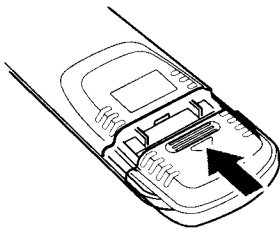
Notes

- Battery life is about 1 year. (The life depends on the conditions of use.)
- Replace both batteries when an operation is unstable or disabled.
- Remove the batteries when the remote control unit will not be used for a long time to safeguard against leaking battery acid.
- Do not dispose of the batteries by incineration.

When Handling the Unit

- For correct operation, press the buttons on the remote control unit at intervals of at least 1 second.
- Keep the unit away from heat and humidity and sources of electrical shock.
- Be careful not to drop or hit the remote control unit.
- Be careful not to spill water on the remote control unit or to place it on anything wet.
- Do not take the remote control unit apart.

Operating Range

The remote control unit must have a "line of sight" to the infrared remote sensor on the front of the VCR. It must be within an angle of 30° on either side of a line perpendicular to the front panel. When you use the remote control unit while aiming it at the front of the VCR, the maximum operating distance is about 23 feet or 7m (within 30° of either side of the center, the effective operating distance is approximately 16 feet or 5m).

30°   30°

23 feet
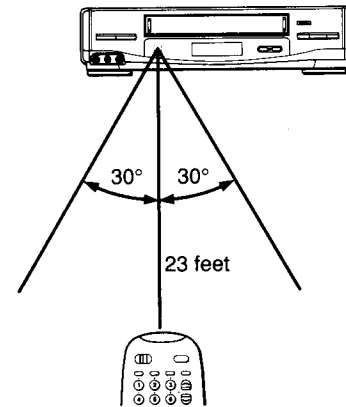
OPERATING A TV

The remote control unit can be used with up to 16 TV brands (including TOSHIBA, RCA, GE, SONY, etc.). Remote control codes for a variety of TV brands have been programmed in this remote control unit. The TOSHIBA code has initially been set in the unit.
If your TV is not a TOSHIBA, you must first select a TV code for your brand of TV, referring to the "Table of TV codes" below.
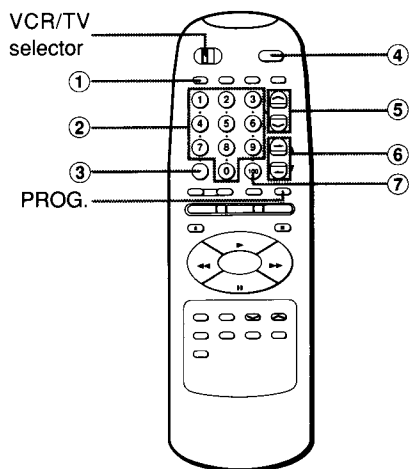
Preparation

- Turn on your TV.
- Set the VCR/TV selector to TV.
- The table below shows the remote control code for each TV brand.
  Find the code number for your TV brand.

Table of TV codes

TOSHIBA	RCA/GE	SONY	MITSUBISHI	JVC
01	02	03	04	05

HITACHI	PANASONIC /QUASAR	SHARP NEW	SANYO (FISHER)	MAGNAVOX (SYLVANIA)
06	07	08	09	10

GOLDSTAR NEW	SAMSUNG	SHARP OLD
11	12	13

Selecting the TV code

While holding down the *PROG.* button, enter the two-digit code number which corresponds to your TV brand with the number buttons, as found in the table.

Example:
To select the code for an RCA TV
While holding down the *PROG.* button, press buttons 0 and 2 in sequence. The RCA TV is ready to be operated with the TV control buttons on the remote control unit.

Notes

- Due to differences in models, the remote control unit may not be compatible with some TV brands, even though you have set the TV code correctly. In this case, use the remote control unit that comes with your TV.
- When the batteries are replaced, the remote control code switches back to the original code for a TOSHIBA TV. You will need to reset the code.

TV Control Buttons

Once the TV code is selected, you can operate your TV with this remote control by using the following buttons. Set the *VCR/TV* selector to TV when operating the TV.

(1) INPUT SELECT button
To select an external source, such as a VCR.

(2) Number buttons (0 – 9)
To select the channels.
When selecting channels 1 through 9, press the 0 button and then the desired channel number.

(3) DISPLAY button
To turn on/off the TV's on-screen displays.

(4) POWER button
To turn the TV on or off.

(5) CHANNEL (∧/∨) buttons
Used for sequential channel selection in the upper or lower direction.

(6) SHIFT/VOL buttons
To adjust the sound level.

(7) 100 button
Used for ENTER key.

Note

Buttons marked with an orange dot are compatible with a TV.

SETTING THE VCR OUTPUT CHANNEL

Set the output channel selector on the rear panel to the vacant channel in your area, 3CH or 4CH.
Insert a screwdriver into the slot and slide the output channel selector to 3CH or 4CH.

Notes

- When you have a cable TV, select the channel which gives you the best reception.
- To play back a tape, set the TV to the same channel as the VCR output channel (3 or 4).

Output channel selector
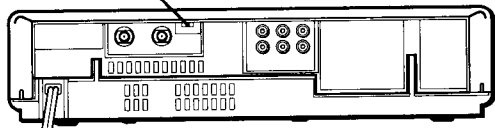
USING THE TV/VCR BUTTON (on the remote control unit)

Use this button to select the TV mode or VCR mode

TV Mode (using the TV tuner)

1 Turn on the TV. There is no need to turn on the VCR.
2 Select the desired channel using the channel select buttons on the TV.

Note

If the VCR is on and the "VCR" indicator lights on the multidisplay, press the TV/VCR button so that the indicator goes off.

VCR Mode (using the VCR tuner)

1 Turn on the TV and select the VCR output channel, 3CH or 4CH.
2 Set the VCR/TV selector on the remote control unit to VCR.
3 Turn on the VCR.
The power indicator lights up.
4 Set the VCR to the VCR mode with the TV/VCR button.
The "VCR" indicator will light on the multidisplay.
5 Select the desired channel with the CHANNEL ∧/∨ buttons on the VCR or the number buttons on the remote control unit.
The program of the selected channel will appear on the TV screen.

PREPARATION

SETUP SCREEN

The SETUP screen is used for setting TAPE LENGTH, EDIT, AUTO REPEAT, SAP SET, SIMUL and AUTO ANTENNA.
To display the SETUP screen, perform the following steps.

1 Press the *PROG.* button on the remote control unit to display the MENU screen.

2 Press the *2* button on the remote control unit to display the SETUP screen.

```
          S E T U P
1  TAPE LENGTH   [  T120  ]
2  EDIT          [  OFF   ]
   AUTO REPEAT   [  OFF   ]
4  SAP SET       [  OFF   ]
5  SIMUL         [  OFF   ]
6  AUTO ANTENNA  [  ON    ]

SET=1-6            END=PROG
```
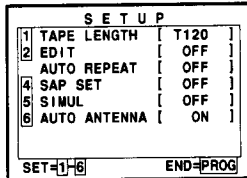
3 Set the following items in the order given.

1	TAPE LENGTH	: see page 34.
2	EDIT	: see page 55.
3	AUTO REPEAT	: see page 32.
4	SAP SET	: see page 51.
5	SIMUL	: see page 53.
6	AUTO ANTENNA	: see below.

Note

If a cassette is not inserted into the VCR, number 3 will not appear on the TV screen.

4 Press the *PROG.* button twice after setting to return to the normal TV screen.

AUTO ANTENNA

To watch TV programs via the TV tuner after playback, set the VCR to the TV mode using the *TV/VCR* button.
If you have a TV with audio/video terminals and use the auto antenna system, this mode setting is not necessary.

Auto Antenna Setting

1 Set the *VCR/TV* selector on the remote control unit to VCR.

2 Turn on the VCR.

3 Press the *PROG.* button on the remote control unit so that the MENU screen appears.

4 Press the *2* button so that the SETUP screen appears.

5 Press the 6 button to set AUTO ANTENNA to "ON".
- To receive a TV broadcast via the TV tuner after playback, set AUTO ANTENNA to "OFF". If the "VCR" indicator lights on the multidisplay, press the *TV/VCR* button to turn off the indicator.
  Now the auto antenna setting is completed.

6 Press the *PROG.* button twice to return the TV to the normal screen.

Note

If your TV does not have audio/video terminals, set AUTO ANTENNA to "ON" at step 5.
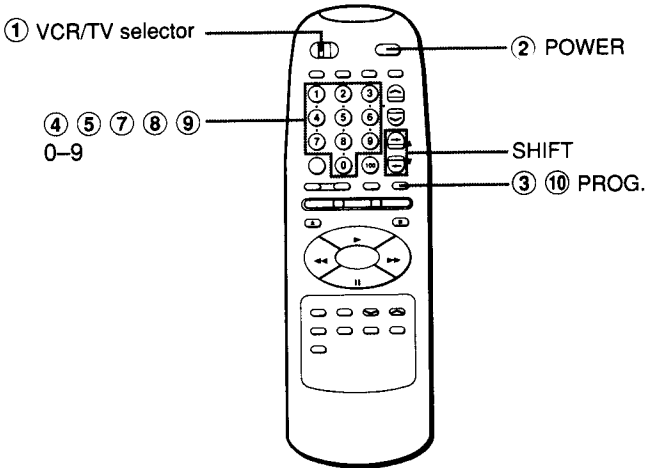
SETTING THE CLOCK

Clock setting is a simple operation. If 12:00 blinks on the multidisplay when the VCR is first connected to an AC power source or after a power failure, clock setting is necessary.

① VCR/TV selector

② POWER

④ ⑤ ⑦ ⑧ ⑨
0–9

SHIFT

③ ⑩ PROG.

Example:
To set the clock to 8:30PM on October 8 (summer time), 1993

(**1**) Set the *VCR/TV* selector to VCR.

(**2**) Press the *POWER* button.

(**3**) Press the *PROG.* button.
The MENU screen appears on the TV screen.

```
         M E N U
    ┌────────────────────┐
    │1│ CLOCK ADJUST      │
    │2│ SETUP             │
    │3│ PROGRAM           │
    │4│ CONFIRM           │
    │5│ CHANNEL MEMORY    │
    └────────────────────┘
       SELECT=1-5
              END=PROG
```
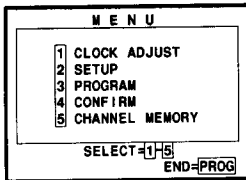
(**4**) To select the CLOCK ADJUST screen, press the *1* button.

```
    ┌──────────────────────┐
    │   CLOCK ADJUST        │
    │ SUMMER TIME [-OUT-]   │
    │                       │
    │ TIME [ --:--   AM  ]  │
    │ MONTH / DAY / YEAR ]  │
    │ [  1 ] [  1 ] ['93 ]  │
    │         FRI           │
    │   IN=1    OUT=2        │
    │           END=PROG    │
    └──────────────────────┘
```
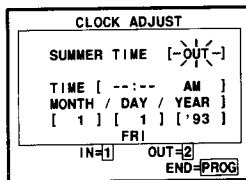
(**5**) To set it for summer (daylight saving) time, press the *1* button to select "SUMMER TIME IN".

```
    ┌──────────────────────┐
    │   CLOCK ADJUST        │
    │ SUMMER TIME [ IN ]    │
    │                       │
    │ TIME [ --:--   AM  ]  │
    │ MONTH / DAY / YEAR ]  │
    │ [  1 ] [  1 ] ['93 ]  │
    │         FRI           │
    │            END=PROG   │
    └──────────────────────┘
```
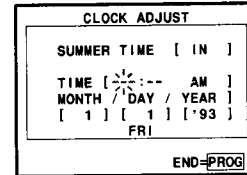
- To set it for regular time, select "OUT" with the *2* button.

(**6**) To set the hour and minutes, press the *0, 8, 3* and *0* buttons. (Pressing *0* is necessary.)

```
    ┌──────────────────────┐
    │   CLOCK ADJUST        │
    │ SUMMER TIME [ IN ]    │
    │                       │
    │ TIME [  8:30  -AM- ]  │
    │ MONTH / DAY / YEAR ]  │
    │ [  1 ] [  1 ] ['93 ]  │
    │         FRI           │
    │   AM=1     PM=2        │
    │            END=PROG   │
    └──────────────────────┘
```
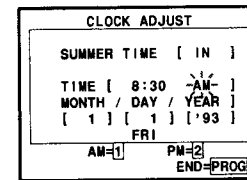
(**7**) To select PM, press the *2* button.

(**8**) To set the month and day, press the *1, 0, 0* and *8* buttons.

(**9**) To set the year, press the *9* and *3* buttons.

```
    ┌──────────────────────┐
    │   CLOCK ADJUST        │
    │ SUMMER TIME [ IN ]    │
    │                       │
    │ TIME [  8:30   PM  ]  │
    │ MONTH / DAY / YEAR ]  │
    │ [ 10 ] [  8 ] ['93 ]  │
    │         FRI           │
    │            END=PROG   │
    └──────────────────────┘
```
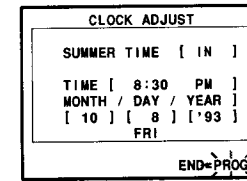
Now the clock setting is completed.

- The day of the week is automatically set according to the built-in calendar.

(**10**) Press the *PROG.* button.
Now the clock starts.
The TV screen returns to the MENU screen.

To return to the normal TV screen, press the *PROG.* button again.

Notes

- Each time the summer time period starts and ends, reset the "SUMMER TIME [   ]" column in step ⑤.
- When correcting the clock after setting, select CLOCK ADJUST in the MENU screen and perform steps ⑤ to ⑩.
- When correcting during clock setting, use the *SHIFT* buttons so that the item to be corrected blinks. Then correct the blinking item using the *0* to *9* buttons.
- The multidisplay automatically dims from 10:00PM to 5:59AM when the VCR is turned off.

24

CABLE BOX SET-UP

The cable box set-up will let you prepare for the recordings of a cable-TV channel including the one touch timer recordings, normal timer recordings and VCR Plus+ recordings.

The set-up procedure varies depending on:
- connection type (refer pages 7 – 12).
- cable box type (remote-controllable type or non remote-controllable type).

This set-up IS NOT necessary
if you use the connection type A (off air TV)

This set-up IS necessary
if you use a connection type B, C or D (cable-TV system)

③ 1 — ④ 6
② 5 — ⑥ 8
⑤ 7 — ① ⑧ PROG.

Preparation

- Set the VCR/TV selector to VCR
- If you use a remote-controllable cable box, make sure you have placed the cable box as shown on page 13.
- If you use a remote-controllable cable box, select a channel except 9 (ex. 8) on the cable box.

Operation

① Press the *PROG.* button to display the MENU screen.

```
       M E N U
  ┌─────────────────────┐
  │ 1  CLOCK ADJUST      │
  │ 2  SETUP             │
  │ 3  PROGRAM           │
  │ 4  CONFIRM           │
  │ 5  CHANNEL MEMORY    │
  └─────────────────────┘
     SELECT=1-5
           END=PROG
```

② Press the *5* button to select CHANNEL MEMORY.

③ Press the *1* button to select CATV.

```
┌──────────────────────────┐
│ 1  TV / CATV    [ CATV ]  │   VCR display
│ 2  AUTO SCAN              │   ┌────────────┐
│ 3  ADD CHANNEL           │   │            │
│ 4  ERASE CHANNEL         │   │     _      │
│ 5  CH.GUIDE SETTING      │   │    [       │
│ --- CABLE BOX ---        │   │    L       │
│ 6  [USE : WITH REMOTE  ] │   │            │
│ 7  OUTPUT CHANNEL [ 3 CH]│   │  CATV      │
│ 8  BRAND TYPE NO. [ 1  ] │   └────────────┘
│ SET=1-8        END=PROG   │
└──────────────────────────┘
```
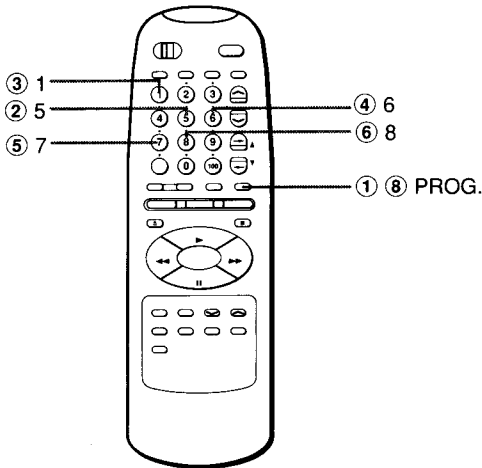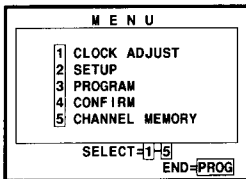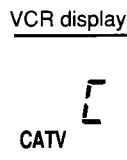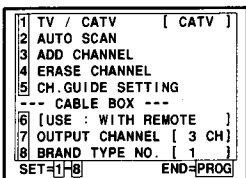

Note

If the VCR display displays "C", it means that the VCR is programmed to control a remote-controllable cable box. In this case even when you press the CHANNEL ∧/∨ or the 0-9 buttons, the display won't change to the number you select.
However the program will be cancelled as you press the 6 button and select [NO CABLE BOX] or [USE: NO REMOTE] in the next step.

Setting the cable box type

④ The procedure from here is divided into three methods. Follow the one that suits your requirements.

For connection B (without cable boxes)/connection D with the A/B switch set to "A"
This method will let you select a desired cable channel with the CHANNEL ∧/∨ buttons on the VCR or the remote control unit.

