GoldStar

VHS VIDEO CASSETTE RECORDER

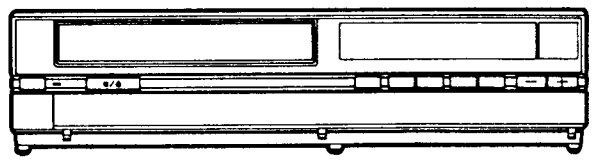
SERVICE MANUAL

CAUTION

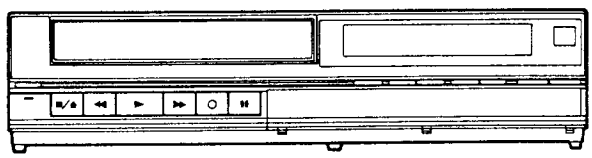
BEFORE SERVICING THE CHASSIS, READ THE"SAFETY PRECAUTIONS" IN THIS MANUAL

=TASHIKO VVE-922

GRANADA



MODEL:GHV-1240I/1244I



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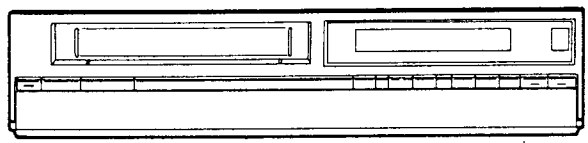

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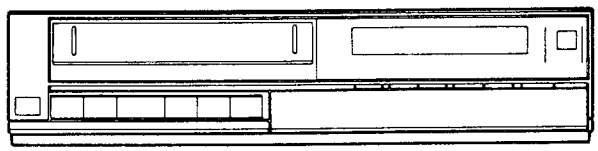

MODEL:GHV-1248I

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CONTENTS

Important Safety Precautions

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note : Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially :
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially :
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistor

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering. (Fig. 1)

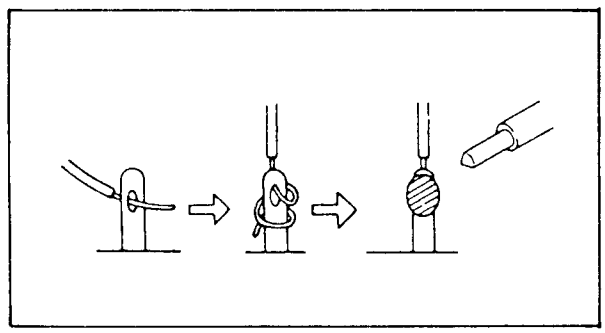


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10-15kg of force in any direction will not loosen it. (Fig. 2)

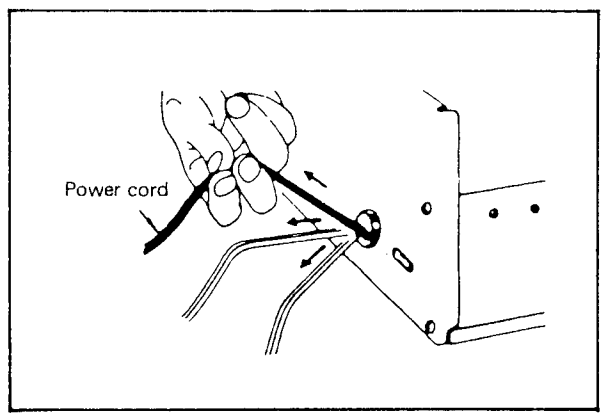


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

• Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

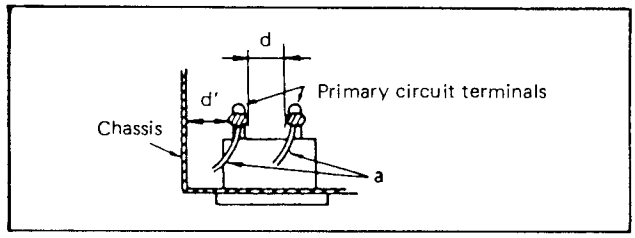


Fig. 3

Table 1 : Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d), (d')
*110 to 130 V 200 to 240 V	Europe Australia	≥10 MΩ/500 V DC	4 kV 1 minute	≧ 6mm(d) ≧ 8mm(d') (a Power cord)

*Class II model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

4. Leakage Current test

Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)
Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

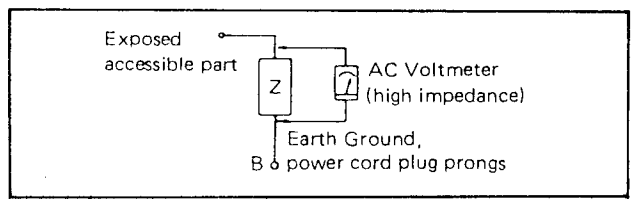


Fig. 4

Table 2 : Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
100 to 130 V	Europe	2kΩ	i≤0.7m A peak i≤2m A dc	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i≤0.7m A peak i≤2m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

1. PREFACE

This service manual provides various service information, containing the mechanical and electrical structure of the set and adjustment for VCR. This Video Cassette Recorder was manufactured and assembled under a strict quality control system.

1.1 FEATURES

• CONVENIENT FRONT LOADING SYSTEM

This unit may be placed in an audio/video rack with other components.

• RECORD UP TO 4 HOURS

You can record up to 4 hours, using a E-240 video cassette tape.

• VISUAL SEARCH FUNCTION (CUE/REVIEW)

View the Picture in forward (CUE) or in reverse (REV) directions at about 5 times the normal speed. This enables you to locate any part of the recorded program you may want to review, quickly and easily.

NOTE : Wide NOISE BARS will appear on the screen during review/cue (search) operation. This is normal and does not indicate a defect or problem in your recorder.

• FREEZE FUNCTION(PAUSE)

Used during recording, the PAUSE function allows you to skip any part of a program that you don't wnat. During playback, you can view a freeze picture by pushing the PAUSE button.

• AUTO POWER AND PLAY FUNCTION

• AUTOMATIC REWIND FUNCTION

The unit will automatically rewind the video cassette when the end of the tape is reached.

• FULL-FUNCTION INFRARED REMOTE CONTROL

The Infrared Remote Control unit lets you give recording and playback commands from your viewing position.

NOTE : In the VCR operation mode, the control buttons on the Remote Control unit have the same control functions as the corresponding control buttons on the VCR.

• MULTI FUNCTION DISPLAY SHOWS

When the mode button is pushed, you can view its display in this window.

• RECORD ONE PROGRAM WHILE VIEWING ANOTHER

• SOFT TOUCH OPERATING CONTROLS

• ANTI-DEWING MECHANISM

• QUICK TIMER RECORDING UP TO 4 HOURS- ONE PROGRAM

• 83 CHANNEL CABLE READY

• HIGH QUALITY PICTURE ENHANCEMENT SYSTEM IMPROVES IMAGE SHARPNESS AND DETAIL

1-2 SPECIFICATIONS

General

Power Source :	AC 240V ± 10%, 50Hz ± 0.5%
Power Consumption :	Approx 31 Watts.
Video Recording System :	2 rotary heads, helical scanning system.
Tape Speed :	23.39 mm/sec(SP mode).
Tape Format :	Tape Width 1/2″ (12.7 mm high density tape VHS).
Maximum Recording Time :	4 hours (With E-240 cassette, SP mode).
FF/Rewind Time :	Less than 400secs (With E-180 cassette).
Dimensions (W × H × D) :	16.9″ × 3.9″ × 13.8″(430 × 99 × 350mm).
Weight :	About 15.43 lbs. (7.0 Kg).
Operating Temperature :	41°F– 95°F(5°C–35°C).
Operating Humidity :	35%–80%.
Timer :	24 hour display type.

Video

Television System :	CCIR standard (625 lines, 50 fields). PAL Colour signal
Recording Format :	PAL I
RF Reception :	PAL I (UHF Only)
RF OUT :	PAL I
Input Level :	VIDEO IN (SCART-PIN type) 1.0Vp-p, 75 ohm, unbalanced.
Output Level :	VIDEO OUT(SCART-PIN type). 1.0Vp-p, 75 ohm, unbalanced.
Signal to Noise Ratio :	More than 43dB
RF Output :	UHF Channels 32-40(Adjustable).

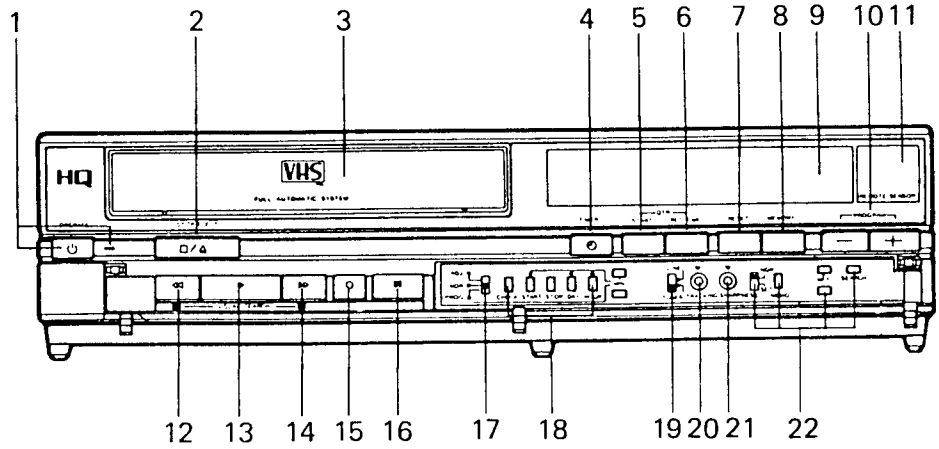
Audio

Input Level :	AUDIO IN(SCART-PIN type). -10 dBm More than 50Kohm.
Output Level :	AUDIO OUT(SCART-PIN type). -4 dBm Less than 1Kohm.
Audio Track :	Monotrack type.
Audio Frequency Response :	100Hz-10kHz
Signal to Noise Ratio :	More than 40dB

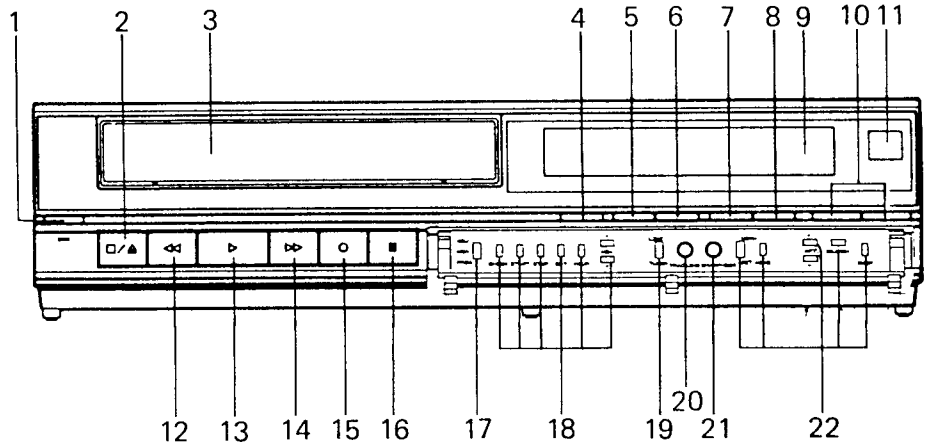
*Designs and specifications are subject to change without notice.

1-3 LOCATION OF CUSTOMER CONTROLS

TOP AND FRONT PANELS MODEL: GHV-1240I/1244I



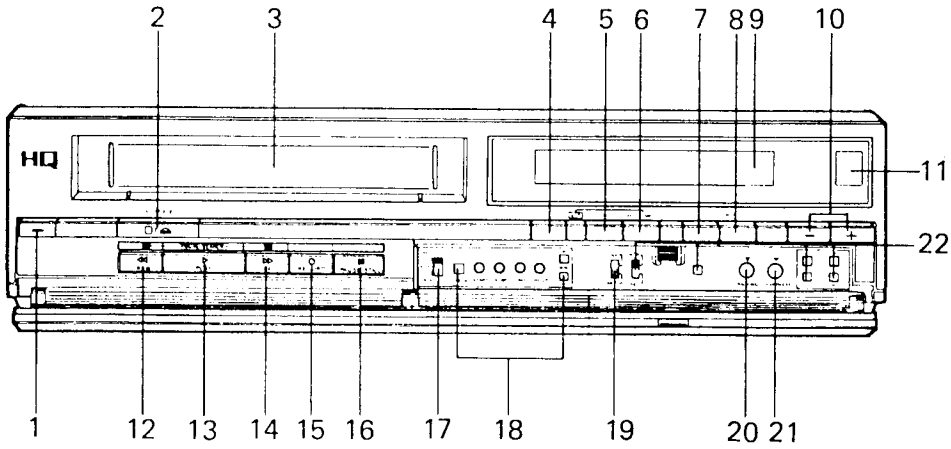
TOP AND FRONT PANELS MODEL: GHV-1241I/1246I



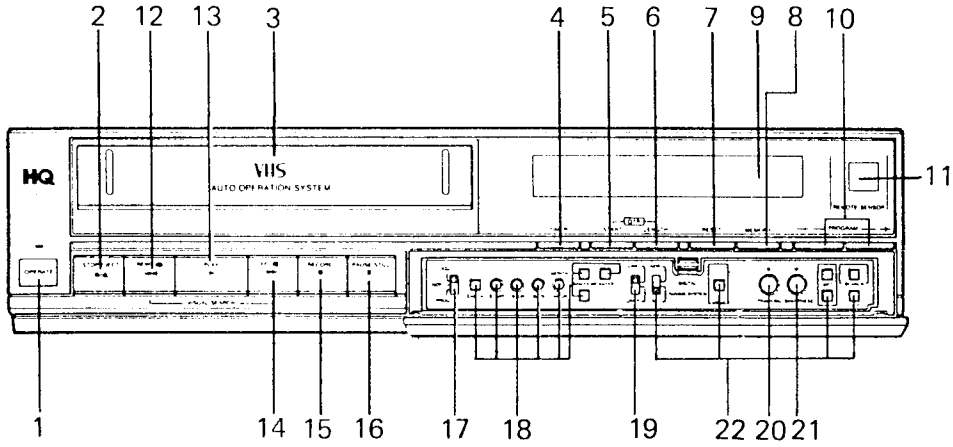
1. OPERATE BUTTON AND INDICATOR
2. STOP/EJECT BUTTON
3. CASSETTE COMPARTMENT
4. TIMER BUTTON
5. QTR START BUTTON
6. QTR (QUICK TIMER RECORD) REC TIME BUTTON
7. TAPE COUNTER RESET BUTTON
8. TAPE COUNTER MEMORY BUTTON
9. MULTI FUNCTION DISPLAY
10. CHANNEL PROGRAMME SELECTORS (UP/DOWN)
11. REMOTE SENSOR WINDOW
12. REWIND/REVIEW BUTTON
13. PLAY BUTTON
14. FAST FORWARD/CUE BUTTON
15. RECORD BUTTON
16. PAUSE/STILL BUTTON
17. TIMER MODE SELECTOR (ADJ/NOR/PROG)
18. CLOCK/TIMER BUTTONS
19. TUNER/LINE SELECTOR
20. TRACKING CONTROL
21. SHARPNESS CONTROL
22. CHANNEL PRESET BUTTONS

LOCATION OF CUSTOMER CONTROLS

TOP AND FRONT PANELS MODEL: GHV-1242I



TOP AND FRONT PANELS MODEL: GHV-1248I



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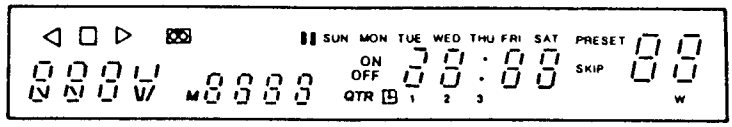
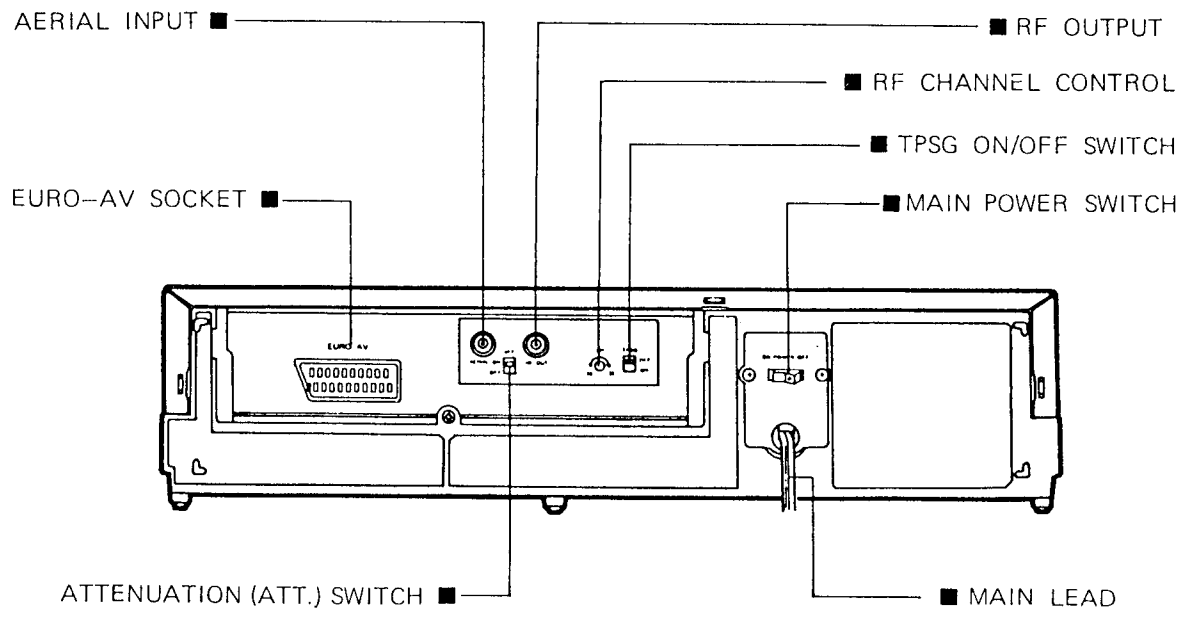
MULTI FUNCTION DISPLAY



- **FUNCTION INDICATOR** ◁□▷ "PLAY"
  Shows current VCR operation.
- **CASSETTE IN INDICATOR**
  Shows a cassette is loaded in the VCR.
- **DEW INDICATOR** "DEW"
  Indicates excessive moisture in the unit.
- **MEMORY INDICATOR M**
  This indicator (M) appears when the MEMORY button is activated.
- **TAPE COUNTER** 8888
  Tape counter number is displayed.
- **ON INDICATOR ON**
  Appears when timer START time is displayed.
- **OFF INDICATOR OFF**
  Appears when timer END time is displayed.
- **WEEK INDICATOR I, II**
  Indicates 1st (I) or 2nd (II) week for Timer recordings.
- **DAY INDICATOR SUN, MON ... SAT**
  Shows present day and/or timer start day.
- **PRESET INDICATOR PRESET**
  Indicates position of NOR/SET selector is in the SET position.
- **SKIP INDICATOR SKIP**
  Appears when the SKIP button is activated.
- **CHANNEL DISPLAY** 88
  Displays selected channel number.
- **PROGRAM NUMBER 1,2,3, W**
  Shows program number for timer recording.
- **TIMER INDICATOR**
  Appears when the unit is set to record Timer program.
- **QTR INDICATOR** *QTR*
  Appears steadily during Quick Timer Recording.



2. DISASSEMBLY

2-1 CABINET DISASSEMBLY

2-1-1 Top Case (Fig. 2-1-1).

A. Remove two screws (A). (See Fig 2-1-1)
B. Hold the back of Top Case and slide it slightly backward then lift up to remove it.

