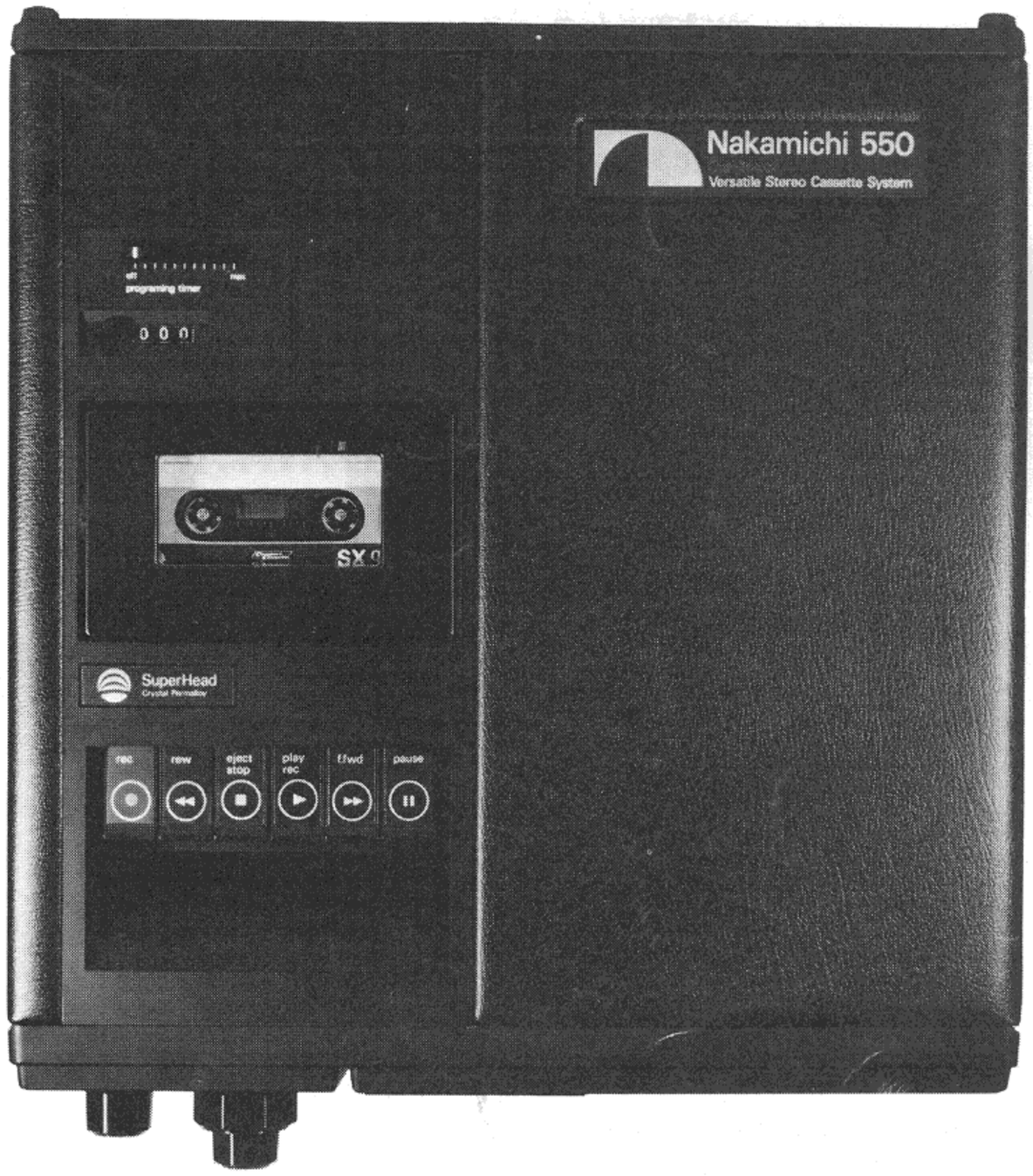
Nakamichi

Service Manual

Nakamichi 550

2 Head Cassette System



CONTENTS

1. GENERAL

This is the second issue of the Nakamichi 550 Service Manual and applies to the Models bearing serial Nos. 3659471 and greater (for SX tape). Refer to chaper 12 "History on 550" for the Models bearing serial Nos. 3659470 and smaller for (Cr02 tape).

2. PRINCIPLE OF OPERATION

2.1. Tape Alarm and Shut-off Circuit

Refer to Fig. 2.1 circuit diagram.

This circuit has functions of shut-off detection, tape alarm indication, and a footage meter drive. The shut-off detection functions when the tape reaches an end during Play, F.F., or REW. The tape alarm LED displays intermittently when the tape residue reduces the volume set by the 550 Program Timer Knob. The footage meter indicates the tape residue.

During Play, F.F., or REW., the counter pulley linked to a take-up reel turns and switches a reed switch ON/OFF repeatedly by means of two magnets mounted in the pulley.

Since the tape speed is constant, the take-up tape diameter (tape residue) is directly proportional to the period of the reed switch ON/OFF operation as shown in Fig. 2.2.

Therefore, if a voltage in proportion to the reed switch ON/OFF period is obtained, the voltages at the beginning and end of tape, V_{BOT} and V_{EOT}, are respectively constant. Accordingly, the residue of a tape during its winding can always be determined by the voltage.

Each time the reed switch turns from ON to OFF, a positive differentiated pulse is impressed on the base of transistor Q906 through the capacitor C905, bringing Q906 to ON.

On the other hand, when Q906 is OFF, C906 and C907 will be charged from the current source Q905 with a constant current linearly according to $V=\frac{1}{C}$ It. Although C906 will discharge with the Q906 turned ON, C907 is prevented from discharging by the diode D905. Namely, D905 and C907 constitute a peak detector circuit, which serves to hold the voltage (Vin) corresponding to the reed switch ON/OFF period.

Q907, 908, and 909 make up a current amplifier which generates the voltage Vout corresponding to Vin.

Corresponding on Vout, the circuits function as follows:

Tape Alarm:

When Vout exceeds the voltage determined by the position of the Program Timer Knob (SV901 100 Kohm), Q911 and Q910 turn ON, thus illuminating the tape alarm LED display. With the reed switch turned ON, however, the display become intermittent, since the Q910, pulled to the GND side through diode D907, is turned OFF.

Footage Meter:

This meter indicates a tape residue, in response to the Vout.

Shut-off:

When ON/OFF operation of the reed switch stops at a tape end, Vin, i.e., Vout, increases beyond the shut-off threshold voltage (approximately 13.5V) that is determined by R926 and R927. Thus the Q912 is turned ON, and the shut-off signal is transmitted to the solenoid driver circuit.

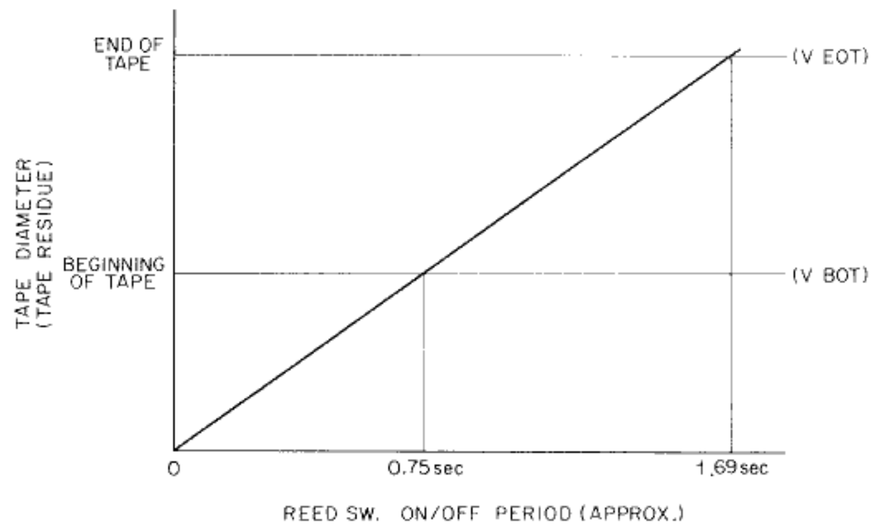


Fig. 2.2

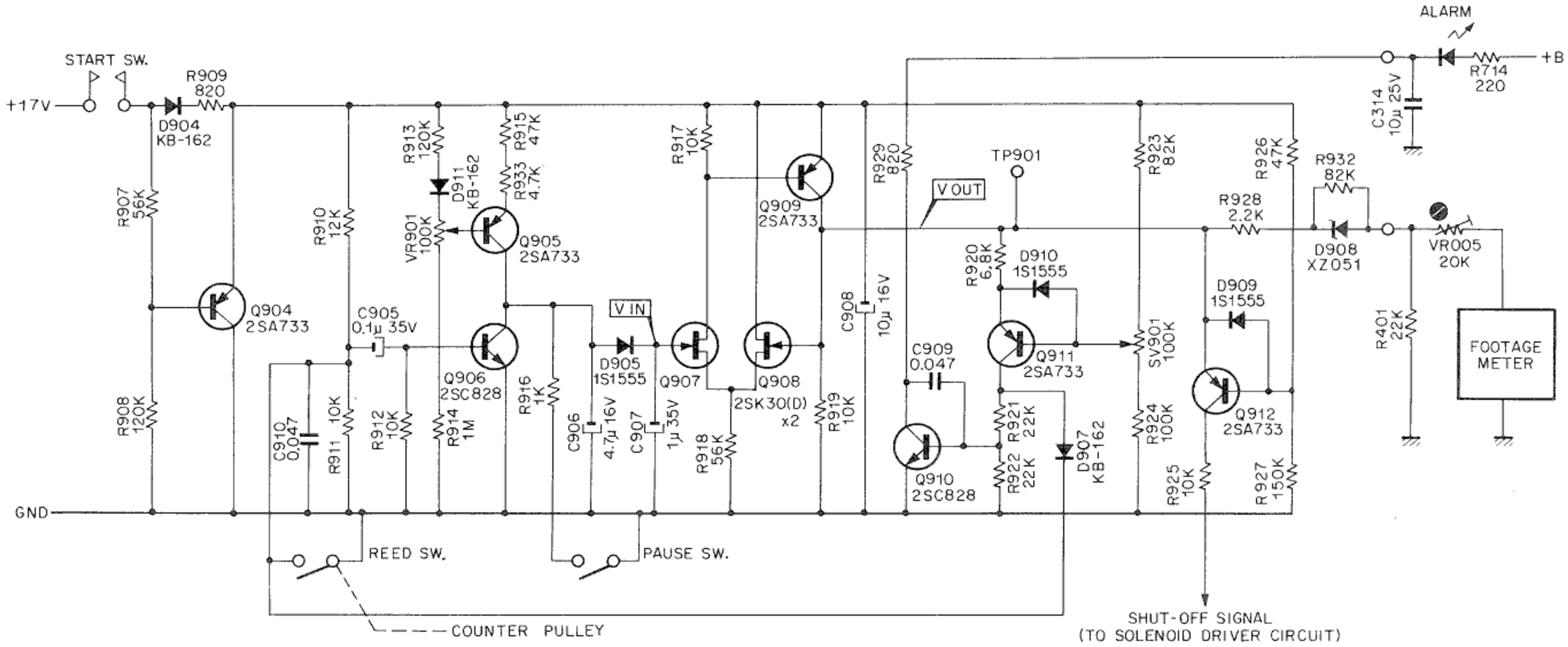


Fig. 2.1

2.2. Solenoid Driver Circuit

Refer to Fig. 2.3. circuit diagram.

Tape End

When Q912 in the shut-off circuit goes ON at a tape end, a positive differentiated pulse is impressed on the Q903 base through the C914, thus bringing Q903 to ON. Q903 causes the base current of Q902 to flow, turning Q902 ON, while supplied with the base current by Q902. Namely, Q903 and Q902, composing a memory circuit, are turned ON by a trigger of the shut-off siganl.

With the Q902 turned ON, the charge of C902 (1000 μF) is discharged through the solenoid coil, and thus the solenoid is driven, releasing the Play, F.F., or REW. buttons. As a result, the start switch is released, cutting off the DC power supply to all mechanism, and stopping the motor.

Power Off

When the AC power supply of 550 is turned OFF, the shut-off operation is automatically performed.

C902 (1000 μF) is slow to discharge because of the diode D901.

On the other hand, since the power source is quick to discharge, the R901 is pulled toward GND side equivalently, leading the Q901 to ON.

Accordingly, the Q902 is tuned ON, and the discharge current of the C902 actuates the solenoid to perform the shut-off operation.

2.3. DC-to-DC Converter

Refer to Fig. 2.4 circuit diagram.

Based on the input on the primary from the 6—12V DC cell, a secondary regulated 17V DC voltage can be obtained. The conversion efficiency is approximately 90%.

When a pulse input is impressed on the base of a transistor Q in the basic DC-to-DC converter circuit diagram as given Fig. 2.5, the Q repeats an ON/OFF operation. With the Q turned ON, a current flows through the coil L, and some electromagnetic energy is stored in it. When the Q is turned OFF, this energy is discharged through the diode D to the secondary side (R,C).

In this way, the secondary voltage is kept at a higher value than the primary voltage. Moreover, when the pulse frequency input to the Q is changed, the amount of energy stored in the L will be changed and thus the secondary voltage can be varied, (the voltage decreases with the increasing frequency).

In the circuit diagram, Q301-Q302 constitutes a non-stable multivibrator, in which Q302 will be turned ON/OFF with a certain frequency. On the other hand, the zener diode D304 and the transistor Q303 serve to feedback the secondary voltage fluctuation to the primary side (Q301 base) and change the frequency of the multivibrator in order to maintain the secondary voltage constant.

The following are the descriptions on the principle of the Nakamichi's unique system which permits a higher conversion efficiency (about 90%) against the conventional system (70—75%). The key point involved in this system is the use of a current transformer CT301.

Conventional System without CT:

If the peak value of the current flowing through the coil (i.e. Q302 collector current), is taken as Ip under the condition of Q302 turned ON and if the current amplification degree of the Q302 is h_{FE}, a larger base current than Ip/h_{FE} will be required for the Q302 to reach its saturation. Therefore, the base resistor R303 must be small, and the power loss in the R303, during ON-period of the Q302 is equal to $B^2/R303$, resulting in reduction of the conversion efficiency due to the increase of loss on the primary side.

On the other hand, Q302 arranged in a Darlington connection allows a smaller base current; however, with Q302 turned ON, this connection produces a collector-emitter voltage of around 1V — equivalent to the reduction of the effective primary voltage — thus reducing the conversion efficiency.

New System with CT:

CT301 is connected between the collector and base of Q302, with a turn ratio in the almost same degree as the Q302's h_{FE}.

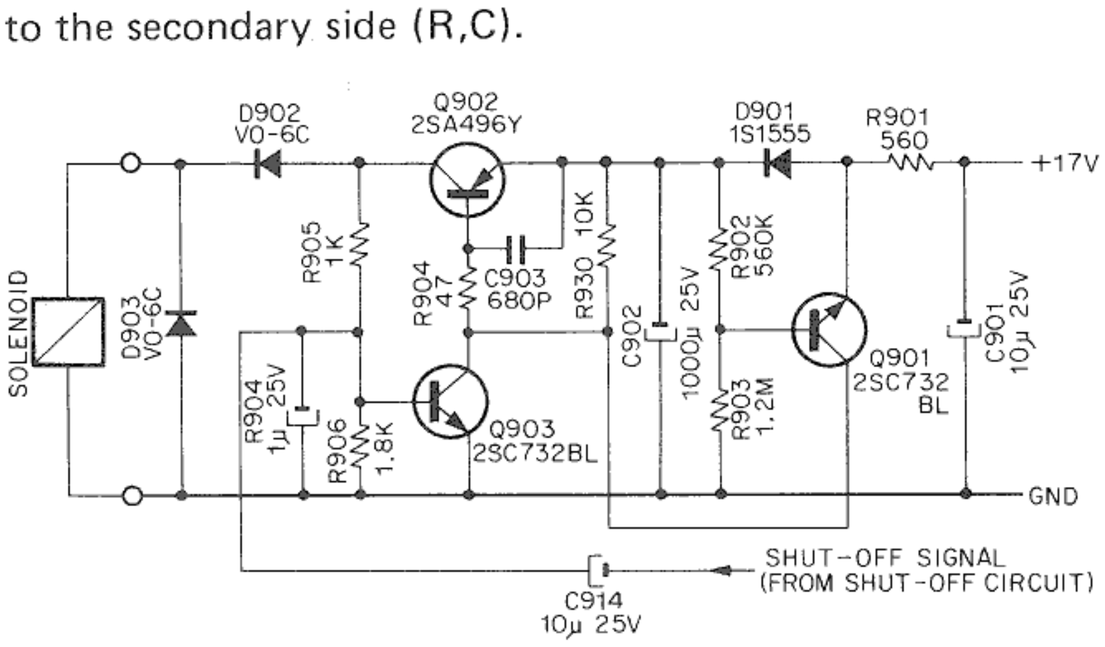


Fig. 2.3

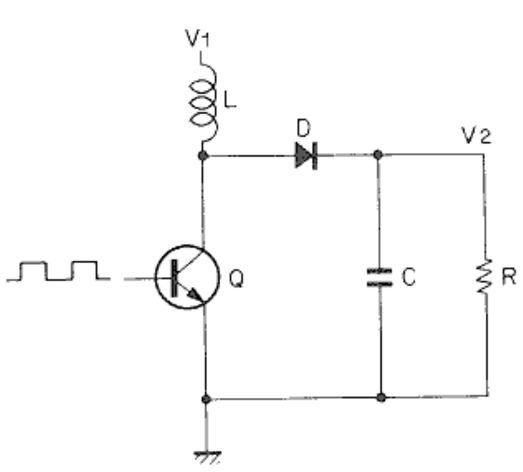


Fig. 2.5

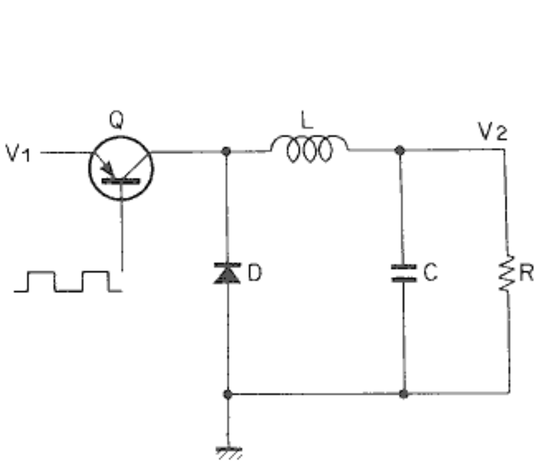


Fig. 2.6

When Q302 is ON, the current flowing in the coil and the primary side of CT301 (i.e. Q302 collector current : Ic) increases gradually from 0.
On the other hand, a current of $1/h_{FE}$ of the primary current (Ic) flows through the secondary side of CT301, and into the Q302 base. Therefore, Q302 is given via CT301 a sufficient base current for saturation. The small base current flowing through the Q302-base-resistor R303 leads to the very small power loss in R303.
The ON/OFF repetition frequency of Q302 is several-ten kHz.

2.4. Motor Governor

Refer to Fig. 2.4 circuit diagram.
For F.F. or REW. operation, the voltage of the PP301 terminal No. 1 is supplied to the motor and for playing operation, the voltage of the terminal No. 2 is supplied through the governor shown in the lower part of the drawing.
During Play, a feedback signal proportional to the motor revolution is input from the terminal No. 0 to the Q308 base. This signal is fed to the Q316 base of the differential amplifier (Q316-Q317) through the monostable multivibrators (Q309-Q310, Q311-Q312).
On the other hand, the Q317 base is connected to the motor supply voltage and the collector current controls the frequency of the non-stable multivibrator in the descending-voltage-type DC-to-DC converter, which determines the voltage fed to the motor.

The following is an explanation on the descending-voltage-type DC-to-DC converter employing the current transformer CT302.
To control the motor speed, it is necessary to supply a proper voltage to the motor. In the conventional system where the supply voltage is controlled by connecting a power transistor in series with the motor, there is a power loss in the form of thermal energy dissipated by the transistor, the amount of which is equal to the product of the collector current and the voltage difference between the power source and the motor terminals.
The 550 descending-voltage-type DC-to-DC converter performs a voltage conversion with very small power loss.
When in the basic circuit as given Fig. 2.6 the Q is turned ON, the voltage V_1 minus V_2 applied between both ends of the coil L leads to a current flow through the coil and some electromagnetic energy is stored in it.
When the Q is turned OFF, the energy stored in the L is supplied to the secondary side (R,C) through the diode D. Namely, on the secondary, the current increases in amount that corresponds to the voltage drop. Theoretically, this signifies a voltage conversion without power loss. CT302 functions in the same manner as described above and permits an extremely small power loss dissipated by the base resistor R345.
The ON/OFF frequency of Q321 varies with supply voltage to the motor in the range of 60 kHz – 150 kHz.

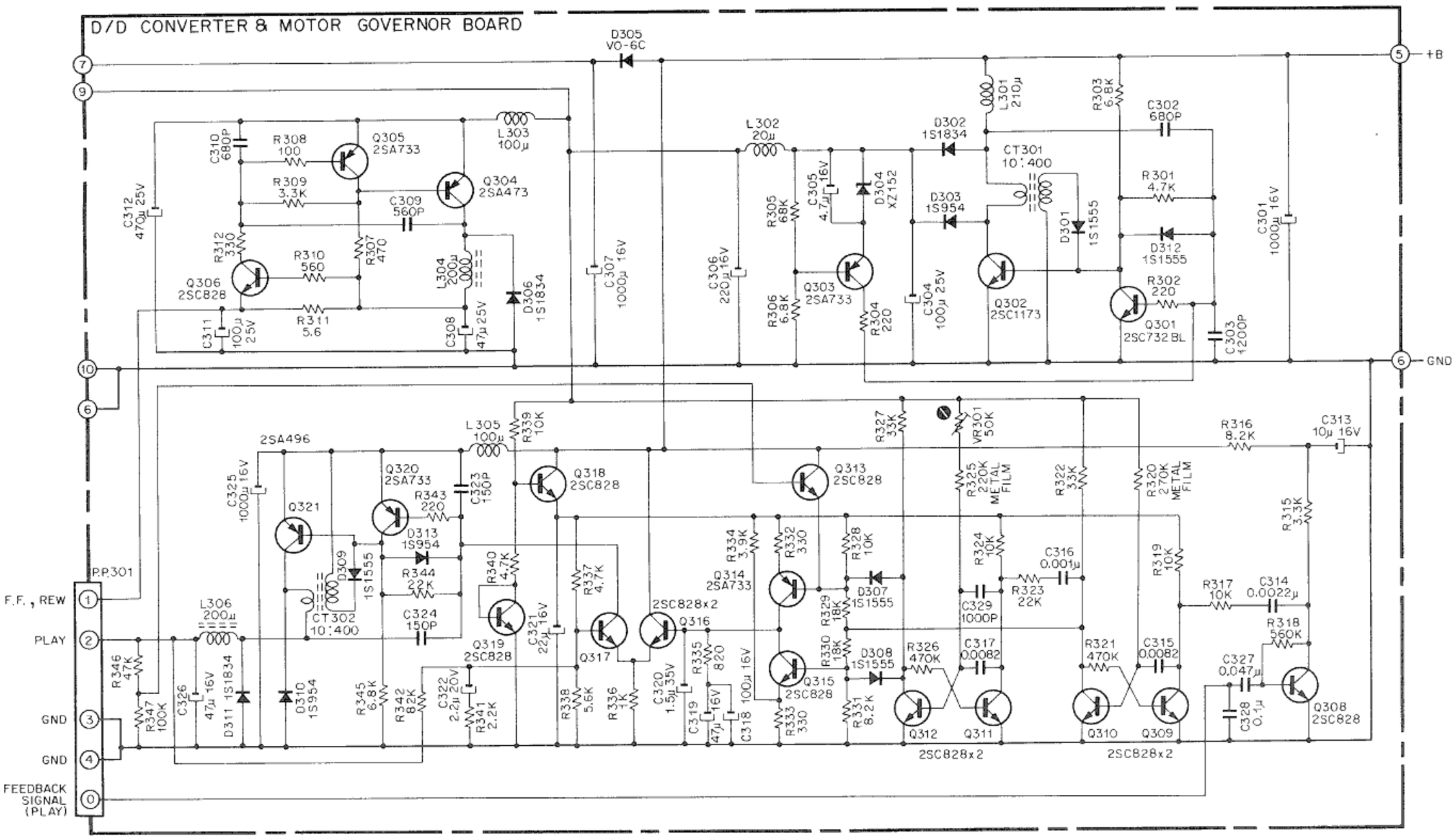


Fig. 2.4

3. CABINET DISASSEMBLY INSTRUCTIONS

Refer to Fig. 3.

(1) Remove 4 screws from the upper Case 3.
(2) Remove the Upper Case 3.
(3) Remove 8 screws from the Bottom Case 6.
(4) Remove the Bottom Case 6 and the Case Spacer 7.
(5) Remove 6 screws from the Rear Panel 10.
(6) Remove the Rear Panel 10.
(7) Remove control Knobs 11 through 15 from the Front Panel 17.
(8) Remove 4 screws from the Front Panel 17.
(9) Remove the Front Panel 17.
(10) Remove Program Timer Knob 18 from the Deck Panel 21.
(11) Remove 4 screws from the Deck Panel 21.
(12) Remove the Deck Panel 21.

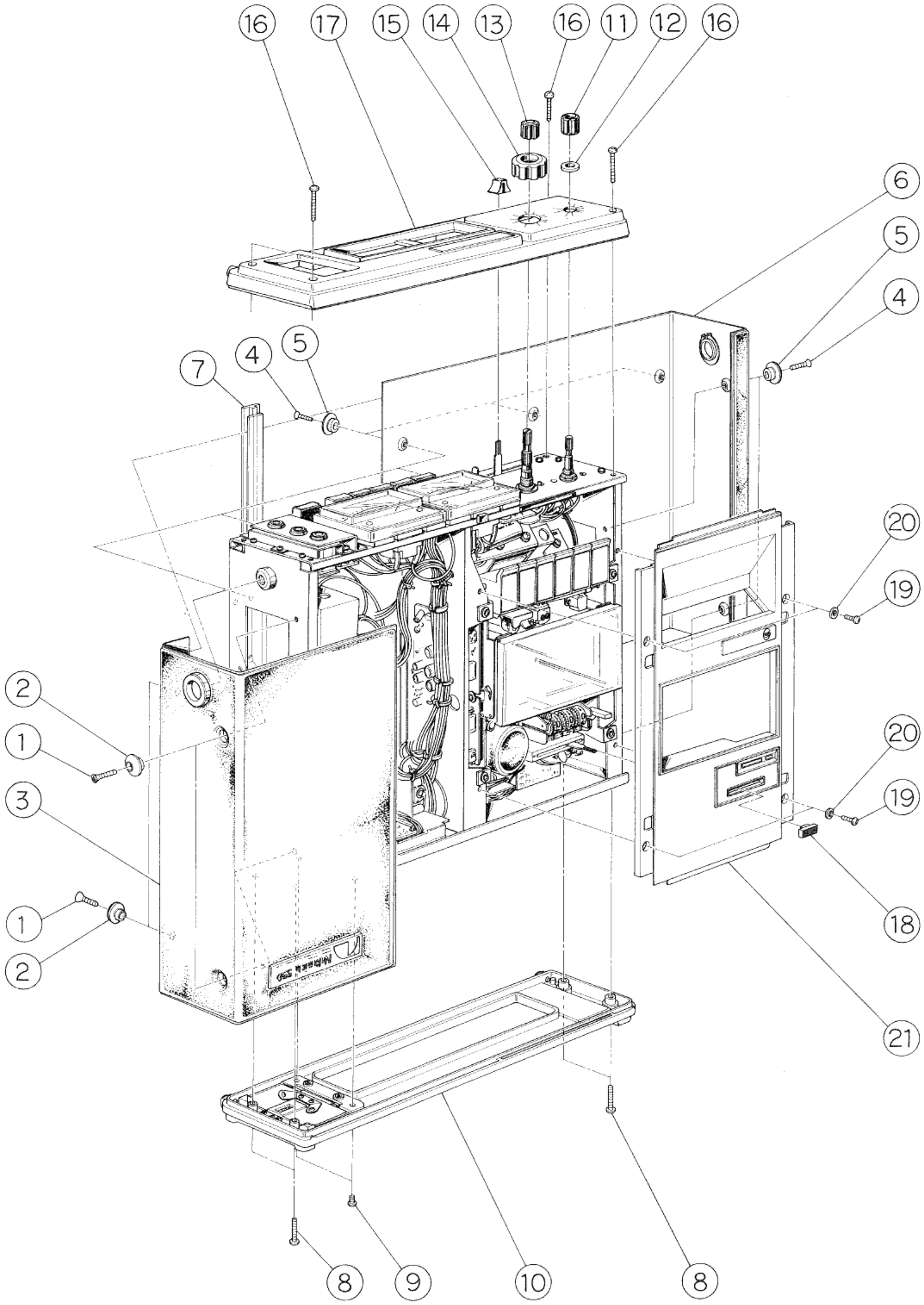


Fig. 3

4. MECHANICAL ADJUSTMENTS

4.1. Take-up Torque and Rewind Torque Adjustment

Refer to Fig. 4.1.

(1) Remove top and bottom cabinets of the cassette recorder.
(2) Remove cassette case.
(3) To adjust torque, move Torque Plate as shown in the figure.
(4) The Take-up Torque should be 45±10g-cm.
(5) The Supply Torque should be 35 to 60g-cm.

