GV-8E

SERVICE MANUAL

AEP Model
UK Model
E Model

VIDEO WALKMAN

U MECHANISM

This manual contains the Spplement-1, -2.

SPECIFICATIONS

System	
Video recording system	Rotary two-head helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	CCIR system, PAL color
Usable cassettes	8 mm video format cassettes
Tape speed	SP: approx. 2.0051 cm/sec. LP: approx. 1.0058 cm/sec.
Recording time	SP mode: 1.5 hours (with Sony P5-90 cassette) LP mode: 3 hours
Playback time	SP mode: 1.5 hours LP mode: 3 hours (with Sony P5-90 cassette)
Fast forward/rewinding time	Approx. 7 minutes (with Sony P5-90 cassette)
LCD section	
Picture	3 inches measured diagonally 6.2 cm × 4.6 cm (2½ × 1⅞ inches)
Screen type	TN LCD/TFT active matrix method Total picture-element number: 92,160 Effective picture-element ratio: more than 99.9%
Tuner section	
Channel coverage	VHF: 2 – 12 channels UHF: 21 – 69 channels
Aerial input	75-ohm minijack for VHF/UHF (For TV program recording only)
Inputs/outputs	
Video input	Phono jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output	Phono jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input	Phono jack, −10 dBs (0 dBs = 0.775 Vrms), input impedance more than 47 kilohms
Audio output	Phono jack, −10 dBs (250 mV) at load impedance 47 kilohms, output impedance less than 10 kilohms
Speakers	8 ohms, 250 mW
Timer section	
Clock	Crystal lock
Time indication	24-hour cycle
Timer setting	Only for recording, 1 event/24 hours

— Continued on next page —

8 VIDEO TV RECORDER

SONY®

General

Power requirements	6 V
Power consumption	7.1 W (for continuous playback)
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to 140°F)
Dimensions	129 × 67 × 213 mm (w/h/d) (5 1/8 × 2 3/4 × 8 1/2 inches)
Weight	Approx. 1.15 kg (2 lb 9 oz) not incl. battery pack
Accessories supplied	Headphones (1) Signal splitter (1) Carrying case (1) Battery pack NP-55 (1) AC power adaptor AC-V30 (1) Lithium battery (1)

AC-V30

Power consumption	20 W
Power requirements	100 – 240 V AC, 50/60 Hz
Output voltage	DC OUT: 7.5 V, 1.6 A in operating mode Battery charge terminal: 10 V, 1.3 A in charge mode
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to 60°C (−4°F to 140°F)
Dimensions	Approx. 67 × 39 × 138 mm (w/h/d) (2 3/4 × 1 5/8 × 5 1/2 inches) including projecting parts and controls
Weight	Approx. 310 g (11 oz)

Design and specifications subject to change without notice.

List of Recommended Accessories

		Page
Battery pack	NP-77	10
	NP-55	10
	NP-22 or NP-22H	9
Battery adaptor	NPA-22	9
Battery charger	BC-55 (not available in UK)	10
AC power adaptor	AC-V30	11
	AC-V55	13
DC pack	DCP-55	13
Battery case	EBP-55	12
Car battery cord	DCC-16AE	13
Color video camera	CCD-G1E	
RFU adaptor	RFU-89EKA	
Edit selector	SB-V1	
Connecting cord	VMC-910MS/920MS (1m/2m)	
	VMC-710M/720M (1m/2m)	
	VMC-810S/820S (1m/2m)	

Carrying case (only for this unit)	LCS-GV8
Carrying case (for this unit and the accessories)	LCH-GV8
Close-up viewer (to enjoy the magnified picture)	VCV-GV8
Car connecting pack (connect to the AUDIO OUT terminal so that you can listen to the sound with the car stereo)	CPA-2

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 ⚠ OR DOTTED LINE WITH MARK ⚠ 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.

TABLE OF CONTENTS

SECTION 1
GENERAL

This section is extracted from instruction manual.

Features

For details, refer to the pages indicated in ●.

With Sony GV-8E video TV recorder, you can;
— view playback picture of 8mm video tapes. ●
— view TV programs. ●
— record TV programs. ●

In addition, if you connect an optional video camera to this unit, you can record pictures through the camera and view them immediately.

Compact and lightweight design which allows you the outdoor use.

Other features

— Timer recording ●
— Sleep timer which turns the power off automatically ●
— Picture can be muted when it is not necessary: e.g. when viewing pictures with another TV/monitor which is connected to this unit or when listening only to the sound. ●

This unit uses 8mm video format cassettes. It records in the SP mode (approximately 2.0051 cm/second) and the LP mode (approximately 1.0058 cm/second) and can play back in the SP mode and LP mode.
The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

PCM recording/playback is not possible with this unit. The PCM sound recorded with another recorder cannot be played back with this unit.

For using the recorder abroad, see page 49.

Precautions

Operation

- Operate the unit on 6–8.5V DC.
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Avoid rough handling or mechanical shock to the unit.
- Do not apply excessive force to the LCD.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  — Locations susceptible to vibration.
  — Locations exposed to strong magnetic fields.
  — Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

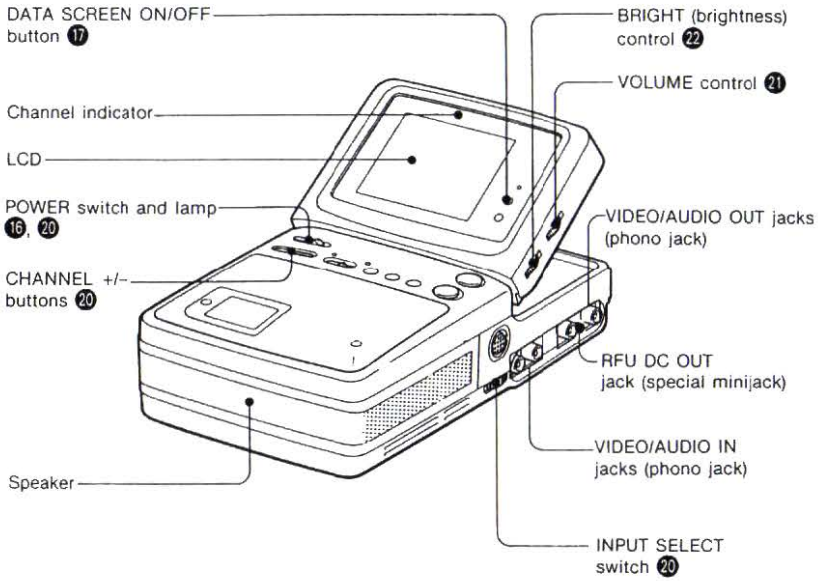
Care

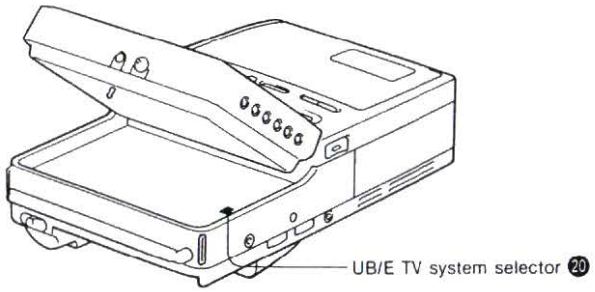
- When the unit will not be used for a long period of time, periodically turn on the power, operate the recorder and play back a tape for about three minutes.
- Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

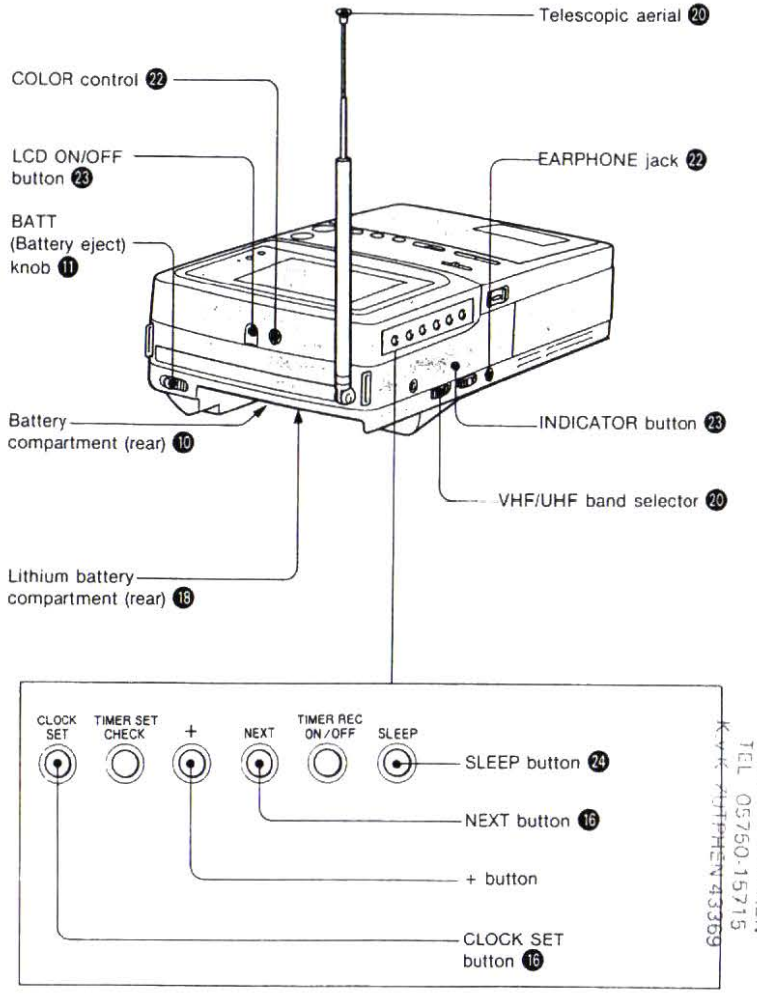
Location of Parts and Controls

Refer to the pages indicated in ● for details.

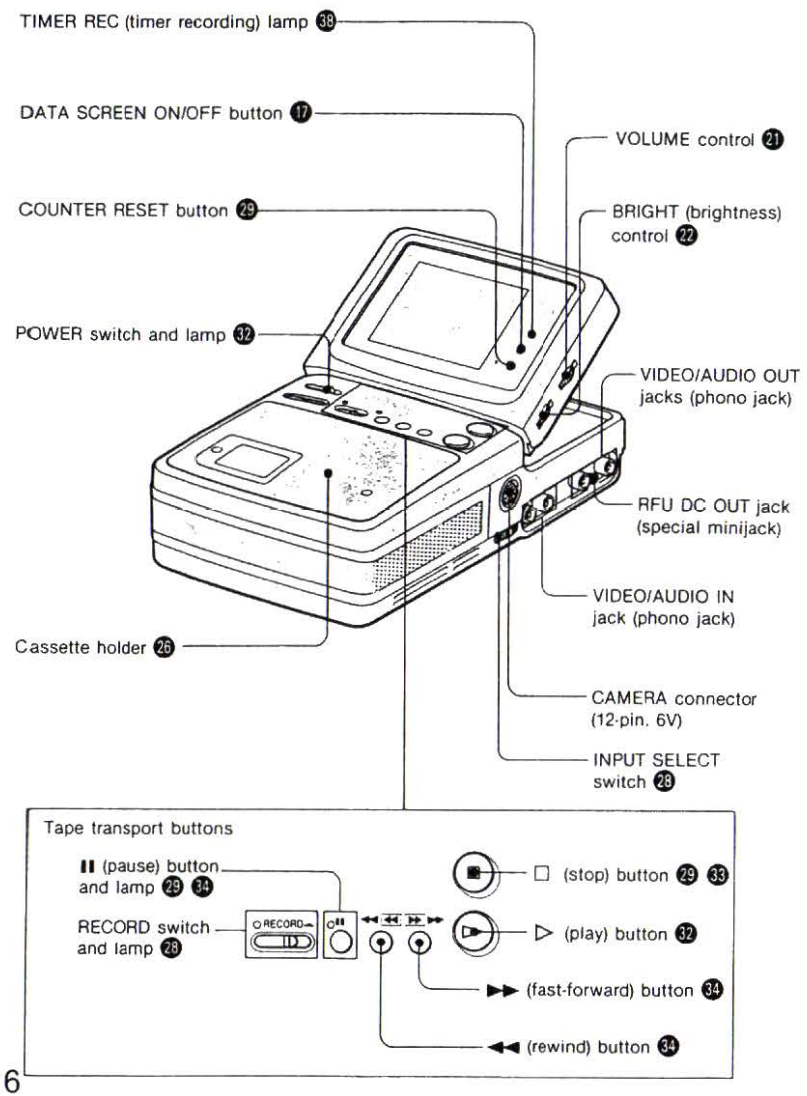
Parts for watching TV programs

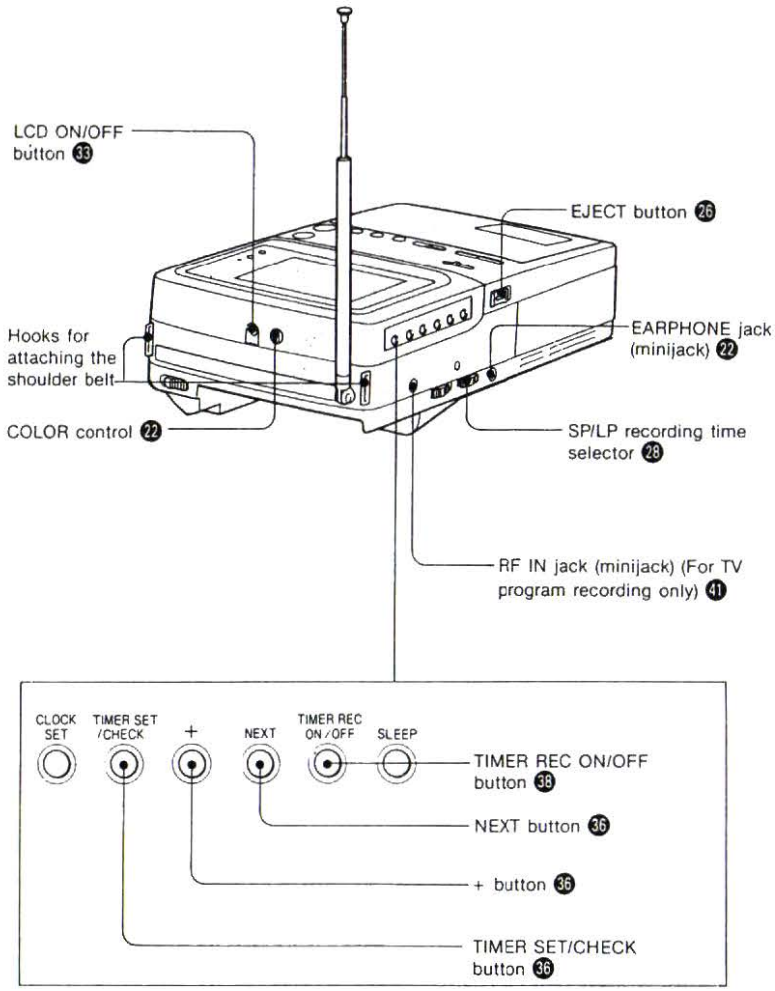






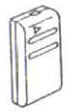
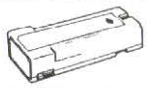
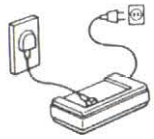
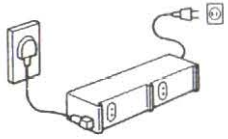
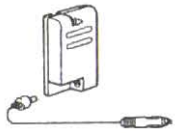
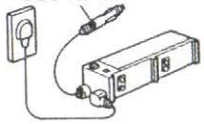
Parts for VCR playback/recording





Power Sources

Selection of Power Sources

Place	Power Source		Page
Outdoors	Battery pack NP-55 (supplied) or NP-77 	or Battery case EBP-55 (with alkaline batteries) 	⑩
	Battery pack NP-22 or NP-22H 		⑨
Indoors	AC power adaptor AC-V30 (supplied)* 	or AC power adaptor AC-V55 	⑭
In the car	DC pack DCP-55 (with car battery cord) 	or AC power adaptor AC-V55 with DCC-16AE or the car battery cord supplied with DCP-55 DCC-16AE 	⑮
	* AC-V30 cannot be used in the car.		

All of above accessories except the AC-V30 and the NP-55 are optional.

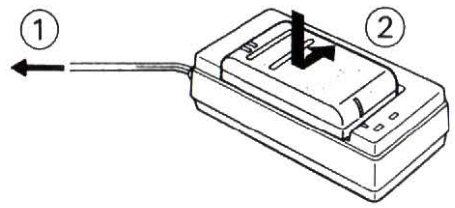
Disconnecting the power source during recording or playback may damage the inserted cassette tape.
If this is done by accident, supply the power again immediately and turn the power on.

Notes

- If the power source is disconnected or the CHARGE button on the AC-V55 is pressed while the tape is being rewound, the DEW indication on the screen may flash and the tape may not run when you use the unit the next time. In this case, take out the cassette, then insert it again.
- To use the NP-22 or NP-22H battery pack, use the optional NPA-22 battery adaptor.
- ACC-GV8 video 8 accessory kit (optional) is available:
  - VCV-GV8 close-up viewer (1)
  - NP-55 battery pack (1)
  - LCS-GV8 video carrying case (1)

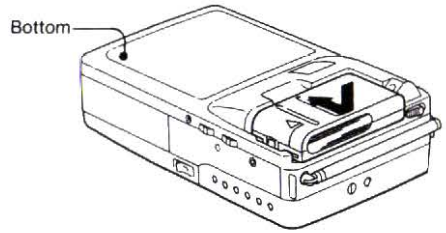
Using with Battery Pack — NP-55 or NP-77

1 First, charge the battery pack.
Use the supplied AC-V30 AC power adaptor.



① Connect the AC-V30 to a wall outlet.
② Install the battery pack.
Align the ▮► marks, then while pressing the battery pack slide the battery pack in the direction of the arrow.
The POWER lamp (green) and the CHARGE lamp (orange) on the AC-V30 will light up. The charging will begin.
When the charging is completed, the CHARGE lamp goes out.
Unplug the AC power adaptor and the POWER lamp will go out.

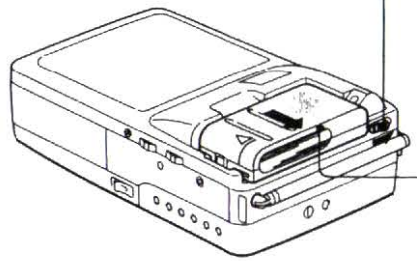
2 Attach the battery pack to the video TV recorder.
Align the metal part of the battery pack to the mounting surface of the unit, and slide the battery pack.



- The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77.
- When you attach two battery packs to the AC-V55 AC power adaptor, first the charging of the battery 1 will be made, then the battery 2 will follow.
- The unit cannot be operated with the AC power adaptor when it is used for charging a battery pack, and the battery pack cannot be charged when the AC power adaptor is used to operate the unit.

To remove the battery pack

1 While sliding the BATT knob in the arrow direction,



2 Slide the battery pack as illustrated.

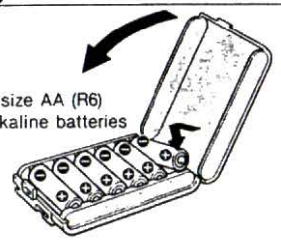
Battery life

A fully-charged NP-55 or NP-77 battery pack can operate this unit as follows:

	NP-55	NP-77
Watching TV programs	Approx. 60 min.	Approx. 120 min.
Playback of VTR	Approx. 45 min.	Approx. 90 min.
TV program recording	Approx. 40 min.	Approx. 80 min.
Camera recording*	Approx. 30 min.	Approx. 60 min.

*When the optional CCD-G1E color video camera is connected.

Using with Battery Case — EBP-55



- Attach or remove the battery case to the unit in the same way as the battery pack.
- For playing back, continuous power for 35 minutes can be provided.

When the battery pack becomes weak

- The POWER lamp and the BATTERY DOWN display on the screen will flash then they will blink rapidly and the power will be turned off automatically.
  Replace the battery pack with the fully charged one.

- Use the battery pack until it is completely exhausted, then charge it fully. If you repeat charging when the battery pack is not exhausted, the battery may be damaged and the battery's life may be shortened.
- As the battery pack is consumed even when it is not used, make sure that you use the fully charged battery packs.
- If the unit is used in a cold place, its operating time is shortened.

- When the video TV recorder is not in use, remove the battery pack or the battery case. If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

Battery life

- Replace the battery pack with a new one when the operating time of the completely charged battery pack has noticeably shortened.

The battery pack may be warm after charging, but this is normal.

Notes

- Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the video TV recorder.
- Keep the battery pack away from fire, as it may explode.
- Do not attempt to open the battery pack.
- Avoid any mechanical shock.
- Clean the battery pack terminals with a soft cloth when they become soiled.

Charging battery packs with other optional charger

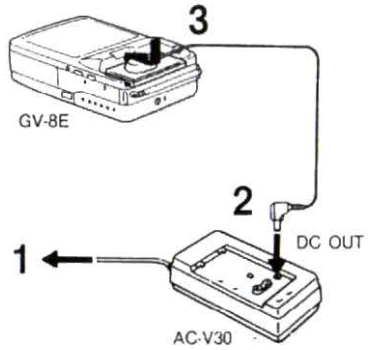
You can also use the AC-V55 AC power adaptor or BC-55 battery charger (not available in UK) to charge an NP-55 and/or an NP-77.
For details, see the instructions of the AC-V55 or BC-55.

Notes on battery case

- You cannot use normal batteries. Use only alkaline batteries.
- If you use the battery case in a cold place, its operating time is shortened.
- When you use the battery case to operate the video TV recorder, occasionally the displays on the screen may not blink.
- If you cannot remove the cassette from the unit, replace the batteries with new ones.

Using with AC Power Adaptor — AC-V30

1 Connect the AC power adaptor to a wall outlet.
2 Insert into the DC OUT jack.
3 Install the other side of the connecting cord to the video TV recorder.



- The optional AC-V55 can also be used.
- Attach or remove the AC power adaptor in the same way as the battery pack.
- When disconnecting, do not pull the cord.

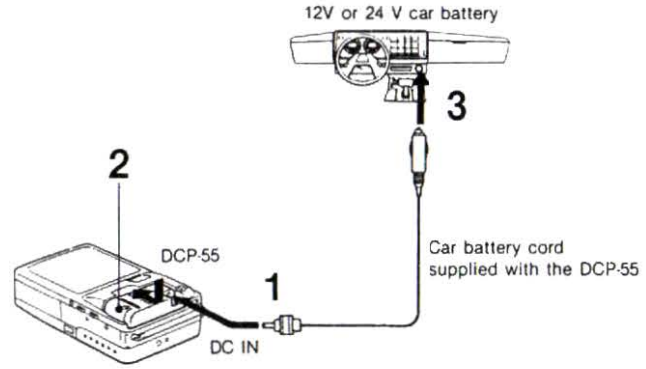
Charging temperature

The temperature range for charging is 5°C to 35°C (41°F to 95°F).
However, to provide maximum battery efficiency, the recommended temperature range when charging is 10°C to 30°C (50°F to 86°F).

- The unit is not disconnected from the AC power source as long as it is connected to the wall outlet.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.

Using with Car Battery — DCP-55

1 Insert into the DC IN jack of the DC pack.
2 Attach to the video TV recorder.
3 Connect to the cigarette lighter socket.



- The optional AC-V55 or the NP-4000 (battery pack) can also be used to operate this unit. In this case, connect them to the cigarette lighter socket of the car with the optional DCC-16AE car battery cord. The AC-V30 cannot be used in a car.
- Attach or remove the DC pack in the same way as the battery pack.