Press the *6* button to select [NO CABLE BOX].

```
┌──────────────────────────┐
│ 1  TV / CATV    [ CATV ]  │   VCR display
│ 2  AUTO SCAN              │   ┌────────────┐
│ 3  ADD CHANNEL           │   │            │
│ 4  ERASE CHANNEL         │   │      _     │
│ 5  CH.GUIDE SETTING      │   │     _]     │
│ --- CABLE BOX ---        │   │     _]     │
│ 6  [NO CABLE BOX       ] │   │            │
│                          │   │  CATV  CH  │
│ SET=1-6        END=PROG   │   └────────────┘
└──────────────────────────┘
```
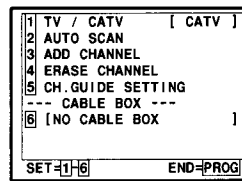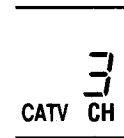
→ *Skip to step ⑧.*

For connection C/connection D with the A/B switch set to "B"

- **With NON remote-controllable cable boxes**
  If you follow this method, you will select a desired cable channel on the cable box. The channel selector on the VCR should be set to the output channel of the cable box.

Press the *6* button to select [USE: NO REMOTE].

```
┌──────────────────────────┐
│ 1  TV / CATV    [ CATV ]  │   VCR display
│ 2  AUTO SCAN              │   ┌────────────┐
│ 3  ADD CHANNEL           │   │            │
│ 4  ERASE CHANNEL         │   │      _     │
│ 5  CH.GUIDE SETTING      │   │     _]     │
│ --- CABLE BOX ---        │   │     _]     │
│ 6  [USE : NO REMOTE    ] │   │            │
│                          │   │  CATV  CH  │
│ SET=1-6        END=PROG   │   └────────────┘
└──────────────────────────┘
```
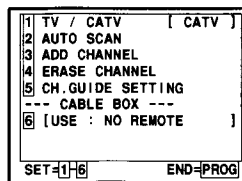
→ *Skip to step ⑧.*

• With remote-controllable cable boxes

This method will let you select a desired cable channel with the remote control unit supplied with this VCR. The VCR can change the cable channel to the desired one when one touch timer recording, normal timer recording and VCR Plus+ recording starts.

Note that if you switch the A/B switch to A after this set-up, the VCR can not receive cable signals coming through the cable box.

Press the 6 button to select [USE: WITH REMOTE].

```
|1| TV / CATV     [ CATV ]
|2| AUTO SCAN
|3| ADD CHANNEL
|4| ERASE CHANNEL
|5| CH.GUIDE SETTING
--- CABLE BOX ---
|6| [USE : WITH REMOTE    ]
|7| OUTPUT CHANNEL [ 3 CH]
|8| BRAND TYPE NO. [ 1   ]
SET=1-8          END=PROG
```

VCR display

```
 r
 L
CATV
```

→ *Proceed to step ⑤.*

Setting the output channel

⑤ Press the 7 button, and enter the output channel of your cable box using the 0-9 buttons. (Usually the output channel is 3 or 4 and is written on the rear of a cable box.)

Example: when the output channel is 3

```
OUTPUT CHANNEL [3 CH]

ENTER CHANNEL NUMBER
            END=PROG
```

VCR display

```
 r
 L
CATV
```

The display will automatically return to the channel memory screen after you input the number.

Setting the cable box brand type number

⑥ Press the 8 button.
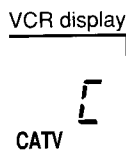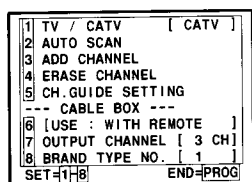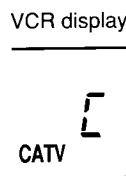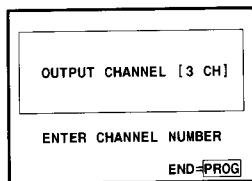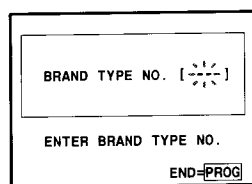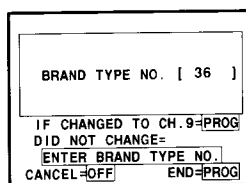The following screen appears.

```
BRAND TYPE NO. [ ]

ENTER BRAND TYPE NO.
            END=PROG
```

⑦ Enter the number of the brand type of your cable box using the 0 to 9 buttons, referring to the "Table of Brand Type Numbers" on page 27.

Example:
A TOSHIBA cable box is identified by the numbers 36, 66 and 70. Select one which your VCR recognizes.

```
                        Cable box display   VCR display



BRAND TYPE NO. [ 36  ]

IF CHANGED TO CH.9=PROG
DID NOT CHANGE=
ENTER BRAND TYPE NO.
CANCEL=OFF      END=PROG
```
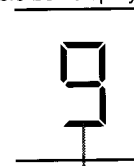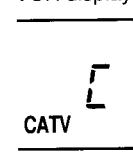
```
 9
```
cable channel number
(when you programmed correctly)

```
 r
 L
CATV
```

If you enter a correct number, the channel display of the cable box will change to channel 9. This means that the cable box is controlled by the VCR remote control unit.

If the channel number on the cable box display does not change to 9, try each number assigned to the brand of your cable box until the cable box changes to channel 9.

⑧ Press the *PROG.* button.
The cable set-up is now completed.
Press the button two more times to return to normal screen.

If the cable box display doesn't change to channel 9 yet:

• Probably the cable box isn't receiving the infrared signal from the VCR properly. Try positioning the cable box (see page 13) and programming the cable box set-up again.
• Try to enter each number from 01 through 82 until the cable box display changes to channel 9. Press the SHIFT ∧ button to advance to the next higher brand type number.
• If trying the above two methods doesn't work, the VCR is not able to change its channel during timer recordings. In this case, follow the method for "With NON remote-controllable cable boxes" instead.

Buttons to Control a Remote-controllable Cable Box

Once you complete the cable box set-up for a remote-controllable cable box, you can let the VCR control your cable box with the following buttons on the remote control unit supplied with the VCR.

• **Number buttons (0 – 9)**
To select desired channels that you want to record.
• **100 button**
Some cable boxes require you to use this button as the enter button.
Press this button after selecting the CATV channel with the number buttons.

| Note |

You cannot control remote-controllable cable boxes with the CHANNEL ∧/∨ buttons.

CABLE BOX SET-UP

Table of Brand Type Numbers

BRAND NAME OF YOUR CABLE BOX	BRAND TYPE NUMBER(S)	BRAND NAME OF YOUR CABLE BOX	BRAND TYPE NUMBER(S)
ANVISION	13, 20, 21, 22, 23, 24, 25, 26, 58, 62	RCA	6, 8, 16, 17
ARCHER	29, 42, , 76	REALISTIC	51, 53
CABLESTAR	13, 20, 21, 22, 23, 24, 25, 26, 58, 62	REGAL	14, 23, 41
CABLEVIEW	42,	REGENCY	26, 28
CITIZEN	42,	REMBRANDT	32, 60
CURTIS	8, 9, 56, 61	SALORA	68, 72
DIAMOND	29, , 76	SAMSUNG	4, 6, 42, 78
DRAKE	37, 67, 71	SCIENTIFIC ATLANTIC	8, 9, 56, 61
EAGLE	13, 20, 21, 22, 23, 24, 25, 26, 58, 62	SHERITECH	27
EASTERN	28	SL MARK	4, 6, 42, 78
GC BRAND	42,	SPRUCER	6, 8, 16, 17
GEMINI	4, 30	STARGATE	4, 6, 42, , 78
GENERAL ELECTRIC	57	SYLVANIA	19
GENERAL INSTRUMENTS	1, 2, 3, 4, 55, 75, 83	TEKNIKA	54, 74
HAMLIN	14, 15	TELECAPTION	77
HITACHI	31, 79, 80	TELEVIEW	4, 6, 42, 78
JERROLD	1, 2, 3, 4, 55, 75, 83	TEXSCAN	18, 19
MACOM	31, 79, 80	TOCOM	33, 34, 48, 49, 73
MAGNAVOX	13, 20, 21, 22, 23, 24, 25, 26, 58, 62	TOSHIBA	36, 66, 70
MOVIETIME	32, 38, 39, 40, 60	UNIDEN SATELLITE	65, 69
NSC	38, 39, 40	UNIKA	20, 21, 29, 42, , 76
OAK	10, 11, 12, 13, 46, 47	UNIVERSAL	43, 52, 63, 82
OAK SIGMA	46	VID TECH	64
PANASONIC	6, 8, 16, 17	VIDEOWAY	7, 45, 50, 59
PHILIPS	4, 13, 20, 21, 22, 23, 24, 25, 26, 58, 62	VIDTER	64
PIONEER	5, 6	VIEWSTAR	13, 20, 21, 22, 23, 24, 25, 26, 58, 62
PULSER	42,	WARNER AMEX	6
RANDTEK	13, 20, 21, 22, 23, 24, 25, 26, 58, 62	ZENITH	7, 45, 50, 59

OPERATING THE FS TUNER

This VCR has an FS (Frequency Synthesizer) tuner and is designed to receive TV and CATV signals.

Before operation, make sure that the *VCR/TV* selector on the remote control unit is set to VCR.
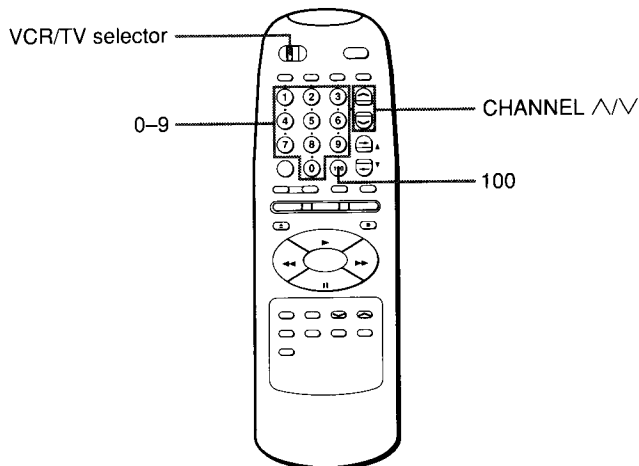
Selecting the TV/CATV Mode

1 Press the *PROG.* button.
The MENU screen appears on the TV screen.

2 Press the *5* button to select CHANNEL MEMORY.

3 Press the *1* button to select TV or CATV.

When TV is selected

```
1 TV / CATV     [ TV  ]
2 AUTO SCAN
3 ADD CHANNEL
4 ERASE CHANNEL
5 CH.GUIDE SETTING


SET=1-5        END=PROG
```

When CATV is selected

```
1 TV / CATV     [ CATV ]
2 AUTO SCAN
3 ADD CHANNEL
4 ERASE CHANNEL
5 CH.GUIDE SETTING
--- CABLE BOX ---
6 [USE : WITH REMOTE    ]
7 OUTPUT CHANNEL [ 3 CH]
8 BRAND TYPE NO. [36   ]
SET=1-8        END=PROG
```
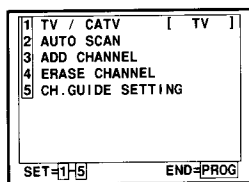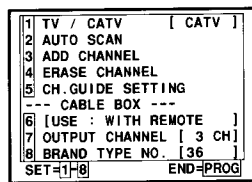
Selecting Channels

Using the number buttons (0 – 9)

To select channels 1 through 9
Two methods are available.
Example: to select channel 4
- Press the *4* button. Channel 4 will be selected after approx. 2 seconds.
- Press the *0* and *4* buttons. Channel 4 will be selected immediately.

To select channels 10 through 99
Example: to select channel 35
Press the *3* and *5* buttons.
If the *5* button is not pressed within 2 seconds, channel 3 will be selected.

To select channel 100 or higher
Example: to select channel 125
Press the *100* button, then the *2* and *5* buttons within 2 seconds.

Using the CHANNEL ∧/∨ buttons

Press the *CHANNEL* ∧ button to select the upper channels or the *CHANNEL* ∨ button to select the lower channels.
In the TV mode, channels 2 to 69 are selected each time the button is pressed.
In the CATV mode, channels 1 to 125 are selected each time the button is pressed.
The channel steps up or down and stops at the next active channel. It will not stop at inactive channels.

Presetting Active Channels into the Channel Memory

Using the auto scan function, the VCR scans through all receivable channels and stores only the active channels in your area into the memory. Once the active channels are preset, you can select a desired channel easily by using the *CHANNEL* ∧/∨ buttons.

Important

The channel presetting procedure varies depending on the antenna/cable and VCR connections. Check your connections if you are using a cable converter box and/or A/B switch. The connection types are classified by A, B, C or D on pages 7–12.

- **For connection C:** You CANNOT preset the channels with auto scanning, since any channel comes in the VCR after it is converted into the output channel of the cable box. Select the channels on the cable box.

- **For connection D:** Before auto scanning, set the A/B switch to A (the position which is not connected to the cable box).

Auto scanning

1 Press the *PROG.* button.
The MENU screen appears on the TV screen.

2 Press the *5* button to select CHANNEL MEMORY.

3 Press the *1* button to select TV or CATV.

4 Press the *2* button to select AUTO SCAN.

"AUTO SCAN" is displayed on the TV screen and the VCR automatically scans channels 2-69 for TV or 1-125 for CATV. The VCR stores the active channels only into the memory. Scanning will stop when the VCR has scanned through all the channels and the channel memory screen will return.

5 When auto scanning is completed, press the *PROG.* button twice.

To cancel auto scanning midway
Press the *PROG.* button. The channel memory screen will return.

28

OPERATING THE FS TUNER

Adding a channel in the memory

An active channel may not be preset with the auto scan function because its signal is weak or it was not broadcasted during auto scanning. You can add the channel into the memory.

1 Press the *PROG.* button.
The MENU screen appears on the TV screen.
2 Press the *5* button to select CHANNEL MEMORY.
3 Press the *1* button to select TV or CATV.
4 Press the *3* button to select ADD CHANNEL.
ADD CHANNEL "--" blinks on the TV screen.
5 Select the channel you want to add using the *100* and *0* to *9* buttons.
The selected channel is added into the memory and the display will return to the channel memory screen.

Erasing a channel from the memory

An inactive channel may be preset with the auto scan function because there was noise on that channel during auto scanning. You can erase the channel from the memory.

1 Press the *PROG.* button.
The MENU screen appears on the TV screen.
2 Press the *5* button to select CHANNEL MEMORY.
3 Press the *1* button to select TV or CATV.
4 Press the *4* button to select ERASE CHANNEL.
ERASE CHANNEL "--" blinks on the screen.
5 Select the channel you want to erase using the *100* and *0* to *9* buttons.
The selected channel is erased from the memory and the display will return to the channel memory screen.

Channel reference chart

Number on the VCR		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Corresponding channel number	TV	–	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	CATV STD (HRC/IRC)	1(A-8)	2	3	4	5 (A-7)	6 (A-6)	7	8	9	10	11	12	13	A	B	C

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	AA	BB	CC	DD	EE	FF	GG	HH	II

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	93	94
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	–	–	–	–
JJ	KK	LL	MM	NN	OO	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY	ZZ	AAA	BBB	65	66	67	68	69	70	71	93	94

| 95	96	97	98	99	100	101	102	103	121	122	123	124	125
–	–	–	–	–	–	–	–	–	–	–	–	–	–
A-5	A-4	A-3	A-2	A-1	100	101	102	103	121	122	123	124	125

CATV signals
- STD (standard) cable TV signals
- HRC (Harmonic Related Carriers) cable TV signals
- IRC (Incremental Related Carriers) cable TV signals
  IRC is also called ICC (Incremental Coherent Carriers).
- PHRC (Pivoted Harmonically Related Carriers) cable TV signals
- MPC (Multi Pivoted Carriers) cable TV signals

VIDEO CASSETTE USE

Only video cassettes with the VHS mark can be used with this VCR.
Unlike audio cassettes, only one side of a video cassette can be recorded on.

EJECT/STOP   Cassette compartment   REC
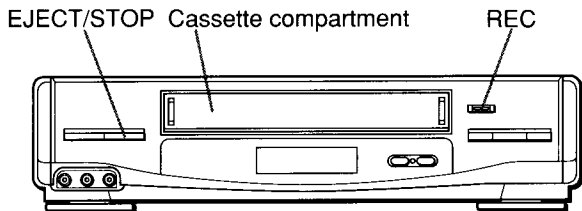

Loading a Cassette
Insert a cassette into the cassette compartment with the window side facing upward. Push until the cassette is pulled into place. The power is automatically turned on when the cassette is inserted. (Auto Power On function)
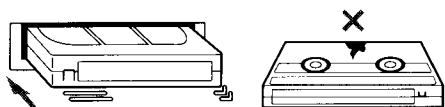
- When the cassette indicator ⊙⊙ lights up on the multidisplay, loading is completed.

Unloading a Cassette
Press the *EJECT/STOP* button when the tape is in stop mode. The cassette will be ejected.
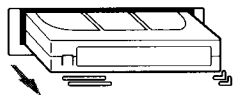
| Notes |

- Do not insert your hand or any foreign object into the compartment. This may result in injury or damage. Take special care with children to avoid accidents.
- The cassette indicator lights whenever a cassette is inside the compartment, even if the power is turned off.
- The cassette indicator flashes when a cassette is being loaded or removed.

Safety Tab

| Preventing erasure of the recorded program |

If the safety tab is removed from the cassette, recording cannot be performed even if the *REC* button is pressed.
To prevent accidental erasure, remove the safety tab with a screwdriver.

