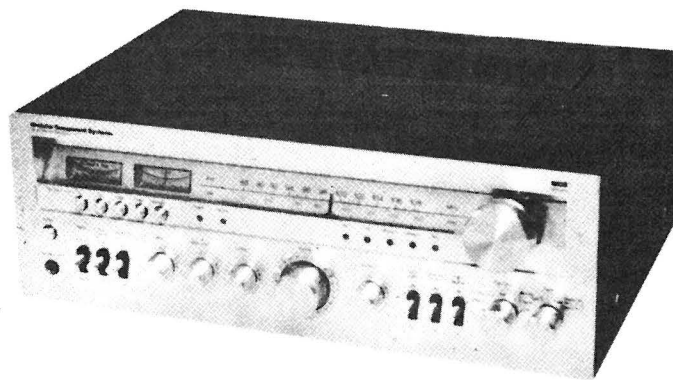


JCPenney

Technical Service Data

AM/FM/FM - MPX STEREO RECEIVER Model No. 3233 Catalog No. 853-0743 Product Service No. 683-3233-00

CPT
27995



Form No. CM-112 Revision A

Form No. CM-112 Revision A

Specifications	
Power Source	AC 120 volts, 60 Hz
Power Consumption	135W
Output Power	33W RMS X2 (at 0.8% THD)
IC	HA1137, HA1156, HA1197.
Transistors & FET	3SK 45(C) 2SC535(B) 2SC461(C) 2SA844(D) 2SC945(P) 2N-3055 2N6554 MPS-A13 LBC557 2N-2955 MPS-9434 H 2SC900(E) or (F) & 2SC1335(D) 2SC460(C) 2N6551
Diodes & Rectifiers	IS2076, IS2790WT, WZ -120, IN4002, MR-502, IN-60
Frequency Response	20-20,000Hz (at 0.8% THD 33W)
Inputs	Phono 1: 45k ohm, Phono 2: 1M ohm Tape : 100k ohm, AUX : 45k ohm
Outputs	EXT Speaker 8 ohm, Stereo Headphone 8 ohm, Tape 10k ohm
Dimensions	W 47.6cm (18 $\frac{3}{4}$ ") x H 38.1cm(15") x D 42cm(16 $\frac{1}{2}$ ")
Weight	11.36kg (25 lbs)
Tuner Section	
Frequency Range	AM: 530-1600kHz, FM: 88-108MHz
Intermediate Frequency	AM: 455kHz, FM: 10.7MHz
Sensitivity	AM: 200uV/M/500mW, FM: 2uV/500mW (IHF)

Disassembly Instructions

To Remove Wood Cabinet

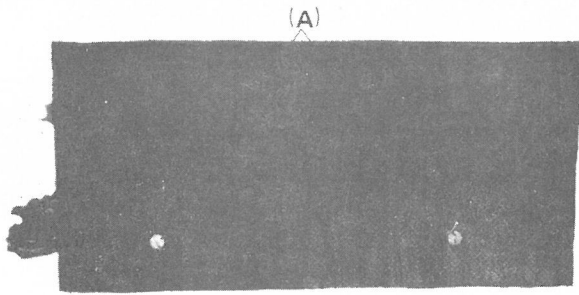


Figure 1

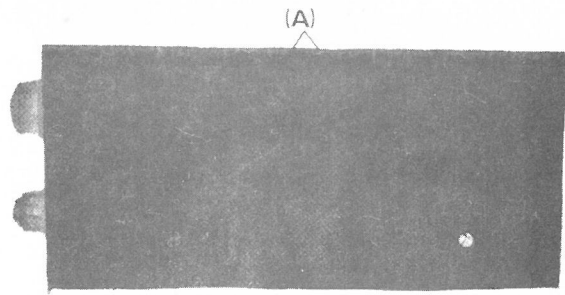


Figure 2

1. Remove 4 screws (A), from the left and right side of wood cabinet (Figure 2).
2. Remove wood cabinet. See Figure 3.

To Remove Front Escutcheon

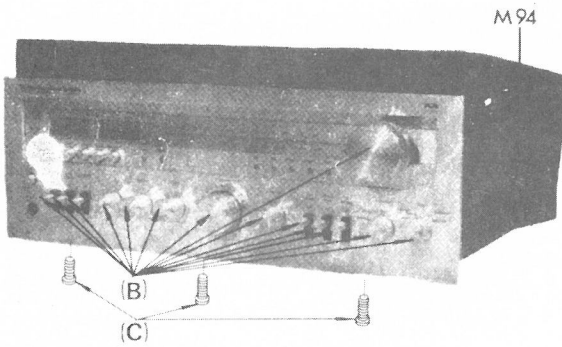


Figure 3

1. Remove 14 knobs (B).
2. Remove 3 mounting screws (C), see Figure 3.
3. Remove front escutcheon.

To Remove Bottom Cover

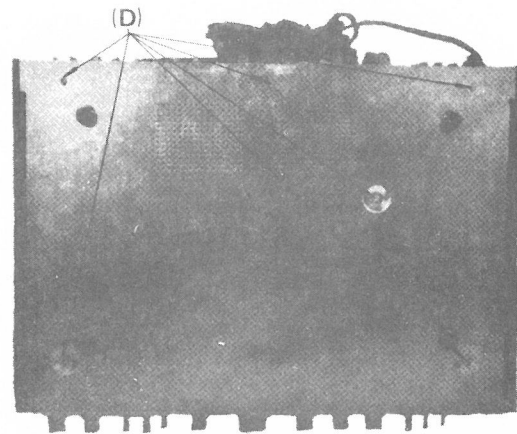
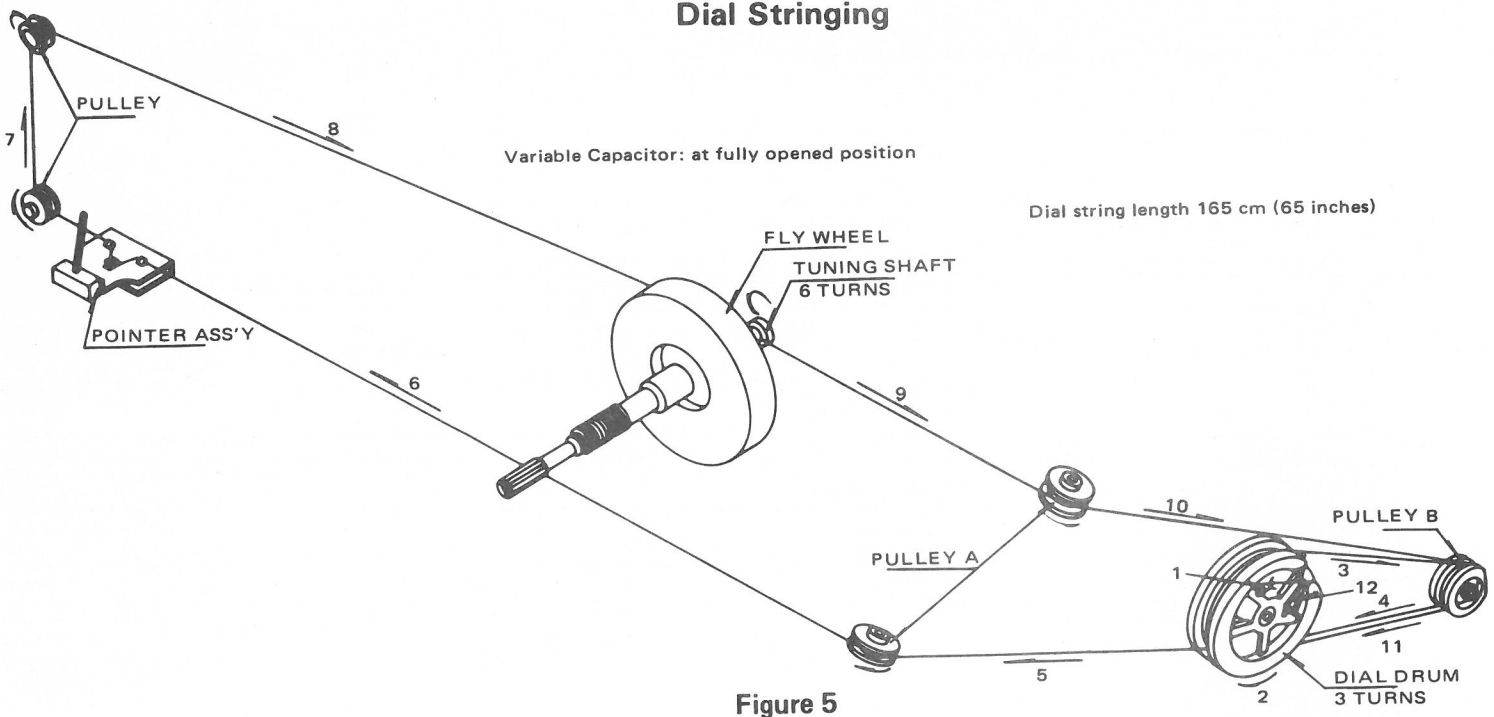


Figure 4

1. Remove 6 mounting screws (D) as shown in Figure 4.
2. Remove bottom cover.

Dial Stringing



The voltages at the emitters of Q513, Q514, Q515, and Q516 should not be measured to ground. The correct voltage is 4mV between the emitters of Q513 and Q515, and 4mV between the emitters of Q516 and Q514.

Idle Current Adjustment

The idle current of the output stage of these amplifiers should be checked whenever the amplifier board is serviced. The proper procedure for adjusting each channel is as follows:

- (1) Ground the wiper of the left volume control with a clip lead.
- (2) Connect the negative lead of a digital voltmeter to the emitter of Q516, and the positive lead to the emitter of Q514.
- (3) Set the voltmeter to the +1 Vdc (or a more sensitive) scale.
- (4) Adjust the left channel bias pot (VT6) to obtain 4 millivolts \pm 1mV.
- (5) Ground the right volume control wiper. Connect the negative lead of the voltmeter to the emitter of Q515, and the positive lead to the emitter of Q513. Adjust the right channel bias pot (VT5) to obtain 4mV \pm 1mV.
- (6) The output current is now set for approximately 6mA \pm 1mA (4mV across 0.66 ohms).

Note: There is no equivalent to the output balance control used in tube type push-pull circuits. The output dc level is clamped to near zero by the differential amplifiers Q504 and Q503.

Tuner Alignment

AM IF Alignment

Output of signal generator should be no higher than necessary to obtain an output reading.					
1. Set Function switch to AM.		4. Set Balance control to center.			
2. Set Volume control to maximum.		5. Set Speaker selector to A.			
3. Set Bass, Treble control to center.		6. Maintain line voltage at 120 volts.			
Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks
AM IF Sweep Generator connected to a standard radiating loop	Sweep centered 455 kHz	Oscilloscope Test point TP 1 (P15)	Minimum frequency	AT-2: 1st AM IF 2nd AM IF	Adjust for maximum output Refer to Figure 7
				Refer to Figure 6	
				AT-3: 3rd AM IF Refer to Figure 6	
Repeat adjustments as necessary for maximum sensitivity					

- Note: 1. Remove line cord antenna from FM external antenna terminal when aligning.
2. Make certain that speaker system or 8-ohm dummy load is connected to the left Sp. jack when aligning.

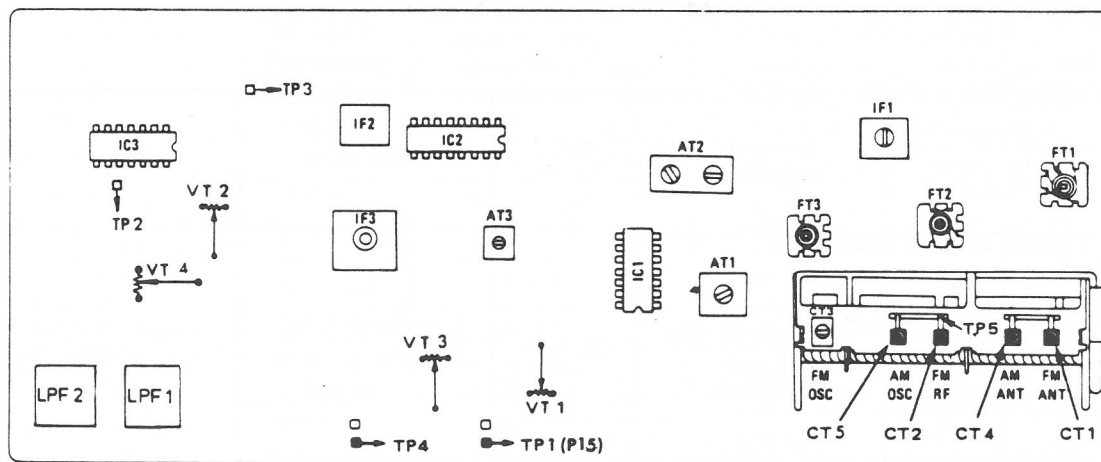


Figure 6

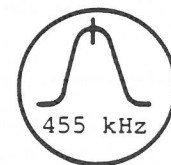


Figure 7

AM RF Alignment

Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks	
AM Signal Generator connected to a standard radiating loop	525 kHz (Modulated)	Output meter across left speaker jack (using 8 ohm resistive load)	525 kHz (low end)	AT-1 OSC coil Refer to Figure 6	Adjust for maximum output	
	1650 kHz (Modulated)		1650 kHz (High end)	CT-5 OSC trimmer Refer to Figure 6		
	Repeat adjustments as necessary to obtain frequency range					
	600 kHz (Modulated)	Output meter across left speaker jack (using 8 ohm resistive load)	600 kHz	AL-1 Antenna coil Refer to Figure 12		
	1400 kHz (Modulated)		1400 kHz	CT-4 Antenna trimmer Refer to Figure 6		
	Repeat adjustments as necessary to minimize tracking error					

AM Signal Meter Alignment

Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks
AM Signal Generator connected to a standard radiating loop	AM 1000 kHz 30% 100mV (modulated)	Output meter across left SP. jack (using 8 ohm resistive load)	1000 kHz	VT-1 AM meter Semi-Fixed resistor.	Adjust for signal meter 90% scale.

