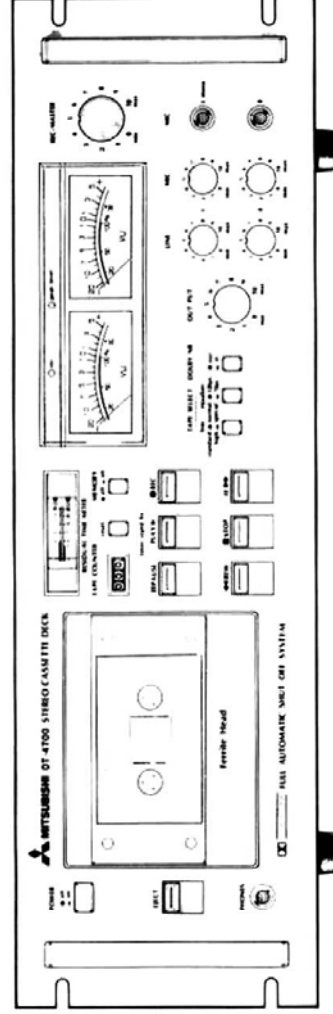


SERVICE MANUAL
STEREO CASSETTE DECK
MODEL DT-4700



CONTENTS

SPECIFICATIONS 2

MECHANICAL PERFORMANCE..... 3

ELECTRICAL PERFORMANCE 3

FREQUENCY CHARACTERISTIC TABLE 4

SERVICING NOTES..... 5

DISASSEMBLING OF COMPONENT PARTS 6

ADJUSTMENT OF MECHANICAL PARTS15

ELECTRICAL ADJUSTMENT17

WIRING AND PRINTED CIRCUIT BOARD DIAGRAM23

CIRCUIT DIAGRAM25

EXPLODED DIAGRAM OF MECHANICAL PARTS.....27

EXPLODED DIAGRAM OF CABINET.....28

PARTS LIST29

(Note) TAPE SELECT part is classified as follows:

Normal is ■ ■ ■
Special tape is ■ ■ ■ .
(Special tape includes
DIATONE X, TDK SA, and
MAXELL UDXL-II.)

Tapes to be used for recording and reproducing are TDK AC-211 (Normal) and TDK AC-511 (Special).

SPECIFICATIONS

Noise reduction system:	Dolby NR
Tracks:	4-track, 2-channel
Tape speed:	4.75 cm/sec.
Recommended type of cassette:	TDK AD (Normal position) TDK SA (Special position)
Recording system:	AC bias (85 kHz)
Erasing system:	AC erasing (85 kHz)
Playback equalization:	
Normal position	3,180μsec./120μsec.
Special position	3,180μsec./70μsec.
Input level and impedance:	
MIC	0.3 mV/2.2 kohms
LINE	80 mV/90 kohms
DIN	5.6 mV/8 kohms
Output level and impedance:	
LINE	0.44V/22 kohms
HEADPHONE	0.8 mW/8 ohms
DIN	0.44V/22 kohms
Motor:	DC servo motor with tachogenerator
Magnetic heads:	
Record/Playback	Ferrite
Erase	Ferrite
Wow and flutter:	0.06% (Wrms) ± 0.12% (Wp-p, DIN)
Signal to noise ratio:	
Weighted Dolby NR out	56 dB (RMS)
Weighted Dolby NR in	49 dB (DIN) 64 dB (RMS)
Frequency response:	
Normal position	40 Hz to 13 kHz
Special position	40 Hz to 16 kHz
Power consumption:	11W
Dimensions (W × H × D):	480 × 154 × 310 mm (18-7/8 × 6-1/16 × 12-3/16")
Weight:	9.5 kg (21 lb)

"DOLBY" and the Double D symbol "D" are trademarks of Dolby Laboratories.

Design and specifications are subject to change without notice for improvement.

MECHANICAL PERFORMANCE

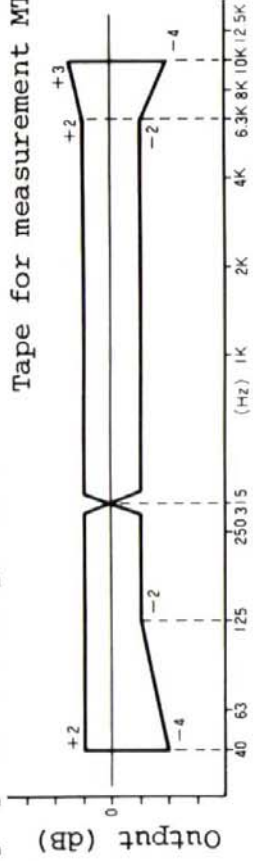
Tape Speed	3000 Hz \pm 60 Hz	PAUSE	Within 0.4 sec. at rising-up time of tape in PAUSE/OFF position Within 4 sec. at rising-down time of tape in PAUSE/ON position
Tape Speed Variation	Within 30 Hz		
Wow & Flutter	Under 0.18% rms in reproducing type	Push Button Force	PLAY 1.8 STOP 1.5 Counter, reset 0.8 REC 1.5 EJECT 1.5 FF 1.5 PAUSE 1.5 (Under kg.)
FF/REW	100 sec. at C-60	Pinch Roller Pressure	400 g \pm 50 g
Numbers on Counter	534 30 at C-90	REW Force	PLAY 40 to 60 FF, REW 105 to 165 (g/cm)
End-Stop Working Time	Within 5 sec.		

ELECTRICAL PERFORMANCE

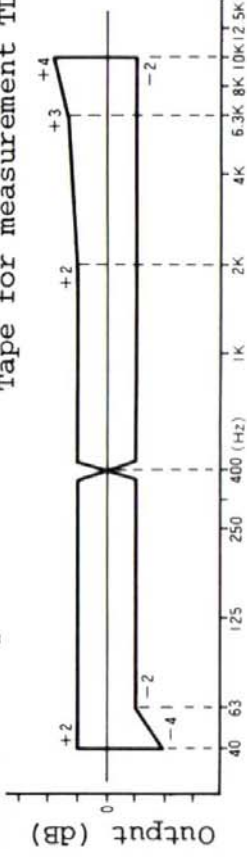
Max. Output Level	-5.5 dB(V) \pm 1 dB -2	Bias Leak	LINE-IN: Under -50 dB(V) MIC: Under -40 dB(V)
Max. Input Level	LINE-IN -22 dB(V) \pm 3 dB MIC -72 dB(V) \pm 3 dB	Cross Stroke	Between channels Over 30 dB at 1 kHz Over 25 dB at 500 Hz to 6.3 kHz Between tracks Over 40 dB at 125 Hz and 60 dB at 1 kHz Over 45 dB at 500 Hz to 6.3 kHz
Reference Output Level	Reproducing system LINE-OUT -7 dB(V) \pm 1 dB HEAD, PHONE -21 dB(V) \pm 1/2 dB Overall system LINE-OUT -7 dB(V) \pm 1/2 dB (TDK AC-221 tape for measurement)	Click Noise	Under -30 dB(V)
Level Variation between Channels	Reproducing system Within 1 dB at 400 Hz Within 3 dB at 40 Hz to 6.3 kHz Overall system Within 1 dB at 400 Hz Within 3 dB at 40 Hz to 6.3 kHz (TDK AC-221 tape for measurement)	Bias Frequency	85 kHz \pm 5%
Min. Input Level	LINE-IN: within 2 dB MIC: within 2 dB	Distortion Factor	Under 2.5% in TDK AC-221 tape for measurement Under 3.0% in TDK AC-511 tape for measurement
Level Meter Reading	Reproducing system +3 VU \pm 1 VU Reading between channels Within 1 VU	Dolby Effect	Over 8.5 dB in TDK AC-221 tape for measurement Within 1 dB in level variation Under +4 dB at lighted level Over 0 dB at lighted-out level
Level Variation	Within 1 VU at 400 Hz Within 2 VU at 40 Hz to 6.3 kHz	Mixing	Under -30 dB(V) in recording noise level, monitor output noise level, and timer re-producing noise level, respectively
S/N ratio	Reproducing system Over 47 dB Overall system Over 43 dB (TDK AC-221 tape for measurement)	Peak Level Indicator	When C-60 tape (TDK AC-221) is used Meter reading Actual tape remaining time 3 min. 5 min. 3 to 3.45 min. 5 to 6 min.
Erasing Ratio	Over 60 dB (Class erasing: within 2 dB)		

