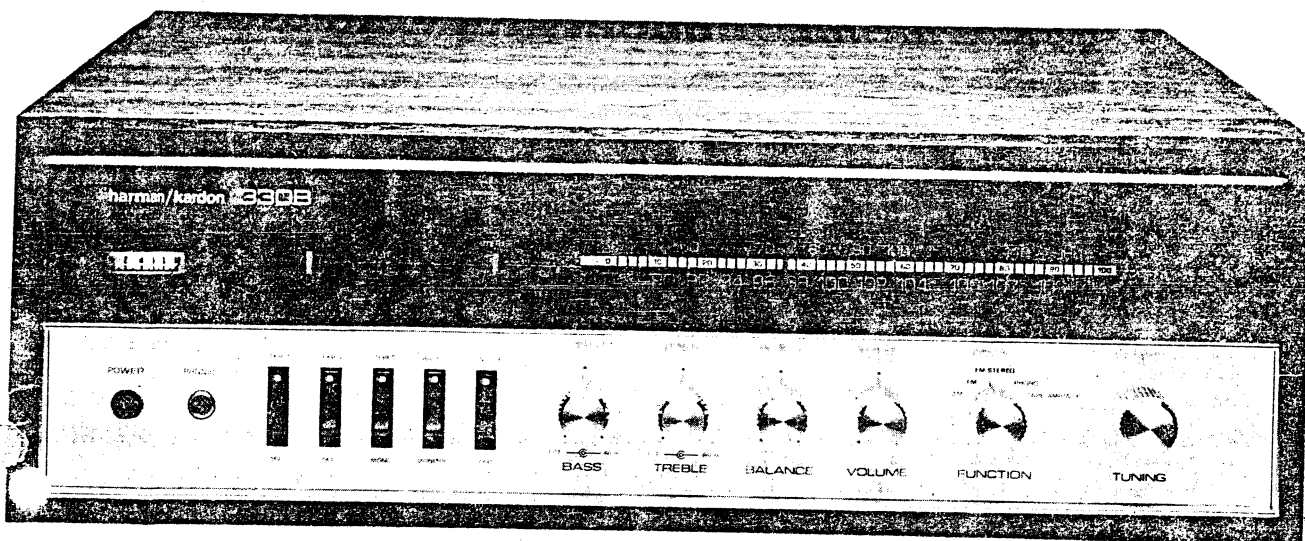


# The Harman-Kardon Model 330B

## AM/Stereo FM Multichannel Receiver

### Technical Manual



harman/kardon

## ALIGNMENT PROCEDURES

### AM ALIGNMENT PROCEDURE

**INSTRUMENTS:** SSG, modulated with 400Hz at 30%, V.T.V.M., AM IF Sweep Generator, and Oscilloscope.

**NOTE:** Set FUNCTION selector to AM.

Connect signal source to a loop placed to radiate signals into AM ANT LOOP STICK.

Step	SIGNAL SOURCE OUTPUT	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1	455kHz of sweep generator	V.T.V.M. & oscilloscope to Junction of R266 & C264	Quiet point near 1600kHz	T251	Maximum and symmetrical pattern on SCOPE
2				T252	
3				T253	
4	Repeat step 1 through 3 for best sensitivity and symmetrical pattern on oscilloscope.				
5	530kHz of S.S.G.	V.T.V.M. to Junction of R266 & C264 and distortion meter together with oscilloscope to speaker out	Gang fully closed	L252	Maximum output
6	1600kHz of S.S.G.		1600kHz	AM oscillator trimmer	
7	Repeat step 5 and 6 for best sensitivity				
8	600kHz of S.S.G.	Same as above	600kHz	AM ANT LOOP STICK	Same as above
9	1600kHz of S.S.G.		1600kHz	AM ANT trimmer	
10	Repeat step 8 and 9 for best sensitivity.				

### FM ALIGNMENT PROCEDURE

**INSTRUMENTS:** FM Sweep Generator, FM Signal Generator, AC V.T.V.M. and Oscilloscope.

**NOTE:** Set FUNCTION selector to FM.

Step	GENERATOR		TUNING DIAL SETTING	OUTPUT INDICATOR CONNECTED TO	ADJUST	ADJUST FOR
	CONNECTED TO	FREQUENCY				
1	FM Sweep Generator to LP201 (on FM IF board)	10.7 MHz	Quiet point on band	Oscilloscope to LP206  (on FM IF board)	T204,203, 202 & 201 (on FM IF board) Top and Bottom	Maximum and Balanced S curve on scope.
2	Disconnect FM Sweep Generator and connect FM Signal Generator to FM antenna terminals.					
3	FM Signal Generator to FM antenna terminals Signal strength must be kept -3db of limiter saturation.	98MHz (400Hz 100% mod.)	Tune for maximum output point.	Oscilloscope and AC VTVM to TAPE OUT jack	T52, Top & Bottom (on Front-end) Touch up T201,202 203 & 204 if necessary.	Maximum and undistorted amplitude on scope.
4		90MHz (400Hz 100% mod.)	90MHz		L52 (OSC), L51 (RF) & T51 (ANT) (on Front end)	Maximum reading on VTVM
5		106MHz (400Hz 100% mod.)	106MHz		TC53 (OSC), TC52 (RF) & TC51 (ANT) (on Front end)	
6	Repeat steps 4 and 5 until no further improvement is noticed.					

## MPX ALIGNMENT PROCEDURE

**INSTRUMENTS:** S.S.G., Stereo Generator, V.T.V.M., Oscilloscope, Oscilloscope of low input capacitance, and Distortion Meter  
 L + R = 90%, PILOT = 10%, modulation

**NOTE:** Set TONE control to flat response (or mechanical center of both of BASS control and TREBLE control).  
 Set FUNCTION selector to FM STEREO.

Step	SIGNAL SOURCE	OUTPUT METER	ADJUST	ADJUST FOR
1	Connect SSG modulated with MPX Generator to FM ANT terminals.  Output level: 1mV Pilot level: 6%	Connect low input capacitance oscilloscope to T.P. 1 of T303.  NOTE: Add a 1 meg. resistor in series with T.P. 1 of T303 to prevent loading of T303.  Connect oscilloscope to TAPE OUT of both channels.	T301	For maximum on scope connected to T.P. 1 of T303 minimum resistance (or extreme counter clockwise) of VR301.
2			T302	
3			T303	
4			VR301	
5	Same as above, but PILOT LEVEL: 10% only RIGHT channel is modulated with main signal of 1kHz.		T302	For maximum stereo separation.
6	Change main signal modulation to LEFT channel.		T302	For maximum stereo separation.
7	Repeat step 5 and 6.			
8	Check PILOT level that STEREO INDICATION lights at 5.5% to 6.5% of PILOT LEVEL and that the INDICATION does not light at 1% of P.L.			
9	Return PILOT LEVEL to 10% and check stereo separation at 100Hz and 10kHz.			
10	At 32dB (40μV) of SSG output, adjust STEREO THRESHOLD, VR201 for STEREO INDICATION ON.			
11	Remove oscilloscope from test point, 1 of T302 and adjust again T303 for best stereo separation.			

## TUNING INDICATOR ADJUSTMENT

**INSTRUMENT:** FM Signal Generator.

**NOTE:** Set FUNCTION switch to FM

Step	FM STEREO SIGNAL GENERATOR		ADJUST	ADJUST FOR
	CONNECTED TO	SIGNAL STRENGTH		
1	FM Antenna Terminal	1mV	VR202	To indicate 9 on Tuning Meter

**POWER AMP ALIGNMENT**

**NOTES:** 1. Set up 330B as follows

FUNCTION - - - - AUX  
 TONE & BALANCE - - - - MID  
 STEREO/MONO SWITCH - - - - STEREO  
 SPEAKER SWITCH - - - - ON

2. Connect 8 Ohm (50W) Resistor across Left and Right Speaker Terminals

**(1) IDLING ADJUSTMENT**

**INSTRUMENT:** DC Voltmeter

**NOTE:** Set VOLUME Control to Minimum Output

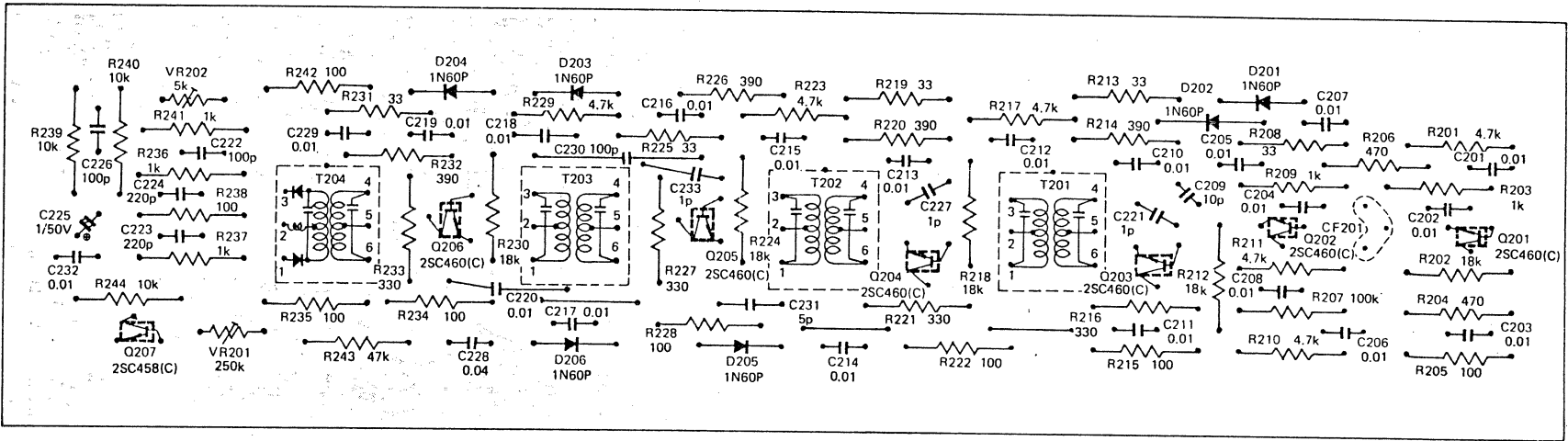
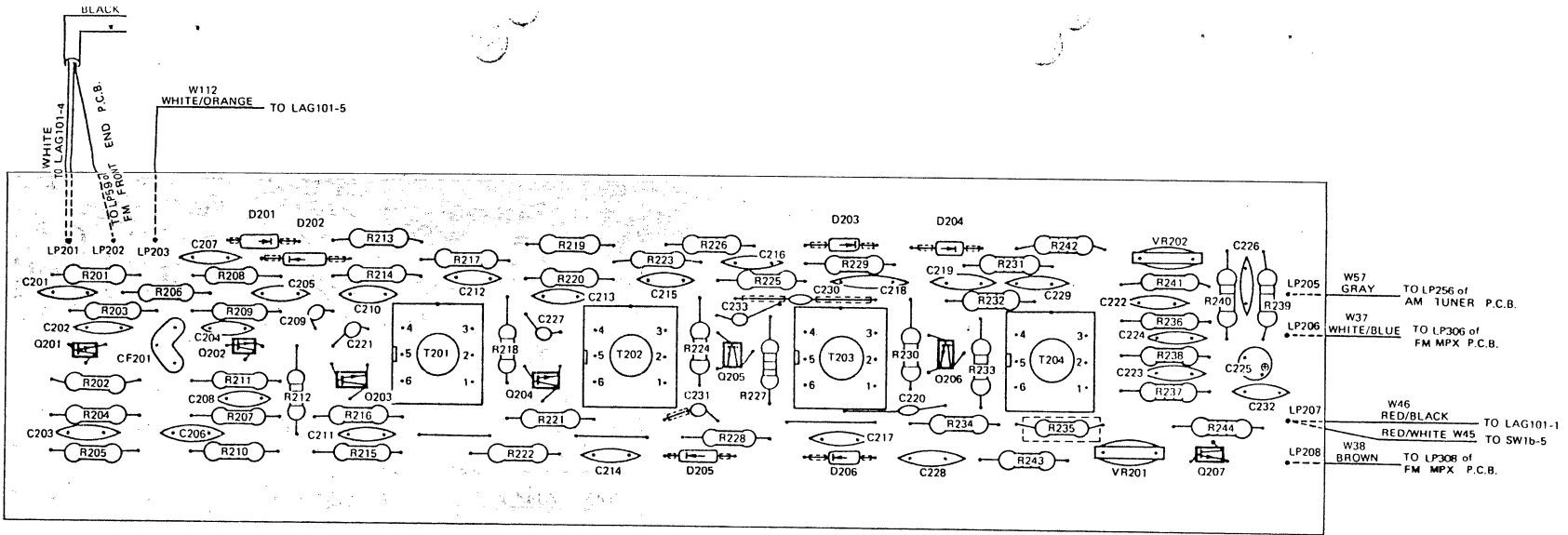
Step	DC VOLTMETER CONNECTION	ADJUST	ADJUST FOR
1	Across R432 Resistor	VR404	5mV DC
2	Across R431 Resistor	VR403	5mV DC