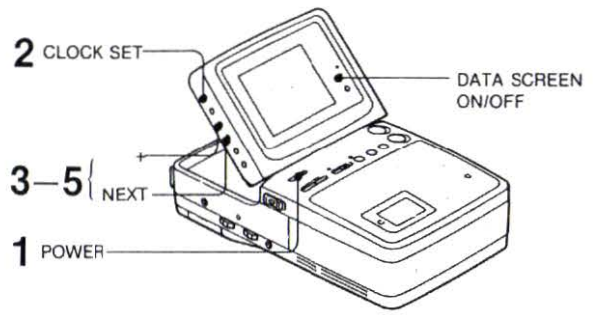
Notes

- Be careful not to let any metal object touch the metal part on the battery pack or the AC power adaptor. When the battery pack is not used, keep it in its case.
- Keep the video TV recorder away from the power source. If not, noise may appear on the screen.

Notes on the use of the GV-8E in a car

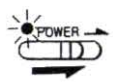
- When you use the DCP-55 or AC-V55, connect them only to the cars with negative ground 12V or 24V car battery.
- For your safety, do not watch the TV or operate the controls while driving.
- Avoid leaving the unit in a place with very high temperature. If you do, it may cause distortion of the cabinet or malfunction of the unit.
- If you use this unit while your car is not in use, the car battery will be consumed.
  Avoid using this unit in such condition over 12 hours.

Setting the Clock



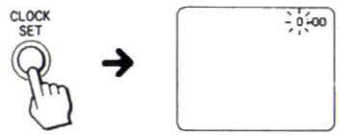
Example: Set to 13:15

1 Slide POWER to the right and release to turn the unit on.
The POWER lamp lights up.



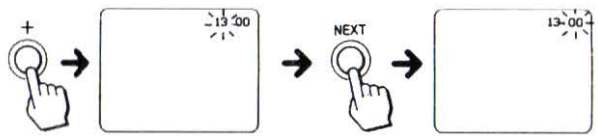
2 Press CLOCK SET.

The screen becomes dark.



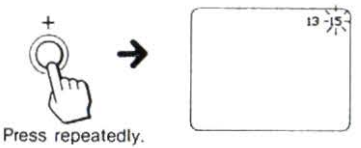
The next item to be set blinks.

3 Set the hour.
Press repeatedly until you get the correct setting.



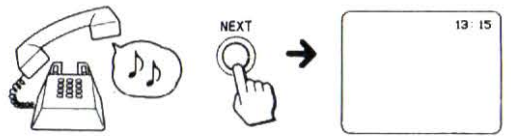
When you press and immediately release the + button, the indication will advance by one. If you keep the button pressed, the indication will advance continuously.

4 Set the minute.



Press repeatedly.

5 Press NEXT at the same time as an annouced time signal.



The screen goes back to the normal brightness.*

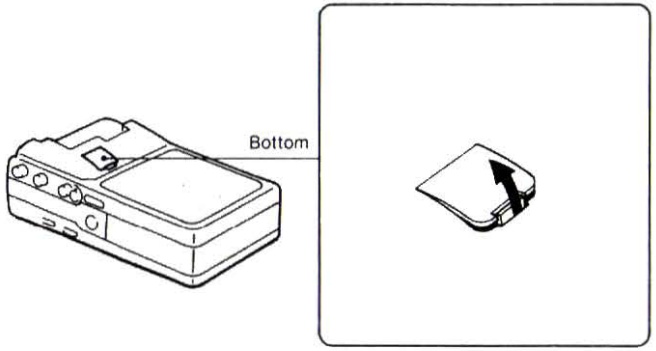
The clock starts.

* If the time indication was not displayed on the screen when you started setting the clock, the display goes off as the setting is completed. But, if the time indication was displayed, by pressing DATA SCREEN ON/OFF, when you started the setting, the display remains on the screen. To make the display disappear, press DATA SCREEN ON/OFF.

Inserting a Lithium Battery

This unit uses a lithium battery to activate the clock when the external power source is disconnected.

1 Open the cover of the lithium battery compartment.



2 Install the supplied CR2032 lithium battery with the + side facing out.

3 Close the cover.

To remove the lithium battery

Press the side of the battery in the direction as indicated for installation and lift it.

Lithium battery life

Approximately 1 year in normal operation.
If the lithium battery becomes weak, the time indication will blink on the screen for several seconds when the power is turned on. In this case, replace the battery with a Sony CR2032 lithium battery.
Use of a battery other than Sony CR2032 lithium battery may present a risk of fire or explosion.
After replacing the battery, the clock display becomes 0:00. Reset the clock.

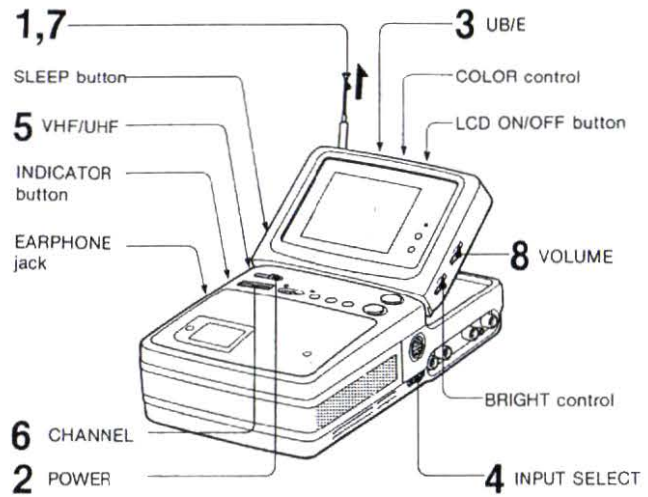
Notes on lithium battery

- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

WARNING

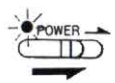
Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Watching TV Programs



1 Pull out the aerial fully.

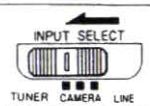
2 Turn the power on.



The POWER lamp lights up.

3 Set UB/E TV system selector.
UB for the United Kingdom.
E for other countiries.

4 Set INPUT SELECT to TUNER.



5 Select VHF or UHF.
In the United Kingdom, only UHF is available.

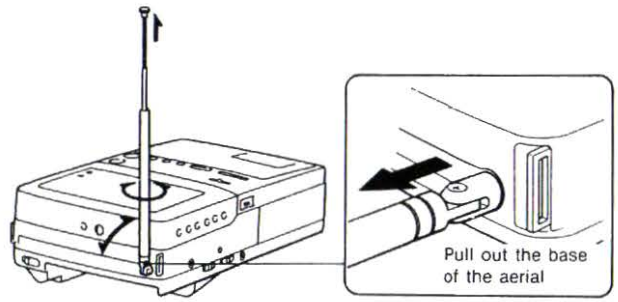
6 Select the desired channel.

A vertical line (VHF: green, UHF: red) appears and moves while the unit is searching for the channel and stops at the next channel.

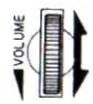
The vertical line disappears after several seconds.

Press + for higher-numbered channels and – for lower-numbered channels. The channels will appear in numerical sequence. Press CHANNEL +/– repeatedly until you get the desired channel on the screen.

7 Adjust the aerial for the best reception.



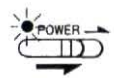
8 Adjust the volume.



To increase volume.

To decrease volume.

To turn off the TV

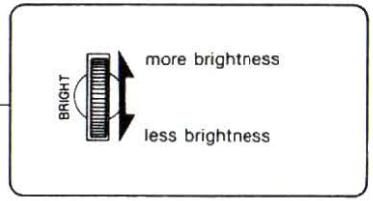


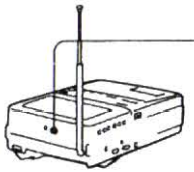
Slide POWER to the right and release. The lamp goes off.

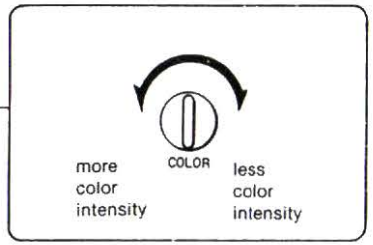
To listen with headphones

Connect the supplied headphones to the EARPHONE jack.
The sound from the speaker will be cut off.
The supplied headphones are of stereo type, but the sound will be heard through both right and left sides in monaural.

To adjust the picture

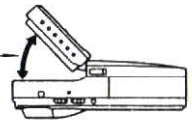






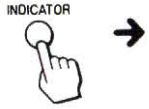
Adjust the above controls to your preference.

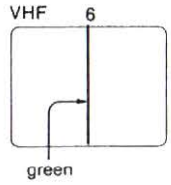
Adjust the angle of the LCD to your preference.



To know the channel you are watching

Press INDICATOR.





If the vertical line is green, you are watching a VHF channnel.
If it is in red, you are watching a UHF channel.

You know that you are watching VHF channel 6.

To mute the picture

Press LCD ON/OFF.

The picture will be muted.

It is recommended that you mute the picture when you view the playback picture of the VTR with another TV or monitor.
Battery life will be longer if you use the unit with the picture turned off.

"Last channel" memory function

- While you are watching the TV, if the power source is disconnected or the battery pack becomes exhausted, the unit turns off with the last channel being memorized.
  When you turn on the unit again, the last channel will appear on the screen.
- The same thing occurs when the TV signal is cut off, for example when you go through a tunnel.

Switching the TV system selector

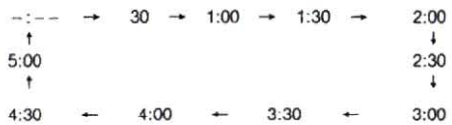
As the voice band in the United Kingdom is different from those on the Continent, set the TV system selector to UB.
Otherwise you will receive pictures without sound.

Note

When no picture is displayed, if the sound is set to a low volume, or the headphones are connected, the unit seems to be turned off though it is not.
Be sure to turn off the POWER when the unit is not used.

To have the unit turned off automatically — SLEEP timer

You can set the unit to turn off automatically after a certain time between 30 minutes and 5 hours while viewing a TV program or video playback , or while recording.
Each time you press the SLEEP button, the display changes as follows:



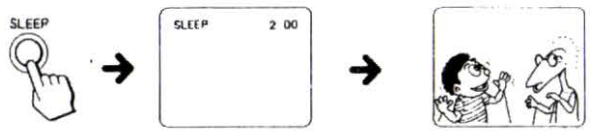
Example: To turn the TV off after 2 hours

1 Make sure the clock is set correctly (page 16).

2 Press SLEEP while watching the TV, etc.

The screen becomes dark.

3 Select the desired time interval by pressing SLEEP.



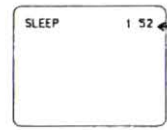
The screen goes back to the normal brightness after several seconds.

The TV will be turned off automaticaly after 2 hours.

The operation will be the same for the tape playback and recording.
The tape will stop running after the selected time interval.

To check the remaining time

Press SLEEP once.



The remaining time is displayed.

Note

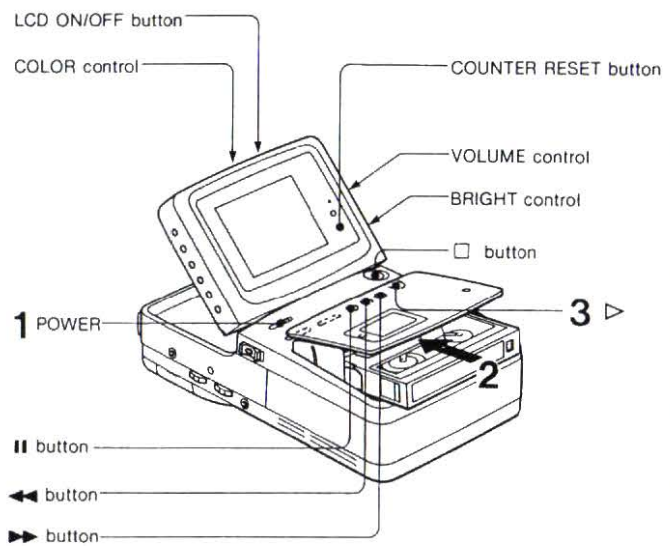
When you use the unit with rechargeable batteries, the unit may be turned off before the selected time because the batteries are exhausted.

To stop the SLEEP timer

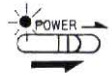
Press SLEEP repeatedly until you have the "-:--" display.

You can also stop the SLEEP timer by turning the unit off with the POWER switch.

Playing Back the Recorded Tapes

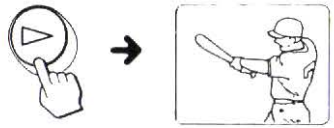


1 Turn the power on.
The lamp lights up.



2 Insert a recorded tape.

3 Press ▷ to start playback.



4 Adjust the volume.

To mute the picture

Press LCD ON/OFF.

To adjust the picture

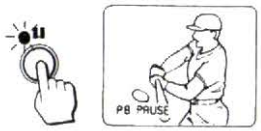
Adjust the BRIGHT and COLOR controls (page 22).

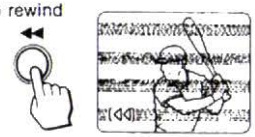
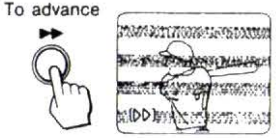
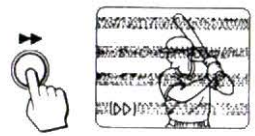
To stop the playback at the desired time

Use the SLEEP function.
You can have the unit turned off at the preset time. See page 24.

		On-screen display
To stop playback	Press □.	—
To rewind the tape and play it back automatically — Auto play	Keep ◀◀ pressed and press ▷.	AUTO PLAY
When the tape is played to the end	The tape stops. The unit is not turned off.	—
To advance the tape rapidly	Press ▶▶.	▷▷
To rewind the tape	Press ◀◀.	◁◁

Various playback modes

<table>
<tr><td rowspan="4">During playback</td><td>To stop the tape for a moment — Still picture</td><td> 

The lamp lights up.</td><td>To resume normal playback, press ❚❚ again, or press ▷. The pause mode will be automatically released after about 5 minutes and playback will resume.</td></tr>
<tr><td rowspan="3">To locate a particular point while viewing the picture — Picture search</td><td>To rewind
 
To advance
  </td><td rowspan="3">When you release the button, the unit will return to the previous mode.</td></tr>
<tr><td>When the unit is in the fast forward mode,</td><td>  </td></tr>
<tr><td>When the tape is being rewound,</td><td>  </td></tr>
</table>

Notes

- In the still picture, picture search or picture at high speed, streaks will appear and the sound will be muted.
- Picture noise will increase when you play back a tape recorded in the LP mode.
- If you make the picture search or the FR picture search with another TV or monitor, the picture may be in black and white, or the picture may shake vertically.
  During picture search or FR picture search, streaks will be larger than those that appear in the pictures viewed on this unit.

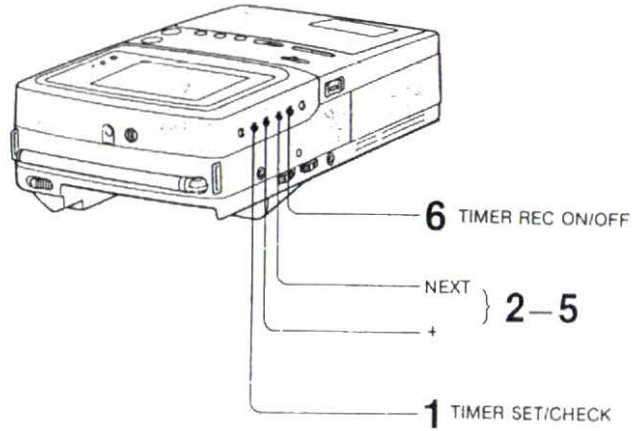
To Start Recording at the Desired Time

A TV program within 24 hours can be preset to be recorded automatically.

Before setting the timer

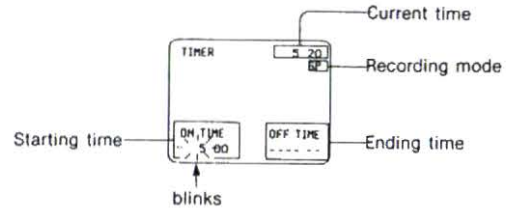
- Make sure that the power is supplied: is the battery pack fully charged? (For long recording, using the AC power source is recommended.)
- Set the clock. (Page 16)
- Insert a cassette. Make sure that the safety tab is slid in.
- Select the recording mode, SP or LP.
- Set the INPUT SELECT switch to the appropriate position. To record TV programs, set to TUNER.
- Select the desired channel for TV program recording.
  For better recording of picture and sound, using an external aerial is recommended. See page 41.

To set the timer



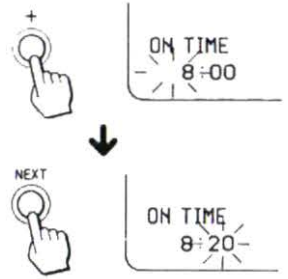
— Timer-activated recording

1 Press TIMER SET/CHECK.
The screen becomes dark



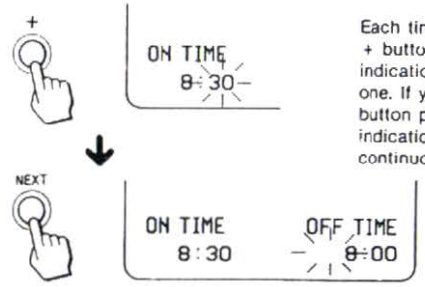
Setting the starting time

2 Set the hour.



Each time you press the + button, the hour indication increases by one.
If you keep the button pressed, the indication will increase continuously.

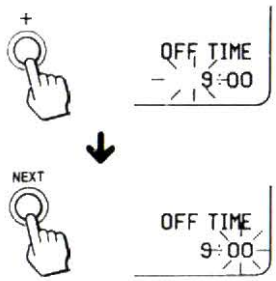
3 Set the minute.



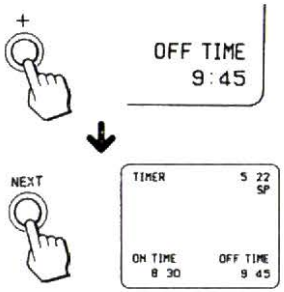
Each time you press the + button, the minute indication increases by one. If you keep the button pressed, the indication will increase continuously.

Setting the ending time

4 Set the hour.



5 Set the minute.



The screen will go back to the previous state in a few seconds.

6 Press TIMER REC ON/OFF.

The power will be turned off.
The TIMER REC lamp lights up.

Recording starts at the preset time and the power is turned off when it ends.
If the safety tab on the cassette is slid out or if no cassette is inserted when you press the TIMER REC ON/OFF button, "CASSETTE" indication will appear.

Note

Be sure to press the TIMER REC ON/OFF button only after you have finished the timer settings. If you press it while presetting, the power turns off at this point and the preset program is erased.

During timer recording, both picture and sound will be muted. To listen to the sound and watch the picture, press LCD ON/OFF.
When the TIMER REC lamp is lit, any buttons except for the TIMER REC ON/OFF button and the TIMER SET/CHECK button do not function.

To stop the timer recording

Press TIMER REC ON/OFF again.

If a power interruption occurs when the unit is connected to the AC power source

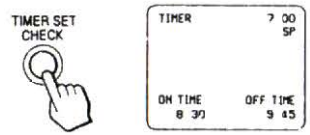
Recording will stop. The power will not be turned on even when the interruption ends.

To set the timer while the tape is running

You can set the timer during playback or recording.
In this case, advance or rewind the tape to the desired position before pressing the TIMER REC ON/OFF button in step 6.

To check the setting

Press TIMER SET/CHECK while the TIMER REC lamp is lit.
The power is turned on and the turn-on and turn-off times will be displayed.



If you have made a mistake in timer setting

Press TIMER REC ON/OFF to cancel the timer recording, then turn the unit on and set the timer again.

If the turn-on and turn-off times are the same

You can record to the end of the tape.
If the tape ends before the turn-off time, recording will stop and the power will be turned off.

Notes

- The timer recording cannot be made on AC power when the AC power adaptor is used for charging a battery pack. Before setting the timer, finish charging the battery pack which will be used later.
- When using the unit with the optional AC-V55 AC power adaptor, timer recording can be made after charging has been completed (see fig. 1). However, if the charging time overlaps the time set for timer recording, the timer recording will not start (see fig. 2). Set the timer so that charging will finish before the timer recording ON TIME.

Fig.1

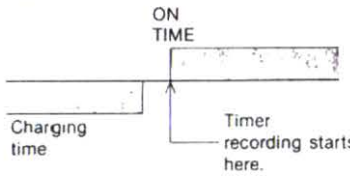
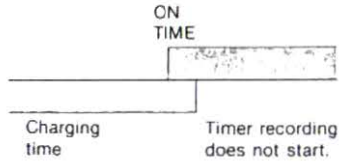
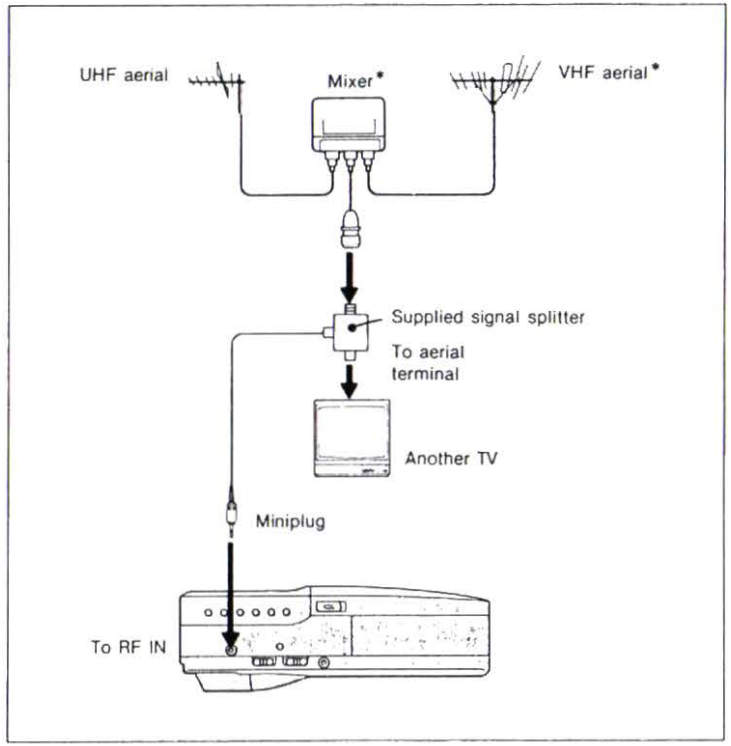


Fig.2



Connecting an Outdoor Aerial

If you cannot obtain satisfactory reception when recording TV programs, use an outdoor aerial.



*The mixer and the VHF aerial are not necessary in the United Kingdom as only UHF is available.

Notes

- Use the RF IN jack only for TV program recording.
- Before connecting the aerials, turn off the unit.
- Make connections firmly. A loose connection may cause a distorted picture.
- When using the unit in a car, use a commercially available car aerial, etc. For details, refer to the instruction manual of the car aerial.

Troubleshooting

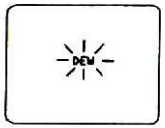
If you think you have a problem, double-check before calling the serviceman.
You may have overlooked something relatively simple!