Safety tab

| Recording on the tape without the safety tab |

Cover the tab hole with adhesive tape.

Adhesive tape
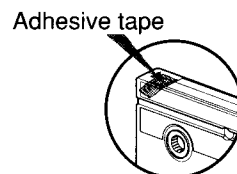
Tape Speed

| Recording |

The tape can be recorded at two different speeds, SP (Standard Play recorded at 3.34cm/sec.) or SLP (Super Long Play recorded at 1.11cm/sec.).
The SLP mode is more economical than the SP mode because its recording time is three times longer.
The SP mode, however, allows you to record or play back a tape with better quality than in the SLP mode.

| Recording time |

Video cassette Recording mode	T-180	T-160	T-120	T-60	T-30
SLP	540 min	480 min	360 min	180 min	90 min
SP	180 min	160 min	120 min	60 min	30 min

| Playback |

There are three possible speeds for playback, SP, LP and SLP.
The appropriate speed will be automatically selected by the VCR.

PREPARATION

RECORDING

Basic Manual Recording

① Cassette compartment   ⑤ REC

⑥ EJECT/STOP   ④ CHANNEL ∨/∧

VCR/TV selector ————— ② TV/VCR

INPUT SELECT ————— ③ SP/SLP

④ 100, 0-9 ————— ④ CHANNEL ∧/∨

⑤ REC —————

————— ⑥ STOP

PAUSE/STILL —————
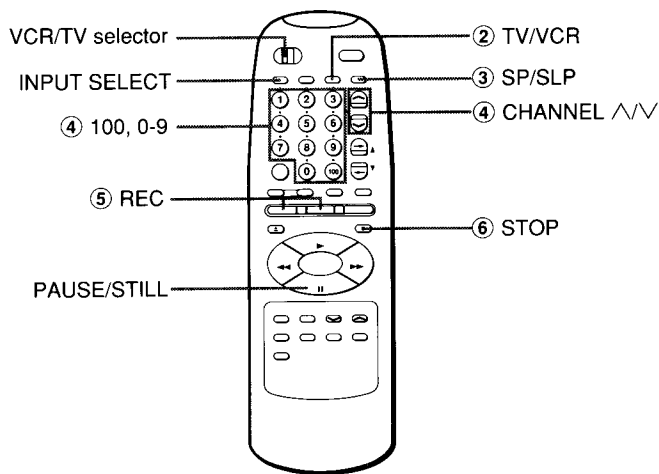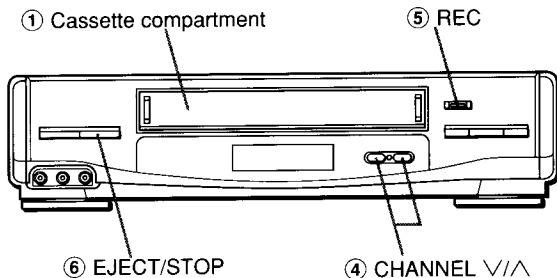
Preparation

- Set the *VCR/TV* selector to VCR.
- Press the *INPUT SELECT* button to receive the TV channel. Each time the *INPUT SELECT* button is pressed, the input source is selected in sequence with the channel number (TV channel reception mode), or "L" indicator (line mode) on the multidisplay.
- Make sure you select TV or CATV mode on the "channel memory" screen program (see page 28).
- For CATV recordings, make sure that you have completed the cable box set-up (see page 25).
- If you use a cable box, turn it on.

Operation

① Load a cassette with the safety tab.
The VCR is automatically turned on.

② Press the *TV/VCR* button so that the VCR indicator lights up.

③ Press the *SP/SLP* button to select the recording tape speed.

④ Press the *CHANNEL* buttons or the number buttons to select the desired channel.
- If you use a non remote-controllable cable box, select the desired channel on the box.

⑤ Press the *REC* button on the VCR, or simultaneously press the *REC* buttons on the remote control unit.

⑥ Press the *EJECT/STOP* button on the VCR or the *STOP* button on the remote control unit to stop recording.

Notes

- Basic manual recording is possible only in the SP or SLP mode.
- If the VCR is in the pause mode for more than 10 minutes, it automatically enters the stop mode to protect the tape.
- To change the TV channels during recording, press the *PAUSE/STILL* button first.
- The pictures may be distorted around where the *PAUSE/STILL* button is used. This is not a malfunction.

Watching Another TV Program While Recording

1 Press the *TV/VCR* button on the remote control unit to select the TV mode.
The VCR indicator will go out.

2 Select the desired channel using the channel select buttons on the TV.

3 Press the *TV/VCR* button when the TV program is finished. The VCR indicator will light up.

4 Set the TV channel to 3 or 4 according to the setting of the output channel selector.

Note

For connections see pages 7, 8, 10, 11 and 12.

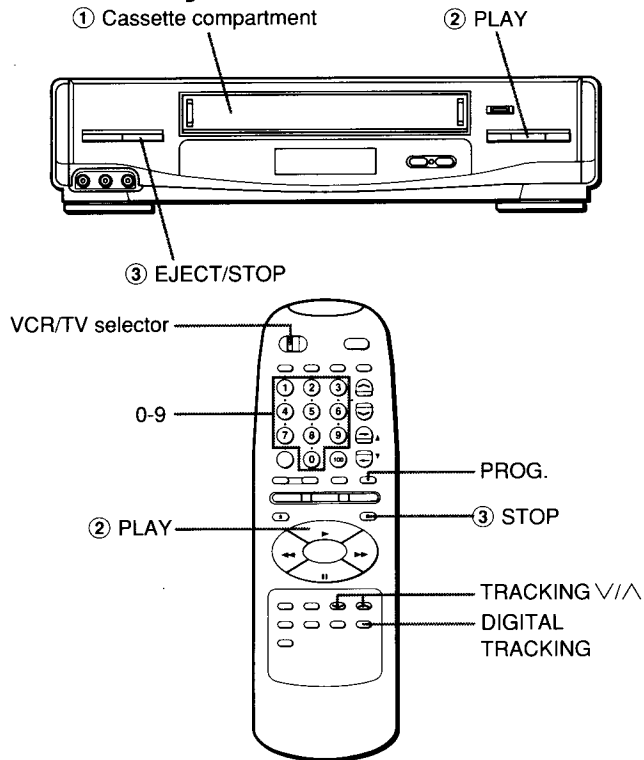## Skipping Unnecessary Scenes or Editing a Tape

To stop recording momentarily, press the *PAUSE/STILL* button on the remote control unit.
To resume recording, press the *PAUSE/STILL* button again.

PLAYBACK

Basic Playback

① Cassette compartment   ② PLAY

③ EJECT/STOP

VCR/TV selector

0-9

② PLAY

PROG.

③ STOP

TRACKING ∨/∧
DIGITAL
TRACKING

① Load the recorded cassette in the cassette compartment.
The VCR is automatically turned on.
- When a cassette without the safety tab is loaded, the auto play function operates to start playback automatically.

② Press the PLAY button.
Playback starts.

③ Press the EJECT/STOP button on the VCR or the STOP button on the remote control unit to stop playback.

| Note |

Basic playback is possible in all three modes, SP, LP and SLP.

Adjusting the Tracking

| Digital auto tracking adjustment |

When the DIGITAL TRACKING button is pressed and the DT indicator is displayed on the multidisplay, the tracking is automatically adjusted during playback.
The DT indicator blinks during tracking adjustment and lights after adjustment.

| Manual tracking |

Tracking adjustment is needed when the noise bars (as lines) appear on the TV screen during playback.
Press the TRACKING ∨/∧ buttons on the remote control unit to move the noise bars.
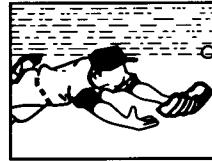
A picture with noise bars   A picture adjusted with
                                   the TRACKING ∨/∧ buttons

| Note |

To reset the tracking to the automatic setting, press the TRACKING ∨/∧ buttons simultaneously.

Auto Repeat

The VCR can repeat playback from the beginning to the end of the tape 10 times.
Before operation, make sure that the VCR/TV selector is set to VCR.

1 Load a cassette.
2 Press the PROG. button so that the MENU screen appears on the TV screen.
3 To select SETUP, press the 2 button.
4 To set AUTO REPEAT to ON, press the 3 button.
The ↻ indicator lights up on the multidisplay.

```
        S E T U P
1 TAPE LENGTH   [ T120 ]
2 EDIT          [ OFF  ]
3 AUTO REPEAT   [  ON  ]
4 SAP SET       [ OFF  ]
5 SIMUL         [ OFF  ]
6 AUTO ANTENNA  [  ON  ]

SET=1-6          END=PROG
```

5 Press the PROG. button twice.
The TV screen returns to the normal screen.
6 Press the PLAY button.
Playback starts.
When the tape reaches its end during playback, the tape will rewind to the beginning and playback will resume. After playback and rewind are repeated 9 times, the tape will automatically rewind to the beginning and change to the playback mode, then the auto repeat function stops.

| Notes |

- When the REC button or the EJECT/STOP (or EJECT) button is pressed in the auto repeat mode, the auto repeat mode is canceled.
- When the power is turned off, the auto repeat mode is canceled.

OPERATION

COUNTER FUNCTION

Linear Time Counter Function

Since the VCR employs a linear time counter, it can indicate the tape elapsed time to the second.
The linear time counter can be displayed on the multidisplay on the VCR and on the TV screen.

VCR/TV selector

① DISPLAY

② COUNTER
RESET

④ ZERO RETURN

③ STOP

REMAIN/
COUNTER
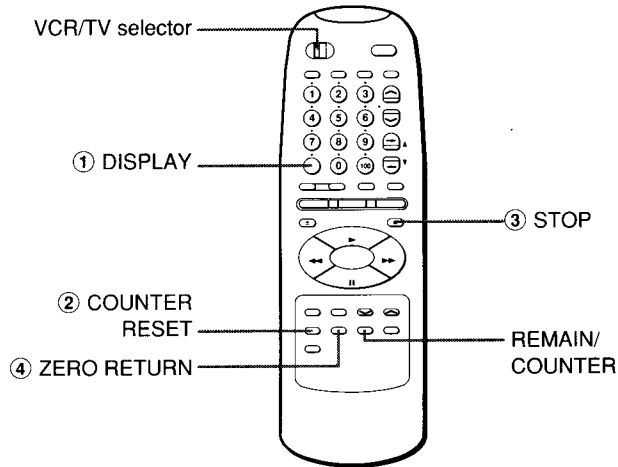
Before operation, make sure that the *VCR/TV* selector is set to VCR.

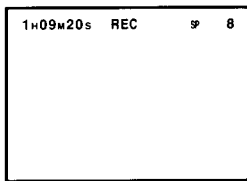### To display the counter on the multidisplay
Load a video cassette tape.
If the clock is displayed on the multidisplay, it will change to the counter when the tape starts running in any operation mode.

To display the counter on the TV screen
Load a video cassette tape and press the *DISPLAY* button.
If the clock is displayed on the TV screen, it will change to the counter when the tape starts running in any operation mode.

```
1H09M20s   REC      SP    8
```

- To display the counter only, press the *DISPLAY* button again.
- To return the TV to the normal screen, press the *DISPLAY* button twice.

To reset the counter to 0H00M00S
Press the *COUNTER RESET* button.
The counter is reset to zero and the previous counter reading is deleted from the memory.
If you start recording or playback with the counter reset to zero, later you can locate the recording/playback start point on the tape easily by searching for the counter zero point.

To change the counter display to the clock
Press the *REMAIN/COUNTER* button.
Pressing it once changes the display to the remaining time, twice to the clock, and three times to the counter.

Notes

- When the cassette is ejected, the counter is reset to 0H00M00S.
- The counter reading does not change at a non-recorded section of the tape.

Zero Return Function

The zero return function enables you to stop the tape around the counter reading "0H00M00S" during rewind or fast-forward.

① Press the *DISPLAY* button if you want to display the counter on the TV screen.
② During recording or playback, press the *COUNTER RESET* button at a scene you want to watch again.
The counter reading changes to "0H00M00S".
③ Press the *STOP* button when the recording or playback is completed.
④ Press the *ZERO RETURN* button.
The tape is rewound to around the counter reading "0H00M00S" or fast-forwarded to that position if it has been rewound beyond "0H00M00S", and stops.

```
0H00M00s   STOP      SP    8
```
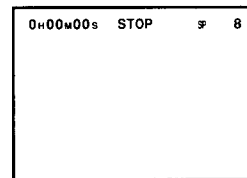
Note

The VCR does not stop exactly at the counter reading zero (0H00M00S), but stops around zero depending on the tape you use.

Tape Remain Display Function

This function displays the tape remaining time on the multi display and TV screen.

VCR/TV selector

③ 2
④ 1

⑥ DISPLAY

① POWER

② ⑤ PROG.

⑧ REMAIN/
    COUNTER

Before operation, make sure that the *VCR/TV* selector is set to VCR.

① Press the *POWER* button to turn on the VCR.

Tape setting

② Press the *PROG.* button to display the MENU screen.

③ Press the *2* button to select the SETUP screen.

④ Press the *1* button to select the tape to be used.

T120: when using a T-120 tape or shorter
T160: when using a T-140 or T-160 tape
T180: when using a T-180

```
           S E T U P
1 TAPE LENGTH    [ T120 ]
2 EDIT           [  OFF ]
3 AUTO REPEAT    [  OFF ]
4 SAP SET        [  OFF ]
5 SIMUL          [  OFF ]
6 AUTO ANTENNA   [   ON ]

SET=1-6          END=PROG
```
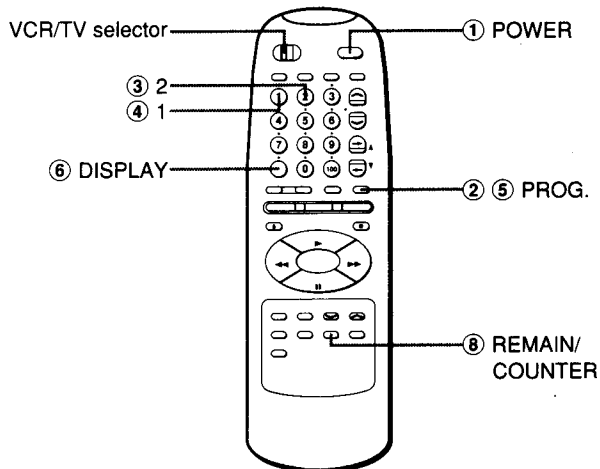
⑤ Press the *PROG.* button twice to return the TV to the normal screen.

Calculation

⑥ Press the *DISPLAY* button for the display on the TV screen.

⑦ Load the cassette into the cassette compartment.
   • If the cassette safety tab is removed, playback starts automatically and the counter is displayed.

⑧ Press the *REMAIN/COUNTER* button to select "RT".
   Each time the button is pressed, the display changes as follows:
   Clock → Counter → Remaining time (RT)

The remaining time is displayed. If calculation is not completed, "RT H M" blinks during calculation.

Example:
   when the remaining time is 48 minutes and the tape is in stop mode

```
RT 0H48M  STOP    ⊅  10
```

• To return the TV to the normal screen, press the *DISPLAY* button twice.

| Notes |

• The displayed remaining time is approximate time.
• During recording, the remaining time is calculated depending on the recording speed selected with the *SP/SLP* button, SP or SLP.
• During playback, the remaining time is calculated depending on the playback mode (SP, LP or SLP mode).

OPERATION

AUTO SEARCH

Registering Index Signals

You can easily locate a desired program using the index signal registered on the tape.

Registering the index signals automatically

The index signal is automatically registered when a recording starts.
Auto register can be done with one touch timer or timer recording start.

Registering the index signals manually

During recording, the index signals can be manually registered at the desired points on the tape using the remote control unit.

INDEX

Press the *INDEX* button during recording.
"INDEX MARK" will blink on the TV screen.

INDEX MARK
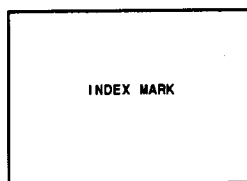
Notes

- When registering or erasing the index signal on the tape recorded with another VCR, the picture may be distorted.
- When registering more than 2 index signals, certain intervals are required: more than 1 minute in the SP mode and more than 3 minutes in the SLP mode.
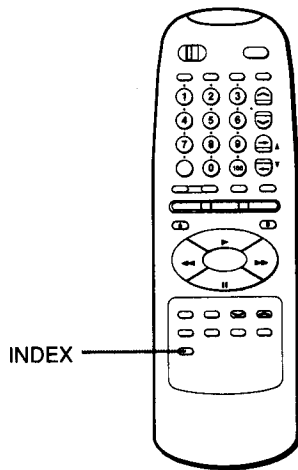- The index signal is not recorded automatically when a recording starts by releasing the recording pause mode.

Index Search

This function plays back around the portion which the index signal is registered on the tape for about 5 seconds while fast forwarding or rewinding. This function is operable using the remote control unit.
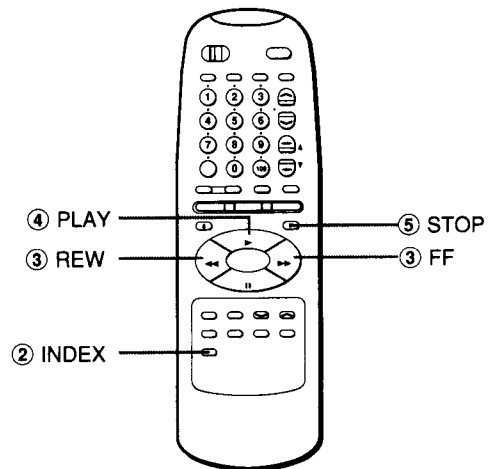
④ PLAY — ⑤ STOP
③ REW — ③ FF

② INDEX

(1) Load a cassette with the index signals.

