

Quality. Uncompromised.

ROTEL®

Technical Manual

STEREO CASSETTE DECK RD-10F

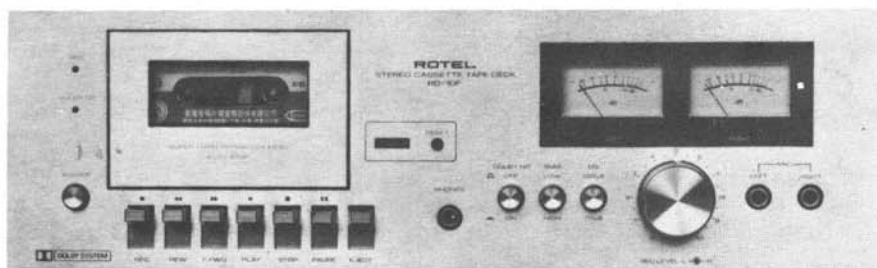
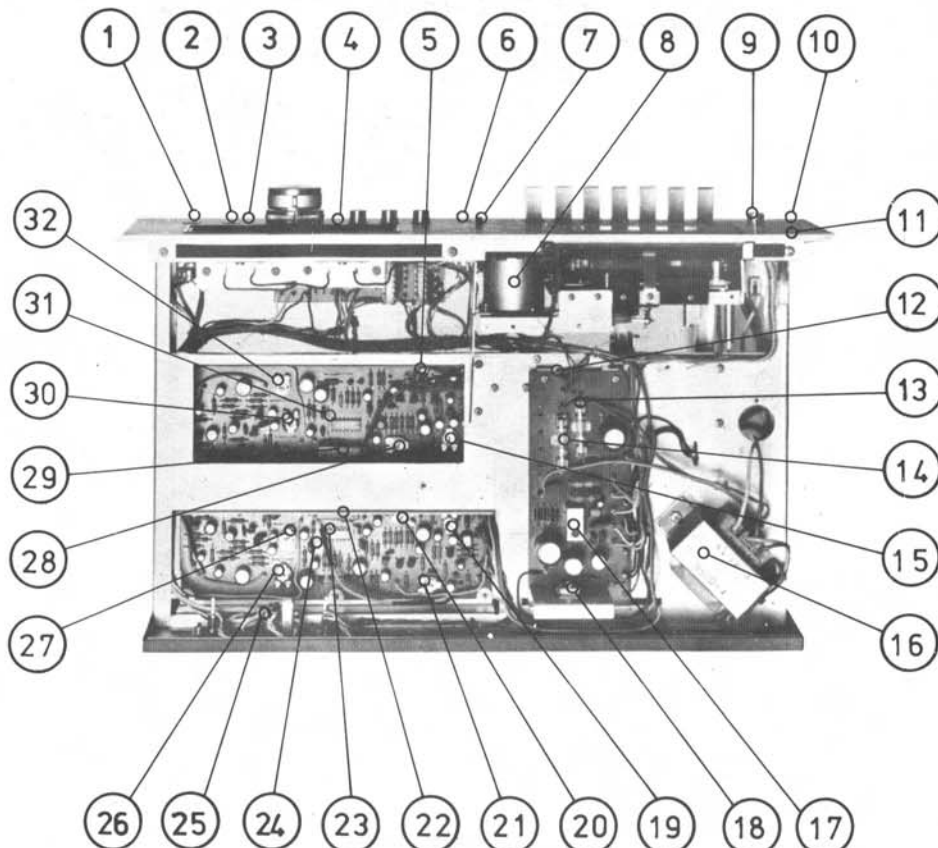


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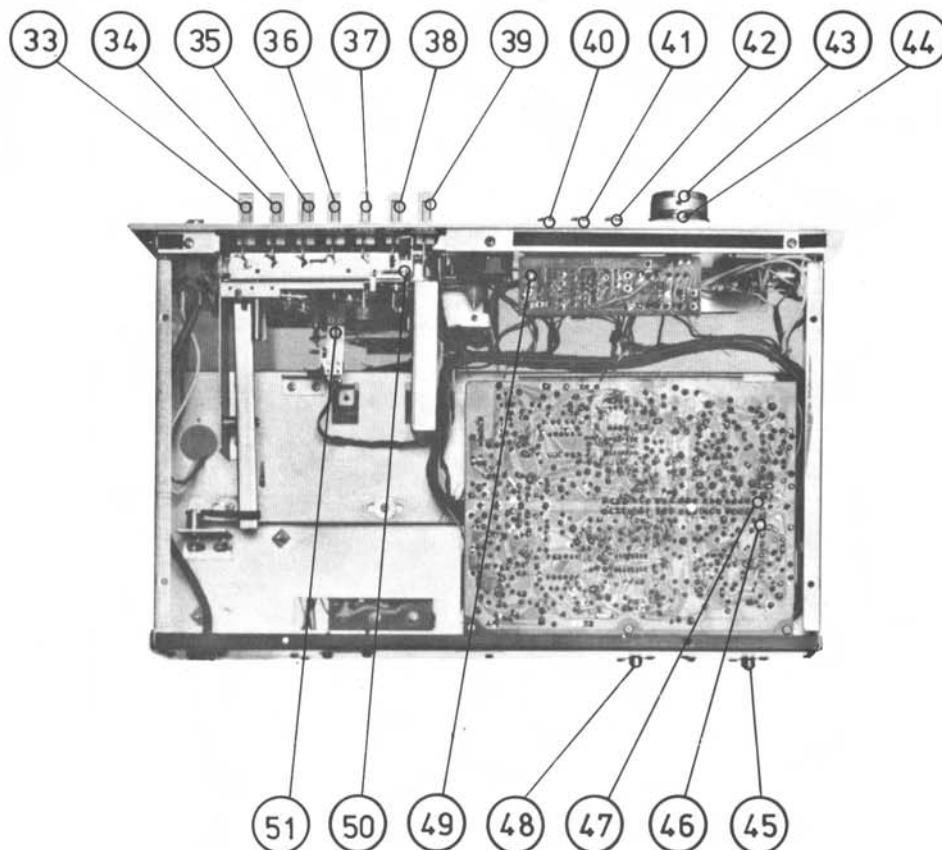
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CHASSIS LAYOUT

1. J002, MIC Jack (L-ch)
2. J003, MIC Jack (R-ch)
3. M001, VU Meter (L-ch)
4. M002, VU Meter (R-ch)
5. VR204, REC Level Adj. (R-ch)
6. J001, Headphone Jack
7. Counter Reset Button
8. Motor
9. S3, Power Supply Switch
10. Indicator PCB, Red for Rec.
11. Indicator PCB, Green for Dolby
12. Power Supply PCB
13. F902, Secondary Fuse
14. F901, Secondary Fuse
15. VR201, Bias Adj. (R-ch)
16. T001, Power Transformer
17. L902, Oscillator Coil
18. Q901, Regulator Transistor
19. VR101, Bias Adj. (L-ch)
20. VR105, Meter Adj. (L-ch)
21. VR104, REC Level Adj. (L-ch)
22. L103, 19KHz Filter (L-ch)
23. IC101, Dolby NR IC
24. REC/PB Amp. PCB
25. REC/PB DIN Jack Terminal
26. VR103, Playback Level Adj. (L-ch)
27. VR102, Playback Equalizer (L-ch)
28. VR205, Meter Adj. (R-ch)
29. L203, 19KHz Filter (R-ch)
30. VR202, Playback Equalizer (R-ch)
31. IC201, Dolby NR IC
32. VR203, Playback Level Adj. (R-ch)
33. REC Button
34. REW Button
35. FF/CUE Button
36. Stop Button
37. Play Button
38. Pause Button
39. Eject Button
40. S6, Dolby NR Switch
41. S5, Bias Switch
42. S4, Equalizer Switch
43. Record Level Control (L-ch)
44. Record Level Control (R-ch)
45. LINE-IN Jack
46. L101, Bias Carrier Trap (L-ch)
47. L201, Bias Carrier Trap (R-ch)
48. LINE-OUT Jack
49. Control PCB
50. Cassette Chassis
51. S7, Muting Switch



(TOP VIEW)



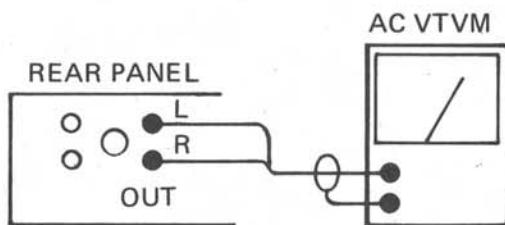
(BOTTOM VIEW)

I. ADJUSTMENT OF PLAYBACK SYSTEM

A. DOLBY LEVEL ADJUSTMENT

Instruments: AC VTVM and Test Tape (LCT-7001 or the equivalent)

1. Connect AC VTVM to LINE OUTPUT Terminal on rear panel.
Set BIAS to LOW and EQ to 120 μ S position and set the DOLBY NR to OFF.
2. Insert Test Tape (LCT-7001) into recorder and play it back.
Adjust Potentiometer VR103 (VR203 for the right channel) so that AC VTVM reads 580mV.
3. Then, adjust Potentiometer VR105 (VR205 for right channel) so that the needle on the VU meter corresponds with the DOLBY Mark (+2dB position).



