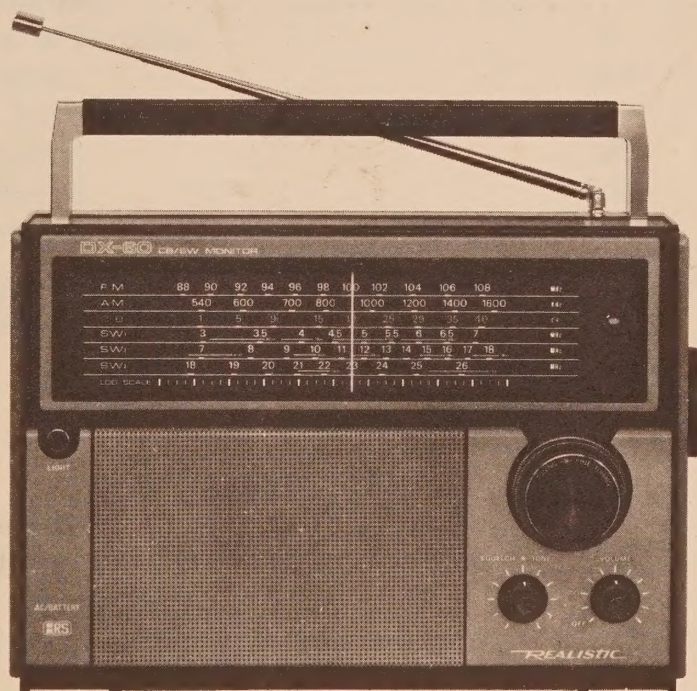


**REALISTIC<sup>®</sup>**

# Service Manual

12-764

## DX-60 CB/SW MONITOR 6-BAND PORTABLE RADIO Catalog Number: 12-764



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

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# SPECIFICATIONS

The supply voltage is  $6\text{ V} \pm 0.2\text{ V}$  DC, from a regulated power supply.

The power source must be isolated from other equipment connected to antenna or output.

The room temperature is 25 degrees C (77 degrees F).

## AM BAND

Speaker impedance: 4 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 and loop pointing toward rear of receiver.

Modulation: 400 Hz, 30 %

|                                                                  | UNIT                   | NOMINAL  | LIMIT    |
|------------------------------------------------------------------|------------------------|----------|----------|
| Frequency Coverage                                               | kHz                    | 510–1650 | 520–1620 |
| IF                                                               | kHz                    | 455      | $\pm 5$  |
| Antenna Sensitivity for S/N 6 dB at 600 kHz                      | $\mu\text{V}/\text{m}$ | 100      | 200      |
| at 1000 kHz                                                      | $\mu\text{V}/\text{m}$ | 100      | 200      |
| at 1400 kHz                                                      | $\mu\text{V}/\text{m}$ | 100      | 200      |
| Antenna Sensitivity for S/N 20 dB at 600 kHz                     | $\mu\text{V}/\text{m}$ | 280      | 500      |
| at 1000 kHz                                                      | $\mu\text{V}/\text{m}$ | 280      | 500      |
| at 1400 kHz                                                      | $\mu\text{V}/\text{m}$ | 280      | 500      |
| ACA at reference level at 1000 kHz                               | dB                     | 25       | 15       |
| AGC figure of merit                                              | dB                     | 45       | 36       |
| IF rejection at 600 kHz                                          | dB                     | 34       | 28       |
| Image rejection at 1400 kHz                                      | dB                     | 42       | 30       |
| Band-width at 6 dB down                                          | kHz                    | 6        | 4–8      |
| Output, at 10 % THD at 1000 kHz<br>5 mV/m, 1000 Hz, 30 % Mod.    | mW                     | 400      | 300      |
| Distortion at reference output<br>at 400 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 1–100 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 about 4 V DC, an over-voltage of 10 % shall not be harmful.

## FM BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

Signal generator impedance: 75 ohms

Disconnect telescopic antenna cable.

The signal voltage in this specification or test data is the voltage appearing across the tuner input terminals.

Modulation: 400 Hz, 22.5 kHz deviation

|                                                  | UNIT          | NOMINAL    | LIMIT  |
|--------------------------------------------------|---------------|------------|--------|
| Frequency Coverage                               | MHz           | 86.5–109.5 | 88–108 |
| IF                                               | MHz           | 10.7       | —      |
| Sensitivity for 50 mW output, 6 dB S/N at 90 MHz | $\mu\text{V}$ | 5          | 10     |
| at 98 MHz                                        | $\mu\text{V}$ | 5          | 10     |
| at 106 MHz                                       | $\mu\text{V}$ | 5          | 10     |



## SW1 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

The generator output shall terminate in an IRE loop with loop pointing toward rear of Receiver.

Modulation: 400 Hz, 30 %

|                                                             | UNIT | NOMINAL | LIMIT |
|-------------------------------------------------------------|------|---------|-------|
| Frequency Coverage                                          | MHz  | 2.8–7.5 | 3–7   |
| IF                                                          | kHz  | 455     | ±5    |
| Sensitivity for reference output power, S/N 6 dB at 3.3 MHz | μV/m | 100     | 150   |
| at 5 MHz                                                    | μV/m | 100     | 150   |
| at 6.7 MHz                                                  | μV/m | 100     | 150   |
| Sensitivity for 20 dB S/N at 3.3 MHz                        | μV/m | 200     | 400   |
| at 5 MHz                                                    | μV/m | 200     | 400   |
| at 6.7 MHz                                                  | μV/m | 200     | 400   |
| S/N ratio at 1 mV/m                                         | dB   | 34      | 26    |
| Image rejection at 6.7 MHz                                  | dB   | 15      | 10    |
| Dial Calibration at 3 MHz                                   | kHz  | —       | ±300  |
| at 7 MHz                                                    | kHz  | —       | ±300  |

The oscillator must operate at 3 MHz, with all supply voltages about 4 V DC, an over-voltage of 10 % shall not be harmful.

## SW2 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

Connect signal generator hot lead through 15 pF capacitor to antenna terminal.

Disconnect telescopic antenna cable.

|                                                           | UNIT | NOMINAL  | LIMIT |
|-----------------------------------------------------------|------|----------|-------|
| Frequency Coverage                                        | MHz  | 6.5–18.7 | 7–18  |
| IF                                                        | kHz  | 455      | ±5    |
| Sensitivity for reference output power, S/N 6 dB at 8 MHz | μV   | 10       | 20    |
| at 12 MHz                                                 | μV   | 10       | 20    |
| at 17 MHz                                                 | μV   | 10       | 20    |
| Sensitivity for 20 dB S/N at 8 MHz                        | μV   | 20       | 40    |
| at 12 MHz                                                 | μV   | 20       | 40    |
| at 17 MHz                                                 | μV   | 20       | 40    |
| S/N at 100 μV, at 12 MHz                                  | dB   | 34       | 28    |
| Image rejection at 17 MHz                                 | dB   | 10       | 4.5   |
| Dial Calibration at 8 MHz                                 | kHz  | —        | ±500  |
| at 17 MHz                                                 | kHz  | —        | ±500  |

The oscillator must operate at 8 MHz, with all supply voltages about 4 V DC, an over-voltage of 10% shall not be harmful.

## SW3 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

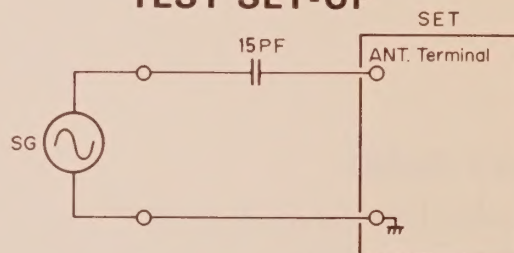
Modulation: 400 Hz, 30 %

|                                                            | UNIT | NOMINAL   | LIMIT |
|------------------------------------------------------------|------|-----------|-------|
| Frequency Coverage                                         | MHz  | 17.5–26.7 | 18–26 |
| IF                                                         | kHz  | 455       | ±5    |
| Sensitivity for reference output power, S/N 6 dB at 19 MHz | μV   | 7         | 20    |
| at 22 MHz                                                  | μV   | 7         | 20    |
| at 25 MHz                                                  | μV   | 7         | 20    |
| Sensitivity for 20 dB S/N at 19 MHz                        | μV   | 20        | 40    |
| at 22 MHz                                                  | μV   | 20        | 40    |
| at 25 MHz                                                  | μV   | 20        | 40    |
| S/N at 100 μV, at 22 MHz                                   | dB   | 34        | 28    |
| Image rejection at 25 MHz                                  | dB   | 5         | 2     |
| Dial Calibration at 18 MHz                                 | kHz  | —         | ±500  |
| at 26 MHz                                                  | kHz  | —         | ±500  |

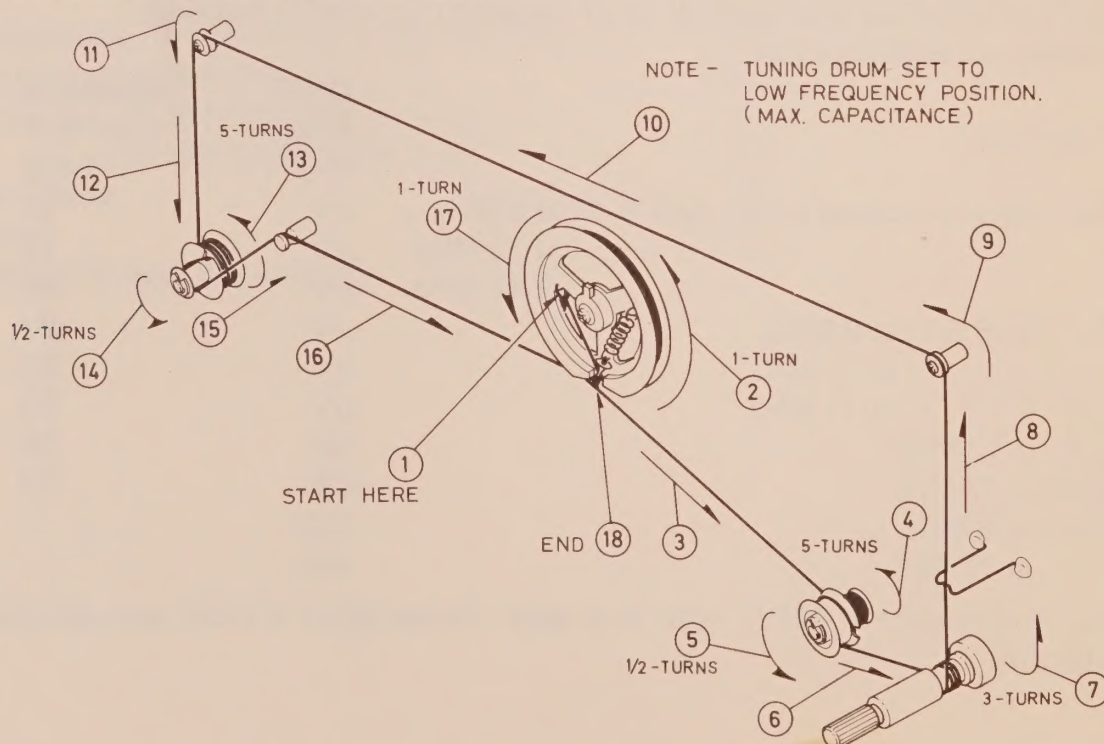
The oscillator must operate at 22 MHz, with all supply voltages about 4 V DC; an over-voltage of 10 % shall not be harmful.