(2) Press the *INDEX* button in the stop or playback mode. (In the stop mode, display a TV program on the TV screen.)

INDEX SEARCH
◄◄ ►► PUSH

SKIP SEARCH
INDEX NO. --
◄◄ ►► PUSH
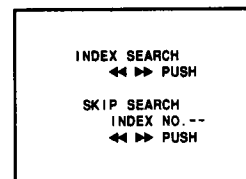
(3) Press the *FF* or *REW* button within 10 seconds.
"INDEX SEARCH" is displayed on the TV screen.
The VCR fast forwards or rewinds the tape while playing back around the portion where the index signals are registered for 5 seconds. The index search is repeated until the tape reaches its end or beginning.

(4) Press the *PLAY* button when the desired program is searched.
"INDEX SEARCH" will disappear from the TV screen.
- If the *PLAY* button is not pressed, the fast forward or rewind mode is resumed to search for the next index signal.

(5) Press the *STOP* button to stop playback.

Notes

- To stop the index search, press the *PLAY* button.
- The index signal registered on the beginning of the tape cannot be detected.

Skip Search

This function fast forwards or rewinds the tape to the point with the selected index signal to start playback from there. The index signal can be selected with the number buttons on the remote control unit.

VCR/TV selector

③ 0-9

⑤ STOP

④ REW
④ FF

② INDEX

Make sure that the *VCR/TV* selector is set to VCR.

① Load a cassette with the index signals.

② Press the *INDEX* button in the stop or playback mode. (In the stop mode, display a TV program on the TV screen.)

```
INDEX SEARCH
   ◄◄ ►► PUSH

SKIP SEARCH
   INDEX NO.--
   ◄◄ ►► PUSH
```

③ Press the number buttons to select the desired index number within 10 seconds. (For numbering the index signals, see below.)
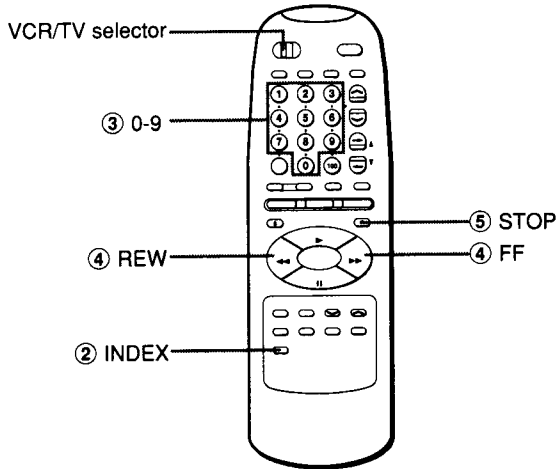The index number is displayed on the TV screen.

```
SKIP SEARCH
 INDEX NO.99
◄◄ ►► PUSH
```
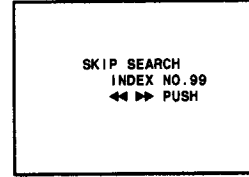
④ Within 10 seconds, press the *FF* button if the desired index signal is in the forward direction or the *REW* button if it is in the backward direction.

```
SKIP SEARCH ►►
  INDEX NO.01
```
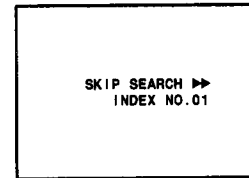
When the VCR detects the selected index signal, it automatically enters the playback mode.

⑤ Press the *STOP* button to stop playback.
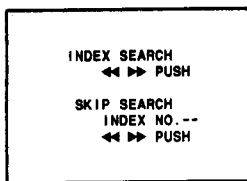
Numbering the Index Signals

Up to 99 index signals backward and forward can be selected for the skip search.

	Index signal	Backward		Forward		Playback direction	
		98th program	1st program	Program being played	1st program	2nd program	98th program	99th program
Index number →	99	2	1	1	2	98	99
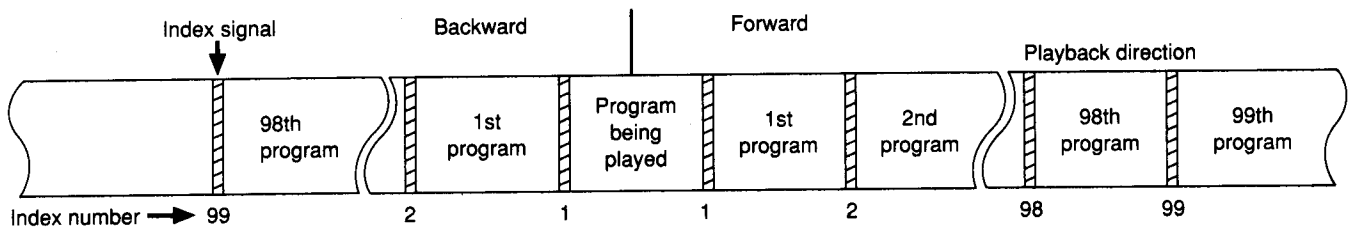
| Notes |

- To stop the skip search, press the *PLAY* or *STOP* button.
- The skip search may not be operated for the 1st program.
- Each time an index signal is skipped, the index numbers reduce by one.

OPERATION

SPECIAL EFFECTS

Picture Search

This function allows you to quickly locate a particular scene or segment on the tape while monitoring the playback picture in the fast forward or rewind mode.
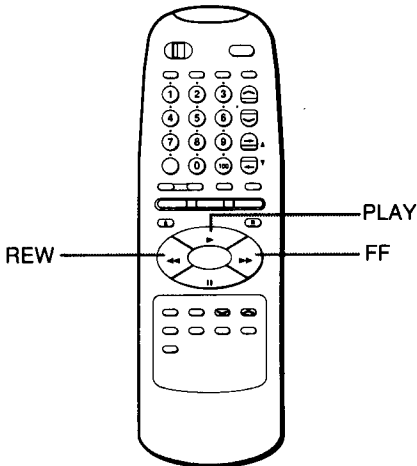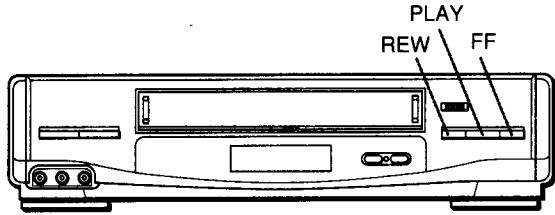
Accel. search

When keeping the *FF* or *REW* button pressed during playback, the searching speed will be accelerated to 7 times (in the SP mode) or 21 times (in the SLP mode) the normal speed.

Forward picture search

Press the *FF* button during playback.
The tape will fast forward at 5 times the normal playback speed.
To return to the normal playback, press the *PLAY* button.

Reverse picture search

Press the *REW* button during playback.
The tape will rewind at 5 times the normal playback speed.
To return to the normal playback, press the *PLAY* button.

The forward or reverse picture search can be performed not only in the playback mode but also in the following modes: fast forward, rewind, forward or reverse picture search, still and slow modes.
Each time the *FF* or *REW* button is pressed, the mode is selected in the following sequence.

Press the *FF* button.

Press the *REW* button.
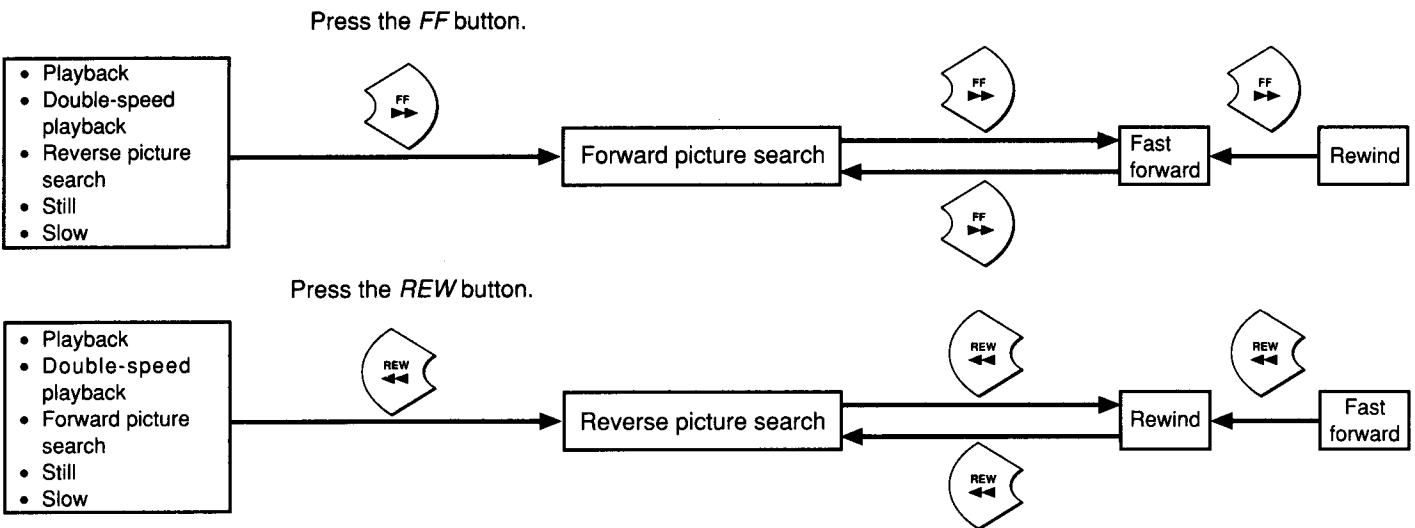
Note

During picture search the sound is muted and the horizontal noise bars appear on the TV screen as shown in Figure (1). This is normal. If the noise patterns appear as shown in Figures (2) and (3), adjust the horizontal/vertical controls on your TV.

(1)   (2)   (3)

37
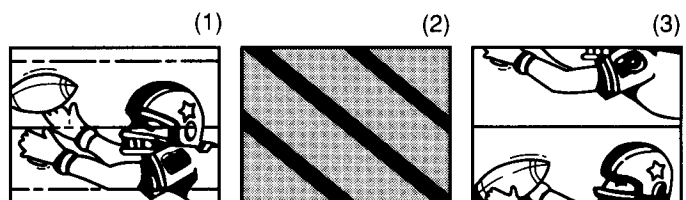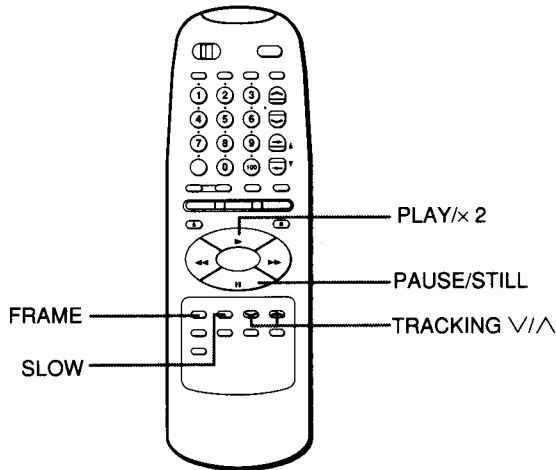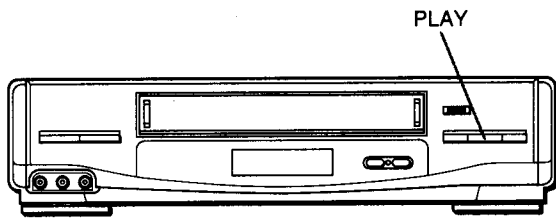
PLAY

Still

This function enables you to freeze a picture so that you can watch important scenes closely.
Press the *PAUSE/STILL* button during playback to freeze the picture.
To return to the normal playback, press the *PAUSE/STILL* button again.

Notes

• The still mode is automatically canceled after about 5 minutes to return to the normal playback.
• If the picture is vertically unstable in the still mode, adjust the tracking using the *TRACKING* ∨/∧ buttons.

PLAY/× 2

PAUSE/STILL

FRAME

TRACKING ∨/∧

SLOW

Frame Advance

1 Press the *PAUSE/STILL* button during playback.
The picture will be frozen.
2 Press the *FRAME* or *PLAY* button while the picture is frozen.
The picture will advance by one frame each time the button is pressed.
Keep the *FRAME* or *PLAY* button pressed to play back the tape at 1/30th the normal speed.
3 To return to the normal playback, press the *PAUSE/STILL* button again.

Double-speed Playback

Press the *PLAY/×2* (or *PLAY*) button during playback.
The picture will move at twice the normal speed.
To return to the normal picture, press the *PLAY/×2* (or *PLAY*) button again.

Slow Playback

This function has two variations: 1/7th and 1/15th the normal speed.
Press the *SLOW* button during playback.
The picture will move at 1/7th the normal speed.
If the button is pressed again, the speed changes to 1/15th the normal speed.
To return to the normal playback, press the *PLAY* button.

Notes

• The slow playback is automatically canceled after 5 minutes to return to the normal playback.
• If noise bars appear on the TV screen in the slow mode during the auto tracking mode, adjust the tracking for the clearest picture using the *TRACKING* ∨/∧ buttons.
• If noise bars appear in the still or frame feeding mode during the auto tracking mode, set the VCR to the slow mode, then adjust the tracking. The *TRACKING* ∨/∧ buttons work only in the slow mode.
• Noise bars may not disappear completely even by adjusting the tracking.
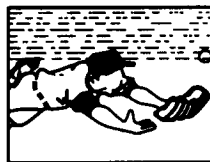
A picture with noise bars

A picture adjusted with the *TRACKING* ∨/∧ buttons

OPERATION
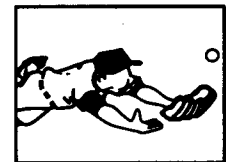
ONE TOUCH TIMER RECORDING

One touch timer function allows you to program the VCR to record TV programs immediately or within 24 hours from the present time. One touch timer recording is performed only when the power is on.

Recording Immediately for Max. 9 hours

This function is convenient when you want to begin recording immediately up to four hours in 30 minute increments and from four to nine hours in 60 minute increments.

POWER

VCR/TV selector
INPUT SELECT
① 100, 0–9
DISPLAY
② OTR OFF

POWER
SP/SLP

③ TIMER

PAUSE/STILL
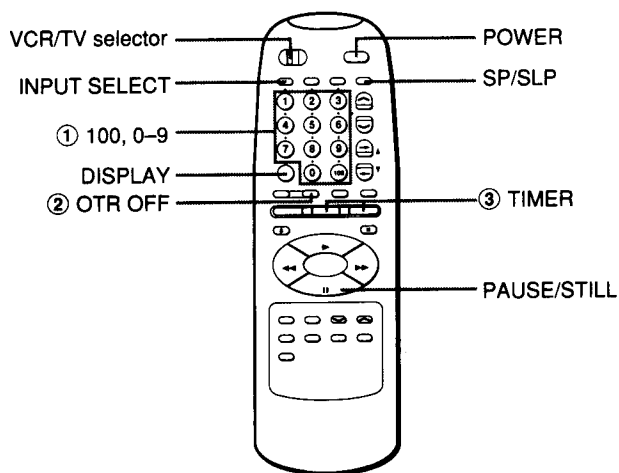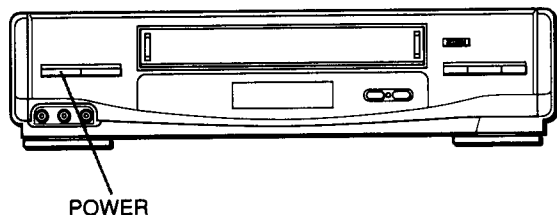
Example:
to record channel 4 in the SLP mode from now (10:05PM) until 11:30PM

Preparation

- Turn on the TV.
- Make sure that the VCR/TV selector is set to VCR.
- Check that the current time is correct.(See page 24.)
- Load a cassette with the safety tab.
  (Press the POWER button if the power is off with a cassette.)
- Press the DISPLAY button to select the OSD mode.
- Press the SP/SLP button to select the SLP mode.
- Select TV or CATV mode (see page 28).
- If you record CATV, make sure that you have completed the cable box set-up on page 25.
- If you use a non remote-controllable cable box, set the VCR output channel selector to the cable box output channel.

Operation

① Press the 4 button to select channel 4.
  - If you use a non remote-controllable cable box, select channel 4 on the box.

② Press the OTR OFF button.
  The ONE TOUCH RECORDING screen appears.
  To set the OFF time, press the OTR OFF button within 10 seconds.
  When the button is
      Pressed once: 10:30PM.
      Pressed twice: 11:00PM.
      Pressed 3 times: 11:30PM.
  The OFF time is set.

```
ONE TOUCH RECORDING

CHANNEL    [    4 CH  ]
REC.SPEED  [    SLP   ]

TIME OFF   [  11:30 PM ]


    TO SET TIMER=TIMER=
```
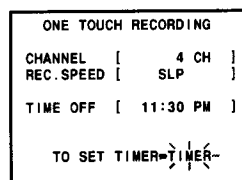
③ Press the TIMER buttons simultaneously.
  The ONE TOUCH RECORDING screen disappears and recording starts.
  - The multidisplay indicates the tape counter with the REC and TIMER indicators lit.
  - When recording is completed, the VCR automatically turns off.

