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REALISTIC[®]

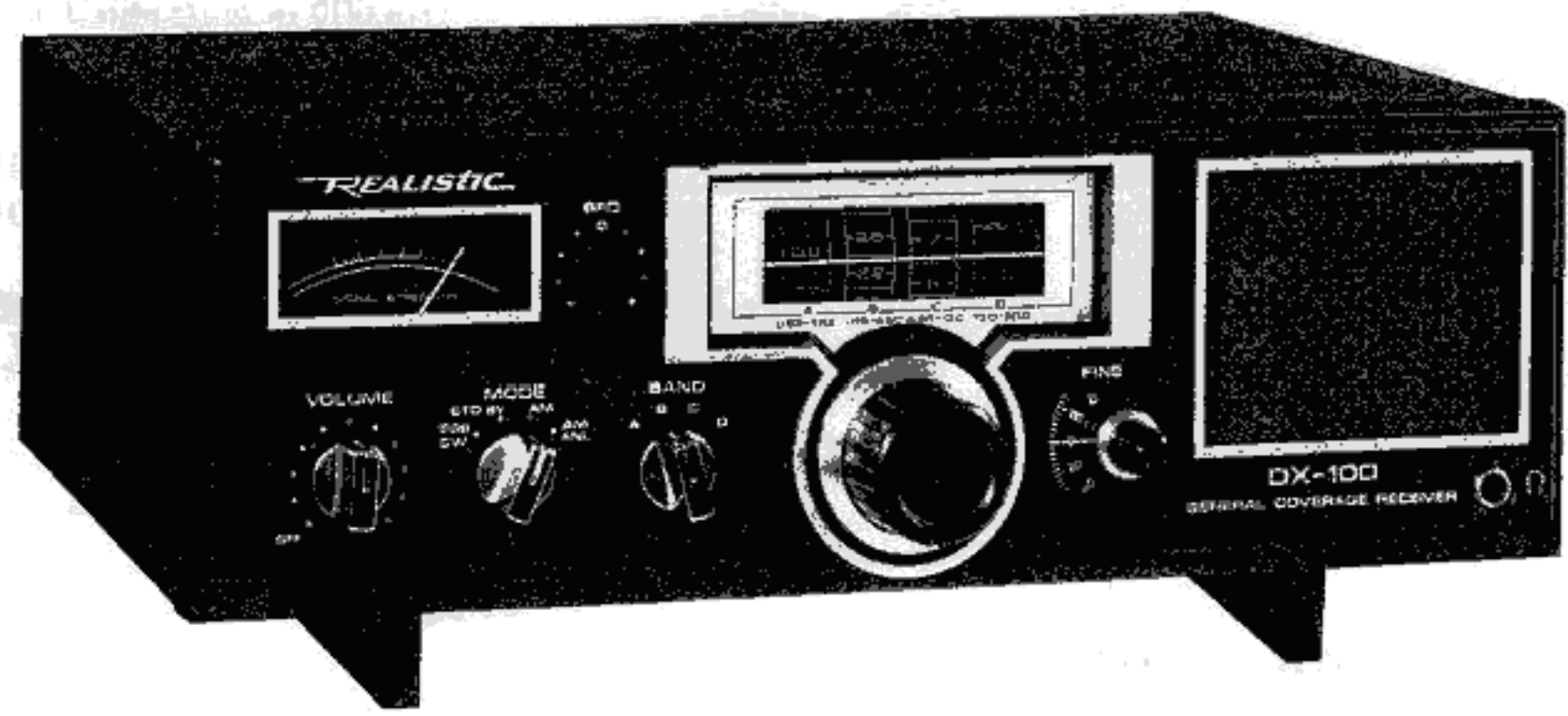
Service Manual

20-206

DX-100

General Coverage Communications Receiver

Catalog Number: 20-206



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

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SPECIFICATIONS

The supply voltage is 120 V \pm 3 V, 60 Hz (240 V AC, 50 Hz for Australian models).
 The power source must be isolated from other equipment connected to antenna or output.
 The room temperature is 25 degrees C (77 degrees F).

A BAND

Speaker impedance: 8 ohms
 Output readings are taken across a non-reactive load.
 Output reference level is 50 mW total power.
 The generator output shall terminate in an IRE loop with loop pointing toward rear of receiver.
 Modulation: 1000 Hz, 30%

| | UNIT | NOMINAL | LIMIT |
|--|-----------|----------|----------|
| Frequency Coverage | kHz | 510–1650 | 520–1620 |
| IF | kHz | 455 | \pm 5 |
| Antenna Sensitivity for S/N 10 dB at 600 kHz | μ V/m | 100 | 250 |
| at 1000 kHz | μ V/m | 100 | 250 |
| at 1400 kHz | μ V/m | 100 | 250 |
| S/N at 1 mV/m at 1000 kHz | dB | 31 | 25 |
| ACA at reference level at 1000 kHz | dB | 50 | 40 |
| AGC figure of merit | dB | 55 | 45 |
| IF rejection at 600 kHz | dB | 34 | 28 |
| Image rejection at 1400 kHz | dB | 38 | 30 |
| Band-width at 6 dB down | kHz | 6 | 3–6 |
| Output, at 10% THD at 1000 kHz 5 mV/m, 1000 Hz, 30% Mod. | mW | 750 | 550 |
| Distortion at reference output at 1000 Hz, 30% Mod. at 5 mV/m | % | 1.5 | 5 |
| DC Current drain, no signal | mA | 15 | 25 |
| Whistle modulation of 2nd & 3rd harmonic at 1–10 mV/m | % | 3 | 15 |
| Dial Calibration at 600 kHz | kHz | — | \pm 25 |
| at 1000 kHz | kHz | — | \pm 50 |
| at 1600 kHz | kHz | — | \pm 75 |

The oscillator must operate at 600 kHz, with all supply voltages of 105 V AC; an over-voltage of 10% shall not be harmful.

B BAND

Speaker impedance: 8 ohms
 Use resistive load.
 Reference output level: 50 mW
 Connect signal generator hot lead through 18 pF capacitor to antenna terminal.
 Disconnect telescopic antenna cable.
 Modulation: 1000 Hz, 30%

| | UNIT | NOMINAL | LIMIT |
|--|-----------|---------|-----------|
| Frequency Coverage | MHz | 1.5–4.8 | 1.55–4.5 |
| IF | kHz | 455 | \pm 5 |
| Sensitivity for reference output power, S/N 10 dB at 1.8 MHz | μ V/m | 15 | 30 |
| at 3 MHz | μ V/m | 10 | 25 |
| at 4 MHz | μ V/m | 7 | 15 |
| Image rejection at 4 MHz | dB | 25 | 20 |
| Dial Calibration at 1.8 MHz | kHz | — | \pm 50 |
| at 4 MHz | kHz | — | \pm 150 |

C BAND

Speaker impedance: 8 ohms

Use resistive load.

Reference output level: 50 mW

Connect signal generator hot lead through 18 pF capacitor to antenna terminal.

Disconnect telescopic antenna cable.

Modulation: 1000 Hz, 30%

| | UNIT | NOMINAL | LIMIT |
|---|-----------|------------|--------|
| Frequency Coverage | MHz | 4.2–13.5 | 4.5–13 |
| IF | kHz | 455 | ±5 |
| Sensitivity for reference output power, S/N 10 dB | at 5 MHz | 15 μ V | 30 |
| | at 7 MHz | 8 μ V | 20 |
| | at 12 MHz | 4 μ V | 10 |
| Image rejection at 12 MHz | dB | 12 | 8 |
| Dial Calibration at 5 MHz | kHz | — | ±150 |
| at 10 MHz | kHz | — | ±300 |
| BFO Pitch range at 7 MHz | kHz | IF ± 5 | IF ± 3 |

D BAND

Speaker impedance: 8 ohms

Use resistive load.

Reference output level: 50 mW

Connect signal generator hot lead through 18 pF capacitor to antenna terminal.

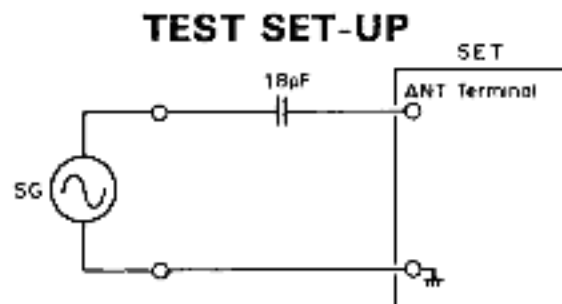
Disconnect telescopic antenna cable.

Modulation: 1000 Hz, 30%

| | UNIT | NOMINAL | LIMIT |
|---|-----------|------------|-------|
| Frequency Coverage | MHz | 12–31 | 13–30 |
| IF | kHz | 455 | ±5 |
| Sensitivity for reference output power, S/N 10 dB | at 14 MHz | 12 μ V | 25 |
| | at 21 MHz | 5 μ V | 12 |
| | at 28 MHz | 3 μ V | 7 |
| Image rejection at 28 MHz | dB | 5 | 2 |
| Dial Calibration at 13 MHz | kHz | — | ±250 |
| at 28 MHz | kHz | — | ±400 |

NOTE: Nominal Specs represent the design specs; all units should be able to approximate these — some will exceed and some may drop slightly below these specs.

Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.



