

**SLV-E510EE/E510VC1/E510VC2/E710B/E710EX/E710NC/E710NP/E710UX/
E710VC/E710VP/E810B/E810BZ/E810EE/E810NP/E810UX/E810VC
RMT-V185A/V186C/V186D/V186E/V186F/V187/V187A**

SERVICE MANUAL



Photo: SLV-E810

French Model

SLV-E710B/E810B/E810BZ

East European Model

SLV-E510EE/E810EE

Irish Model

SLV-E710EX

North European Model

SLV-E710NC

Spanish Model

SLV-E710NP/E810NP

UK Model

SLV-E710UX/E810UX

German Model

SLV-E510VC1/E510VC2/E710VC/E710VP/E810VC

H MECHANISM

- Refer to the **SERVICE MANUAL** of VHS MECHANICAL ADJUSTMENTS IV for MECHANICAL ADJUSTMENTS. (9-973-623-11)

* The abbreviations of E510, E710 and E810 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	E510	E710	E810
All model names SLV-	E510EE/E510VC1/E510VC2	E710B/E710EX/E710NC/E710NP/ E710UX/E710VC/E710VP	E810B/E810BZ/E810EE/E810NP/ E810UX/E810VC

SPECIFICATIONS

System

Channel coverage

E710UX/E810UX:

PAL

UHF E21 to E69

E510EE/E810EE:

VHS E2-E12, R1-R12

UHF E21-E69, R21-R69

CATV S1-S41, S01-S05

E710B/E810B/E810BZ:

SECAM (L)

VHF F2 to F10

CATV B to Q

HYPER S21 to S41

UHF F21 to F69

PAL (B/G)

VHF E2 to E12

VHF Italian channel A to H

CATV S01 to S05, S1 to S20

HYPER S21 to S41

UHF E21 to E69

E710EX:

PAL

VHF 1A to 1J, SA10 to SA13

UHF B21 to B69

CATV S01 to S05, S1 to S20

HYPER S21 to S41

E510VC1/E510VC2/E710NC/E710NP/E710VC/E710VP/
E810NP/E810VC:

PAL (B/G)

VHF E2 to E12

VHF Italian channel A to H

UHF E21 to E69

CATV S01 to S05, S1 to S20

HYPER S21 to S41

RF output signal

UHF channels 28 to 55

Aerial out

75-ohm asymmetrical aerial socket

Inputs and outputs

⊞ EURO-AV (LINE-1):

CANAL+: E710B/E810B/E810BZ

PAY-TV DECODER/CANAL+:

E510VC1/E510VC2/E710NP/E710VC/E810NP

⊞ EURO-AV (LINE-3 IN) : E810UX

21-pin

Video input: pin 20

Audio input: pins 2 and 6

Video output: pin 19

Audio output: pins 1 and 3

— Continued on next page —



PAL NTSC4.43

Hi-Fi VIDEO CASSETTE RECORDER

VIDEOplus+ SHOWVIEW

SONY®

Ⓔ EURO-AV (LINE-2 IN): E710EX/E710NC/E710UX/
E710VP

21-pin

Video input: pin 20

Audio input pins 2 and 6

LINE-2 IN: E510/E810

VIDEO IN, phono jack (1)

Input signal: 1 Vp-p, 75 ohms, unbalanced, sync
negative

AUDIO IN, phono jack (2)

Input level: 327 mVrms

Input impedance: more than 47 kilohms

AUDIO OUT: E710/E810

Phono jack (2)

Rated output level: 327 mVrms

Load impedance: 47 kilohms

Output impedance: less than 10 kilohms

General

Power requirements

220 – 240 V AC, 50 Hz

Power consumption

25 W

Operating temperature

5°C to 40°C

Storage temperature

–20°C to 60°C

Dimensions

Approx. 430 × 109 × 323mm (w/h/d): E510/E810

Approx. 430 × 109 × 310mm (w/h/d): E710

including projecting parts and controls

Mass

Apperox. 4.5 kg: E510/E710

Apperox. 4.7 kg: E810

Supplied accessories

Remote commander (1)

R6 (size AA) batteries (2)

Aerial cable (1)

Audio cable (1)

Mains lead (1)

21-pin adaptor (1): E510EE/E810EE

Design and specifications are subject to change
without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following
safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK $\triangle$ OR DOTTED
LINE WITH MARK $\triangle$ ON THE SCHEMATIC DIAGRAMS
AND IN THE PARTS LIST ARE CRITICAL TO SAFE
OPERATION. REPLACE THESE COMPONENTS WITH
SONY PARTS WHOSE PART NUMBERS APPEAR AS
SHOWN IN THIS MANUAL OR IN SUPPLEMENTS
PUBLISHED BY SONY.

• Feature Difference
SLV-E510 Series

SLV- FEATURE	E510EE	E510VC1/ VC2
NTSC 4.43 PB	O	X
ME SECAM REC/PB	X/X	X/X
AUDIO SYSTEM	MONO	MONO
RF IN/OUT	DK/BG	BG
DUAL MODE SHUTTLE	O	O
OPERATING SWITCH BLOCK	O	O
REMOTE COMMANDER RMT-	V186C	V186C

SLV-E710 Series

SLV- FEATURE	E710B	E710EX/UX	E710NC/NP	E710VC/VP
NTSC 4.43 PB	X	X	X	X
ME SECAM REC/PB	O/O	X/X	X/X	X/X
AUDIO SYSTEM	Hi-Fi	Hi-Fi	Hi-Fi	Hi-Fi
RF IN/OUT	L/BG	I	BG	BG
DUAL MODE SHUTTLE	O	O	O	O
OPERATING SWITCH BLOCK	X	X	X	X
REMOTE COMMANDER RMT-	V186F	V186E	V186D	V186D

SLV-E810 Series

SLV- FEATURE	E810B	E810BZ	E810EE	E810NP	E810UX	E810VC
NTSC 4.43 PB	O	O	O	O	O	O
ME SECAM REC/PB	O/O	O/O	X/X	X/X	X/X	X/X
AUDIO SYSTEM	Hi-Fi	Hi-Fi	Hi-Fi	Hi-Fi	Hi-Fi	Hi-Fi
RF IN/OUT	L	L/BG	DK/BG	BG	I	BG
DUAL MODE SHUTTLE	O	O	O	O	O	O
OPERATING SWITCH BLOCK	O	O	O	O	O	O
REMOTE COMMANDER RMT-	V187A	V187A	V187	V187	V185A	V187

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
Feature Difference		3	5-1-2. Front Panel and Cabinet Assemblies		
Service Note		5	(SLV-E510, E810)		5-3
1. GENERAL			5-1-3. Chassis Assembly		5-5
Getting Started		1-1	5-1-4. Mechanism Chassis Assembly (1)		5-7
Basic Operations		1-15	5-1-5. Mechanism Chassis Assembly (2)		5-8
Additional Operations		1-21	5-1-6. Mechanism Chassis Assembly (3)		5-9
Editing		1-26	5-1-7. Mechanism Chassis Assembly (4)		5-10
Additional Information		1-27	5-2. Electrical Parts List		5-11
2. DISASSEMBLY			6. INTERFACE, IC PIN FUNCTION DESCRIPTION		
2-1. Front Panel Assembly, Case and MF-285 Board			6-1. System Control-Video Block Interface		6-1
(SLV-E710)		2-1	6-2. System Control-Servo Peripheral Circuit Interface		6-2
2-2. Front Panel Assembly and Case			6-3. System Control-Mechanism Interface		6-3
(SLV-E510, E810)		2-1	6-4. System Control-System control Peripheral circuit		
2-3. Control switch Block and MF-285 Board			Interface		6-4
(SLV-E510,E810)		2-2	6-5. System Control-Hi-Fi Audio Block Interface		6-4
2-4. DM-49 Board and PS-357 Board		2-2	6-6. System Control-Normal Audio Block Interface		6-4
2-5. Cassette Compartment Assembly and HI-25 Board		2-3	6-7. System Control-RF Modulator, Input Selection		
2-6. RP-199 Board		2-3	Block Interface		6-5
2-7. Mechanism Chassis Assembly		2-4	6-8. Servo/System Control Microprocessor Pin Function		6-6
2-8. MA-253 Board		2-4	6-9. Tuner/Timer Mode Control Pin Function		6-7
2-9. Internal Views		2-5	7. ADJUSTMENTS		
2-10. Circuit Boards Location		2-6	7-1. Mechanical Adjustments		7-1
3. BLOCK DIAGRAMS			7-2. Electrical Adjustments		7-1
3-1. Overall Block Diagram		3-1	2-1. Pre-Adjustment Preparations		7-1
3-2. Video Block Diagram		3-5	2-1-1. Instruments to be Used		7-1
3-3. Servo System Control Block Diagram		3-9	2-1-2. Connection		7-1
3-4. IO/CANAL+ Block Diagram		3-13	2-1-3. Set-up of Adjustment		7-1
3-5. Mode Control Block Diagram		3-15	2-1-4. Alignment Tape		7-1
3-6. Tuner Block Diagram		3-17	2-1-5. Specified I/O Level and Impedance		7-2
3-7. Audio Block Diagram		3-21	2-1-6. Adjusting Sequence		7-2
3-8. Power Supply Block Diagram		3-23	2-2. Power Supply Check		7-2
4. PRINTED WIRING BOARDS AND			2-3. System Control Check		7-3
SCHEMATIC DIAGRAMS			2-3-1. Clock Check		7-3
4-1. Frame Schematic Diagram		4-1	2-4. Servo System Adjustment		7-3
4-2. Printed Wiring Boards and Schematic Diagrams		4-5	2-4-1. Switching Position Adjustment		7-3
RP-199 Printed Wiring Board		4-5	2-5. Video System Adjustment		7-4
RP-199 Schematic Diagram		4-7	2-5-1. Recording Y Signal Level Check		7-4
MA-253, DC-70 Printed Wiring Boards		4-10	2-5-2. White Clip, Dark Clip Check		7-4
MA-253 (Video) Schematic Diagram		4-13	2-5-3. Playback Y signal Level Check		7-4
MA-253, DC-70(Servo, System TUNER/TIMER/			2-5-4. Recording Chroma Level Check		7-5
MODE Control) Schematic Diagram		4-18	2-5-5. Sync. AGC Check		7-5
MA-253 (IO) Schematic Diagram		4-23	2-5-6. X'tal Oscillation Frequency Check		7-5
MA-253 (Audio) Schematic Diagram		4-26	2-6. Audio System Adjustments		7-6
MA-253 (TUNER) Schematic Diagram		4-29	2-6-1. Hi-Fi Audio System Adjustment		7-6
HI-25, DM-49, MF-285, LE-13 Printed Wiring Boards		4-32	1. VCO f_0 Adjustment		7-6
HI-25, DM-49, MF-285, LE-13 Schematic Diagram		4-35	2. Deviation Check		7-6
PS-357 Printed Wiring Board and Schematic Diagram		4-39	3. BPF f_0 Adjustment		7-6
5. REPAIR PARTS LIST			4. AF Switching Position Adjustment		7-7
5-1. Exploded Views		5-1	2-6-2. Normal Audio System Adjustment		7-7
5-1-1. Front Panel and Cabinet Assemblies			1. ACE Head Adjustment		7-7
(SLV-E710)		5-1	2. E-E Output Level Check		7-7
			3. Recording Bias Adjustment		7-7
			4. Overall Level Characteristic and Distortion		
			Factor Check		7-8
			5. Overall S/N Check		7-8
			2-7. Parts Arrangement Diagram for Adjustments		7-10

SERVICE NOTE

1. UPPER DRUM REPLACEMENT (EXCEPT E510)

1-1. Removal of Upper Drum

- 1) Remove the screw ① (BV3 × 8) and take out the ground shaft assembly ②. (See Fig. 1.)
- 2) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows.
- 3) Remove two screw ③ (PSW3 × 8) and take out the rotary upper drum in the arrow direction **A**. (See Fig. 2.)
If it difficult, remove by shaking the rotary upper drum gradually.

Note: If the drum can not be removed, check whether the solders have been removed or not again.

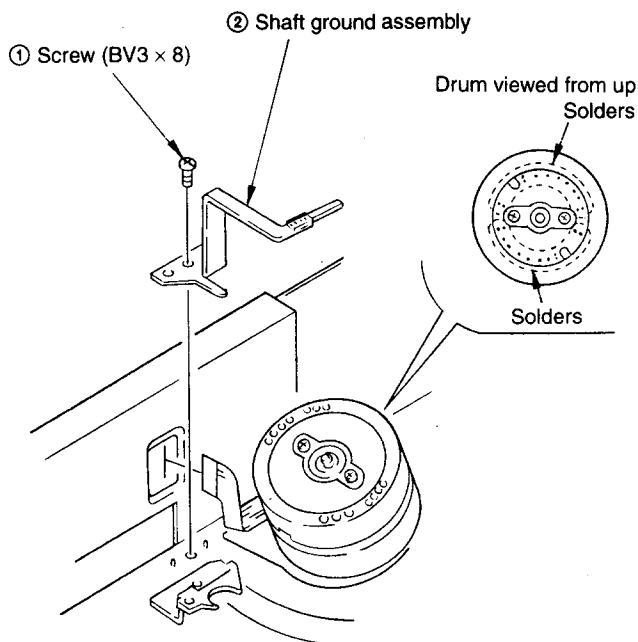


Fig. 1

1-2. Mounting Upper Drum

- 1) When inserting the rotary drum into the lower drum, be careful not to blur the contacting surface with fingerprint or the like.
- 2) Mount the rotary upper drum board so that the screw holes of both upper and lower drums match. (See Fig. 2.)
- 3) If it is difficult, mount the upper drum by shaking it gradually.
Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
- 4) Tighten two screws ③ (PSW3 × 8). (See Fig. 2.)
Note: Temporary tighten two screws. After making sure that upper drum is tightly inserted, tighten the screws.
- 5) Solder points on the board of the rotary upper drum.
- 6) Fix the ground shaft assembly ② using the screw ① (BV3 × 8) so that the protrusion of ground shaft assembly end contacts the center of the drum shaft.
Note: When attaching the ground shaft assembly ②, be careful not to apply force to the spring section of it.

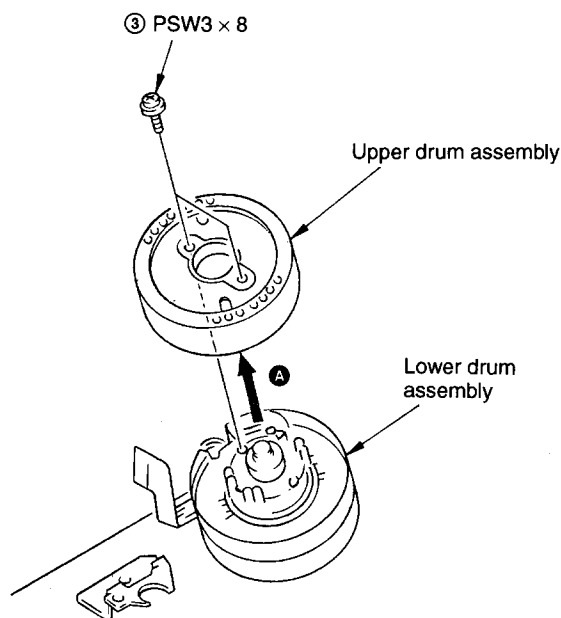


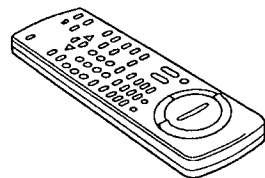
Fig. 2

Step 1

Unpacking

Check that you have received the following items with the VCR:

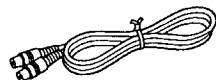
- Remote commander



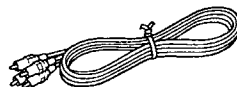
- R6 (size AA) batteries



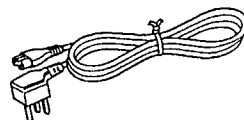
- Aerial cable



- Audio cable



- Mains lead

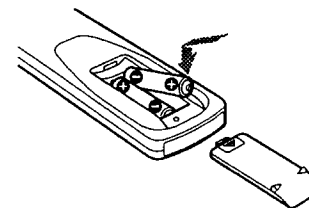


Step 2

Setting up the remote commander

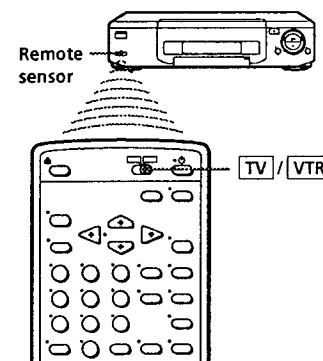
Inserting the batteries

Insert two R6 (size AA) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.



Using the remote commander

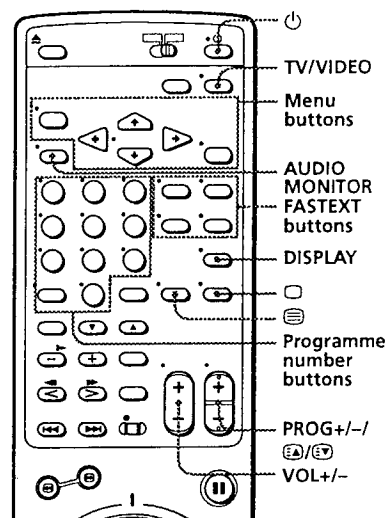
You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV / VTR to
the VCR	VTR and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

continued

Step 2 : Setting up the remote commander (continued)



TV control buttons

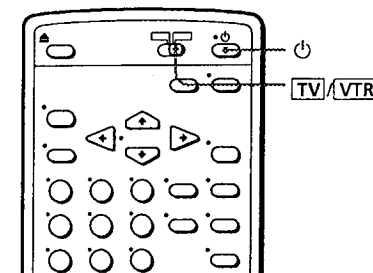
To	Press
Turn the TV into standby or active mode	⏻ (on/standby)
Select an input source of the TV either from aerial in or from line in	TV/VIDEO
Select the programme position of the TV	Programme number buttons PROG +/-
Adjust the volume of the TV	VOL +/-
Switch to TV (Teletext off)	□ (TV)
Switch to Teletext	⊞ (Teletext)
Select the sound	AUDIO MONITOR
Use FASTEXT	FASTEXT buttons
Call up on-screen display	DISPLAY
Change the Teletext page	Ⓜ/Ⓜ
Operate TV menu options	Menu buttons

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.



- 1 Set **TV/VTR** at the top of the remote commander to **TV**.
- 2 Hold down ⏻, and enter your TV's code number(s) using the number buttons. Then release ⏻.

Now you can use the following TV control buttons to control your TV:
⏻ (on/standby), TV/VIDEO, programme number buttons, PROG +/-, VOL +/-, □ (TV), ⊞ (Teletext), FASTEXT buttons.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number	Manufacturer	Code number
Sony	01, 02, 03, 04, 05	Hitachi	24
Aiwa	32	Hyper	31
Akai	68	Inno-Hit	41
Blaupunkt	10, 21	Irradio	20
Brionvega	40	ITT	15, 16
C.G.M, Mivar	09	JVC	33
Dual	44	Loewe	45
Fenner	30, 31	Mitsubishi	27, 28, 50, 51
Ferguson	52	NEC	66
Grundig	10, 11	Nokia	15, 16

continued

Step 2 : Setting up the remote commander (continued)

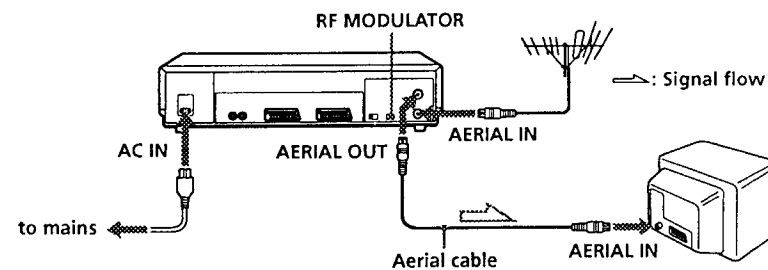
Manufacturer	Code number	Manufacturer	Code number
Nordmende	35, 42	Seleco	14
Orion	47, 48	Sharp	29
Panasonic	17, 49	Siemens	39
Philips	06, 07, 08	Sinudyne	37
Phonola	18, 19	TEAC	67
Pioneer	26	Telefunken	36
Saba	12, 13	Thomson	43
Samsung	22, 23	Toshiba	38
Sanyo	25	White Westinghouse	34
Schneider	46		

Notes

- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

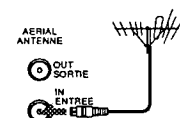
Step 3

Connecting the VCR



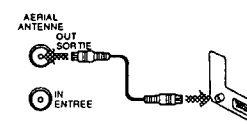
1

Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.

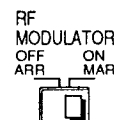


2

Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



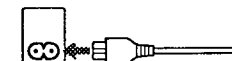
3



Make sure RF MODULATOR is set to ON.

4

Connect AC IN of the VCR to the mains using the supplied mains lead.



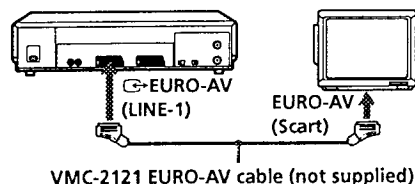
continued

Step 3 : Connecting the VCR (continued)

Additional connections

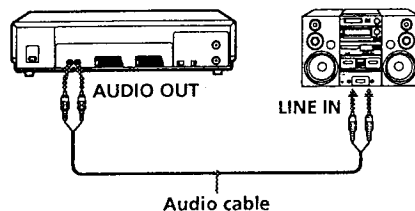
To a TV that has a EURO-AV (Scart) connector

This additional connection improves picture and sound quality. Connect the TV as shown on the right. Whenever you want to watch the VCR picture, press TV/VIDEO on the remote commander (or TV/VTR on the VCR) to display the VTR indicator in the display window.



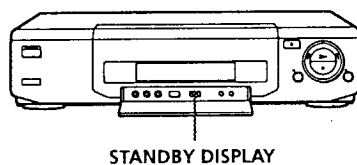
To a stereo system

You can improve sound quality by connecting a stereo system as shown on the right.



To conserve the VCR power while the VCR is standing by

Set **STANDBY DISPLAY** to OFF. The indicators in the display window turn off to conserve the power. When you set a timer recording, the indicators in the display window are on even though **STANDBY DISPLAY** is set to OFF.



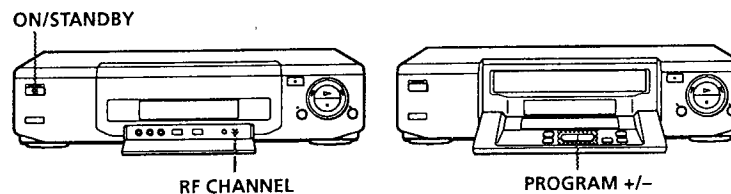
Tip

- When the TV is connected to the EURO-AV (LINE-1) connector, setting the RF MODULATOR switch to OFF is recommended. In the OFF position, only the signal from the aerial is output through the AERIAL OUT connector.