FM Signal Meter Alignment

Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks
FM Signal Generator connected to EXT ant. terminal. Matching network used (Refer to Figure 8).	98 MHz 100 mV 75 kHz (modulated)	Output meter across left SP. jack (using 8 ohm resistive load)	98 MHz	VT-3 FM meter Semi-Fixed resistor.	Adjust for signal meter 100% scale.

FM IF Alignment

<p>Equipment Required</p> <ol style="list-style-type: none"> 1. Signal generator that provides 10.7 MHz marker. 2. Sweep generator that provides 10.7 MHz center frequency and 400kHz sweep width. 3. Oscilloscope <p>Set sweep selector of oscilloscope to external sweep. Apply 60Hz sweep signal from sweep generator to horizontal input terminals of oscilloscope. Set Function switch to FM. Set Volume control to minimum. Set Bass, midrange treble controls to center. Set Balance control to center. Maintain line voltage at 120 volts.</p>					
Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks
FM IF sweep generator connected to .1uF to point TP 5 (Refer to figure 6). Common to chassis.	Sweep centered 10.7 MHz	Oscilloscope <u>Test point TP 4.</u>	Maximum Frequency	IF-1 Refer to Figure 6	Adjust for maximum amplitude and proper linearity between ± 100 kHz Markers. (Refer to Figure 9)
		Test point TP3		IF-3 (upper coil and lower coil) Refer to Figure 6	Adjust IF-3 (upper coil and lower coil) for 10.7MHz marker at the center. (Refer to Figure 10)

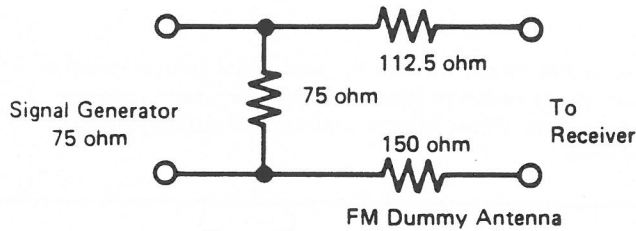


Figure 8

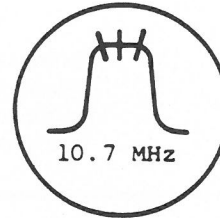


Figure 9

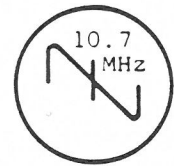


Figure 10

FM RF Alignment

<p>Output of signal generator should be no higher than necessary to obtain an output reading.</p> <ol style="list-style-type: none"> 1. Set Function Switch to FM. 2. Set Volume Control to center. 3. Set Bass, midrange treble controls to center. 4. Set Balance control to center. 5. Set Speakers Selector to A. 6. Maintain line voltage at 120 volts. 						
Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks	
FM Signal Generator connected to EXT ant. terminal. Matching network used (Refer to Figure 8).	87 MHz (modulated)	Output meter across left SP. jack (using 8 ohm resistive load)	87 MHz (low end)	FT-3 OSC Coil	Adjust for maximum output	
	109 MHz (modulated)		109 MHz (high end)	CT -3 OSC Trimmer		
	Repeat adjustments as necessary to obtain frequency range					
	90 MHz (modulated)	Output meter across left SP. jack (using 8 ohm resistive load)	90 MHz	FT-2 RF coil		
	106 MHz (modulated)		106 MHz	CT-2 RF Trimmer		
	Repeat adjustments as necessary to minimize tracking error					
	90 MHz (modulated)	Output meter across left SP. jack (using 8 ohm resistive load)	90 MHz	FT-1 Antenna coil		
	106 MHz (modulated)		106 MHz	CT -1 Antenna Trimmer		
	Repeat adjustments as necessary to minimize tracking error					

FM TUNING METER ALIGNMENT

Signal Source	Signal Generator Frequency	Alignment Indicator Frequency	Dial Setting	Adjustment	Remarks
FM signal generator connected to EXT ant. terminal Matching network used (Refer to figure 8).	10.7 MHz Input level: 100 mV	VTVM & Distortion meter across SP. jack (using 8 ohms resistive load)	Low End	IF-3 Lower coil (Refer to figure 6).	Adjust for center of tuning meter
	98 MHz Input level: 1 mV ± 75 KHz dev. (modulated)		98 MHz	IF-3 Upper coil (Refer to figure 6).	Adjust for minimum reading on distortion meter.

FM-MPX Alignment

Equipment Required:

1. Stereo modulator . . . Connect stereo modulator output to EXT mod. terminal of signal generator.
2. Signal generator . . . Modulation rate by pilot signal10%
Modulation rate by main signal (L + R)45%
Modulation rate by sub signal (L - R)45%

3. Frequency counter
4. Oscilloscope
5. Dummy antenna
6. VTVM

Procedure

Tuner Select switch to FM dial setting to approx. 98MHz, bass treble control to center, balance control to center, mode switch to stereo, filter switch to off, loudness switch to off, speaker A position, adjust volume control until output level of both channels becomes equal.

Item	Signal Source	Signal Generator Frequency	Alignment Indicator	Dial Setting	Adjustment	Remarks
Adjustment of pilot signal	FM Signal Generator connected to EXT ant. terminal. Matching network used.	98 MHz 30 uV	Frequency counter connected to TP-2, Common to chassis	98 MHz	VT-2	*Set stereo (L + R) modulation to zero. *Measure pilot signal only and adjust for 19kHz ±50Hz.
Adjustment of separation		98 MHz 60 uV Modulation L signal	Output meters across left and right SP. jack (using 8 ohm resistive loads)	98 MHz	VT-4	*Adjust volume control until the output voltage of Left Ch. reaches 2.0V. *Modulate R signal only and adjust VT-4 until the output of Left Ch. is minimum. *Modulate L signal only and adjust VT-4 so that Right Ch. output is minimum.
Test of stereo indicator triggering level		98 MHz 60 uV Modulation L signal	Output meter across left SP. jack (using 8 ohm resistive load)	98 MHz	VT-4	* Adjust output of signal generator and make sure that stereo indicator lights at 2-3 uV.

Note: When aligning, remove line cord antenna attached to external FM antenna terminal.

MEMO

A series of horizontal dotted lines for writing.