BLOCK DIAGRAM

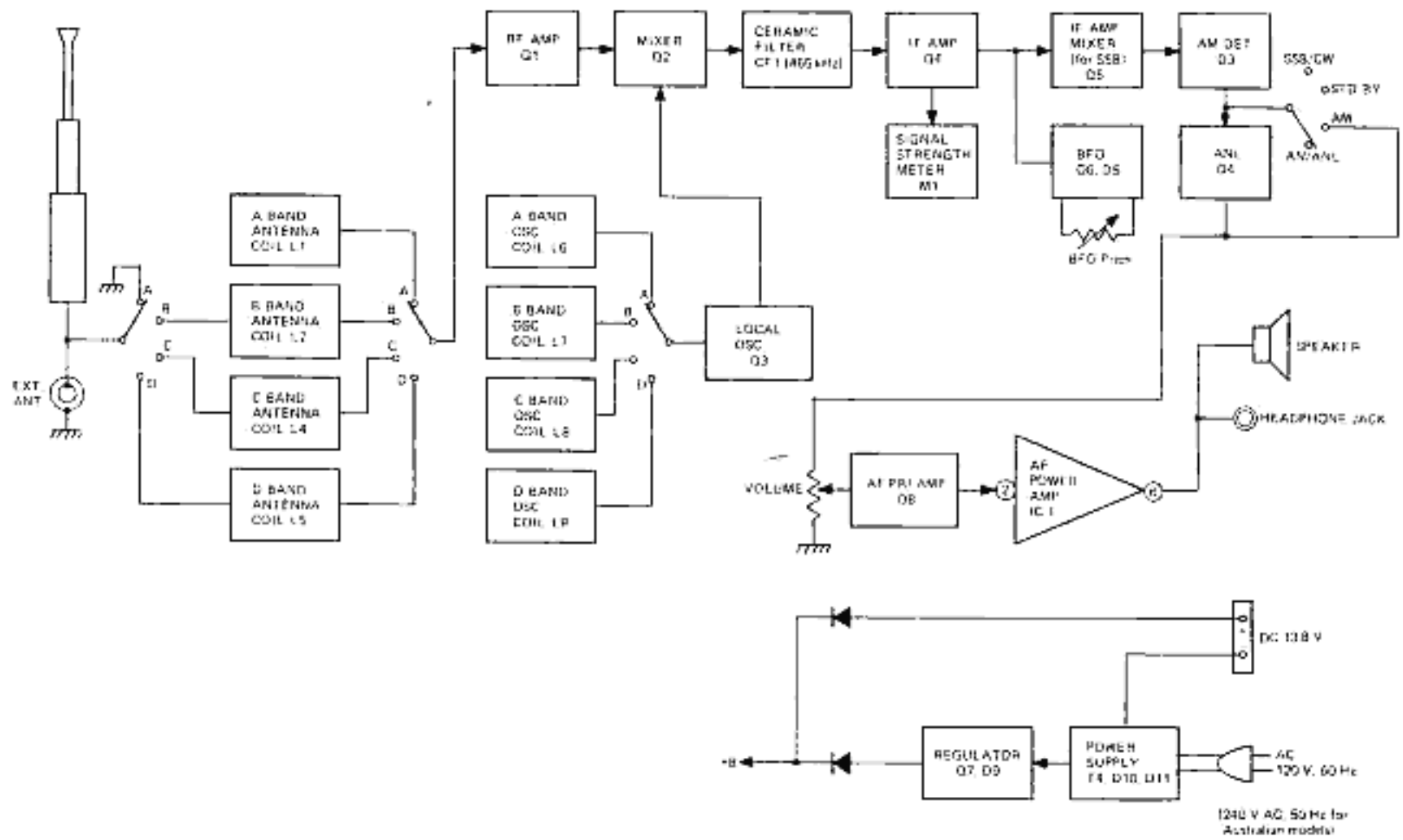


Figure 1

DIAL STRINGING DIAGRAM

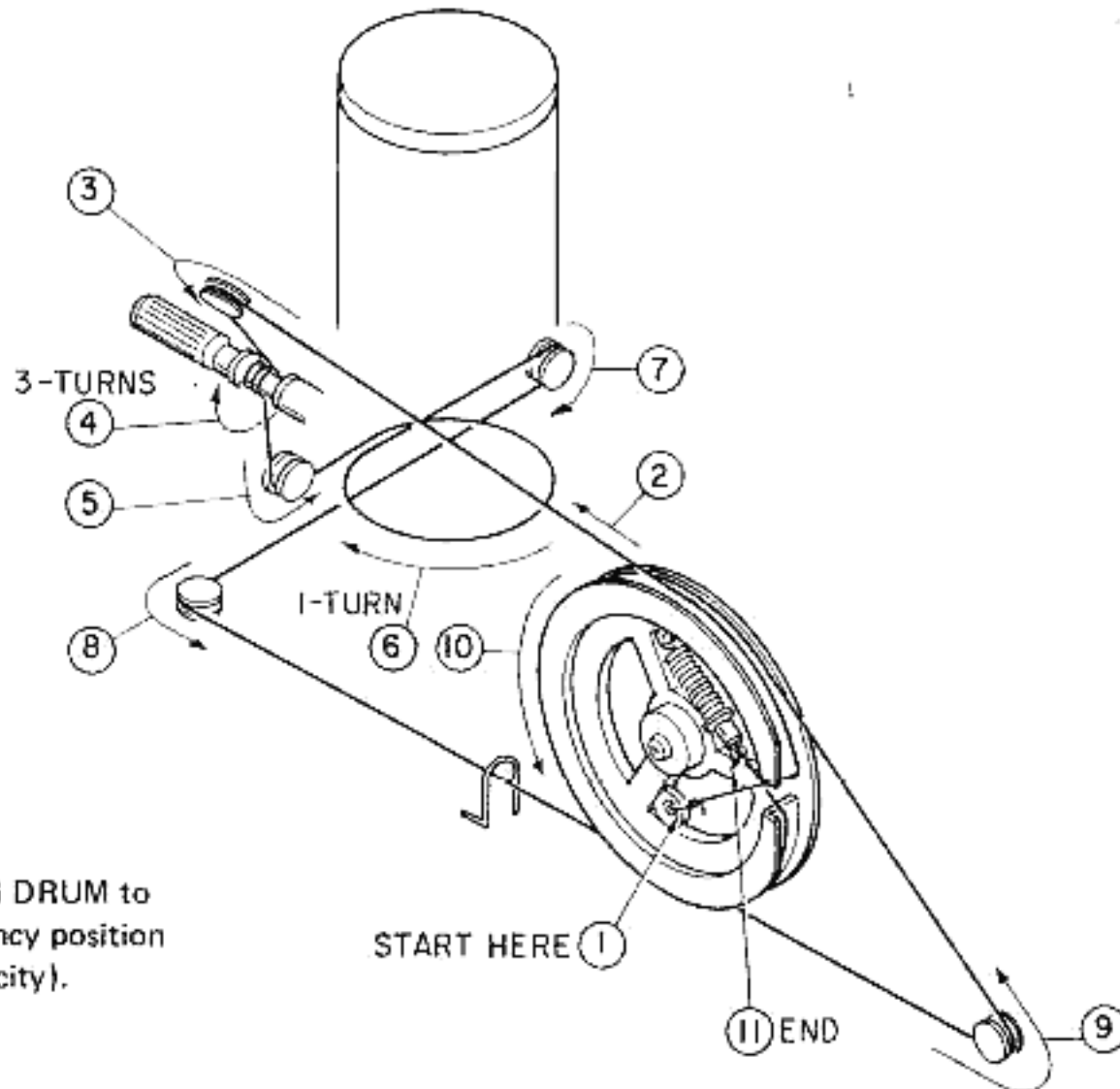


Figure 2

ALIGNMENT INSTRUCTIONS

ALIGNMENT POINTS LOCATION

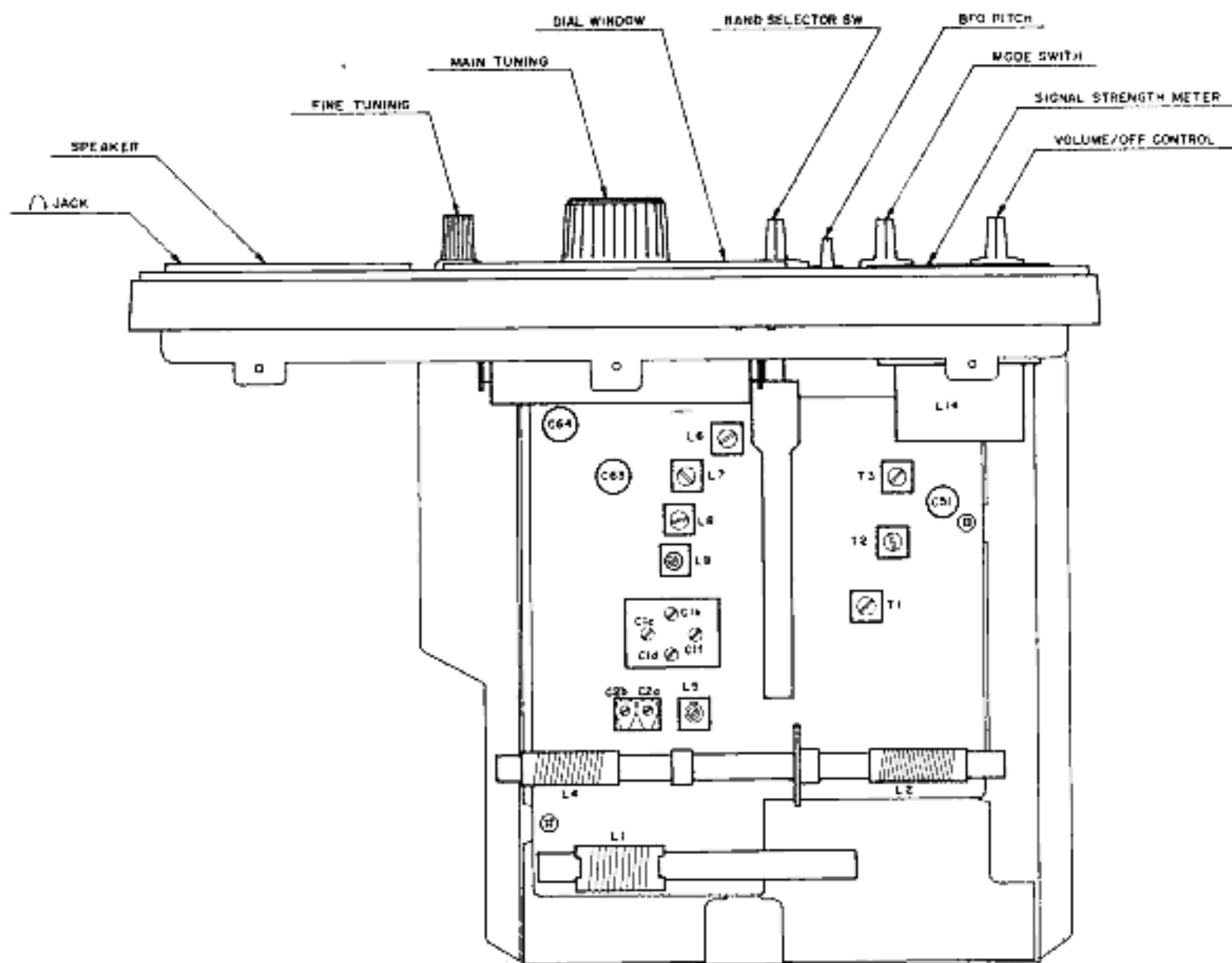


Figure 3

EQUIPMENT REQUIRED

1. AM Signal Generator
2. Vacuum Tube Voltmeter
3. Frequency Counter

GENERAL PREPARATIONS

1. Check source voltage for 120 V, 60 Hz (240 V, 50 Hz for Australian models).
2. Set BAND switch to band being aligned.
3. Turn FINE Tuning and BFO Pitch to center position (zero).
4. Set MODE switch to AM.
5. For bands B, C and D telescopic antenna should be disconnected.
6. Signal input should be kept as low as possible to avoid AGC action.
7. Standard modulation is 1000 Hz 30% for all bands.
8. Connection of signal generator should be between chassis ground and EXT. ANT. Jack.

