

SERVICE DATA



MODEL CR-3000



156-010726

Figure 1. Hallicrafters' Model CR-3000 Receiver.

SPECIFICATIONS

Circuit: 6-band superheterodyne high-fidelity receiver with FM stereo multiplex and stereo preamp/amplifier. Circuit contains 33-transistors, 26 diodes and 4 thermistors.

Frequency Coverage:
 LW 190KC - 400 KC
 BC 535KC - 1605KC
 SW1 2MC - 4 MC
 SW2 5.85 MC - 10.3 MC
 SW3 11.4 MC - 18.2 MC
 FM 88 MC - 108 MC

Inputs: Magnetic cartridge (dual inputs for r & l channels) impedance 47 K ohm

Ceramic/crystal cartridge (dual inputs for r & l channels) impedance 1 meg ohm

Auxiliary equipment (dual inputs for r & l channels) impedance - 100K ohms

Tape recorder (dual inputs for r & l channels) impedance - 100K ohm

External antenna terminals (balanced input for FM, single input and ground for LW, BC and SW) impedance - 300 ohm (FM)

Outputs: Speaker terminals (dual outputs for r & l channels) impedance - 8 ohms

Tape recorder (dual outputs for r & l channels) impedance-100K ohms

Controls: Power ON-OFF
 Function
 Tuning
 Fine Tuning
 BFO ON-OFF & RF Gain
 Loudness
 Stereo Balance
 Bass Control
 Treble Control
 Band Select

Antennas: Self contained ferrite rod for LW and BC, line cord antenna for FM

Indicators: FM stereo indicator light, Tuning meter for AM or FM signal

IF Frequency: AM - 455 KC
 FM - 10.7 MC

Power Output: 20 Watts R.M.S. (10 Watts RMS/channel)

Power Source: 105-125 VAC, 50-60 CPS

Dimensions: 4-7/8" (H) x 15-5/8" (W) x 12-1/4" (D)

Net Weight: 16.5 pounds

REMOVING THE CABINET

1. Remove the 6 screws around the rear of the cabinet, together with the two screws on the bottom front of the cabinet.
2. Remove all four feet.
3. Disconnect the FM line cord antenna.
4. Slide the chassis forward, out of the cabinet.

ERRATA SHEET

MODEL CR-3000

1. In figure 4, the SW3 RF trimmer capacitor labeled C212, located on the right side of the drawing, should be labeled C210.
2. In the AM Alignment Chart, under the column headed "Receiver Adjust", the following changes should be made:
 - A. In step 5, delete the reference to note A.
 - B. In step 6, change C206C to read C208.
 - C. In step 27, change C206B to read C206.
 - D. In step 34, change C206A to read C205.
3. In the FM Alignment Chart, under the column headed "Receiver Adjust", C107 in step 9 should be changed to read C104.

Form Number 094-904865
Pack with Instruction Manual
094-904714

REMOVING THE FRONT PANEL

1. Remove 8 screws (4 front, 4 rear) to remove the chassis top cover plate.
2. Remove all knobs by pulling each knob straight forward.
3. Remove 10 screws along the bottom of the front panel extrusion. Remove 4 screws at the top of the extrusion.
4. Remove plastic front panel end-caps.
5. Pull the front panel directly forward to clear the control shafts, then lift up and place the front panel on top of chassis. NOTE: It is not necessary to remove or disconnect either the power switch, the earphone jack or the tuning meter. Disconnecting the tuning meter, however, will allow the front panel to swing completely out of the way.

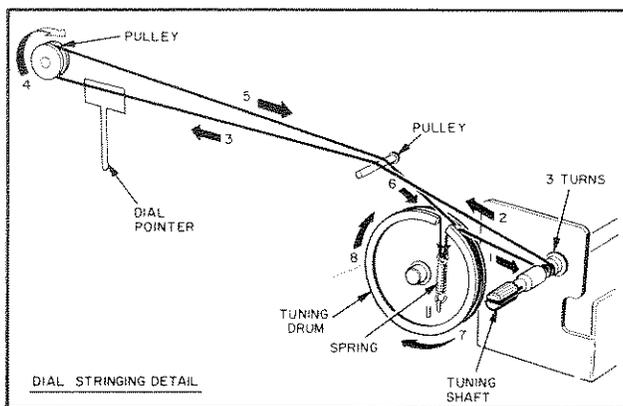


Figure 2. Restringing the Tuning Capacitor Drive Cord.

DIAL CORD RESTRINGING

To restring either the dial drum cord or the tuning capacitor drive cord, remove the receiver from the cabinet and remove the front panel extrusion from the receiver. Place the pulleys in the positions shown on figure 2. Begin stringing at location 1 and continue stringing following the sequence in numerical order. When both cords require restringing, it is easier to string the dial drum cord first. After restringing replace the front panel. Loosen the set screw on the dial drum shaft and rotate the drum slightly to align the dial scale, which corresponds to the particular band switch position, with the dial window. During this procedure view the dial through the window with the receiver positioned at eye level to minimize parallax error. After proper positioning, tighten the set screw, on the dial drum shaft, sufficiently to prevent slipping.

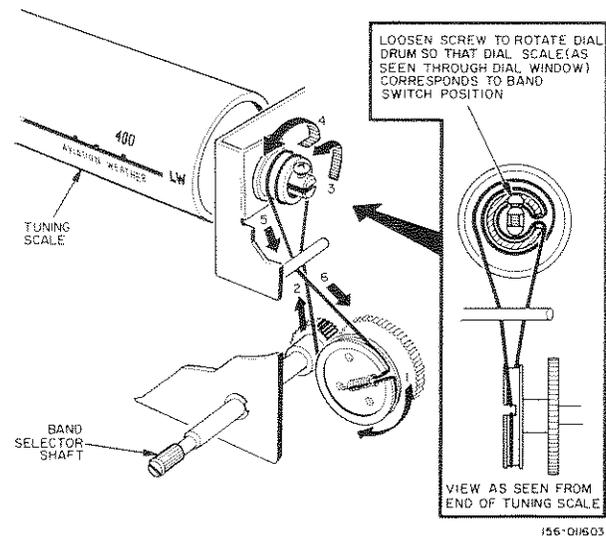


Figure 3. Restringing the Dial Drum Drive Cord.

