

The Harman-Kardon Model 330B

AM/FM/Stereo FM Solid State Receiver

Technical Manual Addendum

This addendum is to be used with all 330B models with
suffix "A" after serial number.



harman/kardon

ALIGNMENT PROCEDURES

AM ALIGNMENT PROCEDURE

INSTRUMENTS: AM Signal Generator modulated with 400Hz at 30%, V.T.V.M. 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 AM Sig. Gen.	V.T.V.M. & oscilloscope to Tape Out	Quiet point near 600kHz	T251	Maximum and undistorted pattern on SCOPE
2				T252	
3				T253	
4	Repeat step 1 through 3 for best sensitivity.				
5	530kHz of AM Sig. Gen.	V.T.V.M. to oscilloscope to Tape Out	Gang fully closed	L252	Maximum output
6	1600kHz of AM Sig. Gen.		1600kHz	AM oscillator trimmer	
7	Repeat step 5 and 6 for best dial accuracy.				
8	600kHz of AM Sig. Gen.	Same as above	600kHz	AM ANT LOOP STICK	Same as above
9	1600kHz of AM Sig. Gen.		1600kHz	AM ANT trimmer	
10	Repeat step 8 and 9 for best sensitivity.				

FM ALIGNMENT PROCEDURE

INSTRUMENTS: FM Signal Generator, AC/DC VTWM, Oscilloscope.

NOTE: Set Function Switch to FM, signal generator for 400 or 1000 cps 100% mod.

Step	FREQUENCY	SIG. STRENGTH	DIAL SETTING	ADJUST	FOR	AT
1	—	0	Quiet point on band	T52 top & bottom (on front end)	Max. noise	LP206 ("OUT" term on IF Board)
2	—	0	Same as above	T201 top (on FM IF board)	Zero Volts D.C.	LP206
3	Near 98 mc	-1 db of Limiter saturation	Tune for Zero Volts D.C. at LP206	T201 bottom T52 top and bottom	Max. symmetric output (on scope)	Tape Out
4	Repeat steps 2 and 3 until no further improvement is noticed.					
5	90 mc	approx. 10 μ v	90 mc	L52 (osc)	Zero Volts D.C.	LP206
6	106 mc	Same as above	106 mc	TC53 (osc)	Zero Volts D.C.	LP206
7	Repeat steps 5 and 6 until no further improvement is noticed.					
8	90 mc	-3 db of Limiter saturation	Tune for Zero Volts D.C. at LP206	L51 (RF) T51 (Ant)	Max. Output	Tape Out
9	106 mc	Same	Same	TC52 (RF) TC51 (Ant)	Max. Output	Tape Out
10	Repeat steps 9 and 10 until no further improvement is noticed.					

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	8mV DC
2	Across R431 Resistor	VR403	8mV 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.

MPX ALIGNMENT PROCEDURE

INSTRUMENTS: Frequency counter, stereo signal generator

NOTE: Set Function switch to FM Stereo

1	Short LP206 (on FM board) to ground.
2	Connect frequency counter to LP301 (Marked "19KC", on MPX Board).
3	Adjust VR301 for 19KC \pm 50C.
4	Remove short from LP206 to ground.
5	Check Pilot level that Stereo indication lights at 6% of pilot level and that the indicator does not light at 1%.
6	Return Pilot level to 9% and check Stereo separation at 1kHz, 100Hz, and 10kHz.
7	At 25 μ v of signal adjust Stereo threshold VR201 for Stereo indicator on.

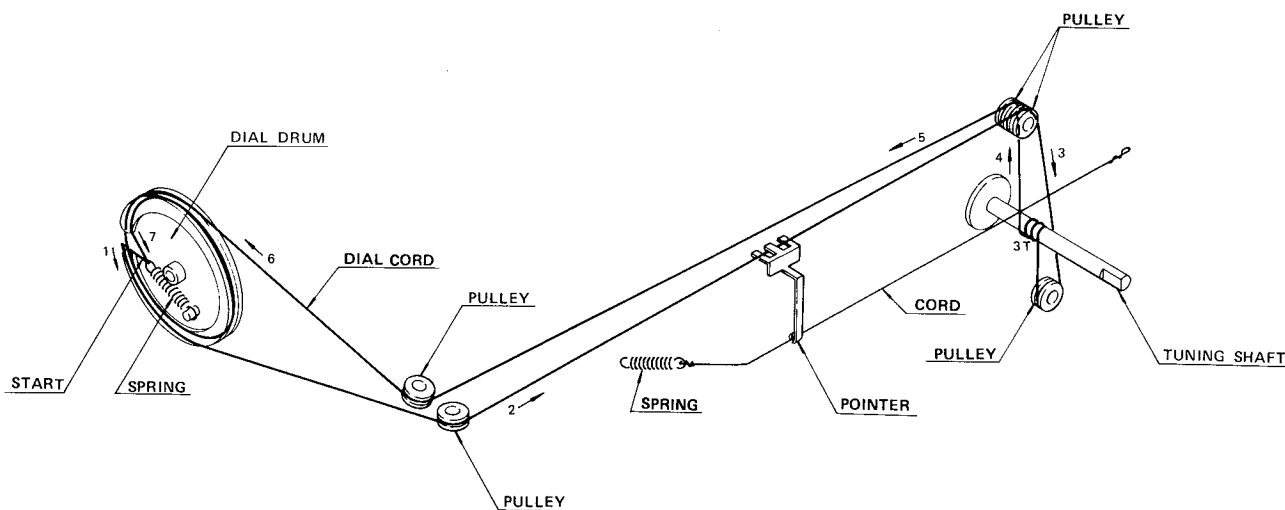
TUNING INDICATOR ADJUSTMENT

INSTRUMENT: FM Signal Generator.

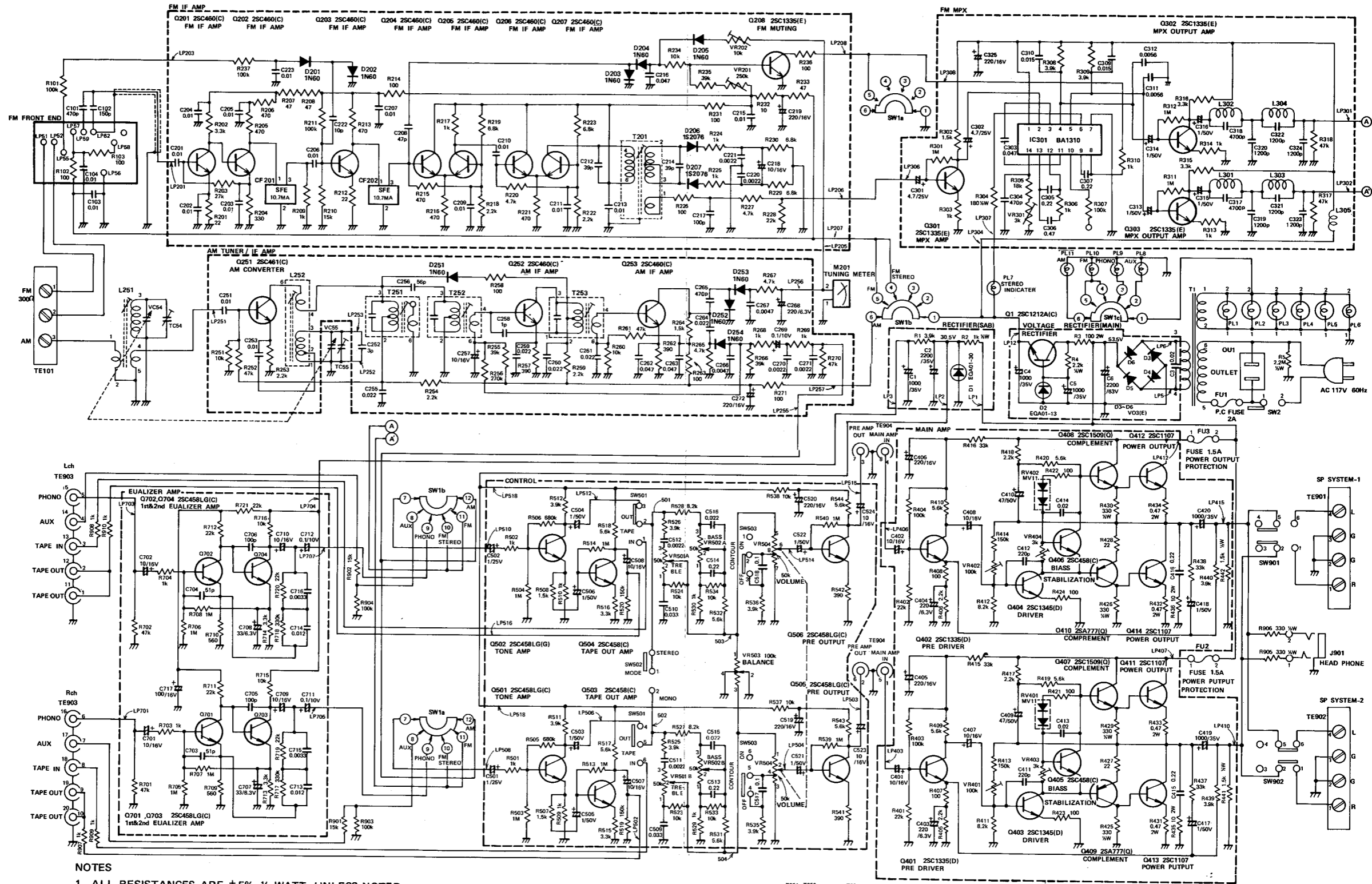
NOTE: Set FUNCTION switch to FM

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

STRINGING DIAGRAM

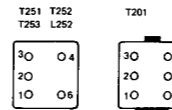


SCHEMATIC DIAGRAM RV



NOTES

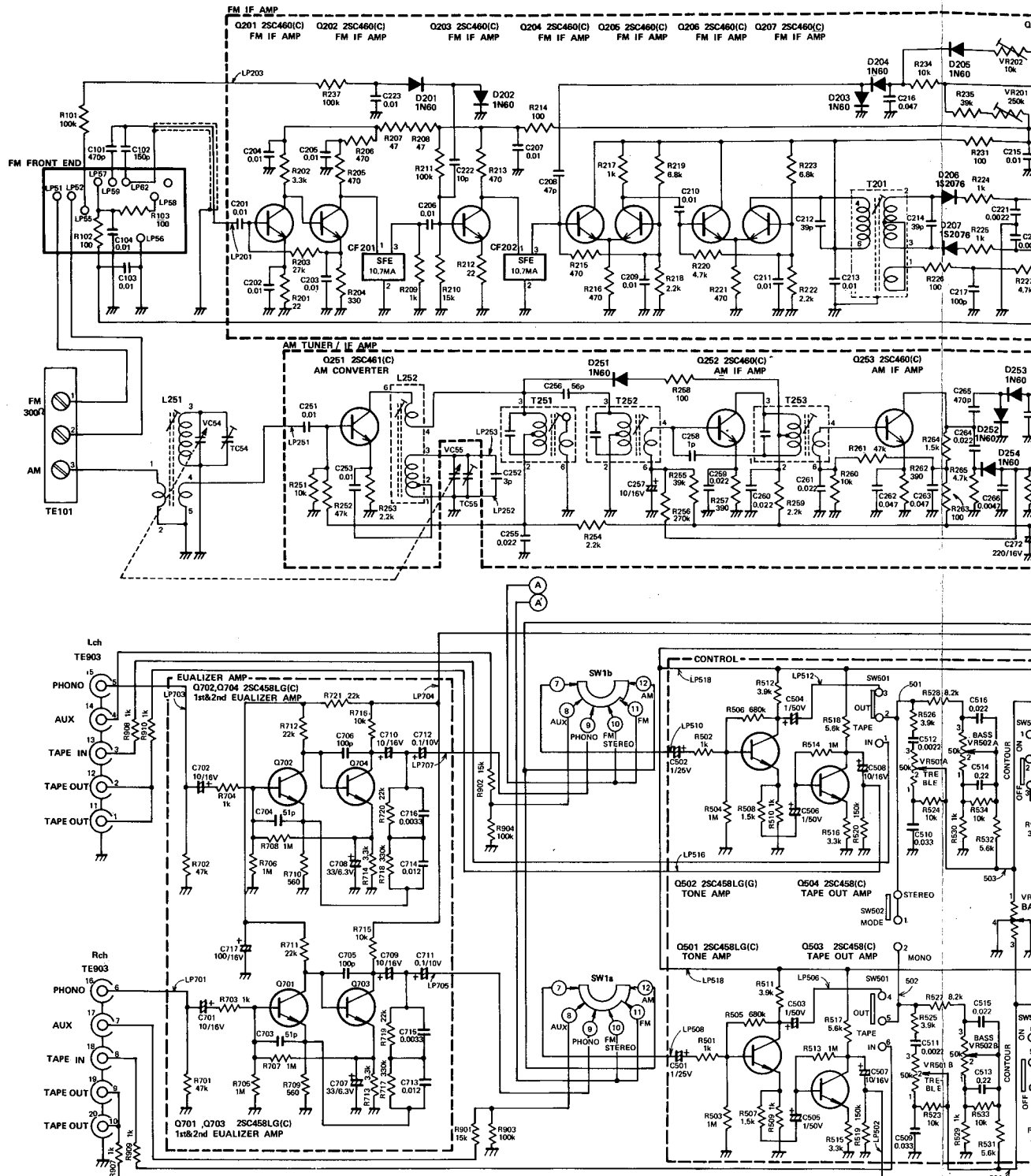
1. ALL RESISTANCES ARE $\pm 5\%$, $\frac{1}{4}$ WATT, UNLESS NOTED OTHERWISE. VALUES ARE IN OHMS. K = 1000 M = 1000K
2. ALL CAPACITANCES VALUES BELOW 1.0 ARE IN MF, THOSE 1.0 AND ABOVE ARE IN PF. UNLESS NOTED OTHERWISE. (EXCEPT ELECTROLYTICS)
3. VOLTAGE READINGS TO NEGATIVE LINE (-) ARE MEASURED WITH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