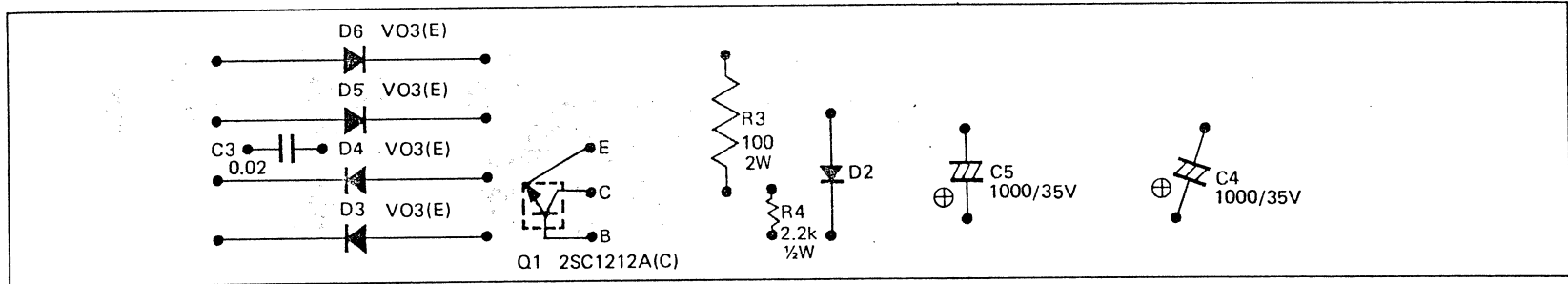
**(2) DC BALANCE ADJUSTMENT**

**INSTRUMENTS:** Audio Generator Oscilloscope  
 AC VTVM

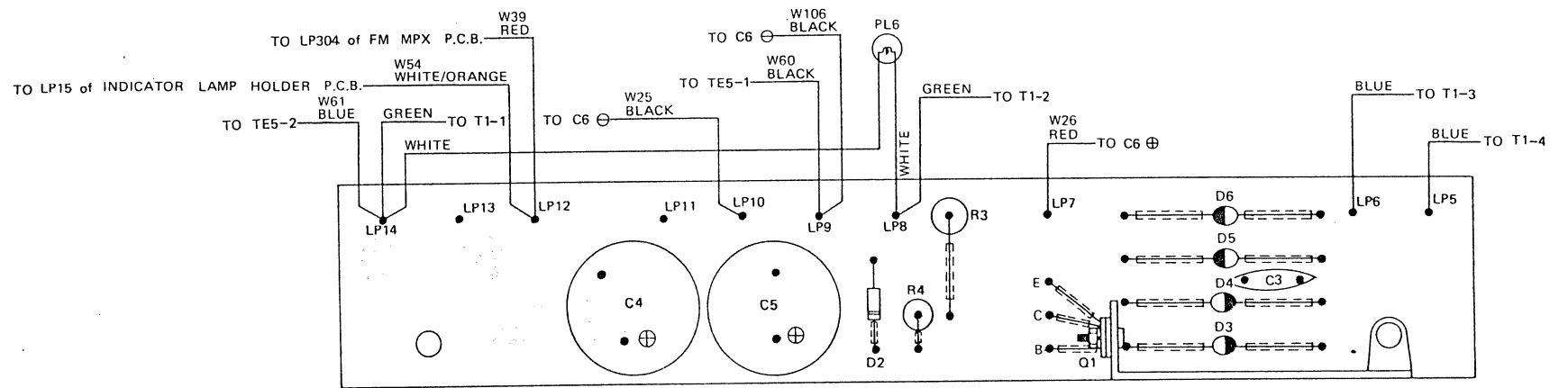
**NOTE:** Set VOLUME Control to maximum output

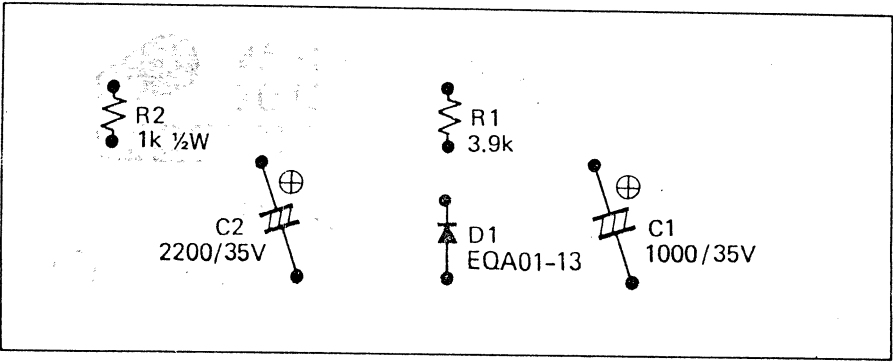
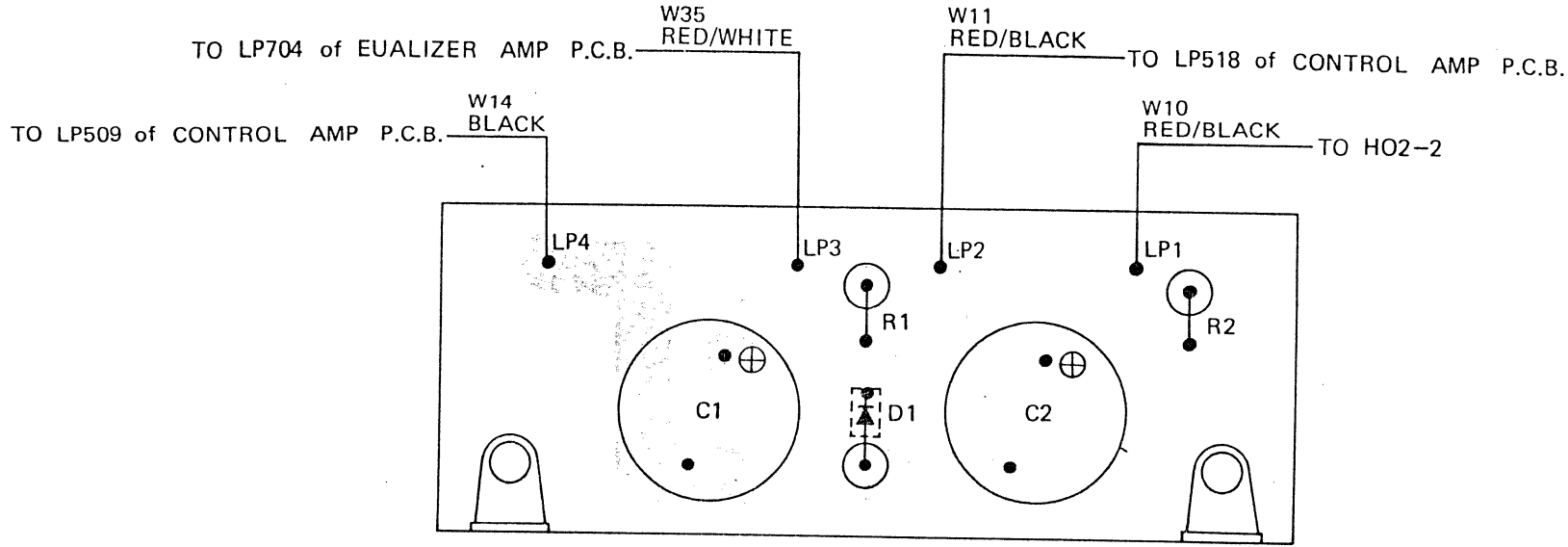
Step	VTVM AND OSCILLOSCOPE CONNECTION	ADJUST	ADJUST FOR
1	Connect an audio generator, set for 1000Hz (sine wave) to the left channel "AUX" input.		
2	To Left Speaker Terminal		Increase generator output until sine wave on scope just starts clipping
3		VR402	Equal clipping on the positive and negative half cycles on the signal
4	To Right Speaker Terminal	VR401	Same as above.