A, B, C, D BAND IF ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Dial Setting | Adjustment | For |
|-----------|-------------------------------|---------------|------|------------|----------------------------|------------|----------------|
| IF | AM Signal Generator, V.T.V.M. | See Figure 4. | | 455 kHz | Maximum Frequency (A BAND) | T1, T2, T3 | Maximum Output |

A BAND ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Dial Setting | Adjustment | For |
|-----------------|-------------------------------|---------------|------|---|-------------------|-----------------|----------------|
| TUNING COVERAGE | AM Signal Generator, V.T.V.M. | See Figure 5. | 1 | 505 kHz | Maximum Frequency | L6 OSC. Coil | Maximum Output |
| | | | 2 | 1650 kHz | Maximum Frequency | C1e | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until tuning coverage is exactly from 505 kHz to 1650 kHz. | | | |
| TRACKING | AM Signal Generator, V.T.V.M. | See Figure 5. | 1 | 600 kHz | Tune to Signal. | L1 Antenna Coil | Maximum Output |
| | | | 2 | 1400 kHz | Tune to Signal. | C1c | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until no further improvement can be made. | | | |

B BAND ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Dial Setting | Adjustment | For |
|--------------|-------------------------------|---------------|------|---|-----------------|-----------------|----------------|
| TUNING RANGE | AM Signal Generator, V.T.V.M. | See Figure 6. | 1 | 1.5 MHz | 1.5 MHz | L7 OSC. Coil | Maximum Output |
| | | | 2 | 4.8 MHz | 4.8 MHz | C1f | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until tuning range covers exactly from 1.5 MHz to 4.8 MHz. | | | |
| TRACKING | AM Signal Generator, V.T.V.M. | See Figure 6. | 1 | 1.8 MHz | Tune to Signal. | L2 Antenna Coil | Maximum Output |
| | | | 2 | 4.0 MHz | Tune to Signal. | C1d | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until no further improvement can be made. | | | |

C BAND ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Dial Setting | Adjustment | For |
|--------------|-------------------------------|---------------|------|--|-----------------|-----------------|----------------|
| TUNING RANGE | AM Signal Generator, V.T.V.M. | See Figure 7. | 1 | 4.2 MHz | 4.2 MHz | L8 OSC. Coil | Maximum Output |
| | | | 2 | 13.5 MHz | 13.5 MHz | C3a | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until tuning range covers exactly from 4.2 MHz to 13.5 MHz. | | | |
| TRACKING | AM Signal Generator, V.T.V.M. | See Figure 7. | 1 | 5 MHz | Tune to Signal | L4 Antenna Coil | Maximum Output |
| | | | 2 | 12 MHz | Tune to Signal. | C2b | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until no further improvement can be made. | | | |

D BAND ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Dial Setting | Adjustment | For |
|--------------|-------------------------------|---------------|------|---|-----------------|-----------------|----------------|
| TUNING RANGE | AM Signal Generator, V.T.V.M. | See Figure 8. | 1 | 12 MHz | 12 MHz | L9 OSC. Coil | Maximum Output |
| | | | 2 | 31 MHz | 31 MHz | C3b | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until tuning range covers exactly from 12 MHz to 31 MHz. | | | |
| TRACKING | AM Signal Generator, V.T.V.M. | See Figure 8. | 1 | 14 MHz | Tune to Signal. | L5 Antenna Coil | Maximum Output |
| | | | 2 | 28 MHz | Tune to Signal. | C2a | Maximum Output |
| | | | 3 | Repeat steps 1 and 2 until no further improvement can be made. | | | |

BFO ALIGNMENT

| Alignment | Equipment | Connection | Step | Gen. Freq. | Adjust for | |
|-----------|--|---------------|------|---|---|--|
| BFO | AM Signal Generator, Frequency Counter, V.T.V.M. | See Figure 9. | 1 | Set BAND Switch to C. | | |
| | | | 2 | Set MODE Switch to AM. | | |
| | | | 3 | Tune BFO Pitch and FINE Tuning to center position (zero). | | |
| | | | 4 | 7 MHz (AM, 1 kHz, 30%) | Tune the Main Tuning on set to Generator Frequency. | |
| | | | 5 | 7 MHz (No Modulation) | Set MODE Switch to SSB/CW. (At this time, Beat Sound comes on.) | |
| | | | 6 | 7 MHz (No Modulation) | Adjust L14 for no Beat Sound indication on speaker. | |
| | | | 7 | Make sure that the Beat frequency is above 3.2 kHz on Frequency Counter by turning BFO Pitch Control to Maximum + (or -). If the frequency is below 3.2 kHz, repeat steps 3 through 6 until no further improvement can be made. | | |

EQUIPMENT CONNECTIONS

A, B, C, D BAND IF

A BAND/TRACKING

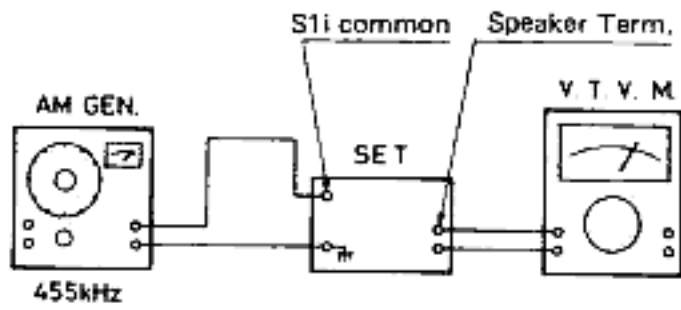


Figure 4

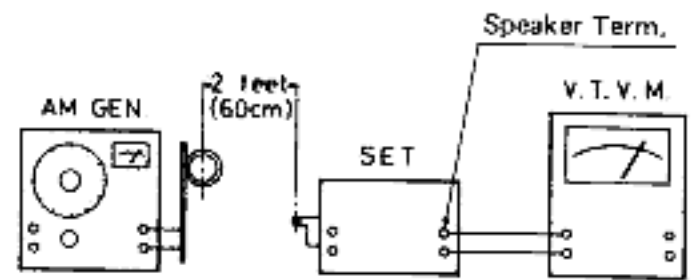


Figure 5

B BAND/TRACKING

C BAND/TRACKING

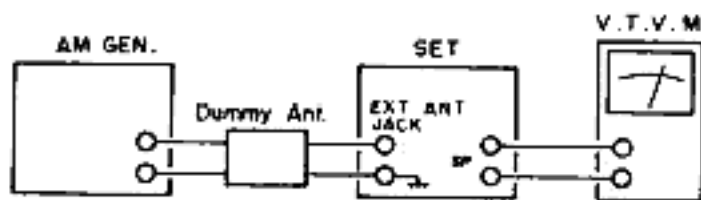


Figure 6

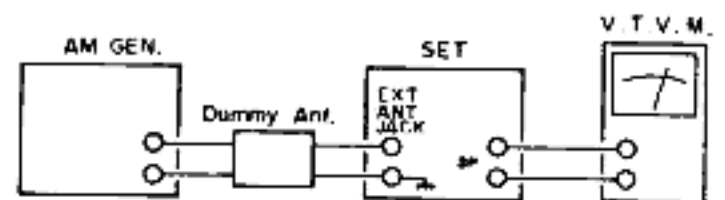


Figure 7

D BAND/TRACKING

BFO ALIGNMENT

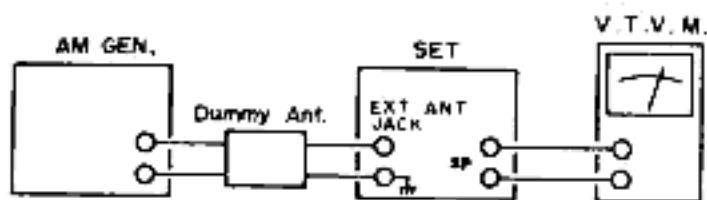


Figure 8

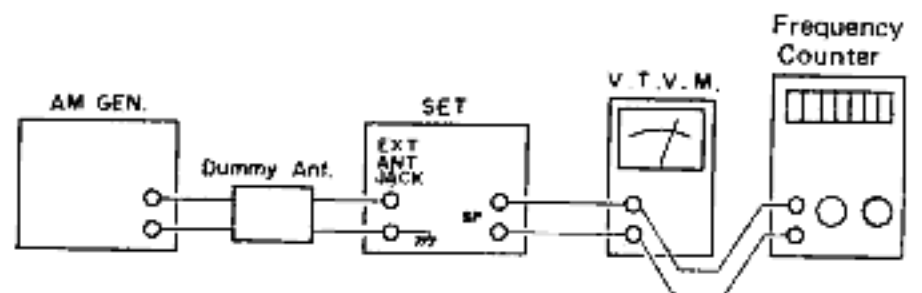


Figure 9

SCHEMATIC OF DUMMY ANTENNA

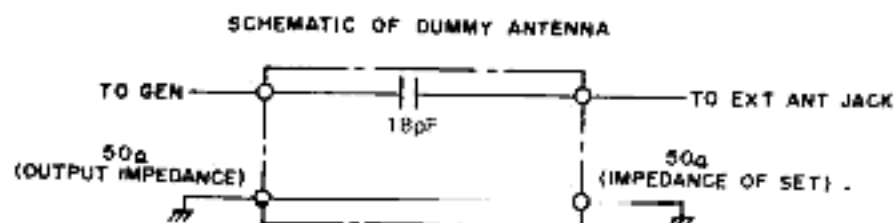


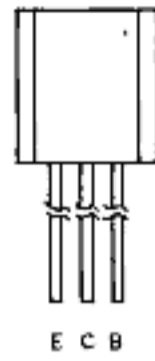
Figure 10

TROUBLESHOOTING CHART

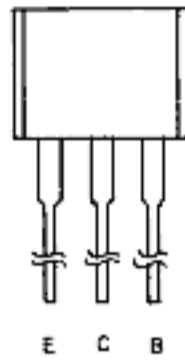
| SYMPTOM | CAUSE AND REMEDY |
|--------------------------|---|
| 1) No output | <p>A) Faulty AC power cord: Replace the cord.</p> <p>B) Faulty 12 V DC Jack: Repair or replace.</p> <p>C) DC cable polarity is wrong: Correct polarity.</p> <p>D) Blown in-line fuse: Replace.</p> <p>E) Rectifier defective: Replace.</p> <p>F) Defective Q7 or D9 circuitry: Replace defective component.</p> <p>G) HEADPHONE jack is defective: Repair or replace.</p> <p>H) Speaker voice coil is defective: Replace.</p> <p>I) Open power transformer: Replace the transformer.</p> <p>J) Defect in the power switch: Replace the switch.</p> <p>K) Defective IC: Replace defective IC.</p> <p>L) Defect in the power switch S4: Repair or replace it.</p> <p>M) Defect in VOLUME (R1): Replace.</p> |
| 2) A BAND does not work. | <p>A) Poor contact in BAND switch: Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, resistor, coil or capacitor in A BAND IF circuit defective: Replace the defective component(s).</p> <p>C) Bar Antenna coil defective: Repair or replace.</p> |
| 3) B BAND does not work. | <p>A) Poor contact in selector switch: Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, resistor, coil or capacitor in B BAND IF circuit defective: Replace the defective component(s).</p> <p>C) Defective Antenna coil L3: Replace it.</p> |
| 4) C BAND does not work. | <p>A) Poor contact in selector switch: Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in C BAND IF circuit defective: Replace the defective component(s).</p> <p>C) Antenna coil defective: Repair or replace.</p> |
| 5) D BAND does not work. | <p>A) Poor contact in selector switch: Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in D BAND IF circuit defective: Replace the defective component(s).</p> <p>C) Defective Antenna coil L5: Replace it.</p> |

