JVC

SERVICE MANUAL

STEREO CASSETTE DECK

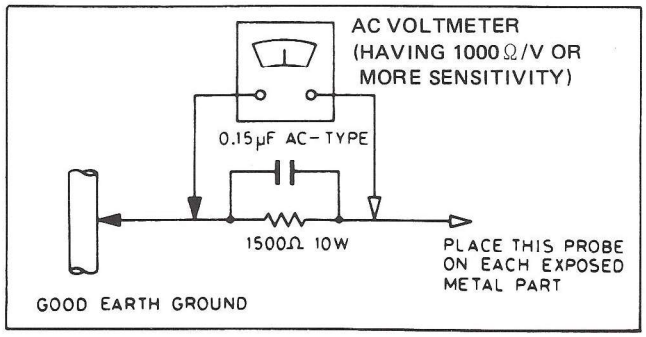
MODEL KD-V6 A/B/C/E/J/U

Contents

No. 4230
January 1984

Safety precaution

1. The design of this product contains special hardware. Many circuits and components specially for safety purposes.
   For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by then necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. Electrical components having such features are identified by (⚠) on the schematics and parts list in Service manual. The use of a substitutue replacement which does not have the same safety characterisitics as the recommended replacement part shown in the parts list in Service manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings barriers and/or the like to be separated from live parts, high temperature part, moving parts and/or sharp edges for the prevention of electric shock and fire hazard.
   When service is required, the original lead routing and dress should be observed, and they should be confirmed to be returned to normal, after re-assembling.
5. Leakage current check
   (Safety for electrical shock hazard)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the Products (antenna terminals, knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc,). Any leakage current must not exceed 0.5 mA AC (r.m.s.).
   - Alternate check method.
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or mroe sesitivity in the following manner. Connect a 1500 Ω 10 W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.).
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured musy not exceed 0.75 V AC (r.m.s.).
     This corresponds to 0.5 mA AC (r.m.s.).



Features

1. Three-head system enables monitoring of the signals immediately after they have been recorded
   - Independent recording, playback and erase heads
   - SA (Sen-Alloy) recording head
   - Solid head housing casting
2. **2-color fluorescent meters with digital peak function**
   - Memory and peak hold facility
3. **2-way digital counter**
   - 4-digit tape counter with 2 memory points
   - Stopwatch function indicates recording/playback lap time
4. **Dolby* B & C noise reduction systems**
   - Dolby C NR system and Dolby B NR system for recording and playback
   - Multiplex filter switch
5. **Microcomputer-controlled mechanism**
   - Auto record muting
   - Index scan
   - Auto repeat
   - Mechanism mode indicators
6. **2-motor full-logic mechanism**
   - Motor exclusively for mechanical drive
   - Silent operation
7. **DC configured recording/playback amplifiers**
   - Play head and playback amplifier are direct coupled
8. **Music Scan mechanism with separate buttons**
   - Single Music Scan in both directions

   "Under license of Staar S.A., Brussels, Belgium."
9. **Timer start with safety lock**
10. **Auto tape select mechanism**
11. **Remote control jack on front panel**

*Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
* "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Specifications

Type	: Stereo cassette deck
Track system	: 4-track, 2-channel
Tape speed	: 1-7/8 inch/sec (4.8 cm/sec)
Frequency response	: (-20 dB recording) Metal tape: 20 – 19,000 (±3 dB) 15 – 21,000 Hz CrO_2 tape: 20 – 19,000 Hz (±3 dB) 15 – 21,000 Hz Normal tape: 20 – 18,000 Hz (±3 dB) 15 – 20,000 Hz (0 dB recording) Metal tape: 20 – 14,000 Hz (±3 dB) CrO_2 tape: 20 – 9,000 Hz (±3 dB) Normal tape: 20 – 9,000 Hz (±3 dB)
S/N ratio	: 58 dB (S = 1 kHz, K3 = 3 %, N = A-weighted, Metal tape) The S/N is improved by about 15 dB at 500 Hz and by max. 20 dB at 1 kHz ~ 10 kHz with DOLBY C NR on and improved by 5 dB at 1 kHz and by 10 dB at above 5 kHz with ANRS/DOLBY B NR on.
Improvement of MOL	: 4 dB at 10 kHz with DOLBY C NR on.
Wow and flutter (Forward direction)	: 0.05 % (WRMS) 0.16 % (DIN 45 500) (with MAXELL UD tape)
Crosstalk	: 65 dB (1 kHz)
Harmonic distortion	: K3; 0.5 % THD; 1.0 % (Metal tape, 1 kHz 0 VU)
Channel separation	: 40 dB (1 kHz)
Heads	: SA head for record 2-Gap ferrite head for erasing METAPERM head for playback
Motor	: Electric governed DC Motor for capstan and reel x 1 DC Motor (for FF & Rewind) x 1 DC Motor (for Mechanical drive) x 1
Fast forward time	: Approx. 100 sec. with C-60 cassette
Rewind time	: Approx. 100 sec. with C-60 cassette
Input terminals	:
Input jack x 2	; Min. input level; 80 mV Input impedance; 80 kΩ
Output terminals	:
Output jack x 2	; Output level; 0 – 500 mV Output impedance; 5 kΩ
Phones jack x 1	; Output level; 0 – 0.6 mW/8 Ω Matching impedance; 8 Ω – 1 kΩ
Other terminal	: Remote control x 1
Power requirement	: AC 240/220/120 V, 50/60 Hz (KD-V6A/B/E) AC 120 V, 60 Hz (KD-V6C/J) AC 240/220/120/100 V, 50/60 Hz (KD-V6U)
Power consumption	: AC 18 watts
Dimensions	: 17-1/8" (435 mm) W 4-3/8" (110 mm) H 11-1/8" (282 mm) D (with feet, buttons, switches)
Weight	: Approx. 10.0 lbs (4.5 kg)

