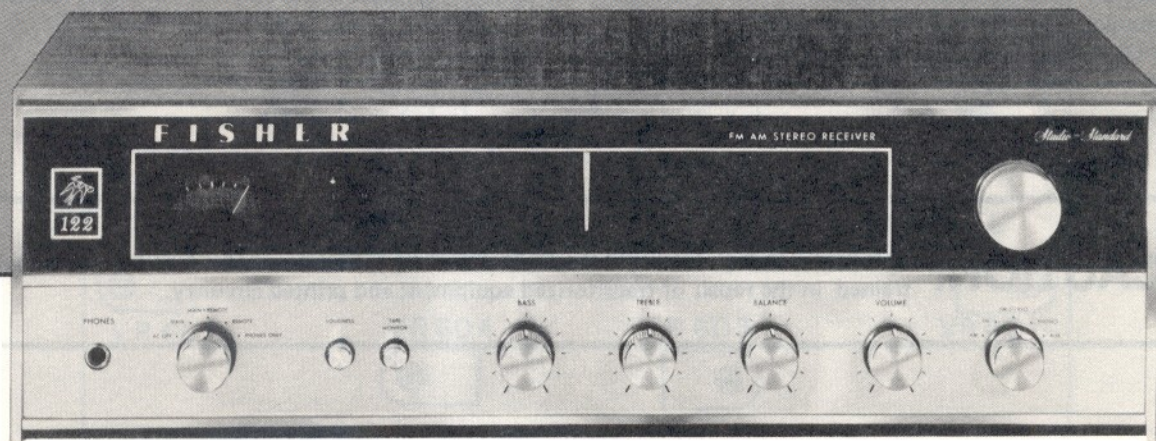


**SERVICE MANUAL**

# The Fisher®

# 122

**4/2-Channel  
Stereo Receiver**



**WORLD LEADER IN HIGH QUALITY STEREO**

## TABLE OF CONTENTS

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### REQUIRED TEST EQUIPMENT

The following test equipment is required to completely test and align the Receiver:

- Line Voltage Autotransformer or Voltage Regulator
- AC DC Multimeter
- Accurately Calibrated AC Voltmeter
- Oscilloscope (Flat to 100 kHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Load Resistor, 8-ohms, 20 Watts (Minimum Rating)
- Low-Distortion AM-FM Signal Generator
- 10.7 MHz Sweep Generator
- Multiplex Generator
- 455 kHz Sweep Generator

**CAUTION:** This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistorized equipment and printed circuitry.

## OUTPUT BALANCE AND IDLE CURRENT ADJUSTMENT

1. Set the receiver's controls to the following position:
  - (a) BALANCE, BASS and TREBLE controls to mid-position.
  - (b) LOUDNESS CONTOUR pushbutton switch out.
  - (c) SELECTOR switch to AUX.
  - (d) SPEAKERS switch to MAIN.
  - (e) VOLUME control to MIN.
2. Connect an 8 ohm 20 watt resistor across the LEFT MAIN speaker terminals (MAIN SPKR and COM).
3. Connect an oscilloscope across the 8 ohm resistor.
4. Connect an audio signal generator to the LEFT AUX IN jack. Turn on generator and set to 1,000 Hz.
5. Turn on the receiver, rotate VOLUME control to MAX, and increase generator until the sine wave pattern on oscilloscope starts to display clipping.
6. Adjust DC balance control VR601 (located on power amplifier board) for equal clipping on positive and negative half cycles of the sine wave. Turn off generator.
7. Connect a VTVM as shown in figure 1 and adjust idling control VR603 to obtain a reading of 7.5mV on the VTVM.
8. Repeat step 2 through 7 for the RIGHT channel using RIGHT MAIN speaker terminals (MAIN SPKR and COM), RIGHT AUX IN jack, DC balance control VR602, and idling control VR604. (Connection shown in figure 1 using dotted lines.)

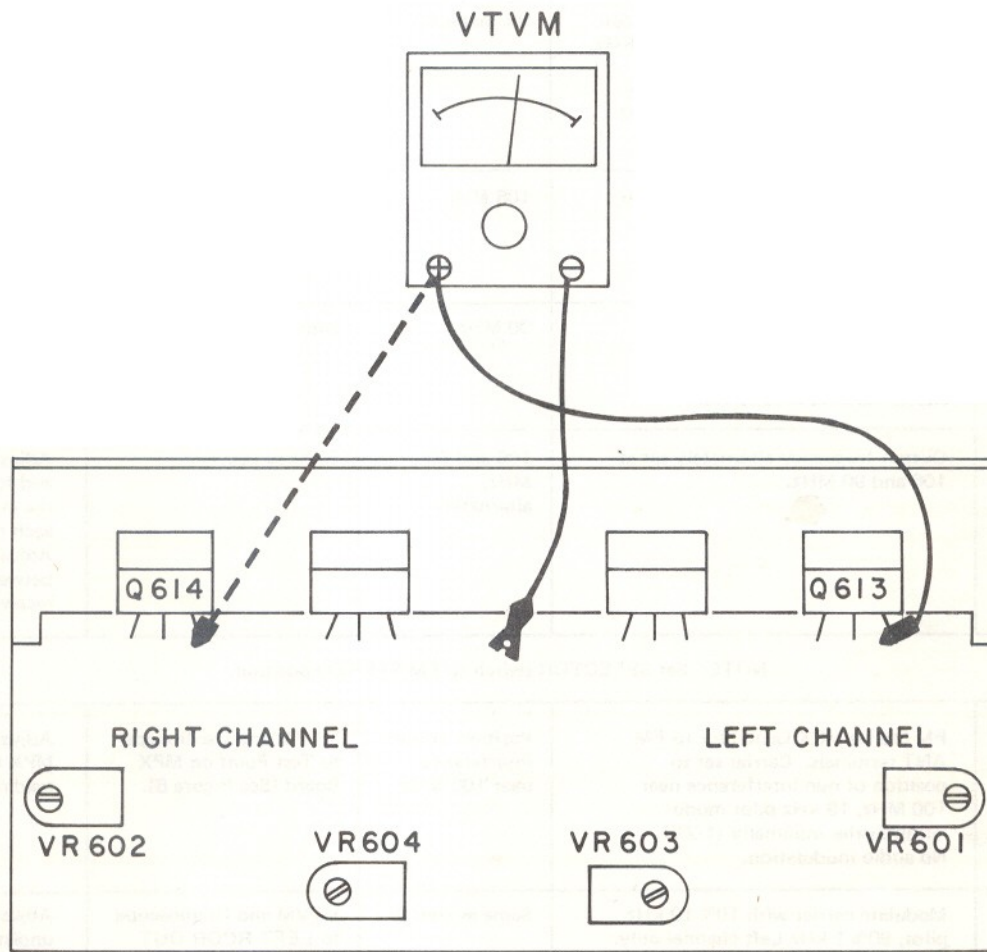


Figure 1. Power Amplifier Output Adjustment Diagram.

# TUNER ALIGNMENT PROCEDURES

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE												
NOTE: Set SELECTOR switch to FM and VOLUME control to MIN.																
1. FM IF Alignment	<p>Connect an FM Sweep Signal Generator through an 0.01 UF capacitor to the FM IF INPUT pin on the IF Board (See Figure 3). Set the generator output frequency according to the Color Dot Code Table below.</p> <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">DOT</th> <th style="text-align: left; border-bottom: 1px solid black;">CENTER FREQ.</th> </tr> </thead> <tbody> <tr> <td>Red</td> <td>10.70 MHz</td> </tr> <tr> <td>Blue</td> <td>10.67 MHz</td> </tr> <tr> <td>Orange</td> <td>10.73 MHz</td> </tr> <tr> <td>Black</td> <td>10.64 MHz</td> </tr> <tr> <td>White</td> <td>10.76 MHz</td> </tr> </tbody> </table>	DOT	CENTER FREQ.	Red	10.70 MHz	Blue	10.67 MHz	Orange	10.73 MHz	Black	10.64 MHz	White	10.76 MHz	Position of non-interference.	Oscilloscope connected to FM IF INPUT pin (See Figure 3).	Adjust, in this order, T103, 102, 101, on IF Board. Then adjust T1 in the Front End (See Figure 2). Adjust for maximum gain and best (most symmetrical) shape of balanced "S" curve.
DOT	CENTER FREQ.															
Red	10.70 MHz															
Blue	10.67 MHz															
Orange	10.73 MHz															
Black	10.64 MHz															
White	10.76 MHz															
2.	Remove generator and connect it to the FM ANT terminals through a pair of 120 ohm resistors. Set for 98 KHz, modulated 100% with 400 Hertz. Set generator output as low as possible for good indication on VTVM and oscilloscope.	98 MHz (Adjust for maximum).	Oscilloscope and VTVM connected to LEFT RCDR OUT jack.	Readjust T103, 102, 101 carefully, and last, T1 in the Front End (very light touch-up, as necessary).												
3.	Change Signal Generator output to 106 MHz.	106 MHz.	Same as above.	Adjust FM Oscillator trimmer CT3 on the Front End for maximum deflection on the oscilloscope.												
4.	Set the receiver at 90 MHz and adjust the output of the signal generator so that the oscilloscope shows maximum deflection.	90 MHz.	Same as above.	Check to be sure signal generator is within 150 kHz of 90 MHz.												
5. Sensitivity balance between 106 and 98 MHz	Output frequency alternately set at 106 and 90 MHz.	106 and 90 MHz, alternately.	Same as above.	Adjust CT1 and CT2, back and forth, while observing the effect on sensitivity at each receiving frequency. Adjust for best compromise between the ends of the receiving range.												
NOTE: Set SELECTOR switch to FM STEREO position.																
6. MPX Adjustment	FM Stereo MPX Generator to FM ANT terminals. Carrier set to position of non-interference near 100 MHz, 19 kHz pilot modulating carrier minimally (1-2%). No audio modulation.	Position of non-interference near 100 MHz.	VTVM and Oscilloscope to Test Point on MPX Board (See Figure 6).	Adjust L302 and 303 on MPX Board for maximum reading on VTVM.												
7.	Modulate carrier with 10% 19 kHz pilot, 90% 1 kHz Left channel only.	Same as step 6.	VTVM and Oscilloscope to LEFT RCDR OUT jack.	Adjust L302 for maximum undistorted sine wave on oscilloscope.												