	Symptom	Possible causes and corrections
POWER	The unit is not operable even if the POWER switch is turned on.	• No battery pack is attached. • The battery pack is exhausted. → Charge it. (page 10) • AC power adaptor or car battery cord is disconnected.
	Power turns off automatically during operation.	• The battery pack is exhausted. • The SLEEP timer has been set.
	The battery pack is quickly discharged.	• The ambient temperature is too low. • The battery pack has not been charged fully.
CLOCK	The clock blinks showing "0:00".	If the lithium battery has been changed, reset the clock (page 16), and if necessary, reset the timer recording.
RECORDING AND PLAYBACK	The playback picture is not clear.	• The video heads may be contaminated. Clean the heads using the Sony V8-25CL cleaning cassette (optional). For details on cleaning, refer to the instructions furnished with the cleaning cassette. • The video heads may be damaged.
	During recording, the picture is not clear.	TV signal is too weak. Adjust the telescopic aerial or connect an external aerial.
	Recording cannot be made.	• The safety tab on the cassette is slid out. • Moisture condensation has occured.
	The tape does not run even if the tape transport button is pressed.	• Timer setting has been made. Press the TIMER REC ON/OFF button and turn on the unit again. • Moisture condensation has occured.
	The camera recording cannot be made.	The camera is not connected correctly.
	The cassette cannot be ejected.	• No power is supplied to the unit. • The battery pack is exhausted. Use the charged battery. (page 10)

	Symptom	Possible causes and corrections
TV	Picture is muted.	LCD ON/OFF button has been pressed. Press it again.
	Both picture and sound are muted.	The unit is in the timer recording mode. Press LCD ON/OFF.
	Picture appears but no sound	• Adjust the VOLUME control. • Disconnect the headphones.
	No color	Adjust COLOR. (page 22)
	Snow and noise appear. 	Check the external aerial.
	Dotted lines or stripes 	This is often caused by local interference. (e.g. cars, neon signs, hair dryers, etc) Adjust aerial for minimum interference.
	Double images or ghosts 	Reflections from nearby mountains or buildings often cause this problem. Adjust the telescopic aerial or change the position of the unit for better reception.
TIMER RECORDING	The timer setting display does not appear.	Set the clock (page 16).
	A timer recording has not been made.	• The safety tab on the cassette was slid out. • The tape was not long enough. • The TIMER REC ON/OFF button has not been pressed. • The clock was not set correctly. • The battery pack was exhausted. • There has been a power interruption (for AC operation). • Moisture condensation has occured.

Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.



If moisture is present inside the unit, the DEW Indication flashes on the screen when you press a tape transport button.
Only the EJECT button functions at this time.

↓

Eject the cassette and turn off the unit and leave it with the cassette holder open at least for one hour.

↓

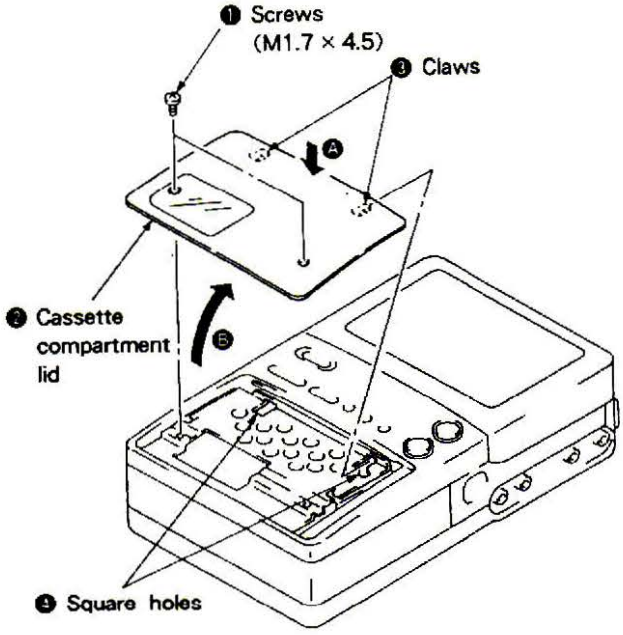
The unit can be used again if the DEW indication does not appear when a tape transport button is pressed.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE COMPARTMENT LID

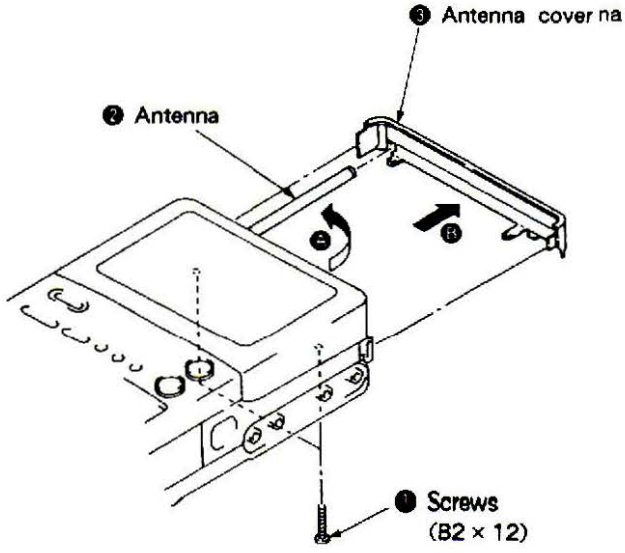
1) Remove two screws ❶.
2) Press the Ⓐ section lightly, and remove the cassette compartment lid ❷ by opening in the direction of arrow Ⓑ.

Note : Put in two claws ❸ into two square holes ❹ before installing.



2-2. REMOVAL OF ANTENNA COVER

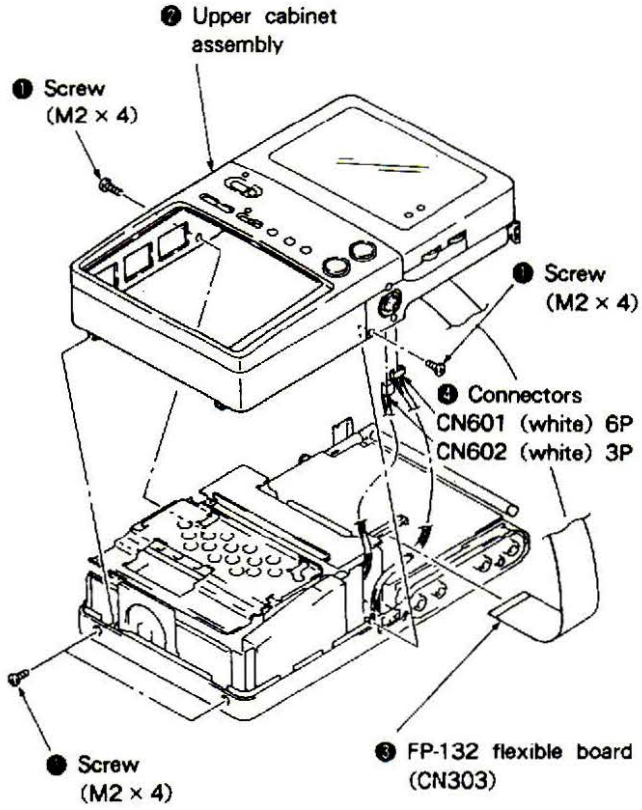
1) Remove two screws ❶.
2) Raise the antenna ❷ in the direction of arrow Ⓐ.
3) Remove the antenna cover ❸ in the direction of arrow Ⓒ, and pull out from the antenna ❷.



2-3. REMOVAL OF UPPER CABINET ASSEMBLY

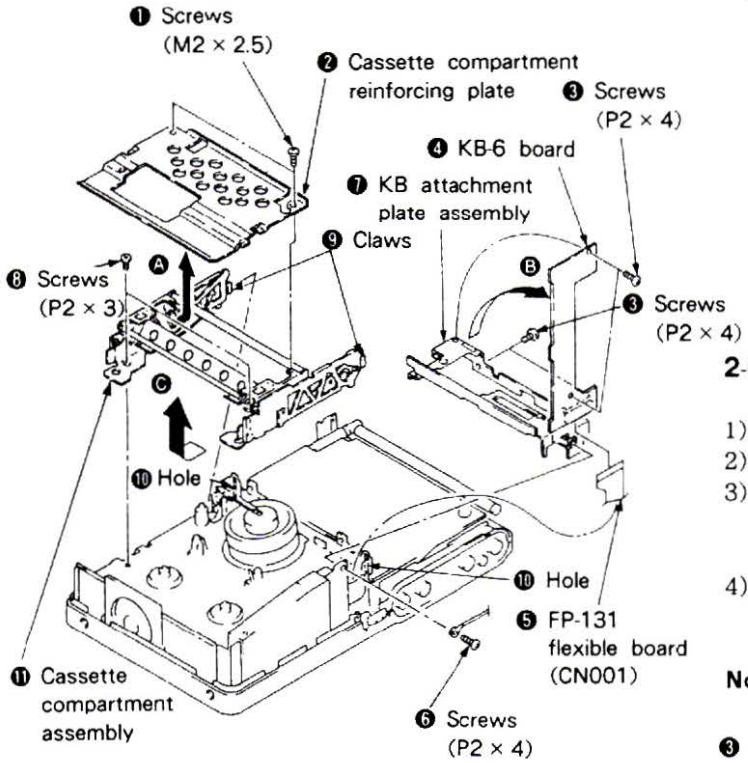
1) Remove four screws ❶.
2) Remove the upper cabinet assembly ❷.
3) Remove the FP-132 flexible board (CN303) ❸.
4) Remove two connectors (CN601, CN602) ❹.

Note : When removing the upper cabinet assembly ❷, be careful not to break the FP-132 flexible board (CN303) ❸.



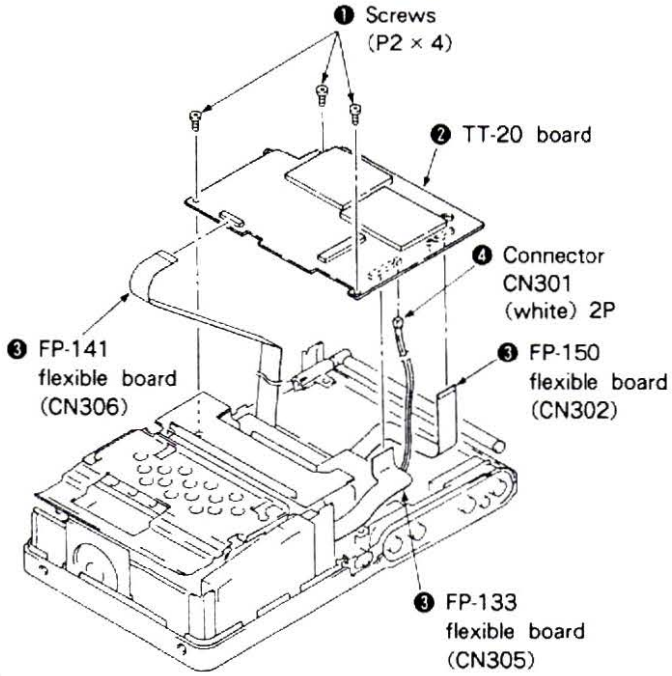
2-4. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

1) Remove two screws ❶, and remove the cassette compartment reinforcing plate ❷, in the direction of arrow Ⓐ.
2) Remove two screws ❸, and remove the portion of the KB-6 board ❹ from the KB attachment plate assembly ❼.
3) Remove the KB-6 board ❹ in the direction of arrow Ⓑ.
4) Remove the FP-131 flexible board (CN001) ❺.
5) Remove three screws ❻, and remove the KB attachment plate assembly ❼.
6) Remove two screws ❽, and remove two claws ❾ from two holes ❿.
7) Remove the cassette compartment assembly ⓫ in the direction of arrow Ⓒ.



2-5. REMOVAL OF TT-20 BOARD

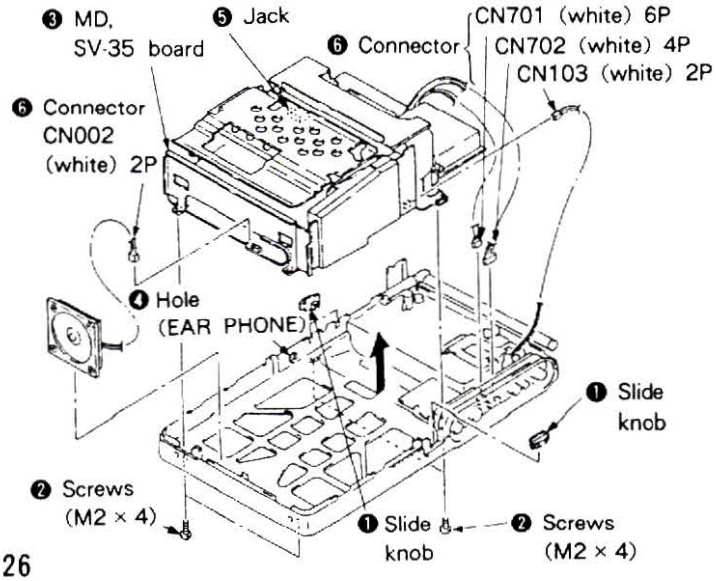
1) Remove three screws ❶, and remove the TT-20 board ❷.
2) Remove three FP-133, FP-141, FP-150 flexible boards (CN305, CN306 and CN302) ❸.
3) Remove the connector (CN301) ❹.



2-6. REMOVAL OF MD, SV-35 BOARD

1) Remove three slide knobs ❶.
2) Remove four screws ❷.
3) Remove the MD, SV-35 board ❸ in the direction of arrow, and remove the jack ❺ from the hole (EAR PHONE) ❹.
4) Remove four connectors (CN701, CN702, CN103 and CN002) ❻.

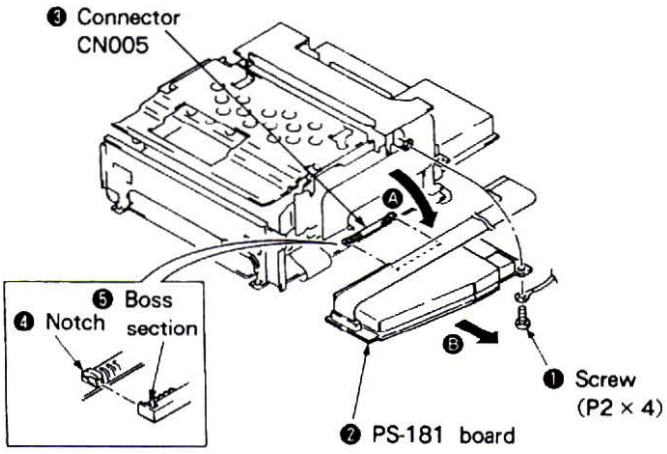
Note : When installing, put the jack ❺ into the hole (EAR PHONE) ❹ before installing.



2-7. REMOVAL OF PS-181 BOARD

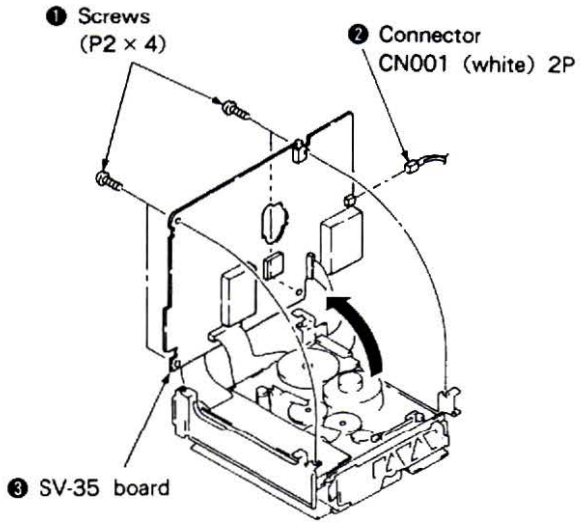
1) Remove the screw ❶.
2) Open the PS-181 board ❷ in the direction of arrow Ⓐ.
3) Remove the PS-181 board ❷ from the connector (CN005) ❸ with pulling the board in the direction of arrow Ⓑ.

Note : When installing, install the PS-181 board ❷ on the main unit with inserting its two boss section ❺ into as many notching section ❹ of the connector (CN005) ❸, and raise the PS-181 board ❷.



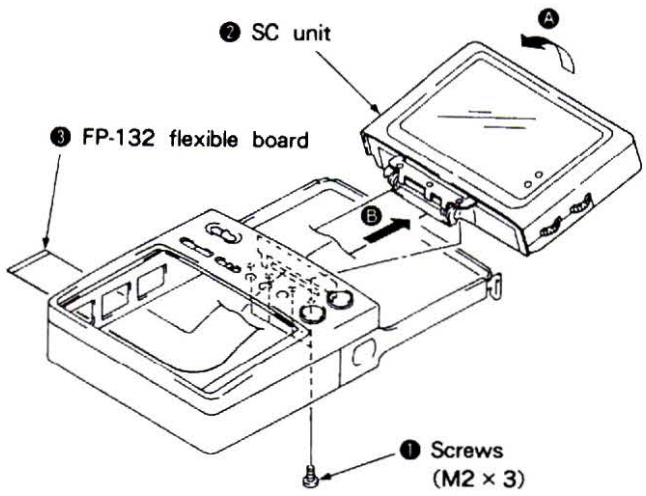
2-8. OPENING OF SV-35 BOARD

1) Remove four screws ❶.
2) Remove the connector (CN001) ❷.
3) Open the SV-35 board ❸ in the direction of arrow.



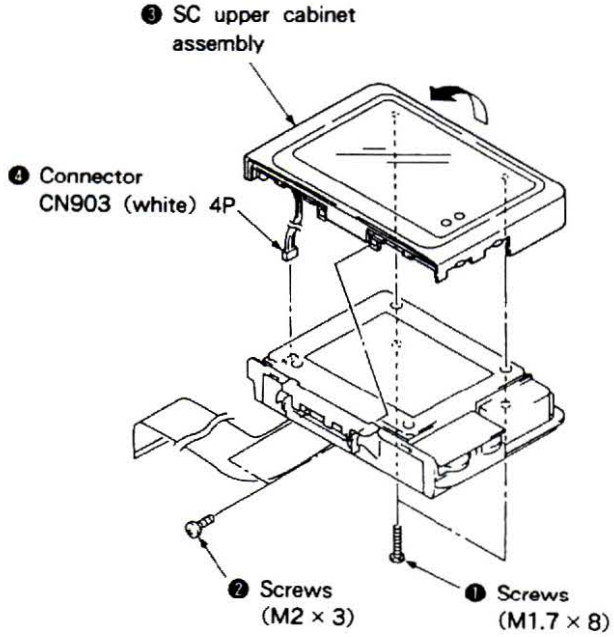
2-9. REMOVAL OF SC UNIT

1) Remove four screws ❶.
2) Raise the SC unit ❷ in the direction of arrow Ⓐ.
3) Remove the SC unit ❷ in the direction of arrow Ⓑ with care for the FP-132 flexible board ❸.



2-10. REMOVAL OF SC UPPER CABINET ASSEMBLY

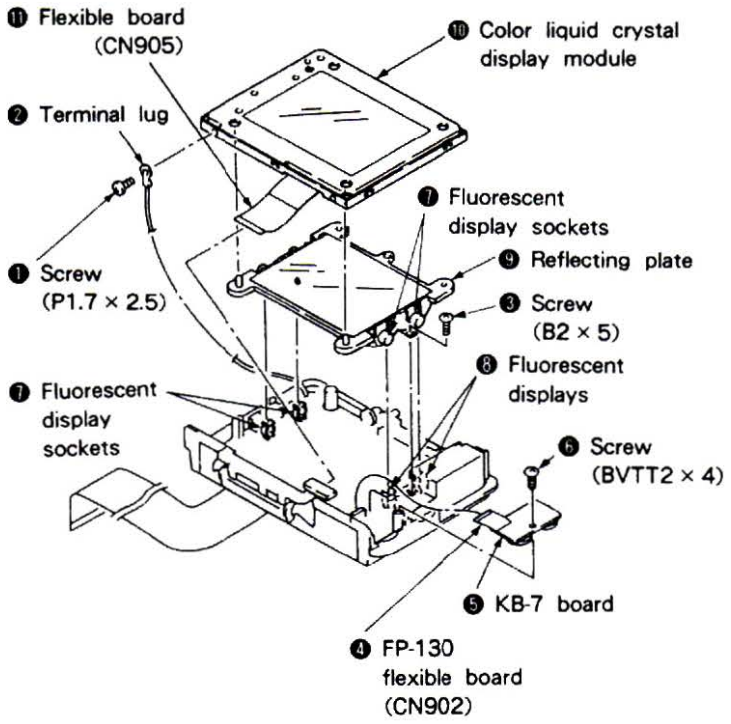
1) Remove two screws ❶.
2) Remove two screws ❷.
3) Remove the SC upper cabinet assembly ❸ in the direction of arrow.
4) Remove the connector (CN903) ❹.



2-11. REMOVAL OF COLOR LIQUID CRYSTAL DISPLAY MODULE AND REFLECTING PLATE

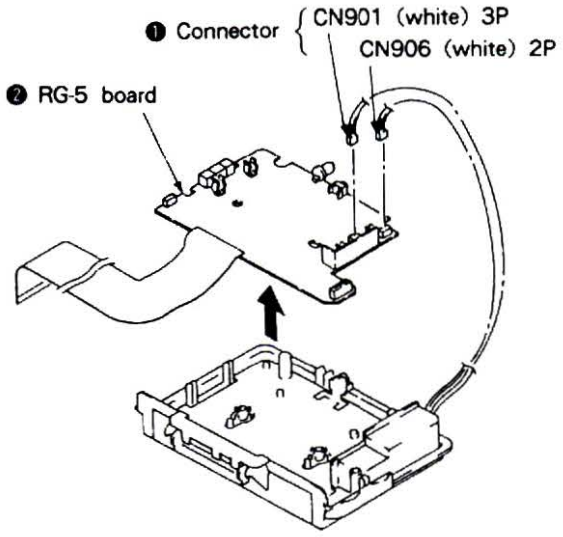
1) Remove the screw ❶, and remove the terminal lug ❷.
2) Remove the screw ❸.
3) Remove the FP-130 flexible board (CN902) ❹, and remove the KB-7 board ❺.
4) Remove the screw ❻.
5) Remove the fluorescent displays ❽ from four fluorescent display sockets ❼, and remove the reflecting plate ❾.
6) Remove the flexible board (CN905) ⓫, and remove the color liquid crystal display module ❿.

Note : When installing, install the flexible board (CN905) ⓫ before installing the reflecting plate ❾.



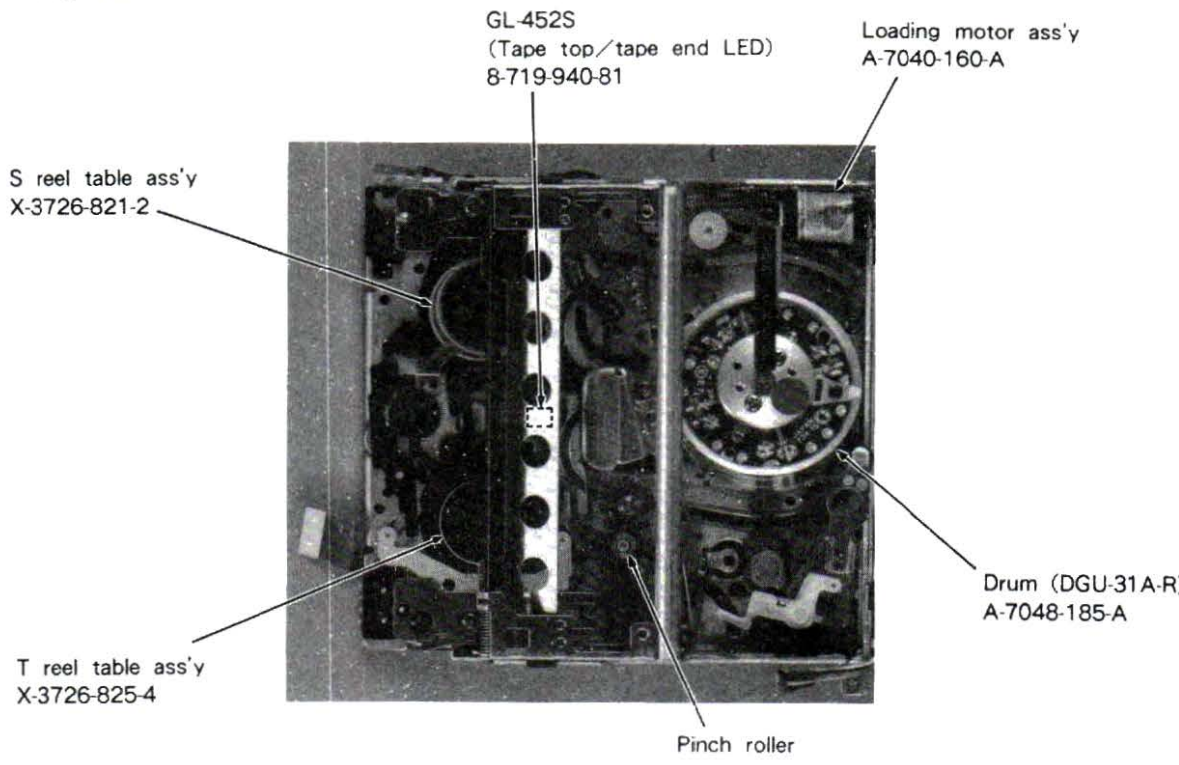
2-12. REMOVAL OF RG-5 BOARD

1) Pull out two connectors (CN901 and CN906) ❶.
2) Remove the RG-5 board ❷ in the direction of arrow.