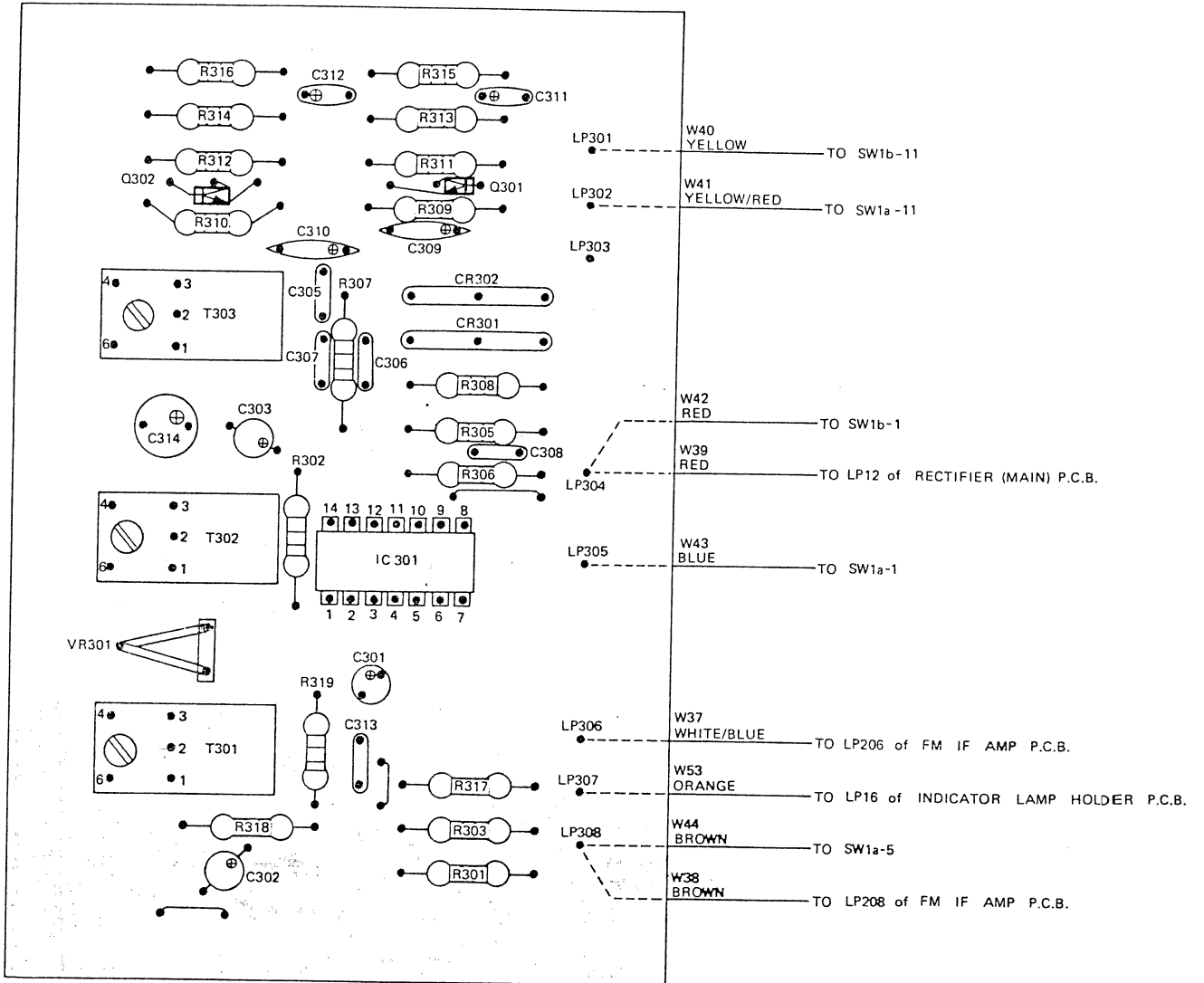


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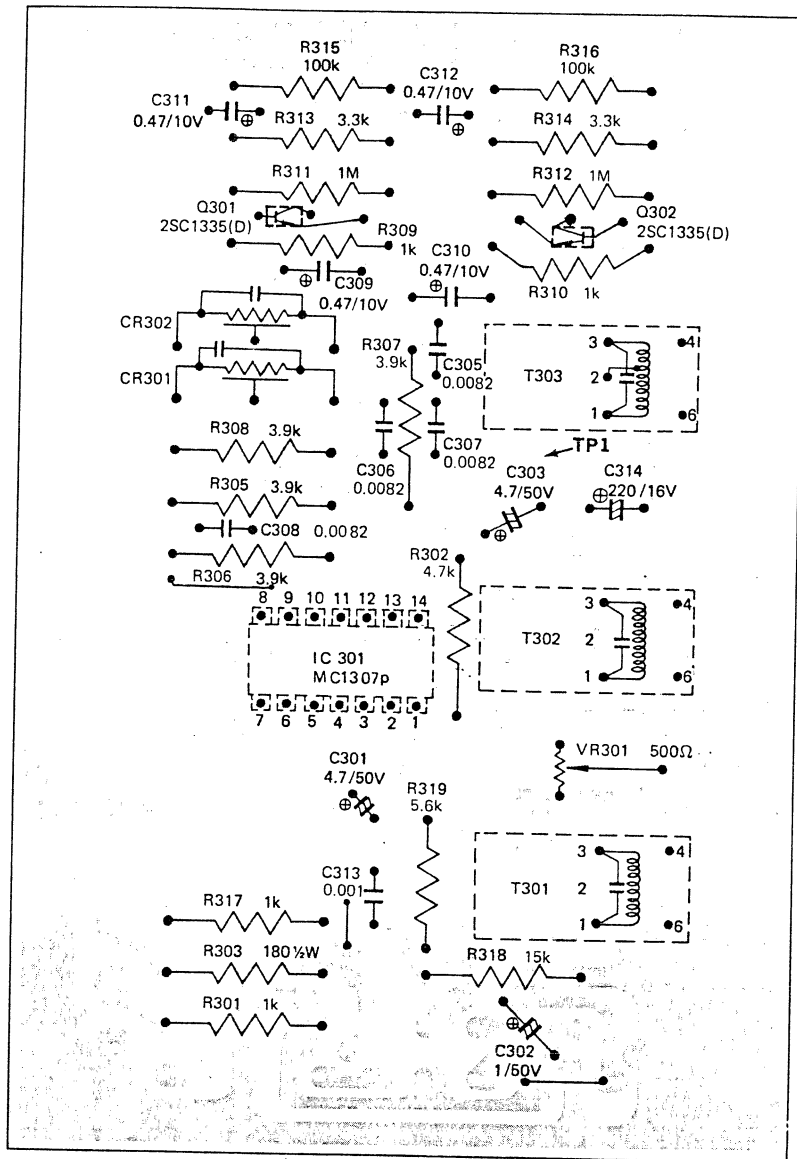


FM MPX BOARD





FM MPX BOARD WITH VALUES

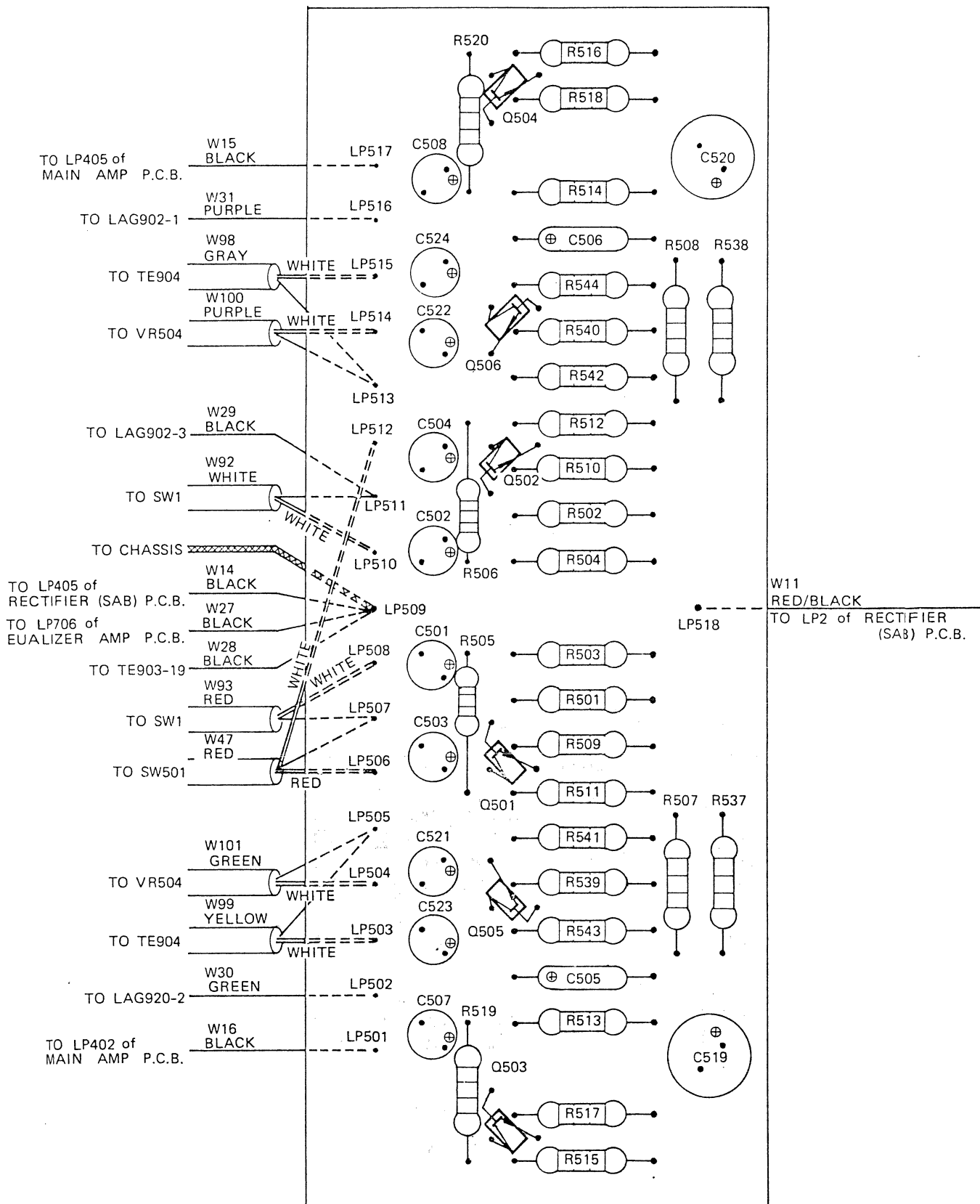


RE: FM MPX PCB EXPORT MODEL ONLY

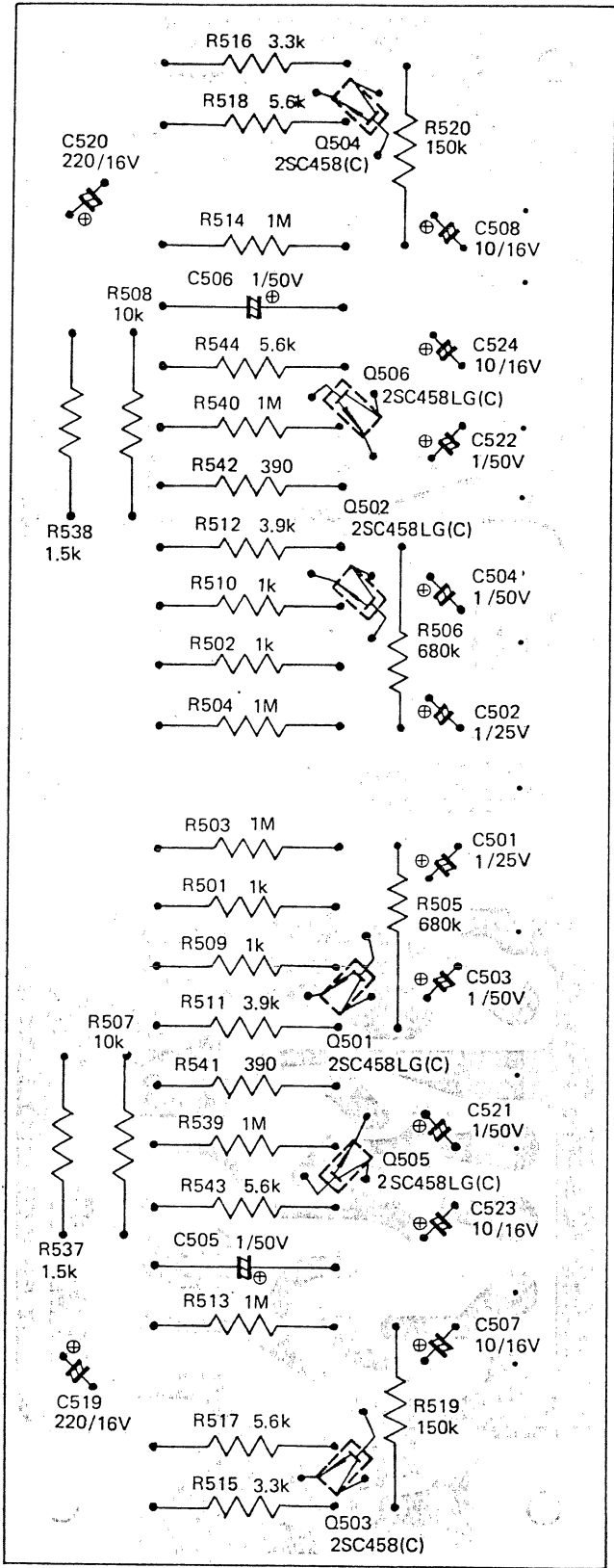
NOTE: HK 330B MULTIVOLTAGE RECEIVERS SUBSTITUTE CAPACITOR VALUES FOR C305 THRU C308 TO ACCOMMODATE EUROPEAN 50  $\mu$ V/SEC TIME CONSTANT AS SHOWN BELOW:

