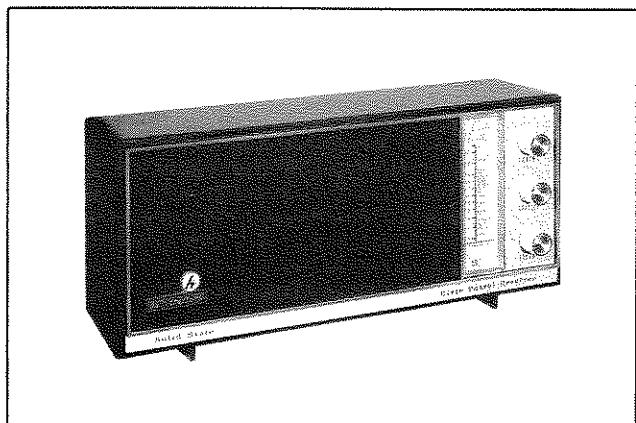


SERVICE DATA
MODEL CRX-103

the hallicrafters co.
A Subsidiary of Northrop Corporation



156-011878-1

Figure 1. Hallicrafters Model CRX-103 Monitor Receiver.

SPECIFICATIONS

Circuit: Single band superheterodyne with tuned RF stage. Circuit contains 11 transistors and 5 diodes.

Controls: TUNING
VOLUME
SQUELCH

Tuning Range: 30-50MHz

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 50MHz

IF Rejection: 40 DB MIN, at 30MHz

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

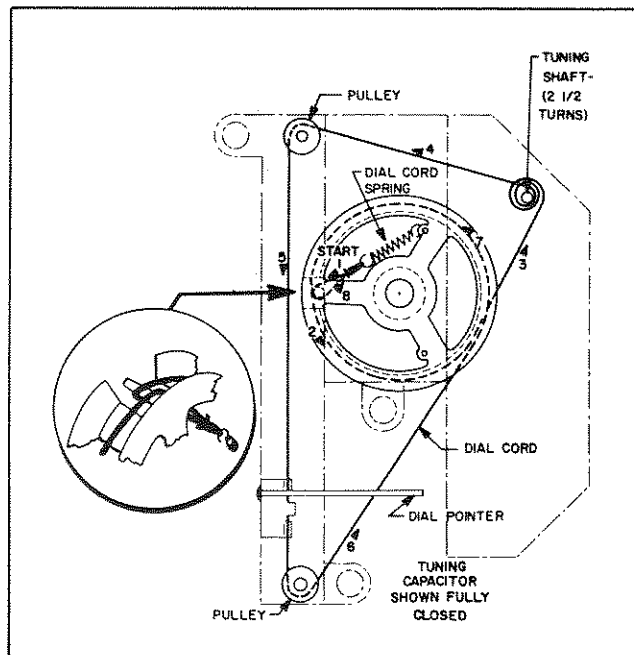
Audio Distortion: 10% MAX, at 1.0 watt

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 51MHz with an output impedance of 75 ohms.
 2. Audio Output Meter having an 8-ohm input impedance.
 3. Nonmetallic alignment tool.
- GENERAL
1. Connect an 8-ohm audio output meter across the receiver output in place of the speaker.
 2. Set the SQUELCH control fully counterclockwise.
 3. Set the VOLUME control fully clockwise.
 4. Set the RF signal generator to produce 30% amplitude modulation.
 5. 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.

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 L5 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. | 29.1MHz | Tuning gang set at MAXIMUM capacity | L6 |
| 3. | Same as Step 2. | 50.3MHz | Tuning gang set at MINIMUM capacity | C56 |
| 4. | Same as Step 2. | 33.0MHz | 33.0MHz | L3, L4 |
| 5. | Same as Step 2. | 48.0MHz | 48.0MHz | C54, C55 |
| 6. | Repeat steps 2, 3, 4, and 5 until no further improvement is obtained. | | | |