Schematic Diagram

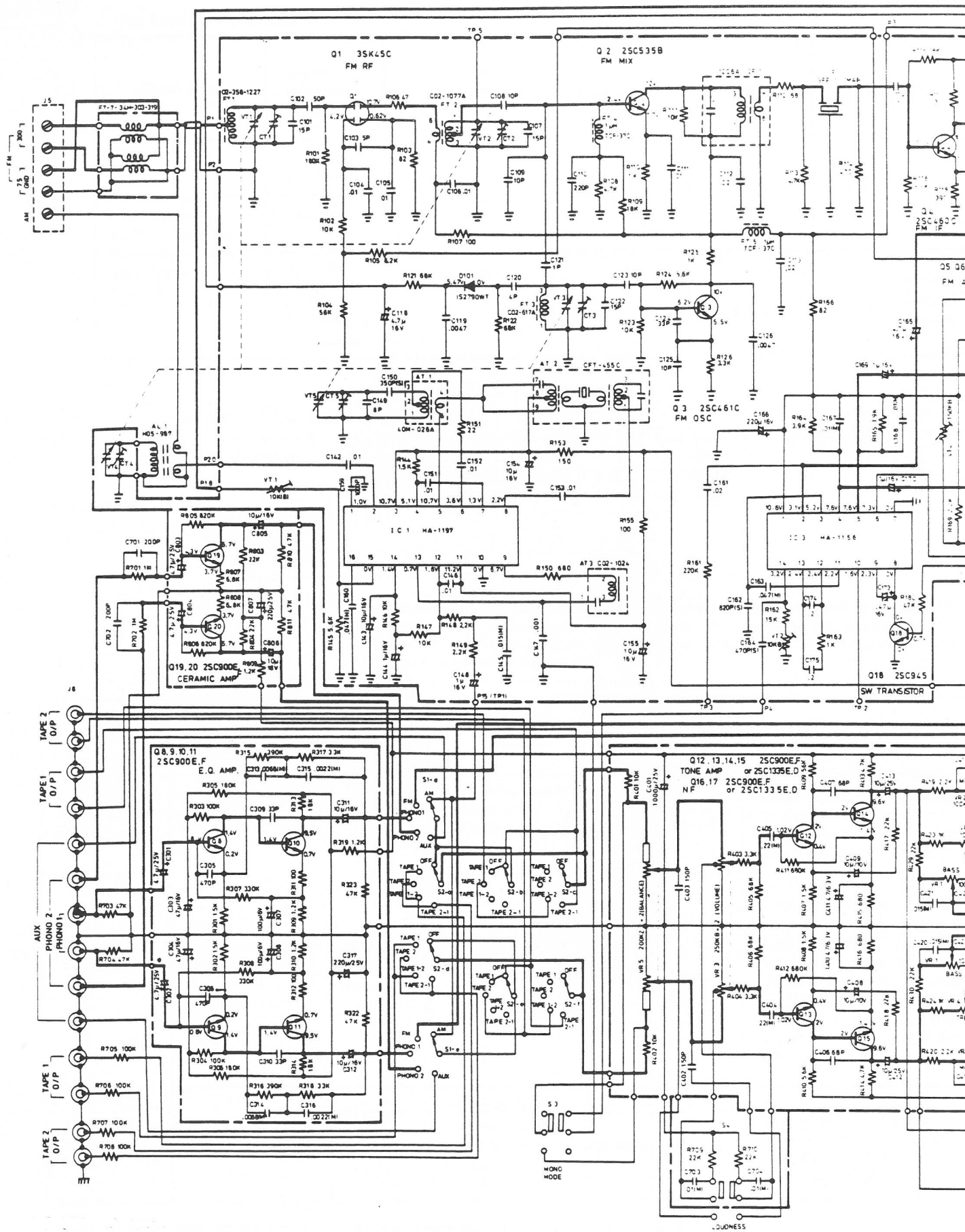


Figure 11

Schematic Diagram

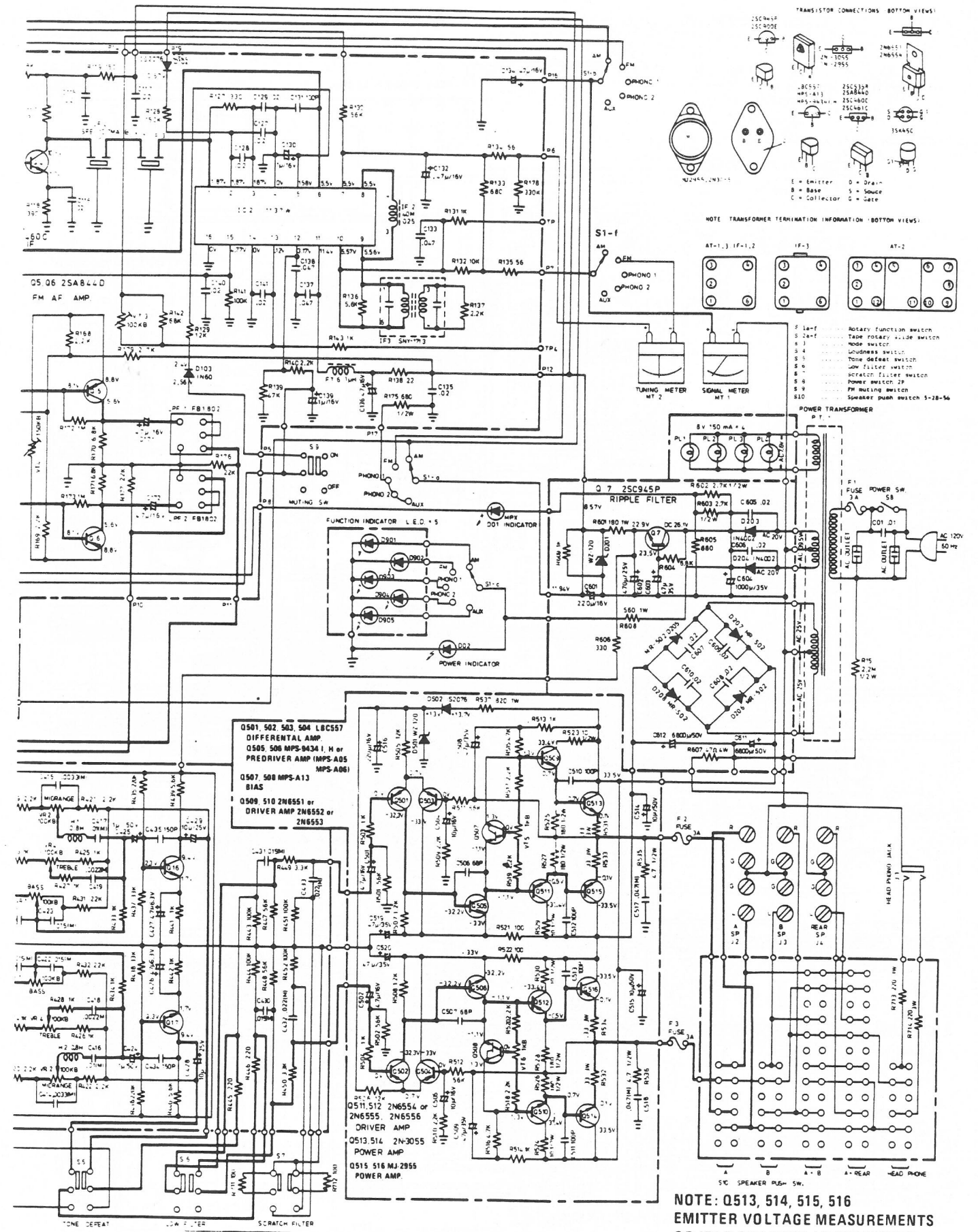


Figure 11

Wiring Diagram

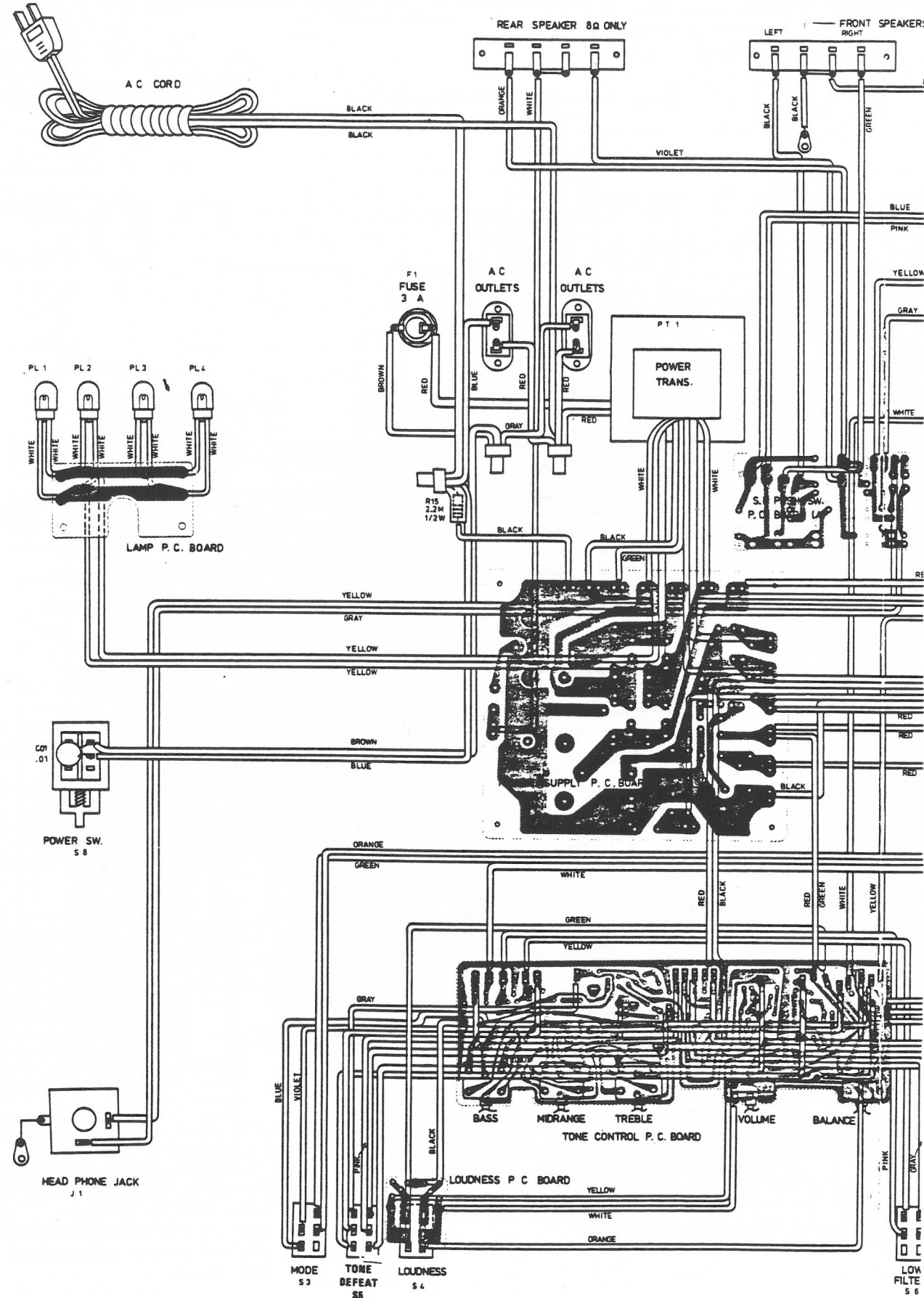


Figure 12

Wiring Diagram

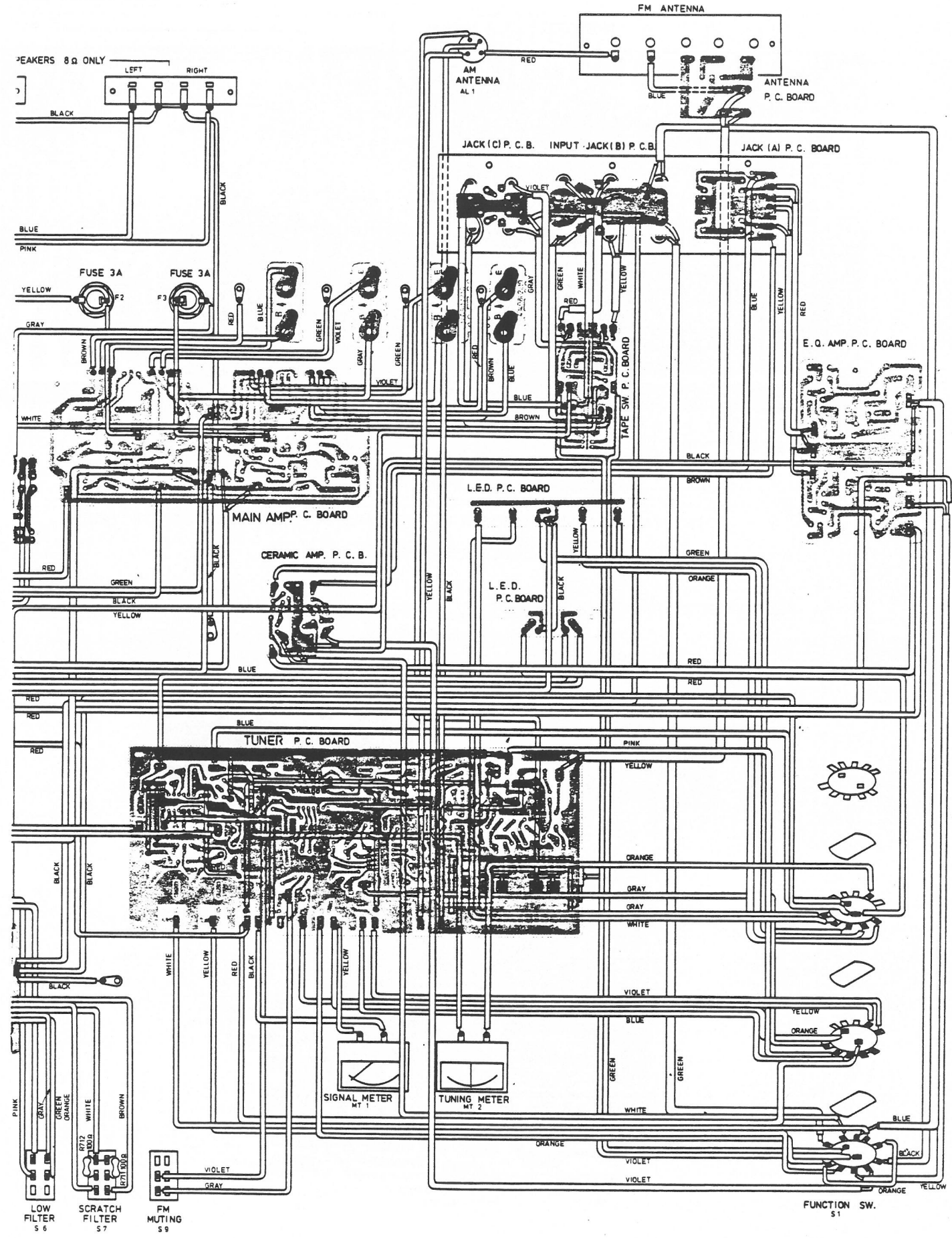


Figure 12

Figure 12

Main Amp P C Board – Solder Side

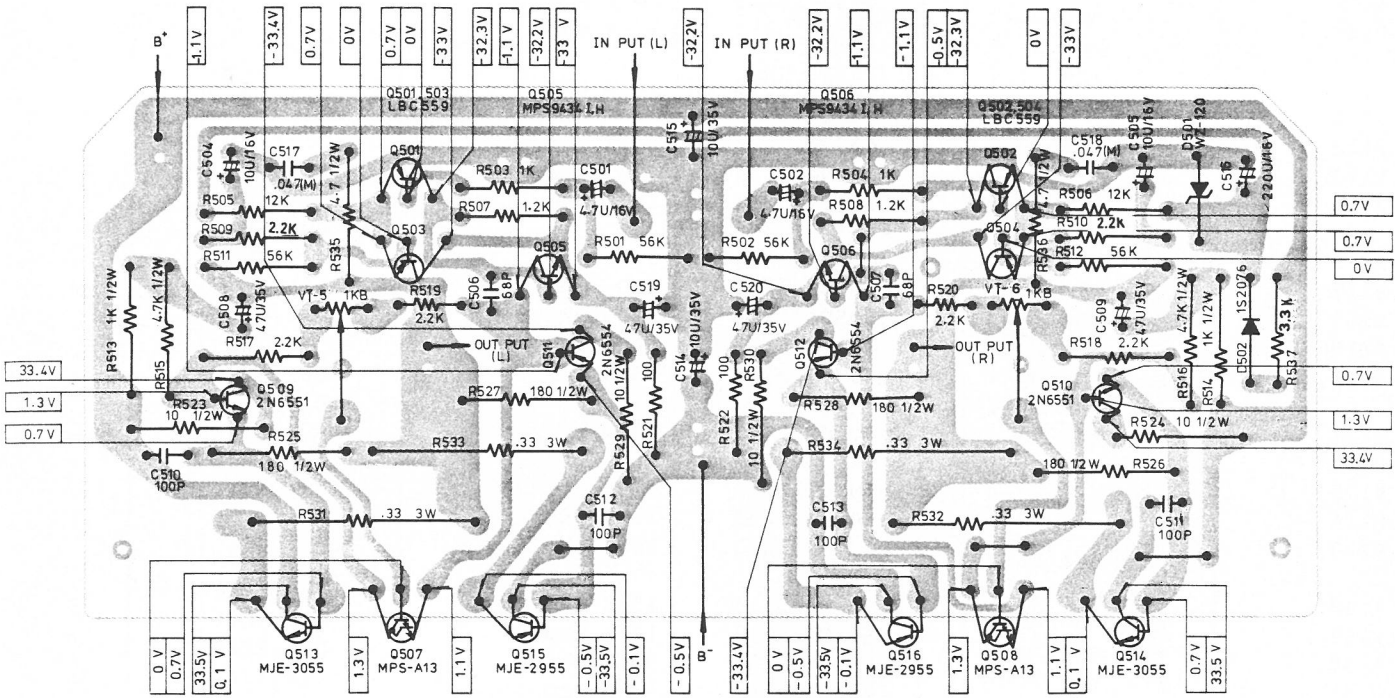


Figure 20

NOTE: VALUES INDICATED IN ARE DC VOLTAGES BETWEEN THE CHASSIS AND ELECTRICAL PARTS.