TRANSISTOR ELEMENTS VOLTAGES

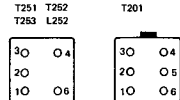
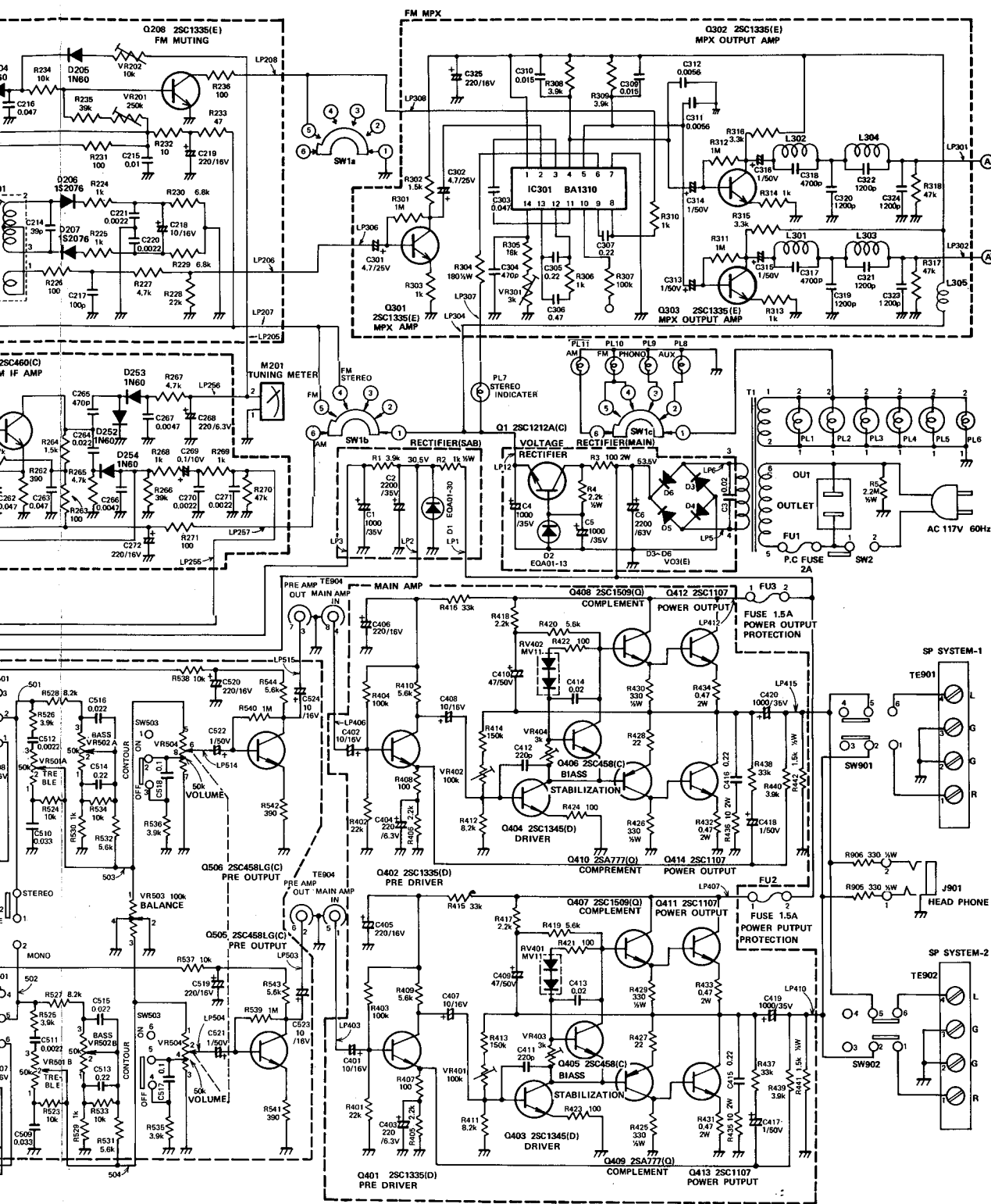
	Q1	Q201	Q202	Q203	Q204	Q206	Q206	Q207	Q208	Q251	Q252	Q253	Q301	Q302	Q303	Q401	Q402	Q404	Q405	Q406
Collector	47.9	2.0	6.0	7.6	10.6	8.4	10.6	10.6	0.02	10.7	9.2	7.2	8.4	6.1	6.1	6.5	6.5	24.6	28.4	28.4
Base	13.5	0.7	2.0	0.8	2.5	2.5	2.5	2.5	0.6	1.8	1.2	1.9	3.1	2.4	2.4	2.3	2.3	1.0	25.3	25.3
Emitter	12.9	0.05	1.3	0.1	1.9	1.9	1.9	1.9	0	1.2	0.6	1.2	2.5	1.8	1.8	1.6	1.6	0.4	24.6	24.6
Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q501	Q502	Q503	Q504	Q505	Q506	Q701	Q702	Q703	Q704			
Collector	53.5	53.5	0.6	0.6	53.5	25.2	25.2	16.9	16.9	17.2	17.2	6.9	6.8	3.6	3.6	10.8	10.8			
Base	26.4	26.4	24.6	24.6	26.8	26.8	0.6	0.6	4.2	8.4	8.4	1.2	1.2	0.8	0.8	3.8	3.8			
Emitter	25.8	25.8	25.2	25.2	25.2	25.2	0	0	3.6	3.6	7.9	7.9	0.6	0.6	0.1	0.1	3.2	3.2		

SCHEMATIC DIAGRAM RV



NOTES

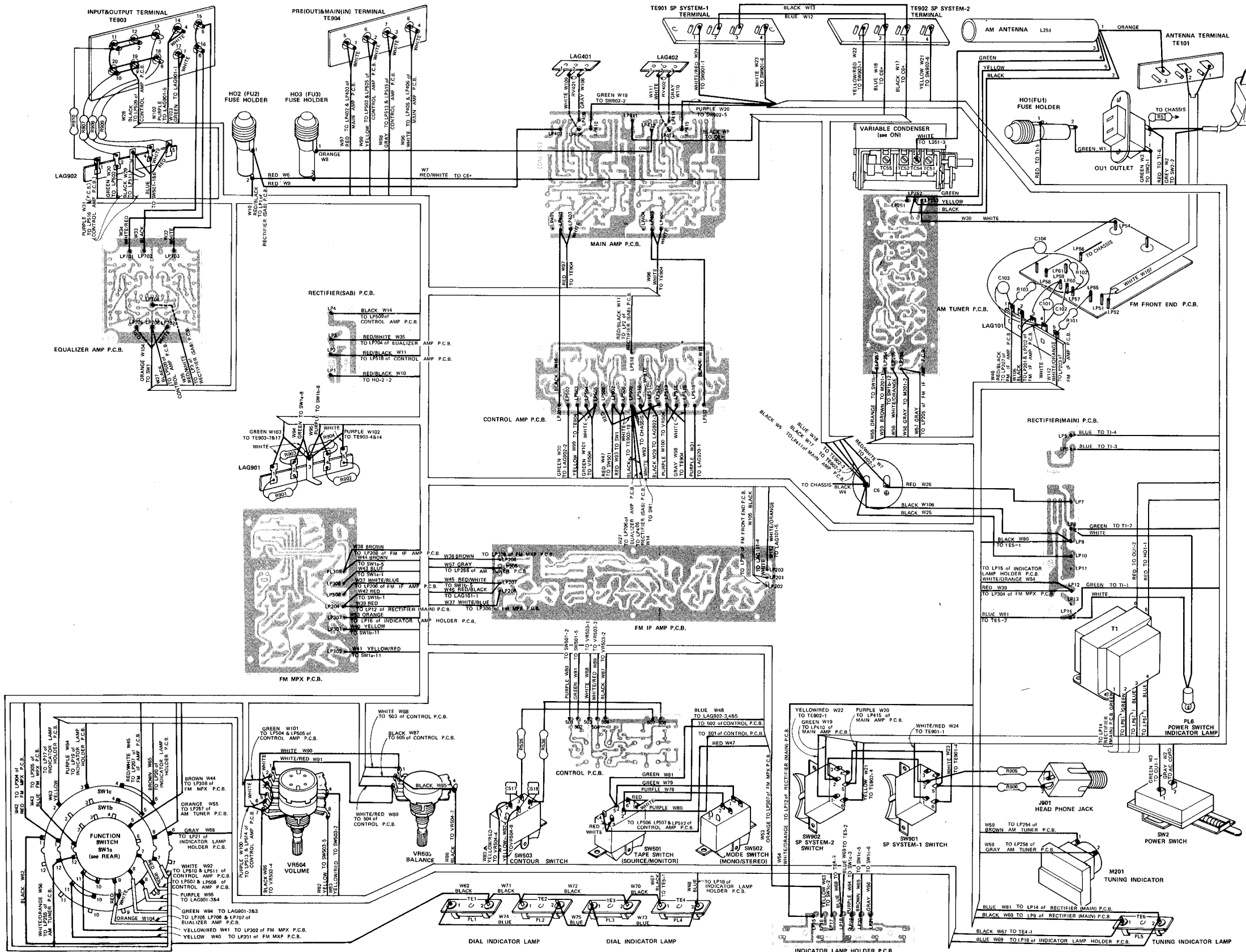
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3. VOLTAGE READINGS TO NEGATIVE LINE (-) ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL
4. FUNCTION SWITCH SW1 IS IN AM POSITION.