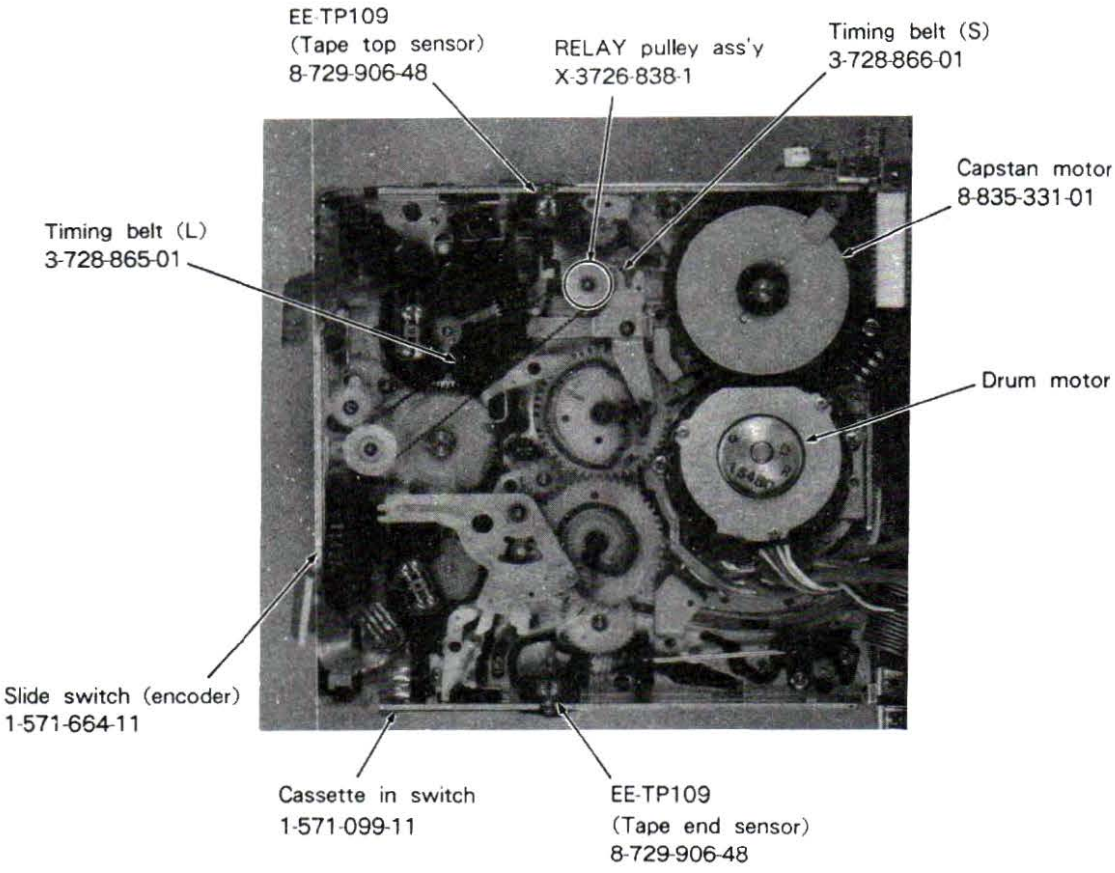


2-13. INTERNAL VIEW

— Top side —



— Bottom side —

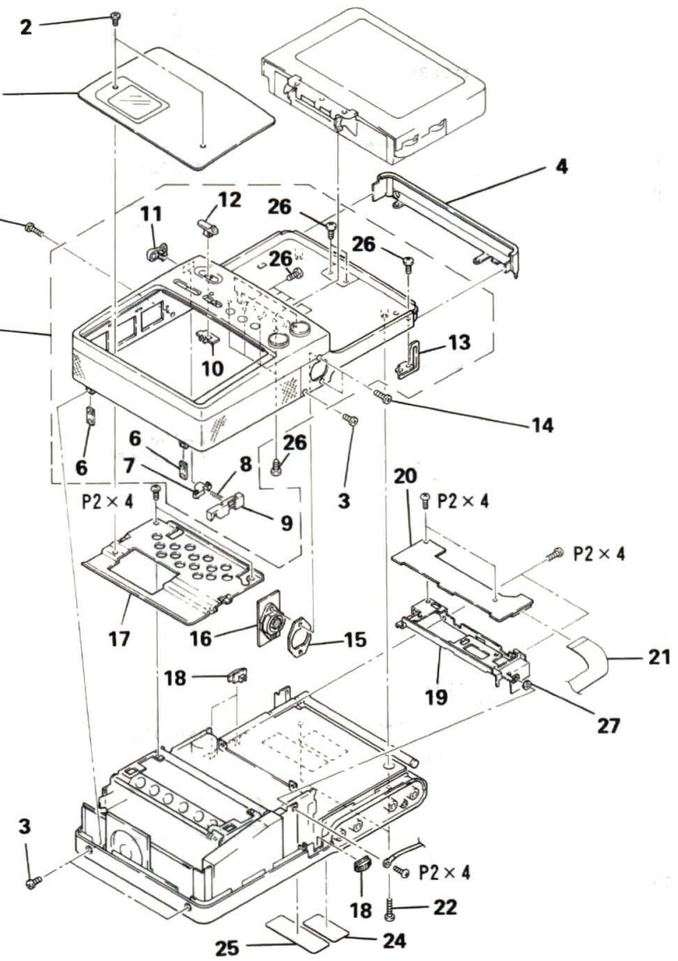


SECTION 5
EXPLODED VIEWS

NOTE:
- –XX, –X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

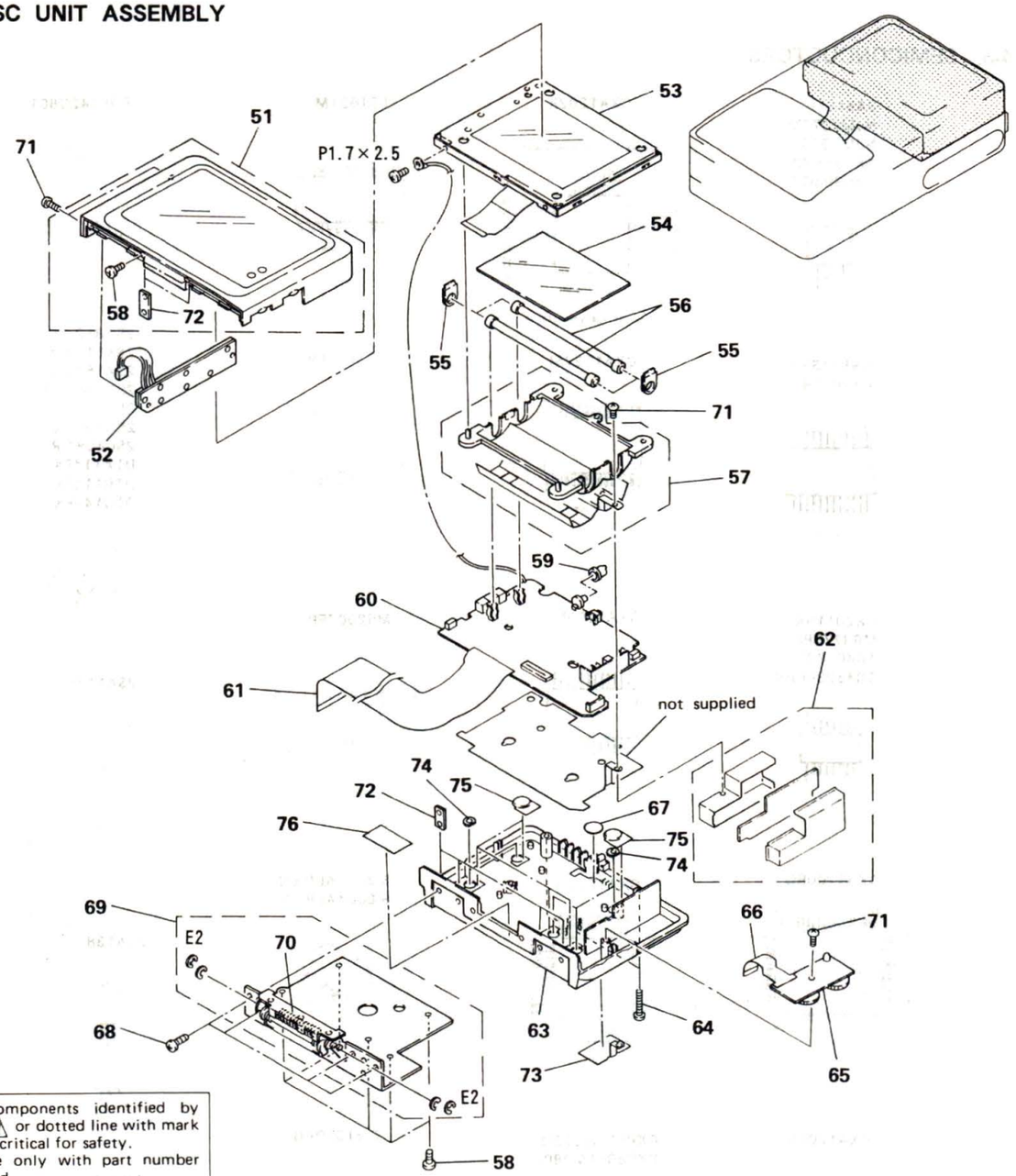
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER) ASSEMBLY



No.	Part No.	Description	Remark
1	X-3726-870-1	LID ASSY, CASSETTE COMPARTMENT	
2	*3-719-555-01	SCREW (M1.7X4.5)	
3	3-719-381-01	SCREW (M2X4)	
4	3-728-969-11	COVER, ANTENNA	
5	A-7080-699-A	CABINET BLOCK ASSY, UPPER	6-13, 26
6	3-730-103-01	NUT, PLATE	
7	3-728-932-01	BUTTON, EJECT LOCK	
8	3-303-973-00	SPRING, COMPRESSION	
9	3-728-955-02	PLATE, SLIDE, EJECT	
10	3-728-958-02	PLATE, SLIDE, POWER	
11	3-728-956-01	BUTTON, EJECT	
12	3-728-959-01	BUTTON, POWER	
13	3-728-940-01	HOLDER (RIGHT), BAND	
14	3-719-381-21	SCREW (M2X6)	
15	*3-728-901-01	SPACER (CA)	
16	*1-627-994-11	CA-15 BOARD	
17	*3-728-923-01	REINFORCEMENT	
18	3-728-950-01	KNOB, SLIDE	
19	*X-3726-850-1	BRACKET ASSY, KB	
20	*A-7070-680-A	KB-6 (A) BOARD, COMPLETE	
21	1-628-031-11	FP-131 FLEXIBLE BOARD	
22	2-370-905-51	SCREW (B) (2X12), TAPPING	
24	*3-730-157-01	LABEL, MODEL NUMBER	
25	*3-728-978-01	LABEL, BATTERY FITTING	
26	3-713-786-21	SCREW (M2X3)	
27	3-730-139-01	WASHER, FIBER	

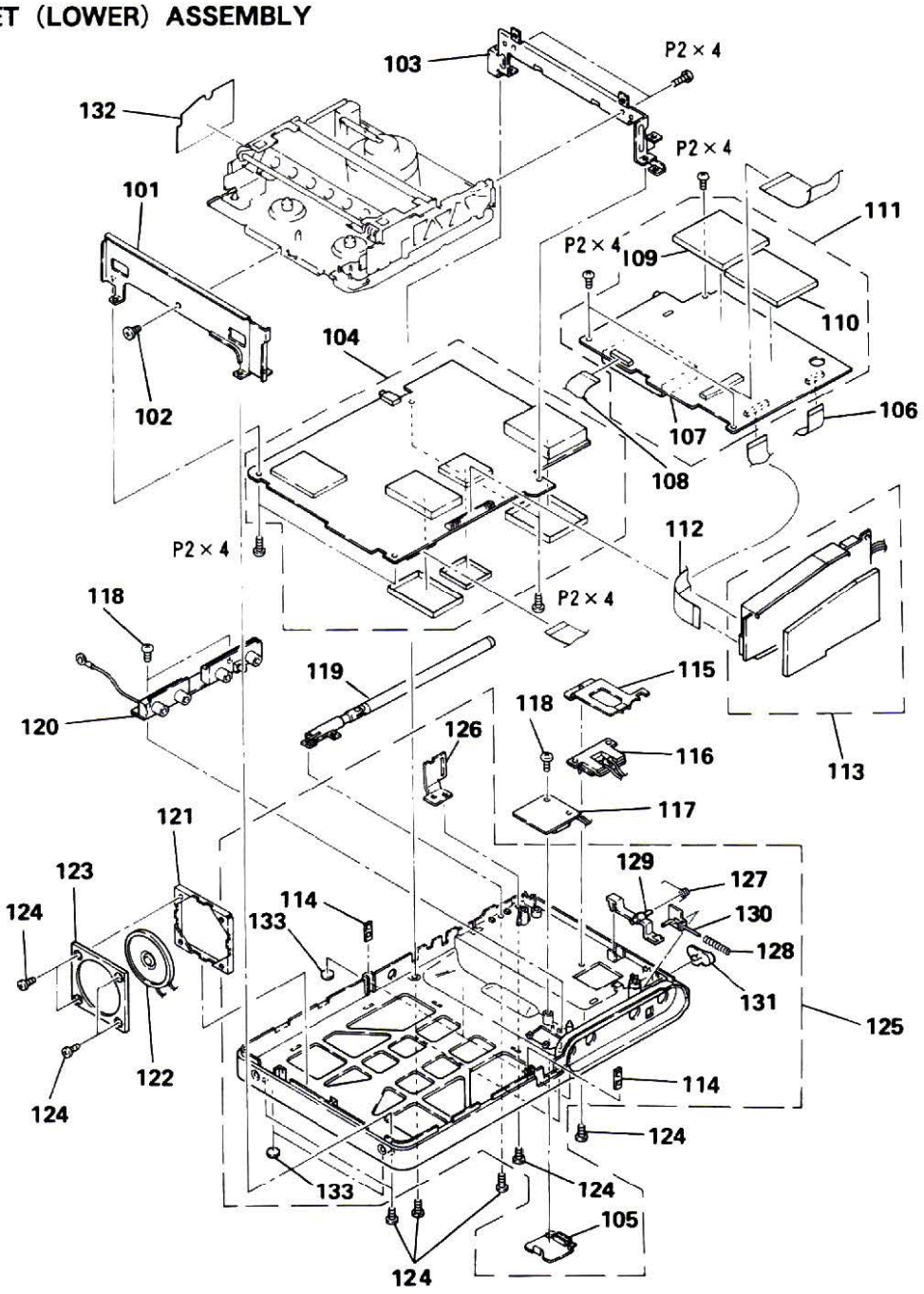
5-2. SC UNIT ASSEMBLY



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

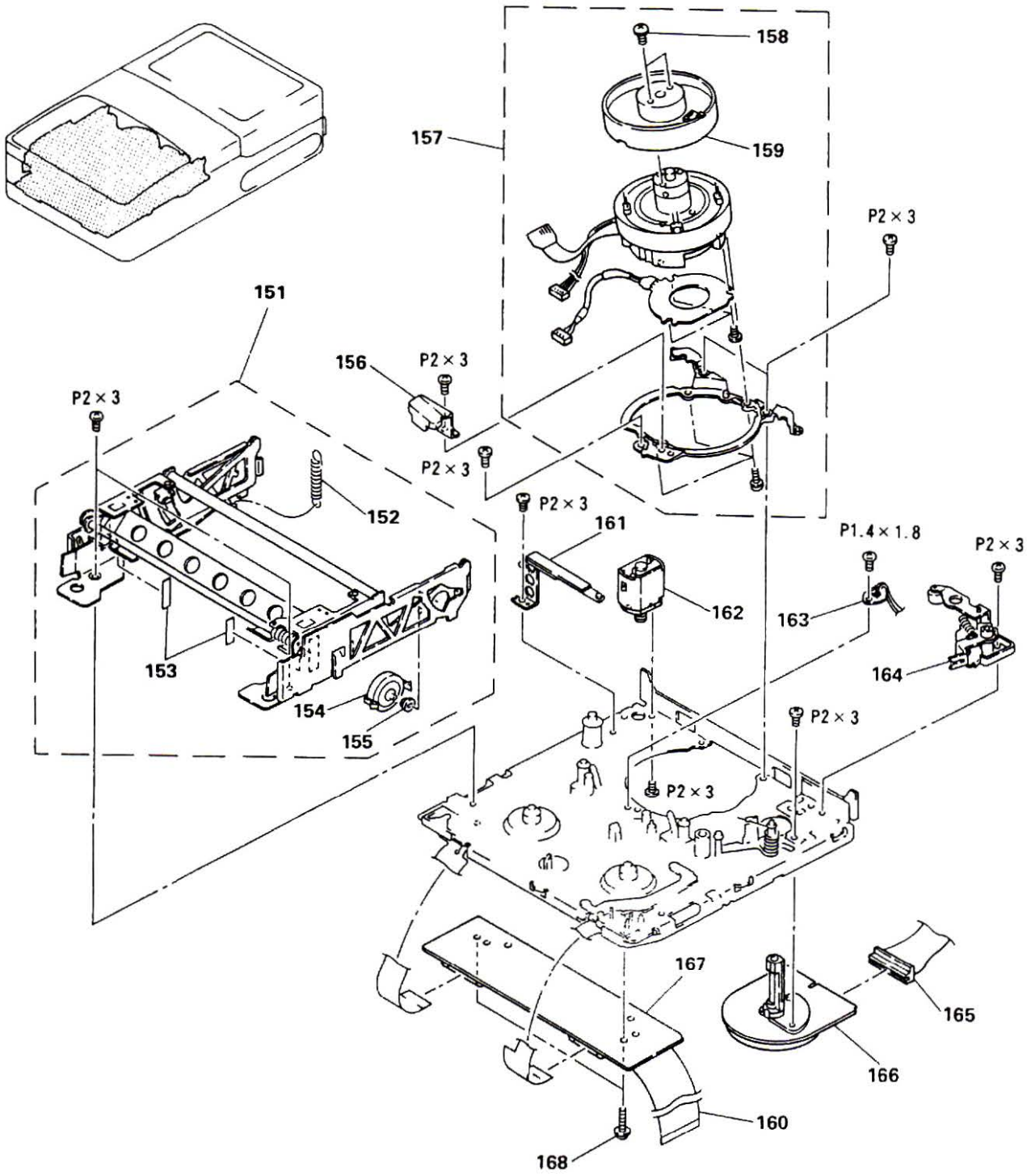
No.	Part No.	Description	Remark
51	X-3726-868-1	CABINET (UPPER) ASSY, SC	58, 72
52	1-466-009-11	SWITCH BLOCK, CONTROL	
53	1-808-658-11	DISPLAY MODULE, LIQUID CRYSTAL	
54	3-728-931-01	ILLUMINATOR	
55	3-728-938-01	RUBBER, RETAINER	
56	1-518-638-11	TUBE, FLUORECENT	
57	X-3726-842-1	REFLECTOR ASSY	
58	3-713-786-21	SCREW (M2X3)	
59	3-728-945-01	KNOB, COLOR	
60	*A-7061-464-A	RG-5 (A) BOARD, COMPLETE	
61	1-628-030-11	FP-132 FLEXIBLE BOARD	
62	⚠1-466-011-11	CONVERTER UNIT, D/A	
63	3-728-970-11	CABINET (BOTTOM), SC	
64	3-730-123-01	SCREW (M1.7X8), SPECIAL HEAD	
65	*A-7070-811-A	KB-7 (B) BOARD, COMPLETE	
66	1-628-032-11	FP-130 FLEXIBLE BOARD	
67	*3-730-112-01	SHEET, INSULATING, LOCK SHAFT	
68	3-719-381-01	SCREW (M2X4)	
69	A-7090-843-A	HINGE BLOCK ASSY	70
70	3-730-118-01	SPRING, COMPRESSION	
71	2-370-905-21	SCREW (B) (2X5), TAPPING	
72	3-730-104-01	NUT, SC PLATE	
73	*3-730-110-01	PLATE, GROUND, DA	
74	3-730-106-01	NUT (D), PLATE	
75	*3-730-111-01	PACK, INSULATING	
76	*3-730-113-01	SHEET, INSULATING, HINGE	

5-3. CABINET (LOWER) ASSEMBLY



No.	Part No.	Description	Remark
101	*3-728-927-01	FRAME (FRONT)	
102	3-730-107-01	SCREW (M2X2.2)	
103	*3-728-928-01	FRAME (REAR)	
104	*A-7061-462-A	SV-35 (A) BOARD, COMPLETE	
105	3-728-949-01	LID, BATTERY CASE, LITHIUM	
106	1-628-035-11	FP-150 FLEXIBLE BOARD	
107	1-465-136-11	TUNER PACK (EC-EE2585) (TU101)	
108	1-628-028-11	FP-141 FLEXIBLE BOARD	
109	*X-3726-840-1	CASE (BOTTOM LID) ASSY, SHIELD, TT	
110	*X-3726-839-1	CASE (BOTTOM LID) ASSY	
111	*A-7061-463-A	TT-20 (A) BOARD, COMPLETE (WEST GERMANY MODEL)	107, 109, 110
	*A-7061-472-A	TT-20 (B) BOARD, COMPLETE (AEP MODEL)	107, 109, 110
112	1-628-029-11	FP-133 FLEXIBLE BOARD	
113	*A-7061-172-A	PS-181 (A) BOARD, COMPLETE	
114	3-730-103-01	NUT, PLATE	
115	*3-728-939-01	HOLDER, TERMINAL BOARD	
116	1-535-658-41	TERMINAL BOARD	
117	*1-627-989-11	LI-6 BOARD	
118	3-713-790-01	SCREW (M2X6), TAPPING, P3	
119	1-501-415-11	ANTENNA, TELESCOPIC	
120	*1-627-995-11	JK-34 BOARD	
121	3-728-899-01	BRACKET, SPEAKER	
122	1-503-293-00	SPEAKER	
123	3-728-915-01	PALTE, BAFFLE	
124	3-719-381-01	SCREW (M2X4)	
125	A-7080-725-A	CABINET BLOCK ASSY, BOTTOM	105, 114, 124, 126-131
126	3-728-941-01	HOLDER (LEFT), BAND	
127	3-728-943-01	SPRING (B)	
128	3-728-944-01	SPRING, COMPRESSION	
129	3-728-946-01	LOCK, BATTERY	
130	3-728-947-01	PLATE, SLIDE, RELEASE	
131	3-728-948-01	BUTTON, RELEASE	
132	*3-730-149-01	PLATE, BLIND, MD	
133	4-879-274-11	SPACER	

