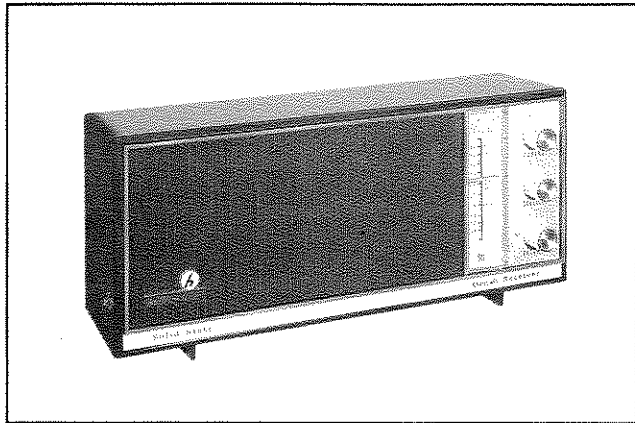


SERVICE DATA
MODEL CRX-104

the hallicrafters co.
A Subsidiary of Northrop Corporation



156-011879-1

Figure 1. Hallicrafters Model CRX-104 Monitor Receiver.

SPECIFICATIONS

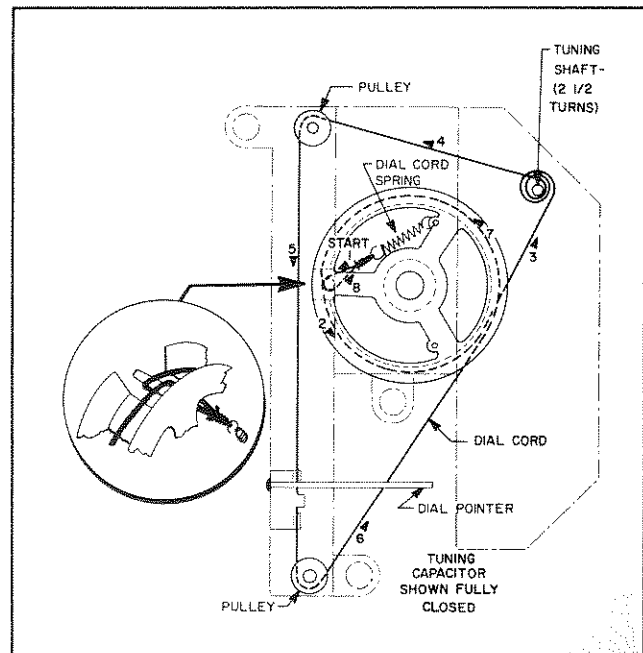
Circuit:	Single band superheterodyne with tuned RF stage. Circuit contains 11 transistors and 5 diodes.
Controls:	TUNING VOLUME SQUELCH
Tuning Range:	108-138MHz
Input Impedance at Antenna Connector:	75 ohms
Sensitivity:	6 μ V MAX. for 12 DBS/N
Selectivity (IF):	250KHz MAX. at 6 DB 600KHz MAX. at 20 DB
Image Rejection:	25 DB MIN. at 135MHz
IF Rejection:	40 DB MIN. at 108MHz
IF Frequency:	10.7MHz
AGC Figure of Merit:	40 DB MIN.
Squelch Sensitivity:	7 μ V MIN.
Squelch Rejection Capability:	50 μ V MIN.
Audio Output:	1.0 watt
Audio Distortion:	10% MAX. at 1.0 watt

Residual Noise: 5 μ W MAX. with volume control fully CCW.

Power Source: 117 VAC, 60Hz

DIAL CORD RESTRINGING

1. Remove the cabinet and front panel. Note: It is not necessary to remove any of the screws on the bottom of the cabinet.
2. Slip the dial cord out of the two notches in the dial pointer and remove the dial pointer.
3. Remove the dial plate.
4. Place the tuning drum in the position shown in figure 2. Start stringing at position 1 in the figure and continue stringing along the direction of ascending numerical order.
5. Replace the dial plate and rotate the tuning control shaft fully counterclockwise.
6. Replace the dial pointer over the lowest mark on the dial scale. Rotate the tuning control shaft fully clockwise and check that the pointer spans the entire dial scale.