Notes

- Press the OTR OFF or TIMER buttons within 10 seconds following the previous step. Otherwise, one touch timer recording is canceled.
- During one touch timer recording, the PAUSE/STILL button does not work.
- During one touch timer recording, the recording time cannot be changed.
- To cancel one touch timer recording, press the TIMER buttons.
- One touch timer recording will start from any mode. The picture is distorted for about 10 seconds when the VCR enters the one touch timer recording mode.
- When one touch timer recording and programmed timer recording are overlapped, one touch timer recording has priority.

Recording Within 24 Hours

This function is convenient when you want to record within 24 hours and have no time to set the programmable timer.

POWER

VCR/TV selector — POWER
INPUT SELECT — SP/SLP
① 100, 0-9
DISPLAY
② OTR ON — ④ TIMER
③ OTR OFF
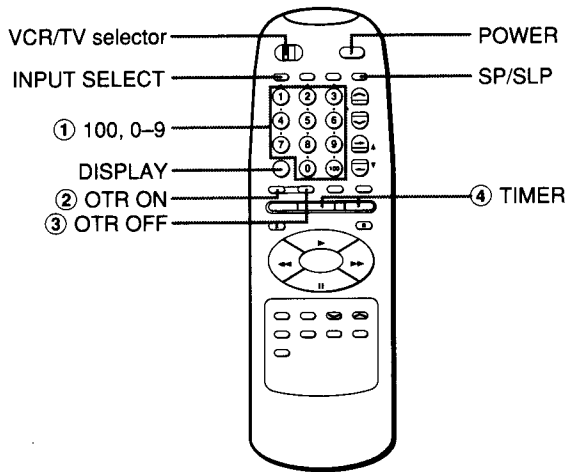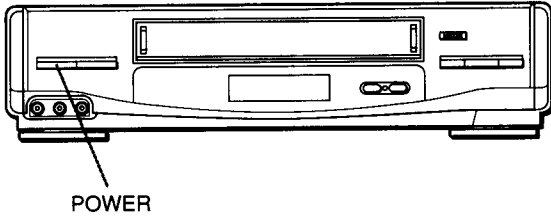
Example:
to record channel 4 from 10:00AM to 11:00AM in the SP mode
(current time: 7:10AM)

Preparation

- Turn on the TV.
- Make sure that the VCR/TV selector is set to VCR.
- Check that the current time is correct.(See page 24.)
- Load a cassette with the safety tab.
  (Press the POWER button if the power is off with a cassette.)
- Press the DISPLAY button to select the OSD mode.
- Press the SP/SLP button to select the SP mode.
- If you use a non remote-controllable cable box, set the VCR output channel selector to the cable box output channel.
- Select TV or CATV mode (see page 28).
- If you record CATV, make sure that you have completed the cable box set-up on page 25.

Operation

① Press the 4 button to select channel 4.
   - If you use a non remote-controllable cable box, select channel 4 on the box.

② Press the OTR ON button.
   The ONE TOUCH RECORDING screen appears.
   To set the ON time, press the OTR ON button within 10 seconds.
   When the button is
        Pressed once: 7:30AM.
        Pressed twice: 8:00AM.

        ....
        Press 6 times: 10:00AM.
   The ON time is preset.

```
ONE TOUCH RECORDING

CHANNEL     [      4 CH  ]
REC.SPEED   [      SP    ]
TIME ON     [   10:00 AM ]
TIME OFF    [   --:-- AM ]
```
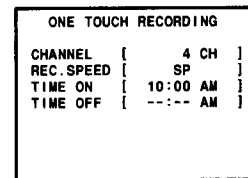
③ Press the OTR OFF button.
   To set the OFF time, press the OTR OFF button within 10 seconds.
   Press twice to record until 11:00AM.
   The OFF time is preset.

```
ONE TOUCH RECORDING

CHANNEL     [      4 CH  ]
REC.SPEED   [      SP    ]
TIME ON     [   10:00 AM ]
TIME OFF    [   11:00 AM ]

·TO SET TIMER=TIMER-
```
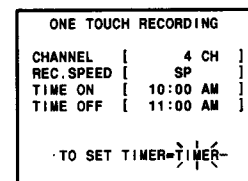
④ Press the TIMER buttons simultaneously.
   The VCR enters the timer standby mode.
   - The TV screen has no picture.
   - The multidisplay displays the |TIMER| indicator.
   Recording will start at the set time.

OPERATION

NORMAL TIMER RECORDING

The built-in timer allows you to record up to 8 different programs over one year. This function is convenient when you are away from home or when you are busy. All you have to do is set the timer to the desired day, time and channel for recording.
The following timer programs are available:
- **Once program:** to execute recording once only
- **Daily program:** to execute recording at the same time Monday through Friday
- **Weekly program:** to execute recording at the same time on the same day every week

VCR/TV selector ——————— POWER

②~⑨ 100, 0–9

—— ① ⑩ PROG.
—— ⑪ TIMER
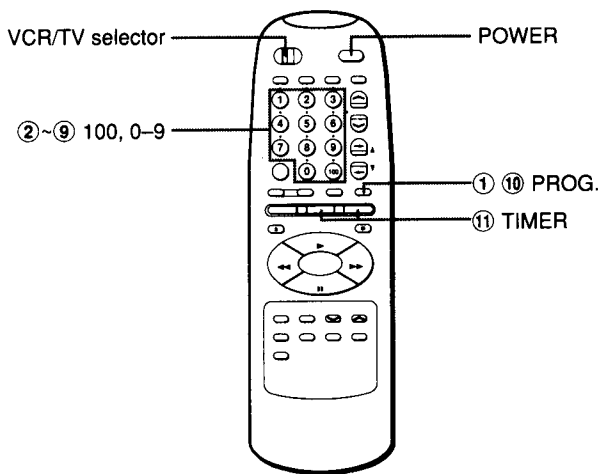
Setting outline

Select the desired timer program on the MENU screen and perform the following steps consecutively, following the blinking cursor. (The next position blinks after finishing each step.)

Preparation

- Turn on the TV.
- Check that the current time is correct (see page 24).
- Load a cassette with the safety tab. (Press the *POWER* button if the power is off with a cassette.)
- Make sure that the *VCR/TV* selector on the remote control unit is set to VCR.
- Select TV or CATV mode (see page 28).
- If you record CATV, make sure that you have completed the cable box set-up on page 25.

Operation

Example:
to record CATV channel 25 in the SP mode from 9:02PM to 10:50PM on October 10, 1993 on program No. 2 (once program) when the current time is 8:30 PM on October 8, 1993.

① Press the *PROG.* button so that the MENU screen appears on the TV screen.

```
        M E N U
   ┌─────────────────────┐
   │ 1 CLOCK ADJUST      │
   │ 2 SETUP             │
   │ 3 PROGRAM           │
   │ 4 CONFIRM           │
   │ 5 CHANNEL MEMORY    │
   └─────────────────────┘
     SELECT=1-5
             END=PROG
```
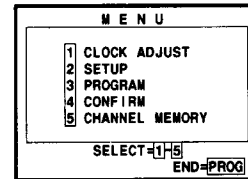
② To select PROGRAM, press the *3* button.
The PROGRAM screen appears with "1 2 3 4 5 6 7 8" blinking. (If any program is preset, the corresponding number lights.)

```
           PROGRAM
  ┌──────────────────────────┐
  │ PROG.NO. [ -12345678- ]  │
  │ CHANNEL  [           ]   │
  │ REC.SPEED[           ]   │
  │ TIME ON  [           ]   │
  │ TIME OFF [           ]   │
  │ DATE     [           ]   │
  │          [           ]   │
  └──────────────────────────┘
               END=PROG
```
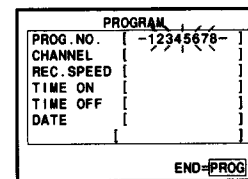
③ To select program number 2, press the *2* button.

```
           PROGRAM
  ┌──────────────────────────┐
  │ PROG.NO. [    2       ]  │
  │ CHANNEL  [  -C   CH-  ]  │
  │ REC.SPEED[    SLP     ]  │
  │ TIME ON  [  --:-- AM  ]  │
  │ TIME OFF [  --:-- AM  ]  │
  │ DATE     [   ONCE     ]  │
  │          [ 10/8/'93 FRI ]│
  └──────────────────────────┘
               END=PROG
```
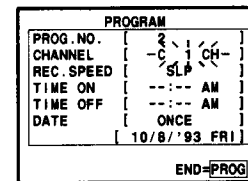
④ To select CATV channel 25, press the *2* and *5* buttons.

```
           PROGRAM
  ┌──────────────────────────┐
  │ PROG.NO. [    2       ]  │
  │ CHANNEL  [  C 25 CH   ]──┼── See below
  │ REC.SPEED[  -SLP-     ]  │
  │ TIME ON  [  --:-- AM  ]  │
  │ TIME OFF [  --:-- AM  ]  │
  │ DATE     [   ONCE     ]  │
  │          [ 10/8/'93 FRI ]│
  │ AUTO=1  SP=2  SLP=3     │
  └──────────────────────────┘
               END=PROG
```
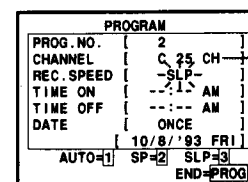
- If [USE: NO REMOTE] has been selected on page 25, with the number buttons enter the cable box output channel number instead. Then on the cable box, select the channel you record.

⑤ To select the tape speed SP, press the *2* button.

```
           PROGRAM
  ┌──────────────────────────┐
  │ PROG.NO. [    2       ]  │
  │ CHANNEL  [  C 25 CH   ]  │
  │ REC.SPEED[    SP      ]  │
  │ TIME ON  [  --:-- AM  ]  │
  │ TIME OFF [  --:-- AM  ]  │
  │ DATE     [   ONCE     ]  │
  │          [ 10/8/'93 FRI ]│
  └──────────────────────────┘
               END=PROG
```
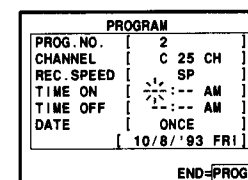
- For recording speed modes, see "Auto Speed Select" on page 42.

41

⑥ To set the ON time, press the *0, 9, 0, 2* and *2* (PM) buttons.

```
              PROGRAM
PROG.NO.  [     2        ]
CHANNEL   [   C 25 CH    ]
REC.SPEED [     SP       ]
TIME ON   [    9:02 PM   ]
TIME OFF  [   09:02 PM   ]
DATE      [     ONCE     ]
          [  10/8/'94 SAT]
                     END=PROG
```

Note

When you set an earlier time than the current time as the ON time (ex. 9:02PM when the current time is 10:00PM), the next year is displayed automatically. (The above illustration shows "94".) It will revert to the current year in step ⑨.

⑦ To set the OFF time, press the *1, 0, 5, 0* and *2* (PM) buttons.

```
              PROGRAM
PROG.NO.  [     2        ]
CHANNEL   [   C 25 CH    ]
REC.SPEED [     SP       ]
TIME ON   [    9:02 PM   ]
TIME OFF  [   10:50 PM   ]
DATE      [    -ONCE-    ]
          [  10/8/'94 SAT]
  ONCE=1      DAILY=2
  WEEKLY=3         END=PROG
```

⑧ To select the ONCE program, press the *1* button.

```
              PROGRAM
PROG.NO.  [     2        ]
CHANNEL   [   C 25 CH    ]
REC.SPEED [     SP       ]
TIME ON   [    9:02 PM   ]
TIME OFF  [   10:50 PM   ]
DATE      [    ONCE      ]
          [  10/8/'94 SAT]
                     END=PROG
```

• If "DAILY" (the 2 button) is selected, the screen shows "MON – FRI."
• If "WEEKLY" (the 3 button) is selected, the screen shows "SU = 1, MO = 2, TU = 3, WE = 4, TH = 5, FR = 6, SA = 7." Select a desired day with a number button (1 – 7).

⑨ To set the date, press the *1, 0, 1* and *0* buttons.

```
              PROGRAM
PROG.NO.  [     2        ]
CHANNEL   [   C 25 CH    ]
REC.SPEED [     SP       ]
TIME ON   [    9:02 PM   ]
TIME OFF  [   10:50 PM   ]
DATE      [    ONCE      ]
          [ 10/10/'93 SUN]
  TO SET TIMER=TIMER
                  END=PROG
```

⑩ Press the *PROG.* button.
Setting program No.2 is completed and the MENU screen is resumed.

• If you want to set another timer recording programs, follow steps ② to ⑩.

⑪ Press the *TIMER* buttons simultaneously.
The power will be turned off and the VCR will enter the timer standby mode.
The recording will automatically start at the set time.

Auto Speed Select

If the tape length may not be long enough for timer recording in the SP mode, set the recording speed to AUTO at step ⑤ above. Recording starts in the SP mode and the VCR automatically selects the tape speed to record the program to the end. If the tape length is not long enough, the tape speed automatically changes from the SP mode to the SLP mode.

To select the speed mode, press the SP/SLP button.
Each time the button is pressed, the speed mode changes accordingly as follows:

SP → SLP → AUTO

Notes

• Make sure to select TAPE 120, 160 or 180 from the SETUP screen according to the tape used.
• When the SLP mode is selected and the tape length is not enough to record the program to the end, the program cannot be recorded to the end.
• The image will be distorted when playing back the part where the recording mode was switched over from the SP mode to SLP mode with the Auto Speed Select method.

Confirming the Programmed Contents

Before the VCR enters the timer standby mode

1 Press the *PROG.* button so that the MENU screen appears.
2 To select the confirm screen, press the *4* button.

```
P CH  DATE  ON     OFF      S
1 12 10/ 9 5:00PM-5:30PM A
2 C25 10/10 9:02PM-10:50PM SP
3 20 WK-FR 1:00PM-2:00PM A
4 15 DAILY 9:15AM-9:30AM A
5
6
7
8
CANCEL=1-8        END=PROG
```

3 Press the *PROG.* button twice when you finish confirming.

In the timer standby mode

Press the *PROG.* button and the confirm screen appears on the TV screen.
After about one minute, the screen disappears.

OPERATION

Cancelling the Programmed Contents

Before the VCR enters the timer standby mode

1 Press the *PROG.* button so that the MENU screen appears.
2 To select the confirm screen, press the *4* button.
3 Select the program number to be cancelled.
   The selected program data is cancelled.
4 Press the *PROG.* button again.

In the timer standby mode

1 Press the *TIMER* buttons to cancel the timer standby mode.
2 Turn on the power and follow the steps above.
3 Press the *TIMER* buttons to reenter the standby mode.

Changing the Programmed Contents in the Timer Standby Mode

1 Set the *VCR/TV* selector to VCR.
2 Press the *TIMER* buttons to cancel the timer standby mode.
3 Press the *POWER* button to turn on the VCR.
4 Press the *PROG.* button to display the MENU screen.
5 Correct the contents following steps ③ to ⑨ for "Normal Timer Recording".
6 Press the *PROG.* button.
7 Press the *TIMER* buttons again to reenter the timer standby mode.

Error Indication

- When a cassette with the safety tab is loaded without setting the timer recording and the *TIMER* buttons are pressed, the "E" indication will appear on the multidisplay and "SET YOUR PROGRAM" will appear on the TV screen. Recording will not be performed.
- When the *TIMER* buttons are pressed without a cassette or with a cassette without the safety tab, "CHECK CASSETTE" will appear on the TV screen. Then, the cassette will eject automatically.

Normal Playback and Recording in the Timer Standby Mode

Normal playback and recording are possible in the timer standby mode (with the TIMER indicator lit on the multidisplay).

1 Set the *VCR/TV* selector to VCR.
2 Press the *TIMER* buttons to turn off the TIMER indicator.
3 Press the *POWER* button to turn on the VCR.
4 Follow the procedure for normal playback or recording.
5 Press the *TIMER* buttons again after playback or recording. The VCR returns to the timer standby mode.

Note

Finish normal use of your VCR before the preset recording start time, since the timer does not work if the VCR is not in the timer standby mode.

Overlap of the Programs

If two programs set for timer recording overlap, the recording ON time of program 2 has priority over the recording OFF time of program 1.
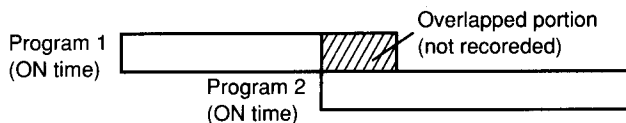
Power Failure During Timer Recording

- When a power failure has occurred, "12:00AM" blinks on the multidisplay. Since the programmed contents have been cleared, reset the clock and timer recording.
- When power has failed for a short time, the colon (:) used for the current time display blinks. The programmed contents are not affected. Reset the clock.

Notes

- The auto rewind function does not operate when the tape reaches the end during timer recording.
- During timer recording, the pause mode cannot be selected.
- When "once" timer recording is completed, the programmed contents are cleared.

VCR Plus+ SET-UP

Before you begin

This set-up will let the VCR start recording a program if you input the PlusCodes* for the desired programs. This is called VCR Plus+* recording.

The flow chart below will give you an idea as to what must be done before you can use the VCR Plus+ features.

| clock setting (page 24) |
↓
| cable box set-up (pages 25 and 26) |
↓
| operating the FS tuner (pages 28 and 29) |
↓
| VCR Plus+ set-up |
↓
| VCR Plus+ programming and recording (pages 48 and 49) |

* VCR Plus+ and PlusCode are trademarks of Gemstar Development Corp. VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

What is VCR Plus+™?

VCR Plus+ is a new timer programming system. Once initial set-up is completed, you are simply requested to enter a one to eight-digit PlusCode number to program the desired TV show. You do not need to set the recording date, start and stop times and channel number. The PlusCodes are published in the TV program listings of selected newspapers and TV guide magazine.