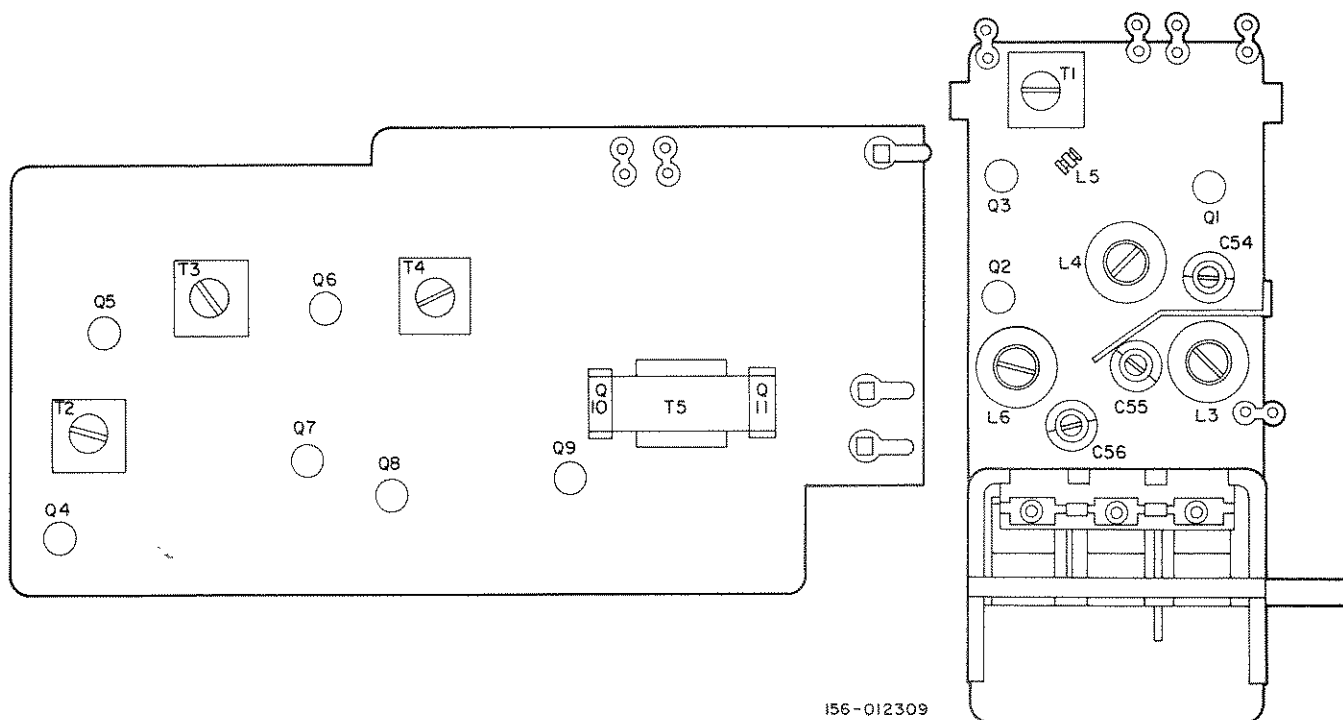
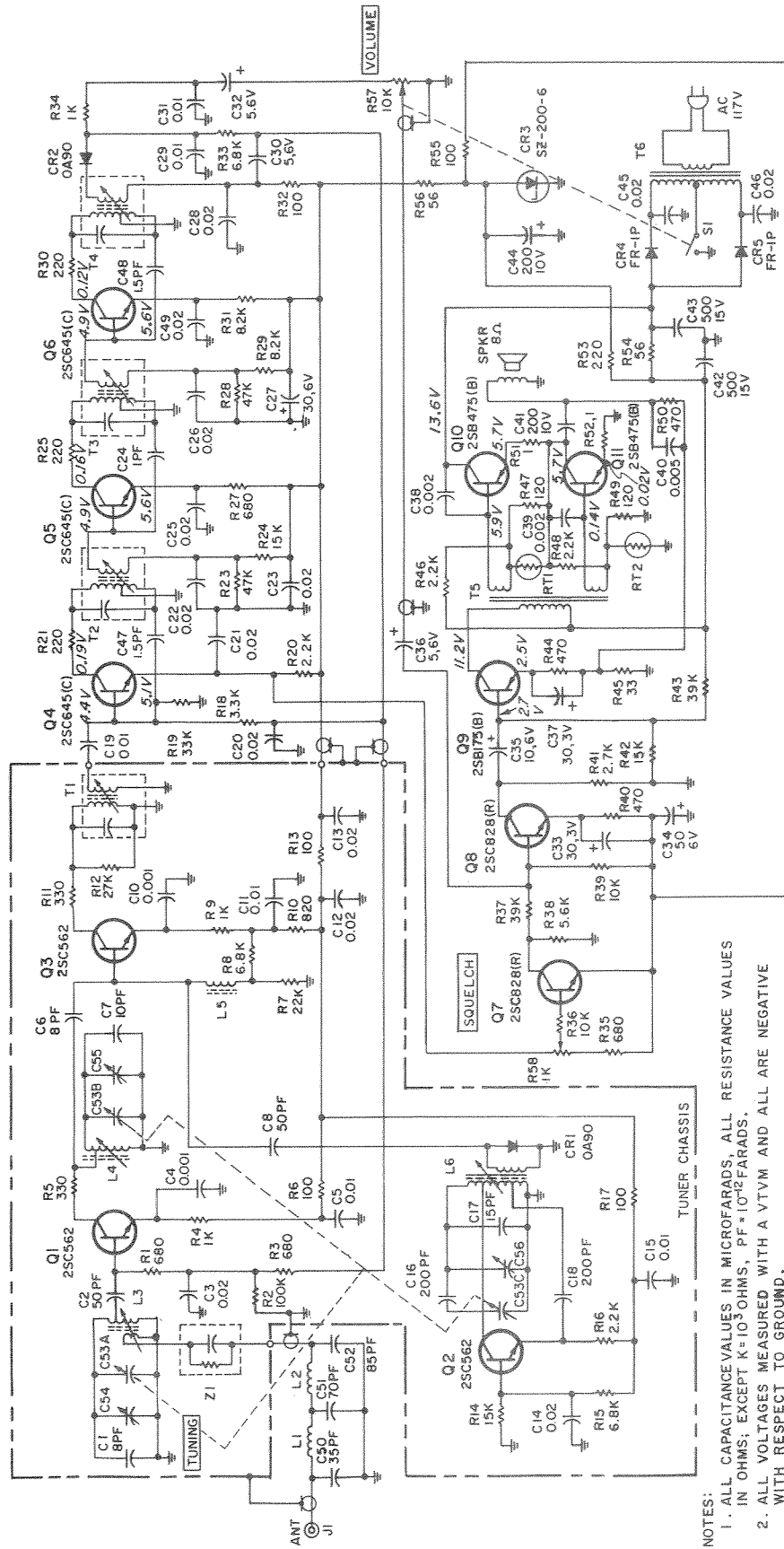