## TUNER ALIGNMENT PROCEDURES (CONT'D)

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
8.	As above, but Right channel only modulated.	Same as step 6.	Same as step 7.	Minimum indication on VTVM.
9.	Same as step 7.	Same as step 6.	VTVM and oscilloscope to RIGHT RCDR OUT jack.	Adjust L302 for maximum undistorted sine wave on oscilloscope.
10.	Same as step 8.	Same as step 6.	Same as step 6.	Minimum indication on VTVM. Repeat steps 7 through 10 until no further improvement can be made.
NOTE: Set SELECTOR switch to AM and VOLUME control to MIN.				
1. AM IF Alignment	AM Signal Generator set to 455 kHz, 30% modulated with 400 Hertz audio.	Point of non-interference near 600 kHz.	VTVM connected to LEFT RCDR OUT jack.	Adjust T106, 105, 104 on Tuner board, in that order, for maximum reading on VTVM.
2. Front End	Connect output of Signal Generator to a loop of wire and place around AM ANT loopstick. Set output to point 600 kHz, modulated as above, of non-interference, modulated as above.	600 kHz.	Same as step 1.	Adjust L102 (Osc) on IF board, then L901 (sliding coil on loopstick).
3.	Change generator output to 1400 kHz, modulated as above.	1400 kHz.	Same as step 1.	Adjust CT5 (Oscillator trimmer) and CT6 (Antenna trimmer) on Front End.
4. Repeat steps 2 and 3 until no further improvement can be obtained.				

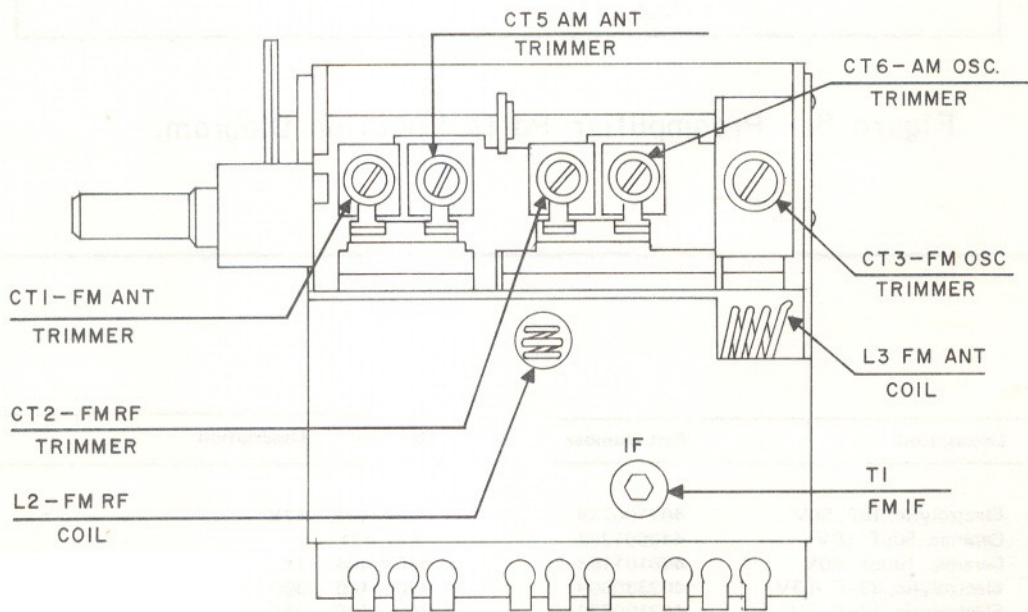


Figure 2. Front End Parts Location Diagram.

# IF FM-AM PCB AND PARTS LIST

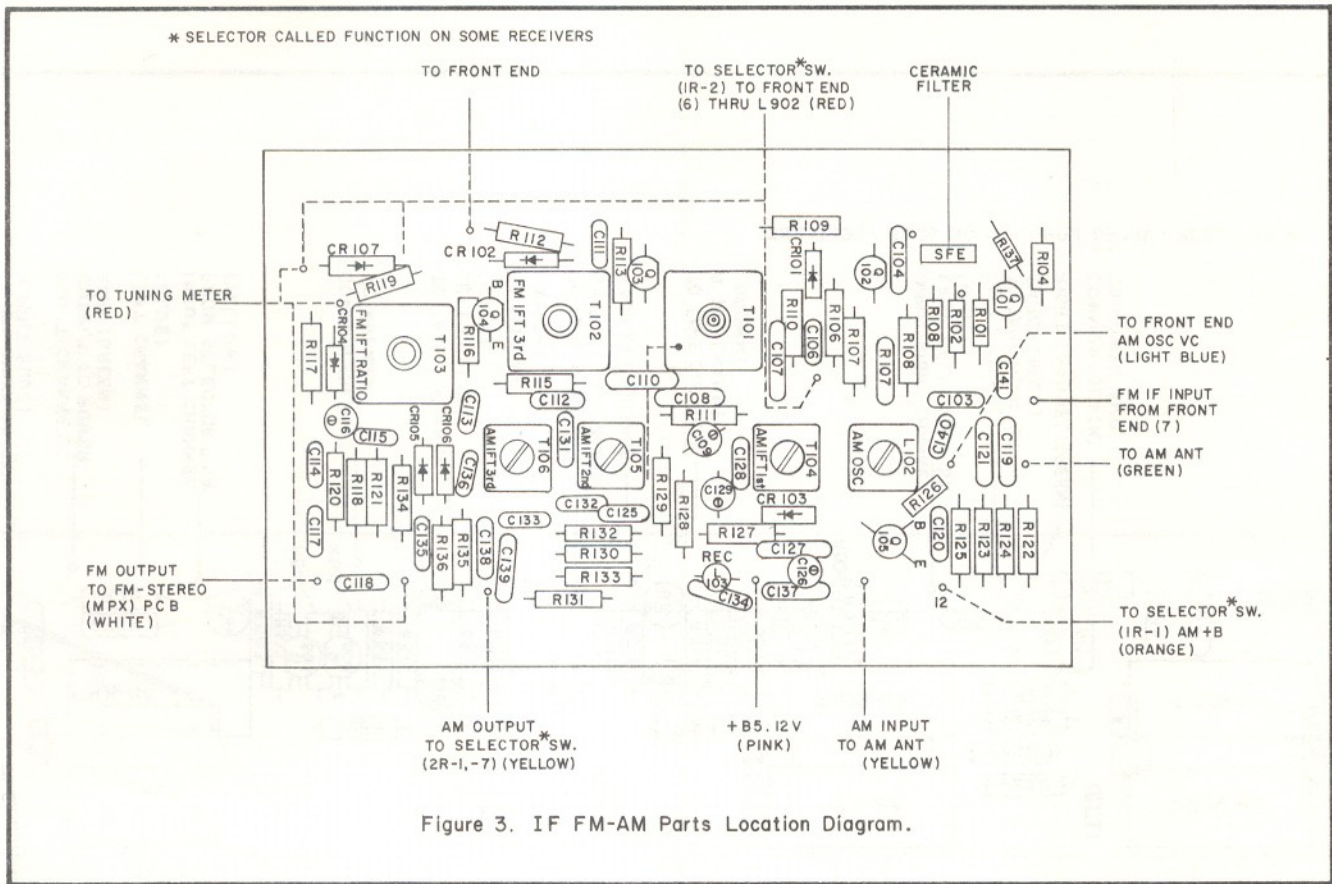


Figure 3. IF FM-AM Parts Location Diagram.

Ref. Des.	Description	Part Number
C101, 102, 103, 104, 105, 107, 108, 112, 120, 135, 136	Ceramic, 0.01uF	440100985
C106, 111	Ceramic, 5pF	440501388
C109	Electrolytic, 10uF, 25V	402100629
C110	Ceramic, 2pF	440201388
C113, 117, 118	Ceramic, 100pF	440101183
C114, 115	Ceramic, 200pF	440201183
C116	Electrolytic, 47uF, 25V	402470629
C119, 121, 125, 127, 133, 134, 137, 138	Ceramic, 0.05	440500985
C122	Ceramic, 50pF	440501283
C123, 124	Ceramic, 150pF	C508659-9
C126	Electrolytic, 1uF, 50V	402100749
C128, 139	Ceramic, 0.002uF	440201085
C129	Electrolytic, 33uF, 6.3V	402330609
C130, 140	Ceramic, 3pF	440301388
C131, 132	Ceramic, 0.001uF	440101085
CR101, 102, 103, 105, 106, 107	Diode, 1S188	300111008
CR104	Diode, SM-1	300919008
L101	AM Oscillator Coil	223301121
L102	RF choke, 47uH	220001121
Q101, 102, 103, 104	Transistor, ED-1502	301901130

Ref. Des.	Description	Part Number
Q105	Transistor, 2SA102	301001124
R101	330K	552033422
R102	330	552033122
R103, 105, 110, 121	100	552010122
R104, 133	220	552022122
R106, 122	33K	552033322
R107	5.6K	552056222
R108, 109, 113, 115, 123, 125, 129, 136	1K	552010222
R111	470	552047122
R112	100K	552010422
R114	10	552010022
R116, 124	1.5K	552015222
R117, 118	10K	552010322
R119	1M	552010522
R120	270	552027122
R126	22	552022022
R127	3.9K	552039222
R128	4.7K	552047222
R130, 135	22K	552022322
R131	47	552047022
R132	6.8K	552068222
R134	2.2K	552022222
SFE101	Ceramic, FM IF Filter	229101134
T101, 102	Transformer, 10.7 MHz	225501116
T103	Transformer, Ratio Detector	225501117
T104	Transformer, 455KHz	225301121
T105	Transformer, 455KHz	225301122
T106	Transformer, 455KHz	225301124

All resistors are deposited carbon, 5%, 1/4W unless otherwise noted. K = Kiloohm, M = Megohm.