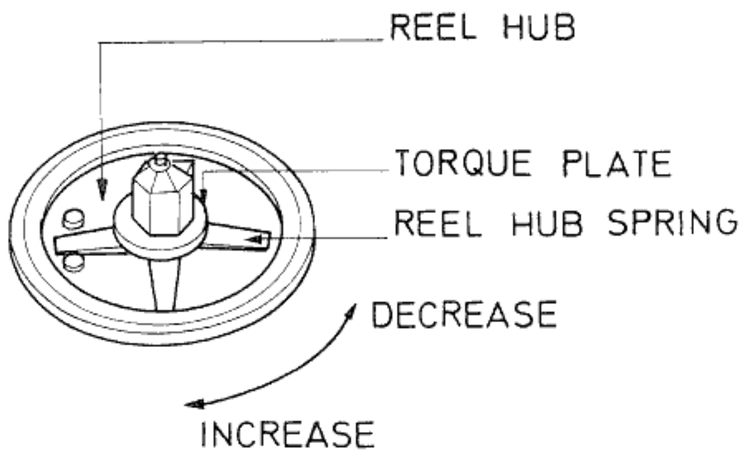


Fig. 4.1

4.2. Record/Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 4.2.

(1) Connect a VTVM to PLAYBACK output jack.
(2) Load the 1KHz Track Alignment Tape (DA09007A) for adjusting the head height.
(3) Insert the Tape Guide Adjuster (0D09001A) into each hole of the tape guide beside the head. Adjust the jig for minimizing each output signal of the right and left channels.
(4) Load the 15KHz Azimuth Tape (DA09004A) for azimuth alignment.
(5) Adjust the azimuth alignment screw for maximizing each output signal of the right and left channels.

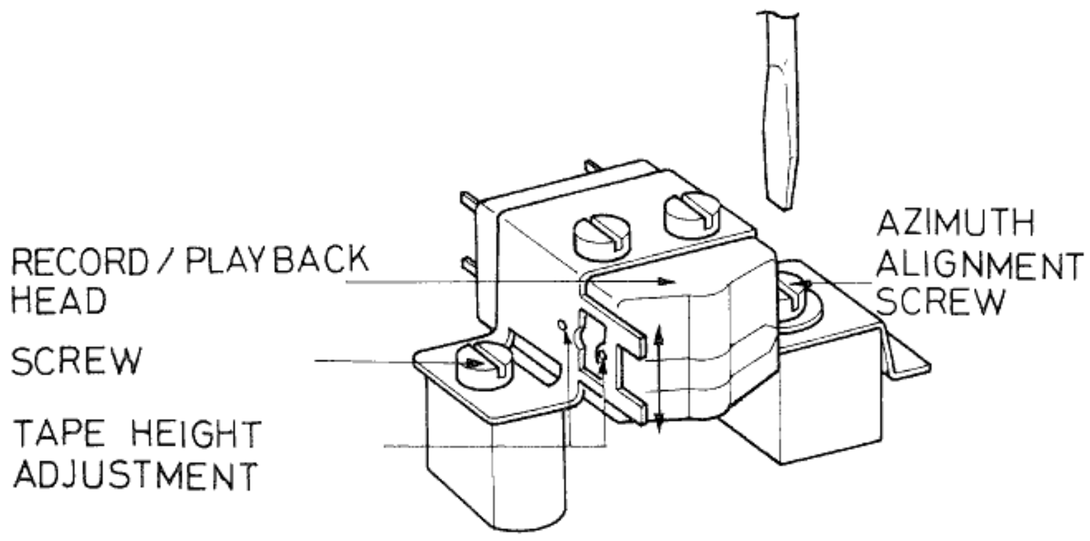


Fig. 4.2

4.3. Tape Speed Adjustment

Refer to Fig. 4.3.

(1) Connect a frequency counter either to the left or right PLAYBACK output jack.
(2) Load the 3KHz Speed Wow Flutter Tape (DA09006A) and play it back.
(3) Adjust the Tape Speed Adjust potentiometer (accessible from the rear apron of the cassette recorder) for an average reading of 3KHz on the frequency counter.

Caution: The above procedures require the use of a frequency counter to accurately set the tape speed. Any other methods used for speed determination may result in an appreciable significant speed error.

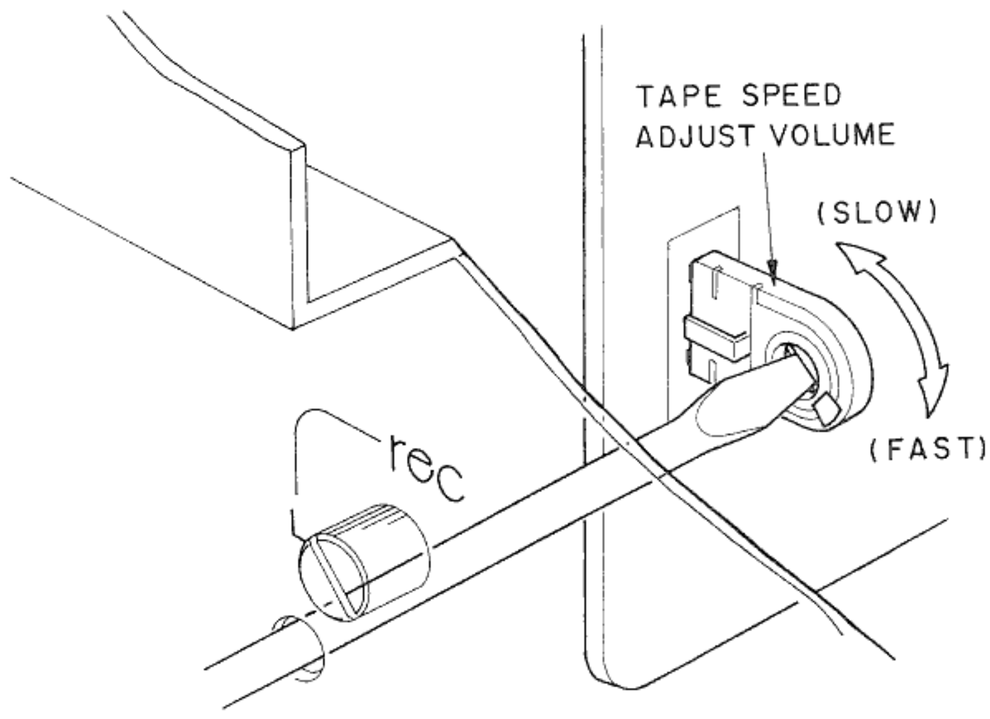


Fig. 4.3

4.4. Automatic Push Button Release Adjustment

Refer to Fig. 4.4

Adjust the location of the solenoid with the screw so that the Push Button key can automatically be released when the tape comes to an end in RECORD mode.

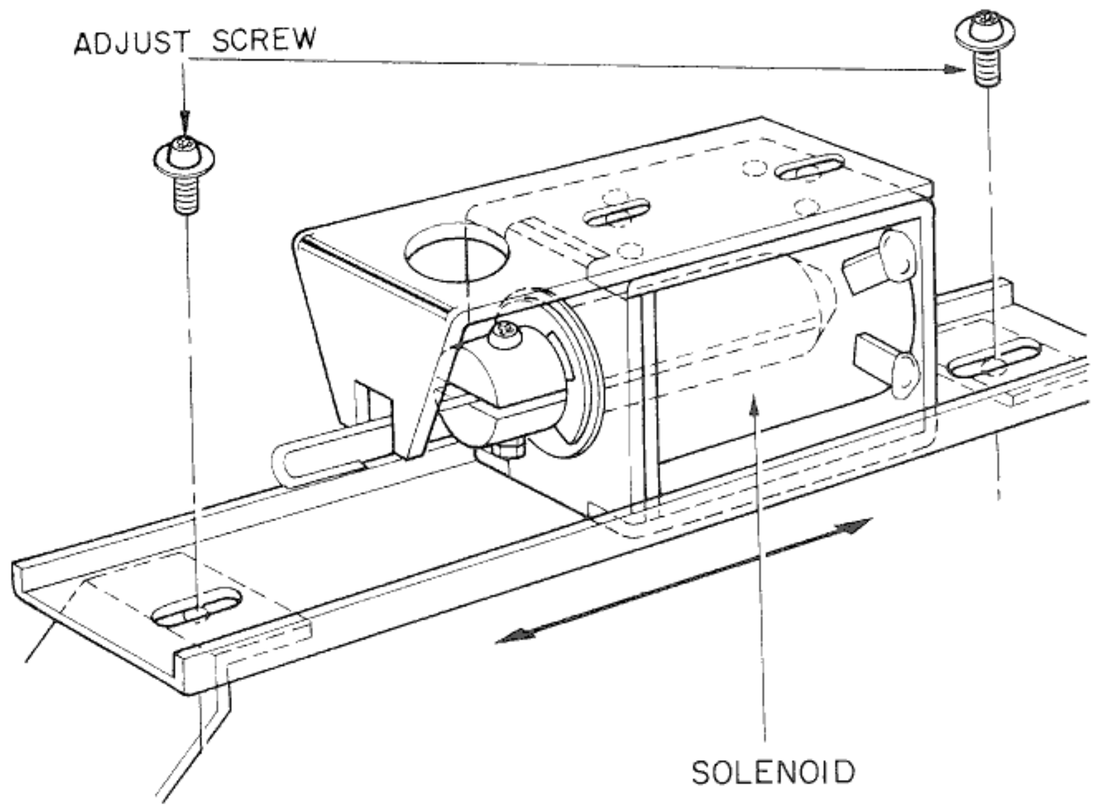


Fig. 4.4

4.5. Belt Travelling Adjustment

Refer to Fig. 4.5.

(1) Adjust the motor pulley position, then check to insure whether the drive belt is travelling along the correct position and also staying at the correct position, i.e. the center part of the motor pulley and idler pulley without contacting the belt guide at the following modes.
Playback, F.F., REW, F.F. to Stop, REW to Stop

(2) In case motor pulley is tilting, insert spacers into A, B (when belt slips upward on the motor pulley) or C (when belt slips downward).

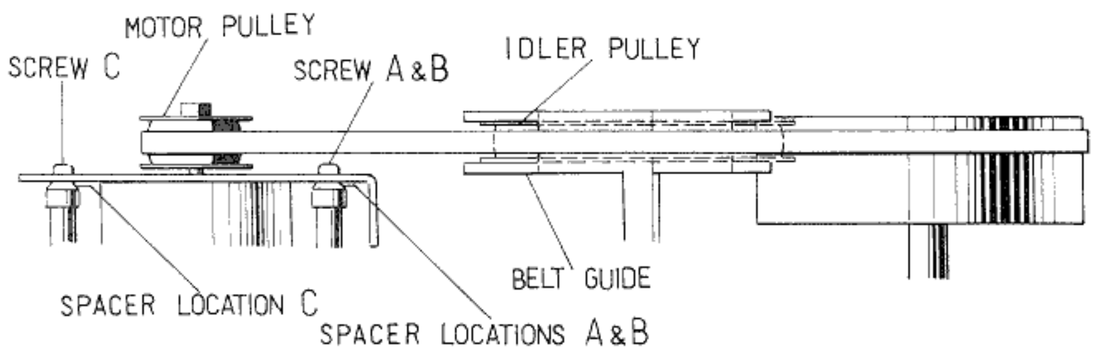


Fig. 4.5

4.6. Flywheel Adjustment

Refer to Fig. 4.6. Adjust the flywheel clearances should be 0.05 to 0.1mm. After adjustment, lock the lock nut.

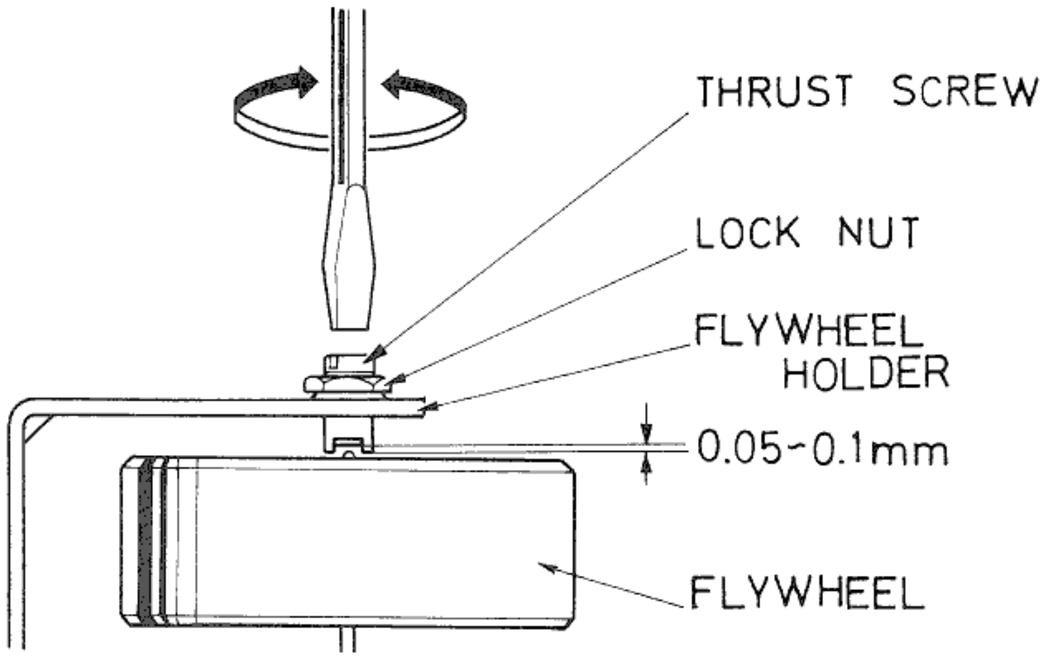


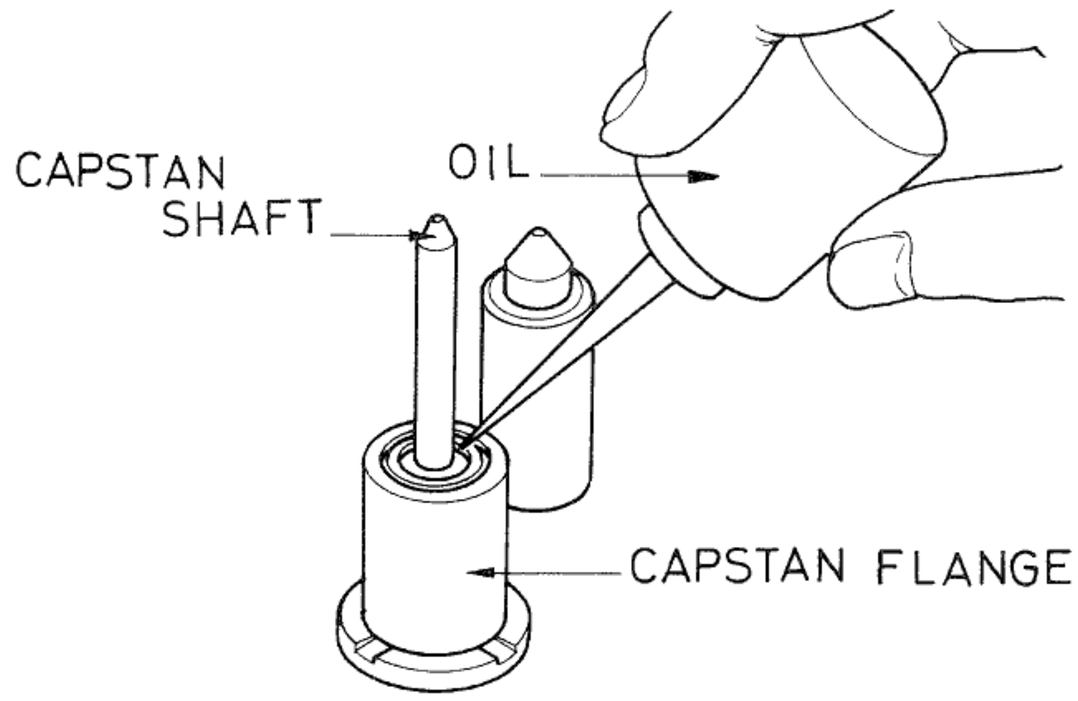
Fig. 4.6

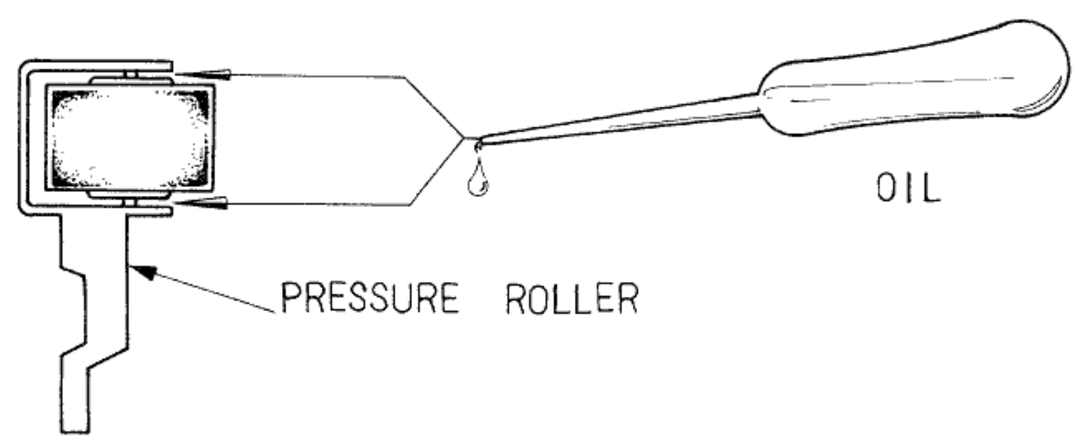
4.7. Lubrication

Refer to Fig. 4.7.

After 500 hours of use apply a few drops of light machine oil (LAUNA No. 40) between capstan and capstan bearing and to the pressure roller.

Note: If oil is applied to the capstan shaft and other drive mechanisms, clean it off with an alcohol-dipped cloth. When flywheel or flywheel holder is replaced apply a few drops of grease to the flywheel holder.





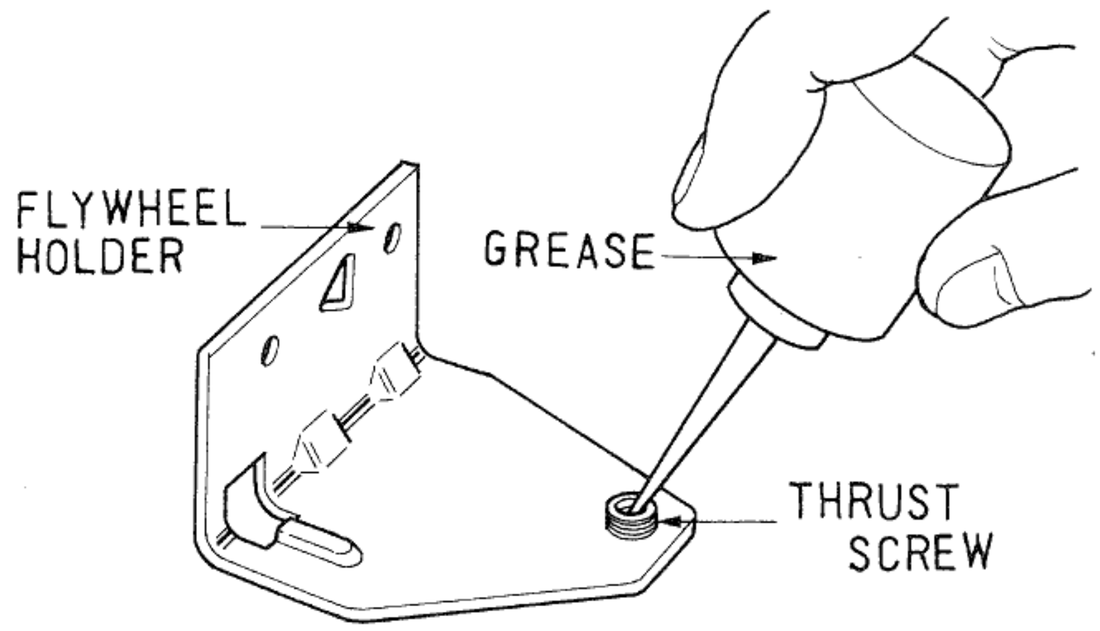


Fig. 4.7

5. ELECTRICAL ADJUSTMENTS

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST	REMARKS
1	Tape Speed	3 KHz Speed & Wow/Flutter Tape (DA09006A)	Wow/Flutter Meter or Frequency Counter to OUTPUT Jack	Playback	Motor Governor PCB VR301	Adjust VR301 to obtain 3 KHz
2	Head Azimuth Alignment	15 KHz Azimuth Tape (DA09004A)	VTVM to OUTPUT Jack	Playback	Azimuth Alignment Screw	Adjust the Screw to obtain maximum reading on the VTVM
3	Playback Output Level	400 Hz Level Tape (DA09005A)	Same as above	Playback	Main PCB VR101 VR201	Adjust the VR101,201 to obtain 580mV on the VTVM
4	Meter Level	400Hz, test tone SW601 : ON	Same as above	Record Pause	400Hz OSC, PCB VR601 Main PCB VR103 VR203	1. Adjust VR601 to obtain 580 mV on the VTVM 2. Adjust VR 103, 203 to obtain 0 dB on the level meters
5	MPX Filter	19 KHz to INPUT Jack	VTVM to OUTPUT Jack	Record Pause	Main Board L102 L202 MPXSW;ON	Adjust the Coils to obtain minimum reading on the VTVM
6	Record Amplifier Equalizer	17 KHz to INPUT Jack	VTVM across Q106, 206 Collector & Ground	Record Pause	Main PCB L103 L203	Adjust the Coils to obtain peak readings at 17 KHz~19 KHz Note: Stop Bias Oscillation
7	Bias Frequency	105 KHz Generator Signal to Oscilloscope Horizontal Terminal	Bias Oscillator Signal at Erase Head to the Scope Vertical Terminal	Record Pause	Main PCB L302	Adjust the Coil until a circle pattern appears on the Oscilloscope
			Coupling Erase Head to Frequency Counter	Record Pause	Main PCB L302	Adjust the Coil to obtain 105 KHz on the Frequency Counter
8	Bias Trap		VTVM across Q106, 206 Collector & Ground	Record Pause	Main PCB L104 L204	Adjust the Coils to obtain minimum reading on the VTVM
9	Recording Bias Current	Test tone or 400Hz to INPUT Jack	VTVM to OUTPUT Jack	Record & Playback	Main PCB VR301 VR302 VR303 VR304	1. Adjust VOL001, 002 Record Input Level Controls to obtain 0 dB on the Level Meters 2. Record the signal on blank tape and palyback 3. Repeating Step 2 adjust VR 303, 304 to obtain maximum output on the VTVM (EX) 4. Repeating Step 2 adjust VR301 302 to obtain maximum output on the VTVM (SX)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST	REMARKS
10	Record/ Playback Output Level	Test tone or 400Hz to INPUT Jack	VTVM to OUTPUT Jack	Record & Playback	REC. CAL. PCB VR001 VR002 VR003 VR004	1. Adjust VOL001, 002 Record input Level Controls to obtain 0dB on the Level Meters 2. Record the signal on blank tape and playback it 3. Repeating Step 2 Adjust VR003, 004 to obtain 580mV on the VTVM (EX) 4. Repeating Step 2 Adjust VR001, 002 to obtain 580mV on the VTVM (SX)
11	Limiter Level	1KHz, 0.5V to INPUT Jack	VTVM to OUTPUT Jack	Record Pause	Main PCB VR102 VR202	1. Adjust VOL001, 002 Record Level Controls to obtain +4dB on the Level Meters. 2. Set Limiter SW to ON position. 3. Adjust VR102, 202, so that the Output Level may be decreased by 1dB.
12	Tape Alarm	C-60 Tape	DC Level Meter to Test Point TP901 (Alarm B PCB)	Playback	Alarm B PCB VR901	1. Rewind the tape until it reaches the beginning of winding. 2. Playback the tape. 3. Adjust VR901 to obtain 3.4V DC at the Test Point.
13	Tape Footage	C-60 Tape		Playback & Meter SW. to CHECK	Tape Footage VR005	1. Push the meter SW. to CHECK side 2. Playback the tape 3. Adjust VR005 to obtain 100% on the left channel meter before 5 ~ 10 seconds the C-60 tape taken supply fully.

DOLBY CIRCUIT ALIGNMENT PROCEDURE

(1) Turn LAW Control VR101, 201 fully counterclockwise.
(2) Turn GAIN Controls VR102 and VR202 fully counterclockwise.
(3) Set Dolby Switch (IN-OUT) to OUT position and ground FET Gate Terminal with a jumper wire.
(4) Connect an AC VTVM to METERING Terminal 3 for the Right channel or 12 for the Left channel.
(5) Apply 5KHz signals having a proper level to INPUT Terminal 2 for the Right channel or 13 for the Left channel, so that the VTVM reads 17.5mV in each channel.
(6) Remove the VTVM from Terminal 3 or 12 and reconnect it to OUTPUT Terminal 6 or 9. Note the output voltage on VTVM.
(7) Set DOLBY Switch to IN position and adjust GAIN Controls VR102 and 202, so that the VTVM indicates 10dB over the noted voltage in Step (6).
(8) Set DOLBY Switch to IN position. Note the voltage at OUTPUT Terminal 6 for the Right channel or 9 for the Left channel.
(9) Remove the jumper wire from the FET Gate Terminal. Adjust the LAW Controls VR101 and VR201, so that the voltage at OUTPUT Terminals 6 and 9 read 2dB below the noted voltage in Step (8).

6. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

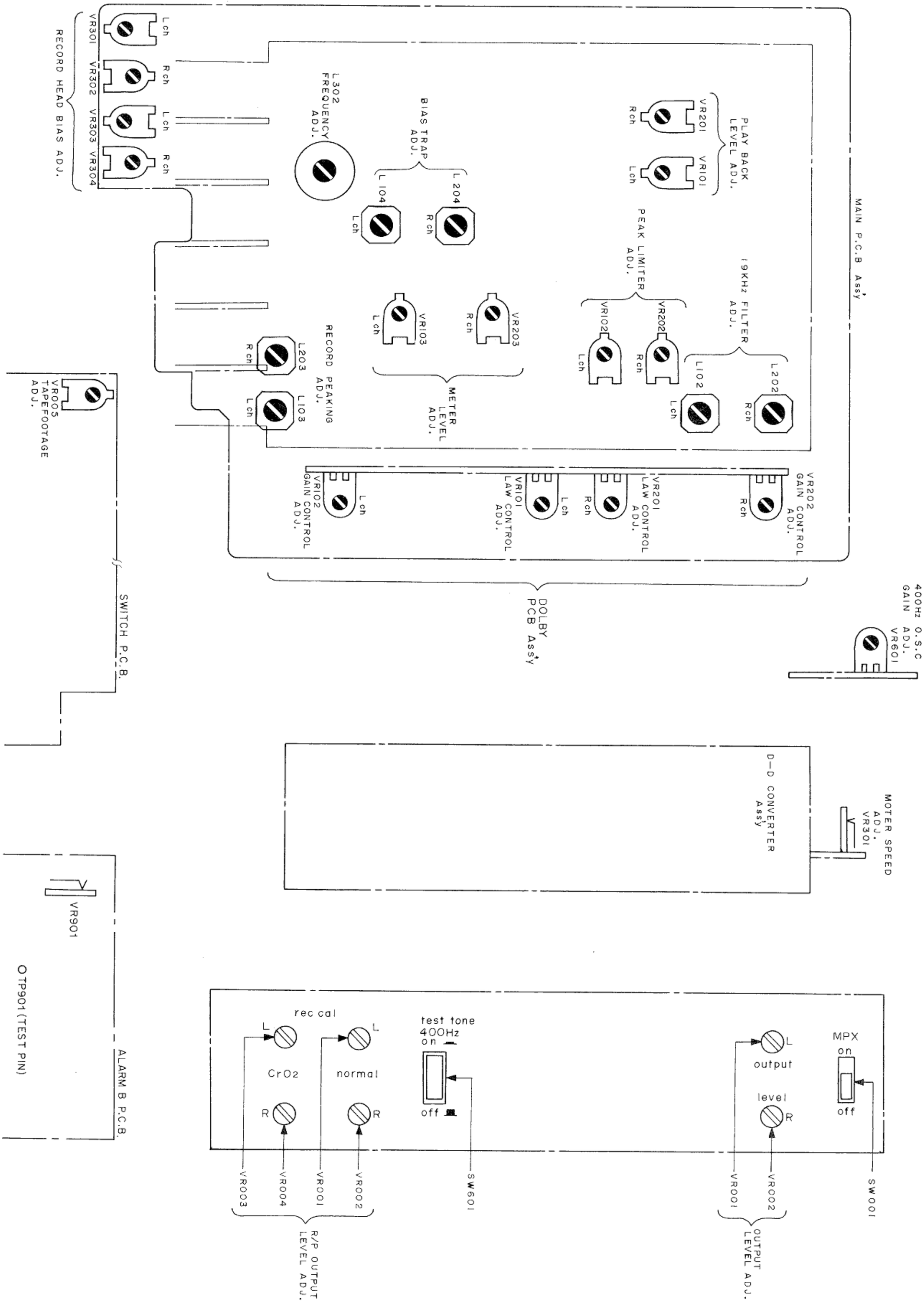


Fig. 6

Schematic Ref. No.	Part No.	Description	
	BA03669A	Main P.C.B. Ass'y (SX)	
		— P.B. EQ. AMP. —	
Q101, 201	0B06003A	Transistor	2SC1000 (BL)
Q102, 202	0B01910A	Transistor	2SC900 (E)
R102, 202	0B05593A	Carbon Resistor	150K ELR¼, J
R103, 203	0B05786A	Carbon Resistor	22(N) ELR¼, J
R104, 204	0B05596A	Carbon Resistor	220K ELR¼, J
R105, 205	0B05664A	Carbon Resistor	3.9K ELR¼, J
R106, 206	0B01902A	Carbon Resistor	68K ELR¼, J
R107, 207	0B01833A	Carbon Resistor	10K ELR¼, J
R108, 208	0B01781A	Carbon Resistor	1K ELR¼, J
R109, 209	0B01920A	Carbon Resistor	100K ELR¼, J
R110, 210	0B01878A	Carbon Resistor	8.2K ELR¼, J
R111, 211	0B05591A	Carbon Resistor	15K ELR¼, J
R112, 212	0B05669A	Carbon Resistor	180K ELR¼, J
C101, 201	0B01412A	Electrolytic Capacitor	10μ 16V
C102, 202	0B01288A	Ceramic Capacitor	100P 50V
C103, 203	0B05744A	Ceramic Capacitor	33P 50V
C104, 204	0B01862A	Electrolytic Capacitor	22μ 16V
C105, 205	0B05583A	Mylar Capacitor	0.033μ 50V, J
C106, 206	0B05657A	Tantalum Capacitor	4.7μ 16V
C127, 227	0B01716A	Ceramic Capacitor	470P 50V
VR101,201	0B01923A	Semi-fixed Volume	20K
		— Peak Limiter —	
Q103, 203	0B01600A	FET	2SK30 (Y)
D101, 201	0B01599A	Silicon Varistor	KB162
R113, 213	0B05600A	Carbon Resistor	270K ELR¼, J
R114, 214	0B01879A	Carbon Resistor	33K ELR¼, J
R115, 215	0B01921A	Carbon Resistor	330K ELR¼, J
118, 218			
R116, 216	0B05596A	Carbon Resistor	220K ELR¼, J
R117, 217	0B05601A	Carbon Resistor	1.5M ELR¼, J
R119, 219	0B05564A	Carbon Resistor	1M ELR¼, J
C107, 207	0B01412A	Electrolytic Capacitor	10μ 16V
C108, 208	0B05598A	Tantalum Capacitor	2.2μ 20V
VR102,202	0B01807A	Semi-fixed Volume	50K
		— MIX. & L.P.F. AMP. —	
Q104, 204	0B06003A	Transistor	2SC1000 (BL)
105, 205			
L101, 201	0B06535A	Inductor B	36mH
L102, 202	0B03857A	19KHz Coil	23mH
R120, 220	0B01846A	Carbon Resistor	4.7K R¼, J
R121, 221	0B05665A	Carbon Resistor	560K ELR¼, J
R122, 222	0B05591A	Carbon Resistor	15K ELR¼, J
R123, 223	0B05927A	Metal Film Resistor	8.2M ER0-50CD,G
R124, 224	0B05564A	Carbon Resistor	1M ELR¼, J
R125, 225	0B01782A	Carbon Resistor	2.7K ELR¼, J
R126, 226	0B05672A	Carbon Resistor	2.2M ELR¼, J
R127, 227	0B01920A	Carbon Resistor	100K ELR¼, J
C109, 209	0B01412A	Electrolytic Capacitor	10μ 16V
110, 210			
C111, 211	0B05789A	SP Capacitor	47P 50V, J
C112, 212	0B01804A	Mylar Capacitor	3900P 50V, J
C113, 213	0B05790A	SP Capacitor	1200P 50V, J
C114, 214	0B05791A	SP Capacitor	1800P 50V, J
C115, 215	0B01802A	Mylar Capacitor	2200P 50V, J
	JA03136A	Noise Shield Ass'y A (2 pcs.)	
	JA03137A	Noise Shield Ass'y B (2 pcs.)	