Step 4

Tuning your TV to the VCR

If you have connected your VCR to the TV using the EURO-AV cable, skip this step.



1



Press ON/STANDBY to turn on the VCR.

2



Press RF CHANNEL on the VCR.

The factory-preset RF channel appears in the display window.
The VCR signal is output through this channel to the TV.



3

Turn on your TV and select a programme position for the VCR picture.

This channel will now be referred to as the video channel.

4

Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" on the next page.

SONY VIDEO CASSETTE RECORDER

continued

Step 4 : Tuning your TV to the VCR (continued)**5**

Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To check to see if the TV tuning is correct

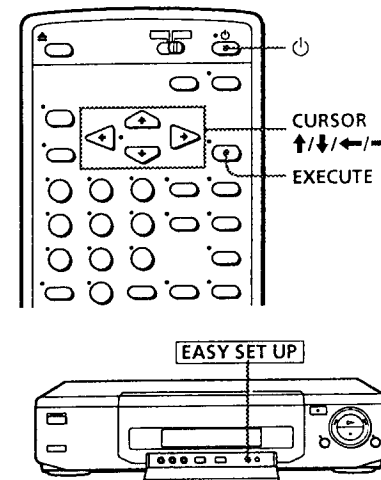
Set the TV to the video channel and press PROGRAM +/- on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/-, the TV tuning is correct.

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 4 above, press PROGRAM +/- in step 4, so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Step 5**Setting up the VCR with EASY SET UP**

Before using the VCR for the first time, set up the VCR using the EASY SET UP function. With this function, you can set the language for the on-screen display, TV channels, guide channels for VIDEO Plus+, and the VCR clock, guided by the sequence indicated on the TV screen.

**1**

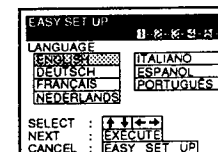
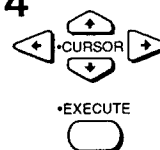
Press to turn on the VCR.

2

Turn on your TV and set it to the video channel.

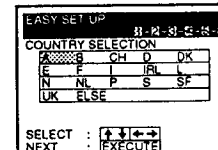
3Press **EASY SET UP** on the VCR.

To cancel the EASY SET UP function, press **EASY SET UP** again.

**4**

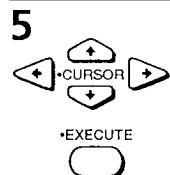
Press CURSOR to highlight the desired language, then press EXECUTE.

The country abbreviations for ITP (Intelligent Tuner Preset) appear.



continued

Step 5 : Setting up the VCR with EASY SET UP (continued)

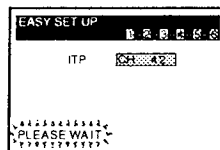


Press CURSOR $\uparrow/\downarrow/\leftarrow/\rightarrow$ to highlight the abbreviation of your country, then press EXECUTE.

The abbreviations of the countries are as follows:

A: Austria	L: Luxemburg
B: Belgium	N: Norway
CH: Switzerland	NL: Netherlands
D: Germany	P: Portugal
DK: Denmark	S: Sweden
E: Spain	SF: Finland
F: France	UK: United Kingdom
I: Italy	ELSE: other countries
IRL: Ireland	

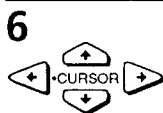
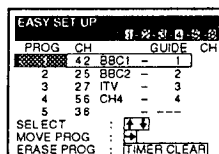
If your country does not appear, select ELSE.



When you press EXECUTE, ITP starts searching for all the receivable channels.

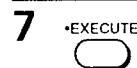
ITP sorts the located channels appropriately for the selected country and presets them to the programme positions. Some VIDEO Plus+ guide channels and station names may also be preset if ITP can detect them.

During presetting, the channel being located is displayed on the TV screen. When all the channels are preset, the following screen appears.



Using CURSOR $\uparrow/\downarrow/\leftarrow/\rightarrow$, set the station names and VIDEO Plus+ guide channels that could not be preset automatically, change the programme positions of the stations, and disable the unused programme positions. (If not necessary, skip this step.)

The setting procedures are the same as those described in "Manual setup — Selecting station names/setting up VIDEO Plus+" on page 20 and "Manual setup — Changing/disabling programme positions" on page 25.

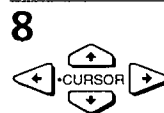
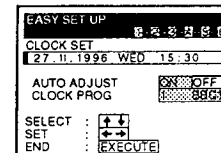
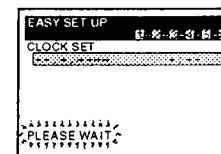


Press EXECUTE.

Auto Clock Set starts searching for a TV station that carries the time signal and sets the clock time automatically. The date is also set if the date data is transmitted from the TV station.

When the clock setting is completed, the following screen appears.

If the VCR does not receive the time signal from any station, "1.1. 1996 MON 0:00" appears and AUTO ADJUST is set to OFF.



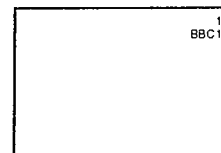
If necessary, adjust the date and/or time manually or change the station for Auto Clock Set using CURSOR $\uparrow/\downarrow/\leftarrow/\rightarrow$.

The setting procedures are the same as those described in "Manual setup — Setting the clock" on page 28.



Press EXECUTE.

A programme position appears on the TV screen. The station name may also appear if the VCR has detected it.



Note

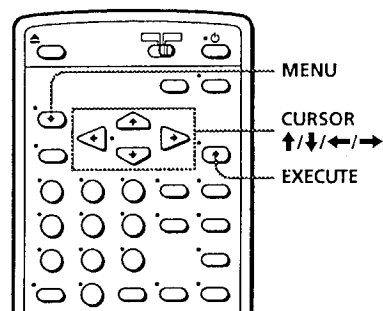
- Do not exit EASY SET UP while ITP is presetting channels. If you do, repeat EASY SET UP from the beginning.

Manual setup — Selecting a language

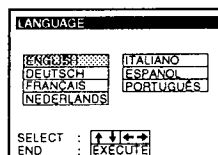
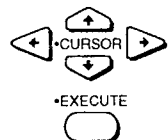
You can change the on-screen display language from the one you selected with EASY SET UP.

Before you start...

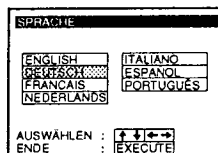
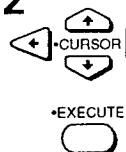
- Turn on the VCR and the TV.
- Set the TV to the video channel.



- 1 Press MENU, then press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to LANGUAGE and press EXECUTE.



- 2 Press CURSOR $\uparrow/\downarrow/\leftarrow/\rightarrow$ to highlight the desired language, then press EXECUTE.

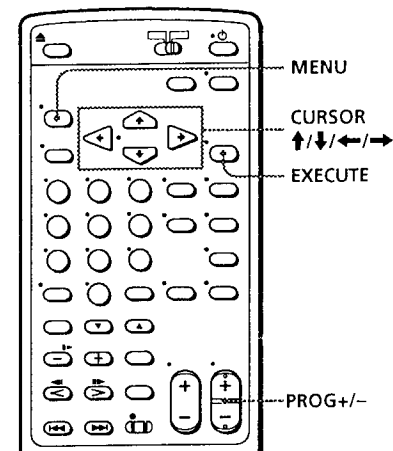


Manual setup — Presetting channels

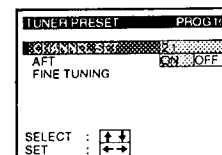
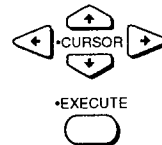
If some channels could not be preset using EASY SET UP, you can preset them manually.

Before you start...

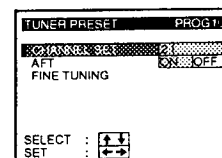
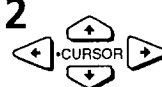
- Turn on the VCR and the TV.
- Set the TV to the video channel.



- 1 Press MENU, then press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to TUNER PRESET and press EXECUTE.



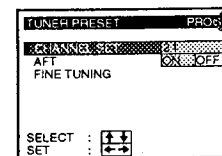
- 2 Press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to CHANNEL SET.



- 3 Press PROG +/- to select the programme position.



Selected programme position



continued

Manual setup — Presetting channels (continued)

4

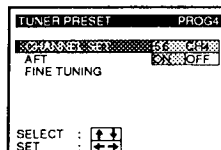


Press CURSOR → to start tuning.

The VCR starts searching for a channel and displays the first one it finds on the TV screen. Press CURSOR ←/→ repeatedly until the channel you want is displayed.

The channels are scanned from VHF E21 to E69.

If you know the number of the channel you want, press the programme number buttons. For example, for channel 43, first press "4" and then press "3."



5

To allocate another channel to another programme position, repeat steps 3 and 4.

6



Press EXECUTE.

Disabling unwanted programme positions

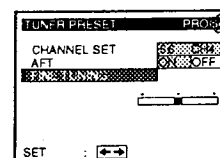
After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/- buttons. You can also disable unwanted programme positions using the SET UP CH & VIDEO Plus+ menu (page 27).

- 1 In step 4 above, press programme number button "0" twice to display the number "0" beside CHANNEL SET.
- 2 Press EXECUTE.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

- 1 Press PROG +/- to select the programme number for which you cannot obtain a clear picture.
- 2 Press MENU, then select TUNER PRESET and press EXECUTE.
- 3 Select FINE TUNING. The fine tuning meter appears.



Selected programme position

- 4 Press CURSOR ←/→ to get a clearer picture, then press EXECUTE. Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Selecting station names/setting up VIDEO Plus+

VIDEO Plus+ is a feature in Sony VCRs that simplifies programming the VCR to make timer recordings. To use VIDEO Plus+, each programme position needs to be matched with its VIDEO Plus+ guide channel. If the guide channels were not preset in the EASY SET UP procedure, set them by selecting the station names. If you cannot find a station name you want, you need to set the guide channel manually. To get the guide channel numbers, see "Guide channels for VIDEO Plus+" on page 23, or look in the programme guide for your area that features PlusCode.

- If you want to record satellite broadcasts using VIDEO Plus+, see page 24.

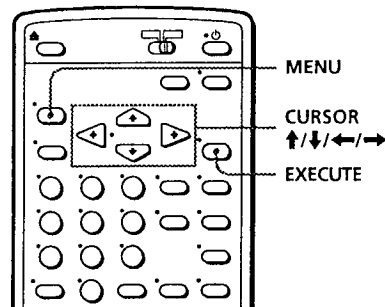
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

- Press MENU, then press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to SET UP CH & VIDEO Plus+ and press EXECUTE.

When using the EASY SET UP procedure, skip this step.

The preset channels are displayed on the screen. The station names and guide channels also appear if the VCR detected them in EASY SET UP. "—" in the GUIDE CH column means that the guide channel has not been preset.



SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT : $\uparrow/\downarrow$			
MOVE PROG : $\leftarrow/\rightarrow$			
ERASE PROG : [TIMER CLEAR]			

- Press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to the row on which you want to set the station name and guide channel.

To display other pages for programme positions 6 to 60, press CURSOR $\uparrow/\downarrow$ repeatedly.

SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT : $\uparrow/\downarrow$			
MOVE PROG : $\leftarrow/\rightarrow$			
ERASE PROG : [TIMER CLEAR]			

- Press CURSOR $\rightarrow$ twice to highlight the station name and guide channel columns only.

SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT NAME : $\uparrow/\downarrow$			
SET GUIDE CH : $\uparrow/\downarrow$			
CONFIRM : [ENTER]			

- Press CURSOR $\uparrow/\downarrow$ to select the station name.

The corresponding guide channel number is set automatically.

 - If you can set the station name and guide channel this way, press CURSOR $\leftarrow$ to confirm the setting and skip steps 5 to 7.
 - If you cannot find the station name you want to set, go on to the next step.

SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT NAME : $\uparrow/\downarrow$			
SET GUIDE CH : $\uparrow/\downarrow$			
CONFIRM : [ENTER]			

- Press CURSOR $\rightarrow$ to highlight the guide channel column only.

SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT NAME : $\uparrow/\downarrow$			
SET GUIDE CH : $\uparrow/\downarrow$			
CONFIRM : [ENTER]			

- Press CURSOR $\uparrow/\downarrow$ to select the guide channel number assigned in the programme guide.

SET UP CH & VIDEO Plus+			
PROG	CH	GUIDE	CH
1	42 BBC1	—	1
2	25 BBC2	—	2
3	27 ITV	—	3
4	56 CH4	—	4
5	36	—	—
SELECT NAME : $\uparrow/\downarrow$			
SET GUIDE CH : $\uparrow/\downarrow$			
CONFIRM : [ENTER]			

continued

Manual setup — Selecting station names/setting up VIDEO Plus+ (continued)

7



Press CURSOR $\leftarrow/\rightarrow$ to confirm the setting.

The cursor (I) appears in the leftmost column.

SET UP CH & VIDEO Plus+				
PROG	CH	GUIDE	CH	
1	42	BBC1	-	1
2	25	BBC2	-	2
3	27	ITV	-	3
4	56	CH4	-	4
5	36	-	-	129
SELECT : $\uparrow/\downarrow$				
MOVE PROG : $\leftarrow/\rightarrow$				
ERASE PROG : TIMER CLEAR				

8

To set the station name and guide channel of another station, repeat steps 2 to 7.

If you want to change the programme positions of the stations, proceed to step 2 of "Manual setup — Changing/disabling programme positions" on page 25.

9



Press EXECUTE.

Guide channels for VIDEO Plus+

Guide channel	Station name	Guide channel	Station name
001	BBC1	122	TELECLUB
002	BBC2	123	UK GOLD
003	ITV	124	DISCOVERY
004	CHANNEL 4		THE LEARNING CHANNEL
005	RTE (IRELAND)	125	BRAVO
006	NETWORK 2 (IRELAND)		ADULT CHANNEL
101	SKY ONE	126	CNN
102	SKY NEWS	127	EURONEWS
103	SKY MOVIES	129	QVC
104	THE MOVIE CHANNEL	130	UK LIVING
105	SKY SPORT	131	RAI 1
106	NICKELODEON	132	RAI 2
	VH-1 GERMANY	133	TV5 EUROPE
107	EUROSPORT	134	TVE INTERNATIONAL
108	GALAVISION	135	MBC/ARABIC
109	MTV EUROPE	136	VTM
110	CHILDREN'S CHANNEL	137	SPORTNET
	THE FAMILY CHANNEL	138	COUNTRY MUSIC TV
111	SKY MOVIES GOLD	139	VIDEO HITS ONE
112	BBC WORLD SERVICE		VH-1
113	RTL 4	140	SKY SPORT 2 & SOAPS & TRAVEL
114	SUPER SPORT		TV ASIA
	FILMNET 2	141	LA-5
	FILMNET +	142	LIVE TV
115	RTL PLUS INTERNATIONAL	143	SUPERCHANNEL
116	SAT 1	144	JAPAN TV
117	PREMIERE	145	SELECT TV TV ASIA
118	3 SAT	146	MOVIE CHANNEL
119	ARD	147	FILMNET 1
120	PRO 7		TNT
121	TELE 5	149	CARTOON NETWORK

Note

- The guide channel codes listed above are as of 11 September 1995. If you have any questions about the guide channels, please consult your nearest Sony service facility or the marketing group of Sony UK.

continued

Manual setup — Selecting station names/setting up VIDEO Plus+ (continued)

Setting up VIDEO Plus+ for satellite broadcasts

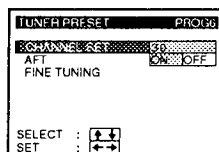
When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH & VIDEO Plus+ menu.

If your satellite tuner is connected via the LINE-3 IN EURO-AV (Scart) connector, you don't have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

- 1 Turn on the satellite tuner.
- 2 Press MENU, then select TUNER PRESET and press EXECUTE.
- 3 Press PROG +/- to select a programme position you want to use for watching a satellite channel.

- 4 Select CHANNEL SET, then press CURSOR → to tune the VCR to the satellite tuner.

The channel number displayed beside CHANNEL SET is used for receiving all satellite broadcasts from the satellite tuner.



- 5 Press PROG +/- to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.

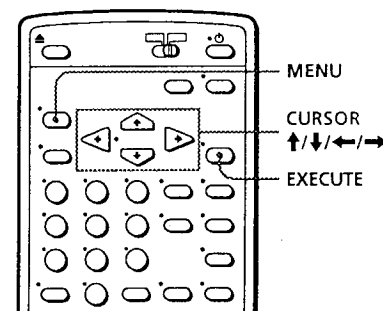
Repeat this step for all satellite channels.

- 6 Set the guide channel number for each programme position assigned to the satellite channel, following the procedures in "Manual setup — Selecting station names/setting up VIDEO Plus+" on page 20.

Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- If you use a satellite tuner connected via the LINE-3 IN EURO-AV (Scart) connector, you don't have to set up VIDEO Plus+. Just record a satellite programme using VIDEO Plus+, and the VCR automatically records the programme from the LINE-3 IN connector.
- If you inadvertently entered a guide channel number, press CURSOR ↑/↓ repeatedly to reset the "GUIDE CH" column to "---". "---" appears between 1 and 255.
- The VCR does not allow entering the guide channel number, if the same number has been set.
- When you record a satellite broadcast using VIDEO Plus+, you need to select the desired channel on the satellite tuner manually.

Manual setup — Changing/disabling programme positions



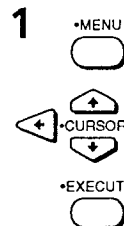
After setting the channels and VIDEO Plus+ guide channels, you can change the programme positions as you like. If any programme positions are unused or contain unwanted channels, you can disable them.

Before you start...

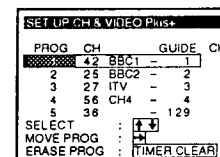
- Turn on the VCR and the TV.
- Set the TV to the video channel.

Changing programme positions

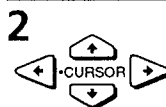
e.g. Moving the programme position from 3 to 1.



Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH & VIDEO Plus+ and press EXECUTE.

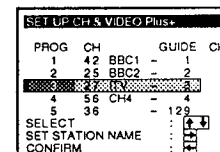


When using the EASY SET UP procedure, skip this step.



Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to change the programme position, then press CURSOR →.

To display other pages for programme positions 6 to 60, press CURSOR ↑/↓ repeatedly.



continued

Manual setup — Changing/disabling programme positions (continued)

- 3** Press CURSOR $\uparrow/\downarrow$ until the selected channel and guide channel row moves to the desired programme position.
- The selected channel and guide channel are inserted at the new programme position and the intermediate channels are displaced to fill the gap.

SET UP CH & VIDEO Plus+					
PROG	CH		GUIDE	CH	
1	27	ITV	-	3	
2	42	BBC1	-	1	
3	25	BBC2	-	2	
4	56	CH4	-	4	
5	36		-	129	
SELECT : $\uparrow/\downarrow$					
SET STATION NAME : $\leftarrow$					
CONFIRM : $\rightarrow$					

- 4** Press CURSOR $\leftarrow$ to confirm the setting.

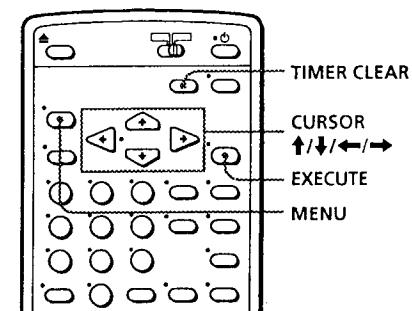
- 5** To change the programme position of another station, repeat steps 2 to 4.

- 6** Press EXECUTE.

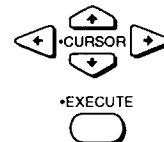
Disabling unwanted programme positions

Note

- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.



- 1** Press MENU, then press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to SET UP CH & VIDEO PLUS+ and press EXECUTE.



When using the EASY SET UP procedure, skip this step.

SET UP CH & VIDEO Plus+					
PROG	CH		GUIDE	CH	
1	42	BBC1	-	1	
2	25	BBC2	-	2	
3	27	ITV	-	3	
4	56	CH4	-	4	
5	36		-	129	
SELECT : $\uparrow/\downarrow$					
MOVE PROG : $\leftarrow$					
ERASE PROG : [TIMER CLEAR]					

- 2** Press CURSOR $\uparrow/\downarrow$ to move the cursor (I) to the row on which you want to disable.



SET UP CH & VIDEO Plus+					
PROG	CH		GUIDE	CH	
1	42	BBC1	-	1	
2	25	BBC2	-	2	
3	27	ITV	-	3	
4	56	CH4	-	4	
5	36		-	129	
SELECT : $\uparrow/\downarrow$					
MOVE PROG : $\leftarrow$					
ERASE PROG : [TIMER CLEAR]					

- 3** Press TIMER CLEAR.
- The selected row will be cleared as shown on the right.



SET UP CH & VIDEO Plus+					
PROG	CH		GUIDE	CH	
1	42	BBC1	-	1	
2	25	BBC2	-	2	
3	0		-		
4	56	CH4	-	4	
5	36		-	129	
SELECT : $\uparrow/\downarrow$					
MOVE PROG : $\leftarrow$					
ERASE PROG : [TIMER CLEAR]					

- 4** Repeat steps 2 and 3 for any other programme positions you want to disable.

- 5** Press EXECUTE.



Manual setup — Setting the clock

You must set the time and date on the VCR to be able to use the timer recording features properly. If the VCR clock was not set in the EASY SET UP procedure, you need to set it manually.

If the Auto Clock Set did not set the clock correctly for your local area, try another station for Auto Clock Set.

Before you start...

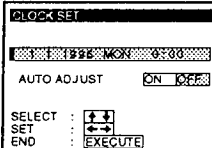
- Turn on the VCR and the TV.
- Set the TV to the video channel.

Setting the clock manually

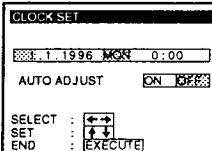
1  Press MENU, then press CURSOR  to move the cursor (I) to CLOCK SET and press EXECUTE.

 When using the EASY SET UP procedure, skip this step.

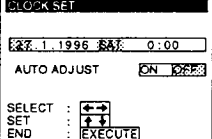




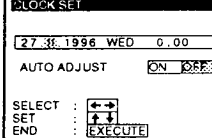
2  Press CURSOR  to highlight the day and the day of the week.

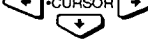


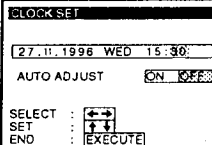
3  Press CURSOR  to set the day. The day of the week is set automatically.



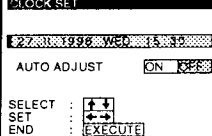
4  Press CURSOR  to highlight the month and set the month using CURSOR .