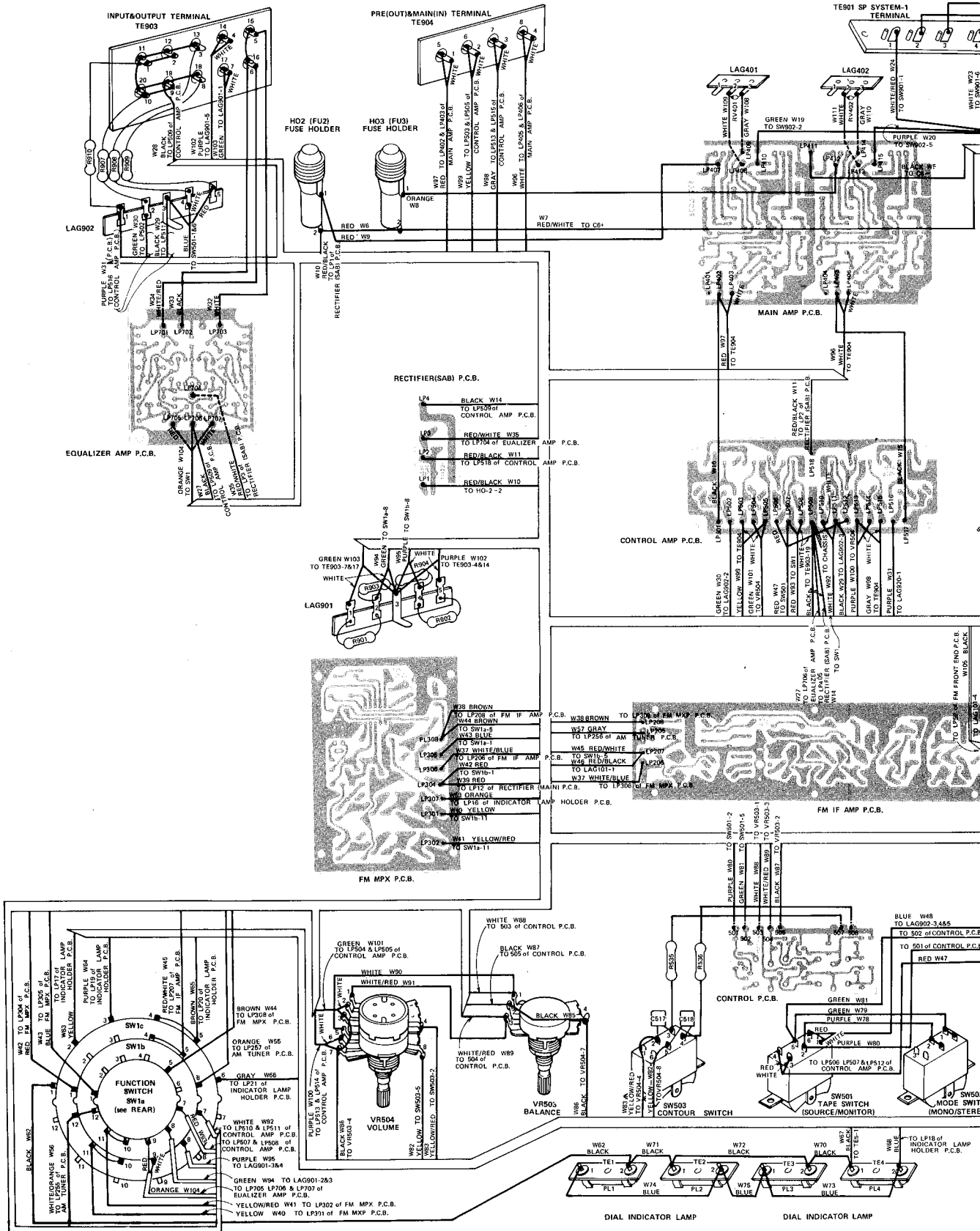
TRANSISTOR ELEMENTS VOLTAGES

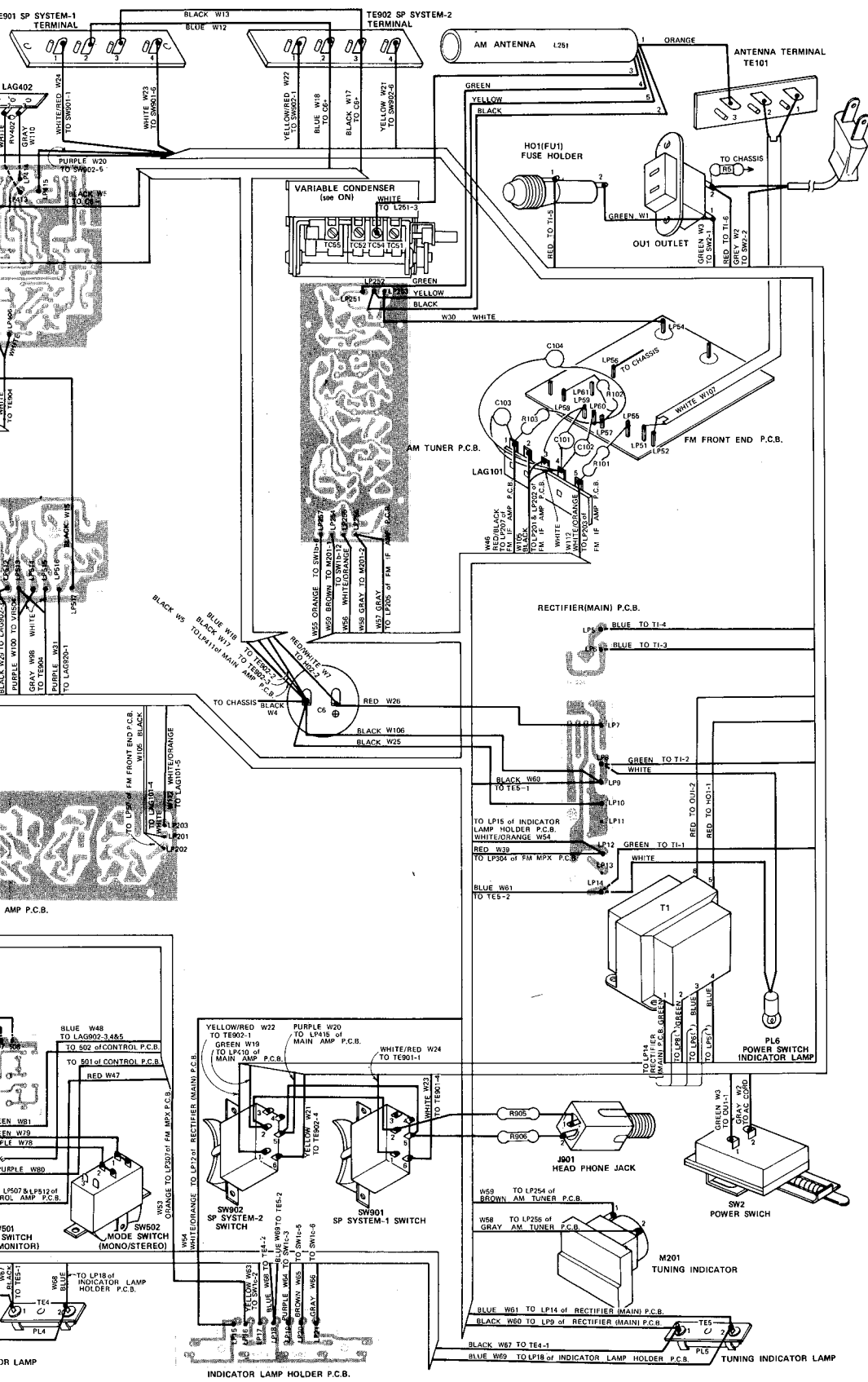
	Q1	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q251	Q252	Q253	Q301	Q302	Q303	Q401	Q402	Q404	Q405	Q408
Collector	47.9	2.0	6.0	7.6	10.6	8.4	10.6	10.6	0.02	10.7	9.2	7.2	8.4	6.1	6.1	6.5	6.5	24.6	24.4	26.4
Base	13.5	0.7	2.0	0.8	2.5	2.5	2.5	2.5	0.8	1.8	1.2	1.9	3.1	2.4	2.4	2.3	2.3	1.0	26.3	26.3
Emitter	12.9	0.05	1.3	0.1	1.9	1.9	1.9	1.9	0	1.2	0.6	1.2	2.5	1.8	1.8	1.6	1.6	0.4	24.6	24.6
Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q501	Q502	Q503	Q504	Q505	Q506	Q701	Q702	Q703	Q704			
Collector	53.5	53.5	0.8	0.6	53.5	53.5	26.2	26.2	16.9	16.9	17.2	17.2	6.8	6.8	3.6	3.6	10.8	10.8		
Base	26.4	26.4	24.6	24.6	26.8	26.8	0.6	0.6	4.2	4.2	8.4	8.4	1.2	1.2	0.8	0.8	3.8	3.8		
Emitter	26.8	26.8	25.2	25.2	26.2	26.2	0	0	3.6	3.6	7.9	7.9	0.6	0.6	0.1	0.1	3.2	3.2		

WIRING DIAGRAM RV

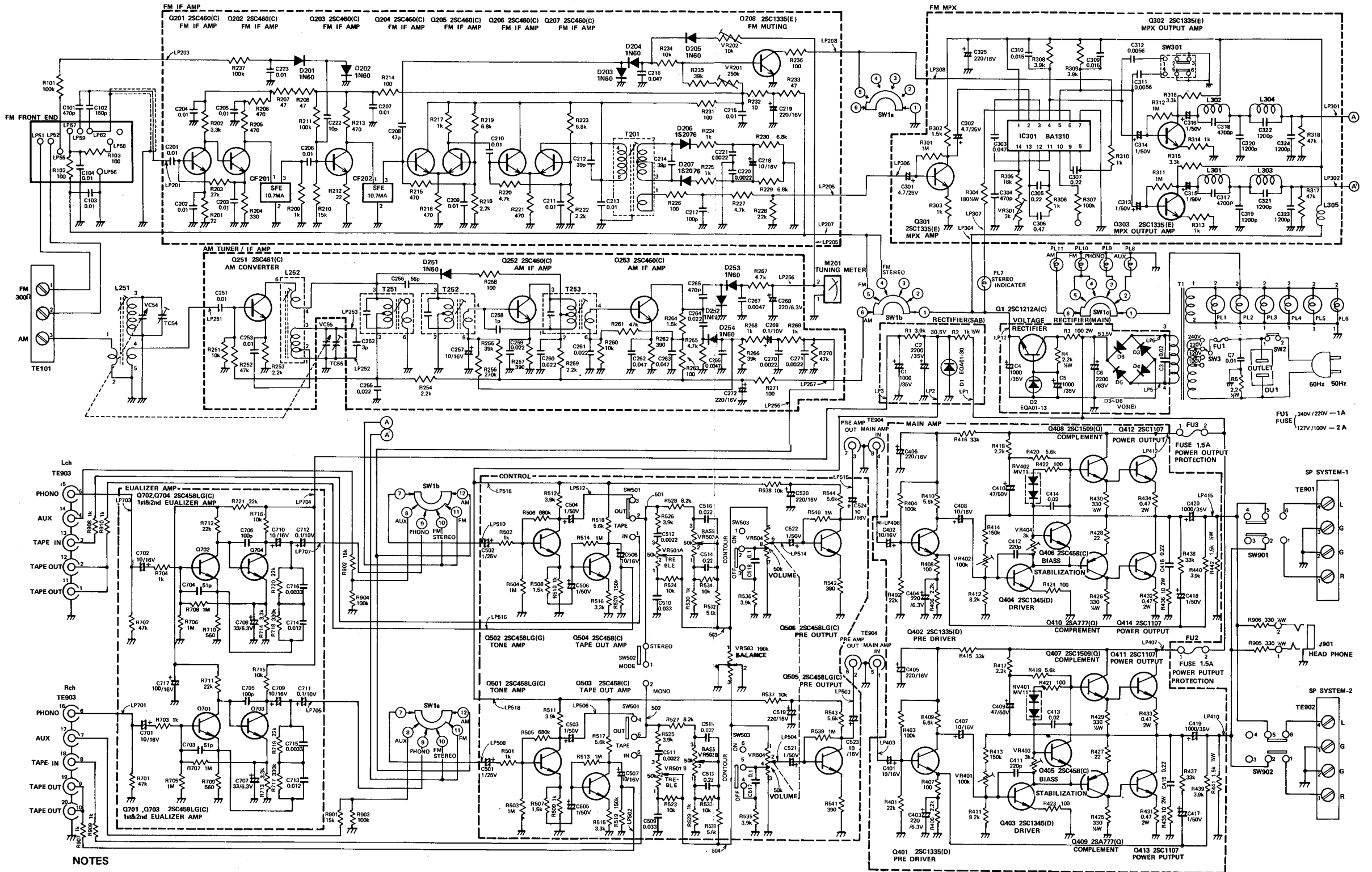


WIRING DIAGRAM RV



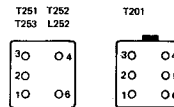


SCHEMATIC DIAGRAM MV



NOTES

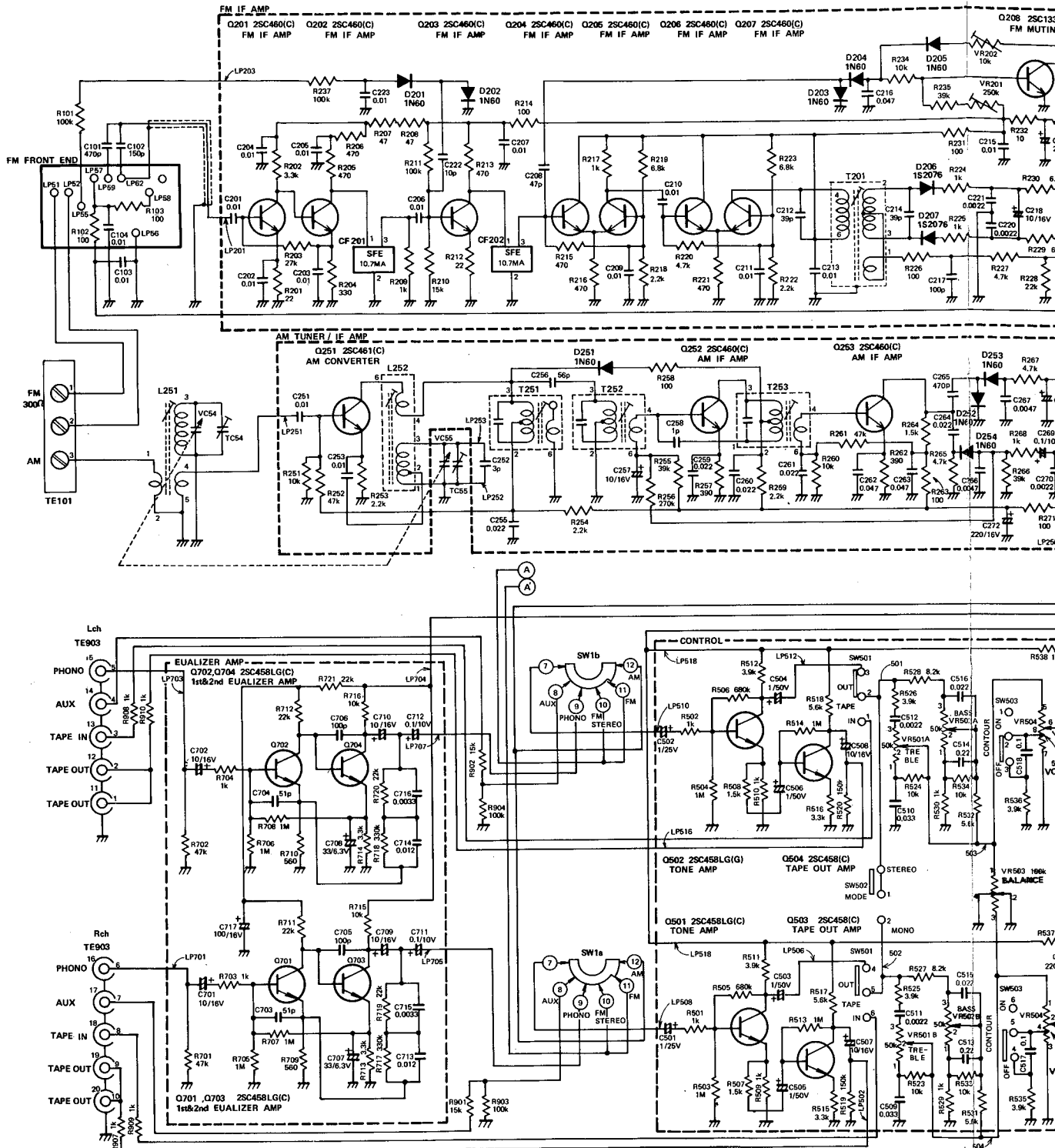
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TRANSISTOR ELEMENTS VOLTAGES

	Q1	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q251	Q252	Q253	Q301	Q302	Q303	Q401	Q402	Q403	Q404	Q405	Q406	Volts
Collector	47.9	2.0	6.0	7.6	10.6	8.4	10.6	10.6	0.02	10.7	9.2	7.2	8.4	6.1	6.1	6.5	6.5	24.6	24.6	24.6	24.6	
Base	13.5	0.7	2.0	0.8	2.5	2.5	2.5	2.5	0.6	1.8	1.2	1.9	3.1	2.4	2.4	2.3	2.3	1.0	26.3	26.3		
Emitter	12.9	0.05	1.3	0.1	1.9	1.9	1.9	1.9	0	1.2	0.6	1.2	2.5	1.8	1.8	1.6	1.6	0.4	24.6	24.6		
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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	3.6	3.6	10.8	10.8				
Base	26.4	26.4	24.6	24.6	26.8	26.8	0.6	0.6	4.2	4.2	8.4	8.4	1.2	1.2	0.8	0.8	3.8	3.8				
Emitter	26.8	26.8	26.2	26.2	26.2	26.2	0	0	3.6	3.6	7.9	7.9	0.6	0.6	0.1	0.1	3.2	3.2				

