

HK1000

The Harman-Kardon Model HK 1000

Professional Stereo Tape Cassette Deck with Dolby Noise Reduction System

Technical Manual

harman / kardon

ELECTRICAL ADJUSTMENTS

Unless otherwise indicated, all electrical adjustments should be made under the following conditions:

- A. Power switch in the ON position.
- B. Stereo/mono switch in the STEREO position.
- C. Dolby NR switch in the OFF position.
- D. Tape switch in the LN position.

Also, make all adjustments in the sequence shown here.

ITEM	SIGNAL SOURCE	MEASUREMENT CONNECTION	MODE	ADJUST	INSTRUCTIONS
400 Hz Oscillator Level	Internal 400 Hz Oscillator	VTVM to OUTPUT Jacks	Record Pause	VR401 on P.C.B. Dolby Test Tone	<ol style="list-style-type: none"> Set PLAYBACK LEVEL on front panel at maximum position. Depress TEST button on front panel. Adjust for 580mV.
Meter Level	Internal 400 Hz Oscillator	VTVM to OUTPUT Jacks	Record Pause	VR203 VR303 on P.C.B. Dolby.	<ol style="list-style-type: none"> Depress TEST button on front panel. Be sure VTVM reads 580mV at each output (PLAYBACK LEVEL maximum position). Adjust to obtain OVU on VU meters.
DOLBY Input Level	400 Hz 20 mM/mm or 200nW/M Test Tape	VTVM to OUTPUT Jacks	Playback	VR5 VR105 Play CAL on front panel	<ol style="list-style-type: none"> Set PLAYBACK LEVEL on front panel to maximum position. Adjust for 580mV. Be sure VU meters each read OVU.
Playback Amplifier Equalization	PHILIPS TCFR Test Tape	VTVM or Response Tracer to OUTPUT JACKS	Playback	VR 3) VR103) L VR4) VR104) M VR2) VR102) H on P.C.B. Deck Amp	<ol style="list-style-type: none"> Adjust for ± 1.5 db in reference to 0 db @ 1KHz. <p>Note: Effective frequency range L – Less than 80 Hz M – More than 3 KHz H – More than 8 KHz</p>
Bias Frequency	105 KHz to Horizontal Input of Oscilloscope	C27 to Vertical Input of Oscilloscope	Record Pause	T2 on P.C.B. Rec. Amp	Adjust for a circle pattern on oscilloscope.
Bias Trap	Internal Bias Oscillator	VTVM from K4 & K104 colloitors to ground	Record Pause	L2 L3 L102 L103 on P.C.B. Rec. Amp	Adjust for minimum readings.
Record Playback Level	Internal 400 Hz Oscillator	VTVM to OUTPUT Jacks	Record		<ol style="list-style-type: none"> Depress TEST button on front panel. Be sure VU meters each read OVU. Record the signal on "TDK C60SD" or on a tape of the brand most often used.
			Playback		<ol style="list-style-type: none"> Play back the recorded signal and note the VTVM readings.
				VR8 VR108 Rec. CAL. on front panel	<ol style="list-style-type: none"> Repeat steps 3 & 4 and adjust to obtain 580mV reading during Playback.

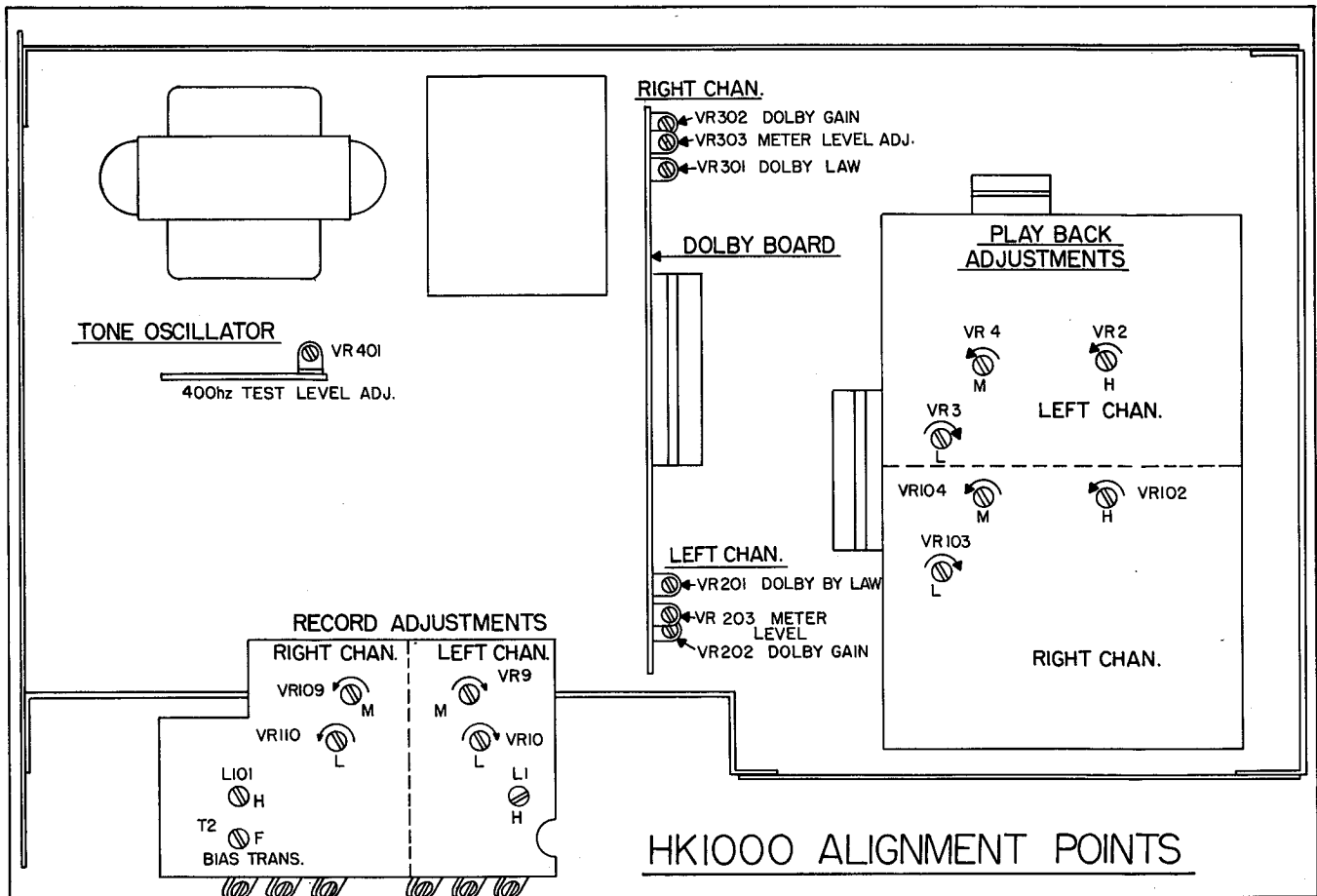
ELECTRICAL ADJUSTMENTS

ITEM	SIGNAL SOURCE	MEASUREMENT CONNECTION	MODE	ADJUST	INSTRUCTIONS
Recording Bias	1 KHz @ 0.1V to Input Low Jacks	VTVM to OUTPUT JACKS	Record		<ol style="list-style-type: none"> 1. Adjust RECORD LEVEL controls on front panel to obtain OVU on both VU meters. 2. Record the signal on "TDK-C60SD" or on a tape of the brand most often used.
			Playback	VR12 VR112 on P.C.B. Rec. Amp	<ol style="list-style-type: none"> 3. Playback the recorded signal and note the VTVM readings. 4. Repeat steps 2 & 3 and adjust to obtain OVU 580mV Out.
Recording Amplifier Equalization	1 KHz @ 0.1V to INPUT LOW JACKS		Record Pause		<ol style="list-style-type: none"> 1. Adjust RECORD LEVEL controls on front panel to obtain OVU on both VU meters.
Recording Amplifier Equalization	from 40Hz to 13KHz @0.01V (OVO-20 dB) to INPUT LOW JACKS		Record		<ol style="list-style-type: none"> 2. Record the signal on "TDK-C60SD" or on a tape of the brand most often used.
Recording Amplifier Equalization		VTVM or Response Tracer to OUTPUT JACKS	Playback		<ol style="list-style-type: none"> 3. Playback the recorded signal and note the VTVM readings or Response Trace.
				VR10) L VR110) L VR9) M VR109) M L1) H L101) H on P.C.B. Rec. Amp	<ol style="list-style-type: none"> 4. Repeat steps 2 & 3 and adjust to obtain ± 1.5dB in reference to 0dB @ 1KHz L: Less than 100Hz M: more than 3KHz H: 13-15KHz Note: Adjustment of VR10 & VR110 effects Record/Playback level, therefore realignment is required.
Recording Bias (STANDARD)	1KHz @0.1V to INPUT LOW JACKS		Record Pause		<ol style="list-style-type: none"> 1. Place Tape switch in the "STANDARD" position. 2. Adjust RECORD LEVEL controls on front panel to obtain OVU on both VU meters.
	from 1KHz to 13KHz @0.01V (OVU-20 dB) to INPUT LOW JACKS		Record		<ol style="list-style-type: none"> 3. Record the signal on "STANDARD" tape of the brand most often used.
		VTVM or Response Tracer to OUTPUT JACKS	Playback		<ol style="list-style-type: none"> 4. Playback the recorded signal and note the VTVM readings or Response Trace.
				VR13 VR113 on P.C.B. Rec. Amp	<ol style="list-style-type: none"> 5. Repeat steps 3 & 4 and adjust to obtain ± 1.5dB reference to 0dB @ 1KHz.

ELECTRICAL ADJUSTMENTS

ITEM	SIGNAL SOURCE	MEASUREMENT CONNECTION	MODE	ADJUST	INSTRUCTIONS
Recording Bias (CR02)	1KHz @ 0.1V to INPUT LOW JACKS		Record Pause		1. Place Tape switch in the CRO2 position. 2. Adjust RECORD LEVEL controls on front panel to obtain OVU on both VU meters.
	from 1KHz to 13KHz @ 0.01V (OVU-20dB) to INPUT LOW JACKS		Record		3. Record the signal on "MEMOREX chromium C-60" tape of the brand most often used.
		VTVM or Response Tracer to OUTPUT JACKS	Playback		4. Playback the recorded signal and note the VTVM readings or Response Trace.
				VR11 VR111 on P.C.B. Rec. Amp	5. Repeat steps 3 & 4 and adjust to obtain $\pm 1.5\text{dB}$ reference to 0dB @ 1 KHz.
MPX Filter	19KHz to INPUT LOW JACKS	VTVM to OUTPUT JACKS	Record Pause	L202 L302 on P.C.B. Dolby	Adjust for minimum readings.
Dolby Unit	5KHz to INPUT LOW JACKS	VTVM from CN-B-9 and CN-B-12 to ground	Record Pause		1. Short FET. Gate (TEST PIN on P.C.B. Dolby) 2. A level of input signal which produces 17.5mV.
				VR202 VR302 on P.C.B. Dolby	3. Note the VTVM reading. Adjust to give a 10dB rese when Dolby NR switch is placed in the ON position.
				VR201 VR301 on P.C.B. Dolby	4. Note the VTVM reading with the Dolby NR switch on the ON position. Adjust for 2dB less at VTVM readings when FET Gate Short is removed.

ALIGNMENT POINTS (BOTTOM VIEW)



HK1000 ALIGNMENT POINTS

BOTTOM VIEW

MECHANICAL ADJUSTMENTS

1. PINCH ROLLER TENSION (Refer to Fig. 1)
Adjust spring (B) so that the tension of the pinch roller (C) against the capstan (A) may be between 350 and 400 grams in play mode.
2. SIDE PULLEY TENSION (Refer to Fig. 2)
Select hole position for spring (D) so that the tension of the test point of the pulley shaft (E) against reel rest (75) may be between 40 and 60 grams in play mode.
3. TAPE END SWITCH (Refer to Fig. 3)
Adjust screws (G) so that clearance between tape end switch (115) and det. lever (F) may be 0.004" – 0.012" (0.1 – 0.3mm). Should the tension of det. lever (F) be less than 60 – 80 grams after adjusted, exchange the tape end switch (115).
4. CASSETTE HOLDER (Refer to Fig. 4)
Adjust the position of cassette holder by adjust screws (98) so that front edges of the cassette tape may be in center of the hooks (H) of cassette holder (27).
5. FLYWHEEL PLAY (Refer to Exploded View #2)
Release screw (98) of flywheel bracket (16), and adjust clearance between thrust bearing of flywheel bracket (16) and the flywheel (53) for 0.008" – 0.012".
6. PLUNGER (Refer to Fig. 5)
Adjust plunger (117) by screws (99) so that edges of lock lever (J) of Push button (12) may be in alignment with front edges of push button bracket (K), when iron core (I) of plunger (117) is fully inserted.
7. RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT (Refer to Fig. 3)

Signal Source	Connections	Mode	Adjust	Remarks
Alignment Test Tape, Phillips 10KHz No. TCA-10	VTVM to OUTPUT Jacks (J4, 104)	Playback	Azimuth Screw (L)	Adjust the screw to obtain maximum reading on VTVM

8. TAPE SPEED ADJUSTMENT AND WOW AND FLUTTER MEASUREMENT (Refer to Fig. 6)

Signal Source	Connections	Mode	Adjust	Remarks *
3KHz Test Tape, Phillips No. TC-FL3	Standard 3KHz Wow & Flutter Meter	Playback	VR 501 on Rear Deck	Adjust VR 501 to obtain the smallest % drift. The wow & flutter meter should read 0.1% (nominal). (WTD/NAB)

*If there is excessive wow and flutter examine the pinch roller, belts, motor, capstan, and reel rest for grease, oil, dirt, and/or wear. Also examine the tape counter assembly for evenness of operation.