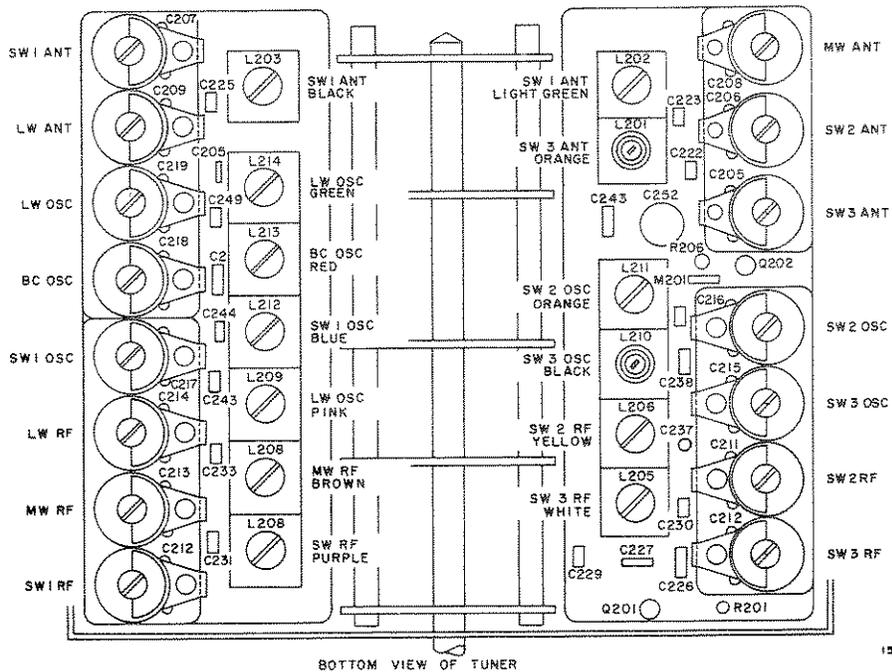
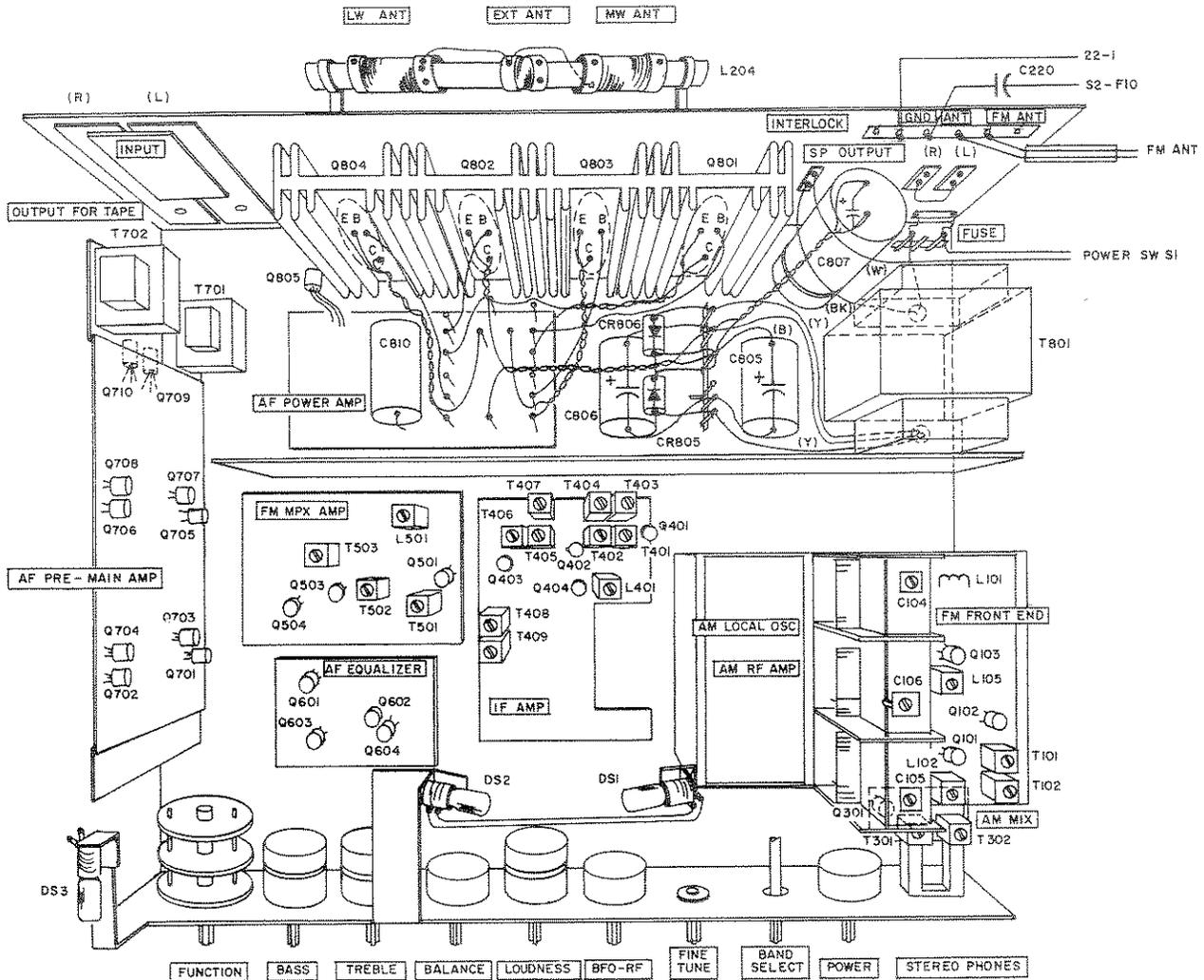
ALIGNMENT PROCEDURE

TEST EQUIPMENT REQUIRED.

1. Audio Power Meter
2. RF Signal Generator (AM - FM)
3. VTVM
4. Oscilloscope
5. FM Multiplex Signal Generator
6. Non-Metallic Alignment Tool
7. Tuning Wand with a brass slug at one end and a powdered iron slug at the other end (used for adjusting the ferrite core antenna).

GENERAL.