FREQUENCY CHARACTERISTIC TABLE

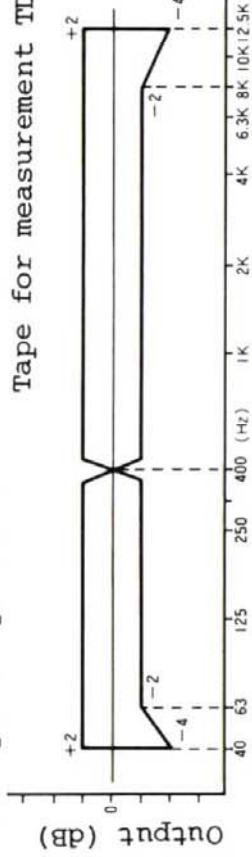
1. Reproducing system Normal position



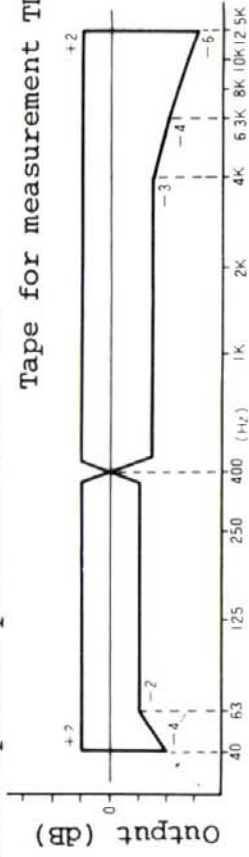
2. Overall system Normal position



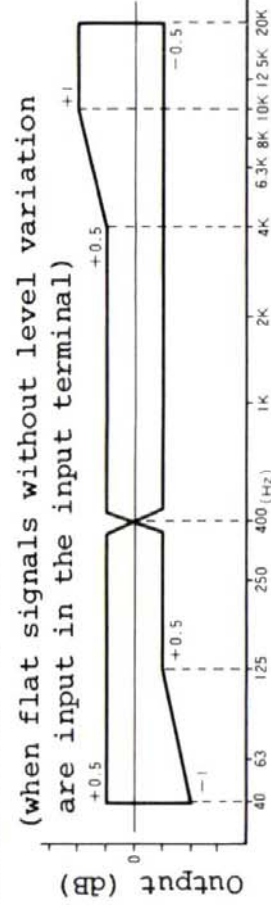
3. Overall system Special position



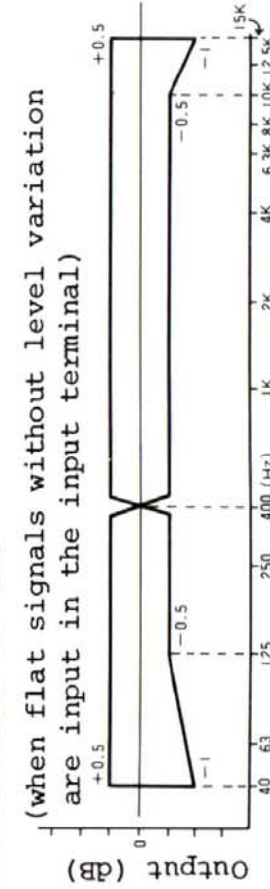
4. Overall system Special position DOLBY "ON"



5. Monitor terminal DOLBY NR "ON"



6. Monitor terminal DOLBY NR "OFF"



SERVICING NOTES

1. Refer to the Instruction Manual (for operation).
2. A number of rubber parts, such as the belt and idler, are used in a tape recorder for purposes of transmitting revolution. The belt, in particular, may not adequately durable on account of the manner of its application. Be sure to check whether it should be replaced or not at the time of servicing.
3. Unlike other audio products, the tape recorder is equipped with a mechanism. And no matter how excellent the electric circuit characteristics may be, the functions of the mechanism cannot be exploited fully unless tape transport is perfect during PLAY. Inadequate adjustments related to the tape transport system may result in serious troubles, such as revolution drift, unstable tape speed and deterioration in electric circuit characteristics arising from instability of tape-head contact. In servicing, therefore, make adjustments or repairs while paying close attention to the points given below.
4. Use special care in handling the capstan and the head, as tape recorder components generally have many precision-finished portions.
5. Demagnetize each head before making adjustment with the standard tape.
Note: Use case as the REC/PLAY head is magnetized when metered with a resistance meter like tester or vacuum tube voltmeter.
6. Demagnetize the head before using metal tools near it for purposes of repair or adjustment.
7. Keep the head surface free of magnetic particles scraped off the tape and dust (use absorbent cotton or gauze impregnated with the head cleaning solution or alcohol to clean the head).
8. Be sure power supply voltage is normal (low power supply voltage leads to deterioration in reproduced sound quality because of slowed-down tape speed and increased wow and flutter and amplifier distortion)
9. Wipe off oil dregs before lubricating, and then give one to two drops of General Oil's GEMICO TL (TAPINOL #30) to the rotary shaft and apply a small amount of Toho Polymer's FL-LUBEA (white) to the sliding faces.
10. Be sure to lock securely the cover of the cassette case when the various characteristics are to be measured.
11. Clean any stain on the cabinet with a neutral detergent.

DISASSEMBLING OF COMPONENT PARTS

Precautions

- 1) Refer to the disassembling diagram at the end of this manual.
- 2) Be careful not to allow oil stick to the revolution transmission unit during disassembling. If any happens to stick, thoroughly clean it off with alcohol or the like before reassembling.
- 3) As oil or grease is applied to the removed parts, especially to mechanical parts, be careful not to let any foreign matter stick to them.
- 4) Be sure to use specified screws when assembling, as use of screws not specified may lead to cracking of shaped articles, failure to fix the parts or demolishing of the screw thread.
- 5) Avoid marring the top panel and the meters.
- 6) Put all the removed screws and knobs in a small box or the like together so as not to lose them.
- 7) As screw locking agent is used for the screws of the mechanism unit to prevent them from becoming loose, apply a drop or two of solvent like thinner when the screws of that unit are to be removed. Then making sure that the screw lock has been softened after a few minutes, unscrew them with a screw driver that fits the screw heads perfectly.
(avoid letting the solvent to stick to any part using plastic as it is corrosive)
- 8) As the disassembling method is described in the order of stops to be taken from the beginning, use it as a reference.
- 9) Be sure to achieve correct reassembling by following the stops taken in reverse order.

DISASSEMBLY

1. Removing Cassette Cover

The cassette cover can be removed by placing both thumbs on the cassette guiding groove of the cassette case and lifting the lower part of the cassette cover with other fingers.

* ASSEMBLY: Fit the two small protrusions on the bottom of the cassette cover in position and then push them closely into the cassette case proper.

2. Removing the Upper Cover

The upper cover can be removed by taking out four screws (M4 x 0.7 x 5) on both sides of the cassette cover.

3. Removing the Lower Cover

The lower cover can be removed by taking out screws (tapping 3 x 8) from ① ~ ⑨ shown in Fig. 1.

The pattern part may be checked in this state.

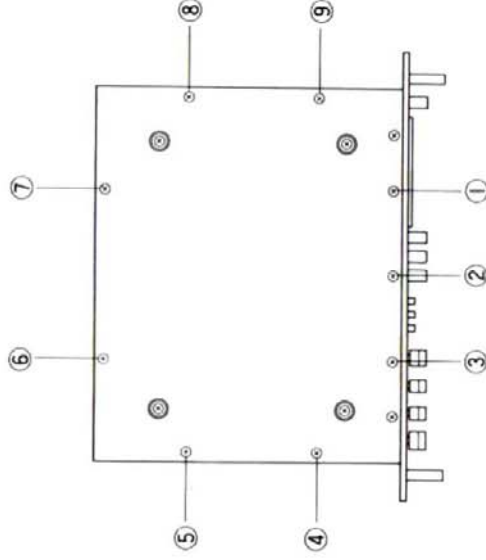


Fig. 1 (Rear View)

4. Removing the Front Panel

- Remove the cassette and upper covers in accordance with above-mentioned procedure 1 and 2.
- Remove six VR knobs.
- Separate the power switch part from the push button part and take out the push button part.
- Fig. 2 shows the upper panel surface

Screws from ① to ③ (tapping 3 x 6)

Screws from ④ to ⑦ (M3 x 0.5 x 6)

Note: Care should be taken since the clamping board is removed if 6 and 7 are taken out.