LUBRICATION

POSITION	OIL	HOW TO APPLY	REMARKS
Pinch Roller Shaft.	Light Oil	Feed a few drops on to the Pinch Roller Shaft.	Be careful not to get any oil on any rubber parts.
Reel Spindles (74, 75) and reel spindle shaft	Light Oil	Remove the reel caps and pull off the reel spindles (74, 75) clean the reel spindle shaft and inside of the reel spindles with a clean cloth. Apply an adequate quantity of oil.	Be careful not to get any oil on any rubber parts.
Capstan Bearing	Light Oil	Clean the capstan and bearing with a clean cloth. Apply an adequate quantity of oil.	After lubrication remove all oil on parts in the tape path. Be sure to re-insert the oil cut nylon washer (37).
All contact points of levers. All lever shafts.	Molykote (Dow Corning Corp., Midland, Michigan, USA)	Apply an adequate quantity of Molykote.	

FIG. 1

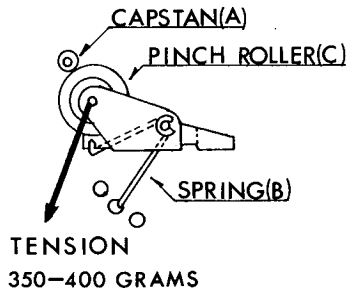


FIG. 2

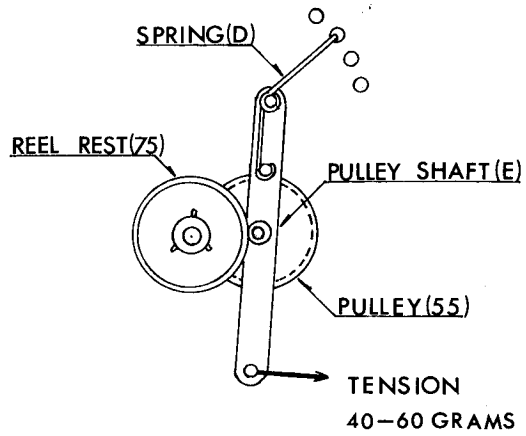


FIG. 3

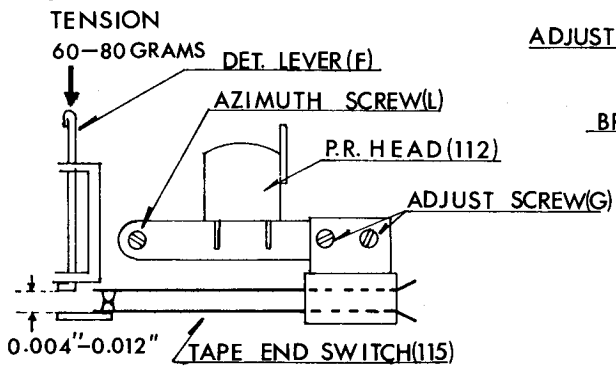


FIG. 4

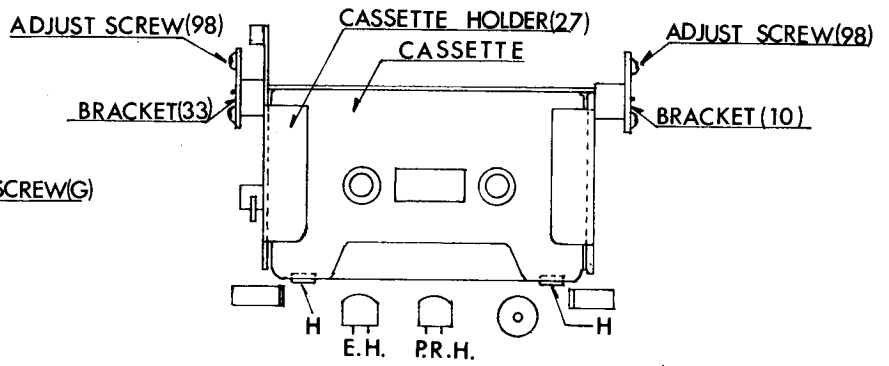


FIG. 5

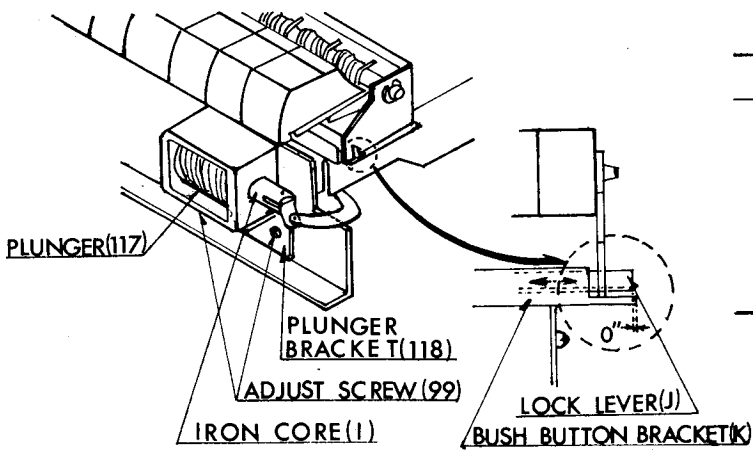
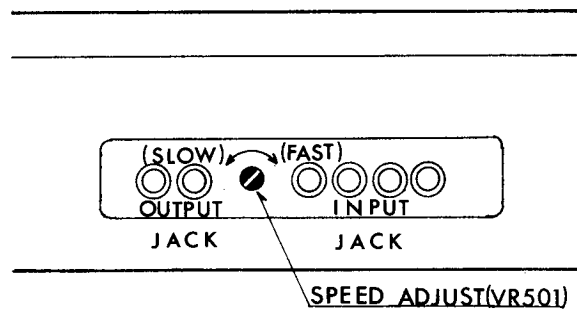
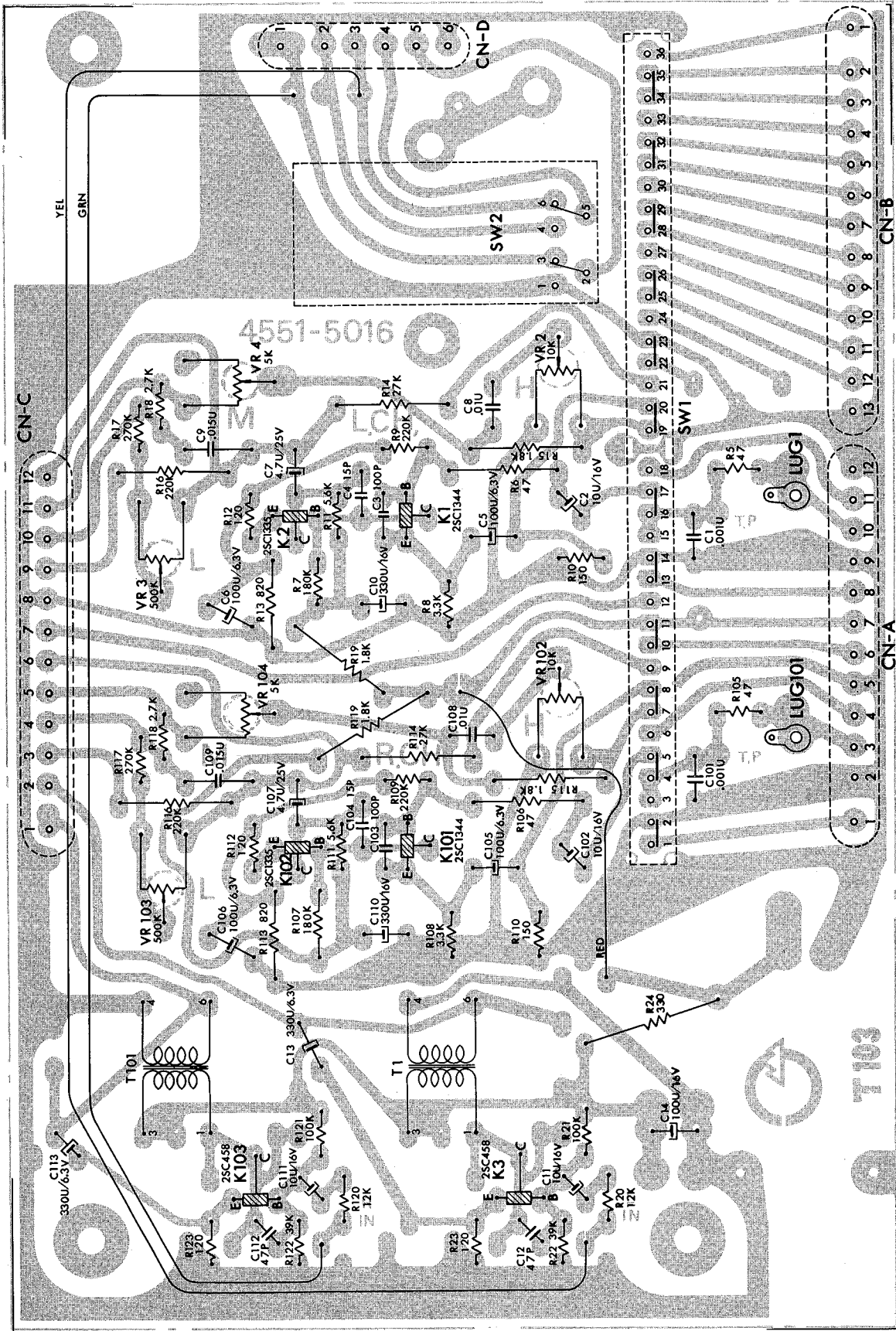