**Replacement Parts List
Resistors**

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Resistors are carbon type $\pm 10\%$ and $\frac{1}{4}$ watt unless otherwise noted.			
R101		4050418413	180K ohm
R102		4050410313	10 K ohm
R103		4050482013	82 ohm
R104		4050456313	56 K ohm
R105		4050482213	8.2K ohm
R106		4050447013	47 ohm
R107		4050410112	100 ohm
R108		4050447213	4.7K ohm
R109		4050418313	18 K ohm
R110		4050410213	1 K ohm
R111		4050410313	10 K ohm
R112		4050468012	68 ohm
R113		4050447213	4.7K ohm
R114		4050447113	470 ohm
R115		4050418313	18 K ohm
R116		4050433213	3.3K ohm
R117		4050433113	330 ohm
R118		4050439113	390 ohm
R119		4050415113	150 ohm
R121,122		4050468313	68 K ohm
R123		4050410313	10 K ohm
R124		4050456213	5.6K ohm
R125		4050410212	1 K ohm
R126		4050433213	3.3K ohm
R127		4050433113	330 ohm
R128		4050415413	150K ohm
R129		4050412313	12 K ohm
R130		4050456313	56 K ohm
R131		4050410213	1 K ohm
R132		4050410313	10 K ohm
R133		4050468113	680 ohm
R134,135		4050456013	56 ohm
R136		4050456212	5.6K ohm
R137		4050422212	2.2K ohm
R138		4050422012	22 ohm
R139		4050447313	47 K ohm
R140		4050422212	2.2K ohm
R141		4050410413	100K ohm
R142		4050468313	68 K ohm
R143		4050410213	1 K ohm
R144		4050415213	1.5K ohm
R145		4050456213	5.6K ohm
R146,147		4050410313	10 K ohm
R148,149		4050422212	2.2K ohm
R150		4050468112	680 ohm
R151		4050422013	22 ohm
R153		4050415112	150 ohm
R155		4050410112	100 ohm

Resistors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Resistors are carbon type $\pm 10\%$ and $\frac{1}{4}$ watt unless otherwise noted.			
R161		4050422413	220K ohm
R162		4050415313	15 K ohm
R163		4050410213	1 K ohm
R164,165		4050439213	3.9K ohm
R166		4050482013	82 ohm
R168,169		4050422213	2.2K ohm
R170,171		4050468213	6.8K ohm
R172,173		4050410513	1 M ohm
R175		4050268112	680 ohm $\frac{1}{2}W$
R176,177		4050422313	22 K ohm
R178		4050433413	330K ohm
R179		4050427213	2.7K ohm
R180		4050447313	47K ohm
R301,302		4050415213	1.5K ohm
R303,304		4050410413	100K ohm
R305,306		4050418413	180K ohm
R307,308		4050433413	330K ohm
R309,310		4050412213	1.2K ohm
R311,312		4050410113	100 ohm
R313,314		4050418313	18 K ohm
R315,316		4050439453	390K ohm $\pm 5\%$
R317,318		4050433353	33 K ohm
R319		4050412213	1.2K ohm $\pm 10\%$
R322,323		4050447313	47 K ohm
R401,402		4050410353	10 K ohm $\pm 5\%$
R403,404		4050433253	3.3K ohm $\pm 5\%$
R405,406		4050468353	6.8K ohm $\pm 5\%$
R407,408		4050415253	1.5K ohm $\pm 5\%$
R409,410		4050456353	56 K ohm $\pm 5\%$
R411,412		4050468453	680K ohm $\pm 5\%$
R413,414		4050447253	4.7K ohm $\pm 5\%$
R415,416		4050468153	680 ohm $\pm 5\%$
R417,418		4050422353	22 K ohm $\pm 5\%$
R419,420		4050422253	2.2K ohm $\pm 5\%$
R421,422		4050422253	2.2K ohm $\pm 5\%$
R423,424,425		4050410253	1 K ohm $\pm 5\%$
R426,427,428		4050410253	1 K ohm $\pm 5\%$
R429,430		4050422353	22 K ohm $\pm 5\%$
R431,432		4050422353	22 K ohm $\pm 5\%$
R433,434		4050410253	1 K ohm $\pm 5\%$
R435,436		4050422453	220K ohm $\pm 5\%$
R437,438		4050433353	33 K ohm $\pm 5\%$
R439,440		4050456253	5.6K ohm $\pm 5\%$
R441,442		4050410253	1 K ohm $\pm 5\%$
R443,444		4050410453	100K ohm $\pm 5\%$
R445,446		4050422153	220 ohm $\pm 5\%$
R447,448		4050456353	56 K ohm $\pm 5\%$
R449,450		4050433253	3.3K ohm $\pm 5\%$
R451,452		4050410453	100K ohm $\pm 5\%$

Resistors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Resistors are carbon type $\pm 10\%$ and $\frac{1}{4}$ watt unless otherwise noted.			
R501,502		4050456312	56 K ohm
R503,504		4050410212	1 K ohm
R505,506		4050412312	12 K ohm
R507,508		4050412212	1.2K ohm
R509,510		4050422212	2.2K ohm
R511,512		4050456312	56 K ohm
R513,514		4050210212	1 K ohm $\frac{1}{2}W$
R515,516		4050247212	4.7K ohm $\frac{1}{2}W$
R517,518		4050422212	2.2K ohm
R519,520		4050422212	2.2K ohm
R521,522		4050410112	100 ohm
R523,524		4050210012	10 ohm $\frac{1}{2}W$
R525,526		4050218112	180 ohm $\frac{1}{2}W$
R527,528		4050218112	180 ohm $\frac{1}{2}W$
R529,530		4050210012	10 ohm $\frac{1}{2}W$
R531,532		4053033852	.33 ohm 3W $\pm 5\%$ cement
R532,533		4053033852	.33 ohm 3W $\pm 5\%$ cement
R535,536		4050247912	4.7 ohm $\frac{1}{2}W$
R537		4051082112	820 ohm 1W
R601		4071018112	180 ohm 1W Metal oxide film
R602,603		4050227212	2.7K ohm $\frac{1}{2}W$
R604		4050468213	6.8K ohm
R605		4050468113	680 ohm
R606		4050433113	330 ohm
R607		4074047012	47 ohm 4W Metal oxide film
R609		4050410213	1 K ohm
R701,702		4050410513	1 M ohm
R703,704		4050447313	47 K ohm
R705,706		4050410413	100K ohm
R707,708		4050410413	100K ohm
R709,710		4050422313	22 K ohm
R711,712		4050410113	100 ohm
R713,714		4053022112	220 ohm 3W
R715		4051056112	560 ohm 1W
R803,804		4050422353	22 K ohm $\pm 5\%$
R805,806		4050482453	820K ohm $\pm 5\%$
R807,808		4050468253	6.8K ohm $\pm 5\%$
R809		4050412253	1.2K ohm $\pm 5\%$
R810,811		4050447353	47 K ohm $\pm 5\%$
R15		4060222512	2.2M ohm Solid $\frac{1}{2}W$

Capacitors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Capacitors are ceramic type and $\pm 10\%$ unless otherwise noted.			
C101		5103150650	15pF $\pm 2\%$
C102		5103500150	50pF
C103		5103509850	5pF $\pm 0.5\text{pF}$
C104,105,106		5101103450	.01uF +80%/-20%
C107		5103150650	15pF $\pm 2\%$
C108,109		5103100150	10pF
C110		5103221150	220pF
C111		5101103450	.01uF +80%/-20%
C112,113,114		5101203450	.02uF +80%/-20%
C115,116,117		5101203450	.02uF +80%/-20%
C118		5158479316	4.7uF/16V +100%/-0% Electrolytic
C119		5101472250	.0047uF $\pm 20\%$
C120		5103409850	4pF $\pm 0.5\text{pF}$
C121		5103109850	1pF $\pm 0.5\text{pF}$
C122		5103150650	15pF $\pm 2\%$
C123		5103100150	10pF
C124		5103330150	33pF
C125		5103100150	10pF
C126		5101472250	.0047uF $\pm 20\%$
C127,128,129		5101203450	.02uF +80%/-20%
C130		5158109316	1uF/16V +100%/-0% Electrolytic
C131		5103101150	100pF
C132		5158478316	.47uF/16V +100%/-0% Electrolytic
C133		5101473450	.047uF +80%/-20%
C134		5158470316	47uF/16V +100%/-0% Electrolytic
C135		5101203450	.02uF +80%/-20%
C136		5158470316	47uF/16V +100%/-0% Electrolytic
C137,138		5101473450	.047uF +80%/-20%
C139		5158109316	1uF/16V +100%/-0% Electrolytic
C140,141		5101203450	.02uF +80%/-20%
C142		5101103450	.01uF +80%/-20%
C143		5158100316	10uF/16V +100%/-0% Electrolytic
C144		5158109316	1uF/16V +100%/-0% Electrolytic
C145		5118153250	.015uF $\pm 20\%$ Mylar
C146		5101103450	.01uF +80%/-20%
C147		5101102250	.001uF $\pm 20\%$
C148		5158109316	1uF/16V +100%/-0% Electrolytic
C149		5103809850	8pF $\pm 0.5\text{pF}$
C150		5149351150	350pF Polystyrol
C151,152,153		5101103450	.01uF +80%/-20%
C154,155		5158100316	10uF/16V +100%/-0% Electrolytic
C159		5179102150	1000pF Polystyrol
C160		5118473150	.0047uF Mylar
C161		5101203450	.02uF +80%/-20%
C162		5149821150	820pF Polystyrol
C163		5118473250	.047uF $\pm 20\%$ Mylar
C164		5149471150	470pF Polystyrol
C165		5158479316	4.7uF/16V +100%/-0% Electrolytic

Capacitors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Capacitors are electrolytic type and +100%/-0% unless otherwise noted.			
C166		5158221316	220uF/16V
C167,168		5118103150	.01uF ±10% Mylar
C169,170		5158109316	1uF/16V
C171,172		5158479316	4.7uF/16V
C173		5158478316	.47uF/16V
C174,175		5134204212	.2uF ±20% Semi-conductive
C301,302		5171479225	4.7uF/25V ±20% Tantal or Al or Low Noise
C303,304		5158470316	47uF/16V
C305,306		5149471150	470pF ±10% Polystyrol
C307,308		5158101306	100uF/6V
C309,310		5103330150	33pF ±10% Ceramic
C311,312		5158100316	10uF/16V
C313,314		5118682150	.0068uF ±10% Mylar
C315,316		5118222150	.0022uF ±10% Mylar
C317		5158221325	220uF/25V
C401		5158102325	1000uF/25V
C402,403		5103151150	150pF ±10% Ceramic
C404,405		5118224250	.22uF Mylar ±20%
C406,407		5103680150	68pF ±10% Ceramic
C408,409		5158100310	10uF/10V
C410,411		5158470306	47uF/6.3V
C412,413		5158100325	10uF/25V
C414,415		5118332250	.0033uF ±20% Mylar
C416,417		5118103250	.01uF ±20% Mylar
C418,419		5118222250	.0022uF ±20% Mylar
C420,421		5118153250	.015uF ±20% Mylar
C422,423		5118153250	.015uF ±20% Mylar
C424,425		5158109350	1uF/50v
C426,427		5158470306	47uF/6.3V
C428,429		5158100325	10uF/25V
C430,431		5118153250	.015uF ±20% Mylar
C432,433		5118223250	.022uF ±20% Mylar
C434,435		5103151150	150pF
C501,502		5158479316	4.7uF/16V
C504,505		5158100316	10uF/16V
C506,507		5103680250	68pF ±20% Ceramic
C508,509		5158470335	47uF/35V
C510,511		5103101250	100pF ±20% Ceramic
C512,513		5103101250	100pF ±20% Ceramic
C514,515		5158100350	10uF/50V
C516		5158221316	220uF/16V
C517,518		5118473250	.047uF ±20% Mylar
C519,520		5158470335	47uF/35V
C601,		5158221316	220uF16V
C602		5158471325	470uF/15V
C603		5158470335	47uF/35V
C604		5158102335	1000uF/35V
C605,606,607		5101203450	.02uF +80% -20% Ceramic