Accessory : Pin cord 2

Design and specifications subject to change without notice.

–20 dB Recording :
Metal tape;
15–21000 Hz (DIN 4550)
Chrome tape;
15–21000 Hz (DIN 4550)
Normal tape;
15–20000 Hz (DIN 4550)

Location of Controls and Connections

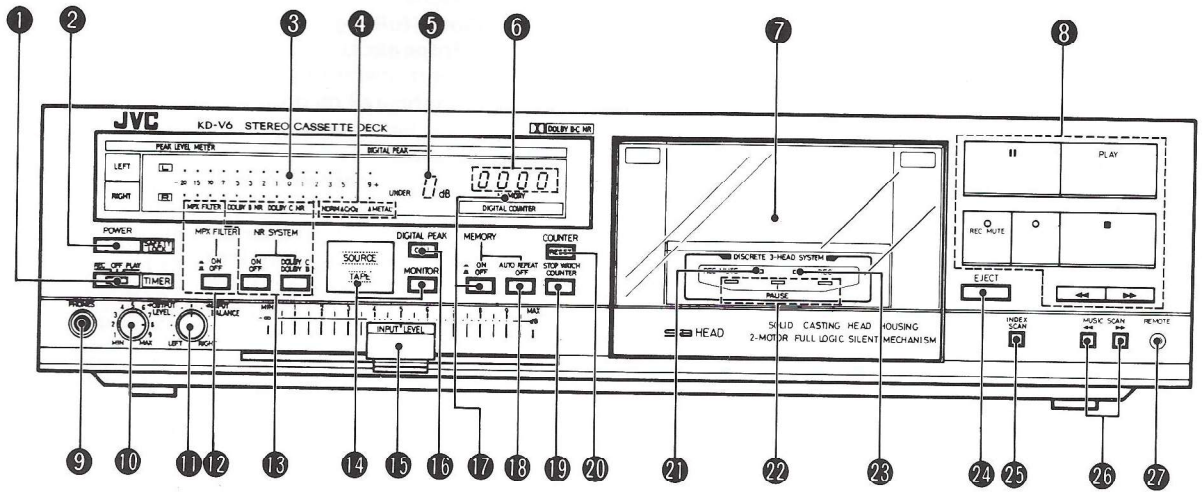


Fig. 1

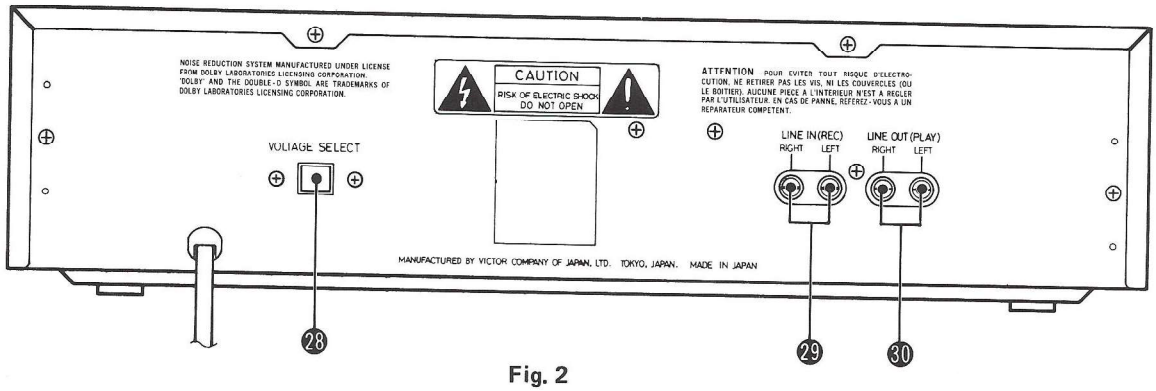


Fig. 2

❶ TIMER switch
❷ POWER switch
❸ PEAK LEVEL METER
❹ TAPE indicators (NORM/CrO_2/METAL)
❺ DIGITAL PEAK indicator
❻ DIGITAL COUNTER
❼ Cassette holder
❽ Cassette operation buttons
❾ Headphone jack (PHONES)
❿ OUTPUT LEVEL control
⓫ INPUT BALANCE control
⓬ MPX FILTER switch and indicator
⓭ NR SYSTEM switches and indicators
⓮ MONITOR switch and indicator
⓯ INPUT LEVEL control
⓰ DIGITAL PEAK button
⓱ MEMORY switches and indicator
⓲ AUTO REPEAT switch
⓳ COUNTER switch
⓴ COUNTER RESET button
㉑ REC MUTE indicator
㉒ Mechanism mode indicators
㉓ REC indicator
㉔ EJECT button
㉕ INDEX SCAN button
㉖ MUSIC SCAN buttons
㉗ REMOTE control jack
㉘ VOLTAGE SELECT switch
㉙ LINE IN terminal
㉚ LINE OUT terminal

Location of Main Parts

1. Power switch
2. Amplifier P.C.B. assembly
3. Voltage selector
4. Power transformer
5. Display P.C.B. assembly
6. Mechanism assembly

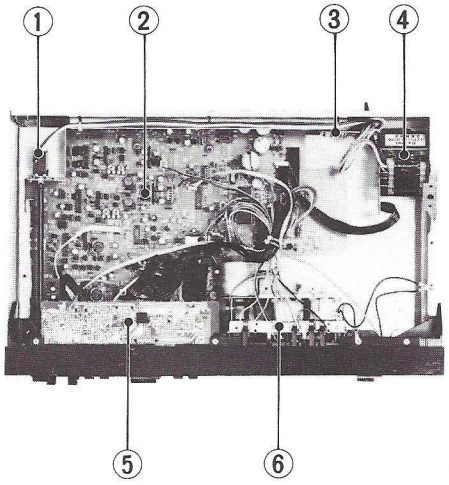


Fig. 3

1. Supply reel disk assembly
2. Take-up reel disk assembly
3. Take-up idler
4. Cam switch P.C. board
5. Tension assembly
6. Adjust screw (for height of the erase head)
7. Erase head
8. Recording head
9. Playback head
10. Pinch roller
11. Capstan