# CONTROL AMPLIFIER PCB AND PARTS LIST

\* SELECTOR CALLED FUNCTION ON SOME RECEIVERS

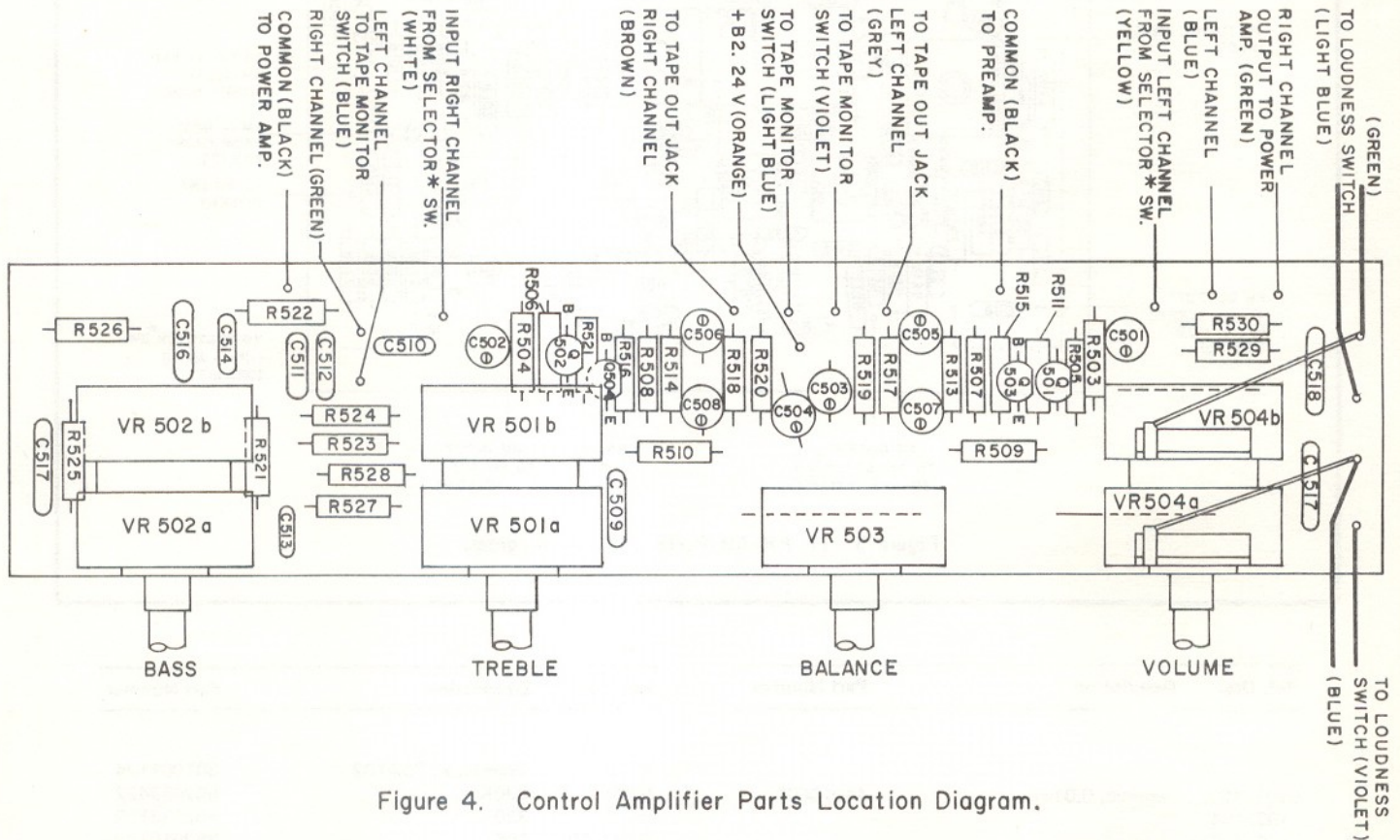


Figure 4. Control Amplifier Parts Location Diagram.

Ref. Des.	Description	Part Number
C501, 502	Electrolytic, 1uF, 50V	402100749
C503, 504, 507, 508	Electrolytic, 10uF, 25V	402100629
C505, 506	Electrolytic, 33uF, 6.3V	402330609
C509, 510	Ceramic, 0.002uF, 50V	442201083
C511, 512	Mylar, 0.02uF, 50V	450200933
C513, 514	Mylar, 0.03uF, 50V	450300933
C515, 516	Mylar, 0.2uF, 50V	450200833
C517, 518	Mylar, 0.1uF, 50V	450100833
Q501, 502, 503, 504	Transistor, ED1402	301901128
R503, 504, 515, 516, 517, 518	1K	552010222
R505, 506, 525, 526	2.2K	552022222

Ref. Des.	Description	Part Number
R507, 508	68K	552068322
R509, 510	3.3K	552033222
R511, 512	680K	552068422
R513, 514, 527, 528	5.6K	552056222
R519, 520	1.5K	552015222
R521, 522	10K	552010322
R523, 524	22K	552068222
R529, 530	3.9K	552039222
VR501, 502	Potentiometer, Bass, Treble 50K	525101113
VR503	Potentiometer, Balance 250K	515121114
VR504	Potentiometer, Volume 100K	525121114

All resistors are deposited film, 5%, 1/4W unless otherwise noted. K = Kilohm.

# PREAMPLIFIER PCB AND PARTS LIS'

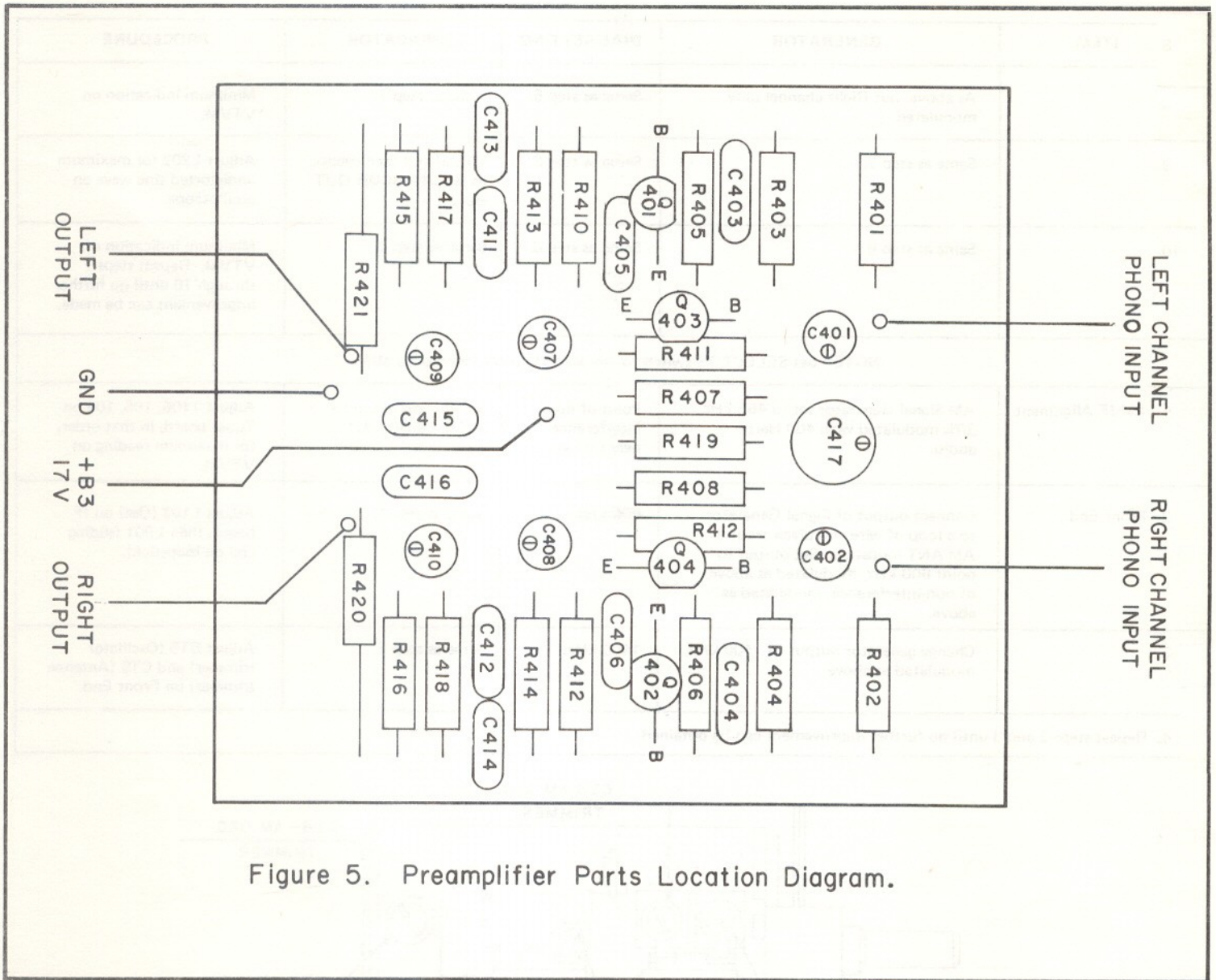


Figure 5. Preamplifier Parts Location Diagram.

Ref. Des.	Description	Part Number
C401, 402	Electrolytic, 1uF, 50V	402100749
C403, 404	Ceramic, 50pF, 50V	440501283
C405, 406	Ceramic, 100pF, 50V	440101183
C407, 408	Electrolytic, 33uF, 6.3V	402330609
C409, 410	Electrolytic, 10uF, 25V	402100629
C411, 412	Ceramic, 4700pF, 50V	442401083
C413, 414	Mylar, 0.015, 50V	0275012
C415, 416	Ceramic, 0.1uF, 50V	440100835
C417	Electrolytic, 100uF, 16V	402100519
Q401, 402,	Transistor, ED 1402	301901128
403, 404		

Ref. Des.	Description	Part Number
R401, 402,	47K	552047322
420, 421		
R403, 404	1K	552010222
R405, 406	390	552056122
R407, 408,	22K	552022322
419		
R409, 410	2.2M	552010522
R411, 412	10K	552010322
R413, 414	3.3K	552015222
R415, 416	15K	552015322
R417, 418	560K	552056422

All resistors are deposited carbon, 5%, 1/4W unless otherwise noted. K = Kilohm, M = Megohm.