156-011885

Figure 2. Dial Cord Restringing Diagram.

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

1. RF Signal Generator (AM) covering 10MHz to 140MHz with an output impedance of 75 ohms.
2. Audio Output Meter having an 8-ohm input impedance.
3. Nonmetallic alignment tool.
4. Set the SQUELCH control fully counterclockwise.
5. Set the VOLUME control fully clockwise.
6. Set the RF signal generator to produce 30% amplitude modulation.
7. Set the audio output meter to its most sensitive range and use the lowest signal generator output producing a 10-DB S/N ratio. Make all adjustments for an indication of maximum output.

GENERAL

1. Connect an 8-ohm audio output meter across the receiver output in place of the speaker.

ALIGNMENT CHART

Step	Signal Generator		Receiver	
	Connection To Receiver	Input Signal Frequency	Dial Setting	Adjust
1.	Connect the high side of the signal generator output through a 300 PF capacitor to the junction of L3 and R7. Connect the ground lead to the receiver chassis.	10.7MHz	Tuning gang set at MAXIMUM capacity	T1, T2, T3, T4
2.	Connect the signal generator 75 ohm output to the receiver antenna connector.	106MHz	Tuning gang set at MAXIMUM capacity	L4
3.	Same as step 2.	140MHz	Tuning gang set at MINIMUM capacity	C56
4.	Same as step 2.	108MHz	108MHz	L1, L2
5.	Same as step 2.	135MHz	135MHz	C54, C55
6.	Repeat steps 2, 3, 4, and 5 until no further improvement is obtained.			