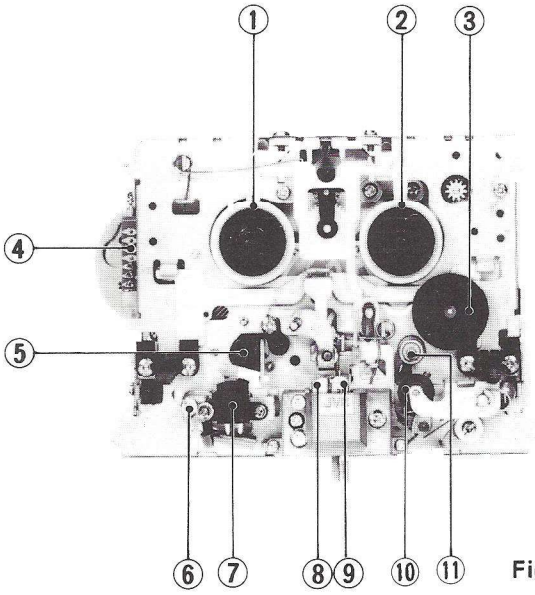


Fig. 4

12. Cam switch
13. Reel motor
14. Capstan motor
15. Flywheel assembly
16. Main belt

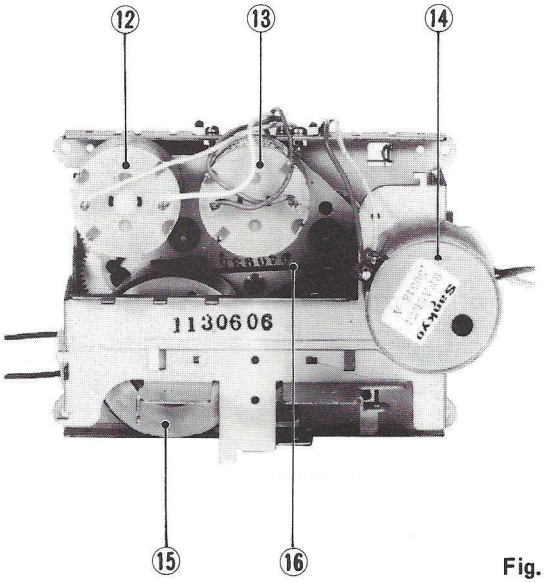


Fig. 5

Removal of the main parts

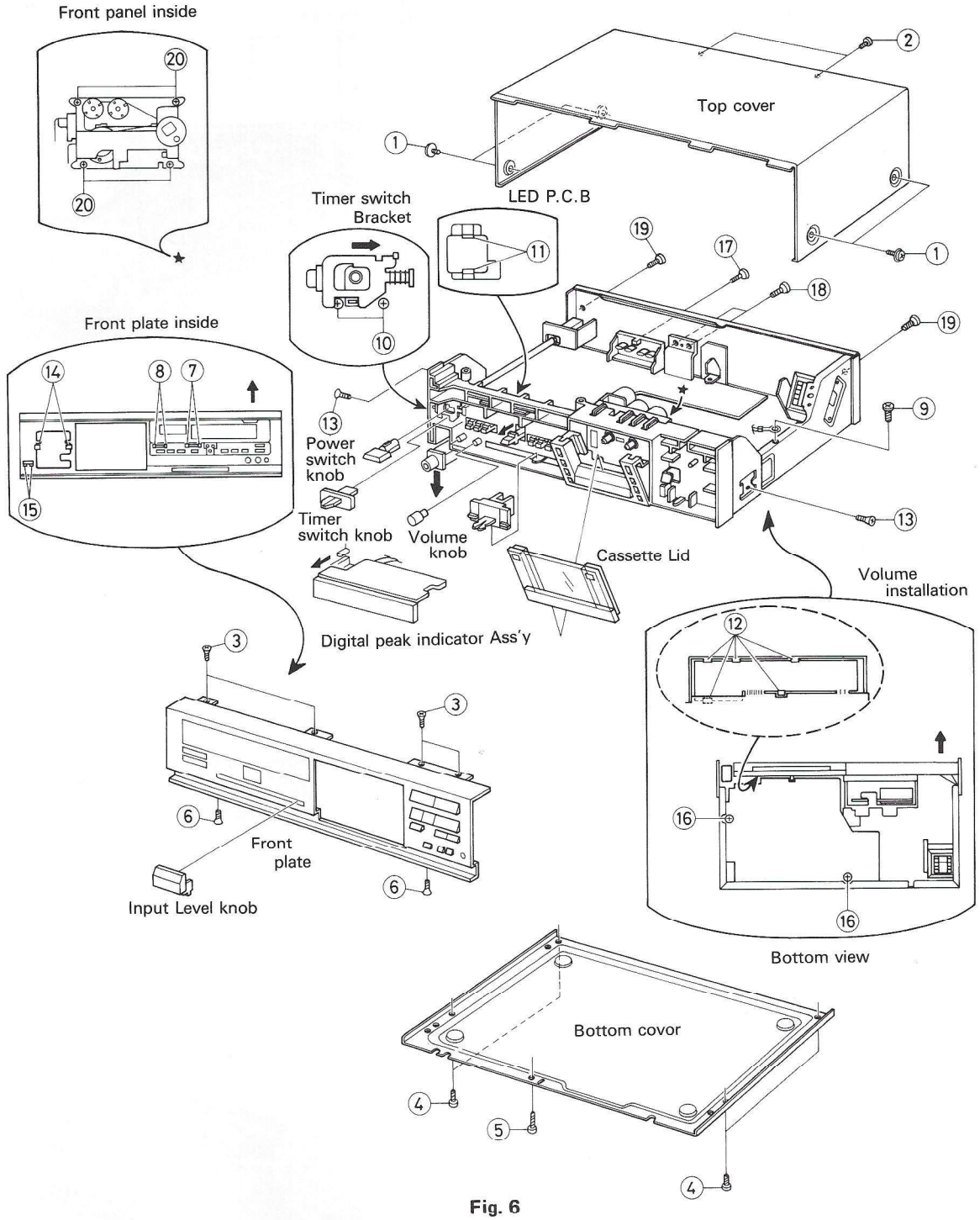


Fig. 6

Removal of External Panels and P.C. Board

Remove in the numbered order. Also refer to the exploded view on page 19.

1. **Top cover**
   1) Remove the four screws (1) holding both sides of the cover.
   2) Remove the two screws (2) holding the back side of the cover.