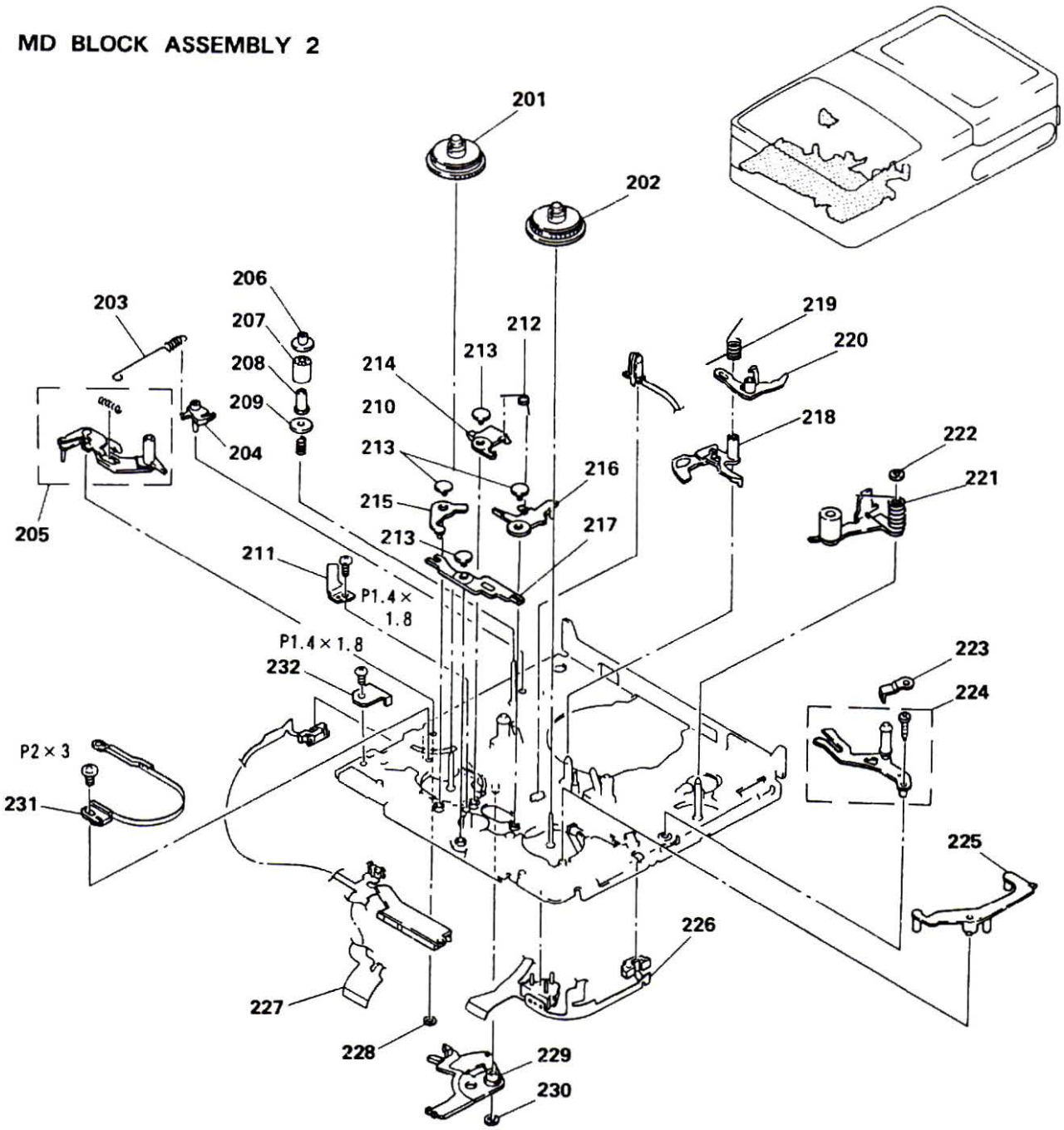
5-4. MD BLOCK ASSEMBLY 1



No.	Part No.	Description	Remark
151	X-3726-833-1	CASSETTE COMPARTMENT ASSY	152-155
152	3-728-825-03	SPRING, TENSION	
153	*3-728-829-01	TAPE	
154	3-728-867-02	DAMPER, OIL	
155	3-728-829-02	GEAR, DAMPER	
156	3-729-868-01	GUARD, GUIDE	
157	A-7048-229-A	DRUM ASSY, (DGU-40A-R)	158, 159
158	3-686-493-01	SCREW (M2X5), P1	
159	A-7049-215-A	DRUM ASSY, UPPER, ROTARY (DGR-40-R)	

No.	Part No.	Description	Remark
160	1-628-033-11	FP-129 FLEXIBLE BOARD	
161	1-535-739-12	TERMINAL, SHAFT EARTH	
162	A-7040-160-A	MOTOR ASSY, THREADING (M903)	
163	1-808-505-11	SENSOR	
164	A-7040-161-B	ROLLER BLOCK ASSY, HC	
165	1-628-034-11	FP-142 FLEXIBLE BOARD	
166	8-835-331-01	MOTOR, DC U-22A (CAPSTAN) (M902)	
167	*1-627-997-11	UC-1 BOARD	
168	3-713-790-01	SCREW (M2X6), TAPPING, P3	

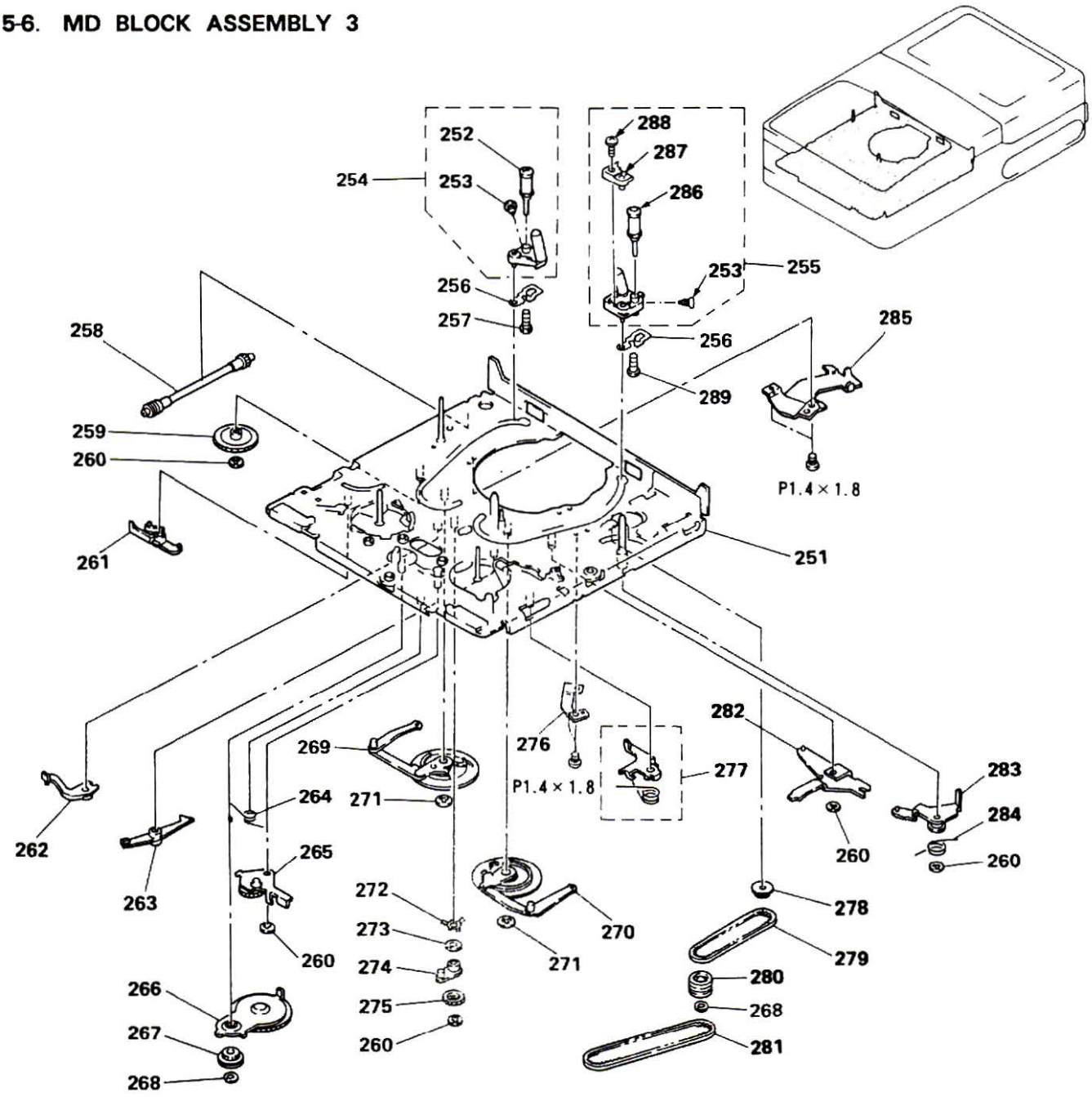
5-5. MD BLOCK ASSEMBLY 2



No.	Part No.	Description	Remark
201	X-3726-821-2	TABLE ASSY, REEL, S	
202	X-3726-825-4	TABLE ASSY, REEL, T	
203	3-728-995-01	SPRING, TENSION	
204	3-728-855-03	ARM, ADJUSTMENT	
205	X-3726-832-3	ARM ASSY, TENSION REGULATOR	
206	3-726-884-01	FLANGE, UPPER, TG2	
207	3-726-883-01	ROLLER, TG2	
208	3-726-885-01	SLEEVE, TG2	
209	3-726-882-02	FLANGE, LOWER, TG2	
210	3-726-886-01	SPRING, COMPRESSION	
211	3-726-848-01	RETAINER, TL	
212	3-726-866-01	SPRING (ST), TORSION	
213	3-726-858-01	PIN, SHAFT RETAINER	
214	3-728-849-01	BRAKE, S	
215	3-726-852-01	BRAKE, LB	
216	3-728-850-01	BRAKE, T	

No.	Part No.	Description	Remark
217	3-726-853-01	LEVER, LB	
218	3-728-875-01	STOPPER, RK	
219	3-726-864-01	SPRING (RK), TORSION	
220	3-728-852-01	ARM, RK STOPPER	
221	A-7040-163-B	ARM BLOCK ASSY, PINCH	
222	3-669-465-00	WASHER (1.5), STOPPER	
223	3-728-808-01	SPRING, LEAF	
224	X-3726-822-1	ARM ASSY, TG7	
225	3-728-848-01	ARM, LB RELEASE	
226	1-628-061-12	FP-90 FLEXIBLE BOARD	
227	1-628-060-12	FP-89 FLEXIBLE BOARD	
228	3-321-393-11	WASHER, STOPPER	
229	X-3726-806-1	LEVER ASSY, SW	
230	3-726-829-01	WASHER, STOPPER	
231	X-3726-809-2	BAND ASSY, TENSION REGULATOR	
232	3-730-125-01	RETAINER, SW	

5-6. MD BLOCK ASSEMBLY 3



No.	Part No.	Description	Remark
251	X-3726-834-4	CHASSIS ASSY, MECHANICAL	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
254	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	252, 253
255	A-7040-129-E	COASTER (RIGHT) BLOCK ASSY	253, 286-288
256	3-726-820-02	SPRING, LEAF	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
258	X-3726-807-1	WORM ASSY	
259	3-726-826-01	GEAR, WHEEL	
260	3-726-829-01	WASHER, STOPPER	
261	3-728-842-01	LEVER, EJECT	
262	3-728-851-01	BRAKE, UL	
263	3-726-854-01	ARM, BRAKE RELEASE	
264	3-726-865-01	SPRING (LB), TORSION	
265	A-7040-130-A	GEAR BLOCK ASSY, LB	
266	X-3726-802-1	GEAR ASSY, RK	
267	X-3726-812-1	GEAR ASSY, RC	
268	3-321-393-11	WASHER, STOPPER	
269	X-3726-830-2	GEAR (LEFT) ASSY, DRIVE	
270	X-3726-831-2	GEAR (RIGHT) ASSY, DRIVE	
271	3-669-465-00	WASHER (1.5), STOPPER	
272	3-726-867-01	SPRING, LEAF	
273	3-701-436-21	WASHER, POLYEHTHYLENE	
274	3-726-857-02	ARM, UL	
275	3-726-856-02	GEAR, UL	
276	*3-726-805-01	REINFORCEMENT (TT)	
277	X-3726-808-2	BRAKE ASSY, TS	
278	X-3726-805-1	GEAR ASSY, JOINT	
279	3-728-866-01	BELT (S), TIMING	
280	X-3726-838-1	PULLY ASSY, RELAY	
281	3-728-865-01	BELT (L), TIMING	
282	X-3726-804-1	LEVER ASSY, THREADING	
283	X-3726-824-1	ARM ASSY, PINCH SUB	
284	3-726-895-01	SPRING	
285	X-3726-841-1	REINFORCEMENT (SS) ASSY	266
286	X-3726-864-1	ROLLER ASSY (U)-BS, GUIDE	
287	X-3726-861-2	ADJUSTOR ASSY, GUIDE	
288	3-730-141-01	SCREW (PSW) (2X4)	
289	3-730-140-01	SCREW (M1.2X4)	

SECTION 7
MECHANICAL ADJUSTMENTS

FOR MECHANICAL ADJUSTMENTS

Refer to mechanical adjustment manual " U MECHANISM" for the adjustments and checks of mechanism section and the mechanical parts replacement.

SECTION 8
ELECTRICAL ADJUSTMENT

Refer to the adjustment-related parts location diagram on page 172.

The following measuring devices are used for electrical adjustment.

[Required equipment]

1) TV Monitor
2) Dual-trace oscilloscope with delay mode for frequencies up to 10 MHz or over (use a 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes

For tracking adjustment (WR5-1C)
Part code : 8-967-995-06

For video frequency characteristic adjustment (WR5-2C)
Part code : 8-967-995-16

For operation check
(WR5-3CL)
Part code : 8-967-995-36
(WR5-3CSP)
Part code : 8-967-995-27

[Connections]

Connect measuring devices as shown below unless otherwise specified.

• INPUT SELECT switch ····· LINE position

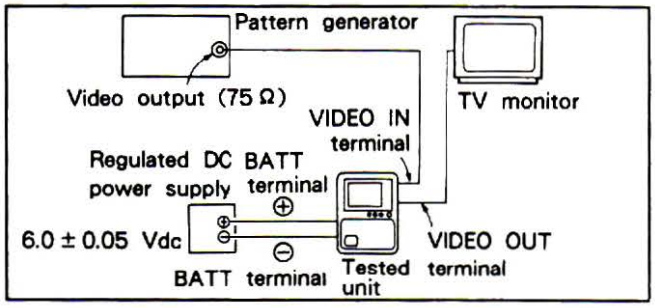


Fig. 8-1.

[Setup for adjustment]

The video signal from the pattern generator is used as adjustment signal, so it must be within specifications. Connect the oscilloscope to J701 on the JK-34 board (VIDEO IN) and confirm that amplitude of the video signal sync component is approx. 0.3V, amplitude of the video component approx. 0.7V, and amplitude of the burst component approx. 0.3V with a flat shape. Also confirm that the ratio between burst and red levels is 0.30 : 0.66.

The video (color bar) signal used for electrical adjustment is shown in Fig. 8-2.

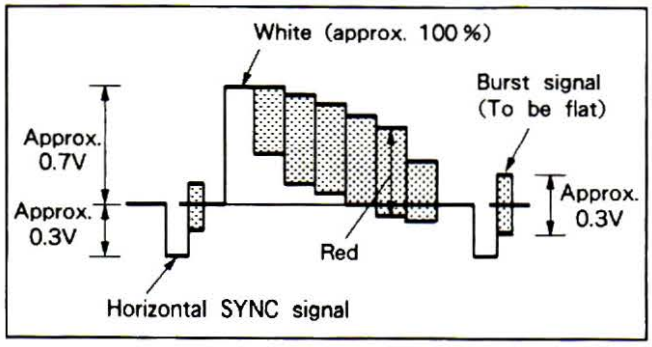
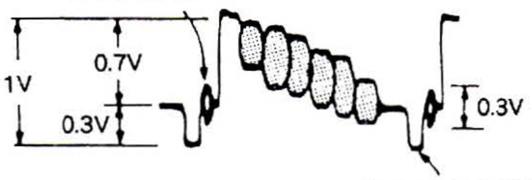


Fig. 8-2.

[Alignment tapes]

Tape	Content	Use
Tracking (WR5-1C)	1. Recording area : PCM – video 2. Recording content : CH2 : 1MHz linearity adjustment signal	Drum linearity adjustment
Video Frequency Response (WR5-2C)	1. Recording area : Video 2. Recording content : RF sweep 0 to 10MHz 3. Maker : 1, 3.58, 5.5 and 7MHz	Frequency response adjustment
Operation Check SP mode (WR5-3CSP) LP mode (WR5-3CL) Note : PCM area is not included in WR5-3CL	1. Recording area : Video 2. Recording content : ■ Video track • Video signals: Color bars 10sec, Monoscope 8sec } Iterative (Color bars)   • Audio signals (AFM) 400Hz 60% modulation ■ PCM area (WR5-3CSP only) • Audio signals (PCM) 1kHz 10sec 20Hz 2sec 400Hz 4sec 14kHz 2sec } Iterative	Operation check

[Input/output level and impedance]

Video input — Pin jack
Input signal : 1 Vp-p, 75 Ω unbalanced, negative sync

Video output — Pin jack
Output signal : 1 Vp-p, 75 Ω unbalanced, negative sync

Audio input — Pin jack
Input level : – 10 dBs (0 dBs = 0.775 Vrms)
Input impedance : 47 kΩ or over

Audio output — Pin jack
Specified output : – 10 dBs
Output impedance : 2.2 kΩ or less

8-1. POWER BLOCK ADJUSTMENT AND CHECK

8-1-1. Unregulated Power Supply Voltage Check (PS-181 Board)

Mode	Power off
Measuring Instrument	Digital voltmeter
MT UNREG B	
Measurment Point	Pin ⑬ of CN101
Specified Value	6.0 ± 0.1 Vdc
MT UNREG A	
Measurement Point	Pin ⑫ of CN101
Specified Value	6.0 ± 0.1 Vdc
SV UNREG	
Measurement Point	Pin ⑩ of CN101
Specified Value	5.9 ± 0.1 Vdc
AU UNREG	
Measurement Point	Pin ⑨ of CN101
Specified Value	5.9 ± 0.1 Vdc
BL UNREG	
Measurement Point	Pin ③ of CN102
Specified Value	5.8 ± 0.1 Vdc

Adjusting method :

1) Adjust the stabilized power supply output voltage so that voltage between Pin ② (BATT 6V) and Pin ① of CN103 becomes 6.0 ± 0.05 Vdc.
2) Confirm that voltage at every check point meets the specifications.

8-1-2. Oscillation Frequency Adjustment (PS-181 Board)

Mode	Stop (power on)
Measurement Point	Collector of Q106
Measuring Instrument	Frequency counter
Adjusting Element	RV101
Specified Value	475 ± 5 kHz

Adjusting method :

1) Adjust oscillation frequency to 475 ± 5 kHz with RV101.

8-1-3. Switch 5V Adjustment (PS-181 Board)

Mode	Stop (power on)
Measurement Point	Pin ⑦ of CN101
Measuring Instrument	Digital voltmeter
Adjusting Element	RV102
Specified Value	4.95 ± 0.05 Vdc

Adjusting method :

1) Adjust to 4.95 ± 0.05 Vdc with RV102.

8-1-4. − 8V Adjustment (PS-181 Board)

Mode	Stop (power on)
Measurement Point	Pin ⑩ of CN102
Measuring Instrument	Digital voltmeter
Adjusting Element	RV103
Specified Value	− 8.3 ± 0.1 Vdc

Adjusting method :

1) Adjust to − 8.3 ± 0.1 Vdc with RV103.

8-1-5. TV Power Voltage Check (PS-181 Board)

Mode	Stop (power on)
Measuring Instrument	Digital voltmeter
TV 5V	
Measurment Point	Pin ⑤ of CN102
Specified Value	4.95 ± 0.05 Vdc
+ 13V	
Measurement Point	Pin ⑧ of CN102
Specified Value	13.0 ± 0.5 Vdc
− 20V	
Measurement Point	Pin ⑪ of CN102
Specified Value	− 20.0 ± 0.5 Vdc
+ 30 Vdc	
Measurement Point	Pin ⑫ of CN102
Specified Value	33.0 ± 2.0 Vdc

Checking method :

1) Confirm that voltage at every check point meets the specifications.

8-1-6. Video 5V Check (PS-181 Board)

Mode	Recording or playback
Measurement Point	Arbitrary
Measuring Instrument	Pin ⑥ of CN101
Adjusting Element	Digital voltmeter
Specified Value	4.85 ± 0.1 Vdc

Checking method :

1) Confirm that voltage at Pin ⑥ of CN101 meets the specifications.

8-1-7. CAM UNREG Check (PS-181 Board)

Mode	Camera standby
Measurement Point	Pin ② of W104
Measuring Element	Digital voltmeter
Specified Value	5.8 ± 0.1 Vdc

Checking method :

1) Turn power on and set the INPUT SELECT switch (S101 on the SV-35 board) to the CAMERA position.
2) Confirm that voltage at Pin ② of W104 meets the specifications.

8-2. SYSTEM CONTROL ADJUSTMENT

8-2-1. Battery Down Adjustment (SV-35 Board)

Mode	Stop (power on)
Signal	Arbitrary
Measurement Point	Check the LCD counter display
Measuring Instrument	
Adjusting Element	RV101
Specified Value	2 : 89 to 2 : 87 reading on the LCD counter display

Connections :

1) Connect the stabilized power supply and the voltmeter as shown in Fig. 8-3.
2) Connect Pin ① (TEST B) and Pin ② (COM) of CN017 with a jumper wire (TEST 2 MODE).

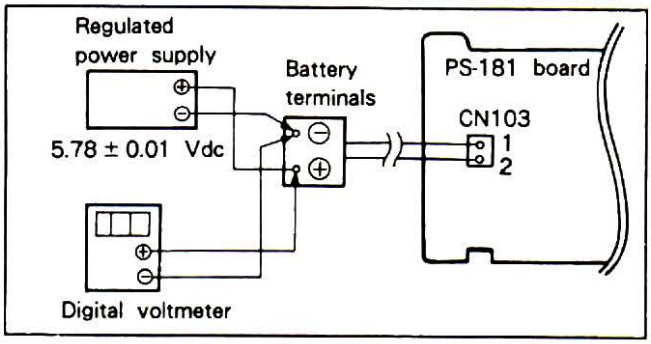


Fig. 8-3.

Adjusting method :

1) Press the LCD block DATA SCREEN button (S302 on the KB-7 board). The counter will be displayed on the LCD (Confirm that it reads "– 1 : 03 : 00").
2) Short-circuit TP001 and TP002 on the KB-6 board once and confirm that the "–" on the display blinks (Fig. 8-4 Ⓐ).
3) Adjust the stabilized power supply output voltage so that the digital voltmeter reading becomes 5.78 ± 0.01 Vdc.
4) Adjust RV101 so that the LCD counter reading is within "– 1 : 02 : 89" and "– 1 : 02 : 87" (Fig. 8-4 Ⓑ).
5) Remove the jumper wire between Pins ① and ② of CN017 and short-circuit TP001 and TP002 on the KB-6 board four times to set the LCD counter reading to "0 : 00 : 00" (TEST mode cancelled).

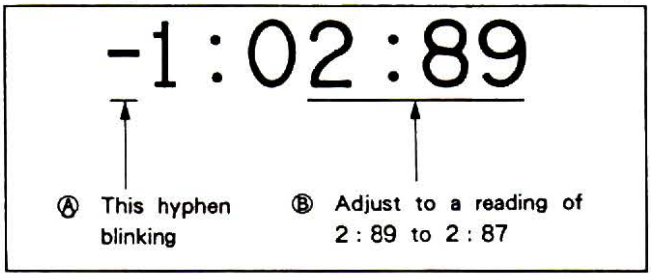


Fig. 8-4.

Checking method :
Check as follows, and repeat adjustment if specifications are not satisfied.