ADJUST VR103 (VR203 FOR R-CH)
TO OBTAIN 580mV READING ON
AC VTVM.

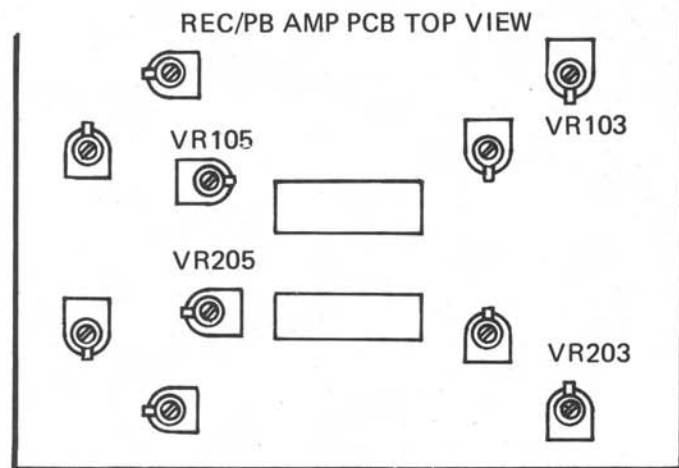
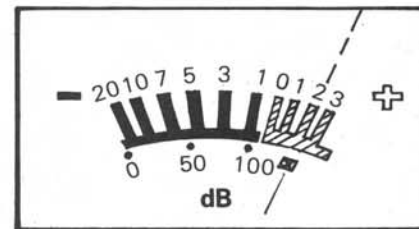


FIG. 1 DOLBY LEVEL ADJUSTMENT HOOK-UP



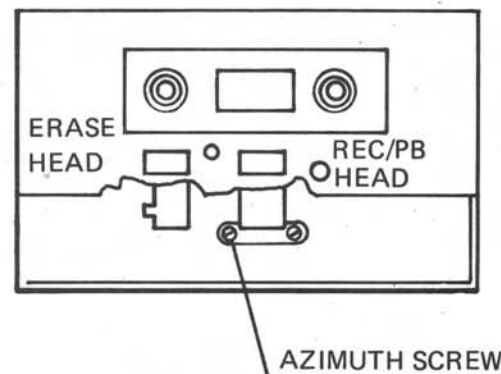
ADJUST POTENTIOMETER VR105
(VR205 FOR R-CH) SO THAT VU
METER NEEDLE INDICATES DOLBY
LEVEL.

B. AZIMUTH ADJUSTMENT

Instruments: Oscilloscope and Test Tape (LCT-3013 or the equivalent)

1. Connect oscilloscope to LINE OUT and insert Test Tape (LCT-3013) into recorder and play it back.
Set BIAS to LOW and EQ to 120 μ S position and set the DOLBY NR to OFF.
 2. Adjust Azimuth Screw to obtain largest wave form on the oscilloscope for both channels. (When adjusting, observe form while switching oscilloscope from left to right channel or vice versa.) Make sure output difference between right and left channels falls within 2dB.
 3. After completing adjustment, lock the screw.
- After completing Azimuth Adjustment, recheck DOLBY LEVEL Adjustment.

CASSETTE TOP VIEW (PORTION)



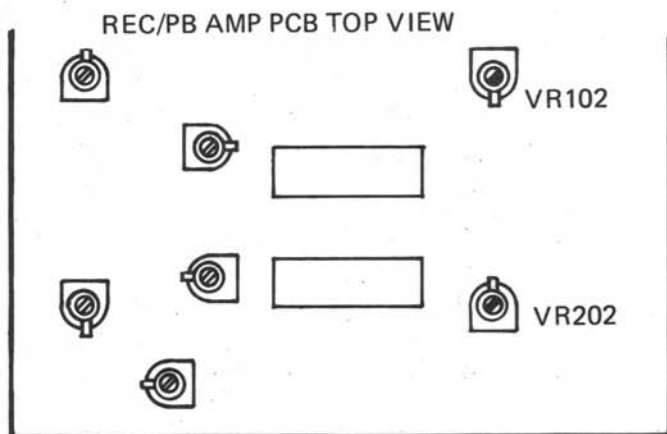
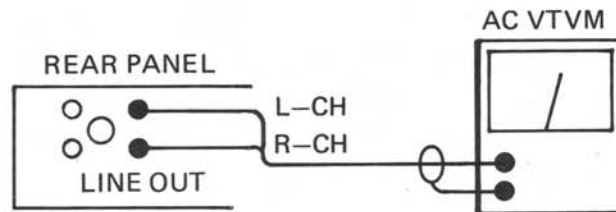
ADJUST AZIMUTH SCREW TO OBTAIN
MAXIMUM DEFLECTION ON SCOPE

FIG. 2 AZIMUTH ADJUSTMENT

C. PLAY BACK EQ ADJUSTMENT

Instruments: Test Tape (LCT-3031-C or equivalent) AC VTVM

1. Connect the AC VTVM to LINE OUTPUT, set BIAS to LOW and EQ to 120 μ S position and set the DOLBY NR to OFF.
 2. Check to see that output level difference between 40Hz, 1KHz and 10KHz signals is within ± 1.0 dB when the Test Tape (LCT-3031-C) is inserted into the recorder and it is played back.
 3. If the difference is large make adjustment of Potentiometer VR102 (VR202 for right channel).
- If output level at 10KHz is higher(lower)than 1KHz, turn Potentiometer counterclockwise (clockwise).



WHEN OUTPUT LEVEL AT 10KHz IS HIGHER (LOWER) THAN 1KHz, TURN IT COUNTERCLOCKWISE (CLOCKWISE) UNTIL OUTPUT LEVEL OF 10KHz & 1KHz ARE SAME.

FIG. 3 PLAY BACK EQ ADJUSTMENT HOOK-UP

II. ADJUSTMENT OF RECORDING SYSTEM

A. BIAS CARRIER TRAP ADJUSTMENT

Instruments: Oscilloscope and Blank Tape

1. Connect oscilloscope to Terminal Pin 33 (Pin 34 for right channel) on the REC/PB PCB.
2. Set RECORD LEVEL control to minimum and insert Blank Tape.
3. Adjust Trap Coil, L101 (L201 for right channel) to obtain minimum deflection on the oscilloscope.

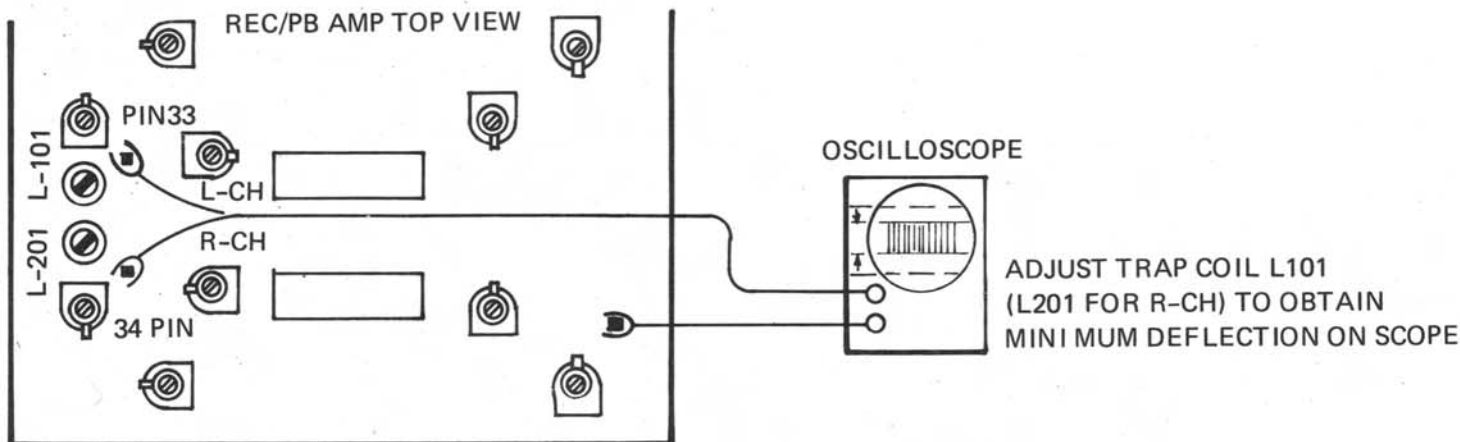
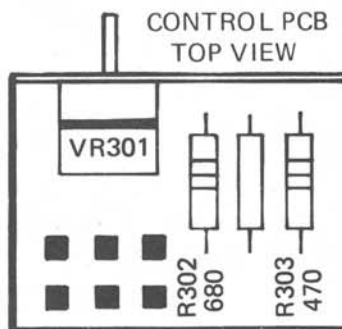


FIG. 4 BIAS CARRIER TRAP ADJUSTMENT HOOK-UP

B. BIAS VOLTAGE ADJUSTMENT

Instruments: AC VTVM and Blank Tape

1. Connect AC VTVM to Pin 11 (Pin 12 for right channel) of REC/PB PCB and insert Blank Tape. Depress REC, play and PAUSE buttons.
 2. Set BIAS Selector to "HIGH". Make adjustment by turning Potentiometer VR101 (VR201 for right channel) so that AC VTVM reads 5mV.
 3. Next, set BIAS Selector to "LOW". Make adjustment by changing R301 and R303 so that AC VTVM reads 4mV on Pin 11 and 12.
- Inserting (removing) R303 680ohms will increase (decrease) the BIAS VOLTAGE.