Figure 3. Alignment Points and Transistor Location.

156-012309



195-000821

- NOTES:
1. ALL CAPACITANCE VALUES IN MICROFARADS, ALL RESISTANCE VALUES 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.
 3. VOLTAGES ON Q7 AND Q8 DEPEND ON SQUELCH CONTROL SETTING. VOLTAGES GIVEN BELOW ARE FOR SQUELCH CONTROL IN CW/CCW 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 | 0/2.2 |

Figure 4. Model CRX-103 Schematic Diagram.

SERVICE REPAIR PARTS LIST

| Schematic Symbol | Description | Hallicrafters Part Number |
|---|-------------------------------------|---------------------------|
| CAPACITORS | | |
| C1,6 | 8PF ±10%,Ceramic | 120-005454 |
| C2,8 | 50PF ±10%,Ceramic | 120-004680 |
| C3,12,13,14, 20,21,22,23, 25,26,28,45, 46,49 | 0.02μF +80%-20%,Ceramic | 120-004512 |
| C4,10 | 0.001μF +80%-20%,Ceramic | 120-005455 |
| C5,11,15,19, 29,31 | 0.01μF +80%-20%,Ceramic | 120-004511 |
| C7 | 10PF ±10%,Ceramic | 120-004507 |
| C16,18 | 200PF ±10%,Ceramic | 120-005231 |
| C17 | 15PF ±10%,Ceramic | 120-005229 |
| C24 | 1PF ±0.5PF,Ceramic | 120-005259 |
| C27 | 30μF +150%-10%,6V, Electrolytic | 120-004522 |
| C30,32,36 | 5μF +150%-10%,6V, Electrolytic | 120-004771 |
| C33,37 | 30μF +150%-10%,3V, Electrolytic | 120-004521 |
| C34 | 50μF +150%-10%,6V, Electrolytic | 120-005258 |
| C35 | 10μF +150%-10%,6V, Electrolytic | 120-004081 |
| C38,39 | 0.002μF +80%-20%,Ceramic | 120-004509 |
| C40 | 0.005μF +80%-20%,Ceramic | 120-004510 |
| C41,44 | 200μF +150%-0%,10V, Electrolytic | 120-004524 |
| C42,43 | 500μF +150%-0%,15V, Electrolytic | 120-004537 |
| C47,48 | 1.5PF ±0.5PF,Ceramic | 120-005453 |
| C50 | 35PF ±5%,Ceramic | 120-005456 |
| C51 | 70PF ±5%,Ceramic | 120-005457 |
| C52 | 85PF ±5%,Ceramic | 120-005458 |
| C53A-53B- 53C | Tuning Capacitor | 120-005459 |
| C54,55,56 | Trimmer Capacitor | 120-004539 |