Capacitors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
Note: All Capacitors are electrolytic type and +100%/-0% unless otherwise noted.			
C608,609,610		5101203450	.02uF + 80%/-20% Ceramic
C611,612		5158682350	6800uF/50V
C701,702		5103201150	200pF ±10% Ceramic
C703,704		5118103250	.01uF ±20% Mylar
C803,804		5158479325	4.7uF/25V
C805,806		5158100316	10uF/16V
C807		5158221325	220uF/25V
C 01		5101103200	.01uF/125V ±20% Ceramic

Variable Resistors

VT 1,2		5221091416or	10K(B) V8K4-1 Type Semi-Fixed Resistor
VT 3		5221101435	10K(B) TR11R Type
VT 4		5221081510or	100K(B) V8K4-1 Type
		5221101538	100K(B) TR11R Type
		5221081512or	150K(B) V8K4-1 Type
VR 1		5221102539	200K TR11R Type
VR 2		5027215212	100KB x 2 Variable resistor(Bass)
VR 3		5027215212	100KB x 2 (Midrange)
VR 4		5020225249	250KB x 2 (Volume)
		5027215212	100KB x 2 (Treble)
VR 5		5020225787	200KZ x 2 (Balance)
VT 5,6		5221101325	1K(B) TR14R Type Semi-Fixed Resistor

Semi-Conductors

Q 1		4100900453	3SK45C FET
Q 2		4100205352	2SC535B Transistor
Q 3		4100204613	2SC461C
Q 4		4100204643	2SC460C
Q 5,6		4100008444	2SA844D
Q 7		4100209452	2SC945P
Q 8,9,10,11		4100209005	2SC900E,F
Q12,13,14		4100209005	2SC900E,F
Q15,16,17		4100209005	2SC900E,F
Q18		4100209452	2SC945P
Q19,20		4100209005	2SC900E,F
Q501,502		4100905570	LBC557
Q503,504		4100905570	LBC557
Q505,506		4100794348	MPS-9434H,I
Q507,508		4100700130	MPS-A13
Q509,510		4100965510	2N6551
Q511,512		4100965540	2N6554
Q513,514		4100930550	2N3055
Q515,516		4100929550	2N2955
IC 1		4154011970	HA1197
IC 2		4154011370	HA1137W
IC 3		4154011560	HA1156

Semi-Conductors

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
D01,02		4120622010	Light emitting diode
D101		4120427909	IS2790WT Varicap
D102		4120120760	IS2076 Si Diode
D103		4120100600	IN-60
D201		4120501200	WZ-120 Zener
D203,204		4130104002	IN4002 Rectifier
D205,206		4130100502	MR-502
D207,208		4130100502	MR-502
D501		4120501200	WZ-120 Zener
D502		4120420760	IS2076 Si Diode
D901,902		4120622010	Light emitting diode
D903,904		4120622010	Light emitting diode
D905		4120622010	Light emitting diode

Transformers and Coils

IF 1		4340200580	FM IFT 1st (09A-1206A)
IF 2		4340200590	Phase shift coil (40M-025)
IF 3		4340200600	Quadrature transformer (SNY-1713)
FT 1		4300400160	FM antenna coil (02-358-1227)
FT 2		4310400250	FM RF coil (C02-1077A)
FT 3		4330400180	FM OSC coil (02-617A)
FT 4,5		4360400110	FM trap coil (TCF-370)
FT 6		4320700260	Inductor 1uH
FT 7		4300400150	FM balun coil (34H-303-319)
AT 1		4330100230	AM OSC coil (40M-026A)
AT 2		4340100300	AM ceramic filter (CFT-455C)
AT 3		4340100280	AM Det transformer (C02-1024)
AL 1		4300100250	AM antenna coil (H05-987)
H 1,2		4211903010	Choke coil 0.8H
P.T. 1		4200961378F	Power transformer

Switches

S 1a-f		4424850120	Rotary function switch (4-8-5)
S 2a-f		4421650140	Tape rotary slide switch 1-6-5
S 3		4441220009	Level switch (Mode)
S 4		4441220009	Level switch (Loudness)
S 5		4441220009	Level switch (Tone defeat)
S 6		4441220009	Level switch (Low filter)
S 7		4441220009	Level switch (Scratch filter)
S 8		4431020464	Power switch PW123-1-2
S 9		4441220009	Level switch (FM muting)
S10		4435285654	Speaker push switch 5-28-56

Miscellaneous

J 1		4500500025	Headphone jack (LJ-109-1AE)
J 2,3,4		4500800034	Speaker jack
J 5		4563005016	Antenna terminal 5P
J 6		0014010302	Input jack (15P)

Miscellaneous

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
PL 1,2,3,4		4702081539	Pilot lamp 8V 150mA
MT 1		4010100070	Signal meter
MT 2		4010300071	Tuning meter
Fuse 1,2,3		5263302009	Fuse 3A
LPF 1,2		4160300007	19KHz filter (FB-1802)
CF 1,2,3		4160200008	10.7M Ceramic filter SFE-10.7MA8
E 1		4570700100	AC receptacle (ST-6423)
E 2		4692103002	Fuse holder (NAF 031-1A)
E 3		5001132011	Variable condenser 752J-100
E 4		4520200002	Wire connector SD-5.5
E 5		2042000065	Cord Clamp
E 6		4580100001	Cord stopper 3p-4
E 7		4562030003	Terminal
E 8		5401150001	FM indoor antenna
E 9		4593000003	Speaker lead wire assembly
E10		2000000010	Terminal pin (B)
E11		2000000037	Terminal pin (G)
E12		2000000014	Terminal pin (C)
E13		N.A.	
E14		N.A.	
E15		N.A.	
E16		N.A.	
E17		N.A.	
E18		N.A.	
E19		N.A.	
E20		N.A.	
E21		N.A.	
E22		N.A.	
E23		N.A.	
E24		N.A.	
E25		N.A.	
E26		N.A.	
E27		N.A.	
E28		N.A.	
E29		N.A.	
E30		N.A.	
E31		N.A.	

N.A. = Not Available

Exploded View

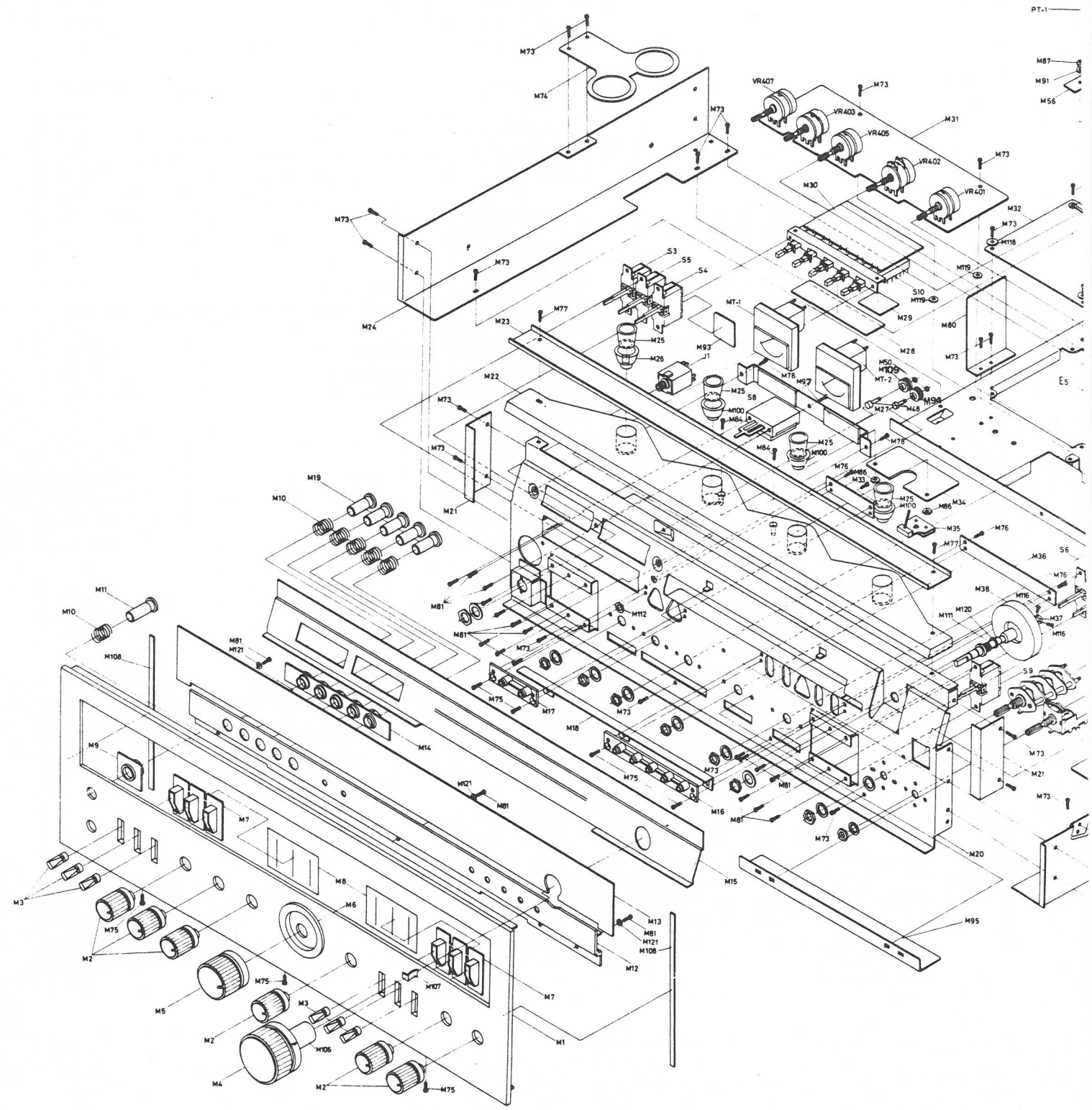
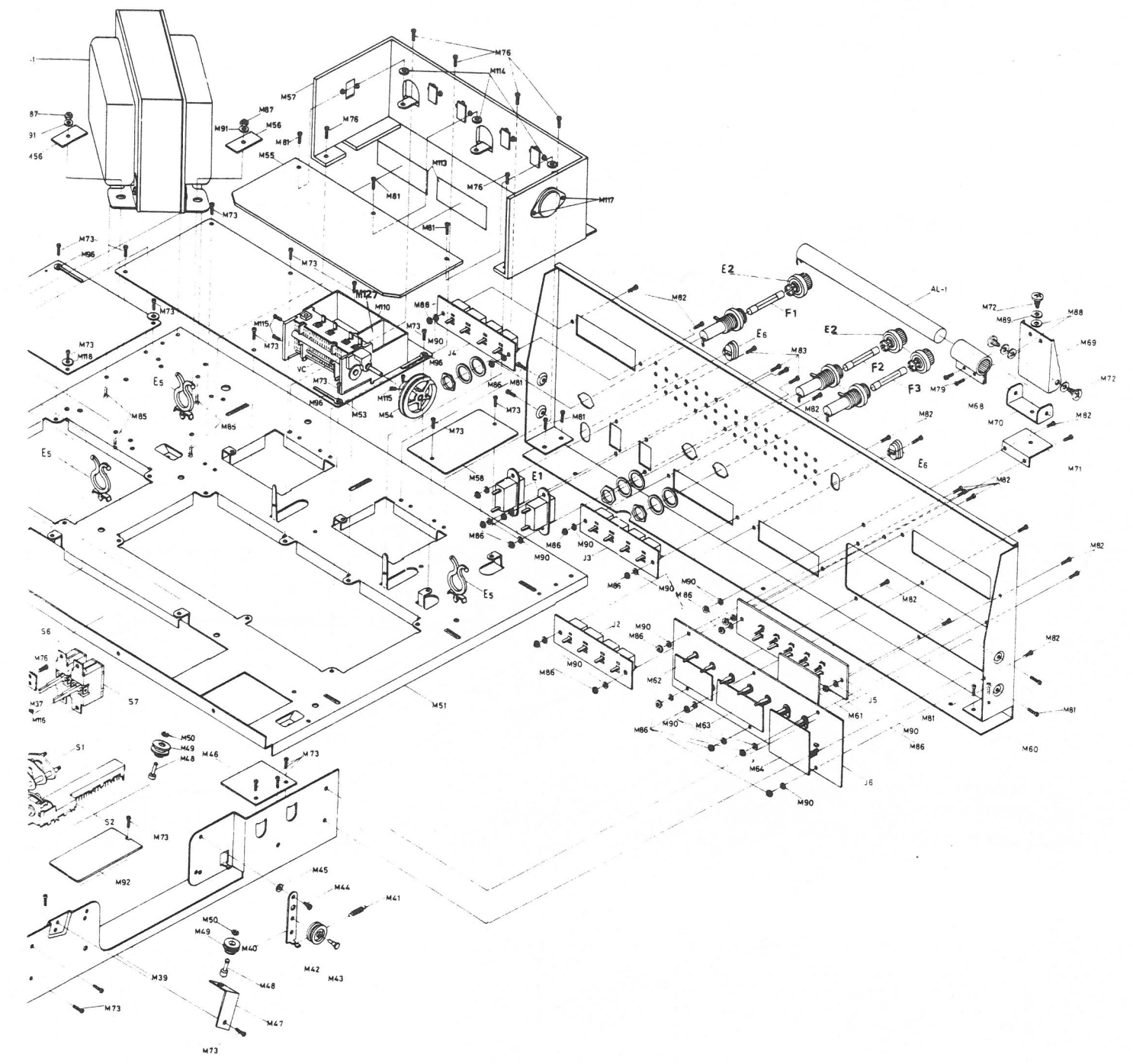