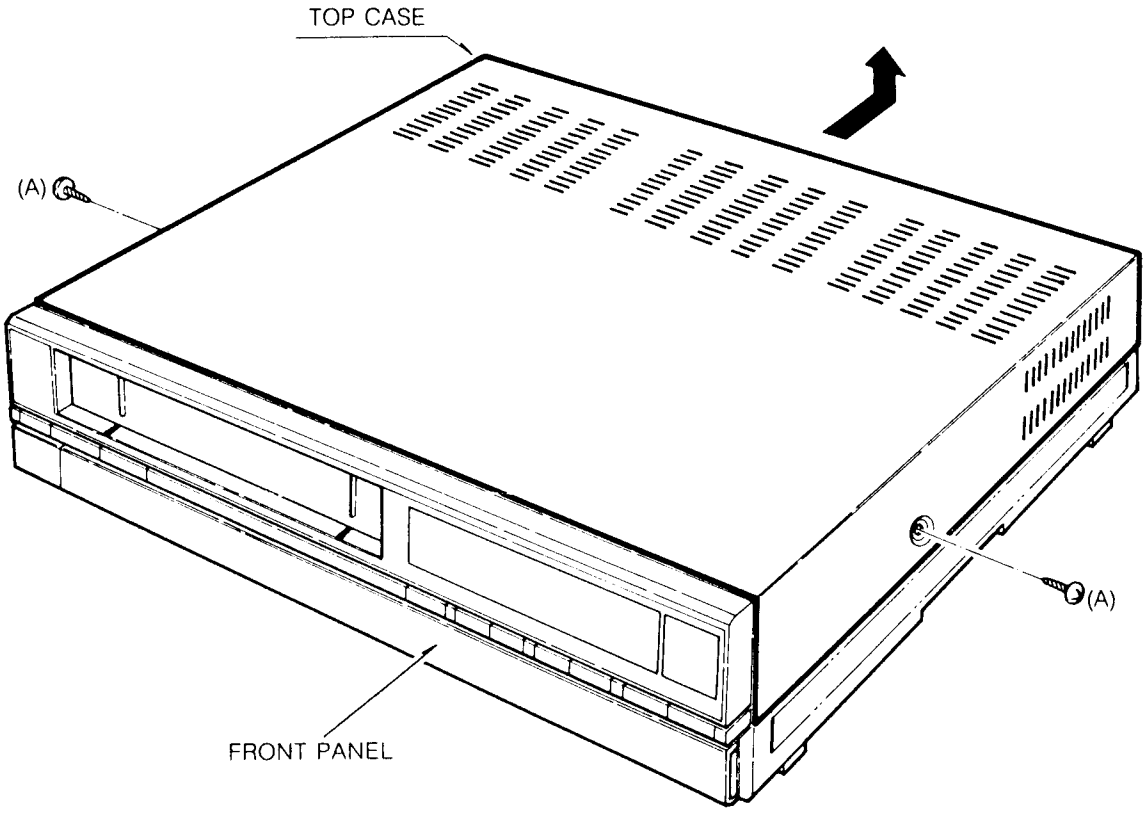


Fig. 2-1-1

2-1-2 Bottom Cover

A. Remove seven screws (B) to remove the Bottom Cover.
(See Fig 2-1-2)

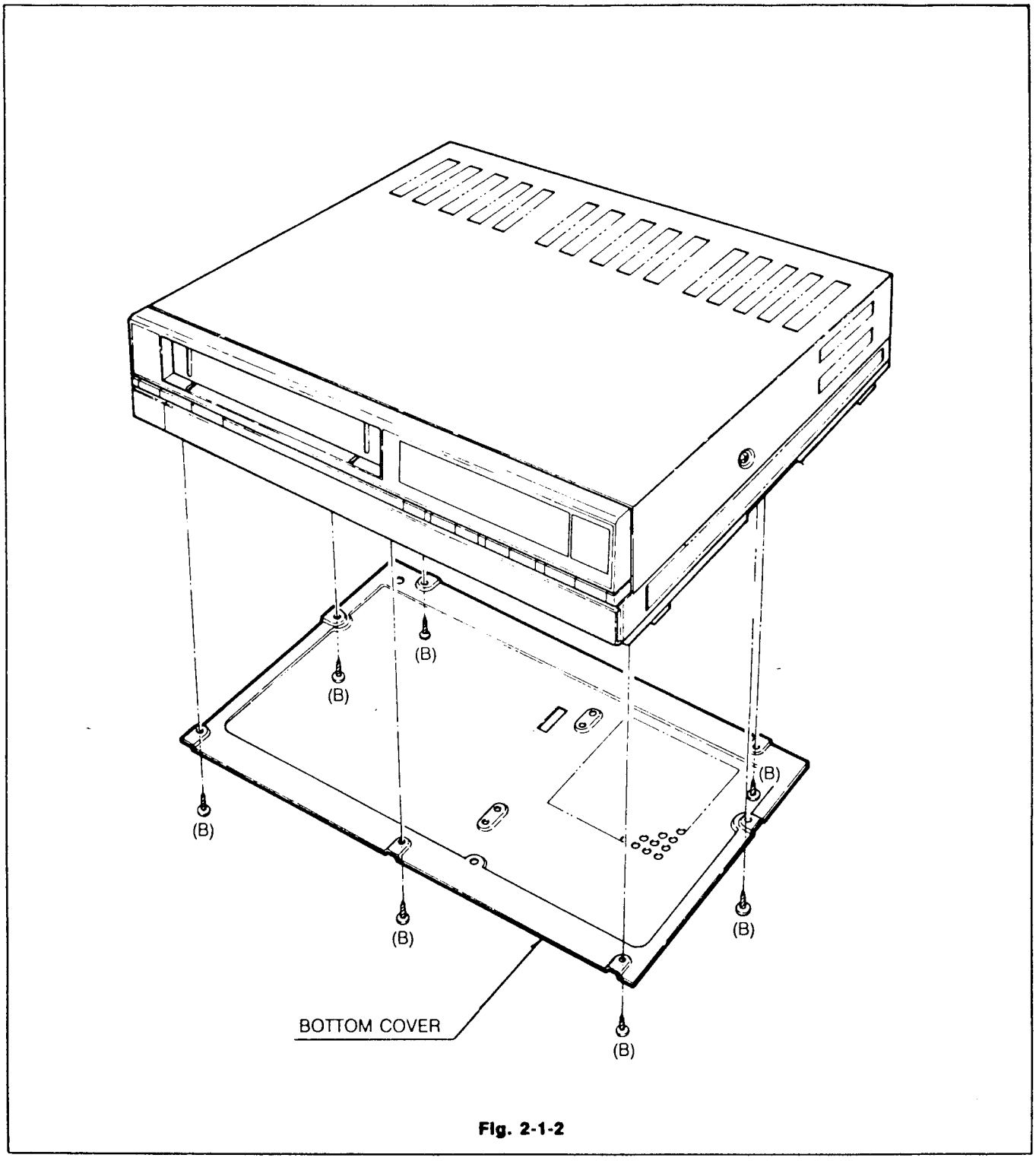


Fig. 2-1-2

2-1-3 Front Panel

A. Remove the Top Case. (See Fig. 2-1-1)
B. Remove the Bottom Cover. (See Fig. 2-1-2)
C. Remove three screws (C) on the top of the Front Panel. (See Fig. 2-1-3)
D. Press three Stoppers (D) in the direction of the small arrows to disengage and then pull the bottom side of the Front Panel toward you to remove it. (See Fig. 2-1-3)

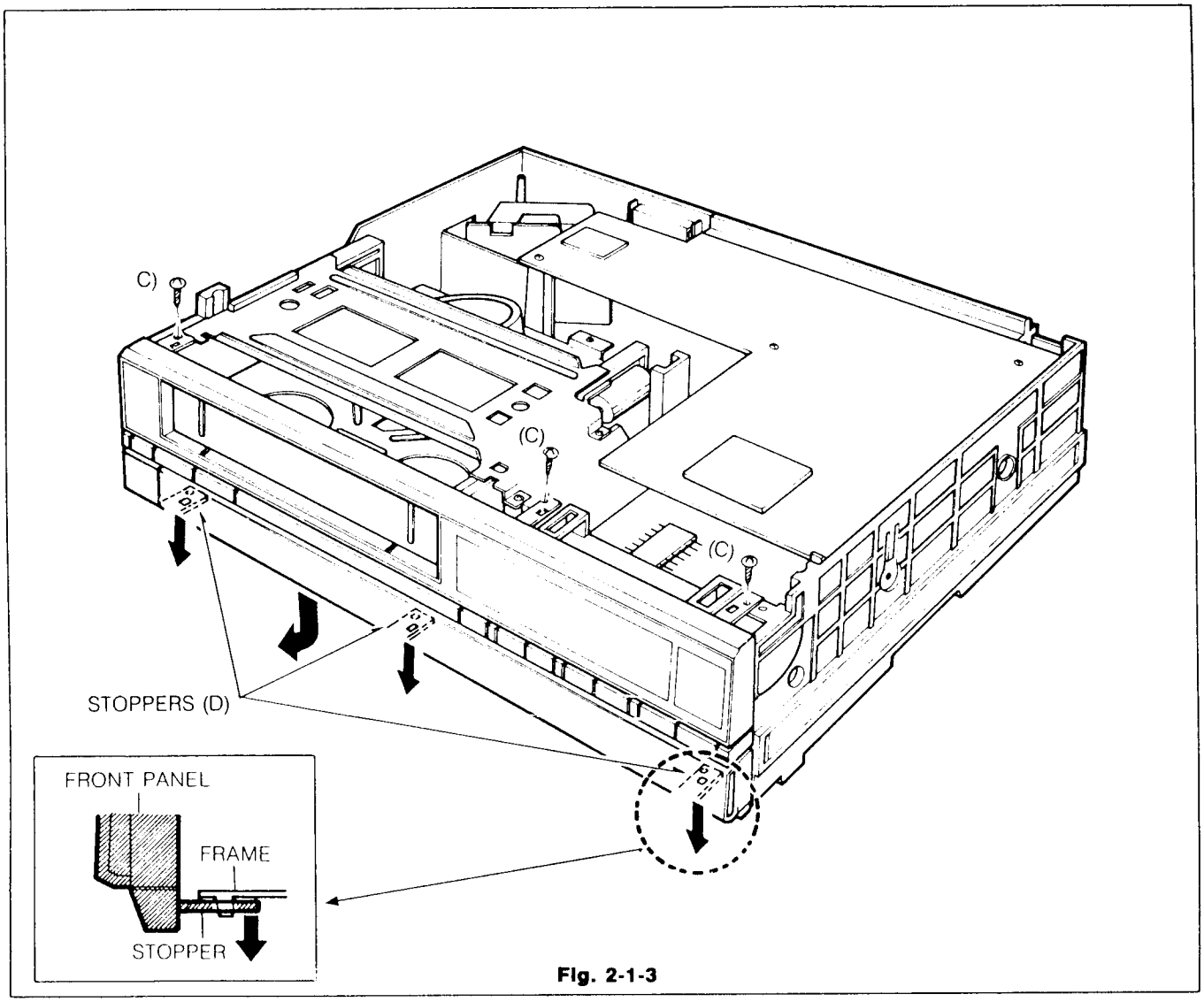


Fig. 2-1-3

2-2 CIRCUIT BOARD DISASSEMBLY

2-2-1 Circuit Board Arrangement

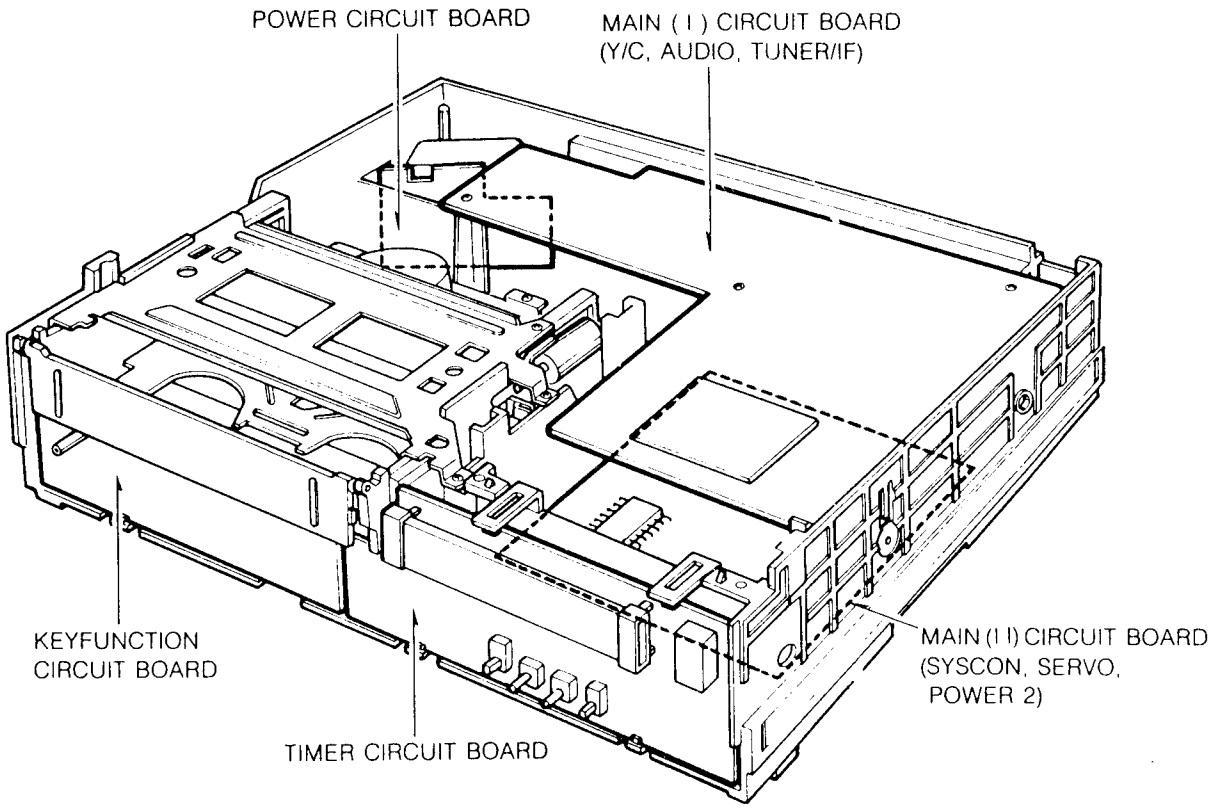


Fig. 2-2-1

2-2-2 Keyfunction Circuit Board

A. Pull the P.C.Board toward you while pressing the two stoppers in the direction of the small arrows to disengage, and remove the P.C.Board. (See Fig. 2-2-2)
B. Remove connector for complete removal.

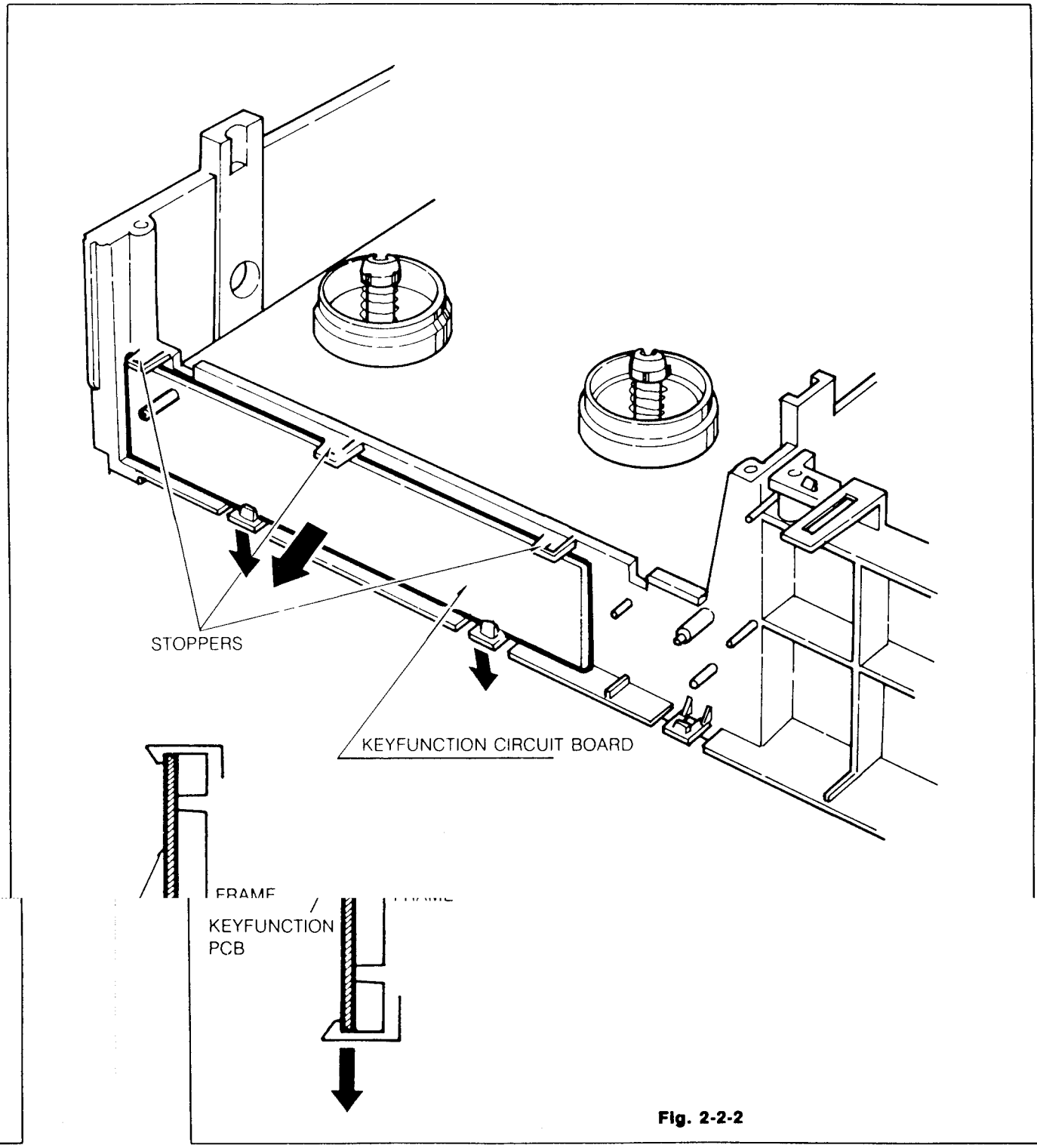


Fig. 2-2-2

2-2-3 Timer Circuit Board

A. Pull the P.C.Board toward you while pressing two stoppers in the direction of the small arrows to disengage, and remove the P.C.Board. (See Fig. 2-2-3)
B. Remove connector for complete removal.

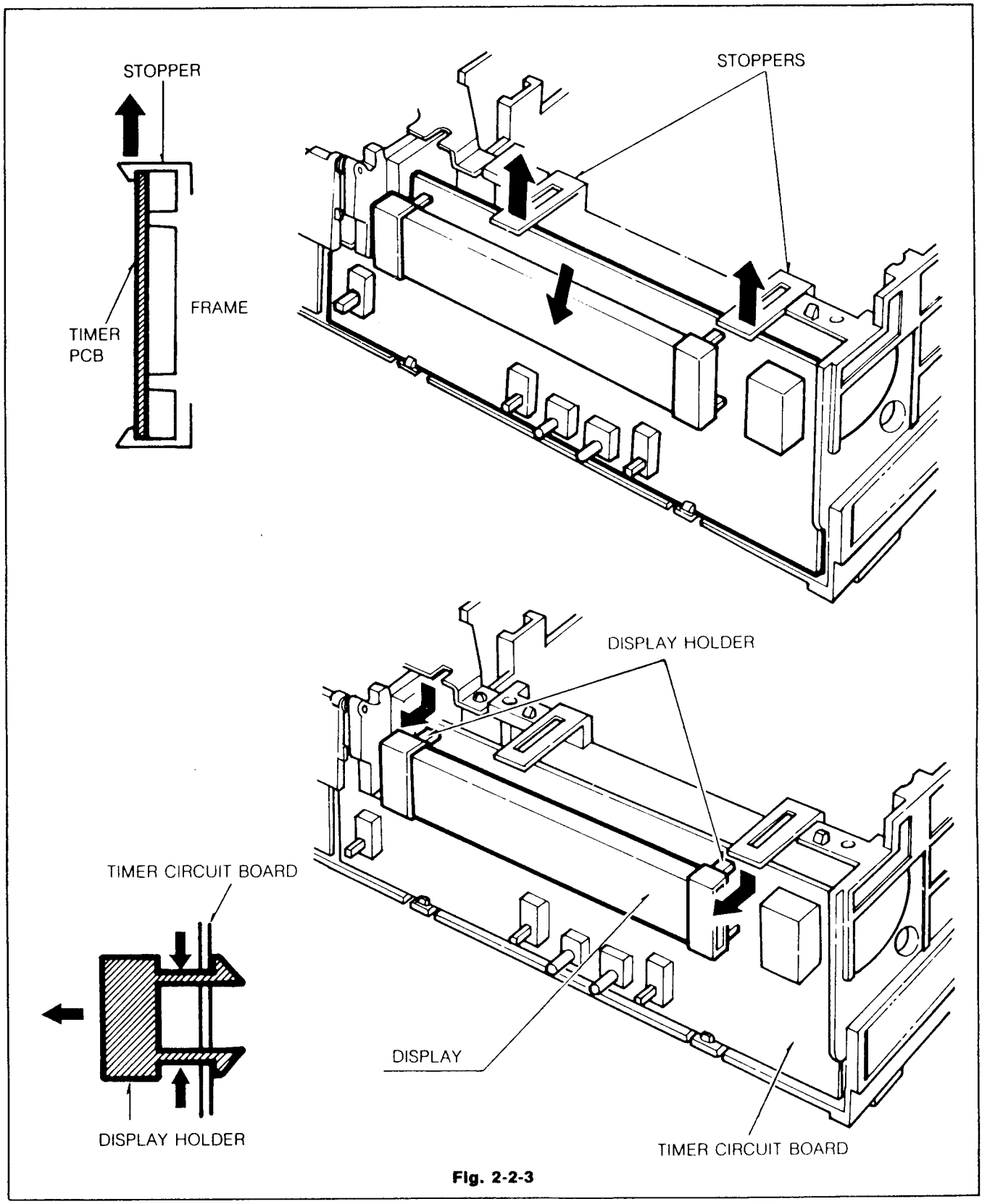


Fig. 2-2-3

2-2-4 Main Circuit Board (1) (Y/C, Audio, Tuner/IF)

A. Remove two screws (D).
B. Press stopper in the direction of the arrow to disengage, and remove the circuit board.
C. Remove connector for complete removal.

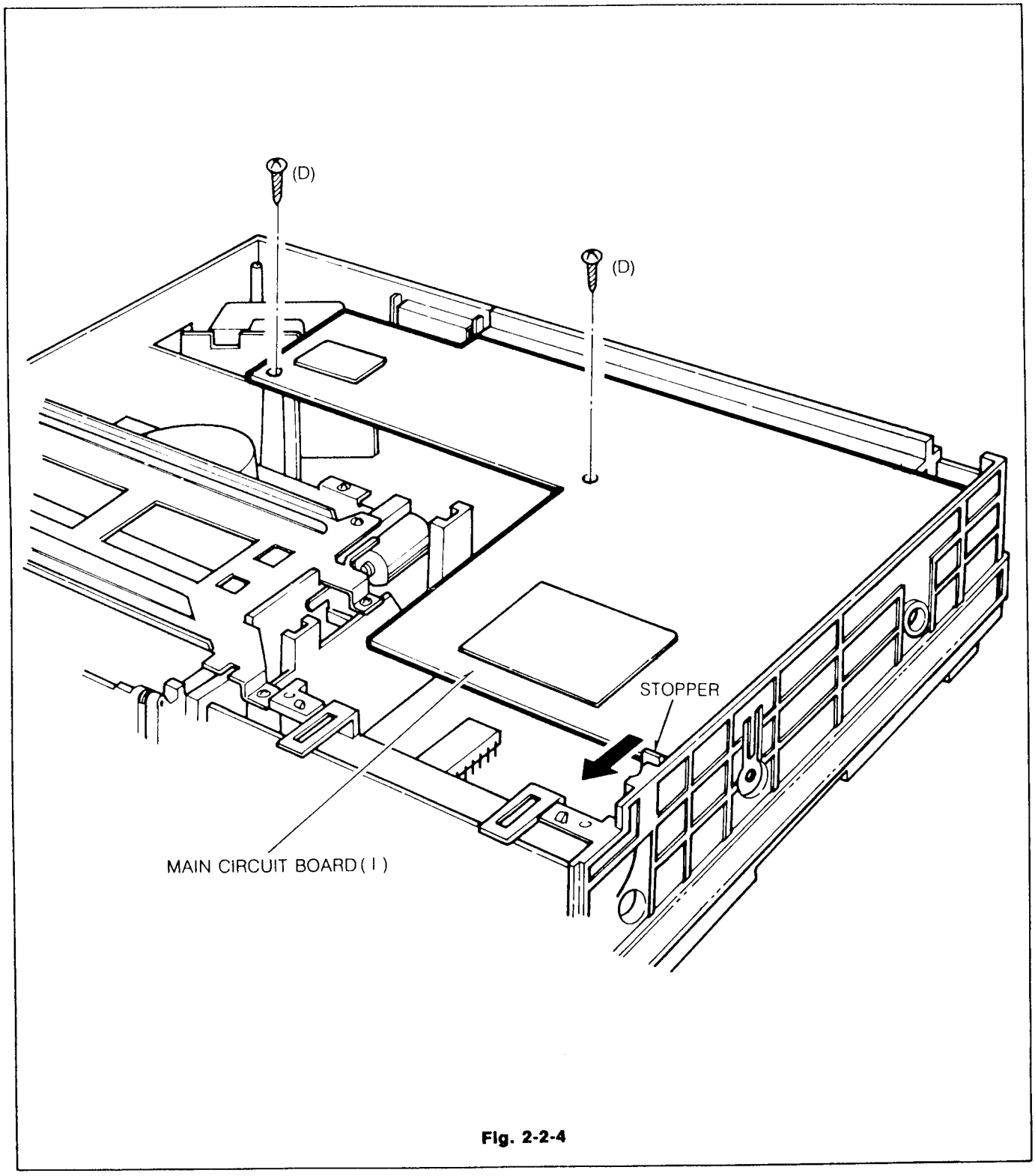


Fig. 2-2-4

2-2-5 Main Circuit Board(II) (Power 2, Servo, Syscon)

A. Remove one screw (E).
B. Press two stoppers in the directions of the arrows to disengage and then lift up the Main circuit board to remove it. (See Fig. 2-2-5)
C. Remove connector for complete removal.