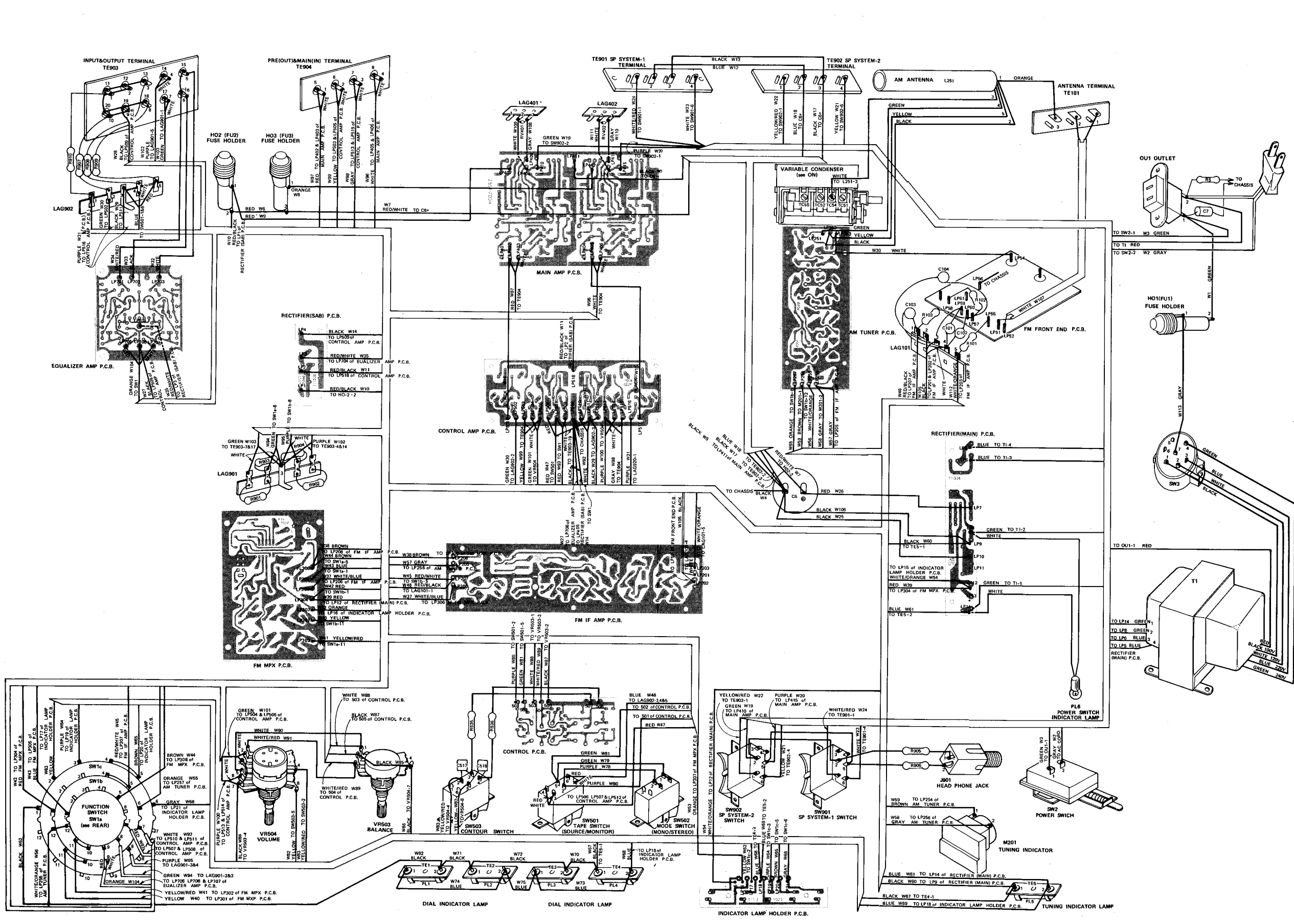
SCHEMATIC DIAGRAM MV



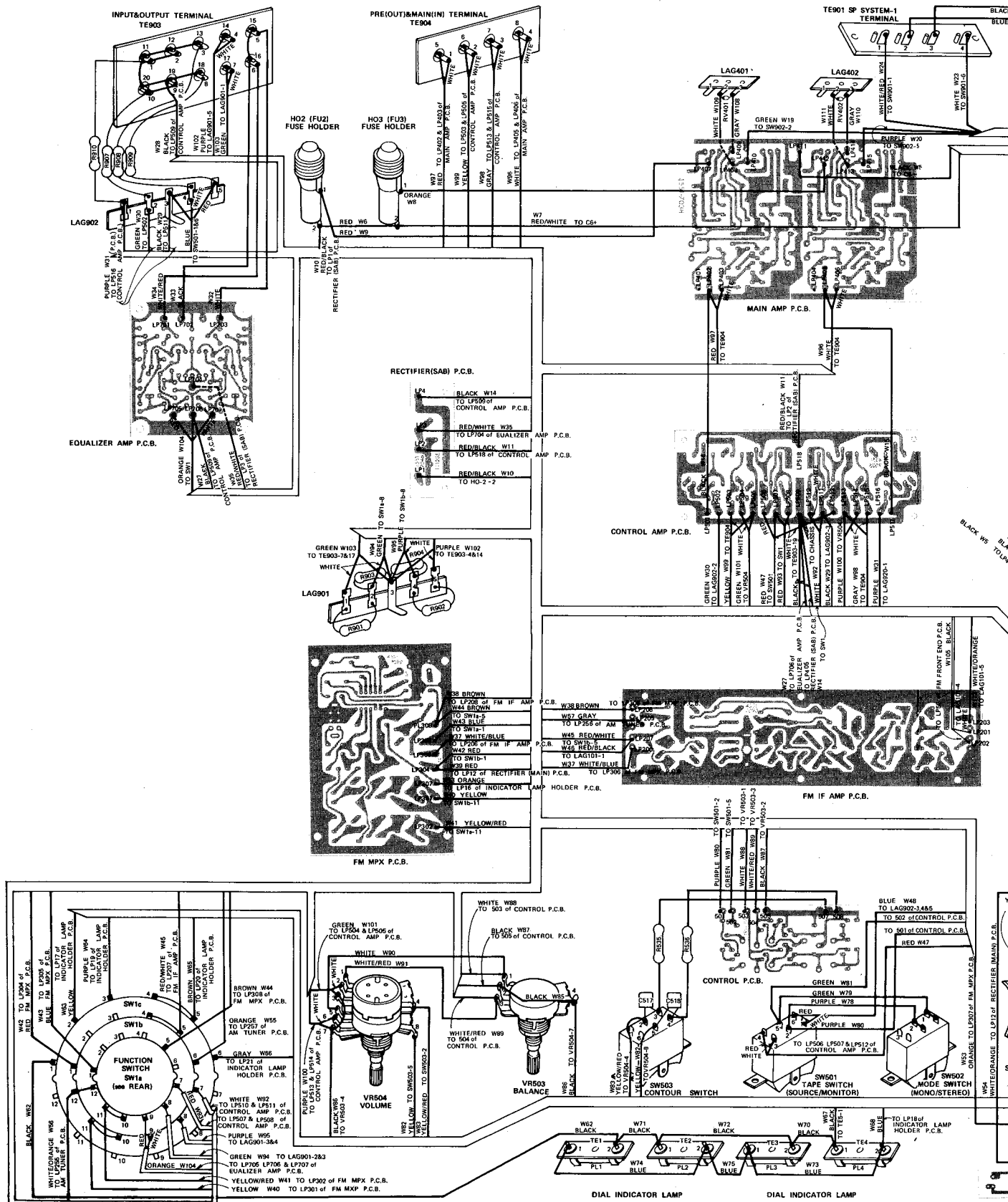
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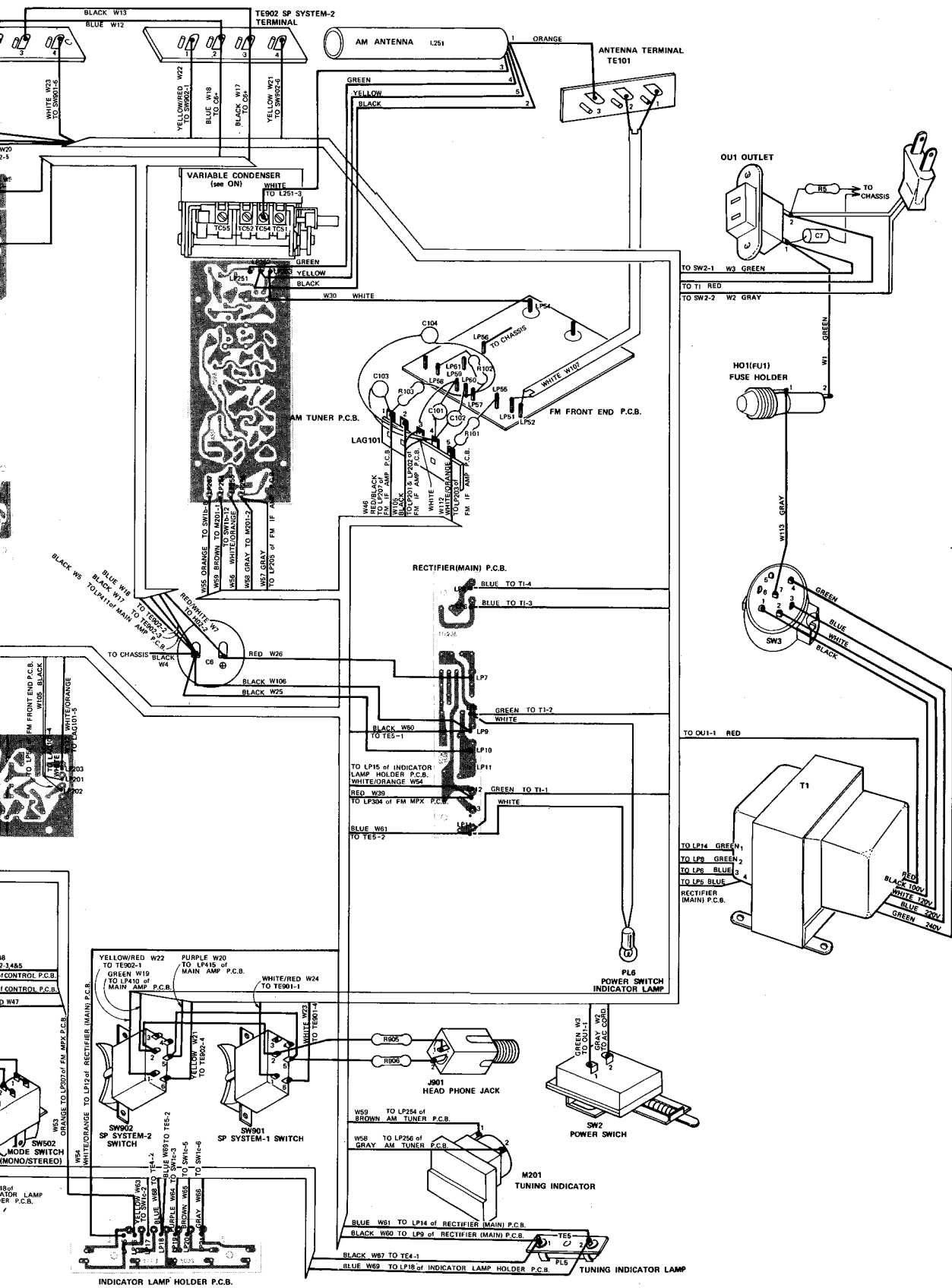
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WIRING DIAGRAM MV

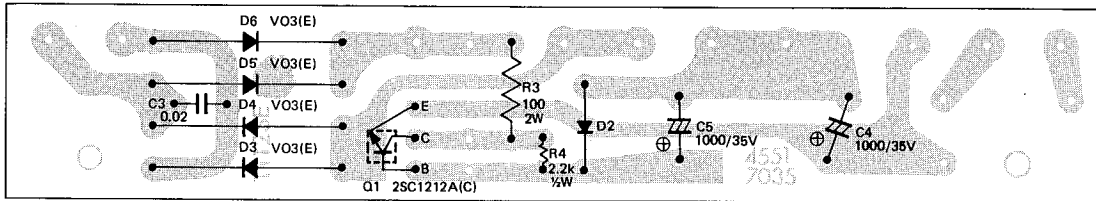
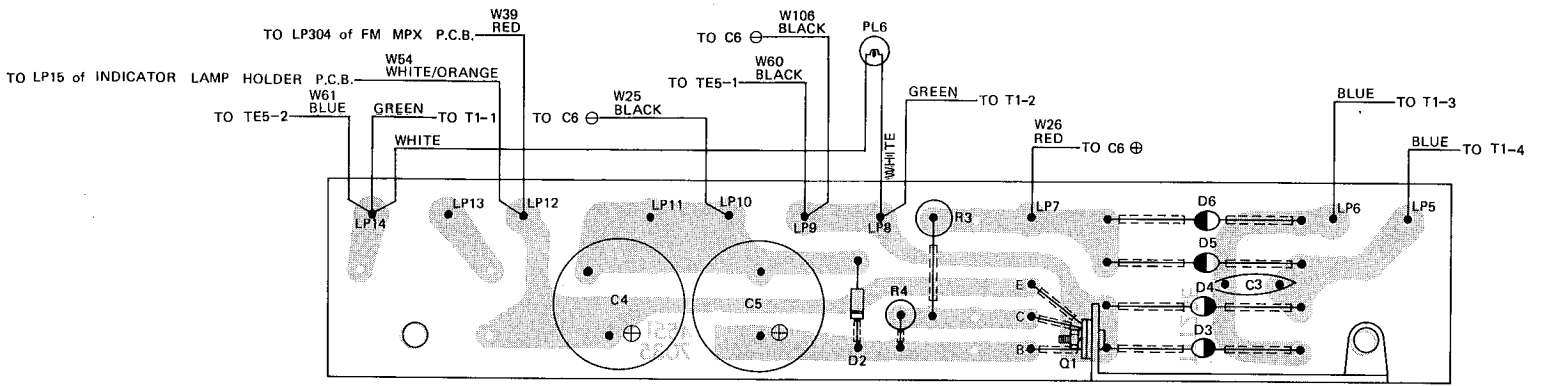