1) Adjust the stabilized power supply output voltage so that the digital voltmeter display reads 6.00 ± 0.01 Vdc.
2) Confirm that the "BATTERY DOWN" indication is not displayed on the LCD and that the POWER LED is not blinking.
3) Slowly lower the stabilized power supply output voltage until the digital voltmeter display reads 5.78 ± 0.01 Vdc.
4) Confirm that the "BATTERY DOWN" indication is displayed on the LCD and that the POWER LED blinks at 1-s intervals.
5) Lower the stabilized power supply output voltage until the digital voltmeter display reads 5.70 ± 0.01 Vdc.
6) Confirm that the screen disappears and power goes off.

8-3. SERVO SYSTEM ADJUSTMENT

8-3-1. Oscillation Frequency Adjustment (SV-35 Board)

Mode	Stop (power on)
Signal	Arbitrary
Measurement Point	Pin ① of IC305
Measuring Instrument	Frequency counter
Adjusting Element	RV301
Specified Value	479.8 ± 5 kHz

Adjusting method :

1) Adjust oscillation frequency to 479.8 ± 5 kHz with RV301.

8-3-2. Switching Position Adjustment (SV-35 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-3CSP)
Measurement Point	CH-1 : Pin ④ of W013 (VIDEO OUT) CH-2 : Pin ④ of CN018 (RF SWP)
Measuring Instrument	Oscilloscope
Adjusting Element	RV102
Specified Value	6.5 ± 0.3 H (410 ± 20 μs)

Adjusting method :

1) Connect Pins ③ (TEST A) and ② (COM) of CN017 with a jumper wire (TEST 1 MODE).
2) Adjust to 6.5 ± 0.3H (410 ± 20 μs) with RV102.

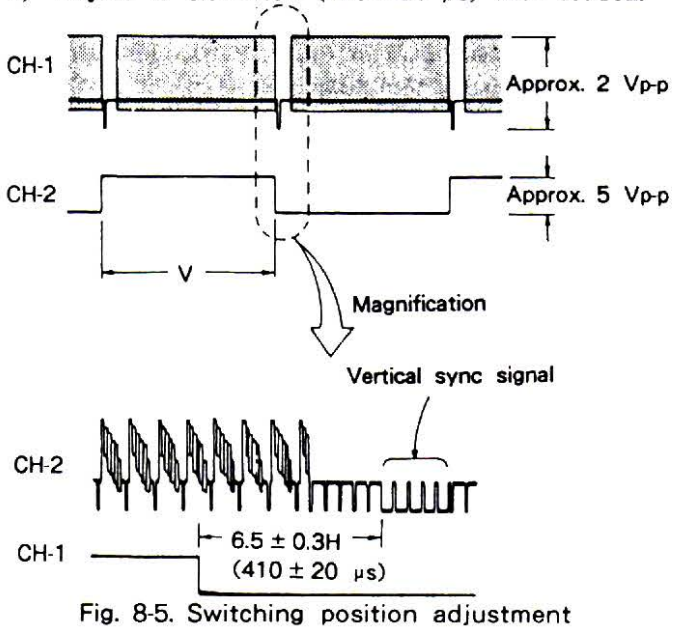


Fig. 8-5. Switching position adjustment

8-3-3. Capstan FG Adjustment (SV-35 Board)

Mode	Recording (LP mode)
Signal	Arbitrary
Measurement Point	Pin ⑦ of IC303
Measuring Instrument	Oscilloscope
Adjusting Element	RV302
Specified Value	Minimum amplitude

Adjusting method :

1) Adjust amplitude of the output waveform (capstan error) at Pin ⑦ of IC303 to the minimum with RV302.

Fig. 8-6.

8-3-4. Still Playback Adjustment (SV-35 Board)

Items between square brackets [ ] indicate the adjusting element for LP mode.

Mode	Playback pause
Signal	Tape self-recorded color bar signal in SP [LP] mode.
Measurement Point	TV monitor screen
Measuring Instrument	
Adjusting Element	RV103 [RV104]
Specified Value	SP mode : Noise on upper and lower areas covering 1/3 of the screen or less. LP mode : Noise on upper and lower areas covering 1/4 of the screen or less.

Adjusting method :

1) Connect Pins ① (TEST B) and ② (COM) of CN107 with a jumper wire (TEST 2 MODE).
2) Play back the tape recorded by the tested unit, wait until the picture is stabilized and press the PAUSE button, setting the playback pause mode.
3) Confirm that noise is confined to upper and lower areas covering 1/3 [1/4] or the screen or less.
4) If the above specification is not satisfied, repeat steps 2) and 3).

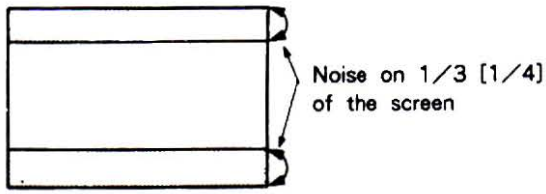


Fig. 8-7. STILL adjustment

8-3-5. Playback SP/LP Adjustment (SV-35 Board)

Mode	Various playback (CUE)
Signal	Alignment tape for operation check (SP mode : WR5-3CSP) (LP mode : WR5-3CL)
Measurement Point	TP202
Measuring Instrument	Digital voltmeter
Adjusting Element	RV201
Specified Value	$\frac{V_S + V_L}{2}$

Adjusting method :

1) Connect Pins ③ (TEST A) and ② (COM) of CN017 with a jumper wire (TEST 1 MODE).
2) Set S602 (SP/LP) to the LP position, then play back the SP mode tape (WR5-3CSP) in CUE mode.
3) Measure the present voltage (V_S) at Pin ② (TP201) of IC201 with a digital voltmeter and record it. (V_S)
4) Set S602 (SP/LP) to the SP position, then play back the LP mode tape (WR5-3CL) in CUE mode.
5) Measure the present voltage (V_L) at Pin ② (TP201) of IC201 with a digital voltmeter and record it. (V_L)
6) Adjust voltage at TP202 to $\frac{(V_S + V_L)}{2}$ with RV201.
7) Remove the jumper wire attached in step 1).

8-4. VIDEO ADJUSTMENT

As a rule, follow the order below for adjustment of the video system.
The color video signal supplied by the pattern generator is used as input video signal for video system adjustment in the recording mode. Confirm that the sync and color burst components meet the specifications in Fig. 8-2 of the "Setup for Adjustment" section.

[**Adjustment order**]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C separation adjustment
5) IR 2 adjustment
6) Emphasis input level adjustment
7) Sync AGC adjustment
8) PB Y level 1 adjustment
9) PB Y level 2 adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) AC clip check
13) Chroma emphasis fo adjustment
14) REC Y recording current adjustment
15) REC C recording current adjustment
16) REC AFM recording current adjustment
17) REC AFT recording current adjustment
18) Delay chroma gain adjustment
19) Quasi burst phase adjustment
20) Delay burst phase adjustment

8-4-1. Playback Frequency Characteristic Adjustment (SV-35 Board)

1. CH-1 and CH-2 adjustments

Items between square brackets [ ] indicate the adjusting element for channel 2.

Mode	Playback
Signal	Alignment tape for frequency characteristic adjustment (WR5-2C)
Measurement Point	Pin ③ of CN018 External trigger : Pin ④ of CN018 Trigger slope : +, [−]
Measuring Instrument	Oscilloscope
Adjusting Element	RV501 (RV502)
Specified Value	3.58 MHz level : 5.5 MHz level = 4 : 2.5

Adjusting method :

1) Adjust the ratio between 3.58 and 5.5 MHz levels to 4 : 2.5 [4 : 2.5] with RV501 [RV502].

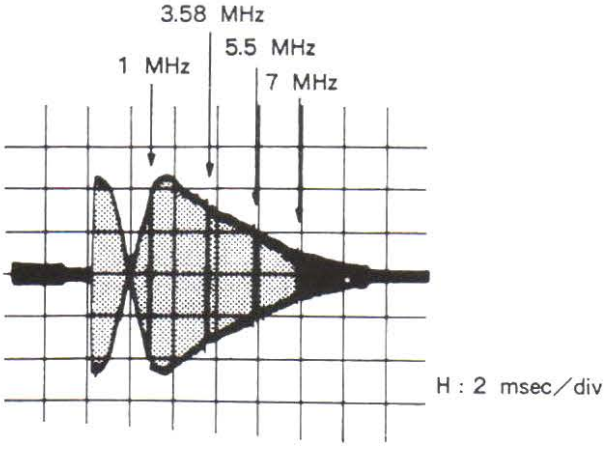


Fig. 8-8. Playback frequency characteristic adjustment

8-4-2. Flying Erase Check (SV-35 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ① of CN015 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency : 8.0 ± 0.5 MHz

Note : Use an MP type tape (level at Pin ⑮ of CN006 must be low).

Checking method :

1) Confirm that oscillation frequency is 8.0 ± 0.5 MHz and oscillation voltage is 8.0 Vp-p or more.

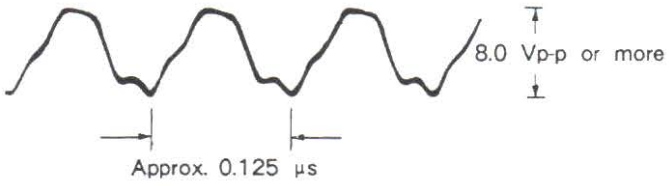


Fig. 8-9.

8-4-3. Crystal Oscillator fo Check (SV-35 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-3CSP)
Measurement Point	Emitter of Q614
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 50 Hz

Adjusting method :

1) Confirm that oscillation frequency at Emitter of Q614 is 4433619 ± 50 Hz.

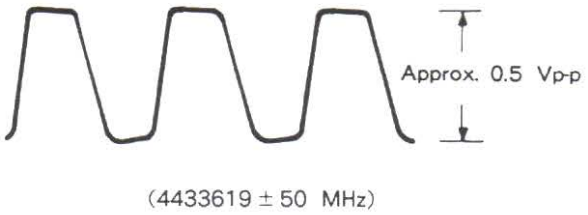


Fig. 8-10. Crystal oscillator fo check

8-4-4. Sync AGC Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊾ of IC600
Measuring Instrument	Oscilloscope
Adjusting Element	RV701
Specified Value	0.50 ± 0.02 Vp-p

Adjusting method :

1) Adjust to 0.50 ± 0.02 Vp-p with RV701.

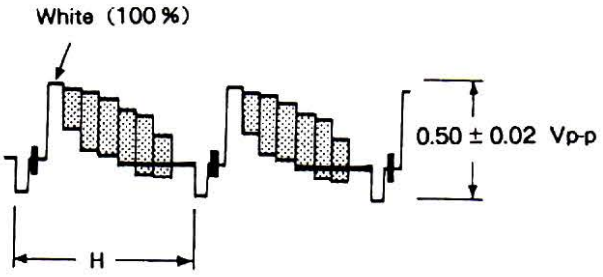


Fig. 8-11. Sync AGC adjustment

8-4-5. Y/C Separation Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㉕ of IC600
Measuring Instrument	Oscilloscope
Adjusting Element	RV600
Specified Value	Minimum residual chroma component

Connection :

1) Connect Pin ㊴ of IC600 (Pin ⑦ of the CCD delay block) to GND with a 10 μF/16V electrolytic capacitor (The negative side of the capacitor is GND).

Adjusting method :

1) Adjust RV600 so as to minimize the residual chroma component.

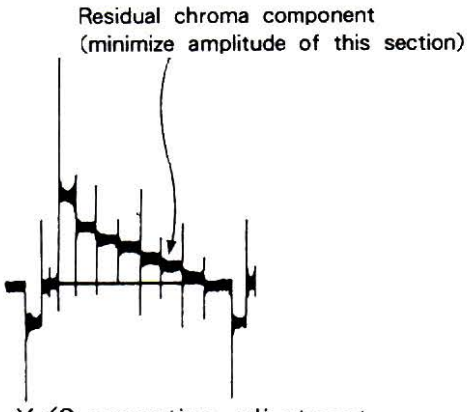


Fig. 8-12. Y/C separation adjustment

8-4-6. IR 2 Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	CH-1 : Pin ⑤ of IC600 (TP601 : REC C RF OUT) CH-2 : Pin ⑧ of IC600 (BF OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV601
Specified Value	a = b (see Fig. 4-13)

Connection :

1) Connect a 1 kΩ resistor between Pin ⑧ of IC600 and GND.

Adjusting method :

1) Adjust RV601 so as to align the falling edge (⌐) of CH-2 burst pulse with the middle point of CH-1 burst signal (see Fig. 8-13).

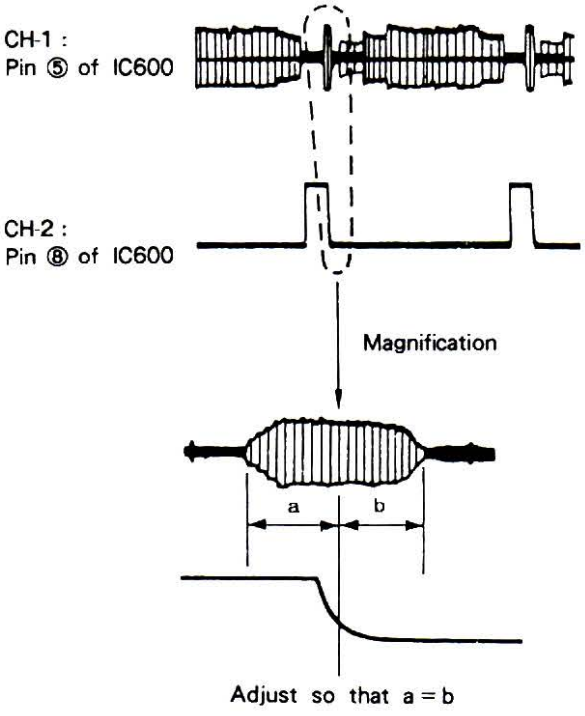


Fig. 8-13. IR 2 adjustment

8-4-7. Emphasis Input Level Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊹ of IC600
Measuring Instrument	Oscilloscope
Adjusting Element	RV603
Specified Value	0.50 ± 0.02 Vp-p

Adjusting method :
1) Adjust to 0.50 ± 0.02 Vp-p with RV603.

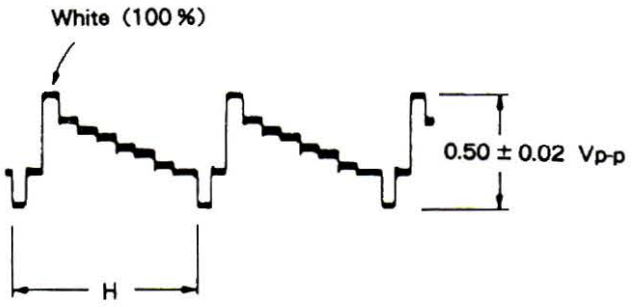


Fig. 8-14. Emphasis input level adjustment

8-4-8. PB Y Level 1 Adjustment (SV-35 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-3CSP) Color bar section
Measurement Point	Pin ㊼ of IC600 (Pin ⑤ of the CCD delay block)
Measuring Instrument	Oscilloscope
Adjusting Element	RV606
Specified Value	0.50 ± 0.02 Vp-p

Adjusting method :
1) Adjust to 0.50 ± 0.02 Vp-p with RV606.
2) Always perform "PB Y level 2 adjustment (8-4-9.)" after this adjustment.

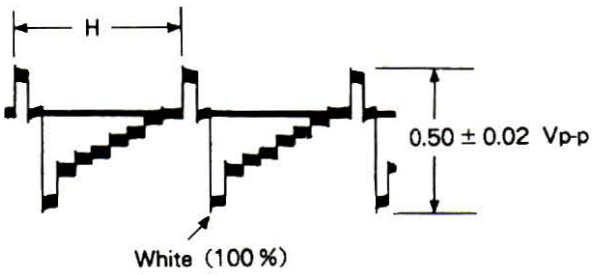


Fig. 8-15. PB Y level 1 adjustment

8-4-9. PB Y Level 2 Adjustment (SV-35 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-3CSP) Color-bar section
Measurement Point	Pin ④ of W013(VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	1.00 ± 0.05 Vp-p

Notes : 1) The VIDEO OUT terminal (J702 on the JK-34 board) must be terminated in 75Ω.
2) Perform "PB Y level 1 adjustment (8-4-8)" first.

Adjusting method :
1) Adjust to 1.00 ± 0.05 Vp-p with RV602.

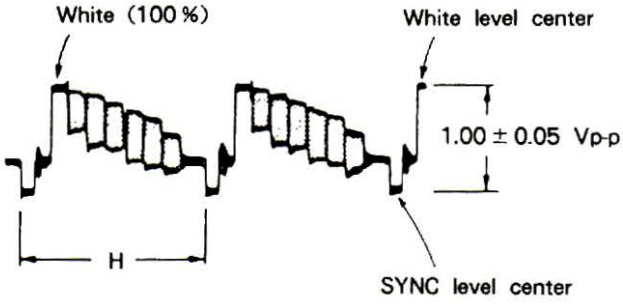


Fig. 8-16. PB Y level 2 adjustment

8-4-10. Y FM Carrier Frequency Adjustment (SV-35 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㊾ of IC600
Measuring Instrument	Frequency counter
Adjusting Element	RV605
Specified Value	4.39 ± 0.02 MHz

Adjusting method :
1) Adjust to 4.39 ± 0.02 MHz with RV605.
2) Perform "deviation adjustment".

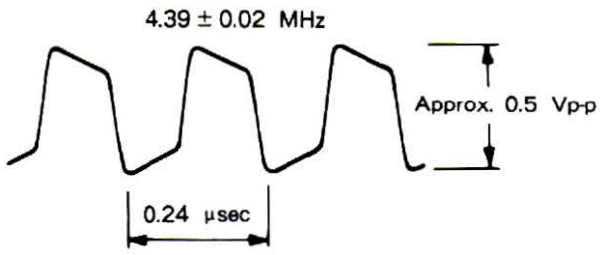


Fig. 8-17. Y FM carrier frequency adjustment

8-4-11. Y FM Deviation Adjustment (SV-35 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	Pin ④ of W013(VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV604
Specified Value	Playback level 1.00±0.05 Vp-p

Notes : 1) Perform "PB Y level 1 adjustment (8-4-8)", "PB Y level 2 adjustment (8-4-9)" and "Y FM Carrier Frequency Adjustment (8-4-10)" first.
2) The VIDEO OUT terminal (J702 on the JK-34 board) must be terminated in 75Ω.

Adjusting method :
1) Record the color bar signal.
2) Play back the recorded signal.
3) Confirm the playback output level.
Specification : 1.00 ± 0.05 Vp-p
4) If the specification is not satisfied, rotate RV604 as follows, then repeat steps 1) to 3).

	RV604 rotating direction
When larger than the specified value	Clockwise (↻)
When smaller than the specified value	Counterclockwise (↺)

Table 8-1.

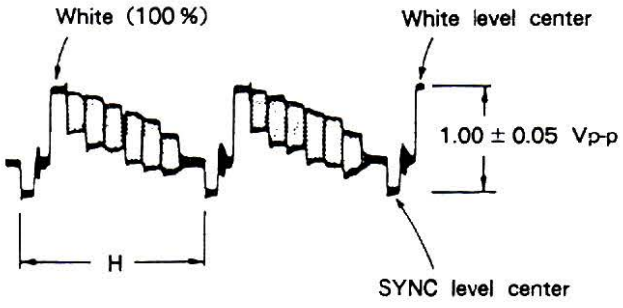


Fig. 8-18. Y FM deviation adjustment

8-4-12. AC Clip Check (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㉕ of IC600
Measuring Element	Oscilloscope
Specified Value	240 ± 10 %

Adjsuting method :
1) Confirm that the white (100 %) peak of the waveform output from Pin ㉕ of IC600 is 240 ± 10 %.

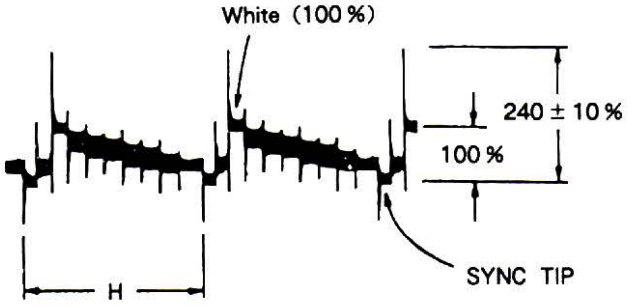


Fig. 8-19. AC clip check

8-4-13. Chroma Emphasis fo Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ⑤ of IC600
Measuring Instrument	Oscilloscope
Adjusting Element	FL601
Specified Value	Minimum fo component

Adjusting method :

1) Adjust FL601 so as to minimize amplitude of the chroma signal red flat portion.

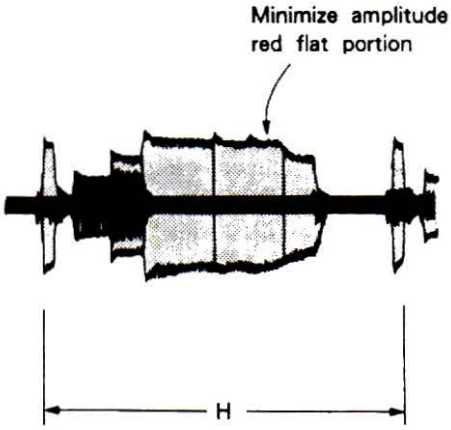


Fig. 8-20. Chroma emphasis fo adjustment

8-4-14. REC Y recording current adjustment (SV-35 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㊲ of IC501 (Fig. 8 22 Ⓐ)
Measuring Instrument	Oscilloscope
Adjusting Element	RV800
Specified Value	390 ± 10 mVp-p

Adjusting method :

1) Adjust to 390 ± 10 mVp-p with RV800.

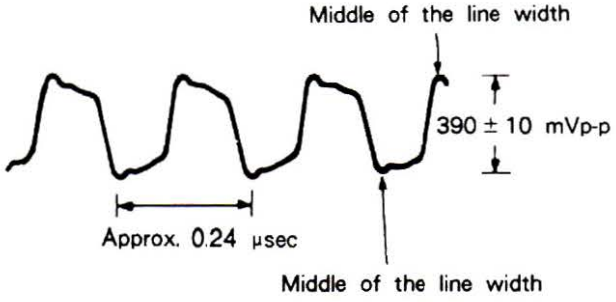


Fig. 8-21. REC Y recording current adjustment

8-4-15. REC C Recording Current Adjustment (SV-35 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊲ of IC501 (Fig. 8-22 Ⓐ)
Measuring Instrument	Oscilloscope
Adjusting Element	RV504
Specified Value	68 ± 3 mVp-p

Notes : 1) Always perform "REC AFM Recording Current Adjustment" after this adjustment.
2) Use an MP-type tape (level at Pin ⑮ of CN006 must be low).

Connections :

1) In order to prevent other recording signals from interfering , connect the following three connections with jumper wires :
   - Emitter of Q803 (REC Y) —— GND
   - Terminal on the C219 side of RV503 (Fig. 8-22 Ⓑ : REC ATF) —— GND
   - Terminal on the C006 side of RV505 (Fig. 8-22 Ⓒ : REC AFM) —— GND

   *Use the RP block shield case as GND.

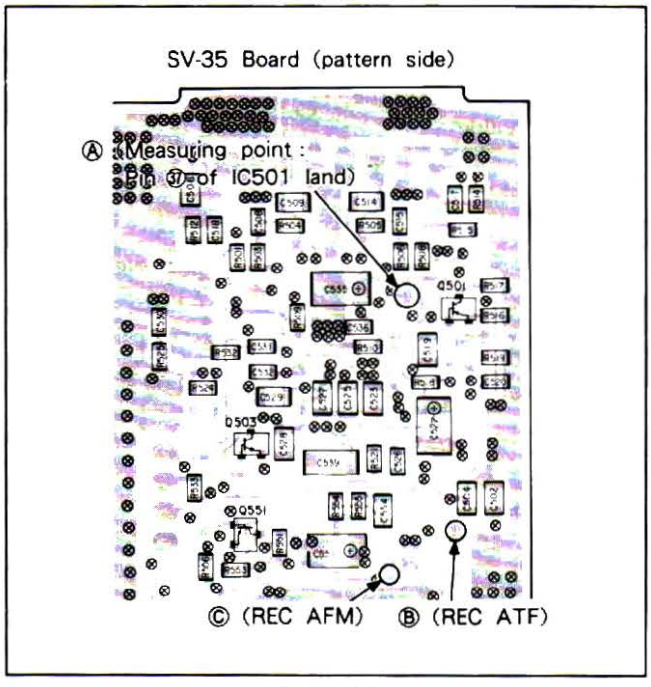


Fig. 8-22.