Fig. 2 shown the lower panel surface

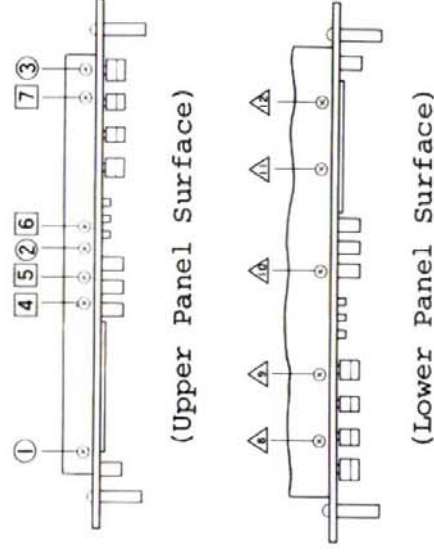


Fig. 2

If all screws from 8 to 12 are taken out, the front panel may be removed.

Note: Care should be taken since the push button of the tape counter is removed when taking out the front panel.

* ASSEMBLY: Before assembly, be sure to confirm that the push button is pushed in its operable position.

5. Removing MIC Jack, Volume and Meter

Each clamping screw should be removed from each part after following the above-mentioned procedure 4.

6. Removing LED (for REC, PEAKLEVEL Indication)

The LED is soldered to the small printed circuit board which is bonded to the holder (aluminum board) of the level meter.

The LED can be replaced if the printed circuit board may be removed properly after removing the upper cover. But it can be removed with ease and properly when the front panel and screw (tapping 3 x 6) of the level meter holder are taken out.

To remove the bonded PC board, a few drops of thinner are poured into the bonded section and take it out with the tip of a screw-driver after checking to see that the bonded section has softened.

* ASSEMBLY: Be careful about the polarity of the LED. (The appearances and polarity of the LED are given in the CIRCUIT DIAGRAM on last page.)

7. Removing Mechanical Part

- a. Remove the front panel in accordance with the foregoing procedure 4.
- b. Remove the bound sections from [A] to [H] shown Fig. 3. (The remaining lines except for mechanical parts must be temporarily bound.)

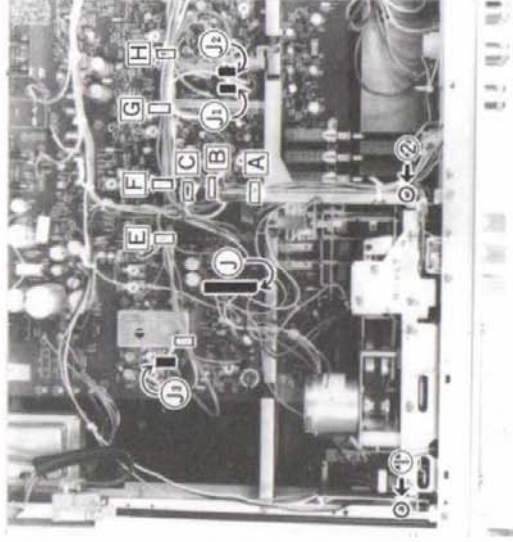


Fig. 3

- c. Remove (J) and (J₁) to (J₃) shown in Fig. 3.

Colors of Jack

	Color of shielding wire	Color of the mid-part of the Jack	Circuit to be connected
J ₁	Gray	White	Recording and play-back head LCH
J ₂	Gray	Red	Recording and play-back head RCH
J ₃	Gray	Black	Erasing head

- d. Remove screws (tapping 3 x 6) from (1) to (2) shown in Fig. 3.
- e. Remove the spring between REC and SW by lifting the mechanical assembly.
- f. If the headphone jack under the left lower part of the mechanical assembly is taken out, the mechanical assembly can be separated.

* In assembly, pay attention to the following:

- 1) Put the spring linking REC and SW and check the lever for operation. Thus assembly must be started.
- 2) As shown in Fig. 4, link the PC clamping screw to the spring. (Two sections)

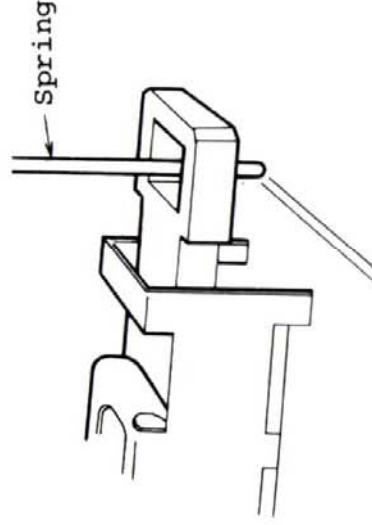


Fig. 4

8. Removing Headphone Jack

Remove the screws from ① to ② shown in Fig. 3 and slide the mechanical assembly, and it can be taken out.

9. Removing Mechanical Parts

Note: This section deals with the removal of the mechanical parts with starting the state of the mechanical assembly being taken out explained in procedure 7.

1) When removing parts on the upper part of the mechanical base:

Remove three holder (cassette case) clamping screws (M2.6 x 0.45 x 4), take out the lever connection on the left of the case, and the case is removed. Thus the parts on the upper part of the mechanical base.

2) When removing parts on the lower part of the mechanical base:

- a. When removing the holders (motor) and (flywheel) shown in Fig. 5, the spring (motor) in Section A and the springs in Section (flywheel) B and C must be removed.
- b. Loosen the rotary shutter in Fig. 5 with a hexagonal monkey wrench (1.3mm) and remove screws (M3 x 0.5 x 4) from ① to ② shown in Fig. 5. As soon as the holder (flywheel) is removed, the rotary shutter is removed.
- c. The holder (motor) can be removed by taking out two screws (M2 x 0.5 x 4).

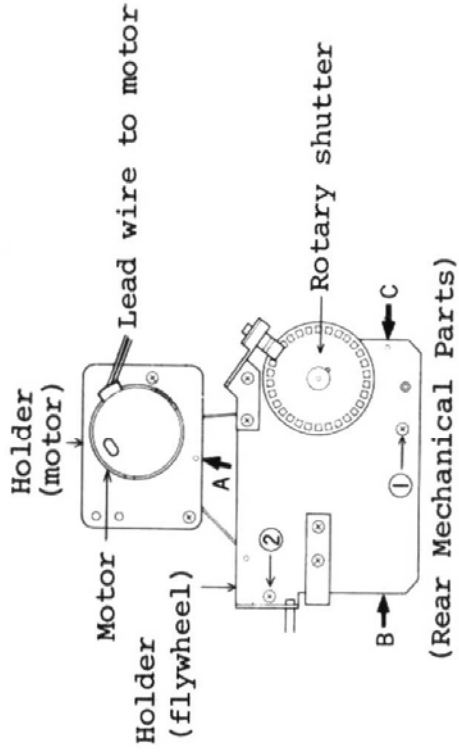


Fig. 5

- d. Fig. 6 shows how the flywheel and holder (motor) has been disassembled. For further disassembly, Link A can be disassembled into two parts and Pulley A can be removed if screw ① (M2.6 x 0.45 x 5) in Fig. 6 is loosened.

* Before assembly, pay attention to the following:

- o Set the end of the Link A in the direction on the right upper portion of Fig. 6.
- o Insert the shaft of the Pulley B in to the end hole of the Link B shown in Fig. 6.

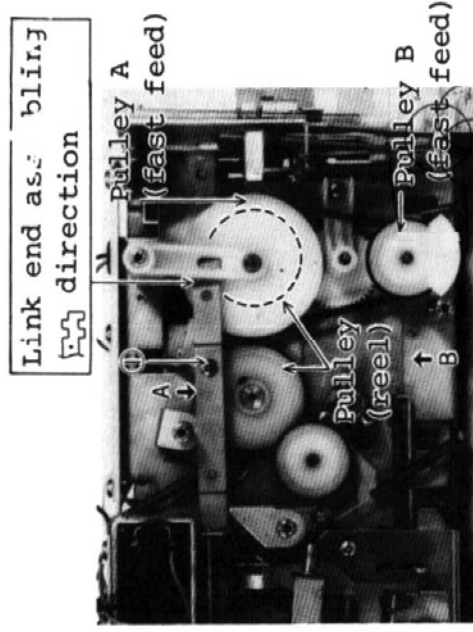
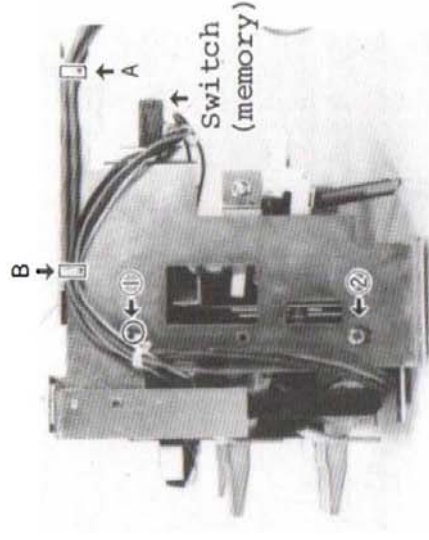


Fig. 6

- e. Removing Reel Shaft and Pulley (Reel)

Remove Pulley A and the pulley (reel) clamping screw with the hexagonal monkey wrench (1.3 mm) following the foregoing procedure. The Reel shaft is taken out by removing the E ring (E2).