WIRING DIAGRAM MV

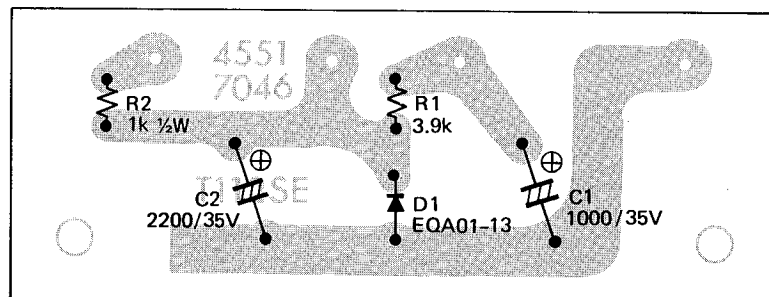
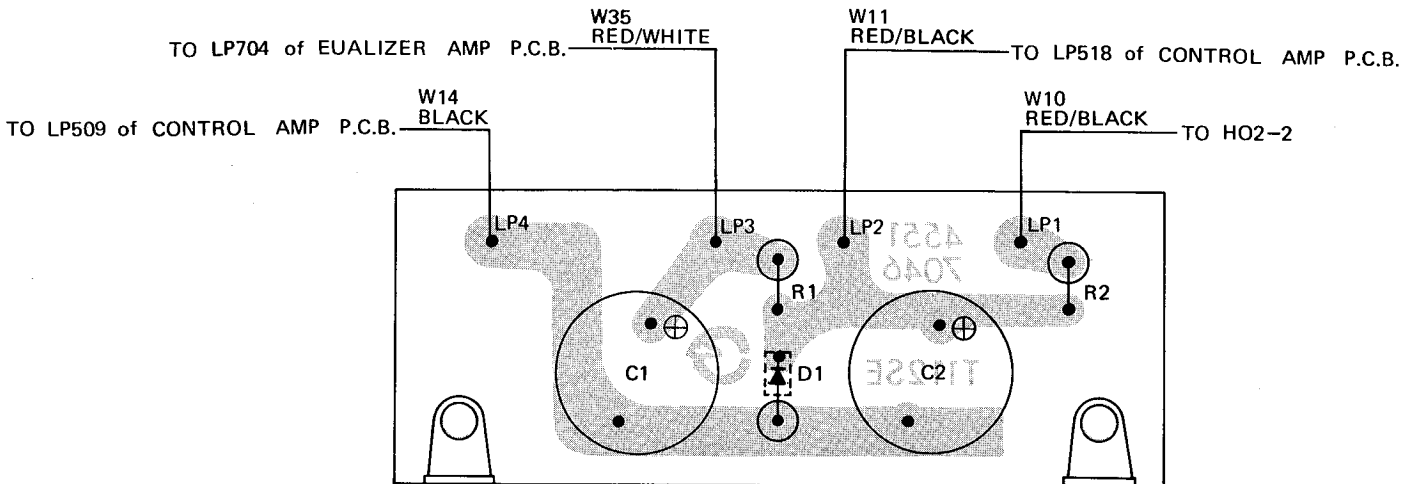




RECTIFIER (MAIN) BOARD



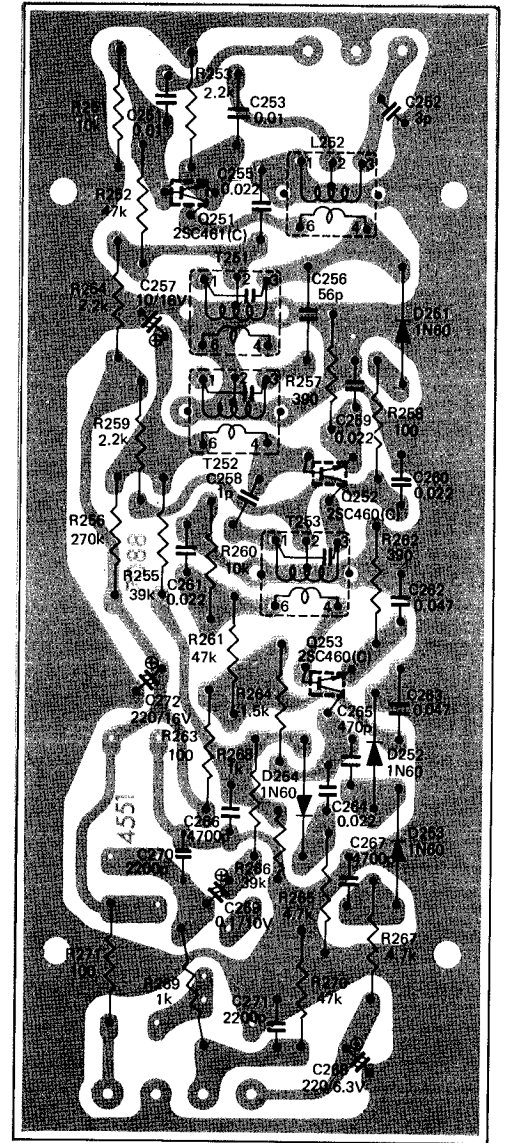
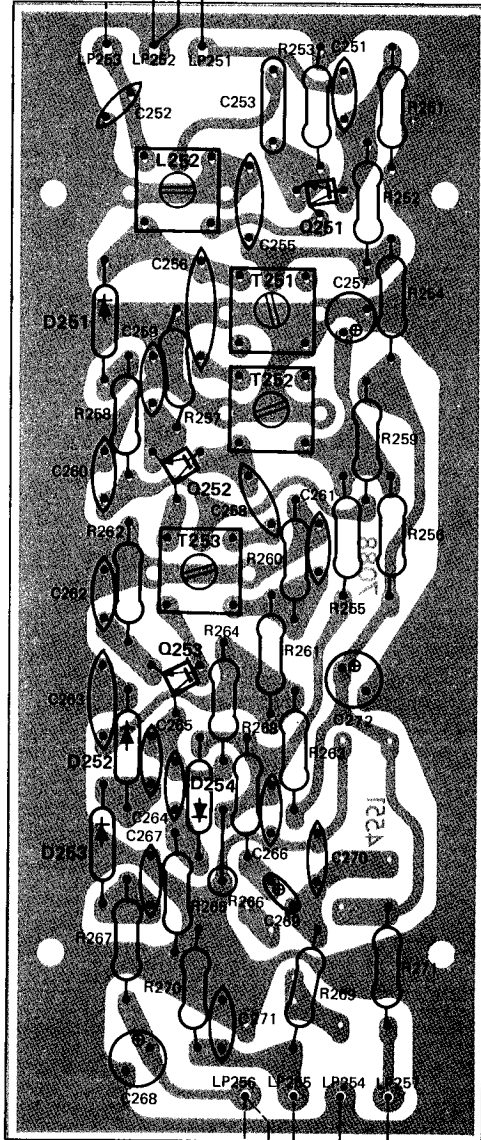
RECTIFIER (SUB) BOARD



AM TUNER BOARD (COMPONENT SIDE)

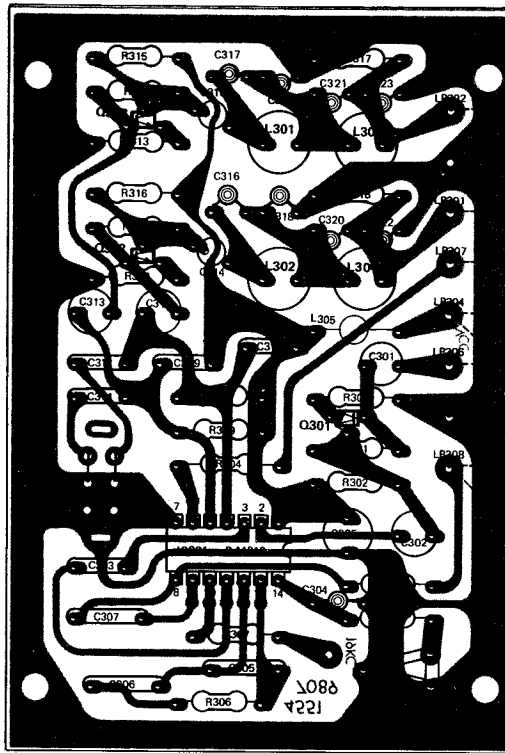
AM TUNER BOARD (CIRCUIT SIDE)

TO LP54 of FM FRONT END P.C.B. — W30 WHITE
 BLACK
 YELLOW
 GREEN — TO L251 AM ANTENNA

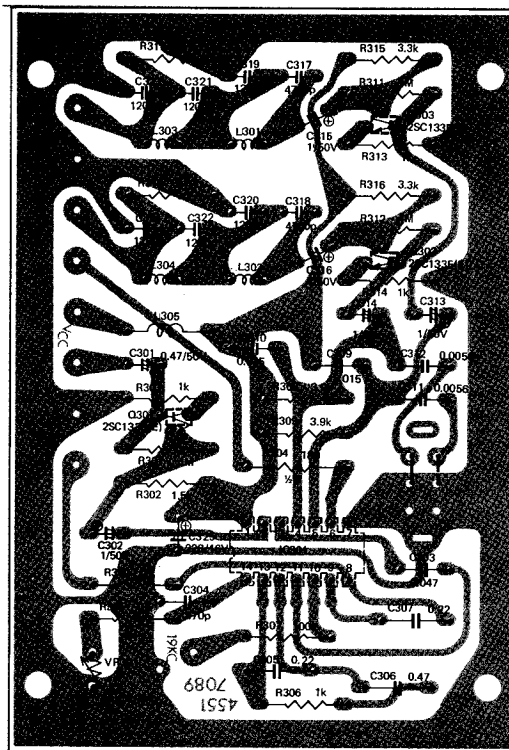


TO M201-2 — W58 GRAY
 TO LP205 of FM IF AMP P.C.B. — W57 GRAY
 W55 ORANGE — TO SW1b-6
 W59 BROWN — TO M201-1
 W56 WHITE/ORANGE — TO SW1b-12

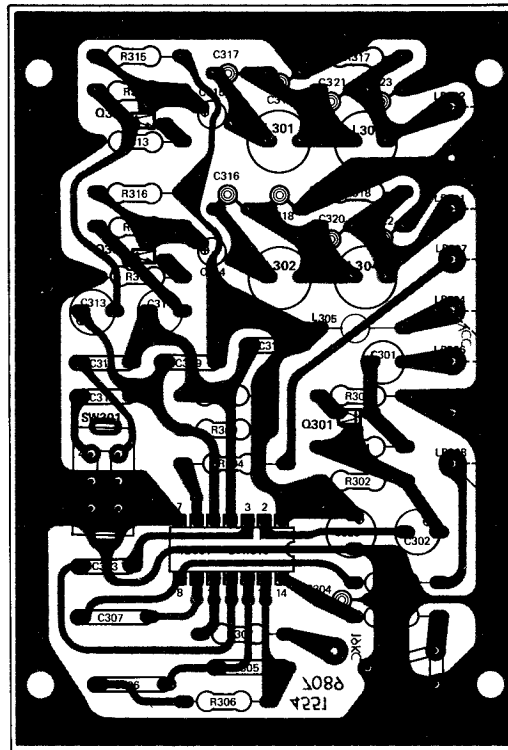
FM MPX BOARD RV



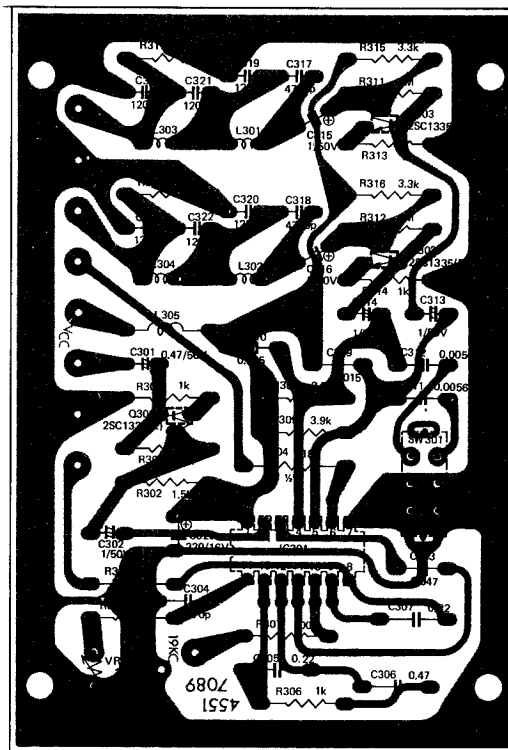
- W41 YELLOW/RED — TO SW1a-11
- W40 YELLOW — TO SW1b-11
- W53 ORANGE — TO LP16 of INDICATOR LAMP HOLDER P.C.B.
- W39 RED — TO LP12 of RECTIFIER (MAIN) P.C.B.
- W42 RED — TO SW1b-1
- W37 WHITE/BLUE — TO LP206 of FM IF AMP P.C.B.
- W43 BLUE — TO SW1a-1
- W44 BROWN — TO SW1a-5
- W38 BROWN — TO LP208 of FM IF AMP P.C.B.