Sample TV program listing of a TV guide magazine

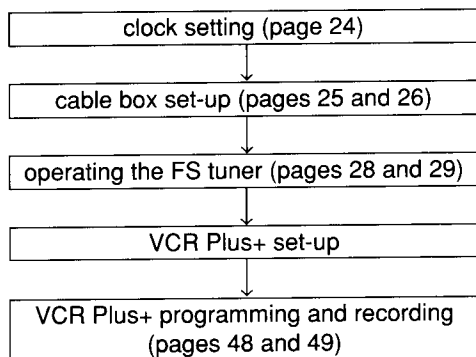5PM (FAM) POPEYE—Cartoon 725692
(HBO) MAKING OF A CHAMPION 237945
A look at gymnast and Olympic hopeful Kim Zmeskal from novice to seasoned competitor.
(NIK) HEY DUDE—Children (793571) ⟶ PlusCode
One of Ted's teachers stays at the ranch. (Shown next to
(USA) MY TWO DADS—Comedy (586858) each program title)
5:35 (TBS) GOOD TIMES—Comedy 2261858

What is the VCR Plus+ initial set-up for?

Before using the VCR Plus+ feature, you must set-up the special guide channel numbers (also called VCR Plus+ channel numbers) assigned to each channel that you receive in your home. The VCR identifies the channel to be recorded by the guide channel number whose information is included in the PlusCode.

Generally speaking, if you have a TV antenna connected to your VCR and you want to record broadcast channels 2 to 32 only, you do not need to set up VCR Plus+ because the guide channel numbers for these channels are the same as the broadcast channel numbers. But if you want to record broadcast channels 33 to 64 and cable-TV channels, VCR Plus+ set-up is required because the guide channel numbers are different for most of these channels. Further, if you are using a cable box, you must also perform the cable box set-up (see page 25).

The guide channel numbers are published in TV guide magazine, and selected local TV publications, or the channel guide from your cable-TV company. If you cannot find the numbers, call Gemstar's customer service department at 1-800-4321-VCR.

Sample of a Guide channel chart from a local TV listing

VCR Plus+ CHANNEL NUMBERS

Broadcast channels	Assigned channels	Cable channels	Assigned channels
3 KCRA (NBC)	3	A & E	39
6 KVIE (PBS)	6	AMC	35
10 KXTV (CBS)	10	BET	57
13 KOVR (ABC)	13	BRAV	54
19 KCSO (SPAN)	19	CMTV	14
31 KRBK (IND)	31	CNBC	23
40 KTXL (FOX)	40	CNN	42
58 KSCH (IND)	25	C-SPAN	28
44 KBHK (IND)	15	CUNY	29
24 KCPM (NBC)	24	DIS	53
4 KRNV (NBC)	28	ESPN	34
42 KFCB (IND)	27	FAM	47
7 KGO (ABC)	28	HBO	33

Sample of a Channel line-up chart from a cable-TV company

CHANNEL LINE-UP CHART

Channel 2	ME/U
Channel 3	8 WISH
Channel 4	4 WTTV
Channel 5	6 WRTV
Channel 6	VCA/Local origination
Channel 7	HOME BOX OFFICE
Channel 8	A.P. News Plus
Channel 9	9 WGN

Worksheet for guide channel (VCR Plus+ channel) set-up

Before setting up the guide channel on page 46, construct a worksheet. This will help you smoothly change the channel numbers on the screen display. The blank worksheet is provided for you on page 47.

Worksheet example

Station name	Guide channel numbur	Your Home channel number
HBO	33	7
ESPN	34	
AMC	35	

↑ Write the station name you want to set
↑ Write the guide (VCR Plus+) channel numbers from the TV Guide, local TV listing, etc.
↑ Write the home channel numbers from the channel line-up chart supplied by cable companies.

OPERATION
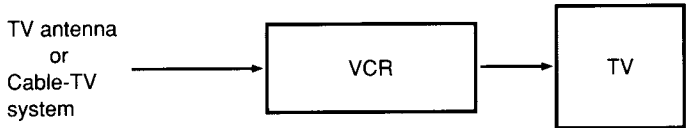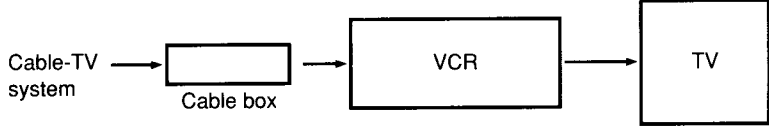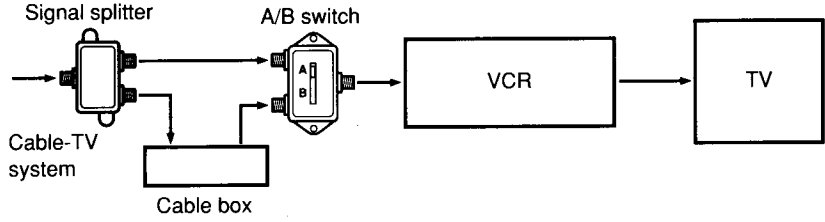
VCR Plus+ SET-UP

Setting Outline

There are three variations in set-up procedures classified as CASES 1, 2 and 3 depending on:
- connection type (refer pages 7 – 12)
- cable box type (remote-controllable type or non remote-controllable type).

As a quick reminder, the following illustrations are provided. Check what your connection type is and which CASE your system is classified as. In the guide channel setting procedure on page 46, each CASE is explained.

CONNECTION		REQUIRED VCR Plus+ SET-UP
Type A or B	Direct connection from a TV antenna or cable-TV system without using a cable box (see pages 7 and 8.) TV antenna or Cable-TV system → VCR → TV	Follow **CASE 1** procedure on page 46.
Type C	Cable-TV system connection using a cable box for all channels (see pages 9 and 10.) Cable-TV system → Cable box → VCR → TV	**If the cable box is remote-controllable** Follow **CASE 1** procedure on page 46. **If the cable box is NOT remote-controllable** Follow **CASE 2** procedure on page 46.
Type D	Cable-TV system connection using a cable box for some channels only and using an A/B switch (see pages 11 and 12.) Signal splitter → A/B switch → VCR → TV, Cable-TV system, Cable box	**If the cable box is remote-controllable** Follow **CASE 1** procedure on page 46. **If the cable box is NON remote-controllable** Follow **CASE 3** procedure on page 47.

| Note |

Type C and D connections are recommended for a remote-controllable cable box. With these connections (given that the A/B switch set to "B" for D connection), the VCR automatically controls the starting of VCR Plus+ recordings and timer recordings.

Guide Channel Setting

Preparation

- Set the VCR/TV selector to VCR.
For CASE 1 and 3 procedures:
- If you want to record CATV channels, make sure that the cable box set up has been completed (see page 25).
- Complete and refer a worksheet (see page 44).

② ③ ④ 0 – 9
⑤ CHANNEL ∧/∨
⑤ 100
① ⑥ PROG.
OTR OFF

Operation

① Press the *PROG.* button to display the MENU screen.

② Press the *5* button to select CHANNEL MEMORY.

③ Press the *1* button to select TV or CATV.

When TV is selected

```
1 TV / CATV        [ TV  ]
2 AUTO SCAN
3 ADD CHANNEL
4 ERASE CHANNEL
5 CH.GUIDE SETTING


SET=1-5          END=PROG
```
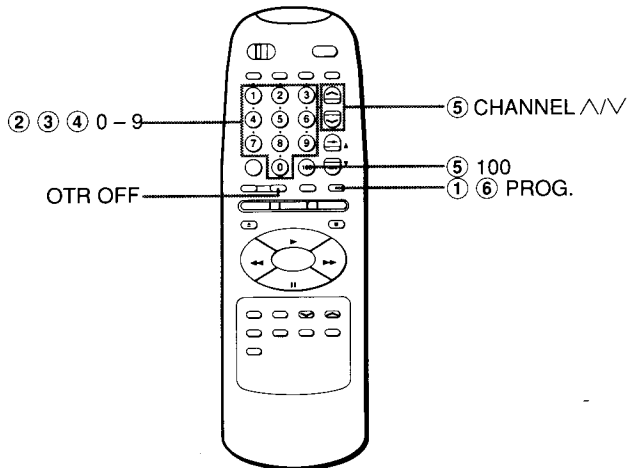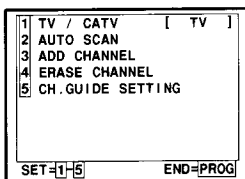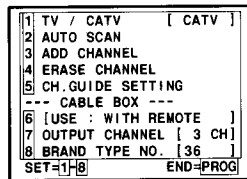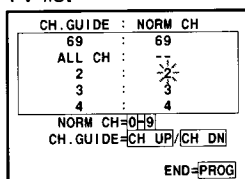
When CATV is selected

```
1 TV / CATV        [ CATV ]
2 AUTO SCAN
3 ADD CHANNEL
4 ERASE CHANNEL
5 CH.GUIDE SETTING
--- CABLE BOX ---
6 [USE : WITH REMOTE    ]
7 OUTPUT CHANNEL [ 3 CH]
8 BRAND TYPE NO. [36    ]
SET=1-8          END=PROG
```
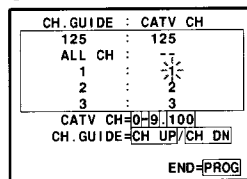
④ Press the *5* button.
The guide channel (VCR Plus+ channel) number list for TV or CATV appears on the screen.

TV list*

```
CH.GUIDE : NORM CH
   69    :    69
  ALL CH :    --
   2     :    *
   3     :    3
   4     :    4
  NORM CH=0-9
  CH.GUIDE=CH UP/CH DN

        END=PROG
```

CATV list

```
CH.GUIDE : CATV CH
   125   :   125
  ALL CH :    --
   1     :    *
   2     :    2
   3     :    3
  CATV CH=0-9.100
  CH.GUIDE=CH UP/CH DN

        END=PROG
```

* The guide channel setting operation for regular TV is the same as in the examples of CATV.

Setting guide channel numbers

⑤ In this step, follow one of CASES 1 to 3 procedures refering to page 45.

CASE 1 – to set your home channel numbers

Press the *CHANNEL ∧/∨* buttons to move the list up or down, and enter your home channel numbers to the right of each guide channel number using the *0* to *9* and *100* buttons.

Example:
to enter home channel number "7" (HBO) when its assigned guide channel number is 33.

Guide channel number column ————————— home channel number column

```
CH.GUIDE : CATV CH
   31    :    31
   32    :    32
   33    :    7
   34    :    34
   35    :    35
  CATV CH=0-9.100
  CH.GUIDE=CH UP/CH DN

        END=PROG
```
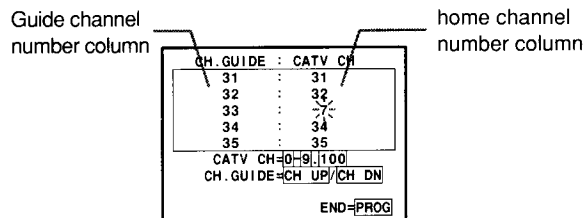
Notes

- You only need to change the numbers in the right column whose guide channel numbers differ from your home channel numbers. Leave the other channels as they are.
- In some regions, some channels may be assigned to more than one guide channel number. In this case, enter the same channel number in the column to the right of each guide channel number assigned to this channel number.

CASE 2 – to set the output channel of the cable box

You must set the cable box output channel in the right column for all guide channel numbers. This is because all channels enter the VCR after being converted into the output channel of the cable box.

Move the list up or down with the *CHANNEL ∧/∨* buttons to select "ALL CH" between 125 and 1 and enter the output channel number (usually 2, 3 or 4).

Example: when the output channel of your cable box is 3.

```
CH.GUIDE : CATV CH
   124   :    3
   125   :    3
  ALL CH :    *
   1     :    3
   2     :    3
  CATV CH=0-9.100
  CH.GUIDE=CH UP/CH DN

        END=PROG
```
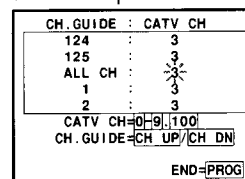
All the numbers in the right column will change to the output channel number.

- If you entered an incorrect number, select "ALL CH" and press the OTR OFF button. Then enter the correct number.
- After you completed the set-up, "ALL CH: 3" column changes to "ALL CH: --" and blinks. But the memory is stored as you input.

VCR Plus+ SET-UP

CASE 3

You must set the cable box output channel number in the right column for the channels you view by setting the A/B switch to "B". For the channels you view by setting the switch to "A", you must set your home channel numbers you want to record in the guide channel number column.

First, following the CASE 2 procedure, set the cable box output channel in the right column for all guide channel numbers.
Secondly, following the CASE 1 procedure, enter your home channel numbers of the CATV channels that you can view when you switch the A/B switch to "A".

Example:
when HBO is viewed when the A/B switch set to "A", select "33 : 3" column with the *CHANNEL* ∧/∨ buttons and in the right column correct home channel number to "7" with the 7 button.

```
CH.GUIDE : CATV CH
   31    :    3
   32    :    3
   33    :    3        (3→7)
   34    :    3
   35    :    3
CATV CH=0-9,100
CH.GUIDE=CH UP/CH DN

           END=PROG
```
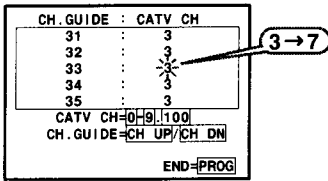
(6) Press the *PROG.* button three times to return to the normal screen.

Notes

- Once you complete the VCR Plus+ set-up, you do not have to repeat it even after power failures.
- When your cable company changes the channel line-up, you must re-enter the channel numbers as mentioned above.

Worksheet

Station name	Guide channel number	Home channel number

VCR Plus+ PROGRAMMING AND RECORDING

Once you have completed the VCR Plus+ set-up on pages 44 – 47, you can program the recording of up to 8 different programs simply by entering PlusCode numbers. The PlusCode numbers are published in the TV listings of newspapers, the TV Guide magazine, etc.

Preparation

- Turn on the TV.
- Set the VCR/TV selector to VCR.
- Check that the current time is correct. (See page 24.)
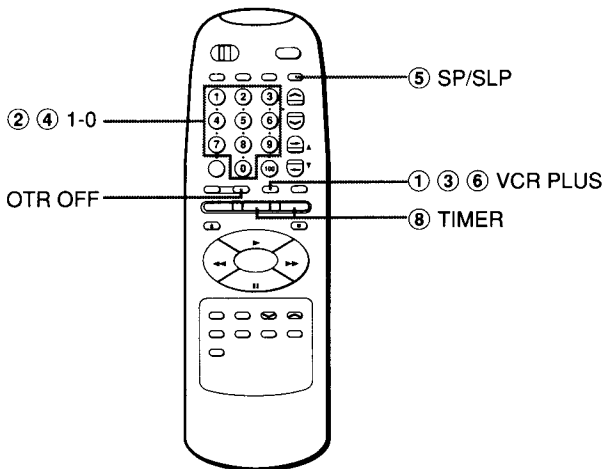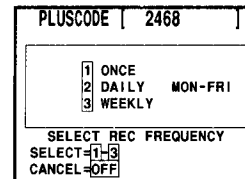- Load a cassette with a safety tab. (Press the POWER button if the power is off and a cassette has been inserted.)

For cable box users:
- Turn on the cable box.
- If your cable box is not remote-controllable, select the recording channel on the box.

⑤ SP/SLP
② ④ 1-0
① ③ ⑥ VCR PLUS
OTR OFF
⑧ TIMER

Operation

① Press the *VCR PLUS* button.
The VCR Plus screen appears on the TV screen.

```
PLUSCODE [ ::  ]]



    ENTER PLUSCODE
FINISH=VCR PLUS
CANCEL=OFF
```
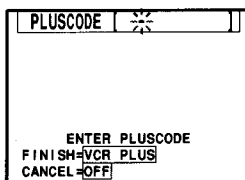
② Enter a PlusCode for the program you want to record using the *0* to *9* buttons.

Example:
if a PlusCode for a desired TV program is 2468 (fictitious code)

```
PLUSCODE [ 2468:: ]]



    ENTER PLUSCODE
FINISH=VCR PLUS
CANCEL=OFF
```
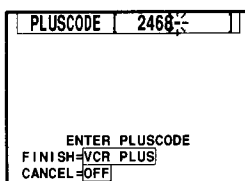
- If you entered an incorrect number, press the *OTR OFF* button and enter the correct number.

③ Press the *VCR PLUS* button.
The timer program menu screen appears on the TV screen.

```
PLUSCODE [ 2468     ]

    ① ONCE
    ② DAILY    MON-FRI
    ③ WEEKLY

   SELECT REC FREQUENCY
SELECT=1-3
CANCEL=OFF
```

- If "ADJUST CLOCK" appears, set the clock (see page 24), and restart the programming.
- If "INVALID DATE" appears, press the OTR OFF button and enter the valid number.

④ Press the *1, 2* or *3* button to select the desired program type.

Button to press	Program	Meaning
1	ONCE	to record once
2	DAILY	to record at the same time Monday through Friday (This menu does not appear when the recording day is Saturday or Sunday)
3	WEEKLY	to record on the same day every week

Example: when "ONCE" is selected (fictious program)

```
PLUSCODE [ 2468     ]
PROG.NO.   [ 1         ]
CHANNEL    [   C 12 CH  ]
REC SPEED  [   SLP      ]
TIME ON    [  8:00 AM   ]
TIME OFF   [  8:30 AM   ]
DATE       [   ONCE     ]
          [10/12/'93 TUE]
   TO SET TIMER=TIMER
CANCEL=OFF   END=VCR PLUS
```

- To cancel the program, press the *OTR OFF* button.