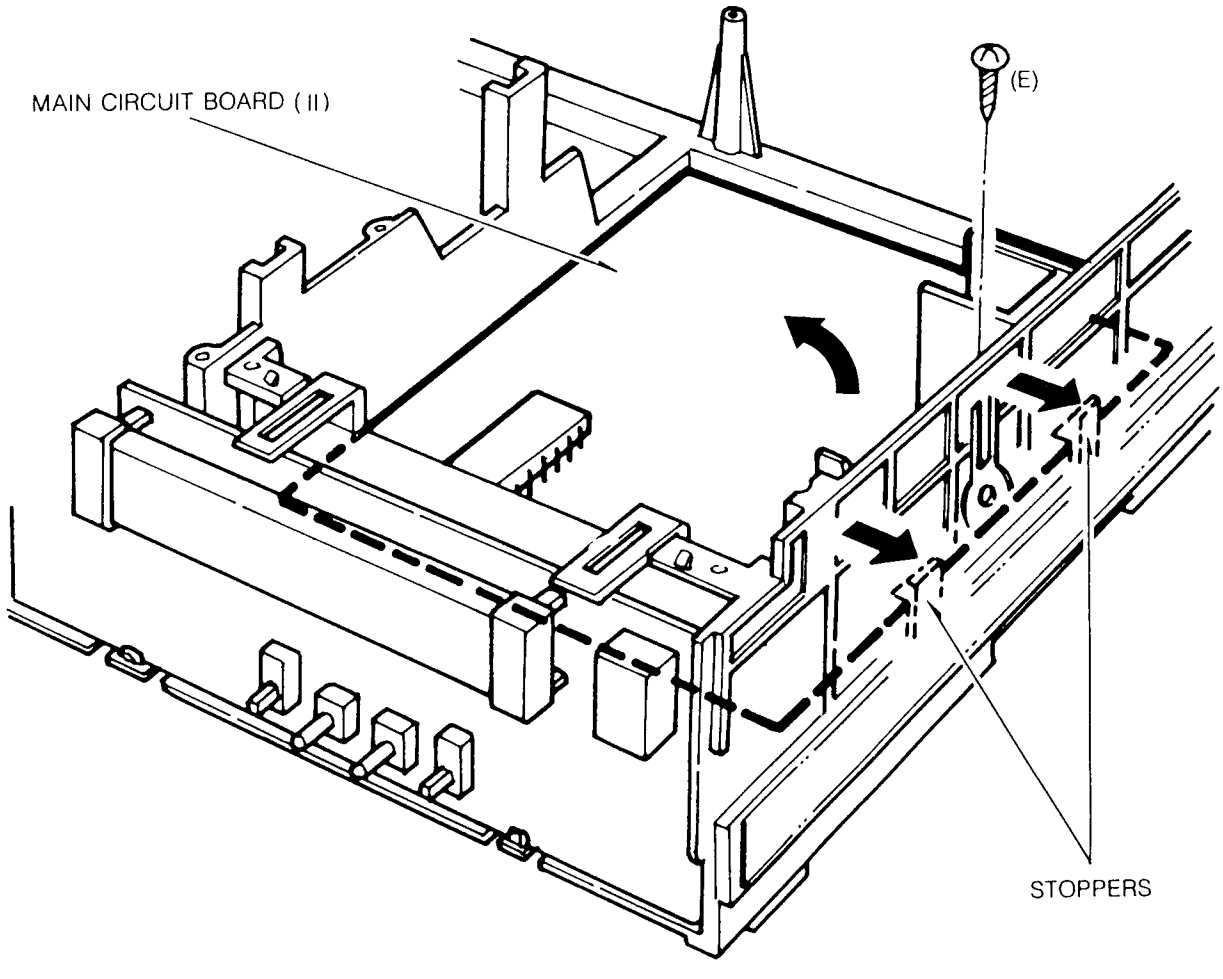


Fig. 2-2-5

2-2-6 Power Circuit Board

A. Remove three screws (F).
B. Lift Power Circuit Board up in the direction of the arrow. (See Fig. 2-2-6)

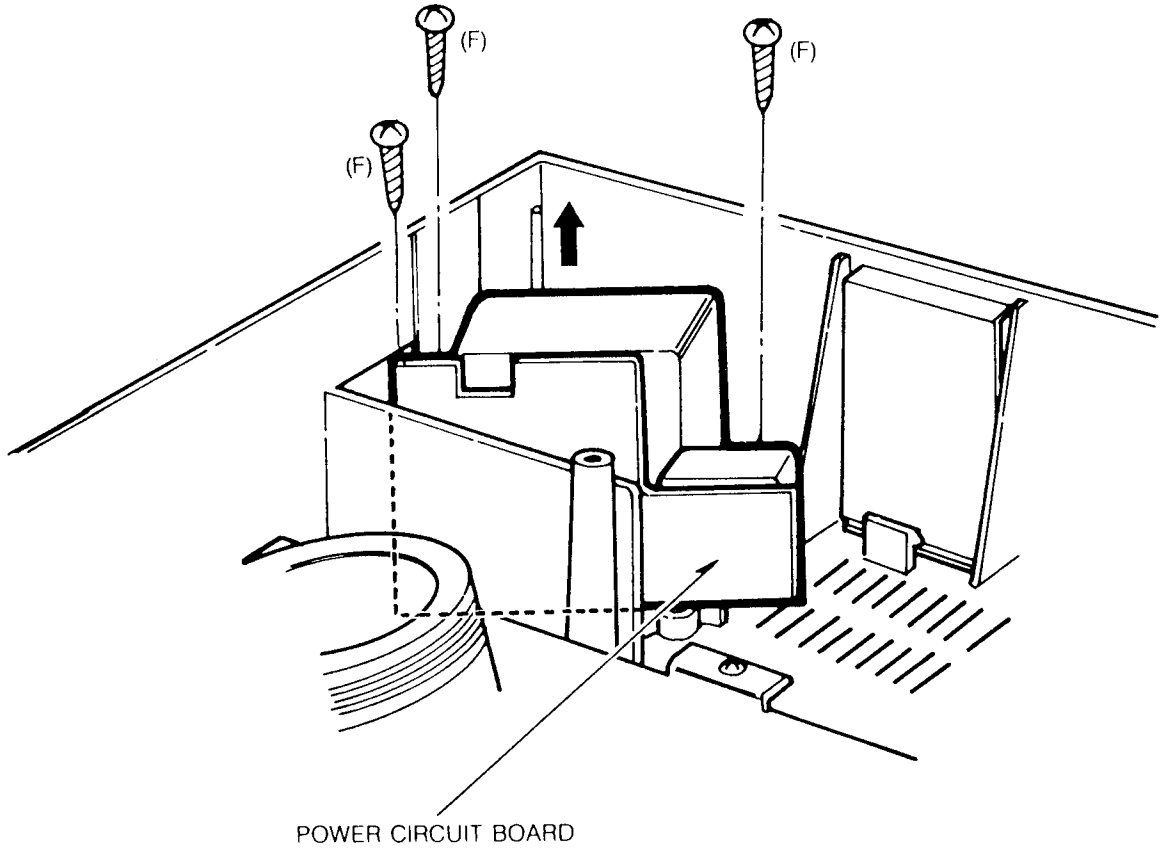


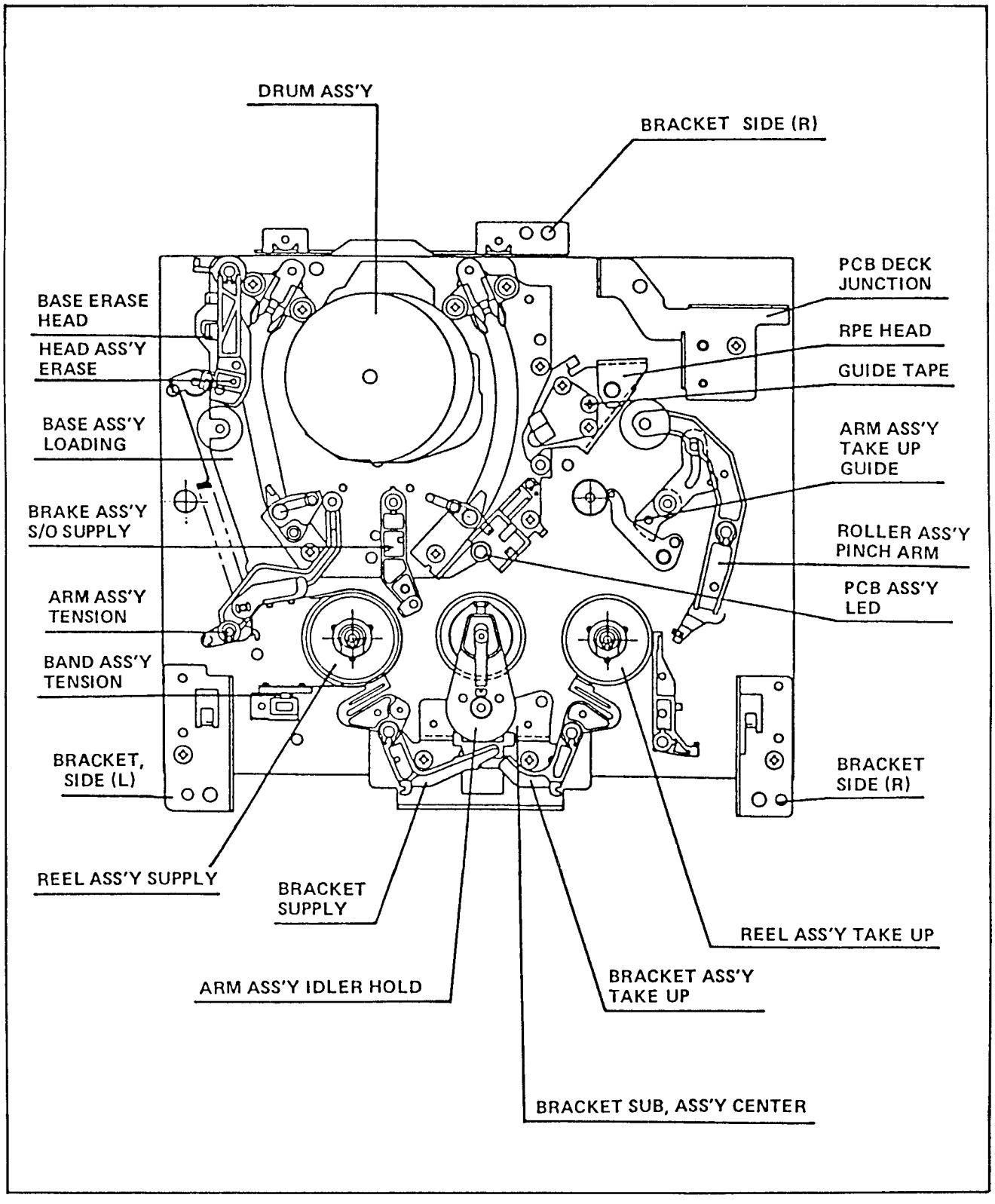
Fig. 2-2-6

2-3 REMOVING MECHANISM PARTS

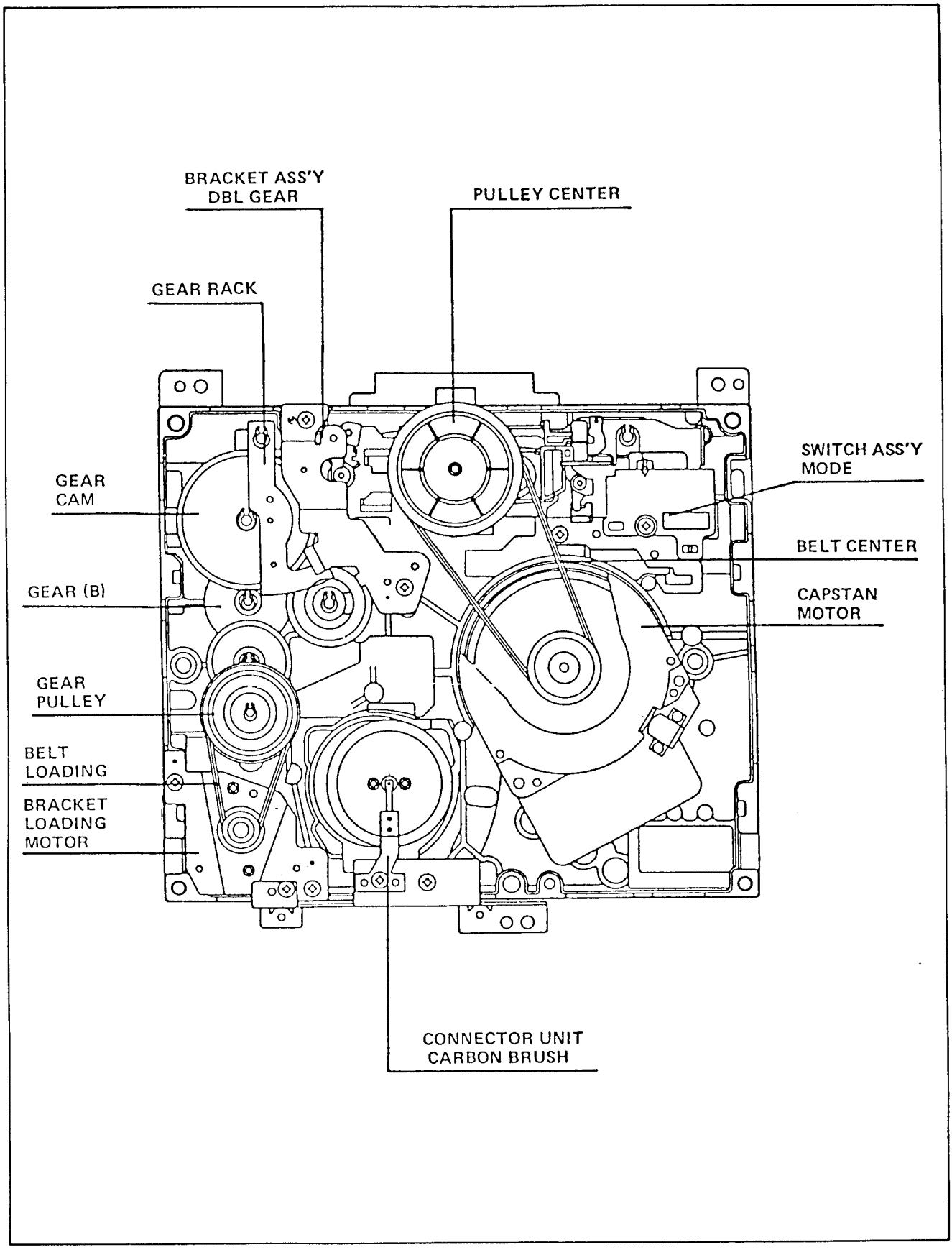
2-3-1 Mechanism Parts Locations

A. Deck Part Location

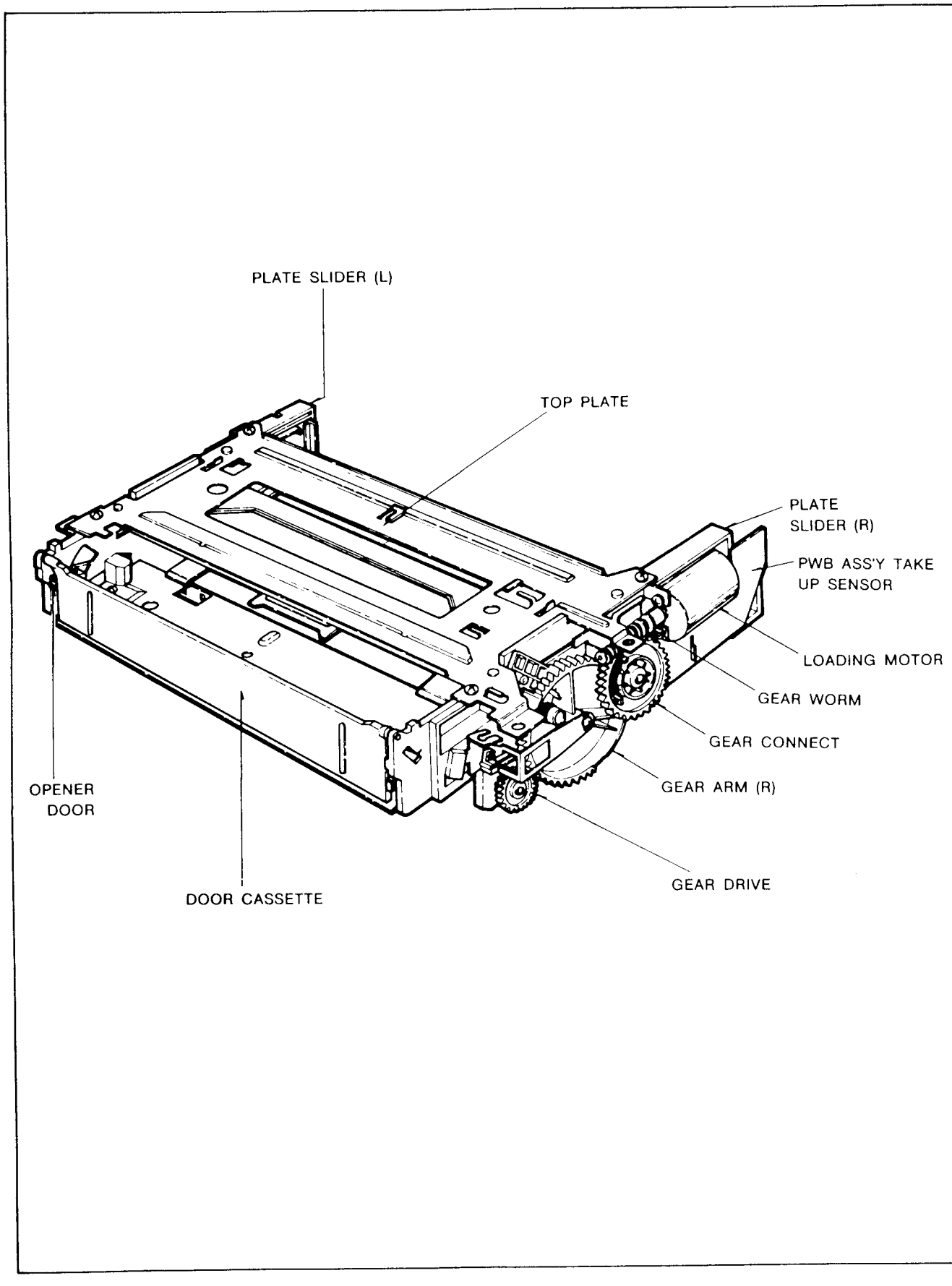
a) Top View



b) Bottom View



c) Cassette Housing



2-3-2 Cassette Housing Assembly

A. Remove 3 screws (A) and then lift Cassette Housing up to remove it.
B. Remove connector for complete removal.

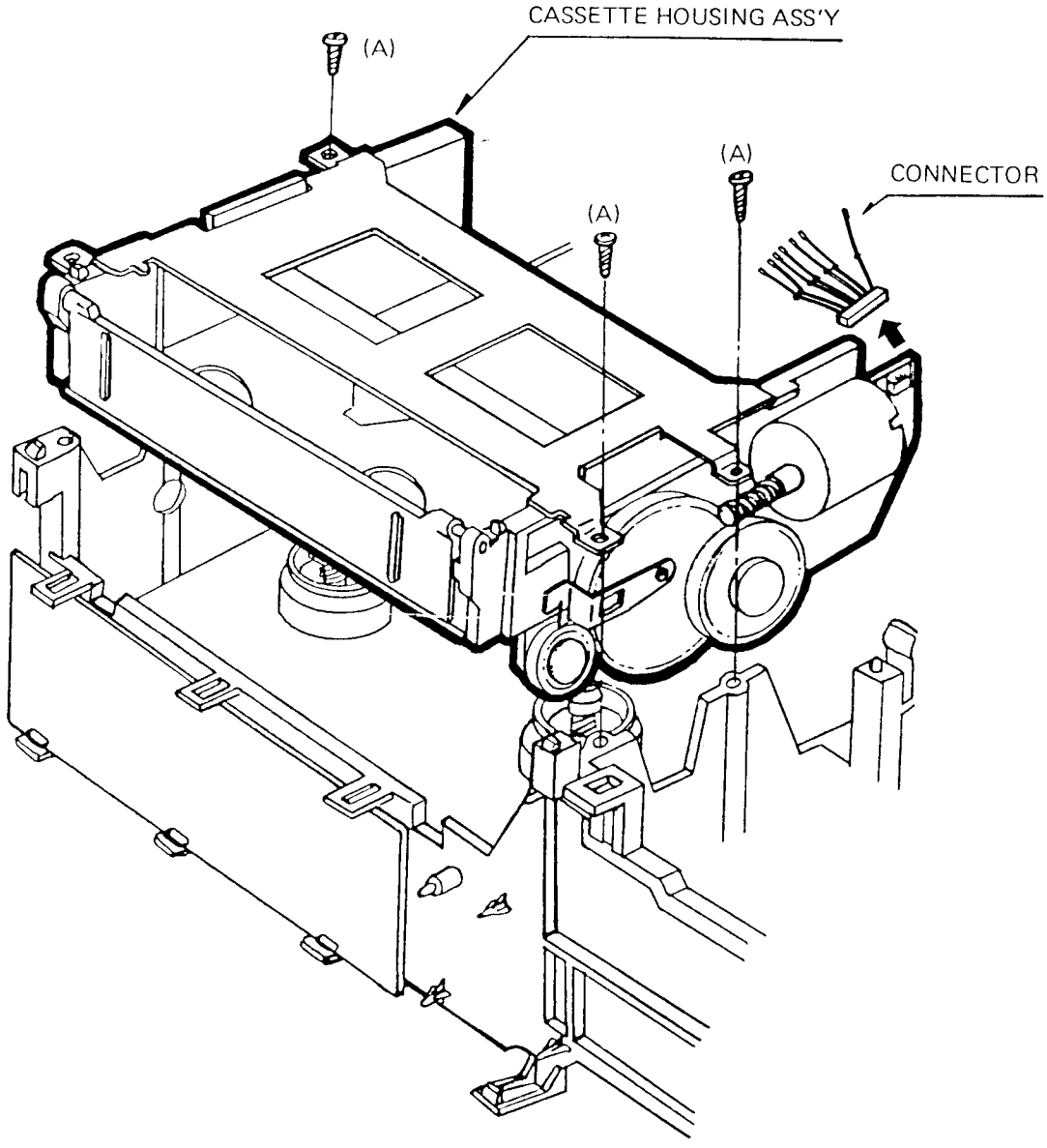


Fig. 2-3-1

2-3-3 Deck Assembly

A. Remove the Cassette Housing.
B. Remove the Y/C (Luminance/Chroma) Circuit board.
C. Remove 3 screws (B) and then lift the Deck Ass'y up to remove it.
D. Disconnect connectors for complete removal.