*RESISTORS AND THERMISTORS

| | | |
|-------------------|---------------------------------|------------|
| R1,3,27,35 | 680 ohm | 120-004108 |
| R2 | 100K ohm | 120-004109 |
| R4,9,31,34 | 1K ohm | 120-004119 |
| R5,11 | 330 ohm | 120-004545 |
| R6,13,17,32 55 | 100 ohm | 120-004543 |
| R7 | 22K ohm | 120-004559 |
| R8,15,33 | 6.8K ohm | 120-004125 |
| R10 | 820 ohm | 120-004549 |
| R12 | 27K ohm | 120-004110 |
| R14,24,42 | 15K ohm | 120-004558 |
| R16,20,46,48 | 2.2k ohm | 120-004120 |
| R18 | 3.3K ohm | 120-004131 |
| R19 | 33K ohm | 120-004560 |
| R21,25,30,53 | 220 ohm | 120-004136 |
| R23,28 | 47K ohm | 120-004118 |
| R29 | 8.2K ohm | 120-005464 |
| R36,39 | 10K ohm | 120-004556 |
| R37,43 | 39K ohm | 120-005465 |
| R38 | 5.6K ohm | 120-004117 |
| R40,44,50 | 470 ohm | 120-004546 |
| R41 | 2.7K ohm | 120-005463 |
| R45 | 33 ohm | 120-005460 |
| R47,49 | 120 ohm | 120-004137 |
| R51,52 | 1 ohm | 120-004540 |
| R54,56 | 56 ohm | 120-005461 |
| R57/S1 | 10K ohm Pot.with SPST Switch | 120-005466 |
| R58 | 1K ohm Pot. | 120-005407 |
| RT1,2 | Thermistor,type 21D28 | 120-005485 |

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

COILS AND TRANSFORMERS

| | | |
|------|---------------------------------------|------------|
| L1,2 | Coil,RF Choke | 120-005444 |
| L3 | Coil,Antenna | 120-005440 |
| L4 | Coil,RF | 120-005441 |
| L5 | Coil,RF Choke | 120-005443 |
| L6 | Coil,Oscillator | 120-005442 |
| T1,2 | Transformer,10.7 MHz, 1st & 2nd IF | 120-004485 |
| T3 | Transformer,10.7 MHz, | 120-004486 |

SERVICE REPAIR PARTS LIST

(CONTINUED)

| Schematic Symbol | Description | Hallicrafters Part Number |
|------------------------|------------------------------------|---------------------------|
| | 3rd IF | |
| T4 | Transformer, 10.7 MHz, 4th IF | 120-005445 |
| T5 | Transformer, Audio Driver | 120-005446 |
| T6 | Transformer, Power | 120-005447 |
| TRANSISTORS AND DIODES | | |
| Q1,2,3 | Transistor, 2SC562 | 120-005448 |
| 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 |
| CR1,2 | Diode, OA90 | 120-004499 |
| CR3 | Diode, Zener, SZ-200-6 | 120-005452 |
| CR4,5 | Diode, FR-1P | 120-004503 |
| MISCELLANEOUS | | |
| | Badge, "hallicrafters" | 120-005476 |
| | Bag, Polyethylene (radio set) | 120-005504 |
| | Bag, Polyethylene (Owner's Guide) | 120-005505 |
| | Box, Packing | 120-005507 |
| | Box, Shield A | 120-005493 |
| | Box, Shield B | 120-005492 |
| | 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-103 | 120-005477 |
| | Name Plate, TUNING-VOLUME-SQUELCH | 120-005472 |
| Z1 | Network, RC, Antenna Coupling | 120-004589 |
| | Nut, M3 | 120-004616 |
| | Overlay, Dial Plate | 120-005473 |
| | Packing, Styrofoam | 120-005506 |
| | Panel, Front | 120-005469 |
| | Plate, Dial | 120-005475 |
| | Plate, Shield Cover | 120-005494 |
| | Pointer, Dial | 120-005478 |
| | Post, Front Panel Stand-off | 120-004601 |
| | Printed Circuit Board A | 120-005482 |
| | Printed Circuit Board B | 120-005483 |
| | Printed Circuit Board C | 120-005484 |
| | Pulley, Dial Cord | 120-005496 |
| | 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 | 120-004617 |
| | *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, "Civic Patrol Receiver" | 120-005471 |
| | 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).