5  Set the year, hour and minutes in sequence, using CURSOR  to highlight the item to be set, and CURSOR  to select the digits.



6  Press CURSOR  to confirm the setting. The cursor (I) appears in the leftmost column.

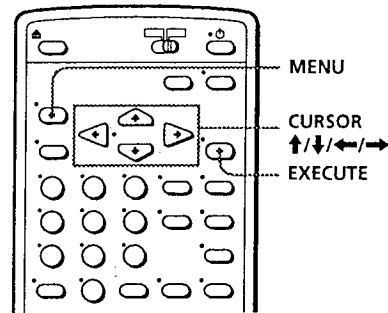


7  Press EXECUTE to start the clock.

continued

Manual setup — Setting the clock (continued)

Changing the station for Auto Clock set



Tips

- To change the digits during setting, press CURSOR ← to return to the item to be changed, and select the digits using CURSOR ↑/↓.
- If you set AUTO ADJUST to ON, the Auto Clock Set is activated whenever the VCR is turned off. The date and time is adjusted automatically by making reference to the time signal from the station whose programme position is displayed in the "CLOCK PROG" row.

If you do not need the Auto Clock Set, highlight OFF.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

1 Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to CLOCK SET and press EXECUTE.

When using the EASY SET UP procedure, skip this step.

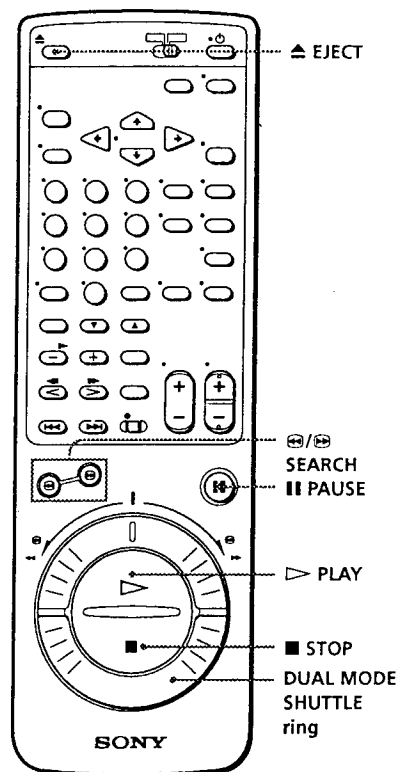
2 Press CURSOR ↓ to move the cursor (I) to AUTO ADJUST, then press CURSOR ← to highlight ON.

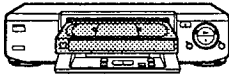
3 Press CURSOR ↓ to move the cursor (I) to CLOCK PROG, then press CURSOR ←/→ repeatedly until the programme position of the station that carries the time signal appears.

If the VCR does not receive the time signal from any station, AUTO ADJUST returns to OFF automatically.

4 Press EXECUTE.

Playing a tape



- 1 Turn on your TV and set it to the video channel.
- 2 The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed. 
- 3  Press ▷ PLAY.
When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	PAUSE
Resume play after pause	PAUSE or ▷ PLAY
Search forward	- Turn the DUAL MODE SHUTTLE (DMS) ring to ⊞ during playback ⊞ SEARCH during playback
Search backward	- Turn the DMS ring to ⊙ during playback ⊙ SEARCH during playback
Fast-forward the tape	Turn the DMS ring to ►► FF during stop
Rewind the tape	Turn the DMS ring to ◄◄ REW during stop
Eject the tape	▲ EJECT

To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the colour system of your TV.

When your TV is	Set NTSC PB to
PAL only	ON PAL TV
PAL and NTSC	NTSC 4.43

To use the time counter

At the point the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.

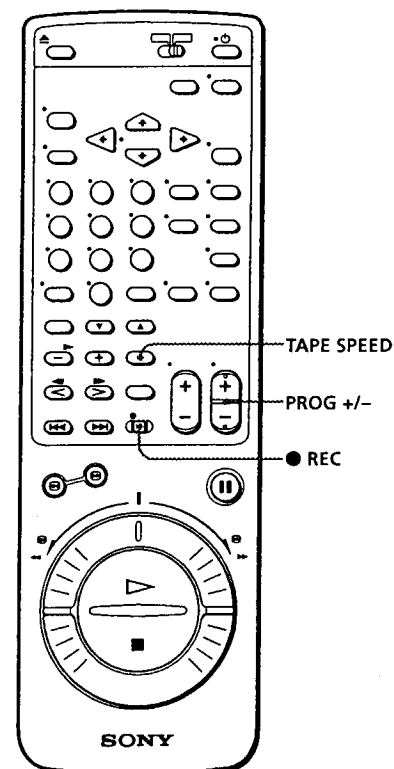


To display the counter on the TV screen, press DISPLAY.

Notes

- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
 - The picture becomes black and white.
 - The picture shakes.
 - No picture appears on the TV screen.
 - Black streaks appear horizontally on the TV screen.
 - The colour density increases or decreases.
- If you play back a tape in LP or EP mode with NTSC system, the sound is heard in monaural.
- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

Recording TV programmes



1 Turn on your TV and set it to the video channel.

2 Open the drop down panel and insert a tape with its safety tab in place.

3 Press PROG +/- to select the programme position you want to record.



- 4** **TAPE SPEED** Press TAPE SPEED to select the tape speed, SP or LP.
 LP provides recording time twice as long as SP, however, SP produces better picture and audio quality.



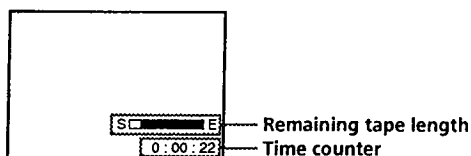
- 5**  Press ● REC to start recording.

To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.

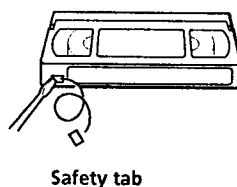


To watch another TV programme while recording

- 1** Press TV/VIDEO on the remote commander (or TV/VTR on the VCR) to turn off the VTR indicator in the display window.
- 2** Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



continued

Recording TV programmes (continued)

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -/- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the EURO-AV (LINE-1) or EURO-AV (LINE-3) connector, or the LINE-2 IN VIDEO/AUDIO L/R jacks using INPUT SELECT.
- To cut out an unwanted scene while recording, press ■ PAUSE and turn the DUAL MODE SHUTTLE ring on the VCR to rewind the tape to the beginning of the unwanted scene, then press ■ PAUSE to resume recording.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

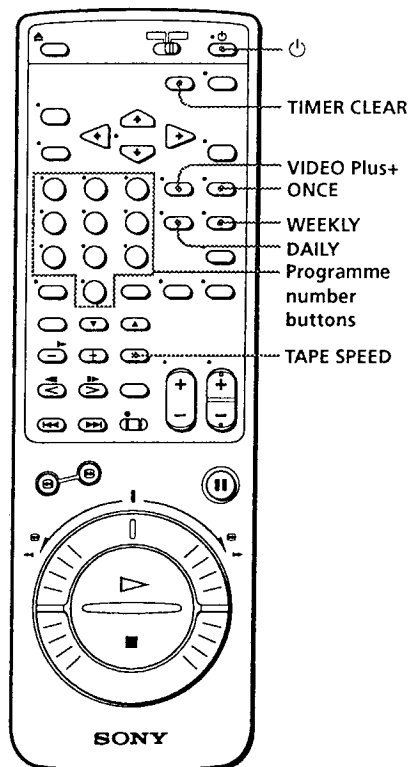
- The display does not appear during still (pause) mode or slow-motion playback.
- The display will not appear while playing an NTSC-recorded tape.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.

Recording TV programmes using VIDEO Plus+

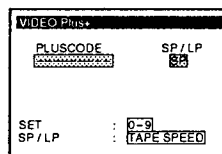
Just enter the programme's "PlusCode" listed in the TV programme guide. The date, times and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

Before you start...

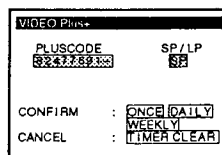
- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 VIDEO Plus+ Press VIDEO Plus+.

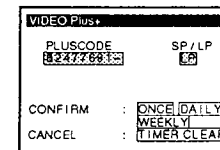


2 ① ② ③ Press the programme number buttons to enter the programme's PlusCode.
④ ⑤ ⑥
⑦ ⑧ ⑨ If you make a mistake, press TIMER CLEAR and re-enter the correct number.
⑩



Recording TV programmes using VIDEO Plus+ (continued)

3 TAPE SPEED Press TAPE SPEED to select SP or LP.



4 ONCE Press ONCE, DAILY or WEEKLY:



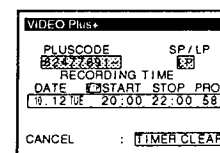
or



or



To record	Press
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY



The date, start and stop times, programme position, and tape speed appear on the TV screen.

If you want to turn on the PDC function, see page 47 and change the TIMER SET/CHECK menu.

For details of the PDC function, see "Timer recording with PDC signals" on page 43.

If the information is not correct, press TIMER CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 Press  to turn off the VCR.

The TIMER indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press  STOP.

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes.

- 1 Turn on the satellite tuner.
- 2 On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
- 3 Repeat the steps described above.
- 4 Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press . The TIMER indicator turns off and the VCR switches on. Remember to press to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Tip

- To cancel the procedure, press VIDEO Plus+ before pressing ONCE, DAILY or WEEKLY.

Note

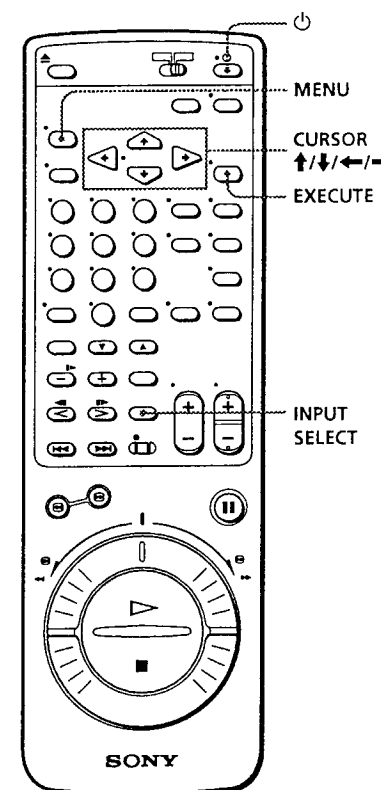
- If the VCR beeps repeatedly, this means that:
 - The PlusCode is incorrect.
 - ONCE, DAILY, or WEEKLY was selected incorrectly. You cannot select DAILY or WEEKLY for a programme that airs more than seven days ahead.

Setting the timer manually

If VIDEO Plus+ is not available in your area, follow the instructions below to set the timer to record programmes.

Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1

•MENU



Press MENU and select TIMER SET/CHECK, then press EXECUTE.



•EXECUTE



TIMER SET / CHECK				0:00:00
DATE	#START	STOP	PROG	
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
VPS / PDC				

2



Set the date, PDC function, start and stop times, programme position, and tape speed:

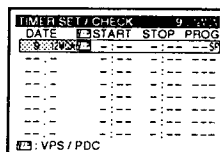
1 Press CURSOR → to highlight each item in turn.

2 Press CURSOR ↑/↓ to set each item. To correct a setting, press CURSOR ← to return to that setting and reset.

To record the same programme every day or the same day every week, press CURSOR ↓ while the date is highlighted. For details, see "Daily/weekly recording" on the next page.

If you don't want to use the PDC function, press CURSOR ↑/↓ to turn off **V/P** in the "**V/P**" position. For details, see "Timer recording with PDC signals" on the next page.

To record from other sources connected to the EURO-AV (LINE-1) or EURO-AV (LINE-3) connector, or the LINE-2 IN jacks, press INPUT SELECT to display "L1," "L3," or "L2" in the "PROG" position.



3



Press CURSOR → to confirm the setting.

The cursor (I) appears at the top of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4



Press EXECUTE.

5



Press ⏻ to turn off the VCR.

The **TIMER** indicator appears in the display window and the VCR stands by for recording.

To record from a decoder or other source, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ **STOP**.

Setting the timer manually (continued)

Daily/weekly recording

In step 2 above, press CURSOR ↓ to select the recording pattern. Each time you press CURSOR ↓, the indication changes as shown below.

the current date → **SUN-SAT** → **MON-SAT** → **MON-FRI** → **EVERY SAT**
→ **EVERY MON** → **EVERY SUN** → 1 month later → (cycles backward)
→ the current date

Timer recording with PDC signals

The broadcast systems transmit PDC (Programme Delivery Control) signals with its TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delay, early starts or broadcast interruptions.

In step 2 above, press CURSOR ↑/↓ to turn on/off the **V/P** indicator after you set the recording date. If you do not want to set the PDC function, turn off the **V/P** indicator.

You can also use the PDC function for a source connected to the EURO-AV (LINE-1) and EURO-AV (LINE-3) connectors, and the LINE-2 IN jacks.

Tips

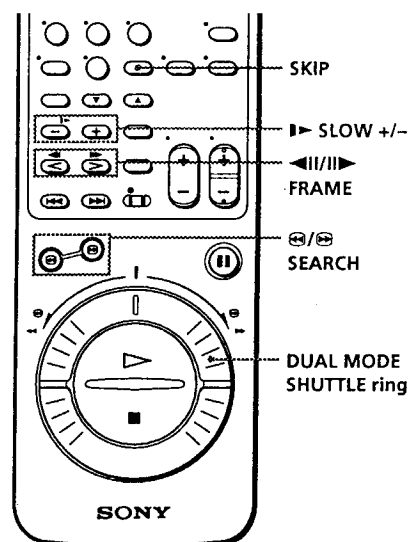
- To set the programme position, you can also use the PROG +/- or programme number buttons.
- To set the tape speed, you can also use TAPE SPEED.

Notes

- When setting the timer with PDC signals, enter the start and stop times exactly as indicated in the TV programme guide, otherwise the PDC function won't work.
- If the PDC signal is too weak or the broadcasting station failed to transmit PDC signals, the VCR will start recording at the set time without using the PDC function.
- "TIMER" flashes in the display window when you press ⏻ with no tape inserted.

continued

Playing/searching at various speeds



To resume normal playback

Press ▷ PLAY.

Tip

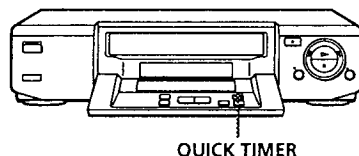
- Adjust the picture using ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST if:
 - Streaks appear while playing in slow motion.
 - Bands appear at the top or bottom while pausing.
 - The picture shakes while pausing.

Notes

- The playback sound is muted during these operations.
- In the LP mode, noise may appear or there may be no colour.

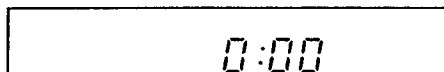
Playback options	Operation
Play at various speeds	During playback, turn the DMS ring and hold it at the speed you want.
Fast-forward/rewind	During stop, turn the DMS ring to ►► FF or ◀◀ REW and release.
View the picture during fast-forward or rewind	During fast-forward, turn the DMS ring to ►► FF. During rewind, turn the DMS ring to ◀◀ REW.
Play at twice the normal speed	During playback, turn the DMS ring to × 2.
Play at high speed	During playback or pause, press 🔍 SEARCH or 🔍 SEARCH. To change direction, press > or <.
Play in slow motion	During playback or pause, press ►► SLOW +/- . Press the +/- buttons to change the speed. To change direction, press > or <.
Play frame by frame	During pause, press ►► FRAME or ◀◀ FRAME. Hold the button down to play one frame each second.
Play in reverse	During playback, press <.
Skip a scene	During playback, press SKIP. Pressing once skips about 30 seconds.
Rewind and start play	During stop, hold the DMS ring on the VCR at the ◀◀ REW position and press ▷ PLAY on the VCR, then release the DMS ring.

Recording TV programmes using the quick timer

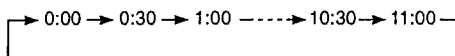


After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.

- 1 While recording, press QUICK TIMER once.



- 2 Press QUICK TIMER repeatedly to set the duration.
Each press advances the time in increments of 30 minutes.



The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

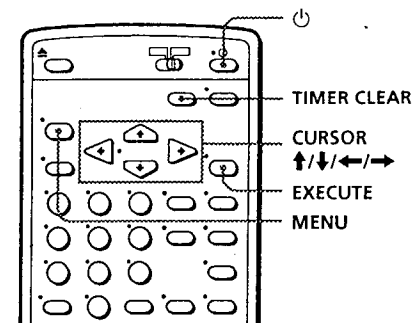
To stop recording

To stop the VCR while recording, press ■ STOP.

Tip

- You can also set the quick timer and start recording during the stop mode.

Checking/ changing/ cancelling timer settings



Before you start...

- Turn on your TV and set it to the video channel.

- 1 Press to turn on the VCR.
- 2 Press MENU, then select TIMER SET/CHECK.
 - If you want to change a setting, go on to the next step.
 - If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby.
- 3 Press CURSOR to select the setting you want to change or cancel:
 - To change the setting, press CURSOR to highlight the item you want to change, and press CURSOR to reset it. To cancel the PDC function, turn off the indicator. Then, press CURSOR repeatedly until the cursor (I) appears at the top of the line.
 - To cancel the setting, press TIMER CLEAR.
- 4 Press EXECUTE.
If any settings remain, turn off the VCR to return to recording standby.

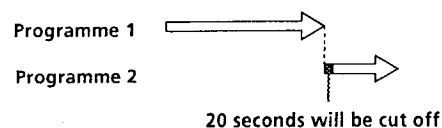
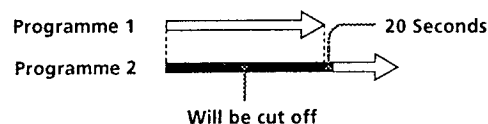
TIMER SET / CHECK			
DATE	START	STOP	PROG
10. 10 THU	20:00	22:00	58U
8. 1 WED	7:00	8:00	63P
28. 10 SAT	9:30	10:15	L1P
17. 10 TUE	9:58	12:00	L2SP
MON - SAT	0:12	13:00	27UP
EVERY SUN	23:00	0:00	L1SP
---	---	---	---
---	---	---	---
VPS / PDC			

continued

Checking/changing/cancelling timer settings (continued)

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

In NICAM system

This VCR receives and records stereo and bilingual programmes based on the NICAM system (the NICAM indicator appears). When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To record a NICAM programme, HIFI AUDIO in the SET UP MENU should be set to NICAM (initial setting). To check the menu setting, see page 60 for details.

To select the sound while recording

Press AUDIO MONITOR to select the sound you want.

Stereo programme

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Standard sound*	No indicator	No indicator

* Usually the mixed sound of left and right channels (monaural)

Bilingual programme

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO
Standard sound*	No indicator	No indicator

* Usually the main sound (monaural)

continued

Recording stereo and bilingual programmes (continued)

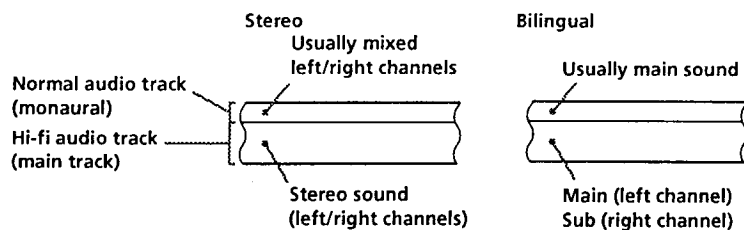
Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	LCH	STEREO
Right channel/sub	RCH	STEREO
Standard sound	No indicator	No indicator

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

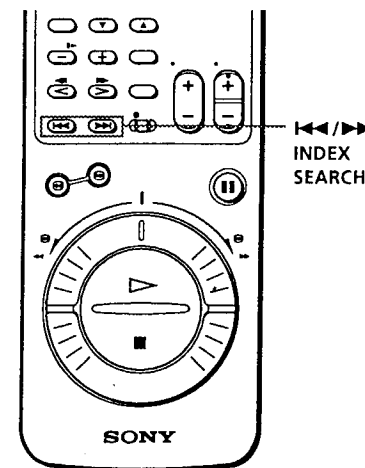


Notes

- To listen to playback sounds in stereo, you must use the EURO-AV or AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HIFI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

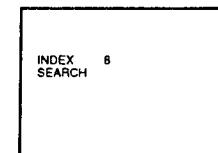
Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.



- 1 Insert an indexed tape into the VCR.
- 2 Press **INDEX SEARCH** repeatedly to specify how many index signals ahead or behind you want to search:
 - To search ahead, press **INDEX SEARCH**.
 - To search backwards, press **INDEX SEARCH**.

The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.



To stop searching

Press **STOP**.

Note

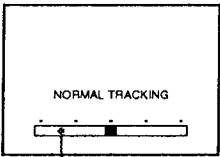
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

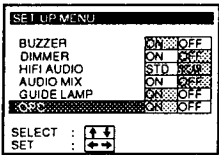
Press ▼/▲ TRACKING NORMAL/SLOW to display the tracking meter. The distortion should disappear as you press one of the two buttons. If you cannot get a clear picture with manual adjustment, press TRACKING AUTO/MANUAL to return to automatic adjustment.



Tracking meter

About Optimum Picture Control (OPC)

Optimum Picture Control (OPC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set OPC to ON in the SET UP MENU (with the OPC indicator in the display window lit).



OPC playback

The OPC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with OPC.

OPC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the OPC function (the OPC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the OPC

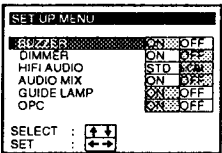
Press MENU and select SET UP MENU, then set OPC to OFF. The OPC indicator in the display window goes off.

Notes

- You can adjust the tracking for the NTSC-recorded tape but the tracking meter won't be displayed.
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the OPC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the OPC indicator flashes rapidly). After the OPC indicator stops flashing, press ■ PAUSE to start recording immediately. If you want to start recording quickly without using the OPC function, first set the VCR to recording pause (the OPC indicator flashes slowly) and press ■ PAUSE to start recording.