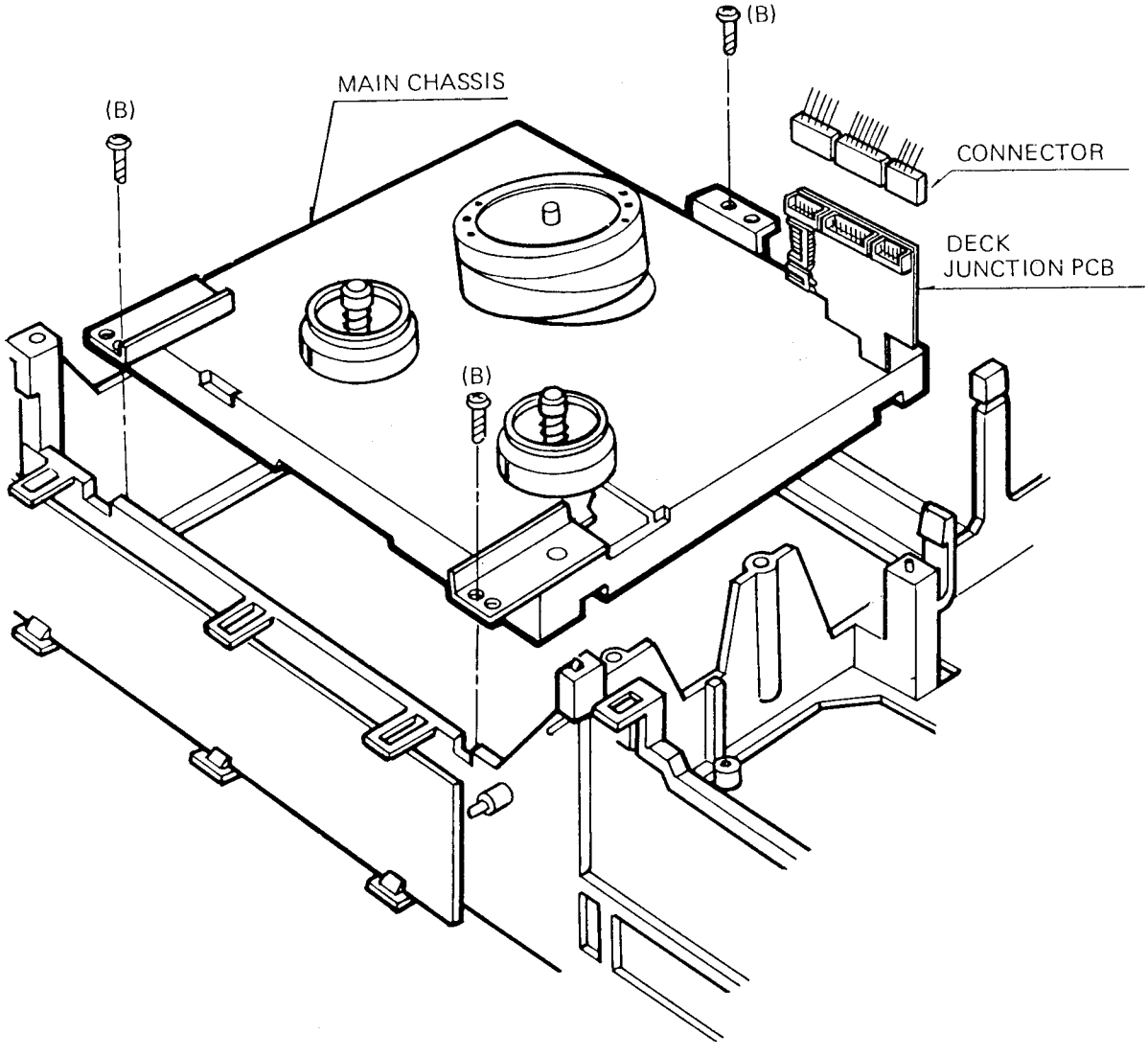


Fig. 2-3-2

2-3-4 Drum Assembly

A. Remove the Top Case and Bottom Cover.
B. Remove 3 screws (C) as shown. (See Fig. 2-3-3)
C. Disconnect connectors for complete removal.

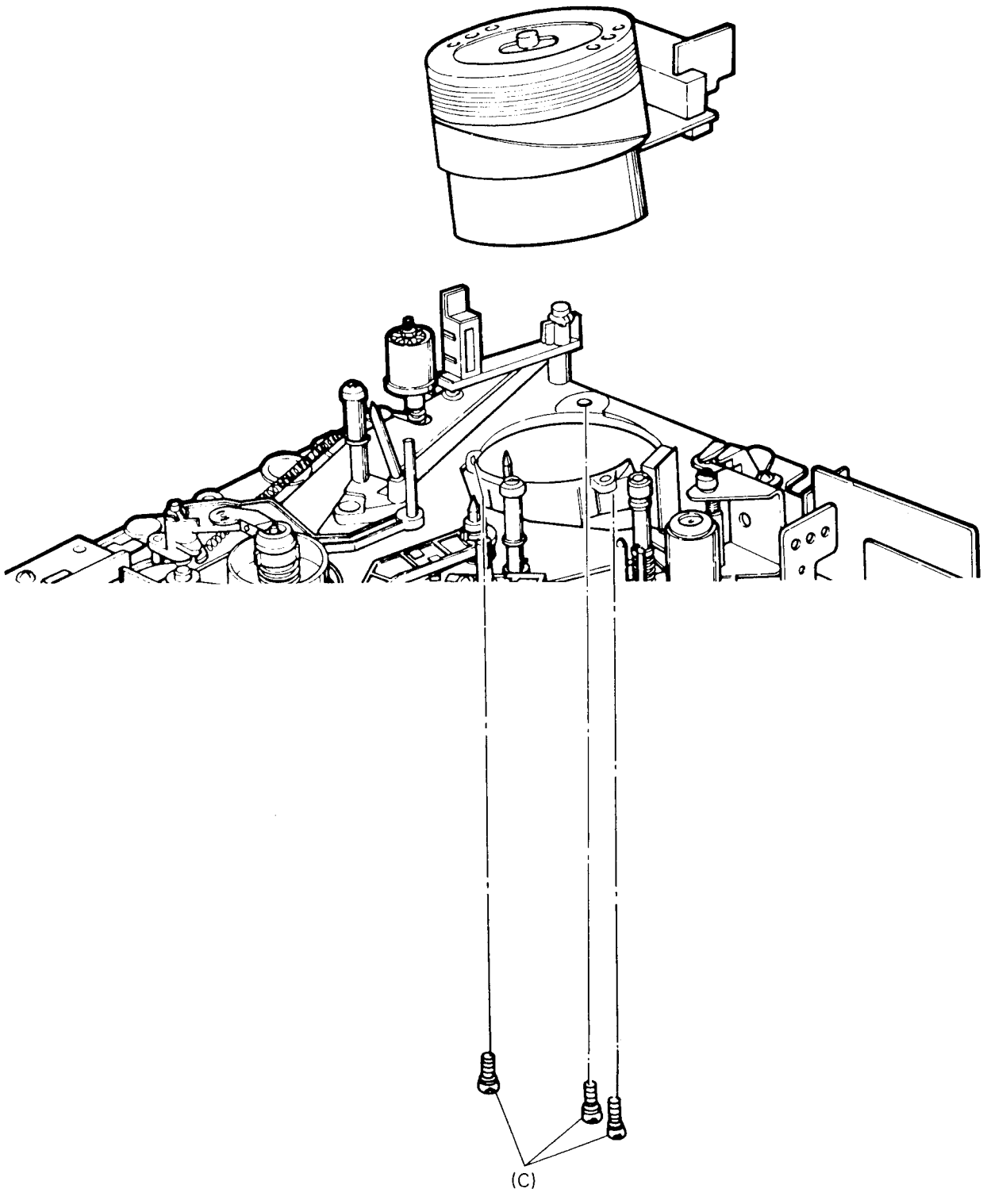


Fig. 2-3-3

2-3-5 Capstan Motor Assembly

A. Remove the Top Case, the Bottom Cover, and the Front Panel.
B. Remove the Belt Center.
C. Remove the Capstan Motor by loosening the 3 screws.

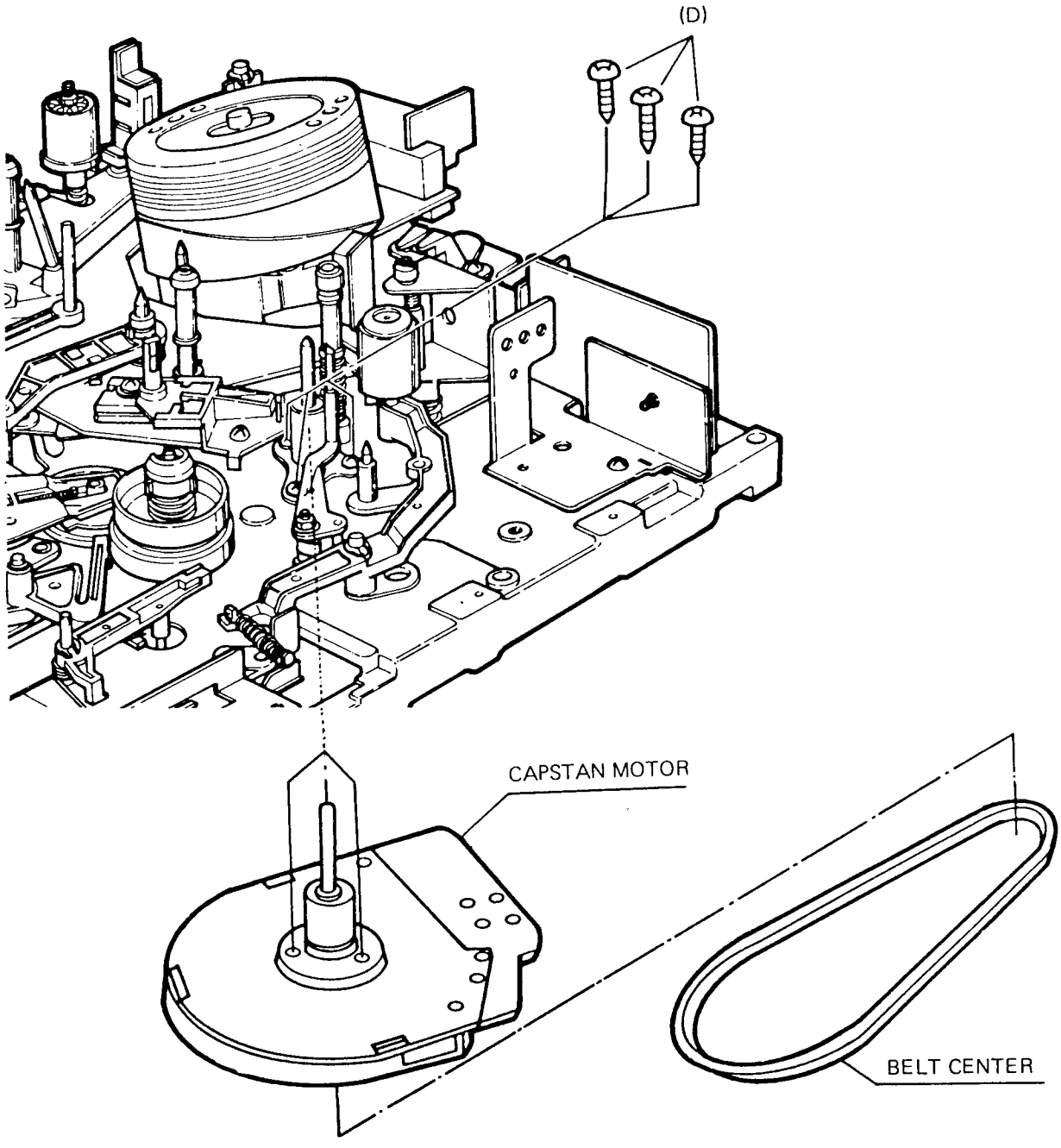


Fig. 2-3-4

2-3-6 Loading Motor Assembly

A. Remove the Top Case, Bottom Cover and Front Panel.
B. Remove the Cassette Housing and Deck Ass'y.
C. Remove the Shield Bracket by loosening the 2 screws (E).
D. Remove the Loading Belt connected to the Pulley Gear.
E. Remove the Bracket and the Loading Motor by loosening the 2 screws (F).
F. Remove the Loading Motor by loosening the 2 screws (G).

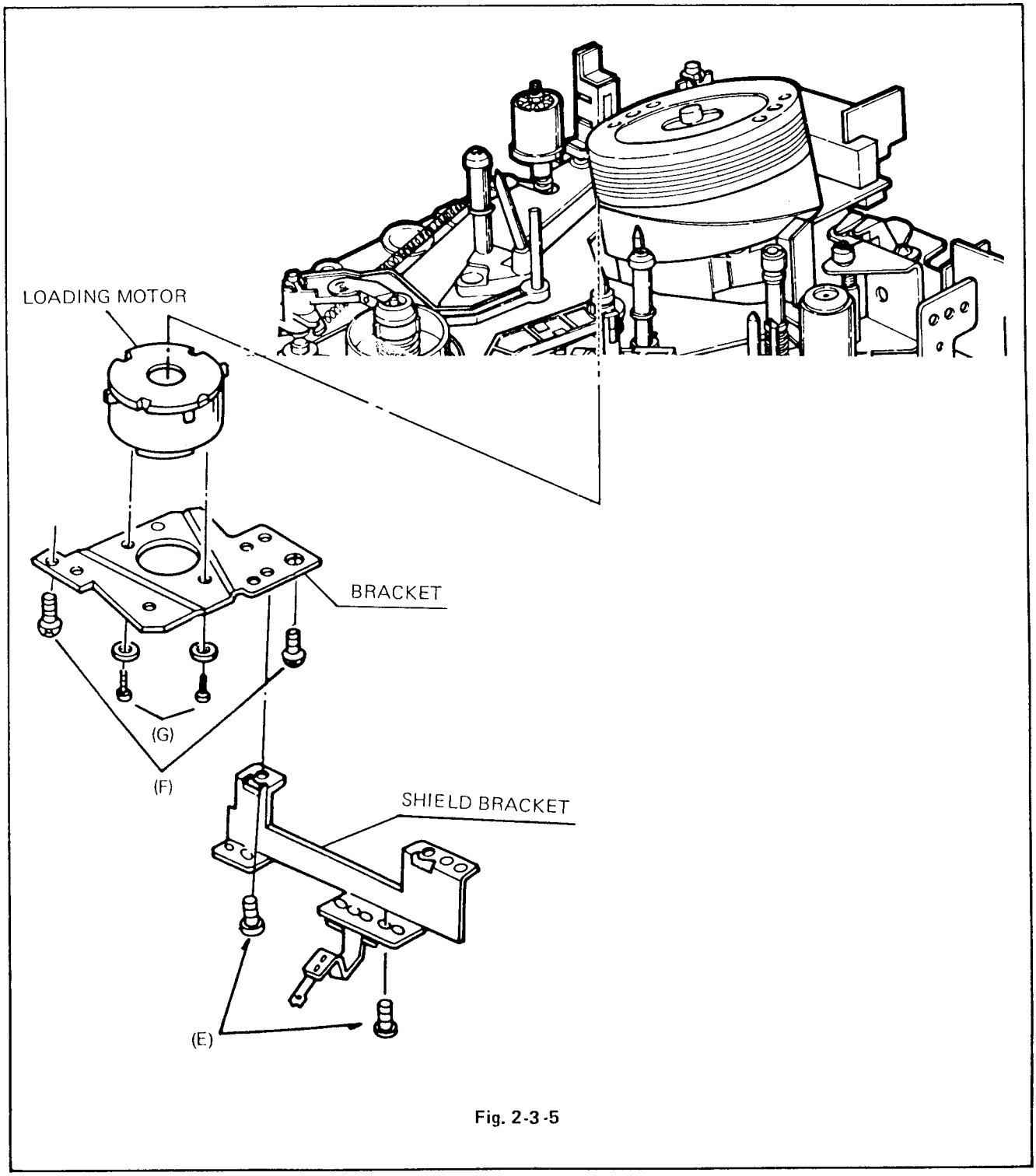


Fig. 2-3-5

2-3-7 Erase Head Assembly

A. Remove the Top Case.
B. Remove the G-Ring (H).
C. Remove the Erase Head Base and the Erase Head Ass'y by loosening the screw (I).

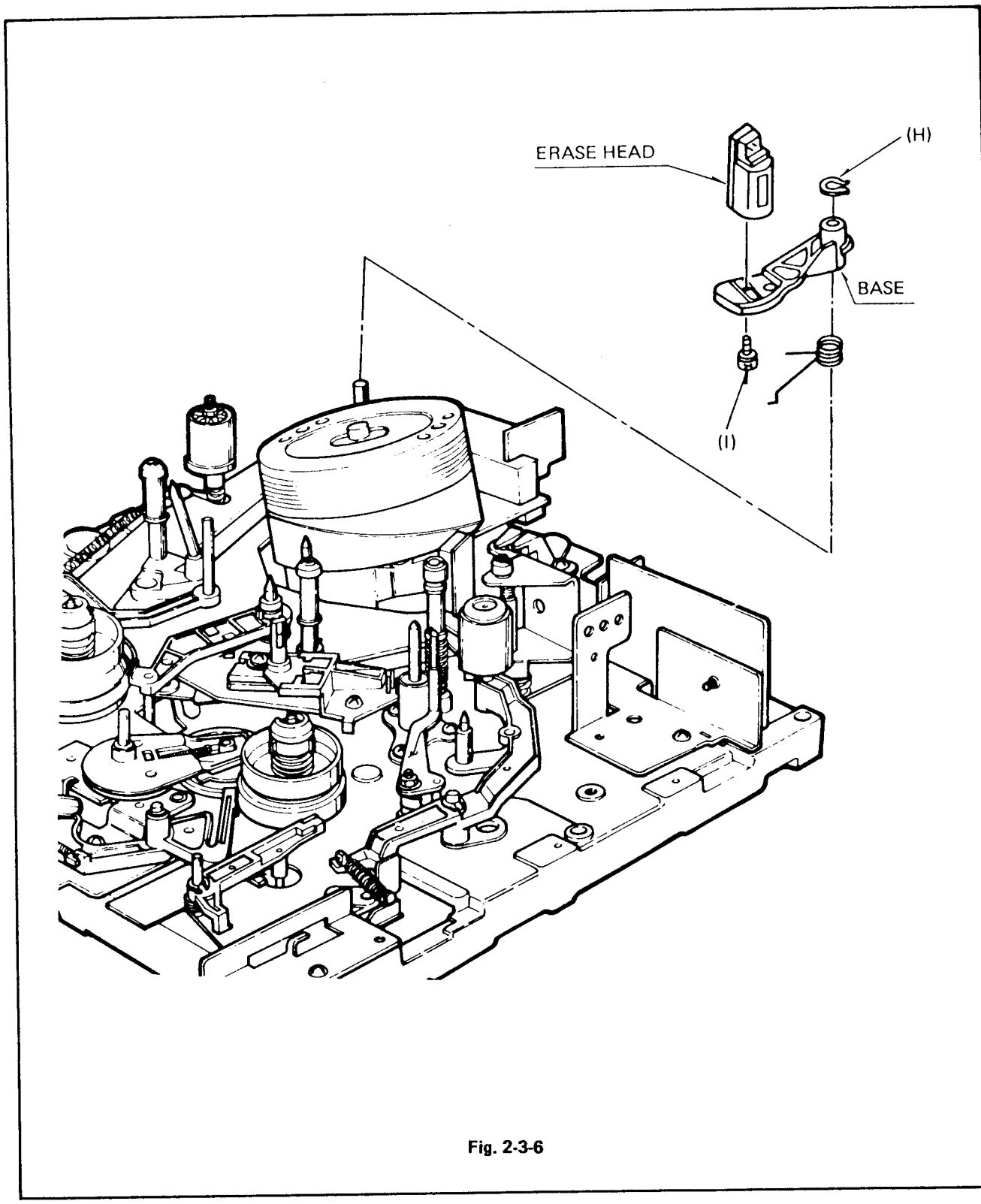


Fig. 2-3-6

2-3-8 R/P/E Head Assembly

A. Remove the Top Case.
B. Loosen the Nut (J) and then disassemble the Spring (I).
C. Remove the A/C Head Bracket (K) and the R/P/E Head Ass'y by loosening the 2 screws (L)

*****CAUTION*****

When reassembling, the initial adjustment of the transport system should be performed.