	FROM (75 $\mu$ V/SEC)	TO (50 $\mu$ V/SEC)
C306 AND 307	8200PF	6800PF
C305 AND 308	8200PF	3900PF

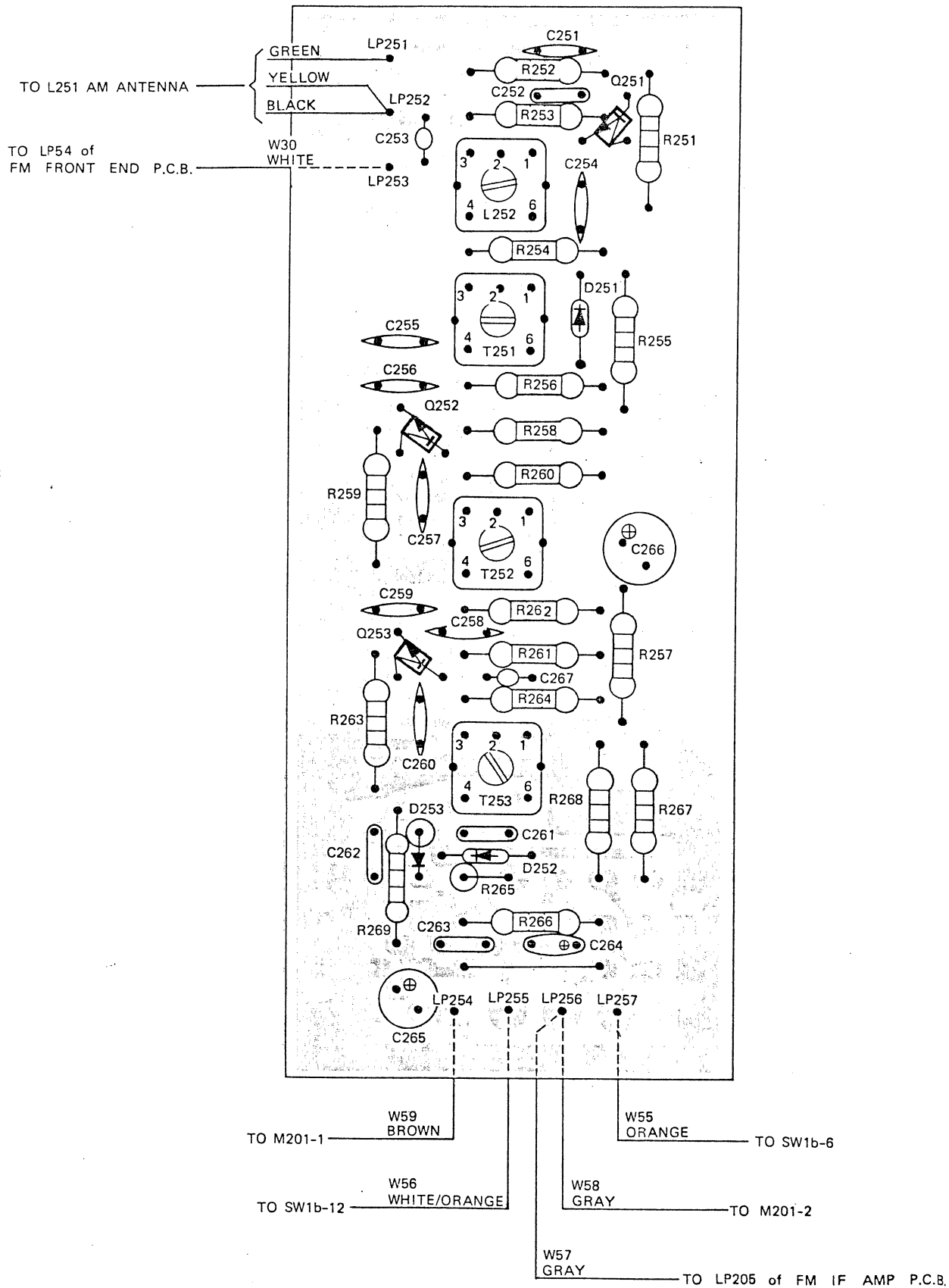
# CONTROL AMP BOARD



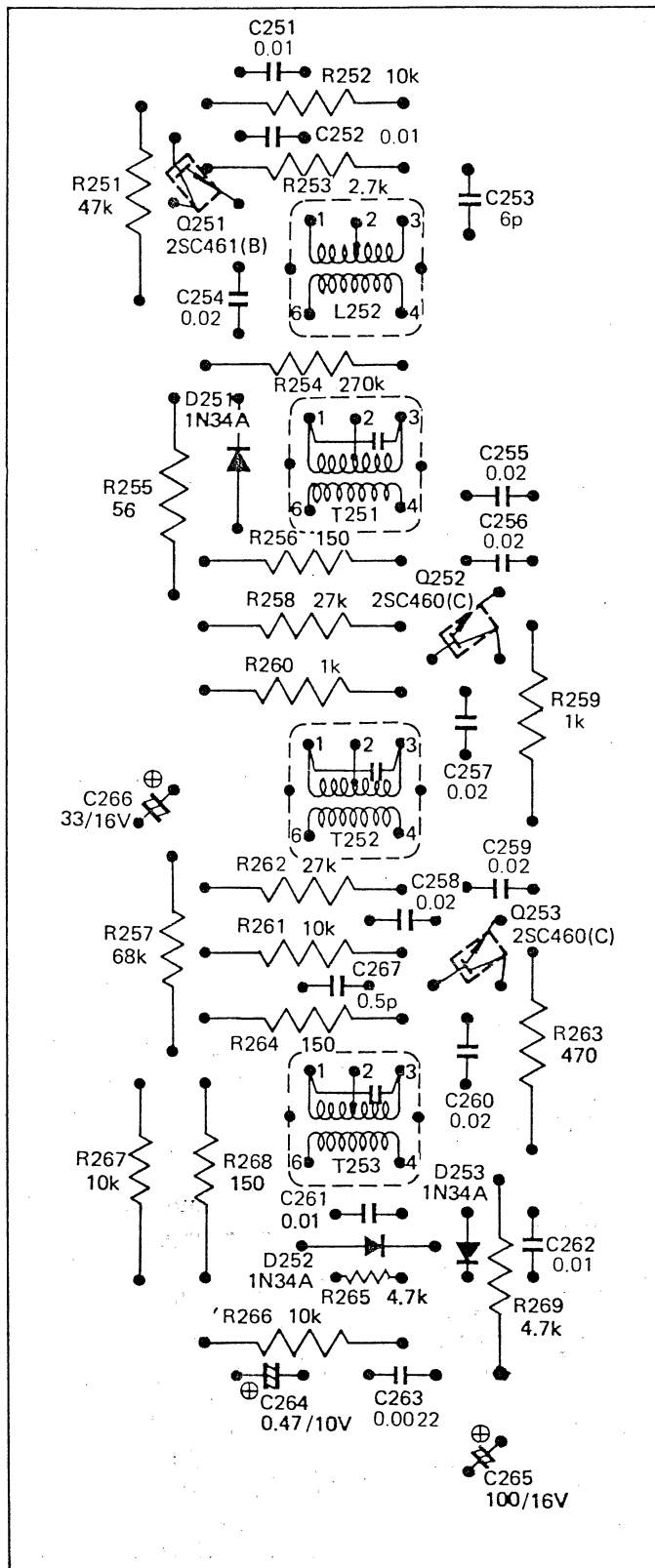
CONTROL AMP BOARD WITH VALUES



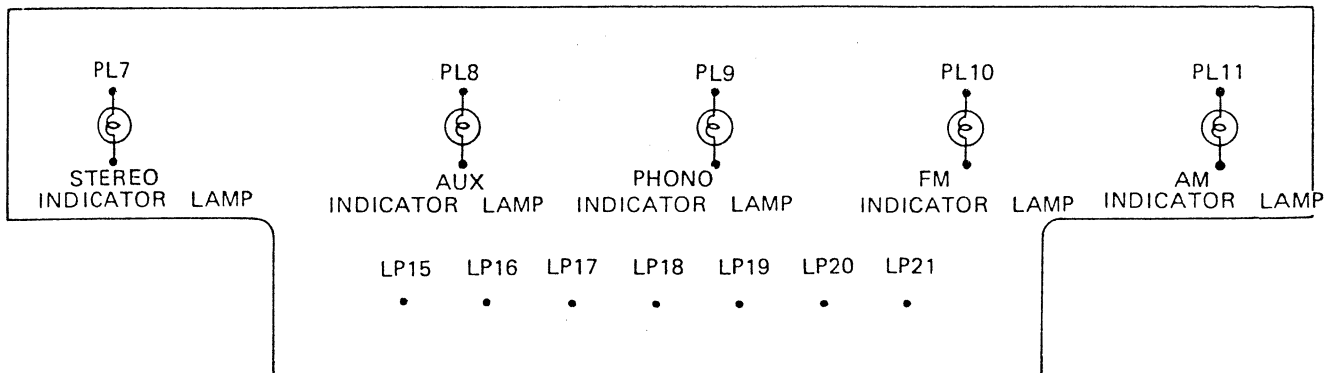
# AM TUNER BOARD



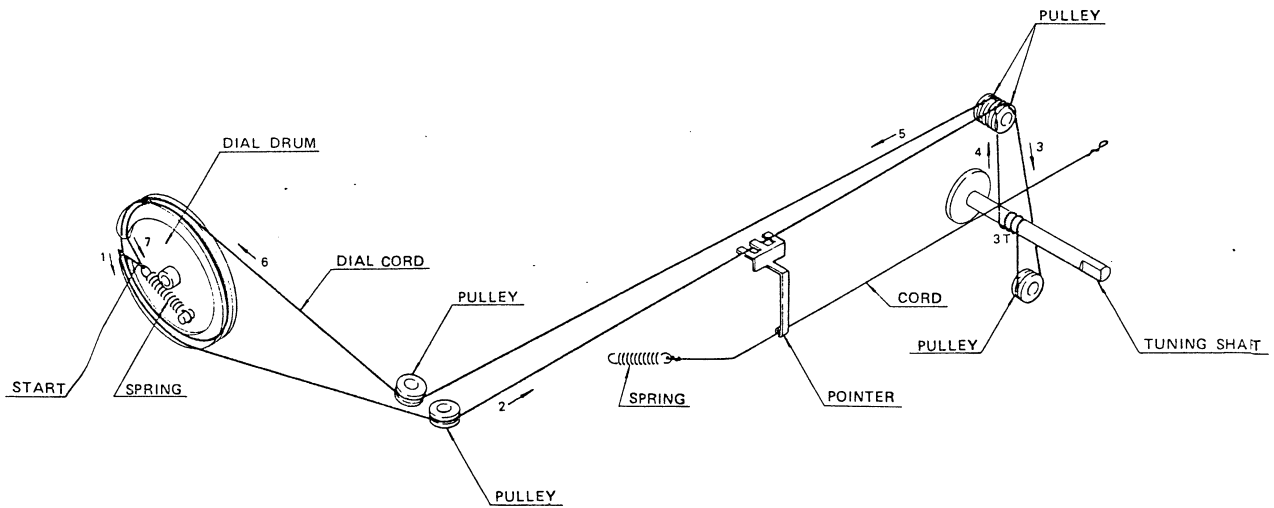
# AM TUNER BOARD WITH VALUES



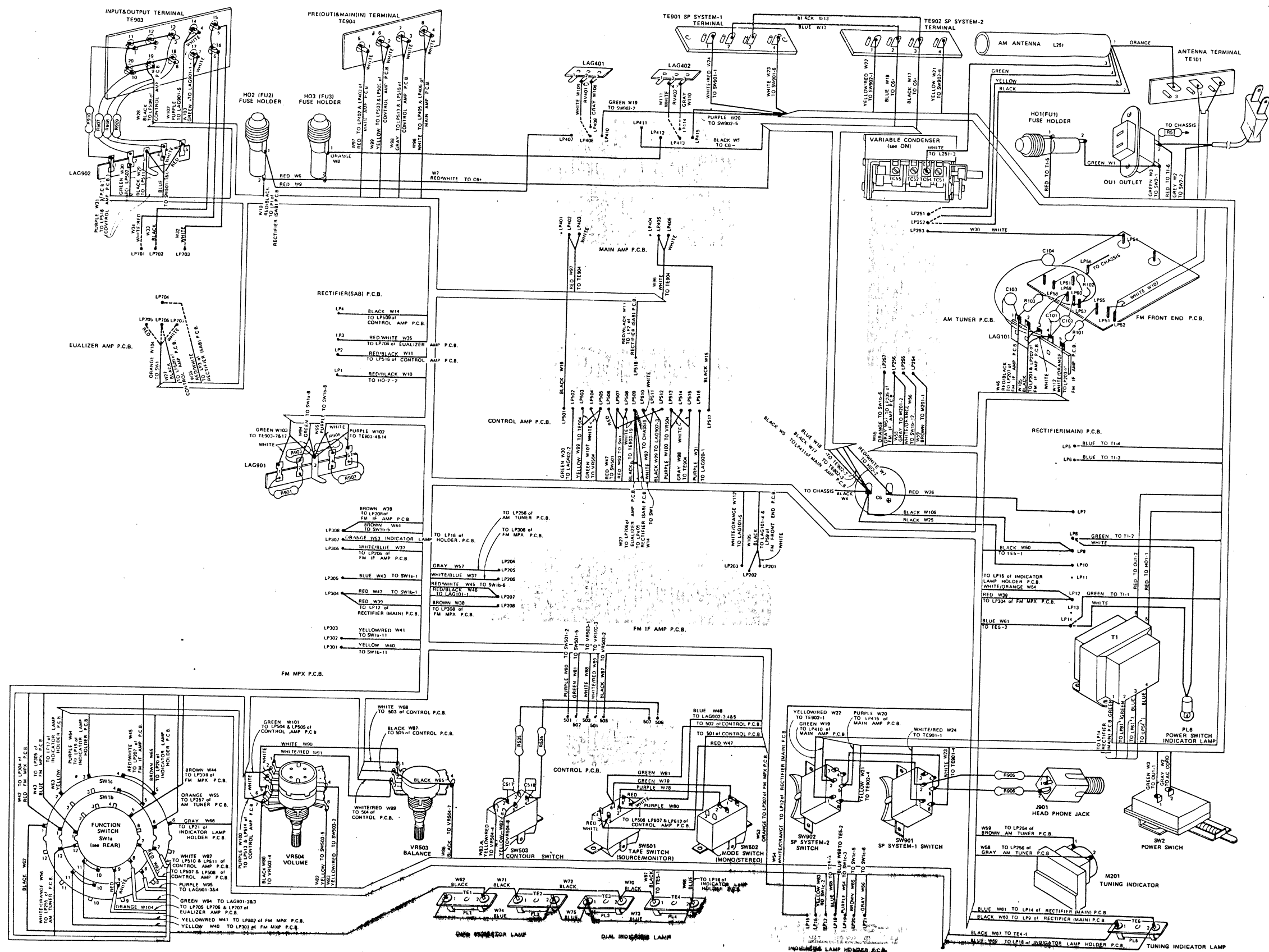
# INDICATOR LAMP HOLDER BOARD



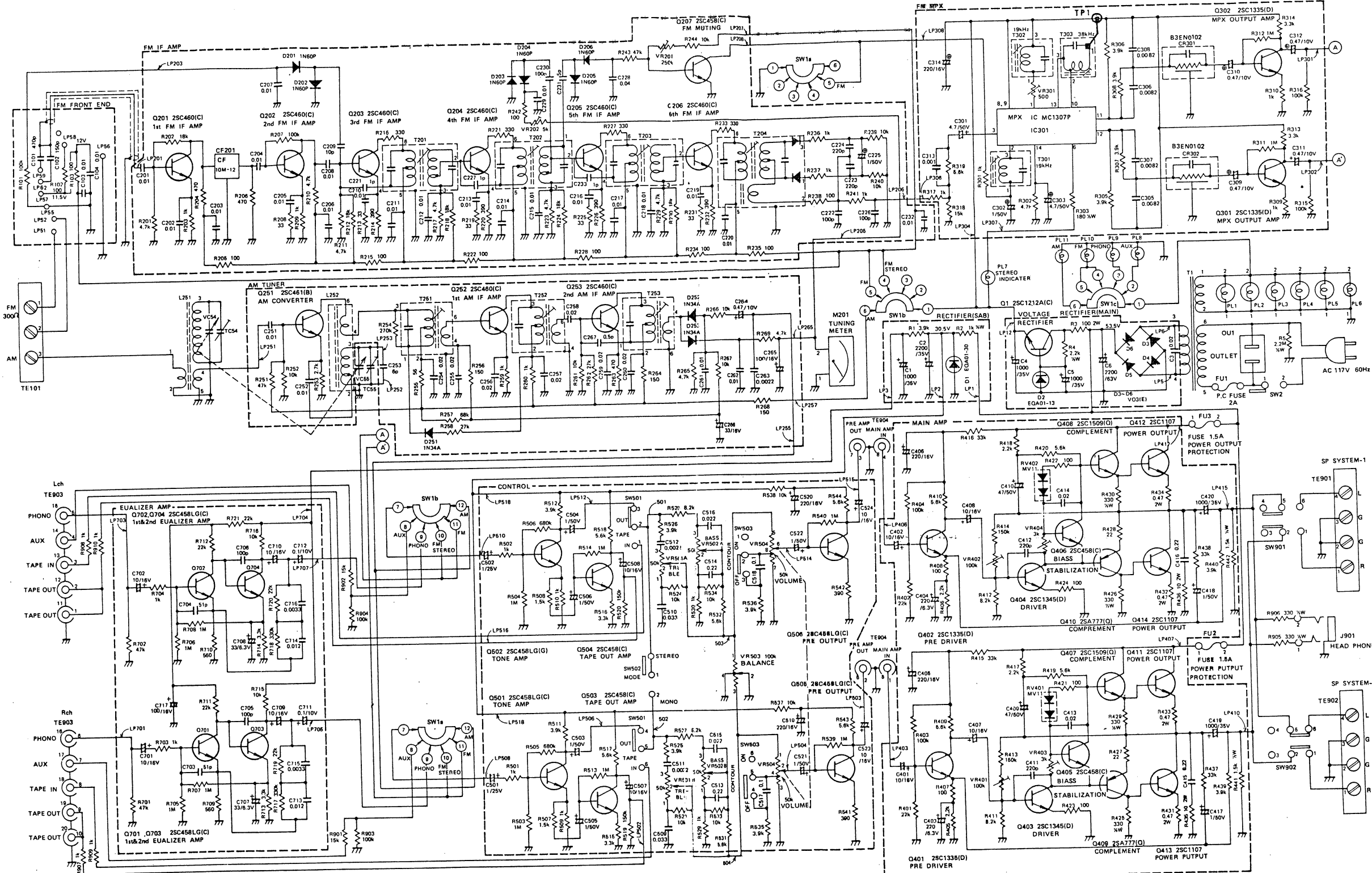
# STRINGING DIAGRAM



FUNCTIONAL WIRING DIAGRAM