**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.

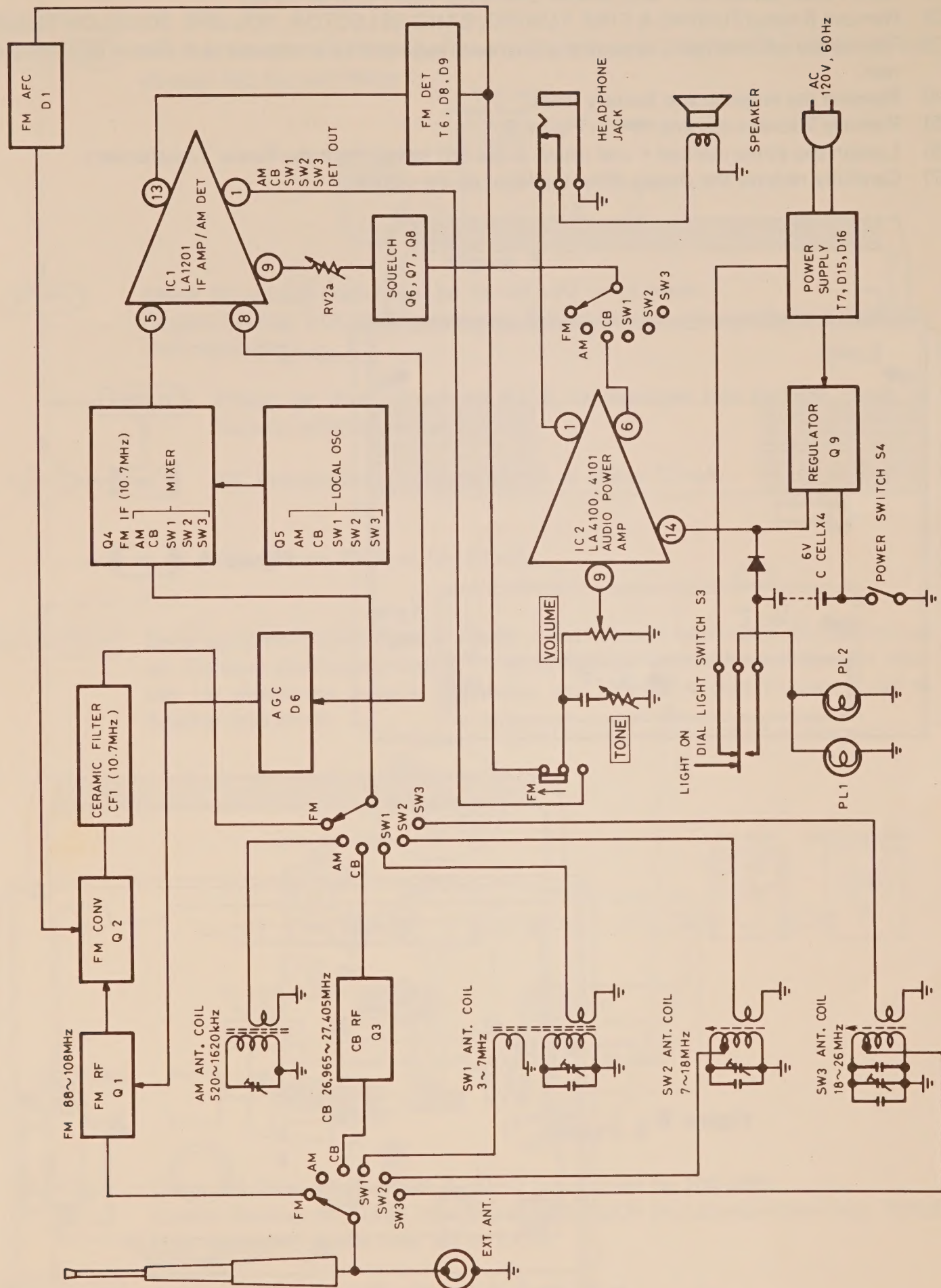
### TEST SET-UP



## DIAL STRINGING DIAGRAM



# BLOCK DIAGRAM



# DISASSEMBLY INSTRUCTIONS

## REMOVE CHASSIS AS FOLLOWS:

- (1) Turn Power Switch OFF and remove Line Cord from AC Wall Outlet.
- (2) Remove Knobs(TUNING & FINE TUNING, BAND SELECTOR, VOLUME, SQUELCH/TONE).
- (3) To remove cabinet back, remove the 5 screws (indicated by arrow marks in Figure A) from the rear.
- (4) Remove the antenna and Battery leads.
- (5) Remove 2 screws marked ➡ in Figure B.
- (6) Loosen the screw marked ★ and move to the left (away from the Power Transformer).
- (7) Carefully remove the chassis from the front of the cabinet.