Figure 21

Exploded View



Mechanical Exploded Views

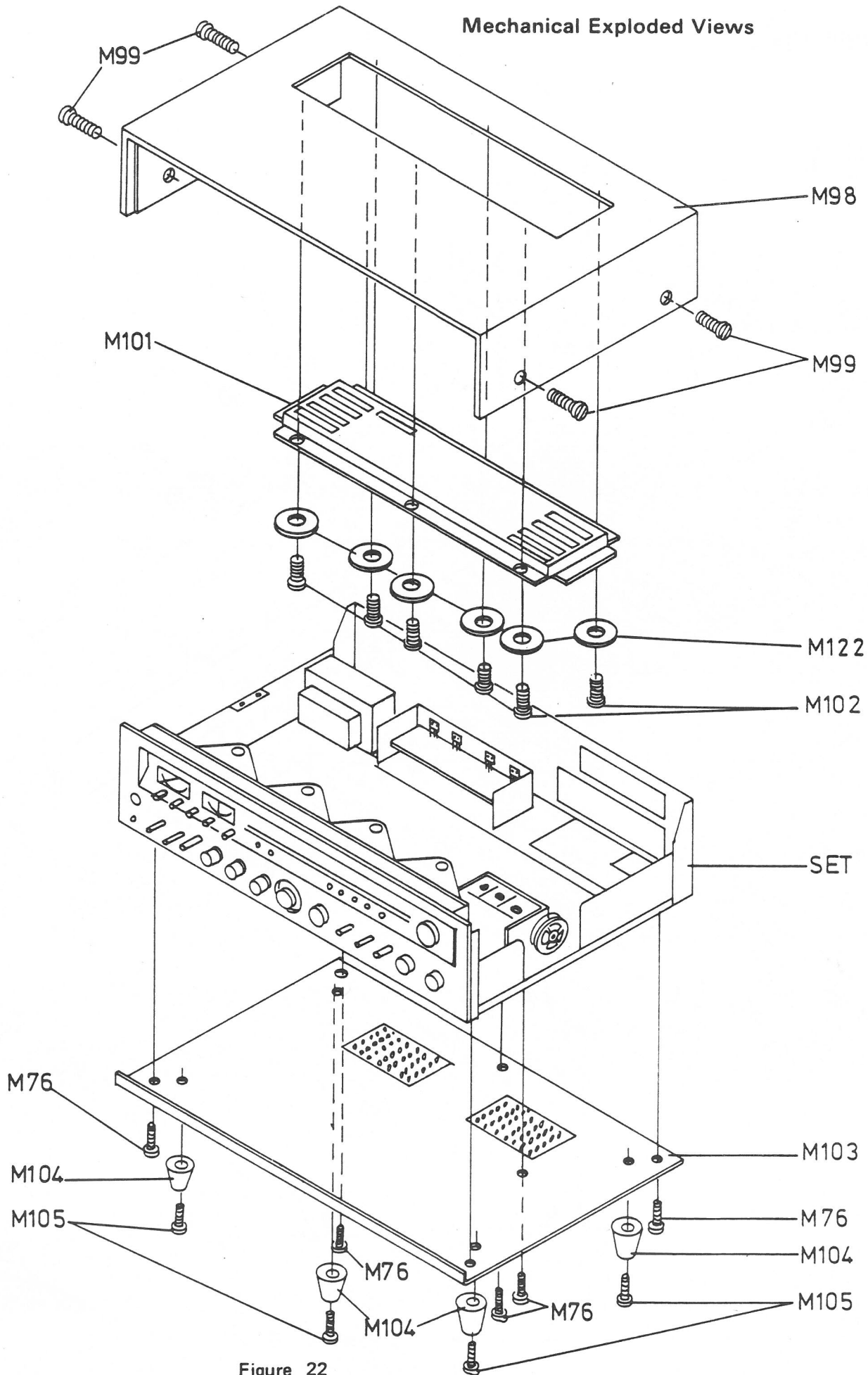


Figure 22

Mechanical Parts

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
M 1		1001510302	Front panel
M 2		0003110302	Selector knob assembly
M 3		0004010302	Lever knob assembly
M 4		0021010302	Tuning knob assembly
M 5		0002110302	Volume knob assembly
M 6		1002010302	Volume scale
M 7		1003010302	Sleeves (A)
M 8		2024010302	Switch net
M 9		1027210302	Sleeves (C)
M10		2012110302	Push knob spring
M11		0007010302	Power knob assembly
M12		1004210302	Sub panel
M13		1010210302	Front acrylic
M14		1005210302	Sleeves (B)
M15		1006210302	Dial scale
M16		2020010302	L.E.D. holder (A)
M17		2022010302	L.D.D. holder (B)
M18		1008010302	Overlay (A)
M19		0005010302	Push knob assembly
M20		N.A.	
M21		1007010302	Dial side plate
M22		2006410302	Light mirror
M23		2005010302	Panel holder
M24		2004010302	Front chassis holder (L)
M25		2005010105	Lamp cover
M26		2010013212	Lamp cover (B)
M27		2043010302	Meter holder
M28(S10)		C424050308	Speaker switch P. C. Board assembly ①
(M29)		4040502000	Speaker switch P. C. Board (C) ①
(M30)		4040501980	Speaker switch P. C. Board (A) ①
M31		C424060079	Tone control P. C. Board assembly ①
M32		C424090077	Power supply P. C. Board assembly ①
M33		C424140310	L.E.D. P. C. Board (B) assembly ①
M34		C424140307	Lamp P. C. Board assembly ②
M35		0006010302	Pointer assembly
M36		C424140309	L.E.D. P. C. Board (A) assembly ①
M37		2031310302	Tuning shaft
M38		2033010302	Flywheel
M39		0012010302	Front chassis holder assembly (R)
M40		2046010065	Dial spring bracket
M41		2030010302	Dial spring
M42		2045010065	Pulley (B)
M43		2000403109	Pulley shaft
M44		3012203008	"+"3φ x 8 Tapping screw
M45		2038090505	Record lever collar
M46		C424060080	Ceramic amp. P. C. Board assembly ①
M47		0013110302	Pulley holder assembly
(M48)		2029170507	Pulley shaft (D)
(M49)		2029010302	Pulley (B)
(M50)		3130000020	(E) ring 2φ

① Field repair. Do not exchange.

② Throw away. Do not repair.

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
M51		N.A.	
M53		C424010075	Tuner amp. P C Board assembly ①
M54		2014010302	Drum
M55		C424080078	Main amp: P C Board assembly ①
M56		2004103109	Washer for transformer
M57		2016110302	Heat sink
M58		C424040076	E Q amp P C Board assembly ①
M60		1012210302	Back plate
M61 (J5)		C424130082	Antenna P C Board assembly ①
M62 (J6)		C424170081	Phono jack P C Board (A) assembly ①
(M63)		4041701410	Jack (B) P C Board ①
(M64)		4041701840	Jack (A) P C Board ①
M68		1023110065	Bar antenna holder
M69		1034010302	Bar antenna bracket (C)
M70		1033010302	Bar antenna bracket (B)
M71		1032010302	Bar antenna bracket (A)
M72		1035010302	Antenna bracket screw
M73		3017203006	"+"3 ϕ x 6 Pan head tapping screw (ZN plating)
M74		2018010302	Condenser holder
M75		3017203008	"+"3 ϕ x 8 Flat head tapping screw (ZN plating)
M76		3017203008	"+"3 ϕ x 8 Pan head tapping screw (ZN plating)
M77		3017203010	"+"3 ϕ x 10 Pan head tapping screw (ZN plating)
M78		3017203004	"+"3 ϕ x 4 Pan head tapping screw (ZN plating)
M79		3013002606	"+"2.6 ϕ x 6 Pan head machine screw (black)
M80		2017010302	Shield plate
M81		3013003006	"+"3 ϕ x 6 Pan head machine screw
M82		3013003008	"+"3 ϕ x 8 Pan head machine screw (black)
M83		3019003010	"+"3 ϕ x 10 Flat head machine screw
M84		3013003014	"+"3 ϕ x 14 Flat head machine screw (ZN plating)
M85		3013004010	"+"4 ϕ x 10 Pan head machine screw (ZN plating)
M86		3030200003	M3 Hexagon nut (ISO) (ZN plating)
M87		3030200004	M4 Hexagon nut (ISO) (ZN plating)
M88		3021105210	5.2 ϕ x 10 ϕ x 1t Flat washer (black)
M89		3028095403	5.4 ϕ x 9 ϕ x 0.3t Nami washer (black)
M90		3022603208	3.2 ϕ x 6 ϕ x 0.8t Spring washer
M91		3022804210	4.2 ϕ x 8 ϕ x 1t Spring washer
M92		C424050083	Tape push switch P. C. Board assembly ①
M93 (S4)		C482000024	Loudness switch P. C. Board assembly ①
M94		2028010302	Pulley (A)
M95		N.A.	
M96		2000000011	Earth terminal 3 ϕ 30m/m
M97		2025010302	Meter cushion

① Field repair. Do not exchange.

② Throw away. Do not repair.

Mechanical Parts

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
M98		1030510302	Wood cabinet
M99		1028010065	Wood cabinet screw
M100		2009013212	Lamp cover (A)
M101		1011013212	Ventilation plate
M102		3018003008	3 ϕ x 8 Wood screw
M103		1011310302	Base plate
M104		1001708079	Rubber foot
M105		3021083005	3 ϕ x 8 ϕ x 0.5t Flat washer screw (ZN plating)
M106		1037010302	Knob tube
M107		2036010302	Knob spring
M108		2039010302	Rubber sheet
M109		2000503109	Pulley
M110		2019010065	Shield cover
M111		2032110302	Tuning shaft bushing
M112		3021603505	6 ϕ x 3.5 ϕ x 0.5t Flat washer
M113		2002010202	Fiber
M114		3020083220	Fiber washer 8 ϕ x 3.2 ϕ x 2t
M115		3013003004	"+"3 ϕ x 4 Pan head machine screw (ZN plating)
M116		3013002604	2.6 ϕ x 4 Pan head machine screw
M117		3013003012	"+"3 ϕ x 12 Machine screw (ZN plating)
M118		3021103210	3.2 ϕ x 10 ϕ x 1t Flat washer
M119		2028083000	Flat washer
M120		3021105205	10 ϕ x 5.2 ϕ x 0.5t Flat washer
M121		3021603210	3.2 ϕ x 6 ϕ x 1t Flat washer
M122		3021803208	8 ϕ x 3.2 ϕ x 0.8t Flat washer
A1		4680400302	Dial Cord.

Do not discard!

Supplement ^{Rev. A} A Form No. CM-112

Models Affected: 3233 with Product Service No. 683-3233-00

Caution:

Whenever a model 3233 is returned for service with a blown speaker fuse and repairs are completed, CHECK THE dc LEVEL ON THE OUTPUT BEFORE CONNECTING THE SPEAKERS.

Symptom:

Blown speaker protection fuses, possibly accompanied by speaker damage.

Corrective Action:

Replace any failed component. Check D501, D502, and C505. Check Q503, Q504 and associated components. If R537 is an 820 Ohm 1/4 watt resistor, replace it with:

<u>Ref No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
R537	1000-6832	ERD1PZK821	820 Ohm, 10% 1 watt, carbon

Note: The above change to R537 is to be performed whenever a 3233 is serviced in shop for any reason.