FIG. 6



DECK AMP PC BOARD

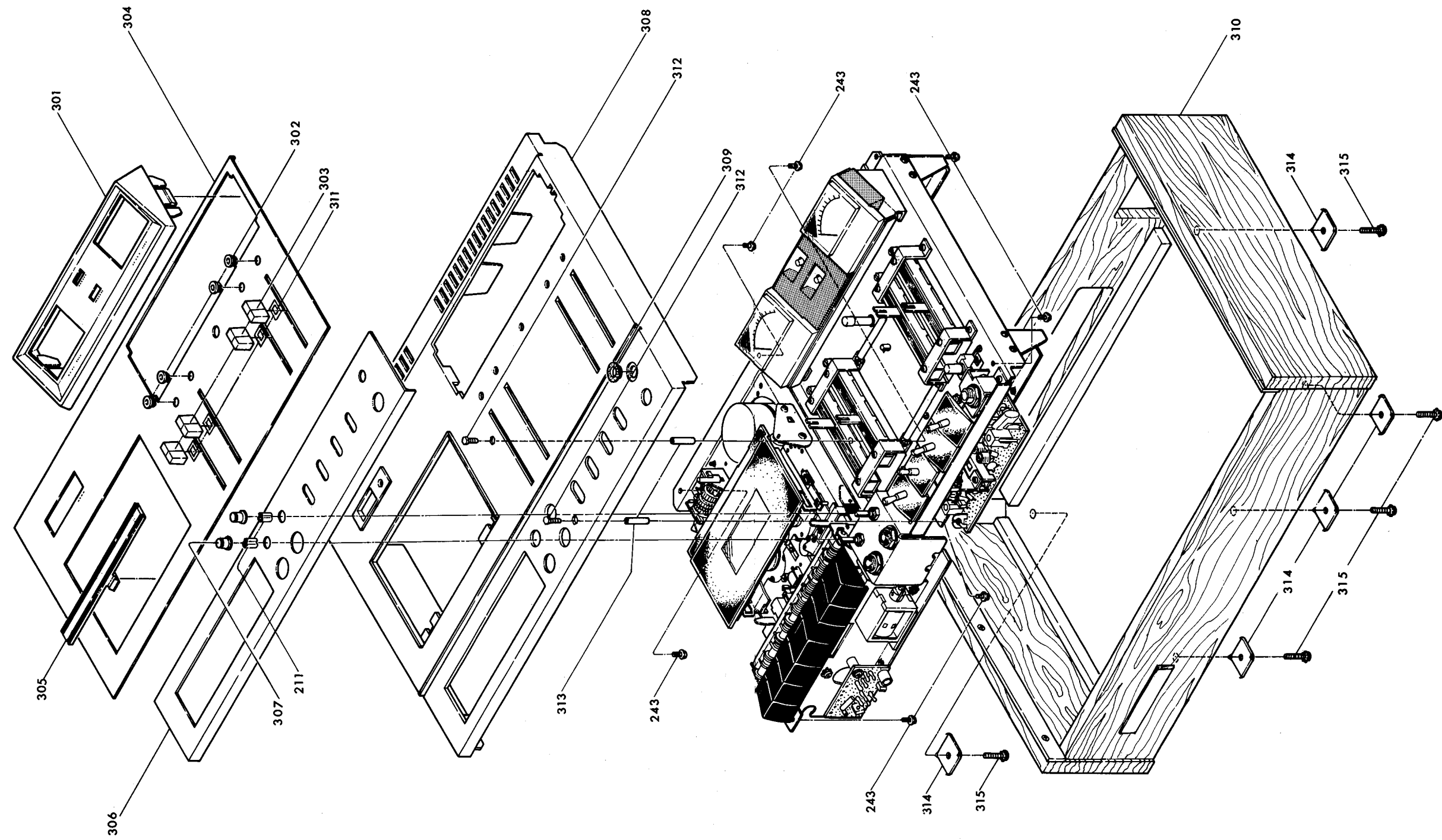


REPLACEMENT PARTS LIST

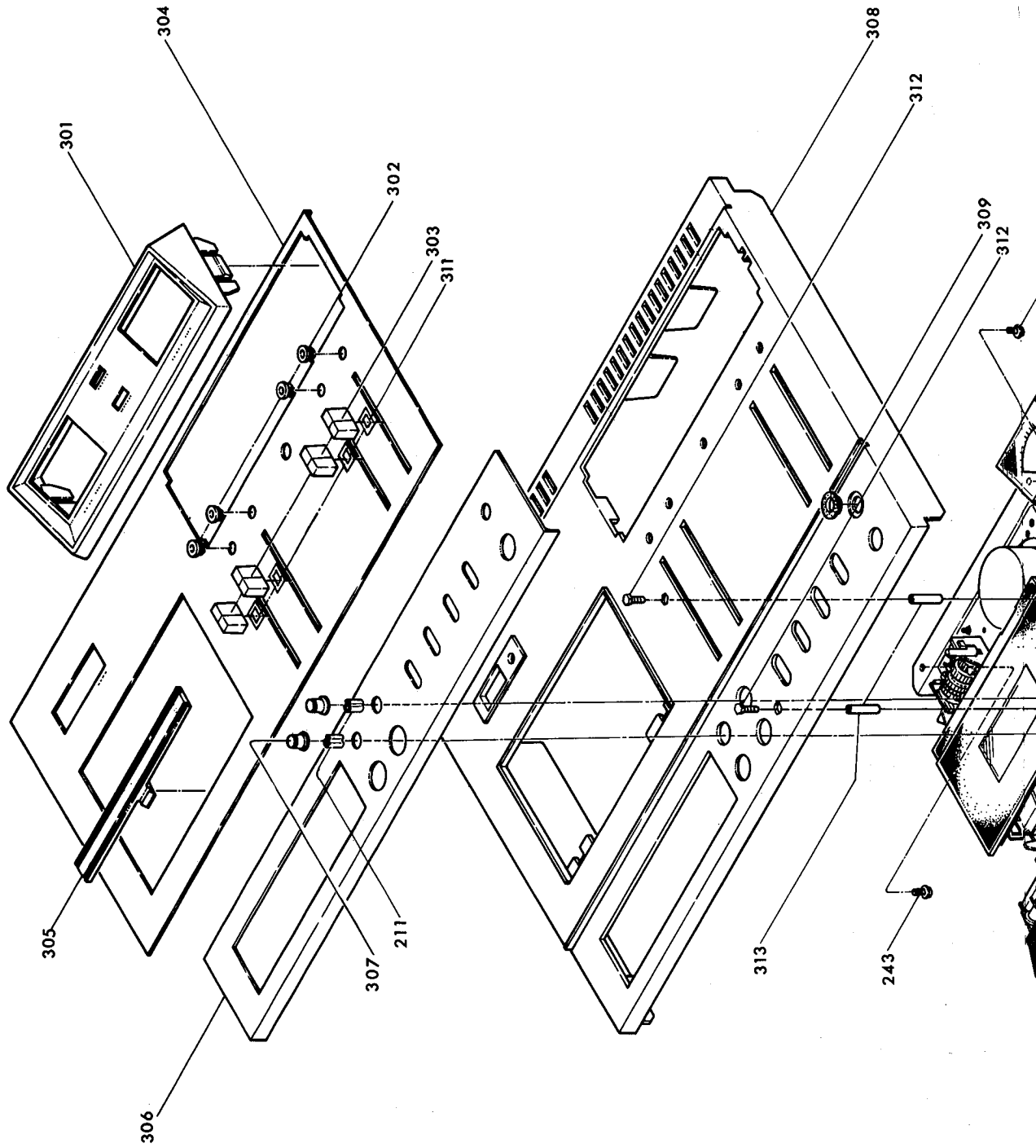
H-K PART NO.	REF. NO.	DESCRIPTION	H-K PART NO.	REF. NO.	DESCRIPTION
RECORDING AMPLIFIER			MOTOR GOVERNOR & DELAY BOARD ASS'Y.		
43028517	K4, K104	Transistor 2SA672(B)	43028516	K501	Transistor 2SC1368(C)
43028518	K5, K105	Transistor 2SC458(D)	23028517	K502,503	Transistor 2SA672(B)
43028540	K6, K7	Transistor 2SC1213(B)	43028518	K504	Transistor 2SC458(D)
38128520	D1, D101	Varistor MVII	43028519	K505	Transistor 2SA738(C)
24528568	SW3	Tape Selector Switch	38128520	D501	Varistor MVII
23528543	VR9, VR109	Variable Resistor 10K Ohm	38128521	D502,503,504	Varistor HV23G
23528551	VR10, VR110	Variable Resistor 2K Ohm	41028522	D505	Silicon Diode W06(A)
12028556	L1, L101	Coil	38028524	TH501	Thermistor 19D27
12028557	L2, L102	Coil Bias Trap	21528523	VR501	Variable Resistor 500 Ohm Speed Adjust
12028558	L3, L103	Coil Bias Trap	RECTIFIER BOARD ASS'Y.		
12028555	T2	Transformer Osc	43028605	K403	Transistor 2SC1368(C)
23528550	VR11, 111	Variable Resistor 50K Ohm	41028606	D401	Silicon Diode HZ12(B)
23527551	VR12, 112	Variable Resistor 100K Ohm	41028607	Rect-401,402	Rectifier 1S2731
23528552	VR13, 113	Variable Resistor 200K Ohm	MOTOR BLOCK BOARD ASS'Y.		
DOLBY TEST TONE BOARD ASS'Y.			01528402		Motor Ass'y (M0501) (52)
43028518	K401, K402	Transistor 2SC458(D)	12028525	L501,502	Coil Ass'y of M0501
25028504	SW401	Calibrate Switch	MISCELLANEOUS		
23528608	VR401	Variable Resistor 10K Ohm 400 Hz Osc Level Adjust	21528542	VR1,101	Volume 1000 Ohm MIC Level
DECK AMPLIFIER BOARD ASS'Y.			21528546	VR5,105	Volume 5K Ohm Playback Calibrate
43028535	K1,101	Transistor 2SC1344(E)	21428547	VR6, 106	Volume 100K Ohm Record Level
43028536	K2,102	Transistor 2SC1335(E)	21428548	VR7, 107	Volume 10K Ohm Playback Level
43028518	K3,103	Transistor 2SC458(D)	21428549	VR8,108	Volume 10K Ohm Record Calibrate
24528566	SW1	Rec/Play	26528569	SW4	Stereo/Mono Switch
24528567	SW2	Output Switch	25028509	SW401	Calibrate Switch
10528554	T1,101	Output Transformer	25028510	SW401	Power Supply Switch
23528543	VR2,102	Variable Resistor 10K Ohm	26528602	SW201	Dolby NR Switch
23528544	VR3,103	Variable Resistor 500K Ohm	53028512	SK401	Line Cord
23528545	VR4,104	Variable Resistor 5K Ohm	65428513	FF401	Fuse Holder
DOLBY AMPLIFIER			65428570	J1,101	MIC Jack
43028582	K201,301,202,302, K204,304,208,307	Transistor 2SC458LG(D)	65428571	J2,3,102,103	Input Jack
43028517	K205,305,209,309, K210,310	Transistor 2SC458(D)	65428572	J4,104	Output Jack
43028590	K206,306	Transistor FET 2SK40(D)	65428573	J5	Headphone Jack
41528591	D201,301,204,304, D206,306,207,307	Germanium Diode IN34A	47028574	PL1	Power Light 30MA 6V
38128521	D202,302,203,303	Varistor HV23G	47028575	PL2,3	Meter Light 30MA 6V
41028593	D205,305	Silicon Diode IS2076	47028576	PL4	Record Light 25MA 12V
41028594	D208	Silicon Diode HZ7(A)	47028577	PL5	Dolby NR Light 25MA 12V
23528595	VR201,301	Variable Resistor 10K Ohm	01528444	RPH1	Rec/Play Head
23528596	VR202,302	Variable Resistor 2K Ohm	01528445	EH1	Erase Head
23528597	VR203,303	Variable Resistor 5K Ohm	12528580	ME1,101	Level Meter
12028598	L201,301	Coil 36MH	65428600	CN-E	14P Connector (Male)
12028599	L202,302	Coil 23MH (19KHZ ADJ)	65428601	CN-E	14P Connector (Female)
			10128615	T401	Power Transformer
			10128616	T402	Power Transformer (Export Only)

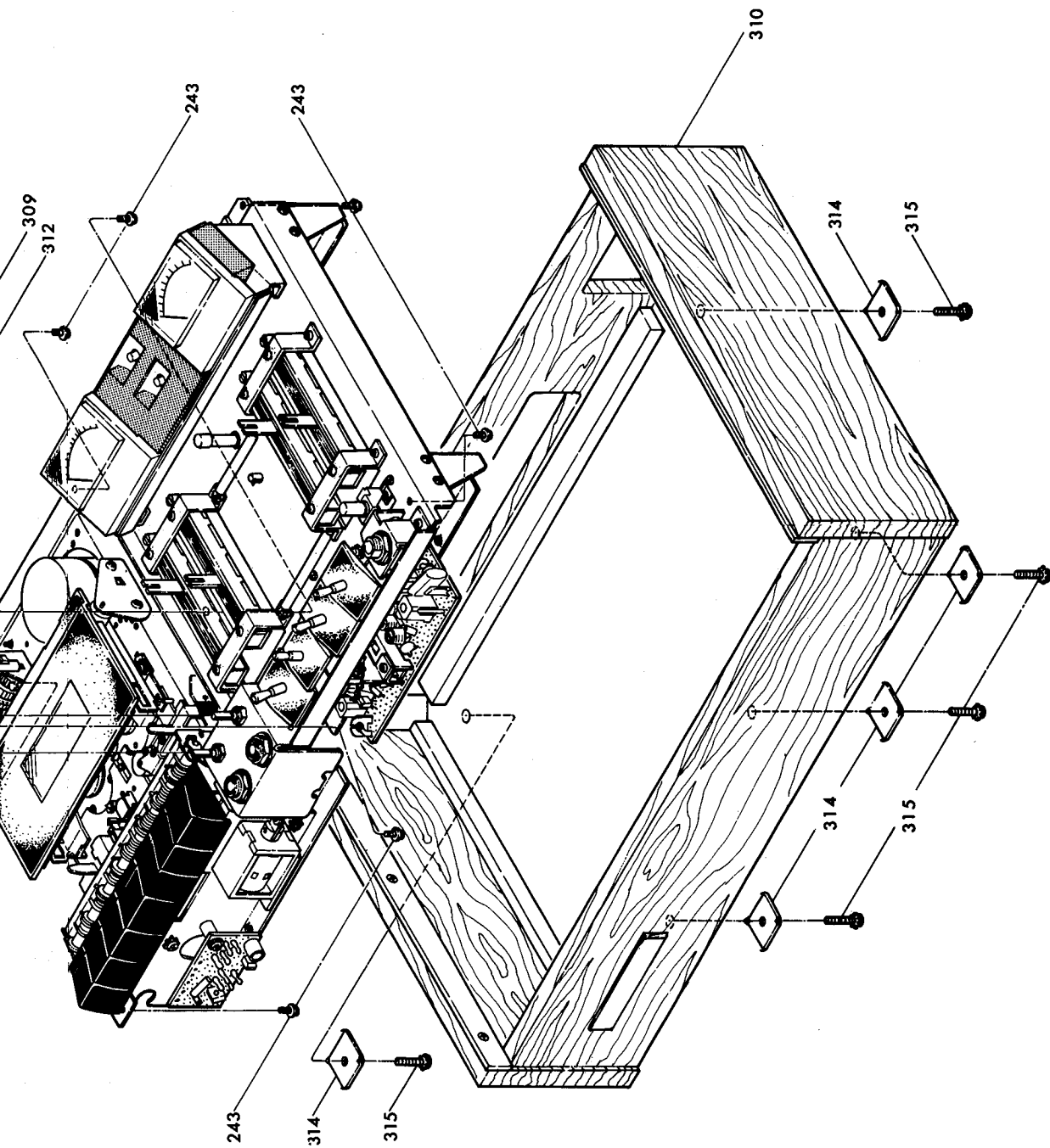
NOTE: To speed handling of your order be sure to include both the model and serial numbers which appear at the back of the chassis, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman-Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman-Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803, Att: Parts Department.