FM MPX BOARD MV

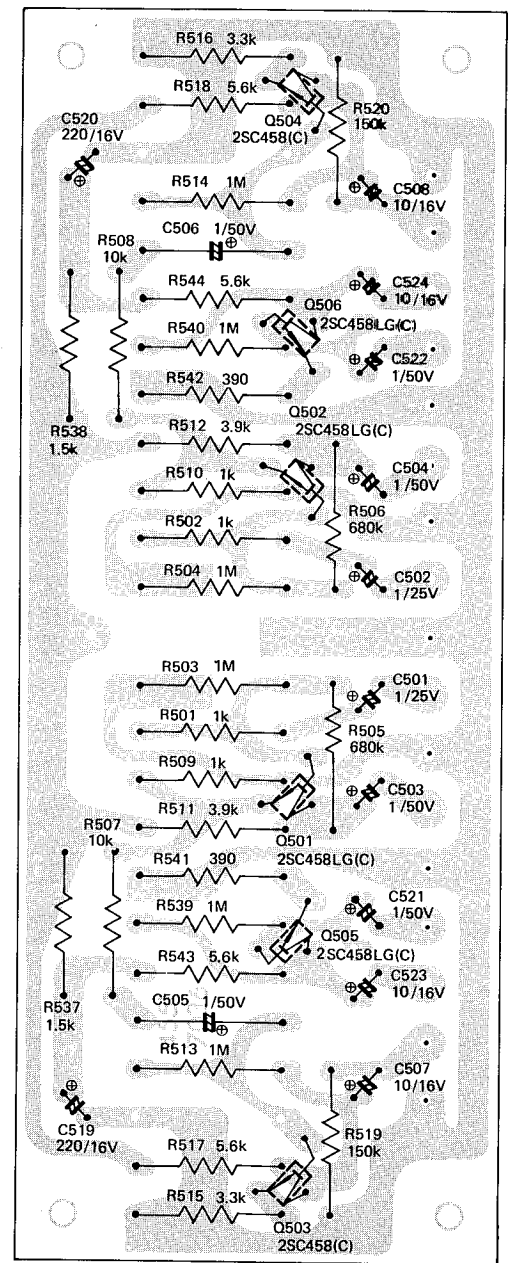
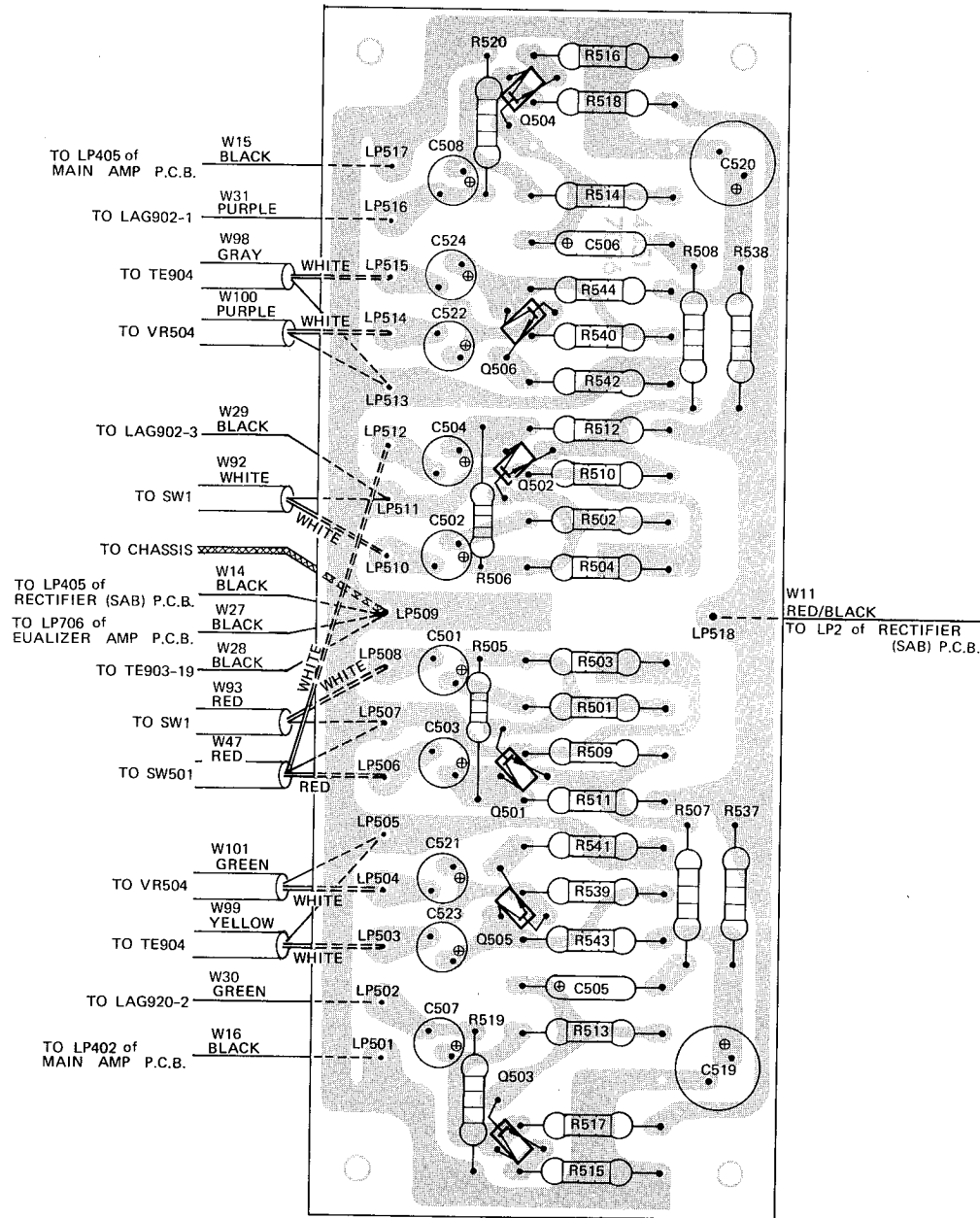


- W41 YELLOW/RED TO SW1a-11
- W40 YELLOW TO SW1b-11
- W53 ORANGE TO LP16 of INDICATOR LAMP HOLDER P.C.B.
- W39 RED TO LP12 of RECTIFIER (MAIN) P.C.B.
- W42 RED TO SW1b-1
- W37 WHITE/BLUE TO LP206 of FM IF AMP P.C.B.
- W43 BLUE TO SW1a-1
- W44 BROWN TO SW1a-5
- W38 BROWN TO LP206 of FM IF AMP P.C.B.

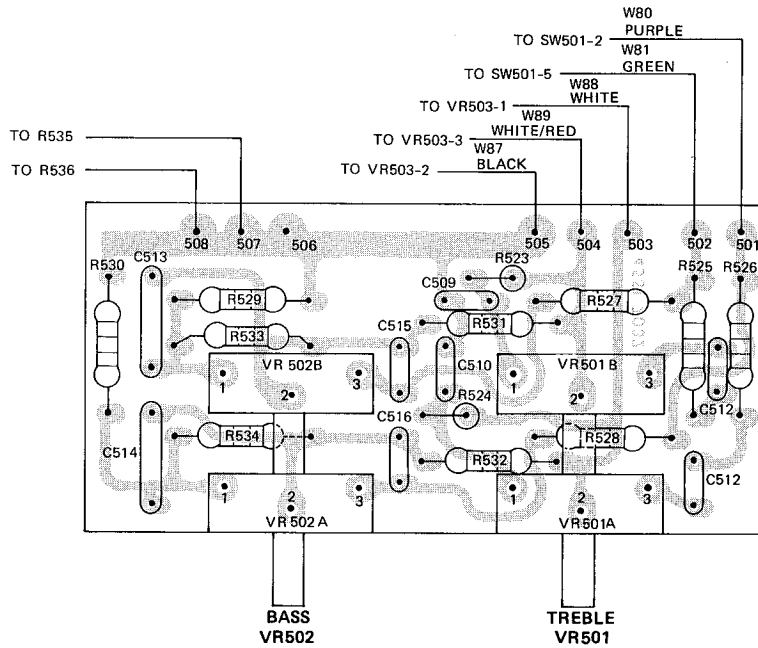


CONTROL AMP BOARD (COMPONENT SIDE)

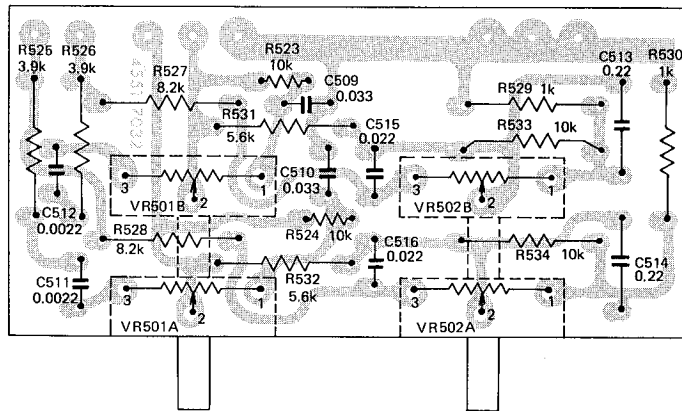
CONTROL AMP BOARD (CIRCUIT SIDE)



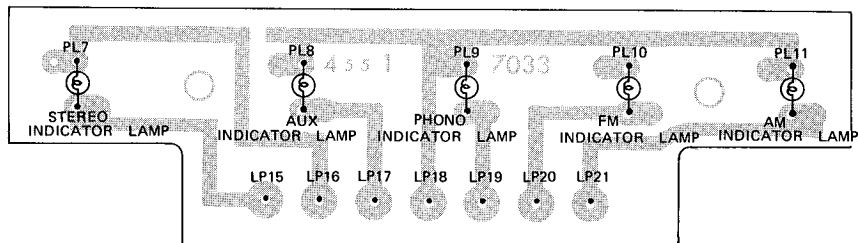
CONTROL BOARD (COMPONENT SIDE)



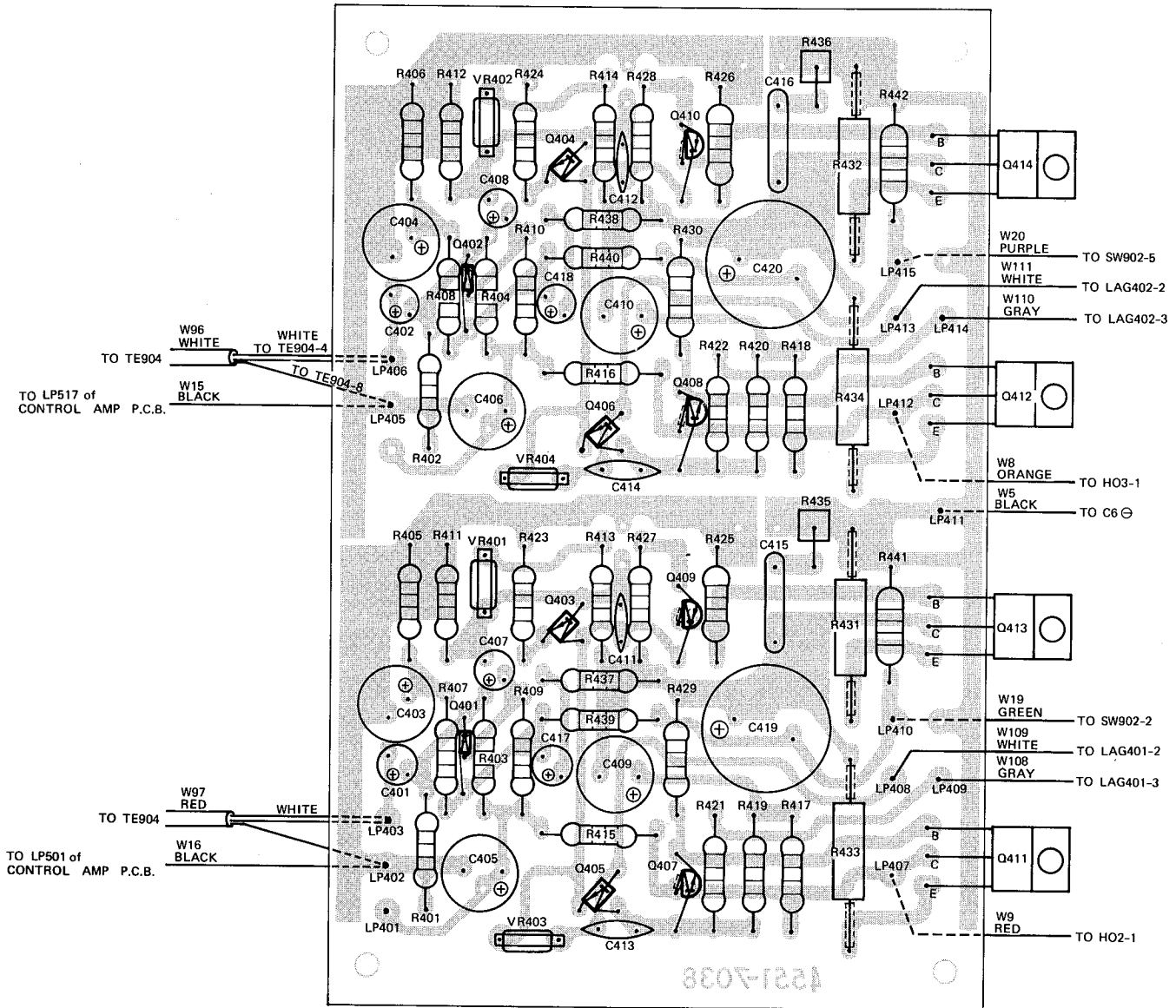
CONTROL BOARD (CIRCUIT SIDE)