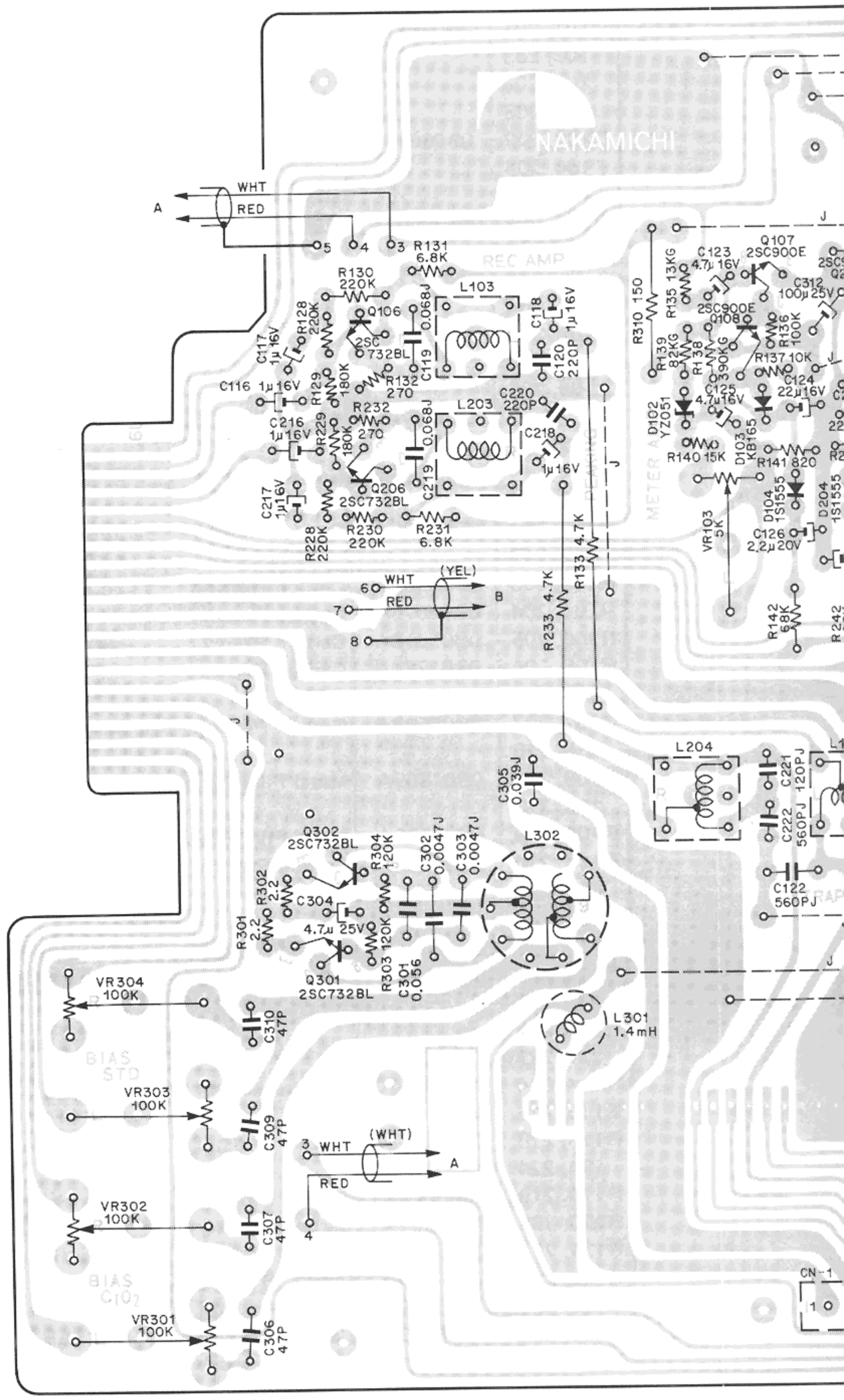
Schematic Ref. No.	Part No.	Description	
		— REC. AMP. —	
Q106, 206	0B01910A	Transistor	2SC900 (E)
L103, 203	0B03858A	Peaking Coil	
L104, 204	0B03859A	Bias Trap Coil	
R128, 228	0B05596A	Carbon Resistor	220K ELR¼, J
130, 230			
R129, 229	0B05669A	Carbon Resistor	180K ELR¼, J
R131, 231	0B01877A	Carbon Resistor	6.8K ELR¼, J
R132, 232	0B05651A	Carbon Resistor	270 ELR¼, J
R133, 233	0B01846A	Carbon Resistor	4.7K R¼, J
C116, 216	0B01405A	Electrolytic Capacitor	1μ 16V
117, 217			
118, 218			
C119, 219	0B05682A	Mylar Capacitor	0.068μ 50V, J
C120, 220	0B01289A	Ceramic Capacitor	220P 50V, M
C121, 221	0B05787A	SP Capacitor	120P 50V, J
C122, 222	0B05788A	SP Capacitor	560P 50V, J
		— METER AMP. —	
Q107, 207	0B01910A	Transistor	2SC900 (E)
108, 208			
D102, 202	0B06058A	Zener Diode	YZ-051
D103, 203	0B06007A	Silicon Diode	KB-165
D104, 204	0B01909A	Silicon Diode	1S1555
R135, 235	0B05767A	Metal Film Resistor	13K ER0-25VK,G
R136, 236	0B01920A	Carbon Resistor	100K ELR¼, J
R137, 237	0B01833A	Carbon Resistor	10K ELR¼, J
R138, 238	0B05544A	Metal Film Resistor	390K ER0-14VK,G
R139, 239	0B05766A	Metal Film Resistor	82K ER0-25VK,G
R140, 240	0B05591A	Carbon Resistor	15K ELR¼, J
R141, 241	0B05511A	Carbon Resistor	820 ELR¼, J
R142, 242	0B01902A	Carbon Resistor	68K ELR¼, J
C123, 223	0B01389A	Electrolytic Capacitor	4.7μ 16V
C124, 224	0B05636A	Tantalum Capacitor	22μ 16V, M
C125, 225	0B05657A	Tantalum Capacitor	4.7μ 16V, M
C126, 226	0B05598A	Tantalum Capacitor	2.2μ 20V, M
VR103,203	0B01805A	Semi-fixed Volume	5K
		— BIAS OSC. —	
Q301, 302	0B01910A	Transistor	2SC900 (E)
L301	0B03861A	Bias Trap Coil	1.4mH
L302	0B06536A	550 OSC. Coil	
R301, 302	0B05605A	Carbon Resistor	2.2 ELR¼, J
R303, 304	0B05568A	Carbon Resistor	120K ELR¼, J
C301	0B05778A	Mylar Capacitor	0.056μ 50V, K
C302, 303	0B05652A	Mylar Capacitor	0.0047μ 50V, J
C304	0B01402A	Electrolytic Capacitor	4.7μ 25V
C305	0B05799A	SP Capacitor	0.039μ 50V, J
C306, 307	0B01456A	Ceramic Capacitor	47P 50V, M
309, 310			
VR301,302	0B01812A	Semi-fixed Volume	100K
303,304			
		— MUTE —	
Q303	0B01824A	Transistor	2SC828
D301	0B01909A	Silicon Diode	1S1555
R305, 306	0B05564A	Carbon Resistor	1M ELR¼, J
R307	0B05596A	Carbon Resistor	220K ELR¼, J
R313	0B01885A	Carbon Resistor	39K ELR¼, J
C310	0B01405A	Electrolytic Capacitor	1μ 16V

Schematic Ref. No.	Part No.	Description
		— Miscellaneous —
R308	0B01857A	Carbon Resistor 1K R¼, J
R309	0B05631A	Carbon Resistor 82 R¼, J
R310	0B05795A	Carbon Resistor 150 R¼, J
R311	0B05575A	Carbon Resistor 560 R¼, J
R312	0B01781A	Carbon Resistor 1K ELR¼, J
C309	0B01401A	Electrolytic Capacitor 470μ 25V
C310	0B05793A	Electrolytic Capacitor 330μ 25V
C311, 312	0B01272A	Electrolytic Capacitor 100μ 25V
C313	0B01400A	Electrolytic Capacitor 100μ 16V
C314	0B01674A	Electrolytic Capacitor 10μ 25V
C315	0B01602A	Mylar Capacitor 0.33μ 50V, K
	0B07608B	Main Board
	0B07036A	Record Switch (1 pce.)
	0B08129A	Record Switch Spring DT (1 pce.)
	0B01814A	14P Connector (2 pcs.)
	0B01797B	19P Connector (1 pce.)
	0B01800A	Connector Pin (47 pcs.)
	0E00176A	Nut Hex. M2 (2 pcs.)
	0E00185A	Screw M2 x 6 Cylinder Head (2 pcs.)
	0E00025A	Washer 2mm Spring (2 pcs.)

7. MOUNTING DIAGRAMS AND PARTS LIST

Notes: 1. Mounting diagram shows a dip side view of the printed circuit boa
2. Diode 1S1555, transistor 2SC900 are compatible with diode FDH
transistor 2SC732.

7.1. Main P.C.B. Ass'y (SX)



G DIAGRAMS AND PARTS LIST

ing diagram shows a dip side view of the printed circuit board.
1S1555, transistor 2SC900 are compatible with diode FDH-999 and
tor 2SC732.

Ass'y (SX)

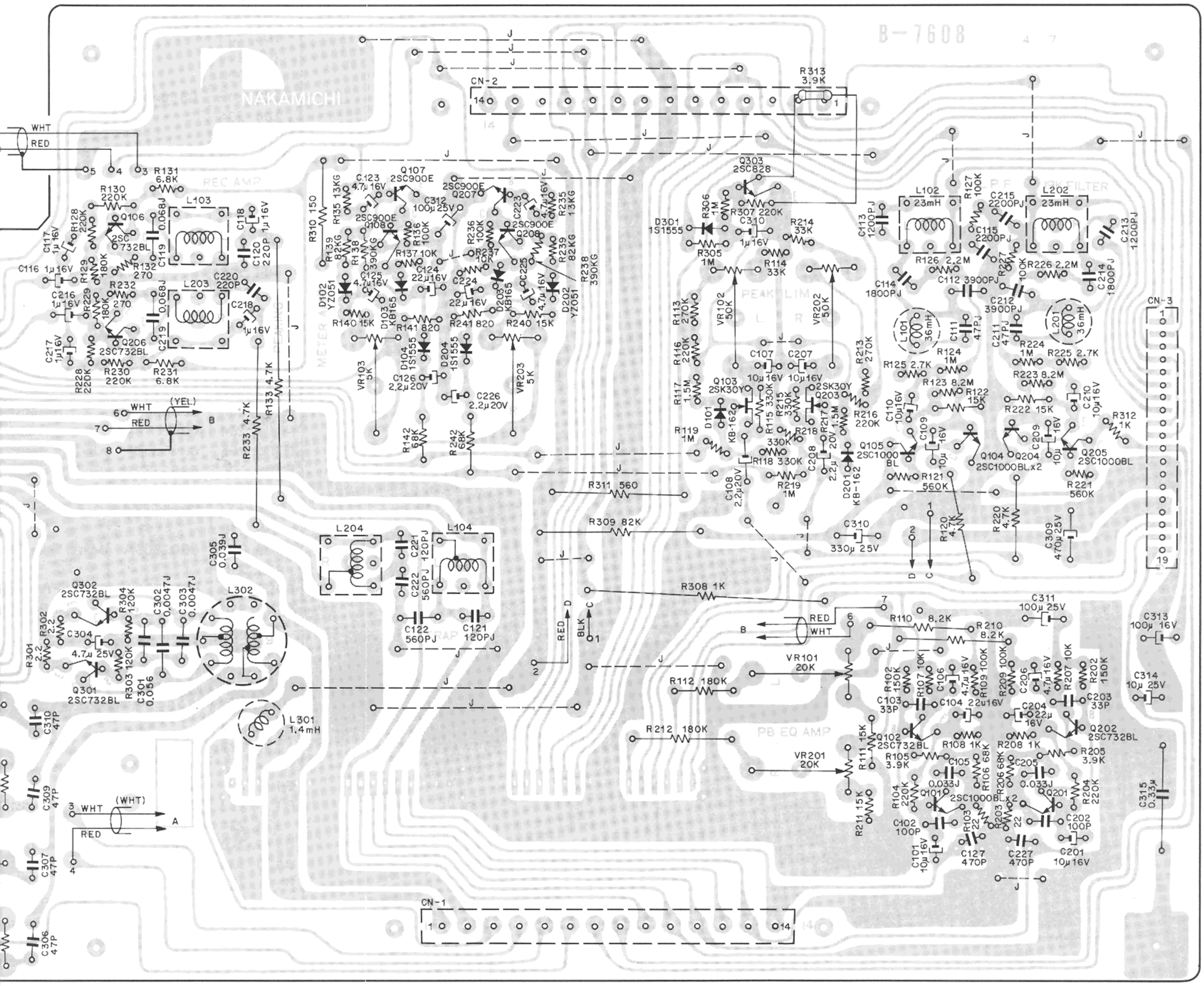


Fig. 7.1

7.2. Dolby P.C.B. Ass'y

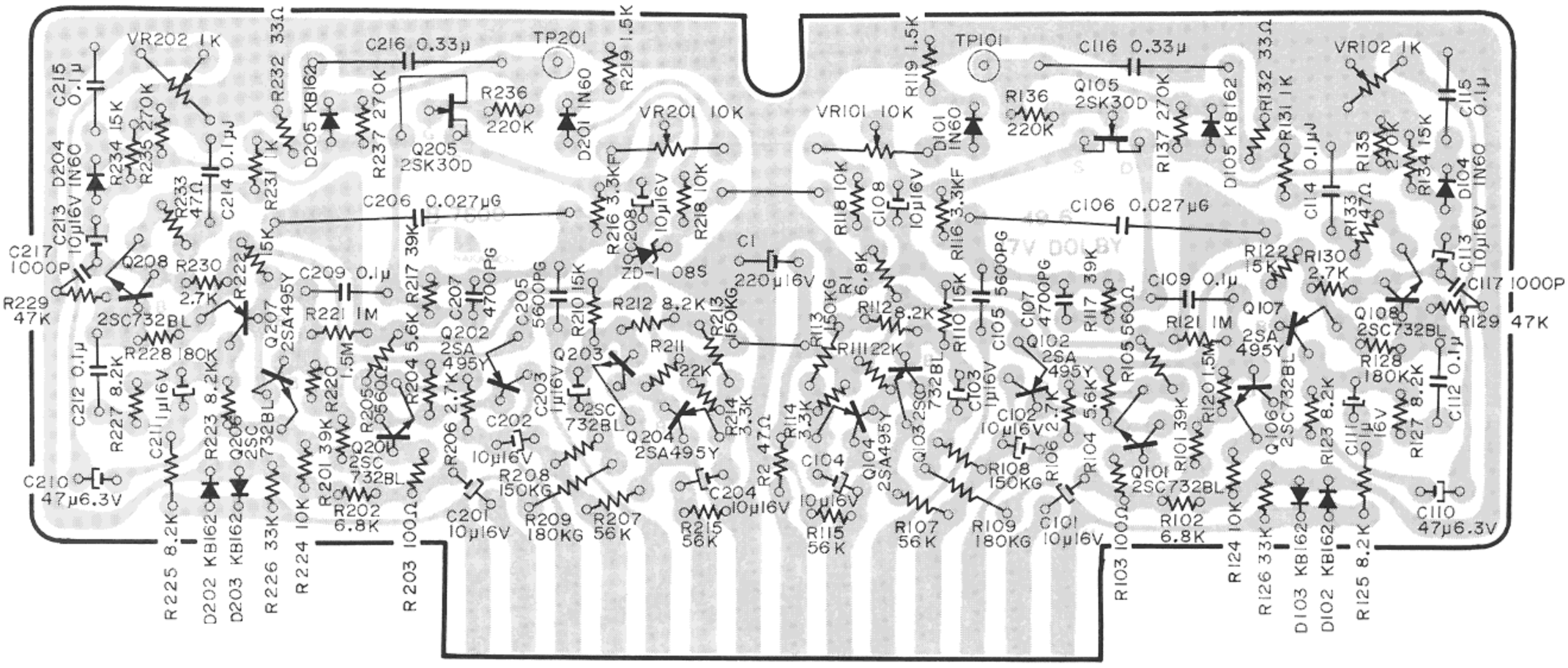


Fig. 7.2

7.3. Rec. Cal. P.C.B. Ass'y

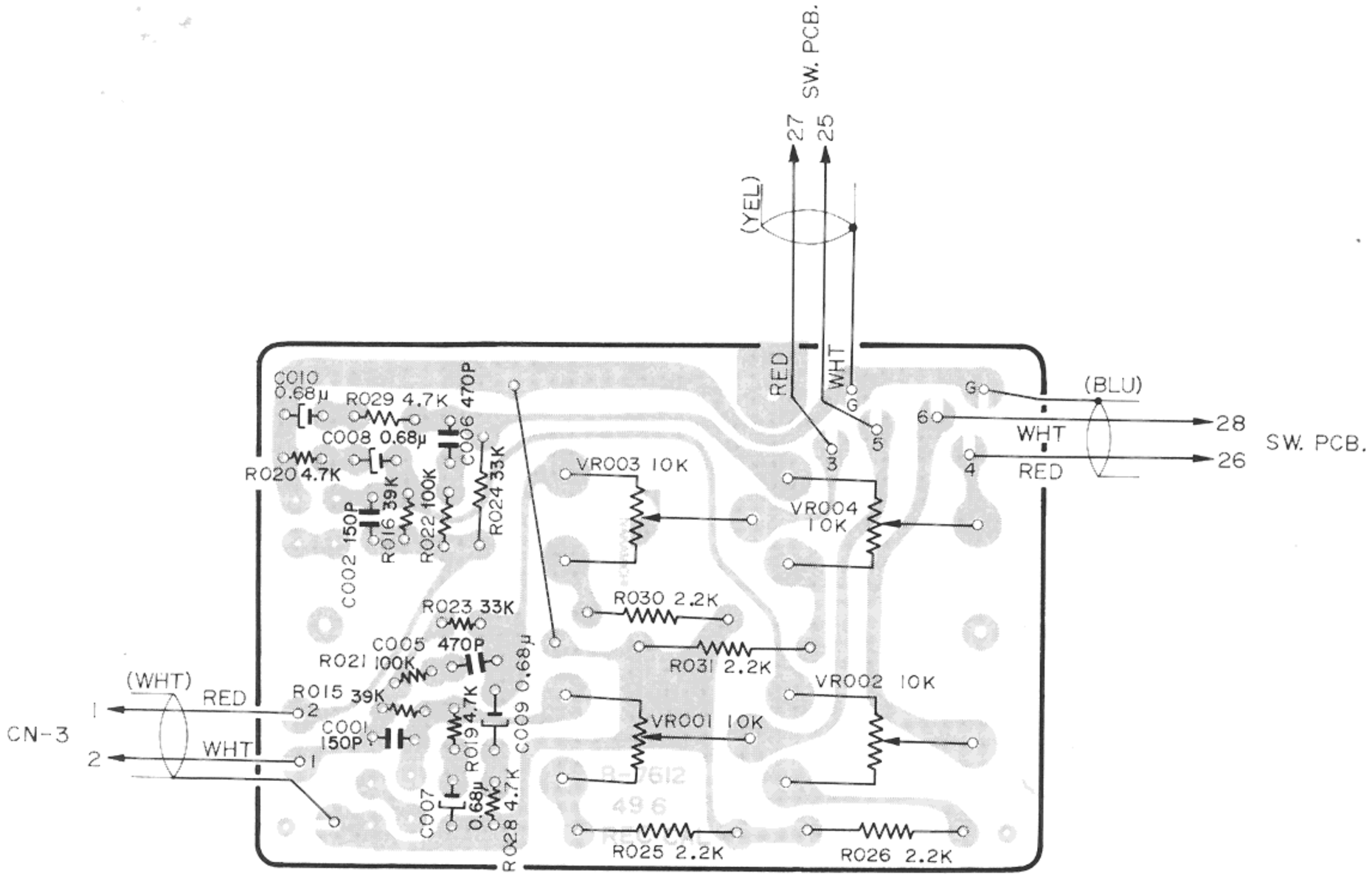


Fig. 7.3

Schematic Ref. No.	Part No.	Description	
	BA03670A	**Dolby P.C.B. Ass'y**	
	0B07609B	Dolby P.C. Board	
Q101, 201 103, 203 106, 206 108, 208	0B01910A	Transistor	2SC900 (E)
Q102, 202 104, 204 107, 207	0B06013A	Transistor	2SA733
Q105, 205	0B06001A	FET	2SK30 (D)
ZD1	0B06004A	Zener Diode	08S
D101, 201 104, 204	0B00030A	Germanium Diode	1N60 (P)
D102, 202 103, 203 105, 205	0B01599A	Silicon Varistor	KB-162
R1 102, 202	0B01877A	Carbon Resistor	6.8K ELR¼, J
R2 133, 233	0B05569A	Carbon Resistor	47 ELR¼, J
R101, 201 117, 217	0B01885A	Carbon Resistor	39K ELR¼, J
R103, 203	0B05558A	Carbon Resistor	100 ELR¼, J
R104, 204	0B05673A	Carbon Resistor	5.6K ELR¼, J
R105, 205	0B05678A	Carbon Resistor	560 ELR¼, J
R106, 206 130, 230	0B01782A	Carbon Resistor	2.7K ELR¼, J
R107, 207 115, 215	0B05563A	Carbon Resistor	56K ELR¼, J
R108, 208 113, 213	0B01859A	Metal Film Resistor	150K ER0-25VK,G
R109, 209	0B01590A	Metal Film Resistor	180K ER0-25VK,G
R110, 210 122, 222 134, 234	0B05591A	Carbon Resistor	15K ELR¼, J
R111, 211	0B05661A	Carbon Resistor	22K ELR¼, J
R112, 212 123, 223 125, 225 127, 227	0B01878A	Carbon Resistor	8.2K ELR¼, J
R114, 214	0B01793A	Carbon Resistor	3.3K ELR¼, J
R116, 216	0B01585A	Metal Film Resistor	3.3K ER0-25VK,F
R118, 218 124, 224	0B01833A	Carbon Resistor	10K ELR¼, J
R119, 219	0B05505A	Carbon Resistor	1.5K ELR¼, J
R120, 220	0B05601A	Carbon Resistor	1.5M ELR¼, J
R121, 221	0B05564A	Carbon Resistor	1M ELR¼, J
R126, 226	0B01879A	Carbon Resistor	33K ELR¼, J
R128, 228	0B05669A	Carbon Resistor	180K ELR¼, J
R129, 229	0B05562A	Carbon Resistor	47K ELR¼, J
R131, 231	0B01781A	Carbon Resistor	1K ELR¼, J
R132, 232	0B05567A	Carbon Resistor	33 ELR¼, J
R135, 235 137, 237	0B05600A	Carbon Resistor	270K ELR¼, J
R136, 236	0B05596A	Carbon Resistor	220K ELR¼, J
C1	0B01398A	Electrolytic Capacitor	220μ 16V
C101, 201 102, 202 104, 204 108, 208 113, 213	0B01412A	Electrolytic Capacitor	10μ 16V
C103, 203 111, 211	0B01405A	Electrolytic Capacitor	1μ 16V
C105, 205	0B01864A	P.P. Capacitor	5600P 50V, G
C106, 206	0B01892A	P.P. Capacitor	0.027μ 50V, G
C107, 207	0B01608A	P.P. Capacitor	4700P 50V, G
C109, 209 112, 212 115, 215	0B01603A	Mylar Capacitor	0.1μ 50V, K
C110, 210	0B01404A	Electrolytic Capacitor	47μ 6.3V
C114, 214	0B01780A	Mylar Capacitor	0.1μ 50V, J
C116, 216	0B01602A	Mylar Capacitor	0.33μ 50V, K
C117, 217	0B04059A	Mylar Capacitor	1000P 50V, K
VR101,201	0B01458A	Semi-fixed Volume	10K
VR102,202	0B01428A	Semi-fixed Volume	1K
TP101,201	0B03924A	FET Gate Pin	
	BA03764A	**Rec. Cal. P.C.B. Ass'y**	
	0B07612B	Rec. Cal. P.C. Board	
VR001,002 003,004	0B07077A	Semi-fixed Volume	10K
R015, 016	0B01885A	Carbon Resistor	39K ELR¼, J
R019, 020 028, 029	0B01795A	Carbon Resistor	4.7K ELR¼, J
R021, 022	0B01920A	Carbon Resistor	100K ELR¼, J
R023, 024	0B01879A	Carbon Resistor	33K ELR¼, J
R025, 026 030, 031	0B05622A	Carbon Resistor	2.2K R¼, J
C001, 002	0B05599A	Ceramic Capacitor	150P 50V, M
C005, 006	0B01716A	Ceramic Capacitor	470P 50V, M
C007, 008 009, 010	0B05773A	Tantalum Capacitor	0.68μ 35V, M

7.4. Switch P.C.B. Ass'y

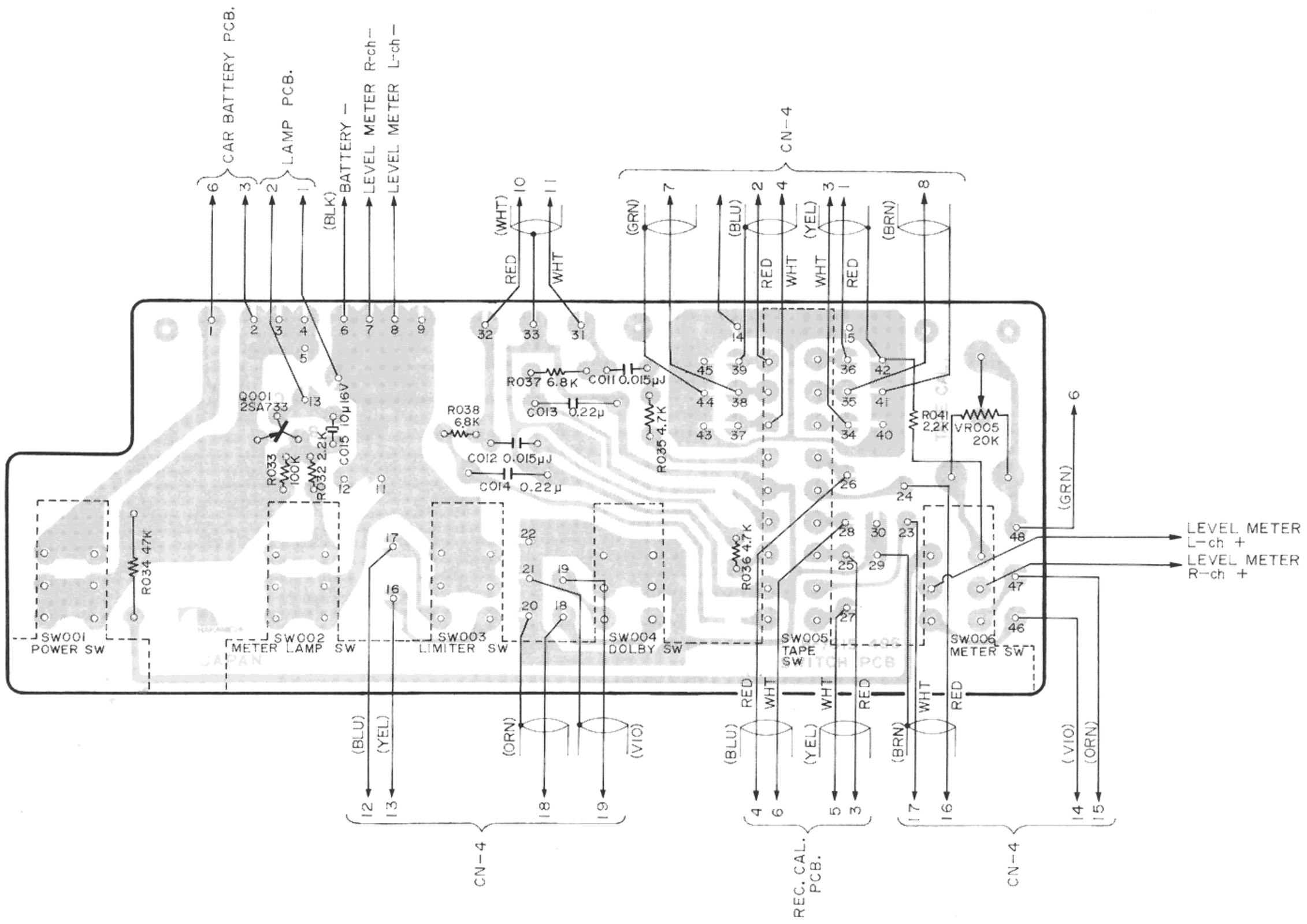


Fig. 7.4

Schematic Ref. No.	Part No.	Description	
	BA03676A	**Switch P.C.B. Ass'y**	
	0B07615A	Switch P.C. Board	
Q001	0B06013A	Transistor	2SA733
R032, 041	0B05566A	Carbon Resistor	2.2K ELR¼, J
R033	0B01920A	Carbon Resistor	100K ELR¼, J
R034	0B05641A	Carbon Resistor	47K R¼, J
R035, 036	0B01795A	Carbon Resistor	4.7K ELR¼, J
R037, 038	0B01877A	Carbon Resistor	6.8K ELR¼, J
C011, 012	0B05557A	Mylar Capacitor	0.015μ 50V, J
C013, 014	0B05785A	Mylar Capacitor	0.22μ 50V, K
C015	0B01412A	Electrolytic Capacitor	10μ 16V
VR005	0B01923A	Semi-fixed Volume	20K
SW001	0B03870A	Power SW. 550	
SW002, 003 004, 005 006	0B07079A	550 Switch Ass'y B	
	0E00071A	Washer 3mm Fiber (2 pcs.)	