1. With receiver off, connect an 8 ohm audio output power meter to the speaker terminals of either the right or left channel. Connect an 8 ohm resistor across the speaker terminals of the other channel. Note: Do not open or short the speaker terminals with the receiver operating.
2. Set the BALANCE, BASS and TREBLE controls to mid position. Set the FUNCTION switch to the band to be aligned.
3. Use the lowest signal generator output which will produce a 12 DB S/N indication on the output meter. Set the loudness control to produce an indicated 300 MW output.
4. Use a non-metallic alignment tool throughout the procedure.
5. Repeat each adjustment, and the entire procedure to insure an optimum alignment.
6. Each adjustment should be performed for maximum indication on the output meter, unless otherwise noted.



156-010887

Figure 4. Alignment Points and Major Component Location.

AM ALIGNMENT CHART

AM Alignment Signal Generator				Receiver	
Step	Band	Connection to Receiver	Input Signal Frequency	Dial Setting	Adjust
1	BC	Connect signal generator through a 0.05 UF capacitor to TP301. Ground lead to the receiver chassis.	Exactly 455 KC. (400 CPS, 30% AM modulated)	Tuning gang fully open (minimum capacity)	T301, 302, 403, 404, 407
2	BC	Use radiating loop of several turns of wire, or place generator lead close to receiver for adequate signal pickup. Connect generator output to one end of the wire.	Exactly 600 KC (400 CPS, 30% AM modulated)	600 KC	BC Oscillator core L213
3	BC	Same as step 2	Exactly 1400 KC (400 CPS, 30% AM modulated)	1400 KC	BC Oscillator trimmer C218
4	BC	Same as step 2	Exactly 600 KC (400 CPS, 30% AM modulated)	600 KC	BC antenna coil L204. (See note A)
5	BC	Same as step 2	Exactly 600 KC (400 CPS, 30% AM modulated)	600 KC	BC RF core L208 (See note A)
6	BC	Same as step 2	Exactly 1400 KC (400 CPS, 30% AM modulated)	1400 KC	BC Antenna trimmer, C206C
7	BC	Same as step 2	Exactly 1400 KC (400 CPS, 30% AM modulated)	1400 KC	BC RF trimmer C213
8	BC	Repeat steps 2, 3, 4, 5, 6, and 7 until no further improvement is obtained.			
9	LW	Same as step 2	Exactly 200 KC (400 CPS, 30% AM modulated)	200 KC	LW Oscillator core L214
10	LW	Same as step 2	Exactly 370 KC (400 CPS, 30% AM modulated)	370 KC	LW Oscillator trimmer C219
11	LW	Same as step 2	Exactly 200 KC (400 CPS, 30% AM modulated)	200 KC	LW Antenna coil L204 (See note A)
12	LW	Same as step 2	Exactly 200 KC (400 CPS, 30% AM modulated)	200 KC	LW RF core L209
13	LW	Same as step 2	Exactly 370 KC (400 CPS, 30% AM modulated)	370 KC	LW Antenna trimmer C209
14	LW	Same as step 2	Exactly 380 KC (400 CPS, 30% AM modulated)	370 KC	LW RF trimmer C214
15	LW	Repeat steps 9, 10, 11, 12, 13 and 14 until no further improvement is obtained.			
16	SW1	Connect signal generator through a 30 PF in series with 47 ohm resistor to the external antenna coil lug. Ground lead to the receiver chassis.	Exactly 2.2 MC (400 CPS, 30% AM modulated)	2.2MC	SW1 Oscillator core L212
17	SW1	Same as step 16.	Exactly 3.8 MC (400 CPS, 30% AM modulated)	3.8 MC	SW1 Oscillator trimmer C217

AM ALIGNMENT CHART - Continued

AM Alignment Signal Generator				Receiver	
Step	Band	Connection to Receiver	Input Signal Frequency	Dial Setting	Adjust
18	SW1	Same as step 16	Exactly 2.2 MC (400 CPS, 30% AM modulated)	2.2 MC	SW1 Antenna core L203
19	SW1	Same as step 16	Exactly 2.2 MC (400 CPS, 30% AM modulated)	2.2 MC	SW1 RF core L207
20	SW1	Same as step 16	Exactly 3.8 MC (400 CPS, 30% AM modulated)	3.8 MC	SW1 Antenna trimmer C207
21	SW1	Same as step 16	Exactly 3.8 MC (400 CPS, 30% AM modulated)	3.8 MC	SW1 RF trimmer C212
22	SW1	Repeat steps 16, 17, 18, 19, 20 and 21 until no further improvement is obtained.			
23	SW2	Same as step 16	Exactly 6.4 MC (400 CPS, 30% AM modulated)	6.4 MC	SW2 Oscillator core L211
24	SW2	Same as step 16	Exactly 9.4 MC (400 CPS, 30% AM modulated)	9.4 MC	SW2 Oscillator trimmer C216
25	SW2	Same as step 16	Exactly 6.4 MC (400 CPS, 30% AM modulated)	6.4 MC	SW2 Antenna core L202
26	SW2	Same as step 16	Exactly 6.4 MC (400 CPS, 30% AM modulated)	6.4 MC	SW2 RF core L206
27	SW2	Same as step 16	Exactly 9.4 MC (400 CPS, 30% AM modulated)	9.4 MC	SW2 Antenna trimmer C206B
28	SW2	Same as step 16	Exactly 9.4 MC (400 CPS, 30% AM modulated)	9.4 MC	SW2 RF trimmer C211
29	SW2	Repeat steps 23, 24, 25, 26, 27, and 28 until no further improvement is obtained.			
30	SW3	Same as step 16	Exactly 12 MC (400 CPS, 30% AM modulated)	12 MC	SW3 Oscillator core L210
31	SW3	Same as step 16.	Exactly 17 MC (400 CPS, 30% AM modulated)	17 MC	SW3 Oscillator trimmer C215
32	SW3	Same as step 16	Exactly 12 MC (400 CPS, 30% AM modulated)	12 MC	SW3 Antenna core L201
33	SW3	Same as step 16.	Exactly 12 MC (400 CPS, 30% AM modulated)	12 MC	SW3 RF core L205
34	SW3	Same as step 16	Exactly 17 MC (400 CPS, 30% AM modulated)	17 MC	SW3 Antenna trimmer C206A
35	SW3	Same as step 16	Exactly 17 MC (400 CPS, 30% AM modulated)	17 MC	SW3 RF trimmer C210
36	SW3	Repeat steps 30, 31, 32, 33, 34 and 35 until no further improvement is obtained.			
37	BFO	Connect signal generator through a 0.05 UF capacitor to mixer base, (TP301) Q301. Ground lead to the receiver chassis.	Exactly 455 KC (unmodulated)	600 KC	BFO core L401 Adjust for zero-beat on output meter.