EXPLODED VIEW #1



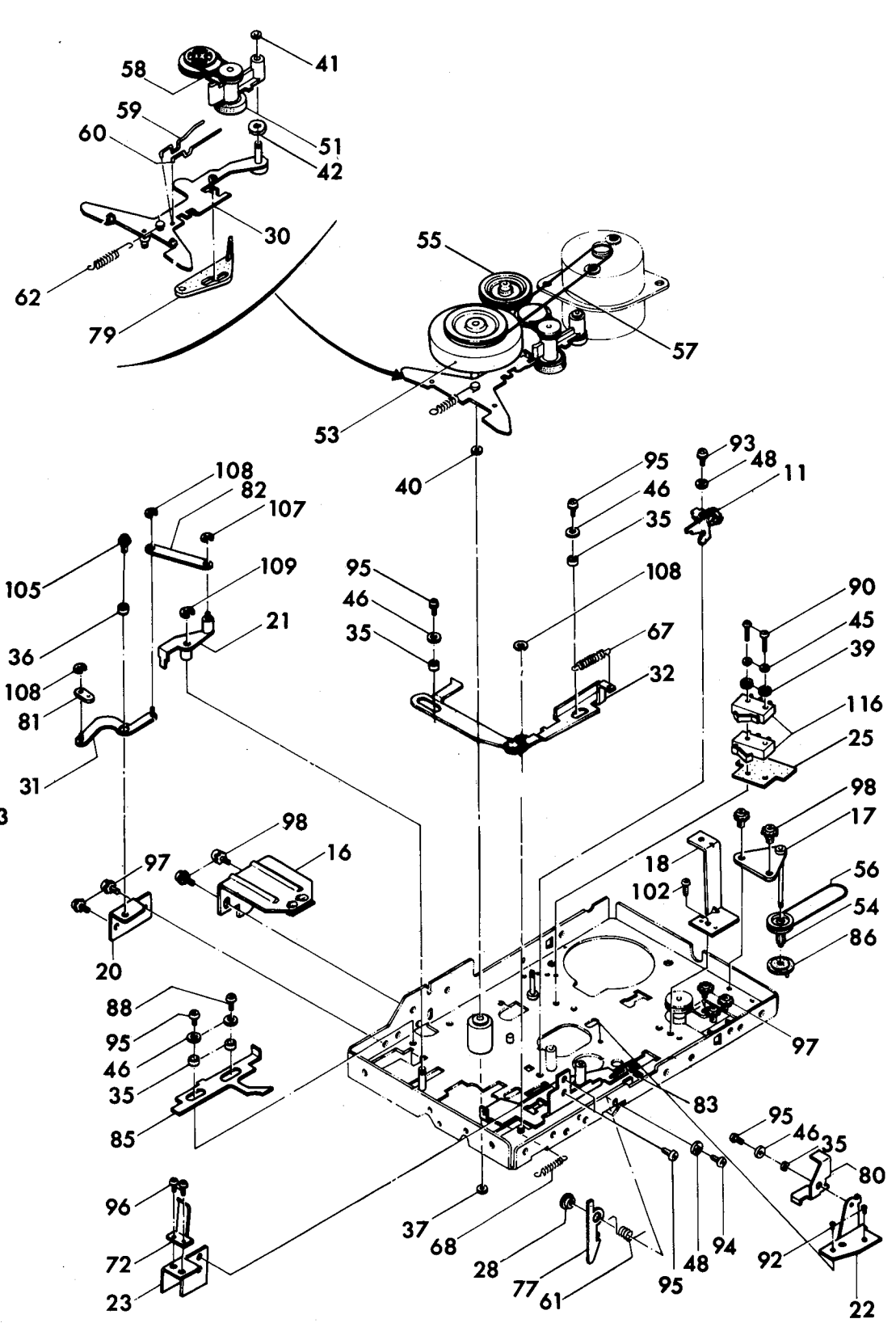
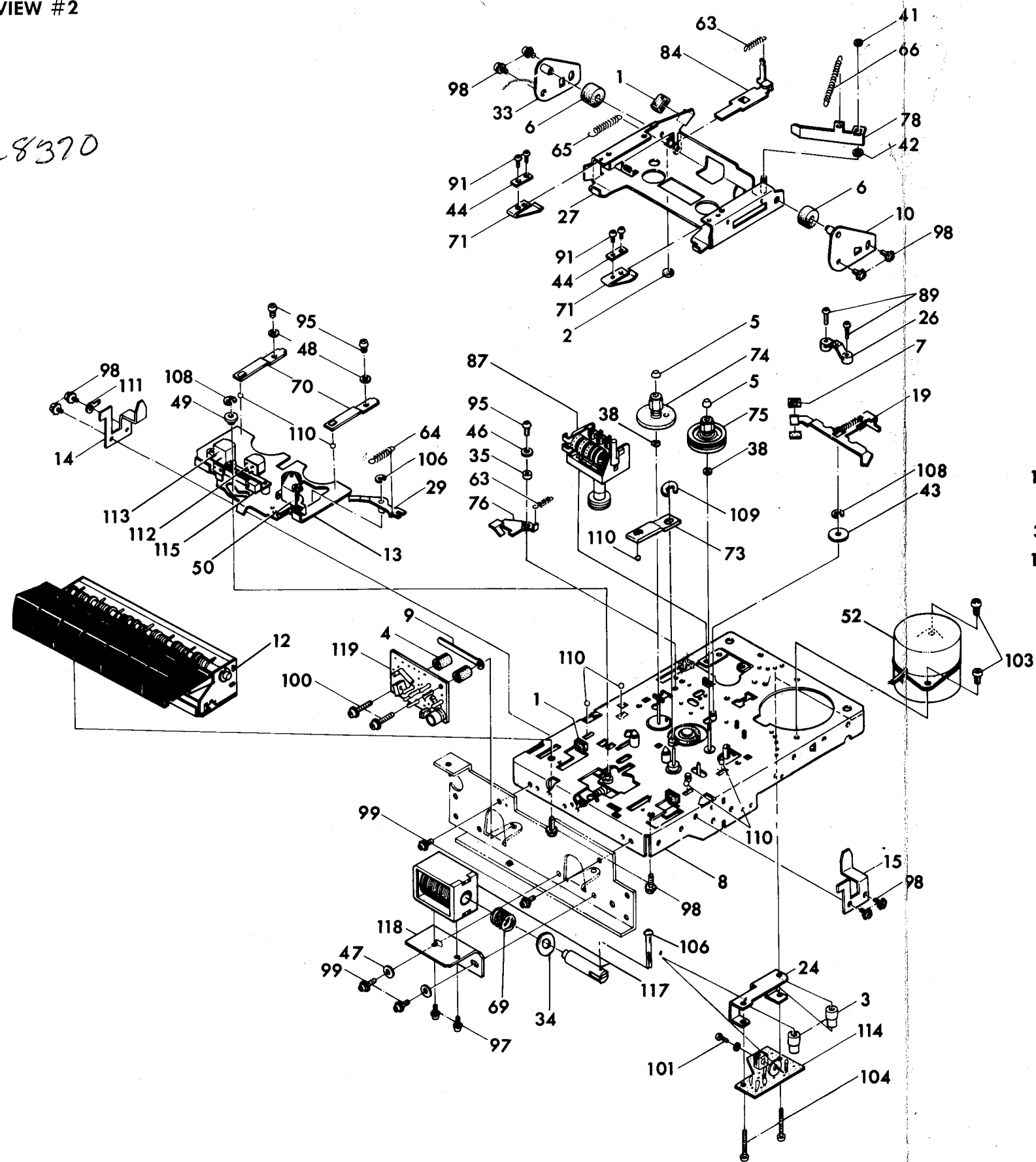
EXPLODED VIEW #1