C. DOLBY REC/PB OUTPUT LEVEL ADJUSTMENT

Instruments: Audio Generator and Normal Blank Tape (Sony Hf, etc.)

1. Insert Normal Tape into recorder and depress REC, PLAY and PAUSE buttons. Set RECORD LEVEL control to maximum. Then set DOLBY NR switch to ON.
 2. Connect Audio Generator to LINE IN, and apply 400Hz (sine wave). Control output of Audio Generator so that VU meter needle falls on DOLBY Mark (+2dB).
 3. In step 2, release PAUSE and record the tape. Check to see that the VU meter needle falls on DOLBY Mark when playing back the recorded tape.
 4. If recording and playback levels are different. Repeat Step 3 until the two levels almost equal by adjusting Potentiometer VR104 (VR204 for right channel) when recording tape. Allowable margin of difference is within $\pm 1.5\text{dB}$.
- If playback level is higher, turn Potentiometer (VR104 or 204) counterclockwise, and if it is lower, turn clockwise. Then, record and playback the tape.

REC/PB AMP PCB TOP VIEW

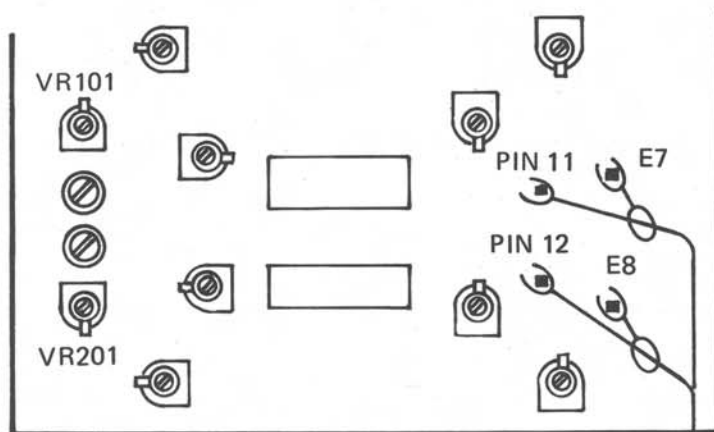
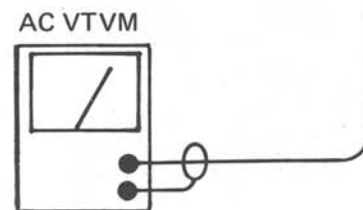


FIG. 5 BIAS VOLTAGE LEVEL ADJUSTMENT HOOK-UP



AUDIO GENERATOR

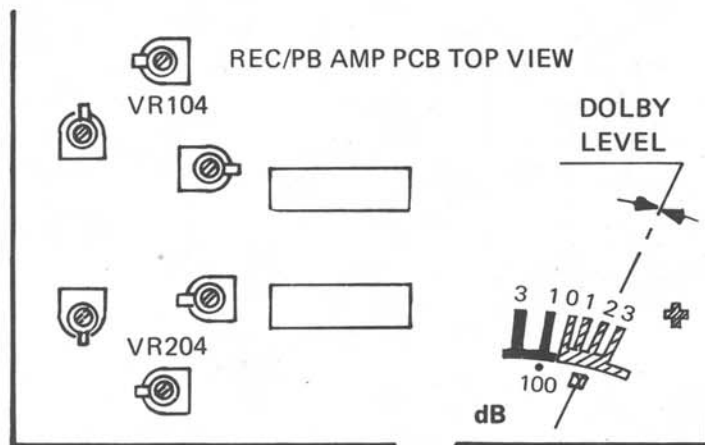
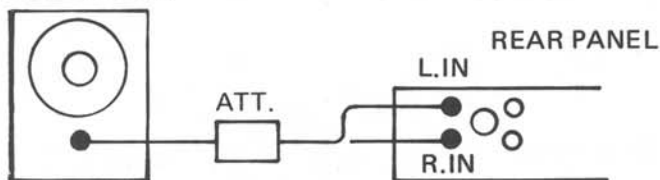


FIG. 6 REC/PB LEVEL ADJUSTMENT HOOK-UP

- STEP 2
ADJUST ATTENUATOR SO THAT THE READING OF VU METER IS DOLBY LEVEL (+2dB POINT).
- STEP 4
ADJUST POTENTIOMETER VR104 (VR204 FOR R-CH). SO THAT THE READING OF VU METER IS DOLBY LEVEL (+2dB POINT).

D. BIAS CURRENT ADJUSTMENT

Instruments: Audio Generator, AC VTVM and Blank Tape, Chrome Tape.

1. Chrome Tape

- Set BIAS Selector to "HIGH" position, and EQ Selector to "70 μ S", insert Chrome Tape (Sony CR, etc.). into recorder. Set RECORD LEVEL to maximum.
 - Connect AC VTVM to LINE OUT, and connect Audio Generator to LINE IN. Apply 400Hz signal from Audio Generator. Record 400Hz signal at 20dB below 0VU. Then, record 10KHz signal at the same level.
 - Check to see that output level difference between 400Hz and 10KHz signal is within ± 1.0 dB when playing back the recorded tape.
 - If the difference is large, repeat Step b and c until the difference falls within ± 1.0 dB by making fine adjustment of Potentiometer VR101 (VR201 for right channel).
- If output level at 10KHz is higher (lower) turn Potentiometer clockwise (Counter-clockwise)

2. Normal Tape

- Set BIAS Selector to "LOW" position, and EQ Selector to "120 μ S", insert Normal Tape (Sony Hf, etc.). Follow the same procedures as in Chrome Tape. Make adjustment by changing R301 and 303.
- Make sure to check Procedure E after completing the above adjustment.

E. DISTORTION CHECK

Instruments: HD Analyzer, Audio Generator and Blank Tape.

- Connect Audio Generator to LINE IN, and HD Analyzer to LINE OUT.
- Insert Blank Tape and apply 400Hz signal from Audio Generator. Record the tape at 0VU.
- Check to see that the distortion is within the following range when playing back the recorded tape.
 - Normal Tape : under 1.5%
 - CrO₂ : under 3%
- If the distortion factor exceeds the above values, check bias current and make fine adjustment. Then check distortion again.

F. CHECKING TAPE SPEED DEFLECTION AND ADJUSTING SPEED

Instruments: Frequency Conuter and Test Tape (LCT-3001 or the equivalent).

- Connect Frequency Counter to LINE OUT. Set BIAS to LOW, EQ to 120 μ S and set the DOLBY NR to OFF.
- Insert Test Tape (LCT-3001) into recorder and depress PLAY button to play back the tape. Check to see that allowable margin of deflection at the beginning of, at the middle of or at the end of winding is in the range of +2% -1%. (at 3,000Hz, allowable margin of deflection of speed is 3,060-2,970).
- If tape speed deflection surpasses the above range, adjust speed of the motor.

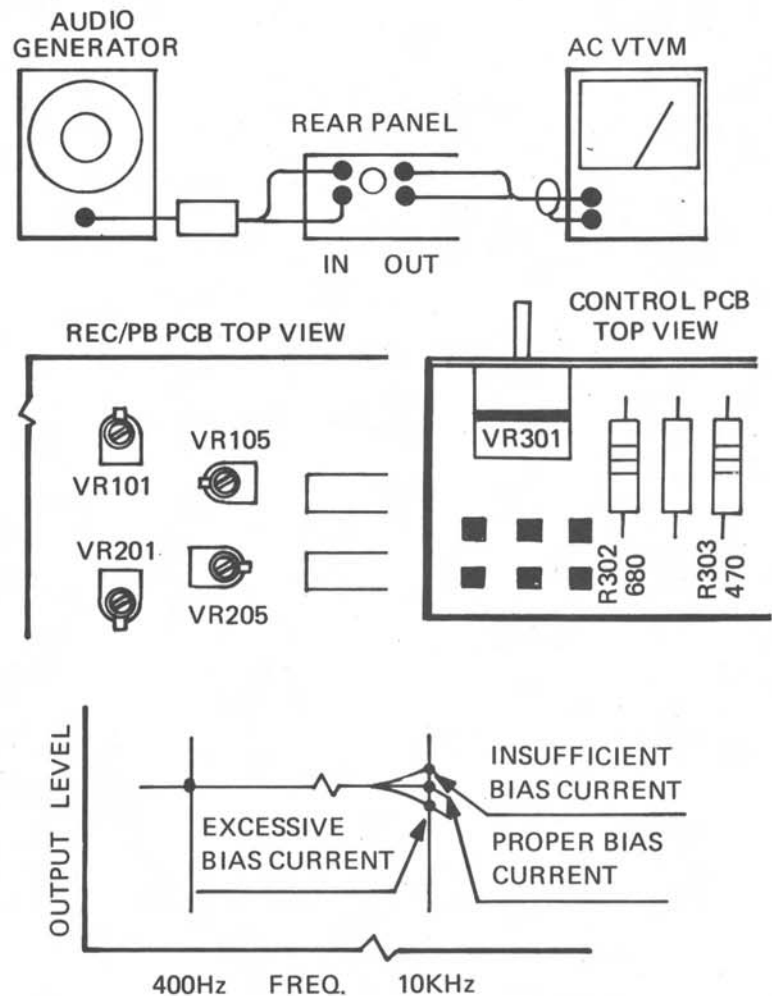


FIG. 7 BIAS CURRENT ADJUSTMENT HOOK-UP

SPEED ADJ

ADJUST POTENTIOMETER INSIDE THE MOTOR, SO THAT FREQUENCY COUNTER INDICATES 3000Hz.