7.5. Volume P.C.B. Ass'y

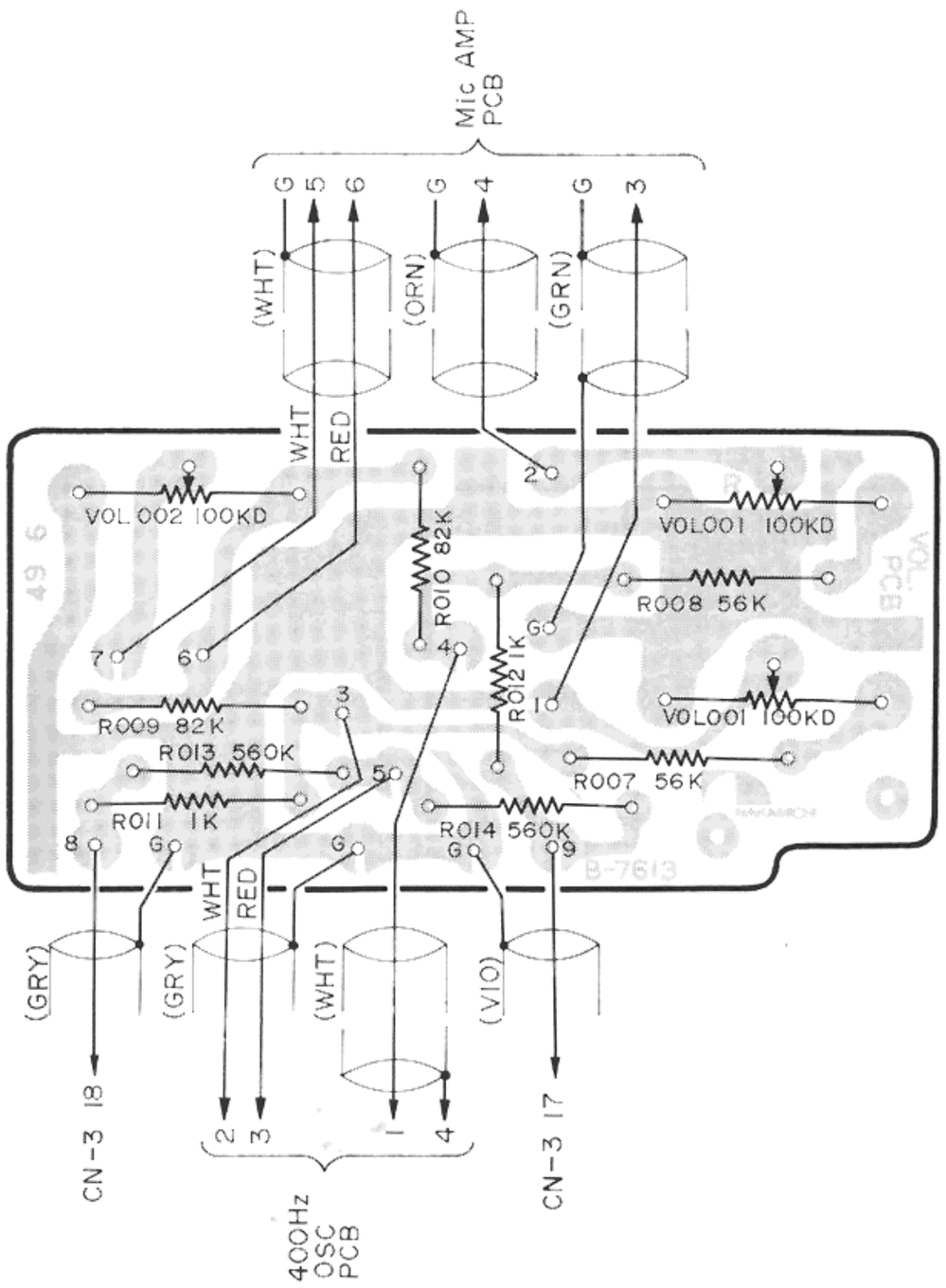


Fig. 7.5

7.6. 400 Hz OSC. P.C.B. Ass'y

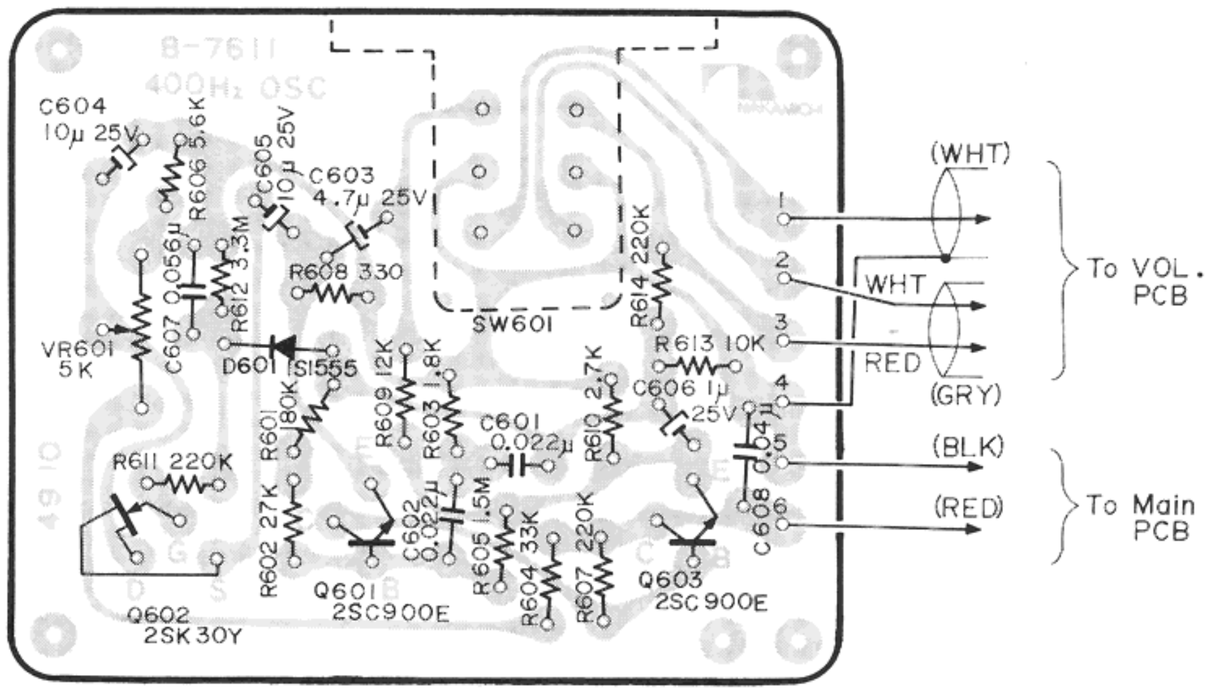


Fig. 7.6

7.7. Headphone AMP. P.C.B. Ass'y

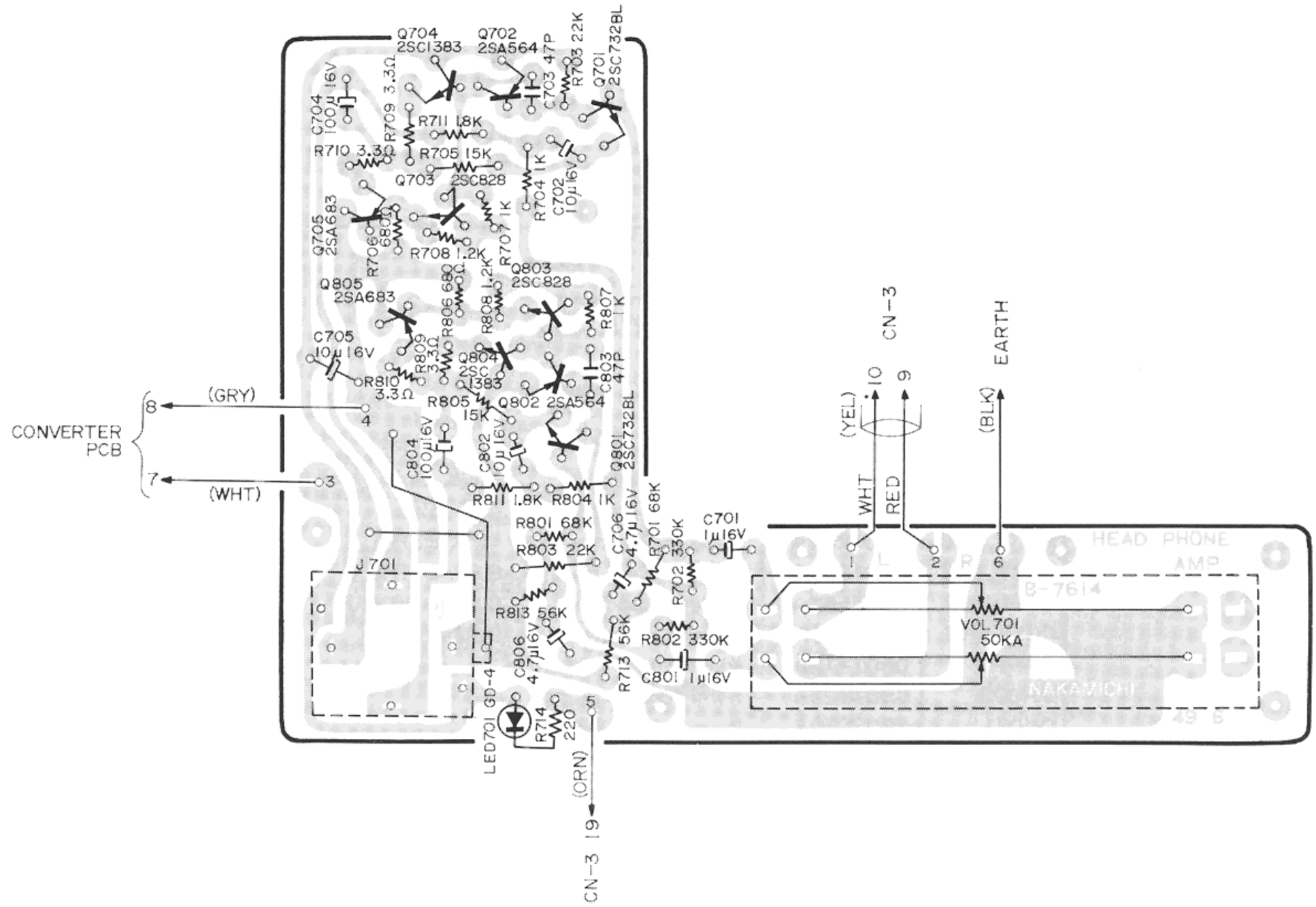


Fig. 7.7

7.8. Solenoid Driver P.C.B. Ass'y

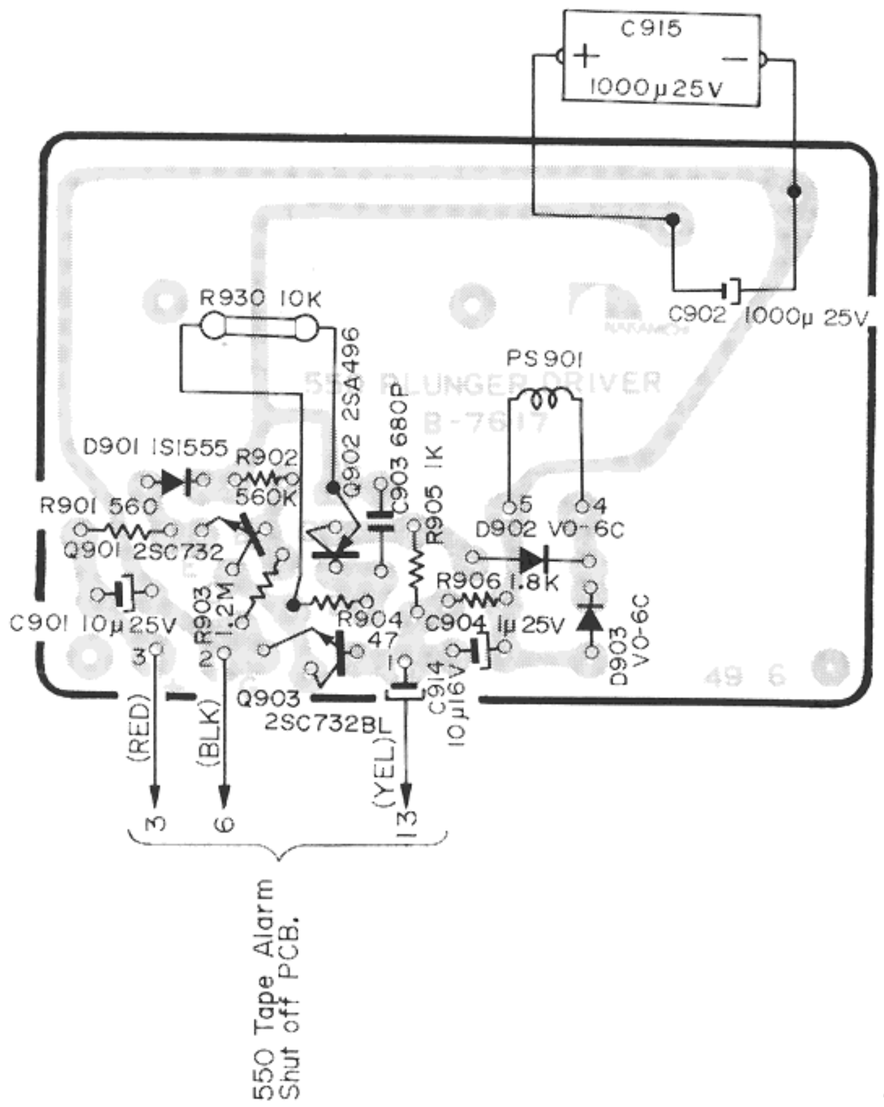


Fig. 7.8

Schematic Ref. No.	Part No.	Description	
	BA03674A	**Volume P.C.B. Ass'y**	
	0B07613A	Volume P.C. Board	
R007, 008	0B05508A	Carbon Resistor	56K R¼, J
R009, 010	0B05668A	Carbon Resistor	82K R¼, J
R011, 012	0B01857A	Carbon Resistor	1K R¼, J
R013, 014	0B05784A	Carbon Resistor	560K R¼, J
VOL 001	0B07074A	Volume	100K (D)
VOL 002	0B07075A	Volume	100K (D)
	BA03672A	**400Hz OSC. P.C.B. Ass'y**	
	0B07611B	400Hz OSC P.C. Board	
Q601, 603	0B01910A	Transistor	2SC900 (E)
Q602	0B01600A	FET	2SK30 (Y)
D601	0B01909A	Silicon Diode	1S1555
R601	0B05669A	Carbon Resistor	180K ELR¼, J
R602	0B05538A	Carbon Resistor	27K ELR¼, J
R603	0B01830A	Carbon Resistor	1.8K ELR¼, J
R604	0B01879A	Carbon Resistor	33K ELR¼, J
R605	0B05601A	Carbon Resistor	1.5M ELR¼, J
R606	0B05673A	Carbon Resistor	5.6K ELR¼, J
R607, 611 614	0B05596A	Carbon Resistor	220K ELR¼, J
R608	0B01789A	Carbon Resistor	330 ELR¼, J
R609	0B05650A	Carbon Resistor	12K ELR¼, J
R610	0B01782A	Carbon Resistor	2.7K ELR¼, J
R612	0B05775A	Carbon Resistor	3.3M ELR¼, J
R613	0B01833A	Carbon Resistor	10K ELR¼, J

Schematic Ref. No.	Part No.	Description	
	BA03675A	**Headphone AMP. P.C.B. Ass'y**	
	0B07614C	Headphone AMP. P.C. Board	
Q701, 801	0B01910A	Transistor	2SC900(E)
Q702, 802	0B06053A	Transistor	2SA 564(S)
Q703, 803	0B01824A	Transistor	2SC828
Q704, 804	0B06052A	Transistor	2SC 1383
Q705, 805	0B06051A	Transistor	2SA683
LED701	0B06050A	LED	GD-4
R701, 801	0B01902A	Carbon Resistor	68K ELR¼, J
R702, 802	0B01921A	Carbon Resistor	330K ELR¼, J
R703, 803	0B05661A	Carbon Resistor	22K ELR¼, J
R704, 804 707, 807	0B01781A	Carbon Resistor	1K ELR¼, J
R705, 805	0B05591A	Carbon Resistor	15K ELR¼, J
R706, 806	0B05559A	Carbon Resistor	680 ELR¼, J
R708, 808	0B05565A	Carbon Resistor	1.2K ELR¼, J
R709, 809 710, 810	0B05779A	Carbon Resistor	3.3 ELR¼, J
R711, 811	0B01830A	Carbon Resistor	1.8K ELR¼, J
R713, 813	0B05563A	Carbon Resistor	56K ELR¼, J
R714	0B01933A	Carbon Resistor	220 R¼, J
C701, 801	0B01405A	Electrolytic Capacitor	1μ 16V
C702, 802 705	0B01412A	Electrolytic Capacitor	10μ 16V
C703, 803	0B01456A	Ceramic Capacitor	47P 50V
C704, 804	0B01400A	Electrolytic Capacitor	100μ 16V
C706, 806	0B01389A	Electrolytic Capacitor	4.7μ 16V
VR701	0B07071A	Slide Volume	50K (A)
	0B03881A	MIC. Jack (1 pce.)	
	0J03341A	Headphone Jack Holder (1 pce.)	
	0E00120A	Screw M2.6 x 3 Philips Pan Head (2 pcs.)	
	CA03212A	**Solenoid Driver P.C.B. Ass'y**	
	0B07617A	Solenoid Driver P.C. Board	
Q901, 903	0B01910A	Transistor	2SC900 (E)
Q902	0B01695A	Transistor	2SA496 (Y)
D901	0B01909A	Silicon Diode	1S1555
D902, 903	0B01501U	Silicon Diode	V0-6C
R901	0B05678A	Carbon Resistor	560 ELR¼, J
R902	0B05665A	Carbon Resistor	560K ELR¼, J
R903	0B05537A	Carbon Resistor	1.2M ELR¼, J
R904	0B05569A	Carbon Resistor	47 ELR¼, J
R905	0B01781A	Carbon Resistor	1K ELR¼, J
R906	0B01830A	Carbon Resistor	1.8K ELR¼, J
R930	0B01888A	Carbon Resistor	10K R¼, J
C901, 914	0B01674A	Electrolytic Capacitor	10μ 25V
C902, 915	0B01870A	Electrolytic Capacitor	1000μ 25V
C903	0T04027A	Ceramic Capacitor	680P 50V
C904	0B01173A	Electrolytic Capacitor	1μ 25V