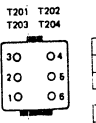
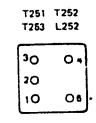


1ATIC DIAGRAM



NOTES

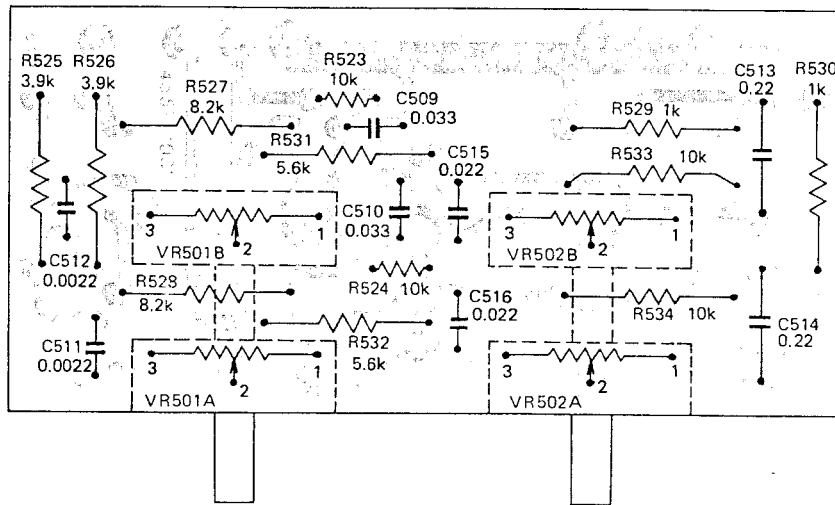
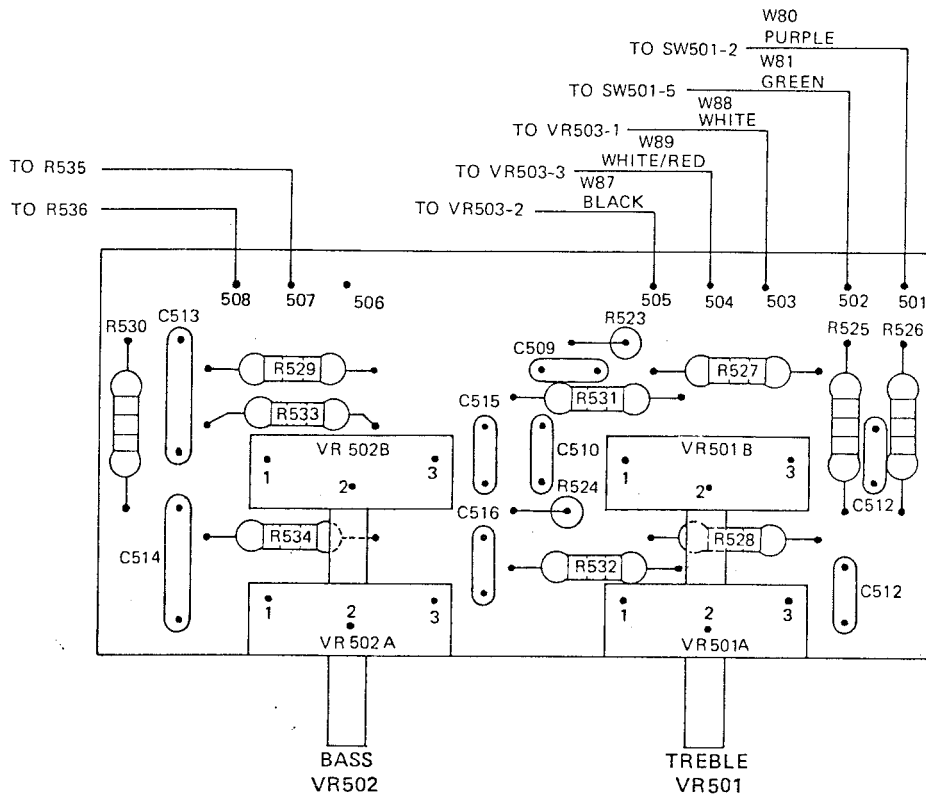
1. ALL RESISTANCES ARE ± 5%, 1/4 WATT, UNLESS NOTED OTHERWISE. VALUES ARE IN OHMS. K = 1000 M = 1000K
2. ALL CAPACITANCES VALUES BELOW 1.0 ARE IN MF, THOSE 1.0 AND ABOVE ARE IN PF. UNLESS NOTED OTHERWISE. (EXCEPT ELECTROLYTICS)
3. VOLTAGE READINGS TO NEGATIVE LINE (-) ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL
4. FUNCTION SWITCH SW1 IS IN AM POSITION.