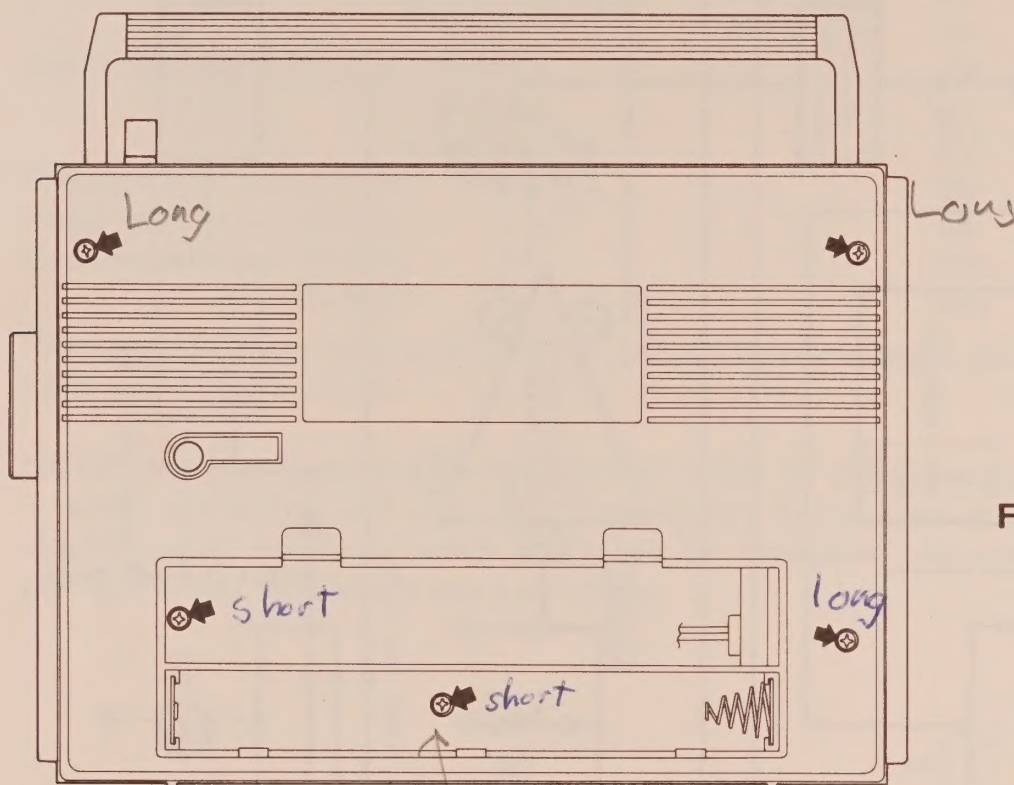


Figure A

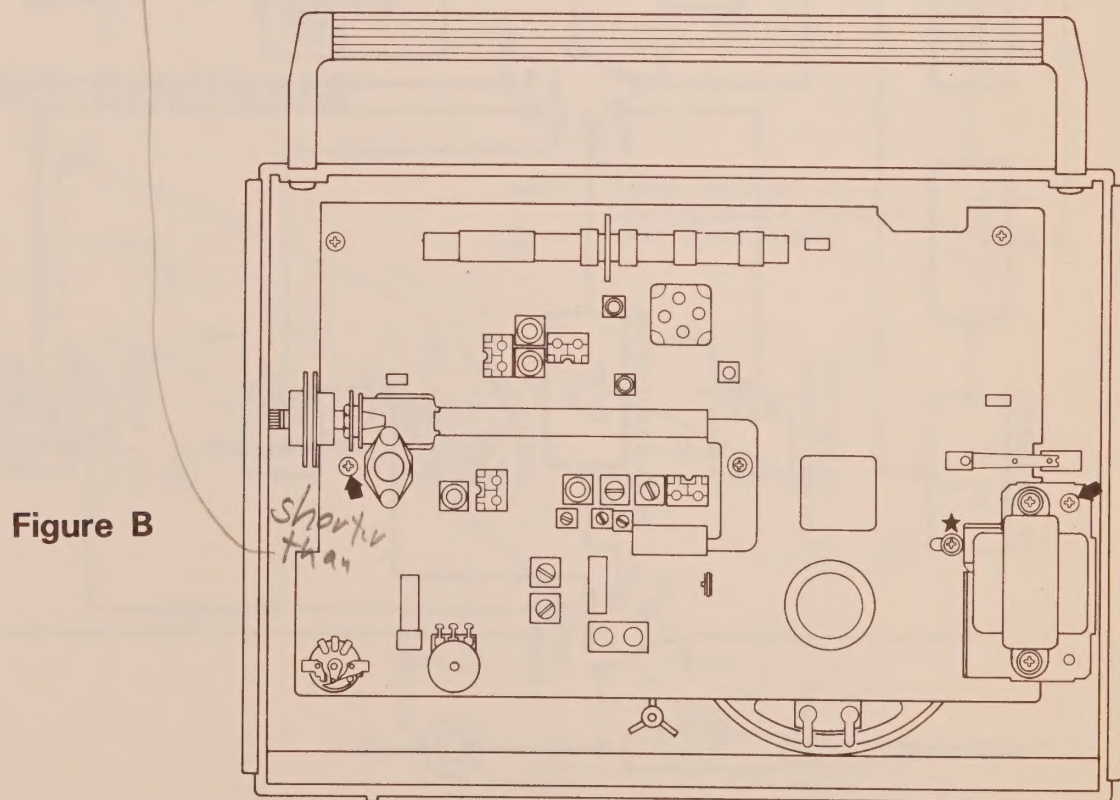
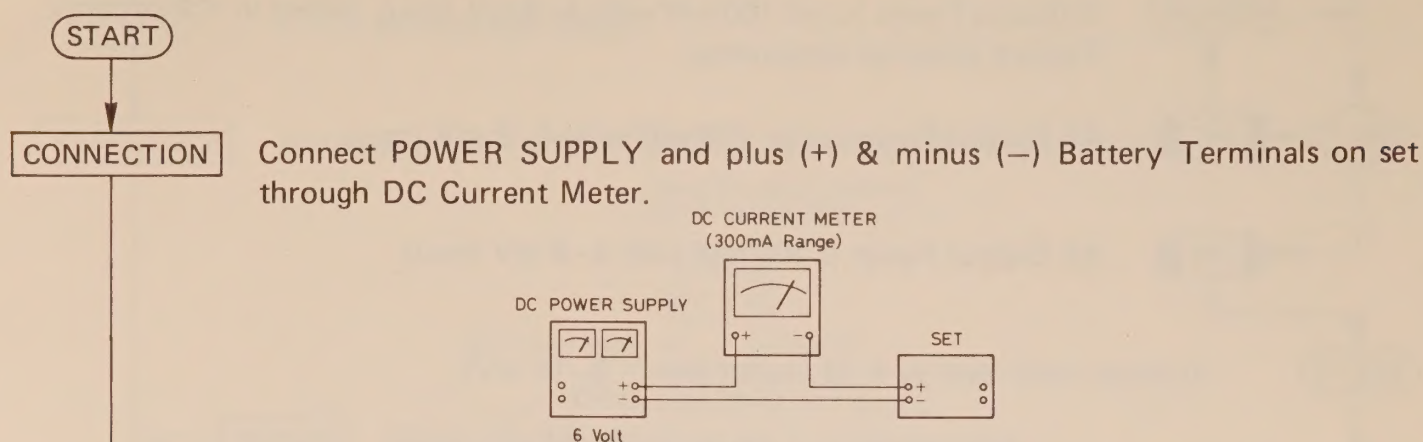
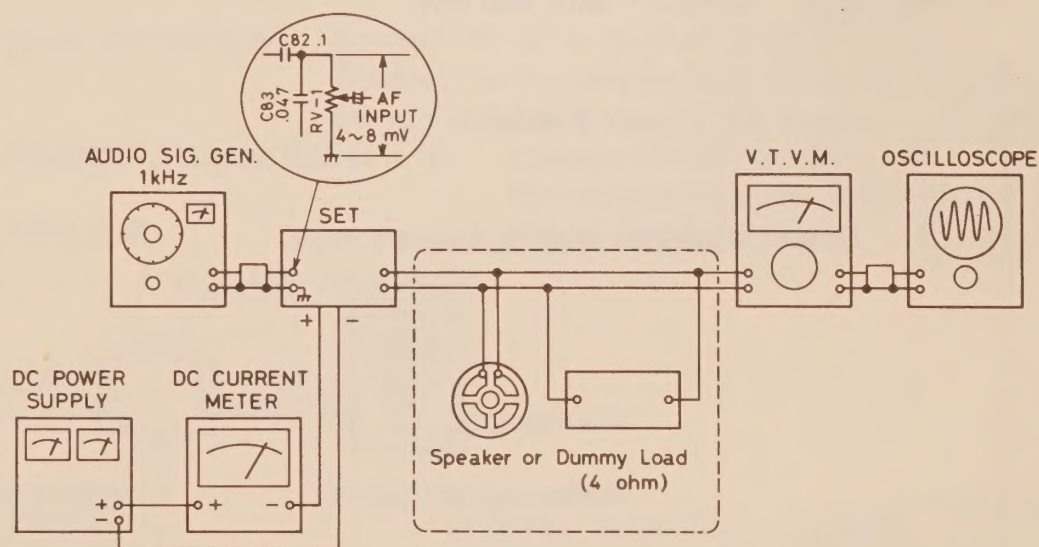
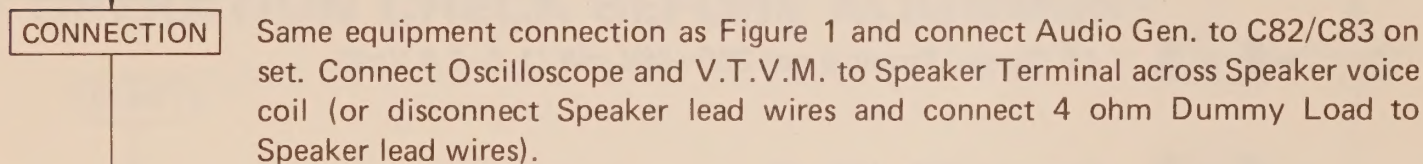
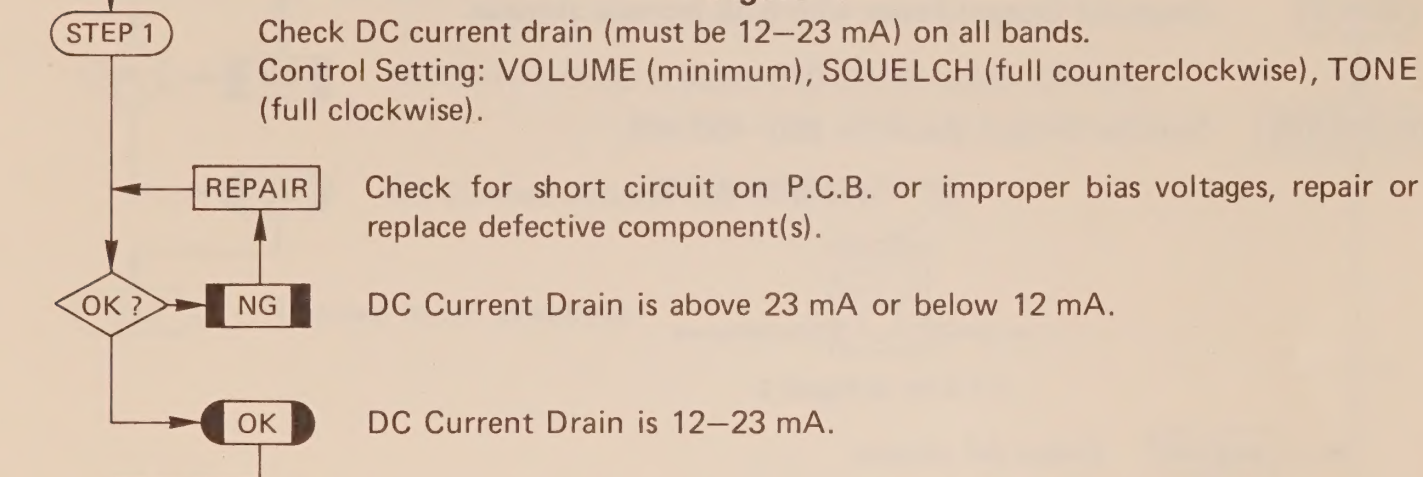