7.9. Alarm B P.C.B. Ass'y

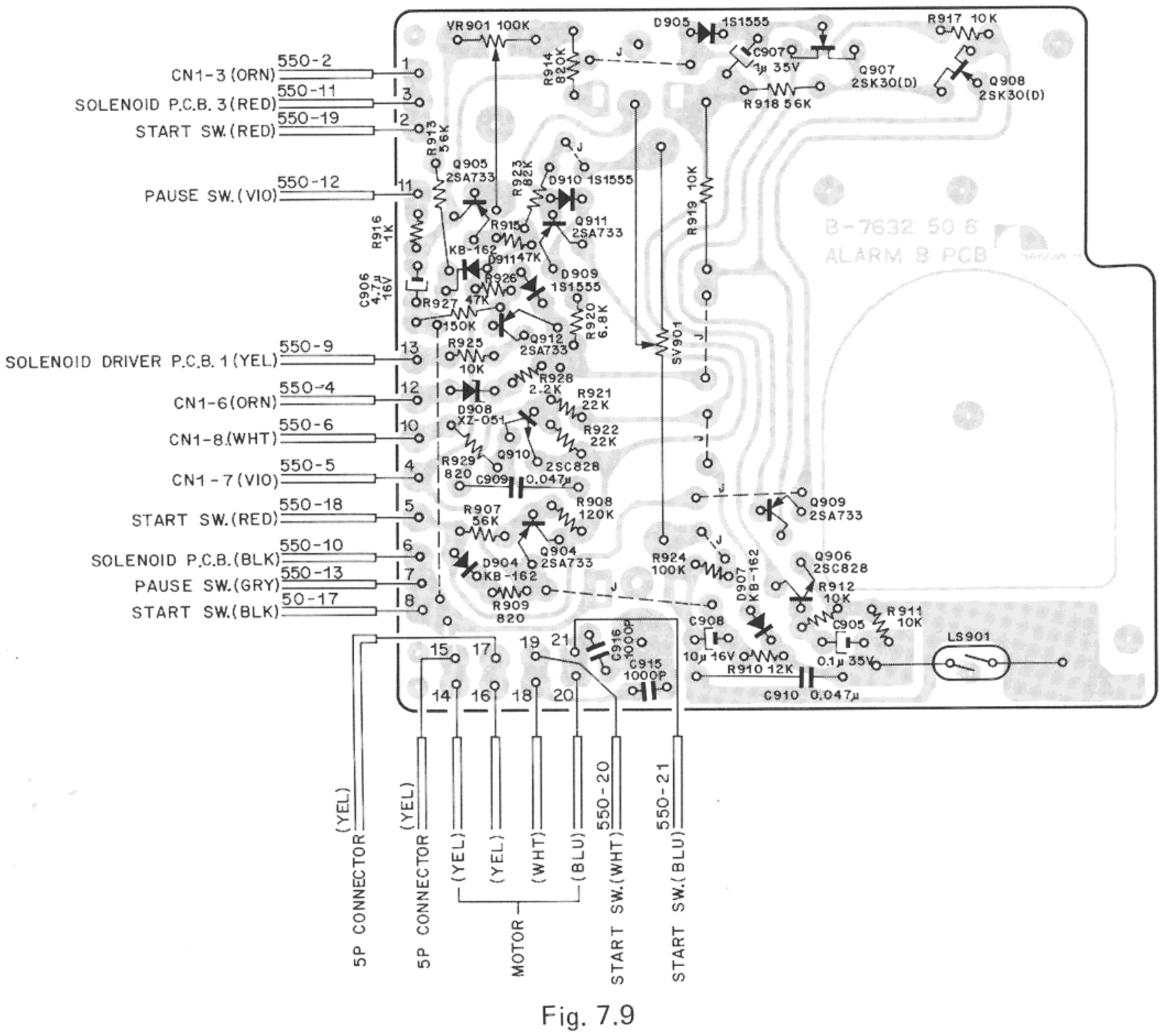


Fig. 7.9

7.10. Mic. AMP. P.C.B. Ass'y

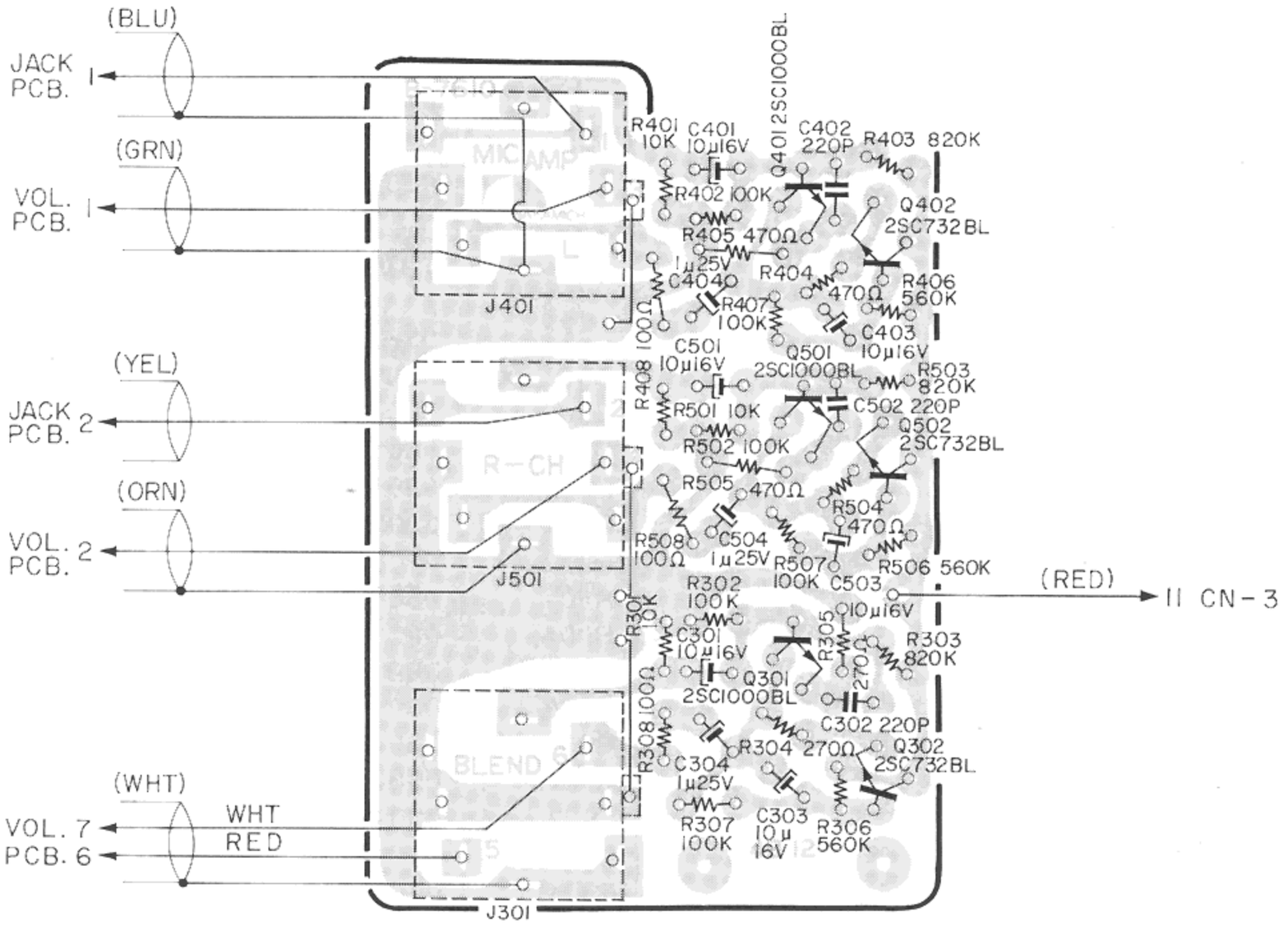


Fig. 7.10

7.11. Jack P.C.B. Ass'y

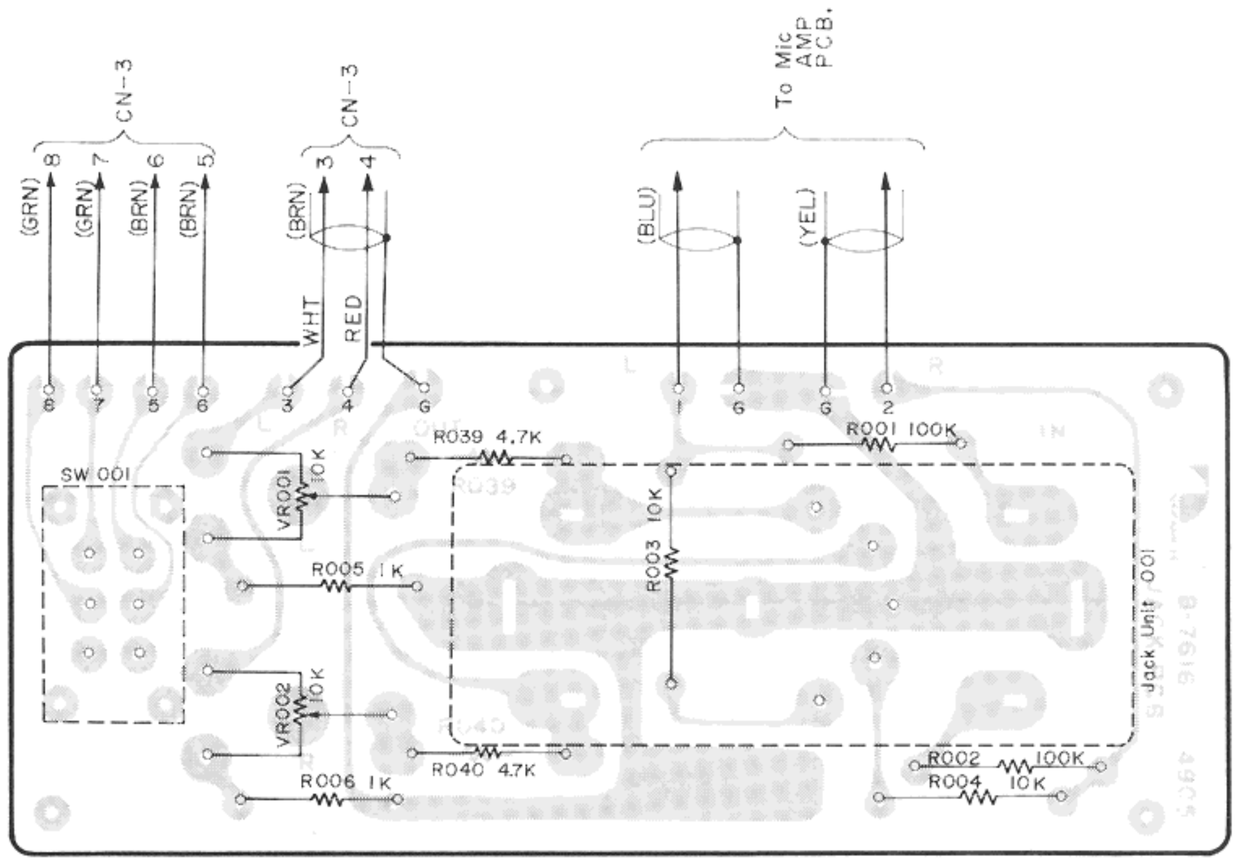


Fig. 7.11

Schematic Ref. No.	Part No.	Description	
	CA03248B	**Alarm B P.C.B. Ass'y**	
	0B07632A	Alarm B P.C.B.	
Q904, 905 909, 911 912	0B06013A	Transistor	2SA733
Q906, 910	0B01824A	Transistor	2SC828
Q907, 908	0B06001A	FET	2SK30A (D)
D904, 907 911	0B01599A	Silicon Varistor	KB-162
D905, 909 910	0B01909A	Silicon Diode	1S1555
D908	0B06048A	Zener Diode	XZ051
VR901	0B01812A	Semi-fixed Volume	100K
SV901	0B07081A	Slide Volume	100K (B)
R907, 913 918	0B05563A	Carbon Resistor	56K ELR¼, J
R908	0B05568A	Carbon Resistor	120K ELR¼, J
R909, 929	0B05511A	Carbon Resistor	820 ELR¼, J
R910	0B05650A	Carbon Resistor	12K ELR¼, J
R911, 912 917, 925	0B01833A	Carbon Resistor	10K ELR¼, J
R914	0B05674A	Carbon Resistor	820K ELR¼, J
R915, 926	0B05562A	Carbon Resistor	47K ELR¼, J
R916	0B01781A	Carbon Resistor	1K ELR¼, J
R919	0B01888A	Carbon Resistor	10K R¼, J
R920	0B01877A	Carbon Resistor	6.8K ELR¼, J
R921, 922	0B05661A	Carbon Resistor	22K ELR¼, J
R923	0B01564A	Carbon Resistor	82K ELR¼, J
R924	0B01920A	Carbon Resistor	100K ELR¼, J
R927	0B05593A	Carbon Resistor	150K ELR¼, J
R928	0B05566A	Carbon Resistor	2.2K ELR¼, J
C905	0B05781A	Tantalum Capacitor	0.1μ 35V, M
C906	0B05657A	Tantalum Capacitor	4.7μ 16V, M
C907	0B05638A	Tantalum Capacitor	1μ 35V, M
C908	0B01412A	Electrolytic Capacitor	10μ 16V
C909, 910	0B05797A	Ceramic Capacitor	0.047μ
C911, 912	0T04025A	Ceramic Capacitor	1000P
TP901	0B03924A	FET Gate Pin	
	BA03671A	**MIC. AMP. P.C.B. Ass'y**	
	0B07610B	MIC. AMP. P.C. Board	
Q301, 401 Q501	0B06003A	Transistor	2SC 1000(BL)
Q302, 402 502	0B01910A	Transistor	2SC 900(E)
R301, 401 501	0B01833A	Carbon Resistor	10K ELR¼, J
R302, 402 502, 307 407, 507	0B01920A	Carbon Resistor	100K ELR¼, J
R303, 403 503	0B05674A	Carbon Resistor	820K ELR¼, J
R304	0B05651A	Carbon Resistor	270 ELR¼, J
R404, 504	0B01792A	Carbon Resistor	470 ELR¼, J
R305	0B05780A	Carbon Resistor	270(N) ELR¼, J
R405, 505	0B05812A	Carbon Resistor	470(N) ELR¼, J
R306, 406 506	0B05665A	Carbon Resistor	560K ELR¼, J
R308, 408 508	0B05558A	Carbon Resistor	100 ELR¼, J
C301, 401 501, 303 403, 503	0B01412A	Electrolytic Capacitor	10μ 16V
C302, 402 502	0B01289A	Ceramic Capacitor	220P 50V
C304, 404 504	0B01173A	Electrolytic Capacitor	1μ 25V
J301, 401 501	0B03881A	MIC. Jack	
	0J03342A	MIC. Jack Bracket (1 pce.)	
	BA03677A	**Jack P.C.B. Ass'y**	
	0B07616B	Jack P.C. Board	
R001, 002	0B01889A	Carbon Resistor	100K R¼, J
R003, 004	0B01888A	Carbon Resistor	10K R¼, J
R005, 006	0B01857A	Carbon Resistor	1K R¼, J
R039, 040	0B01846A	Carbon Resistor	4.7K R¼, J
VR001, 002	0B07077A	Semi-fixed Volume	10K
SW001	0B07053A	Filter Switch	
	0B08097A	Jack Unit (1 pce.)	

7.12. Lamp P.C.B. Ass'y

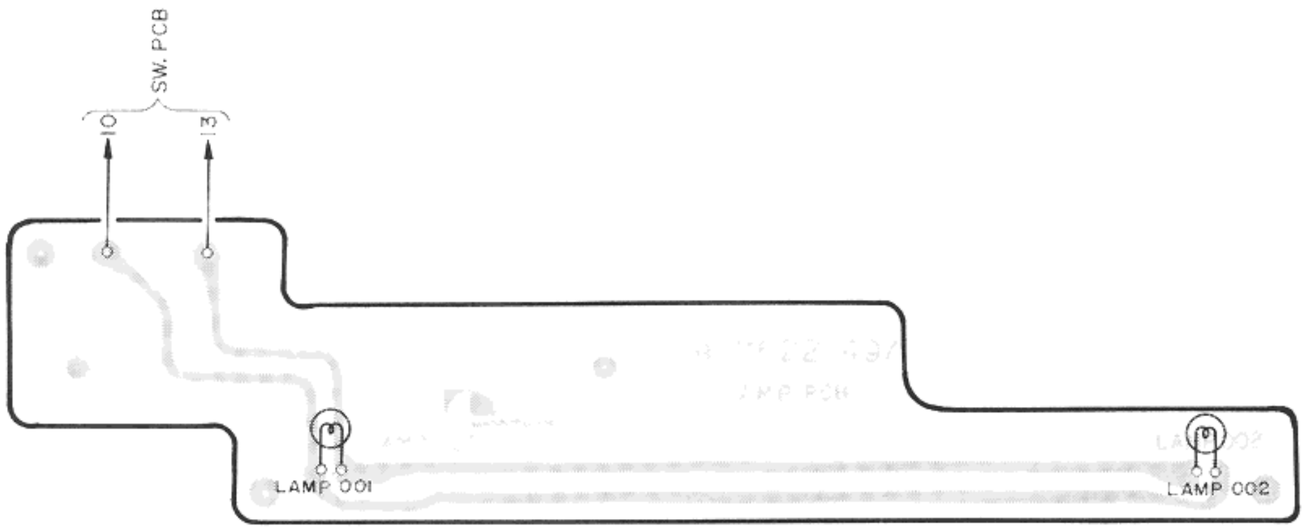


Fig. 7.12

7.13. Car Battery P.C.B. Ass'y

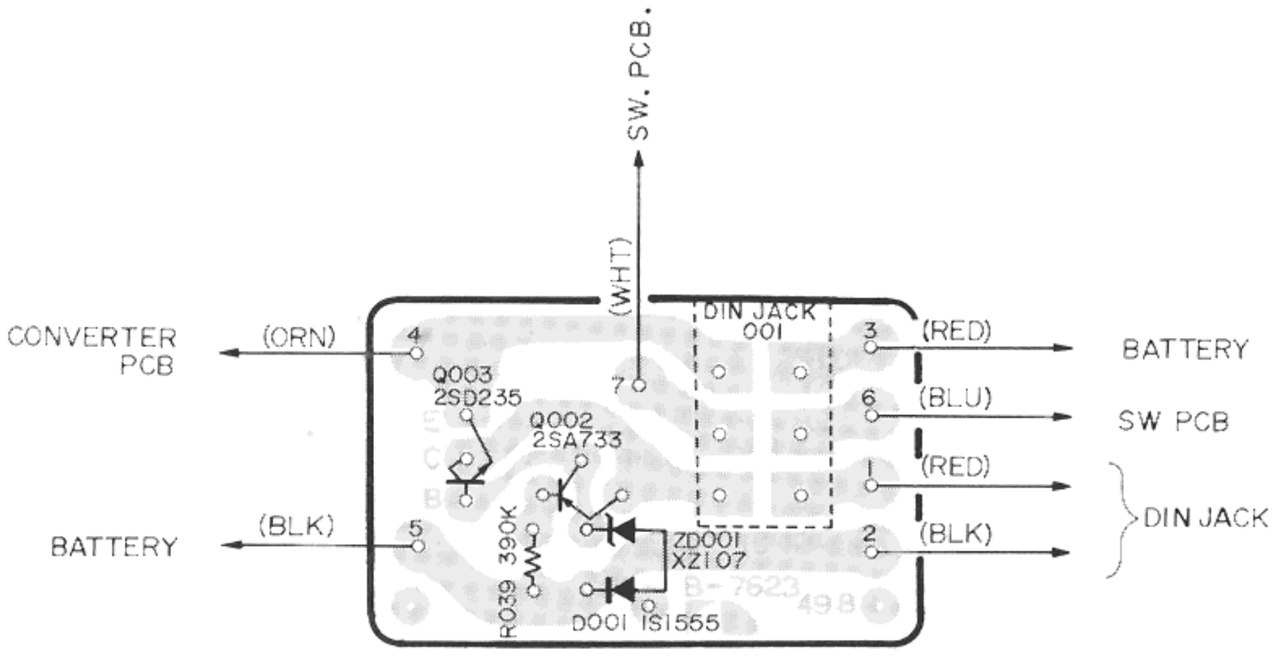


Fig. 7.13

7.14. D-D, MHX P.C.B. Ass'y

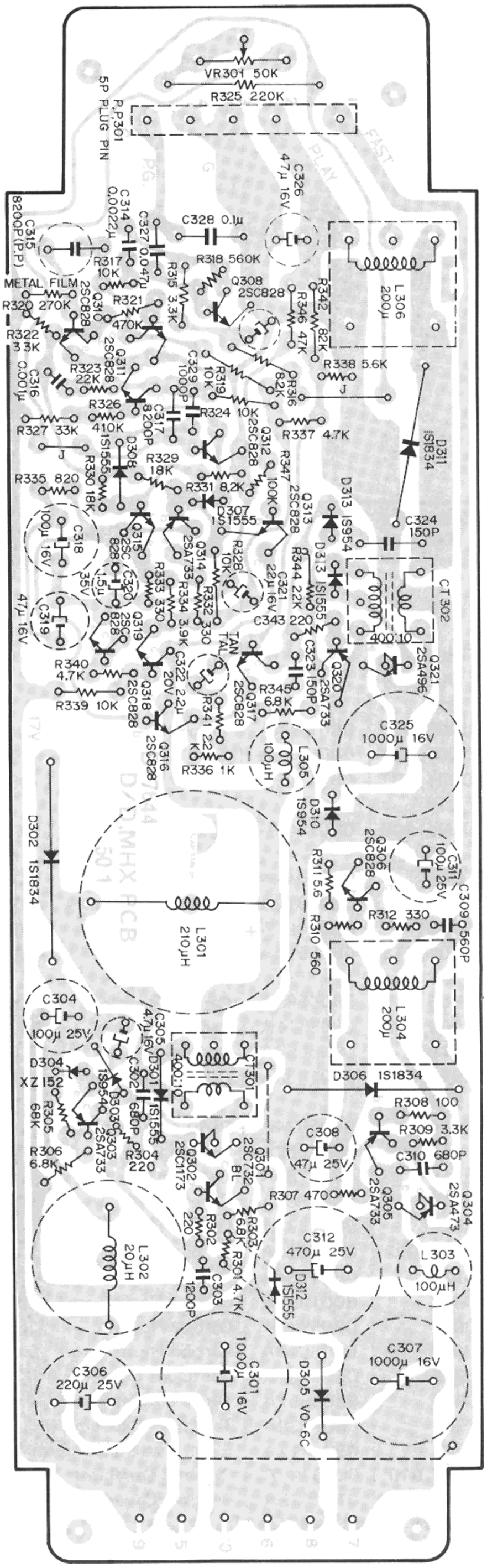


Fig. 7.14

Schematic Ref. No.	Part No.	Description
	BA03683A	**Lamp P.C.B. Ass'y**
	0B07622A	Lamp P.C. Board
	0B08126A	Meter Lamp 14V, 40mA (2 pcs.)
	BA03686A	**Car Battery P.C.B. Ass'y**
	0B07623B	Car Battery P.C. Board
Q002	0B06013A	Transistor 2SA733
Q003	0B01823A	Transistor 2SD235
ZD001	0B06057A	Zener Diode XZ-107
D001	0B01909A	Silicon Diode 1S1555
R039	0B05669A	Carbon Resistor 180K ELR¼, J
	0J03371B	Car Battery Heat Sink (1 pce.)
	0B08135A	DIN Socket (4P) (1 pce.)
	0E00503A	Screw M3 x 10 Philips Pan Head (1 pce.)
	0E00507A	Nut Hex. M3 (1 pce.)
	0E00581A	Washer 3mm Spring (1 pce.)
	0E00030A	Washer 3mm Steel (1 pce.)
	BA03730A	**D-D, MHX P.C.B. Ass'y**
	0B07644A	D-D, MHX P.C.B.
Q301	0B06005A	Transistor 2SC732 (BL)
Q302	0B06054A	Transistor 2SC1173 (Y)
Q303, 305 314, 320	0B06013A	Transistor 2SA733
Q304	0B06060A	Transistor 2SA473 (Y)
Q306, 308 309, 310 311, 312 313, 315 316, 317 318, 319	0B01824A	Transistor 2SC828
Q321	0B01695A	Transistor 2SA496
D301, 307 308, 309 312	0B01909A	Silicon Diode 1S1555
D302, 306 311	0B06056A	Silicon Diode 1S1834
D303, 310 313	0B06055A	Silicon Diode 1S954
D304	0B06057A	Zener Diode XZ-152
D305	0B01501U	Silicon Diode V0-6C
CT301, 302	0B06527A	Converter OSC. Coil (400 : 10)
L301	BA03761A	D-D Converter Coil Ass'y 210μH
L302	BA03760A	Converter Trap Coil Ass'y 20μH
L303, 305	0B06533A	Motor Trap Coil 100μH
L304, 306	0B06532A	D-FAST Converter Coil 200μH
VR301	0B07017A	Semi-fixed Volume 50K
R301, 337 340	0B01795A	Carbon Resistor 4.7K ELR¼, J
R302, 304 343	0B05608A	Carbon Resistor 220 ELR¼, J
R303, 306 345	0B01877A	Carbon Resistor 6.8K ELR¼, J
R305	0B01902A	Carbon Resistor 68K ELR¼, J
R307	0B01792A	Carbon Resistor 470 ELR¼, J
R308	0B05558A	Carbon Resistor 100 ELR¼, J
R309, 315	0B01793A	Carbon Resistor 3.3K ELR¼, J
R310	0B05678A	Carbon Resistor 560 ELR¼, J
R311	0B05818A	Carbon Resistor 5.6 ELR¼, J
R312, 332	0B01789A	Carbon Resistor 330 ELR¼, J
R316, 331	0B01878A	Carbon Resistor 8.2K ELR¼, J
R317, 319 324, 328 339	0B01833A	Carbon Resistor 10K ELR¼, J
R318	0B05665A	Carbon Resistor 560K ELR¼, J
R320	0B05809A	Metal Film Resistor 270K CRA¼, FX
R321, 326	0B05700A	Carbon Resistor 470K ELR¼, J
R322, 327	0B01879A	Carbon Resistor 33K ELR¼, J
R323, 344	0B05661A	Carbon Resistor 22K ELR¼, J
R325	0B05808A	Metal Film Resistor 220K CRA¼, FX
R329, 330	0B05561A	Carbon Resistor 18K ELR¼, J
R333	0B05688A	Carbon Resistor 390 ELR¼, J
R334	0B05664A	Carbon Resistor 3.9K ELR¼, J
R335	0B05511A	Carbon Resistor 820 ELR¼, J
R336	0B01781A	Carbon Resistor 1K ELR¼, J
R338	0B05673A	Carbon Resistor 5.6K ELR¼, J
R341	0B05566A	Carbon Resistor 2.2K ELR¼, J
R342	0B01564A	Carbon Resistor 82K ELR¼, J
R346	0B05562A	Carbon Resistor 47K ELR¼, J
R347	0B01920A	Carbon Resistor 100K ELR¼, J
C301, 307 325	0B01397A	Electrolytic Capacitor 1000μ 16V
C302, 310	0T04027A	Ceramic Capacitor 680P
C303	0B05750A	Mylar Capacitor 1200P 50V, K
C304, 311	0B01272A	Electrolytic Capacitor 100μ 25V
C305	0B01389A	Electrolytic Capacitor 4.7μ 16V
C306	0B01391A	Electrolytic Capacitor 220μ 25V
C308	0B01409A	Electrolytic Capacitor 47μ 25V
C309	0B05783A	Ceramic Capacitor 560P
C312	0B01401A	Electrolytic Capacitor 470μ 25V
C313	0B01412A	Electrolytic Capacitor 10μ 16V
C314	0B04060A	Mylar Capacitor 2200P 50V, K
C315	0B05859A	P.P. Capacitor 8200P 50V, J
C316, 329	0B05550A	Mylar Capacitor 1000P 50V, J
C317	0B05814A	Mylar Capacitor 8200P 50V, J
C318	0B01400A	Electrolytic Capacitor 100μ 16V
C319, 326	0B01403A	Electrolytic Capacitor 47μ 16V
C320	0B05639A	Tantalum Capacitor 1.5μ 35V
C321	0B01862A	Electrolytic Capacitor 22μ 16V
C322	0B05598A	Tantalum Capacitor 2.2μ 20V
C323, 324	0B05599A	Ceramic Capacitor 150P 50V, K
C327	0B05811A	Mylar Capacitor 0.047μ 50V, K
C328	0B01603A	Mylar Capacitor 0.1μ 50V, K
PP301	0B08140A	5P Plug Pin
	0E00166A	Screw M2 x 4 Cylinder Head (2 pcs.)