Changing menu options

1 Press MENU, then select SET UP MENU.



2 Press CURSOR ↑/↓ to select the option to change, then press CURSOR ←/→ to change the setting.

3 Press EXECUTE to return to the original screen.

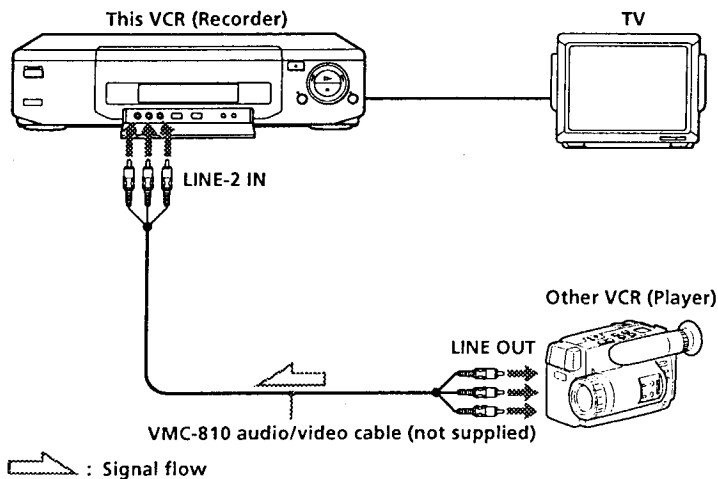
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
BUZZER	ON to output a beep sound when all illogical operation is made. OFF to deactivate it.
DIMMER	ON to make the display window dim, OFF to make it brighter.
HIFI AUDIO	STD to record standard sound on the hi-fi audio track. NICAM to record NICAM broadcasts on the hi-fi audio track. For details, see page 50.
AUDIO MIX	ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. OFF to listen to the hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button. For details, see page 50.
GUIDE LAMP	ON to illuminate the ● REC button on the VCR in orange when you can start recording. OFF to turn it off.
OPC	ON to switch on the OPC (Optimum Picture Control) function and improve picture quality, OFF to switch off OPC. For details, see page 52.

Connecting to a VCR or stereo system

How to connect to record on this VCR



Notes

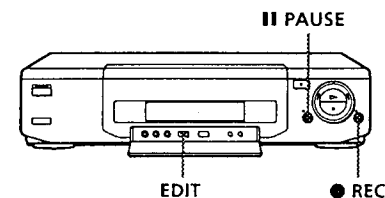
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can also use the EURO-AV (LINE-1 or LINE-3 IN) connector instead.

How to connect to a stereo system

Connect the LINE-2 IN AUDIO L/R jacks on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

Basic editing

(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" (or "L1" or "L3" depending on the connection) in the display window.
- Press TAPE SPEED to select the tape speed, SP or LP.
- On this VCR, set the EDIT switch to ON. If the other VCR has a similar switch, set it to ON as well.

- 1 Insert a source tape with its safety tab removed into the other (playback) VCR.
Search for the point to start playback and set it to playback pause.
- 2 Open the drop down panel and insert a tape with its safety tab in place into this (recording) VCR.
Search for the point to start recording and press **II PAUSE**.
- 3 Press **● REC** on this VCR and set it to recording pause.
- 4 To start editing, press the **II PAUSE** buttons on both VCRs at the same time.

To stop editing

Press the **■ STOP** buttons on both VCRs.

Tips

- To edit more precisely, press the **II PAUSE** buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press **II PAUSE** on this VCR when an unwanted scene begins. When it ends, press **II PAUSE** again to resume recording (Assemble Editing).

Note

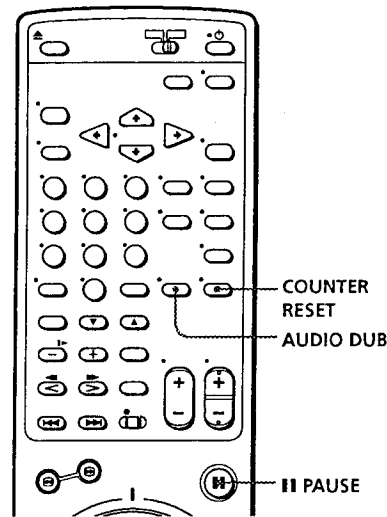
- If you start recording following the procedure above, the VCR won't start recording with the OPC function. To record a tape with the OPC function, press **● REC** again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press **II PAUSE** after the OPC indicator stops flashing. If you press **II PAUSE** before the OPC indicator stops flashing, the OPC function is cancelled.

Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.

Before you start editing...

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.



- 1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.
- 2 Open the drop down panel and insert a prerecorded tape with its safety tab in place into this (recording) VCR. Search for the end of the section to be replaced and press **PAUSE**.
- 3 Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."
- 4 Rewind the prerecorded tape to the beginning of the section to be replaced.
The VCR pauses.
- 5 Press AUDIO DUB.
The audio dubbing indicator $\ominus$ appears in the display window.
- 6 To start editing, press the **PAUSE** buttons on this VCR and the stereo system (or other VCR) at the same time.
When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while editing

Press the **STOP** buttons on this VCR and the stereo system (or other VCR).

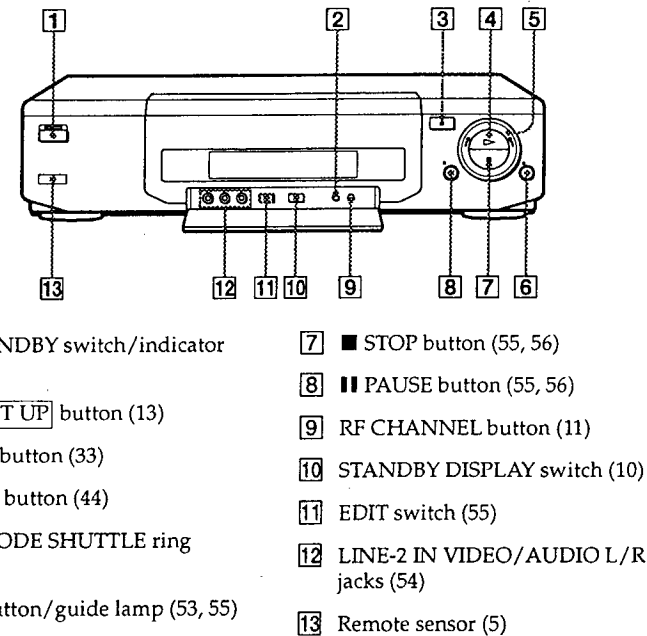
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the SET UP MENU (page 53). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

Refer to the pages indicated in parentheses () for details.

Front panel

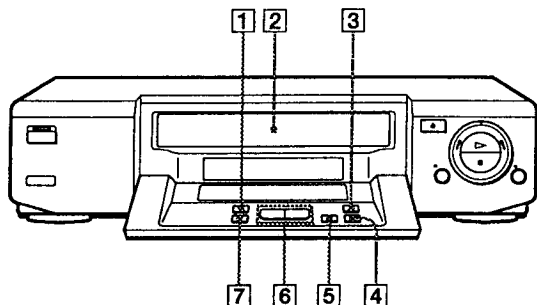


- | | |
|---|---|
| 1 ON/STANDBY switch/indicator (11) | 7 STOP button (55, 56) |
| 2 EASY SET UP button (13) | 8 PAUSE button (55, 56) |
| 3 EJECT button (33) | 9 RF CHANNEL button (11) |
| 4 PLAY button (44) | 10 STANDBY DISPLAY switch (10) |
| 5 DUAL MODE SHUTTLE ring (33, 44) | 11 EDIT switch (55) |
| 6 REC button/guide lamp (53, 55) | 12 LINE-2 IN VIDEO/AUDIO L/R jacks (54) |
| | 13 Remote sensor (5) |

continued

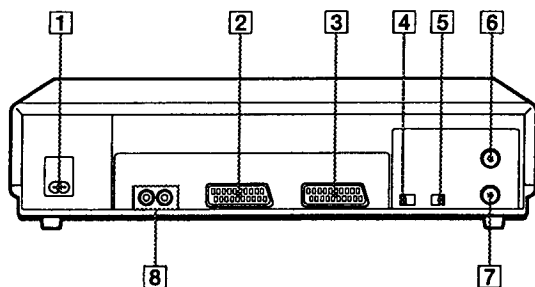
Index to parts and controls (continued)

Front panel, with cover opened



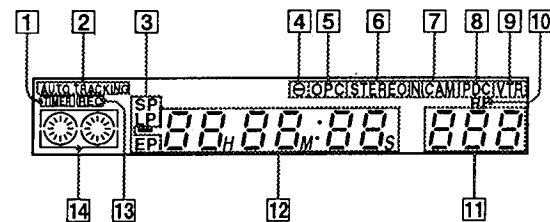
- | | |
|---------------------------|------------------------------------|
| 1 TV/VTR button (10, 36) | 5 COUNTER RESET button (33) |
| 2 Tape compartment | 6 PROGRAM +/- buttons (11) |
| 3 QUICK TIMER button (46) | 7 INPUT SELECT button (37, 55, 56) |
| 4 TAPE SPEED button (36) | |

Rear panel



- | | |
|--|--|
| 1 AC IN connector (9) | 6 AERIAL OUT/
ANTENNE SORTIE
connector (9) |
| 2 EURO-AV (LINE-1)/PERITEL
(LIGNE-1) /DISP ON/AVEC
AFFICH connector (10) | 7 AERIAL IN/ANTENNE
ENTREE connector (9) |
| 3 EURO-AV (LINE-3 IN)
connector (37, 42, 43) | 8 AUDIO OUT L/R/
SORTIE AUDIO D/G
jacks (10) |
| 4 NTSC PB switch (33) | |
| 5 RF MODULATOR switch (9) | |

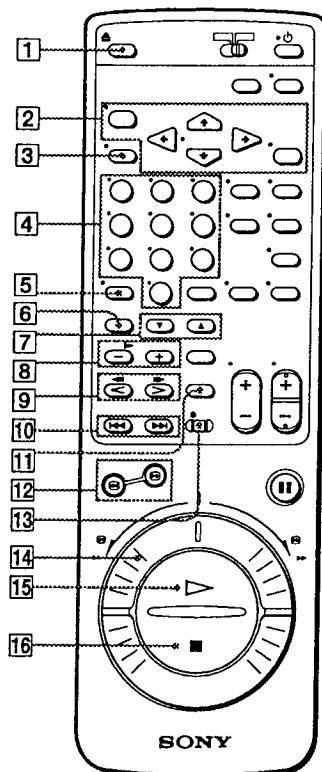
Display window



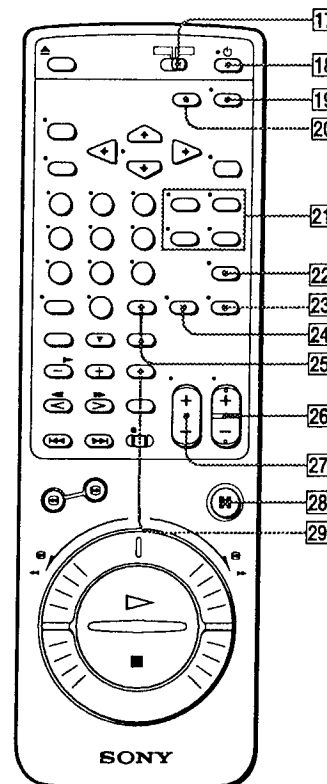
- | | |
|--------------------------------|--|
| 1 TIMER indicator (39, 42) | 9 VTR indicator (10, 36) |
| 2 AUTO TRACKING indicator (52) | 10 RF indicator (11) |
| 3 Tape speed indicator (36) | 11 Line/programme position indicator
(11, 35, 55, 56) |
| 4 Audio dubbing indicator (56) | 12 Time counter/clock (33) |
| 5 OPC indicator (52) | 13 REC indicator |
| 6 STEREO indicator (49) | 14 Tape indicator |
| 7 NICAM indicator (49) | |
| 8 PDC indicator (43) | |

continued

Remote commander



- 1 ▲ EJECT button (33)
- 2 Menu buttons (13)
MENU button
CURSOR ↑/↓/←/→ buttons
EXECUTE button
- 3 AUDIO MONITOR button (50)
- 4 Programme number buttons (7, 18, 38)
- 5 -/-- (ten's digit) button (37)
- 6 TRACKING AUTO/MANUAL button (52)
- 7 ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST buttons (45, 52)
- 8 ► SLOW +/- buttons (44)
- 9 ◀/▶ FRAME </> buttons (44)
- 10 ◀◀/▶▶ INDEX SEARCH buttons (51)
- 11 INPUT SELECT button (37, 42, 55, 56)
- 12 🔍/🔍 SEARCH buttons (33, 44)
- 13 ● REC button (36)
- 14 DUAL MODE SHUTTLE ring (33, 44)
- 15 ▷ PLAY button (32)
- 16 ■ STOP button (33)



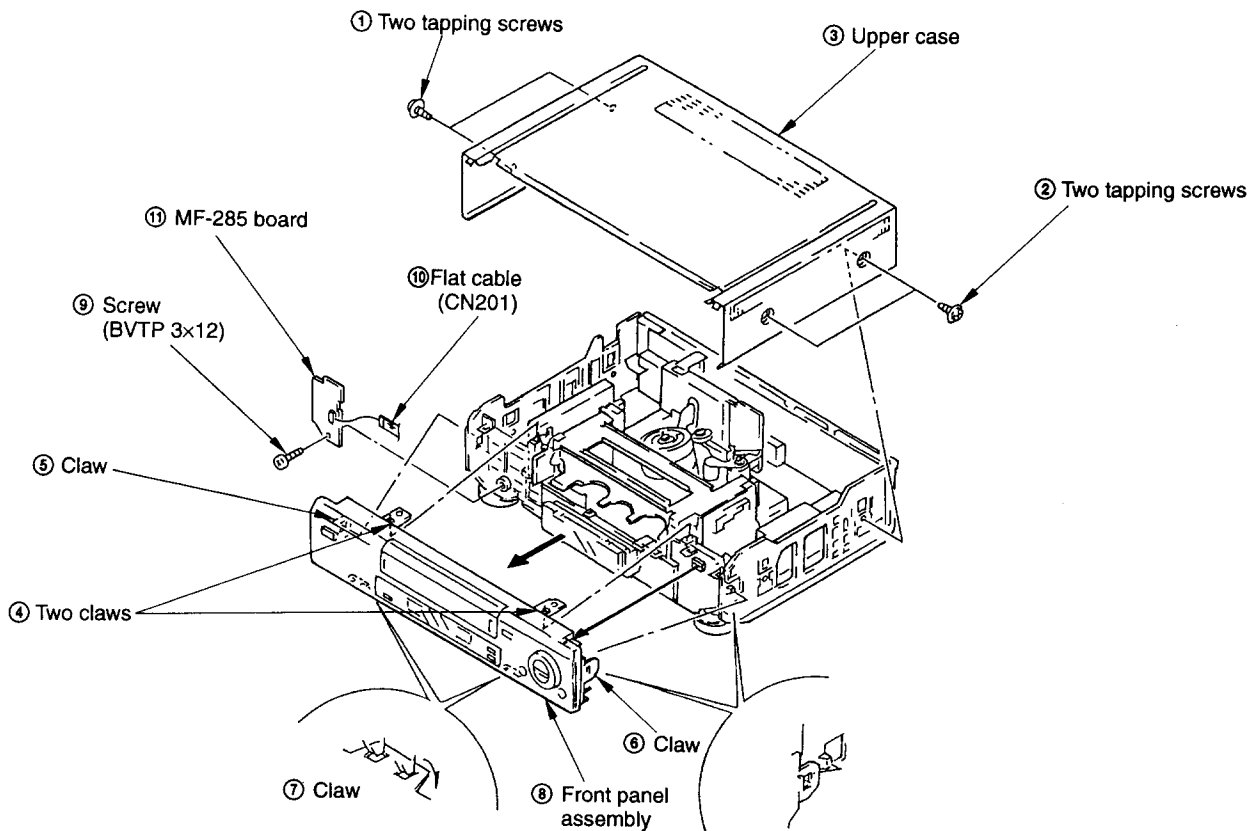
- 17 TV / VTR remote control switch (7)
- 18 ⏻ (on/standby) switch (6, 7, 42)
- 19 TV/VIDEO button (6, 10)
- 20 TIMER CLEAR button (27, 39, 47)
- 21 VIDEO Plus+ buttons (38, 39)
VIDEO Plus+ button
ONCE button
DAILY button
WEEKLY button
FASTTEXT buttons (6, 7)
- 22 DISPLAY button (36)
- 23 COUNTER RESET button (33)
□ TV power on/TV mode select button (for TV) (6, 7)
- 24 AUDIO DUB button (56)
📄 Teletext button (for TV) (6, 7)
- 25 SKIP button (44)
- 26 PROG +/- buttons (17, 35)
📄/📄 Teletext page access buttons (for TV) (6, 7)
- 27 VOL +/- buttons (for TV)
- 28 ⏸ PAUSE button (33)
- 29 TAPE SPEED button (36)

SECTION 2

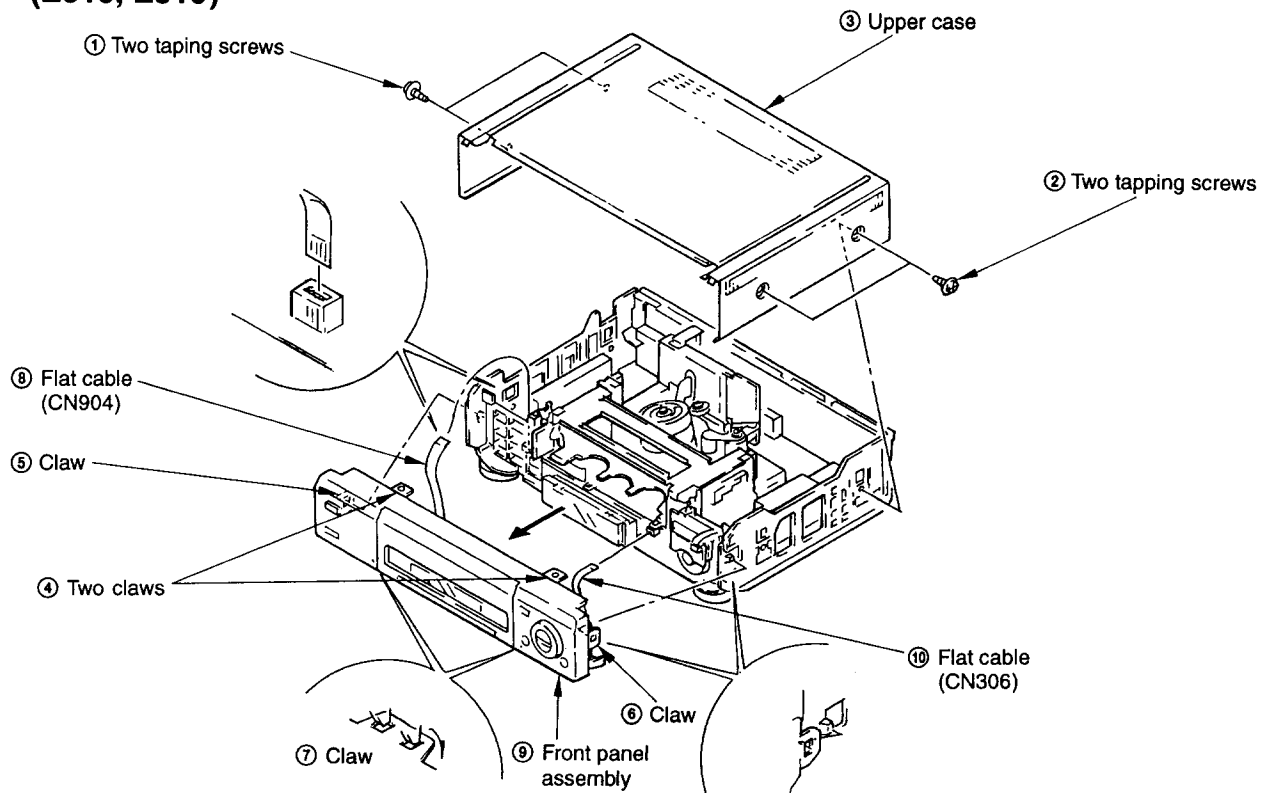
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

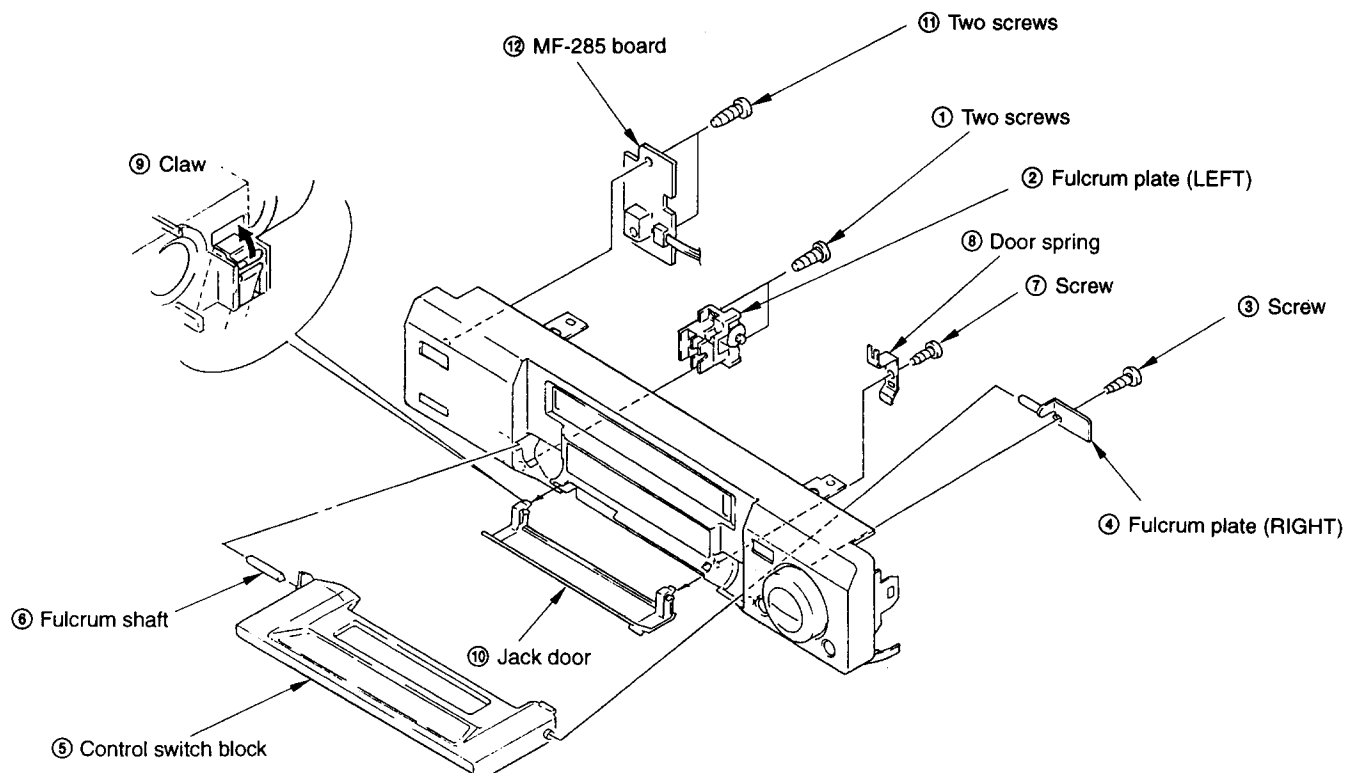
2-1. FRONT PANEL ASSEMBLY, CASE AND MF-285 BOARD (E710)