FM ALIGNMENT CHART

FM Alignment Signal Generator				Receiver			
Step	Band	Connection to Receiver	Input Signal Frequency	Dial Setting	Remarks	Adjust	
1	FM	Connect signal generator through a 0.05 UF capacitor to Q402 base, TP402. Ground lead to the receiver chassis.	Exactly 10.7 MC (400 CPS, 30% AM modulated)	Tuning gang fully closed (maximum capacity)	Connect VTVM between TP403 and TP407	Detune T408. Tune T405 and T406 for maximum indication	
2	FM	Connect signal generator through a 0.05 UF capacitor Q401 base, TP401. Ground lead to the receiver chassis.	Exactly 10.7 MC (400 CPS, 30% AM modulated)	Same as step 1	Same as step 1	Tune T401 and T402 for maximum indication	
3	FM	Connect signal generator through a 10 PF to mixer emitter, TP101. Ground lead to the receiver chassis.	Same as step 1	Same as step 1	Same as step 1	Tune T101 and T102 for maximum indication	
4	FM	Same as step 3	Exactly 10.7 MC (unmodulated)	Same as step 1	Connect VTVM between TP406 and chassis ground	Tune T408 and T409 for null point (0 volt). See note B.	
5	FM	See note C.	Exactly 88 MC (400 CPS, 30% FM modulated)	88 MC	Adjust for maximum output on meter.	FM oscillator core L105	
6	FM	Same as step 5	Exactly 105 MC (400 CPS, 30% FM modulated)	105 MC	Same as step 5	FM oscillator trimmer C106	
7	FM	Same as step 5	Exactly 88 MC (400 CPS, 30% FM modulated)	88 MC	Same as step 5	FM antenna coil L101	
8	FM	Same as step 5	Same as step 7	Same as step 7	Same as step 5	FM RF core L102	
9	FM	Same as step 5	Exactly 105 MC (400 CPS, 30% FM modulated)	105 MC	Same as step 5	FM antenna trimmer C107	
10	FM	Same as step 5	Same as step 9	Same as step 9	Same as step 5	FM RF trimmer C105	
11	FM	Repeat steps 5, 6, 7, 8, 9 and 10 until no further improvement is obtained.					

FM STEREO ALIGNMENT CHART

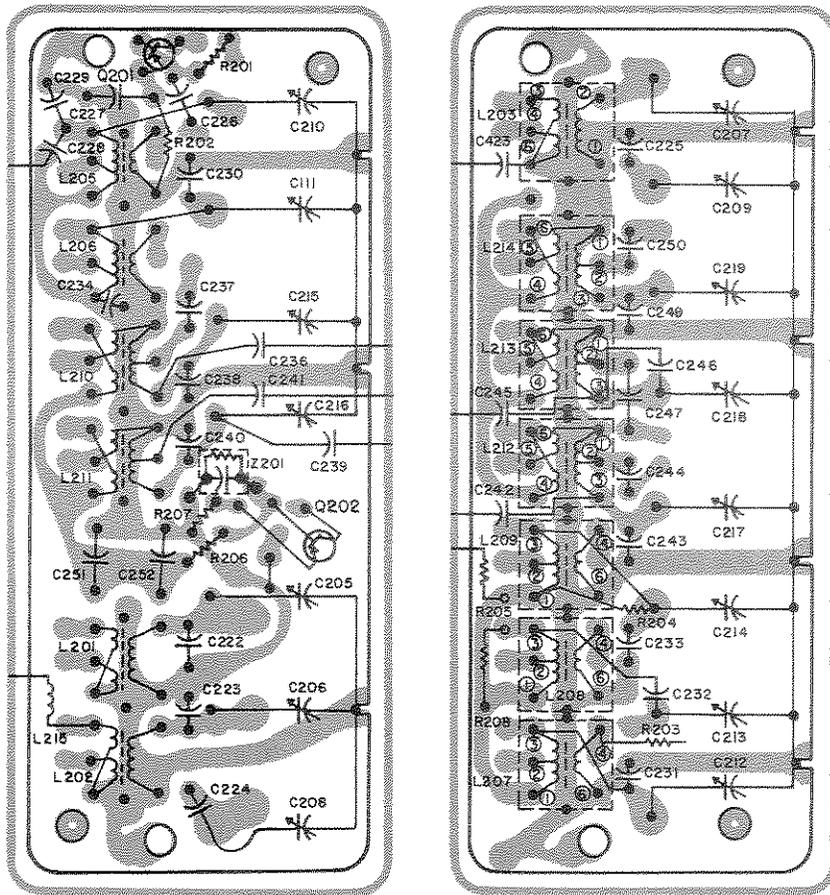
NOTE: Set the FM Stereo Signal Generator Output Level to 60 DB.						
FM Stereo Signal Generator						
Connection	Mod Frequency	Tuning Frequency	Selector Setting	Scope Connection	Adjust	Remarks
FM Antenna	67 KC 10% modulated	98 MC	FM Auto	Across R511 5.6K	L501	Set for max. amplitude
FM Antenna	19 KC Mod. level as low as possible	98 MC	FM Auto	TP501 Sensitivity maximum	T501, T502 respectively	Set for max. amplitude Repeat two or three times.
FM Antenna	19 KC 10% modulated	98 MC	FM Auto	TP502	T503	Set for max. amplitude
Adjust the 19 KC modulation from 0 to 10% to check the on-off action of stereo indicator circuit.						
FM Antenna	1000 CPS Ch L only	98 MC	FM Auto	Across Ch L output load	Readjust T502	Set for max. amplitude
FM Antenna	1000 CPS Ch L only	98 MC	FM Auto	Across CH R output load	Readjust T502	Set for max. amplitude
FM Antenna	1000 CPS Ch R only	98 MC	FM Auto	Across Ch R output load	Readjust T502	Set for max. amplitude
Optimize the adjustment of T503 by repeating two or three times.						