- 3) When the mechanical push button part, this is the procedure.
 - a. Remove the A and B on the right of Fig. 7.
 - b. Remove the screws (M3 x 0.5 x 4) from ① to ② shown in Fig. 7.
 - c. Remove the link attached to the switch (memory) illustrated on the right upper side of Fig. 7. Remove the right board after taking out the two switch (memory) clamping screws (M3 x 0.5 x 4).



(Right Mechanical Parts)

Fig. 7

- d. Remove the solenoid by taking out the two solenoid clamping screws (M3 x 0.5 x 4).

* Cautionary Instructions for Assembly

- Note: Be sure to use M3 x 0.5 x 4 screws for clamping the solenoid.
- o For solenoid assembling position adjustment, refer to the paragraph of "Adjustment of Mechanical Parts".
- e. To remove the holder, take out the two screws (M2.6 x 0.45 x 4) clamping the holder (flywheel).

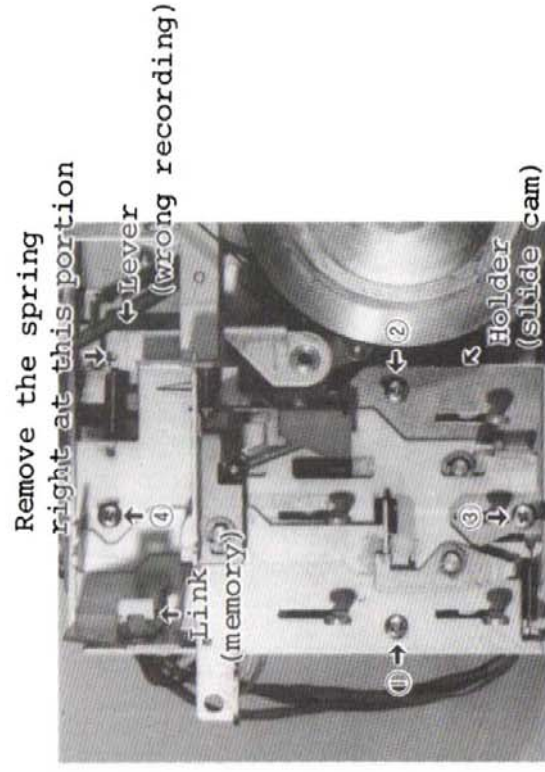
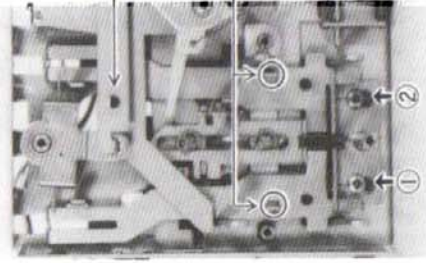


Fig. 8 (Rear Push Button Part)

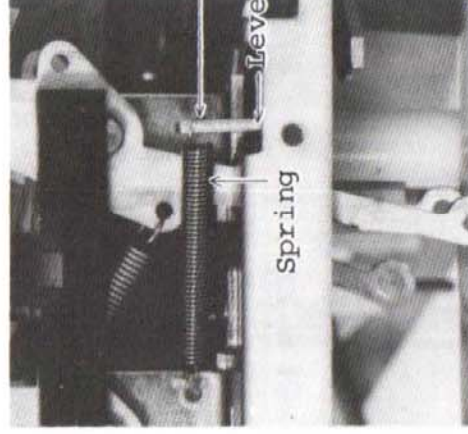
- f. Remove screws (M2.6 x 0.45 x 1.2) from ① to ② and those (M2.6 x 0.45 x 5) on the rear of the push button given in Fig. 8 and the push button part by taking out the button on the tip of the link (memory) and the link. If the spring shown on the right upper portion of Fig. 8 is removed on the lever side, the holder (slide cam) can be disassembled.



Note (Assembly)
To the left end of
this link

Note (Assembly)
This part is aligned and
1 and 2 screws are
tightened

Fig. 9



Remove the spring right
at this portion

Fig. 10

- g. Remove the screws (2.6 x 0.45 x 5) from ① to ② shown in Fig. 9.
h. Remove the spring shown in Fig. 10 on the lever side.

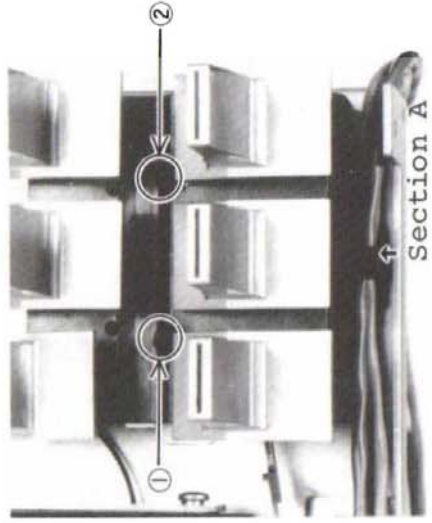


Fig. 11

- i. Remove the three shielding wires supported in Section A in Fig. 11 from its supporting part.

Remove the screws (2.6 x 0.45 x 12) of Fig. 11.

Thus the upper part of the mechanical base of the push button part can be taken out.

- 4) For further disassembly of the push lever part, it can be disassembled by taking out the screws (tapping 3 x 10) shown in Fig. 12 after finishing the procedures given in Item 3).

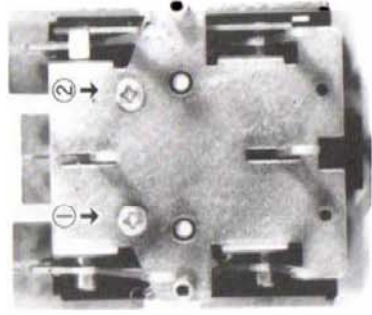


Fig. 12

To replace the mechanical push button (lever) assembly, the assembly must be disassembled into a single lever unit in accordance with the procedure 4). (EJECT Button is exception.)

10. How to Replace the Mechanical Push Button Part (Stock Item)
(Mechanical Disassembly Drawing No. 19 to 21)

When a button breaks and it must be replaced, replace it in the following manner.

- 1) a. The EJECT button can be replaced with the mechanical assembly being taken out.
 - b. The other lever buttons for mechanical units must be taken out with the button being adhered to the push button lever following the steps given in the above-mentioned Paragraphs from 1) to 4).
 - c. As soon as the button side of the metal lever part to be replaced is heated hot with a soldering iron, the button part is taken out.
 - d. When the button is removed, wipe off dirt on the metal lever.
 - e. Bond a new button to the metal lever.
Use an epoxy adhesive.
- Note 1) The button must be bonded in line with the other button part.
- 2) Care should be taken not to let the adhesive flow into the mechanical parts until it has set.

ADJUSTMENT OF MECHANICAL PARTS

1. Solenoid Assembling Position
 - a. Pinch lever pressure
 - b. Be sure to use a screw of 4 mm long as a solenoid clamping screw (M3 x 0.5 x 4). The solenoid is temporarily clamped with this screw so that it can be moved back and forth.
 - c. Put the solenoid between fingers in the A and B direction shown in Fig. 13 and place it as much close as possible towards direction.

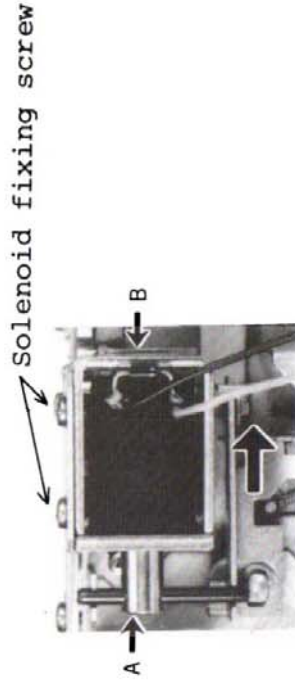


Fig. 13 (Solenoid Part)

2. Pinch Lever Pressure

Measurement is made by applying the end of the tension gauge at right angle against measurement direction, in the direction linking the capstan shaft and the pinch roller shaft in straight line.

400 g \pm 50 g (See the mechanical performance)

3. Back Tension

- a. When the felt is dirty, replace it (There are service parts available and it is bonded.)
- b. Put the spring (back tension) onto the position No. 3 given in the lever.