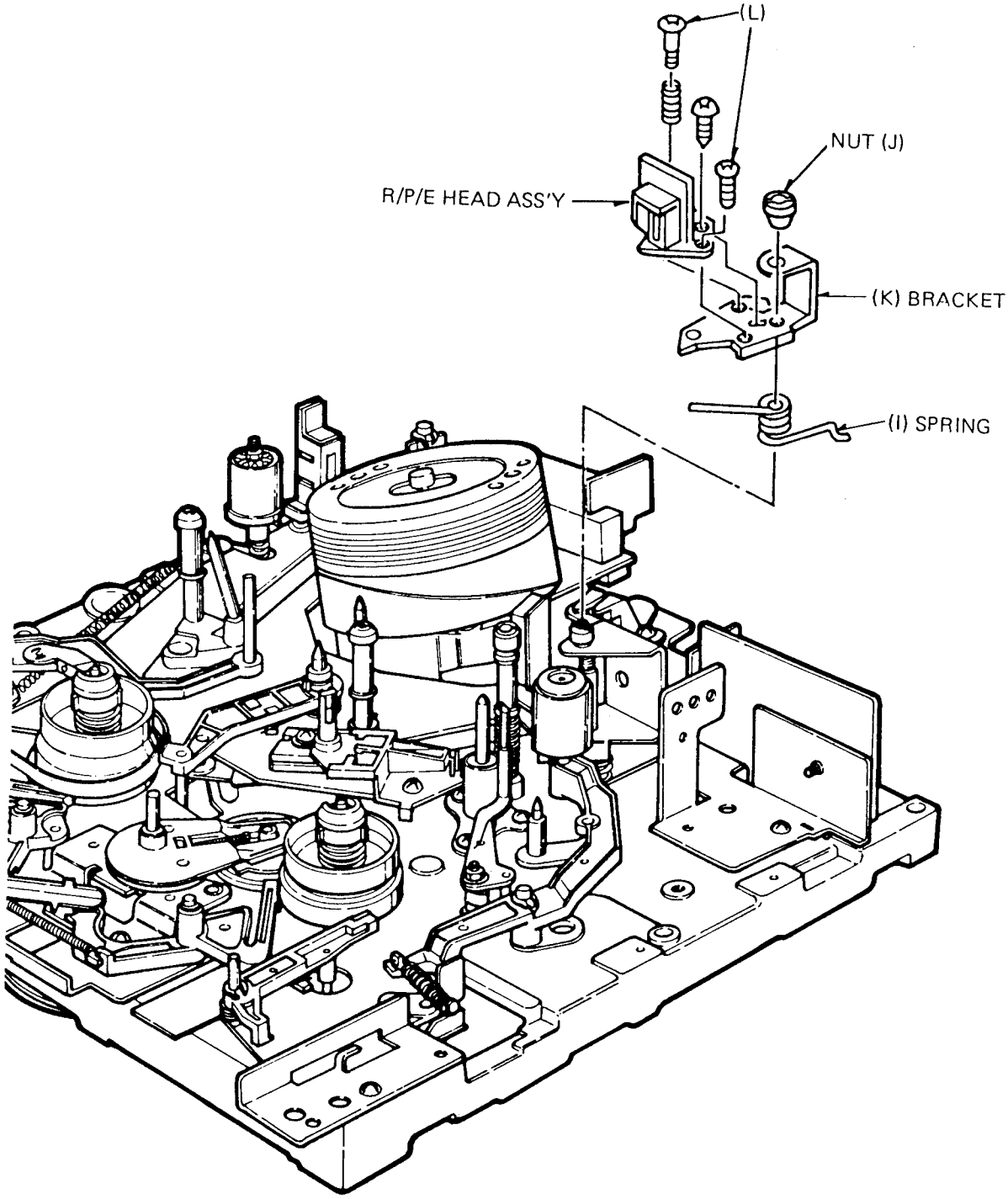


Fig. 2-3-7

3. ADJUSTMENT

3-1 MECHANISM ADJUSTMENT

3-1-1 Reel Table Height Adjustment

A. Preparations

a) Reel table height adjusting reference JIG
b) Reel table height adjusting JIG
c) Polyslide washer t 0.13mm, t 0.25mm, t 0.55mm.

B. Specification

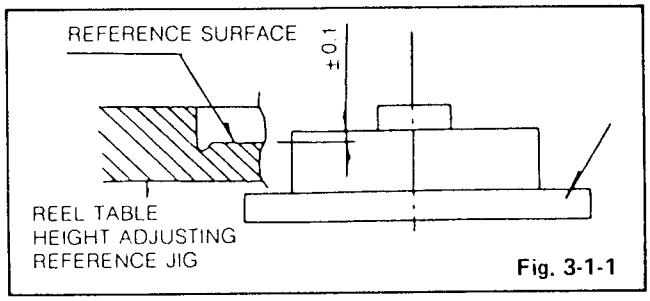


Fig. 3-1-1

C. Adjustment

a) Place the reel table height adjusting reference JIG on the deck.

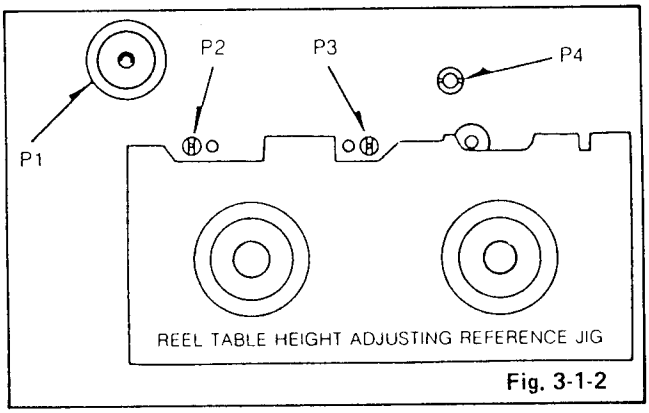


Fig. 3-1-2

b) Fix the dial scale by setting the surface "A" of the JIG at the standard of the JIG at the standard of the dial gauge ('O') of the reel table height adjusting JIG.

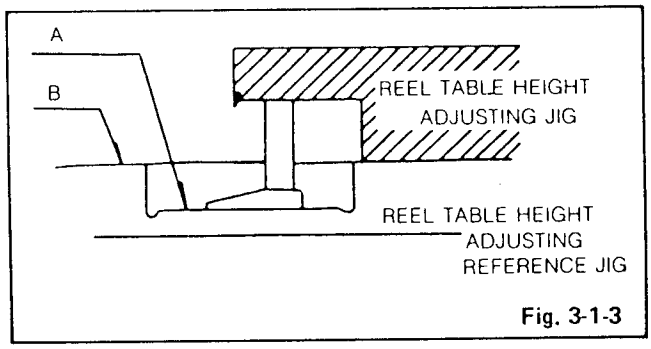


Fig. 3-1-3

c) Adjust the height after measuring upper surface of the supply and take up reel table. If it is off by more than ±0.1mm, adjust it to within ±0.1mm by combining three kinds of polyslide washers. (t 0.13, t 0.25, t 0.5)

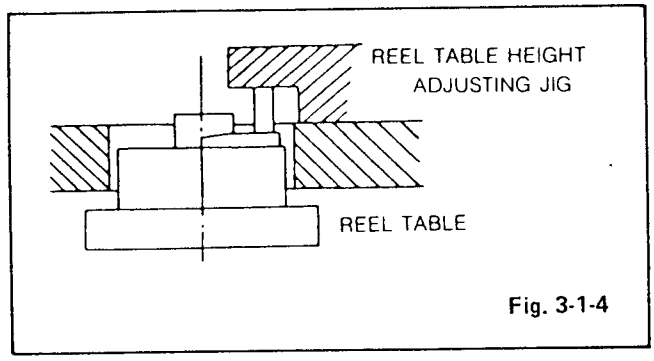


Fig. 3-1-4

D. Caution

Take care not to damage P1-P4 and other parts, when setting the reel table height adjusting reference JIG on the deck and using the reel-table height adjusting JIG.

3-1-2 Tape Guide Height Adjustment

A. Preparations

a) Post height adjusting JIG
b) Reel height adjusting reference JIG
c) Nut driver ø5.5
d) Post height adjusting driver

B. Specification

a) P1, P2, P3 & P4 of Fig. 3-1-2.
Agreement between the JIG reference surface and the lower guide edge.

C. Adjustment

a) Place the post height adjusting reference JIG on the reference surface ad then place the post height adjusting JIG on the post height adjusting reference JIG.
b) Raise slowly with the nut driver (as shown in Fig. 3-1-5) with the reference surface of the post height adjusting JIG.
c) Place post height adjusting JIG on the post height adjusting reference JIG, and adjust with the post adjusting driver in order to make the lower guide edge of P2 & P3 in line (Fig. 3-1-2) with the reference surface of the post height adjusting JIG.

D. Caution

The reference surface of the post height adjusting JIG is to be in complete contact with each guide (P1-P4) surface, as shown in Fig. 3-1-5.

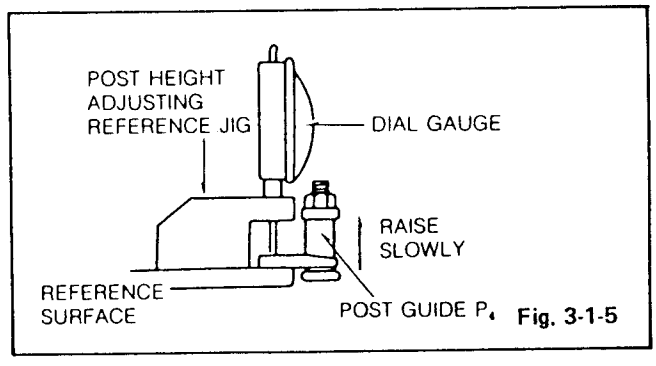


Fig. 3-1-5

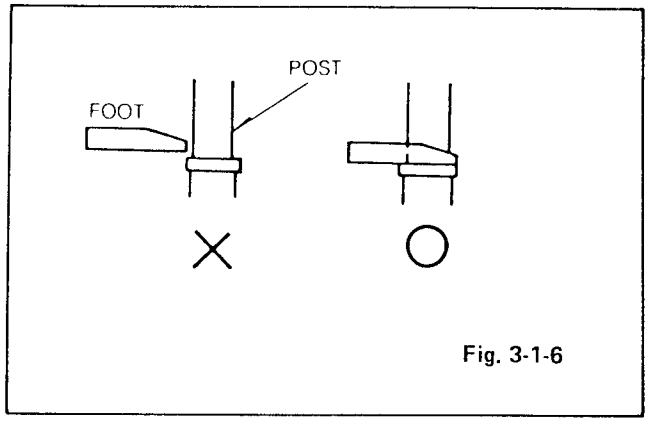


Fig. 3-1-6

3-1-3 Take-up Guide Height Adjustment

A. Preparations
  a) Reel table height adjusting reference JIG
  b) Post height adjusting JIG
  c) Nut driver ø5.5

B. Specification
  0.06±0.02mm

C. Adjustment
  a) Place the reel table height adjusting reference JIG on the deck.
  b) Adjust the take up guide with the nut driver ø5.5 so that the lower take up guide and the contact gauge of post height adjusting JIG A, B may be made in line as shown Fig. 3-1-5.

****CAUTION****

- After adjusting, fix the nut with lockscrew paint to prevent it from rotating.

3-1-4 Tension Post Position Adjustment

A. Preparations
  a) Tension post position adjusting JIG
  b) Gear driver
  c) Driver (+) type ø3

B. Adjustment
  a) Complete loading without the tape.
  b) Set the tension post position adjusting JIG on the deck and loosen the screw (B) a little as shown in Fig. 3-1-7.
  c) To move right or left for the tension post on the straight with P1 with the side line of the deck.
  d) After the adjustment is completed, tighten screw and remove the driver, making sure that the position of the tension post is correct.

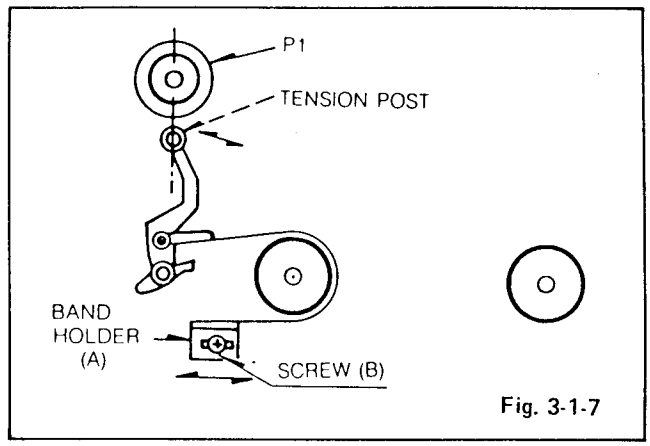


Fig. 3-1-7

3-1-5 Brake Torque Measurement

A. Preparations
  Torque-Meter with adapter 300 g.cm and 600g.cm, or cassette type Torque-Meter.

B. Specification
  The value of the torque in the STOP mode during unloading.

Mode	Measured Polt	Torque(g-cm)
PLAY	Take-Up Reel	160-250
FF	Take-Up Reel	Over 400
REW	Supply Reel	Over 400
STOP	Both	Over 350(B→A) Over 70-150(A→B) (Fig. 3-1-8)

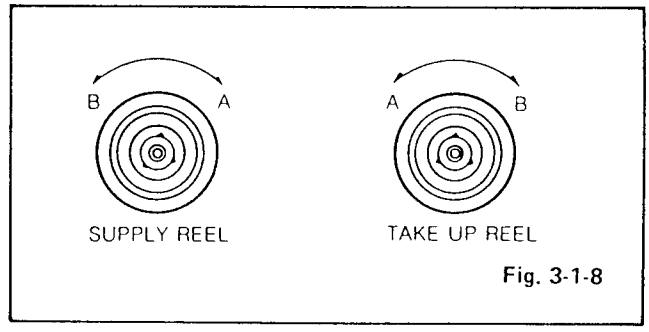


Fig. 3-1-8

C. Measurement
  a) Firstly place the torque meter on the measured part at each mode, and read the value of the torque during operating.
  b) When stop mode, place the torque meter on each reel table and on the condition that any force isn't given in the direction of P, torque meter is to be turned as arrows in Fig. 3-1-9.

****CAUTION****

- If the confirmed values are not achieved, measure again after cleaning the exposed surface of each idler and reel table with a difron solvent.
  If the correct values are still not achieved, measure again after changing the idler & reel table.
- When changing the reel table, repeat the above stated adjustment items Fig. 3-1-1, 3-1-4.

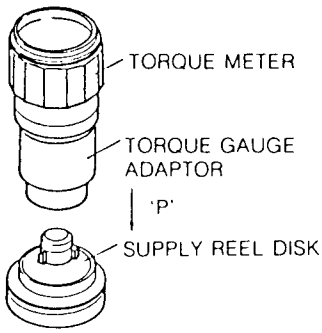


Fig. 3-1-9

3-1-6 The First Adjustment of the Transport System

A. Preparations
  a) Post adjusting driver
  b) The eccentric driver
  c) Hex wrench 0.9mm
  d) Driver, (+) or (−) type ø3
  e) Nut driver ø5.5, ø7
  f) VHS cassette tape T-30 or substitute
  g) Bended driver (+) type

B. Specifications
  Tape is not to be folded or curled at any guide that guides tape.

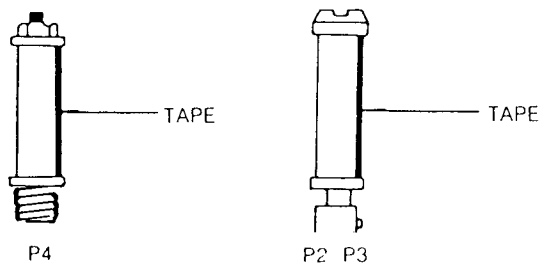


Fig. 3-1-10

C. Adjustment
  a) Insert a VHS cassette tape E-30 into the deck and push the play button, causing the tape to run.
  b) Make the adjustment P2 or P3 with post adjusting driver, so that the Tape does not fold or curl in the running condition at P2 & P3 and B & C(The inlet & outlet of drum at the tape lower edge).
  c) Observe the tape running state at P4, and when the tape is folded at upper or lower guide, or moves continuously upward or downward, adjust the tilt adjusting screw and the azimuth adjusting screw in Fig. 3-1-13 with the driver (+) or (−) type as shown Fig. 3-1-14.

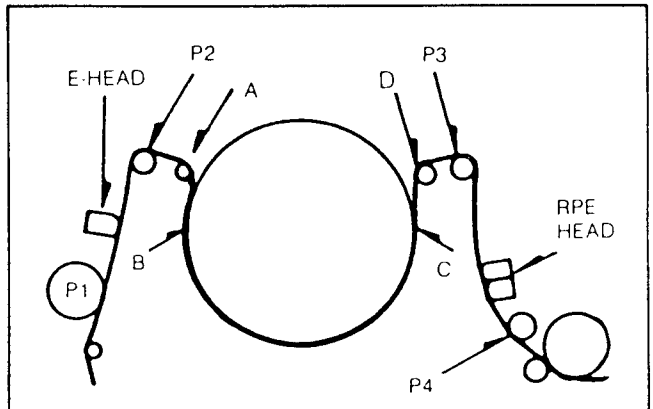


Fig. 3-1-11

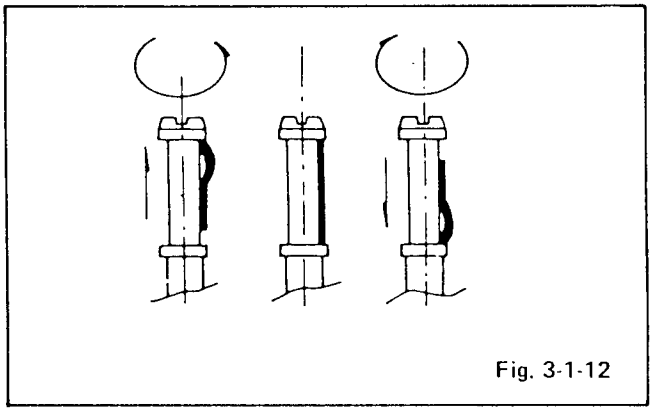


Fig. 3-1-12

****CAUTION****

- adjust the tilt adjustment screw, azimuth adjustment screw and RPE head adjust so that the RPE head is Vertical.(Fig. 3-1-13).
- The tape is absolutely not to be wrinkled of folded at the edges of the upper & lower guides of P4 or between P4 and RPE Heads.

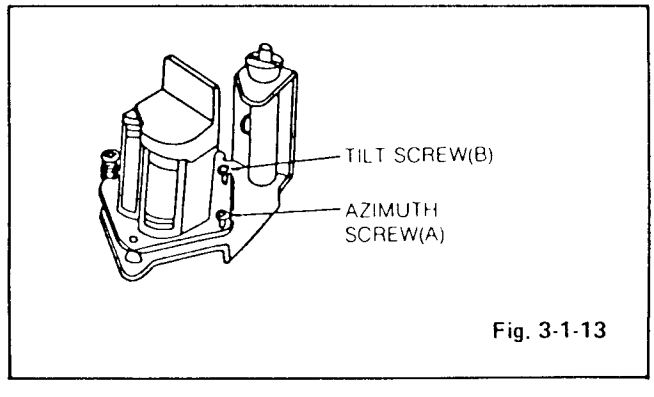


Fig. 3-1-13

Tape running State at P4	Tape running state at RPE head	TILT screw adjusting direction

Fig. 3-1-14

d) Adjust nut (A) (in Fig. 3-1-15) with the horizontal adjusting driver so that the tape's lower edge at the RPE head is not higher than the CTL head's lower edge. If it is turned clockwise, the tape height will become higher than the head height, and if turned counterclockwise, it will become lower than the head height.

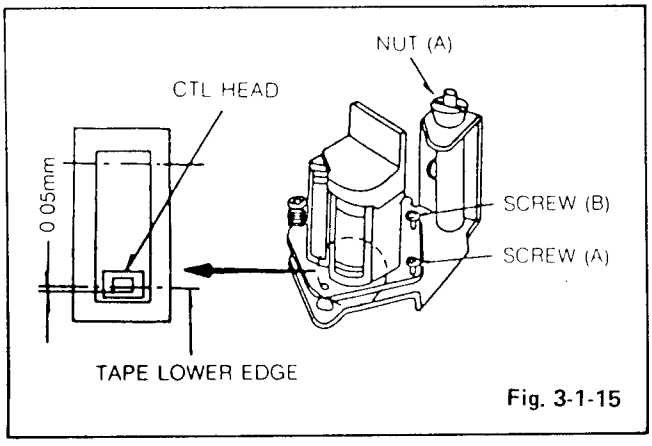


Fig. 3-1-15

e) If the tape is curled between P3 and Erase-head, which are separated from the E-head and the inertia roller, loosen the screw (C) a little (as shown in Fig. 3-1-16), insert the eccentric driver into the hole, turn right and left, and adjust the right and left slant post so that tape will not be distorted or wrinked.

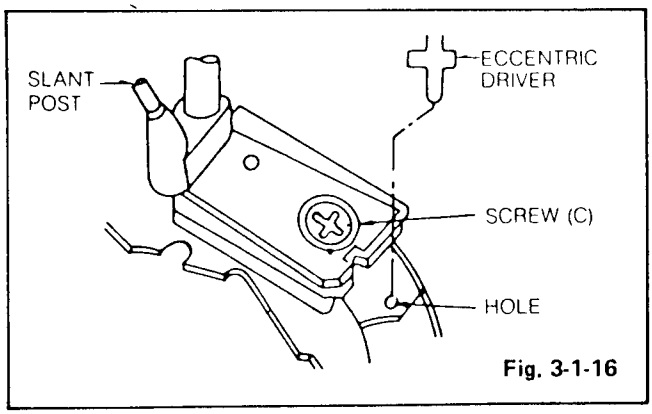


Fig. 3-1-16

f) Eject the tape by pushing the eject button, and after making the tape run, repeat the adjustment of the above steps a)-b). Especially observe in detail, the tape between P2, A, B and C, D P3 as shown in Fig. 3-1-11.

****CAUTION****

- The tape is not to be distorted or wrinkled at A.D. and B.C. which are the points leaving the drum(as shown in Fig. 3-1-11).
- Notice the tension at the upper & lower edge of P2 and A, P3 & D(as shown in Fig. 3-1-11).