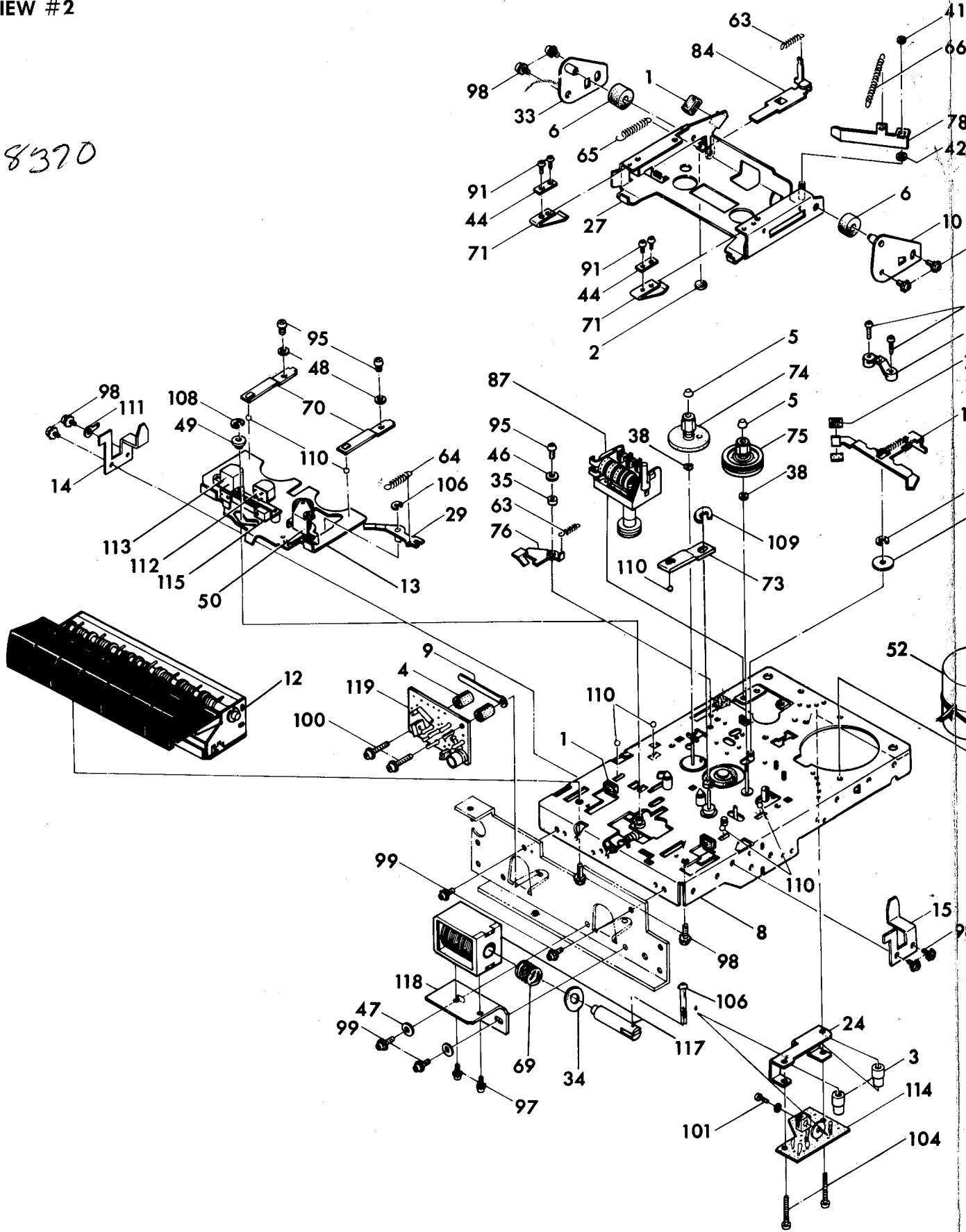
EXPLODED VIEW #2

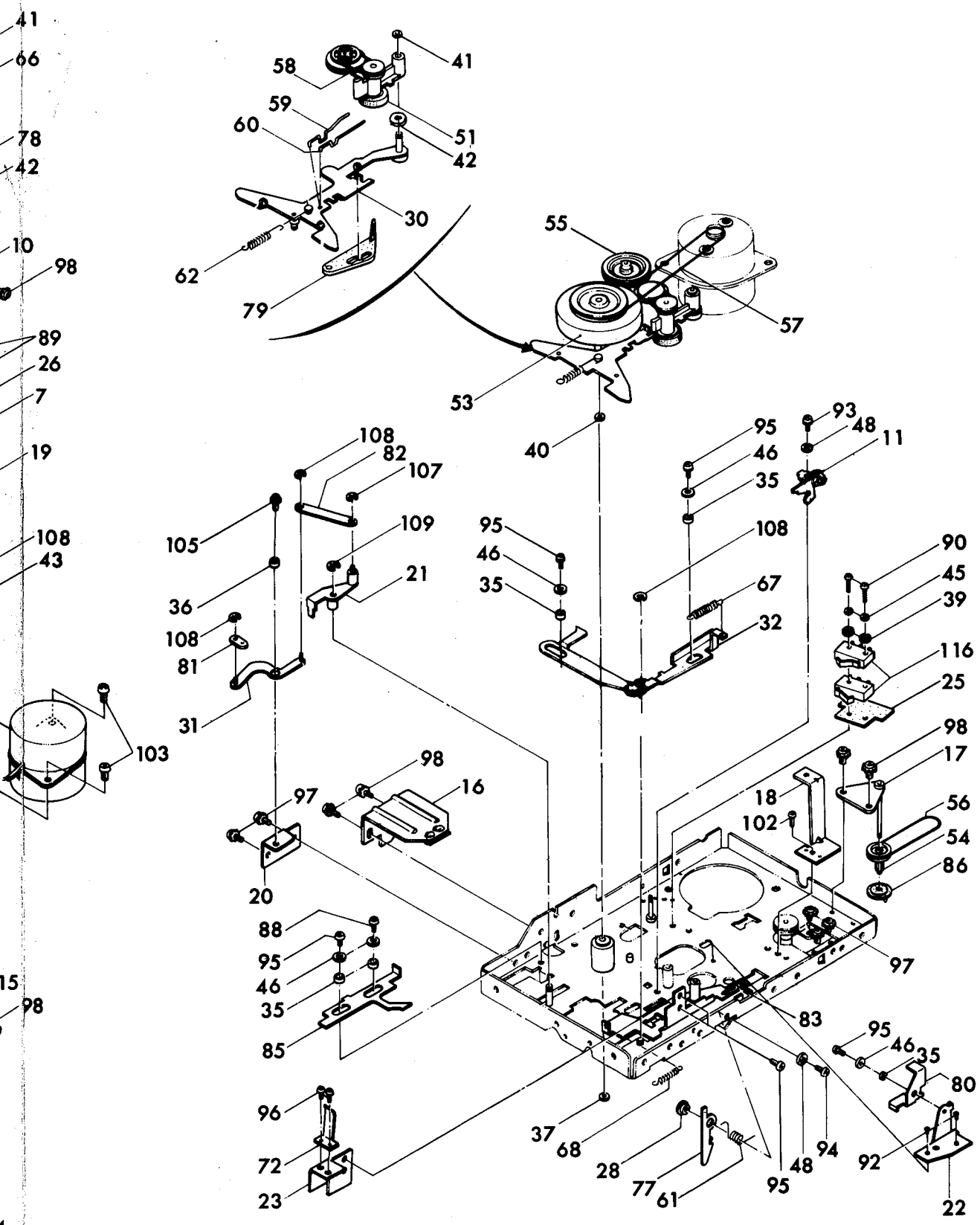
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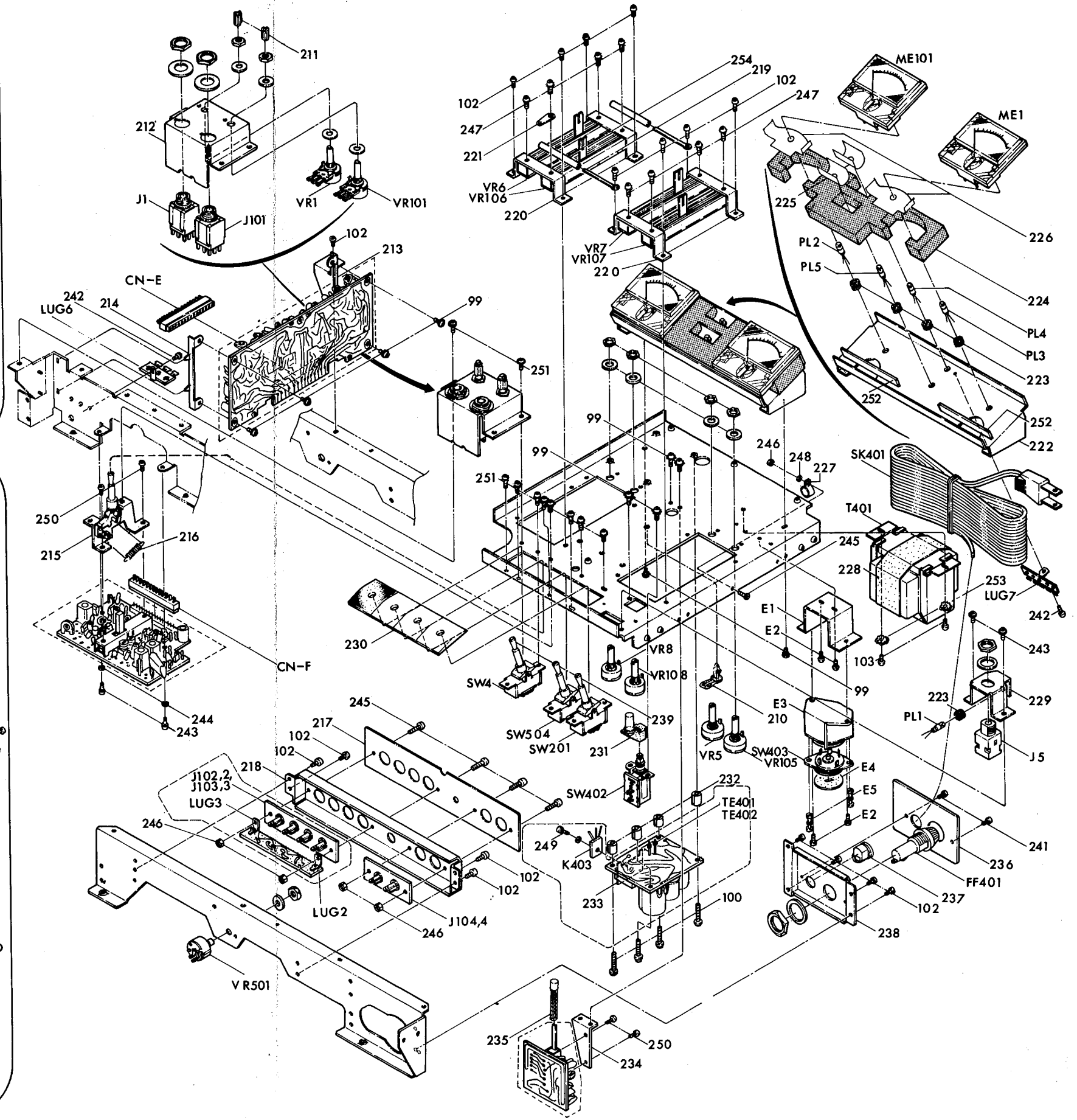
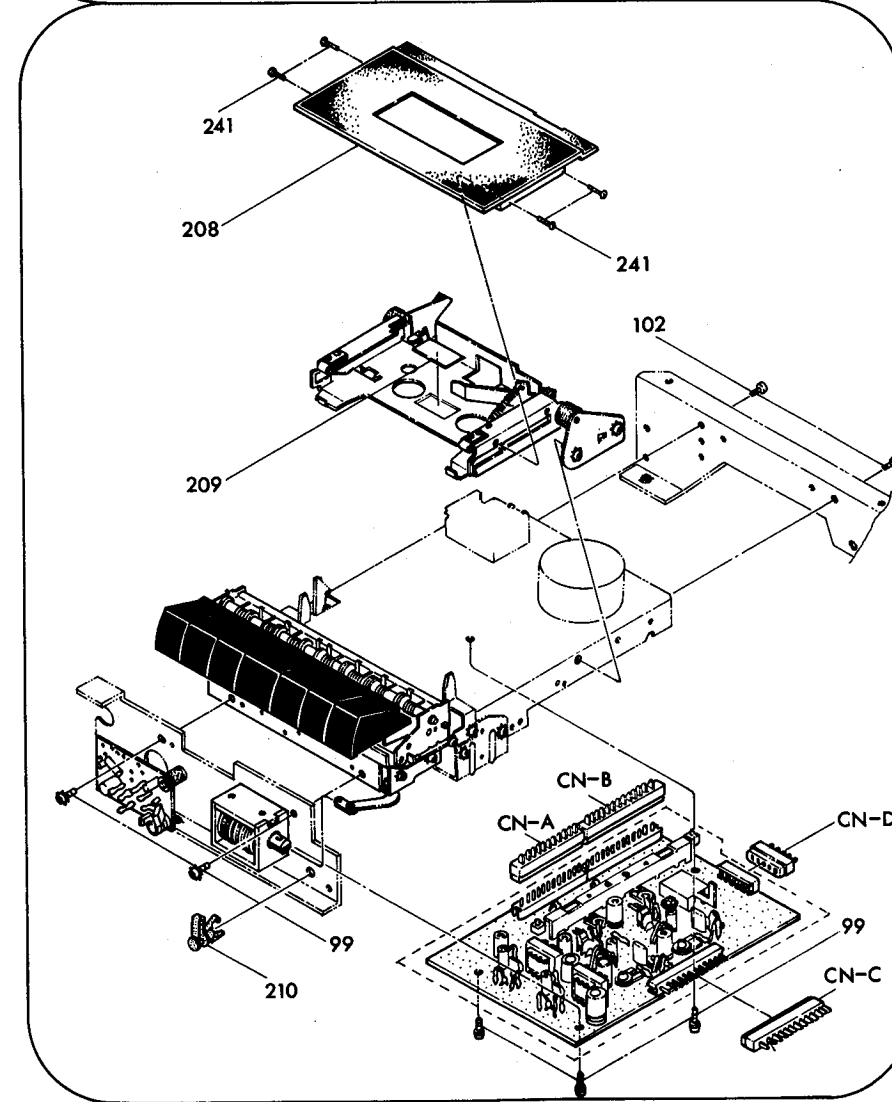
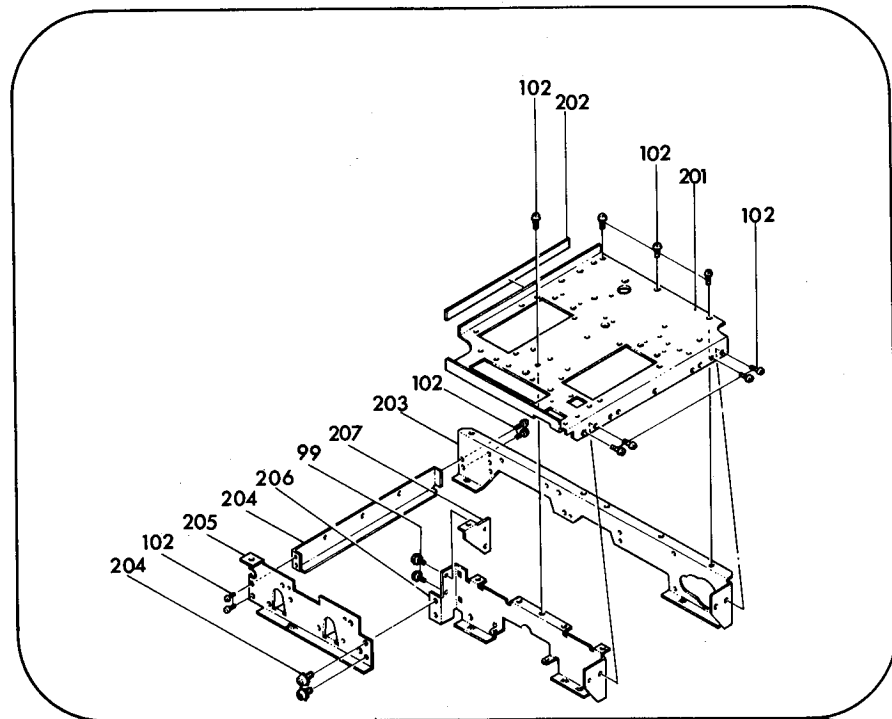


EXPLODED VIEW #2

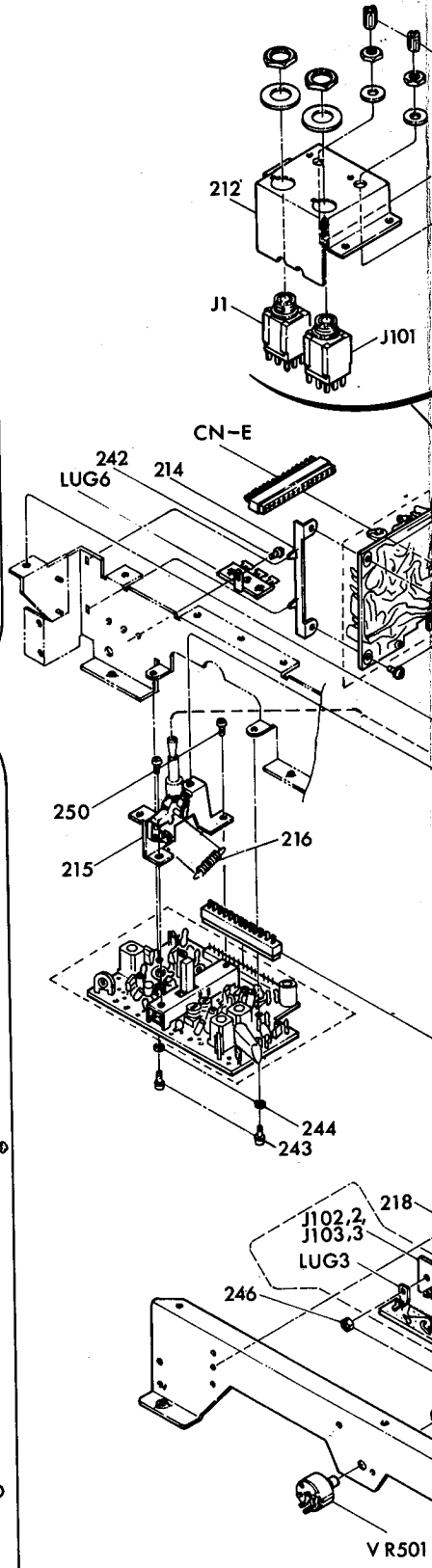
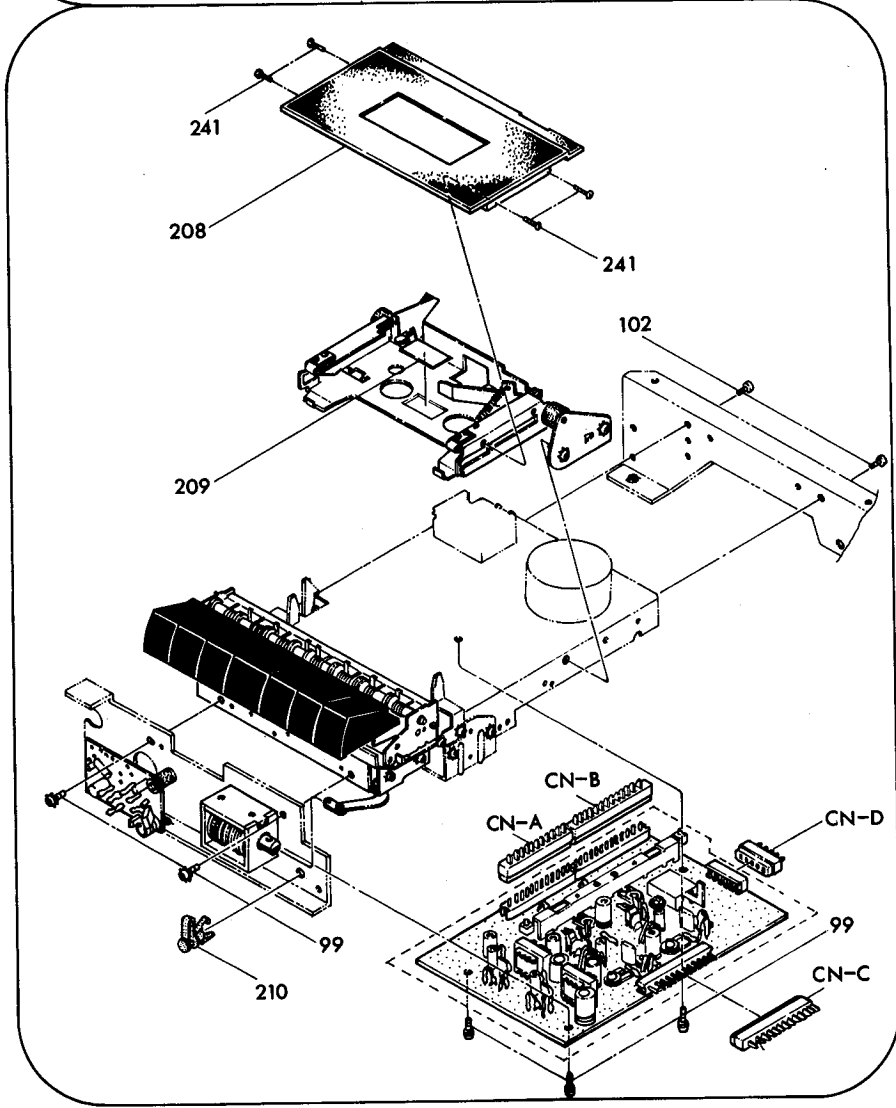
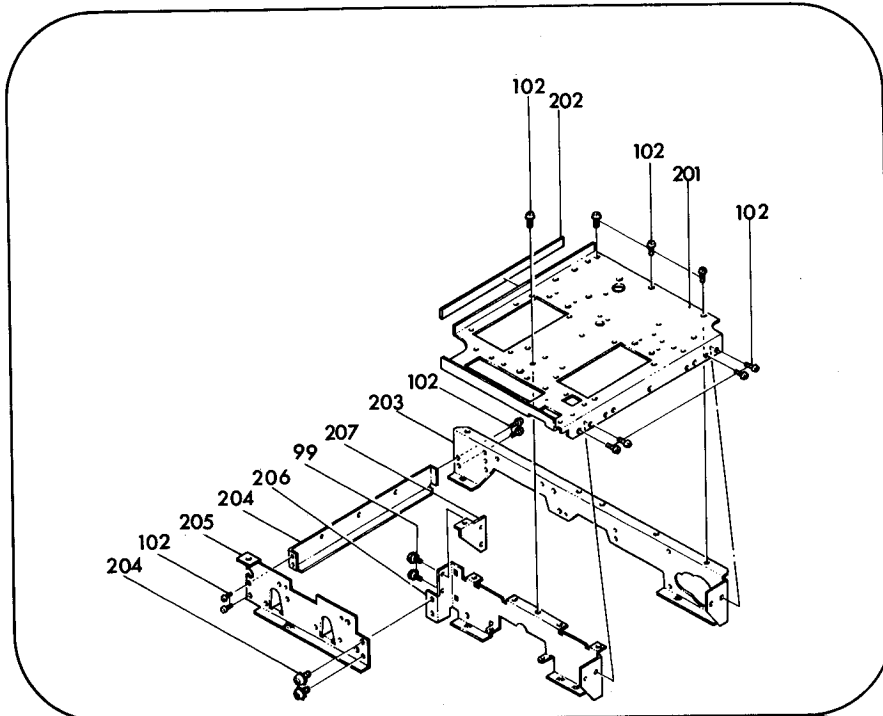
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EXPLODED VIEW #3