4. PALY, FF, and REW Measurement

- a. Measure with the cassette for measuring REW.
- b. Measure with torque dial gauge for measuring rotation.

REW force PLAY 40 to .60 g/cm
FF, REW 105 to 165 g/cm
(See the mechanical performance.)

5. Motor Replacement and Speed Adjustment

- a. The motor must be installed so that the leading wire to the motor can be out in the direction shown in Fig. 5.
- b. Speed is adjusted in accordance with the step described in Fig. 14. The tape to be used is MTT-111 (3000 Hz).
3000 Hz \pm 60 Hz (See the mechanical performance.)

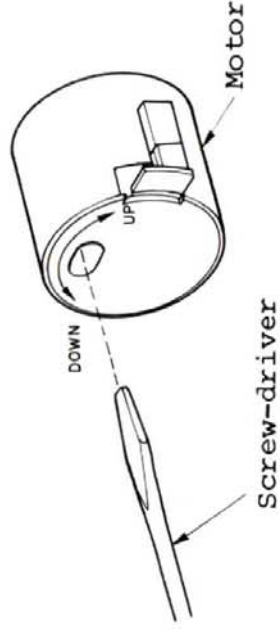


Fig. 14

6. Head Angle Adjustment

When the recording and playback head is replaced or moved at a wrong angle, use the tape MTT-115 (333/6.3 kHz) for measurement or MTT-115C (330/10 kHz) and set a playback output of the higher frequency at the maximum position in L and RCH together.

(Screws must be locked after adjustment.)

ELECTRICAL ADJUSTMENT

- Undertake adjustment when necessary after parts replacement and so forth.
- Instrument Used
 - 1) Low-frequency oscillator: 20Hz - 20kHz
 - 2) Variable resistance attenuator: 0 - 90dB or 0.1 or 0.5dB step
 - 3) AC voltmeter: 20Hz - 100kHz or more, input impedance of 100k Ω or more, capable of measuring down to -60dB (V)
 - 4) Vacuum tube voltmeter: for DC voltage measurement
 - 5) Frequency counter
 - 6) Oscilloscope
 - 7) Test tapes
- Output Unit Connection

For each of L and R channels connect a 22k Ω resistor as shown in Fig. 15 and undertake adjustment (the reason is to make the output level proper).

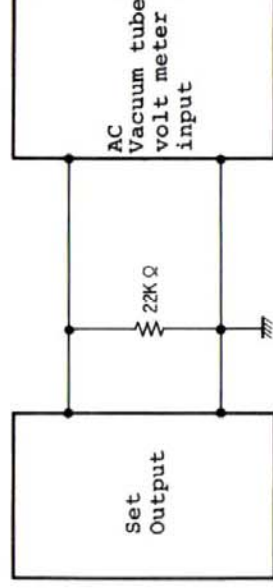


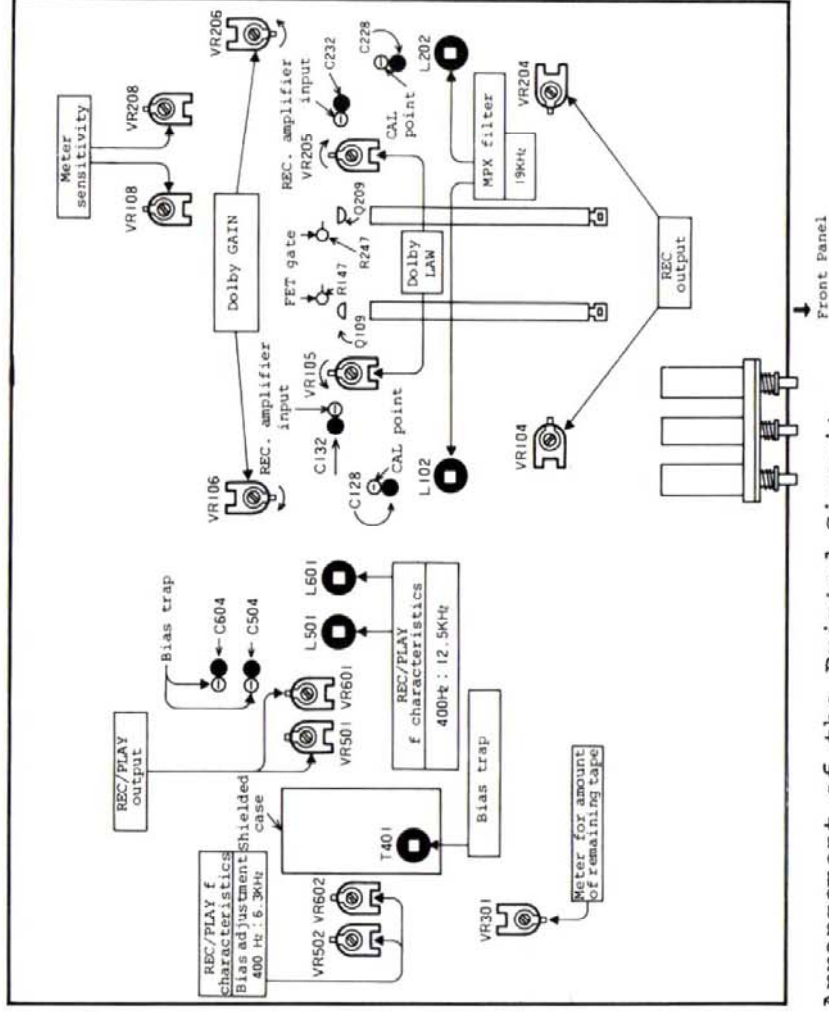
Fig. 15

- Unless otherwise specified, leave TAPE SELECT on the NORMAL side and DOLBY NR on the OUT side during adjustment.
- Selection of AC Power Source (Primary Side)
When AC power source is 240 V, be sure to use the voltage selector attached to this set in harmony with specified 240 V.

Voltage Selector



Set the voltage to the position having a cavity.



Arrangement of the Printed Circuit Board (Components) Showing Where to be Adjusted

Fig. 16

CIRCUIT ADJUSTMENT

- Note 1) Before adjustment, check to see that the head angle is right and has been cleaned well.
- 2) Unless otherwise specified, take the following steps in turn to make adjustments.
- 3) Try to adjust VR starting with approximately the center of the adjustable range.
- 4) When the REC/PLAY head is replaced, all the adjustment steps mentioned below must be taken.
- 5) When the erasing head is replaced, the bias trap, REC/PLAY f characteristics and REC/PLAY output must be adjusted.

Step	Adjustment	Adjusting Points	Adjusting Method
1	Play output	VR104 (L) VR204 (R)	<ul style="list-style-type: none"> Play back the tape MTT-150 for measuring output level and set the output of CAL Point to be 580/mV \pm0.25 dB. <p>Note: As the error measured in the above CAL point becomes double if recorded and played at Dolby IN, it must be correctly set.</p>
		(Detection Position) Between - pole of C128 (L) and C228 (R) of CAL Point and earth	
2	Meter Sensitivity	VR108 (L) VR208 (R)	<ul style="list-style-type: none"> Play back the MTT-150 (400 Hz) and set the swing of the level meter at +3 VU.
		T401 (in shielded case)	
3	Bias trap	(Detection Position) Between - poles of C504 (L) and C604 (R) and earth	<ul style="list-style-type: none"> Set the machine in a recording state. Connect the DC voltmeter between - pole sides of C504 (L) and C604 (R) and set the voltage values of L and R to a minimum (Consider the balance of L and R). <p>[The voltage is about 1 to 0.2 V.]</p>
		Steps 5 and 6 must be followed	
4	REC/PLAY characteristics (See Fig. 18)	(Bias adjustment) VR502(L) VR602(R)	<ul style="list-style-type: none"> Use SA tape (AC-511). Record a signal by -30 dB minus from +3 VU level when signals are given from LINE IN.
		L501 (L) L601 (R)	
5	REC/PLAY Output		<ul style="list-style-type: none"> Follow the Step 4. Record 400 Hz and 6.3 kHz alternately and when they are played back, set 6.3 kHz at 0 to -0.5 dB(V) against 400 Hz. (Detect at LINE OUT.) Satisfy the condition described in Step 4. Record 400 Hz and 12.5 kHz alternately and when played back, set the frequencies of both of them to be a minimum. (Detect at LINE OUT.)
		VR-501 (L) VR-601 (R)	
6			<ul style="list-style-type: none"> Satisfy the condition described in Step 4. Set the REC/PLAY output to be the same as the output (monitor level) of LINE OUT at 400 Hz while being recorded. (Detect at LINE OUT.)