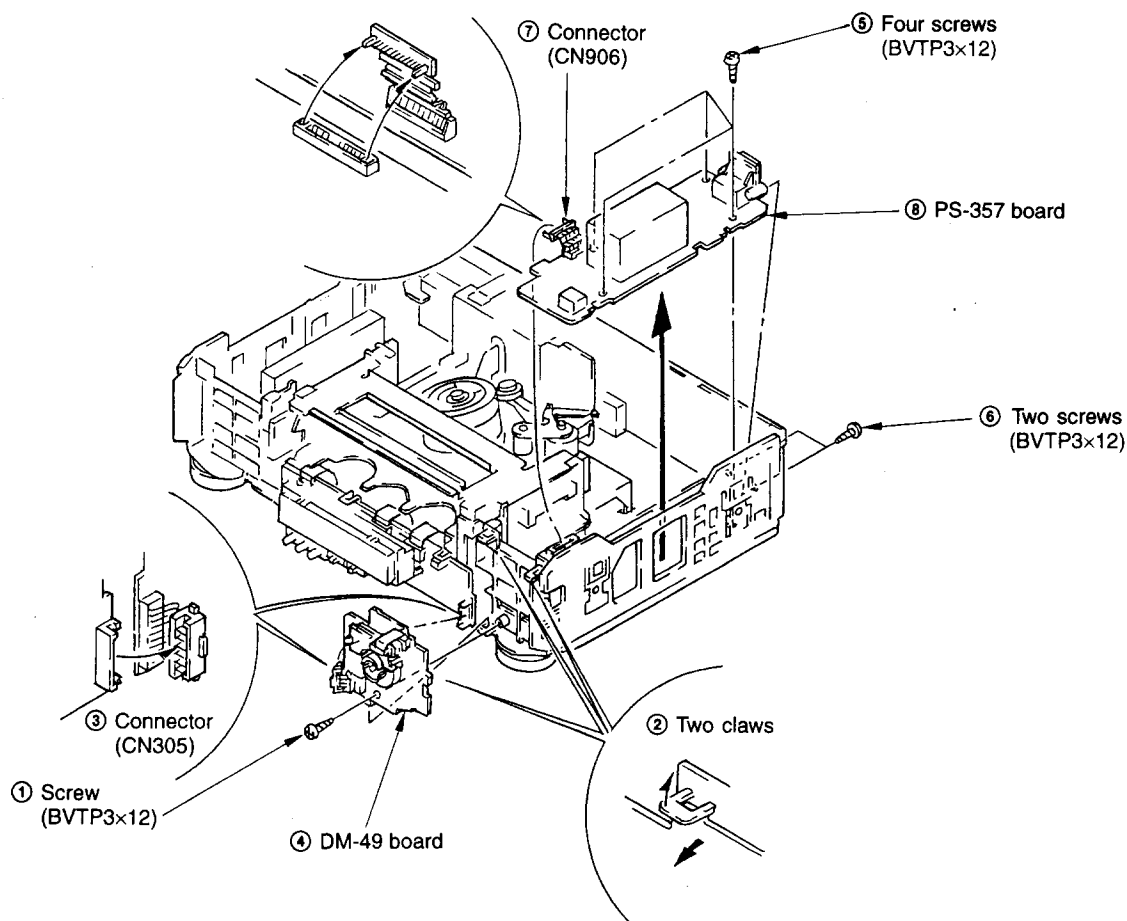
2-2. FRONT PANEL ASSEMBLY AND CASE (E510, E810)



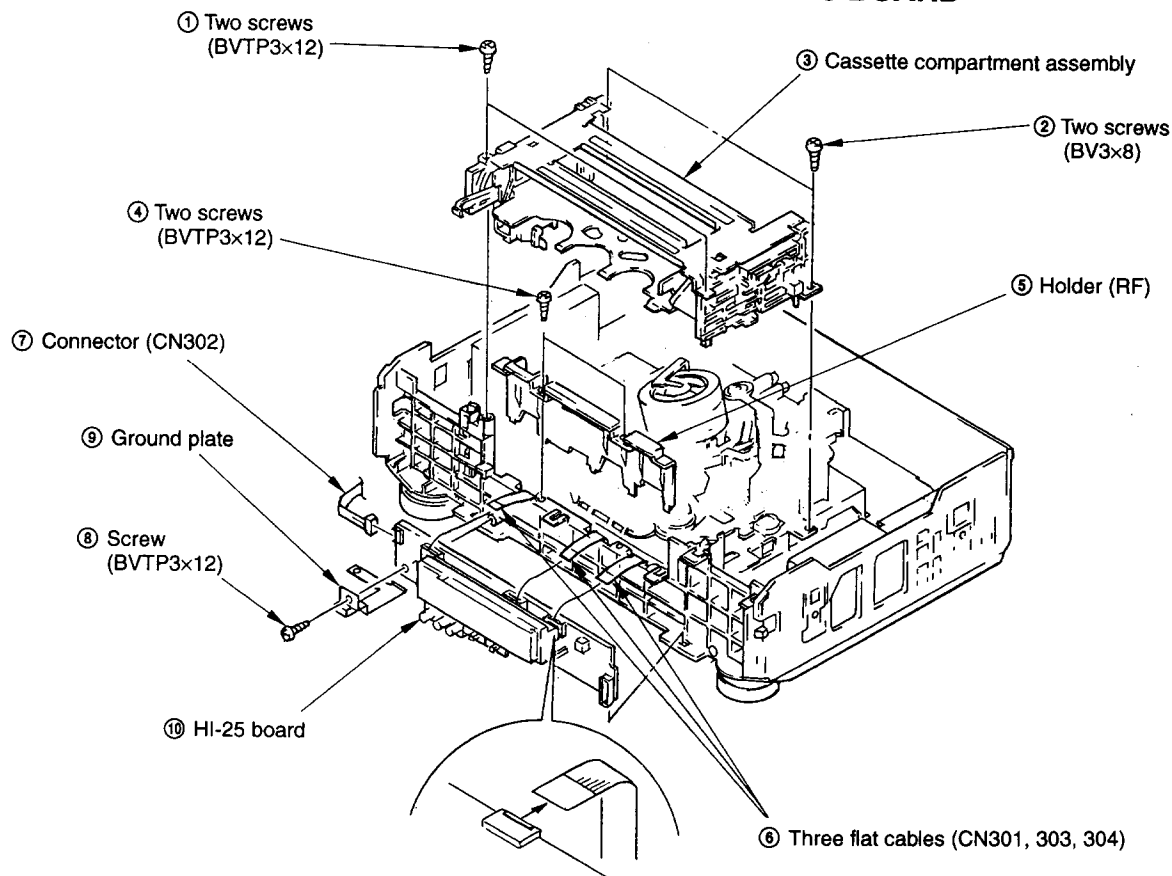
2-3. CONTROL SWITCH BLOCK AND MF-285 BOARD (E510, E810)



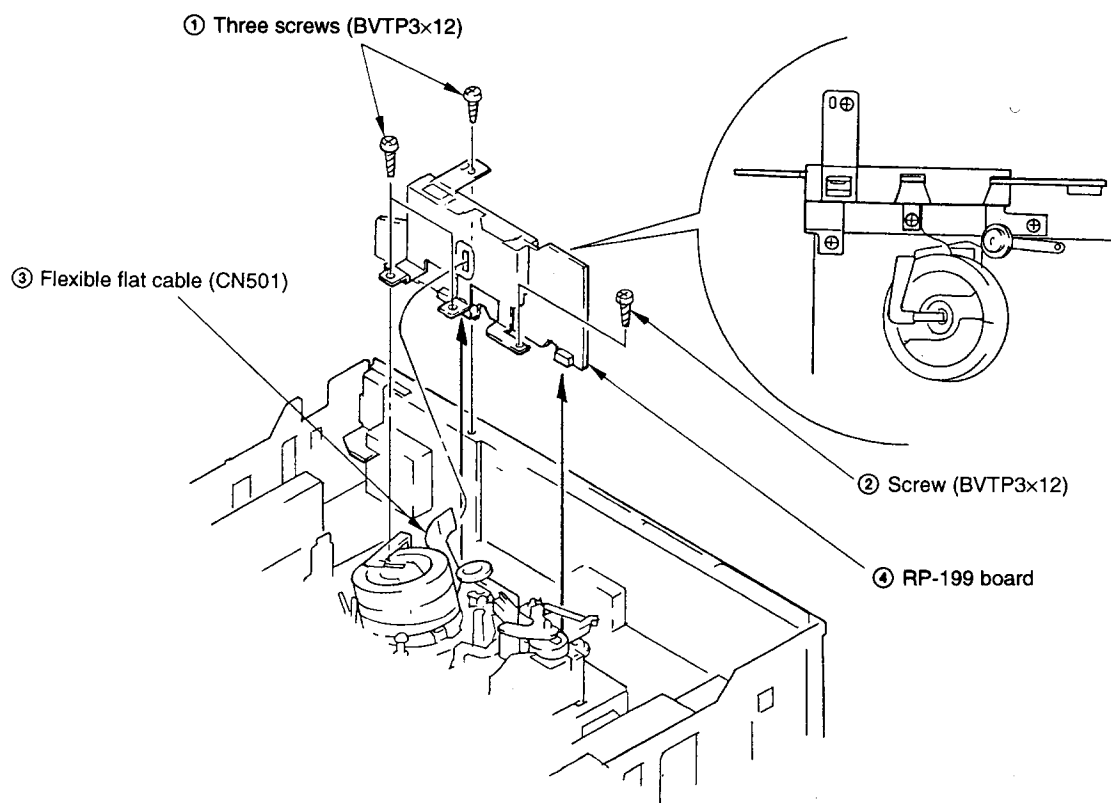
2-4. DM-49 BOARD AND PS-357 BOARD



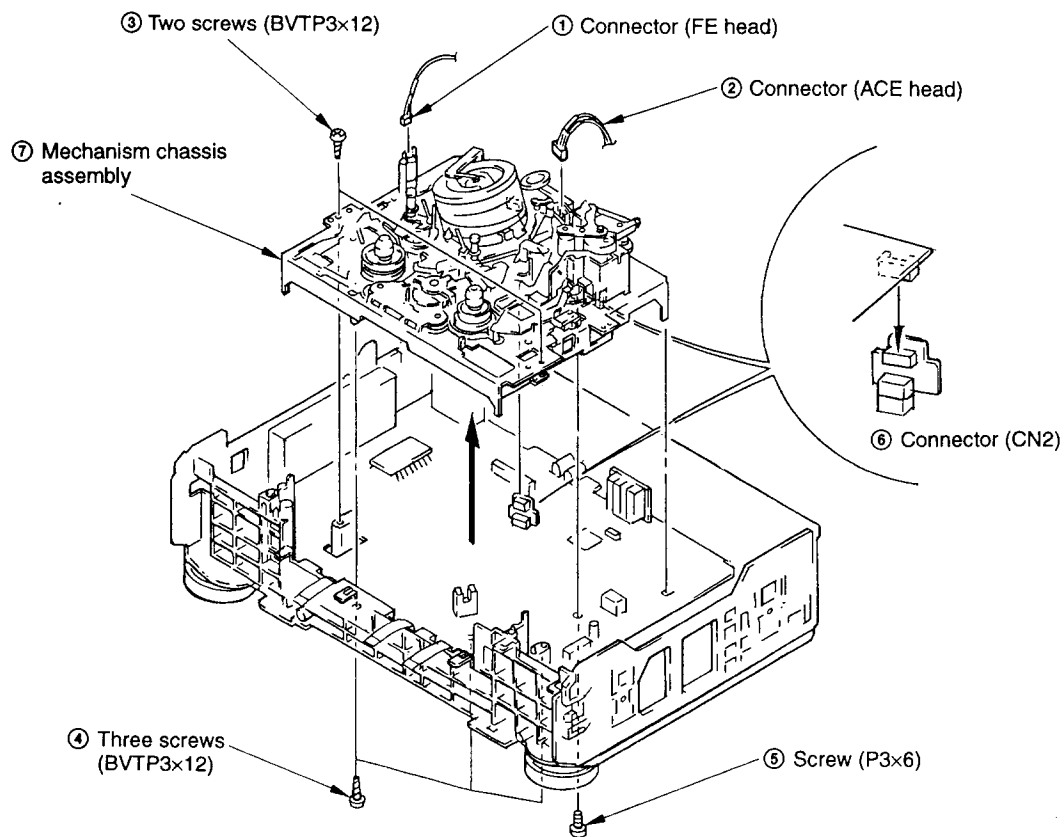
2-5. CASSETTE COMPARTMENT ASSEMBLY AND HI-25 BOARD



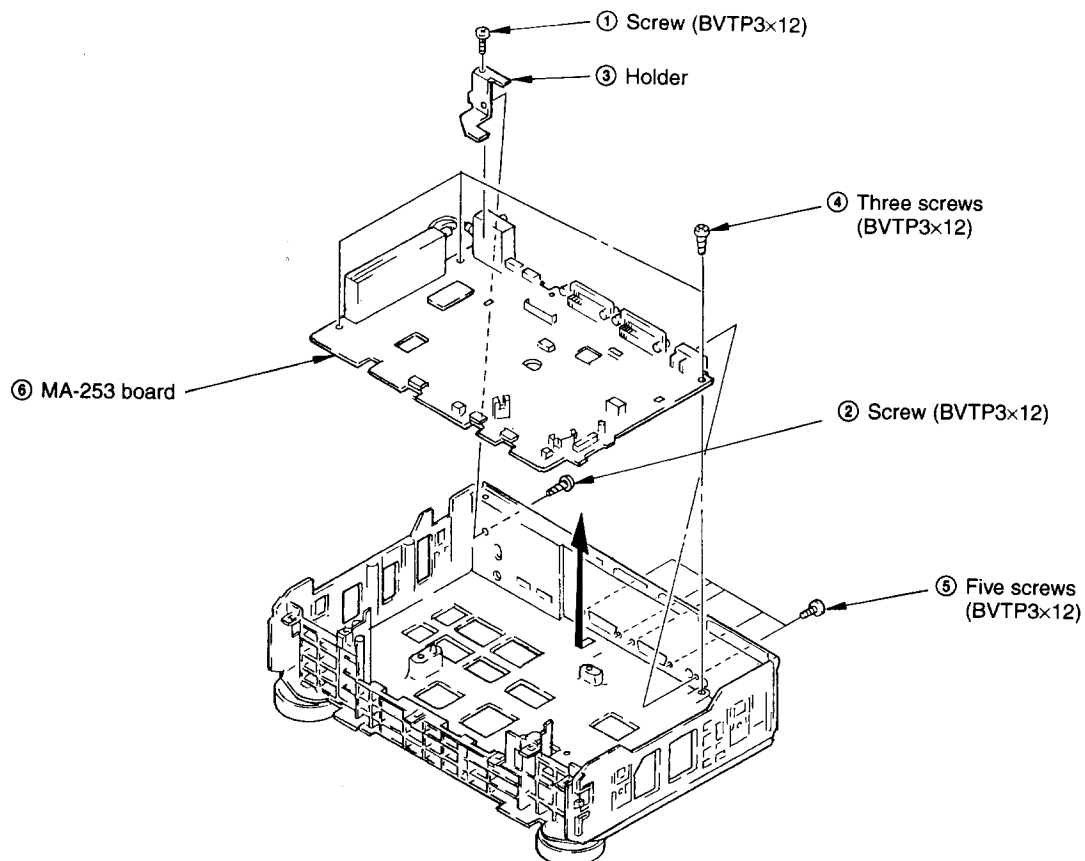
2-6. RP-199 BOARD



2-7. MECHANISM CHASSIS ASSEMBLY



2-8. MA-253 BOARD

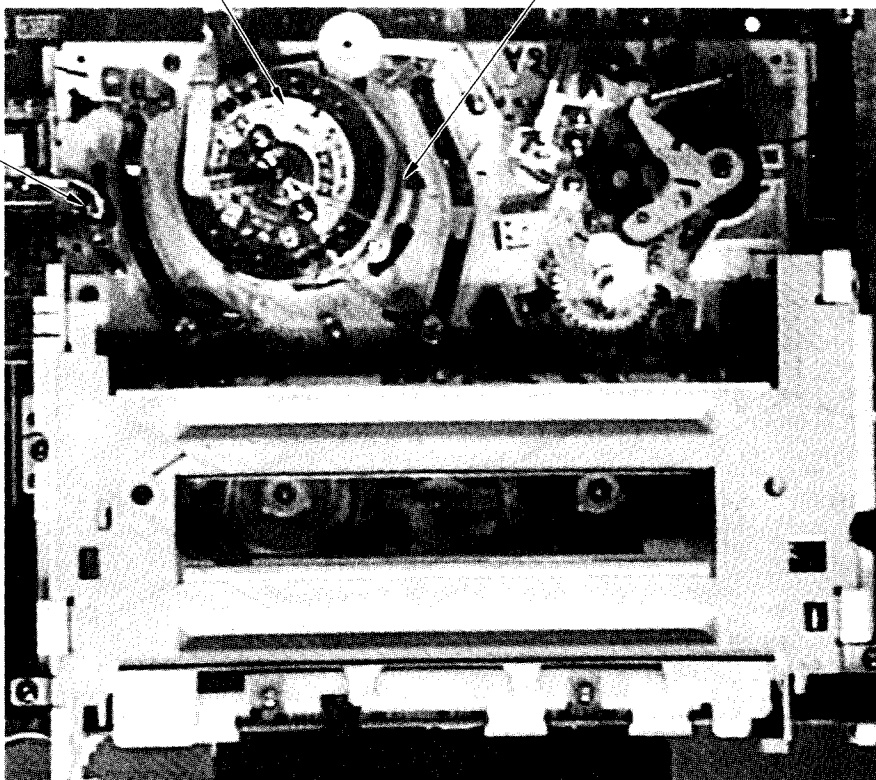


2-9. INTERNAL VIEWS

Drum assembly (DZH-74B/Q-RP)
8-848-682-11 (E510)
Drum assembly, rotary upper (DZR-66-R)
8-848-622-02 (E710, E810)

Drum assembly, lower (DZL-51/J-RP)
8-848-666-11 (E710, E810)

FE head
1-500-144-11



M902
Capstan motor (SCV-0801A/Z-NP)
1-698-409-11

Drum assembly (DZH-74B/Q-RP)
8-848-682-11 (E510)
Drum assembly, lower (DZL-51/J-RP)
8-848-666-11 (E710, E810)

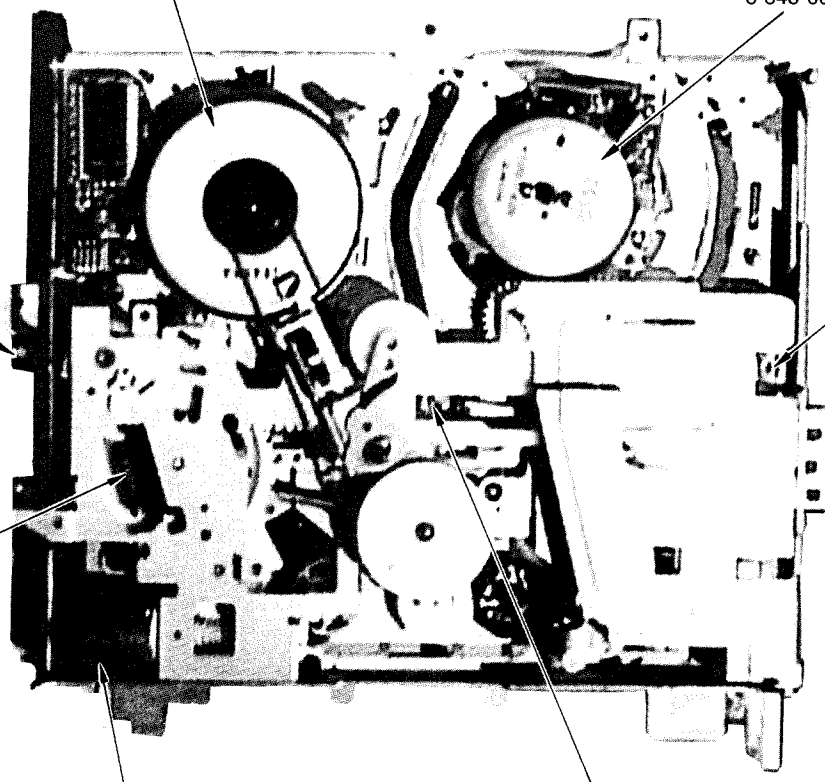
Q261
Tape top sensor
8-729-025-92

Q262
Tape end sensor
8-729-025-92

Rotary switch
1-762-076-11

M903
Cam motor assembly
X-3943-883-1

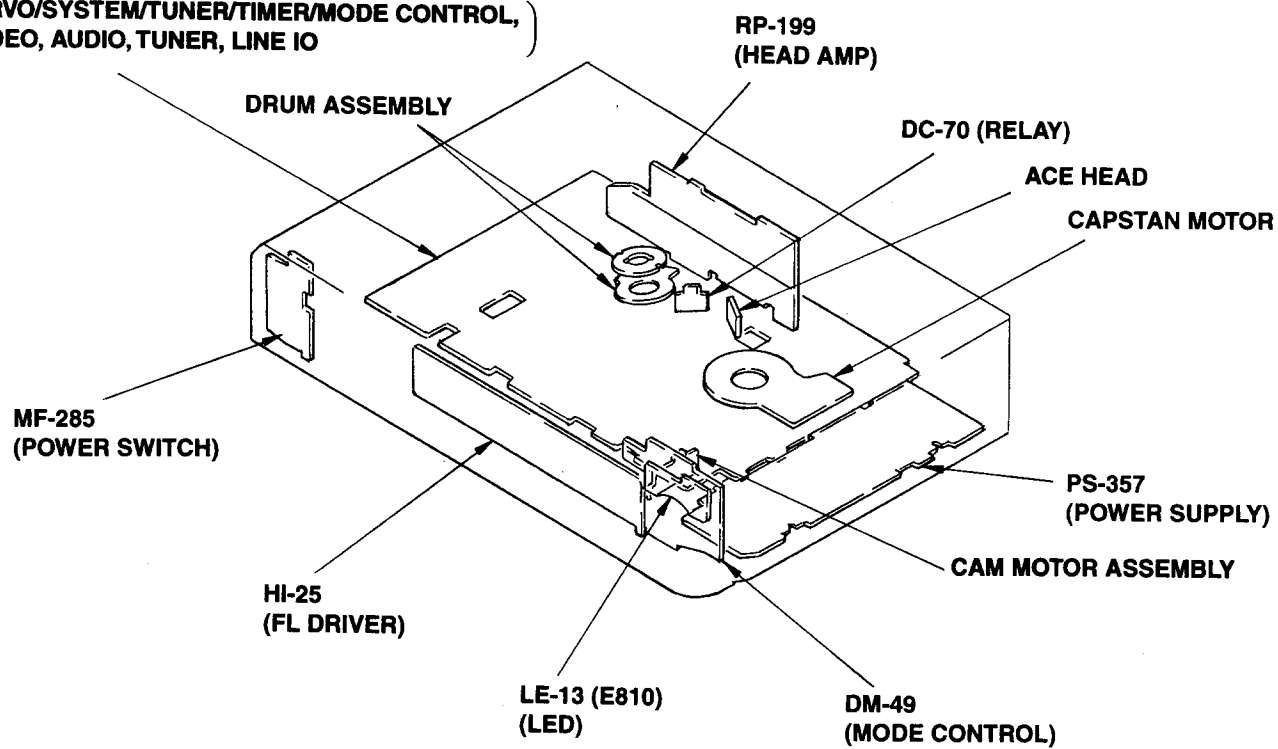
D261
Tape top/end LED
8-719-048-26



2-10. CIRCUIT BOARDS LOCATION

MA-253

(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL,
VIDEO, AUDIO, TUNER, LINE IO)