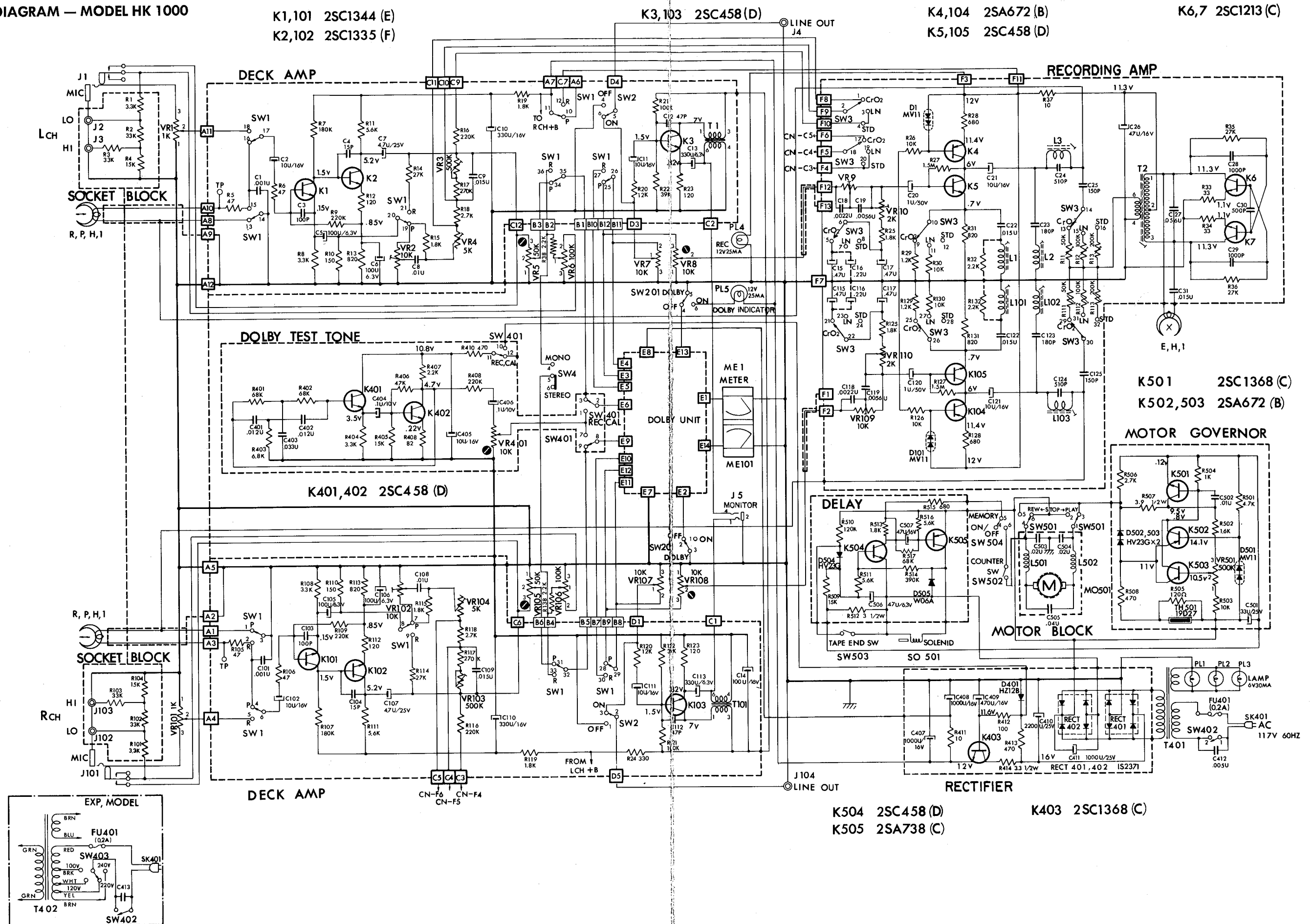
SCHEMATIC DIAGRAM — MODEL HK 1000

K1,101 2SC1344 (E)
K2,102 2SC1335 (F)

K3,103 2SC458 (D)

K4,104 2SA672 (B)
K5,105 2SC458 (D)

K6,7 2SC1213 (C)

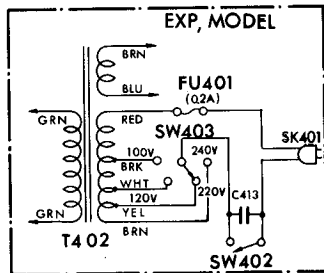
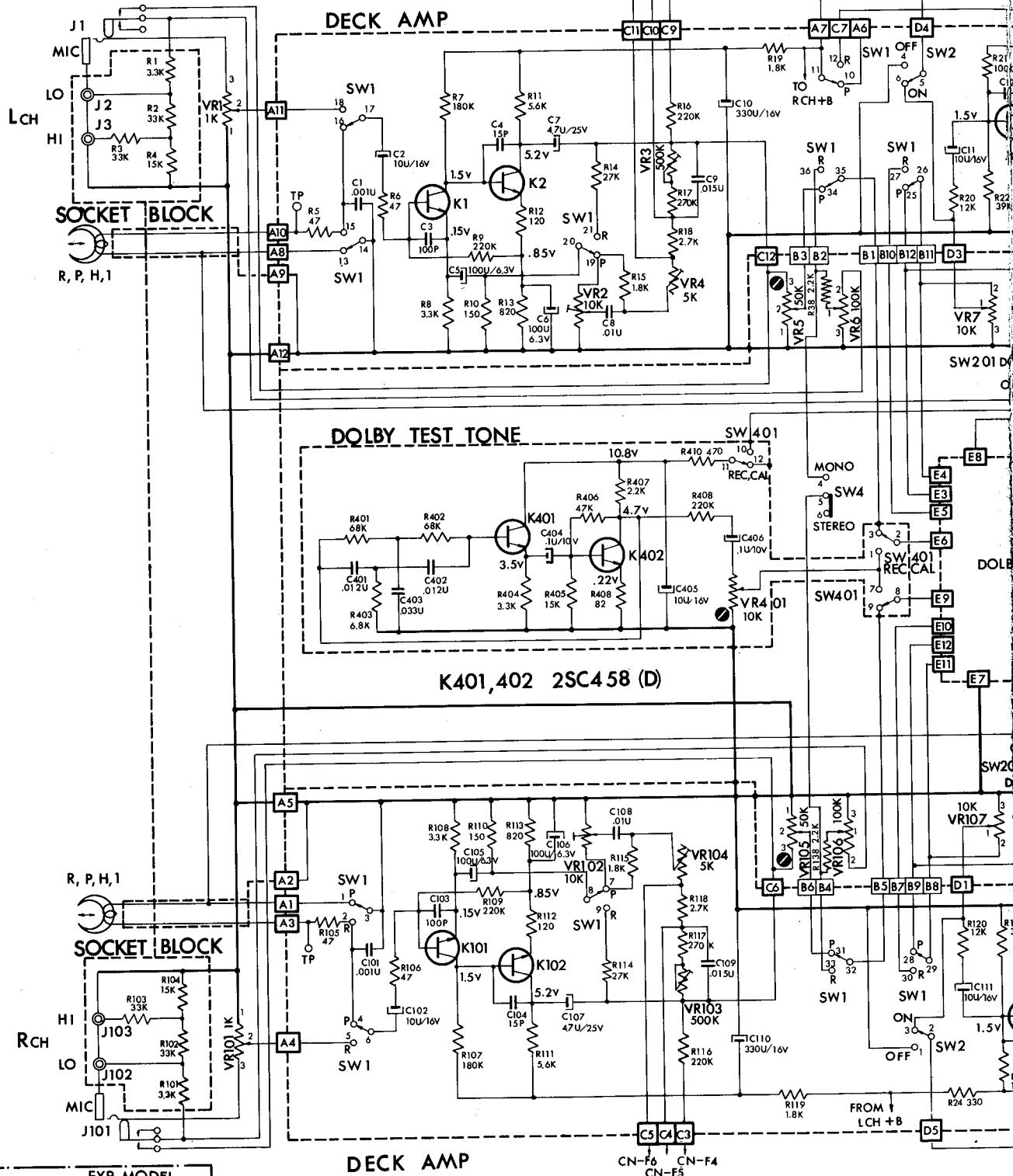


SCHEMATIC DIAGRAM — MODEL HK 1000

K1,101 2SC1344 (E)

K2,102 2SC1335 (F)

K3,103

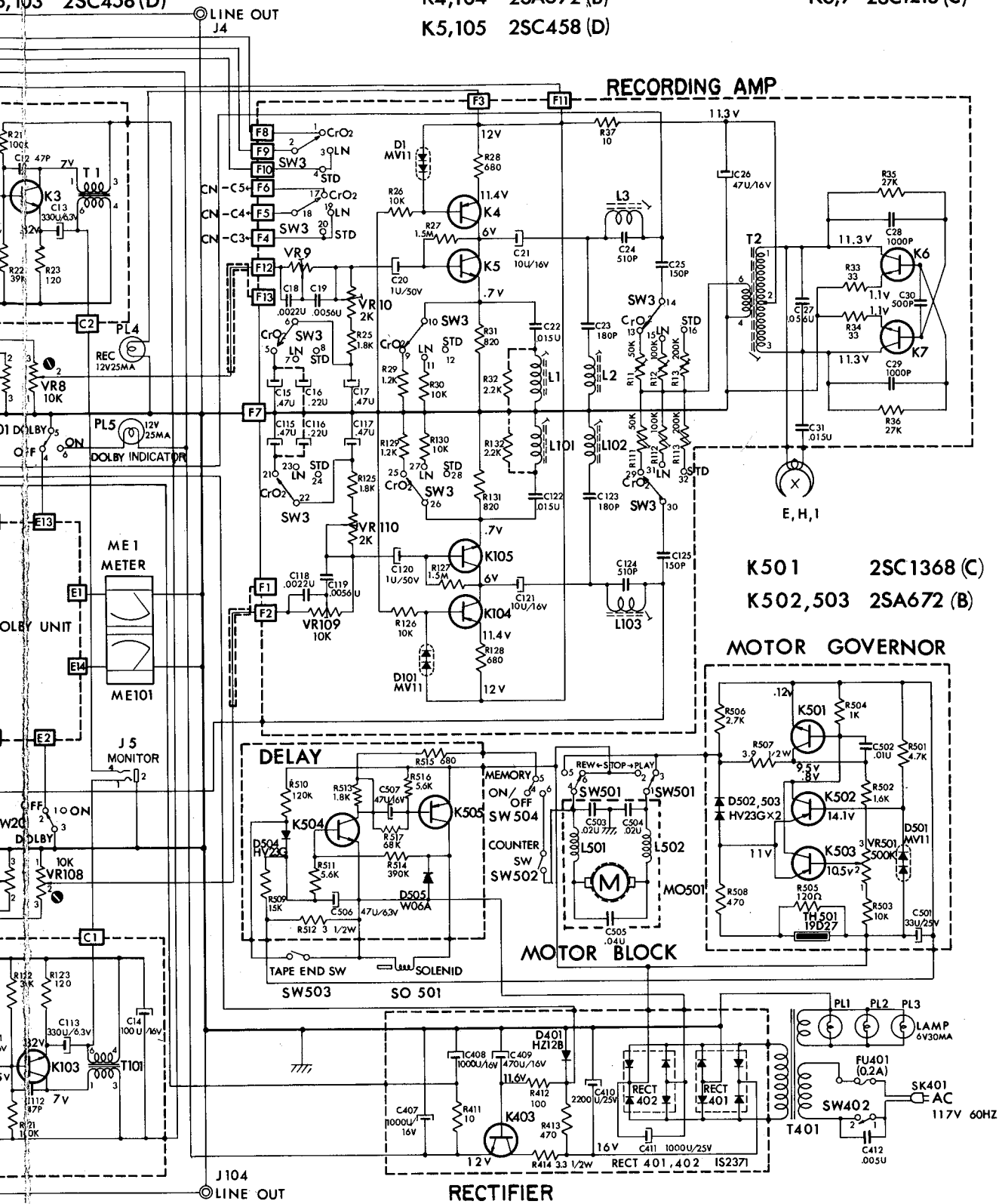


3,103 2SC458 (D)

K4,104 2SA672 (B)

K6,7 2SC1213 (C)

K5,105 2SC458 (D)