2. **Front plate and bottom cover**
   1) Remove the four screws (3) holding the top of the front panel.
   2) Remove the four screws (4) and one screw (5) holding the bottom cover.
   3) Remove the two screws (6) holding the bottom of the front plate.
   4) Pull out the input level control.

3. Removing the front plate from the P.C. board

1) Widen the hooks (7) holding the digital peak (CALL) switch P.C. board to remove it.
2) Widen the hooks (8) holding the counter reset switch P.C. board to remove it.
3) Remove the mechanism control switch connector from the main P.C. board.
4) Remove the screw (9) holding the ground plug to the right chassis.

4. Peak Indicator P.C. Board

Pull forward to remove the P.C. board.

5. Switch P.C. board assembly

1) Slightly lift the knobs of memory/auto repeat/counter switch (to remove from the stoppers) and draw the switch assembly backward.
(Perform this with the switches up.)
2) Remove the MPX filter/Dolby NR switch etc. assembly in the same way as 1).
3) Remove the parallel wire from the connectors on the P.C. board.
(When the digital indicators are removed.)

6. Timer switch P.C. board assembly

1) Remove the knob.
2) Slide the timer bracket to the right to remove it.
3) Remove the two screws (10) holding the timer switch.

8. Headphones jack

Press down to remove it.

8. LED indicators (SOURCE/TAPE)

Widen the two hooks (11) holding the indicator P.C. board to remove it.

9. Front panel (Mold parts are used inside.)

1) Remove the five hooks (12) holding the volume P.C. board.
(Widen enough to remove fully.)
2) Remove the two screws (13) holding the panel from both sides.
3) Pull out the panel (with the mechanism assembly).

10. Mechanism control switch board and earphone jack

1) Remove the two hooks (14) holding the switch board.
2) Open and remove the hooks (15) holding the jack.

11. Oil damper

Disengage the hook holding the damper and remove with upper side widen.

12. Main P.C. board

1) Remove the screw (16) holding the main board.
2) Remove the screw (17) holding the pin jack.
3) Remove the screw (18) holding the heat-sink.
4) Remove the screw (19) holding the rear panel and disengage the power cord stopper.
5) Pull the main board backward.

13. Removing the whole mechanism section

Remove the four screws (20) holding the mechanism assembly to the panel. (When removing the mechanism assembly from the panel, set the door lock arm to the eject mode.)

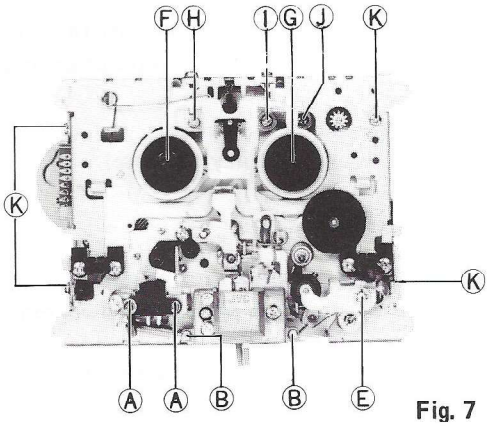


Fig. 7

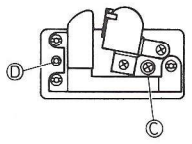
Removing the Mechanical Parts

1. Erase head

Remove the two screws (A).

2. Record/play head assembly (Replace the unit.)

1) Remove the two screws (B) holding the head mount case.
2) Remove the screws (C) and (D) holding the head mount.



3. Pinch roller assembly

Remove the E-washer (E) together with the torsion spring.

4. Supply reel disk

Pull out the reel stopper (F).

5. Take-up reel disk

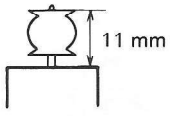
Pull out the reel stopper (G).

6. Flywheel

1) Remove the three screws (K) holding the FM bracket.
2) Remove the belt from the flywheel and attach to the holder.
3) Pull out the flywheel (at this time, the roller and oil washer are disengaged, so be careful not to lose them).

7. Capstan motor

Remove the three screws holding the motor to the FM bracket. Pull out the motor pully.



8. Reel motor

Remove the two retaining screws (H) and (I).

9. Mechanism drive (cam) motor

Remove the two retaining screws (J) and (K).