| SYMPTOM | CAUSE AND REMEDY |
|--|--|
| 6) No effect with fully extended rod Antenna on B, C, D BAND | A) Poor contact of band selector switch and rod Antenna: Repair or replace. B) Broken wire between band selector switch and antenna: Repair or replace. |
| 7) No effect when connecting external antenna | A) Poor contact on jack for EXT. ANT. or defective jack: Repair or replace. |
| 8) HEADPHONE jack does not function. | A) Poor contact on HEADPHONE jack or defective jack: Repair or replace. |
| 9) MODE Switch does not work. | A) Poor contact in MODE Switch: Repair or replace. B) Defective D4 circuitry: – Replace defective component(s). C) Defective L14, Q6, D5 or R2 circuitry: Replace defective component(s). |
| 10) BFO does not work. | A) Defective R2: Replace. B) Defective R51, R52, D5 or Q6 circuitry: Replace defective component(s). |
| 11) SIGNAL STRENGTH Meter does not work. | A) Defective SIGNAL STRENGTH Meter: Replace. B) Defective C73: Replace. |
| 12) FINE Tuning does not work. | A) Defective R3: Replace. B) Defective D14, C69 or S1f circuitry: Repair or replace defective component(s). |

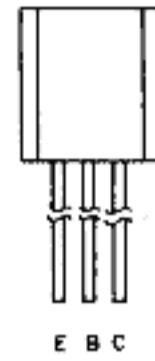
IC & TRANSISTOR LEAD IDENTIFICATION



E C B



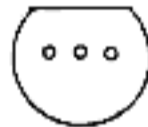
E C B



E B C



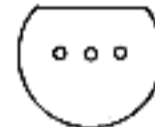
E C B



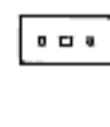
2SC1674
2SC1730



2SC668

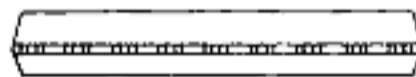
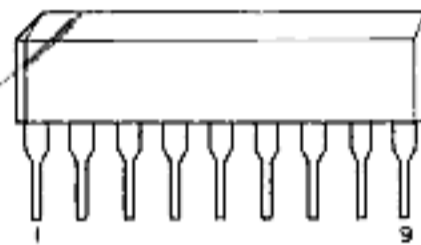


JE9011
JE9014



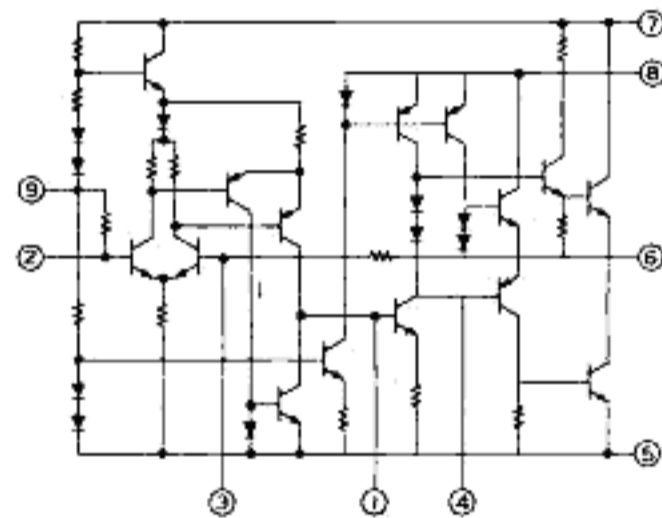
MJE9400

IC-1 TA7313P/HA12013



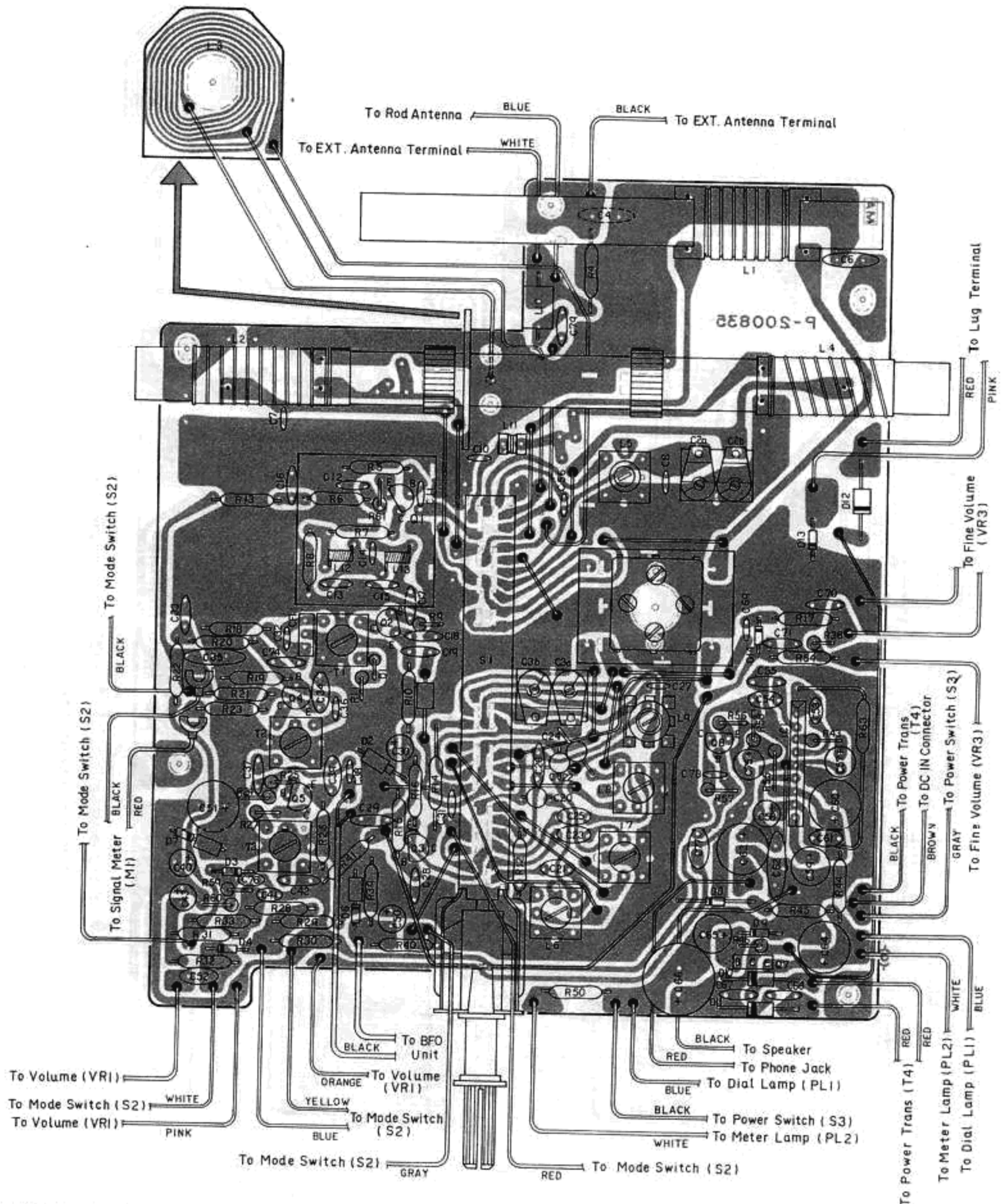
TA7313P

IC, INTERNAL CONNECTION

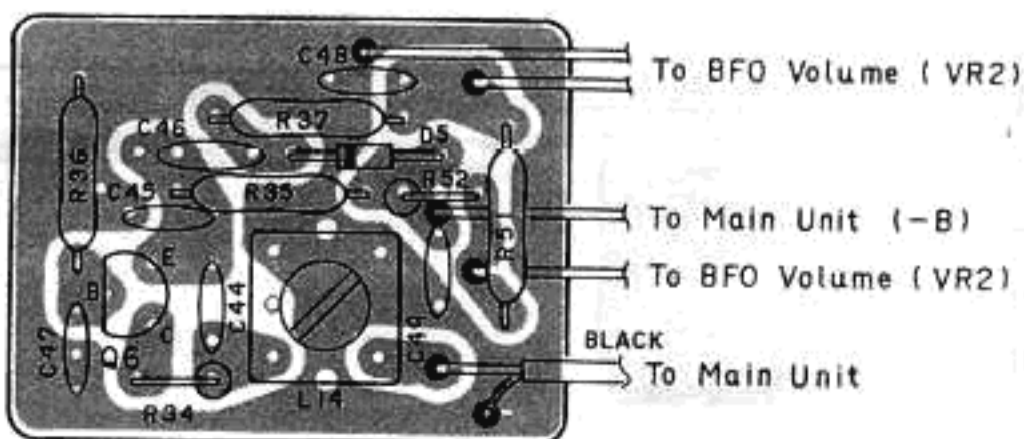


TA7313P

PRINTED CIRCUIT BOARD (TOP VIEW)