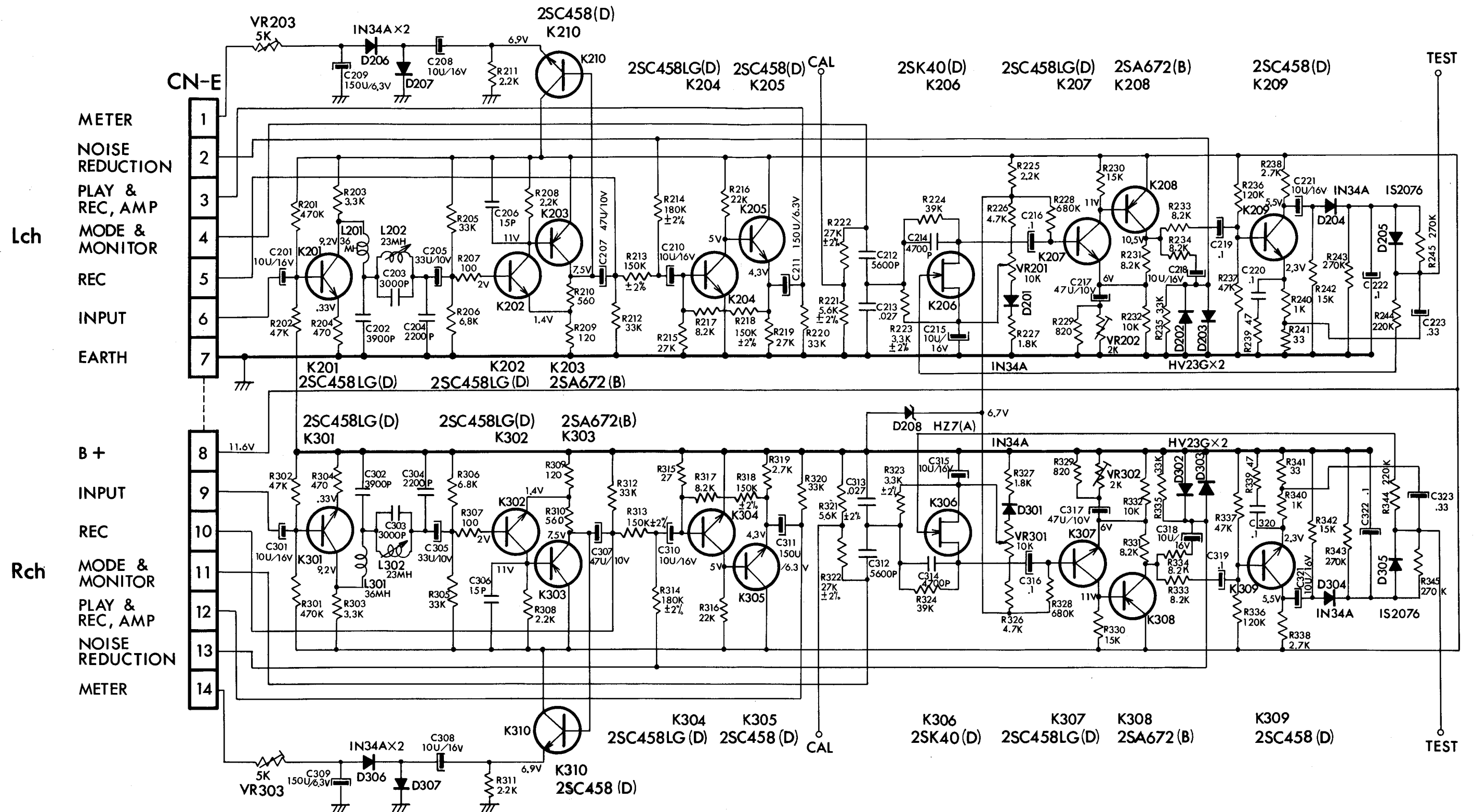


K504 2SC458 (D)

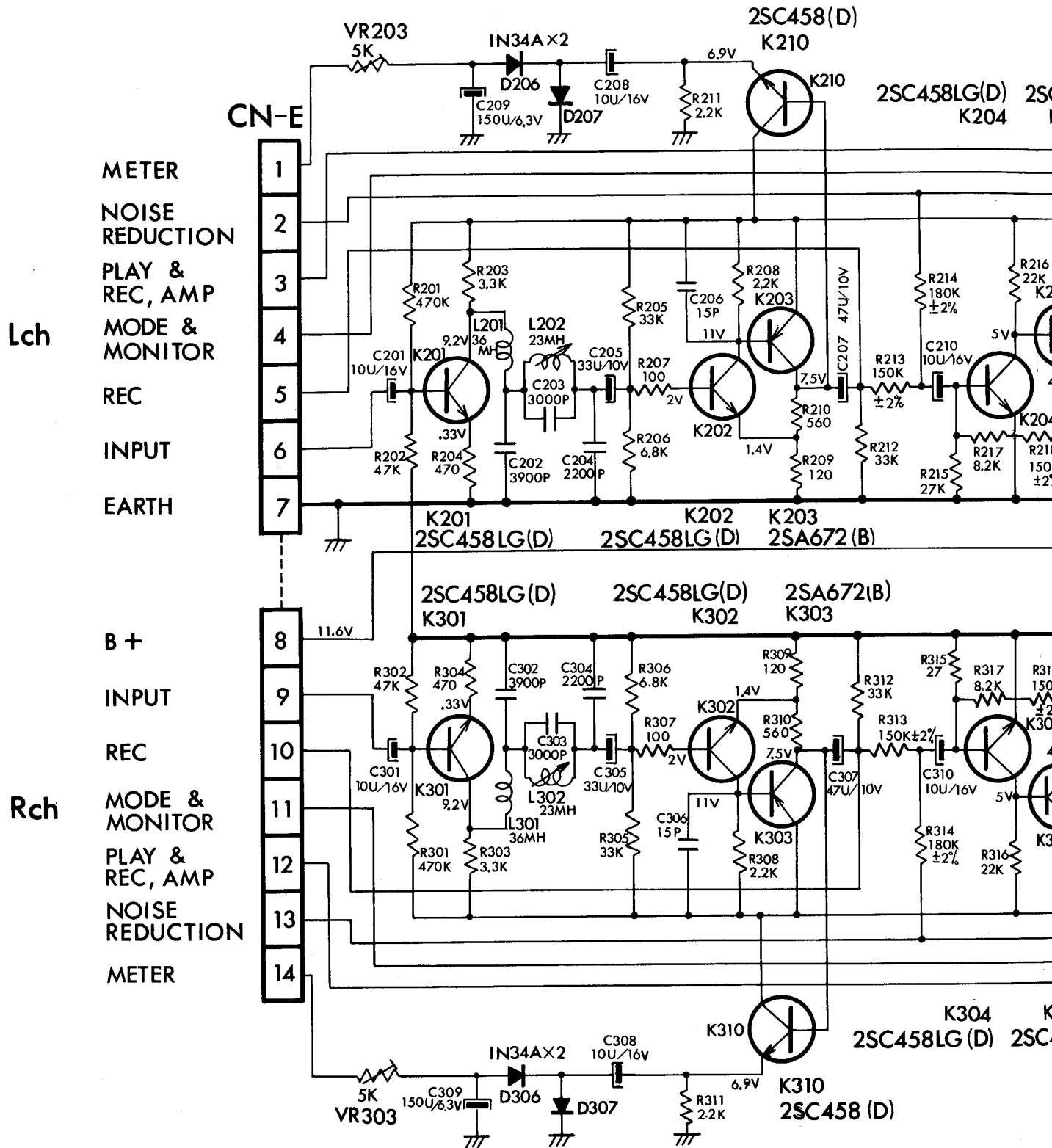
K403 2SC1368 (C)

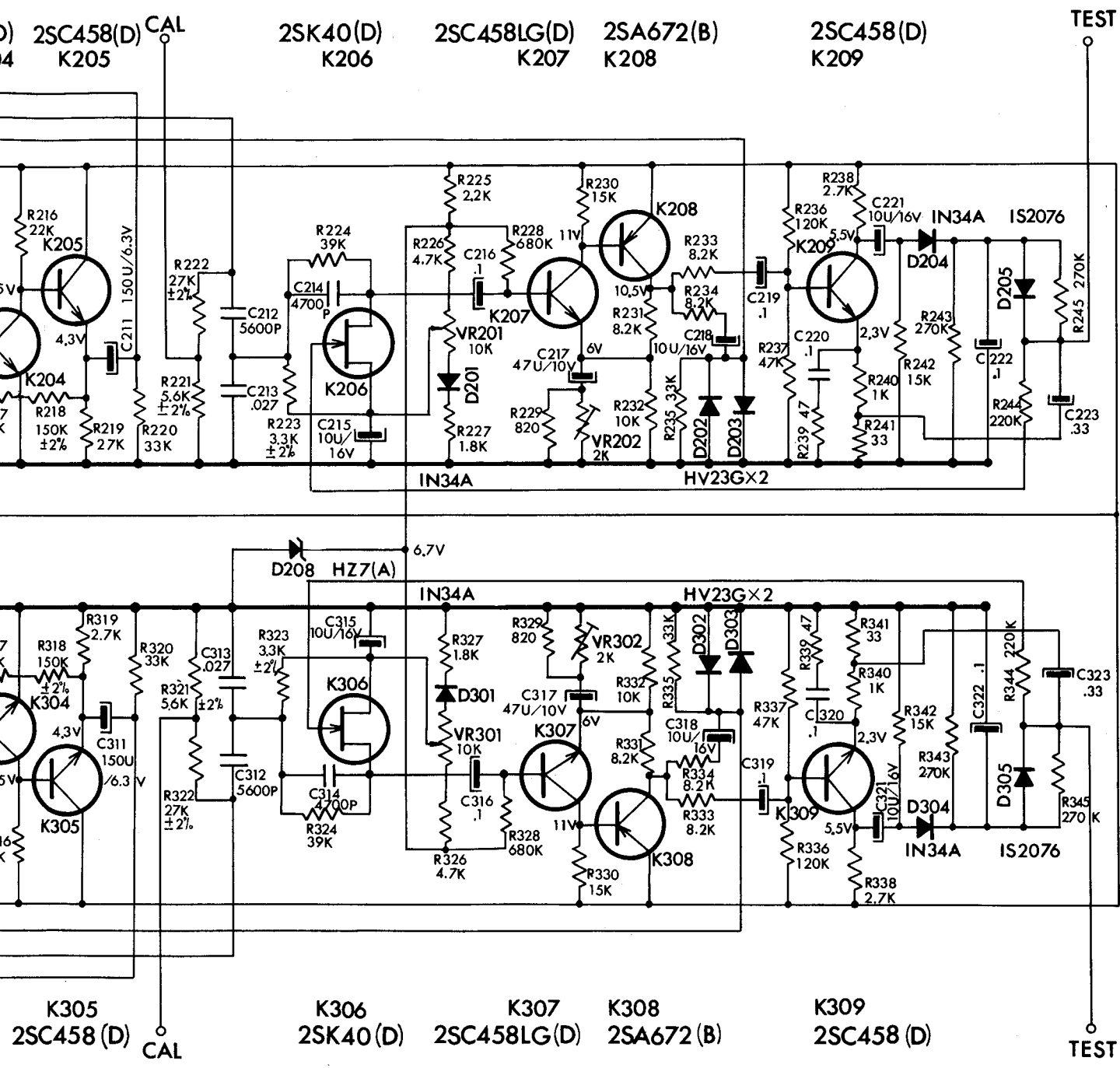
K505 2SA738 (C)