8. MECHANISM ASS'Y AND PARTS LIST

8.1. Solenoid Holder Ass'y (10)

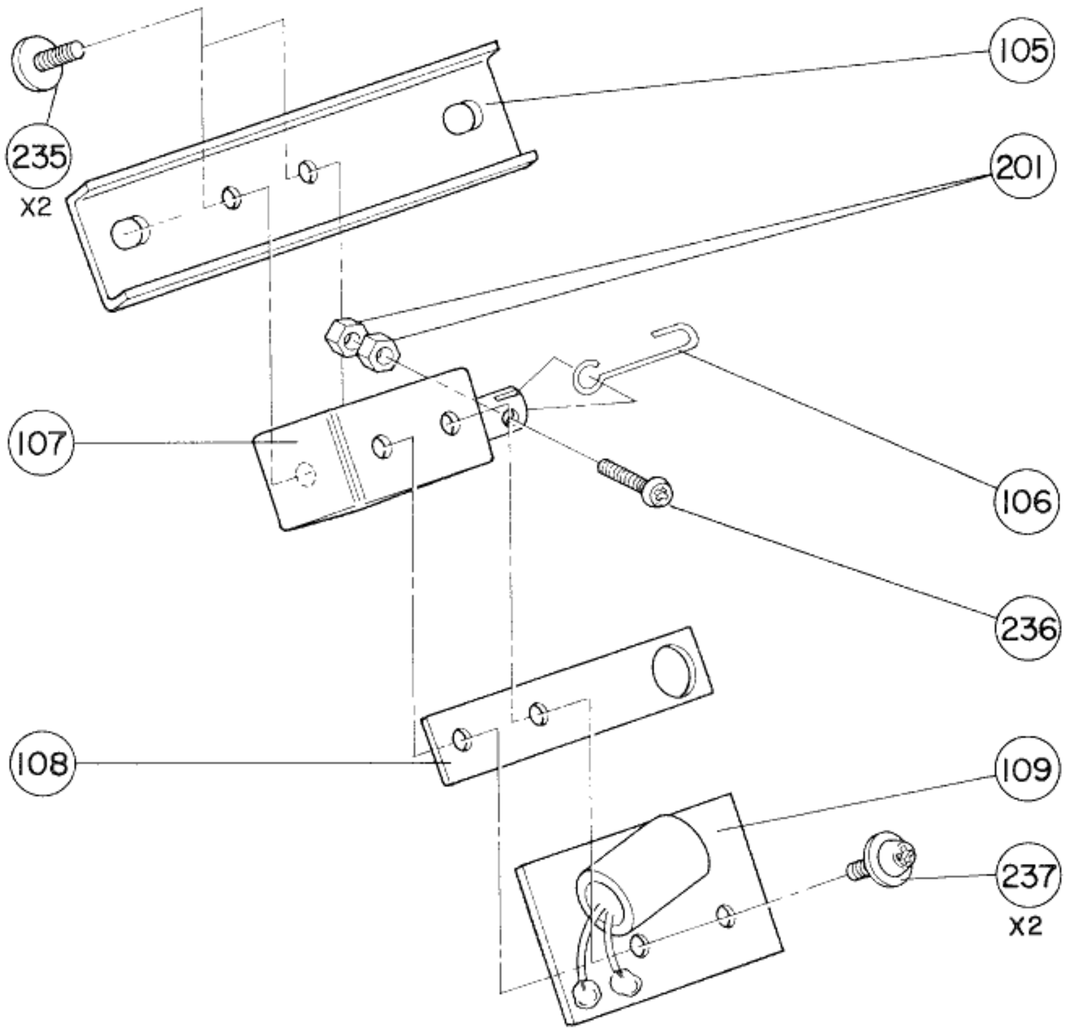


Fig. 8.1

8.2. Head Base B Ass'y (12)

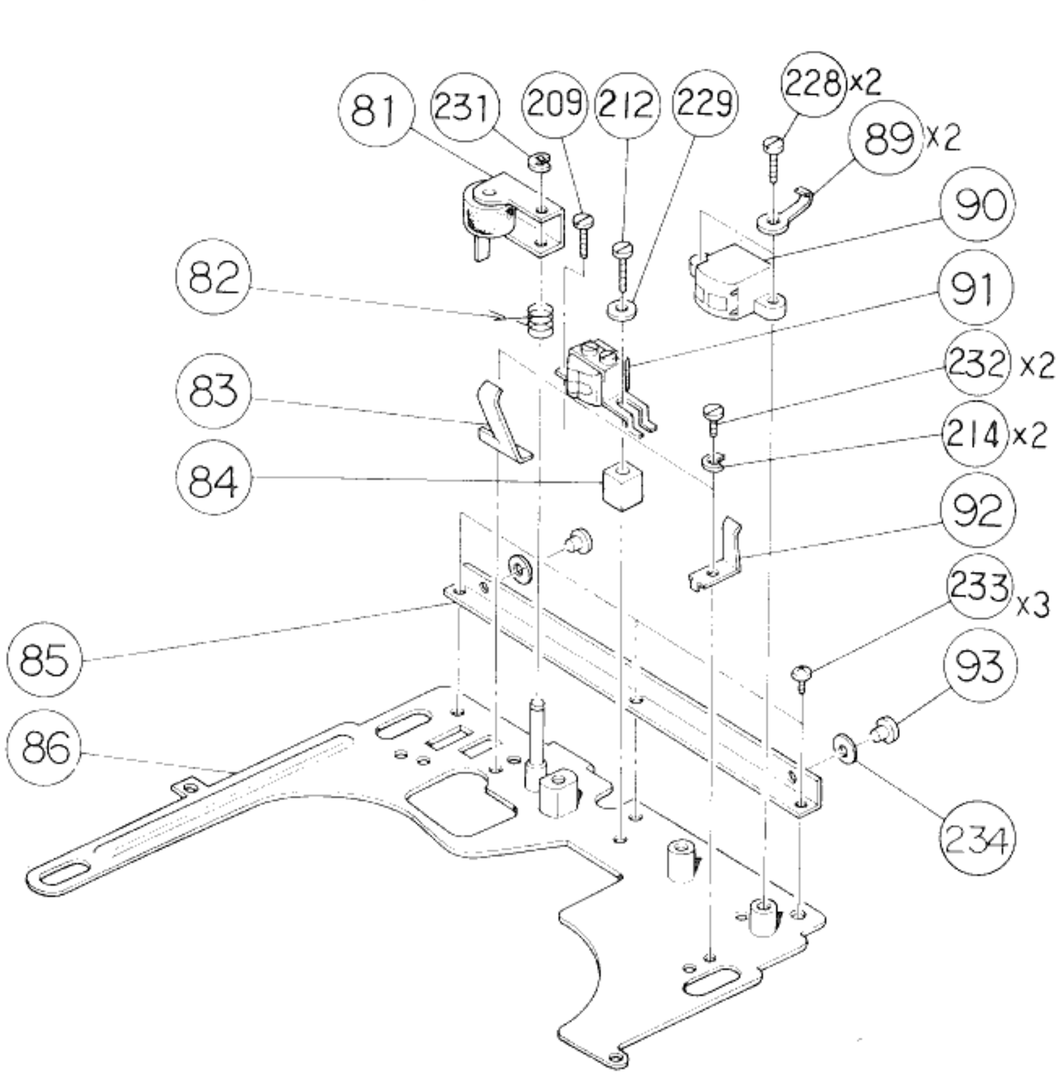


Fig. 8.2

8.3. Mechanism Bracket L Ass'y and Mechanism Bracket R Ass'y (14, 24)

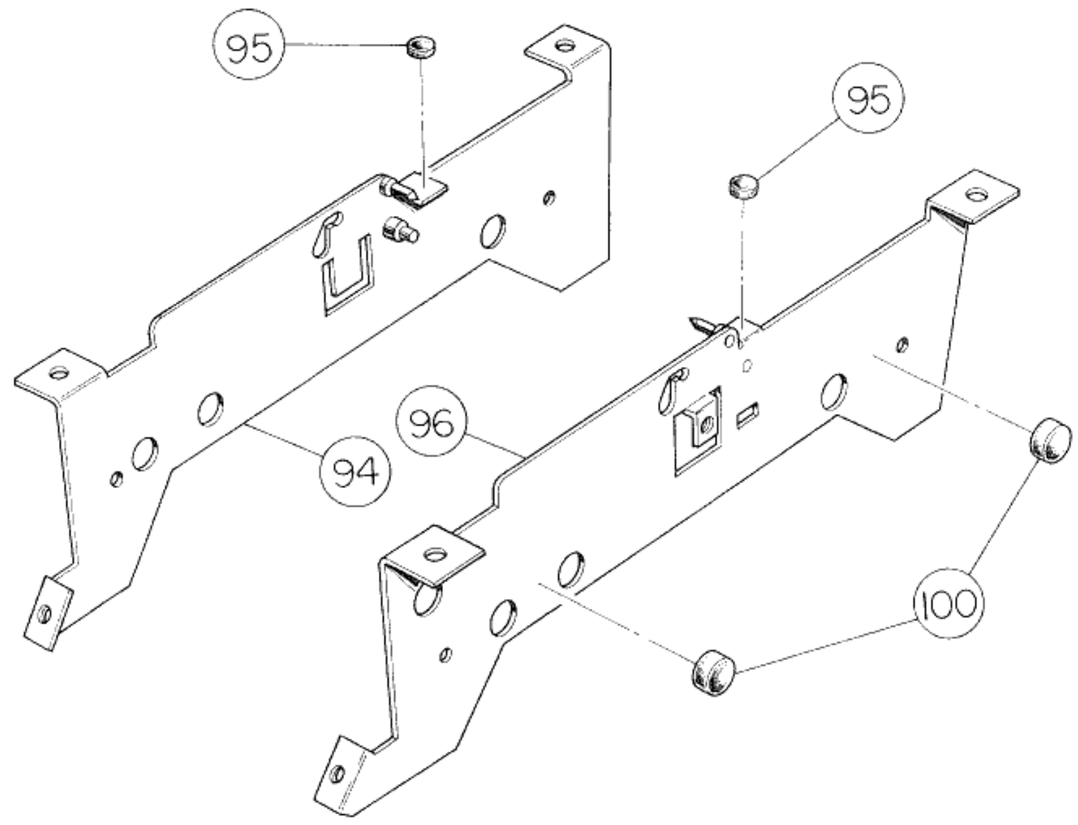


Fig. 8.3

8.4. Auto Shut-off Ass'y (4)

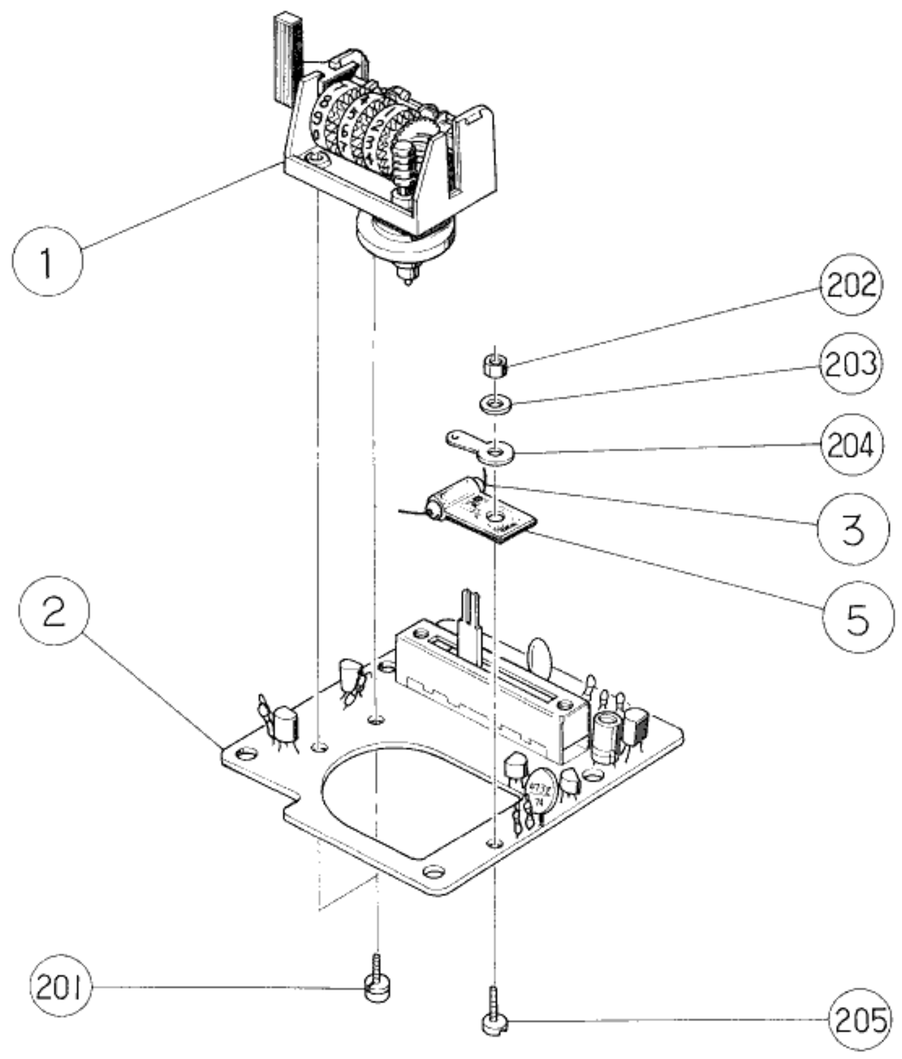


Fig. 8.4

8.5. MHX Motor Ass'y (55)

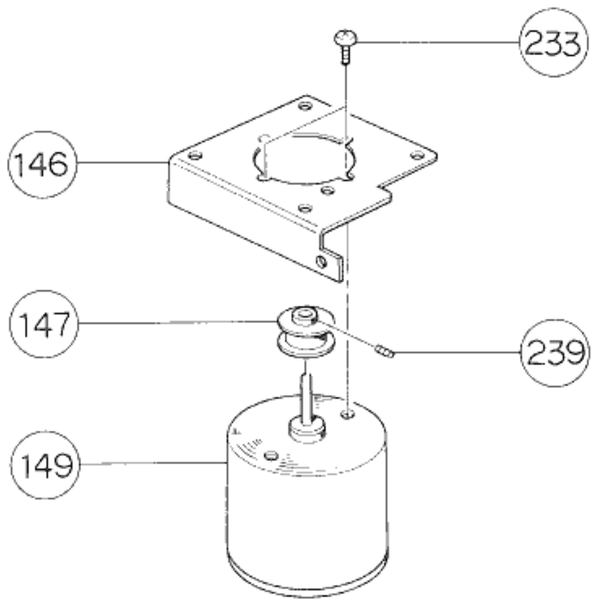


Fig. 8.5

8.6. Flywheel Holder Ass'y C (28)

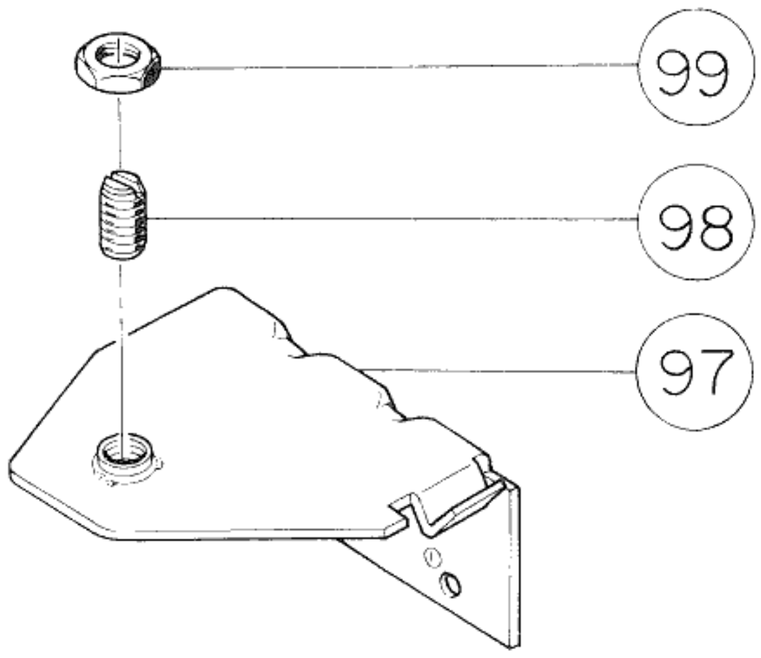


Fig. 8.6

8.7. Motor Cover Ass'y C (68)

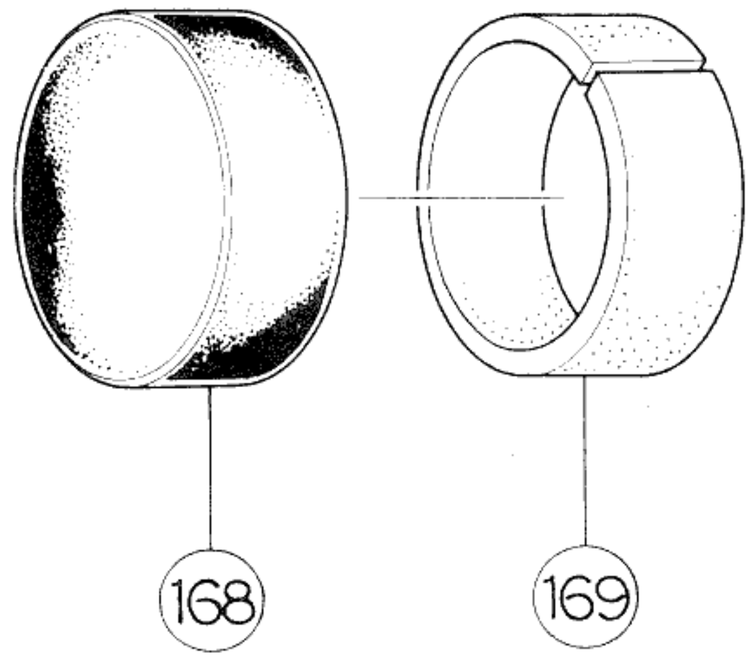


Fig. 8.7

Schematic Ref. No.	Part No.	Description
10	**CA03209A**	**Solenoid Holder Ass'y**
105	0C03840A	Solenoid Holder
106	0C03843A	Solenoid Connection Wire E
107	0B08092A	Solenoid
108	0C03850B	Pole Stopper
109	CA03212A	Solenoid Driver P.C.B. Ass'y
201	0E00507A	Nut Hex. M3
235	0E00618A	Screw M3 x 4 Philips Pan Head (Triple)
236	0E00514A	Screw M3 x 15 Philips Pan Head
237	0E00613A	Screw M3 x 5 Philips Pan Head (Triple)
	0B08099A	Solenoid Mylar
12	**CA03216A**	**Head Base B Ass'y**
81	CA03159B	Pressure Roller Ass'y B
82	0C03758B	Pressure Roller Spring B
83	0C03691A	Cassette Retainer Spring R
84	0C03588A	Azimuth Adjust Rubber
85	0C03692D	Base Angle
86	CA03217A	Head Base C Sub Ass'y
89	0C03591B	Cord Holder
90	0C03862B	Erase Head (E-50S)
91	CA03207B	Record/Playback Head Ass'y (RP-52)
92	0C03690A	Cassette Retainer Spring L
93	0C03767A	Base Stopper Rubber
209	0E00166A	Screw M2 x 4 Cylinder Head
212	0E00218A	Screw M2 x 10 Cylinder Head
214	0E00025A	Washer 2mm Spring
228	0E00185A	Screw M2 x 6 Cylinder Head
229	0E00149A	Washer 2.3mm Steel
231	0E00042A	E-Ring 1.5mm
232	0E00002A	Screw M2 x 3 Cylinder Head
233	0E00120A	Screw M2.6 x 3 Philips Pan Head
234	0E00030A	Washer 3mm Steel
14	**CA03210A**	**Mechanism Bracket L Ass'y**
94	CA03245A	Mechanism Bracket L Sub Ass'y
95	0C03767A	Base Stopper Rubber

Schematic Ref. No.	Part No.	Description
24	**CA03211A**	**Mechanism Bracket R Ass'y**
96	CA03246A	Mechanism Bracket R Sub Ass'y
95	0C03767A	Base Stopper Rubber
	0C03764B	Well Stopper Rubber
100	0B03671A	Board Stopper B
4	**CA03238A**	**Auto Shut-off Ass'y**
2	CA03248B	Alarm B P.C.B. Ass'y
3	0B03803A	Reed Switch ORD222
5	0C03763A	Reed Switch Holder
1	CA03247A	Tape Counter
202	0E00176A	Nut Hex. M2
205	0E00185A	Screw M2 x 6 Cylinder Head
203	0E00149A	Washer 2.3mm Steel
204	0E00037A	Earth Lug B-5
201	0E00612A	Screw M3 x 6 Philips Pan Head (2A)
55	**CA03253B**	**MHX Motor Ass'y**
146	0C03976A	Motor Bracket C
147	0C03770B	Motor Pulley JA
149	0C03950A	MHX B Motor
233	0E00120A	Screw M2.6 x 4 Philips Pan Head
239	0E00224A	Screw M2 x 3 Cup Point
28	**CA03226B**	**Flywheel Holder Ass'y C**
97	CA03280A	Flywheel Holder Sub Ass'y C
98	CA03281A	Thrust Screw Ass'y
99	0C03857A	Lock Nut
68	**CA03232A**	**Motor Cover Ass'y C**
168	0C03796A	Motor Cap
169	0C03794A	Motor Cover A

8.8. Transport Mechanism 1

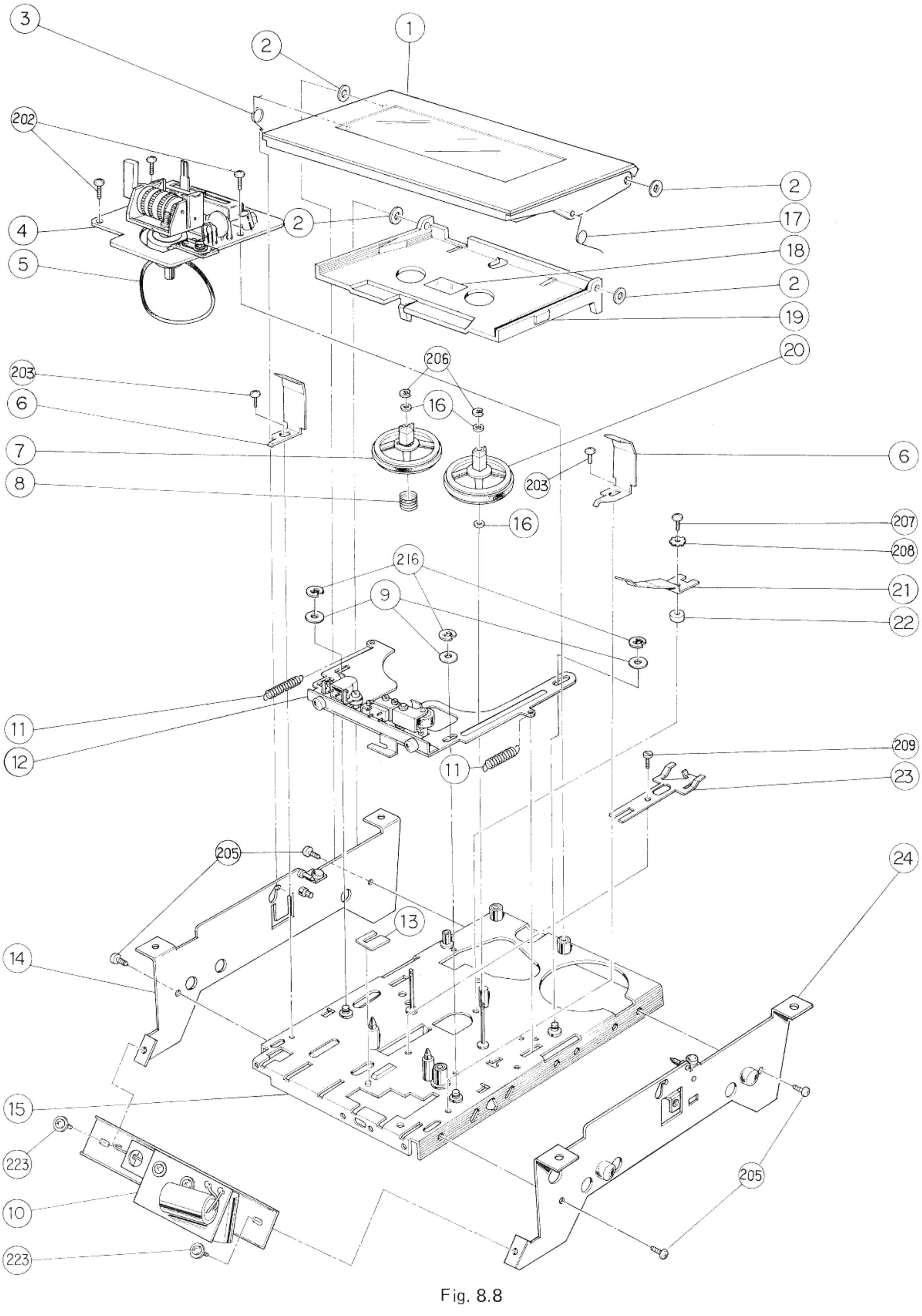


Fig. 8.8

Schematic Ref. No.	Part No.	Description
1	CA03283A	Cassette Lid Ass'y
2	0E00254A	Washer 3.1mm Plastics
3	0C03759D	Lid Spring Left
4	CA03238A	Auto shut-off Ass'y
5	0C03651A	Counter Belt E
6	0C03975A	Cassette Guide C
7	CA03192A	Reel Hub Ass'y (Supply)
8	0C03612C	Back Tension Spring
9	0C06243A	W4 x 8 x 0.2F
10	CA03209A	Solenoid Holder Ass'y
11	0C03694B	Base Return Spring
12	CA03216A	Head Base B Ass'y
14	CA03210A	Mechanism Bracket L Ass'y
15	CA03229C	Mechanism Chassis Ass'y (C)
16	0C03613A	Washer 1.6mm Plastics
17	0C03760D	Lid Spring Right
18	0M03167A	Silver Seal B
19	0C03699K	Cassette Well
20	CA03193A	Reel Hub Ass'y (Take-up)
21	0C03973A	Cassette Well Spring D
22	0C03706A	Cassette Well Spring Stud
23	CA03140A	Brake Ass'y
24	CA03211A	Mechanism Bracket R Ass'y
202	0E00219A	Screw M2.6 x 5 Philips Pan Head
203	0E00226A	Screw M2.6 x 4 Philips Pan Head
205	0E00502A	Screw M3 x 5 Philips Pan Head
206	0E00165A	E-Ring 1.2mm
207	0E00231A	Screw M2.6 x 8 Philips Pan Head (FT)
208	0E00233A	Washer 2.6mm Toothed Lock
209	0E00166A	Screw M2 x 4 Cylinder Head
210	0E00004A	Screw M2 x 8 Cylinder Head
211	0E00222A	E-Ring 2mm
223	0E00606A	Screw M3 x 6 Philips Pan Head (3A)

8.9. Transport Mechanism 2

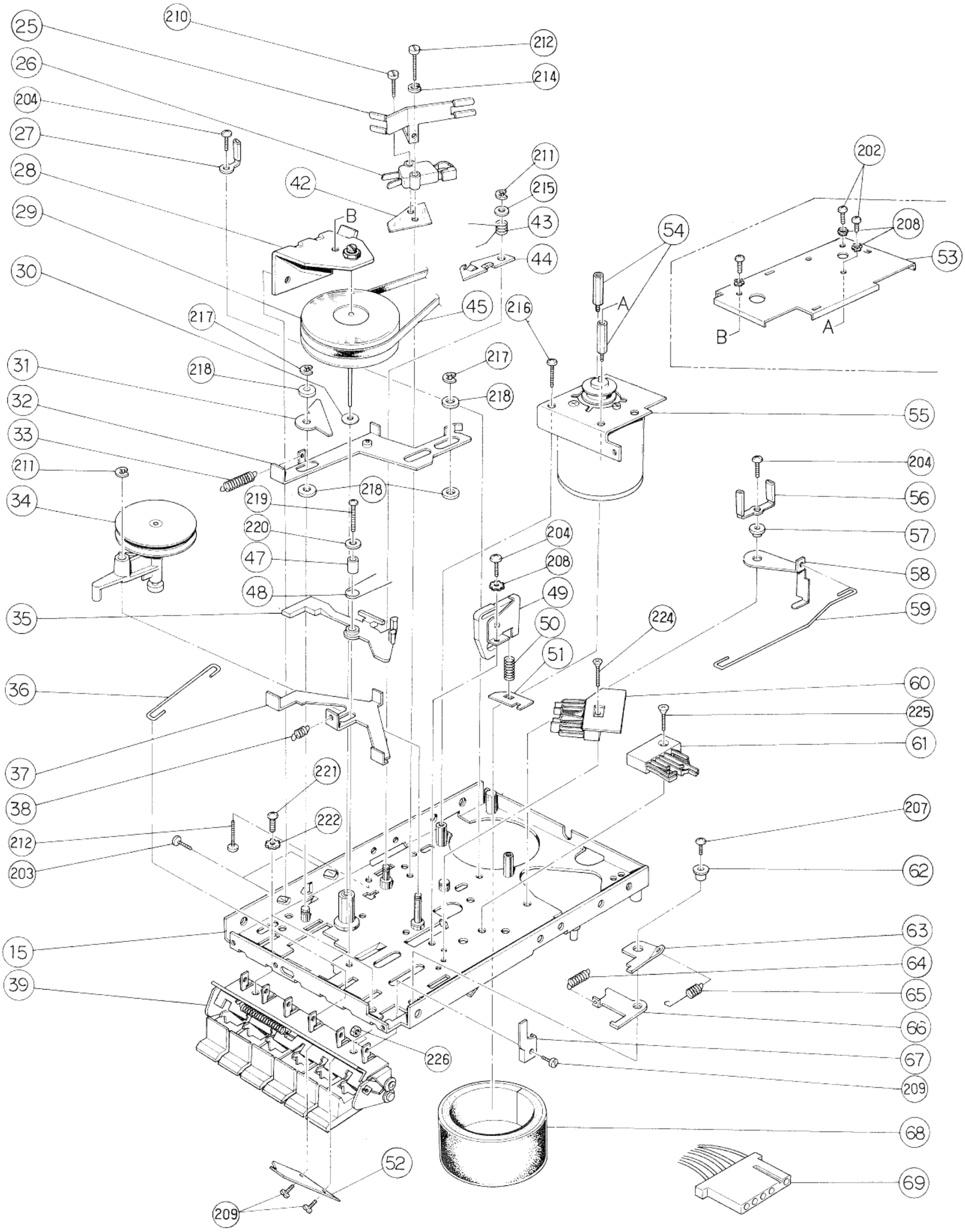


Fig. 8.9

Schematic Ref. No.	Part No.	Description
25	0C03799E	Belt Guide
26	0C03743A	Pause Switch
27	0C03591B	Cord Holder
28	CA03226B	Flywheel Holder Ass'y C
29	CA03225B	Flywheel B Ass'y
30	0C03174A	Washer 2.1mm Plastics
31	0C03746C	Pause Bar
32	CA03167A	Slide Plate Ass'y
33	0C03748A	Slide Plate Spring
34	CA03301B	Idler Pulley Ass'y
35	0C03646B	FRP Lever B
36	0C03553B	Eject Linkage Wire
37	0C03647B	See-Saw Arm
38	0C03649A	See-Saw Arm Spring
39	CA03230A	Button Bracket Ass'y B
42	0C03800A	Pause Switch Mylar
43	0C03747A	Lock Lever Spring
44	0C03084A	Pause Lock Lever
45	0C03668B	Driving Belt
47	0C03648A	See-Saw Arm Pipe
48	0C03650B	Lever Spring
49	CA03118A	Eject Arm Ass'y
50	0C03873B	Eject Spring
51	0C03644C	Spring Stopper
52	0C03839B	Solenoid Connection Plate E
53	0C03970B	Shield Cover
54	0C03971B	Shield Cover Stud
55	CA03253B	MHX Motor Ass'y
56	0B03067A	Bind Holder
57	0C03546A	Record Lock Shaft
58	0C03703B	Record Sensor B
59	0C03704A	Record Sensor Linkage B
60	CA03231A	Start Switch Ass'y (C)
61	CA03141A	Mute Switch Ass'y (C)
62	0C03775C	Base Cam Shaft
63	0C03652C	Record Lock B
64	0C03774A	Base Cam Spring
65	0C03791A	Record Lock Spring B
66	0C03773C	Base Cam
67	0C03792A	Record Cam Link B
68	CA03232A	Motor Cover Ass'y C
69	0B08141A	5P Connector Ass'y
202	0E00219A	Screw M2.6 x 5 Philips Pan Head
203	0E00226A	Screw M2.6 x 4 Philips Pan Head
204	0E00228A	Screw M2.6 x 6 Philips Pan Head (FT)
207	0E00231A	Screw M2.6 x 8 Philips Pan Head (FT)
208	0E00233A	Washer 2.6mm Toothed Lock
209	0E00166A	Screw M2 x 4 Cylinder Head
210	0E00004A	Screw M2 x 8 Cylinder Head
211	0E00222A	E-Ring 2mm
212	0E00218A	Screw M2 x 10 Cylinder Head
213	0E00030A	Washer 3mm Steel
214	0E00025A	Washer 2mm Spring
215	0E00253A	Washer 3.3mm Steel
216	0E00220A	Screw M2.6 x 8 Philips Pan Head
217	0E00181A	E-Ring 3mm
218	0E00031A	Washer 4mm Steel
219	0E00229A	Screw M2.6 x 10 Philips Pan Head
220	0E00142A	Washer 2.6mm Steel
221	0E00509A	Screw M3 x 6 Philips Pan Head
222	0E00172A	Washer 3mm Toothed Lock
224	0E00223A	Screw M2 x 10 Flat Head
225	0E00008A	Screw M2.6 x 8 Flat Head
226	0E00176A	Nut Hex. M2

Schematic Ref. No.	Part No.	Description
39	**CA03230A**	**Deck Button Ass'y (B)**
	0C03752E	Deck Button SS
	0C03609A	Lock Spring A
	0C03677A	Lock Plate Stopper
	0C03560A	Button Shaft
	0C03558C	Cam Spring
	0C03554E	Button Bracket
	0C03555D	Button Cam
	0C03735D	Cam Spring B
	CA03168A	Lock Plate Ass'y
	0C03783A	Stud B
	0C03861A	Button Cam B
	0E00166A	Screw M2 x 4 Cylinder Head
	0E00181A	E-Ring 3mm
	0E00184A	Screw M2.6 x 6 Flat Head
	0E00030A	Washer 3mm Steel

8.10. Chassis

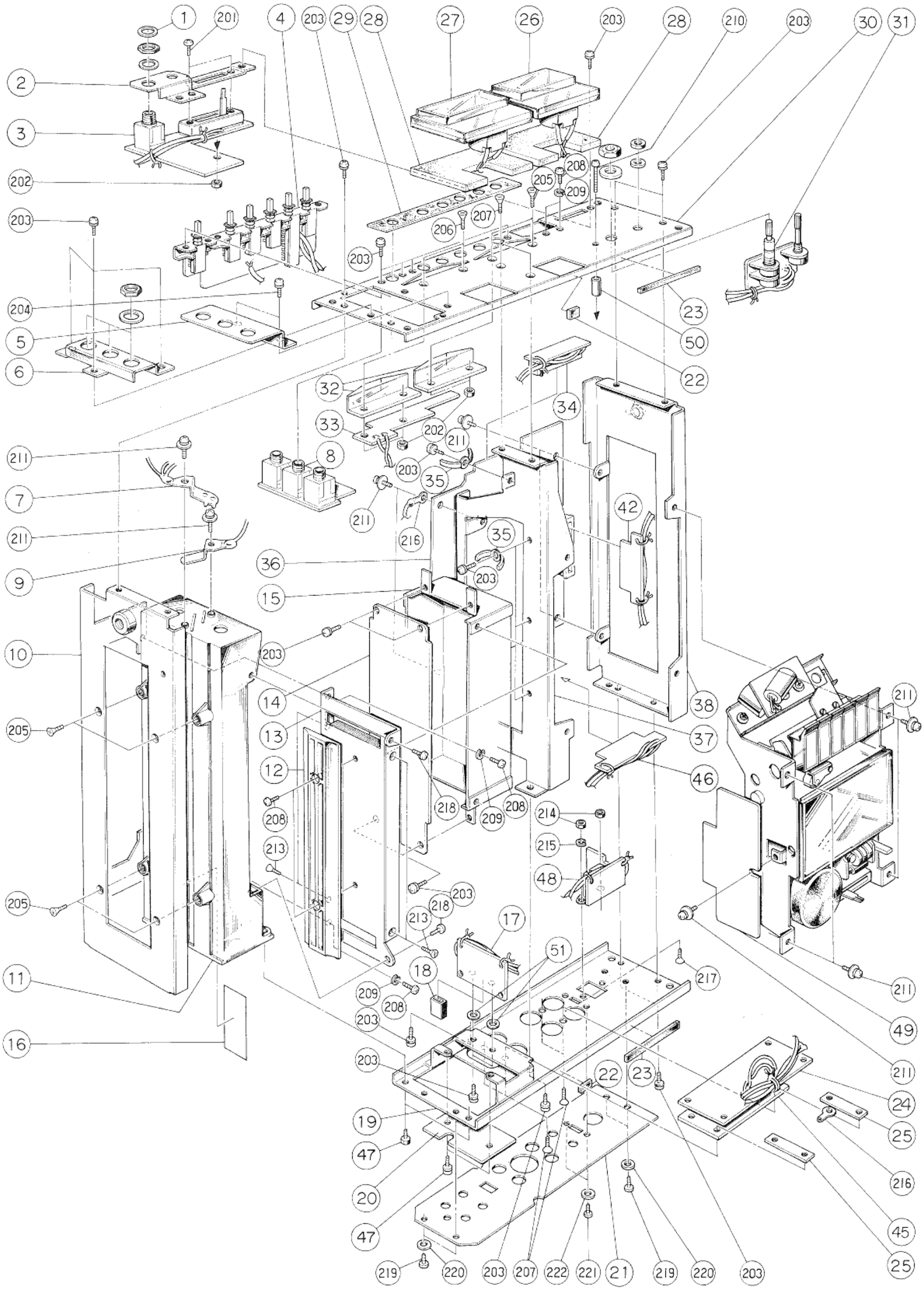


Fig. 8.10

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
1	0J03236B	Jack Cover	219	0E00589A	Screw M3 x 6 Philips Pan Head
2	0J03341A	Headphone Jack Holder	220	0E00157A	Washer 3mm Plastics
3	BA03675A	Headphone AMP. P.C.B. Ass'y	221	0E00592A	Screw M2.6 x 4 Philips Pan Head
4	BA03676A	Switch P.C.B. Ass'y	222	0E00651A	Washer 2.6mm Plastics
5	0M03533A	Jack Name Plate			
6	0J03342A	Jack Bracket			
7	JA03021A	Contact Plate D Ass'y			
8	BA03671A	Mic. AMP. P.C.B. Ass'y			
9	0J03354A	Contact Plate B			
10	JA03022A	Slide Plate R Ass'y			
11	0J03347A	Battery Case			
12	0J03349A	Battery Slide Guide			
13	0J03352A	Converter Case Cover			
14	BA03730A	D-D, MHX P.C.B. Ass'y			
15	0J03351C	Converter Case			
16	0M03531A	Battery Indication Label			
17	BA03672A	400Hz OSC. P.C.B. Ass'y			
18	0H03104A	Push Button			
19	JA03023A	Rear Chassis Ass'y			
20	BA03764A	Rec. Cal. P.C.B. Ass'y			
21	0M03664B	Rear Name Plate			
22	0B03939A	Cushion			
23	0J03370A	Stopper Rubber			
24	BA03677A	Jack P.C.B. Ass'y			
25	0J03277A	Bolt Receptacle Plate			
26	0B08143C	Meter (L)			
27	0B08142C	Meter (R)			
28	0J03344B	Meter Cushion			
29	0H03373A	Push Switch Cover			
30	0J03365B	Front Chassis			
31	BA03674A	Volume P.C.B. Ass'y			
32	0J03345B	Lamp House			
33	BA03683A	Lamp P.C.B. Ass'y			
34	BA03694A	19P Sub Board Ass'y			
35	0B03067A	Bind Holder			
36	BA03669A	Main P.C.B. Ass'y (SX)			
37	0J03355C	Center Chassis			
38	JA03024A	Slide Plate L Ass'y			
42	0B01651B	14P Plug Board			
45	0B08097A	Jack Unit			
46	0B01798C	19P Plug Board			
47	0J03358B	Rear Chassis Stud			
48	BA03686A	Car Battery P.C.B. Ass'y			
49	BA03670A	Dolby P.C.B. Ass'y			
50	0J03375A	Headphone AMP. Stud			
51	0B03053B	Switch Stud			
201	0E00120A	Screw M2.6 x 3 Philips Pan Head			
202	0E00507A	Nut Hex. M3			
203	0E00612A	Screw M3 x 6 Philips Pan Head (2A)			
204	0E00622A	Screw M3 x 5 Philips Pan Head (2A)			
205	0E00518A	Screw M3 x 8 Flat Head			
206	0E00524A	Screw M3 x 10 Flat Head			
207	0E00505A	Screw M3 x 6 Flat Head			
208	0E00522A	Screw M3 x 4 Philips Pan Head			
209	0E00581A	Washer 3mm Spring			
210	0E00519A	Screw M3 x 25 Philips Pan Head			
211	0E00606A	Screw M3 x 6 Philips Pan Head (3A)			
213	0E00076A	Screw M2.6 x 4 Flat Head			
214	0E00021A	Nut Hex. M2.6			
215	0E00026A	Washer 2.6mm Spring			
216	0E00037A	B5 Earth Lug			
217	0E00184A	Screw M2.6 x 6 Flat Head			
218	0E00121A	Screw M2.6 x 6 Philips Pan Head			