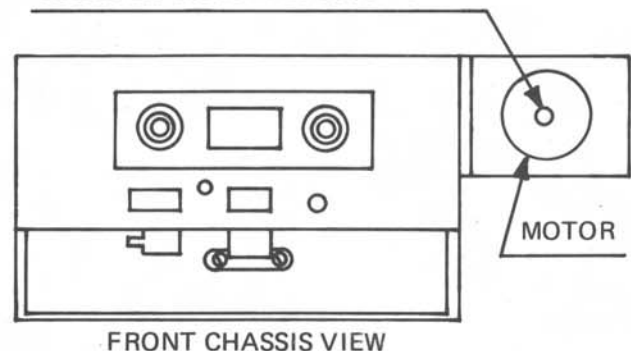
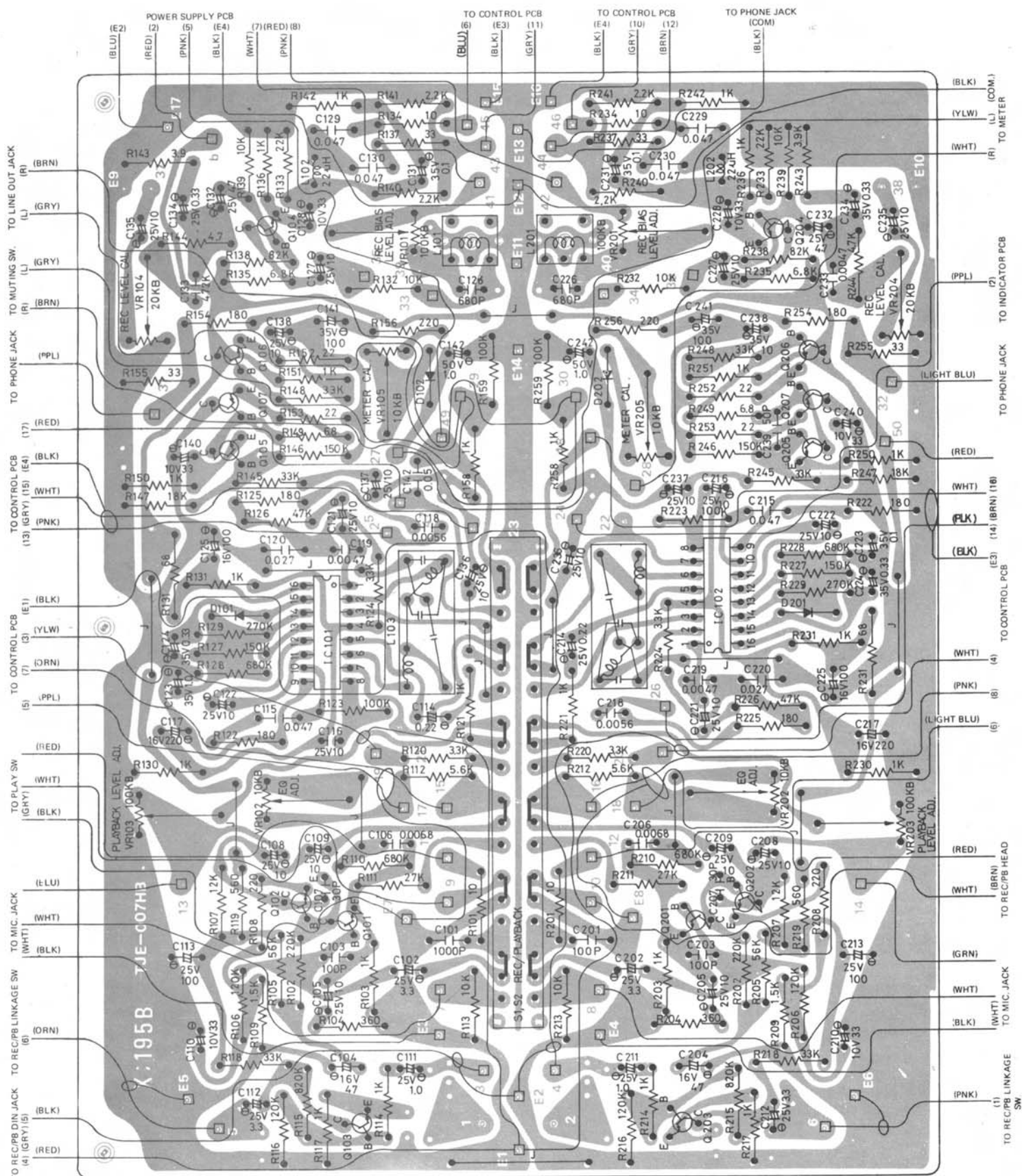
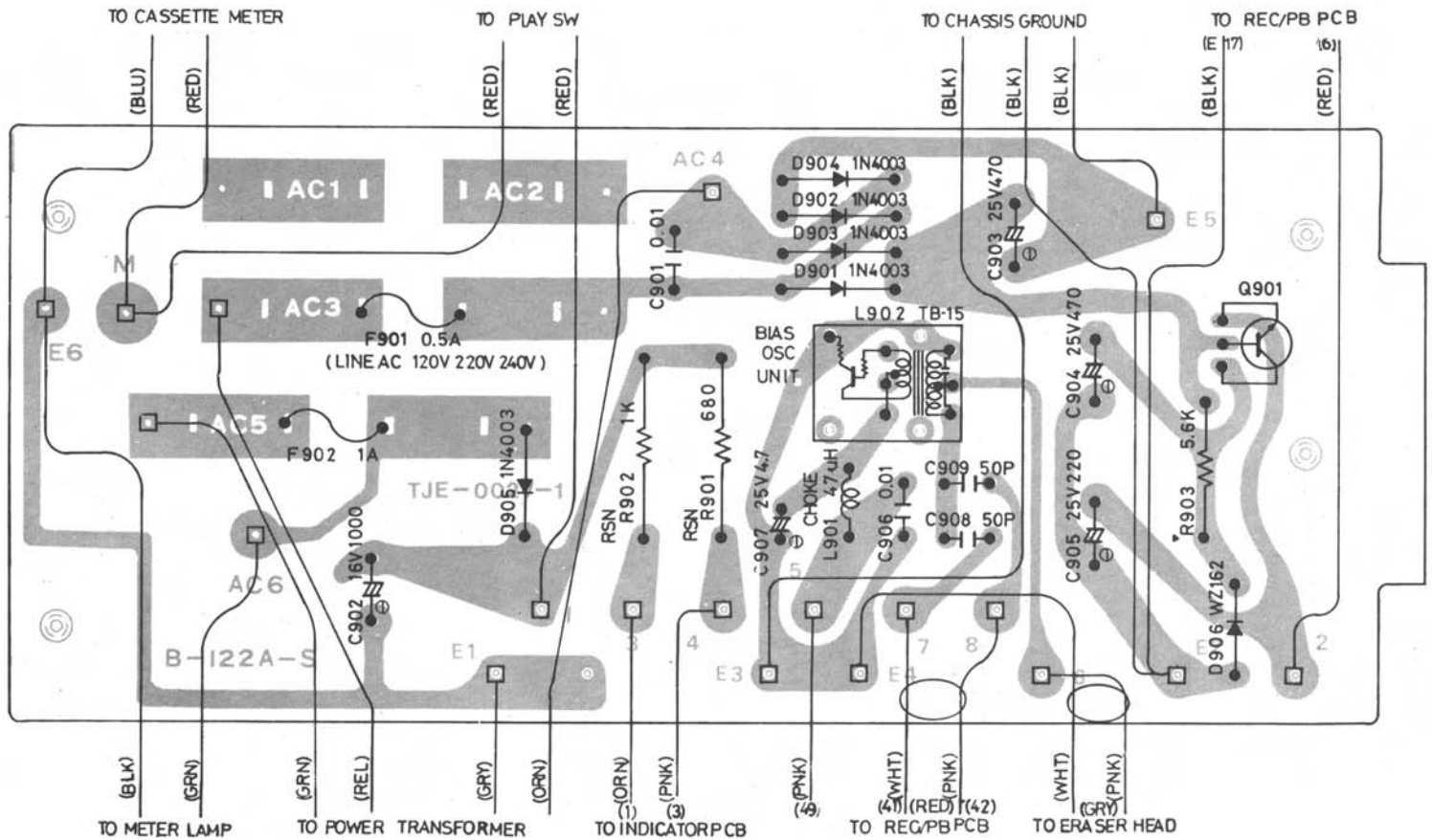