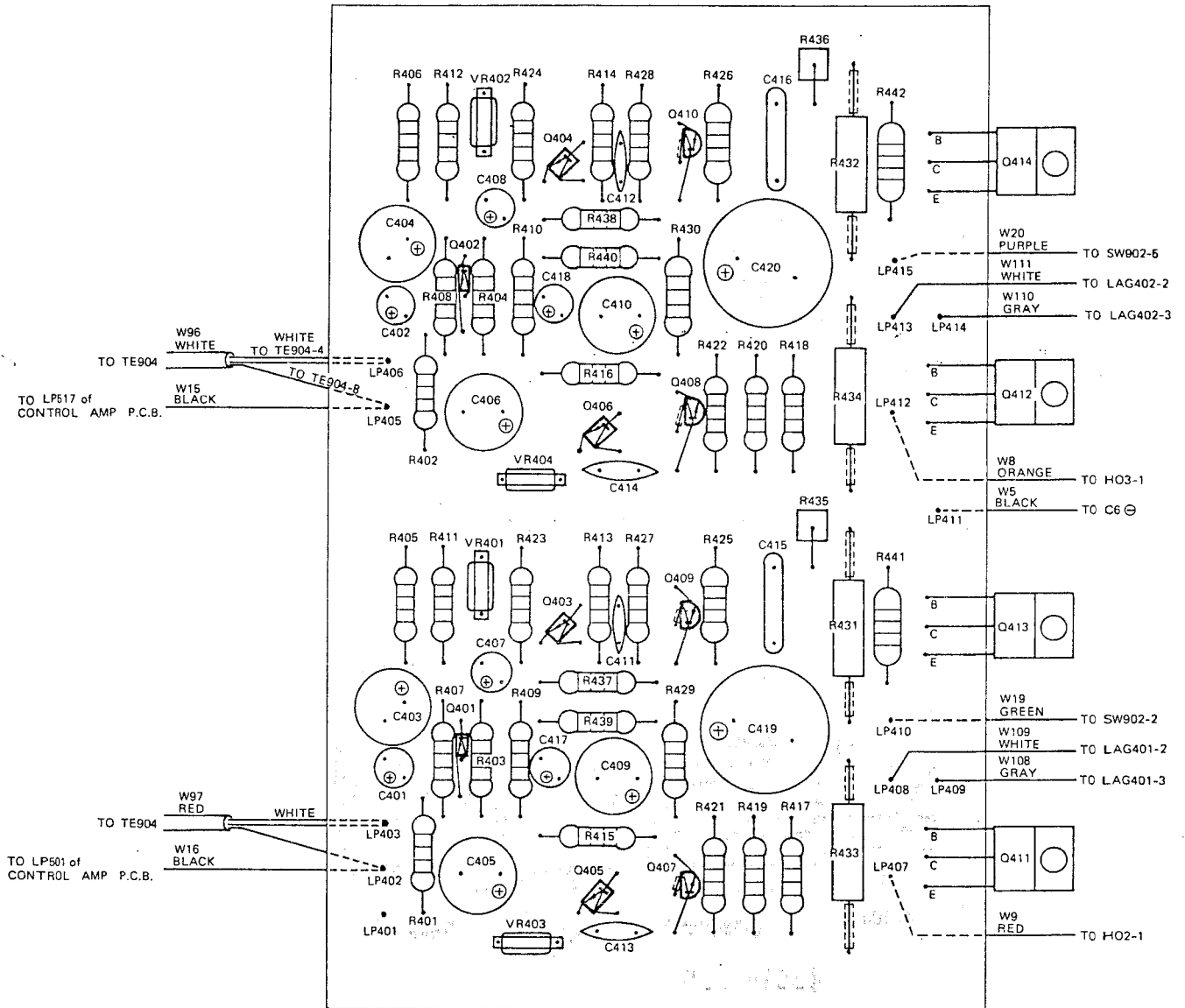
	Q1	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q251	Q252	Q263	Q301	Q302	Q401	Q402	Q403	Q404	Q405	Q408
COLLECTOR	47.9	7.5	3.3	7.7	8.2	8.1	9.8	0.2	11.8	10.6	11.0	8.8	8.8	8.5	6.5	24.8	24.8	26.4	26.4
BASE	13.2	1.5	1.8	1.8	1.7	1.8	1.9	0.8	2.0	1.8	3.0	2.4	2.4	2.3	2.3	1.0	1.0	26.3	26.3
EMITTER	12.6	0.9	1.0	1.0	1.0	1.2	1.3	0	1.4	1.0	2.3	1.8	1.8	1.9	1.6	0.4	0.4	24.9	24.9
	Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q601	Q602	Q603	Q604	Q606	Q609	Q701	Q702	Q703	Q704	
COLLECTOR	53.5	53.5	0.6	0.6	53.6	53.6	26.2	26.2	16.9	16.9	17.2	17.2	6.8	6.8	3.8	3.8	10.8	10.8	
BASE	26.4	26.4	24.6	24.6	26.8	26.8	0	0	4.2	4.2	8.4	8.4	1.2	1.2	0.8	0.8	3.8	3.8	
EMITTER	25.8	25.8	26.2	26.2	26.2	26.2	0	0	3.8	3.8	7.9	7.9	0.8	0.8	0.1	0.1	3.2	3.2	