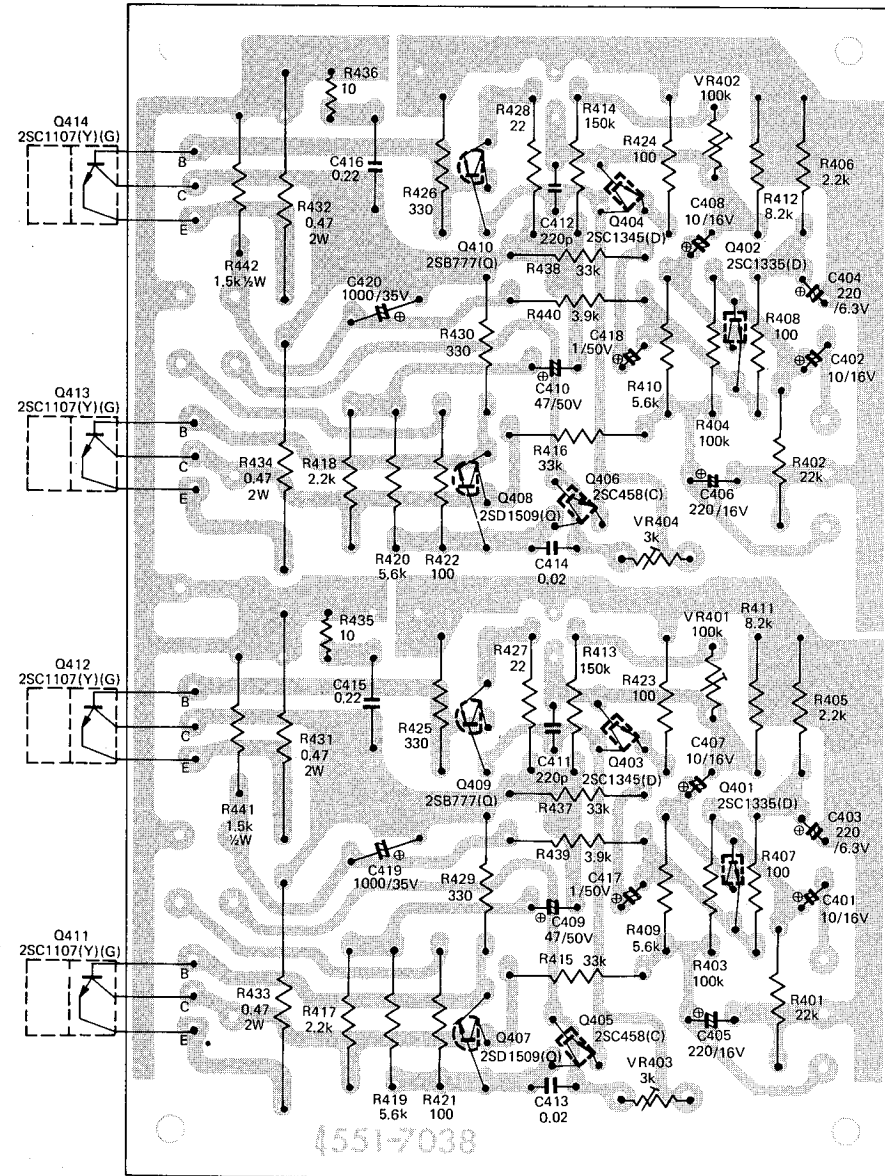
INDICATOR LAMP HOLDER BOARD



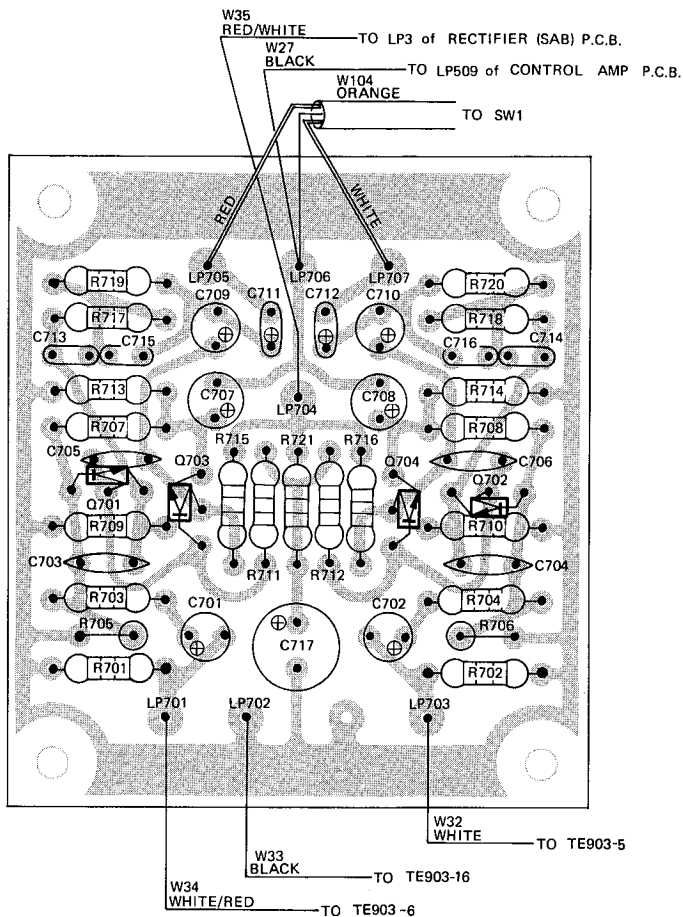
MAIN AMP BOARD (COMPONENT SIDE)



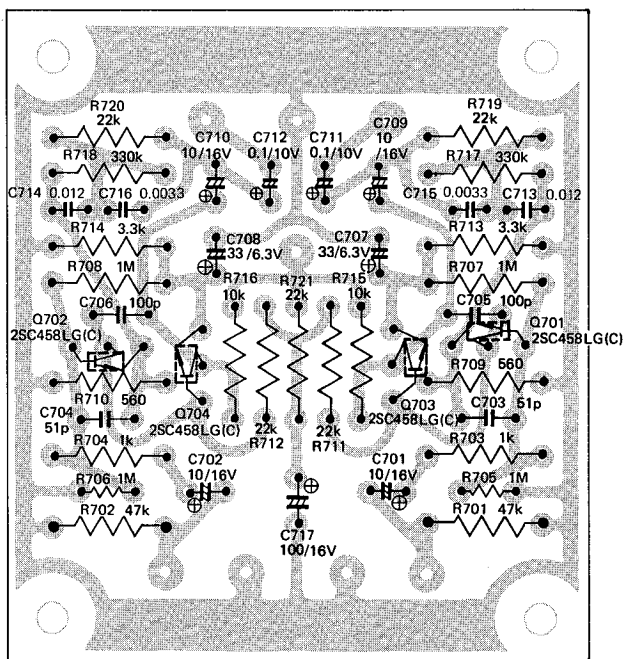
MAIN AMP BOARD (CIRCUIT SIDE)



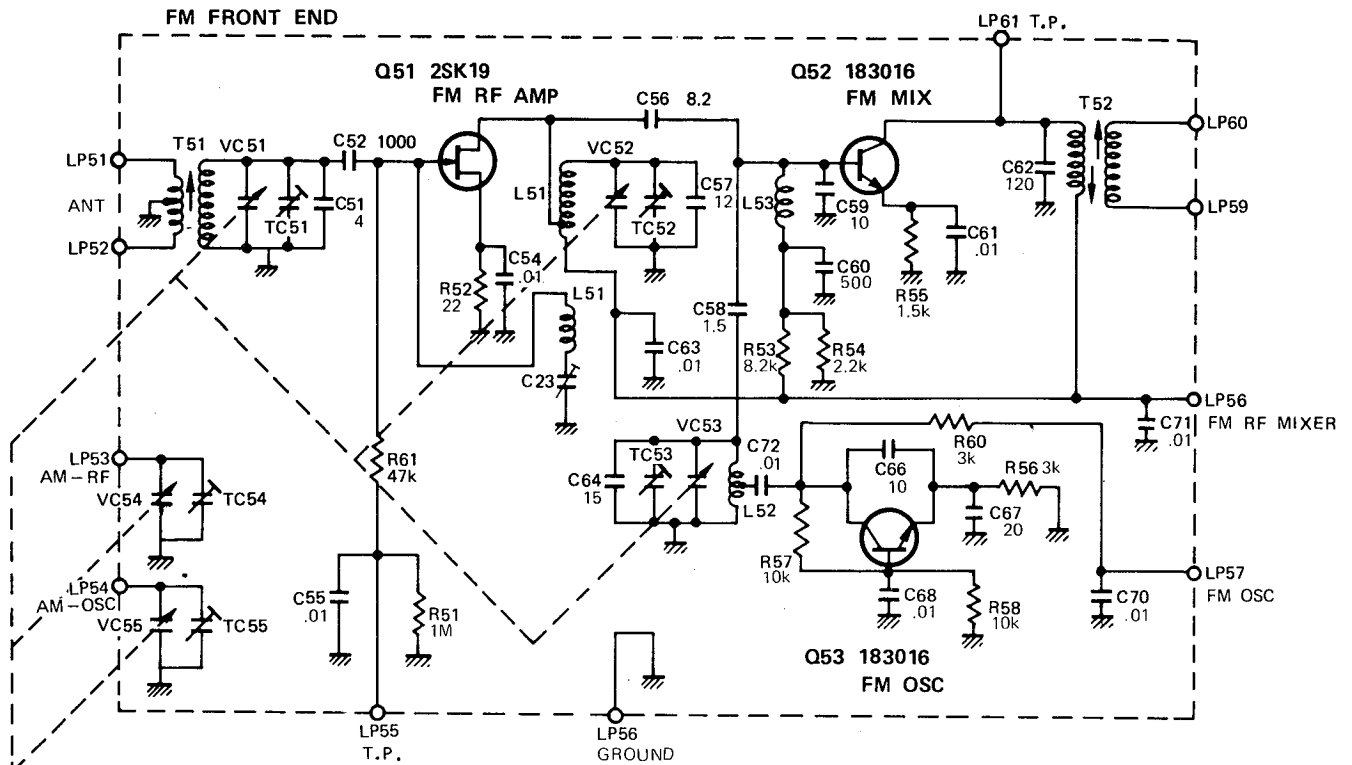
EQUALIZER AMP BOARD (COMPONENT SIDE)



EQUALIZER AMP BOARD (CIRCUIT SIDE)



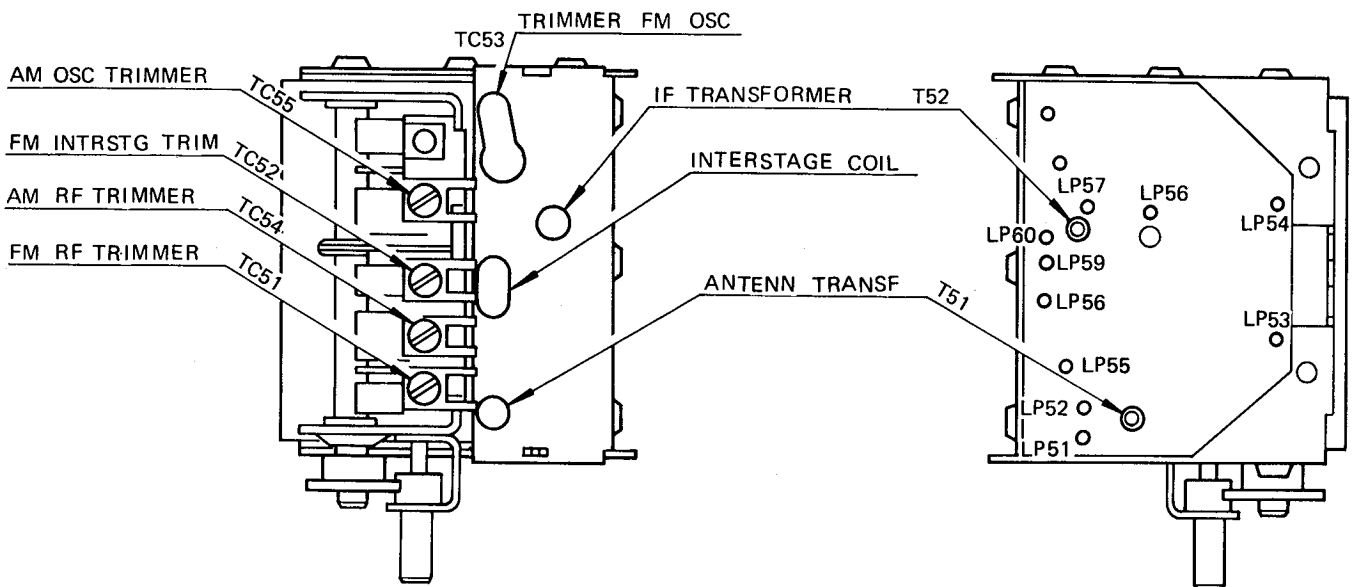
FM FRONT END BOARD



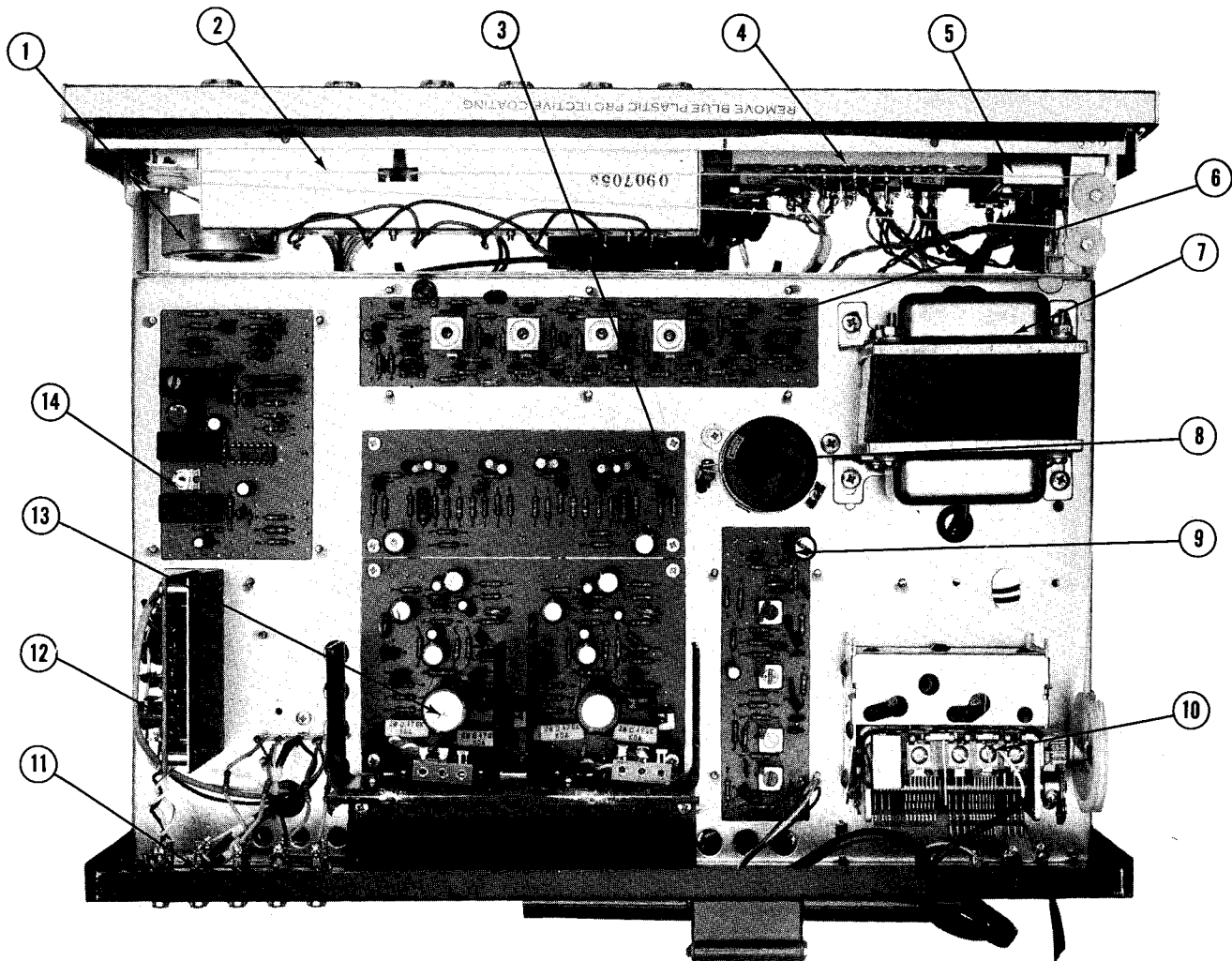
- NOTES:
1. ALL CAPACITANCE VALUES IN μF EXCEPT DECIMAL VALUES IN MF.
 2. ALL RESISTANCE VALUES IN OHMS.