Figure B

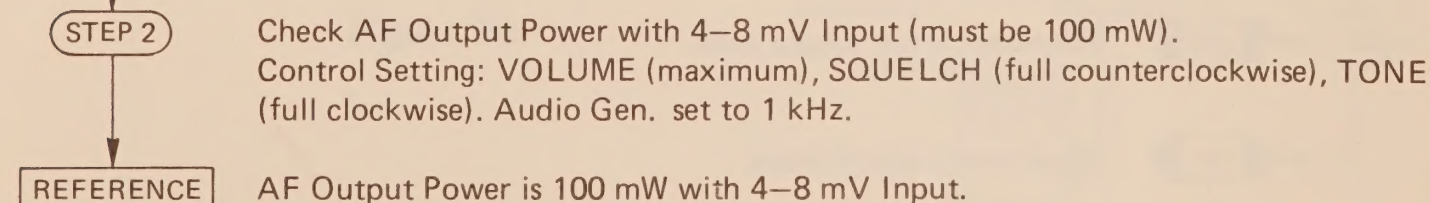
# AF OPERATION CHECK BEFORE ALIGNMENT

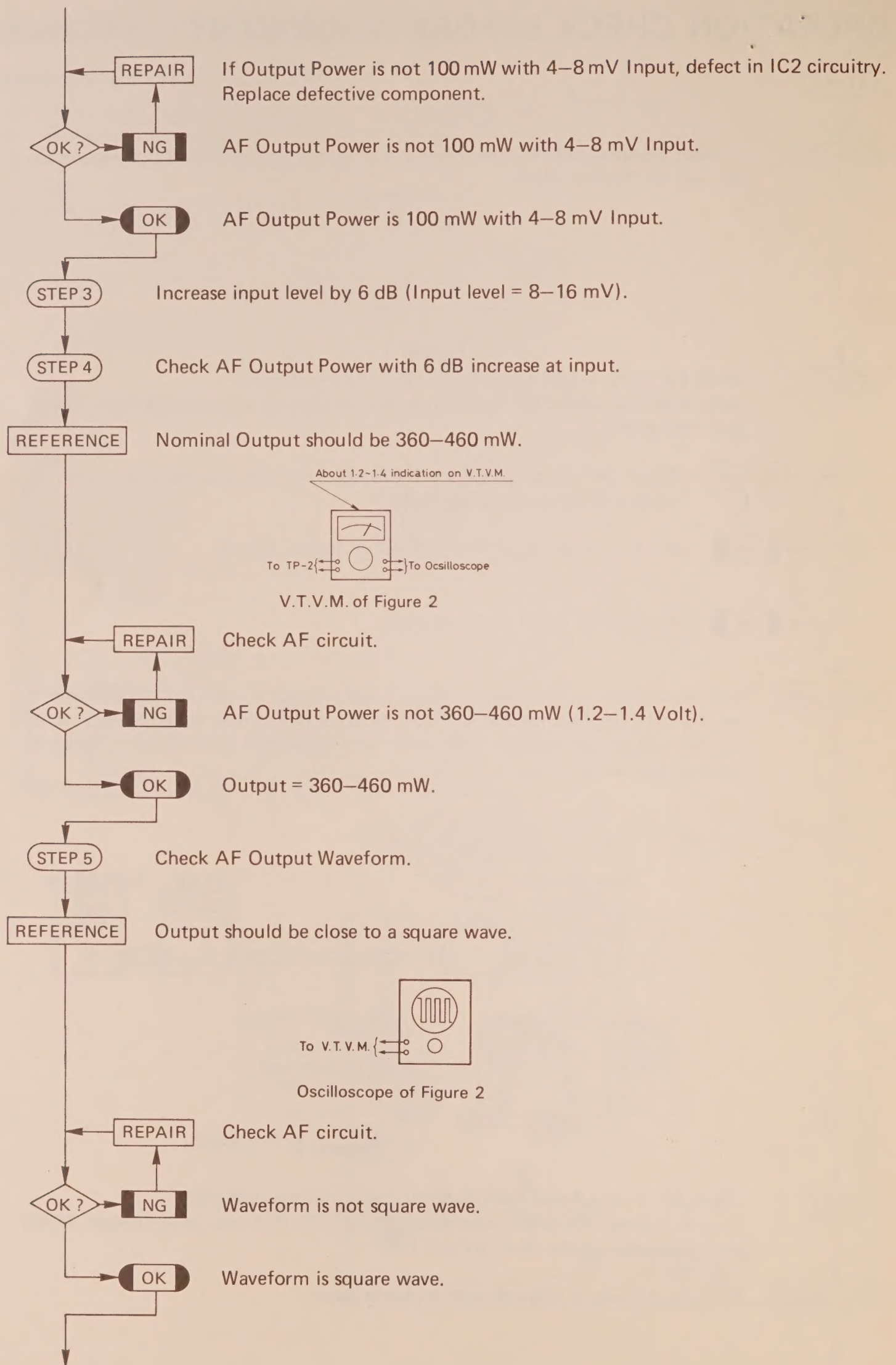


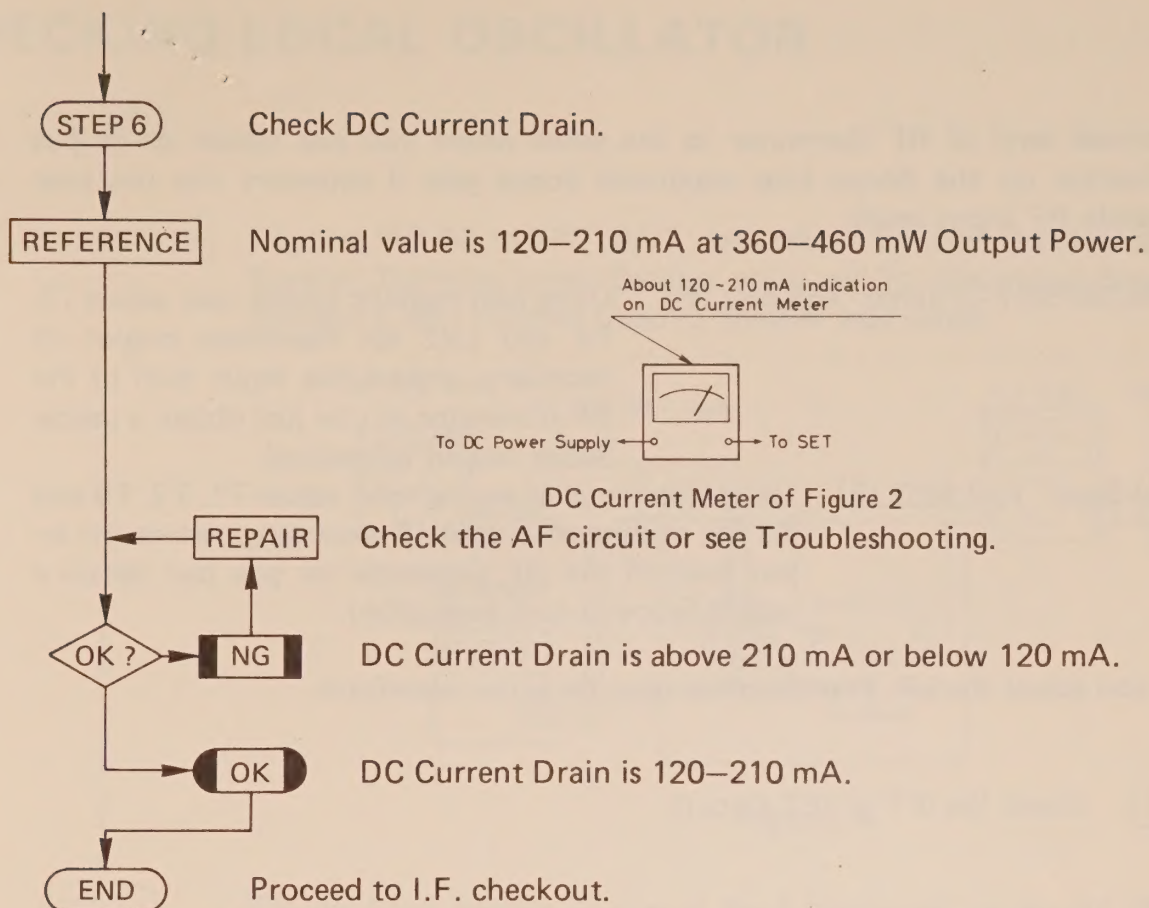
**Figure 1**



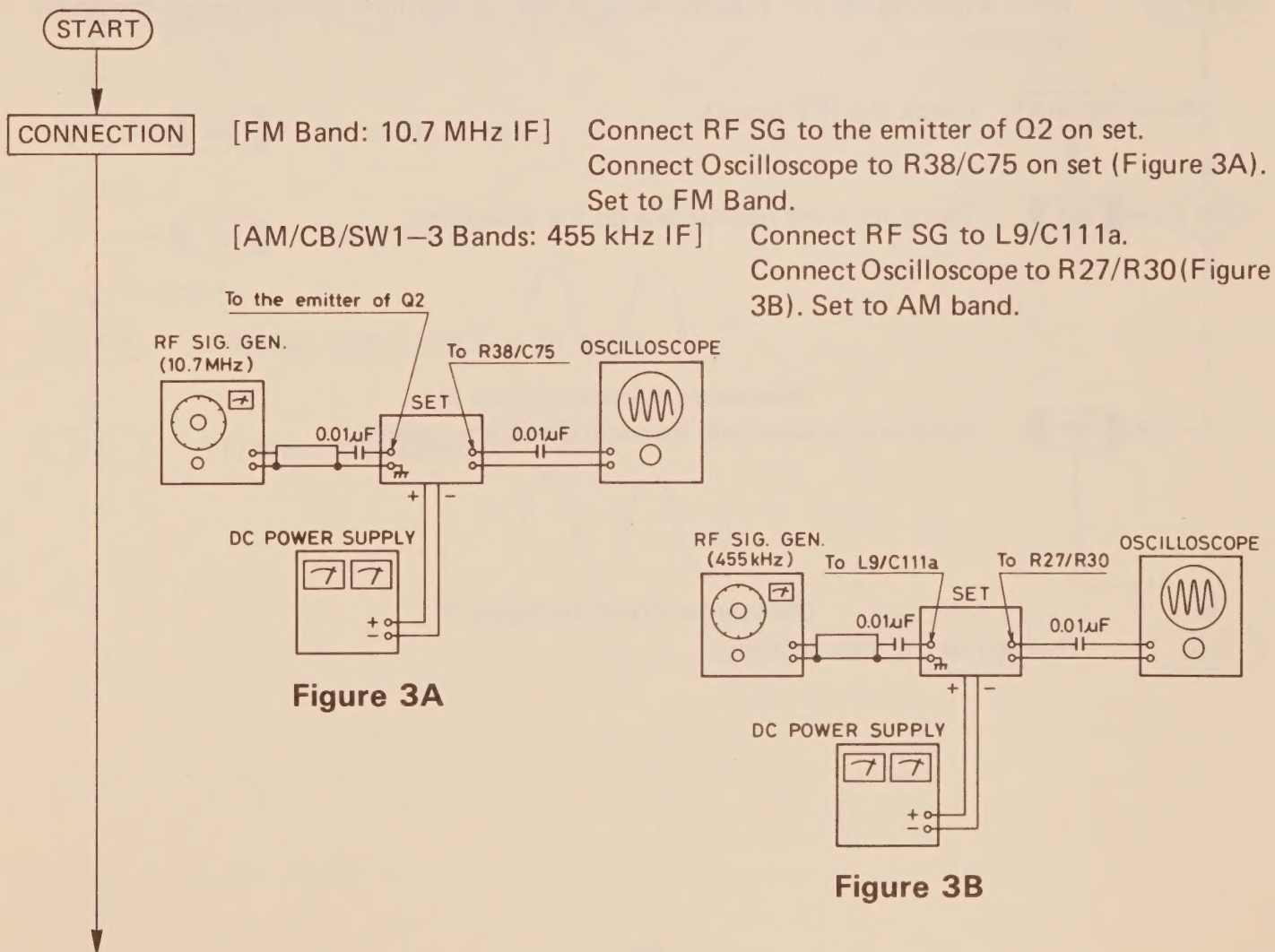
**Figure 2**

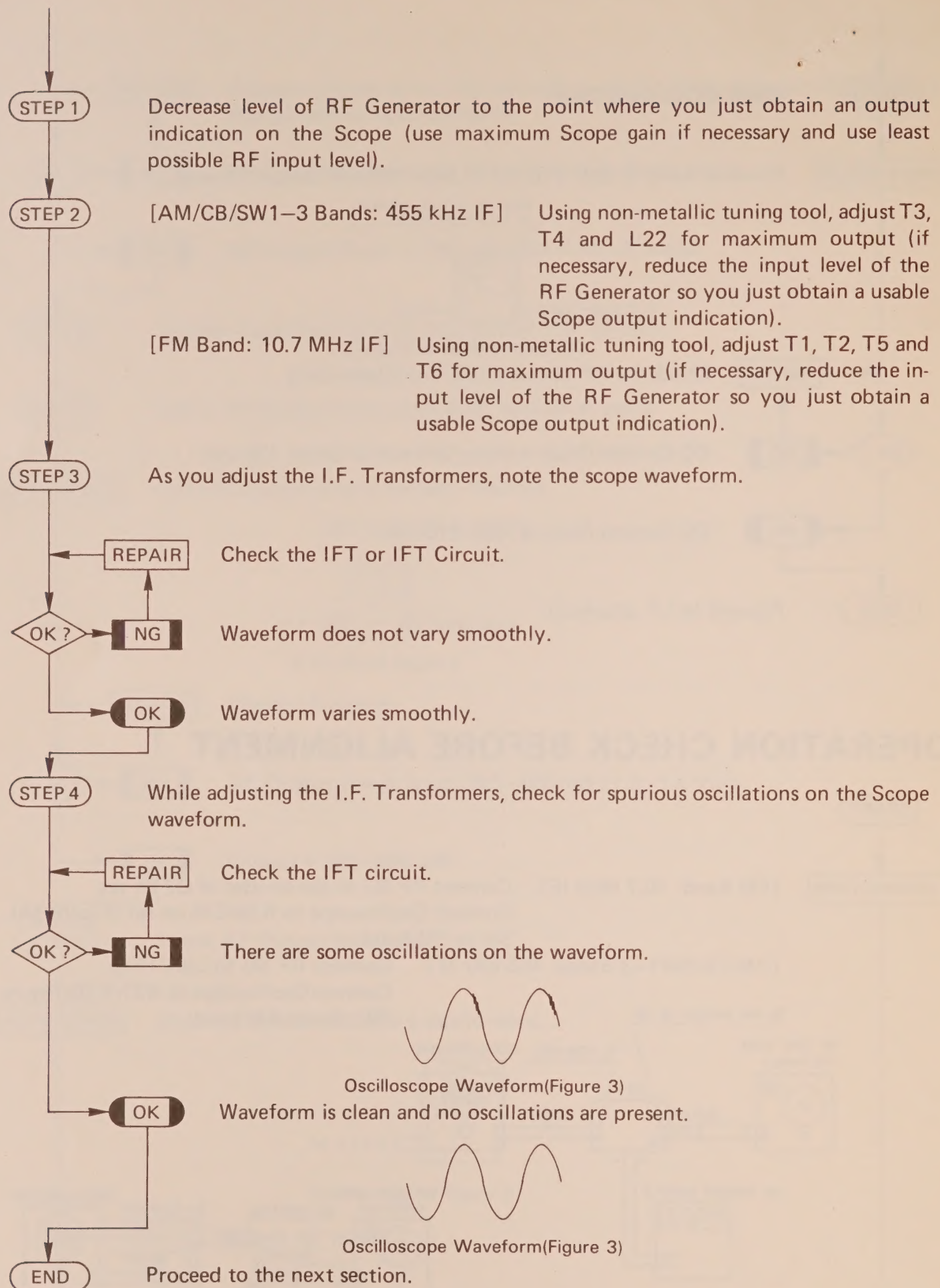




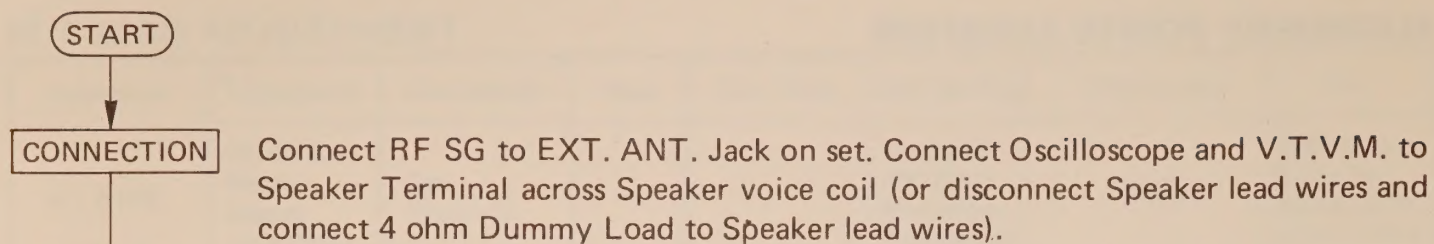


## IF OPERATION CHECK BEFORE ALIGNMENT

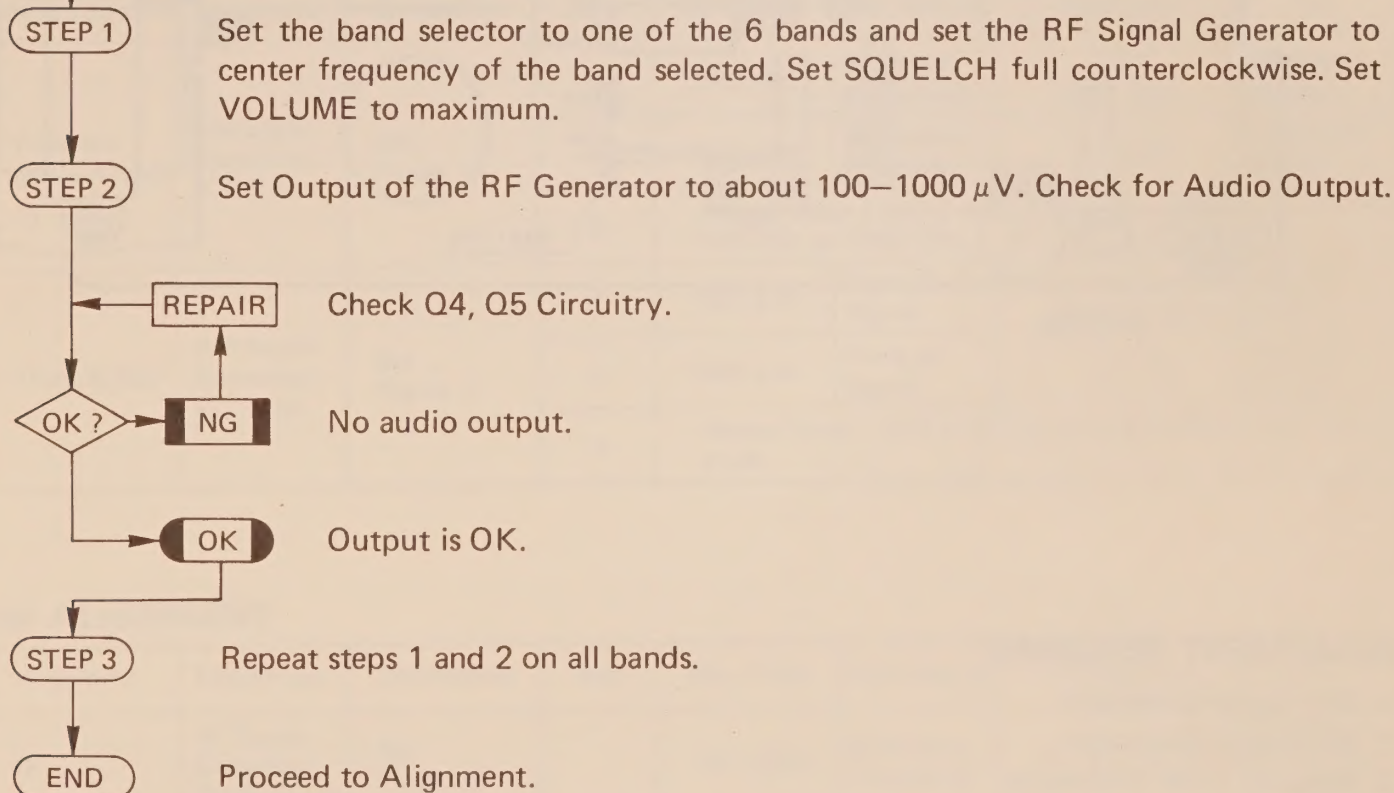




# CHECKING LOCAL OSCILLATOR

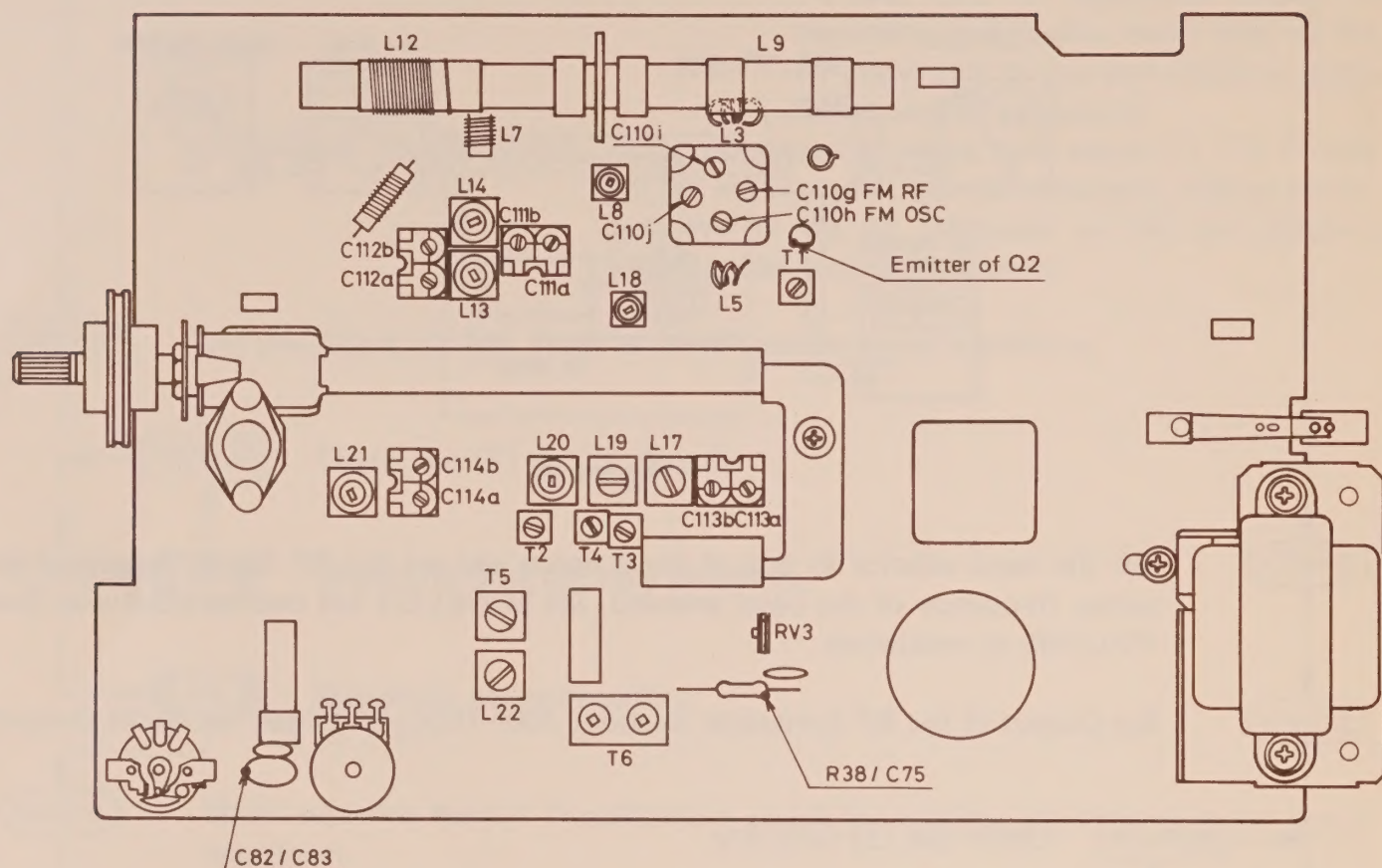


**Figure 4**



# ALIGNMENT INSTRUCTIONS

## ALIGNMENT POINTS LOCATION



## EQUIPMENT REQUIRED

1. AM Signal Generator
2. FM Signal Generator
3. Vacuum Tube Voltmeter
4. IF Sweep Generator
5. Oscilloscope
6. DC Voltmeter

## GENERAL PREPARATION

1. Check source voltage.
2. Set function switch to band being aligned.
3. FM/AM/CB/SW2 and SW3 telescopic antenna should be disconnected.
4. Signal input should be kept as low as possible to avoid AGC action.
5. Standard modulation is 400 Hz 30% for AM, CB, SW1, SW2, SW3.
6. Standard modulation is 400 Hz 22.5 kHz deviation for FM.
7. Connection of signal generator to be between chassis ground and EXT. ANT. JACK.