⑤ Press the *SP/SLP* button to select the tape speed. (See page 42.)

⑥ Press the *VCR PLUS* button.
The display disappears and the program is now stored into the memory.

⑦ Repeat steps ① to ⑥ to store other programs into the memory.

⑧ Press both *TIMER* buttons simultaneously.
The power is turned off and the VCR enters the timer standby mode.

VCR Plus+ PROGRAMMING AND RECORDING

Error Indication

If you are programming more than 8 programs

When you press the *1, 2* or *3* button in step ④, "FULL CANCEL PROG.?" appears on the screen with the list of stored programs contents.
If you want to replace one program with another, press the *1* to *8* button, whichever corresponds to the program to be replaced, and program the new program.
If you do not want to, press the VCR PLUS button to finish programming.

If you are programming a program which overlaps a stored one

When you press the *1, 2* or *3* button in step ④, "CLASH CANCEL PROG.?" appears on the screen with the list of stored programs.
If you want to replace one program with another, press the *1* to *8* button, whichever corresponds to the program to be replaced, and program the new program.
If you do not want to, press the VCR PLUS button to finish programming.

Confirming the List of Programs To Be Recorded

Before the VCR enters the timer standby mode

1 Press the *PROG.* button to make the MENU screen appear.
2 Press the *4* button to select CONFIRM.
   The CONFIRM screen appears.
3 Press the *PROG.* button again when you have confirmed the list.

In the timer standby mode

Press the *PROG.* button, and the confirm screen appears on the TV screen.
After about one minute, the screen disappears.

Cancelling a Programmed Program

Before the VCR enters the timer standby mode

1 Press the *PROG.* button so that the MENU screen appears.
2 Press the *4* button to select CONFIRM.
   The CONFIRM screen appears.
3 Press the *1* to *8* button to select the program number you want to cancel.
   The selected program data is canceled.
4 Press the *PROG.* button again.

In the timer standby mode

1 Press the TIMER buttons to cancel the timer standby mode.
2 Turn on the power and follow the steps above.
3 Press the TIMER buttons to reenter the standby mode.

Normal Playback and Recording in the Timer Standby Mode

Normal playback and recording are possible in the timer standby mode (with the TIMER indicator lit on the multidisplay).

1 Set the *VCR/TV* selector to VCR.
2 Press the *TIMER* buttons to turn off the TIMER indicator.
3 Press the *POWER* button to turn on the VCR.
4 Follow the procedure for normal playback or recording.
5 Press the *TIMER* buttons again after playback or recording.
   The VCR returns to the timer standby mode.

Note

Finish normal use of the VCR before the preset recording start time, since the timer does not work if the VCR is not in the timer standby mode.

Overlap of the Programs

If two VCR Plus+ programs overlap, the recording ON time of program 2 has priority over the recording OFF time of program 1.
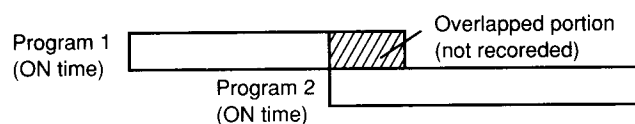
Power Failure During Timer Recording

- When a power failure has occurred, "12:00AM" blinks on the multidisplay. Since the programmed contents have been cleared, reset the clock and VCR Plus+ programming.
- When power has failed for a short time, the colon (:) used for the current time display blinks. Reset the clock. The programmed contents are usually not affected.
  Depending on your cable box, the VCR can not turn it on and start the programmed recordings, or the VCR starts recording the channels not desired. In this case, turn on your cable box and restart the recording.

Notes

- During VCR Plus+ recording, the pause mode cannot be selected.
- When VCR Plus+ "once" recording is completed, the programmed contents are cleared.
- The operation related to the timer is the same in the normal timer recording and the VCR Plus+ recording.

SPECIAL OPERATIONS

Connection for the MTS

to antenna

to VHF terminal

Normal TV
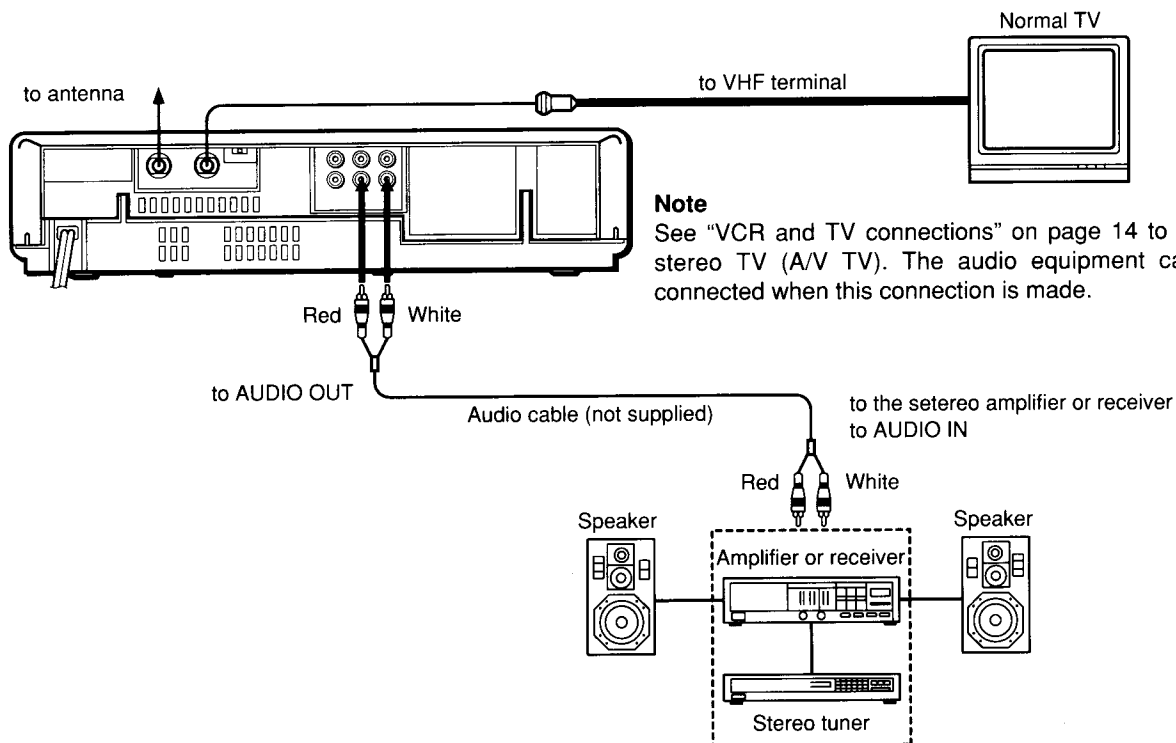
Note
See "VCR and TV connections" on page 14 to use your stereo TV (A/V TV). The audio equipment cannot be connected when this connection is made.

Red   White

to AUDIO OUT

Audio cable (not supplied)

to the setereo amplifier or receiver
to AUDIO IN

Red   White

Speaker

Amplifier or receiver

Speaker

Stereo tuner

Notes

• Be sure to turn off the power before making any connections.
• Turn down the volume so any sudden loud sound does not damage your speakers.
• Make sure to turn off the power of the amplifier before plugging or unplugging the power cord of the VCR. Otherwise, the speakers may be damaged.

MTS (Multichannel TV Sound)

You can enjoy the multichannel TV sound while viewing a monaural sound TV, using the stereo amplifier and speakers.

SAP (Second Audio Program)

The SAP permits reception of dual audio broadcasting.
For example: The standard audio program is transmitted in English and the second in Spanish.

Multidisplay

STEREO: Lights when a stereo program is received.
SAP: Lights when the second audio program is received.
SAPSET: Lights when SAP SET is set to ON on the SETUP screen.

OPERATION

50

SPECIAL OPERATIONS

Recording the SAP and/or Stereo Broadcasts

You can record the SAP and/or stereo broadcasts with this unit.
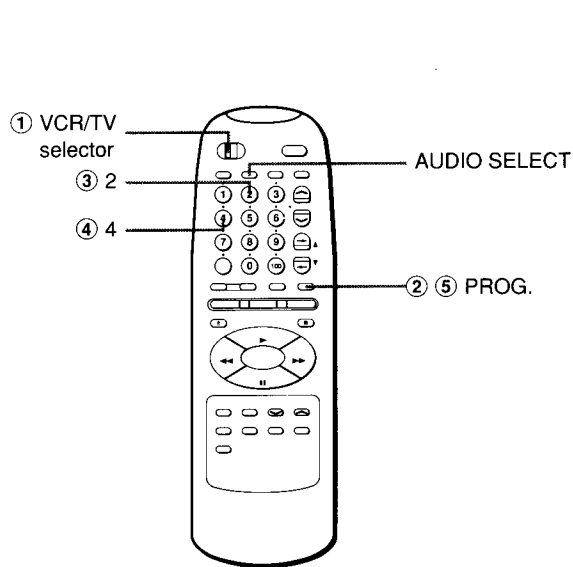
① Set the *VCR/TV* selector to VCR.

② Press the *PROG.* button to display the MENU screen.

③ Press the *2* button to display the SETUP screen.

④ Press the *4* button to set SAP SET to ON.
Each time the *4* button is pressed, ON or OFF is selected alternately.

```
              S E T U P
[1] TAPE LENGTH    [ T120  ]
[2] EDIT           [  OFF  ]
[3] AUTO REPEAT    [  OFF  ]
[4] SAP SET        [  ON   ]
[5] SIMUL          [  OFF  ]
[6] AUTO ANTENNA   [  ON   ]


SET=[1]-[6]            END=PROG
```
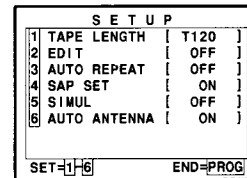
⑤ Press the *PROG.* button twice to set the TV to the normal screen.

⑥ Perform the basic manual recording operation on page 31.

Setting the SAP

Type of broadcast	Indicator		SAP SET ON or OFF on the SETUP screen	Contents of recorded sound		
	SAP	STEREO		Normal sound track (Mono)	Hi-Fi sound track	
					L	R
Regular (monaural audio)	OFF	OFF	ON or OFF	MONO	MONO	MONO
Stereo	OFF	ON	ON or OFF	MONO (MIXED)	STEREO	
Regular+SAP	ON	OFF	ON	MONO	MONO	SAP
			OFF	MONO	MONO	MONO
Stereo+SAP	ON	ON	ON	MONO	MONO	SAP
			OFF	MONO (MIXED)	STEREO	

Playing SAP and/or Stereo Broadcasts

You can play SAP and/or stereo broadcasts with this unit. Press the *AUDIO SELECT* button to select the desired sound so that the ⎣L⎦ ⎣R⎦ indicators on the multidisplay turn on or off.
Then, perform the basic playback operation on page 32.

Setting the SAP and/or stereo sound

Desired sound	⎣L⎦ ⎣R⎦ indicators on the multidisplay	Sound through line output
SAP sound	R(right) is ON.	SAP
Stereo sound	Both R (right) and L (left) are ON.	Stereo

Note

When the TV is connected to RF OUT of the VCR, the sound is monaural.

Simulcast Recording

Connection
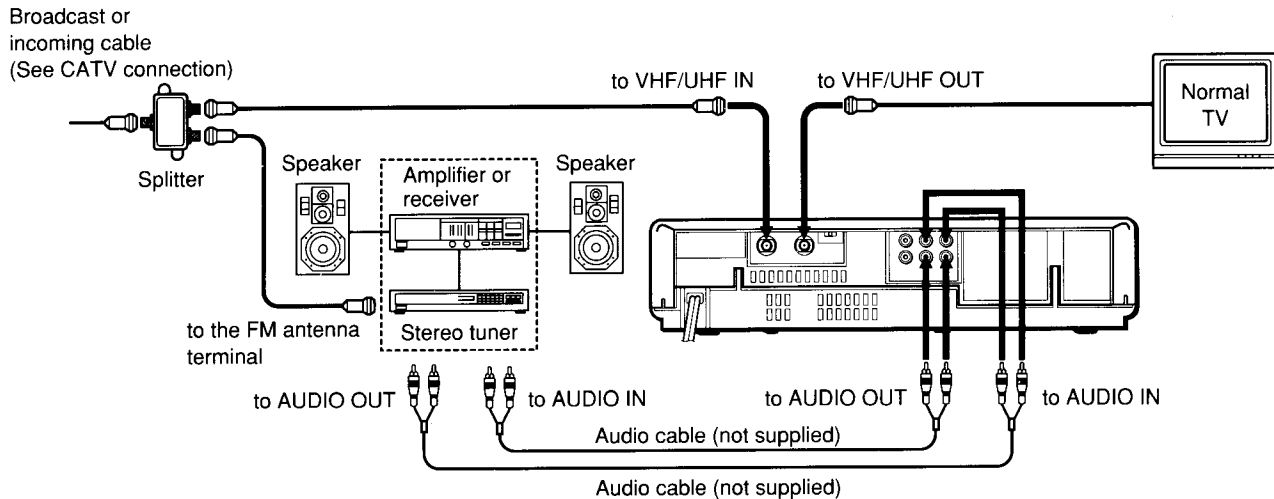
Broadcast or incoming cable (See CATV connection)

Splitter

Speaker

Amplifier or receiver

Speaker

to the FM antenna terminal

Stereo tuner

to AUDIO OUT   to AUDIO IN

to VHF/UHF IN   to VHF/UHF OUT

Normal TV

to AUDIO OUT   to AUDIO IN

Audio cable (not supplied)

Audio cable (not supplied)

Note
See "VCR and TV connections" on page 14 to use your stereo TV (A/V TV). The stereo tuner and the VCR should also be connected when this connection is made.

Notes

- If the VCR is placed near a tuner or radio, noise may occur when receiving an AM program. In such a case, separate it from any tuner or radio.
- Since the tapes recorded with hi-fi equipment have a wide dynamic range, turn down the volume so any sudden loud sound does not damage your speakers.

- Be sure to turn off the power of the amplifier before plugging or unplugging the power cord of the VCR. Otherwise, the speakers may be damaged.
- Be sure to turn off the power before making any connections.

OPERATION

SPECIAL OPERATIONS

Simulcast Recording

When TV program such as MTV, HBO or MAX is being simulcast in FM stereo in your area, the VCR can also record the simulcast sound from a FM stereo tuner or receiver onto the Hi-Fi sound or normal sound track.

① Cassette compartment   ⑧ REC

⑨ EJECT/STOP   ⑥ CHANNEL ∨/∧

VCR/TV selector

③ 2
④ 5
⑧ REC

⑦ SP/SLP
⑥ CHANNEL ∧/∨

② ⑤ PROG.
⑨ STOP

- Make sure that your connections are as shown on page 52.
- Turn on the FM stereo tuner or receiver and tune to the station for the simulcast program.
- Turn on the TV and select CH3 or CH4 according to the output channel selector at the rear.
- Set the *VCR/TV* selector to VCR.
- If you record a cable channel, make sure that you complete the cable box set-up on page 25.

Operation

① Load a cassette.
The VCR automatically turns on.

② Press the *PROG.* button to display the MENU screen.

③ Press the *2* button to display the SETUP screen.

④ Press the *5* button to set SIMUL to ON.
Each time the *5* button is pressed, ON or OFF is selected alternately.

```
          S E T U P
1 TAPE LENGTH   [ T120 ]
2 EDIT          [ OFF  ]
3 AUTO REPEAT   [ OFF  ]
4 SAP SET       [ OFF  ]
5 SIMUL         [  ON  ]
6 AUTO ANTENNA  [  ON  ]

SET=1-6            END=PROG
```

⑤ Press the *PROG.* button twice to set the TV to the normal screen.

⑥ Press the *CHANNEL* buttons to select the desired channel.
- If you use a cable box, select the desired channel on the box.

⑦ Press the *SP/SLP* button to select SP or SLP.

⑧ Press the *REC* button on the VCR, or simultaneously press the *REC* buttons on the remote control unit.

⑨ Press the *EJECT/STOP* button on the VCR or the *STOP* button on the remote control unit to stop recording.