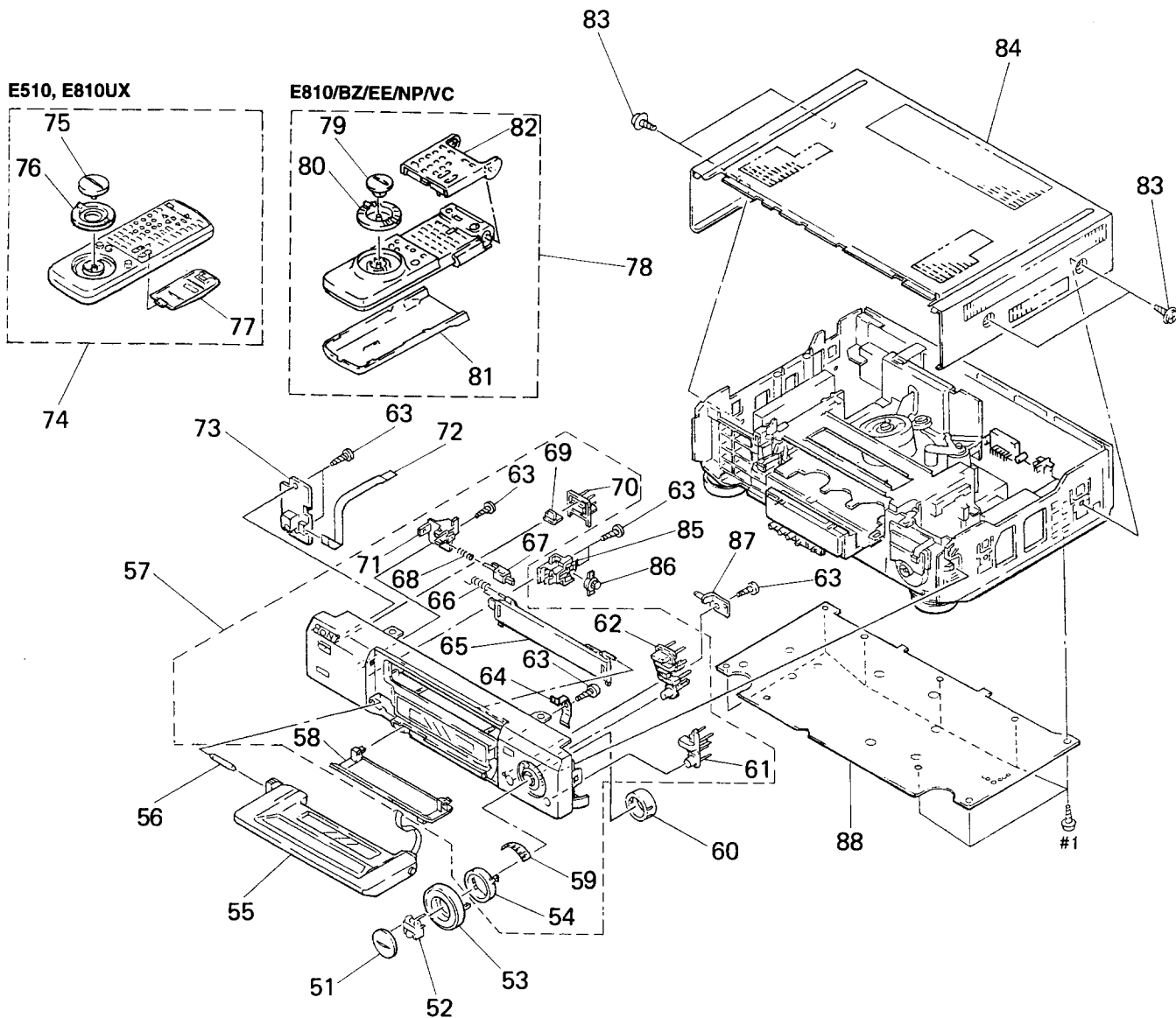


This exploded view diagram illustrates the assembly of a car stereo unit. The components are numbered as follows:

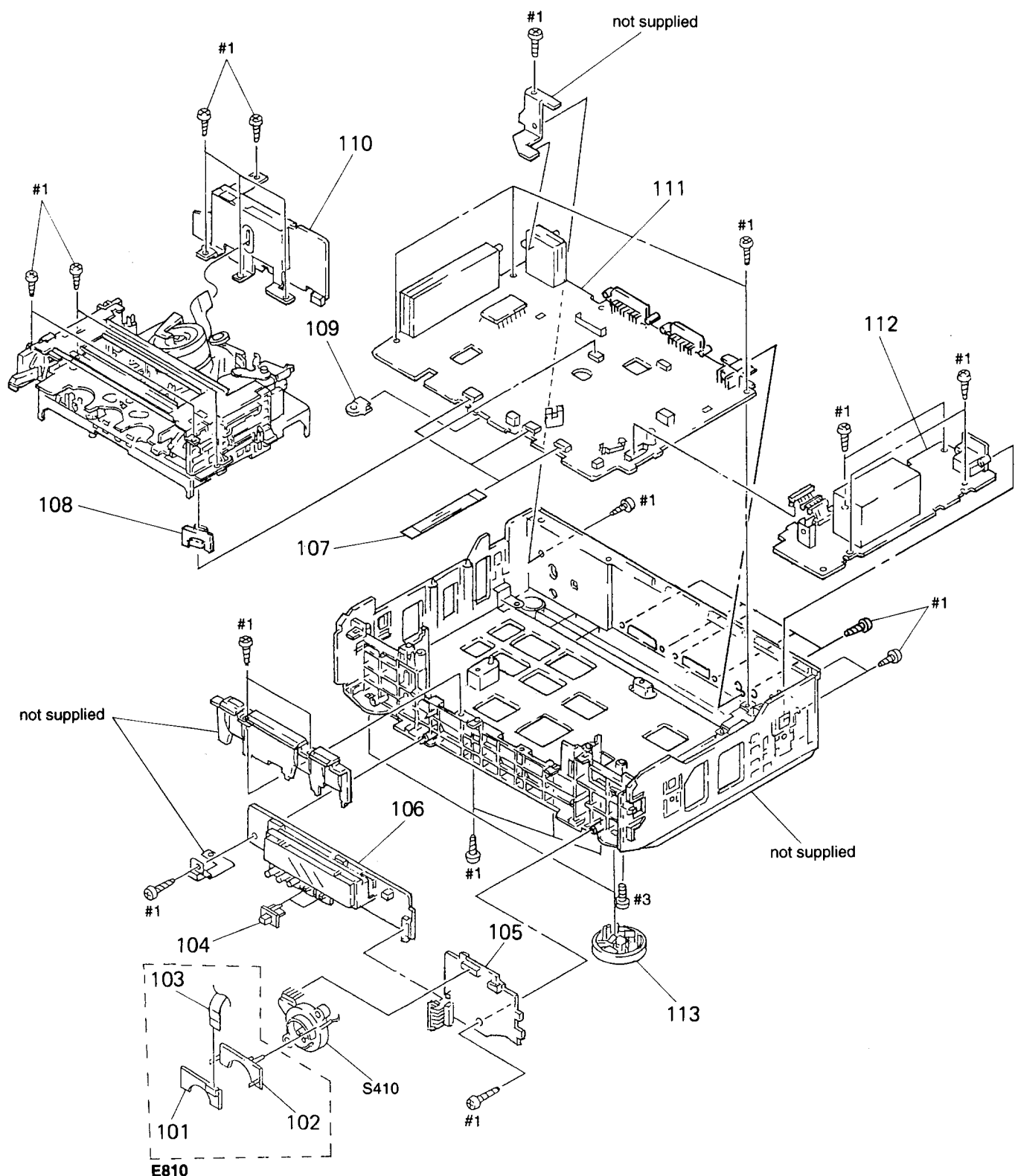
- 1**: A small screw.
- 2**: A pulley or wheel.
- 3**: A pulley or wheel.
- 4**: A long metal bracket or frame.
- 5**: A metal plate or cover.
- 6**: A small screw.
- 7**: A small screw.
- 8**: A small screw.
- 9**: A small screw.
- 10**: A metal plate or cover.
- 11**: A small screw.
- 12**: A small screw.
- 13**: A small screw.
- 14**: A small screw.
- 15**: A metal plate or cover.
- 16**: A small screw.
- 17**: A small screw.
- 18**: A small screw.
- 19**: A small screw.
- 20**: A small screw.
- 21**: A small screw.

The diagram shows the stereo unit (21) being assembled onto the car's dashboard (15). The unit is secured by screws (20) and a bracket (4). The internal components, including the cassette deck (10) and amplifier (11), are shown being installed into the unit's chassis (5). The front panel (6) is shown being attached to the unit. The diagram also shows the installation of the stereo unit into the car's dashboard (15) using a bracket (4) and screws (20).

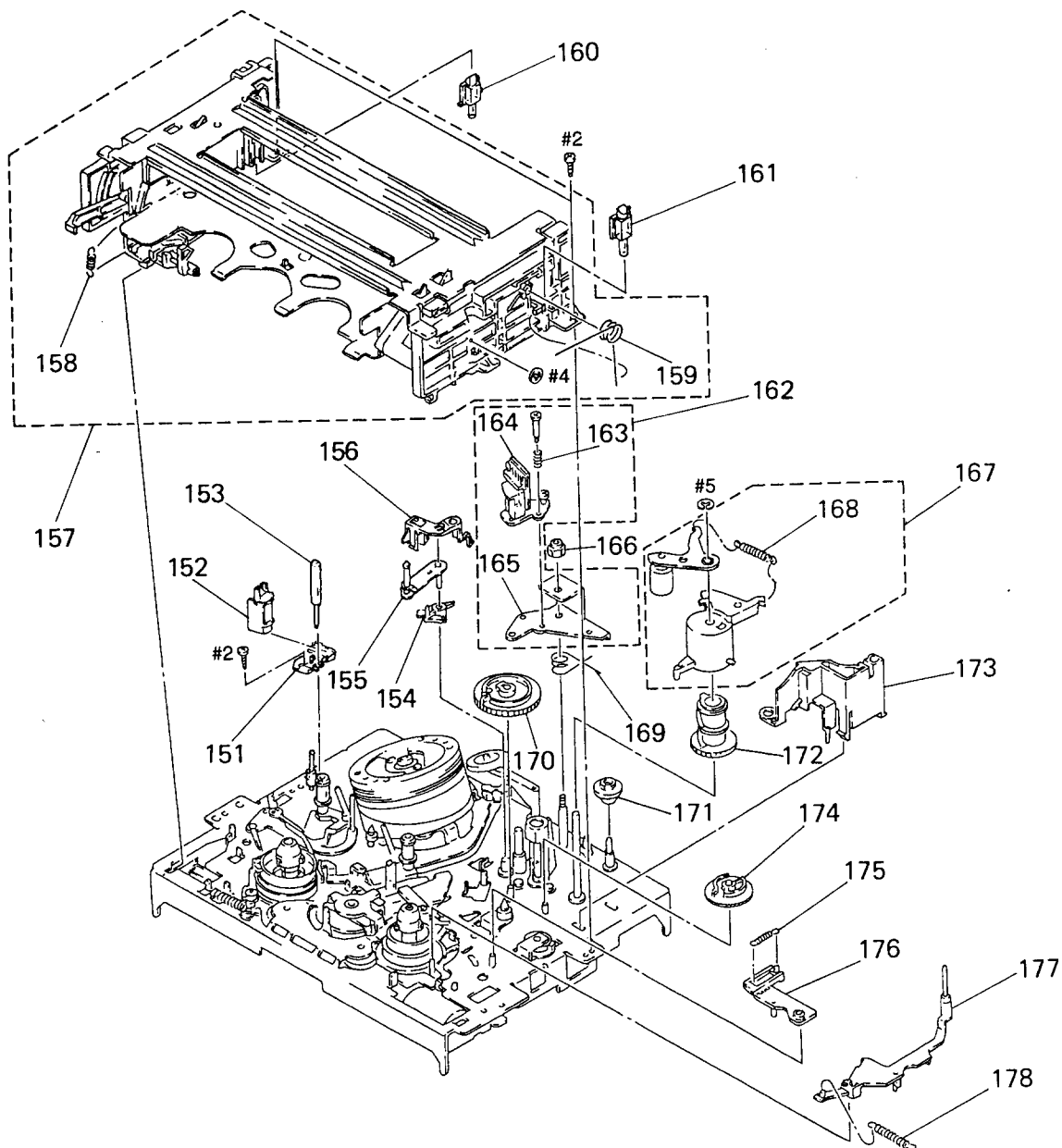
5-1-2. FRONT PANEL AND CABINET ASSEMBLIES (E510, E810)



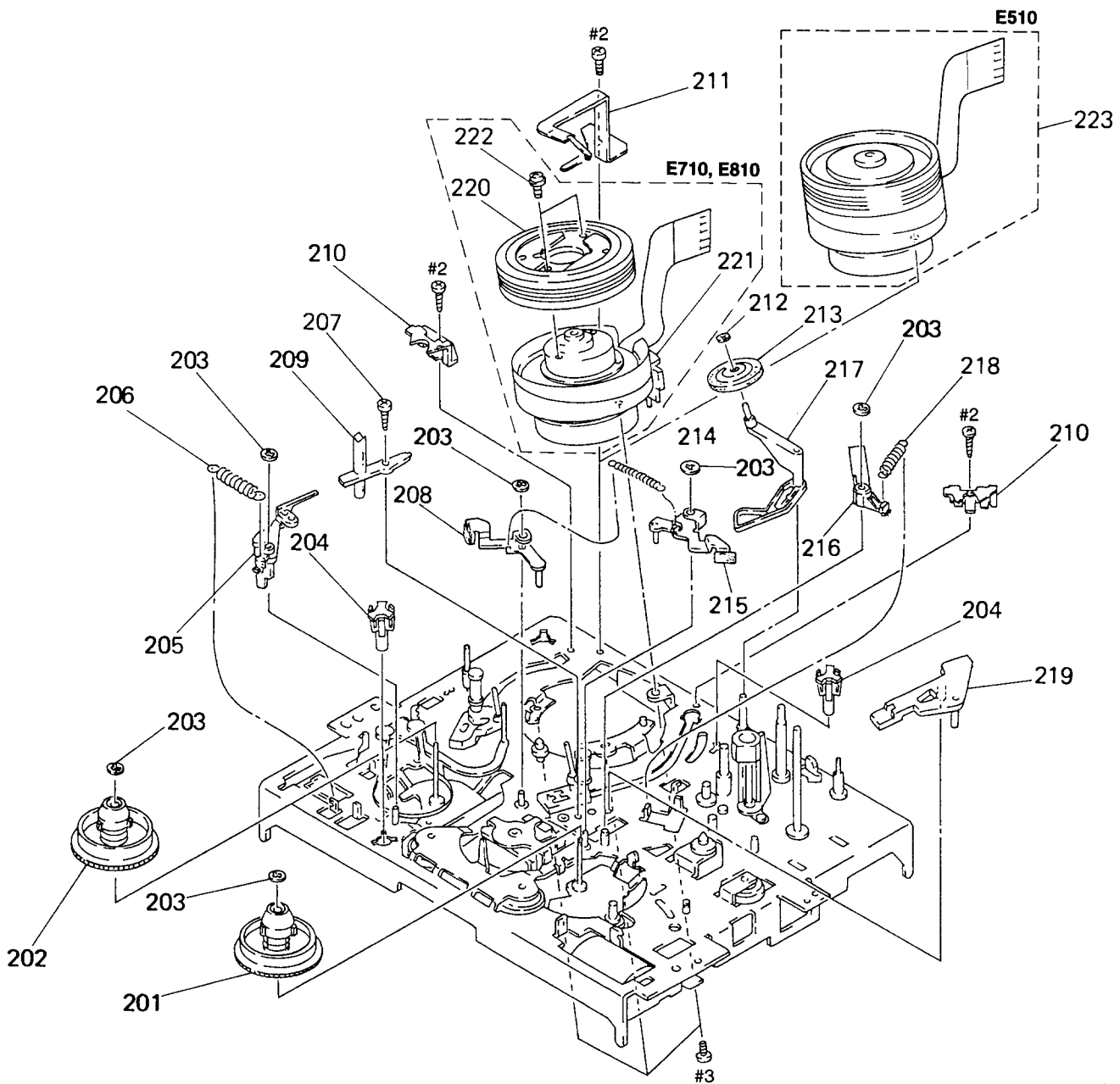
5-1-3. CHASSIS ASSEMBLY



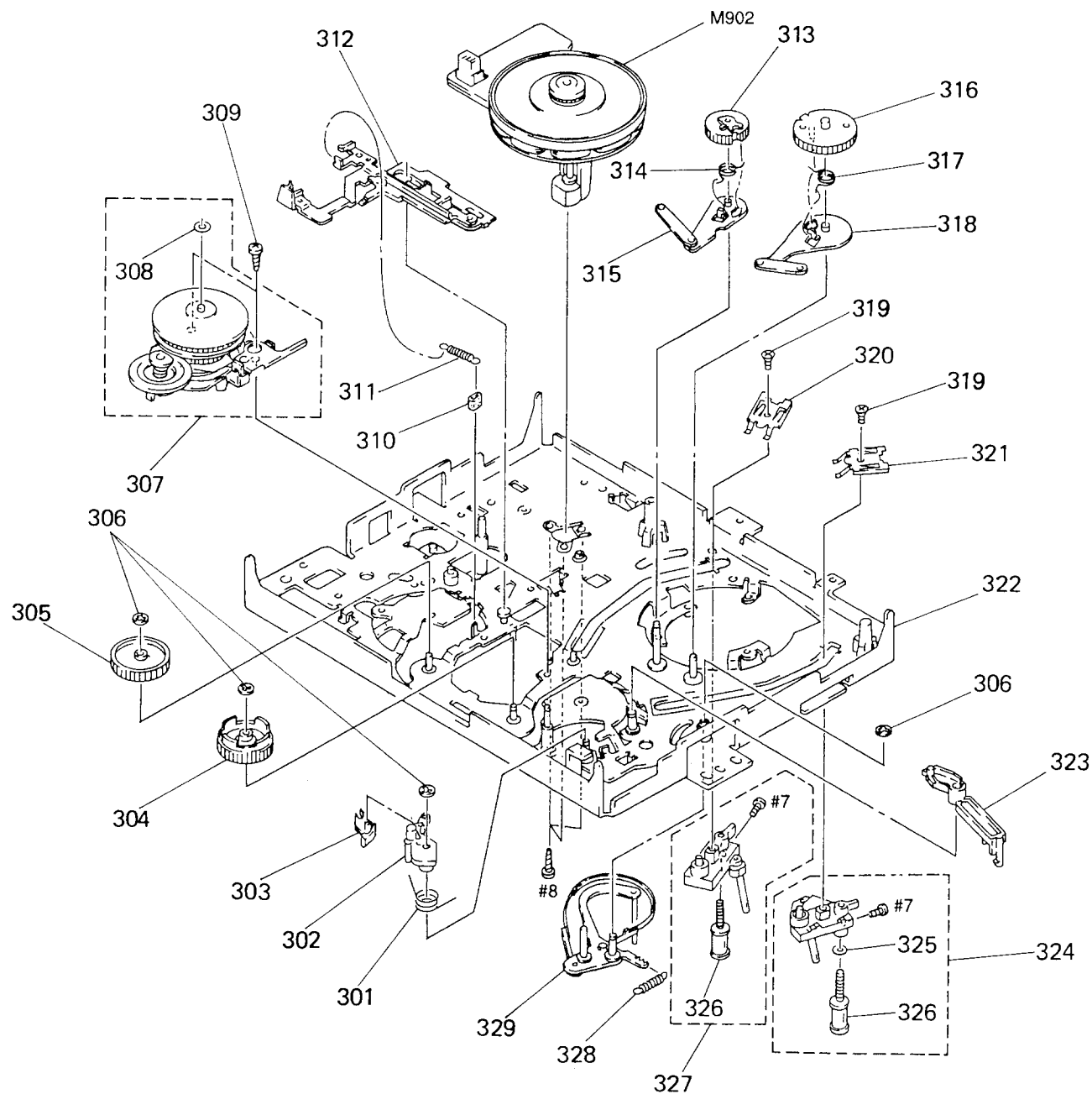
5-1-4. MECHANISM CHASSIS ASSEMBLY (1)