## IC 1 BIAS ADJUSTMENT

| Alignment | Equipment                                 | Connection    | Step | Gen. Freq. | Dial Setting                              | Adjustment | For                                         |
|-----------|-------------------------------------------|---------------|------|------------|-------------------------------------------|------------|---------------------------------------------|
| IC1 BIAS  | DC Volt Meter<br>(above 50 K $\Omega$ /V) | See Figure 5. |      |            | No signal<br>AM Band<br>Maximum Frequency | RV3        | Adjust for 0.5 V between terminals 4 and 6. |

## AM,CB,SW1,SW2,SW3 IF ALIGNMENT

| Alignment | Equipment                     | Connection    | Step | Gen. Freq. | Dial Setting      | Adjustment  | For            |
|-----------|-------------------------------|---------------|------|------------|-------------------|-------------|----------------|
| IF        | AM Signal Generator, V.T.V.M. | See Figure 6. |      | 455 kHz    | Maximum Frequency | T3, T4, L22 | Maximum Output |

## AM ALIGNMENT

| Alignment       | Equipment                     | Connection    | Step | Gen. Freq.                                                                      | Dial Setting      | Adjustment      | For            |
|-----------------|-------------------------------|---------------|------|---------------------------------------------------------------------------------|-------------------|-----------------|----------------|
| TUNING COVERAGE | AM Signal Generator, V.T.V.M. | See Figure 7. | 1    | 510 kHz                                                                         | Maximum Frequency | L17 OSC. Coil   | Maximum Output |
|                 |                               |               | 2    | 1650 kHz                                                                        | Maximum Frequency | C113a           | Maximum Output |
|                 |                               |               | 3    | Repeat steps 1 and 2 until tuning coverage is exactly from 510 kHz to 1650 kHz. |                   |                 |                |
| TRACKING        | AM Signal Generator, V.T.V.M. | See Figure 7. | 1    | 600 kHz                                                                         | Tune to Signal.   | L9 Antenna Coil | Maximum Output |
|                 |                               |               | 2    | 1400 kHz                                                                        | Tune to Signal.   | C111a           | Maximum Output |
|                 |                               |               | 3    | Repeat steps 1 and 2 until no further improvement can be made.                  |                   |                 |                |

## FM ALIGNMENT

| Alignment       | Equipment                        | Connection    | Step | Gen. Freq.                                                                    | Dial Setting      | Adjustment              | For                          |
|-----------------|----------------------------------|---------------|------|-------------------------------------------------------------------------------|-------------------|-------------------------|------------------------------|
| IF              | IF Sweep Generator, Oscilloscope | See Figure 8. |      | 10.7 MHz                                                                      | Maximum Frequency | T1, T2, T5, T6          | Symmetrical S-Curve on Scope |
| TUNING COVERAGE | FM Signal Generator, V.T.V.M.    | See Figure 9. | 1    | 88 MHz                                                                        | 88 MHz            | L5 (Stretch or Squeeze) | Maximum Output               |
|                 |                                  |               | 2    | 108 MHz                                                                       | 108 MHz           | C110h                   | Maximum Output               |
|                 |                                  |               | 3    | Repeat steps 1 and 2 until tuning coverage is exactly from 88 MHz to 108 MHz. |                   |                         |                              |
| TRACKING        | FM Signal Generator, V.T.V.M.    | See Figure 9. | 1    | 90 MHz                                                                        | Tune to Signal.   | L3 (Stretch or Squeeze) | Maximum Output               |
|                 |                                  |               | 2    | 106 MHz                                                                       | Tune to Signal.   | C110g                   | Maximum Output               |
|                 |                                  |               | 3    | Repeat steps 1 and 2 until no further improvement can be made.                |                   |                         |                              |

## CB RF ALIGNMENT

| Alignment          | Equipment                           | Connection        | Step | Gen. Freq.                                                                            | Dial Setting | Adjustment       | For               |
|--------------------|-------------------------------------|-------------------|------|---------------------------------------------------------------------------------------|--------------|------------------|-------------------|
| TUNING<br>COVERAGE | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 10. | 1    | 26.965 MHz                                                                            | Channel 1    | L18<br>OSC. Coil | Maximum<br>Output |
|                    |                                     |                   | 2    | 27.405 MHz                                                                            | Channel 40   | C110j            | Maximum<br>Output |
|                    |                                     |                   | 3    | Repeat steps 1 and 2 until tuning range covers exactly from 26.965 MHz to 27.405 MHz. |              |                  |                   |
| TRACKING           | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 10. | 1    | 26.965 MHz                                                                            | Channel 1    | L8               | Maximum<br>Output |
|                    |                                     |                   | 2    | 27.405 MHz                                                                            | Channel 40   | C110i            | Maximum<br>Output |
|                    |                                     |                   | 3    | Repeat steps 1 and 2 until no further improvement can be made.                        |              |                  |                   |
|                    |                                     |                   | 4    | 27.185 MHz                                                                            | Channel 19   | L7               | Maximum<br>Output |
|                    |                                     |                   | 5    | Repeat steps 1 thru 4 until no further improvement can be made.                       |              |                  |                   |

## SW1 ALIGNMENT

| Alignment       | Equipment                           | Connection        | Step | Gen. Freq.                                                                  | Dial Setting       | Adjustment          | For               |
|-----------------|-------------------------------------|-------------------|------|-----------------------------------------------------------------------------|--------------------|---------------------|-------------------|
| TUNING<br>RANGE | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 11. | 1    | 3 MHz                                                                       | 3 MHz              | L19<br>OSC. Coil    | Maximum<br>Output |
|                 |                                     |                   | 2    | 7 MHz                                                                       | 7 MHz              | C113b               | Maximum<br>Output |
|                 |                                     |                   | 3    | Repeat steps 1 and 2 until tuning range covers exactly from 3 MHz to 7 MHz. |                    |                     |                   |
| TRACKING        | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 11. | 1    | 3.3 MHz                                                                     | Tune to<br>Signal. | L12<br>Antenna Coil | Maximum<br>Output |
|                 |                                     |                   | 2    | 6.7 MHz                                                                     | Tune to<br>Signal. | C111b               | Maximum<br>Output |
|                 |                                     |                   | 3    | Repeat steps 1 and 2 until no further improvement can be made.              |                    |                     |                   |

## SW2 ALIGNMENT

| Alignment       | Equipment                           | Connection        | Step | Gen. Freq.                                                                   | Dial Setting       | Adjustment          | For               |
|-----------------|-------------------------------------|-------------------|------|------------------------------------------------------------------------------|--------------------|---------------------|-------------------|
| TUNING<br>RANGE | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 12. | 1    | 7 MHz                                                                        | 7 MHz              | L20<br>OSC. Coil    | Maximum<br>Output |
|                 |                                     |                   | 2    | 18 MHz                                                                       | 18 MHz             | C114a               | Maximum<br>Output |
|                 |                                     |                   | 3    | Repeat steps 1 and 2 until tuning range covers exactly from 7 MHz to 18 MHz. |                    |                     |                   |
| TRACKING        | AM Signal<br>Generator,<br>V.T.V.M. | See<br>Figure 12. | 1    | 8 MHz                                                                        | Tune to<br>Signal. | L13<br>Antenna Coil | Maximum<br>Output |
|                 |                                     |                   | 2    | 17 MHz                                                                       | Tune to<br>Signal. | C112a               | Maximum<br>Output |
|                 |                                     |                   | 3    | Repeat steps 1 and 2 until no further improvement can be made.               |                    |                     |                   |

## SW3 ALIGNMENT

| Alignment    | Equipment                     | Connection     | Step | Gen. Freq.                                                                    | Dial Setting    | Adjustment       | For            |
|--------------|-------------------------------|----------------|------|-------------------------------------------------------------------------------|-----------------|------------------|----------------|
| TUNING RANGE | AM Signal Generator, V.T.V.M. | See Figure 13. | 1    | 18 MHz                                                                        | 18 MHz          | L21 OSC. Coil    | Maximum Output |
|              |                               |                | 2    | 26 MHz                                                                        | 26 MHz          | C114b            | Maximum Output |
|              |                               |                | 3    | Repeat steps 1 and 2 until tuning range covers exactly from 18 MHz to 26 MHz. |                 |                  |                |
| TRACKING     | AM Signal Generator, V.T.V.M. | See Figure 13. | 1    | 19 MHz                                                                        | Tune to Signal. | L14 Antenna Coil | Maximum Output |
|              |                               |                | 2    | 25 MHz                                                                        | Tune to Signal. | C112b            | Maximum Output |
|              |                               |                | 3    | Repeat steps 1 and 2 until no further improvement can be made.                |                 |                  |                |