SIMPLE STEREO ALIGNMENT METHOD (RECEIVING BROADCASTS)

Tuning	Scope Con.	Adjust	Remarks
MPX signal	TP501 sens. max.	T502 T501	Set for max. amplitude
MPX signal	TP502	T503	Set for max. amplitude
MPX signal Test signal of Ch L or R only	Across Ch R or L output load	T502	Set for max. amplitude

NOTES:

- A. Check alignment of the receiver antenna coil by bringing the powdered iron end of a tuning wand near the antenna loop stick, then the brass end. If powdered iron increases the output, the loop requires more inductance; if the brass increases the output the loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of the ferrite core to increase inductance, or away to decrease inductance.
- B. Connect VTVM (0.1 volt range DC scale) across VOLUME control of receiver. Adjust discriminator section core (orange) for 0 volt on VTVM. Change signal generator frequency to 10.8 MC and then to 10.6 MC. Adjust the discriminator primary core (green) for balanced peaks. Peak separation should be approximately 200 KC.
- C. Connect the shield conductor on a 75Ω signal generator output to the chassis, near the FM antenna terminals. Connect the center conductor to either FM antenna terminal, leaving the other terminal unconnected. If the signal generator has a 50Ω output, insert a 27Ω, non-inductive resistor in series with the center wire to the antenna terminal.

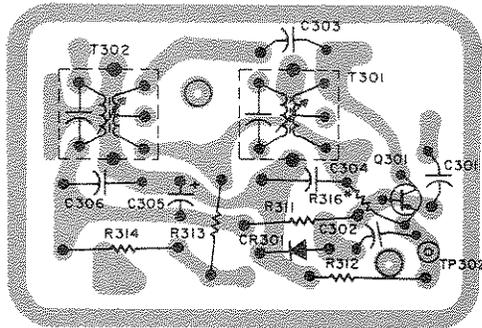


NOTE:

1. WIRING SHOWN FROM FOIL SIDE OF BOARD.

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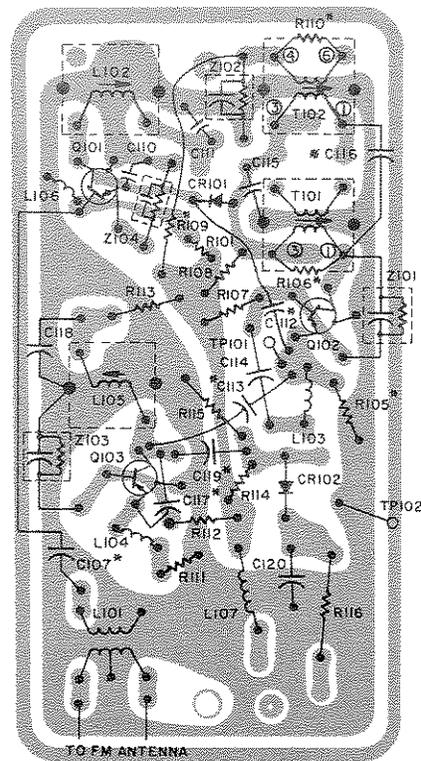
AM LOCAL OSC & RF AMP PCB BOARD



- NOTES:
1. WIRING SHOWN FROM FOIL SIDE OF BOARD.
 2. * INDICATES COMPONENT LOCATED ON UNDERSIDE (FOIL SIDE) OF BOARD.

156-010848

AM MIXER PC BOARD



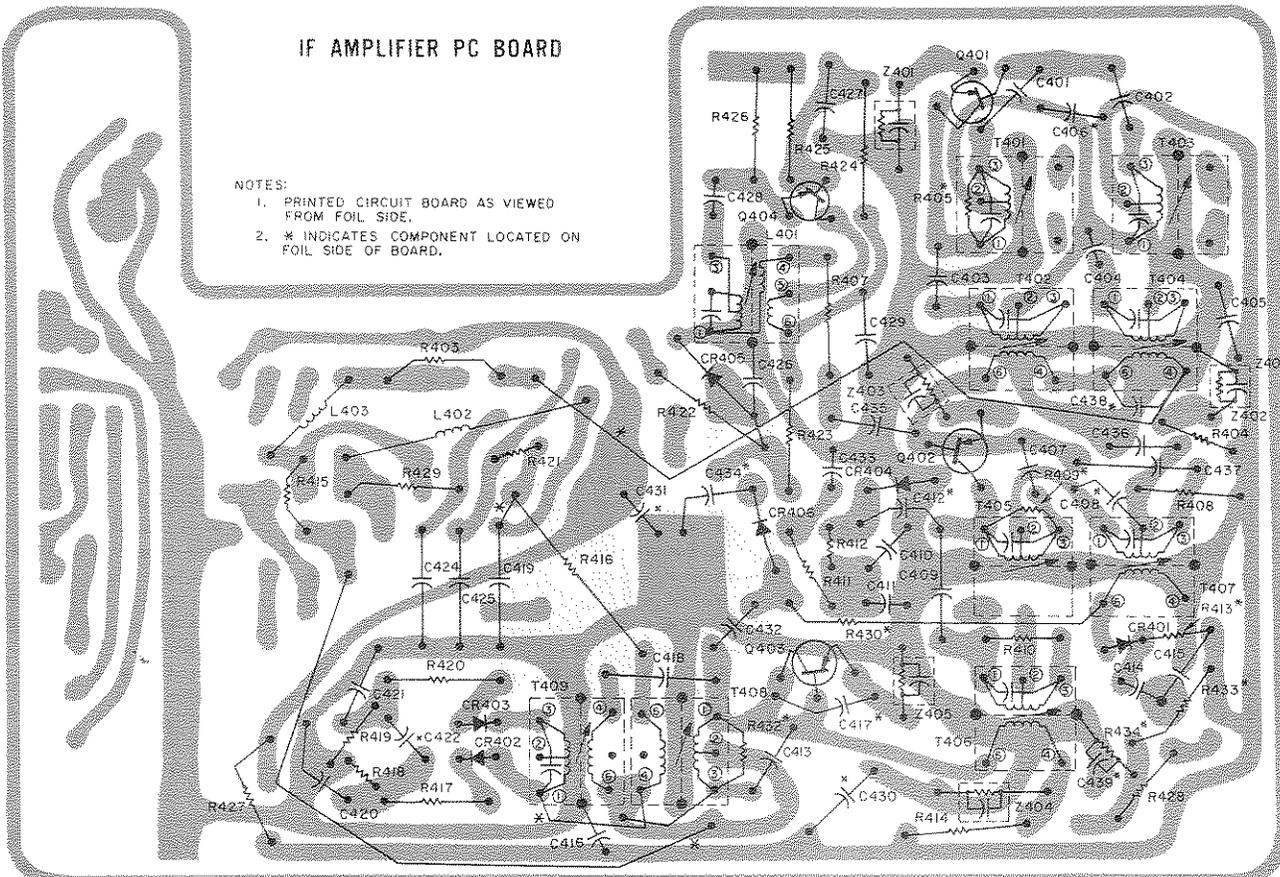
- NOTES:
1. WIRING SHOWN FROM FOIL SIDE OF BOARD.
 2. * INDICATES COMPONENT LOCATION ON UNDERSIDE (FOIL SIDE) OF BOARD.