# MPX PCB AND PARTS LIST

\* SELECTOR CALLED FUNCTION ON SOME RECEIVERS

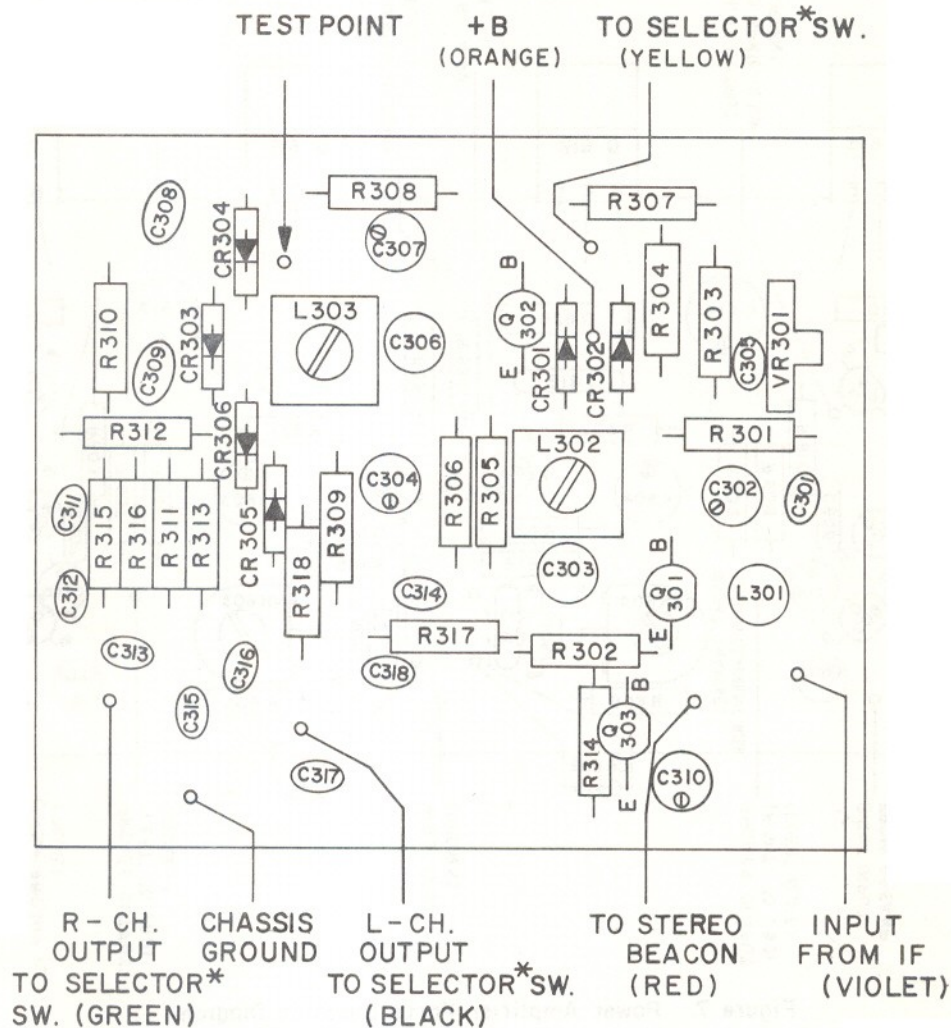


Figure. 6 MPX Parts Location Diagram.

Ref. Des.	Description	Part Number
C301	Ceramic, 200pF, 50V	440201183
C302	Electrolytic, 1uF, 50V	402100749
C303, 306	Polystyrene, 3.300pF, 50V	454331033
C304, 307, 310	Electrolytic, 10uF, 50V	402100629
C305	Ceramic, 0.005uF, 50V	442501083
C308, 309, 311, 314, 317, 318	Mylar, 4700pF, 50V	450471033
C312, 315	Mylar, 8200pF, 50V	450821033
C313, 316	Mylar, 0.05uF, 50V	450500933
CR301, 302, 303, 304, 305, 306	Diode 1K 188	300111008
L301	SCA Filter RL59	228641116
L302	MPX trap, 19KHz RL57	225601133
L303	Transformer, MPX, 38KHz RL58	225601134
Q301	Transistor, 2SC644	301201114

Ref. Des.	Description	Part Number
Q303	Transistor, 2SC1384	301201113
Q302	Transistor, ED1402	301901128
R301	560K	552056422
R302	470	RC07BF4710
R303, 307	2.2K	552022222
R304	220K	552022422
R305	5.6K	552056222
R306	100	552010122
R308, 309, 310, 312, 315, 317	47K	552047322
R311, 313, 316, 318	3.9K	552039222
R314	680 1/2W	RC20BF681J
VR301	Potentiometer, Separation adj 10K	510502102

All resistors are deposited carbon, 5%, 1/4W unless otherwise noted. K = Kilohm.

# POWER AMPLIFIER PCB AND PARTS LIST

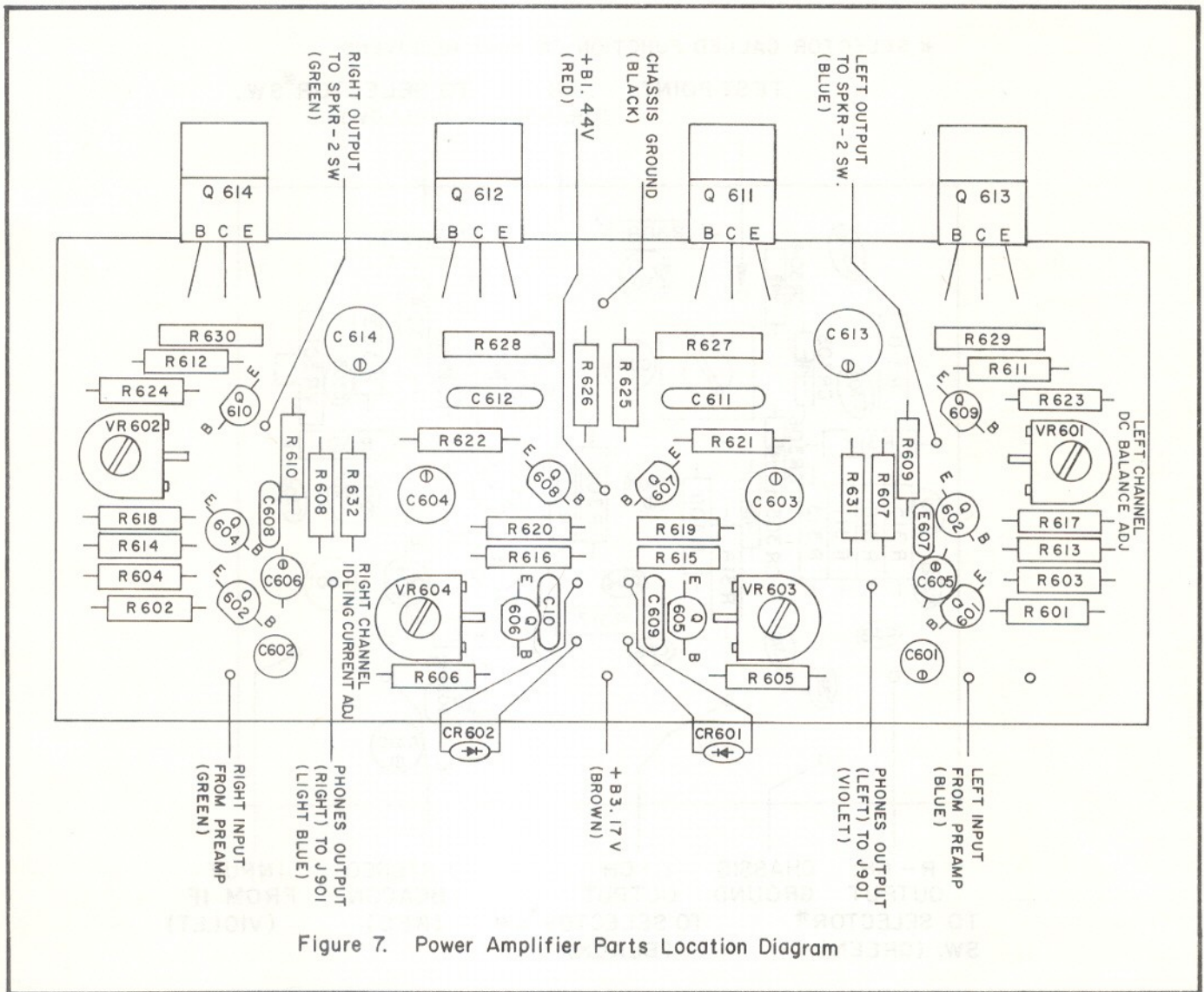
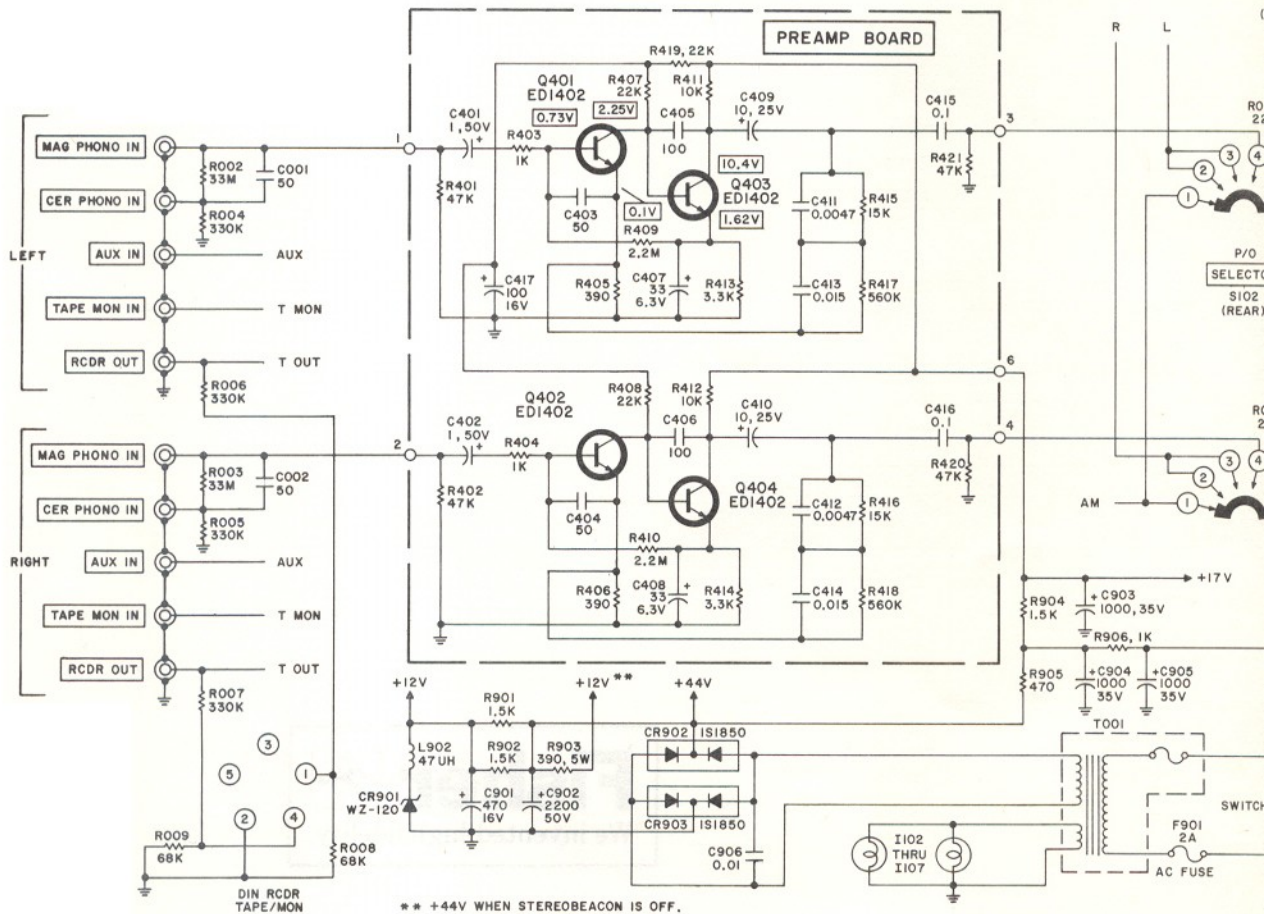
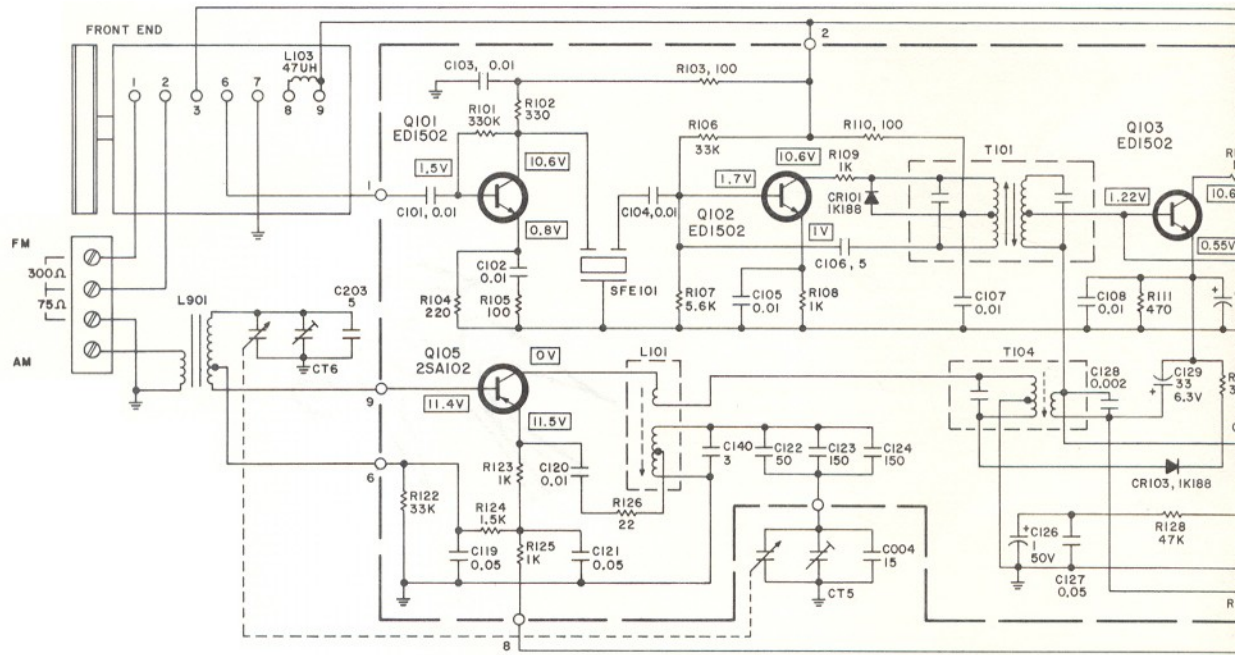