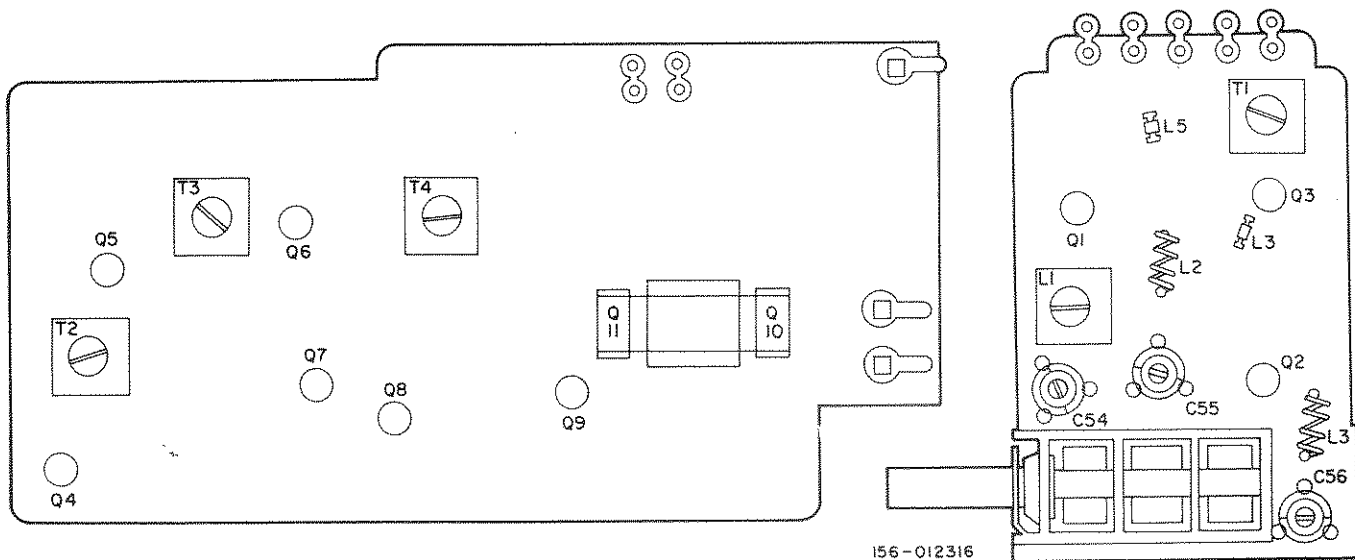
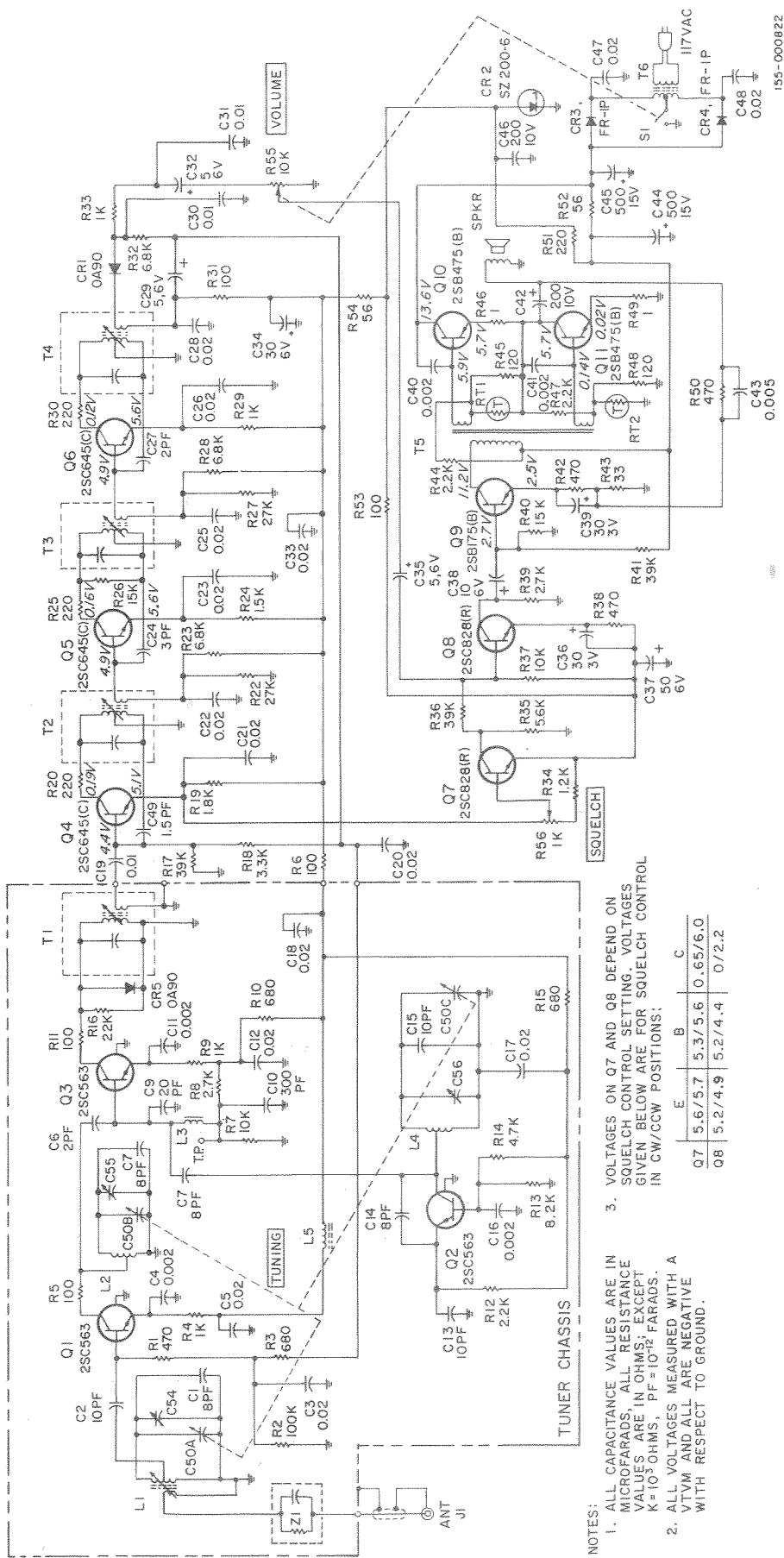


Figure 3. Alignment Points and Transistor Location.