****REFERENCE****

I. The condition of the observation of the running state of guides P1-P4.
   (1) Run the rewinded tape.
   (2) Isolated tension post from the tape and free it from back tension.

II. When the tilt screw (B) is turned clockwise, the screw (A) is to be turned counterclockwise, since they counteract each other at the RPE head.

III. Height adjustment of P2 and P3 is to be performed as if the tape were set softly on the drum lead line.

IV. The guide part is to be adjusted above the lower tape edge for P1, P4 and the upper tape edge for P2, P3.

V. The changed or damaged parts of the tape during the first running adjustments are not to be used.

VI. The diameter of the reel hub of the tape during the first running adjustment is to be no less than 62mm.

3-1-7 Back Tension Measurement And Adjustment

A. Preparation
   a) VHS cassette tape E-120 or substitute
   b) Back tension meter
   c) Gear Driver
   d) Driver, (+) type ø3
   e) Adhesive tape or substitute

B. Specification
   Back tension : 27.5±2.5g

C. Measurement & Adjustment
   a) Insert a VHS cassette tape (E-120) and pull the erase head back so that it does not interfere with the back tension meter. You may use adhesive tape to hold the erase head away from the tape.
   b) Push the play button, Causing the tape to run and wait for the tape speed to Stabilize(approx. 10-20 Seconds).
   c) Measure the tension of the back tension probe on the condition that is touched by the tape as shown in Fig. 3-1-17.

****CAUTION****

- The probe of the back tension meter is to be completely in contact with the tape and the two fixed probes are to be turned to the drum.
- Considering the sensitivity of the back tension meter select the average value of the adjusted measurement at least three times.
- Measurement if performed at the starting point of the E-120 tape. The length of the wound diameter at the side of the supply reel is to be about 85mm.

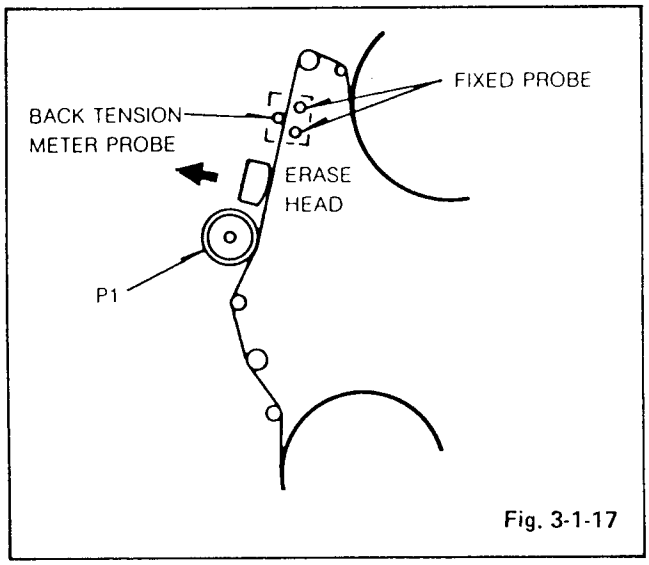


Fig. 3-1-17

d) When the reading is out of spec, loosen the screw (A) a little, and turn the hook up and down (in Fig. 3-1-18) in the direction which requires tension, when the reading is large turn it down, when small up.

e) Repeat the measurement and adjustment in the above manner with the screw tightened as shown in Fig. 3-1-20.

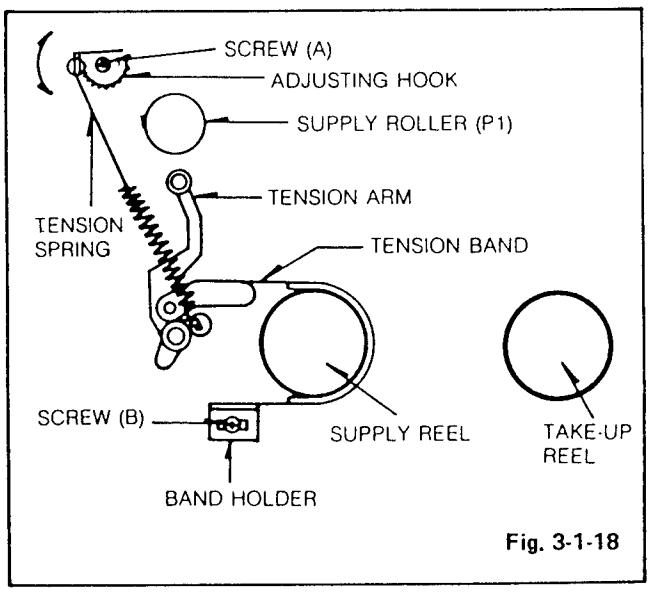


Fig. 3-1-18

f) After measuring and adjusting, remove the adhesive tape holding the erase head and completely rewind the tape by pushing the REW button.

3-1-8 The Second Adjustment of the Transport System

A. Preparations

a) Alignment tape
b) Horizontal position adjusting driver
c) Post height adjusting driver
d) Driver + Type ø5, ø3

B. Specifications

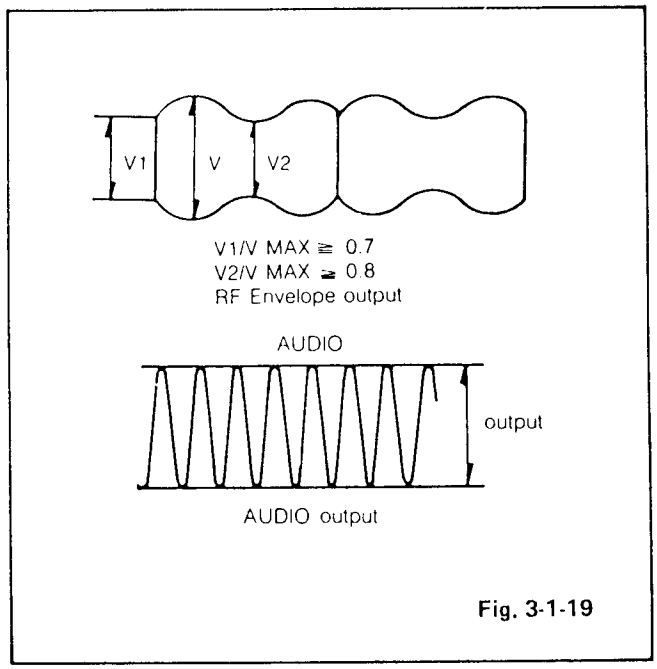


Fig. 3-1-19

C. Adjustment

a) Connect probe of an oscilloscope to the audio output testpoint, RF output testpoint, and head switching output testpoint.

****CAUTION****

- First, connect the GND of the probe to the PCB or to the GND of set.

b) Insert the alignment tape and playback. Adjust the tilt adjustment screw and the azimuth adjustment screw so that the audio output is at max.(Fig. 3-1-13).

c) Adjust the nut (A) by horizontal position adjusting driver so that the audio output is max.

****CAUTION****

- The nut (A) is not turned left, right over one quarter.
- To adjust the RPE head, refer to the first adjustment of the transport system.

d) Adjust P2 and P3 using post height adjusting driver so that the RF envelope output is at maximum.
Adjust P2 if the RF output is small at start point. (Fig. 3-1-20)
Adjust P3 if the RF output is small at end point. (Fig. 3-1-21)

e) Adjust the adjustor in Fig. 3-1-22 with horizontal position adjusting driver. So that the RF envelope output may be at the maximum. At this time rotate the horizontal position adjusting driver counterclockwise or clockwise and adjust the maximum of the RF output to the mid-point between the point with RF output begins to decrease and the point which the opposite output begins to decrease.

****CAUTION****

- Repeat the adjustment of P2 and P3, since the horizontal position of the RPE head is connected close to the RF output.
- Check that the tracking volume is at the center point.

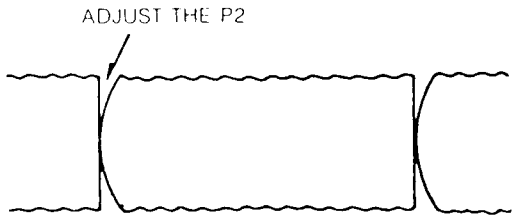


Fig. 3-1-20

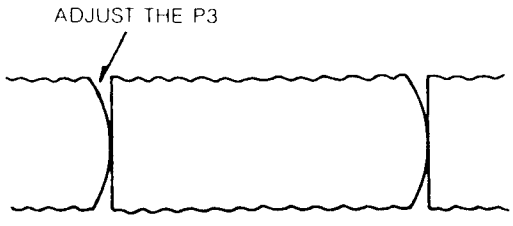


Fig. 3-1-21

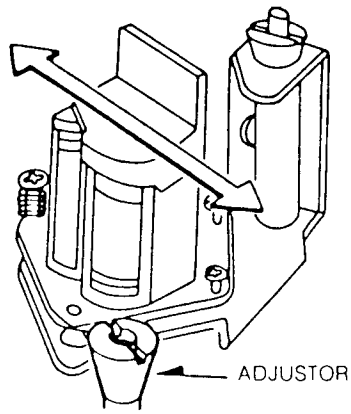


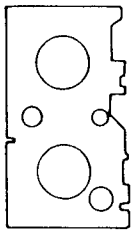
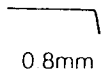
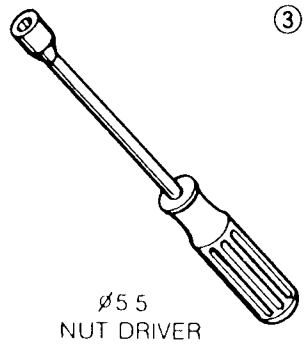
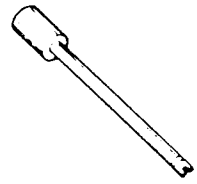
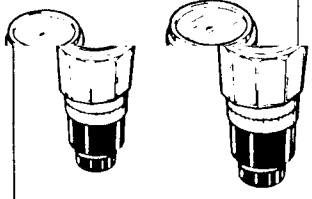
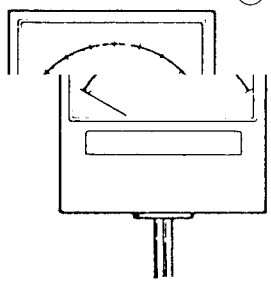
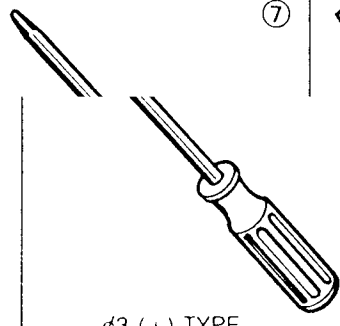
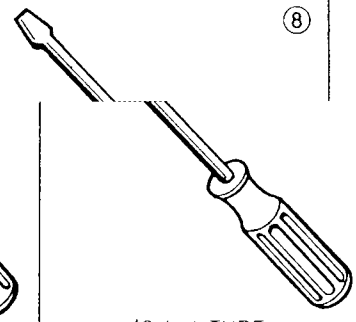
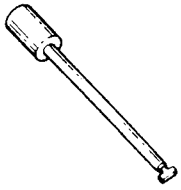
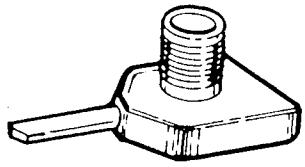
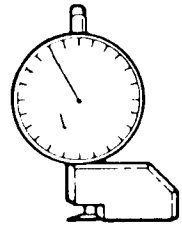
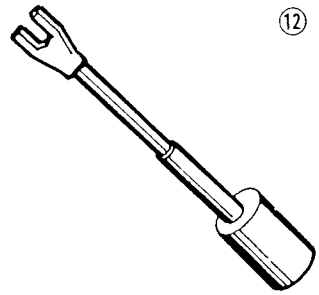
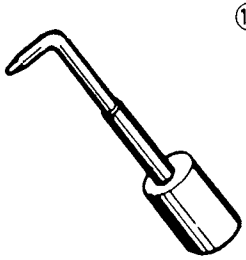
Fig. 3-1-22

f) Observe the waveform which RF output charges by rotating the tracking volume left and right.

g) After ejection the standard tape, insert the tape again and make it run. Confirm and readjust in the procedure of a)-f).

h) After confirming, make sure to secure the set screw at P2 & P3.

3-1-9 Servicing Jigs and Tools

J1007 ①  REEL TABLE HEIGHT ADJUSJTING REFERENCE	T001 ②  HEX WRENCH	③  ø5 5 NUT DRIVER	T005 ④  POST HEIGHT ADJUSTING DRIVER
⑤ T007 T008  300g.Cm 600g.Cm TORQUE METER	⑥  BACK TENSION METER	⑦  ø3 (+) TYPE	⑧  ø3 (−) TYPE
T003 ⑨  ECCENTRIC DRIVER	J40051B ⑩  POST HEIGHT ADJUSJTING	RJ2003 ⑪  REEL TABLE HEIGHT ADJUSTING	⑫  HORIZONTAL POSITION ADJUSTING DRIVER
⑬  BENDED DRIVER (+) TYPE			

3-2 CIRCUIT ADJUSTMENT

3-2-1 Servo Circuit Adjustment

1) Adjustment parts and test point arrangement view

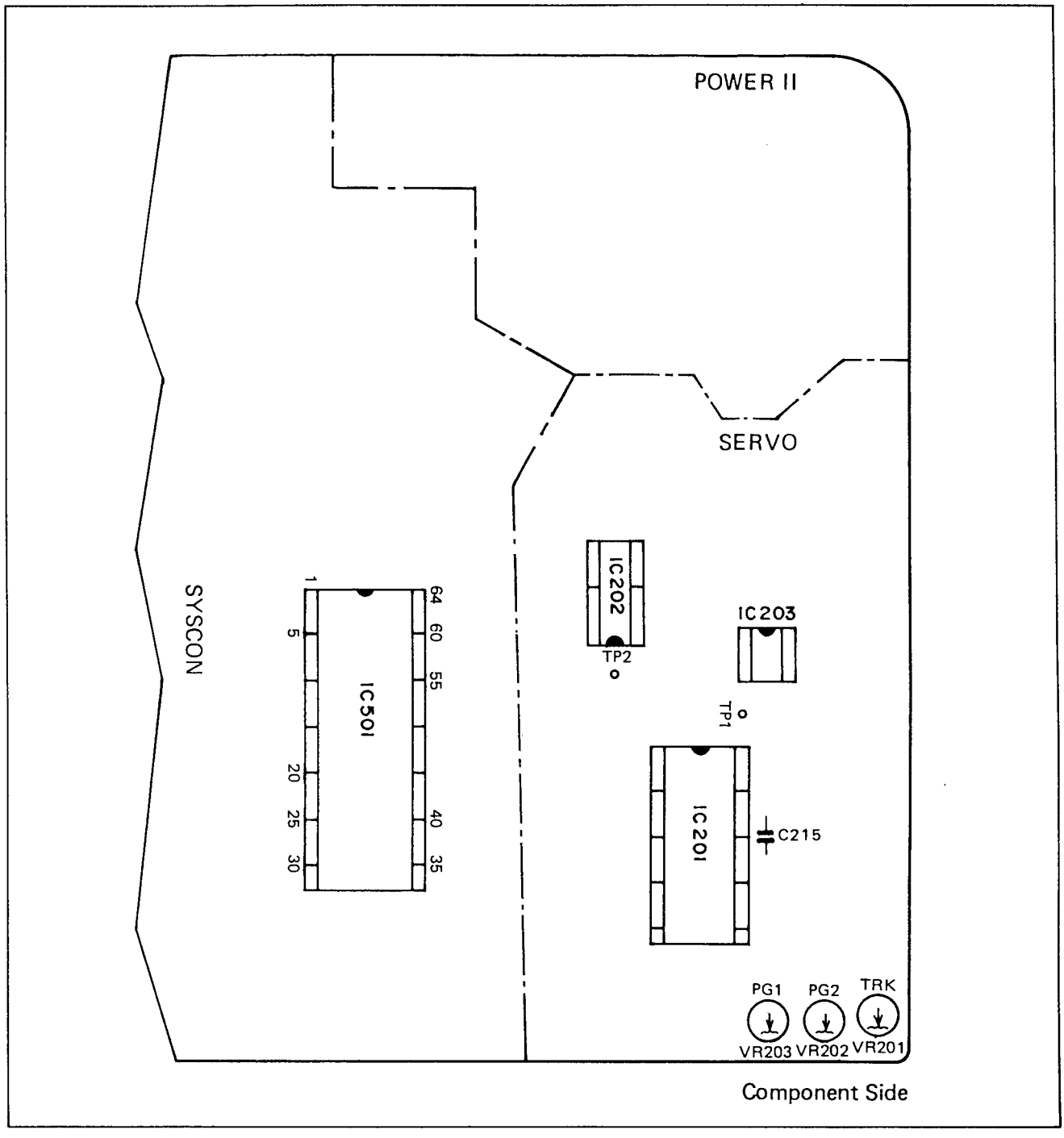


Fig. 3-2-1 Adjustment and test point arrangement view

2) Tracking Preset Adjustment

	MODE	Specification	Test Point	Adjustment point
Method (1)	SP PLAY	2.8±0.2ms	TP1, TP2	VR 201
Method (2)	SP PLAY	22.3±0.2ms	C 215	VR 201

A. This adjustment is to set the phase of recorded track on the magnetic tape and Video Heads accurately. Coincidentally, this is to satisfy VHS Specification.

B. Adjustment Procedures

a) Insert the PAL SP Standard tape and playback.

b) Set the outside tracking knob to the center of it.

[Method(1)]

c) Connect the oscilloscope probe as the Fig.3-2-3.

d) While observing the waveform of the oscilloscope, adjust VR201, so that time difference from H.SW signal to the half rising edge of CTL signal may be 2.8ms as shown in 3-2-2(a).

[Method (2)]

c) Connect the oscilloscope probe as the Fig.3-2-3.

d) While observing the TRK M.M waveform of oscilloscope, adjust VR201 so that the period of TRK M.M is 22.3ms as shown in 3-2-2(b).

C. Reference & Caution

a) Before adjusting, confirm that the outside tracking knob is set to the center of it.

b) When CTL signal moves right and left, read the Center point of the moving.

c) Confirm that the CTL signal is triggered by the high level of H.SW signal.

(If you want to check the CTL pulses are triggered, confirm the CTL pulse doesn't move to the one direction slow or fast.)

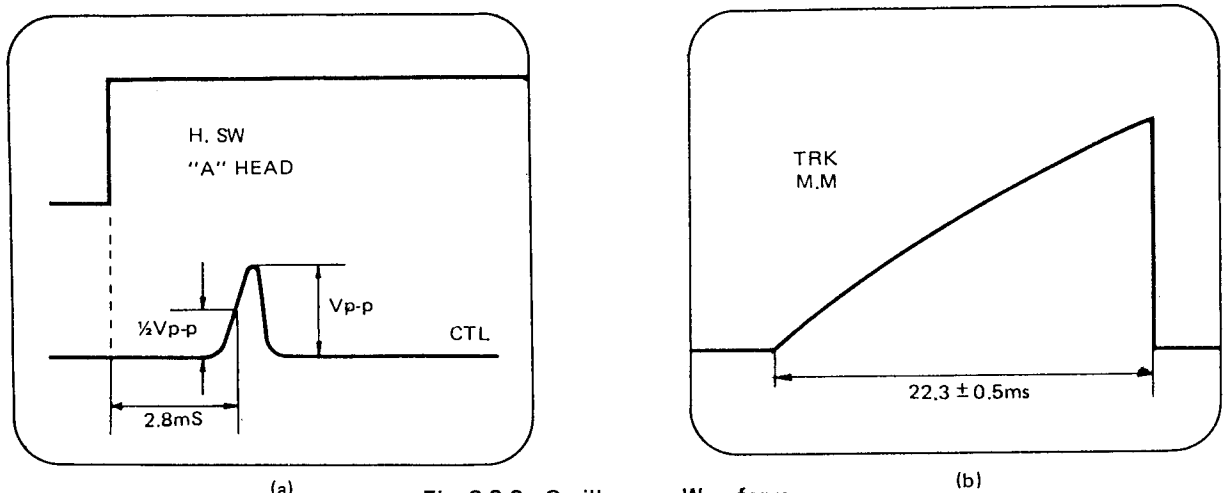


Fig. 3-2-2. Oscilloscope Waveform

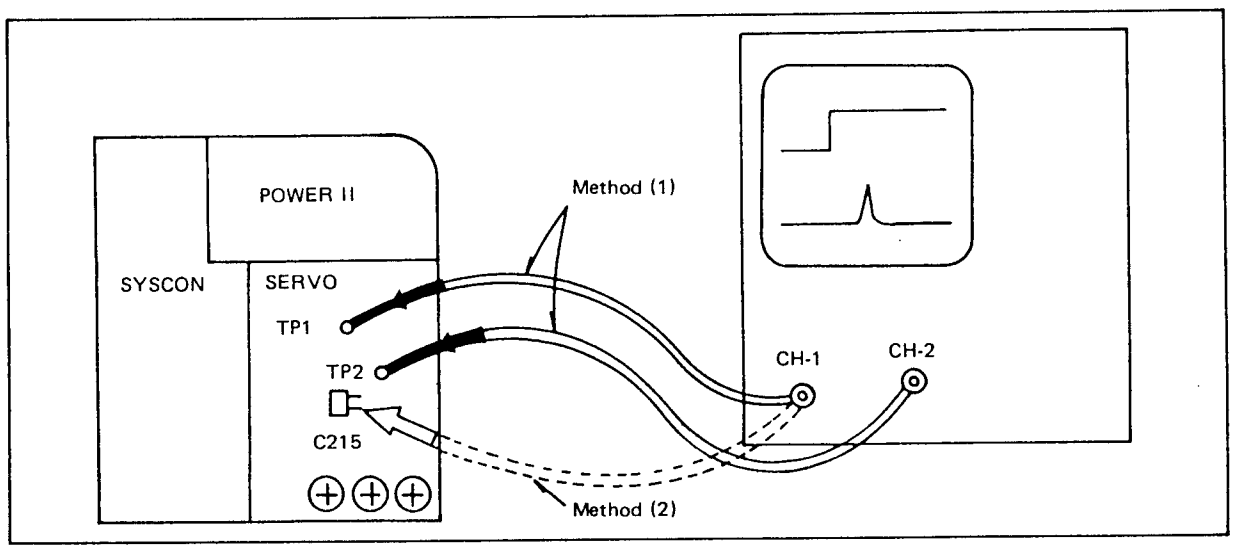


Fig. 3-2-3. Connection View

3) PG Adjustment

MODE	Specification	Test Point	Adjustment point
SP PLAY	6.5H±0.5H (416μsec±32μsec) 1H=64μsec	TP1 W301 (VIDEO OUT JACK)	VR202 (A HEAD) VR203 (B HEAD)

A. This adjustment is to keep the condition that the phase of video A/B Heads is divided into 180° and to satisfy the changiability with other VCR set with the same specification.