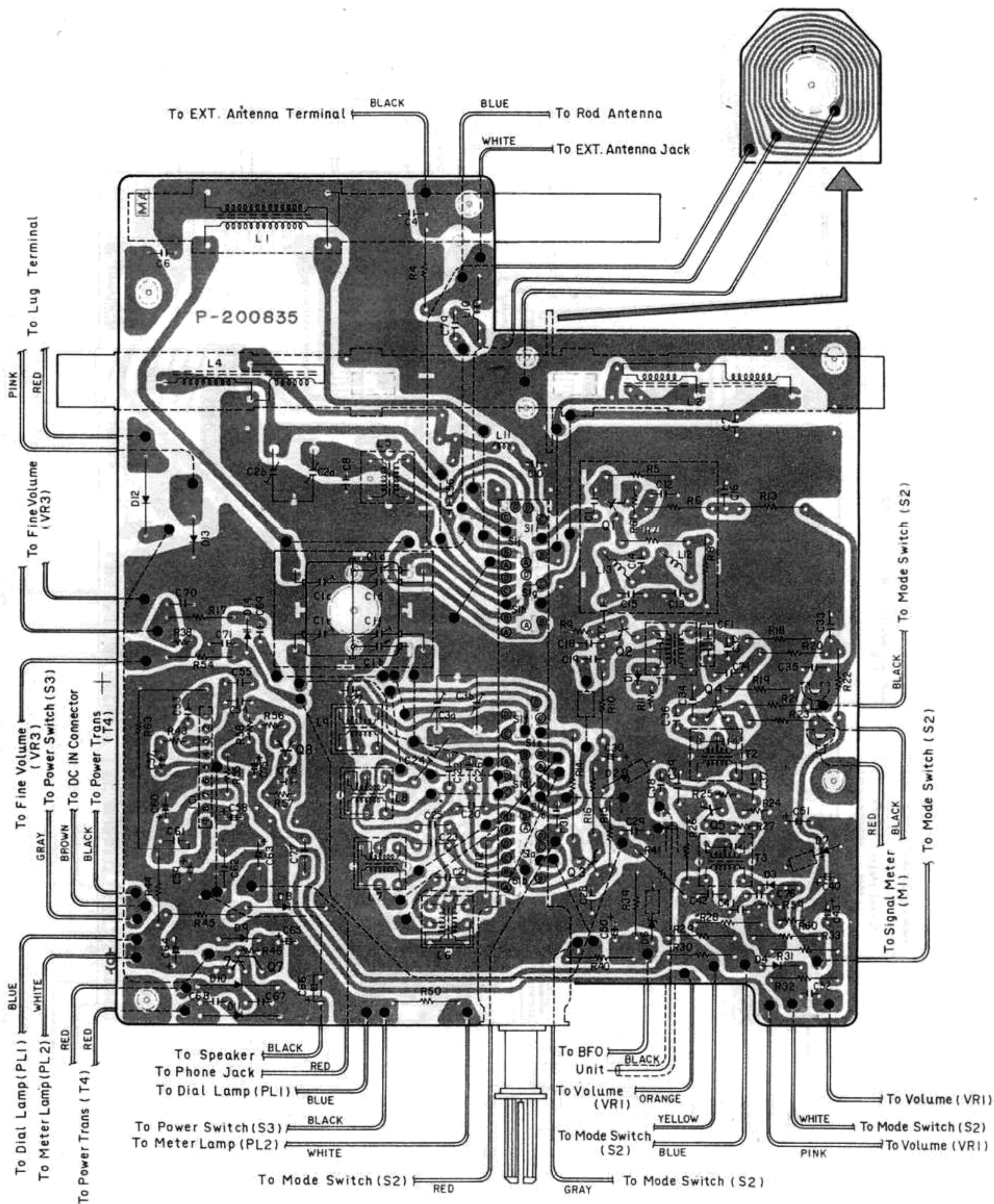
BFO P.C.B.



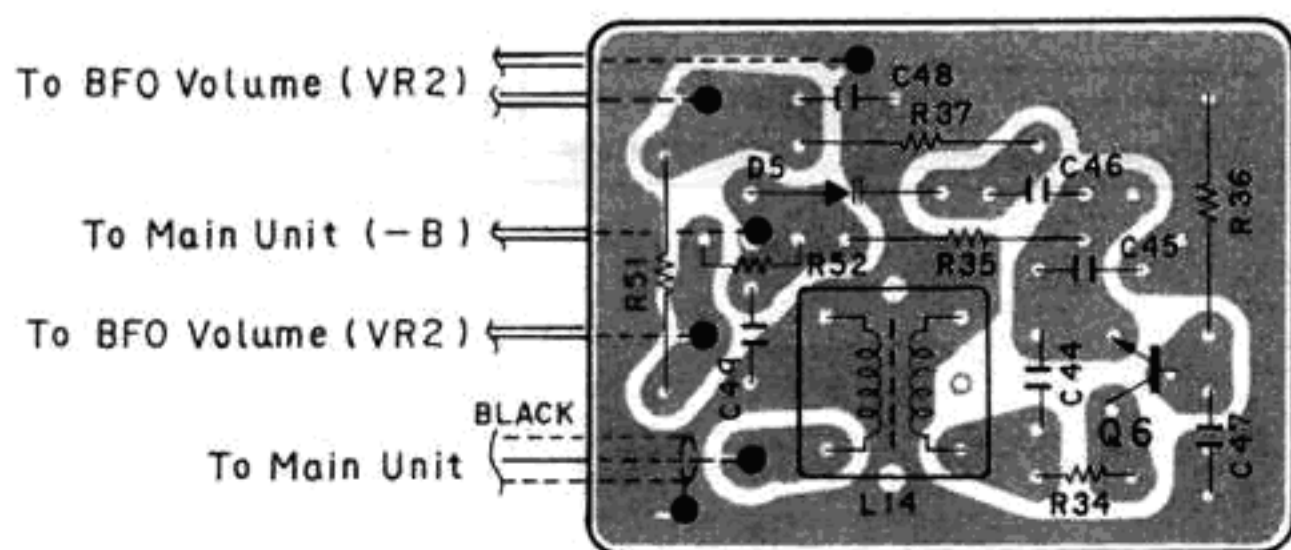
LAMP P.C.B.



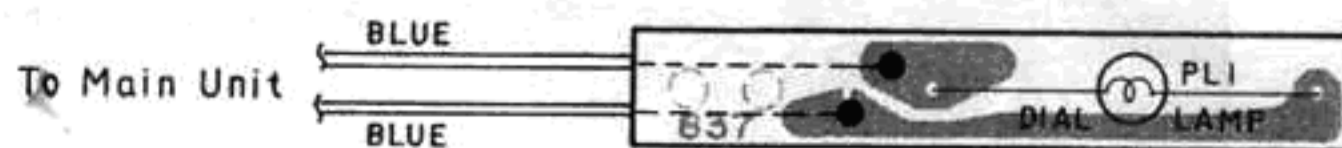
PRINTED CIRCUIT BOARD (BOTTOM VIEW)



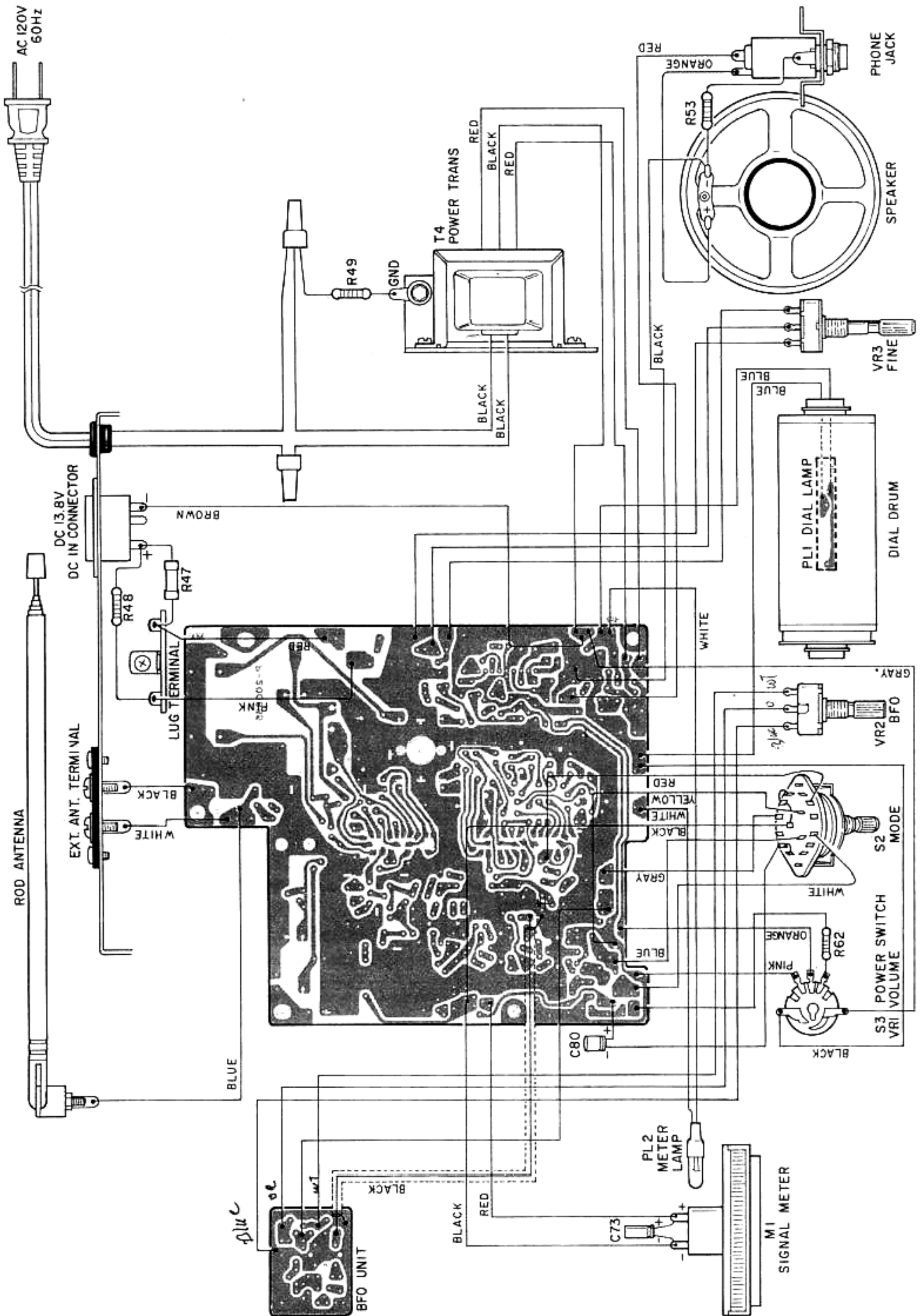
BFO P.C.B.