FIG. 8 TAPE SPEED ADJUSTMENT

REC/PB AMP. CIRCUIT BOARD DIAGRAM

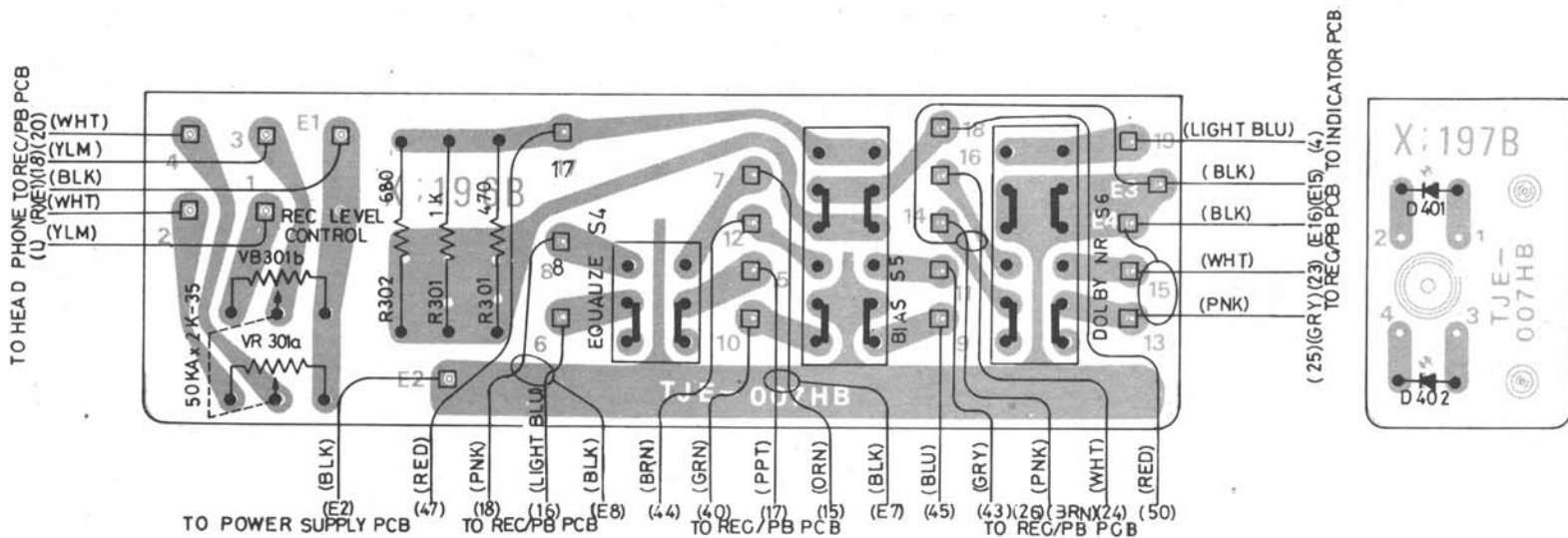


POWER SUPPLY CIRCUIT BOARD DIAGRAM

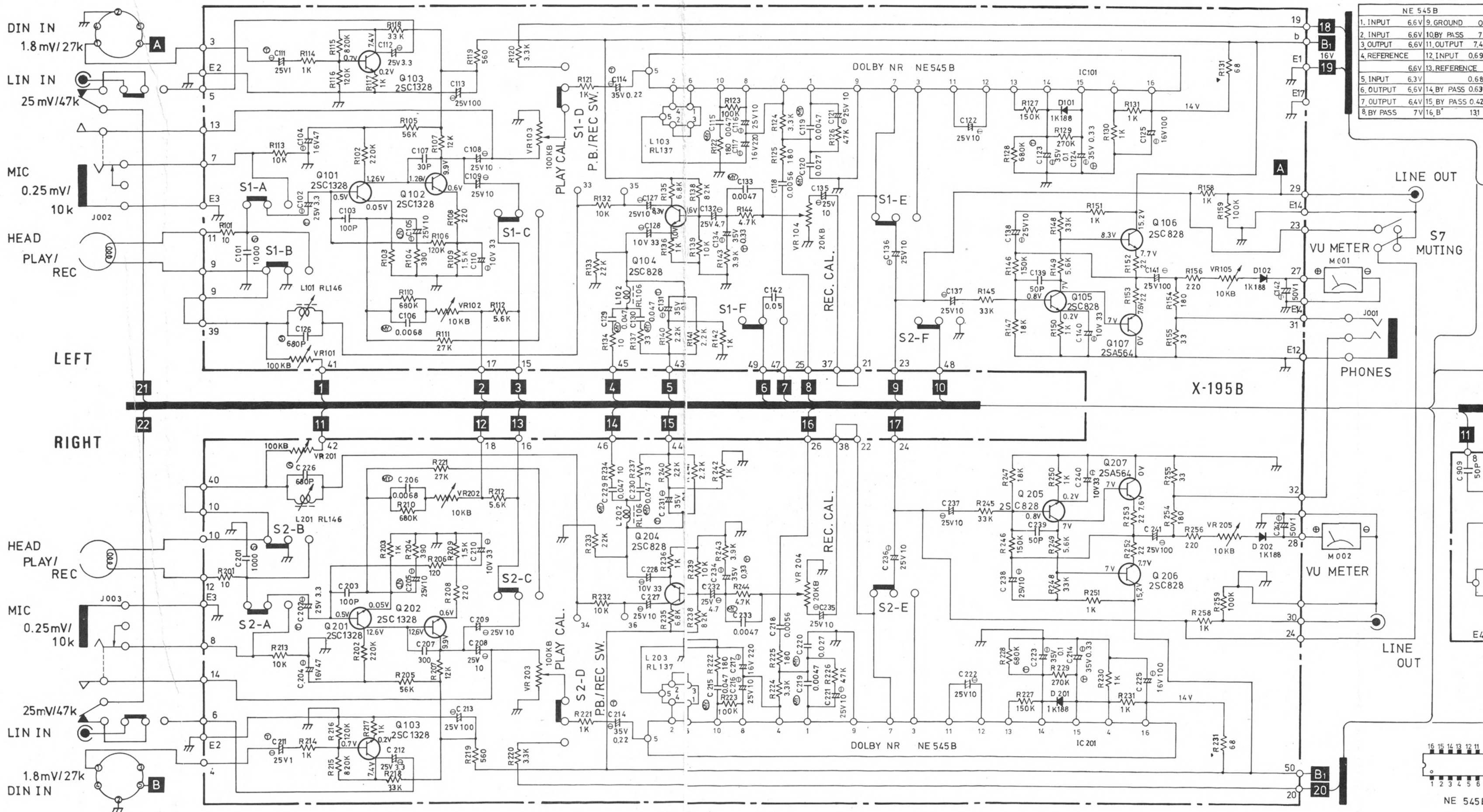


CONTROL CIRCUIT BOARD DIAGRAM

INDICATOR CIRCUIT BOARD DIAGRAM



SCHEMATIC DIAGRAM



NE 545B			
1. INPUT	6.6V	9. GROUND	0 V
2. INPUT	6.6V	10. BY PASS	7 V
3. OUTPUT	6.6V	11. OUTPUT	7.4 V
4. REFERENCE	6.6V	12. INPUT	0.69V
5. INPUT	6.3V	13. REFERENCE	0.68V
6. OUTPUT	6.6V	14. BY PASS	0.63V
7. OUTPUT	6.4V	15. BY PASS	0.42V
8. BY PASS	7V	16. B'	131 V