156-010849

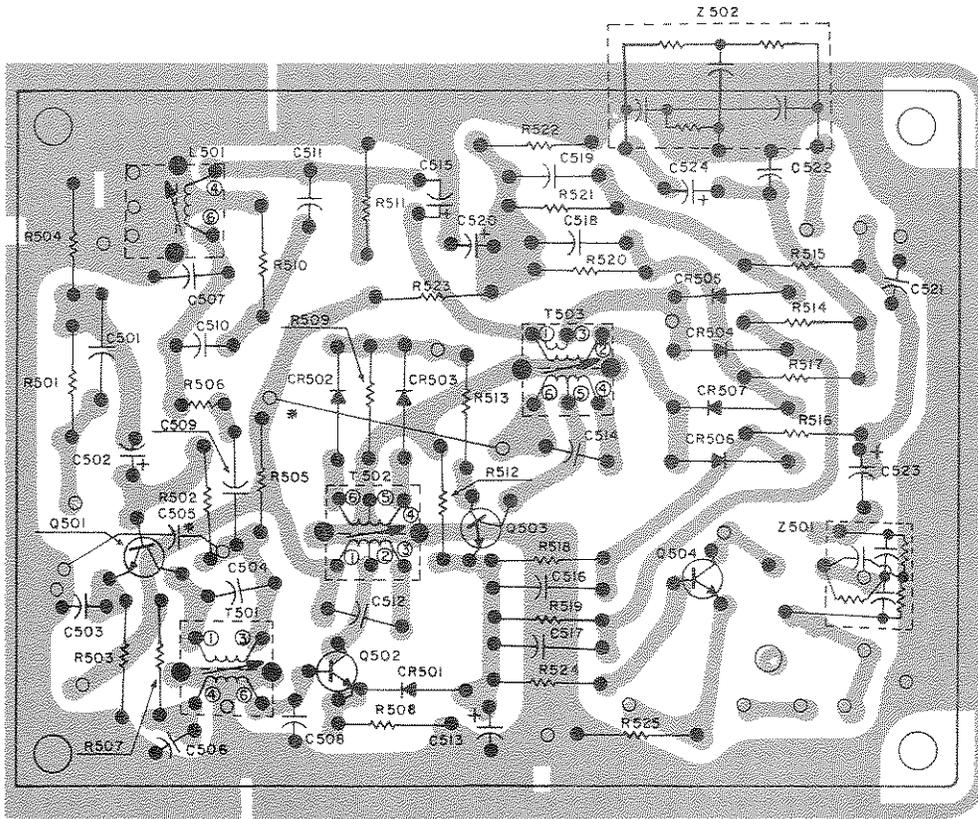
FM FRONT END PC BOARD

IF AMPLIFIER PC BOARD

- NOTES:
1. PRINTED CIRCUIT BOARD AS VIEWED FROM FOIL SIDE.
 2. * INDICATES COMPONENT LOCATED ON FOIL SIDE OF BOARD.

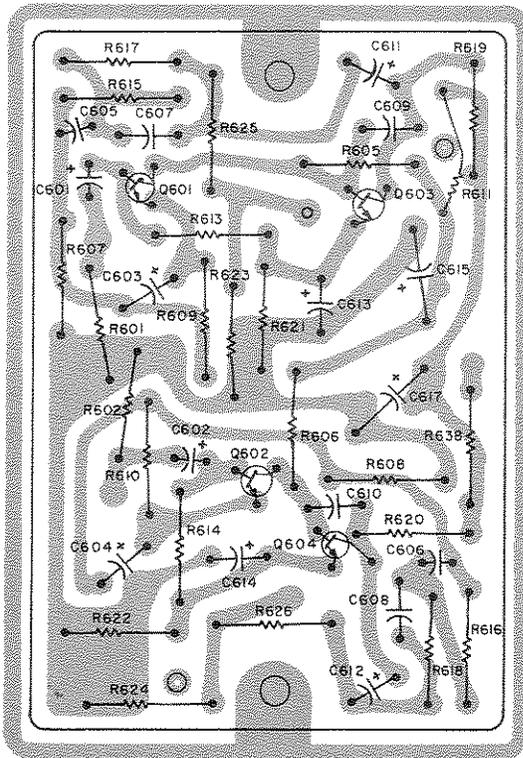


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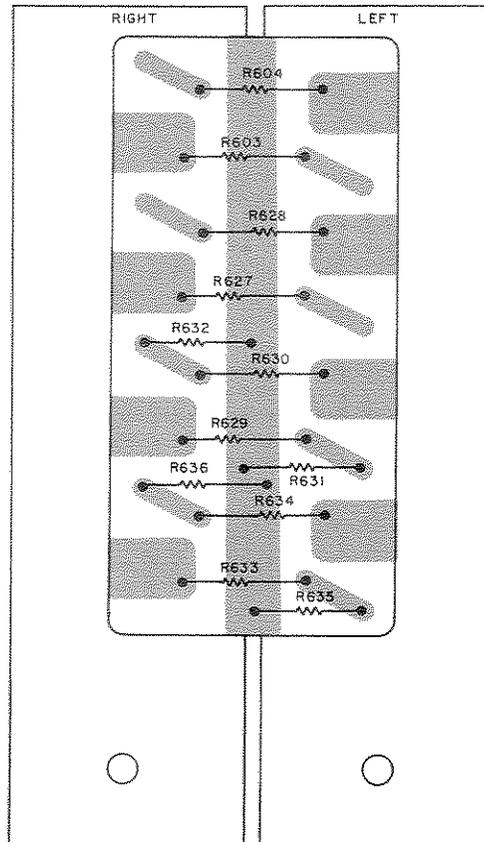