LAMP P.C.B.



WIRING DIAGRAM



ELECTRICAL PARTS LIST

| Ref. No. | Description | RS Part No. (Mfr's Part No.) | Ref. No. | Description | RS Part No. (Mfr's Part No.) |
|--|--|--|-----------------------|-----------------------------------|---------------------------------|
| CAPACITORS (): Variance Value SL : 350-100 ppm/°C | | | C44 | Polystyrene 680 pF ± 5% 50 WV | |
| C1a-f | Poly Variable Capacitor 226 pF x 2 | C-4723 (P-150047) | C45 | Ceramic 240 pF ± 5% 50WV(N470) | CF-2163 |
| C2a, b | Trimmer Capacitor AT2-52W or 2T16M or 2T-P15 | C-1119 (P-160015) or (P-160022) or (P-160012) | C46 | Ceramic 100 pF ± 10% 50WV(NPO) | CF-1424 |
| C3a, b | Trimmer Capacitor AT2-52W or 2T16M or 2T-P15 | C-0858 (P-160015) or (P-160022) or (P-160012) | C47 | Ceramic 330 pF ± 10% 50WV(SL) | CF-2026 |
| C4 | Ceramic 0.04 μF 25 WV | | C48 | Ceramic 0.01 μF 50 WV | |
| C5 | Not used | | C49 | Ceramic 0.04 μF 25 WV | |
| C6 | Ceramic 0.04 μF 25 WV | | C50 | Electrolytic 10 μF/10 V or 16 V | |
| C7 | Ceramic 5 pF ± 0.5 pF 50WV(SL) | CF-1105 | C51 | Electrolytic 470 μF/10 V | |
| C8 | Ceramic 15(0-22)pF ± 10% 50WV(SL) | CF-1195 | C52 | Polyester 0.0047 μF ± 20% 50 WV | |
| C9 | Not used | | C53 | Polyester 0.0022 μF ± 20% 50 WV | |
| C10 | Ceramic 24 pF ± 10% 50WV(SL) | CF-1262 | C54 | Polyester 0.022 μF ± 20% 50 WV | |
| C11 | Ceramic 0.022 μF 25 WV | | C55 | Ceramic 0.01 μF 50 WV | |
| C12 | Ceramic 0.04 μF 25 WV | | C56 | Ceramic 7 pF ± 0.5 pF 50WV(SL) | CF-1120 |
| C13 | Ceramic 100 pF ± 10% 50WV(SL) | CF-1425 | C57 | Electrolytic 33 μF/10 V | |
| C14 | Ceramic 47 pF ± 10% 50WV(SL) | CF-1366 | C58 | Electrolytic 47 μF/10 V | |
| C15 | Ceramic 100 pF ± 10% 50WV(SL) | CF-1425 | C59 | Electrolytic 100 μF/10 V | |
| C16 | Ceramic 0.022 μF 25 WV | | C60 | Electrolytic 220 μF/10 V | |
| C17 | Ceramic 0.022 μF 25 WV | | C61 | Ceramic 0.022 μF 25 WV | |
| C18 | Ceramic 68 pF ± 10% 50WV(SL) | CF-1959 | C62 | Ceramic 0.1 μF 25 WV | |
| C19 | Polyester 0.01 μF ± 20% 50 WV | | C63 | Electrolytic 220 μF/10 V | |
| C20 | Polystyrene 240 pF ± 5% 50 WV | | C64 | Electrolytic 220 μF/10 V | |
| C21 | Polyester 0.0047 μF ± 20% 50 WV | | C65 | Electrolytic 100 μF/10 V | |
| C22 | Polystyrene 680 pF ± 5% 50 WV | | C66 | Electrolytic 470 μF/16 V | |
| C23 | Polyester 0.0022 μF ± 20% 50 WV | | C67 | Ceramic 0.022 μF 25 WV | |
| C24 | Polystyrene 2200 pF ± 5% 50 WV | | C68 | Ceramic 0.022 μF 25 WV | |
| C25 | Polyester 0.001 μF ± 20% 50 WV | | C69 | Ceramic 15 pF ± 10% 50WV(NPO) | CF-1190 |
| C26 | Ceramic 470 pF ± 10% 50WV(SL) | CF-1519 | C70 | Ceramic 0.01 μF 50 WV | |
| C27 | Ceramic 24(0-27)pF ± 10% 50WV(NPO) | CF-1261 | C71 | Ceramic 0.022 μF 25 WV | |
| *C27 | Ceramic 18(0-27)pF ± 10% 50WV | | C72 | Not used | |
| C28 | Ceramic 0.022 μF 25 WV | | C73 | Electrolytic 3.3 μF/50 V | |
| C29 | Ceramic 0.04 μF 25 WV | | C74 | Ceramic 0.022 μF 25 WV | |
| C30 | Electrolytic 10 μF/10 V or 16 V | | C75 | Electrolytic 47 μF/10 V | |
| C31 | Ceramic 0.022 μF 25 WV | | C76 | Polyester 0.0056 μF ± 20% 50 WV | |
| C32 | Ceramic 1 pF ± 0.25 pF 50WV(SL) | CF-1015 | C77 | Polyester 0.047 μF ± 20% 50 WV | |
| C33 | Ceramic 0.022 μF 25 WV | | C78 | Ceramic 680 μF ± 20% 50 WV | |
| C34 | Polyester 0.039 μF ± 20% 50 WV | | C79 | Ceramic 0.01 μF 50 WV | |
| C35 | Ceramic 0.1 μF 25 WV | | C80 | Electrolytic 4.7 μF/25 V | |
| C36 | Ceramic 1 pF ± 0.25 pF 50WV(SL) | CF-1015 | C81 | Not used | |
| C37 | Ceramic 0.022 μF 25 WV | | CERAMIC FILTER | | |
| C38 | Ceramic 33(22-72)pF ± 10% 50WV(SL) | CF-1315 | CF1 | Ceramic Filter CFM2-455Z | C-1118 (P-130090) |
| C39 | Polyester 0.039 μF ± 20% 50 WV | | DIODES | | |
| C40 | Electrolytic 1 μF/50 V | | D1 | Silicon Diode 1N4148 | DX-0022 |
| C41 | Polyester 0.001 μF ± 20% 50 WV | | D2 | Zener Diode XZ062 or RD6.2EB2 | DX-1419 |
| C42 | Ceramic 0.04 μF 25 WV | | D3 | Silicon Diode 1N4148 | DX-0022 |
| C43 | Electrolytic 0.47 μF/50 V | | D4 | Silicon Diode 1N4148 | DX-0022 |
| | | | D5 | Silicon Diode 1S310S or 1S2688 | DX-1240 |

*For Japanese Models Only

| Ref. No. | Description | RS Part No. (Mfr's Part No.) |
|----------|-------------------------------|------------------------------|
| D6 | Zener Diode XZ062 or RD6.2EB2 | DX-1419 |
| D7 | Zener Diode XZ072 or RD7.5EB2 | DX-1435 |
| D8 | Silicon Diode 1N4148 | DX-0022 |
| D9 | Zener Diode XZ090 or RD9.1EB3 | DX-1434 |
| D10 | Silicon Diode 10E-1 | DX-1039 |
| D11 | Silicon Diode 10E-1 | DX-1039 |
| D12 | Silicon Diode 10E-1 | DX-1039 |
| D13 | Silicon Diode 1N4148 | DX-0022 |
| D14 | Silicon Diode 1S2139-A | DX-0291 |

INTEGRATED CIRCUITS

| | | |
|-----|------------------------------|---------|
| IC1 | TA7313P or LA4140 or HA12013 | MX-3426 |
|-----|------------------------------|---------|

| Ref. No. | Description | Mfr's Part No. | RS Part No. |
|----------|-------------|----------------|-------------|
|----------|-------------|----------------|-------------|

COILS

| L1 | ANT Coil | AC-128 | CA-0702 | P-110128 |
|-----|---------------|------------------------|---------|----------|
| L2 | ANT Coil | AC-129 | CA-5344 | P-110129 |
| L3 | Coil P.C.B. | | X-8601 | P-200838 |
| L4 | ANT Coil | AC-129 | CA-5344 | P-110129 |
| L5 | ANT Coil | AC-127 | CA-5487 | P-110127 |
| L6 | OSC Coil | OC-100 | CA-5483 | P-120100 |
| L7 | DSC Coil | OC-101 | CA-5484 | P-120101 |
| L8 | OSC Coil | OC-102 | CA-5485 | P-120102 |
| L9 | OSC Coil | OC-103 | CA-5486 | P-120103 |
| L10 | Inductor | C8-A1 1.2 μ H | CA-5482 | P-360095 |
| L11 | Feri Inductor | 0.63 μ H | CA-0675 | P-360010 |
| L12 | AIR Coil | HR5-8 $\frac{1}{2}$ TI | CA-5480 | P-340108 |
| L13 | AIR Coil | HL5-9 $\frac{1}{2}$ TI | CA-5481 | P-340109 |
| L14 | OSC Coil | GC-099 | | P-120099 |

| Ref. No. | Description | RS Part No. (Mfr's Part No.) |
|----------|-------------|------------------------------|
|----------|-------------|------------------------------|

LAMPS

| | | | |
|-----|------------|--------------------------------|----------------------|
| PL1 | Dial Lamp | 3.4 ϕ 10 V 40 mA | L-0874 (P-240104) |
| PL2 | Meter Lamp | LEAD TYPE 4.2 ϕ 8 V 30 mA | L-1219 (P-240126) |

TRANSISTORS

| | | | |
|----|------------|-------------------------|---------|
| Q1 | Transistor | 2SC1674(L) or 2SC668(D) | |
| Q2 | Transistor | 2SC1674(M) or 2SC668(C) | |
| Q3 | Transistor | 2SC1730(L) | |
| Q4 | Transistor | JE9011(F) | MX-3740 |

| Ref. No. | Description | RS Part No. (Mfr's Part No.) | |
|----------|-------------|------------------------------|---------|
| Q5 | Transistor | JE9011(H) | MX-3742 |
| Q6 | Transistor | JE9011(G) | MX-3741 |
| Q7 | Transistor | MJE9400-2 | MX-4481 |
| Q8 | Transistor | JE9014(C) | MX-4417 |