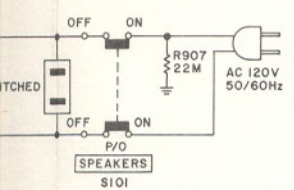
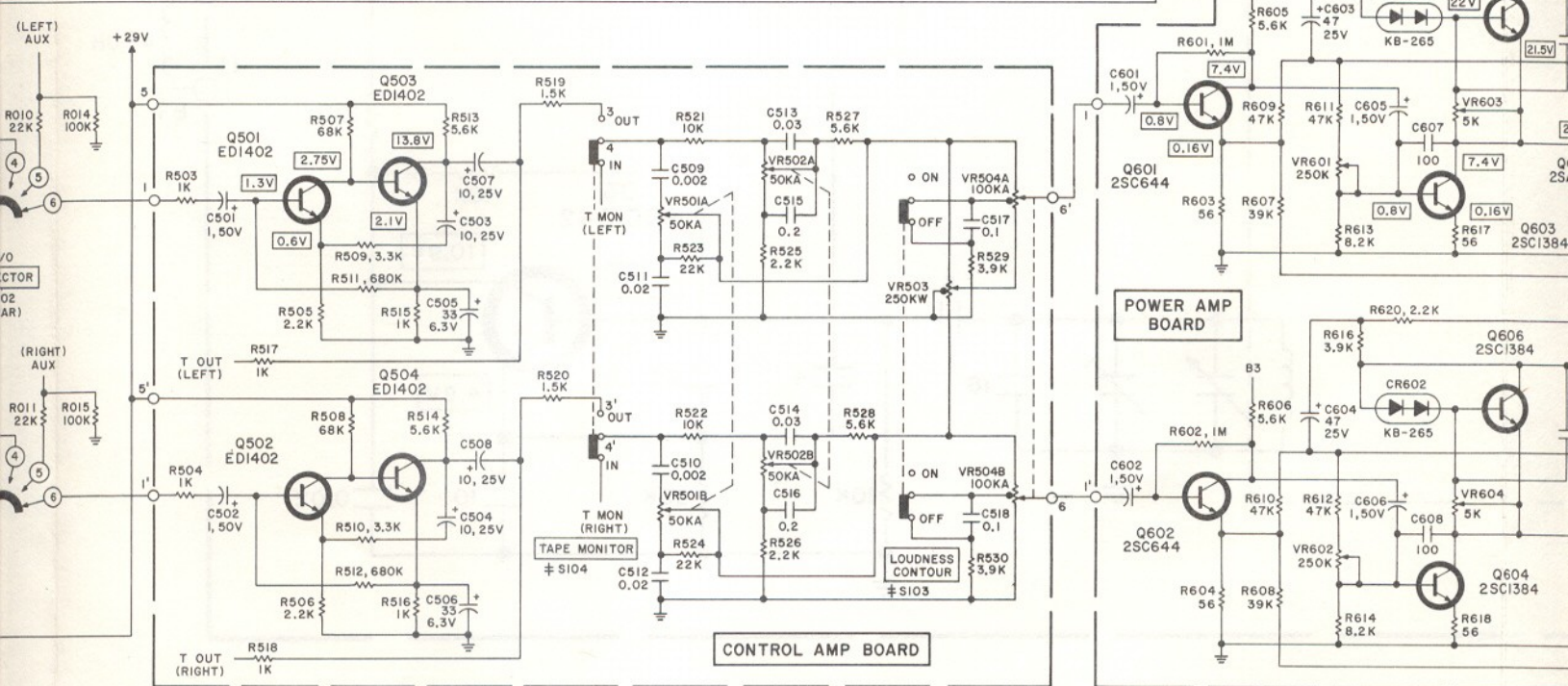
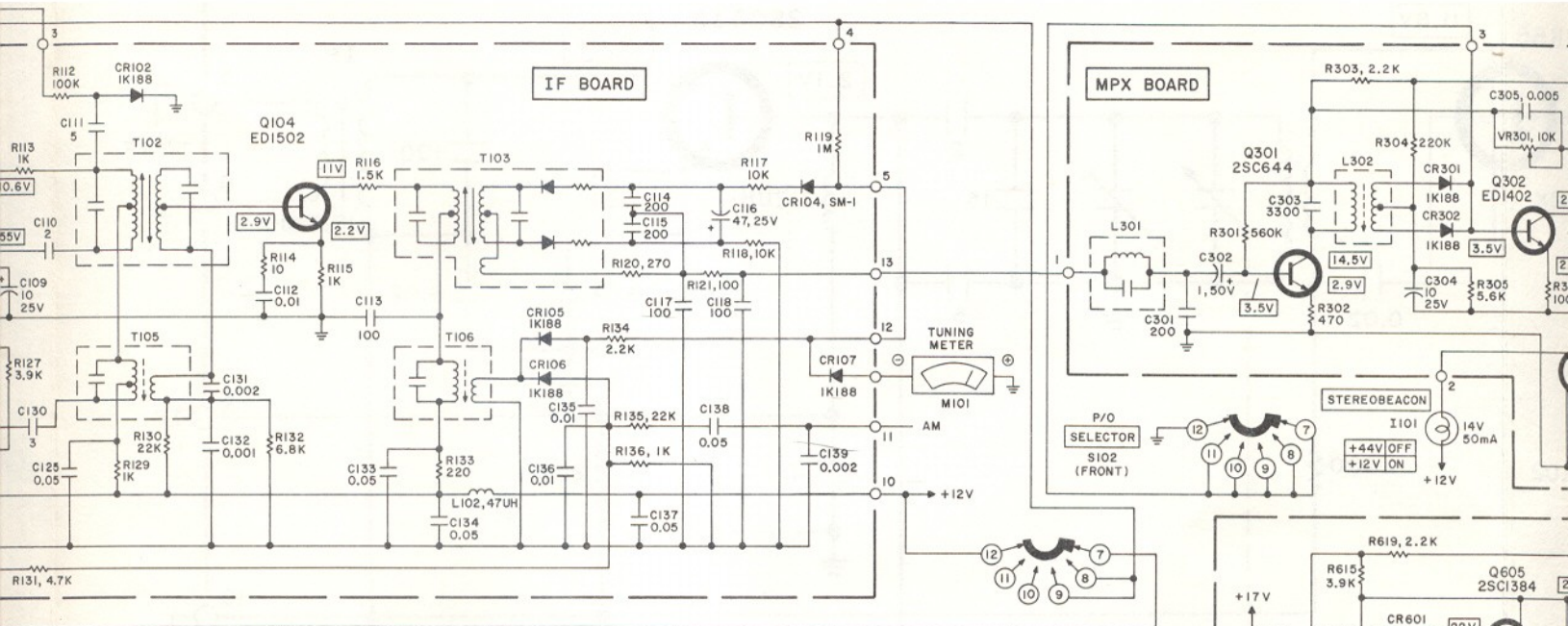
Figure 7. Power Amplifier Parts Location Diagram