## EQUIPMENT CONNECTIONS

### INTEGRATED CIRCUIT BIAS

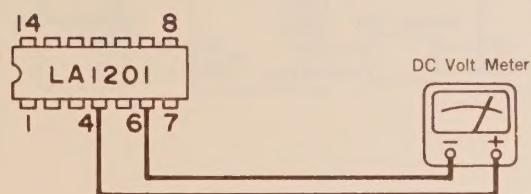


Figure 5

### AM, CB, SW1, SW2, SW3 IF

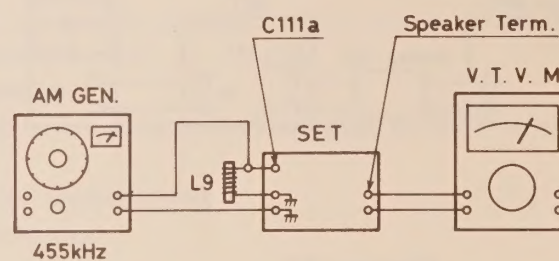


Figure 6

### AM BAND/TRACKING

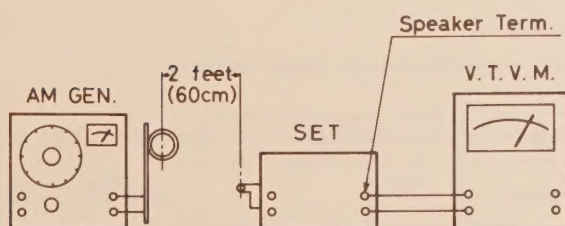


Figure 7

### FM IF

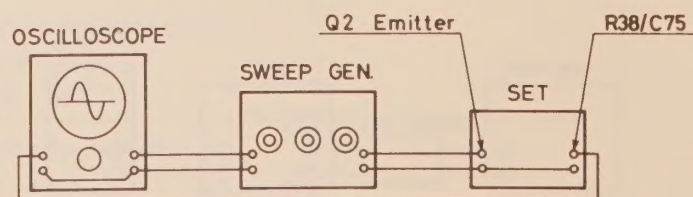


Figure 8

## FM BAND/TRACKING

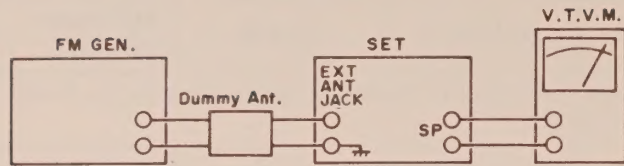


Figure 9

## CB BAND/TRACKING

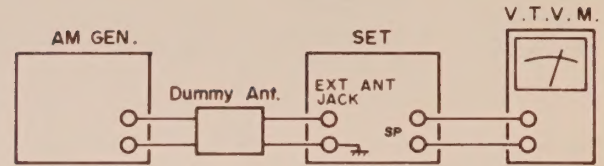


Figure 10

## SW1 BAND/TRACKING

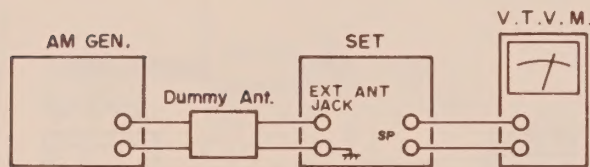


Figure 11

## SW2 BAND/TRACKING

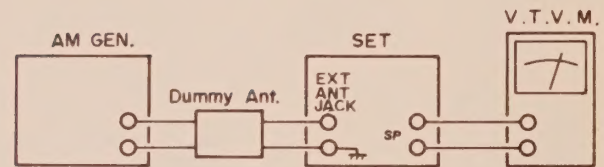


Figure 12

## SW3 BAND/TRACKING

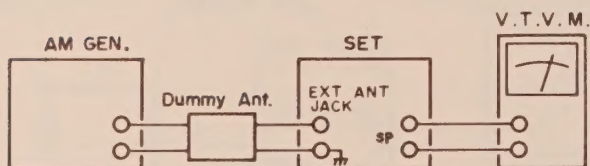


Figure 13

## SCHEMATIC OF DUMMY ANTENNA

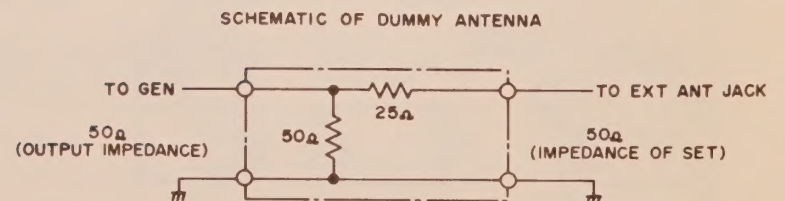


Figure 14

# TROUBLESHOOTING CHART

| SYMPTOM      | CAUSE AND REMEDY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) No output | <p>A) Faulty AC power cord:<br/>Replace the cord.</p> <p>B) Broken wire in the Battery Case:<br/>Repair or replace.</p> <p>C) Batter polarity is wrong:<br/>Correct batteries.</p> <p>D) Weak batteries:<br/>Replace.</p> <p>E) Rectifier defective:<br/>Replace.</p> <p>F) Defective Q9 or D14 circuitry:<br/>Replace defective component.</p> <p>G) HEADPHONE JACK is defective:<br/>Repair or replace.</p> <p>H) Speaker voice coil is broken:<br/>Replace.</p> <p>I) Open power transformer:<br/>Replace the transformer.</p> <p>J) Defect in the power switch:<br/>Replace the switch.</p> <p>K) Defective IC:<br/>Replace defective IC.</p> <p>L) Defect in the power switch S4:<br/>Repair or replace it.</p> <p>M) Defect in VOLUME (RV1):<br/>Replace.</p> |
| 2) No AM     | <p>A) Poor contact in selector switch:<br/>Repair or replace switch.</p> <p>B) Transistor diode, IFT, IC, resistor, coil or capacitor in AM IF circuit defective:<br/>Replace the defective component(s).</p> <p>C) Bar Antenna coil defective:<br/>Repair or replace.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3) No FM     | <p>A) Poor contact in selector switch:<br/>Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in FM IF circuit defective:<br/>Replace the defective component(s).</p> <p>C) Poor contact in ANT lead:<br/>Repair as required.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4) No CB     | <p>A) Poor contact in selector switch:<br/>Repair or replace the switch.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in CB IF defective:<br/>Replace the defective component(s).</p> <p>C) Poor contact in ANT. lead:<br/>Repair as required.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5) No SW1    | <p>A) Poor contact in selector switch:<br/>Repair or replace switch.</p> <p>B) Transistor, diode, IFT, IC, resistor, coil or capacitor in SW IF circuit defective:<br/>Replace the defective component(s).</p> <p>C) Defective Antenna coil L12:<br/>Replace it.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| SYMPTOM                                           | CAUSE AND REMEDY                                                                                                                                                                                                                                      |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6) No SW2                                         | A) Poor contact in selector switch:<br>Repair or replace switch.<br>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in SW-IF circuit defective:<br>Replace the defective component(s).<br>C) Antenna coil defective:<br>Repair or replace. |
| 7) No SW3                                         | A) Poor contact in selector switch:<br>Repair or replace switch.<br>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in SW IF circuit defective:<br>Replace the defective component(s).<br>C) Defective Antenna coil L14:<br>Replace it.    |
| 8) No effect at full length of rod Antenna on FM. | A) Poor contact of band selector switch and rod Antenna:<br>Repair or replace.<br>B) Broken wire between band selector switch and rod antenna:<br>Repair or replace.                                                                                  |
| 9) No effect when connecting EXT ANT.             | A) Poor contact on jack for EXT ANT or defective jack:<br>Repair or replace.                                                                                                                                                                          |
| 10) HEADPHONE jack does not function.             | A) Poor contact on HEADPHONE jack or defective jack:<br>Repair or replace.                                                                                                                                                                            |
| 11) TONE does not work.                           | A) Control RV2b defective:<br>Replace.<br>B) Defective C83:<br>Replace.                                                                                                                                                                               |
| 12) No SQUELCH                                    | A) Defective Q7, Q8 or RV2a circuitry:<br>Replace defective component(s).                                                                                                                                                                             |
| 13) Distortion                                    | A) Power voltage is lower than required:<br>Replace batteries.                                                                                                                                                                                        |

## VALUE SELECTED PARTS

The values of some parts are selected at the factory for optimum operation. If the circuitry does not operate properly, you can change these values.

### A. Capacitors

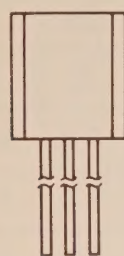
C7/C15/C37 : These are to complement Trimmer Capacitors. Try different values within the range shown in Parts List when you can't get optimum results by adjusting Trimmer Capacitors.

### B. Resistors

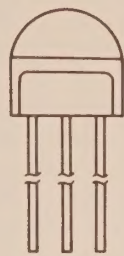
R5/R9/R13 : These are to control Sensitivity. The larger the value, the less the sensitivity.

R58/R59 : These are to control local oscillator of SW2/SW3. Use larger value to prevent excess sensitivity on SW2/SW3 (R58 for SW2, R59 for SW3). Change values only with great care; check for proper operation of local oscillator at low voltages.

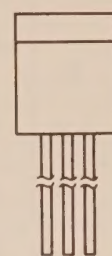
# IC & TRANSISTOR LEAD IDENTIFICATION



ECB



ECB



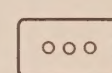
ECB



2SC536, 2SC1317

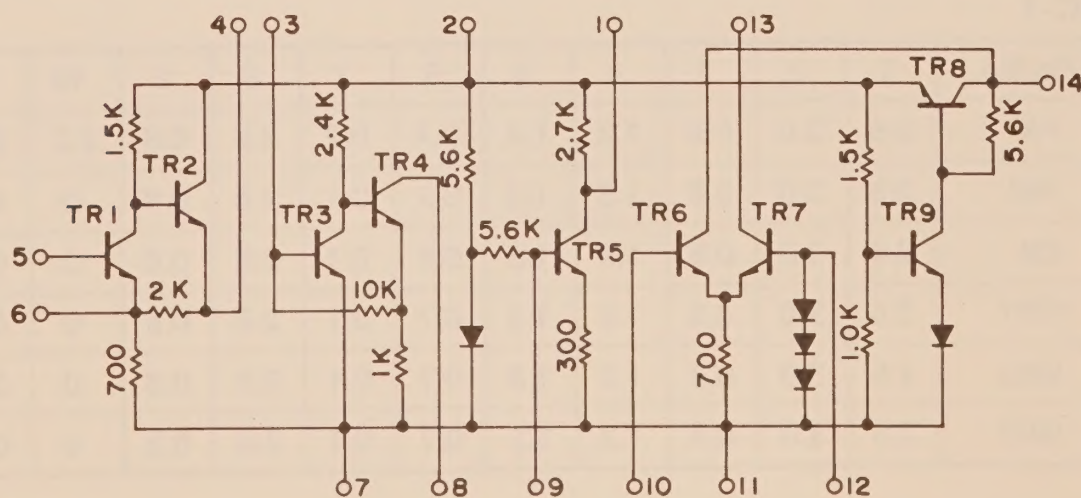
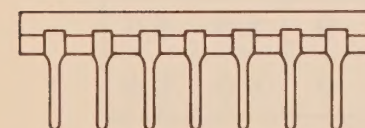
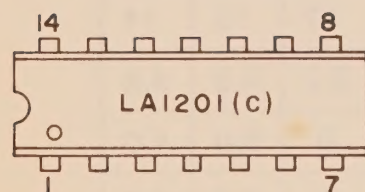
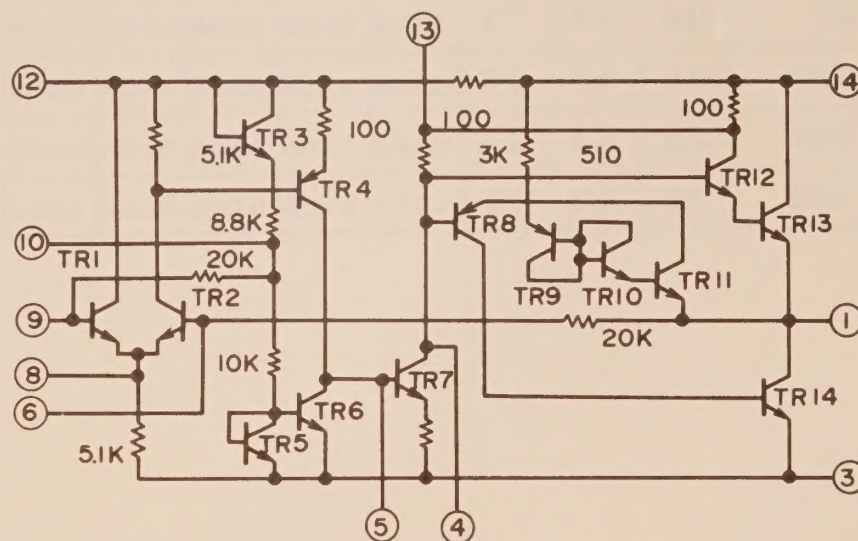
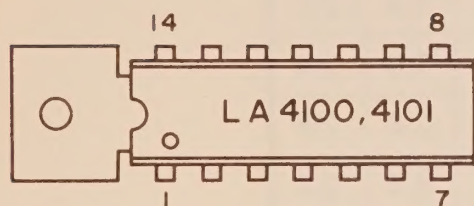