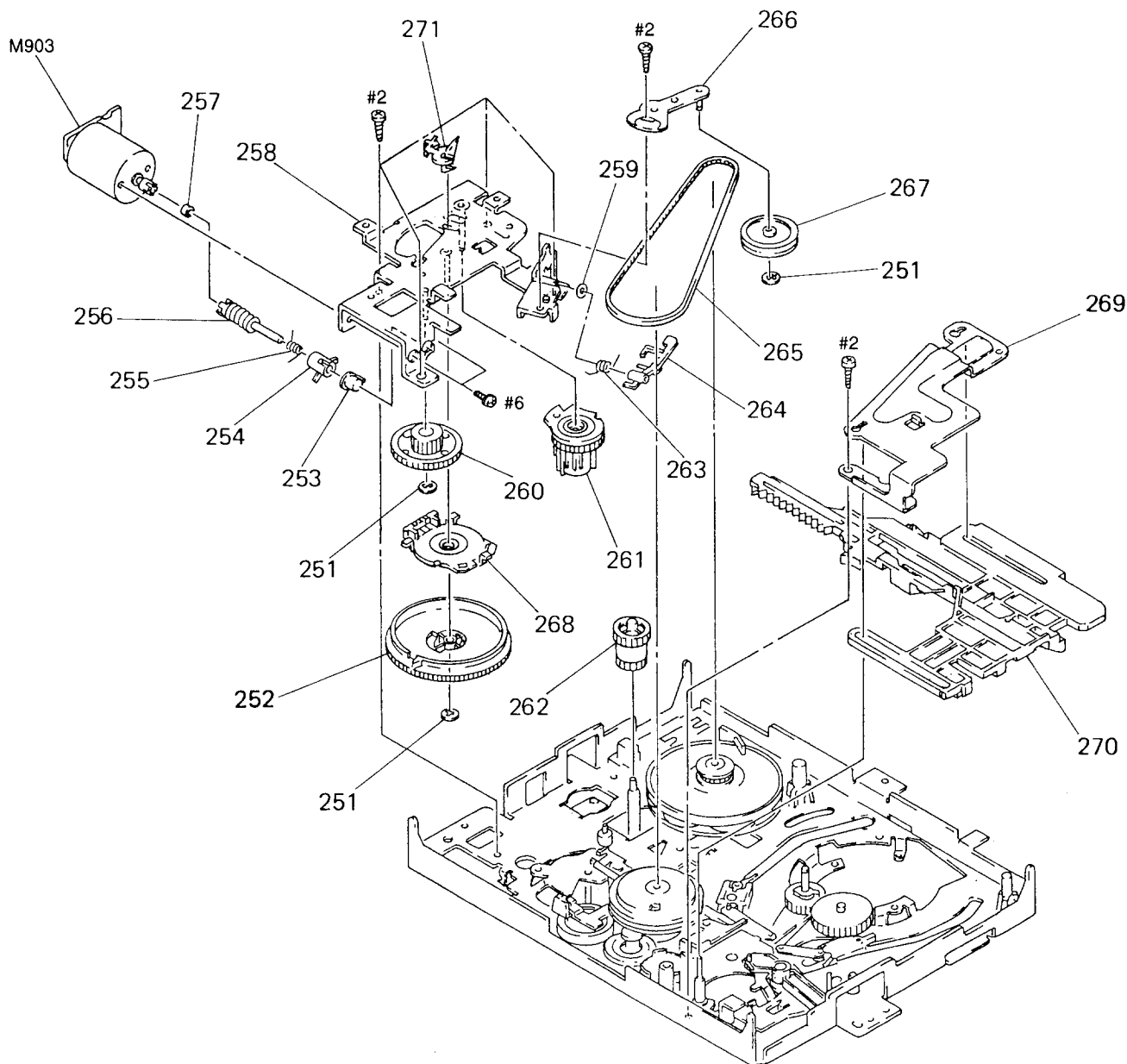
5-1-5. MECHANISM CHASSIS ASSEMBLY (2)



5-1-7. MECHANISM CHASSIS ASSEMBLY (4)



5-1-6. MECHANISM CHASSIS ASSEMBLY (3)



SECTION 6 INTERFACE, IC PIN FUNCTION DESCRIPTION

6-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-253 BOARD IC201)

Signal	Pin No.	VO	STOP FF/ REW	TAPE THREAD- ING	TAPE UNTHREAD- ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
V PB	MA-253 IC201⑩	O	H	H	H	L	L	L	L	L	L	H	H
RF SWP (SW30)	MA-253 IC201⑪	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-253 IC201⑫	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
NA SP	MA-253 IC201⑬	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
SP/EP/EP	MA-253 IC201⑭	O	*8	*8	*8	*5	*5	*5	*5	*5	*5	*8	*8
V SYNC	MA-253 IC201⑮	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
REC CTL	MA-253 IC201⑰	O	L	L	L	L	L	L	L	L	L	H	L
BLUE BACK ON	MA-253 IC201⑱	O	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	MA-253 IC201⑲	O	L	L	L	L	H	H	L	L	L	L	L
ORC SETTEI	MA-253 IC201⑳	O	L	L	L	L	L	L	L	L	L	*9	*9
NTSC	MA-253 IC201㉑	O	L	L	L	L	L	L	L	L	L	L	L

- *1. Synchronized with drum rotation. 30 Hz 50% duty pulse.
- *2. Normally "L". "H" when CTL signal is not generated.
- *3. V period "H" pulse.
- *4. Selected by REC mode. SP mode: "L"
- *5. Selected by tape recording mode.

- *6. Composite Sync signal (positive).
- *7. "H" when menu screen or blue back screen.
- *8. Selected by REC mode: "H" LP mode.
- *9. "H" during APC measurement.

Mode Signal	SP	LP	EP
SP ㉒	L	H	H
SP/LP/EP ㉓	L	L	H

6-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-253 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD -ING	TAPE UNTHREAD -ING	PB	PB • PAUSE	SLOW	CUE	× 2	REVIEW	REC	REC • PAUSE	PB INDEX WRT/ERS
REC CTL	MA-253 IC201⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
CAP STOP	MA-253 IC201⑤	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	MA-253 IC201⑩	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	MA-253 IC201⑦	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL-INDEX	MA-253 IC201⑦	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
PB CTL	MA-253 IC201⑦	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRM PG	MA-253 IC201⑩	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1	
DRM FG	MA-253 IC201⑩	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
CAP FG	MA-253 IC201⑦	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L	
CAP DA	MA-253 IC201⑦	O	*8	*8	*8	*8	*8	*9	*8	*8	*9	*9	*9	*9	*8	
DRM DA	MA-253 IC201⑦	O	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	
CTL STEP	MA-253 IC201⑦	O	L	L	L	L	L	L	L	*11	L	L	L	L	L	

*1. 25 Hz pulse.

*2. Pulse at tape running.

*3. Reverse logic pulse of STEP PLS.

*4. "L" when drum rotation stop.

*5. Unstable period pulse.

*6. Pulse of period in proportion to tape speed.

*7. 300 Hz pulse.

*8. Approx. 2 msec period "H" or "L" pulse.

*9. Approx. 1.5 msec period "H" or "L" pulse.

*10. Approx. 3 msec period "H" or "L" pulse.

*11. "H" when FWD direction STEP drive.

6-3. SYSTEM CONTROL – MECHANISM INTERFACE (MA-253 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TEPE THREAD- ING	TAPE UNTHREAD- ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
CAM LOAD	MA-253 IC201⑬	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	MA-253 IC201⑭	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	MA-253 IC201⑮	O		H	L	H	L											
MODE 1	MA-253 IC201⑯	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-253 IC201⑰	I	L	L	L	*1	*1	L	L	L	H	H	H	H	H	H	H	H
MODE 3	MA-253 IC201⑱	I	L	L	L	*1	*1	H	H	H	L	H	H	L	L	H	L	H
MODE 4	MA-253 IC201㉑	I	L	H	H	*1	*1	H	L	L	L	L	L	L	L	L	L	L
REC PRF	MA-253 IC201⑲	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	MA-253 IC201㉒	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	MA-253 IC201㉓	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	MA-253 IC201㉔	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ 1	MA-253 IC201㉕	O (O.D)											*1					
CAP TRQ 2	MA-253 IC201㉖	O (O.D)										L	*1					L
CAP TRQ 3	MA-253 IC201⑱	O (O.D)							H	H			*1		H	H		
CAP STOP	MA-253 IC201㉗	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-253 IC201㉘	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-253 IC201㉙	O																
T SENS	MA-253 IC201㉚	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	MA-253 IC201㉛	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. Uncertainty.

*2. "L" when erasing protection tab is bent, "H" when not bent.

*3. Pause of period in proportion to reel rotating speed.

*4. Approx. 2 msec period "H" pulse.

*5. Pulse at tape running.

*6. "L" when tape running and CAP RVS is "H".

*7. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.

6-4. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-253 BOARD IC201)

Signal	Pin No.	I/O	I/O level
ASURA RESET	MA-253 IC201④	I	Normally "H", "L" when service interruption is detected or restored.
ASURA CS	MA-253 IC201④	I	Chip select signal from timer microprocessor. V period "L" pulse.
S IN 0	MA-253 IC201④	I	Serial communication data from timer microprocessor. V period "L" pulse.
S OUT 0	MA-253 IC201④	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	MA-253 IC201⑦	I	Serial communication clock with timer microprocessor. V period "L" pulse.

6-5. SYSTEM CONTROL – Hi-Fi AUDIO BLOCK INTERFACE (MA-253 BOARD IC201) (SLV-E710/E810)

Signal	Pin No.	I/O	STOP/FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-253 IC201⑤	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-253 IC201⑥	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
NA REC P	MA-253 IC201⑪	O	L	L	L	L	L	L	L	L	L	H	L
AF REC P	MA-253 IC201④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-253 IC201⑩	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
FULL ERS	MA-253 IC201⑨	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz 50% duty pulse approx. 5 msec delayed from RF SW P.

6-6. SYSTEM CONTROL – NORMAL AUDIO BLOCK INTERFACE (MA-253 BOARD IC201) (SLV-E510)

Signal	Pin No.	I/O	STOP/FF/REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
NA PB	MA-253 IC201⑨	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA-253 IC201⑥	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
NA SP	MA-253 IC201④	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
NA REC P	MA-253 IC201⑪	O	L	L	L	L	L	L	L	L	L	H	L
FULL ERS	MA-253 IC201⑨	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 25 Hz 50% duty pulse approx. 5 msec delayed from RF SW P.

*2. Selected by REC mode selector. SP mode: "L".

*3. Selected by tape recording mode. SP mode: "L".

6-7. SYSTEM CONTROL – RF MODULATOR, INPUT SELECTION BLOCK INTERFACE (MA-253 BOARD IC201)

Signal	Pin No.	I/O	I/O level			
			TUNER	LINE 1	LINE 2	LINE 3
LINE 1	MA-253 IC201 ⁽⁸³⁾	O	L	H	L	L
LINE 2	MA-253 IC201 ⁽⁸²⁾	O	L	L	H	L
LINE 3	MA-253 IC201 ⁽⁸¹⁾	O	L	L	L	H

6-8. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION (MA-253 BOARD IC201 CXP-87630-009Q)

Pin No.	Pin name	I/O	Function
1	RF SWP	O	RF switching pulse output
2	QVD	O	Quasi VD pulse output
3	QHD ENABLE	O	Quasi HD voltage level control
4	AF REC P	O	"H" output when hi-fi audio REC
5	NTSC	O	"H" PAL "L" when NTSC mode
6	FE ON	O	Flying erase ON/OFF
7	REC CTL	O	REC CTL signal output
8	CAP TRQ3	O	Capstan current control
9	APC2	I	APC control input terminal 2
10	APC1	I	APC control input terminal 1
11	NA REC P	I/O	Normal audio recording mode H: recording mode
12	SP/EP/LP	O	"L" when SP mode "H" when EP/LP mode
13	CAM LOAD	I	Loading motor rotating direction control
14	CAM UNLOAD	I	Loading motor rotating direction control
15	C IN (REC PRF)	I	Erasing protection bab, cassette IN detection input
16	RENTAL	I/O	YNR control
17	NC	O	Not used
18	NC	-	Not used
19	358 NTSC	I	Tuner audio selection signal H: 3.58 XTAL
20	NT JUDGE	I	4.43/3.58 judge input.
21	BLUE BACK ON	O	Not used
22	PAL 60	O	NTSC PB control signal "H" when NTSC PB on pal TV
23	TV/VTR	O	"L" when VTR mode "H" when TV mode Not used
24	AV CONT	O	ON/OFF control
25	MESECAM	I/O	"L" in NT mode
26	CBC ON	O	Cable box control on. Not used
27	MODE 4	I	Mechanism section CAM encoder input
28	MODE 3	I	Mechanism section CAM encoder input
29	MODE 2	I	Mechanism section CAM encoder input
30	MODE 1	I	Mechanism section CAM encoder input
31	CAM 12V	O	CAM motor reference voltage
32	T/E LED	O	T/E LED output
33	CAP TRQ2	O	Capstan current control signal 2 L: FF/REW to STOP
34	CAP TRQ1	O	Capstan current control signal 1 L: SLOW speed down
35	CAP STOP	O	Capstan STOP signal output
36	FULL ERS	O	Full erase control
37	NC	O	Not used
38	NC	O	Not used
39	MP	I	Fixed to L
40	ASURA RESET	I	System reset input
41	VSS	-	GND
42	XTAL	-	System clock 16 MHz
43	EXTAL	-	System clock 16 MHz
44	ASURA CS	I	S/S microcomputer chip select signal
45	S IN 0	I	Serial communication signal
46	S OUT 0	O	Serial communication signal
47	SCLK	O	Serial communication signal
48	NICOL ON	O	Not used
49	F MONO	O	Tuner Audio Select Not used
50	EDIT	O	EDIT control

Pin No.	Pin name	I/O	Function
51	LINE 3 CONT	O	Input selection control signal 3
52	AVSS	-	UNSW GND
53	AVREF	-	AD port reference input UNSW 5V
54	AVDD	-	UNSW 5V
55	APC ERROR	I	APC error input
56	NTPB SW	I	NTSC PB switch
57	DEST2	I	DEW sensor input Not used
58	VA ADJ	I	ADJ mode OV: SWP Adj 2.5V: HiFi Adj
59	AF ENV	I	Hi-Fi audio playback signal envelope
60	RF ENV	I	Video playback signal envelope
61	T SENS	I	Take up end sensor input
62	S SENS	I	Supply end sensor input
63	S REEL FG	I	S side reel FG input
64	T REEL FG	I	T side reel FG input
65	VDD	I	5V
66	V SYNC	I	Composite sync input
67	PB CTL	I	Playback CTL input
68	DRM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstan FG input
71	POWER SAVE CONT	O	Power save control signal output
72	CAP RVS	O	Capstan reverse control H when reverse
73	CAP DA	O	Capstan error D/A output
74	DRUM DA	O	Drum FG input
75	CTL RED	O	"H" CTL write
76	CTL STEP	O	CTL amp, STEP operation control
77	VDD	I	5V
78	VDD	O	5V
79	CTL INDEX	O	CTL INDEX signal input
80	SO1	I/O	Signal for serial communication
81	SCLK1	I/O	Signal for serial communication
82	LINE 2 CONT	I	Input selection control signal 2
83	LINE 1 CONT	O	Input selection control signal
84	APC PWM	O	PWM output for APC
85	NC	I	Not used
86	NC	-	Not used
87	NC	-	Not used
88	VSS	-	GND
89	VDD	-	5V
90	NC	-	Not used
91	ORC SETTEI	O	H when ORC measurement
92	A MUTE	O	"H" when audio Mute
93	SP	O	Normal audio tape speed select
94	NA SP	O	Normal audio tape speed select.
95	NA PB	O	Audio output control signal H when normal audio playback
96	AF REC	O	"H" output when hi-fi audio REC
97	JOG	O	"H" when trick play mode
98	V PB	O	Video system playback mode "L" when playback
99	STEP PLS	O	Step pulse H when capstan step driving
100	AF SWP	O	AF switching pulse output

6-9. TUNER/TIMER MODE CONTROL PIN FUNCTION (MA-253 BOARD IC151)

Pin. No.	Pin Name	I/O	Function
1	PDC DAV	I	Line 21H output pulse. Pulse signal synchronized with line 21 of input video signal.
2	PAWER FAIL	I	Power failure detect signal input.
3	H DET	I	Video signal detect signal input
4	SIRCS IN	I	SIRCS signal input
5	EEP BUSY	I	EEP Busy signal input
6	SIRCS OUT	O	SIRCS signal output
7	BUZZER	O	Buzzer output
8	STEREO	I	Tuner audio mode input (stereo)
9	EEP RST	O	EEP ROM reset signal output (stereo)
10	SCK0	O	Clock for serial communication
11	SIO	I	Serial data input
12	S00	O	Serial data output
13	EEP CS	O	EEP ROM chip select signal output
14	LANC IN	I	LANC input
15	LANC OUT	O	LANC output
16	A/D0	I	Key reading A/D input
17	A/D1	I	Key reading A/D input
18	A/D2	I	Key reading A/D input
19	A/D3	I	Key reading A/D input
20	A/D4	I	Key reading A/D input
21	A/D5	I	Key reading A/D input
22	A/D6	I	Key reading A/D input
23	AFT	I	Key reading A/D input
24	AVDD	-	UNSW 5V
25	AV REF	-	AD port reference input UNSW 5V
26	SCL0	O	I ² C BUS (clock)
27	CG CS	O	Character generator chip select signal
28	SDA0	O	I ² C BUS (data)
29	LED CS	O	LED driver chip select signal
30	AVSS	-	UNSW GND
31	EXTAL	-	System clock
32	XTAL	-	
33	VSS	-	GND
34	RST	I	Reset signal in
35	PLL CLK	O	Tuner clock signal
36	PLL DATA	O	Tuner data signal
37	PLL ENABLE	O	Tuner enable signal
38	C+DATA	O	CANAL+ control data
39	C+DET	I	CANAL+ detection
40	C+CLK	O	CANAL+ control

Pin. No.	Pin Name	I/O	Function
41	TA MUTE	O	Tuner audio mute control signal
42	AUTO PRESET	O	"H" during auto preset
43	VFDP	-	-30V
44-62	SEG 1-19	O	LCD segment output
63	N.C.	-	Not used
64	N.C.	-	Not used
65	N.C.	-	Not used
66-71	GRID 6-1	O	LCD grid output
72	VDD	-	UNSW 5V
73	TX	-	Connected to oscillator for clock
74	TEX	-	
75	NC/VPP	-	Connect to +5 V
76	ASURA CS	O	S/S microcomputer chip select
77	SYS RESET	O	System reset signal output
78	POWER CONT 1	O	Power supply control signal output
79	POWER CONT 2	O	Power supply control signal output for EDS
80	CG V	I	Vertical sync. signal input

SECTION 7

ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustment on page 7-10.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT IV.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used.

- 1) Color TV
- 2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, deley mode, as provided.
- 3) Frequency counter (min. 8 digits)
- 4) PAL pattern generator
- 5) Digital voltmeter
- 6) Audio level meter
- 7) Audio generator
- 8) Modulation Analyzer
- 9) Distortion factor meter
- 10) Attenuator
- 11) Alignmeter tape
Part Code: H-7099-052-H (MH-2)
- 13) Extension cable
RP-199 board CN501 ↔ Drum Head flexible

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

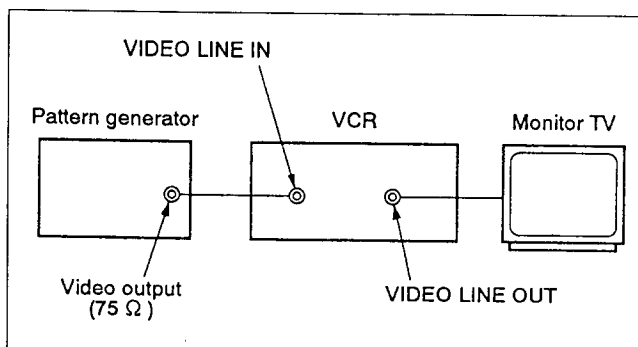


Fig. 7-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL pattern generator is connected with LINE input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal PAL signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

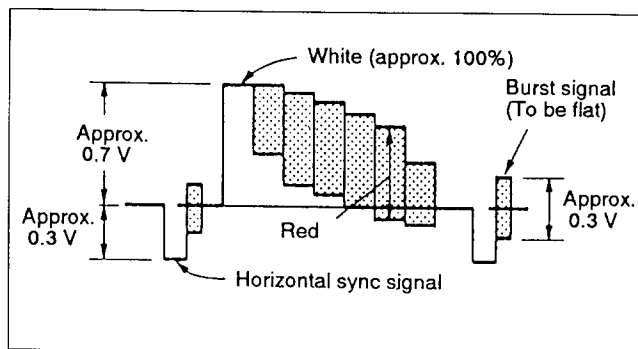


Fig. 7-2-2.

2-1-4. Alignment Tape [Alignment Tape (MH-2)]

	Time	Video signal	Audio signal
1	10 minutes	Stair-step	6 kHz
2	5 minutes	—	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	—

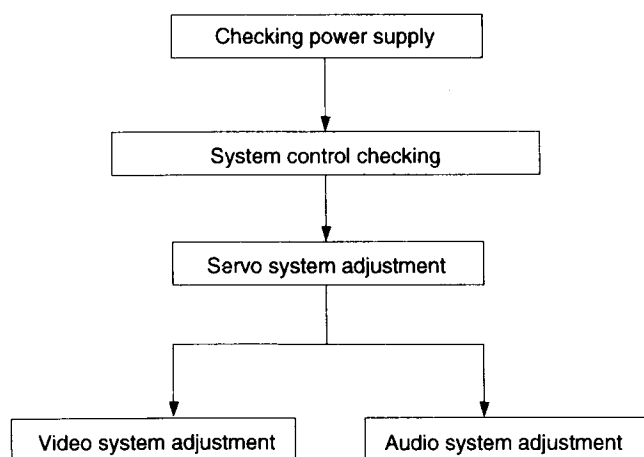
2-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs	LINE IN	: phono jacks
	EURO-AV	: 21-pin (Pin ⑳) 1 Vp-p, 75Ω, unbalanced, sync negative
Audio inputs	LINE IN	: phono jacks
	EURO-AV	: 21-pin (Pin ㉑ and ㉒) 47 kΩ, -7.5 dBs (0 dBs = 0.775 Vrms) More than 10 kΩ, -4 dBs
Video outputs	LINE OUT	: phono jack
	EURO-AV	: 21-pin (Pin ㉓) 1 Vp-p, 75Ω, unbalanced, sync negative
Audio outputs	LINE OUT	: phono jacks
		-7.5 dBs at load
		impedance 47kΩ
		Output impedance : less than 10kΩ
	EURO-AV	: 21-Pin (Pin ㉔ and ㉕)
		Output impedance : less than 1kΩ
		-4dBs with 10 kΩ load

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



2-2. POWER SUPPLY CHECK (PS-357 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmeter
+F, -F check	
Measurement Point	Pin ④ (+), ①(-) of CN101
Specified Value	4.3±1Vdc
-30V check	
Measurement Point	Pin ② of , CN101
Specified Value	-30±3Vdc
-8V check	
Measurement Point	Pin ⑤ of CN101
Specified Value	13.5±2Vdc
D6V check	
Measurement Point	Pin ⑥ of CN101
Specified Value	5.9±0.5V
SW12V	
Measurement Point	Pin ⑧ of CN101
Specified Value	12±1Vdc
MTR12V check	
Measurement Point	Pin ⑫ of CN101
Specified Value	12±0.5Vdc
13 V check	
Measurement Point	Pin ⑭ of CN101
Specified Value	13±1Vdc
+38V check	
Measurement Point	Pin ⑯ of CN101
Specified Value	38.0±3Vdc
SW5 V check	
Measurement Point	Pin ⑰ of CN101
Specified Value	5 ±0.5 Vdc

Checking Method:

- 1) Confirm that each voltage meets its specified value.

2-3. SYSTEM CONTROL CHECK

2-3-1. Clock Check (MA-253 Board)

Purpose:

Adjust to improve the clock precision. When it is out of order, errors gradually increases.

Measurement point	Pin ⑦ of IC151 : MA-253 Board
Measurement Equipment	Frequency counter (Interval counter mode)
Specified Value	0.1249995 ± 0.0000005 sec

Confirmation Method:

- 1) Connect to the GND from IC151 pin ⑮ through a resistor $22k\Omega$ (1-249-489-00): MA-253 board
(The set goes to adjusting mode.)
- 2) Connect the frequency counter as shown below.
- 3) Confirm that the oscillation frequency is the specified value.