RESISTORS

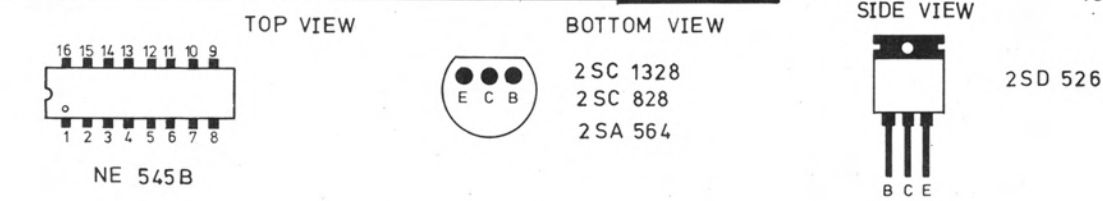
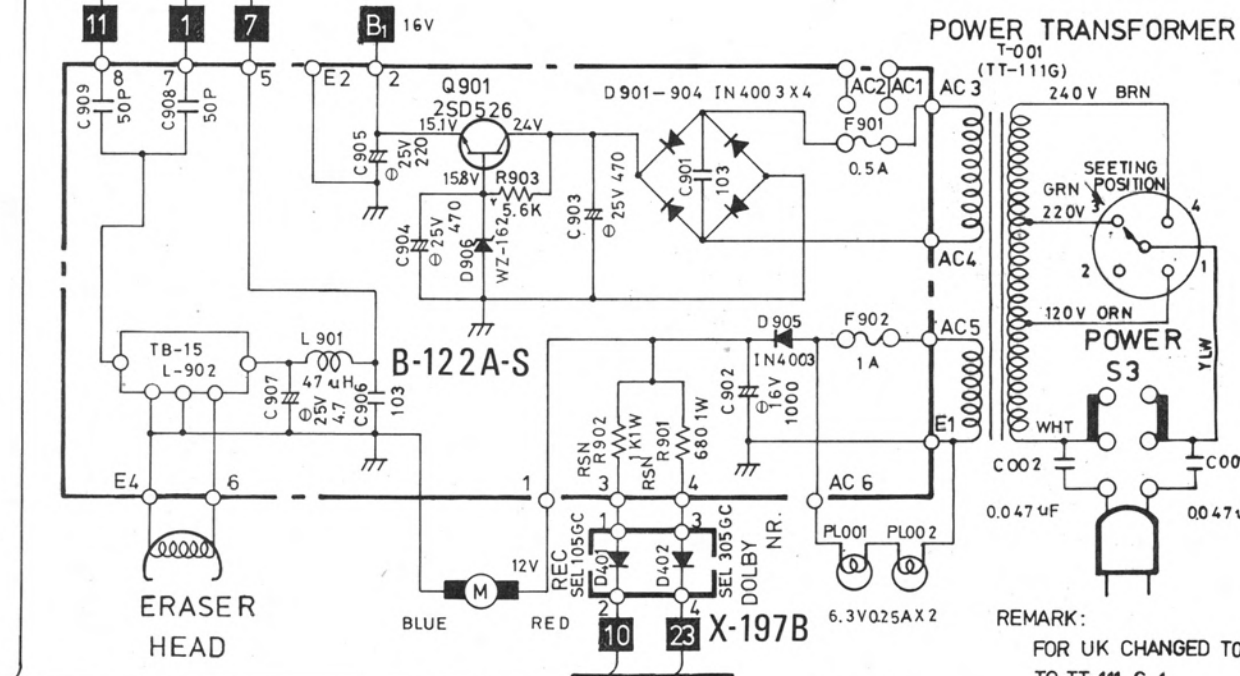
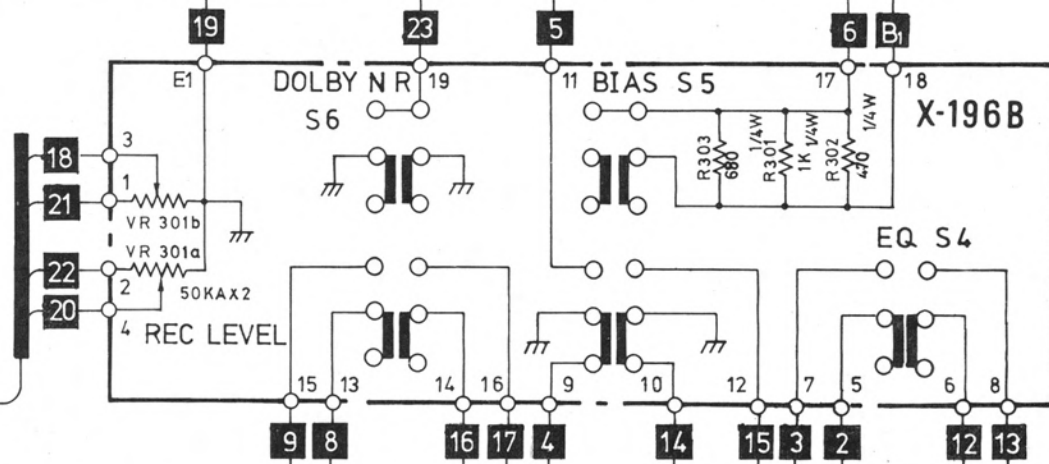
5% TOLERANCE UNLESS OTHERWISE NOTED.
 K--- KILO OHM
 M--- MEGA OHM
 --- COMPOSITION RESISTOR 1/2 WATT.
 RSN--- METAL OXIDE FILM RESISTORS.
 NON MARK--- LOW NOISE TYPE CARBON RESISTORS
 1/4 WATT.

CAPACITORS

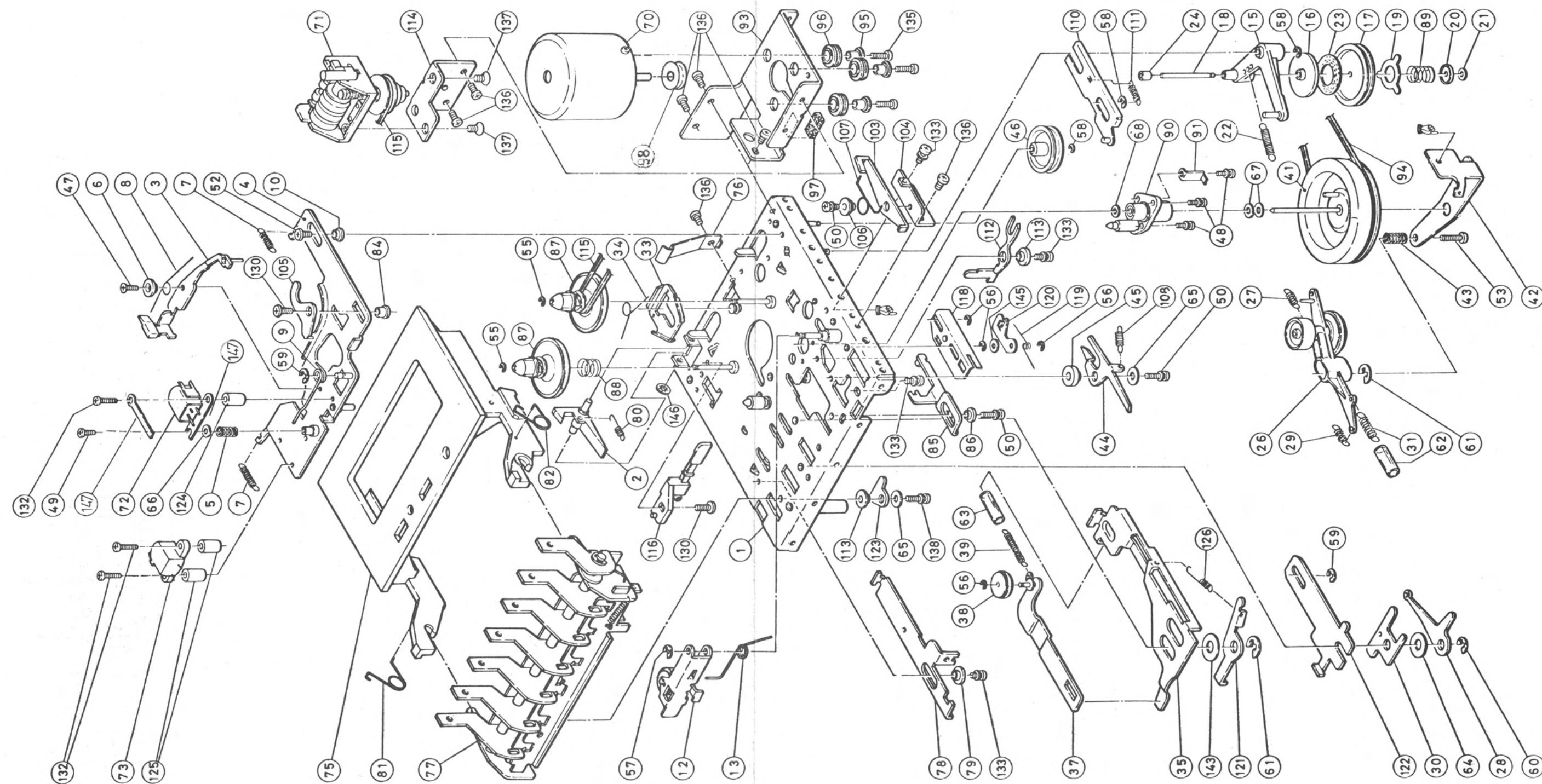
---MYLAR FILM CAPACITORS.
 ---LOW NOISE CAPACITORS.
 ---POLYSTYRENE CAPACITORS.
 ---TANTALUM CAPACITORS.
 ---ELECTROLYTIC CAPACITORS.
 NON MARK--- CERAMIC CAPACITORS.
 UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD.