3. VOLTAGES ON Q7 AND Q8 DEPEND ON SQUELCH CONTROL SETTING. VOLTAGES GIVEN BELOW ARE FOR SQUELCH CONTROL IN CW/CWV POSITIONS:

	E	B	C
Q7	5.6/5.7	5.3/5.6	0.65/6.0
Q8	5.2/4.9	5.2/4.4	0.7/2.2

- NOTES:
1. ALL CAPACITANCE VALUES ARE IN MICROFARADS; ALL RESISTANCE VALUES ARE IN OHMS; EXCEPT K=10³ OHMS, PF=10⁻¹² FARADS.
 2. ALL VOLTAGES MEASURED WITH A VTVM AND ALL ARE NEGATIVE WITH RESPECT TO GROUND.

Figure 4. Model CRX-104 Schematic Diagram.

SERVICE REPAIR PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
CAPACITORS		
C1,7,14	8PF $\pm 10\%$, Ceramic	120-005519
C2,13,15	10PF $\pm 10\%$, Ceramic	120-004507
C3,5,12,17, 18,20,21,22, 23,25,26,28, 33,47,48	0.02 μ F $\pm 80\%$ -20%, Ceramic	120-004532
C4,11,16,40, 41	0.002 μ F $\pm 100\%$ -0%, Ceramic	120-005520
C6,27	2PF ± 0.5 PF, Ceramic	120-005517
C8	5PF ± 0.5 PF, Ceramic	120-005518
C9	20PF $\pm 10\%$, Ceramic	120-004508
C10	300PF $\pm 10\%$, Ceramic	120-004530
C19,30,31	0.01 μ F $\pm 80\%$ -20%, Ceramic	120-005516
C24	3PF ± 0.5 PF, Ceramic	120-004505
C29,32,35	5 μ F $\pm 150\%$ -10%, 6V, Electrolytic	120-004771
C34	30 μ F $\pm 150\%$ -10%, 6V, Electrolytic	120-004522
C36,39	30 μ F $\pm 150\%$ -10%, 3V, Electrolytic	120-004521
C37	50 μ F $\pm 150\%$ -10%, 6V, Electrolytic	120-005258
C38	10 μ F $\pm 150\%$ -10%, 6V, Electrolytic	120-004081
C42,46	200 μ F $\pm 150\%$ -10%, 10V, Electrolytic	120-004524
C43	0.005 μ F $\pm 80\%$ -20%, Ceramic	120-005515
C44,45	500 μ F $\pm 150\%$ -10%, 15V, Electrolytic	120-004537
C49	1.5PF ± 0.5 PF, Ceramic	120-005453
C50A-50B- 50C	Tuning Capacitor Assembly	120-005521
C54,55,56	Trimmer Capacitors	120-004539

*RESISTORS AND THERMISTORS

R1,38,42,50	470 ohm	120-004546
R2	100K ohm	120-004109
R3,10,15	680 ohm	120-004108
R4,9,29,33	1K ohm	120-004119
R5,6,11,31,53	100 ohm	120-004543
R7,37	10K ohm	120-004556
R8,39	2.7K ohm	120-005527
R12,44,47	2.2K ohm	120-004120
R13	8.2K ohm	120-005464
R14	4.7K ohm	120-004112
R16	22K ohm	120-004559
R17,36,41	39K ohm	120-005465
R18	3.3K ohm	120-004131
R19	1.8K ohm	120-004116
R20,25,30,51	220 ohm	120-004136
R22,27	27K ohm	120-004110
R23,28,32	6.8K ohm	120-004125
R24	1.5K ohm	120-004115
R26,40	15K ohm	120-004558
R34	1.2K ohm	120-004551
R35	5.6K ohm	120-004117
R43	33 ohm	120-005460
R45,48	120 ohm	120-004137
R46,49	1 ohm	120-004540
R52,54	56 ohm	120-005461
R55/S1	10K ohm, variable with SPST Switch	120-005466
R56	1K ohm, variable	120-005467
RT1,2	Thermistor, Type 21D28	120-005485

*NOTE: All resistors are 1/4 watt, 10%, carbon.