NOTES:
 1. WIRING SHOWN FROM FOIL SIDE OF BOARD. 2. * INDICATES COMPONENT LOCATED ON UNDERSIDE (FOIL SIDE) OF BOARD.
 186-010853

FM MULTIPLEX PC BOARD

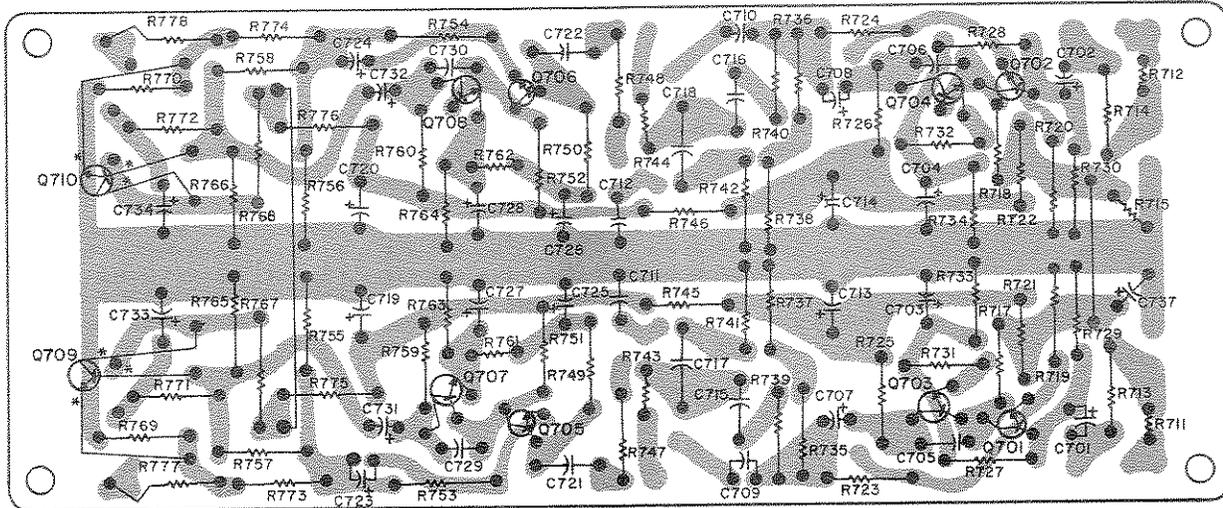


NOTE:
 1. WIRING SHOWN FROM FOIL SIDE OF BOARD



AF EQUALIZER PC BOARD

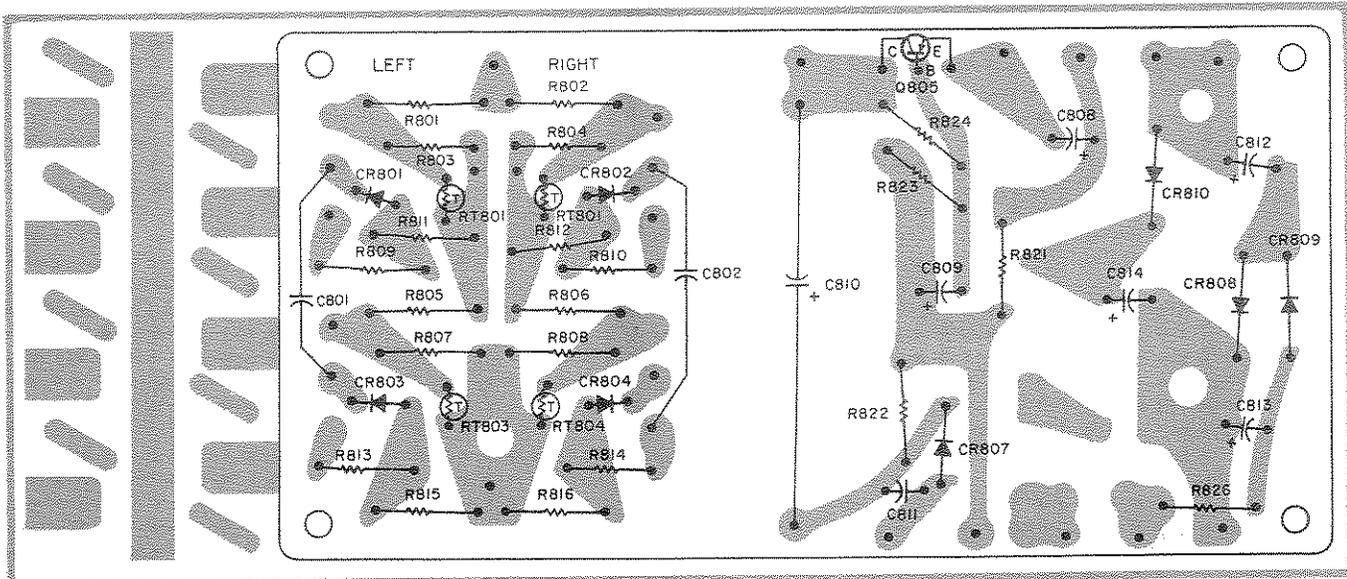
186-010852



- NOTES:
1. WIRING SHOWN FROM FOIL SIDE OF BOARD.
 2. * INDICATES COMPONENT LOCATED ON UNDERSIDE (FOIL SIDE) OF BOARD.