ITEM	SCHEMATIC	LOCATION (LAST)
REC/PB AMP	R 159	C 142
TAPE SELECTOR	R 303	
POWER SUPPLY	R 903	C 909
CHASSIS		C 002

DOLBY NR. SW. BIAS SW. EQ SW.
 ON HIGH 70us
 OFF LOW 120us



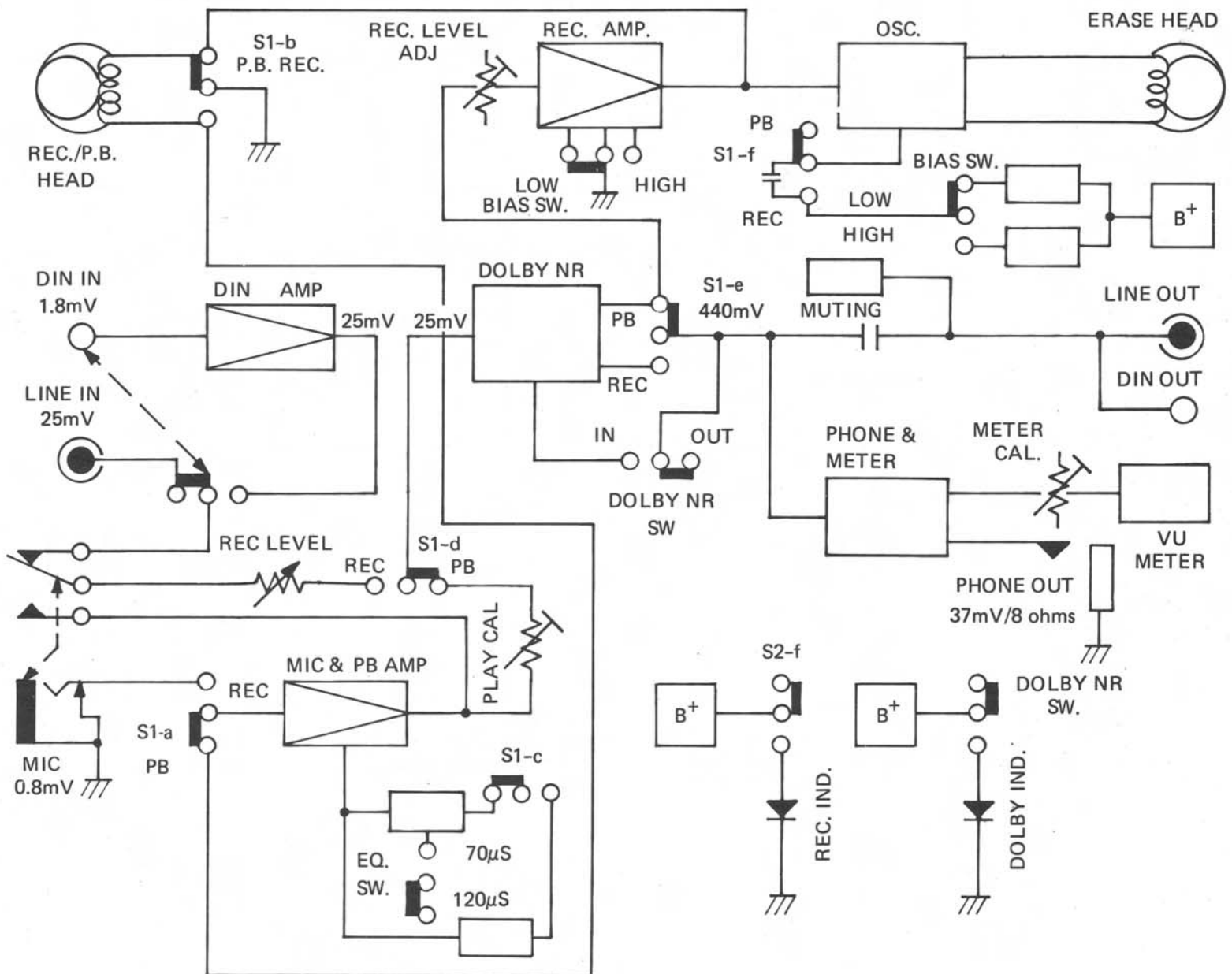
MECHANISM ASSEMBLY BLOCK DIAGRAM



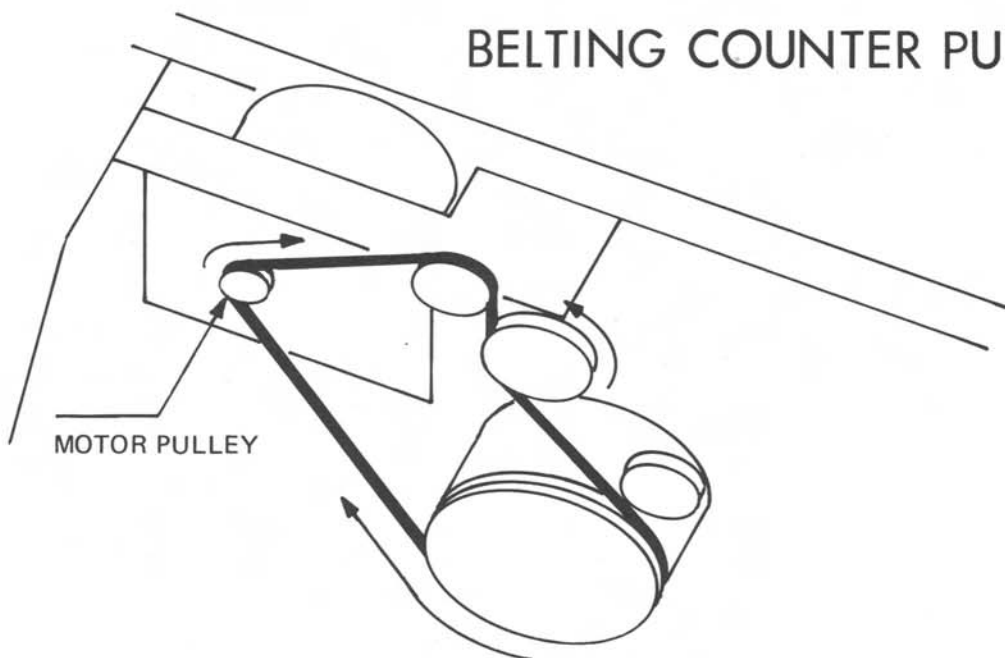
MACHANISM ASSEMBLY BLOCK

No.	Part No.	Description	Q'ty	No.	Part No.	Description	Q'ty
1.	090171001	Chassis Ass'y	1	74.	090176121	Not used	0
2.	090171002	REC Lock Lever	1	75.	090176121	Tape Pack Holder	1
3.	090171003	Sensing Plate Ass'y	1	76.	090176122	Spring, Pack Pressure	1
4.	090171004	Sub-chassis Ass'y	1	77.	090171017	Push Lever Ass'y	1
5.	090176101	Spring, Rec/PB Head Mtg.	1	78.	090171018	Rec Lever	1
6.	090177201	Collar, Sensing Plate Mtg.	1	79.	090177227	Collar, Rec Lever Mtg.	1
7.	090176102	Spring, Sub-chassis	2	80.	090176123	Spring, Rec Lock Lever	1
8.	090176103	Spring, Sensing Plate	1	81.	090176124	Spring, Eject (L)	1
9.	090176104	RQ Spring	1	82.	090176125	Spring, Eject (R)	1
10.	090177202	Collar, Sub-chassis Mtg.	1	83.	090176125	Not used	0
11.	090171005	Pinch Roller Ass'y	1	84.	090177228	Collar, Sub-chassis & Eject	1
12.	090176105	Spring, Pinch Roller	1			Stopper Mtg.	1
13.	090176105	Not used	0	85.	090171019	Play Lever	1
14.	090171006	Clutch Arm Ass'y	1	86.	090177227	Collar, Play Lever Mtg.	1
15.	090171007	Clutch Plate	1	87.	090176126	Reel Table Ass'y	2
16.	090176106	Clutch Pulley	1	88.	090176127	Spring, Back Tention	1
17.	090176107	Clutch Shaft	1	89.	090176128	Spring, Clutch	1
18.	090171008	Clutch Spring Plate	1	90.	090176129	Flywheel Bearing	1
19.	090171009	Clutch Spring Saucer	1	91.	090171020	Earth Metal	1
20.	090177203	Nylon Washer	1	92.	090171021	Not used	0
21.	090176109	Spring, Clutch Arm	1	93.	090171021	Bracket, Motor Mtg.	1
22.	090179302	Felt, Clutch	1	94.	090176130	Belt, Main	1
23.	090176110	Idler Pulley, Take-up	1	95.	090177230	Collar, Motor Mtg.	3
24.	090176110	Not used	0	96.	090176131	Cushion Rubber, Motor Mtg.	3
25.	090171033	F.F. Idler Pulley Ass'y	1	97.	090179301	Mat G, Shock Absorber	1
26.	090176111	Spring	1	98.	090176132	Motor Pulley	1
27.	090171010	F.F. Arm Link	1	99.	090176132	Not used	0
28.	090176112	Spring	1	100.	090176132	Not used	0
29.	090171011	RWD Arm Link	1	101.	090176132	Not used	0
30.	090176113	Spring	1	102.	090176132	Not used	0
31.	090176113	Not used	0	103.	090171022	Eject Stopper Arm	1
32.	090171012	Brake Arm	1	104.	090171023	Bracket, Eject Arm	1
33.	090176114	Spring, Brake	1	105.	090171024	Eject Stopper	1
34.	090171013	Brake Arm Link	1	106.	090177231	Collar, Eject Stopper Mtg.	1
35.	090171013	Not used	0	107.	090176133	Spring, Eject Stopper	1
36.	090171014	RWD Idler Arm Ass'y	1	108.	090176134	Spring, Stop Lever	1
37.	090176115	RWD Idler Pulley	1	109.	090176134	Not used	0
38.	090176116	Spring, RWD Idler Arm	1	110.	090171025	Slide Lever Ass'y	1
39.	090176116	Not used	0	111.	090176135	Spring, Slide Lever	1
40.	090176117	Flywheel Capstan	1	112.	090171026	Arm Lever	1
41.	090171015	Flywheel Bracket	1	113.	090177232	Collar, Arm Lever Mtg.	2
42.	090176118	Thrust Spring	1	114.	090171027	Bracket, Tape Counter Mtg.	1
43.	090171016	Stop Lever	1	115.	090176136	Belt, Tape Counter	2
44.	090177204	Collar, Stop Lever Mtg.	1	116.	090176137	Leaf Switch	1
45.	090176119	Pulley	1	117.	090176137	Not used	0
46.	090177205	Screw, M2x5, Sensing Plate Mtg.	1	118.	090171028	Pause Slide Lever Ass'y	1
47.	090177206	Screw, M2x5, Flywheel Bearing Mtg.	3	119.	090176138	Spring, Pause Lever	1
48.	090177207	Screw, M2x6, Rec/PB Head Mtg.	1	120.	090171029	Pause Lever	1
49.	090177208	Screw, M2.6x7, Stop Lever Mtg., etc.	3	121.	090171030	RQ Lever	1
50.	090177208	Not used	0	122.	090171031	RQ Lever Link	1
51.	090177210	Screw, M2.6x4, Sub-chassis Mtg.	1	123.	090171032	Stopper B	1
52.	090177211	Screw, M2.6x10, Flywheel Bracket Mtg.	1	124.	090177234	Collar, Rec/PB Head Mtg.	1
53.	090177211	Not used	0	125.	090177235	Collar, Erase Head Mtg.	2
54.	090177213	E Ring, φ 1.2, Reel Table Mtg.	2	126.	090176139	Spring, RQ Lever	1
55.	090177214	E Ring, φ 1.5, Pause Link Mtg.	4	127.	090176139	Not used	0