Main Adjustments

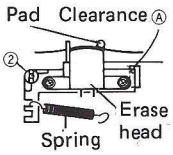
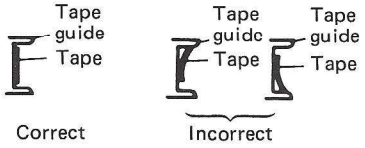
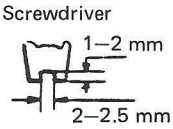
1. Measuring instruments for adjustment

1. **Audio generator** (range: 50 Hz – 20 kHz and output of 0 dB with terminal impedance of 600 ohms)
2. **Attenuator** (with impedance of 600 ohms)
3. **Electronic voltmeter**
4. **Reference tapes**
   TMT702 (for head azimuth adjustment) 14 kHz,
   VTT712 (for tape speed or wow and flutter adjustment) 300 Hz,
   VTT664 (reference level) 1 kHz,
   VTT739 (playback frequency response),
   TMT6447 (for music scan),
   TMT6448 (for music scan)
5. **Recording reference tapes**
   The reference tapes should be TS-5 (UD), TS-6 (SA) and TS-7 (ME) or their equivalent.
   (Use the designated reference tape of this division.)
6. **Resistors 600 ohms** (for attenuator matching)
7. **Distortion meter** (band pass filter)
8. **Torque gauge** (cassette) CTG-N
9. **C-120 tape** (for confirming the tape transport) } For mechanism adjustment

Notice: The VTT712 has improved accuracy and TMT702 is newly added. The substitution of BTT658 (10 kHz) is possible.

2. Mechanism adjustments and repairs

(Mechanism adjustment or confirmation are required before performing the electrical circuit adjustment.)

Items	Adjustment	Adjusting point	Standard value	Remarks
Erase head adjustment 	1) Make sure that the moving part of the erase head assembly move smoothly around the pivot of screw ② and also confirm that there is clearance Ⓐ as shown in the figure during the playback mode. 2) Check the tape transport as follows. Adjust the height of the erase head with screw ② while observing curl in the tape transport with C-120 tape and adjust so no curl will appear in the tape guide section of the play head or the erase head.  Lock the screws after adjustment.	②		Be sure to perform this adjustment after erase head replacement.  **Notes:** • After adjustment, confirm by ear how effectively the erasure is performed using a metal tape. • After replacement of the erase head, play or record head, loosen the associated wires and clamp a new head then confirm that the new head movement is normal.

Replacement and adjustment of record head and play head

This deck has three independent heads and the head units are completely separate. However, they are assembled and adjusted on a single head board, therefore they can be dealt with as one unit in principle. Accordingly, replace or adjust the head assembly when any head is defective. In addition, since certain screws have been precisely adjusted in the factory, care should be taken when handling them as well as referring to the following adjustment items (1. Reference dimensions, 2. Screw explanations, 3. Adjustment methods).

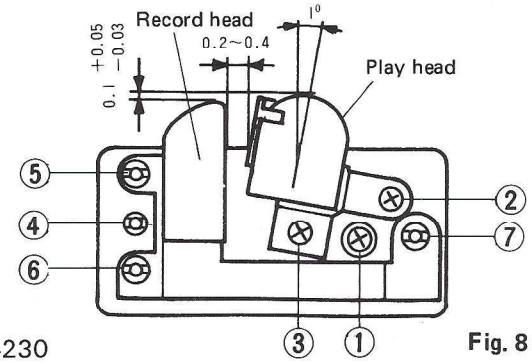


Fig. 8

1. Reference dimensions

The reference dimensions of record head and play head are shown in Fig. 7. After checking or replacing the head assembly because of characteristic deterioration, confirm that there is no big disagreement.

2. Screw explanations

The screws marked ○ require adjustment when repairing. The screws marked X are basically required not to move when repairing.

(1) is the head base fixing screw.

(2) and (3) marked X are the play head fixing screws (for adjusting the relative position to the record head).

(4) marked ○ is a special nut for playback azimuth adjustment.
(5) marked X is a special nut for the record head height adjustment.
(6) marked X is a special nut for the record head tilt adjustment.
(7) marked ○ is a special nut for the record head azimuth adjustment.

3. Adjusting methods

Perform the following adjustment procedure after head assembly replacement.

1) Play head azimuth
- Connect the LINE OUT jacks to an electronic voltmeter (two-meter VTVM).
- Play test tape TMT-702 and adjust the screw 4 so that the output of electronic voltmeter is optimized.

2) Record head azimuth
- Connect the LINE OUT jacks to a two-meter VTVM.
- Observe the simultaneous monitor output with the two-meter VTVM while recording a 14 kHz signal at 0 VU −20 dB and adjust the screw 7 so that the output is maximum.

Note: Perform this adjustment using the stable middle part of side A of TS-5 (UD) and also confirm it using TS-6 (SA) and TS-7 (ME).

The above adjustments are recommended to check after fixing the mechanical section to the cabinet.