COILS AND TRANSFORMERS

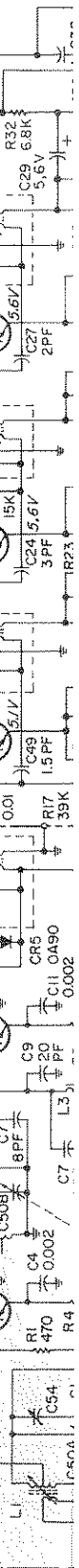
L1	Coil, Antenna	120-005508
L2	Coil, RF	120-005509
L3,5	Coil, RF Choke	120-005443
L4	Coil, Oscillator	120-005510
T1,2	Transformer, 10.7 MHz, 1st & 2nd IF	120-004485
T3	Transformer, 10.7 MHz, 3rd IF	120-005511
T4	Transformer, 10.7 MHz,	120-005512

SERVICE REPAIR PARTS LIST

(CONTINUED)

Schematic Symbol	Description	Hallicrafters Part Number
	4th IF	
T5	Transformer, Audio Driver	120-005446
T6	Transformer, Power	120-004491
TRANSISTORS AND DIODES		
Q1,2,3	Transistor, 2SC563	120-005513
Q4,5,6	Transistor, 2SC645(C)	120-004497
Q7,8	Transistor, 2SC828(R)	120-005449
Q9	Transistor, 2SB175(B)	120-005450
Q10,11	Transistor, 2SB475(B)	120-005451
CR1,5	Diode, OA90	120-004499
CR2	Diode, Zener SZ-200-6	120-005452
CR3,4	Diode, FR-1P	120-004503
MISCELLANEOUS		
	Badge, "hallicrafters"	120-005730
	Bag, Polyethylene (radio set)	120-005504
	Bag, Polyethylene (Owners Guide)	120-005505
	Box, Packing	120-005507
	Box, Shield	120-005725
	Bracket, Tuner Angle	120-005727
	Cabinet, Plastic	120-005468
	Cord, Dial	120-005480
	Chassis, Metal	120-005491
	Clamp, Feeder Cord	120-004604
	Grille, Speaker	120-005470
	Grommet, Rubber, Chassis Mounting	120-005500
	Grommet, Rubber, Tuner Mounting	120-005499
	Heat Sink, Transistor	120-005486
J1	Jack, Antenna	120-005498
	Knob, Tuning	120-005488
	Knob, Volume, Squelch	120-005487
	Name Plate, Antenna	120-005490
	Name Plate, CRX-104	120-005731
	Name Plate, TUNING-VOLUME-SQUELCH	120-005472
Z1	Coupling Network, RC, Antenna	120-004589
	Nut, M3	120-004616
	Overlay, Dial Plate	120-005728
	Packing, Styrofoam	120-005506
	Panel, Front	120-005469
	Plate, Dial	120-005475
	Plate, Shield Cover	120-005726
	Pointer, Dial	120-005478
	Post, Front Panel Stand-off	120-004601
	Printed Circuit Board A	120-005482
	Printed Circuit Board B	120-005732
	Pulley, Dial Cord	120-005446
	Pulley, Dial Drum	120-005479
	*Screw, RH Machine, 3x4	120-005501
	*Screw, RH Machine, 3x6	120-004607
	*Screw, RH Machine, 3x8	120-004608
	*Screw, RH Machine, 3x10	120-004609
	*Screw, RH Machine, 3x16	120-004610
	*Screw, RH Machine, 3x30	120-004611
	*Screw, Self Tapping, 3x6	120-004613
	*Screw, RH Self Tapping, 3x8	120-004612
	*Screw, RH Self Tapping, 3x12	120-004615
	Screw, Tuning Drum Set	120-005497
	Shaft, Tuning	120-005495
SPKR	Speaker	120-004591
	Spring, Tuning Drum	120-005481
	Strain Relief, Line Cord	120-005503
	Terminal, External Antenna	120-004602
	Trim, "Aircraft Receiver"	120-005729
	Washer, Cabinet & Chassis Mounting	120-004618
	Washer, Fiber	120-005502
	Washer, Knob, Vinyl	120-005489
	Washer, Lock	120-004617
	Washer, Tuner Mounting	120-004619
	Window, Dial	120-005474