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C601, 602, 605, 606	Electrolytic, 1uF, 50V	402100749	R605, 606	5.6K	552056222
C603, 604	Electrolytic, 47uF, 35V	402470639	R607, 608	39K	552039322
C607, 608	Ceramic, 100pF, 50V	440101183	R609, 610, 611, 612	47K	552047322
C609, 610	Ceramic, 0.01uF, 50V	440100983	R613, 614	8.2K	552082222
C611, 612	Mylar Film, 0.2uF, 50V	450200833	R615, 616	3.9K	552039222
C613, 614	Electrolytic, 1000uF, 35V	402100439	R619, 620	2.2K	552022222
CR601, 602	Varistor, KB-265	300212004	R621, 622, 623, 624, 631, 632	330 1/2W	551033133
Q601, 602	Transistor, 2SC644	301201114	R625, 626	10 1/2W	551010033
Q603, 604, 605, 606, 607, 608	Transistor, 2SC1384	301201113	R627, 628, 629, 630	0.47 2W	554147953
Q609, 610	Transistor, 2SA684	301001123	VR601, 602	Potentiometer, DC Balance, 250K	510502115
Q611, 612, 613, 614	Transistor, 2SC789 (Output)	301201142	VR603, 604	Potentiometer, Idling Current, 5K	510502114
R601, 602	1M	552010522		Heat Sink (Output)	127012104
R603, 604, 617, 618	56	552056022			

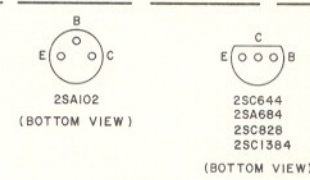
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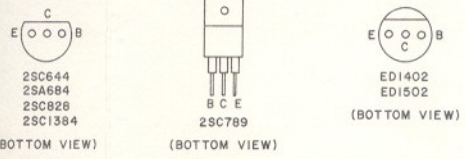
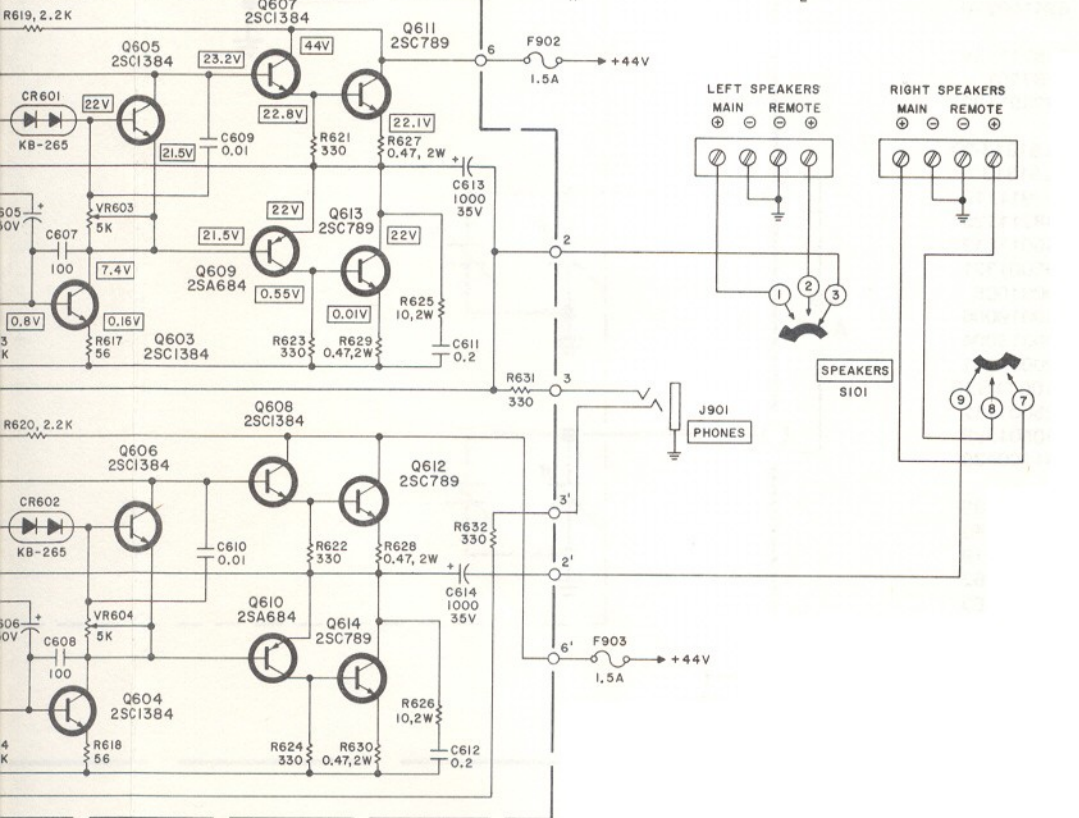
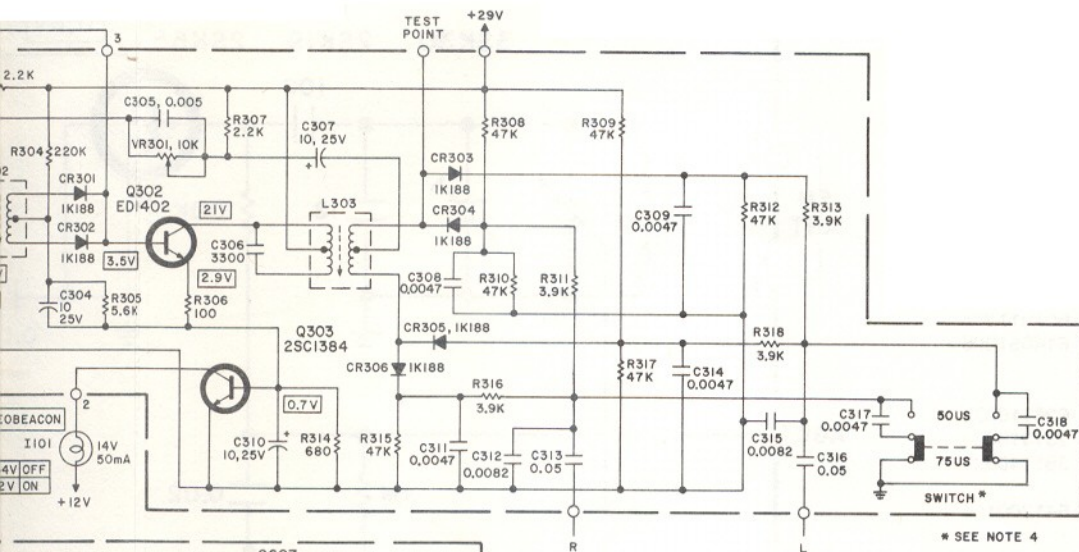


\*\* +44V WHEN STEREOBEACON IS OFF.