8.11. Cabinet

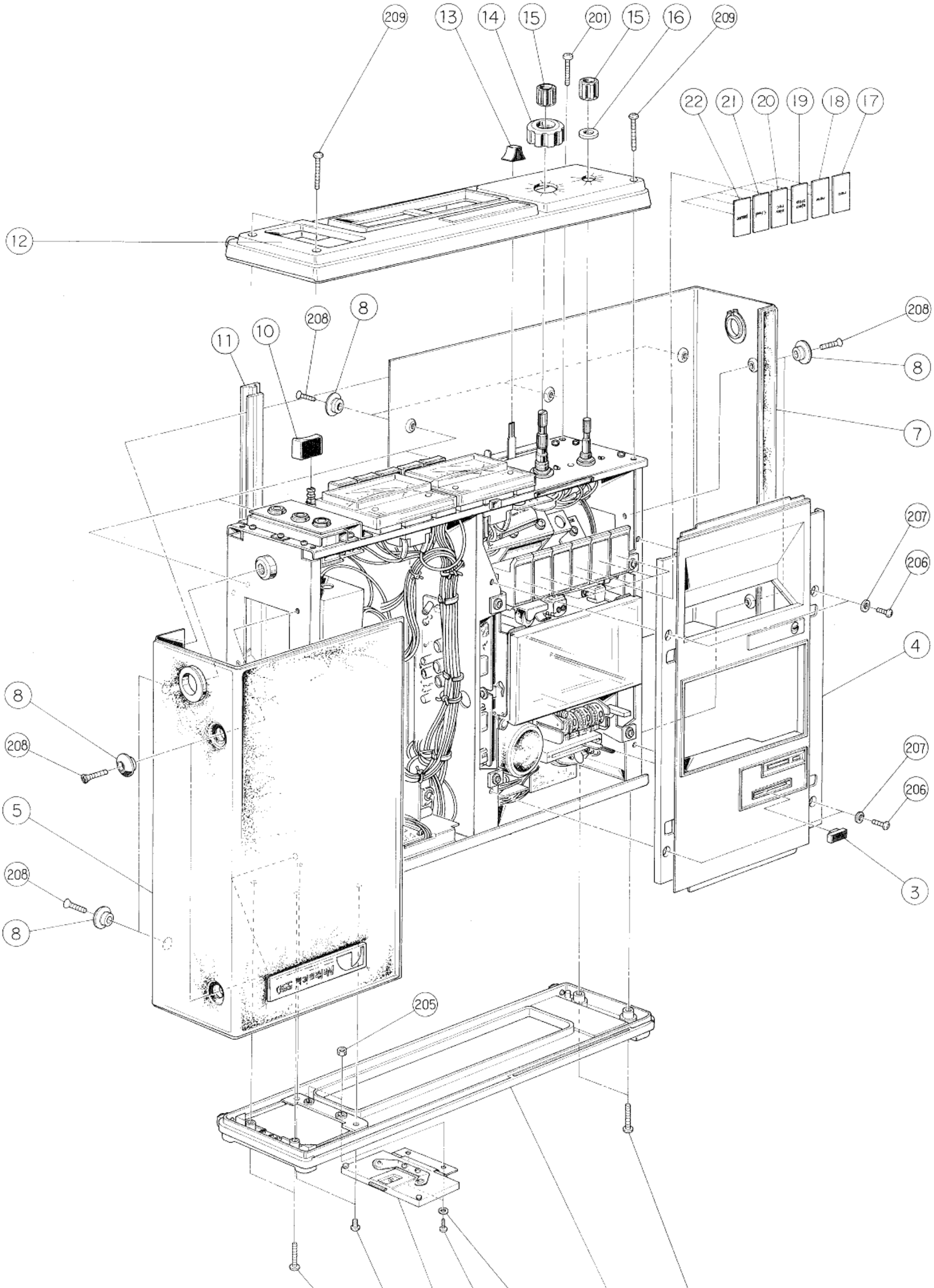


Fig. 8.11

Schematic Ref. No.	Part No.	Description
1	HA03613B	Battery Door Ass'y
2	HA03614A	Rear Panel Ass'y
3	0H03394A	Program Timer Knob
4	HA03615A	Deck Panel Ass'y
5	HA03616A	Upper Case Ass'y
7	HA03617A	Bottom Case Ass'y
8	0H03390A	Wave Washer (B)
10	0H03371A	Push Button 550
11	0H03367A	Case Spacer
12	HA03637A	Front Panel Ass'y
13	0H03375C	Slide Volume Knob 550
14	0H03370D	Volume Knob B
15	0H03369C	Volume Knob A
16	0H03386A	Volume Knob Felt
17	0M03563A	Record Name Plate
18	0M03564A	Rewind Name Plate
19	0M03565A	Stop Name Plate
20	0M03566A	Play Name Plate
21	0M03567A	FF Name Plate
22	0M03568A	Pause Name Plate
201	0E00604A	Screw M3 x 15 Philips Pan Head
202	0E00661A	Screw M3 x 4 Philips Pan Head
203	0E00685A	Screw M2.6 x 5 Philips Pan Head
204	0E00651A	Washer 2.6mm Plastics
205	0E00681A	Nut Hex. M2.6
206	0E00589A	Screw M3 x 6 Philips Pan Head
207	0E00183A	Washer (3.5 x 7 x 0.5) Steel
208	0E00659A	Screw M3 x 10 Oval Countersunk Head
209	0E00683A	Screw M3 x 22 Philips Pan Head
1	**HA03613B**	**Battery Door Ass'y**
	HA03626A	Case Knob Ass'y
	0A03239D	Battery Case Cover
	0J03360B	Contact Plate C
	0J03364A	Hinge Shaft
	0J03363C	Hinge
	0J03649A	Battery Cover Slide Cover B
	0J03650A	Lock Spring
	0J03651A	Battery Cover Spring
	0M03537B	Model Name Plate
	0E00076A	Screw M2.6 x 4 Philips Countersunk Head
	0E00219A	Screw M2.6 x 5 Philips Pan Head
	0E00681A	Nut Hex. M2.6
2	**HA03614A**	**Rear Panel Ass'y**
	0A03238B	Rear Panel
	0M03538C	Dolby Name Plate
	0A03240B	Rubber Foot
	0J03362A	Battery Cover Stopper
	0E00612A	Screw M3 x 6 Philips Pan Head (2A)
4	**HA03615A**	**Deck Panel Ass'y**
	0J03370A	Stopper Rubber
	0A03236A	Deck Panel
	0H03099A	Counter Lens V
	0M03532A	Tape Alarm Name Plate
	0M03840B	SH Badge

Schematic Ref. No.	Part No.	Description
12	**HA03637A**	**Front Panel Ass'y**
	0A03237A	Front Panel
	0M03663A	Front Name Plate
	0M03535A	Brand Name Plate
	0A03240B	Rubber Foot
	0H03294A	Volume Shade

9. BLOCK DIAGRAM

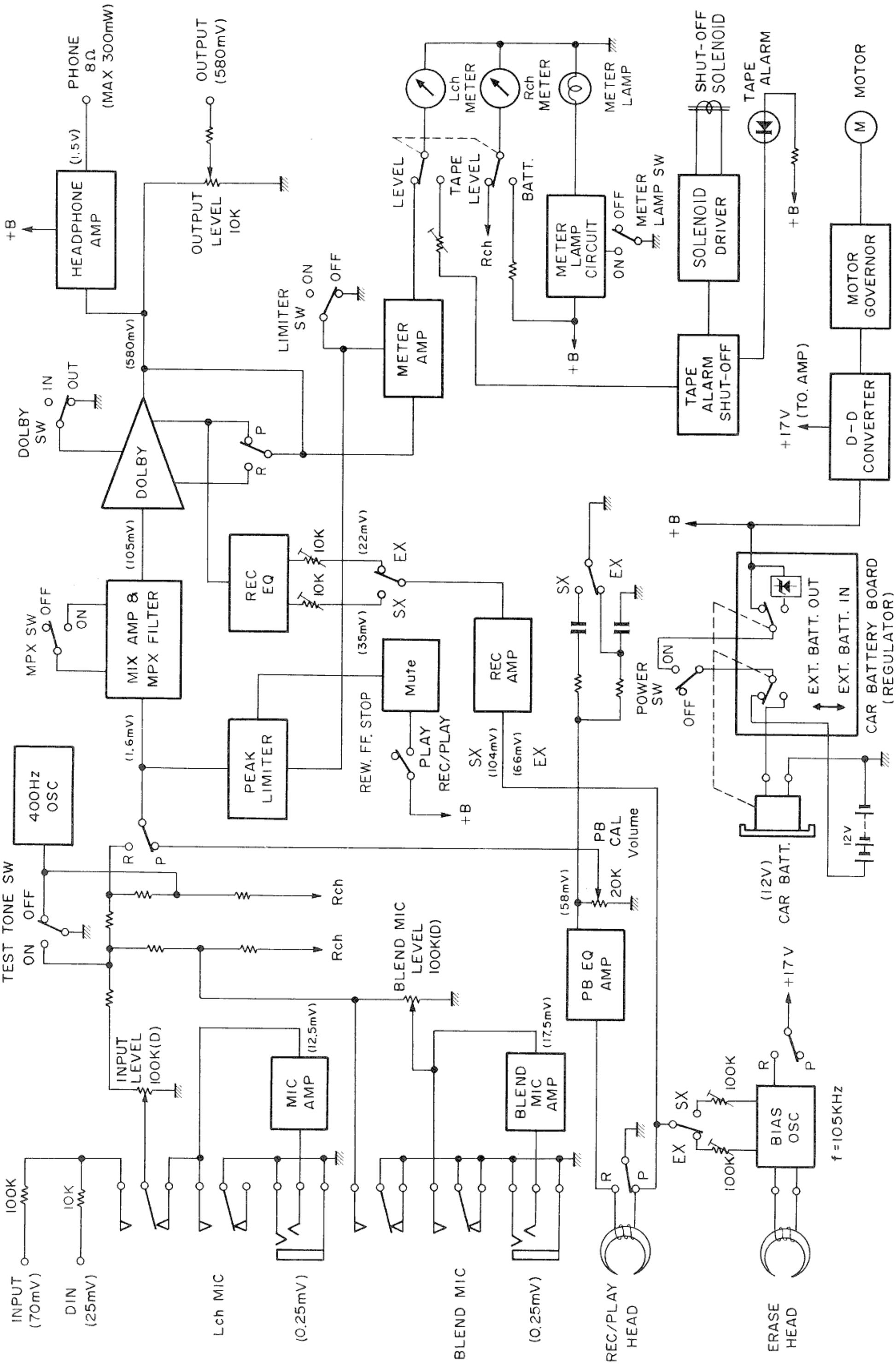


Fig. 9

10. SCHEMATIC DIAGRAMS

10.1. Amplifier

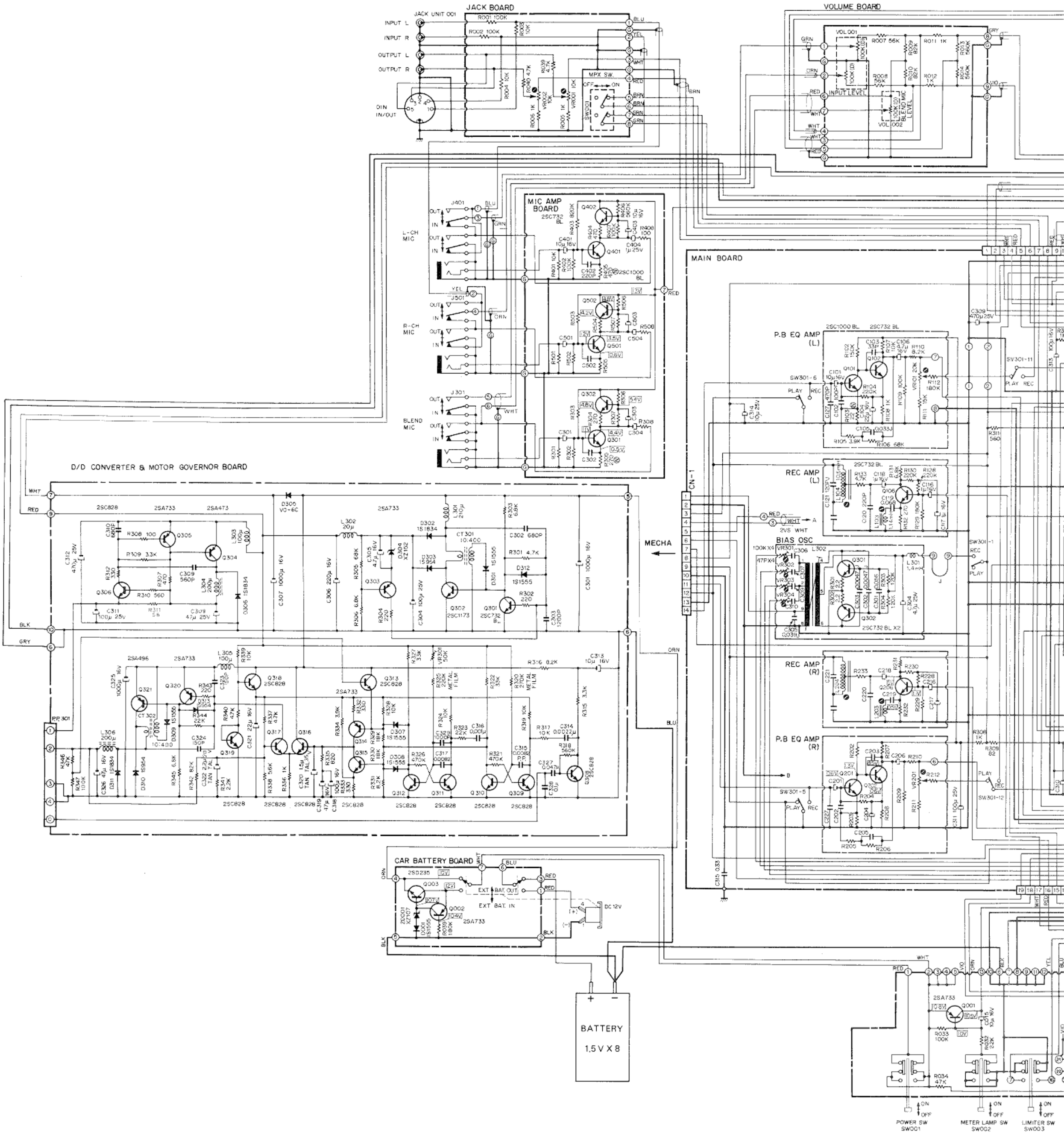
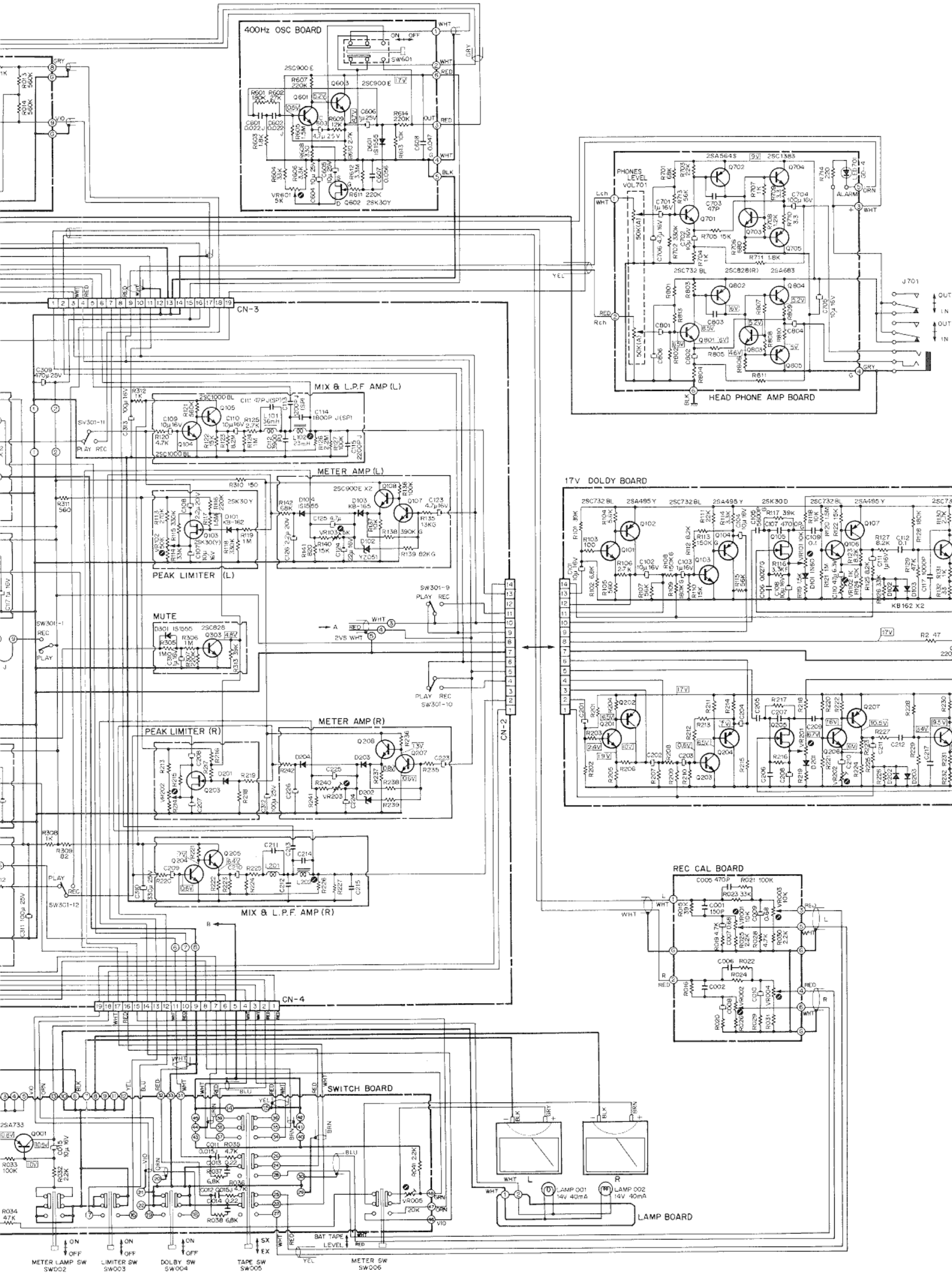


Fig. 10.1


400Hz OSC BOARD
ON OFF
SW601
2SC900 E
Q603
Q601
Q602 2SK30Y
D601 1S1555
VR601 5K
CN-3
CN-2
CN-4
MIX & L.P.F AMP (L)
2SC1000 BL
Q105
Q104
PLAY REC
SW301-11
METER AMP (L)
2SC900E X2
Q108
Q107
PEAK LIMITER (L)
2SK30Y
Q103
Q101
MUTE
D301 1S1555
2SC828
Q303
SW301-1
REC
PLAY
SW301-9
PLAY REC
SW301-10
METER AMP (R)
PEAK LIMITER (R)
Q208
Q207
Q203
Q201
MIX & L.P.F. AMP (R)
Q205
Q204
SW301-12
PHONES LEVEL VOL701
2SA564S
2SC1383
Q702
Q704
Q701
Q703
Q705
2SC732 BL
2SC828(R)
2SA683
Q802
Q804
Q801
Q803
Q805
HEAD PHONE AMP BOARD
J701
OUT
IN
OUT
IN
ALARM
17V DOLDY BOARD
2SC732 BL
2SA495 Y
2SK30 D
Q102
Q101
Q104
Q103
Q107
Q106
Q108
KB162 X2
Q202
Q201
Q204
Q203
Q207
Q205
Q208
Q206
REC CAL BOARD
SWITCH BOARD
2SA733
Q001
METER LAMP SW SW002
LIMITER SW SW003
DOLBY SW SW004
TAPE SW SW005
METER SW SW006
BAT TAPE LEVEL
LAMP 001 14V 40mA
LAMP 002 14V 40mA
LAMP BOARD

ig. 10.1

10.2. Mechanism

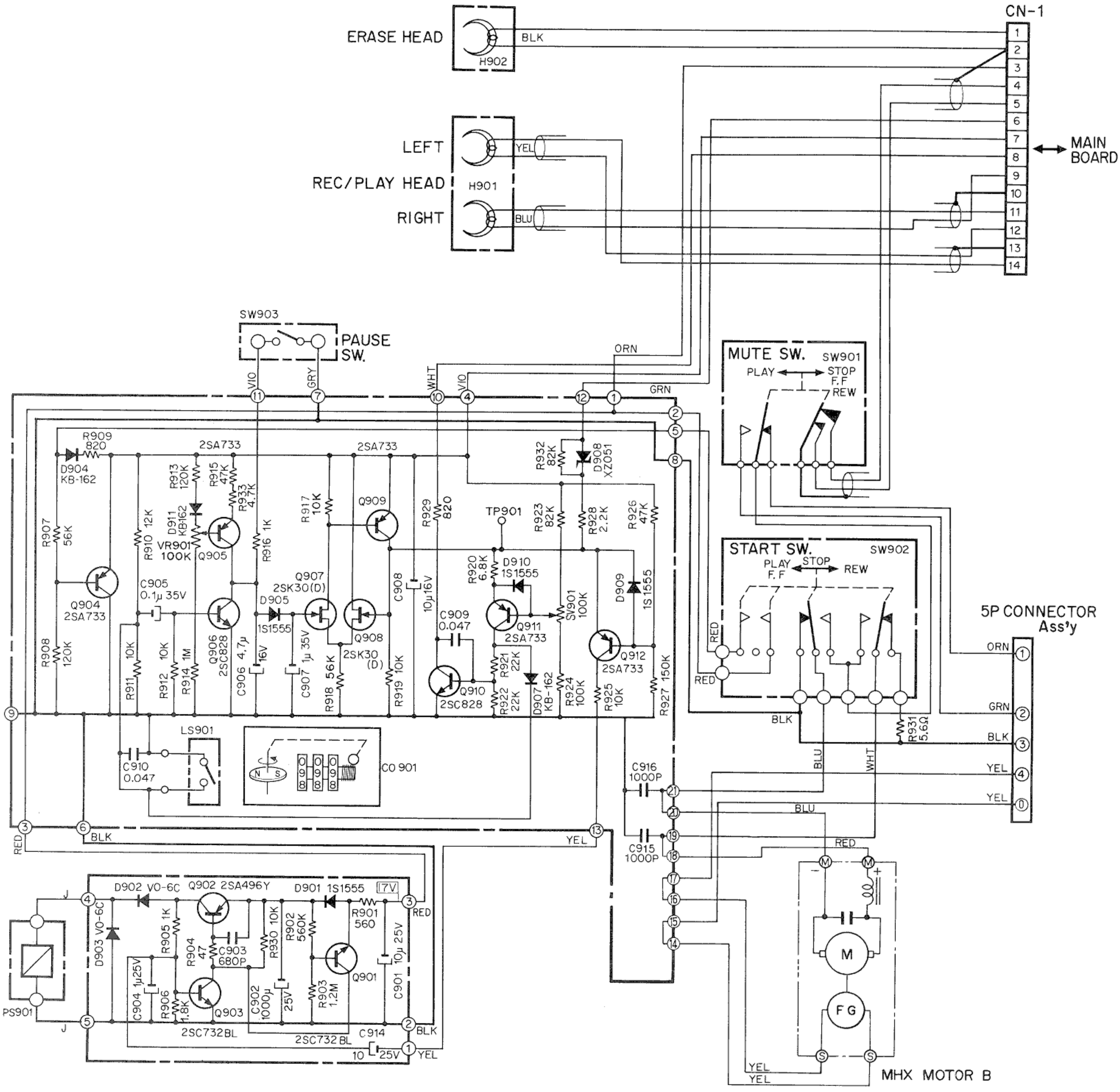


Fig. 10.2

11. SPECIFICATIONS

Power Supply		DC 12V (D Size Dry Battery x 8, Car Battery, AC with AC pack)
Tape Speed		1-7/8 ips ± 1.5%
Wow Flutter		0.13% WTD Peak
Frequency Response		40-17,000Hz ± 3 dB (SX or EXII tape)
Signal to Noise Ratio		Better than 65 dB (Dolby NR In, Wrms, CCITT, 400 Hz, 3% Distortion)
Total Harmonic Distortion		Less than 1.5% (400 Hz 0 dB)
Erasure		Better than 60 dB (1 KHz 0 dB)
Channel Separation		Better than 35 dB (1 KHz 0 dB)
Cross Talk		Better than 60 dB (1 KHz 0 dB)
Bias Frequency		105 KHz
Input	Mic	0.2 mV 10 K ohm (-72 dBm)
	Line	70 mV 150 K ohm
Output	Line	580 mV
	Headphone	100 mW (1 KHz 0 dB)
Battery Life		15 Hrs (Continuous use)
Size		12-1/4" (W) x 3-1/2 (H) x 13-3/4 (D) 311 m/m (W) x 89 m/m (H) x 350 m/m (D)
Weight		11-1/4 lbs (5.1 Kg) (Without Batteries)

- Specifications and appearance design are subject to change for further improvement without notice.
- Dolby System under license from Dolby Laboratories Inc.
- The word "DOLBY" and the Double-Symbol are trademarks of Dolby Laboratories Inc.

12. HISTORY ON 550

12.1. Major Modifications

(1) Tape and Time Constants

S/N 3659471

Tape: NORMAL, CrO_2 Time Constants: NORMAL: 1590 μs+120 μs CrO_2 : 3180 μs+70 μs	Tape: EX, SX Time Constants: EX: 3180 μs+120 μs SX: 3180 μs+70 μs

(2) Motor and Governor

S/N 54666 S/N 3661871

JA Motor and Governor	NE Motor and Governor	MHXB Motor and Governor

12.2. Modification (details)

Following shows each of the revised history of P.C.B., mounting diagrams and schematic diagrams.

12.2.1. Main P.C.B. Ass'y

(1) S/N – 3659470 (for CrO_2 tape)
Part No.: BA-3669
Same as the latest one except capacitor C316 (C316 has been removed in the latest one).

(2) S/N 3659471 – (for SX tape)
Latest one
(Including the modification of resistors R303,304 from 470K to 120K).

12.2.2. Dolby P.C.B. Ass'y

Stays the same.

12.2.3. Rec. Cal. P.C.B. Ass'y

(1) S/N – 3659470 (for CrO_2 tape)
Part No.: BA-3673
See Figs. 12.1 and 12.7.

(2) S/N 3659471 – (for SX tape)
Latest one

12.2.4. Switch P.C.B. Ass'y

(1) S/N – 3659470 (for CrO_2 tape)
Part No.: BA-3676
See Figs. 12.2 and 12.7.
Only patterns are different from the latest one (patterns connected to the Tape Switch have been cut in the latest one).

(2) S/N 3659471 –
Latest one

12.2.5. Volume P.C.B. Ass'y

Stays the same.

12.2.6. Solenoid Driver P.C.B. Ass'y

Stays the same.

12.2.7. 400 Hz OSC. P.C.B. Ass'y

Stays the same except resistor R606 (changed from 3.3K to 5.6K).

12.2.8. Headphone AMP. P.C.B. Ass'y

Stays the same.

12.2.9. Tape Alarm Shut-off P.C.B. Ass'y

(1) S/N – 57670
Part No.: CA-3213
See Figs. 12.3 and 12.6.

(2) S/N 57671 –
Latest one (Alarm B P.C.B. Ass'y)

12.2.10. Mic. AMP. P.C.B. Ass'y

Stays the same except for resistors R301, 401 and 501 (changed from 680-ohm to 10K).

12.2.11. Jack P.C.B. Ass'y

Stays the same.

12.2.12. D-D Converter and Motor Governor P.C.B. Ass'y

(1) S/N – 54665 (for JA Motor)
Part No.: BA-3679
See Figs. 12.4 and 12.7.

(2) S/N 54666-3661870 (for NE Motor)
Part No.: BA-3699 (D-D, D-Fast Converter and Motor Governor P.C.B. Ass'y)
See Figs. 12.5 and 12.8.

(3) S/N 3661871 – (for MHXB Motor)
Latest one (D-D, MHX P.C.B. Ass'y)
(Including the modification of the R301 from 10K to 4.7K).

12.2.13. Lamp P.C.B. Ass'y

Stays the same.

12.2.14. Car Battery P.C.B. Ass'y

Stays the same.

12.2.15. Schematic Diagrams (Mechanism)

(1) S/N – 57670
See Fig. 12. 6.

(2) S/N 57671 –
Latest one

12.2.16. Schematic Diagrams (Amplifier)

(1) S/N – 3659470 (for CrO_2 tape)
See Fig. 12.7.