Item	Adjustment	Adjusting points	Standard value	Remarks
Motor speed adjustment	Play back test tape VTT712 and connect electronic counter to the LINE OUT jacks of deck to measure the speed then adjust the semi-fixed resistor on the motor P.C. board by turning it so that the reading of the meter is 3,000 Hz.	Semi-fixed resistor on motor P.C. board	3,000 Hz	When the electronic counter is incorporated in the wow/flutter meter, just connect the electronic counter to the input jacks of the meter.
Wow/flutter	Play VTT712 and plug the wow/flutter meter into the LINE OUT jacks of the deck then confirm that the reading of the meter is less than 0.08% (WRMS).			Even when it is within a standard value, if its variation becomes more than 0.08% (WRMS), repairs are required because of possible claims.
Playback torque	Measure using the torque testing cassette tape CTH-N.		40–70 g-cm	
Fast-forward torque	Set the unit in the fast forward mode and measure the torque in the same way as above.		More than 80 g-cm	
Rewind torque	Set the unit in the rewind mode and measure the torque in the same way as above.		More than 80 g-cm	
Music scan check	1. Music scan operation should be performed when using TMT-6447 tape. 2. Music scan operation should not be performed when using TMT-6448 tape.			

4. Positions of electrical adjustment

Display P.C. board

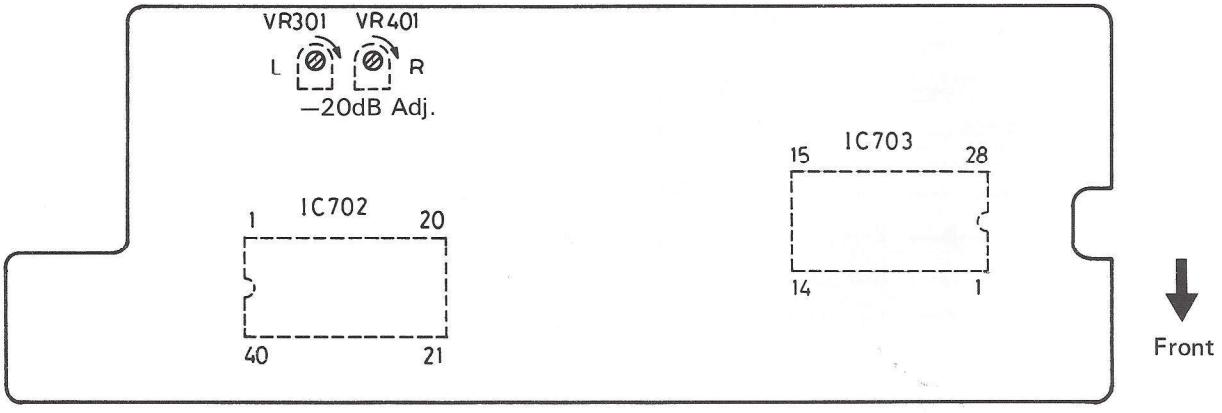


Fig. 9

Amplifier P.C. board

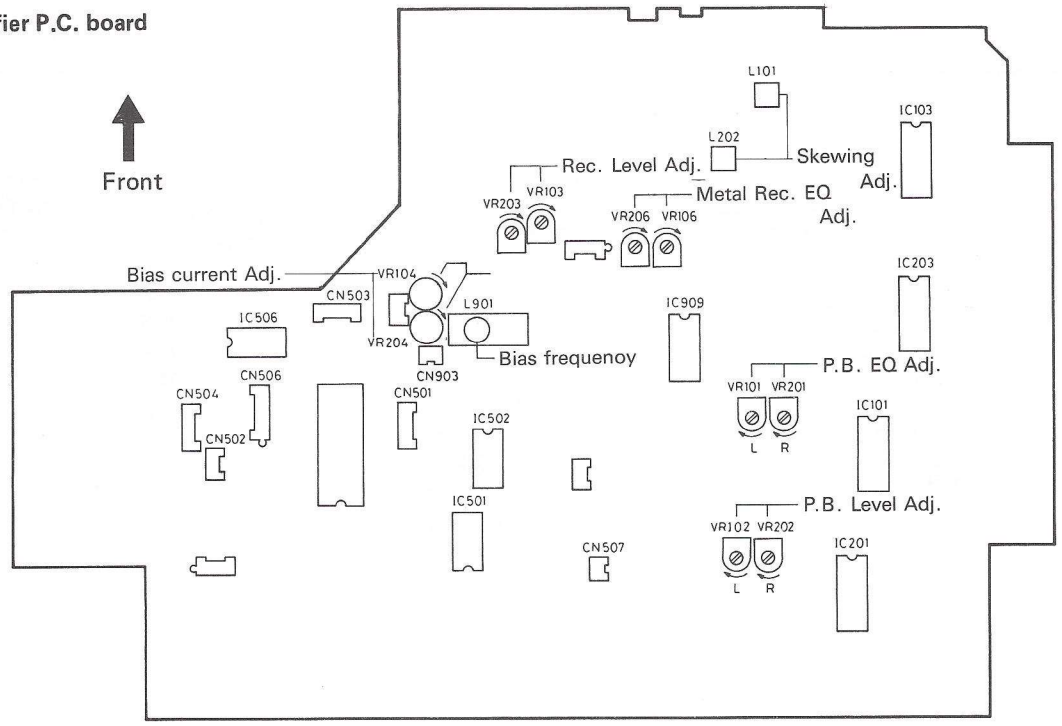
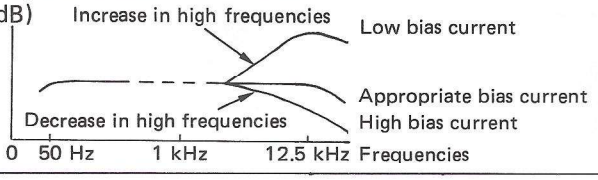