TRANSFORMERS

| | | |
|-----|-----------------------------------|--------------------------|
| T1 | AM IFT 0A-088 | CA-8114 (P-130088) |
| T2 | AM IFT 0A-079 | CA-8115 (P-130079) |
| T3 | AM IFT 0A-089 | CA-8116 (P-130089) |
| *T4 | Power Transformer 120 V, 60 Hz | TA-0841 (P-100753) |
| *T4 | Power Transformer 120 V, 60 Hz | (P-100754) |
| *T4 | Power Transformer 240 V, 50 Hz | (P-100788) or (P-100799) |
| *T4 | Power Transformer 100 V, 50/60 Hz | (P-100820) |

RESISTORS () : Variance Value

| | | | |
|-----|-------------|------------------|----------------------|
| R1 | VOLUME | 5 k Ω D | (P-171435) |
| R2 | BFO Volume | 100 k Ω B | P-6645 (P-171302) |
| R3 | FINE Volume | 100 k Ω B | P-6494 (P-171303) |
| R4 | Carbon PZ | 1.2 M Ω | $\frac{1}{2}$ WV |
| *R4 | Not used | | |
| *R4 | Not used | | |
| R5 | Carbon PZ | 820 k Ω | $\frac{1}{4}$ WV |
| R6 | Carbon PZ | 820 Ω | $\frac{1}{4}$ WV |
| R7 | Carbon PZ | 47 Ω | $\frac{1}{4}$ WV |
| R8 | Carbon PZ | 100 Ω | $\frac{1}{4}$ WV |
| R9 | Carbon PZ | 820 k Ω | $\frac{1}{4}$ WV |
| R10 | Carbon PZ | 3.3 k Ω | $\frac{1}{4}$ WV |
| R11 | Carbon PZ | 22 k Ω | $\frac{1}{4}$ WV |
| R12 | Carbon PZ | 47 Ω | $\frac{1}{4}$ WV |
| R13 | Carbon PZ | 47 Ω | $\frac{1}{4}$ WV |
| R14 | Carbon PZ | 880 Ω | $\frac{1}{4}$ WV |
| R15 | Carbon PZ | 470 k Ω | $\frac{1}{4}$ WV |
| R16 | Carbon PZ | 6.8 k Ω | $\frac{1}{4}$ WV |
| R17 | Carbon PZ | 100 k Ω | $\frac{1}{4}$ WV |
| R18 | Carbon PZ | 3.3 k Ω | $\frac{1}{4}$ WV |
| R19 | Carbon PZ | 220 k Ω | $\frac{1}{4}$ WV |
| R20 | Carbon PZ | 8.2 k Ω | $\frac{1}{4}$ WV |
| R21 | Carbon PZ | 470 Ω | $\frac{1}{4}$ WV |
| R22 | Carbon PZ | 1 k Ω | $\frac{1}{4}$ WV |
| R23 | Carbon PZ | 1 k Ω | $\frac{1}{4}$ WV |
| R24 | Carbon UZ | 330 k Ω | $\frac{1}{4}$ WV |
| R25 | Carbon UZ | 47 Ω | $\frac{1}{4}$ WV |
| R26 | Carbon PZ | 680 Ω | $\frac{1}{4}$ WV |
| R27 | Carbon UZ | 680 Ω | $\frac{1}{4}$ WV |

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| Ref. No. | Description | RS Part No. (Mfr's Part No.) | Ref. No. | Description | RS Part No. (Mfr's Part No.) |
|----------|---------------------------------|---------------------------------|---------------------------|--|---------------------------------|
| R28 | Carbon PZ 100 k Ω | | R51 | Carbon PZ 27-47 k Ω | |
| R29 | Carbon PZ 300 k Ω | | R52 | Carbon UZ 10-22 k Ω | |
| R30 | Carbon PZ 68 k Ω | | R53 | Carbon PZ 82 Ω | |
| R31 | Carbon PZ 68 k Ω | | R54 | Carbon PZ 15 k Ω | |
| R32 | Carbon PZ 68 k Ω | | R55 | Carbon UZ 5.6 k Ω | |
| R33 | Carbon PZ 33 k Ω | | R56 | Carbon UZ 120 Ω | |
| R34 | Carbon UZ 150 Ω | | R57 | Carbon UZ 150 k Ω | |
| R35 | Carbon PZ 150 k Ω | | R58 | Carbon UZ 1.5 k Ω | |
| R36 | Carbon PZ 470 k Ω | | R59 | Carbon UZ 39 k Ω | |
| R37 | Carbon PZ 100 k Ω | | R60 | Carbon UZ 68 k Ω | |
| R38 | Carbon UZ 18 k Ω | | R61 | Carbon UZ 22 Ω | |
| R39 | Carbon PZ 10 k Ω | | R62 | Carbon PZ 22(10-68) k Ω | |
| R40 | Carbon PZ 150 Ω | | R63 | Carbon PZ 82(47-82) k Ω | |
| R41 | Carbon PZ 150 Ω | | SWITCHES | | |
| R42 | Not used | | S1a- | Slide Rotary Switch BAND | S-1453 (P-180465) |
| R43 | Carbon UZ 18 Ω | | S2 | Rotary Switch MODE | S-1454 (P-180466) |
| R44 | Carbon PZ 4.7(4.7-8.2) Ω | | FERRITE BEADS CORE | | |
| R45 | Carbon PZ 27 Ω | | Ferrite Beads Core | HB-7169 (P-500099) or (P-500006) | |
| R46 | Carbon UZ 270 Ω | | | | |
| R47 | Metal Oxide 15 Ω | | | | |
| R48 | Carbon PZ 330 Ω | | | | |
| R49 | Carbon PZ 2.2 M Ω | | | | |
| *R49 | Not used | | | | |
| *R49 | Not used | | | | |
| R50 | Carbon PZ 56 Ω | | | | |

*For Australian Models Only

*For Japanese Models Only

Refer to NOTE (4) on page 21.

EXPLODED VIEW PARTS LIST

| Ref. No. | Description | RS Part No. | Mfr's Part No. | Ref. No. | Description | RS Part No. | Mfr's Part No. |
|----------|---|-------------|----------------|----------|------------------------------|-------------|------------------|
| 1 | VOLUME/MODE/BAND Knob | K-3451 | P-650349 | *51 | Power Transformer | | P-100789or |
| 2 | BFO Knob | K-4083 | P-650454 | | | | P-100799 |
| 3 | Main Tuning Knob (with cap: P-710198) | K-4336 | P-650461 | *51 | Power Transformer | | P-100820 |
| 4 | FINE Tuning Knob (with cap: P-710199) | K-4337 | P-650462 | 52 | Clamp Connector | H-3305 | P-320006 |
| 5-8 | Front Panel Ass'y | Z-5728 | M-00083 | *52 | Terminal Block | | P-320251 |
| 5 | Front Panel | | P-610747 | 53 | Cord Stopper | HB-0705 | P-480010 |
| 6 | Dial Frame | | P-710201 | *53 | Cord Stopper | | P-480080 |
| 7 | Dial Window | | P-610749 | *54 | AC Line Cord | W-1000 | P-310115 |
| 8 | Window | | P-610750 | *54 | AC Line Cord | W-2527 | P-310034 |
| 9 | Phone Jack Holder | | P-412220 | 55 | DC 12 V Jack (J2) | J-4684 | P-190321 |
| 10 | Headphone Jack (J1) | J-0994 | P-190139 | 56 | Terminal Plate | HB-7354 | P-320221 |
| 11 | Speaker | S-4924 | P-270093 | 57- | | | |
| 12 | SCALE (FINE Tuning Controller) | D-5434 | P-610748 | 59 | Cabinet Ass'y | Z-5729 | M-00084 |
| 13 | Coil Spring | RB-6969 | P-440102 | 57 | Cabinet | | P-600122A |
| 14 | Pulley | D-0269 | P-430007 | 58 | Shield Sheet | | P-480358 |
| 15 | Tuning Shaft Ass'y | | P-420367 | 59 | Rubber Foot | F-0237 | P-680168 |
| 16 | Shaft Holder | HB-1344 | P-810094 | 60 | Net | | P-660234 |
| 17 | Cushion | | P-680283 | 61 | Net | | P-660225 |
| 18 | Meter | M-0469 | P-230101 | *62 | Back Board | Z-5730 | P-630137 |
| 19 | Cushion | | P-680254 | *62 | Back Board | | P-630141 |
| 20 | Front Chassis | | P-400293 | *62 | Back Board | | P-630144 |
| 21 | Lamp Holder A (for PL2) | | P-412219 | 63 | Antenna Stopper | A-4463 | P-610753 |
| 22 | Shield Case C (for BFO P.C.B.: P-200836) | X-8600 | P-412214 | 64 | Rod Antenna | A-0376 | P-330028 |
| 23 | NET | | P-650233 | 64 | Rod Antenna | | P-330032 |
| 24 | Cushion | | P-680282 | | | | |
| 25 | Dial Drum | D-0458 | P-610751 | Ref. No. | Description | RS Part No. | (Mfr's Part No.) |
| 26 | Drum Guide | D-0459 | P-610754 | F1 | Tapping Screw 3φ x 8BT-PLAX | | |
| 27 | Sheet | | P-680270 | F2 | Tapping Screw 3φ x 8BT-III | | |
| 28 | Drum Holder | D-0457 | P-610752 | F3 | Screw 3φ x 12 x 3 | | |
| 29 | Lamp P.C.B. (with Lamp) | | P-200837 | F4 | Tapping Screw 3φ x 8BT-II | | |
| 30 | Lamp Holder (for PL1) | HC-0137 | P-412218 | F5 | Nylon Rivet 3φ x 4.5 | | |
| 31 | Holder | HC-0136 | P-412217 | F6 | Tapping Screw 3φ x 10BT-PLAX | | |
| 32 | BFO Volume (R2) | P-8645 | P-171302 | F7 | Fiver Washer 3.2φ x 8φ | | |
| 33 | VOLUME (R1) | | P-171435 | F8 | Screw 2φ x 5P | | |
| 34 | MODE Rotary Switch | | P-180465 | F9 | Screw 3φ x 6P | | |
| 35 | Main P.C.B. Unit | X-8539 | U-24402 | F10 | Triple Screw 3φ x 6P | | |
| 36 | Shield Cover | | P-412216 | F11 | Screw 3φ x 9 x 3 | | |
| 37 | Shield Case B | | P-412213 | F12 | Screw 2.5φ x 6P | | |
| 38 | Shield Case A | | P-412212 | F13 | Screw 3φ x 6P | | |
| 39 | Core Holder | HB-2897 | P-610395 | F14 | Screw 2φ x 6P | | |
| 40 | Coil P.C.B. | | P-200838 | F15 | Screw 2φ x 12P | | |
| 41 | Pulley Shaft | D-3270 | P-420303 | F16 | Nut 2N | | |
| 42 | FINE Volume (R3) | P-6494 | P-171303 | F17 | Flange Nut 3N | | |
| 43 | Pulley 76 | D-0359 | P-430031 | F18 | Egg Lug 3 | | |
| 44 | Dial Spring A | RB-5620 | P-440075 | F19 | Screw (Black) 3φ x 6P | | |
| 45 | P.C.B. Holder | | P-480348 | F20 | Screw 3φ x 10B | | |
| 46 | Spacer | | P-420234 | F21 | Tapping Screw 3φ x 12BT-PLAX | | |
| 47 | Pulley Shaft | D-3203 | P-400292 | F22 | Screw 3φ x 8B | | |
| 48 | Chassis | | P-320078 | F23 | Nut 3N | | |
| 49 | LUG Terminal | | P-412323 | F24 | Lug Terminal t = 0.5 | | (P-320075) |
| 50 | Transformer Holder | | P-100753 | F25 | Spring Washer 3SW | | |
| *51 | Power Transformer | TA-0841 | P-100753 | *F26 | Screw 3φ x 16 | | |
| *51 | Power Transformer | | P-100754 | *F27 | Square Nut | | (P-410111) |