(2) S/N 3659471 – (for SX tape)
Latest one

Rec. Cal. P.C.B. Ass'y

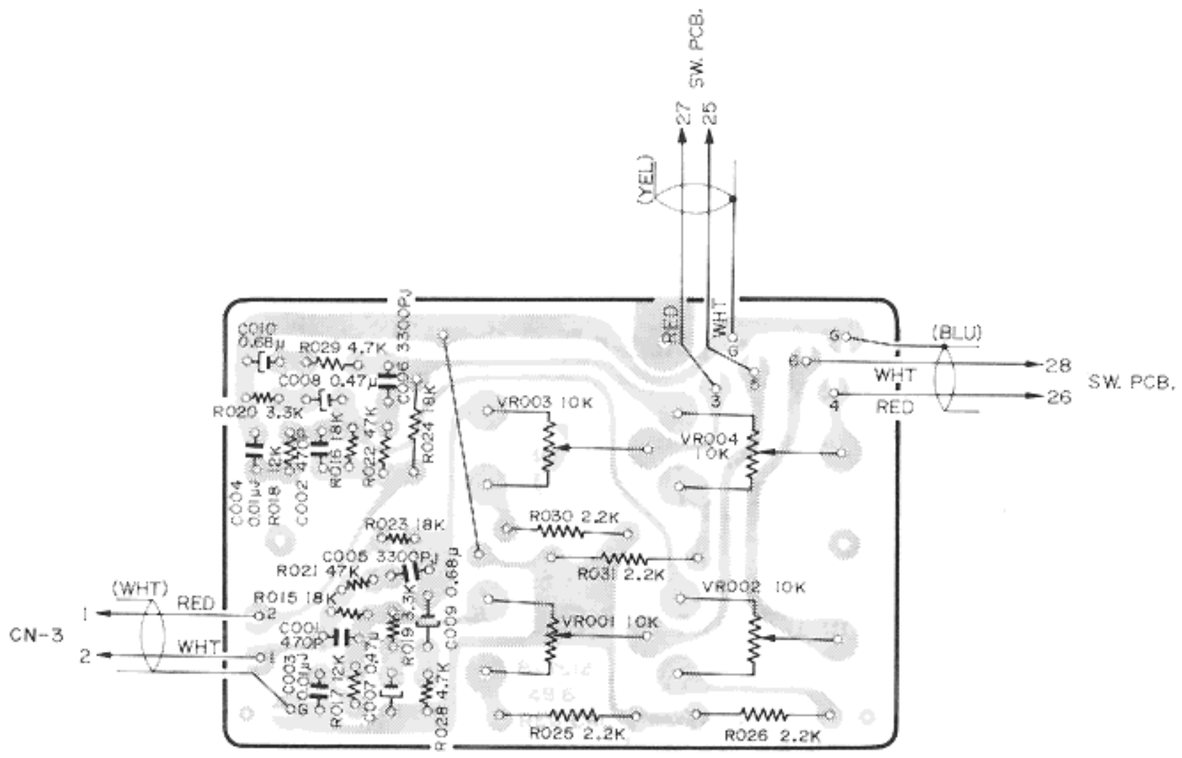


Fig. 12.1 S/N -3659470 (for CrO2 tape)

Tape Alarm Shut-off P.C.B. Ass'y

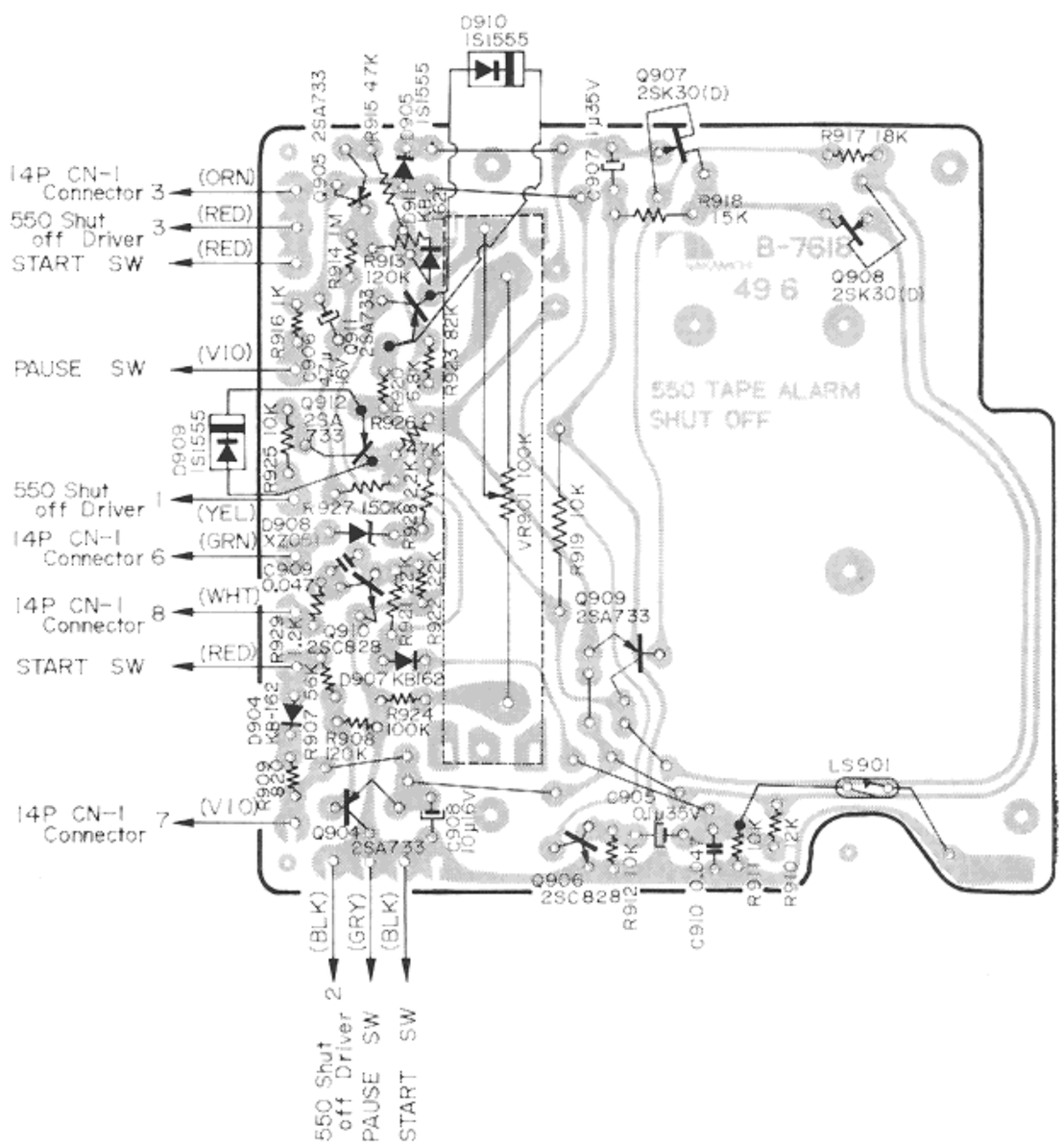


Fig. 12.3 S/N -57670

Switch P.C.B. Ass'y

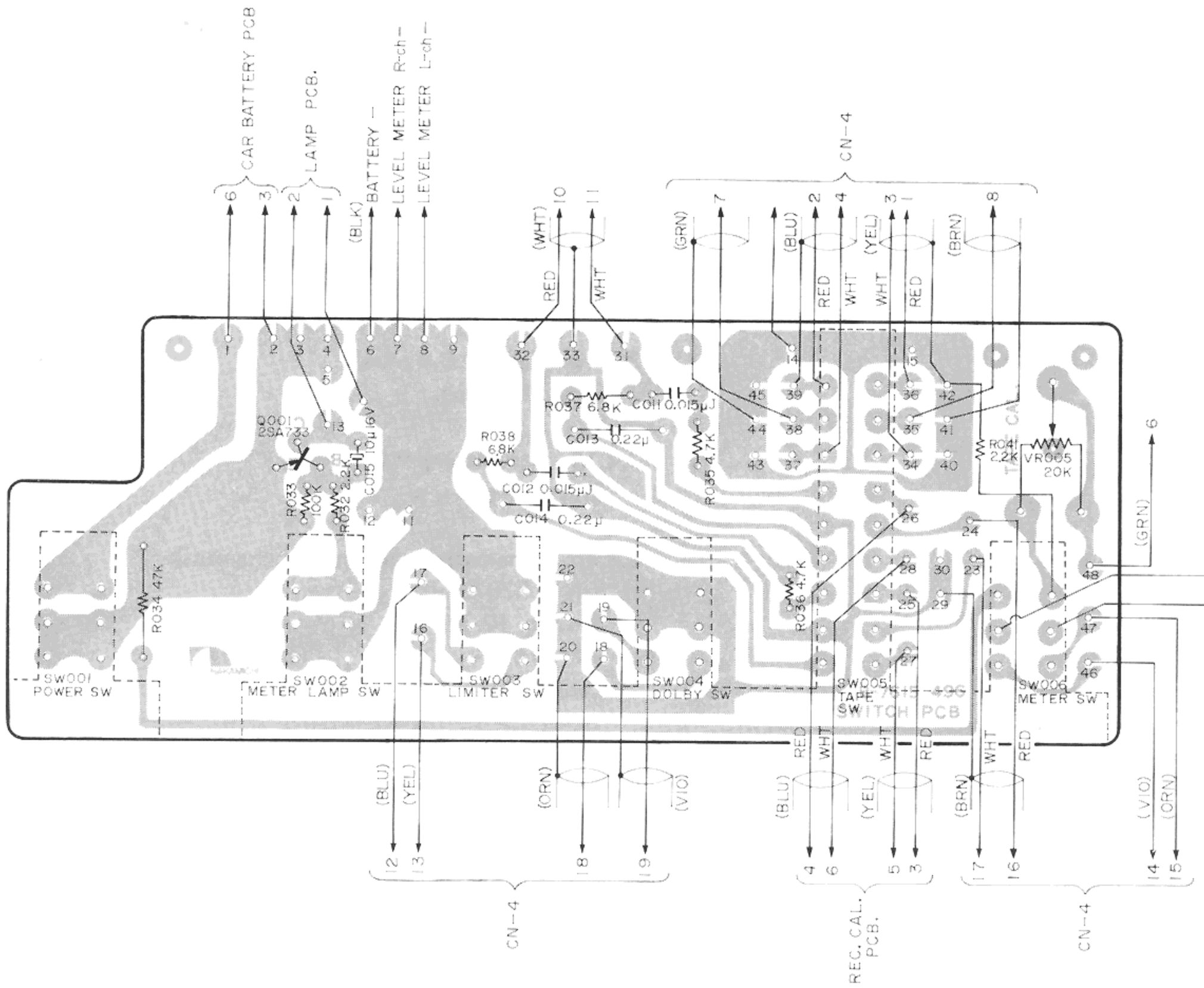


Fig. 12.2 S/N - 3659470 (for CrO2 tape)

D-D Converter and Motor Governor P.C.B. Ass'y

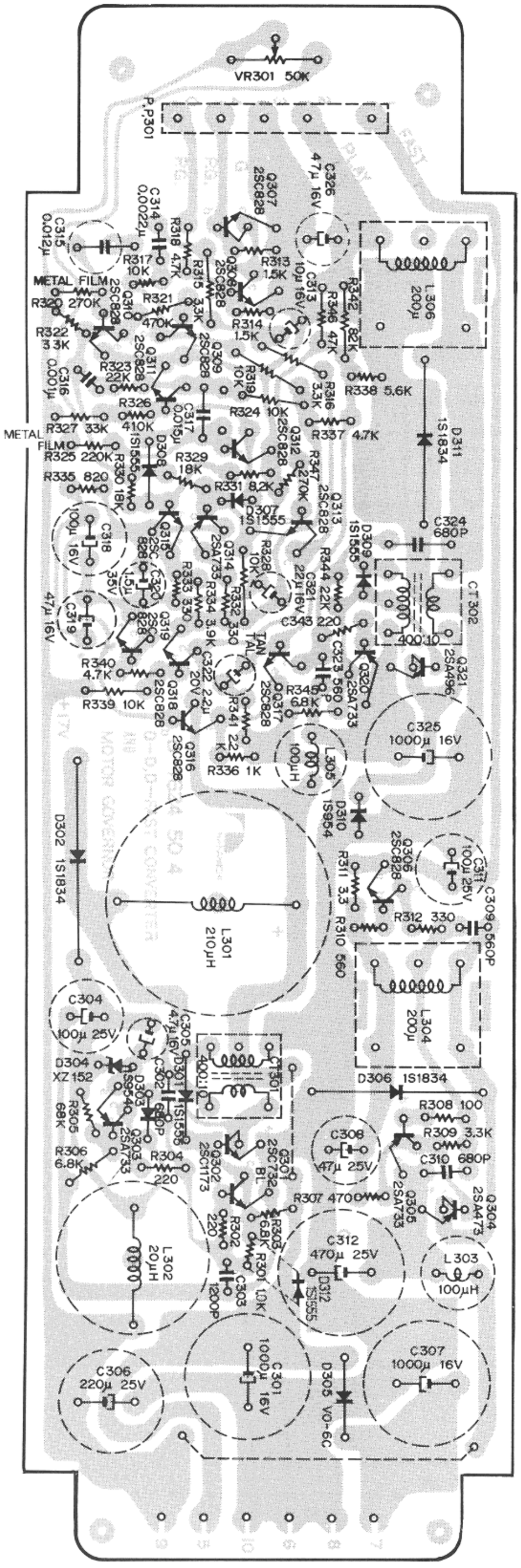


Fig. 12.5 S/N 54666-3661870 (for NE Motor)

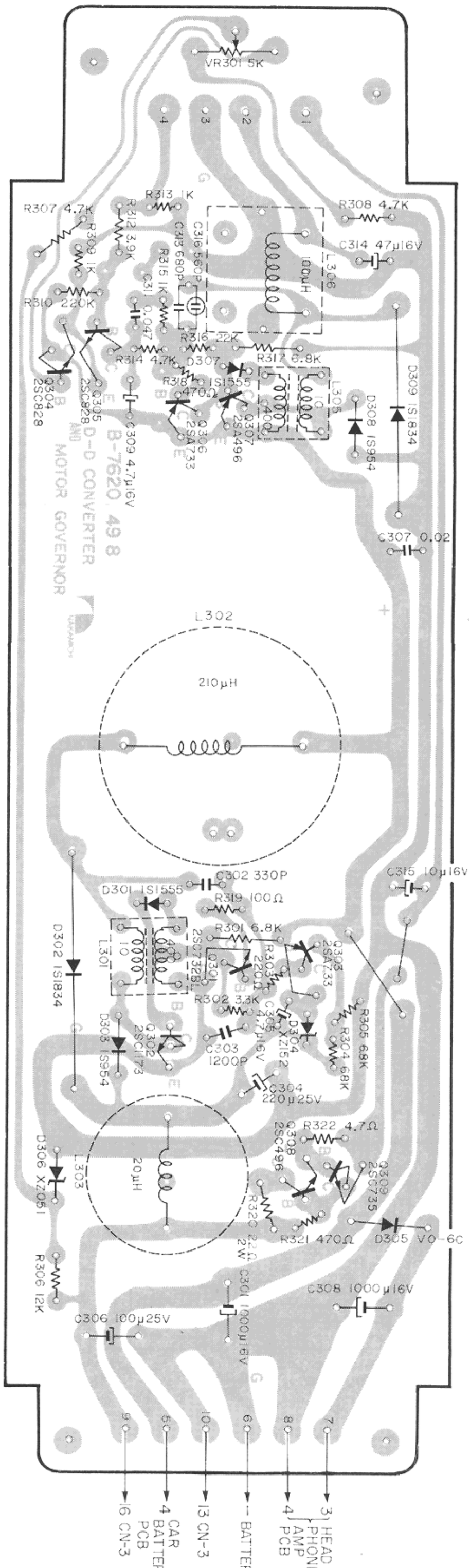


Fig. 12.4 S/N -54665 (for JA Motor)

Schematic Diagram (Mechanism)

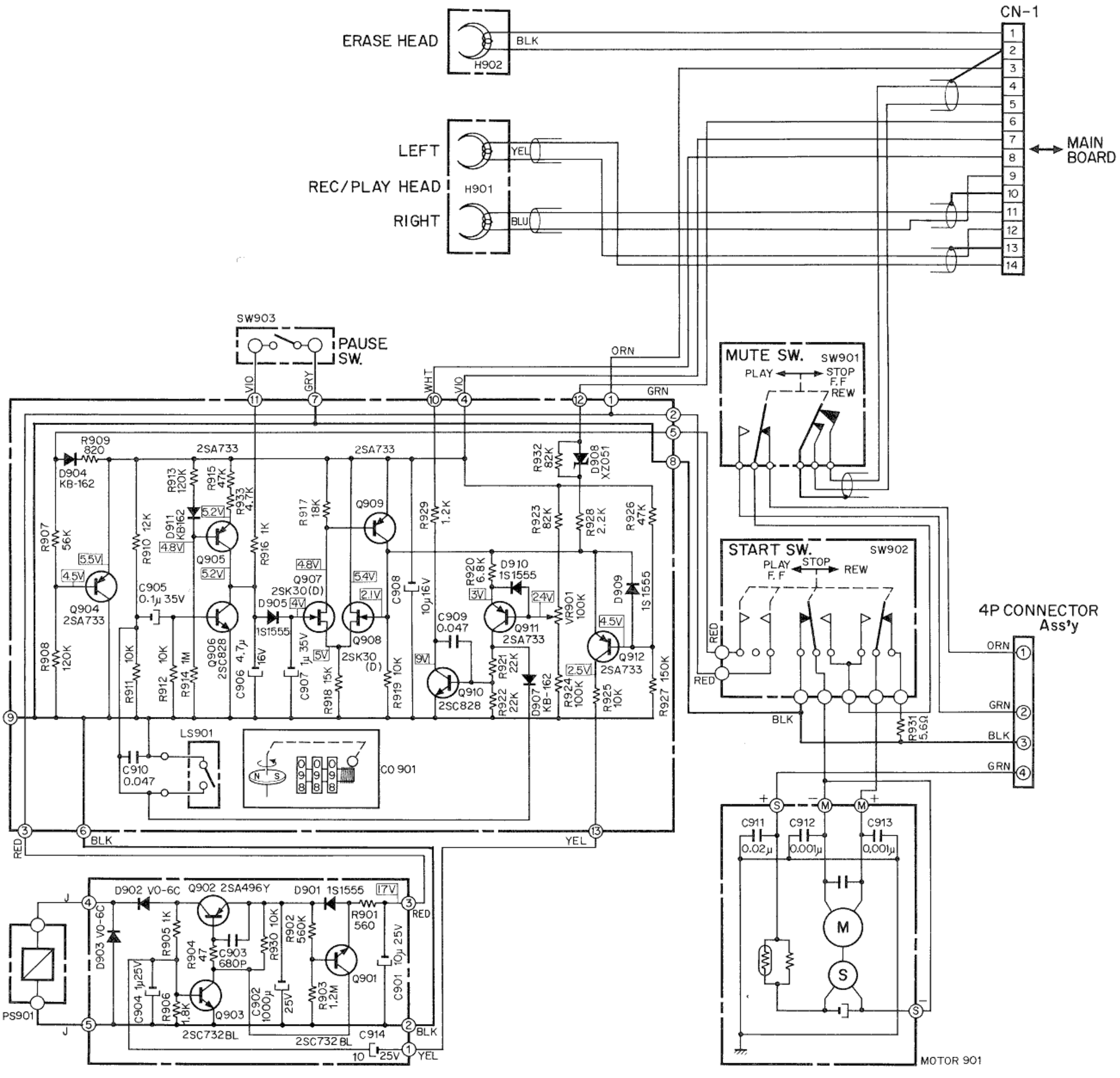


Fig. 12.6 S/N -57670

Schematic Diagram (Amplifier)

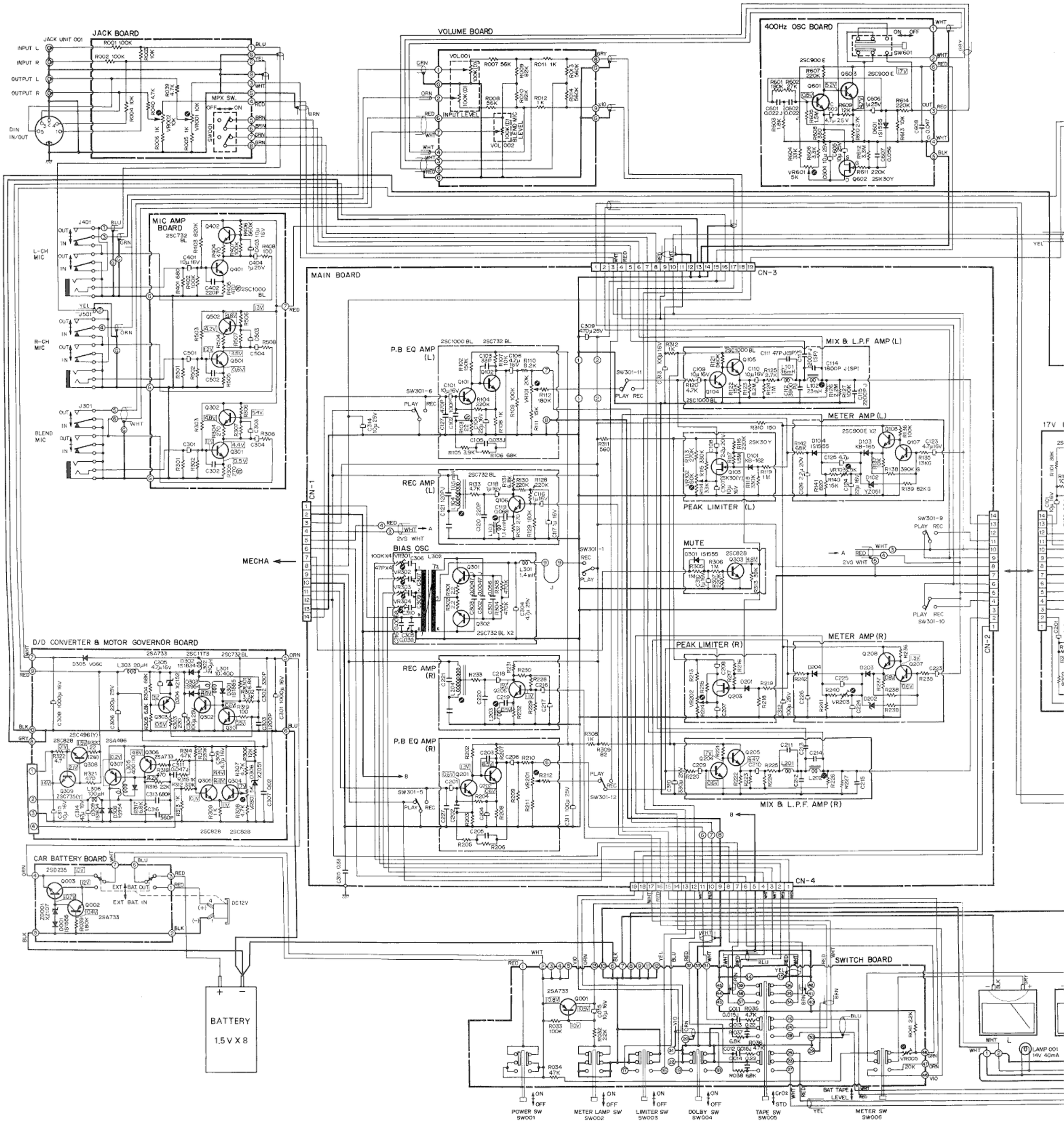
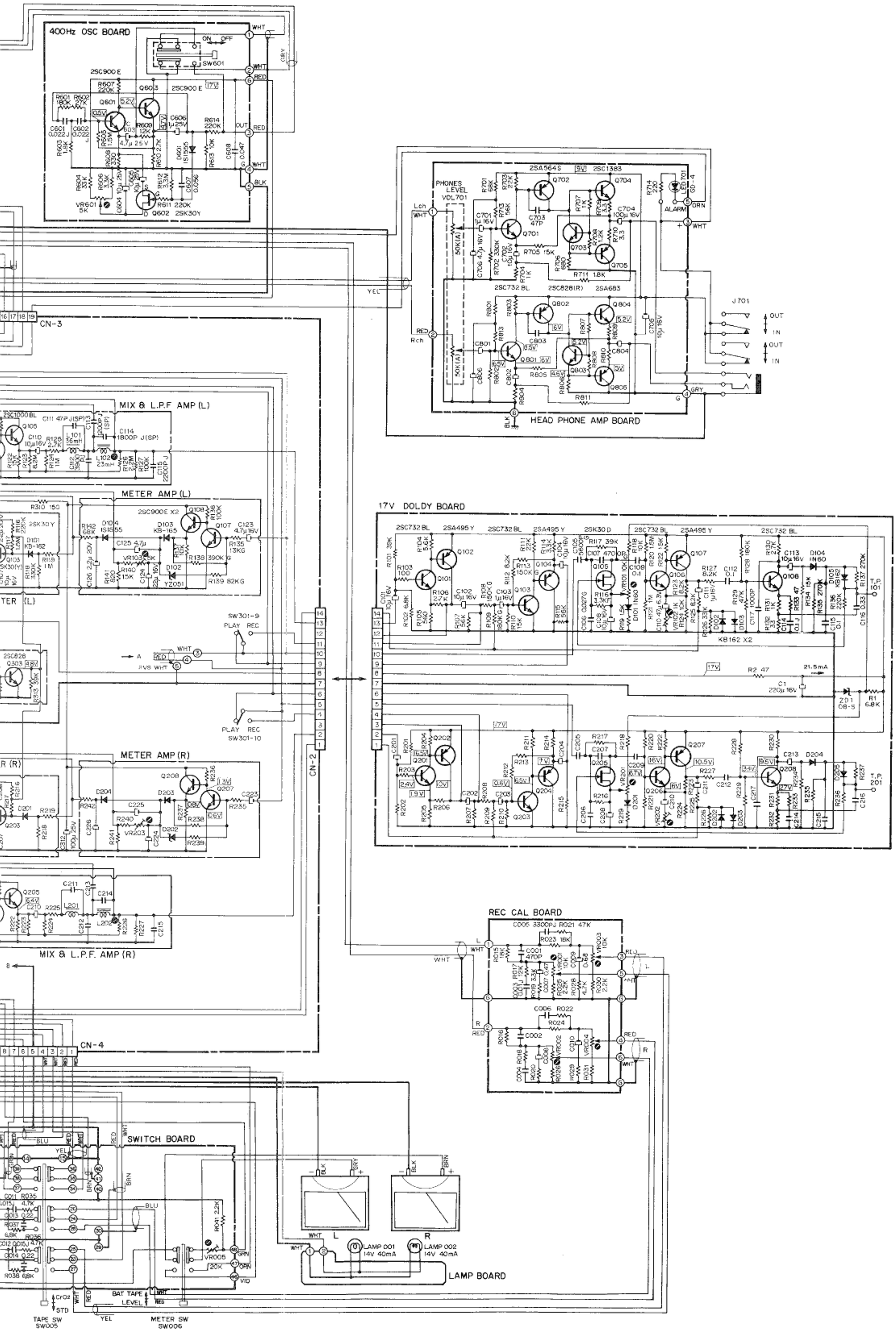


Fig. 12.7 S/N -3659470 (for CrO2 tape)



659470 (for CrO2 tape)

Schematic Diagram (D-D Converter and Motor Governor)

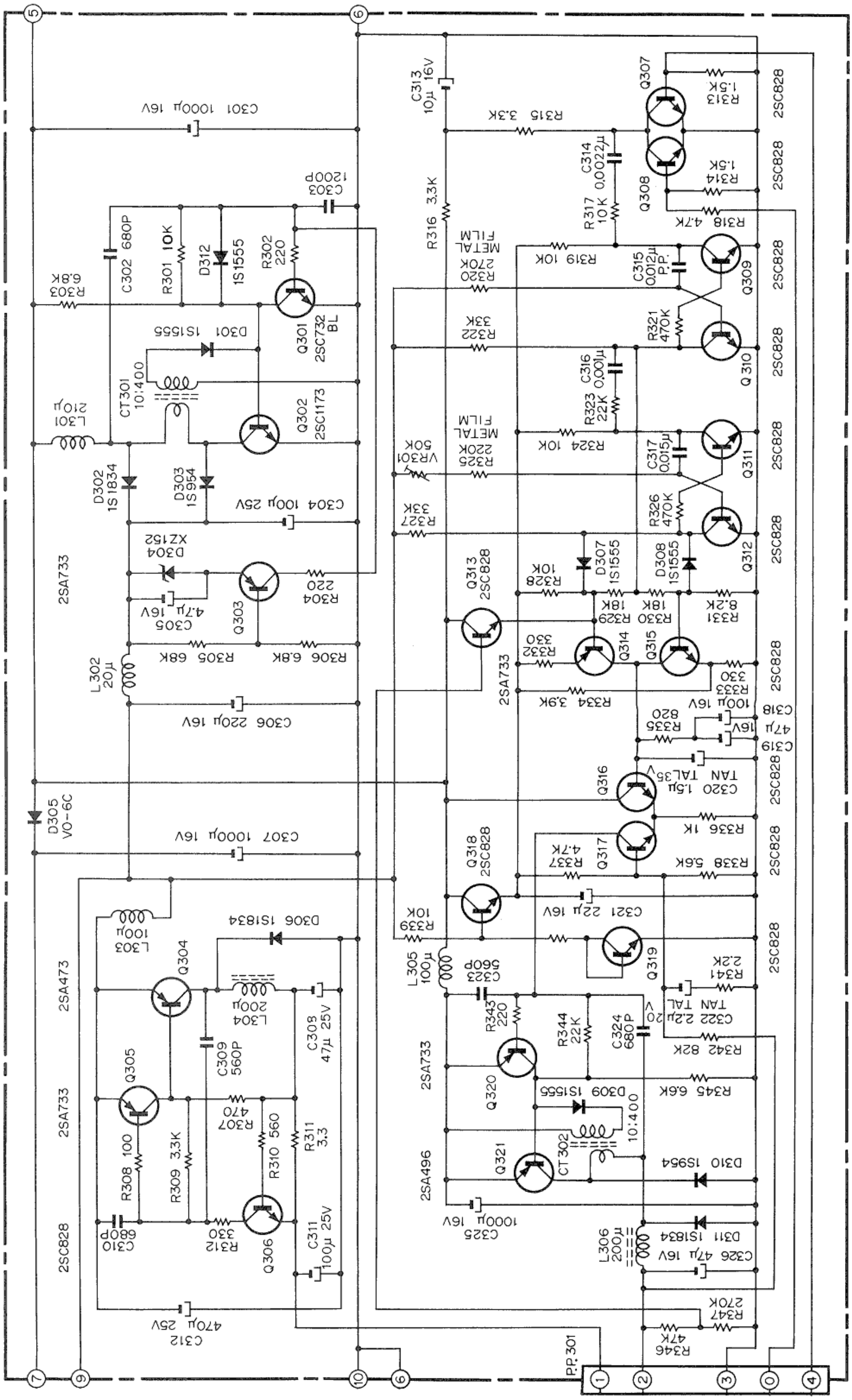


Fig. 12.8 S/N 54666-3661870

Service Manual

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