B. Adjustment procedure
   a) Insert the PAL SP standard tape, and playback.
   b) Connect the probe of oscilloscope as the Fig.3-2-4 and trigger to CH-1(H.SW).
   c) While observing the waveform of scope adjust VR202(VR203) so that the time difference from H.SW to V-Sync of video signal may be 6.5H under the condition of being the largest RF output level.
   d) VR202(VR203) adjustment should be done under the condition that V-Sync signal is triggered by the rising(falling) edge of H.SW signal.

C. Reference and Caution
   a) The adjustment difference between CH-1 and CH-2 should be less than 20μsec.
   b) If you want to check the V-Sync of video signal is triggered by H.SW signal, confirm the V-Sync pulses do not move to the one direction slow or fast.

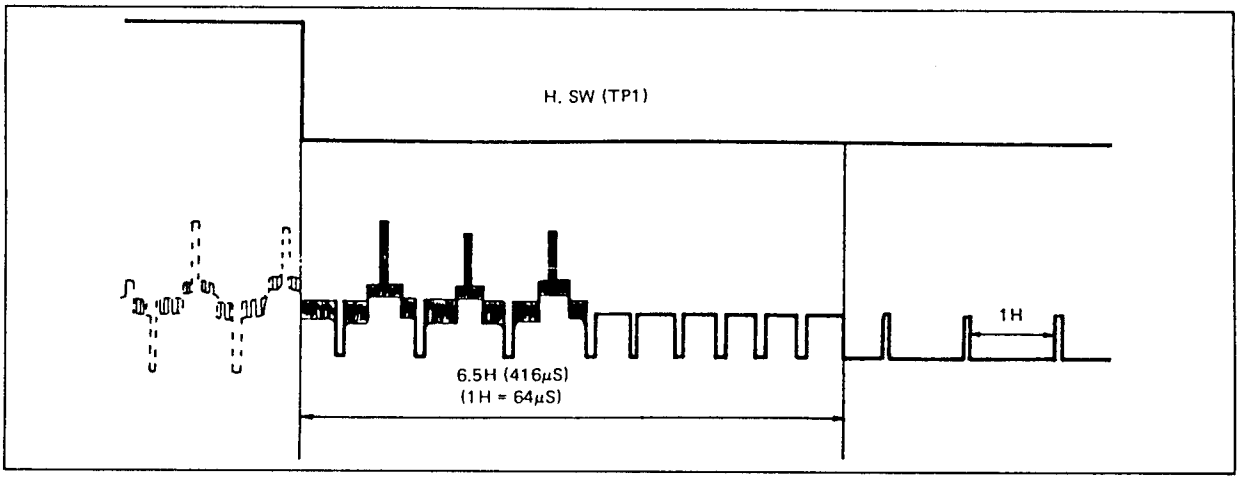


Fig. 3-2-4

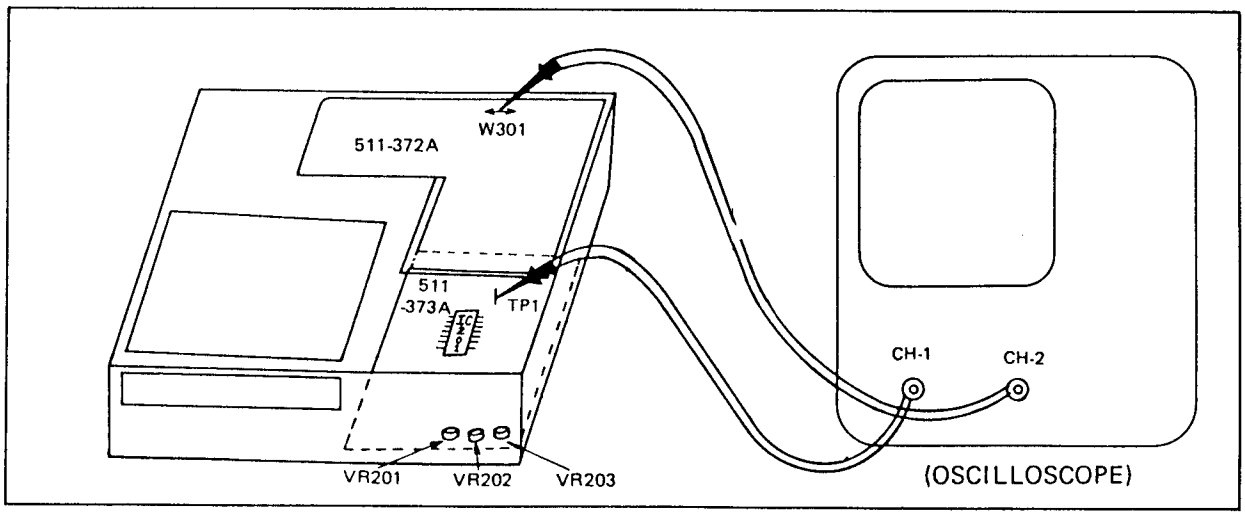


Fig. 3-2-5

3-2-2 Y/C Circuit Adjustment

1) Adjustment part and adjustment General Method.

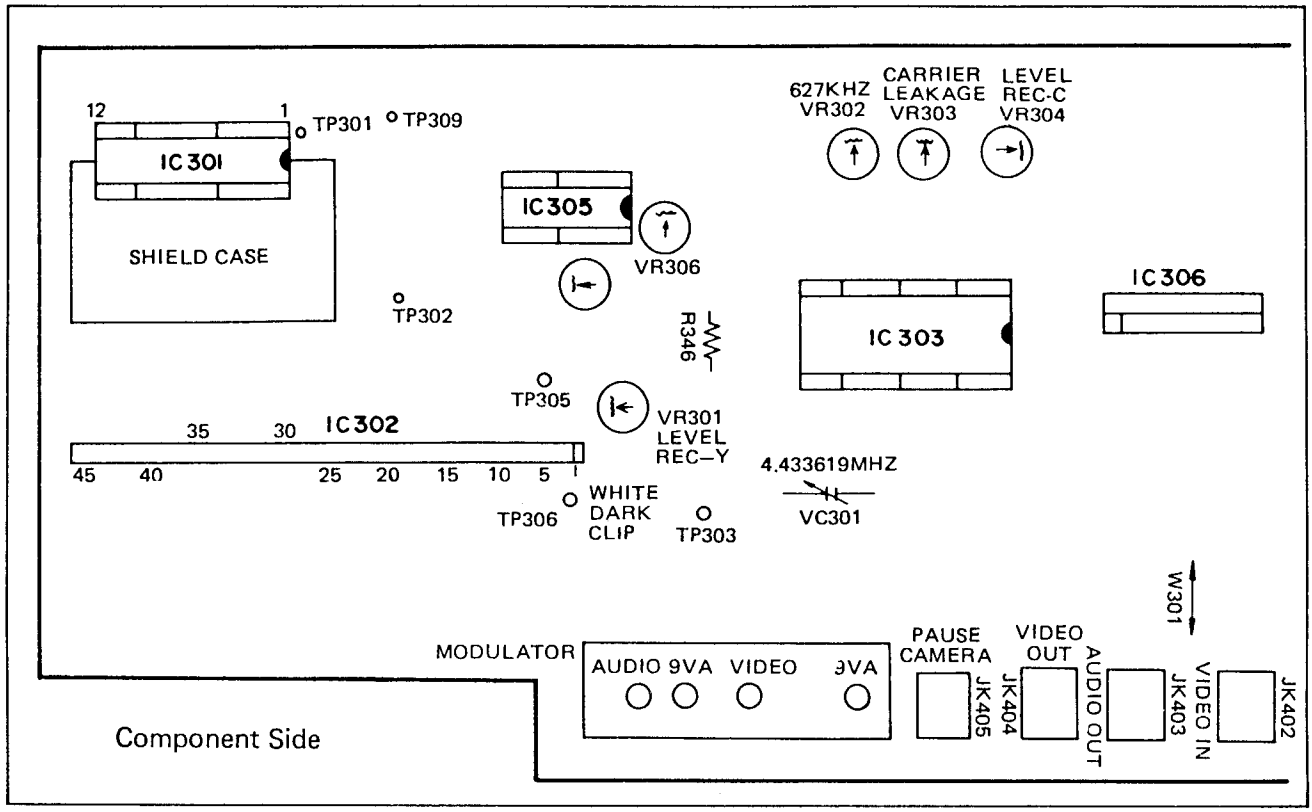


Fig. 3-2-6. Adjustment and Test Point Arrangement View

A. General Adjustment Procedures

a) Connect the power source of AC 220V±5% 50Hz.
b) Connect the Input signal to the Video in terminal.
c) After setting the Main Power to ON, set the Operate Switch to ON.

Input Signal

Video level 1 Vp-p±0.1V
4.43 MHz PAL Color signal
4.43 MHz PAL Color Burst signal
100% white signal
Satisfy sync. level signal spec.
Y : S/N ratio must be more than 60 dB.
C : S/N ratio must be more than 50 dB.

2) 40fH Adjustment

MODE	Specification	Test Point	Adjustment point
STOP	627kHz±3kHz	IC303 ⑯ pin	VR 302
*Reference : Connect TP304 and TP309 in shorting.			

3) FSCI Adjustment

MODE	Specification	Test Point	Adjustment point
PLAY	4.433619MHz±50Hz	TP303	VC301

4) Chroma Leakage

MODE	Specification	Test Point	Adjustment point
PLAYBACK	Refer to Fig.3-2-7	Video Out Jack	VR303

Reference : This is the adjustment for setting to make the colour noise minimize.

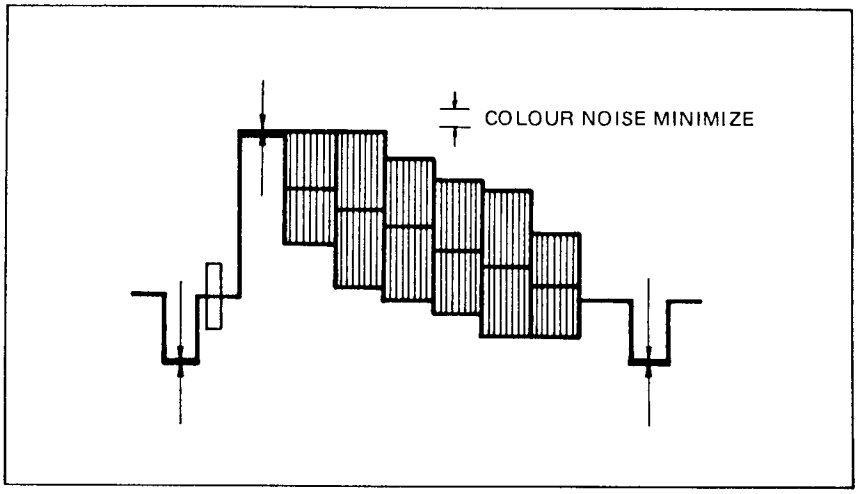


Fig. 3-2-7

5) Noise Canceller Adjustment

MODE	Specification	Test Point	Adjustment point
PLAY	Refer to Fig.3-2-8	TP305	VR305, VR306

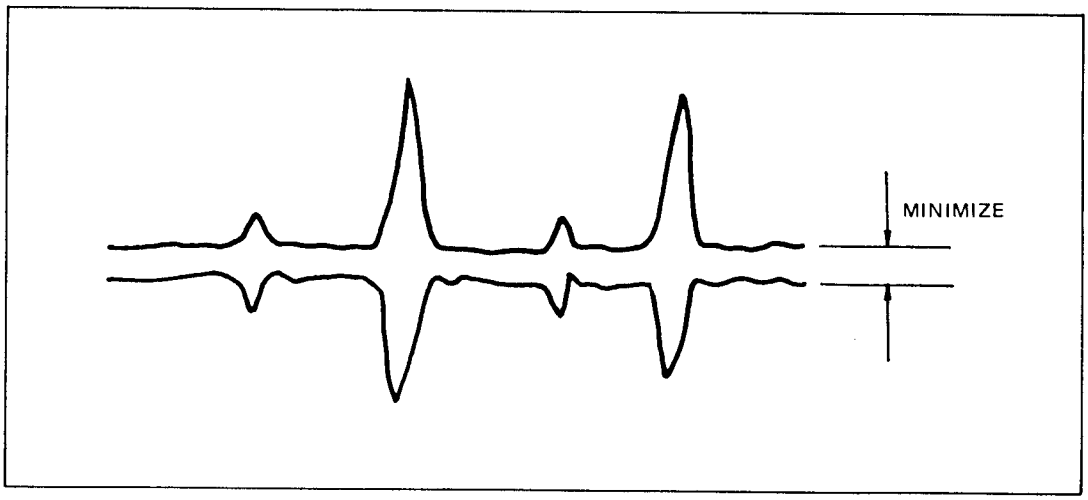


Fig. 3-2-8

6) Recording Colour Level Adjustment

MODE	Specification	Test Point	Adjust point
RECORD	30±5mV	TP 302	VR 304

Reference : a) Minimize the luminance FM output.
b) Connect the Ground probe of the oscilloscope to TP 302 and the probe tip of the oscilloscope to TP 302.
c) Connect the TP 309 and TP 301 in shorting.

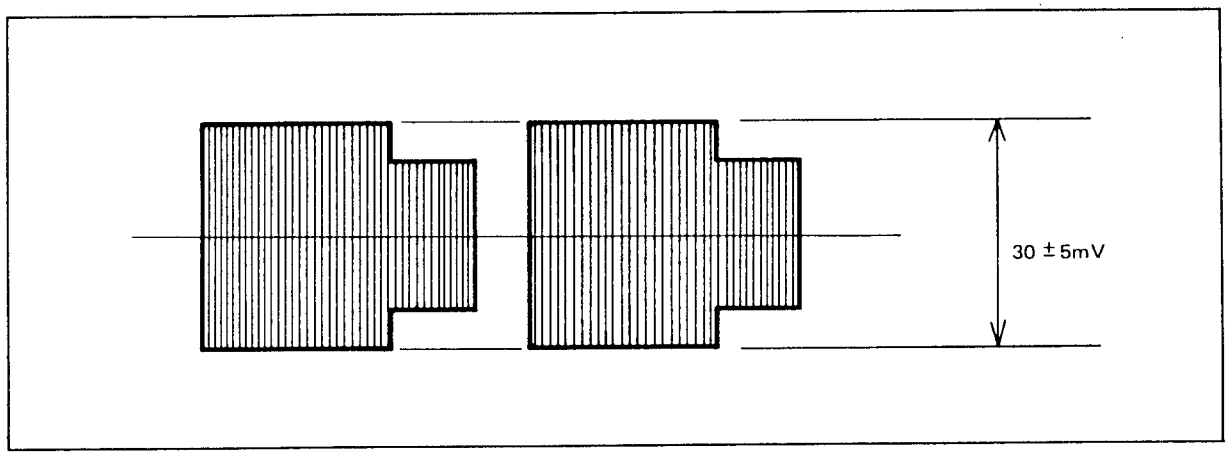


Fig. 3-2-9

7) Recording Luminance Level Adjustment

MODE	Specification	Test Point	Adjustment point
RECORD	100±5mV	TP 302	VR 301

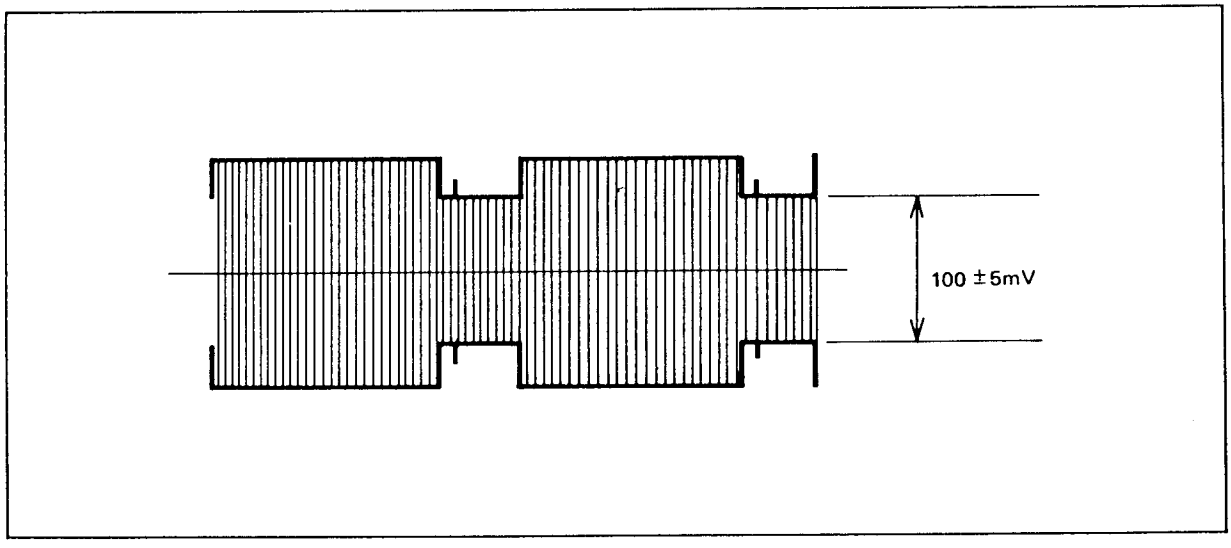


Fig. 3-2-10

3-2-3 Audio Circuit Adjustment

1) Adjustment part and Test point Arrangement view

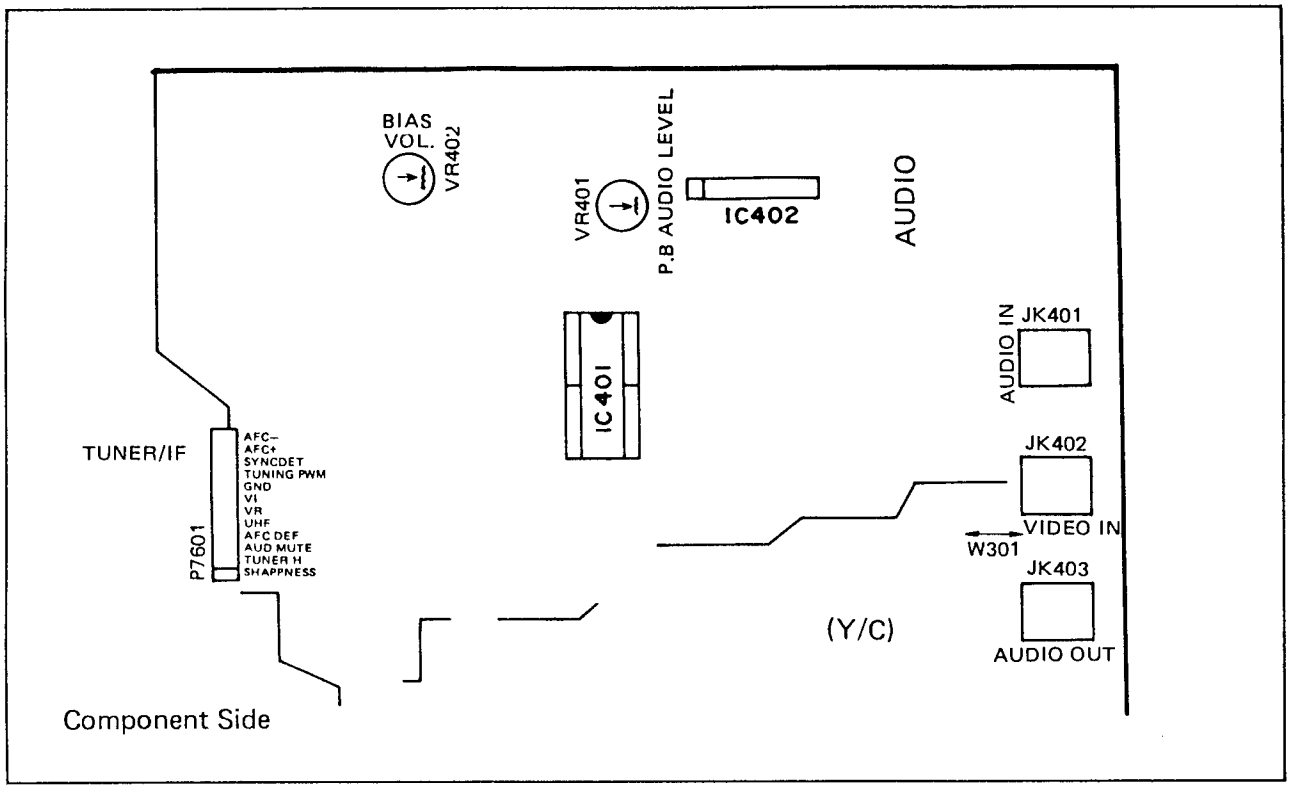


Fig. 3-2-11 Adjustment Part Arrangement View

2) Adjustment of Playback System Level

MODE	Specification	Test Point	Adjustment point
PLAY	-4±1.5dBm	Audio out jack	VR401

A. Adjustment Procedures.
   a) Play the standard Tape SP 1 KHz.
   b) Confirm that Level Meter output Level is -4±1.5 dBm.
   c) By adjusting VR 401, adjust the output Level to fit -4±1.5 dBm.

3) Record Oscillation Frequency Adjustment

MODE	Specification	Test Point	Adjustment point
RECORD	70kHz±2kHz	TP401	T401

A. Adjustment Procedures
   a) By Connecting Frequency Counter to TP401 confirm the frequency is 70kHz.
   b) If the oscillation frequency isn't fit to specification adjust to fit specification by adjusting T401.

4) Adjustment of Record Oscillation Voltage

MODE	Specification	Test Point	Adjustment point
RECORD	2.4mV	R/P Head LUG pin	VR402

A. Adjustment Procedures

a) Confirm that the oscillation voltage is 2.4mV(RMS) by fitting the LEVEL METER terminal to LUG PIN inside R/P HEAD PWB in recording.

b) If it isn't fit to the spec, turn VR402 and adjust.