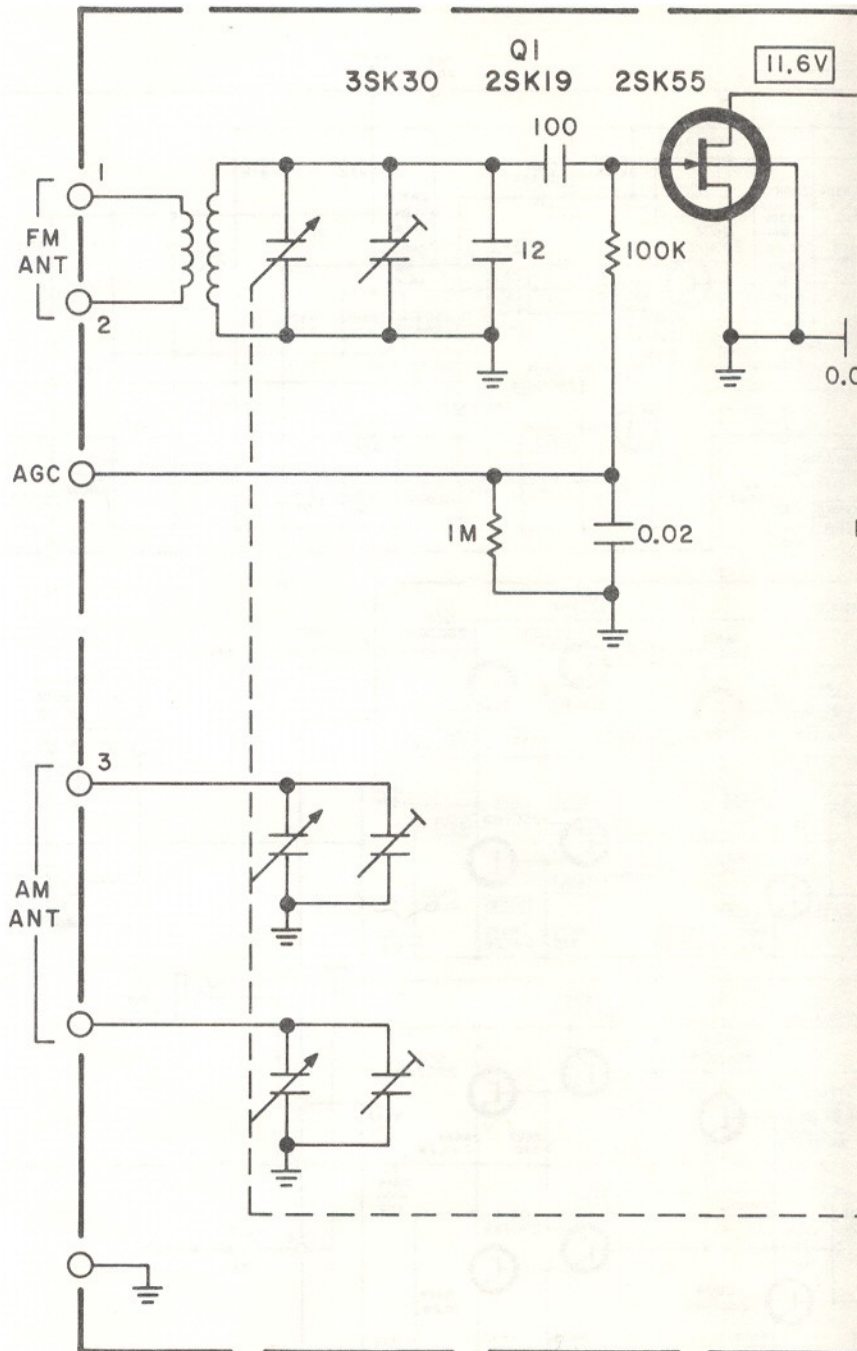
- NOTES:
1. LINE VOLTAGE SET TO 120V AC FOR ALL VOLTAGE MEASUREMENTS.
  2. EXCEPT AS NOTED, ALL VOLTAGES  $\pm 20\%$ .
  3. [XXX] DENOTES DC VOLTAGES MEASURED WITH VTVM TO CHASSIS.
  4. SWITCH NOT FOUND ON ALL MODELS (LOCATED ON MPX BOARD).
  5. LOCATED ON FRONT PANEL.





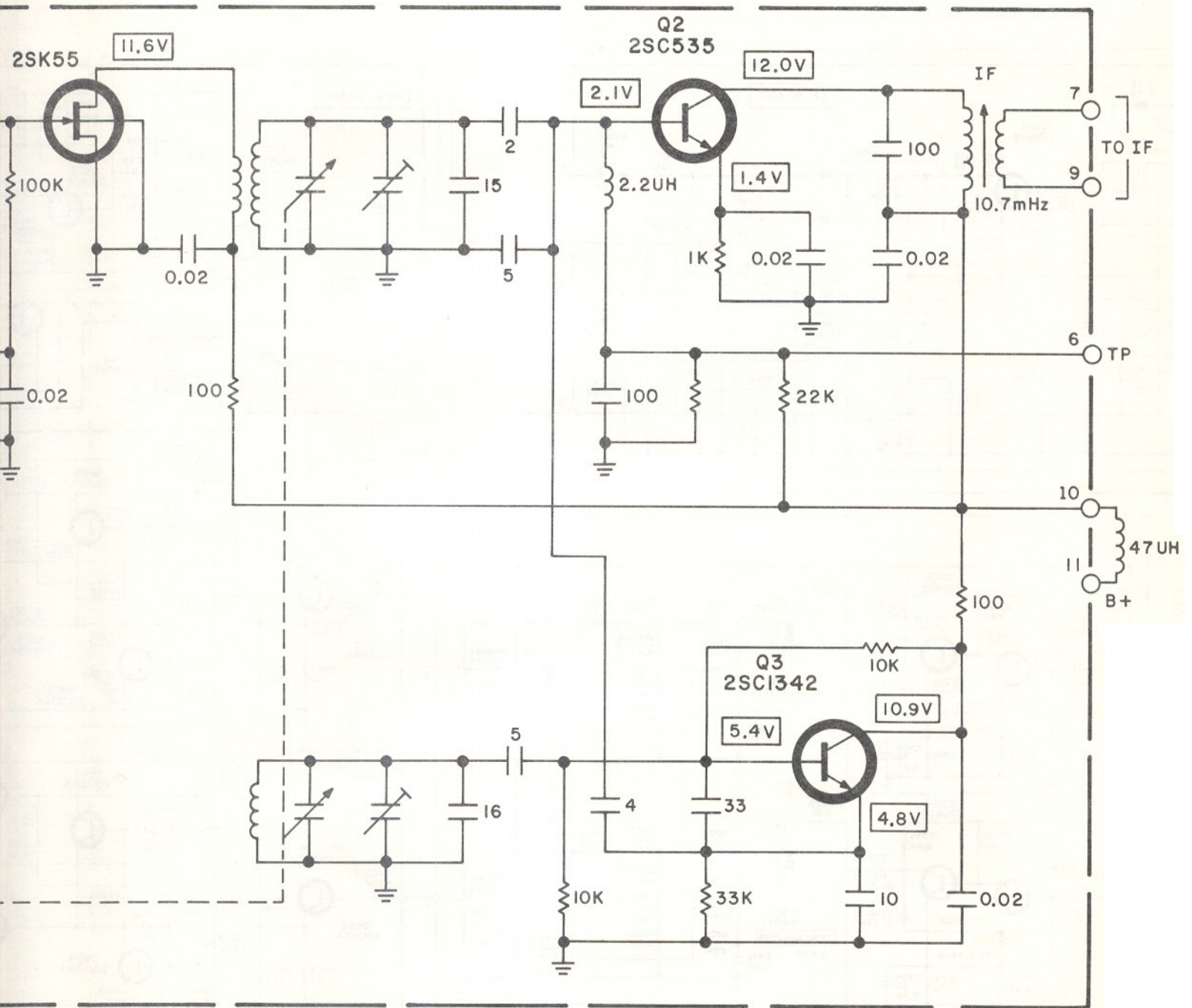
# MAIN CHASSIS PARTS LIST

Ref. Des.	Description	Part Number
--	Tuner Front End (Incl. tuning gang)	321304368
--	Cabinet	131011229
--	Knob, tuning	116310105
--	Knob, small	116310106
--	Button, push	116210020
--	Escutcheon	111911294
--	Tuning scale (dial)	112011277
--	Dial Pointer, w/lamp	151691117
I102 thru 107	Lamp only, for above, 8V, 0.15A	351080015
--	Pulley, tuning gang	655310007
--	Spring for above	658601113
--	Pulley, small	651110008
--	Tuning shaft	654911291
S101	Switch, SPEAKERS	613000021
S102	Switch, SELECTOR (FUNCTION)	601011234
S103, 104	Switch, Pushbutton LOUDNESS CONTOUR, TAPE MONITOR	614051006
	Jack, PHONES	626110023
M101	Meter, tuning	231310038
I101	Lamp, STEREOBEACON, 14V, 50mA	351140005
--	Terminal Board, SPEAKERS (4 terminals)	641200104
--	Terminal Board, RCA jacks (10 jacks)	624100210
--	Fuse holder w/cap	648211134
--	Lamp, dial, 6.3V, 250mA	2767201
--	AM ANT Loopstick, w/bracket	222391122
	Fuse, 2A, normal (3AG)	FL51313-29
	Fuse, 1.5A normal (3AG)	FL51313
--	GND terminal, w/nut	767911119
--	AC jack	648211126
--	Bracket, dial lamp	640011112
--	Power Transformer	205001321
CR902	Rectifier 1850	30091005
CR903	Rectifier 1850R	300919006
CR901	Zener Diode, BZ-120	300313004
L103	RF Choke, 47uH	220001121
	Terminal strip 4-6 lugs	E100T1G2G
	DIN jack	625001112
C203	Ceramic, 5pF, 50V	440501388
C903, 904, 905	Electrolytic, 1000uF, 35V	401100439
C415, 416	Ceramic, 0.1uF, 50V	440100835
C902	Electrolytic, 2200uF, 50V	400220449
C901	Electrolytic, 470uF, 16V	401470519
R901, 902	Metal Oxide 1500 2W	553015262
R903	390, 5W	553139163
R904	1.5K	552015222
R905	470 1/2W	552047122
R906	1K	552010222
<b>PRINTED CIRCUIT BOARDS</b>		
--	PCB, IF Circuit (w/components)	1413311358
--	PCB, MPX Circuit (w/components)	141411444
--	PCB, Preamplifier Circuit (w/components)	141510143
--	PCB, Control Circuit (w/components)	141710252
--	PCB, Power Amplifier (w/components, less output transistors.)	141610256



All resistors are deposited carbon, 5%, 1/4W unless otherwise noted. K = Kilohm.