156-010851

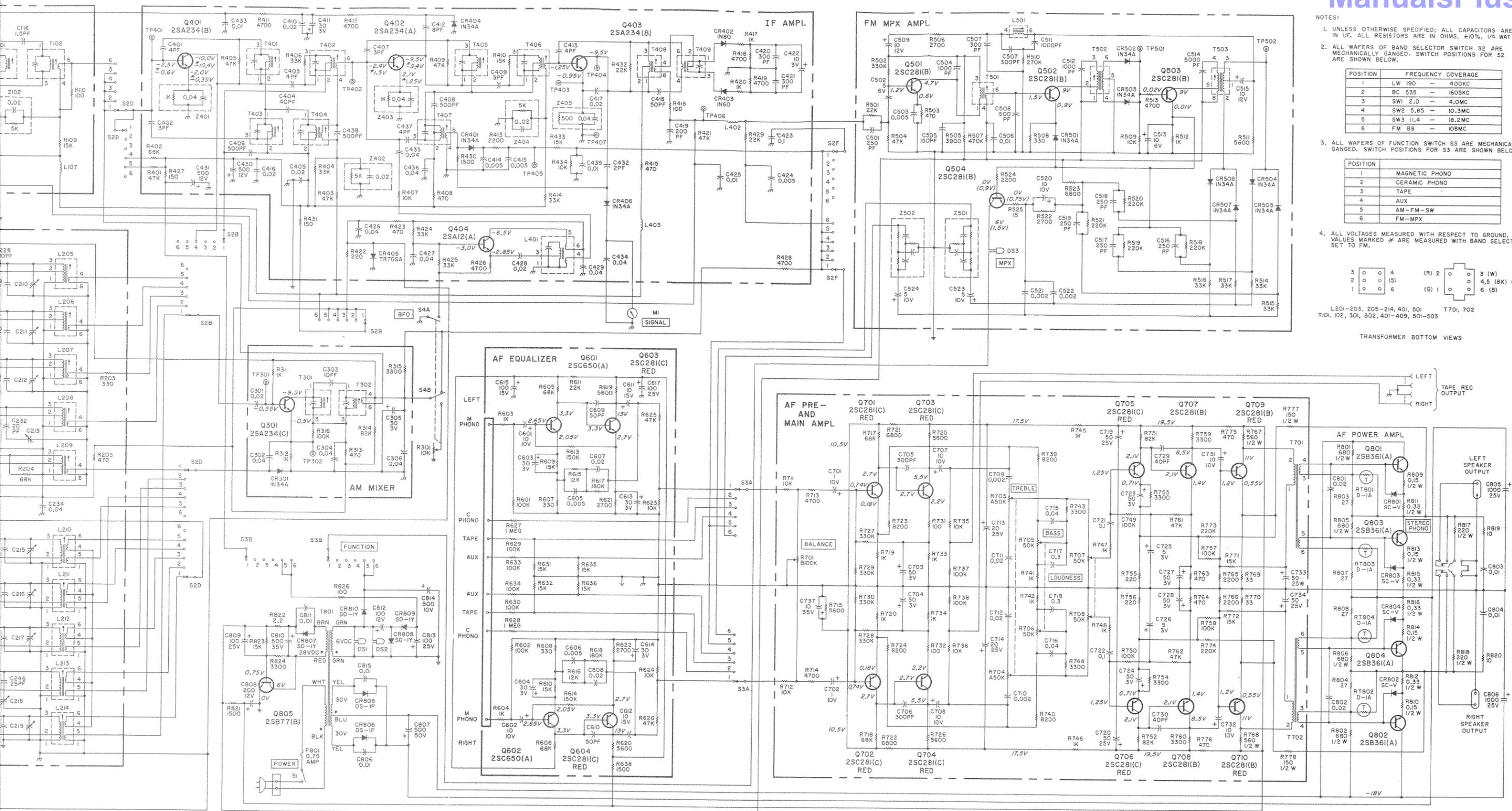
AF PREAMP-MAIN AMP PC BOARD



- NOTE:
1. WIRING SHOWN FROM FOIL SIDE OF BOARD.

156-010854

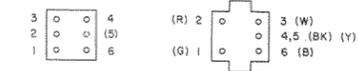
AF POWER AMP PC BOARD



- NOTES:
- UNLESS OTHERWISE SPECIFIED; ALL CAPACITORS ARE IN UF. ALL RESISTORS ARE IN OHMS, $\pm 10\%$, 1/4 WATT.
 - ALL WAFERS OF BAND SELECTOR SWITCH S2 ARE MECHANICALLY GANGED. SWITCH POSITIONS FOR S2 ARE SHOWN BELOW.
 - ALL WAFERS OF FUNCTION SWITCH S3 ARE MECHANICALLY GANGED. SWITCH POSITIONS FOR S3 ARE SHOWN BELOW.
 - ALL VOLTAGES MEASURED WITH RESPECT TO GROUND. VALUES MARKED * ARE MEASURED WITH BAND SELECT SET TO FM.

POSITION	FREQUENCY COVERAGE
1	LW 190 — 400KC
2	BC 535 — 1605KC
3	SW1 2.0 — 4.0MC
4	SW2 5.85 — 10.3MC
5	SW3 11.4 — 18.2MC
6	FM 88 — 108MC

POSITION	FUNCTION
1	MAGNETIC PHONO
2	CERAMIC PHONO
3	TAPE
4	AUX
5	AM-FM-SW
6	FM-MPX



L201-203, 205-214, 401, 501
T101, 102, 301, 302, 401-409, 501-503
T701, 702

TRANSFORMER BOTTOM VIEWS

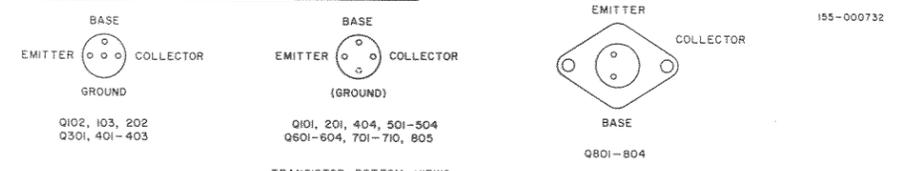
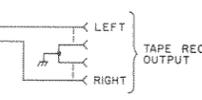


Figure 5. Model CR-3000 Schematic Diagram.