Audio Equipment Connection
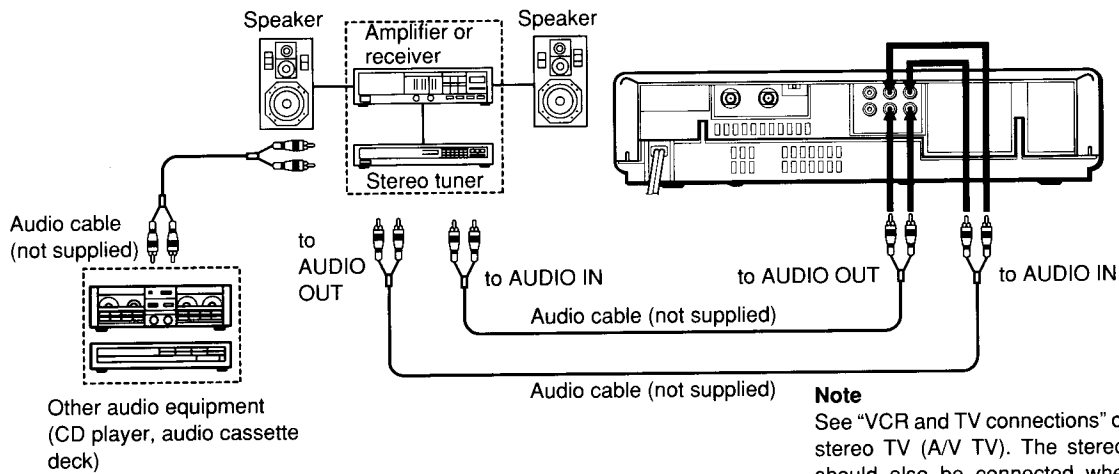
Speaker | Amplifier or receiver | Speaker

Stereo tuner

Audio cable (not supplied)

to AUDIO OUT   to AUDIO IN   to AUDIO OUT   to AUDIO IN

Audio cable (not supplied)

Other audio equipment (CD player, audio cassette deck)

Audio cable (not supplied)

Note

See "VCR and TV connections" on page 14 to use your stereo TV (A/V TV). The stereo tuner and the VCR should also be connected when this connection is made.
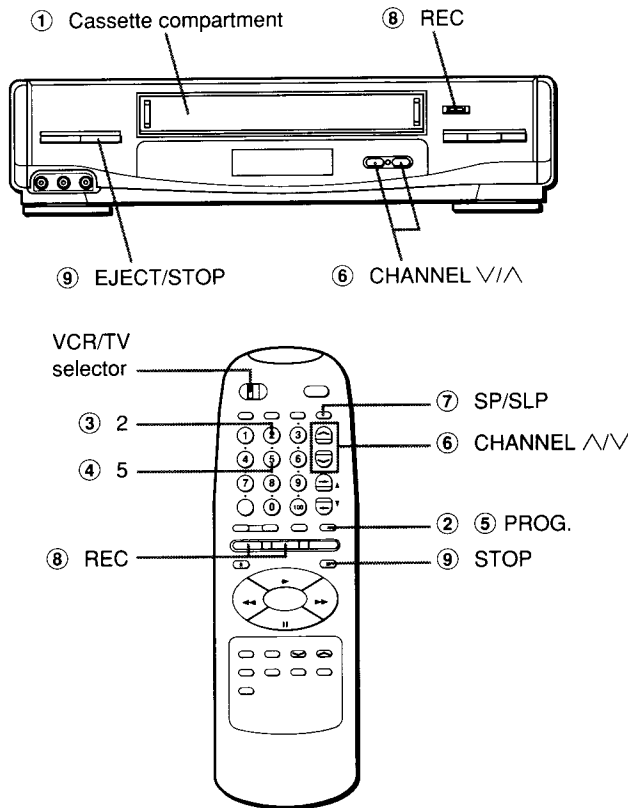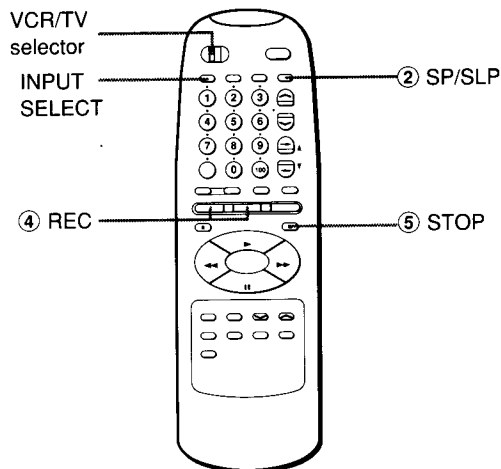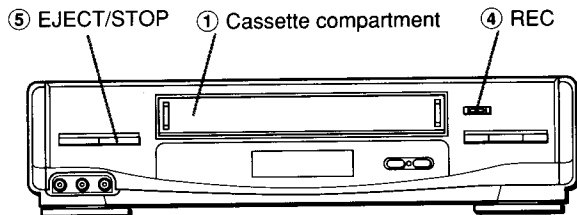
Notes

- If the VCR is placed near a tuner or radio, noise may occur when receiving an AM program. In such a case, separate it from any tuner or radio.
- Turn down the volume so any sudden loud sound does not damage your speakers.

- Be sure to turn off the power of the amplifier before plugging or unplugging the power cord of the VCR. Otherwise, the speakers may be damaged.
- Be sure to turn off the power before making any connections.
- When an external audio equipment is connected only to L of the AUDIO IN jacks, the same sound is recorded on both L and R on the Hi-Fi track.

Audio Hi-Fi Recording

The VCR can be also used as an audio tape recorder for hi-fi long play recording (for example, max. 8 hours in the SLP mode with a T-160 cassette).

⑤ EJECT/STOP   ① Cassette compartment   ④ REC

VCR/TV selector

INPUT SELECT

② SP/SLP

④ REC

⑤ STOP

Preparation

- Set the FM tuner to the broadcast to be recorded.
- Make sure that the VCR/TV selector is set to VCR.

Operation

① Load a cassette with the safety tab.

② Press the SP/SLP button to select the recording tape speed, SP or SLP.

③ Press the INPUT SELECT button to display "L" on the multidisplay.

④ Press the REC button on the VCR, or simultaneously press the REC buttons on the remote control unit.
Recording will begin.
Set the audio equipment to the playback mode at the same time.

⑤ Press the EJECT/STOP button on the VCR or the STOP button on the remote control unit to stop recording.

Note

You can record with better audio quality in the SP mode.

OPERATION

54

SPECIAL OPERATIONS

Copying a VCR Recording

You can dub a tape for editing by connecting this VCR to another VCR.

• Make sure that the *VCR/TV* selector is set to VCR.

| WARNING |

Tapes can be copied and used only in accordance with the applicable copyright laws. But, if the tape is covered by a copyright, it is illegal to copy it and/or charge an entrance fee to see it.

Using this VCR for playback (See page 32.)

1 Playback VCR: Set EDIT to ON on the SETUP screen. (See below.)

2 VCR for recording: Press the record button, then the pause button to enter the recording pause mode.

3 Playback VCR: Press the *PLAY* button to start playback.

4 VCR for recording: Cancel the recording pause mode to start recording.

5 Both VCRs: Press the stop button of each VCR to stop recording.
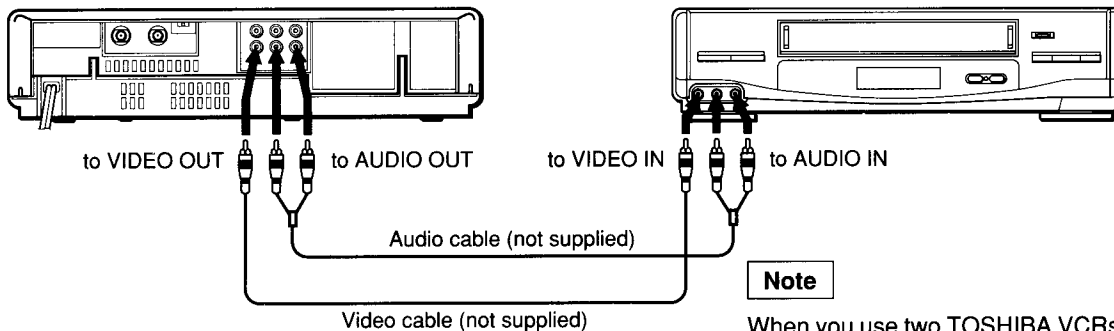   Copying is completed.

Using this VCR for recording (See page 31.)

1 VCR for playback: Select the edit mode, if possible.

2 Recording VCR: Press the *REC* button, then the *PAUSE/STILL* button to enter the recording pause mode.

3 VCR for playback: Press the play button to start playback.

4 Recording VCR: Press the *PAUSE/STILL* button again to cancel the recording pause mode and to start recording.

5 Both VCRs: Press the stop button of each VCR to stop recording.

• For recording, press the *INPUT SELECT* button so that the "L" indicator lights on the multidisplay.

Connection

to VIDEO OUT   to AUDIO OUT   to VIDEO IN   to AUDIO IN

Audio cable (not supplied)

Video cable (not supplied)

| Note |

When you use two TOSHIBA VCRs for recording and playback, keep the VCRs away from each other so that both are not operated simultaneously by the remote control unit.

EDIT function

```
          S E T U P
[1] TAPE LENGTH   [  T120  ]
[2] EDIT          [   ON   ]
[3] AUTO REPEAT   [   OFF  ]
[4] SAP SET       [   OFF  ]
[5] SIMUL         [   OFF  ]
[6] AUTO ANTENNA  [   ON   ]

SET=1-6          END=PROG
```

| Notes |

• Be sure to set EDIT to OFF when dubbing is completed. If EDIT remains ON during playback, the picture quality is not at its best.

• In general, the picture quality deteriorates somewhat in the dubbed tapes. It is best to use the SP mode.

1 Press the *PROG.* button.

2 Press the *2* button to display the SETUP screen.

3 Press the *2* button to set EDIT to ON .

4 Press the *PROG.* button twice to set the TV to the normal screen.

BEFORE CALLING SERVICE PERSONNEL

Check the following list of problems and remedies before calling service personnel. The problem may be one you can solve yourself.

	PROBLEM	REMEDY
Power Supply	• No power.	• The power cord is not plugged in. Plug it firmly into the outlet.
	• Although the power is on, the VCR will not work.	• Wait for two hours if moisture has condensed.(See page 2.) • There is no cassette in the VCR. Load a cassette.
Clock/Timer	• The clock does not work. • The timer does not work properly.	• There has been a power failure. Reset the clock. (See page 24.) • The clock is incorrect. Set the clock correctly. (See page 24.)
TV Reception	• The picture does not appear on the TV screen.	• Set the TV channel to the VCR output channel or set the **TV/VCR** button on the TV to VCR. • Adjust the antenna direction or use an optional antenna booster. • Plug the power cord into the outlet firmly.
Recording and Playback	• The picture does not appear on the TV screen during recording and playback.	• Press the **TV/VCR** button to select the VCR mode and set the TV channel to 3 or 4.
	• The VCR does not record.	• The cassette's safety tab is broken. Use a cassette with tab or cover the hole with cellophane tape.
	• The picture on the VCR tape is poor.	• Adjust the tracking on the VCR. • Clean the video heads with a commercially available cleaning tape.
	• The desired sound is not correct, such as SAP, stereo, or regular sound.	• Set the **AUDIO SELECT** button on the remote control unit. (See page 51.)
	• Noise is present in the hi-fi sound being played.	• Adjust the tracking on the VCR.
	• The timer recording function does not work.	• There is an error in programming. Reset the timer recording program. • There is no cassette in the VCR. • If the cassette does not have its safety tab, use another cassette or cover the hole with cellophane tape. • Press the two **TIMER** buttons on the remote control unit simultaneously. • There has been a power failure. Reset the clock to the correct time if "12:00" is flashing and reprogram the timer. (See page 24.) • The cable box set-up has not been programmed correctly (see page 25). • The cable box is not turned on (see page 25).
	• The VCR Plus+ recording cannot be done.	• The guide channel numbers are not set up correctly (see page 46). • The cable box is not turned on when the channel comes in the VCR via the converter box. • The cable box set-up has not been programmed correctly (see page 25). • The VCR is not set to the timer standby mode. Press the two **TIMER** buttons simultaneously.
Remote Control Unit	• The remote control unit does not work properly.	• Replace with new batteries if the old ones are exhausted. • Make sure the remote control unit is within 30° of the remote control receiver on the VCR. • Use the remote control unit within 23 feet (7 m) from the VCR. • Remove any obstacle between the VCR and the remote control unit. • Check the **VCR/TV** selector setting.
Miscellaneous	• The cassette is ejected immediately after it is loaded.	• Remove the cassette and reload it carefully.
	• The cassette does not go into the cassette compartment.	• There is already a cassette in the VCR.

OTHERS

SPECIFICATIONS

Power supply:	120 V AC, 60 Hz
Power consumption:	25 W
External dimensions:	370 × 92 × 335 mm (W.H.D.)
	(Approx. 14⅝ × 3⅗ × 13⅕ inches)
Weight:	11.9 lbs (5.4 kg)
Channels received:	VHF: Channels 2–13
	UHF: Channels 14–69
	CATV: Channels 1–125
Antenna input/output terminals:	UHF/VHF: 75 ohm F type connector
Signal system:	Standard NTSC
Recording/Playback system:	Recording: VHS format (SP, SLP)
	Playback: VHS format (SP, LP, SLP)
Cassette:	Video cassette with VHS mark
Tape speed:	SLP: 1.11 cm/second, SP: 3.34 cm/second
Video recording/playback time:	SLP: 480 minutes, SP: 160 minutes (When T-160 video cassette is used.)
Fast forward/rewind time:	Within approx. 100 seconds (When T-120 video cassette is used.)
Video input:	1 Vp-p, 75 ohm, unbalanced, negative sync., pin jack
Video output:	1 Vp-p, 75 ohm, unbalanced, negative sync., pin jack
Audio input:	Line input: –8.0 dBs, more than 47 k ohm, pin jack
Audio output:	Line output: –8.0 dBs, less than 4.7 k ohm, pin jack
Audio frequency range (Hi-Fi):	20 Hz – 20 kHz
Audio dynamic range (Hi-Fi):	90 dB
Utilization conditions:	Temperature: 41°F to 104°F (5°C to 40°C)
	Humidity: less than 80% RH

Designs and specifications are subject to change without notice.

Toshiba America Consumer Products, Inc. ("TACP") and Toshiba Hawaii Inc. ("THI") make the following limited warranties. These limited warranties extend to the original consumer purchaser or any person receiving this set as a gift from the original consumer purchaser and to no other purchaser or transferee.

Limited Ninety (90) Day Warranty
TACP and THI warrant this product against defects in materials or workmanship for a period of ninety (90) days after the date of original retail purchase. During this period, TACP and THI will repair a defective product or part, without charge to you. You must deliver the entire product to a TACP/THI Service Center. You pay for all transportation and insurance charges for the set to and from the Service Center.

Limited One (1) Year Warranty
TACP and THI further warrant the parts in this product against defects in materials or workmanship for a period of one year after the date of original retail purchase. During this period, TACP and THI will replace a defective part without charge to you, except that if a defective part is replaced after ninety (90) days from the date of the original retail purchase, you pay labor charges involved in the replacement. You must also deliver the entire product to one of the TACP/THI Service Centers. You pay for all transportation and insurance charges for the set to and from the Service Center.

Owner's Manual and Registration Card
You should read the owner's manual thoroughly before operating this product. You should also insure that your name and address are on file as owners of a TACP/THI product by completing and mailing the enclosed registration card within ten days after you, or the person who has given you this product as a gift, purchased this product. This is one way to enable TACP/THI to establish the date of purchase of the product, as well as to provide you with better customer service and improved products. Failure to return the card will not affect your rights under this warranty so long as you retain other proof of purchase such as a bill of sale.

Your Responsibility
The above warranties are subject to the following conditions:
(1) You must retain your bill of sale or provide other proof of purchase. Completing and mailing in the enclosed registration card within ten days after the original retail purchase is one way of providing such other proof of purchase.
(2) You must notify an Authorized TACP/THI Service Station within thirty (30) days after you discover a defective product or part.
(3) All warranty servicing of this product must be made by an Authorized TACP/THI Service Station.
(4) These warranties are effective only if the product is purchased and operated in the U.S.A..
(5) Labor service charges for set installation, set up, adjustment of customer controls and installation of repair or antenna systems are not covered by this warranty. Reception problems caused by inadequate antenna systems are your responsibility.
(6) Warranties extend only to defects in materials or workmanship as limited above and do not extend to any product or parts which have been lost or discarded by you or to damage to products or parts caused by misuse, accident, improper installation, improper maintenance or use in violation of instructions furnished by us; or to units which have been altered or modified without authorization of TACP/THI or to damage to products or parts thereof which have had the serial number removed, altered, defaced or rendered illegible.

Step-By-Step Procedures ≈ How To Obtain Warranty Service
IN THE CONTINENTAL
UNITED STATES ...
Should your unit require
service or parts, CALL

Toll Free

800-631-3811

HAWAII
Toshiba Hawaii Inc.
Service Department
327 Kamakee Street
Honolulu, HI 96814
Phone Number:
(808) 521-5377

IN THE EVENT A PROBLEM SHOULD DEVELOP WITH YOUR PRODUCT, PLEASE PROCEED AS FOLLOWS:
(1) Refer to the troubleshooting guide in your owner's manual. This check list may solve your problem.
(2) Contact one of the TACP/THI Service Centers listed below for warranty service or call the TACP toll free number 1-800-631-3811 within thirty (30) days after you find a defective product or part.
(3) Arrange for the delivery of the product to the Authorized TACP/THI Service Center. Products shipped to the Service Center must be insured and safely and securely packed, preferably in the original shipping carton, and a letter explaining the defect and also a copy of the bill of sale or other proof of purchase must be enclosed. All transportation and insurance charges must be prepaid by you. (See PROCEDURE.)
(4) If you have any question about service, please contact one of the following TACP/THI Service Centers:

EAST	**SOUTHEAST**	**MIDWEST**	**SOUTHWEST**	**WEST**
82 Totowa Road	490 Armour Circle,	1010 Johnson Drive	1421 Champion Drive	5490 E. Francis
Wayne, NJ 07470	N.E.	Buffalo Grove, IL 60089	Suite 304	Street, Ontario,
Phone Number:	Atlanta, GA 30324	Phone Number:	Carroollton, TX 75006	CA 91761
(201) 628-8000	Phone Number:	(708) 541-9400	Phone Number:	Phone Number:
	(404) 872-6955		(214) 243-1367	(714) 988-5303

IMPORTANT: PACKING AND SHIPPING INSTRUCTIONS
When you send the product to a service center, you must use the original carton box and packing material, then insert the original carton box containing the unit into another carton, using more packing material.

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