*NOTE: Screw dimensions are given in millimeters (diameter x length)



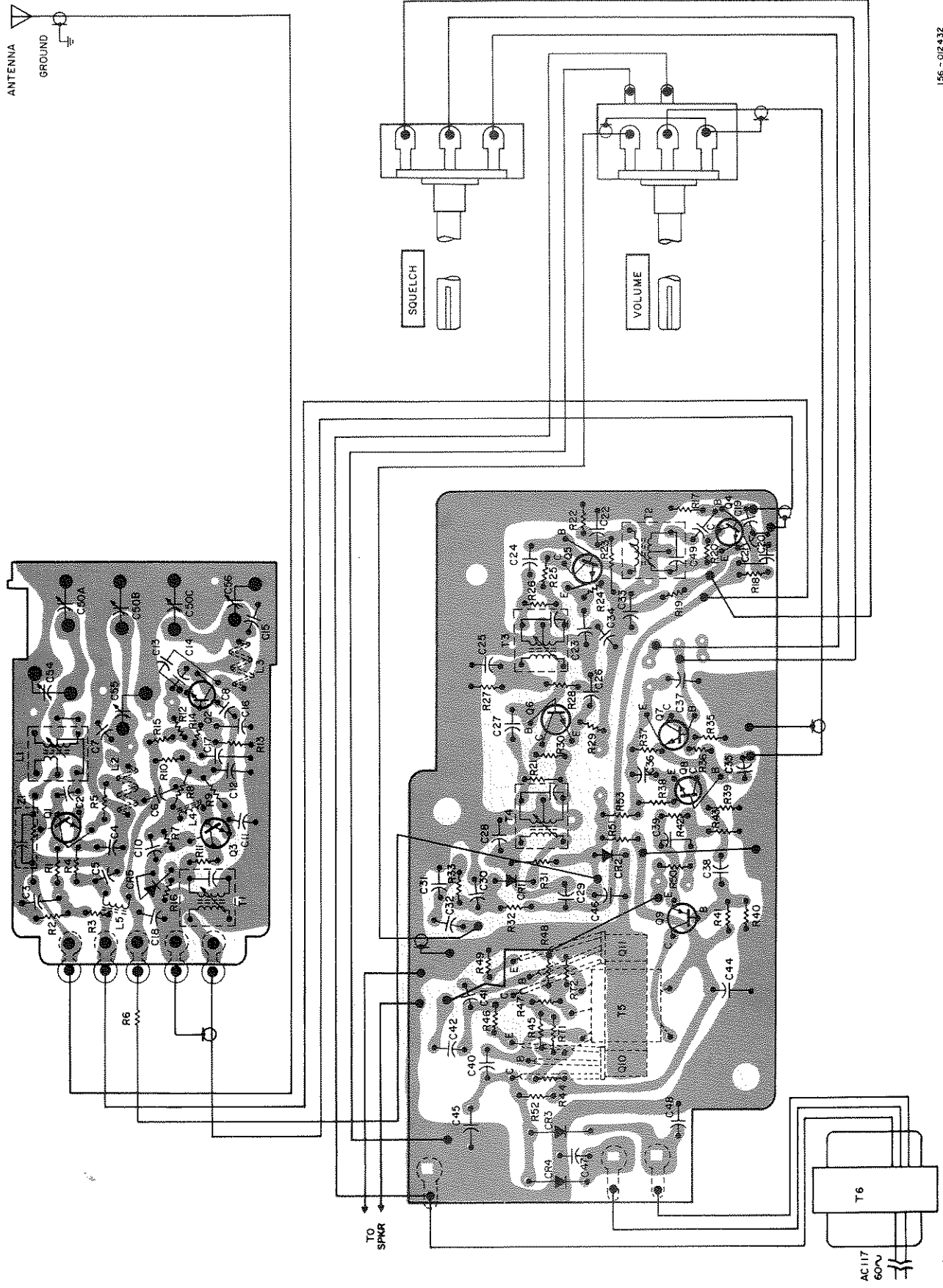


Figure 5. Model CRX-104 Wiring Diagram.

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