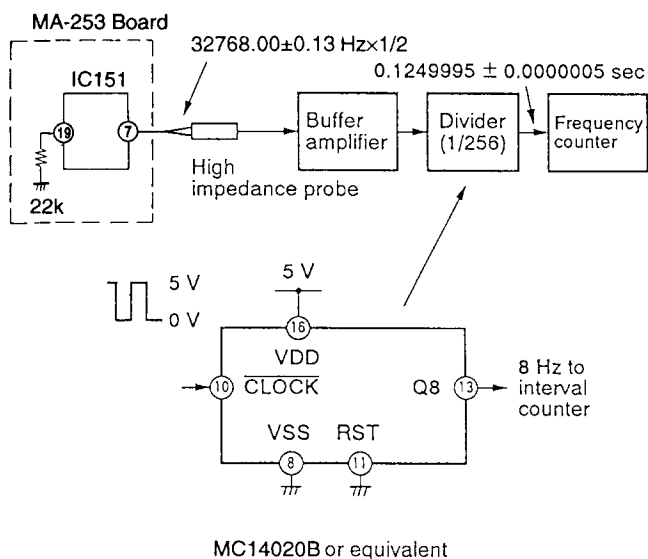


Fig. 7-2-3.

2-4. SERVO SYSTEM Adjustment

2-4-1. Switching Position Adjustment (MA-253 Board)

Purpose:

Adjust the interval between A ch and B ch of tape playback output. Improve the interchangeability with other tapes and sets. When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: VIDEO LINE OUT CH2: Pin ③ of CN502 (RP-199 board) (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	$6.5 \pm 0.5H$ ($410 \pm 32\mu\text{sec}$)

Adjusting Method:

- 1) Connect IC201 pin ⑤ to the GND for about 1 second to activate the RF switching position adjustment mode.
- 2) Using the channel + and - buttons, adjust to $410 \pm 32\mu\text{sec}$ ($6.5 \pm 0.5H$).

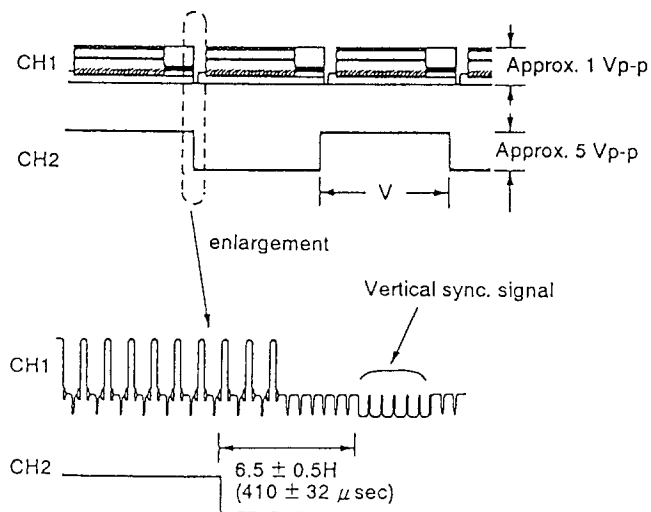


Fig. 7-2-4.

2-5. VIDEO SYSTEM ADJUSTMENT

Adjust the video system in the following sequence as a rule. The color video signal supplied from the pattern generator is used as a video input signal for video system adjustment in the recording mode. Make sure that sync. and color burst signals meet requirements specified at set up of adjustment shown in Fig. 7-2-1.

[Adjustment Sequence]

2-5-1. Recording Y Signal Level Check

2-5-2. White Clip, Dark Clip Check

2-5-3. Playback Y Signal Level Check

2-5-4. Recording Chroma Level Check

2-5-5. Sync. AGC Check

2-5-6. X'tal Oscillation Frequency Check

2-5-1. Recording Y Signal Level Check (MA-253 Board)

Purpose:

Check the brightness signal level after passing through the V/C separating circuit.

Mode	E-E
Signal	Color bar
Measurement point	Emitter of Q352
Measurement equipment	Oscilloscope
Specified value	$950 \pm 100 \text{ mVp-p}$

Confirmation Method:

- 1) Confirm that the record Y level is $950 \pm 100 \text{ mVp-p}$.

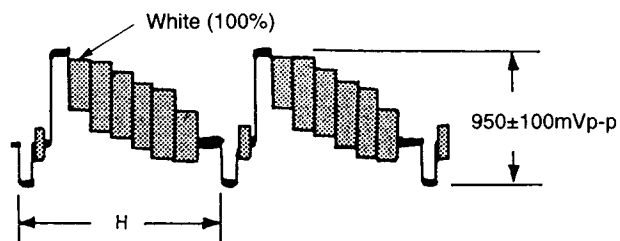


Fig. 7-2-5.

2-5-2. White Clip, Dark Clip Check (MA-253 Board)

Purpose:

Confirm that no overshoot is generated by the pre-emphasis circuit. If shifted, the signals are overmodulated, thus causing a noise in the images.

Mode	E-E
Signal	Color bar
Measurement point	Pin ③ of IC301
Measurement equipment	Oscilloscope
Specified value	White clip: $190 \pm 15\%$ Dark clip: $52 \pm 10\%$

Confirmation Method:

- 1) Confirm that the white clip is $190 \pm 15\%$, on condition that the level between white and sync. is 100%.
- 2) Confirm that the dark clip is $52 \pm 10\%$, on condition that the level between white and sync. is 100%

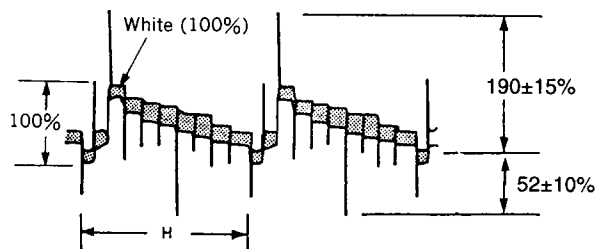


Fig. 7-2-6.

2-5-3. Playback Y Signal Level Check (MA-253 Board)

Purpose:

Confirm that the playback Y signal level is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	VIDEO LINE OUT
Measurement equipment	Oscilloscope
Specified value	$1.97 \pm 0.18 \text{ Vp-p}$

Note: Make this adjustment with the EDIT switch turned off.

Confirmation Method:

- 1) Confirm that the play Y level is $1.97 \pm 0.18 \text{ Vp-p}$.

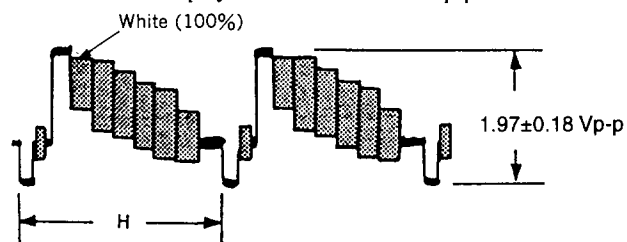


Fig. 7-2-7.

2-5-4. Recording Chroma Level Check (MA-253 Board)

Purpose:

Check the chroma signal level after passing through the Y/C separating circuit.

If shifted, the image is roughened and another color may appear on the edges.

Mode	E-E
Signal	Color bar
Measurement point	Pin ③⑩ of IC301
Measurement equipment	Oscilloscope
Specified value	$160 \pm 23 \text{ mVp-p}$

Confirmation Method:

- 1) Confirm that the record chroma level is $160 \pm 23 \text{ mVp-p}$.

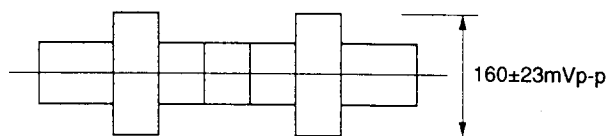


Fig. 7-2-8.

2-5-5. Sync. AGC Check (MA-253 Board)

Purpose:

Confirm that the video level is correct.

Mode	E-E
Signal	Color bar
Measurement point	VIDEO LINE OUT
Measurement equipment	Oscilloscope
Specified value	$2.02 \pm 0.14 \text{ Vp-p}$

Note: Video output terminal must be terminated at 75Ω .

Confirmation Method:

- 1) Confirm that the sync. AGC level is $2.02 \pm 0.14 \text{ Vp-p}$.

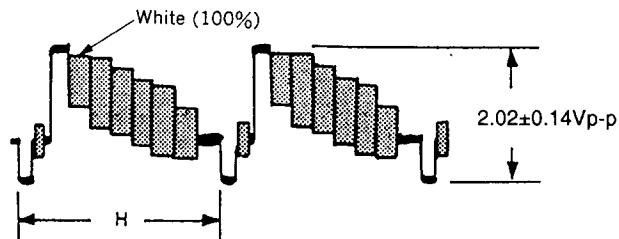


Fig. 7-2-9.

2-5-6. X'tal Oscillation Frequency Check (MA-253)

Purpose:

Confirm that the fsc is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	Pin ② of IC301
Measurement equipment	Frequency counter, Oscilloscope
Specified value	$4,433,619 \pm 96 \text{ Hz}$

Note: connect the frequency counter through a probe of high input impedance (about $10 \text{ M}\Omega$) and low capacity (10 pF or less).

Confirmation Method:

- 1) Confirm that the frequency is $4,433,619 \pm 96 \text{ Hz}$
- 2) Confirm that the amplitude is $450 \pm 200 \text{ mVp-p}$.

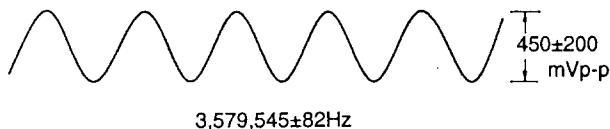


Fig. 7-2-10.

2-6. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

[Connection]

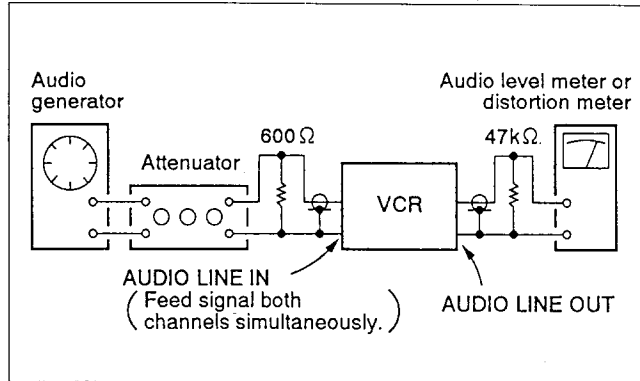


Fig. 7-2-11

2-6-1. Hi-Fi Audio System Adjustment

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.

INPUT SELECT switch LINE
AUDIO MONITOR STEREO

[Adjusting Sequence]

- VCO f_0 adjustment
- Deviation check
- BPF f_0 adjustment
- AF switching position

1. VCO f_0 Adjustment (MA-253 Board)

Purpose:

Adjust to have interchangeability in HiFi audio.
When it is out of order, the sound is distorted.

Mode	REC
Signal	No signal
Measuring Instrument	Frequency counter
1.3 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking ON (Remote commander)
Adjusting Element	RV521 (R CH)
Specified Value	1.4 MHz $\pm$ 1 kHz
1.7 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking OFF (Remote commander)
Adjusting Element	RV531 (R CH)
Specified Value	1.8 MHz $\pm$ 1kHz

Note: Connect the frequency counter through a probe of high input impedance (more than 1 M Ω) and low capacity (10 pF or less).

Connection:

Connect pin ② and ③ of CN881 with a jumper wire.

Adjusting Method:

- Connect the frequency counter to pin ① of CN501.
- Adjust each volume so that each frequency meets its specified value.

2. Deviation Check (MA-253 Board)

Purpose:

Set the HiFi audio signal level to specified value.
Adjust to have interchangeability with other tapes and sets.
When it is out of order, the volume of sound is different on playback.

Mode	REC
Signal	Pin ② (Lch), ① (Rch) of IC501 400Hz $\sim$ 7.5 dBs (920m Vp-p)
Measurement Point	pin ① of CN501 Lch: Auto tracking ON (Remote commander) Rch: Auto tracking OFF (Remote commander)
Measurement Equipment	Modulation analyzer
Specified Value	50 $\pm$ 5kHz

Connection:

Connect pin ② and ③ of CN881 with a jumper wire.

3. BPF f_0 Adjustment (MA-253 Board)

Purpose:

Adjust to separate carrier component precisely and to operate normally the filter for cutting video signal.
When it is out of order, the sound is distorted.

Mode	PB
Signal	1.608 MHz Input 200 mVp-p: Pin ③ of CN501
Measurement point	Pin ① of CN501
Measuring Instrument	Oscilloscope
Adjusting Element	RV541

Note: Talk a trigger from AF SWP (Pin ⑥ of CN501).

Connection:

- Feed 1.608 MHz, 200 mVp-p sine wave to Pin ③ of CN503.

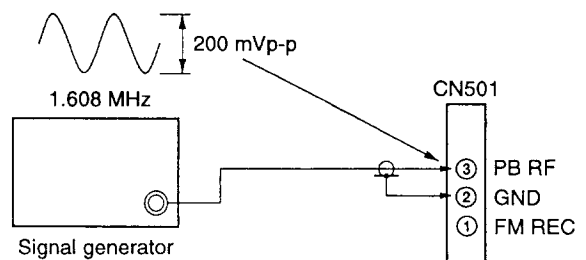
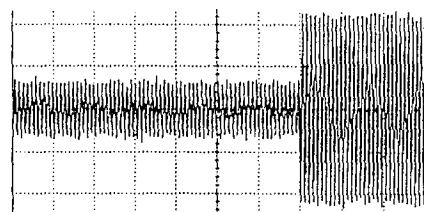


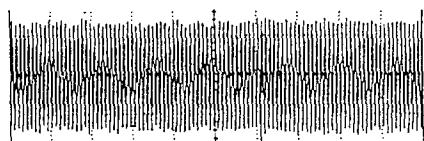
Fig. 7-2-12.

Adjusting method:

- 1) In the play mode, turn off the auto tracking from the remote controller.
- 2) Adjust RV541 so that the amplitudes of A and B are on the same level ($\pm 2\text{mVp-p}$).



Disordered condition



Adjusted condition

Fig. 7-2-13

4. AF Switching Position Adjustment (MA-253 Board) (SLV-E710/E810)

Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets. When it is out of order, noisy sound is increased and big noise is heard.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement point	CH1: Pin ③ of CN502 (RP-199 Board) CH2: Pin ① of CN501 (MA-253 Board)
Measuring Instrument	Oscilloscope
Specified Value	Fig. 7-2-15

Adjusting method:

- 1) Connect IC201 pin ⑤⑧ to the GND for about 1 second to activate the RF switching position adjustment mode.
- 2) Press the record button to activate the AF switching position adjustment mode.
- 3) Using the channels + and - buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.

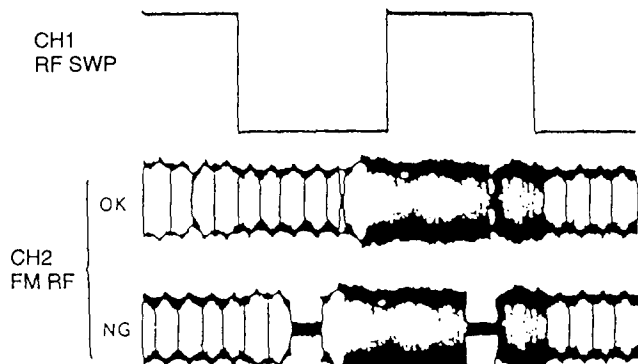


Fig. 7-2-14.

2-6-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified.
- Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]

1. ACE Head Adjustment
2. E-E Output Level Check
3. Recording Bias Adjustment
4. Overall Level Characteristic and Distortion Factor Check
5. Overall S/N Check

1. ACE Head Adjustment

Refer to the service manual of VHS MECHANICAL ADJUSTMENT IV.

2. E-E Output Level Check

Purpose:

Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400Hz, -7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	-7.5 $\pm$ 2dBs

Confirmation Method:

- 1) Simultaneously input a signal of 400Hz, -7.5dBs to both L and R channels of Audio Line Input.
- 2) Confirm that the audio output level is -7.5 $\pm$ 2dBs.

3. Recording Bias Check (MA-253 Board)

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400Hz, -27.5 dBs 7kHz, -27.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0+3dB/-6dB

Note: Tape path adjustment must have been completed.

Confirmation Method:

- 1) Supply a signal of 400 Hz, -27.5 dBs to both L and R channels of Audio Line Input.
- 2) Connect the audio level meter to the Audio Line Output.
- 3) Adjust the attenuator so that the audio level meter will indicate -27.5 dBs.
- 4) Make recording in the SP mode.
- 5) Set an audio line input signal to 7 kHz and make recording.
- 6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
- 7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0+3 dB/-6 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400Hz, -7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: -7.5 ± 3 dBs Distortion factor: 4% or less

Confirmation Method:

- 1) Supply an audio signal of 400Hz, -7.5 dBs simultaneously to both L and R channels of Audio Line Input.
- 2) Make recording
- 3) Play back a recorded portion.
- 4) Confirm that a playback level is -7.5 ± 3 dBs.
- 5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

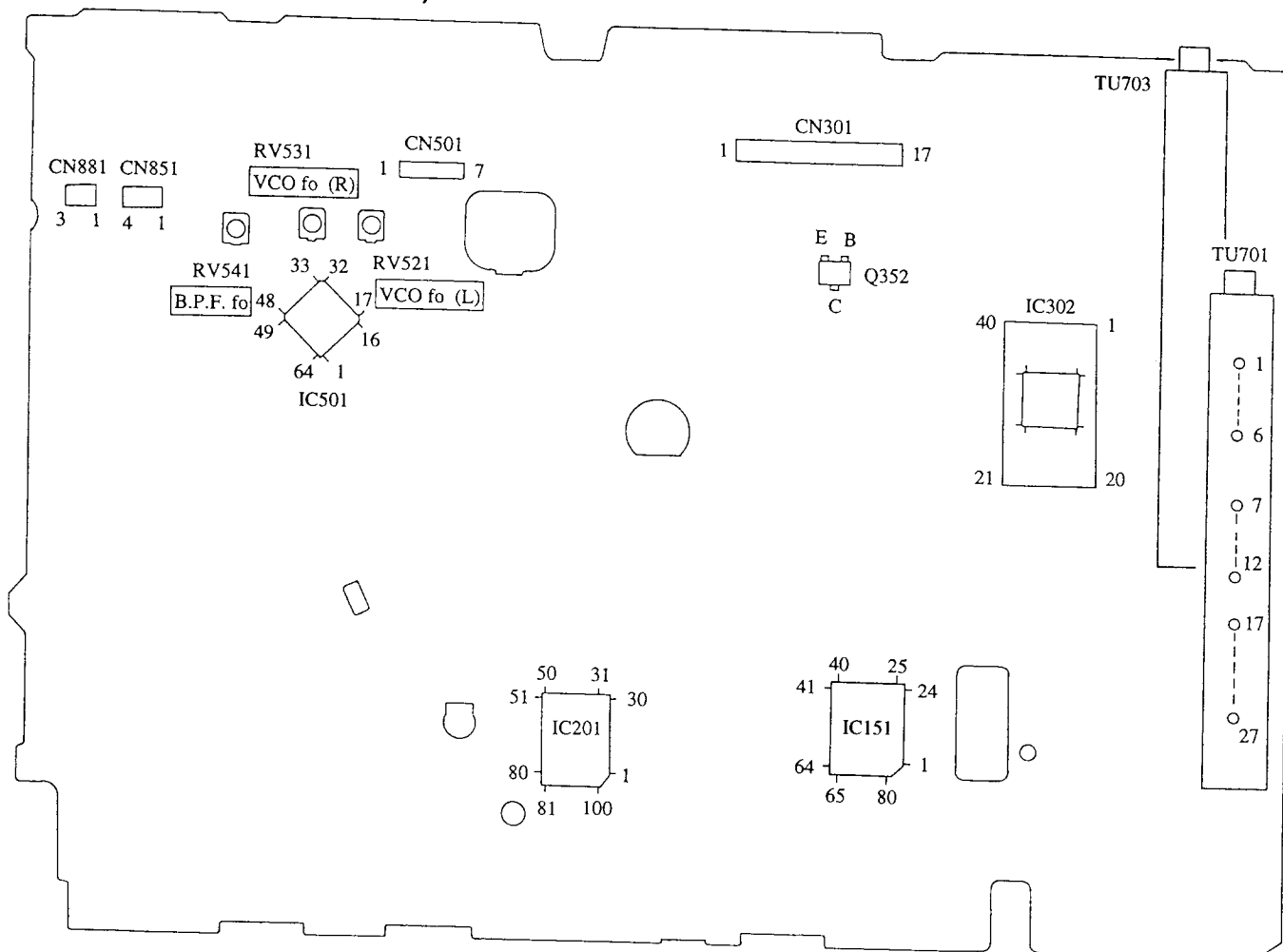
Mode	REC and PB (SP mode)
Signal	No signal
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	-46dB or more

Confirmation Method:

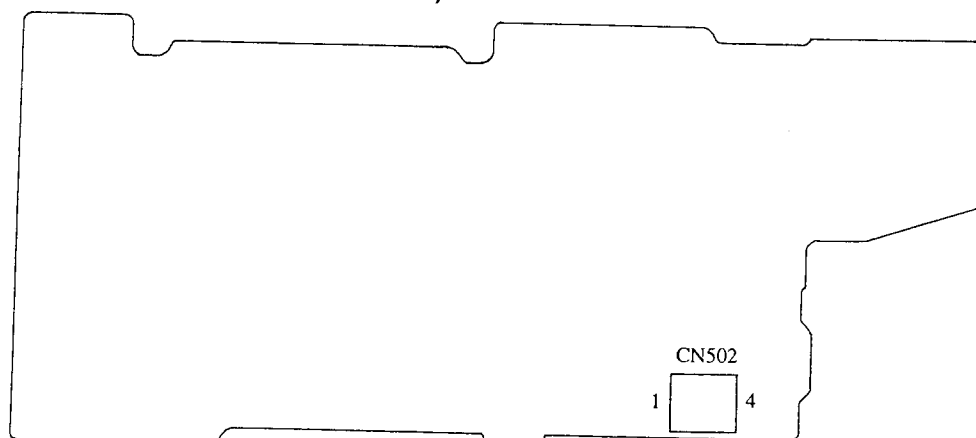
- 1) Connect both L and R channels of audio line input to the GND.
- 2) Start recording.
- 3) Play the recorded part to confirm that the noise is below -46dB.

2-7. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-253 BOARD (CONDUCTOR SIDE)



RP-199 BOARD (COMPONENT SIDE)



PS-357 BOARD (COMPONENT SIDE)