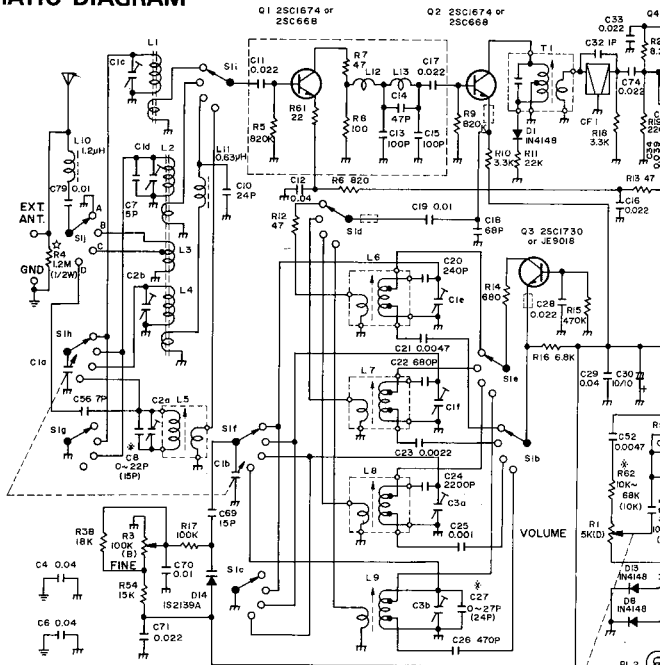
*For USA Models Only

*For Canadian Models Only

*For Australian Models Only

*For Japanese Models Only

SCHEMATIC DIAGRAM



TRANSISTOR AND IC VOLTAGE CHART

IC-1 VOLTAGE CHART

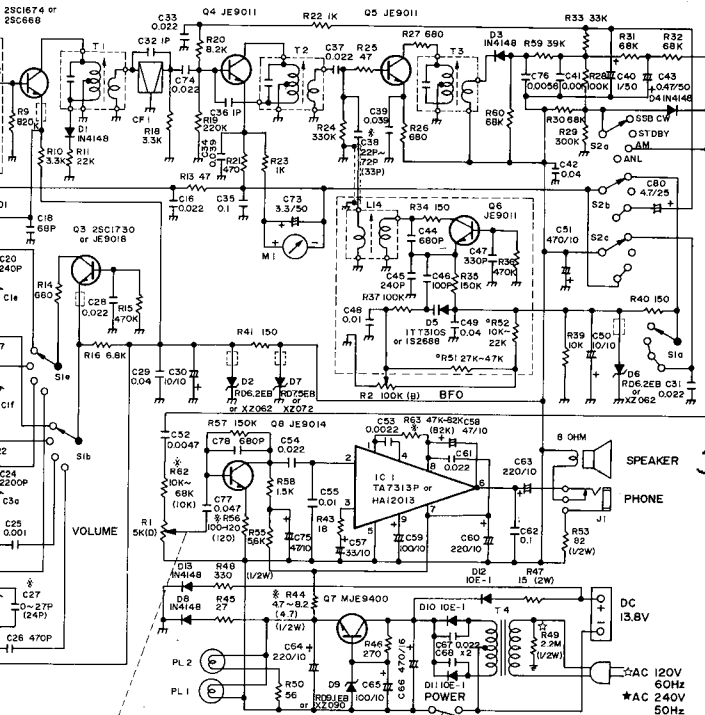
| PIN No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------------|-----|-----|-----|-----|---|-----|-----|-----|-----|
| PIN VOLTAGE | 0.7 | 4.1 | 4.2 | 4.2 | 0 | 4.2 | 8.4 | 8.2 | 4.2 |

TRANSISTOR VOLTAGE CHART

| | Q1 | | | Q2 | | | Q3 | | | Q4 | | | Q5 | | | Q6 | | | Q7 | | |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B |
| Transistor Voltage [V] | 0.7 | 7.2 | 1.4 | 2.3 | 7.3 | 2.9 | 4.1 | 7.0 | 4.6 | 0.5 | 7.3 | 1.2 | 1.3 | 6.0 | 2.0 | 5.8 | 7.3 | 6.5 | 8.4 | 11.5 | 9.1 |

All Voltage are same regardless of BAND Switch position. MODE Switch is AM position. BFO and FINE are center position. All voltage value are indicated in volts with no signal measured with V.T.V.M.

20-206



M-342

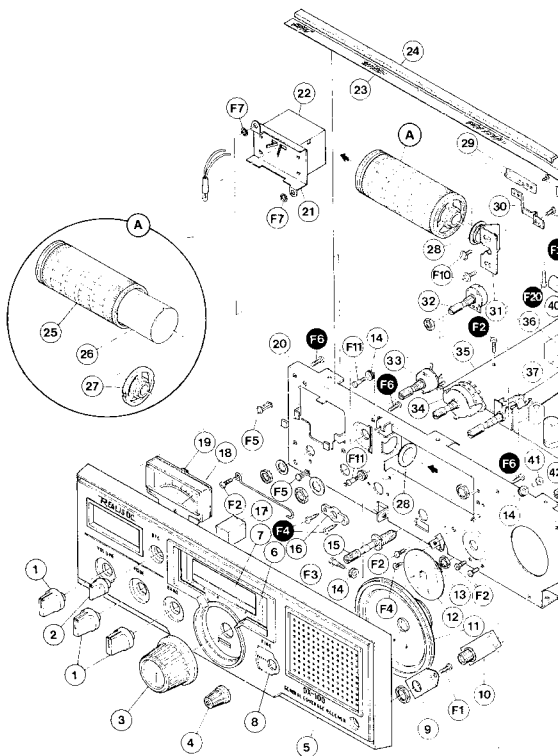
| Q6 | | Q7 | | | |
|-----|-----|-----|-----|------|-----|
| E | C | B | E | C | B |
| 1.8 | 7.3 | 6.5 | 8.4 | 11.5 | 9.1 |

AM position, BFO and signal measured with

NOTE:

- (1) ALL RESISTANCE VALUES ARE INDICATED IN "OHM" (K = 10³ OHM, M = 10⁶ OHM).
- (2) ALL CAPACITANCE VALUES ARE INDICATED IN "μF" (P = 10⁻⁶ μF).
- (3) * MAY VARY FROM UNIT TO UNIT FOR BEST PERFORMANCE.
- (4) ○ WHEN D5 IS USED AS 1T7310S, THE VALUE OF R51 MUST BE 47K OHM AND R52 MUST BE 22K OHM.
○ WHEN D5 IS USED AS 1S2688, THE VALUE OF R51 MUST BE 27K OHM AND R52 MUST BE 10K OHM.
- (5) ○ FOR USA AND CANADIAN MODELS ONLY.
* FOR AUSTRALIAN MODELS ONLY.

EXPLODED VIEW



Removal of Cabinet

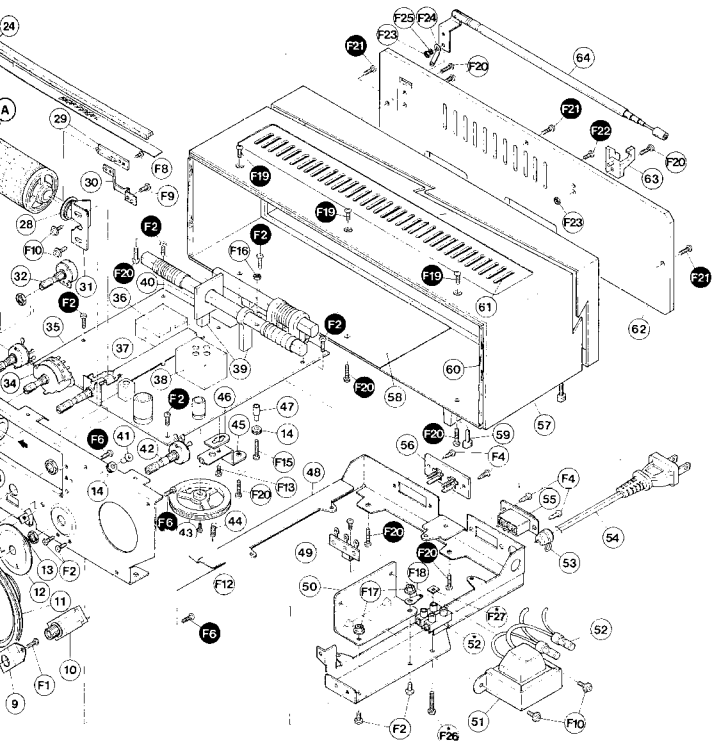
Remove 12 screws from the cabinet (57) [3 screws (F19) from the top of cabinet, 5 screws (F20) on the bottom of cabinet and 3 screws (F21), 1 screw (F22) on the back board].

Removal of

1. Remove k
2. Remove E
3. Remove t
4. Remove t
5. Remove O
6. Remove F

Caution: So

* For Austr




Removal of Main P.C.B.

1. Remove knobs (VOLUME, MODE, BFO, BAND, Tuning, FINE knob).
2. Remove 6 screws **F6** from Front Panel **(5)** [**F6** on the Front Chassis **(20)**].
3. Remove the shaft holder **(16)** by removing 2 screws **F4** on the Front Chassis.
4. Remove the MODE Rotary Switch **(34)**.
5. Remove Dial string from Pulley **76** **(43)**, Pulley **(14)**.
6. Remove P.C.B. **(35)** by removing 5 screws **F2** on the Main P.C.B.

Caution: Some wires are attached to Front Panel.

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