56.	090177215	E Ring, φ 1.9, Pinch Roller Ass'y Mtg.	1	128.	090176139	Not used	0
57.	090177216	E Ring, φ 2.0, Clutch Arm Ass'y Mtg.	3	129.	090177236	Screw, M2.6x6, Leaf SW Mtg.	2
58.	090177217	E Ring, φ 2.5, RQ Link Mtg.	4	130.	090177236	Not used	0
59.	090177218	E Ring, φ 3.2, FF Arm Link Mtg.	1	131.	090177238	Screw, M2x12, Erase Head Mtg., etc.	3
60.	090177219	E Ring, φ 4.0 RQ Lever Mtg. etc.	4	132.	090177239	Screw, M2.6x5, Pause Lever Ass'y Mtg.	4
61.	090177220	Vinyl Tube, φ 4.5x10, RWD Link Spring Sleeve	1	133.	090177239	Not used	0
62.	090177221	Vinyl Tube, φ 3x10, RWD Idler Spring Sleeve	1	134.	090177241	Screw, M2.6x7, Motor Mtg.	3
63.	090177222	Nylon Washer, φ 4xφ3x0.3φ, FF Arm Link Spacer	1	135.	090177242	Screw, M2.6x4, Counter Bracket Mtg., etc.	1
64.	090177223	Washer, φ2.6xφ7.5x0.5t, Stopper B Mtg., etc.	2	136.	090177243	Screw, M3x5, Counter Mtg.	2
65.	090177224	Washer, M2, Rec/PB Head Spring Mtg.	1	137.	090177244	Screw, M2.6x8, Stopper B Mtg., etc.	1
66.	090177225	F Washer, φ1.9xφ5x0.5t	1	138.	090177244	Not used	0
67.	090177226	Not used	0	139.	090177244	Not used	0
68.	090172001	Motor	1	140.	090177244	Not used	0
69.	090176120	Tape Counter	1	141.	090177244	Not used	0
70.	090172002	Rec/PB Head	1	142.	090177244	Not used	0
71.	090172003	Erase Head	1	143.	090177246	Nylon Washer, φ6.1xφ10x0.5t, RQ Lever Mtg.	1
72.				144.	090177249	Not used	0
73.				145.	090177250	Not used	0
				146.	090177249	CS Ring, φ2.0, Rec Lock Lever Mtg.	1
				147.	090177250	Cord Clamp	1

BLOCK DIAGRAM



BELTING COUNTER PULLEYS



REPAIR PART LIST

Symbol	Part No.	Description
TRANSISTORS, IC'S AND DIODES		
Q101, 102	301201147	2SC1328(S, T), MIC/PB Amp.
Q201, 202		
Q103, 203	301201147	2SC1328(S, T), DIN Rec. Amp.
Q104, 204	301201115	2SC828(R, S), Buff Amp.
Q105, 106	301201115	2SC828(R, S), Phono, VU Meter Amp.
Q205, 206		
Q107, 207	301201117	2SC564A, Phono, VU Meter Amp.
Q901	301301131	2SD526, Stabilizer
IC101, 102	303452161	NE-545B, Dolby NR Amp.
D101, 102	300111008	1K188, Meter Rect.
D201, 202		
D401	300414014	SEL-105RC, Rec. Indicator
D402	300414015	SEL-305GC, Dolby NR Indicator
D901-905	300919026	1N4003, Rectifier
D906	300313017	WZ-162, Zener Regulator, 16V, 1/2W
VARIABLE RESISTORS AND COILS		
VR101, 201	510502155	100KB, Rec. Bias Level Adj.
VR102, 202	510502153	10KB, EQ Adj.
VR103, 203	510502155	100KB, Playback Level Cal.
VR104, 204	510502165	20KB, Rec. Level Cal.
VR105, 205	510502153	10KB, Meter Cal.
VR301	525101147	50KAx2, Rec. Level Control
L101, 201	228641135	Rec. Bias Carrier Trap.
L102, 202	226501128	2.2mH, Choke Coil
L103, 203	228641134	19KHz Filter
L901	226501123	47 μ H, Choke Coil
L902	228641136	TB-15, REC/Erase Carrier OSC Unit

Symbol	Part No.	Description
OTHERS		
T001	203001420	Power Transformer (for BS Apprication)
	207001420	Power Transformer
S1, S2	613000031	Switch, Rec./Playback
S3	614010127	Switch, Power Supply
S4, S5, S6	614030815	Switch, Push, 3-Key, EQ Tape Bias
(1 set)		Selector
M001, 002	231310076	Meter, Level Indicator
PL001, 002	359101116	Lamp, 6.3V 250mA, Meter Illumination
J001	626110025	Jack, Phones
J002, 003	627117824	Jack, Mic.
	090172002	Rec./Playback Head
	090172003	Erase Head
	090176130	Driver Belt
	090172001	Motor, DC 12V
	109111004	Tape Holder Cover Ass'y
	111911378	Front Panel Ass'y
	116310202	Double Knob, R-ch
	116310203	Double Knob, L-ch
	116210009	Push Button
	124011288	Bottom Board
	138011281	Upper Cover
	624202202	Pin Jack, 2P
	625001115	DIN Jack, 5P, with Switch
	615212259	Swith, Leave
	141810721	Rec./Playback Amp. Circuit Board Ass'y
	141810722	Control Circuit Board Ass'y.
	141810723	Indicator Circuit Board Ass'y.
	141810724	Power Supply Circuit Board Ass'y
F901	341220005	Fuse, O. 5A AC Circuit (Sec.) Overload Protector
	345220005	Fuse, O. 5A AC Circuit (Sec.) Overload Protector (Mini Type)
	345250005	Fuse, 500mA AC Circuit (Sec.) Overload Protector (Mini Type With "S" "D" Mark)
F902	341220010	Fuse, 1A, Lamp Overload Protector
	345220010	Fuse, 1A, Lamp Overload Protector (Mini Type)
	345250010	Fuse, 1A, Lamp Overload Protector (Mini Type With "S" "D" Mark)

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