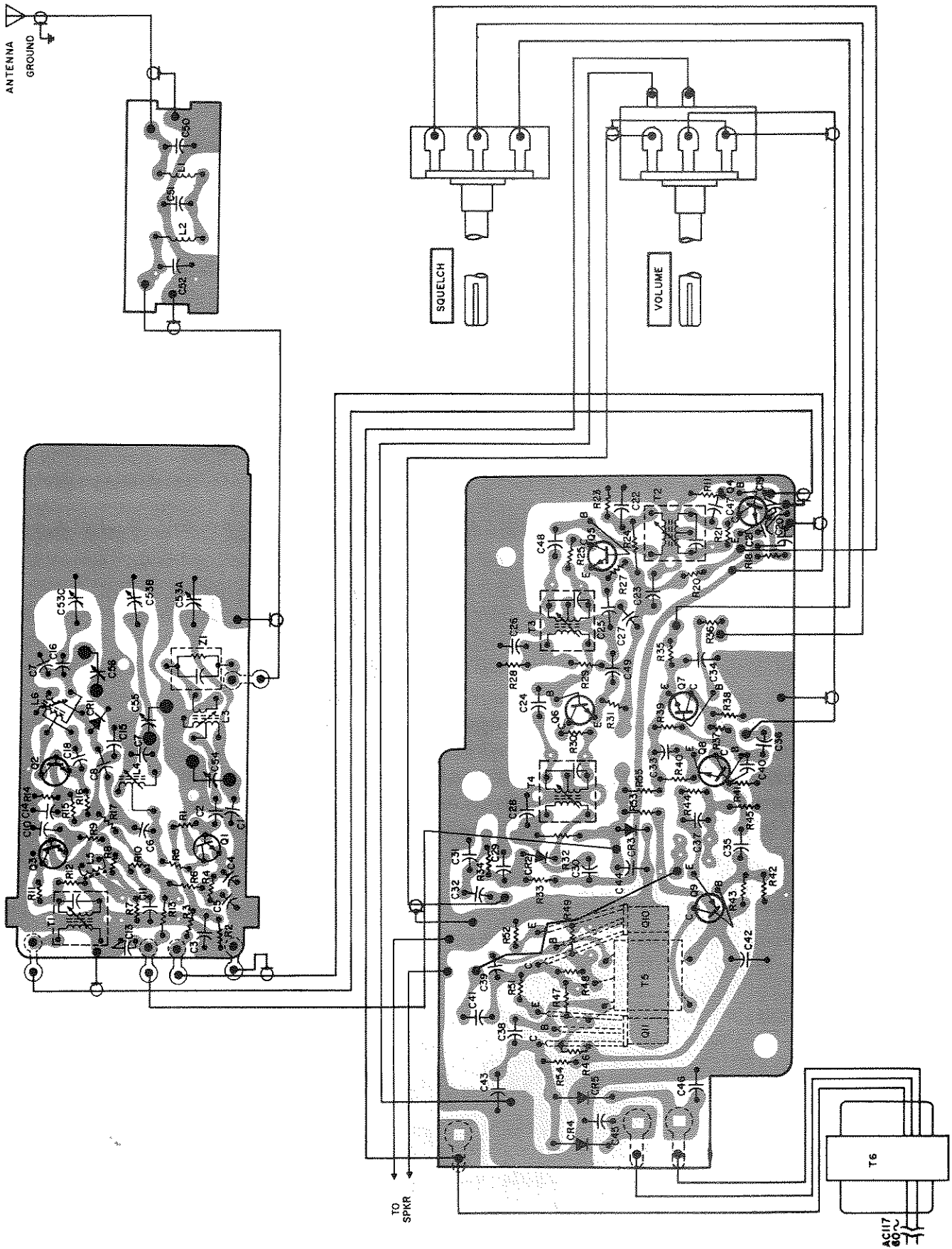


Figure 5. Model CRX-103 Wiring Diagram.

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