SCHEMATIC DIAGRAM — MODEL HK 1000

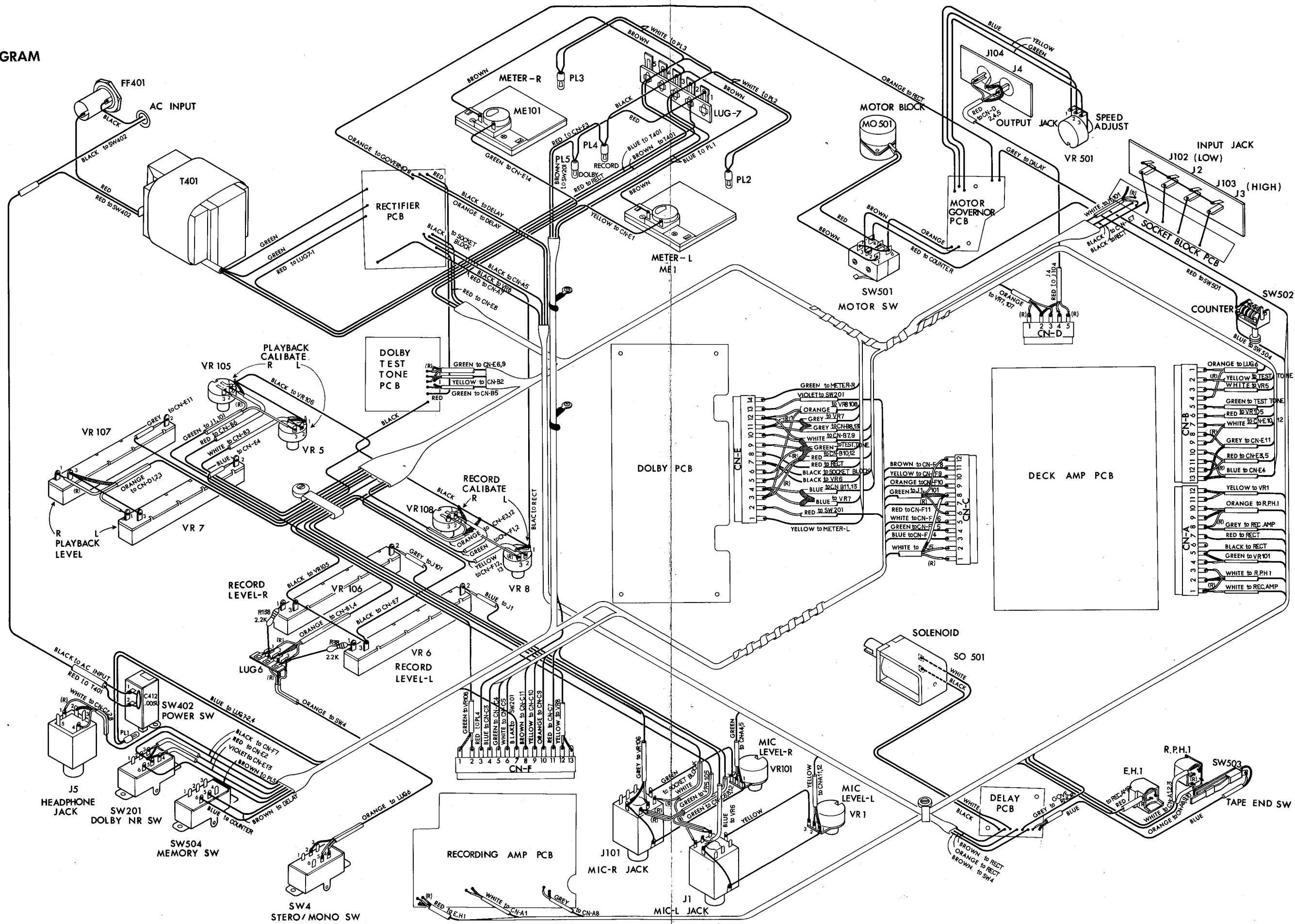


SCHEMATIC DIAGRAM — MODEL HK 1000

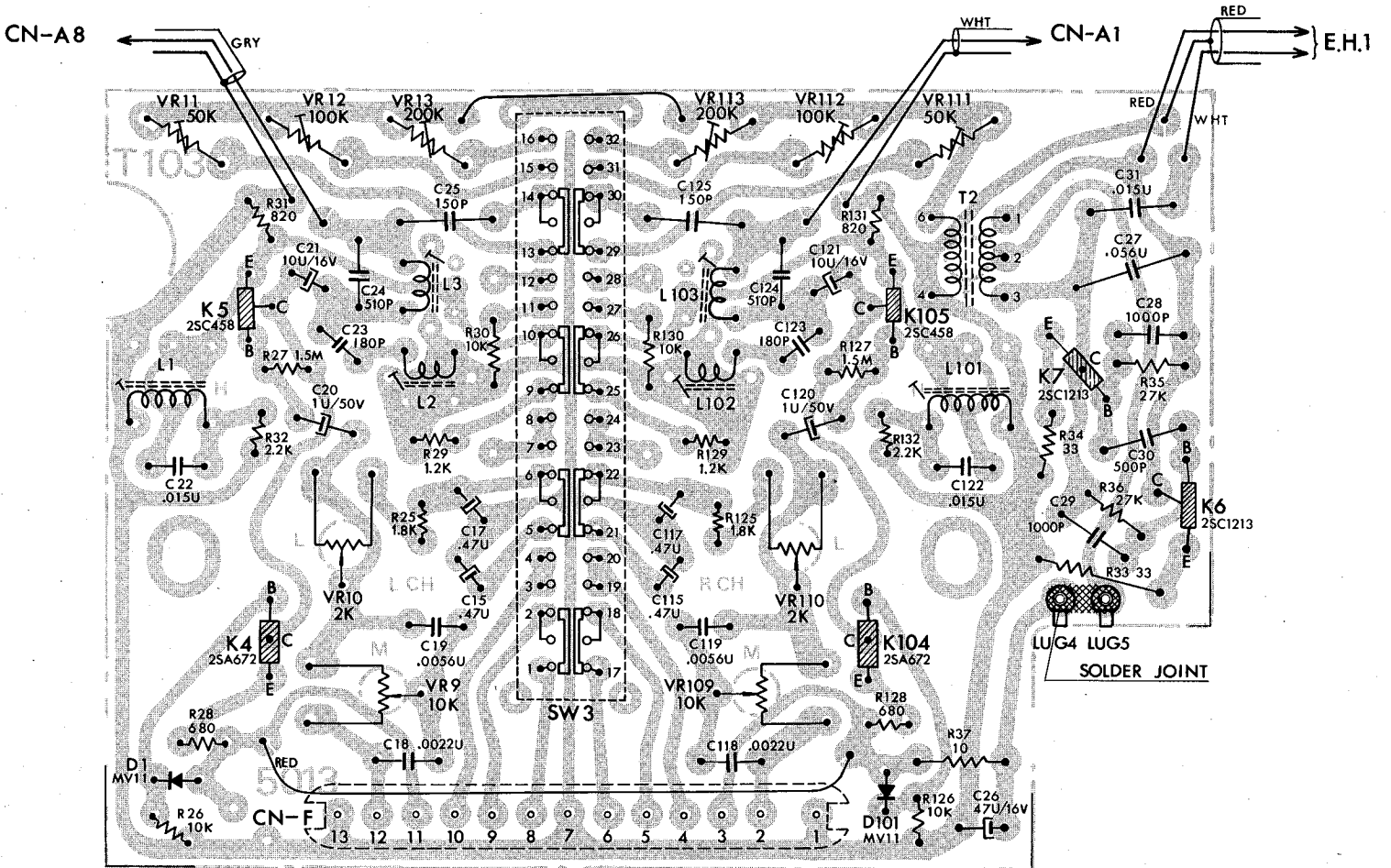




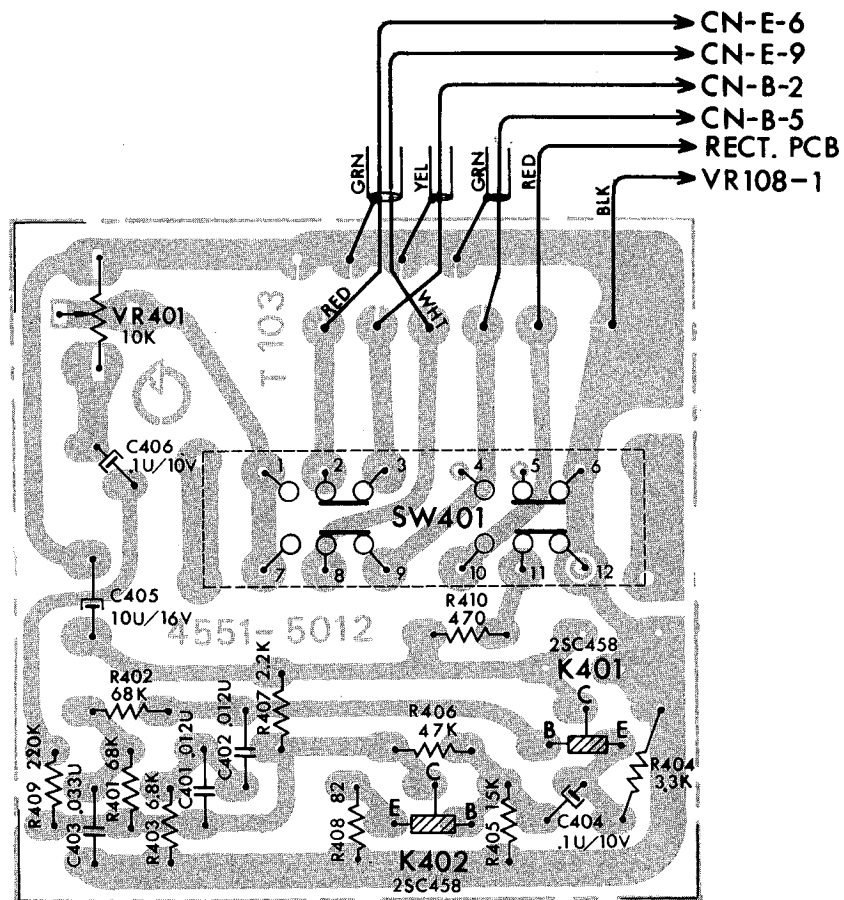
WIRING DIAGRAM



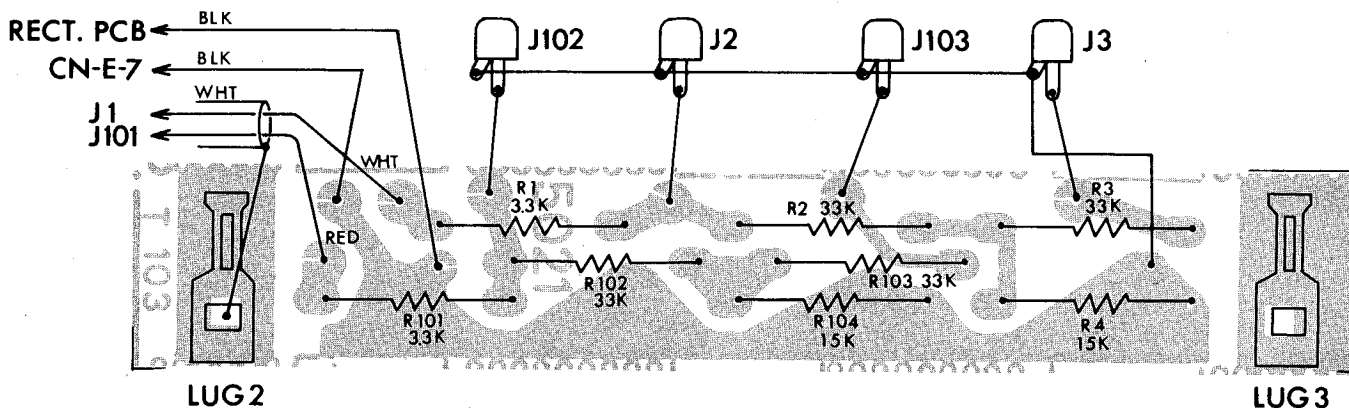
RECORD AMP PC BOARD



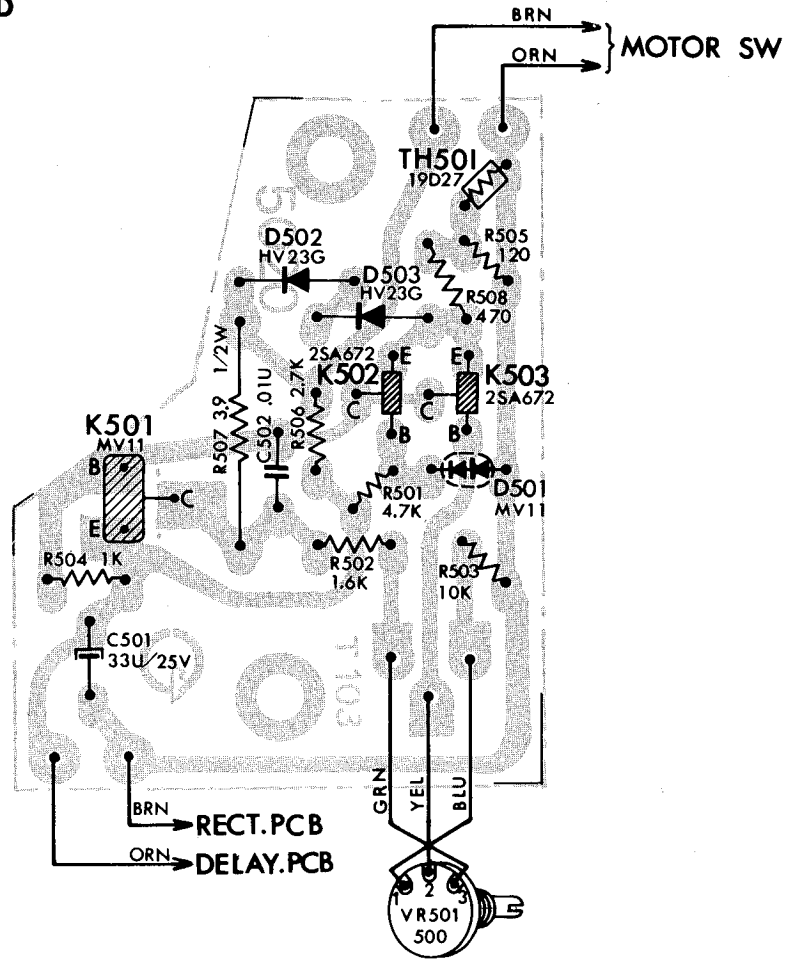
DOLBY TEST TONE PC BOARD



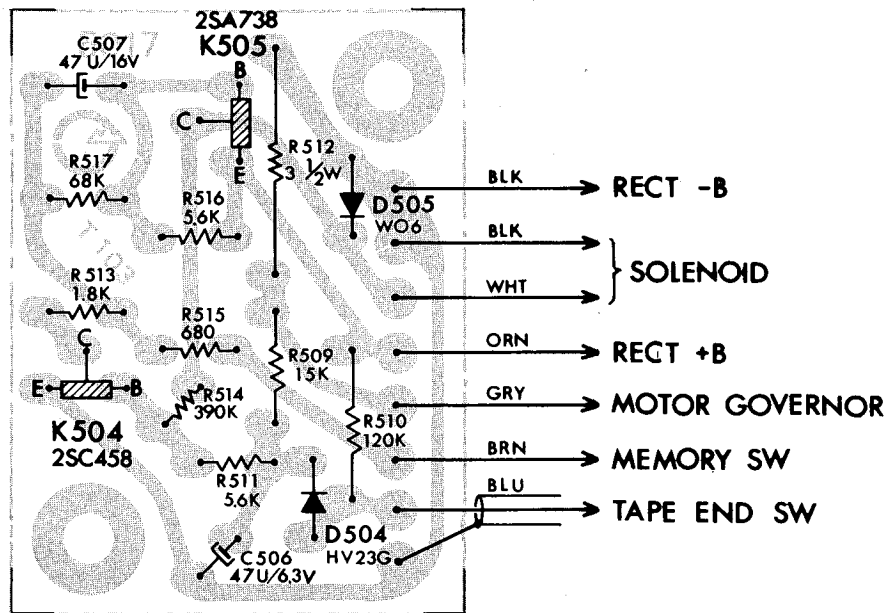
SOCKET BLOCK BOARD



MOTOR GOVERNOR BOARD



DELAY BOARD (AUTOMATIC STOP)



RECTIFIER BOARD