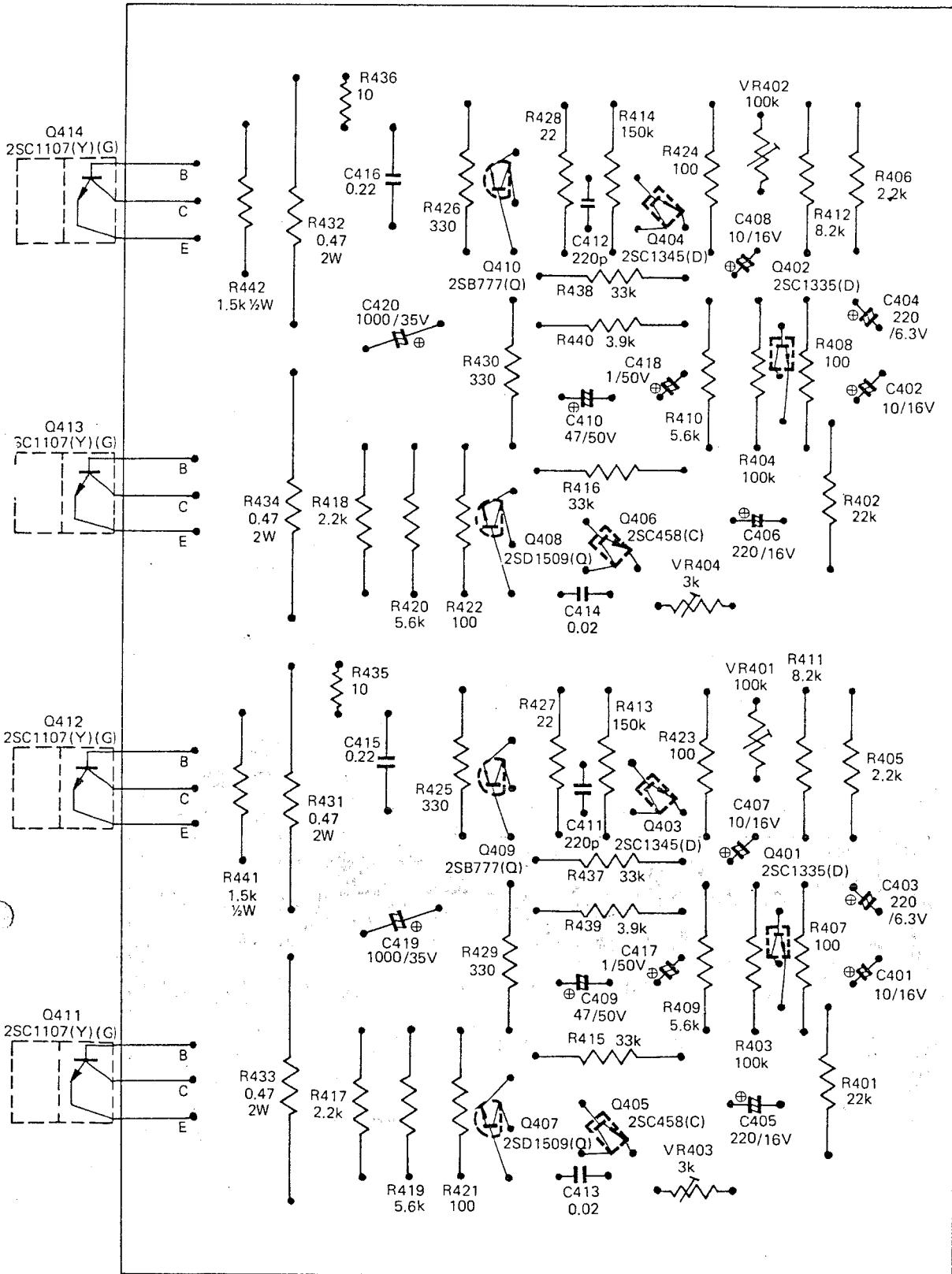
# CONTROL BOARD



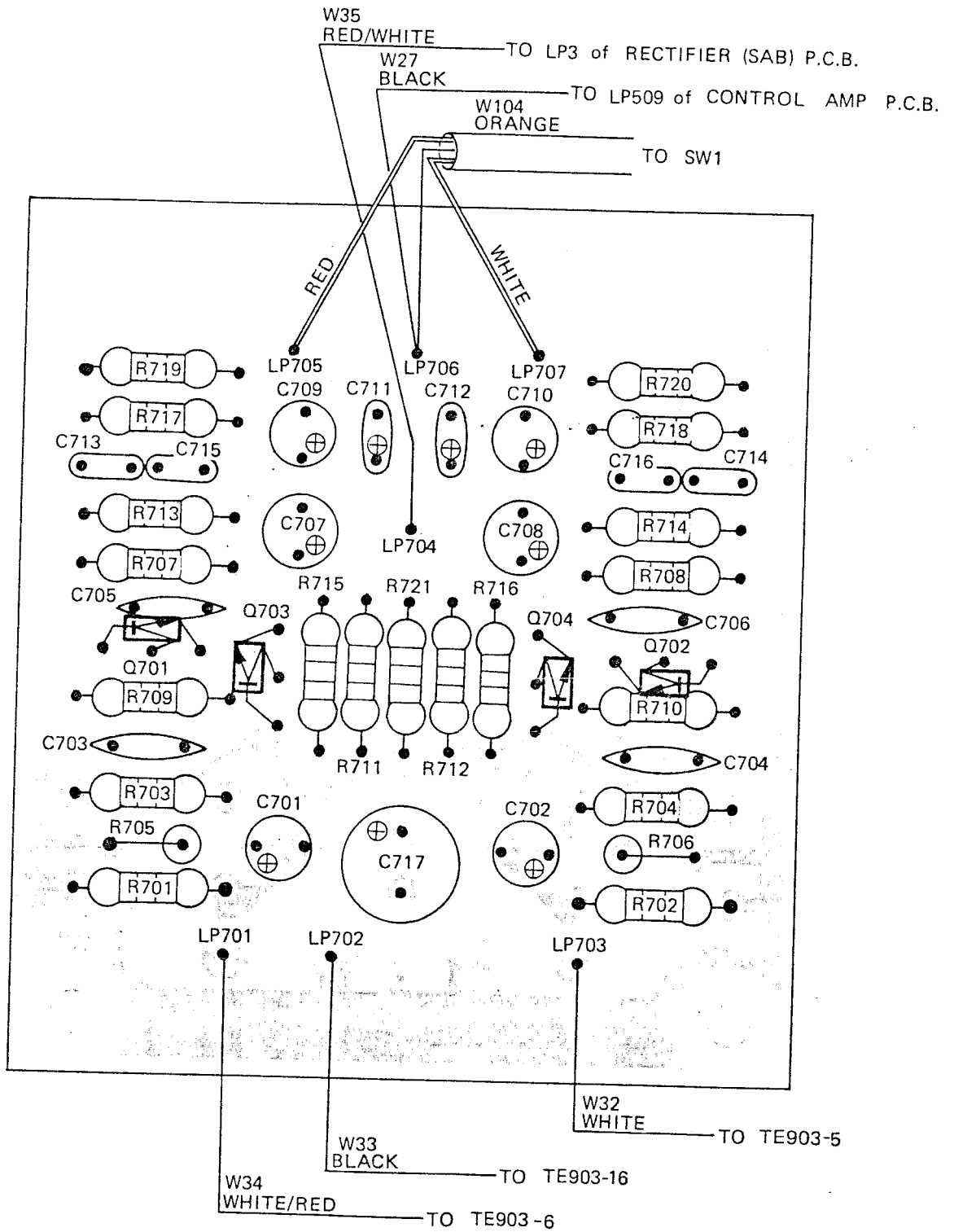
# MAIN AMP BOARD



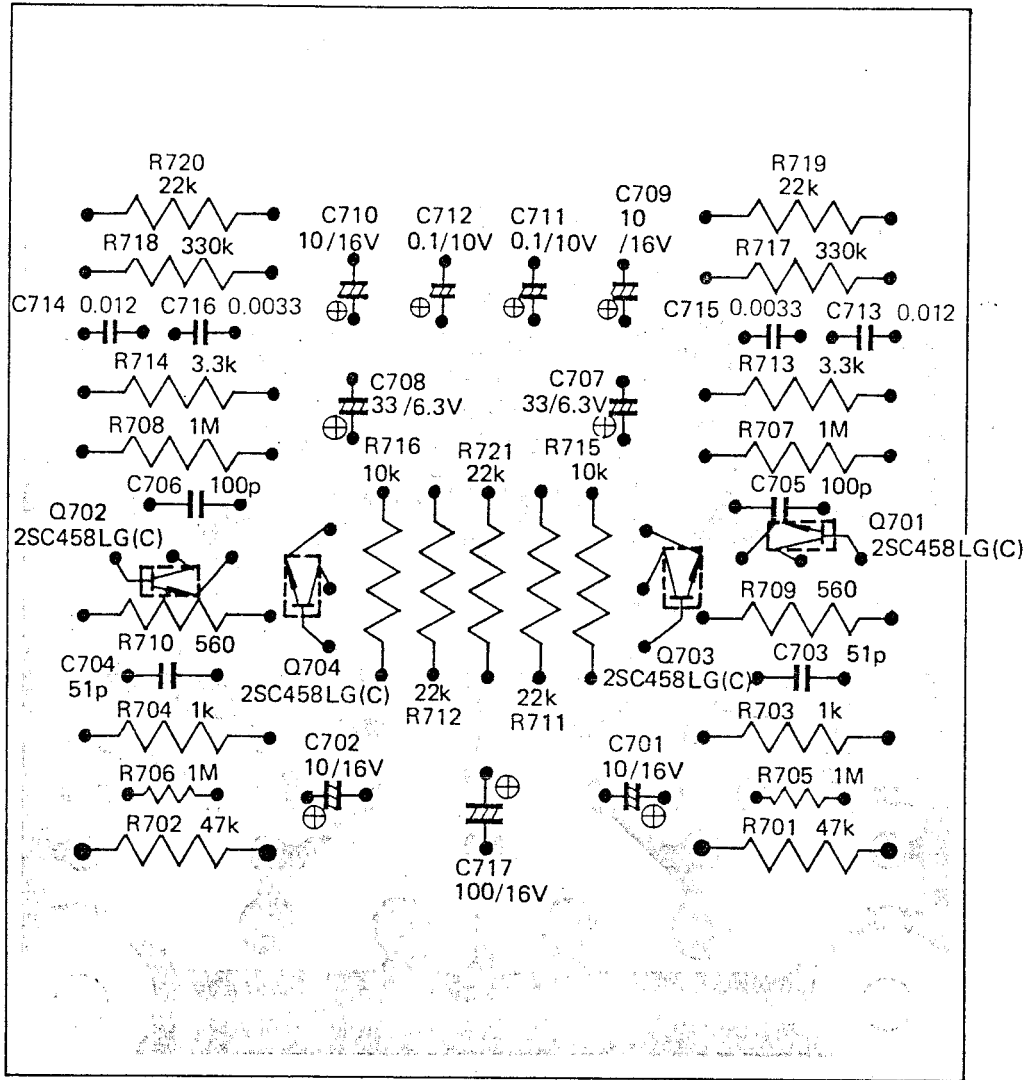
MAIN AMP BOARD WITH VALUES



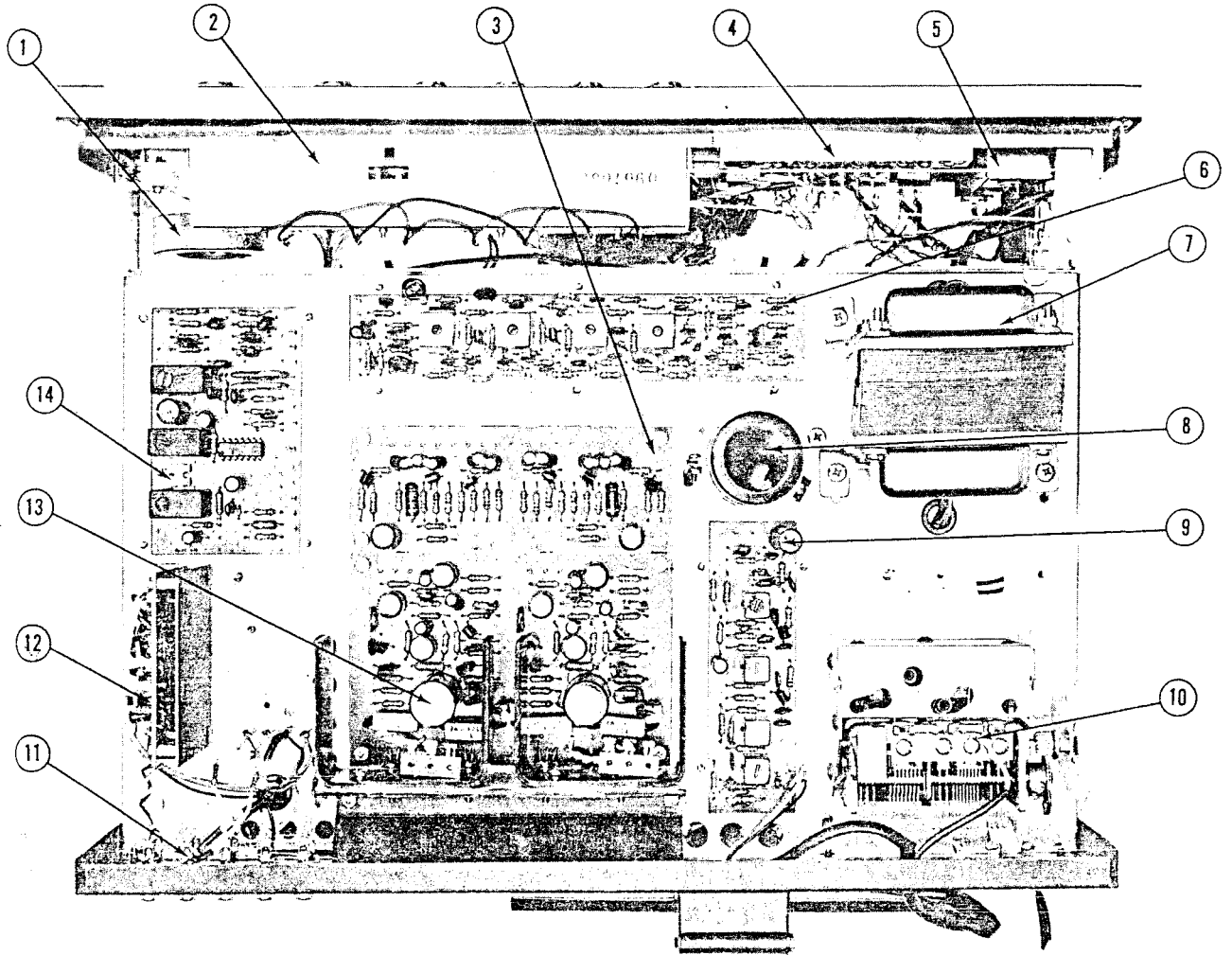
# EQUALIZER AMP BOARD



EQUALIZER AMP BOARD WITH VALUES

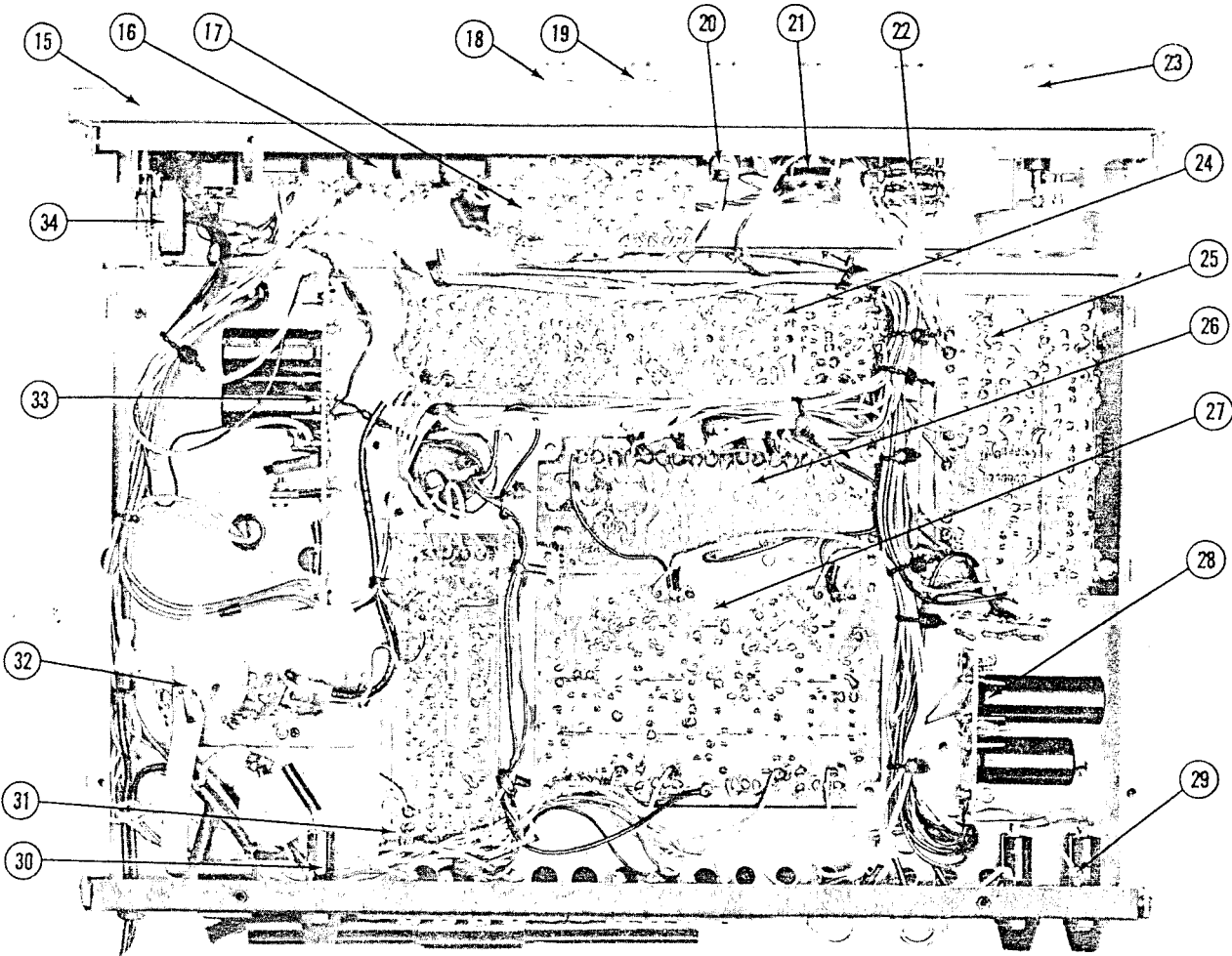


TOP VIEW



- |                                     |   |
|-------------------------------------|---|
| ① FLYWHEEL                          | ⑧ ELECTROLYTIC CAPACITOR, 2200 $\mu$ F, 63V |
| ② LAMP HOUSING                      | ⑨ AM TUNER P.C.B.                           |
| ③ CONTROL AMP P.C.B.                | ⑩ VARIABLE CONDENSOR                        |
| ④ INDICATOR LAMP HOLDER P.C.B.      | ⑪ INPUT & OUTPUT TERMINAL TE903             |
| ⑤ TUNING INDICATOR M201, & LAMP PL5 | ⑫ EQUALIZER AMP P.C.B.                      |
| ⑥ FM-IF AMP P.C.B.                  | ⑬ MAIN AMP P.C.B.                           |
| ⑦ POWER TRANSFORMER T1              | ⑭ FM MPX P.C.B.                             |

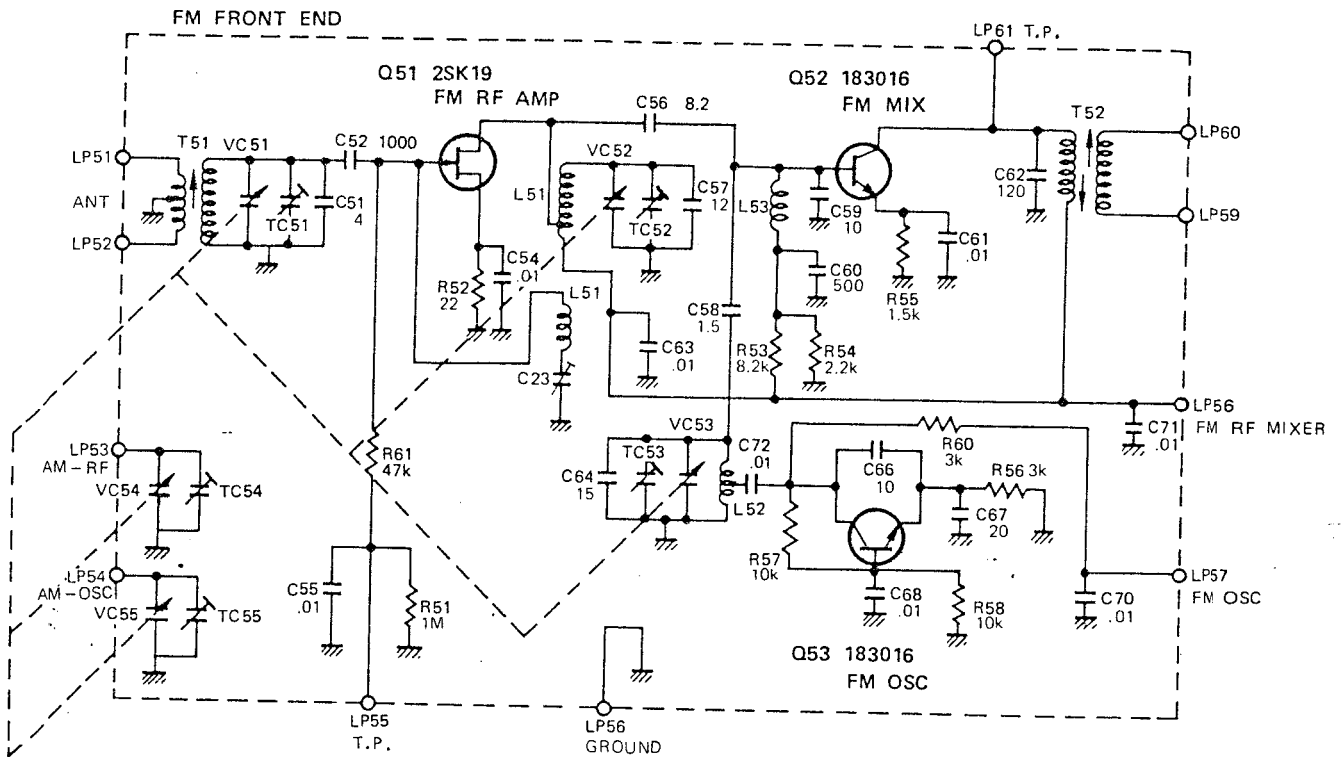
BOTTOM VIEW



- 15 FRONT PANEL
- 16 ROCKER SW501-503,901,902
- 17 CONTROL P.C.B.
- 18 BASS CONTROL
- 19 TREBLE CONTROL
- 20 BALANCE CONTROL
- 21 VOLUME CONTROL
- 22 FUNCTION SWITCH SW1
- 23 TUNING
- 24 FM-IF AMP P.C.B.