Conclusion:

The change to R537 is necessary to improve the reliability of the reference source for Q503 & Q504. The differential amplifiers Q503 & Q504 maintain 0Vdc at the speaker terminals. A failure of the reference source can permit full B+ to appear at the speaker terminals.

Do not discard!

Supplement B Form No. CM-112

Models Affected: 3233 With Product Service No. 683-3233-20 Beginning With
Serial Number 8190190001

Some cosmetic changes were made to stereo receiver Model 3233. The parts affected are listed below:

Stereo Receiver Parts List

Ref. No.	JC Penney Part No.	Supplier Part No.	Description
M7		1041010302	Sleeves (A)
M10		2044010302	Push Knob Spring (B)
M12		1042010302	Sub Panel
M14		1043010302	Sleeves (B)
M15		1044010302	Dial Scale
M16		2045010302	LED Holder (A)
M17		2046010302	LED Holder (B)
M19		0022010302	Push Knob Assy
MT1		4010100070	Signal Meter
MT2		4010300071	(P-55-511)
S10			Tuning Meter
D01, D02		4435235654	(P-55-512)
D901-D905		4120602010	Speaker Push Sw (5-23-56) Light Emitting Diode

Do not discard!

Supplement E Form No. CM-112

Models Affected: 3233

Caution:

Whenever a model 3233 stereo receiver is returned for service with blown speaker protector fuses, when repairs are complete; CHECK THE DC LEVEL ON THE OUTPUT BEFORE CONNECTING THE SPEAKERS.

Symptom:

Blown speaker protection fuses, possibly accompanied by speaker damage.

Corrective Action:

Replace any failed component. Check D501, D502, and C505. Check Q503, Q504 and associated components. If R537 is an 820 Ohm 1/4 watt resistor, replace it with:

<u>Ref No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
R537	1000-6823	ERD1PZK821	820 Ohm, 10%, 1 watt, carbon

Note: The above change to R537 is to be performed whenever a 3222 or 3233 is serviced in shop for any reason.

Conclusion:

The change to R537 is necessary to improve the reliability of the reference source for Q503 & Q504. The differential amplifiers Q503 & Q504 are charged with maintaining 0 VDC at the speaker terminals. A failure of the reference source can permit full B+ to appear at the speaker terminals.

Do not discard!

Supplement F **Form No.** CM-112

Models Affected: 3233 With Product Service Number 683-3233-00.
3233 With Product Service Number 683-3233-10

The following replacement part was omitted from Form Number CM-112 Original Issue, and from Form Number CM-112 Supplement C:

<u>Ref. No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
CF1,CF2,CF3	1084-2219	4160200008	Crystal Filter

September 1978

JCPenney

Do not discard!

Supplement G Form No. CM-112

Models Affected: 3233 with Product Service No. 683-3233-00

The following replacement parts were listed inaccurately in Form No. CM-112, Original Issue.

<u>Ref No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
M66	1088-2942	5263302009	Fuse 3A, type 3AG
M67	1077-0535	4692103002	Fuse holder
MT1	1077-0519	4010100012	Signal Meter
MT2	1084-1898	4010300013	Tuning Meter

Should read:

<u>Ref No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
M66	1077-0535	4692103002	Fuse Holder
M67	1088-2942	5263302009	Fuse 3A, type 3AG
MT1	1088-2363	4010100034	Signal Meter
MT2	1088-2371	4010300035	Tuning Meter

Do not discard!

Supplement H Form No. CM-112

Models Affected: 3233 with Product Service No. 683-3233-00

Some 3233 Receivers drift as indicated on the Center-of-Channel Tuning meter.

Excessive drift is characterized by both the pointer drifting 1/8 inch or more beyond the box line (in either direction), and by the stereo light blinking or totally extinguishing.

If the pointer drifts excessively to the right, replace C132 with:

<u>Ref. No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
C122	1117-1667	5104150650	15 pf capacitor with black dot

If the pointer drifts excessively to the left, replace C122 with:

<u>Ref. No.</u>	<u>JCPenney Part No.</u>	<u>Supplier Part No.</u>	<u>Description</u>
C122	1122-1306	5106215050	15 pf capacitor with blue dot

The color dot on the body of the capacitor indicates its temperature characteristics. Choice of the proper characteristic will reduce drift.

March 1979

JCPenney

Do not discard!

Supplement B Form No. CM-112

Models Affected: 3233

Some PC Board illustrations in the original manual are illegible. Refer to the illustrations in this supplement.

PAGE 8 (FIGURE 12)

PAGE 9 (FIGURE 13)

PAGE 10 (FIGURES 14 & 15)

PAGE 11 (FIGURES 16 & 17)

PAGE 12 (FIGURES 18 & 19)

PAGE 13 (FIGURE 20)

JCPenney

1106-6412

Wiring Diagram

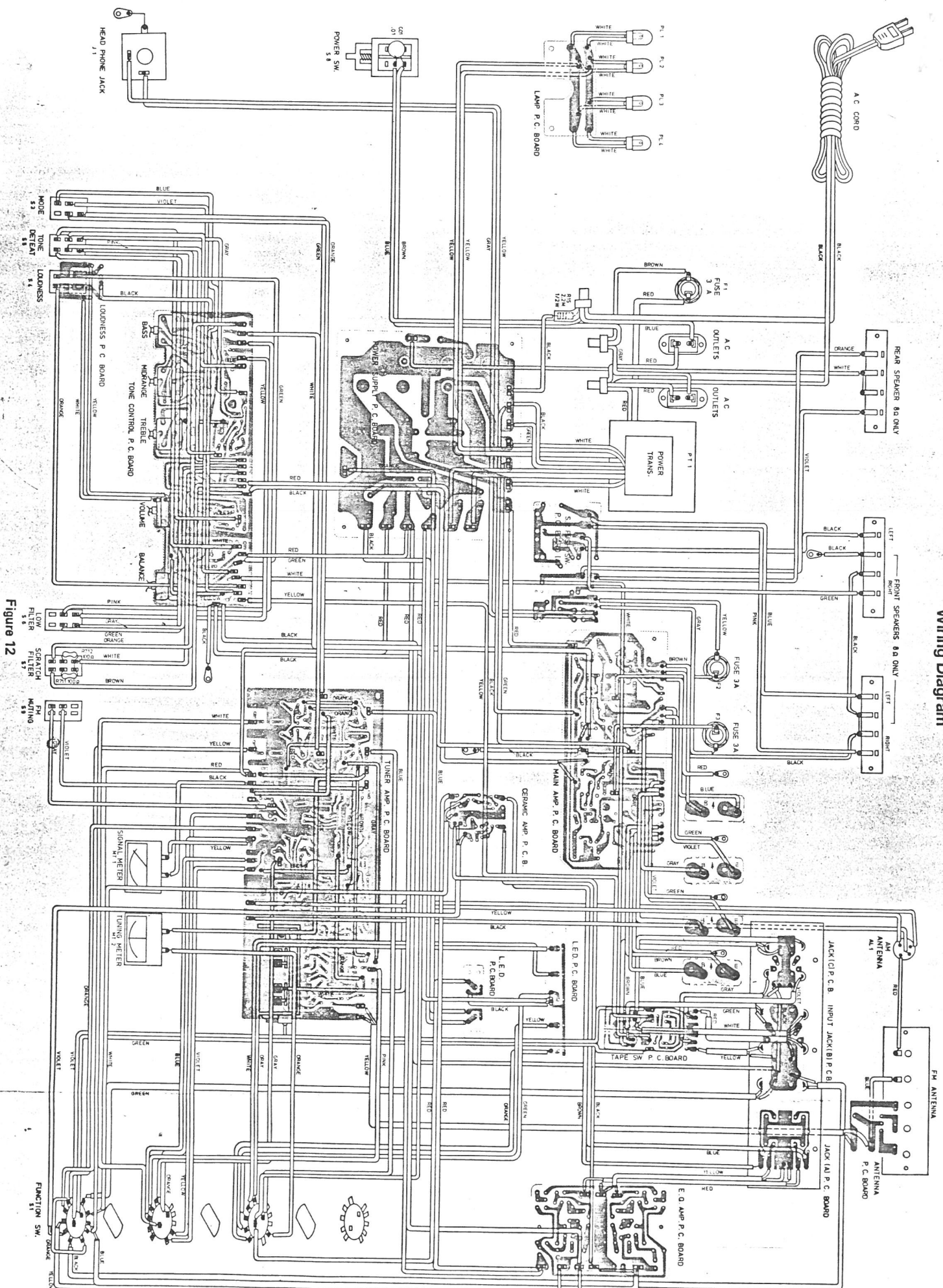


Figure 12

Tuner PC Board

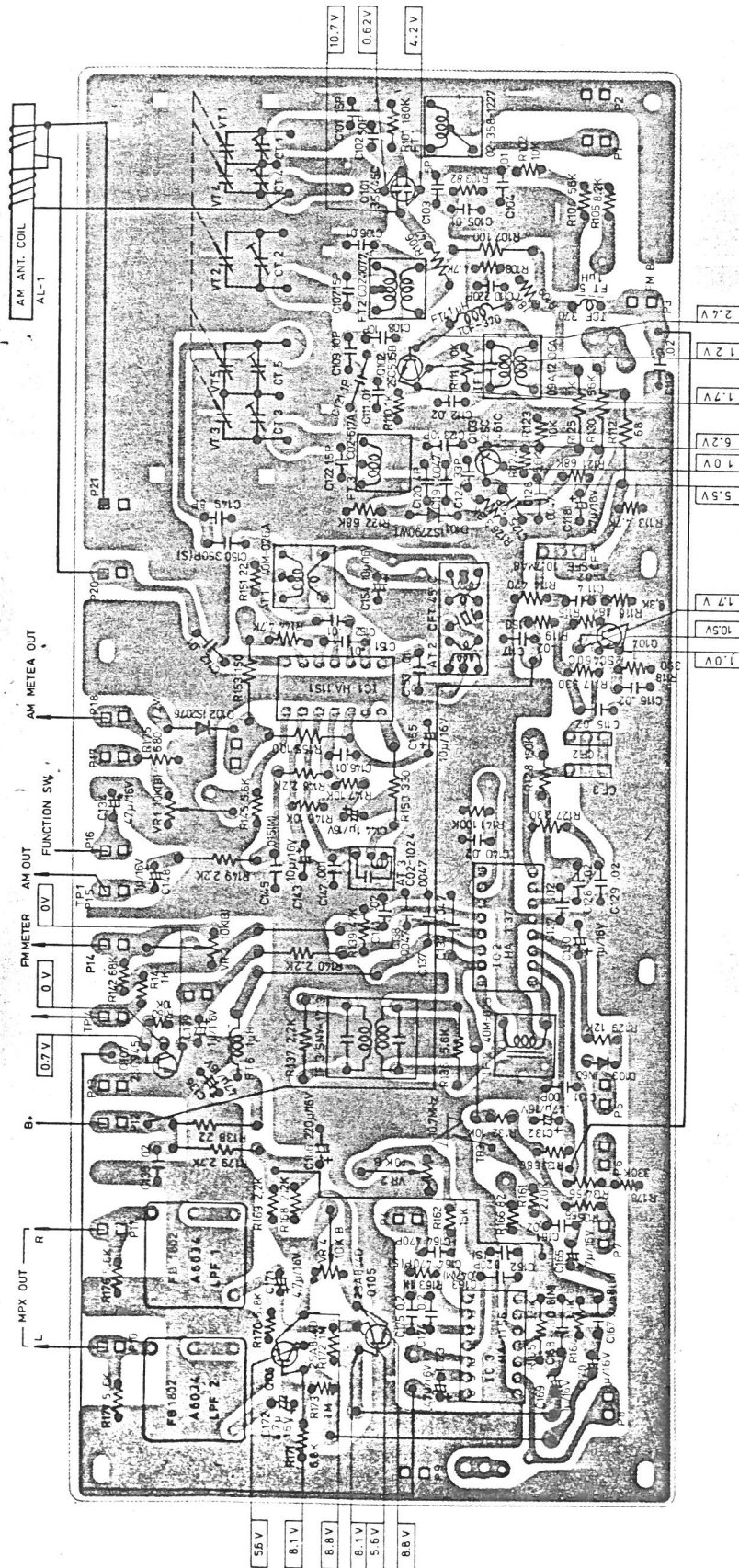


Figure 13

NOTE: VALUES INDICATED IN ARE DC VOLTAGES BETWEEN THE CHASSIS AND ELECTRICAL PARTS.