Fig. 10

5. Electrical circuit adjustment procedure

Perform the electrical circuit adjustment after the tape transport and head angle adjustments.
Adjustment should be performed in the order 1, 2, 3, . . .
Set the MPX: OFF, output volume control to maximum when measuring.

Items	Adjustment	Adjusting point	Standard value	Remarks
1 Playback level adjustment	1) Set the Dolby NR switch to OFF. 2) Set the monitor switch to TAPE. 3) Play back test tape VTT-664 and adjust VR102 and VR202 so that the output level at LINE OUT is –4 dBs.	VR102, 202 (Amp. P.C.B.)	–4 dBs	
2 Playback frequency response	Play back test tape VTT739 (1 kHz, 10 kHz) and adjust VR101 and VR202 so that outputs of 1 kHz and 10 kHz are the same.	VR101, 201 (Amp. P.C.B.)	Reference frequency 1 kHz; 0 ± 2 dB at 10 kHz	
3 SKEWING coil adjustment	1) Set the monitor switch to SOURCE. 2) Apply a 17.5 kHz signal of around –20 dB to the LINE IN jacks. 3) Adjust the input level control with the Dolby NR switch set to OFF so that the output of the LINE OUT jacks is –4 dBs. 4) Set the NR switch to ON and Dolby C NR switch to ON. 5) Adjust L102 and L202 so that the output at the LINE OUT jacks is –4 dB. 6) Check that level difference is within ±0.5 dB in the frequency range of 10 kHz to 20 kHz.	VR903 (Input level) VR901 (Balance) L102, 202		

Items	Adjustment	Adjusting point	Standard value	Remarks
4 Peak meter checking	1) Set the monitor switch to SOURCE. 2) Set the OUTPUT LEVEL control to MAX. 3) Apply a signal to LINE and adjust the attenuator and confirm that 0 dB meter indicator lights when the LINE OUT is –4.0 dBs. 4) Lower the attenuator level by 20 dB and adjust VR301 and VR401 so that the –20 dB meter lights. 5) Check that the 0 dB indicator lights again.	VR301, 401 Display board		
5 Bias oscillating frequency	1) Apply 1 Ω in series to the erase head. 2) Connect a VTVM to both terminals of a 1 Ω resistor and connect the output of the VTVM to COUNTER. 3) Use a metal tape and set the unit to the REC PAUSE mode. 4) Adjust OSC BLOCK L901 and set to 81 kHz ± 1 kHz.	L901		
6 Rec/Play frequency response	1) Set the monitor switch to SOURCE. 2) Apply a 1 kHz signal of around –20 dBs to LINE IN. 3) Adjust the INPUT LEVEL control and set LINE OUT to –4 dBs. 4) Lower the attenuator level by 20 dB. 5) Use a normal tape and set the unit to the recording mode. 6) Set the monitor switch to TAPE. 7) Record 1 kHz then 50 Hz, 12.5 kHz and when playing the tape back, adjust VR104 and 204 so that the 50 Hz and 12.5 kHz outputs are in the range of standard values, using a 1 kHz signal as reference. (Ordinarily adjust so that the 1 kHz and 12.5 kHz outputs are the same.) 8) Use metal tape and record 1 kHz and 12.5 kHz, then play back the tape, adjust VR106 and 206 so that the levels are the same. 9) Use a CrO_2 tape and record 50 Hz, 1 kHz and 12.5 kHz then play back the tape and check that they are in the range of standard values.	VR104 204 VR106, 206	Reference frequencies: 1 kHz, 0±3dB at 50 kHz 0 ± 3 dB at 12.5 kHz	
	Response (dB)  			When the bias current is not adjusted properly, the recording characteristics are as shown on the left.