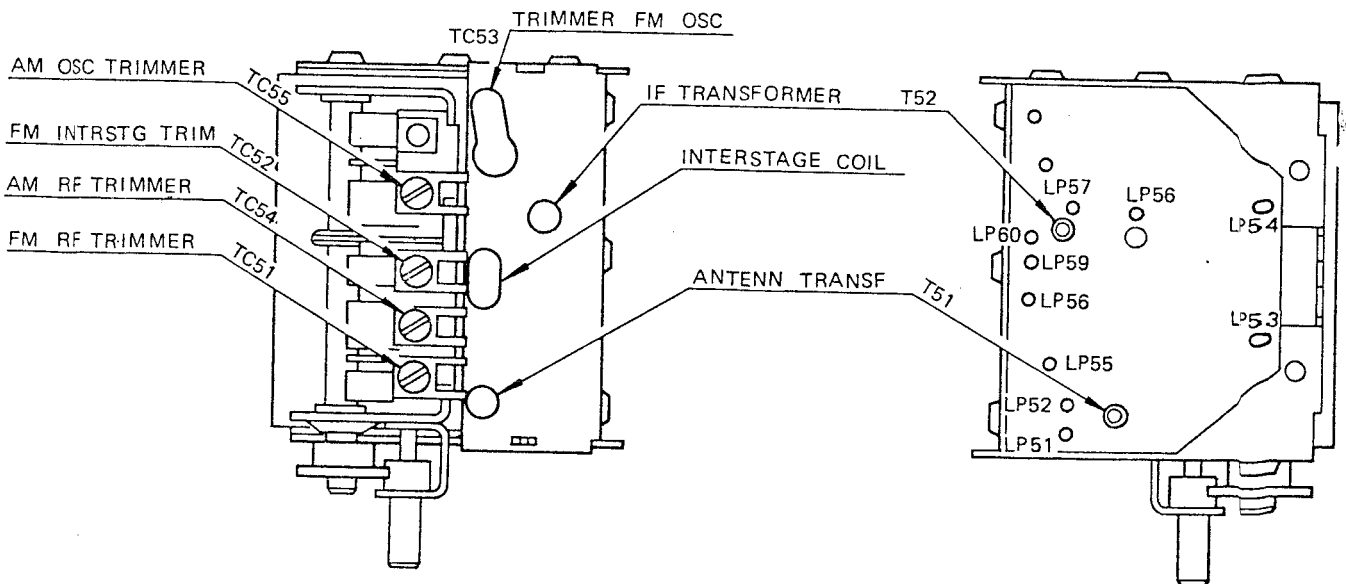
- 25 FM MPX P.C.B.
- 26 CONTROL AMP P.C.B.
- 27 MAIN AMP P.C.B.
- 28 RECTIFIER P.C.B.
- 29 SPEAKER FUSES FU2,FU3
- 30 AC FUSE FU1
- 31 AM TUNER P.C.B.
- 32 VARIABLE CONDENSOR
- 33 VOLTAGE RECTIFIER (MAIN) P.C.B.
- 34 POWER SWITCH SW2

# FM FRONT END BOARD



TOP VIEW

BOTTOM VIEW





**USER ACTIVITY COMMENTS**

**MODEL**

**SERIAL NO.**

**PROBLEM AREA:**

**IX:**

**FIELD CHANGES AND/OR REPAIRS:**

**SUGGESTIONS:**

# REPLACEMENT PARTS LIST

REF. NO.	HK PART NO.	DESCRIPTION	REF. NO.	HK PART NO.	DESCRIPTION
<b>POWER SOURCE</b>			<b>FM IF AMP (Continued)</b>		
C1,4,5	31129491	1000 $\mu$ F +50% – 10% 35V Electrolytic	T201	12029447	Transformer, 1st FM IF 146B6
C2	31819227	2200 $\mu$ F +50% – 10% 35V Electrolytic	T202,203	12020448	Transformer, 2nd & 3rd FI 147B6
C6	31825664	2200 $\mu$ F +50% – 10% 63V Electrolytic	T204	12029449	Transformer, Ratio Ret, 147E3
D1	41029498	Diode EQA01-30	Q201,202, 203,204	43029472	Transistor 2SC460(C) 1st thru 6th FM IF AMP
D2	42029566	Diode EQA01-13	205,206		
D3,4,5,6	41029499	Diode V03(E)	Q207	43025972	Transistor 2SC458(C), FM Muting
Q1	43025972	Transistor 2SC1212A(C) Voltage Rectifier	VR201	23529481	250K ohm Variable Resis
T1	10129496	Transformer, Power, Export	VR202	23528597	5K ohm Variable Res
T1	10129497	Transformer, Power, Domestic	M201	12529522	Meter, Tuning Indic
D551-HK330K	00129462	Indicator Lamp Holder, P.C.B. Complete			
D551-HK330H	00129460	Rectifier (Main) P.C.B. Complete			
D551-HK330J	00129464	Rectifier (Sub) P.C.B. Complete			
SW1	24029523	Function Switch	<b>AM TUNER</b>		
SW2	24029514	Power Switch			
H01,2,3	65424895	Fuse Holder	D251,252	41029009	Diode, 1N34A, AM Det
FU1	45012856	Fuse 2.0A AC Power	253		
FU2,3	45012953	Fuse 1.5A Power Output Protection	L251	12029512	Coil AM Antenna
TE1,2,3, 4,5	65429517	Terminal Dial & Tuning Indicator Lamp	L252	12029473	Coil AM OSC
PL1,2,3, 4,5	46529502	Lamp, Dial & Tuning Indicator	T251	12029474	Transformer 1st AM IF
PL6	46529501	Lamp, 6.3V 50mA Power Switch Indicator	T252	12029475	Transformer 2nd AM IF
PL7,8,9 10,11	46529500	Lamp, 60V30mA Stereo AM FM, Phono Aux Indicator	T253	12029476	Transformer 3rd AM IF
			Q251	43029471	Transistor 2SC461(B) AM Converter
			Q252,253	43025972	Transistor 2SC460(C) 1st & 2nd AM IF AMP
<b>FM FRONT END</b>			<b>FM MPX</b>		
TE101	00229511	FM Front End, P.C.B. Complete	C314		
421449	65129518	Antenna Terminal Strip	C314	32529490	220 $\mu$ F +50% – 10% 16 V Electrolytic
			CR301,302	21029766	CR Component B3EN012C
			VR301	23529771	500 ohm Variable Resistor
<b>FM IF AMP</b>			T301,302	10429769	Transformer Filter 19KHZ
CF201	12029479	Ceramic Filter CF-10M-12	T303	10429770	Transformer Filament 38k
D201,202, 203,204, 205,206	41029290	Diode, 1N60P, FM Detector	Q301,302	43025972	Transistor 2SC1335(D) FM MPX Output AMP
			IC301	43126551	IC MC 1307(P)

REF. NO.	HK PART NO.	DESCRIPTION
<b>MAIN AMP</b>		
RV401,402	38128541	Varistor MV11
VR401,402	23529513	100K ohm
VR403,404	23528597	3K ohm
Q401,402	43025972	Transistor 2SC1335(D) • Pre Driver
Q403,404	43029483	Transistor 2SC1345(D) Driver
Q405,406	43025972	Transistor 2SC458(C) Bias • Stabilization
Q407,408	43029484	Transistor 2SC1509(Q) Complement
Q409,410	43029485	Transistor 2SA777(Q) Complement
Q411,412, 414	43029486	Transistor 2SC1107(Y)(G) Power Output
<b>CONTROL</b>		
VR501,502	21529526	Variable Resistor 50K ohm Bass, Treble
VR504	21529525	Variable Resistor 50K ohm Volume
VR503	21529524	Variable Resistor 100K ohm Balance
Q501,502, 505,506 503,504	43025972	Transistor 2SC458LG(C) Tone AMP, Pre Output
SW501,502, 503	25529515	Transistor 2SC458(C) Tape Out AMP Switch, Contour, Tape, Mode

REF. NO.	HK PART NO.	DESCRIPTION
<b>EQUALIZER AMP</b>		
Q701,702, 703,704	43025972	Transistor 2SC458LG(C) 1st & 2nd Equalizer AMP
SW901,902	25529515	Switch, SP System 1&2
TE903	65429520	Multi-Pin Jack (Input/Output Term.)
TE904	65429521	4-Pin Jack, 4484-5
<b>CABINETY</b>		
A314-HK330	00229468	Top Cover
A338-HK330	00229469	Front Panel Assembly
1352-017007	63229503	Knob, Tuning
1352-017008	63229504	Knob, Volume, Balance, Function
1352-017009	63229505	Knob, Bass (Left), Treble (Left)
1352-017010	63229506	Knob, Bass (Right), Treble (Right)
1353-017011	63229507	Push Button, Power Switch Assembly
<b>CHASSIS</b>		
3602-HK330	00229470	Tuning Shaft Assembly
2631-017006	60729510	Pointer, Dial
<b>MISCELLANEOUS</b>		
1221-017032	90129508	Carton, Shipping
1222-7032	90129509	Packing Cushion

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.

## TEST SPECIFICATIONS

The following test specifications are to be used as a guide and indicate satisfactory performance within established Quality Control limits.

All measurements are taken at 120 volts AC line.

		330B	
SPECIFICATION	TEST CONDITIONS	TEST SPECIFICATIONS	
1. Continuous Power Stereo Mode	8 Ohm Load, 2 Channels Driven, 0.5% Total Harmonic Distortion (THD) at 1KHz	21/21 Watts RMS Per Channel	
2. Frequency Response Stereo Mode	8 Ohm Load, Both Channels Driven, 1.0 Watt	≤10 Hz to ≥35 KHz	
3. Hum and Noise	0dB = .775 VRMS Reference Phono Aux, Tape MON 1 Residual	≥ -30dB ≥ -35dB ≥ -50dB	
4. Sensitivity	21 Watts, 8 Ohm Load, 1KHz Tape MON Aux Phono	≥ 530 to ≤ 750mV ≥ 160 to ≤ 300mV ≤ 3.3 mV	
5. Phono Overload	1KHz	≥ 45mV	
6. Limiter Saturation	±75KHz -3dB	≤ 10μV	
7. IHF Sensitivity (Usable Sensitivity)	3% THD, 300 Ohm Source ±75KHz 90, 98, 106MHz	8μV	
8. MPX Separation	100% 1 Channel only Modulated 1000μV RF Input 100Hz 1KHz 10KHz	≥ 15dB ≥ 25dB ≥ 10dB	