Adjustment is made at Special position up to these Steps (not necessary at Normal position).

Step	Adjustment	Adjusting Points	Adjusting Method
7	MP Filter	L102(L) L202(R)	<ol style="list-style-type: none"> 1) Set them in a recording state. 2) Take out the jack (J3) leading to the PCboard from the current between terminals 1 and 3 on PC board side of the jack. (Stop oscillating bias.) 3) Give a signal of 19 kHz $\pm 1\%$ from LINE IN. 4) Minimize a signal of 19 kHz at LINE OUT in this state.
8	Dolby circuit	<p style="text-align: center;"><u>GAIN VR</u> VR106(L) VR206(R)</p> <p style="text-align: center;"><u>LAW VR</u> VR105(L) VR205(R)</p> <ul style="list-style-type: none"> ● Detection position CAL Point (See Step 1) ● Detection position REC. amplifier input Between-pole sides of C132(L) and C232(R) and earth 	<ul style="list-style-type: none"> ● Set it in a state of ① and ② described in Step 7 for MPX filter. (Stop oscillating bias.) ● Depress the Dolby switch (S8) to OUT. ● Turn GAIN VR and LAW VR together in opposite direction of the arrow printed on PC board. ● Earth for a while to adjust a part shown in Fig. 17. ● Give a signal of 5 kHz from LINE IN and set the output of CAL Point at 17.5 mV with LINE input or REC LEVEL VR. ● Adjust <u>GAIN VR</u> to rise by 10 dB ± 0.25 dB when the Dolby switch (S8) is changed to IN after detecting the output of REC. amplifier output. ● When the earth specified in Fig. 18 is plugged out, adjust <u>LAW VR</u> to fall by 2 dB ± 0.25 dB. ■ When all the above-mentioned steps have completed, take out the short-circuited terminals 1 and 3 in the case of the (2) Step of MPX Filter and insert J3 jack instead.
9	Meter for amount of remaining tape	VR301 (Set at 3010 Hz)	<ul style="list-style-type: none"> ● Run the tape (TDK AC-221) at C-60 for 3.30 minutes starting with the beginning part of the tape. ● Turn the inside out and record voice, counting from 10 to 0, for the first 10 seconds, for example, at an interval of 1 second and then make a tape which enables you to find where the remaining tape is at a position of 3.20 minutes. ● When the tape has reached the above position, set the meter to indicate the remaining 3-minute position on the scale of C-60 *upper).

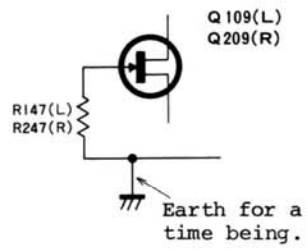


Fig. 17

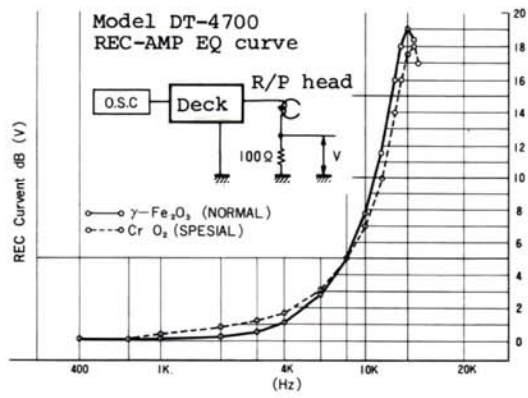
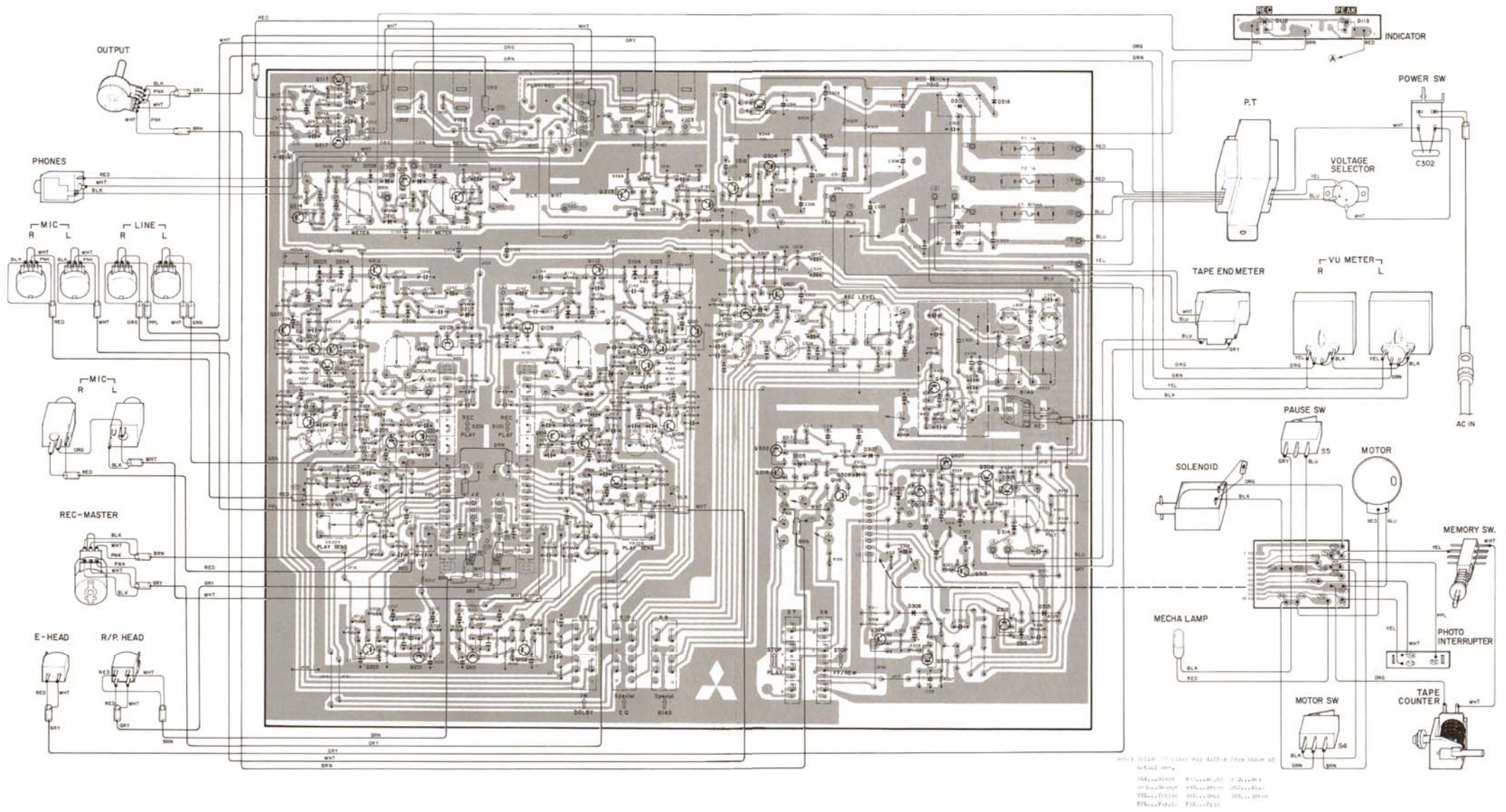
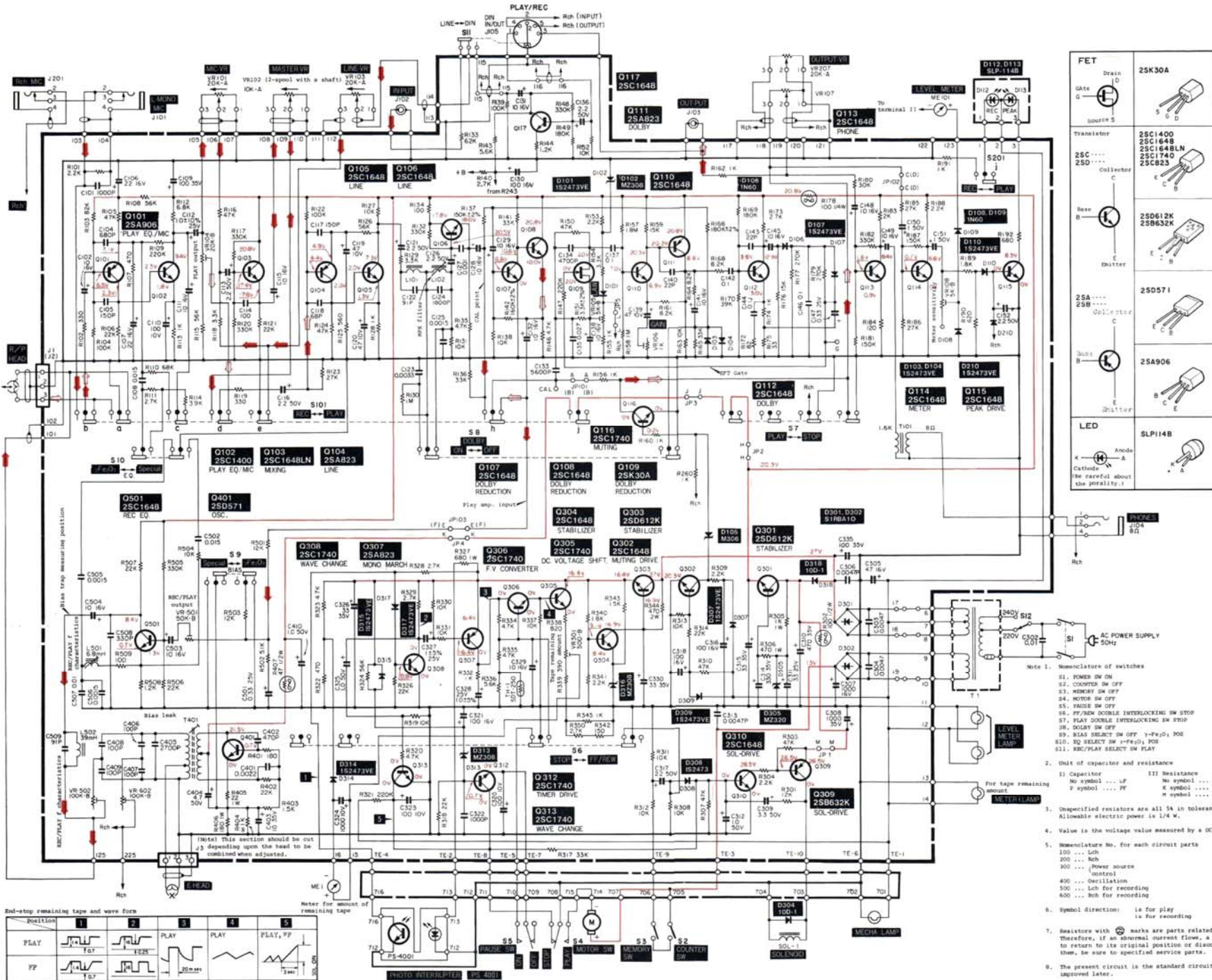