Input Jack (B) Loudness PC Board

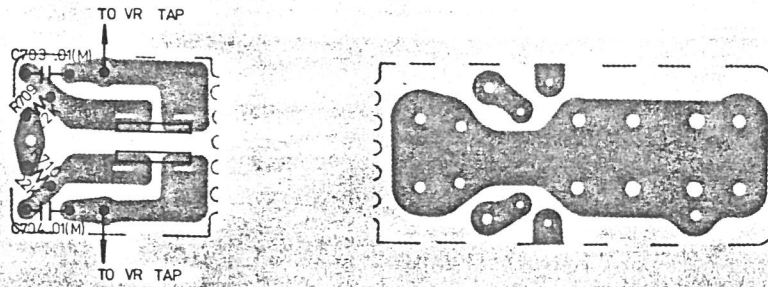


Figure 14

NOTE: VALUES INDICATED IN ARE DC VOLTAGES BETWEEN THE CHASSIS AND ELECTRICAL PARTS.

Tape Switch PC Board

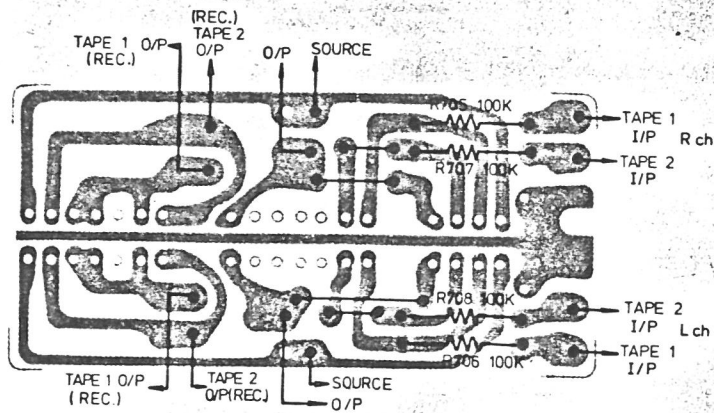


Figure 15

Power Supply PC Board

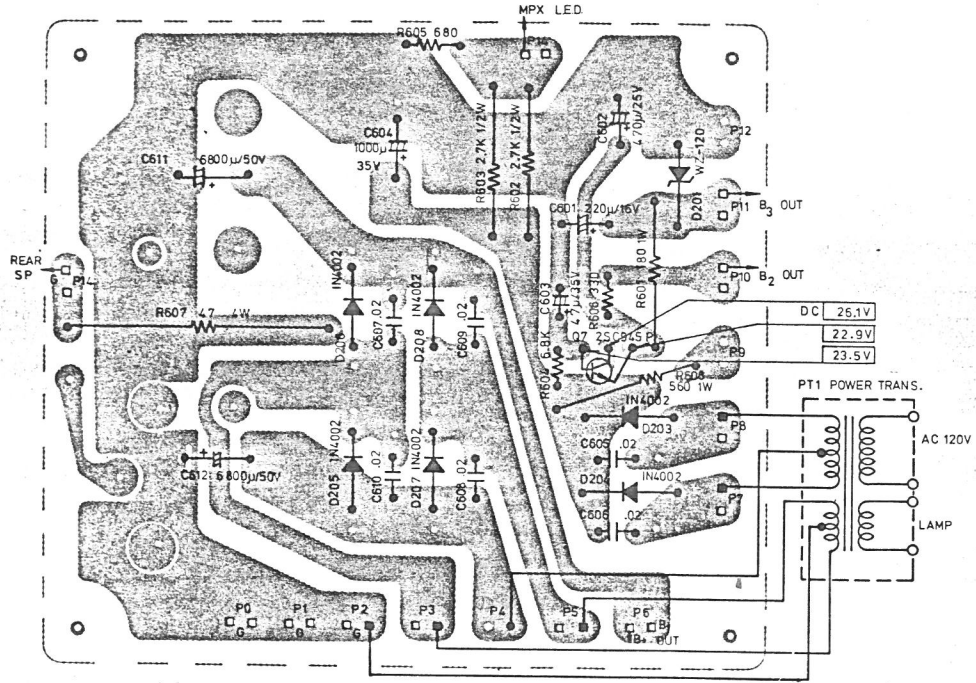
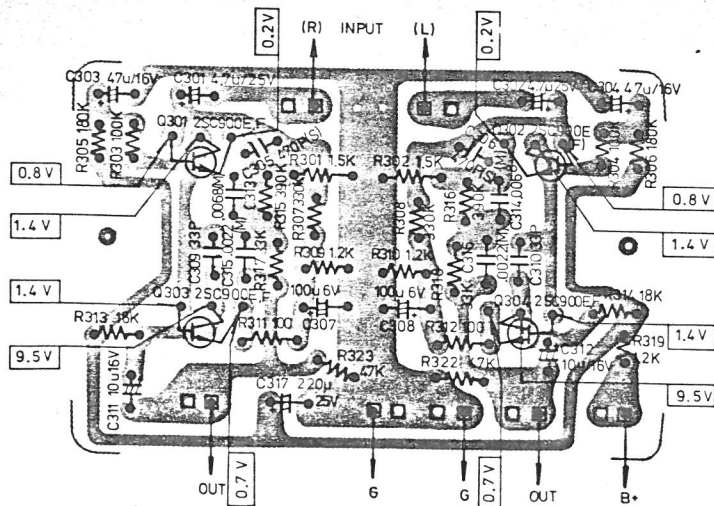


Figure 16

NOTE: VALUES INDICATED IN ARE DC VOLTAGES BETWEEN THE CHASSIS AND ELECTRICAL PARTS.

EQ Amp PC Board



Input Jack (A) & Jack (C) & Ceramic Amp PC Board

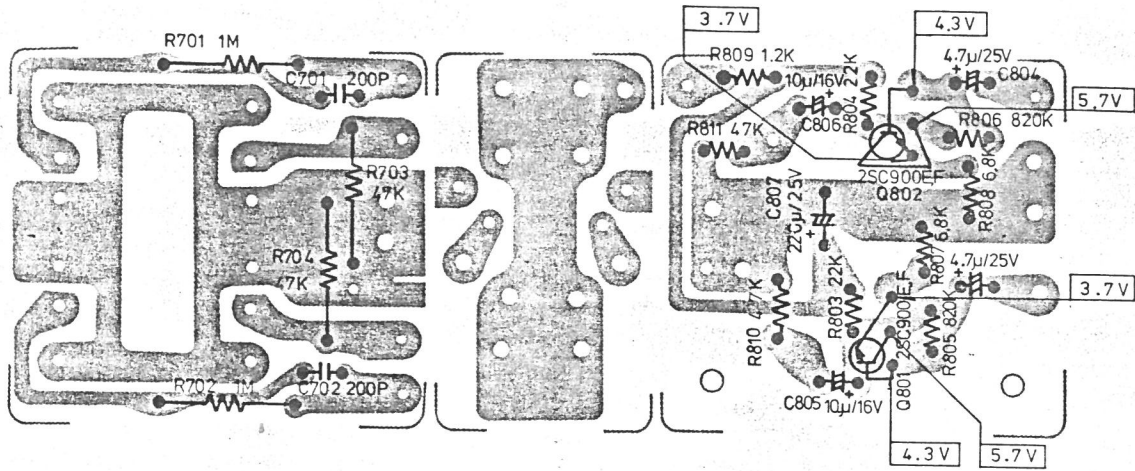


Figure 18

Tone Control PC Board

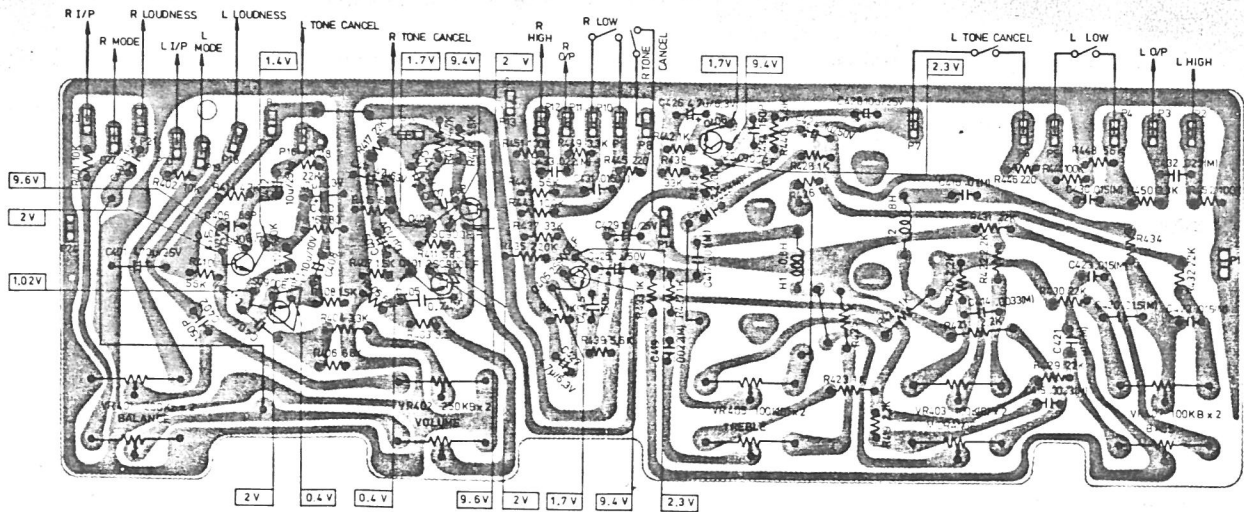


Figure 19

Main Amp PC Board

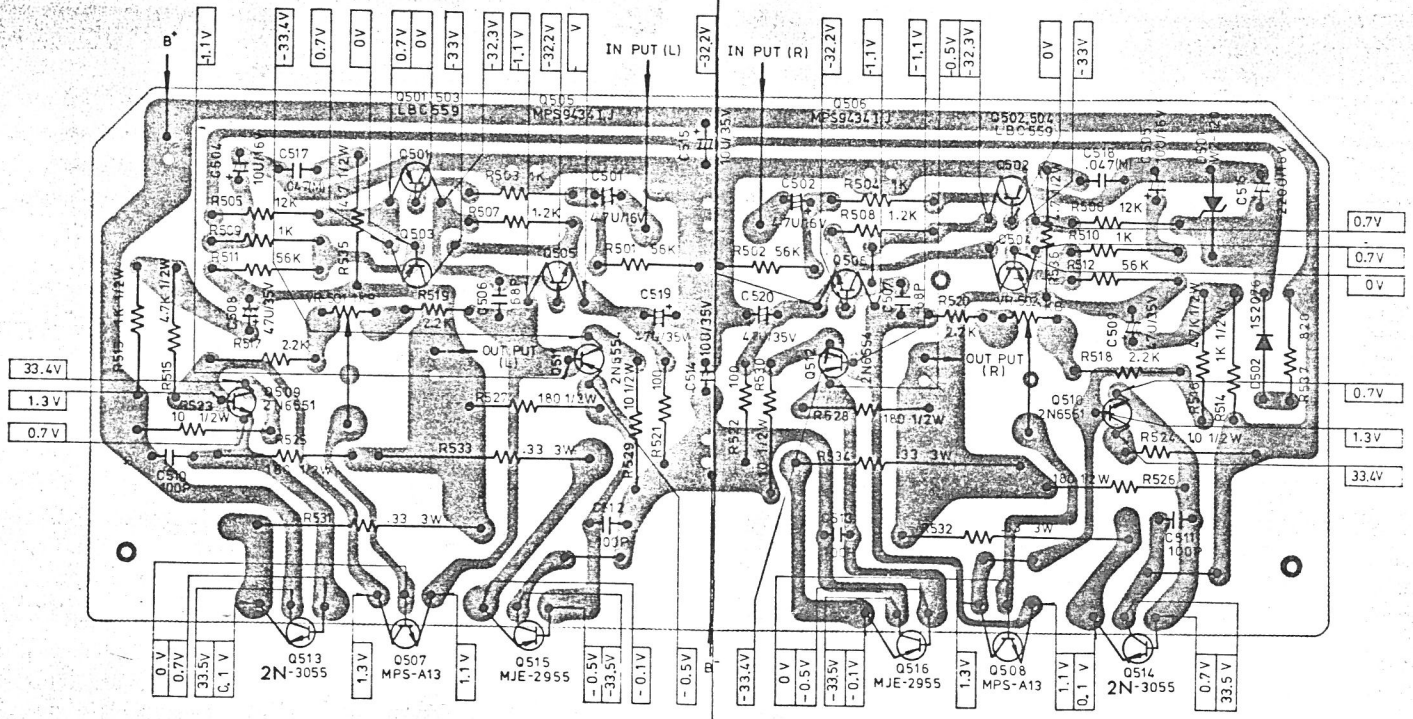


Figure 20

NOTE: VALUES INDICATED IN ARE DC VOLTAGES BETWEEN THE CHASSIS AND ELECTRICAL PARTS.