TOP VIEW

BOTTOM VIEW

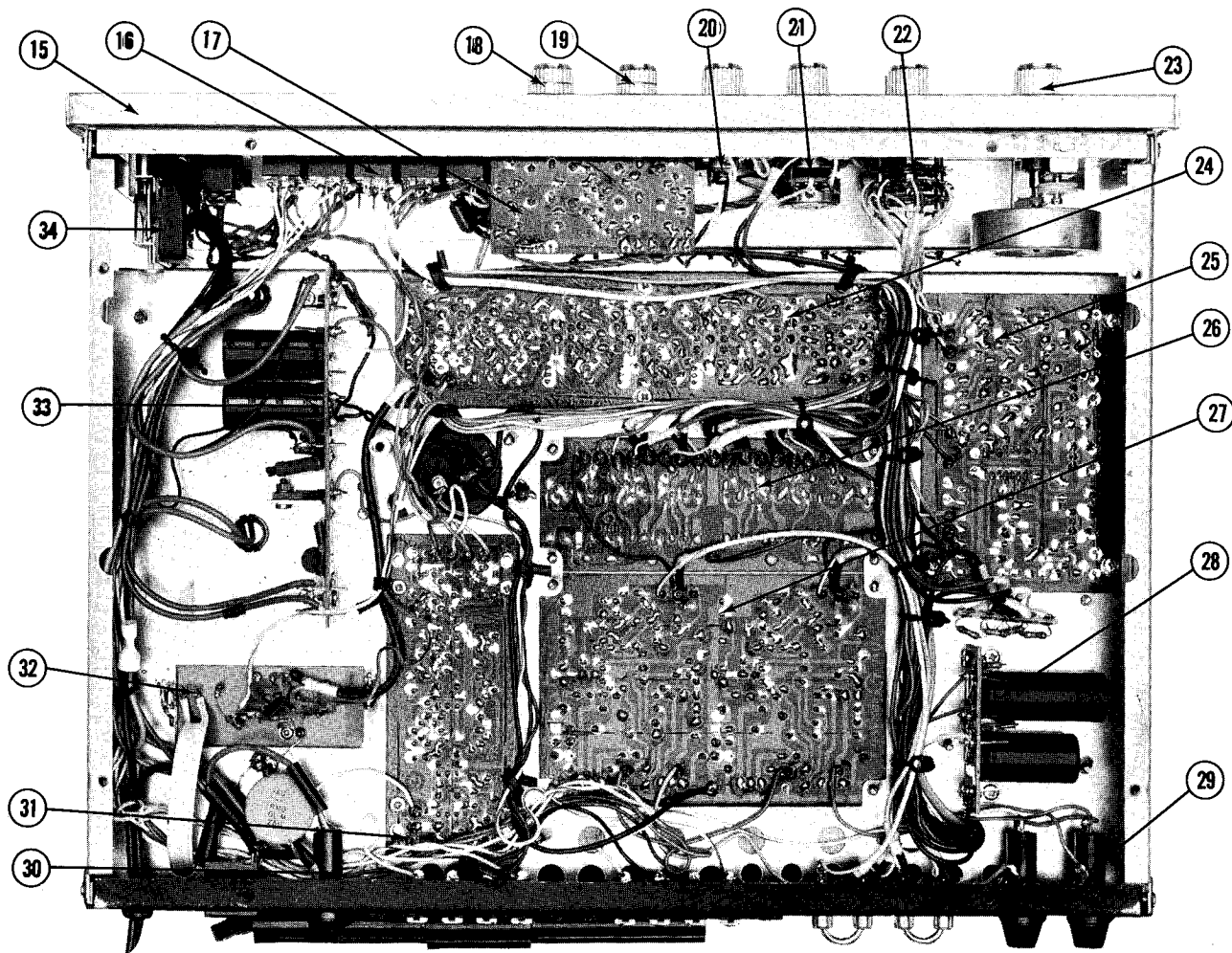


TOP VIEW



- | | | | |
|---|---------------------------------------|---|---|
| ① | FLYWHEEL | ⑧ | ELECTROLYTIC CAPACITOR, 2200 μ F, 63V |
| ② | LAMP HOUSING | ⑨ | AM TUNER P.C.B. (PG. 15) |
| ③ | CONTROL AMP P.C.B. (PG. 18) | ⑩ | VARIABLE CONDENSOR (PG. 23) |
| ④ | INDICATOR LAMP HOLDER P.C.B. (PG. 19) | ⑪ | INPUT & OUTPUT TERMINAL TE903 |
| ⑤ | TUNING INDICATOR M201, & LAMP PL5 | ⑫ | EQUALIZER AMP P.C.B. (PG. 22) |
| ⑥ | FM-IF AMP P.C.B. (PG. 13) | ⑬ | MAIN AMP P.C.B. (PG. 20 and 21) |
| ⑦ | POWER TRANSFORMER TI | ⑭ | FM MPX P.C.B. (PG. 16 and 17) |

BOTTOM VIEW



- | | | | |
|----|---------------------------|----|----------------------------------|
| 15 | FRONT PANEL | 25 | FM MPX P.C.B. (PG. 16 and 17) |
| 16 | ROCKER SW501-503,901,902 | 26 | CONTROL AMP P.C.B. (PG. 18) |
| 17 | CONTROL P.C.B. (PG. 19) | 27 | MAIN AMP P.C.B. (PG. 20 and 21) |
| 18 | BASS CONTROL | 28 | RECTIFIER (SUB) P.C.B. (PG. 14) |
| 19 | TREBLE CONTROL | 29 | SPEAKER FUSES FU2,FU3 |
| 20 | BALANCE CONTROL | 30 | AC FUSE FU1 |
| 21 | VOLUME CONTROL | 31 | AM TUNER P.C.B. (PG. 15) |
| 22 | FUNCTION SWITCH SW1 | 32 | VARIABLE CONDENSOR |
| 23 | TUNING | 33 | RECTIFIER (MAIN) P.C.B. (PG. 14) |
| 24 | FM-IF AMP P.C.B. (PG. 13) | 34 | POWER SWITCH SW2 |

REPLACEMENT PARTS LIST

REF. NO.	HK PART NO.	DESCRIPTION	REF. NO.	HK PART NO.	DESCRIPTION
POWER SOURCE			FM IF AMP		
C1,4,5	31129491	1000 μ F +50% – 10% 35V Electrolytic	CF201,202	12030549	Ceramic Filter, SFE 10.7mA
C2	31819227	2200 μ F +50% – 10% 35V Electrolytic	D201,202	41029290	Diode, 1N60, FM Detector
C6	31825664	2200 μ F +50% – 10% 63V Electrolytic	203,204, 205		
D1	41029498	Diode EQA01-30	D206,207	41030552	Diode, 1S2076, FM Ratio Detector
D2	42029566	Diode EQA01-13	T201	12030553	Transformer
D3,4,5,6	41029499	Diode V03(E)	Q201,202, 203,204, 205,206, 207	43029472	Transistor 2SC460(C) 1st thru 7th FM IF AMP
Q1	43025972	Transistor 2SC1212A(C) Voltage Rectifier	Q208	43030569	Transistor 2SC1335(E) FM Muting
T1	10130560	Transformer, Power, Export	VR201	23530558	250K ohm Variable Resistor
T1	10129497	Transformer, Power, Domestic	VR202	23530559	10K ohm Variable Resistor
D551-HK330K	00129462	Indicator Lamp Holder, P.C.B. Complete	M201	12529522	Meter, Tuning Indicator
D551-HK330H	00129460	Rectifier (Main) P.C.B. Complete	AM TUNER		
D551-HK330J	00129464	Rectifier (Sub) P.C.B. Complete	D251,252, 253,254	41029290	Diode, 1N60, AM Det
SW1	24029523	Function Switch	L251	12030563	Coil AM Antenna
SW2	24029514	Power Switch	L252	12030561	Coil AM OSC
SW3	25530562	Switch, Power Source Volt. Sel.	T251,252	10130556	Transformer AM IF
H01,2,3	65424895	Fuse Holder	T253	10130557	Transformer 3rd AM IF
FU1	45012856	Fuse 2.0A AC Power Export	Q251	43029471	Transistor 2SC461(C) AM Converter
FU1	45029684	Fuse 1.0A AC Power Domestic	Q252,253	43025972	Transistor 2SC460(C) 1st & 2nd AM IF AMP
FU2,3	45012953	Fuse 1.5A Power Output Protection	FM MPX		
TE1,2,3, 4,5	65429517	Terminal Dial & Tuning Indicator Lamp	CR301,302	21029766	CR Component B3EN0120
PL1,2,3, 4,5	46529502	Lamp, Dial & Tuning Indicator	VR301	23530554	3K ohm Variable Resistor
PL6	46529501	Lamp, 6.3V 50mA Power Switch Indicator	T301,302	10429769	Transformer Filter 19KHz
PL7,8,9, 10,11	46529500	Lamp, 60V 30mA Stereo AM FM, Phono Aux Indicator	T303	10429770	Transformer Filament 38kHz
FM FRONT END			Q301,302, 303	43030569	Transistor 2SC1335(E) FM MPX Output AMP
TE101	00229511	FM Front End, P.C.B. Complete	IC301	43130555	IC BA1310
4214-49	65129518	Antenna Terminal Strip			

REF. NO.	HK PART NO.	DESCRIPTION	REF. NO.	HK PART NO.	DESCRIPTION
MAIN AMP			EQUALIZER AMP		
RV401,402	38128541	Varistor MV11	Q701,702,	43025972	Transistor 2SC458LG(C)
VR401,402	23529513	100K ohm	703,704		1st & 2nd Equalizer AMP
VR403,404	23528597	3K ohm	SW901,902	25529515	Switch, SP System 1&2
Q401,402	43025972	Transistor 2SC1335(D) Pre Driver	TE903	65429520	Multi-Pin Jack (Input/Output Term.)
Q403,404	43029483	Transistor 2SC1345(D) Driver	TE904	65429521	4-Pin Jack, 4484-5
Q405,406	43025972	Transistor 2SC458(C) Bias Stabilization	CABINETRY		
Q407,408	43029484	Transistor 2SC1509(Q) Complement	A314-HK330	00229468	Top Cover
Q409,410	43029485	Transistor 2SA777(Q) Complement	A338-HK330	00229469	Front Panel Assembly
Q411,412, 413,414	43029486	Transistor 2SC1107(Y)(G) Power Output	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
CONTROL			CHASSIS		
VR501,502	21529526	Variable Resistor 50K ohm Bass, Treble	3602-HK330	00229470	Tuning Shaft Assembly
VR504	21529525	Variable Resistor 50K ohm Volume	2631-017006	60729510	Pointer, Dial
VR503	21529524	Variable Resistor 100K ohm Balance	MISCELLANEOUS		
Q501,502, 505,506	43025972	Transistor 2SC458LG(C) Tone AMP, Pre Output	1221-017032	90129508	Carton, Shipping
Q503,504		Transistor 2SC458(C) Tape Out AMP	1222-7032	90129509	Packing Cushion
SW501,502, 503	25529515	Switch, Contour, Tape, Mode			

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 Simultaneously 0.5% Total Harmonic Distortion (THD) at 50 – 20kHz	20 Watts RMS Per Channel	
2. Frequency Response Stereo Mode	8 Ohm Loads Both Channels Driven Simultaneously at 1.0 Watt per channel	10 Hz to 35 KHz	
3. Hum and Noise	0dB = .775 VRMS Reference Phono Aux. Tape MON 1 Residual	-30dB min. -35dB min. -50dB min.	
4. Sensitivity	20 Watts, 8 Ohm Load, 1KHz Tape MON Aux Phono	530 to 750mV 160 to 300mV 4.0 mV max.	
5. Phono Overload	1KHz	45mV min.	
6. Limiter Saturation	±75KHz -3dB	10μV max.	
7. IHF Sensitivity (Usable Sensitivity)	3% THD, 300 Ohm Source ±75KHz 90, 98, 106MHz	8μV max.	
8. MPX Separation	100% 1 Channel only Modulated 1000μV RF Input 100Hz 1KHz 10KHz	25dB min. 35dB min. 20dB min.	