Fig. 18

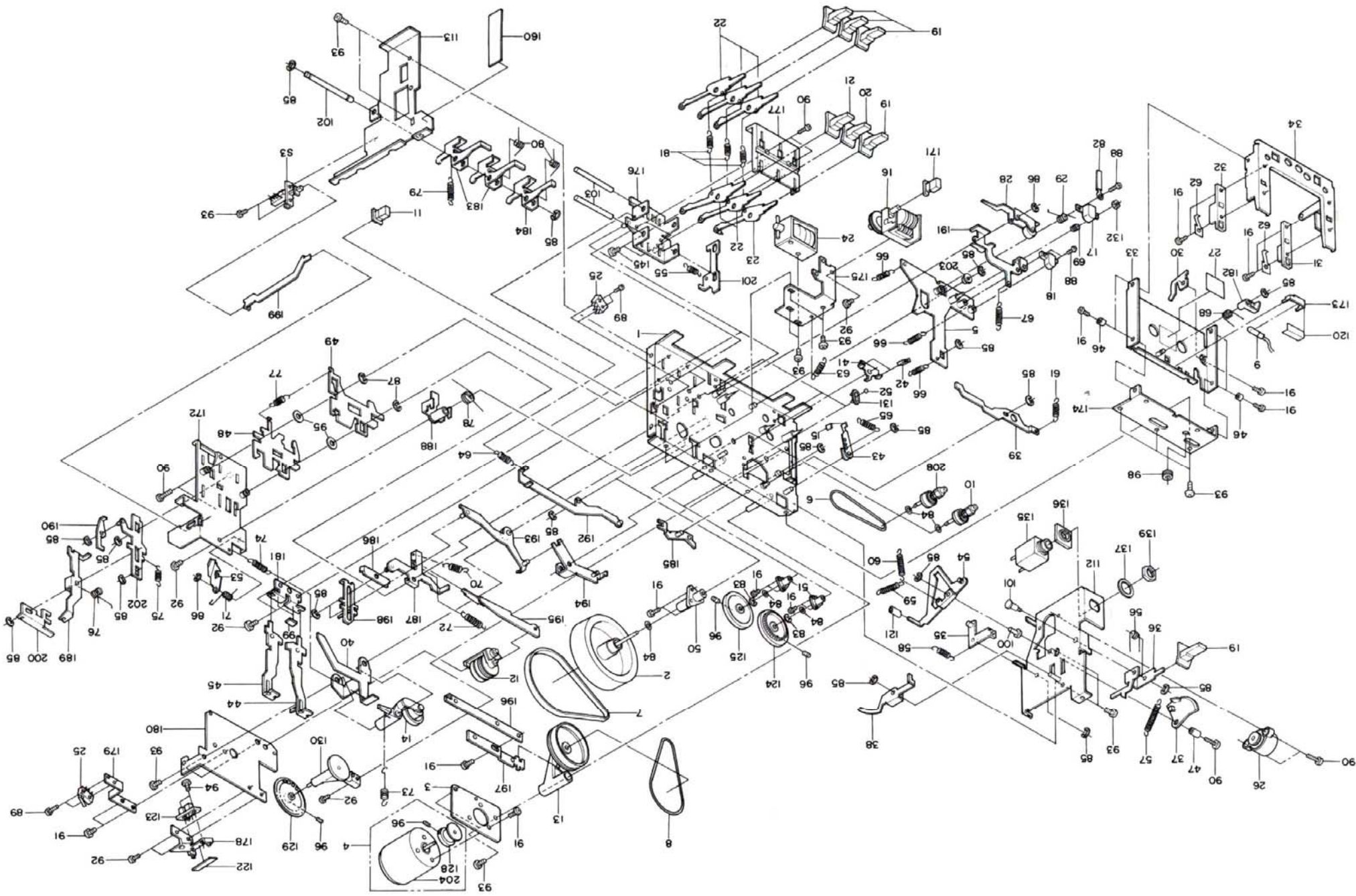




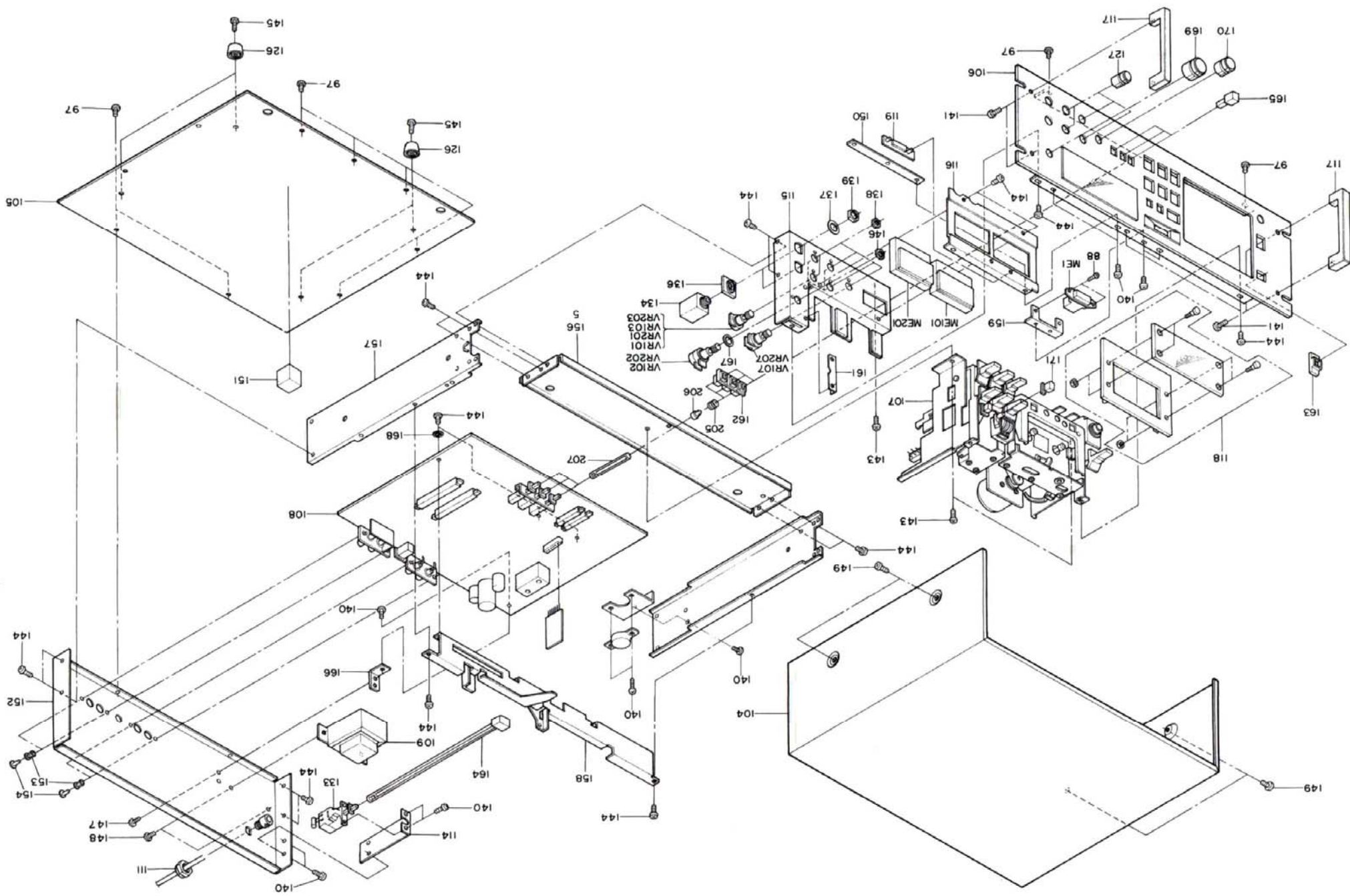
FET	Drain D Gate G Source S	2SK30A	
Transistor	Collector C Base B Emitter E	2SC1400 2SC1648 2SC1648LN 2SC1740 2SC823	
		2SD612K 2SB632K	
		2SD571	
		2SA906	
LED	Anode A Cathode K (Be careful about the polarity.)	SLP114B	