Adjusting method :

1) Adjust to 68 ± 3 mVp-p with RV504.

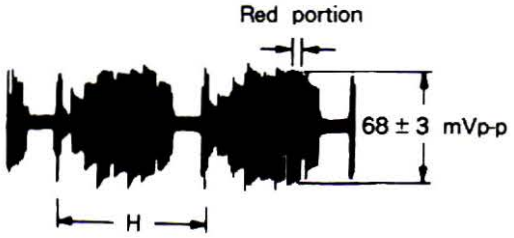


Fig. 8-23. REC C level adjustment

8-4-16. REC AFM Recording Current Adjustment (SV-35 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㊲ of IC501(Fig. 8-22 Ⓐ)
Measuring Instrument	Oscilloscope
Adjusting Element	RV505
Specified Value	17.0 ± 1.0 mVp-p

Notes : 1) Use an MP-type tape (level at Pin ⑮ of CN006 must be low).

2) If level at Pin ㊲ of IC501 is too low and difficult to measure, connect directly through a 100 Ω resistor as shown in the figure below rather than using a 10 : 1 probe.

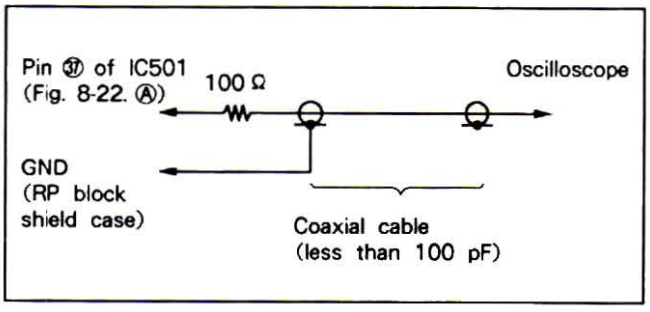


Fig. 8-24.

Connections :

1) In order to prevent other recording signals from interfering, connect the following two connections with jumper wires :
   - Emitter of Q803 (REC Y) —— GND
   - Terminal on the C219 side of RV503 (Fig. 8-22 Ⓑ : REC ATF) —— GND

   *Use the RP block shield case as GND.

Adjusting method :

1) Adjust to 17.0 ± 1.0 mVp-p with RV505.

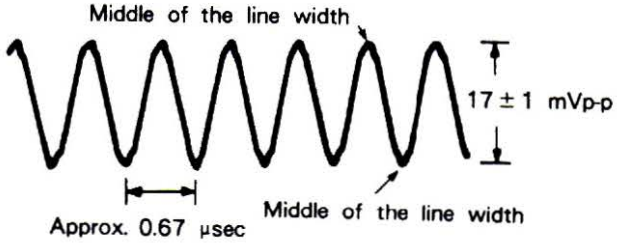


Fig. 8-25. AFM recording current adjustment

8-4-17. REC ATF Recording Current Adjustment (SV-35 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ㊲ of IC501(Fig. 8-22 Ⓐ)
Measuring Instrument	Oscilloscope
Adjusting Element	RV503
Specified Value	13.5 ± 1.0 mVp-p

Notes : 1) Use an MP-type tape (level at Pin ⑮ of CN006 must be low).
2) If level at Pin ㊲ of IC501 is too low and difficult to measure, connect directly through a 100 Ω resistor as shown in the figure below rather than using a 10 : 1 probe.

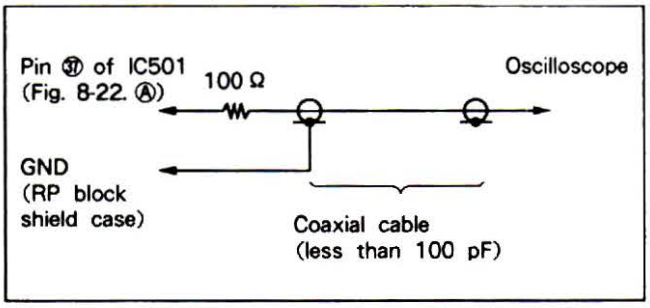


Fig. 8-26.

Connections :
1) In order to prevent other recording signals from interfering, make the following two connections with jumper wires :
- Emitter of Q803 (REC Y) —— GND
- Terminal on the C006 side of RV505 (Fig. 8-22 Ⓒ : REC AFM) —— GND

*Use the RP block shield case as GND.

Adjusting method :
1) Adjust to 13.5 ± 1.0 mVp-p with RV503.

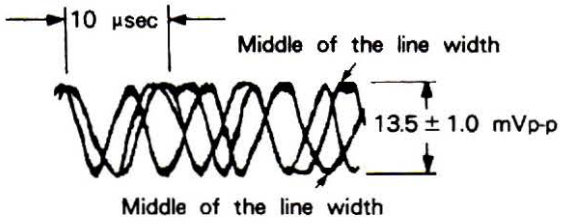


Fig. 8-27. REC ATF recording current adjustment

8-4-18. Delay Chroma Gain Adjustment (SV-35 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape for operation check (WR5-3CL), color bars
Measurement Point	CH1 : Pin ㊺ of IC600 (or Emitter of Q904) CH2 : Pin ⑰ of IC900
Measuring Instrument	Oscilloscope (TRIG : CH2)
Adjusting Element	RV901
Specified Value	Delay chroma level is same as through chroma level

Adjusting method :
1) Adjust RV901 until the delay chroma level is the same as the through chroma level.

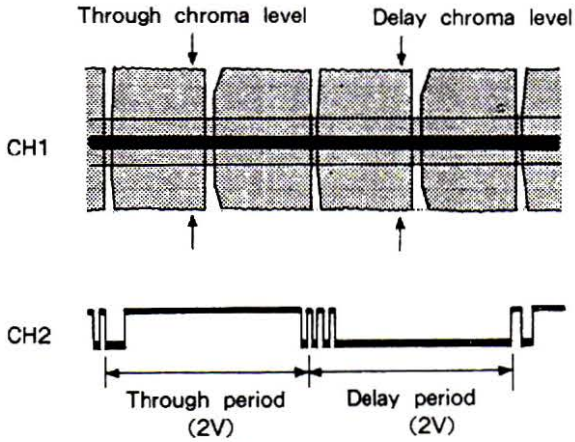


Fig. 8-28.

8-4-19. Quasi Burst Phase Adjustment (SV-35 Board)

1. Method using vectorscope

Mode	Playback
Signal	Tape with recorded color bars
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Adjusting Element	RV902
Specified Value	Phase of color luminance points in quasi burst mode is same as phase of color luminance points in through burst mode

Adjusting method :

1) Make a record of the phase of the color luminance points (especially red). (Through burst mode)
2) Connect Pin ㉑ of IC900 and Pin ① of IC900 with a diode (1SS119, etc.). (Quasi burst mode)

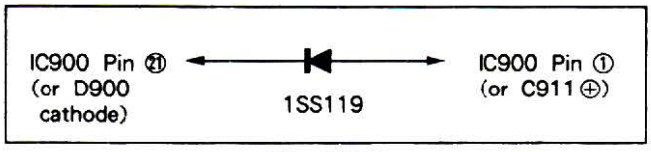


Fig. 8-29.

3) Adjust RV902 so that the phase of the color luminance points is the same as the phase recorded in 1).
4) Remove the diode.

2. Method using monitor TV

Mode	Playback
Signal	Tape with recorded color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV902
Specified Value	Minimum chroma flickering

Connection :

1) Connect Pin ㉑ of IC900 and Pin ④ of CN018 (RF SWP) using a diode (1SS119, etc.).

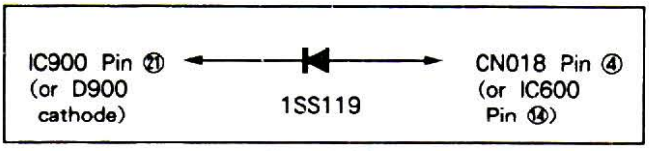


Fig. 8-30.

Adjusting method :

1) Set the color level of the monitor TV to maximum.
2) Adjust RV902 for minimum chroma flickering.

8-4-20. Delay Burst Phase Adjustment (SV-35 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape for operation check (WR5-3CL), color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV903
Specified Value	Minimum chroma flickering

Adjusting method :

1) Set the color level of the monitor TV to maximum.
2) Rotate RV903 fully in the counterclockwise direction (◯).
3) Slowly rotate RV903 in the clockwise direction and stop at the position where there is minimum chroma flicker.

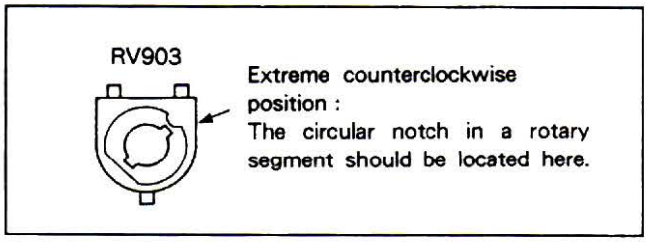


Fig. 8-31.

8-5. LCD SYSTEM ADJUSTMENT

Note : You will receive an electric shock if you touch the back-light holder. When the back light is not in use, remove the back-light drive unit.

Preparations :

1) The back-light drive unit is required only for white balance check, V COM DC adjustment and ANTI PAL adjustment. Remove it before every other adjustment/check.
2) Set the following VRs as below, unless otherwise indicated :
   BRIGHT (RV302) ····· Mechanical center
   COLOR (RV902)
   ····· Position in which voltage at Pin ⑨ of IC901 on the RG-5 board is 1.20 ± 0.05V.
3) External sync
   ····· J701 (VIDEO IN) on the JK-34 board
4) The following devices are used for LCD system adjustment :
   Fluorescent tube holder jig (J-6082-022-A)
   COMMON voltage adjusting jig (J-6082-024-A)

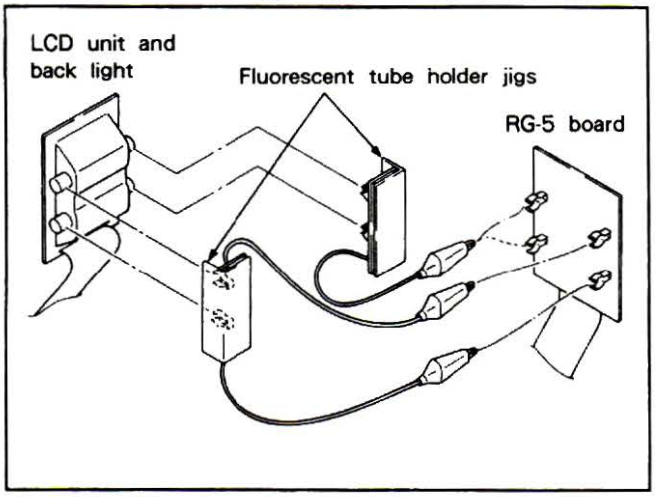


Fig. 8-32. Usage of the fluorescent tube holders

[Input video signal for adjustment]

Unless indicated otherwise input a color bar signal into the video input terminal as the adjustment video input signal.

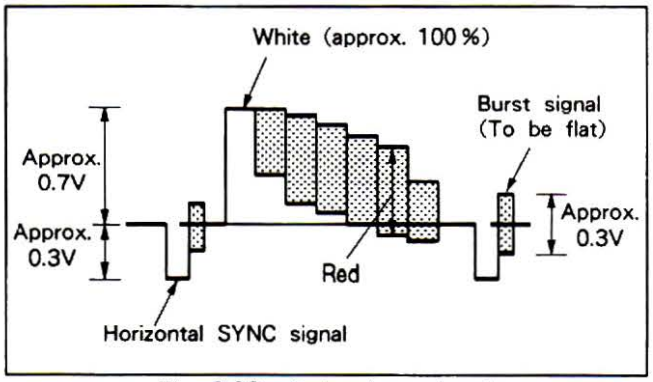


Fig. 8-33. Color bar signal

8-5-1. Oscillation Frequency Adjustment (RG-5 Board)

Mode	Power on
Signal	Non-signal
Measurement Point	Pin ⑨ of IC901
Adjusting Element	CV901
Specified Value	4433450 ± 10 Hz

Adjusting method :

1) Adjust to 4433450 ± 10 Hz with CV901.

8-5-2. Contrast Adjustment (RG-5 Board)

Mode	Power on
Signal	Color bar
Measurement Point	CH1 : Pin ⑧ of CN905 CH2 : Pin ② of CN905
Measuring Instrument	Oscilloscope (TRIG : CH2)
Adjusting Element	RV901
Specified Value	4.0 ± 0.1 Vp-p

Adjusting method :

1) Adjust voltage between white (100 %) and pedestal sections to 4.0 ± 0.1 Vp-p with RV901.

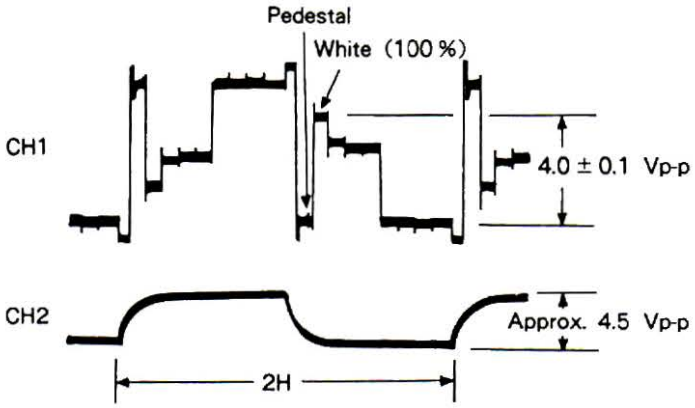


Fig. 8-34.

8-5-3. Common-bias Preset Adjustment (RG-5 Board)

Mode	Power on
Signal	Color bar
Measurement Point	Collector of Q908 (V_G)
Measuring Instrument	Oscilloscope (DC range)
Adjusting Element	RV905
Specified Value	-6.2 ± 0.1 Vdc

Adjusting method :

1) Adjust DC level of the G signal pedestal to -6.2 ± 0.1 Vdc with RV905.

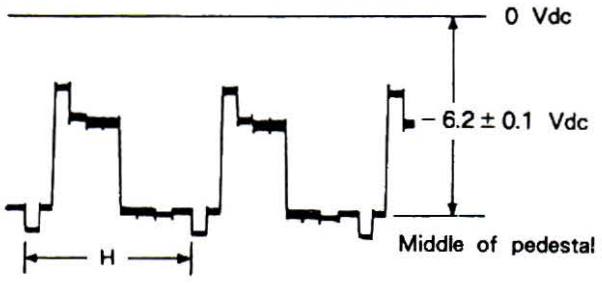


Fig. 8-35.

8-5-4. R, B P-P Gain Adjustment (RG-5 Board)

Mode	Power on
Signal	Color bar
Measurement Point	Collector of Q909 (V_R) Collector of Q907 (V_B)
Measuring Instrument	Oscilloscope
Adjusting Element	RV907 (R gain 1) RV906 (B gain 1)
Specified Value	(Gp-p) ± 0.05 Vp-p

Adjusting method :

1) Connect the oscilloscope to the collector of Q909 (V_R).
2) Adjust voltage between white (100%) and pedestal sections to (Gp-p) ± 0.05 Vp-p with RV907 (R P-P gain).
3) Connect the oscilloscope to the collector of Q907 (V_B).
4) Adjust voltage between white (100%) and pedestal sections to (Gp-p) ± 0.05 Vp-p with RV906 (B P-P gain).
5) Connect the oscilloscope to the collector of Q908 (V_G)
6) Measure the voltage between white (100%) and pedestal section. (= Gp-p)

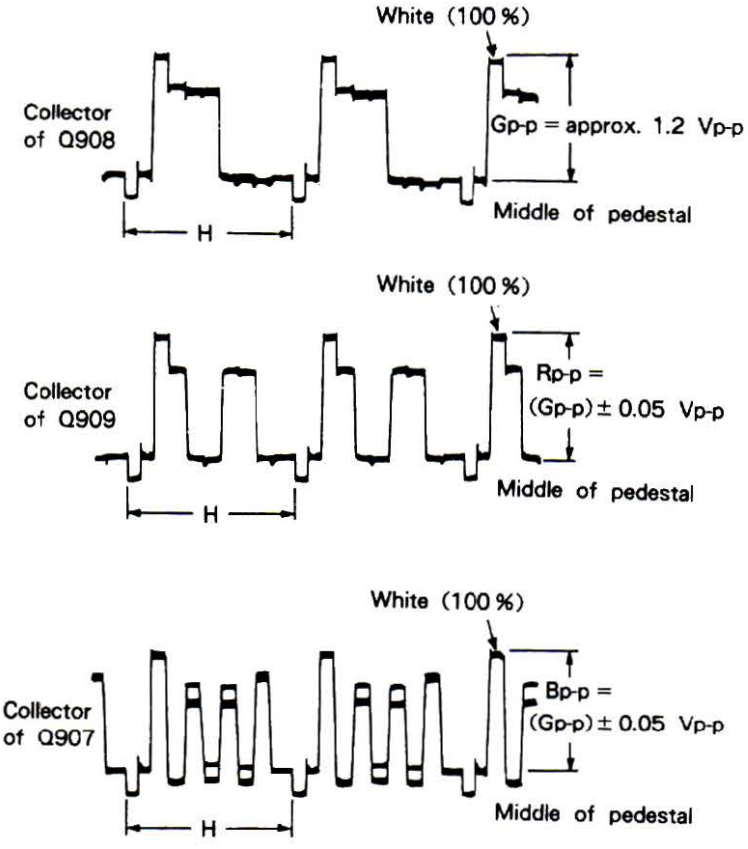


Fig. 8-36.

8-5-5. R, B DC Gain Adjustment (RG-5 Board)

Mode	Power on
Signal	Color bar
Measurement Point	Collector of Q909 (V_R) Collector of Q907 (V_B)
Measuring Instrument	Oscilloscope (DC range)
Adjusting Element	RV909 (R gain 2) RV908 (B gain 2)
Specified Value	V_G ± 0.05 Vp-p

Adjusting method :

1) Connect the oscilloscope to the collector of Q908 (V_G).
2) Measure DC voltage of the G signal pedestal and record it (− 6.2 ± 0.2 Vdc).
3) Connect the oscilloscope to the collector of Q909 (V_R).
4) Adjust the R signal pedestal DC voltage to the value obtained in step 1) (G signal pedestal DC voltage) with RV909 (R DC gain).
5) Connect the oscilloscope to the collector of Q907 (V_B).
6) Adjust the B signal pedestal DC voltage to the value obtained in step 1) (G signal pedestal DC voltage) with RV908 (B DC gain).

White Balance Check :

1) Connect the back-light unit to the LCD rear using the fluorescent tube holder jigs (see Fig. 8-28).
   Note : Proceed carefully as fluorescent tubes are highly charged.
2) Connect Pin ① of FL902 to GND with a jumper wire.
3) Observe the LCD screen and confirm that no color is displayed.
4) If white balance is not satisfactory, repeat R, B DC gain adjustment until no color is displayed on the LCD.
5) Remove the jumper wire.

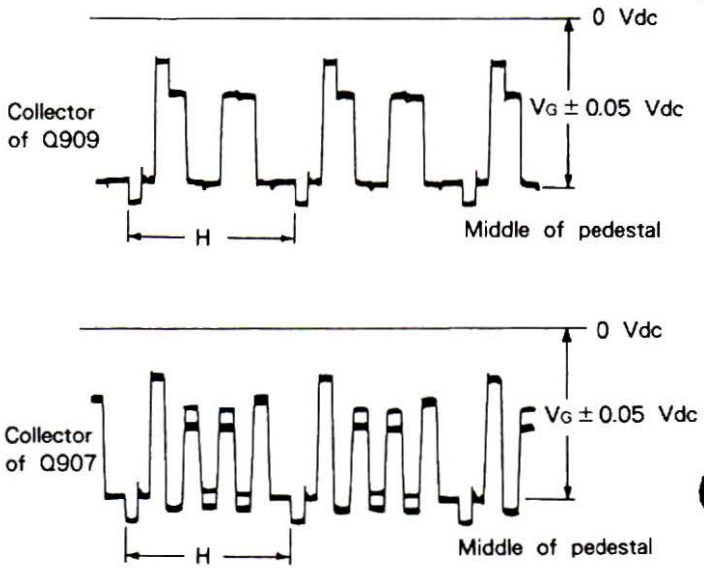


Fig. 8-37.

8-5-6. Anti PAL Adjustment 1 (RG-5 Board)

Mode	Power on
Signal	Video signal*1 with anti PAL signal
Measurement Point	Collector of Q908
Measuring Instrument	Oscilloscope
Adjusting Element	RV920
Specified Value	Minimum amplitude of anti PAL sections

* 1. The waveform varies according to the signal.

Adjusting method :

1) Set the COLOR knob (RV902) to the MAX position.
2) Adjust the amplitude of the anti PAL sections to minimum with RV902.

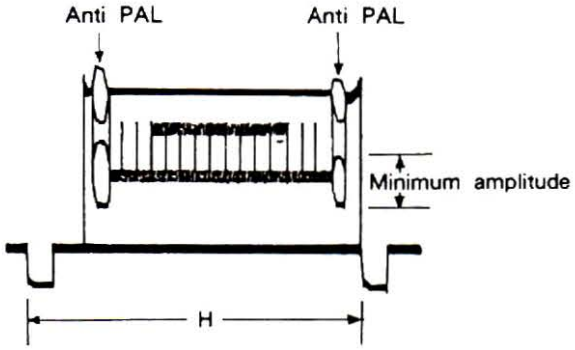


Fig. 8-38.

8-5-7. Anti PAL Adjustment 2 (RG-5 Board)

Mode	Power on
Signal	Video signal*1 with anti PAL signal
Measurement Point	LCD screen
Measuring Instrument	
Adjusting Element	CV902
Specified Value	No coloring of anti PAL sections

* 1. The pattern and anti PAL signal position vary according to the signal.

Connection :

1) Perform adjustment with the backlight and backlight drive unit attached.

Adjusting method :

1) Set the COLOR knob (RV902) to the MAX position.
2) Adjust CV902 for minimum coloring of anti PAL sections.

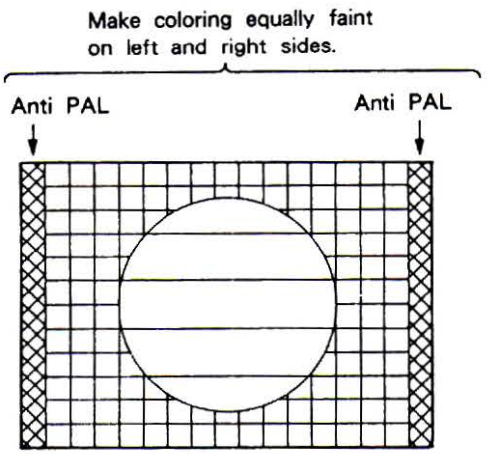


Fig. 8-39.

8-5-8. Anti PAL Adjustment 3 (RG-5 Board)

Mode	Power on
Signal	Color bars
Measurement Point	Collector of Q908
Measuring Instrument	Oscilloscope
Adjusting Element	T901
Specified Value	Minimum amplitude of "green" section

Adjusting method :

1) Set the COLOR knob (RV902) to the MAX position.
2) Adjust the amplitude of the "green" section to minimum with T901.