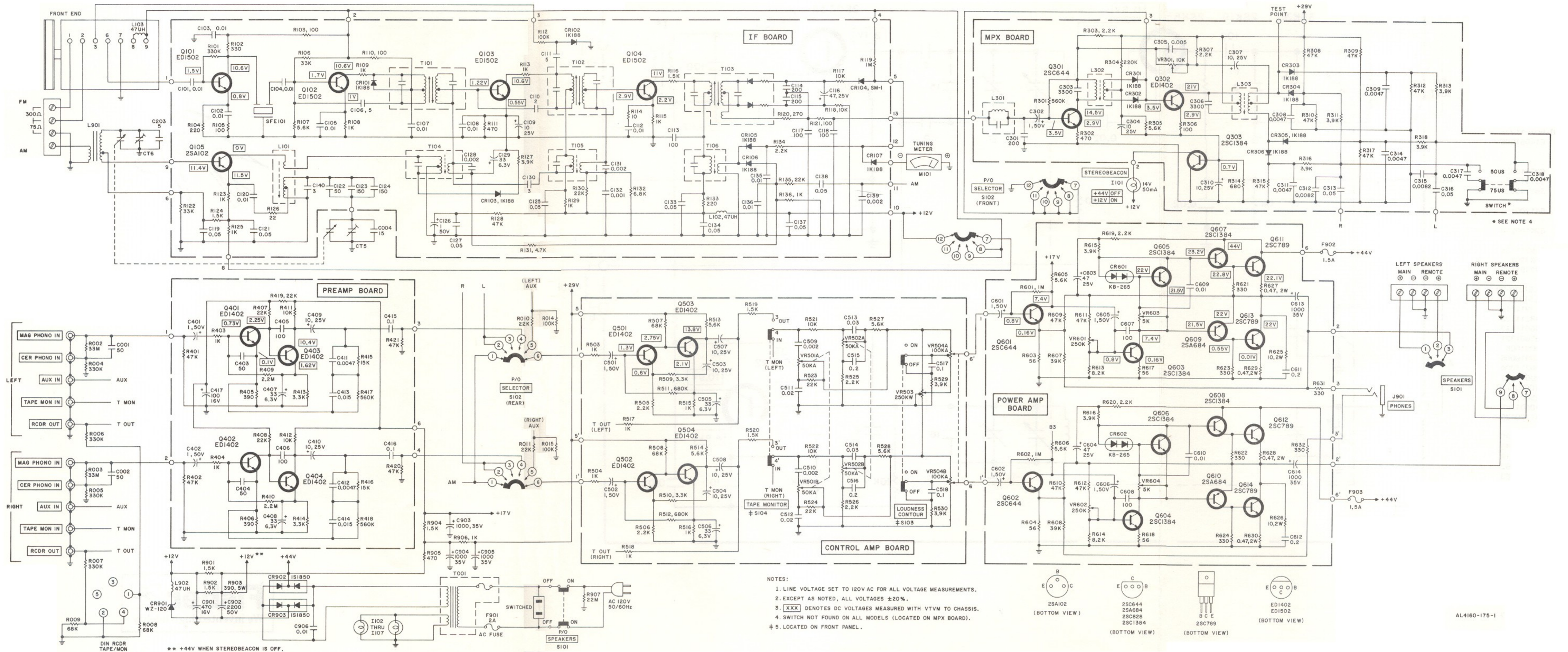
# FRONT END SCHEMATIC DIAGRAM



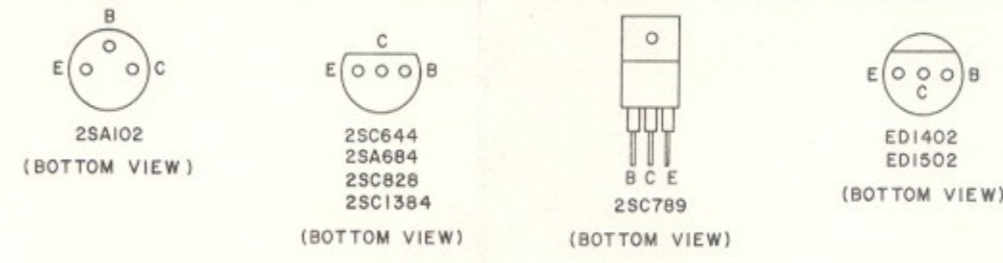


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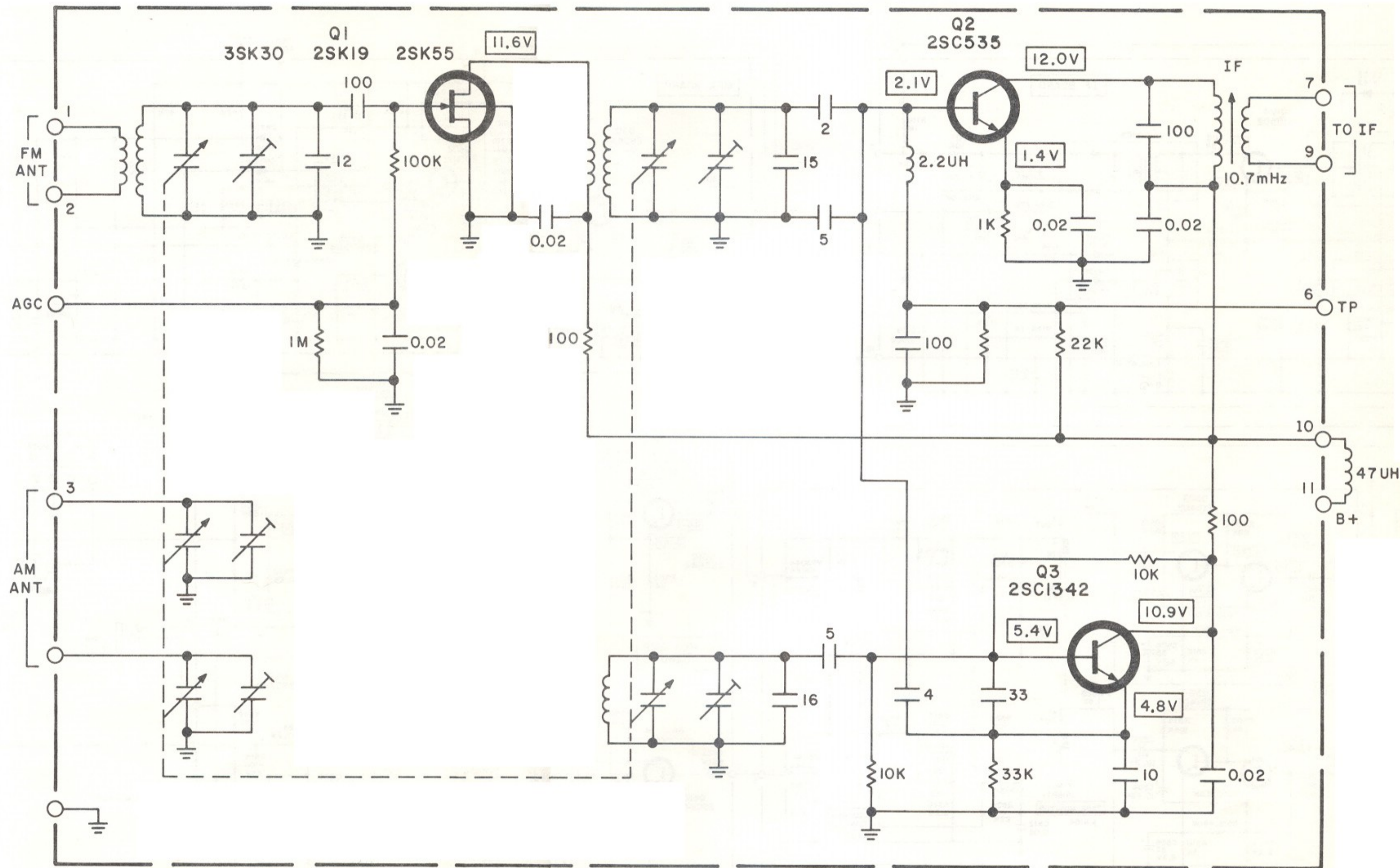
- NOTES:
1. LINE VOLTAGE SET TO 120V AC FOR ALL VOLTAGE MEASUREMENTS.
  2. EXCEPT AS NOTED, ALL VOLTAGES  $\pm 20\%$ .
  3. [XXX] DENOTES DC VOLTAGES MEASURED WITH VTVM TO CHASSIS.
  4. SWITCH NOT FOUND ON ALL MODELS (LOCATED ON MPX BOARD).
  5. LOCATED ON FRONT PANEL.



# MAIN CHASSIS PARTS LIST

# FRONT END SCHEMATIC DIAGRAM

Ref. Des.	Description	Part Number
--	Tuner Front End (Incl. tuning gang)	321304368
--	Cabinet	131011229
--	Knob, tuning	116310105
--	Knob, small	116310106
--	Button, push	116210020
--	Escutcheon	111911294
--	Tuning scale (dial)	112011277
--	Dial Pointer, w/lamp	151691117
1102 thru 107	Lamp only, for above, 8V, 0.15A	351080015
--	Pulley, tuning gang	655310007
--	Spring for above	658601113
--	Pulley, small	651110008
--	Tuning shaft	654911291
S101	Switch, SPEAKERS	6130000021
S102	Switch, SELECTOR (FUNCTION)	601011234
S103, 104	Switch, Pushbutton LOUDNESS CONTOUR, TAPE MONITOR	614051006
M101	Jack, PHONES	626110023
I101	Meter, tuning	231310038
--	Lamp, STEREOBEACON, 14V, 50mA	351140005
--	Terminal Board, SPEAKERS (4 terminals)	641200104
--	Terminal Board, RCA jacks (10 jacks)	624100210
--	Fuse holder w/cap	648211134
--	Lamp, dial, 6.3V, 250mA	2767201
--	AM ANT Loopstick, w/bracket	222391122
--	Fuse, 2A, normal (3AG)	FL51313-29
--	Fuse, 1.5A normal (3AG)	FL51313
--	GND terminal, w/nut	767911119
--	AC jack	648211126
--	Bracket, dial lamp	640011112
--	Power Transformer	205001321
CR902	Rectifier 1850	30091005
CR903	Rectifier 1850R	300919006
CR901	Zener Diode, BZ-120	300313004
L103	RF Choke, 47uH	220001121
--	Terminal strip 4-6 lugs	E100T1G2G
--	DIN jack	625001112
C203	Ceramic, 5pF, 50V	440501388
C903, 904, 905	Electrolytic, 1000uF, 35V	401100439
C415, 416	Ceramic, 0.1uF, 50V	440100835
C902	Electrolytic, 2200uF, 50V	400220449
C901	Electrolytic, 470uF, 16V	401470519
R901, 902	Metal Oxide 1500 2W	553015262
R903	390, 5W	553139163
R904	1.5K	552015222
R905	470 1/2W	552047122
R906	1K	552010222
<b>PRINTED CIRCUIT BOARDS</b>		
--	PCB, IF Circuit (w/components)	1413311358
--	PCB, MPX Circuit (w/components)	141411444
--	PCB, Preamplifier Circuit (w/components)	141510143
--	PCB, Control Circuit (w/components)	141710252
--	PCB, Power Amplifier (w/components, less output transistors.)	141610256



All resistors are deposited carbon, 5%, 1/4W unless otherwise noted. K = Kilohm.