- Note 1. Nomenclature of switches
- S1. POWER SW ON
 - S2. COUNTER SW OFF
 - S3. MEMORY SW OFF
 - S4. MOTOR SW OFF
 - S5. PAUSE SW OFF
 - S6. FF/REW DOUBLE INTERLOCKING SW STOP
 - S7. PLAY DOUBLE INTERLOCKING SW STOP
 - S8. SOLAR SW OFF
 - S9. REAR SELECT SW OFF (-Fe)₀, POS
 - S10. RD SELECT SW (-Fe)₀, POS
 - S11. REC/PLAY SELECT SW PLAY
- Note 2. Unit of capacitor and resistance
- I) Capacitor: No symbol ... pF, K symbol ... nF, M symbol ... μF
 - III Resistance: No symbol ... Ω, K symbol ... kΩ, M symbol ... MΩ
- Note 3. Unspecified resistors are all 1/4 W in tolerance. Allowable electric power is 1/4 W.
- Note 4. Value is the voltage value measured by a DC 20 kΩ tester.
- Note 5. Nomenclature No. for each circuit parts
- 100 ... Lch
 - 200 ... Rch
 - 300 ... Power source control
 - 400 ... Oscillation
 - 500 ... Lch for recording
 - 600 ... Rch for recording
- Note 6. Symbol direction: is for play, is for recording
- Note 7. Resistors with ⊕ marks are parts related to safety. Therefore, if an abnormal current flows, a resistance increases too much to return to its original position or disconnection may arise. To replace them, be sure to specified service parts.
- Note 8. The present circuit is the standard circuit, which may be improved later.

EXPLODED DIAGRAM OF MECHANICAL PARTS




EXPLODED DIAGRAM OF CABINET



PARTS LIST

SYMBOL NO.	PART NO.	DESCRIPTION
D101	M07060320	Diode 1S2473VE
D102	M07133322	" MZ308
D103,D203	M07060320	" 1S2473VE
D104,D204	"	" "
D105	M05139320	" MZ306
D106,D206	M04097320	" 1N60
D107,D207	M07060320	" 1S2473VE
D108,D208	M04097320	" 1N60
D109,D209	"	" "
D110,D210	M07060320	" 1S2473VE
D112,D113	M05129321	LE Diode SLP-114B
D301	M07151320	Diode SLRBA10
D302	"	" "
D304	M04079320	" 10D1
D305	M07140320	" MZ320
D307	M07060320	" 1S2473VE
D308	"	" "
D309	"	" "
D313	M07133322	" MZ308
D314	M07060320	" 1S2473VE
D315	"	" "
D316	M07133322	" MZ308
D317	M07060320	" 1S2473VE
D318	M04079320	" 10D1
Q101,Q201	M05131316	Transistor 2SA906
Q102,Q202	M05131315	" 2SC1400
Q103,Q203	M05104310	" 2SC1648
Q104,Q204	M05104312	" 2SA823
Q105,Q205	M05104310	" 2SC1648
Q106,Q206	"	" "
Q107,Q207	"	" "
Q108,Q208	"	" "
Q109,Q209	M07068309	" 2SK30A
Q110,Q210	M05104310	" 2SC1648
Q111,Q211	M05104312	" 2SA823
Q112,Q212	M05104310	" 2SC1648
Q113,Q213	"	" "
Q114,Q214	"	" "
Q115,Q215	"	" "
Q116,Q216	M05104313	" 2SC1740
Q117,Q217	M05104310	" 2SC1648
Q301	M05131311	" 2SD612K
Q303	"	" "
Q305	M05104313	" 2SC1740
Q306	"	" "
Q307	M05104312	" 2SA823
Q308	M05104313	" 2SC1740
Q309	M05131312	" 2SB632K
Q310	M05104310	" 2SC1648

SYMBOL NO.	PART NO.	DESCRIPTION
Q311	M05104313	Transistor 2SC1740
Q312	"	"
Q313	"	"
Q401	M07228303	2SD571
Q501	M05104310	2SC1648
Q601	"	"
TH-1	M05099330	Termistor SDT-250
R178, R278	M05129471	R-Fuse-1/4W 100 Ω 
R302	M05067365	R-Fuse-1/2W 100 Ω "
R407	M07113411	R-Fuse-1/2W 47 Ω "
VR101, VR201	M05129350	VR-STD-A20K25
VR103, VR203	"	"
VR107, VR207	M05131350	VR-W-A20K25
VR120, VR220	M05131351	VR-W-A10K25
T1	M05150410	Trans Power
S1	M05113430	SW Push (POWER)
S3	M05131431	" (MEMORY)
S4, S5 (25)	M05129431	SW-Micro
S6, S7	M05085435	SW Slide (FF, REW, PLAY)
S8, S9, S10	M05131430	SW Push (DOLBY, EQ, BIAS)
S101, S201	M05067430	SW Slide (R/P)
J101, J201	M05129447	Jack (MIC)
J105	M05104441	" (HEADPHONE)
ME1	M05131400	Meter
ME101, ME201	M05130400	" (LEVEL)
F1, F2	M05110472	Fuse 1A SEMKO
F3	M05110471	" 800MA SEMKO

EXPLODED DIA. NO.	PART NO.	DESCRIPTION
2	M05104520	Flywheel
6	M05104552	Belt (COUNTER)
7	M05131550	" (MOTOR)
8	M05104550	" (FF.REW)
9	M05131490	Lamp
10	M05104525	Reel Rest Ass'y
11	M05131216	Knob Ass'y (MEMORY)
13	M05104543	Pulley Ass'y (FF/REW)
16	M05131404	Counter
17	M05104830	Head (REC/PLAY)
18	M05104831	Head (ERASE)
24	M05131390	Solenoid
26	M05131621	Gear Ass'y
28	M05104544	Pinch Lever Ass'y
57	M05131560	Spring-W (EJECT)
118	M05150111	Cover Ass'y
123	M05131314	Photo Interrupter PS4001
124	M05131540	Pulley
125	M05104541	"
126	M07215195	Leg
127	M05131212	VR Knob (LINE, MIC)
130	M05131620	Gear Ass'y
164	M05131213	Knob Link Ass'y (POWER)
165, 205, 206	M07215214	Knob Ass'y (DOLBY, BIAS, EQ)
169	M05131210	VR Knob (REC, MASTER)
170	M05131211	" (LINE, MIC)
171	M05131215	Knob Ass'y (RESET)
204	M05149500	Motor
208	M05131525	Reel Rest Ass'y
	M07050470	Lead (L+R for Connection Cord)