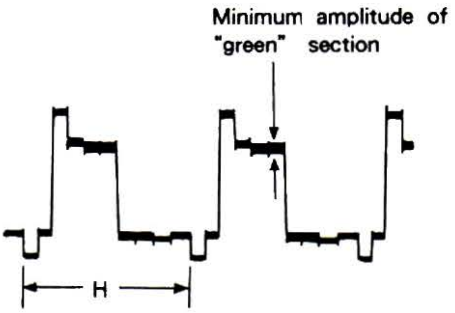


Fig. 8-40.

8-5-9. V COM DC Adjustment (RG-5 Board)

Mode	Power on
Signal	Color bar
Measurement Point	LCD screen
Measuring Instrument	Oscilloscope
Adjusting Element	RV912
Specified Value	Minimum amplitude of flicker waveform

Notes : 1) This adjustment can be performed from the LCD block rear with the unit assembled.
2) Prevent external light from getting into the COMMON voltage adjusting jig.

Adjusting method :
1) Attach the COMMON voltage adjusting jig sensor to the LCD screen (place the LCD facing down so that no external light gets into the sensor).
2) Connect the oscilloscope to the COMMON voltage adjusting jig.
3) Turn RV912 and confirm that the flicker waveform in Fig. 8-38 is output (if it is not, confirm the sensor position and external light conditions, then try turning the BRIGHT control).
4) Adjust RV912 so as to minimize flicker waveform amplitude.

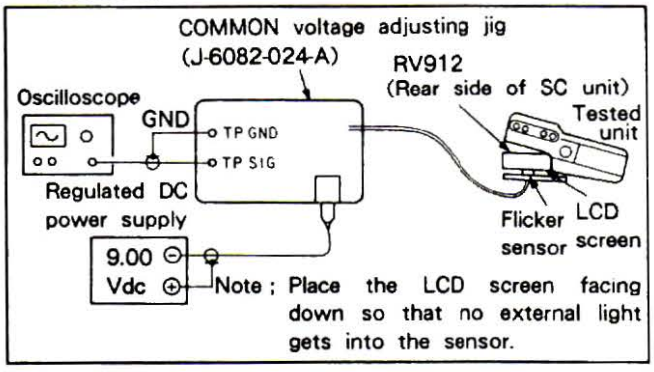


Fig. 8-41.

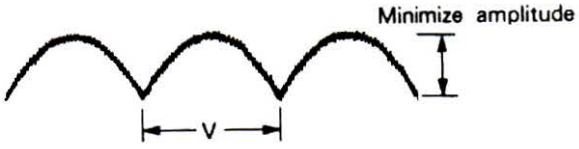


Fig. 8-42.

8-6. TIMER SYSTEM ADJUSTMENT

• Proceed as follows to set the TT check mode, which is required for timer system adjustment.
1) Turn the regulated power supply off.
2) Connect the TT check land (Fig. 8-43. Ⓐ) and TP303 (GND) with a jumper wire.
3) Turn the regulated power supply and the POWER switch on.
4) Remove the jumper wire attached in step 2).
5) Perform timer system adjustment in this condition.

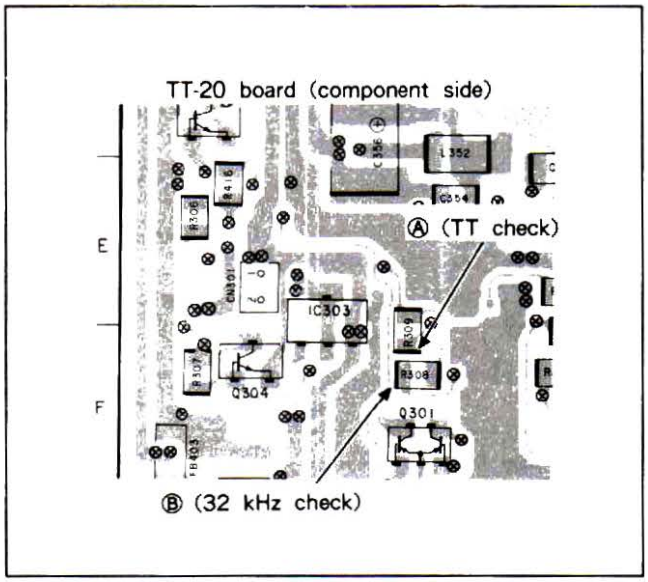


Fig. 8-43.

8-6-1. Clock Precision Adjustment (TT-20 Board)

Mode	Stop (power on)
Measurement Point	Pin ㊾ of IC301
Measuring Instrument	Frequency counter
Adjusting Element	CV301
Specified Value	16.38400 ± 0.00020 kHz

Adjusting method :
1) Connect the 32 kHz check land (Fig. 8-43. Ⓑ) and TP303 (GND) with a jumper wire to set the check mode.
2) Adjust oscillation frequency to 16.38400 ± 0.00020 kHz with CV301.
3) Remove the jumper wire attached in step 1).

8-6-2. Character Position Adjustment (TT-20 Board)

Mode	Power on
Signal	Color bar
Measurement Point	LCD screen
Measuring Instrument	
Adjusting Element	CV351
Specified Value	Black frame on horizontal center of screen.

Adjusting method :

1) Connect the TT check land (Fig. 8-43. Ⓐ) and TP303 (GND) with a jumper wire.
2) Press the CLOCK SET button of the LCD block and confirm that the black frame and the "0 : 00" indication appear on the LCD screen (adjust the LCD block BRIGHT VR so that the black frame can be seen clearly).
3) Adjust CV351 so that the black frame gets on the horizontal center of the screen.
4) Press the LCD block NEXT button twice to clear the black frame.
5) Remove the jumper wire attached in step 1).

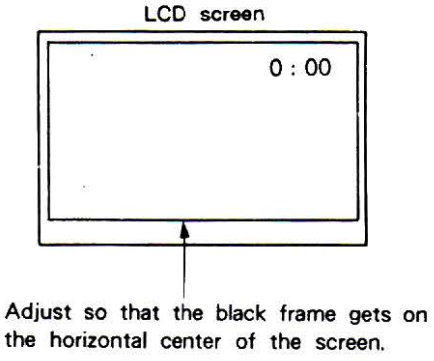


Fig. 8-44.

8-6-3. Channel Display Position Adjustment (TT-20 Board)

Mode	Power on
Signal	VHF 12 channel
Measurement Point	LCD screen
Measuring Instrument	
Adjusting Element	RV372
Specified Value	Cursor indicating the received channel

Adjusting method :

1) Set the INPUT SELECT switch (S101 on the SV-35 board) to the TUNER position.
2) Receive the VHF 12 channel.
3) While pressing the INDICATOR button (S301 on the TT-20 board), move the green cursor to the channel 12 position with RV372.
4) Select channel 1 and confirm that the green cursor is displayed on the channel 1 position.

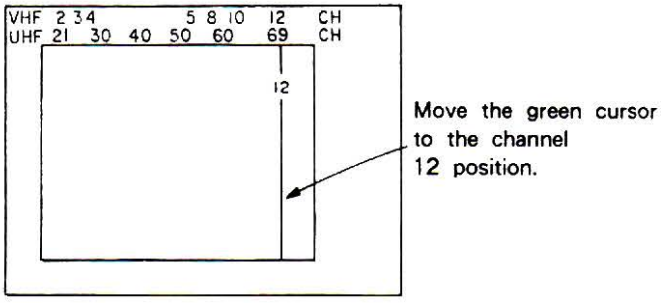


Fig. 8-45.

8-7. AUDIO SYSTEM ADJUSTMENT

• Use a color bar signal as input video signal for adjustment.

[Connection of Audio Measuring Devices]
Besides video measuring devices, connect audio measuring devices as shown in the figure below, and perform the adjustment in input select switch LINE position.

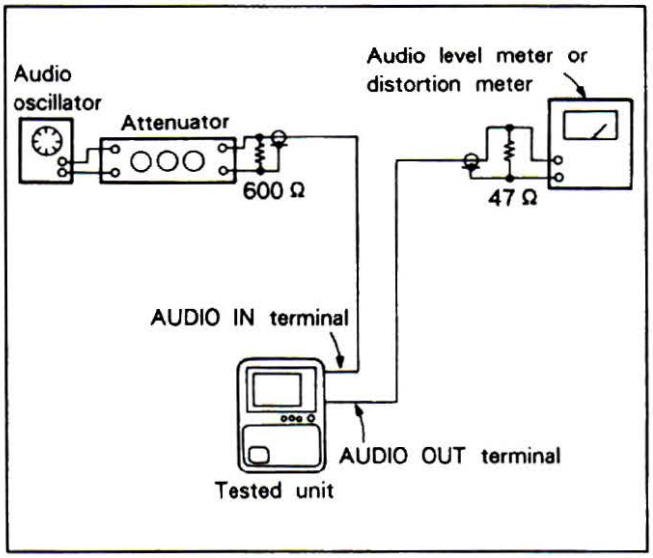


Fig. 8-46.

8-7-1. AFM Audio System Check

1. AFM carrier frequency check (SV-35 board)

Mode	Recording (SP mode)
Signal	Non-signal
Measurement Point	Pin ㉑ of HIC001 (REC AFM RF)
Measuring Instrument	Frequency counter
Specified Value	1.50 ± 0.01 MHz

Checking method :
1) Turn the audio oscillator output off.
2) Confirm that AFM carrier frequency is 1.50 ± 0.01 MHz.

2. AFM deviation check

Mode	Playback
Signal	Alignment tape for operation check (WR5-3CSP)
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Audio level meter
Specified Value	− 10 ± 2 dBs

Checking method :
1) Confirm that audio output level is − 10 ± 2 dBs.

3. E-E output level check

Mode	E-E
Signal	400 Hz, − 10 dBs
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Audio level meter
Specified Value	− 10 ± 2 dBs

Checking method :
1) Confirm that audio output level is − 10 ± 2 dBs.

4. Overall level characteristic check

Mode	Self-recording and playback
Signal	400 Hz, − 10 dBs
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Audio level meter
Specified Value	− 10 ± 2 dBs

Checking method :
1) Record the signal.
2) Play back the recorded section.
3) Confirm that audio output level is − 10 ± 2 dBs.

5. Overall frequency characteristic check

Mode	Self-recording and playback
Signal	Ⓐ 400 Hz, − 20 dBs Ⓑ 30 Hz, − 20 dBs Ⓒ 10 Hz, − 20 dBs
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Audio level meter
Specified Value	30 Hz and 14 kHz playback output level is 0 ± 3 dB when 400 Hz playback output level is set to 0 dB

Checking method :
1) Record the Ⓐ to Ⓒ signals in that order.
2) Play back the recorded section.
3) Confirm that 30 Hz and 14 kHz playback output level is 0 ± 3 dB when 400 Hz playback output level is set to 0 dB.

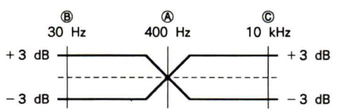


Fig. 8-47. AFM Overall frequency characteristic

6. Overall distortion check

Mode	Self-recording and playback
Signal	400 Hz, − 10 dBs
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Distortion meter
Specified Value	0.3 % or less *1

Checking method :
1) Record the signal.
2) Play back the recorded section.
3) Confirm that distortion is 0.3 % or less. *1
*1 When using a 30 kHz LPF.

7. Overall noise level check

Mode	Self-recrding and playback
Signal	Non-signal (Insert a shorting plug into the AUDIO IN terminal)
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Audio level meter
Specified Value	− 70 dBs or less *2

Checking method :
1) Record the signal.
2) Play back the recorded section.
3) Confirm that noise level is − 70 dBs or less. *2
*2 When using an IHF-A hearing compensation filter.

8-8. TUNER SYSTEM ADJUSTMENT

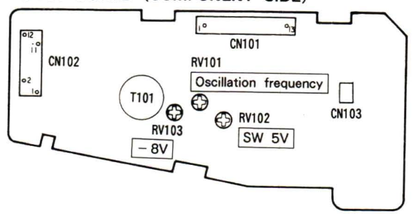
8-8-1. RF AGC Adjustment (TT-20 Board)

Mode	E-E
Signal	TV broadcast signal
Measuring Instrument	RV101

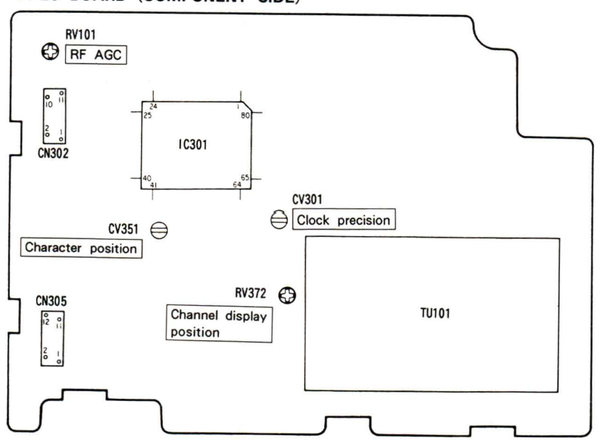
Adjusting method :
1) Adjust the TV monitor to maximum contrast and receive the TV broadcast signal.
2) Turn RV101 until snow noise appears.
3) Turn RV101 in the opposite direction until where snow noise disappears.
4) Select all channels in succession and confirm that no intermodulation beat, picture breakage or snow noise occurs.

ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

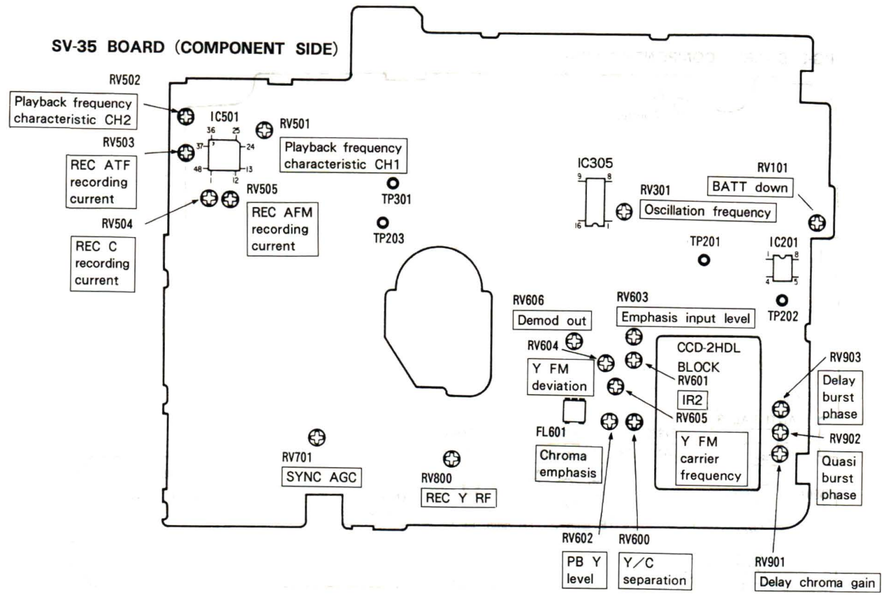
PS-181 BOARD (COMPONENT SIDE)



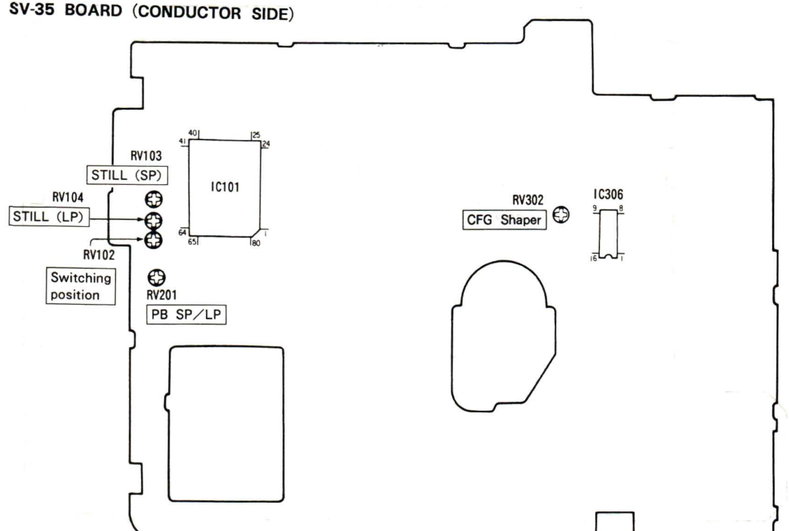
TT-20 BOARD (COMPONENT SIDE)



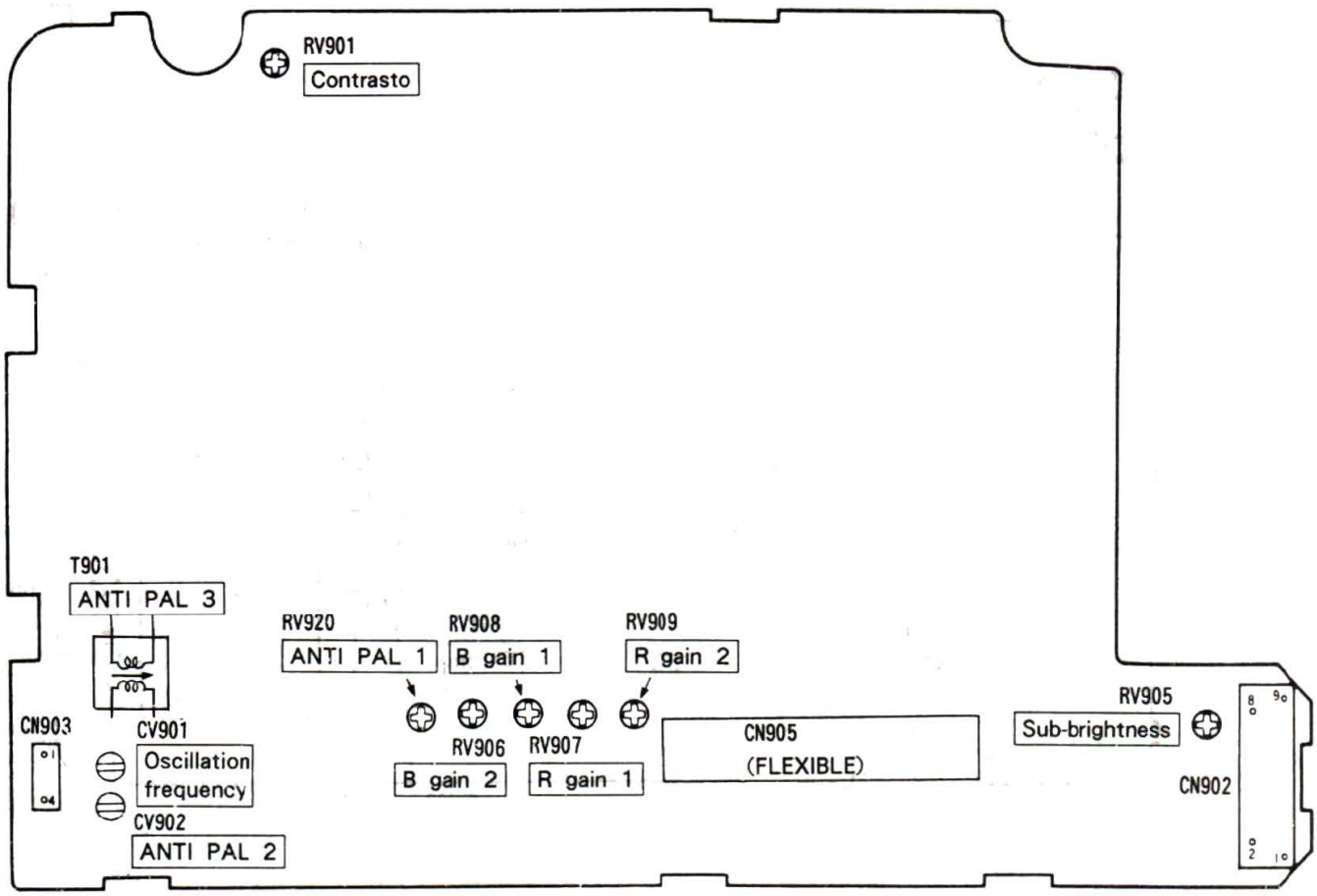
SV-35 BOARD (COMPONENT SIDE)



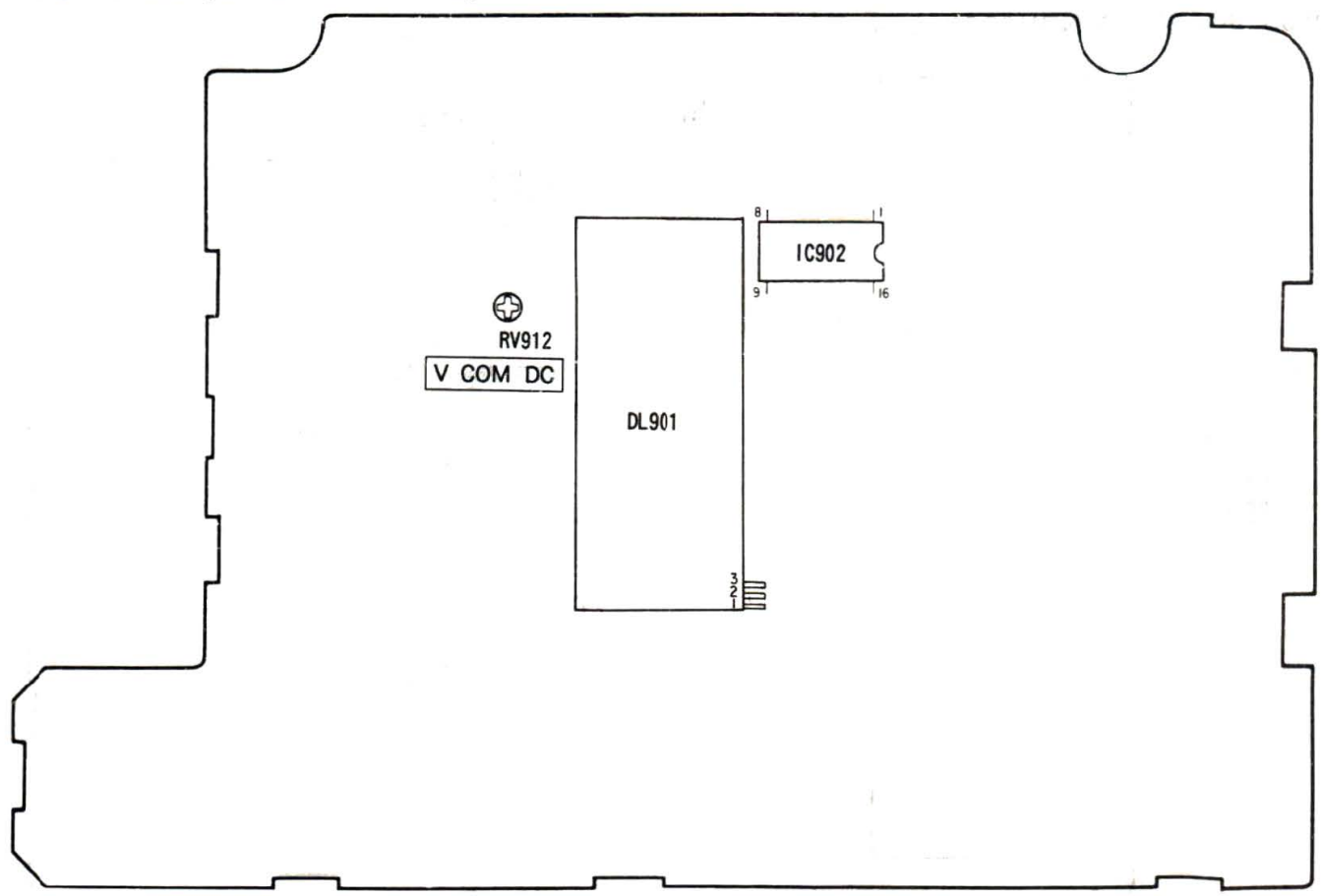
SV-35 BOARD (CONDUCTOR SIDE)



RG-5 BOARD (COMPONENT SIDE)



RG-5 BOARD (CONDUCTOR SIDE)



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