3-2-4 Tuner/IF Circuit Adjustment

1) Adjustment parts and Test parts arrangement view

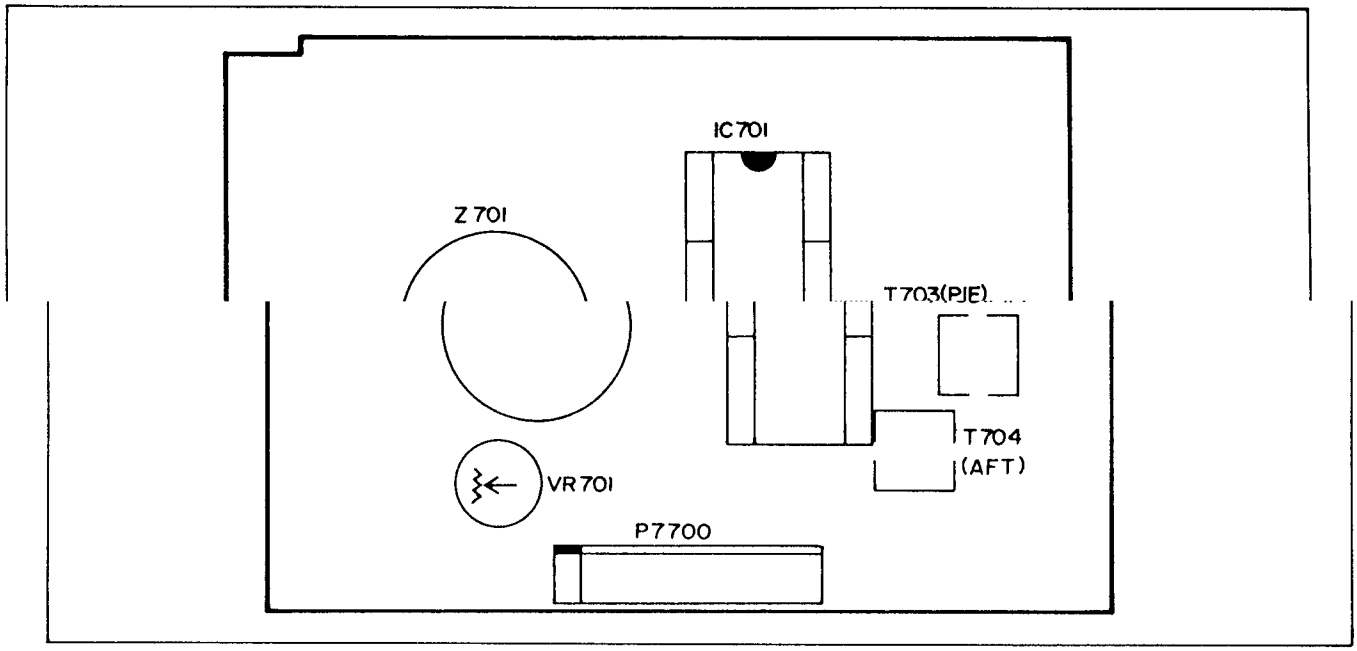


Fig. 3-2-12 IF Pack PCB Adjustment Point

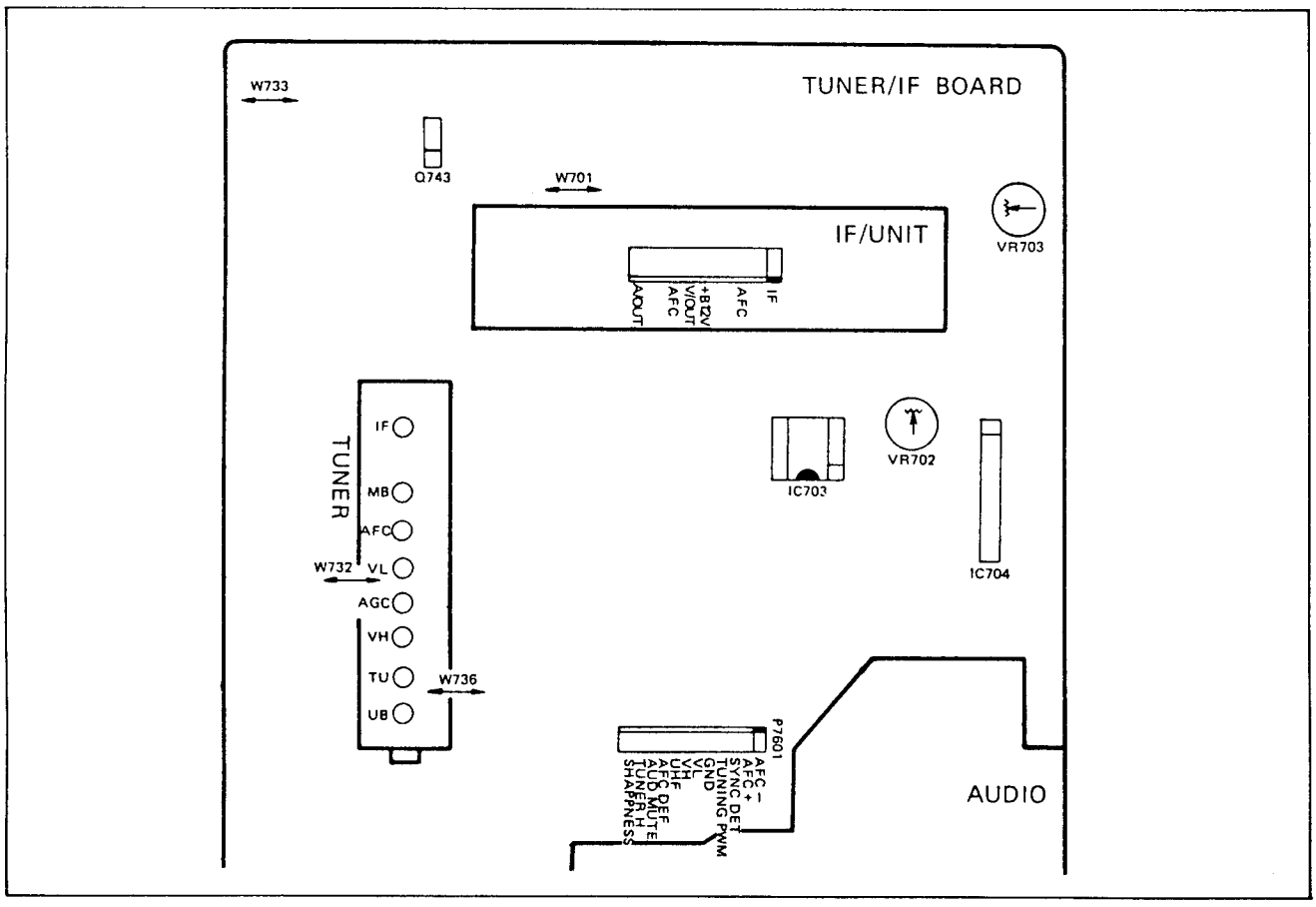


Fig. 3-2-13 Tuner/IF PCB Test and Adjustment Point

***Caution in testing**

Ⅰ. When practicing this adjustment, adjust after more than 10 minutes with T.V set turning on.
Also, adjust after keeping enough applied measuring apparatus ON.

Ⅱ. Apply after confirming the output GAIN of the measuring apparatus for testing and the condition of single adjustment.

Ⅲ. In this adjustment, adjust by the criteria of IF and adjustment order without adjusting the Tuner.

Ⅳ. In this adjustment, adjust the SWEEP OSC MARKER Frequency by the criteria of Table.3-2-1.

(MHz)

ADDRESS / TABLE	1	2	3	4	5	6
FREQUENCY	31.5	33.5	35.07	36.5	39.5	41.5
MARKER NAME	A·P	SIF	CIF	CENTER	PIF	A·S

Table 3-2-1 Frequency Table

*Internal Circuit diagram of De-modulator(For reference)

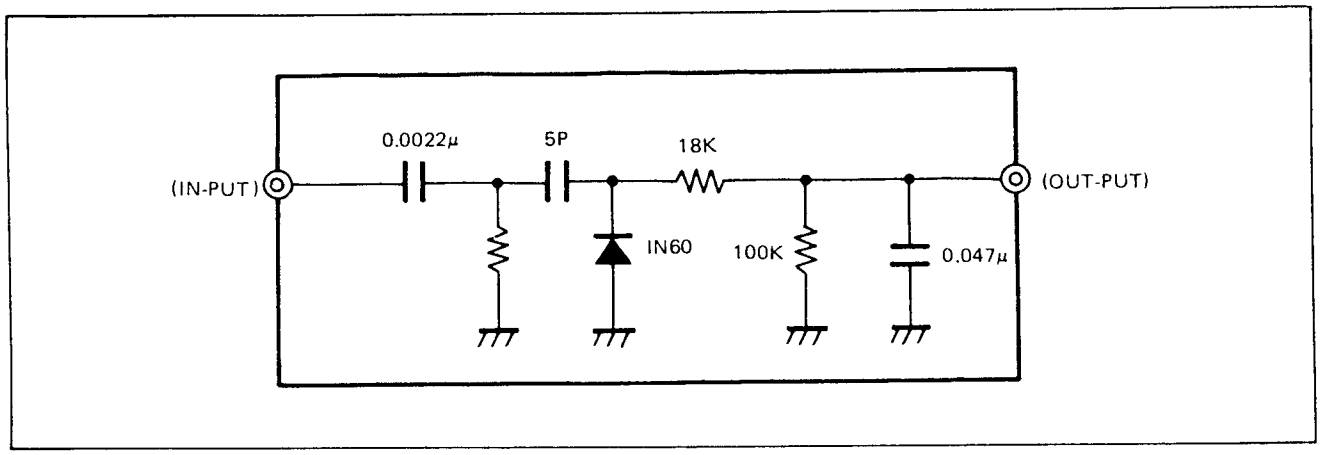


Fig. 3-2-14

*Impedance matching cable for the IF Adjustments.

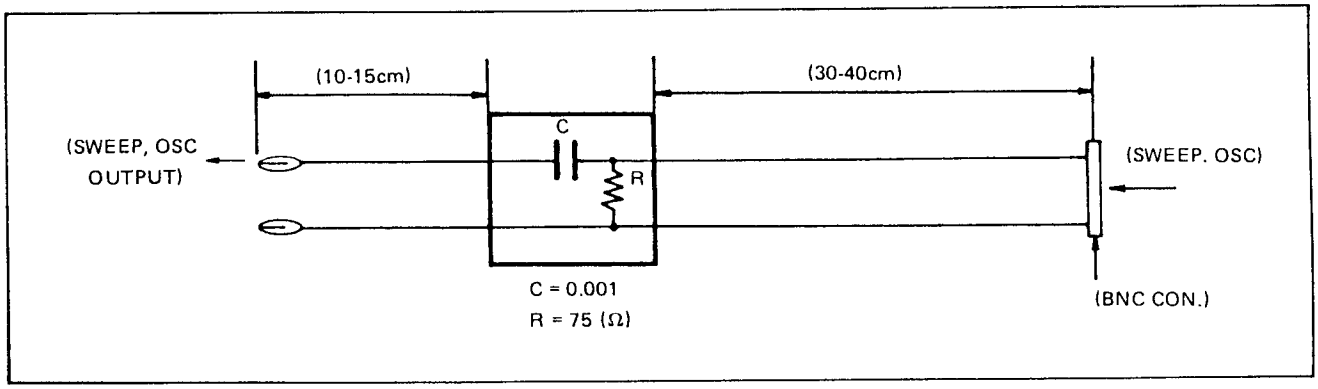


Fig. 3-2-15

Note : 1) Be a ware of impedance at every adjustment process, use cables with good V.S.W.R 93db)
2) Cables should be connected as short as possible.

2) SYNC, DET OSC adjustment

MODE	Specification	Test Point	Adjustment point
EE Mode (with no signal)	64±0.5μs	W706	VR702

A. Adjustment procedure

a) Connect oscilloscope probe to W706. (Time range 10μs)

b) Adjust VR702 so that the waveform period is to meet the specification.

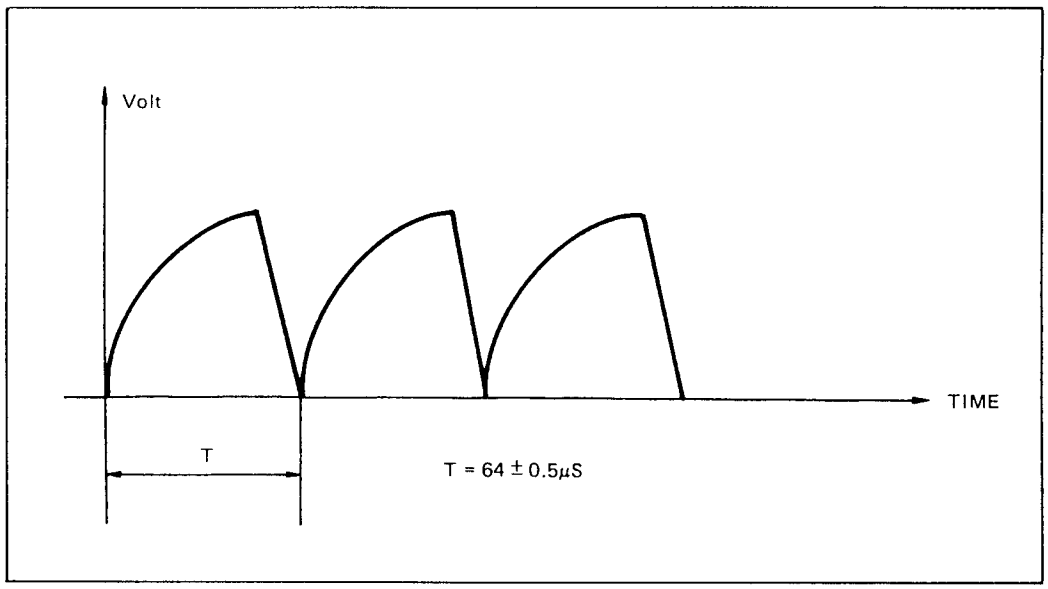


Fig. 3-2-16

3) AGC adjustment

MODE	Specification	Test Point	Adjustment point
EE Mode CH45~50(60dBu)	4.8±0.1V	W732	VR701

A. Adjustment procedure

a) Tune the tuner to CH45~50 (Electric Field Strength 60 dBu)

b) Measure DC Voltage at W732 with Digital Voltmeter.

4) VIF adjustment

MODE	Specification	Test Point	Adjustment point
EE Mode (with no signal)	Refer to Fig.3-2-17	Q743 Emitter	T703

A. Adjustment Procedure

a) Attenuate sweep oscillator gain by 25 dB ± 3.

b) Apply 4.0 ± 0.1(V) (AGC voltage) to TP701.

c) Adjust T703 so that the waveform is the same as Fig.3-2-17

Note : If this adjustment cannot be achieved recomfirm the TRAP adjustment.

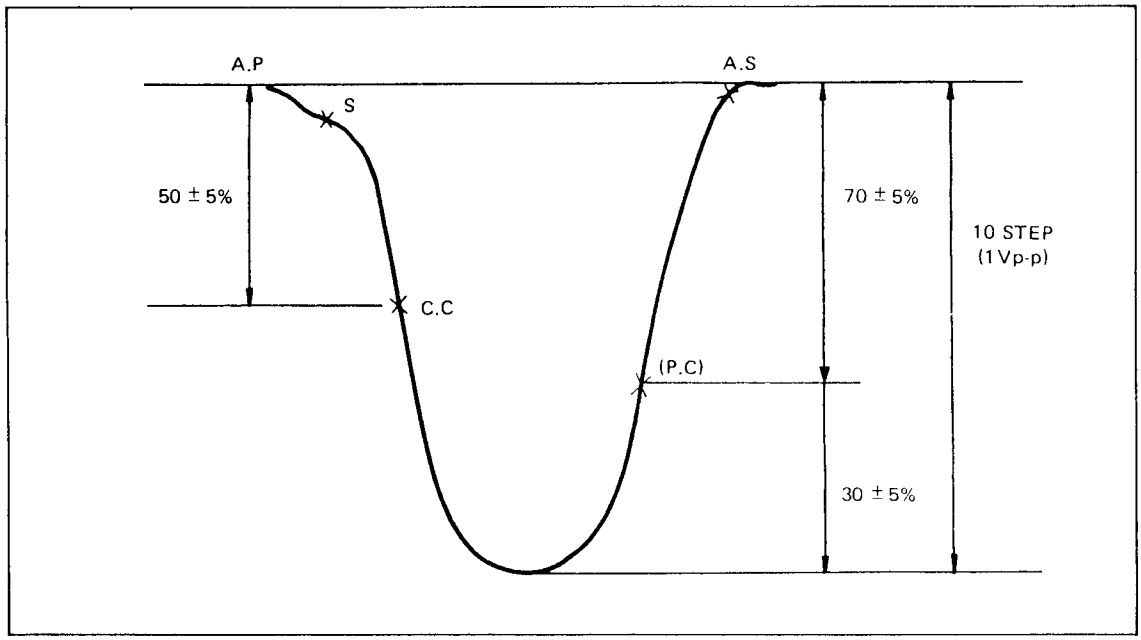


Fig. 3-2-17

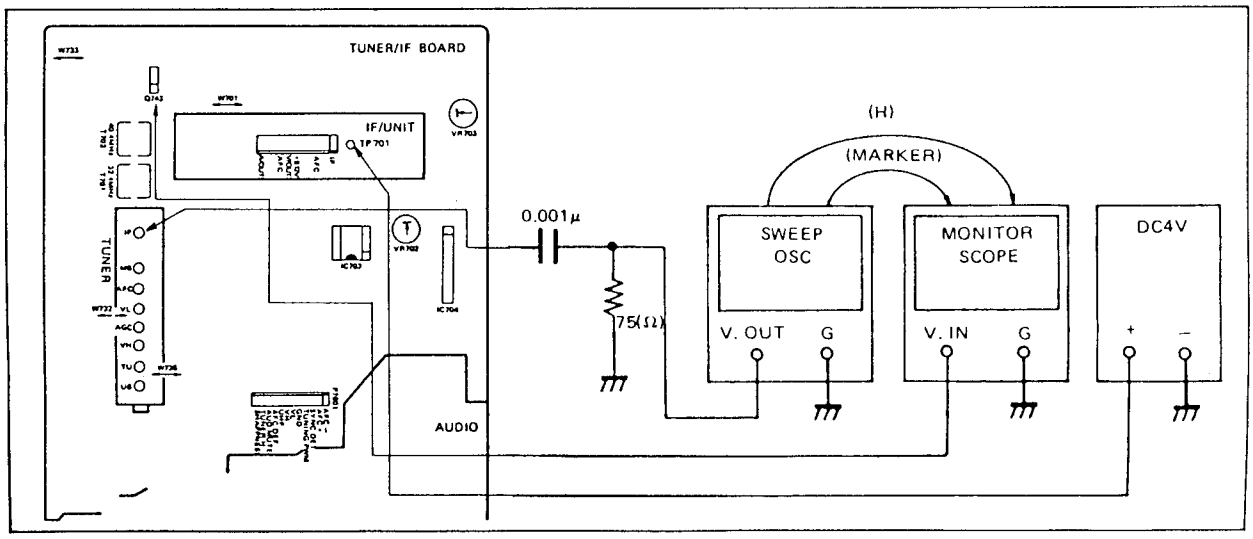


Fig. 3-2-18 Connection Diagram

5) AFC adjustment

MODE	Specification	Test Point	Adjustment point
EE Mode (with no signal)	Refer to Fig.3-2-19	IF pack 8 pin	T704

A. Connection method
   a) Delete AGC DC Voltage.
   b) Connect monitor scope to pin 8 of IF pack.

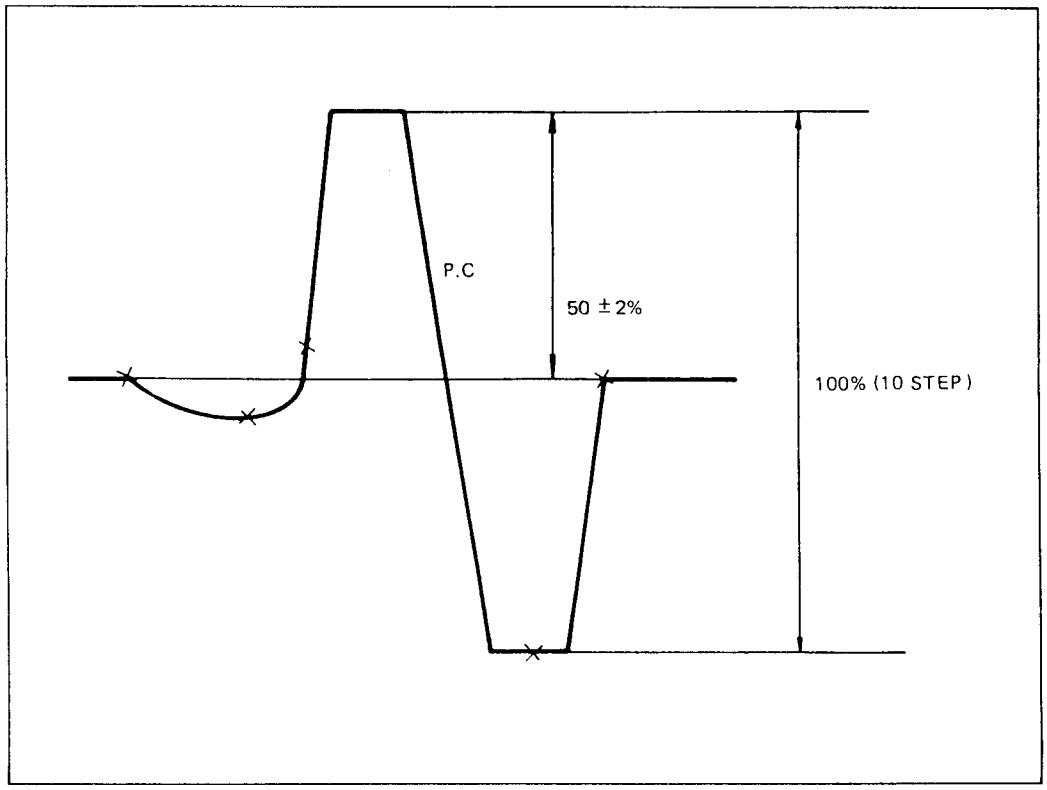


Fig. 3-2-19

6) Audio level adjustment

MODE	Specification	Test Point	Adjustment point
CH.9 Reception (1kHz 50k Division)	-4±0.5dBm	Line out or Scart pin	VR703