2SC668, 2SC929  
2SC930



2SC509

## IC, INTERNAL CONNECTION



# IC & TRANSISTOR VOLTAGE CHART

## TRANSISTOR VOLTAGE CHART

| Transistor<br>Number | Q1  |     |     | Q2      |         |         | Q3      |         |         | Q4  |     |     | Q5  |     |     |
|----------------------|-----|-----|-----|---------|---------|---------|---------|---------|---------|-----|-----|-----|-----|-----|-----|
|                      | E   | C   | B   | E       | C       | B       | E       | C       | B       | E   | C   | B   | E   | C   | B   |
| FM                   | 0.3 | 4.7 | 1.0 | 1.1     | 4.8     | 1.8     | 2.6     | 4.8     | 1.0     | 0.5 | 4.8 | 1.1 | 0.2 | 0.2 | 0.8 |
| AM                   | 4.5 | 5.0 | 1.3 | 4.5     | 5.0     | 4.8     | 2.6     | 5.0     | 0.9     | 0.5 | 5.0 | 1.1 | 1.8 | 4.8 | 2.4 |
| CB                   | 4.5 | 5.0 | 1.3 | 4.5     | 5.0     | 4.8     | 0.2     | 4.9     | 0.9     | 0.5 | 4.9 | 1.1 | 1.7 | 4.9 | 2.4 |
| SW1                  | 4.5 | 5.0 | 1.3 | 4.5     | 5.0     | 4.8     | 2.5     | 5.0     | 1.0     | 0.5 | 5.0 | 1.1 | 1.7 | 4.5 | 2.4 |
| SW2                  | 4.5 | 5.0 | 1.3 | 4.5     | 5.0     | 4.8     | 2.5     | 5.0     | 1.0     | 0.5 | 5.0 | 1.1 | 1.8 | 4.9 | 2.4 |
| SW3                  | 4.5 | 5.0 | 1.3 | 4.5     | 5.0     | 4.8     | 2.5     | 5.0     | 1.0     | 0.5 | 5.0 | 1.1 | 1.3 | 5.0 | 2.0 |
| Transistor<br>Number | Q6  |     |     | *Q7     |         |         | *Q8     |         |         | Q9  |     |     |     |     |     |
|                      | E   | C   | B   | E       | C       | B       | E       | C       | B       | E   | C   | B   |     |     |     |
| FM                   | 2.6 | 4.8 | 3.0 | 0.1/0.2 | 0.1/0.8 | 0.7/0.6 | 0.1/0.2 | 4.8/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |
| AM                   | 2.6 | 5.0 | 3.0 | 0.1/0.2 | 0.1/0.8 | 0.7/0.6 | 0.1/0.2 | 5.0/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |
| CB                   | 0.4 | 3.4 | 1.1 | 0.1/0.2 | 0.1/0.8 | 0.7/0.8 | 0.1/0.2 | 4.0/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |
| SW1                  | 2.5 | 5.0 | 3.0 | 0.1/0.2 | 0.1/0.8 | 0.7/0.6 | 0.1/0.2 | 5.0/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |
| SW2                  | 2.5 | 5.0 | 3.0 | 0.1/0.2 | 0.1/0.8 | 0.7/0.6 | 0.1/0.2 | 5.0/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |
| SW3                  | 2.5 | 5.0 | 3.0 | 0.1/0.2 | 0.1/0.8 | 0.7/0.6 | 0.1/0.2 | 5.0/0.2 | 0.1/0.8 | 5.3 | 2.4 | 2.4 |     |     |     |

## IC VOLTAGE CHART

### IC-1

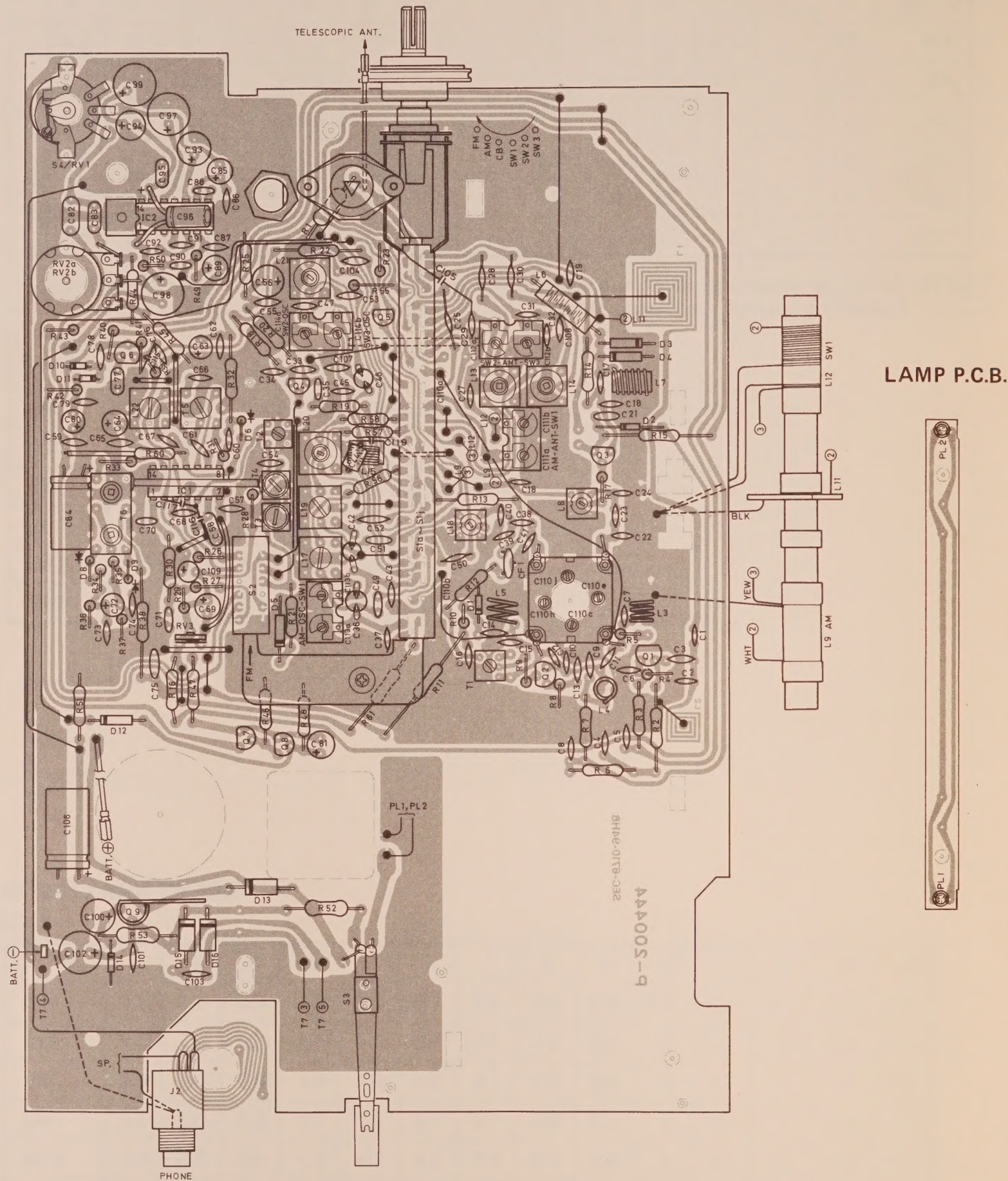
| Pin No. | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| FM      | 2.5 | 3.0 | 0.8 | 1.3 | 1.4 | 0.7 | 0.2 | 2.8 | 0.8 | 2.2 | 0.2 | 2.2 | 4.3 | 4.8 |
| AM      | 2.5 | 3.0 | 0.8 | 1.3 | 1.3 | 0.7 | 0.1 | 2.8 | 0.8 | 0   | 0.1 | 0   | 5.0 | 5.0 |
| CB      | 2.4 | 3.0 | 0.8 | 1.6 | 1.3 | 0.6 | 0.1 | 2.8 | 0.8 | 0   | 0.1 | 0   | 5.0 | 5.0 |
| SW1     | 2.5 | 3.0 | 0.8 | 1.2 | 1.3 | 0.7 | 0.1 | 2.8 | 0.8 | 0   | 0.1 | 0   | 5.0 | 5.0 |
| SW2     | 2.5 | 3.0 | 0.8 | 1.2 | 1.3 | 0.7 | 0.1 | 2.8 | 0.8 | 0   | 0.1 | 0   | 5.0 | 5.0 |
| SW3     | 2.5 | 3.0 | 0.8 | 1.2 | 1.3 | 0.7 | 0.1 | 2.8 | 0.8 | 0   | 0.1 | 0   | 5.0 | 5.0 |

**IC-2**

| Pin No. | 1   | 2 | 3   | 4   | 5   | 6   | 7 | 8   | 9   | 10  | 11 | 12  | 13  | 14  |
|---------|-----|---|-----|-----|-----|-----|---|-----|-----|-----|----|-----|-----|-----|
| FM      | 2.6 | — | 2.0 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |
| AM      | 2.7 | — | 1.7 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |
| CB      | 2.7 | — | 1.7 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |
| SW1     | 2.7 | — | 1.7 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |
| SW2     | 2.7 | — | 1.7 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |
| SW3     | 2.7 | — | 1.7 | 3.9 | 0.8 | 2.6 | — | 1.9 | 2.6 | 2.7 | —  | 5.2 | 5.2 | 5.3 |

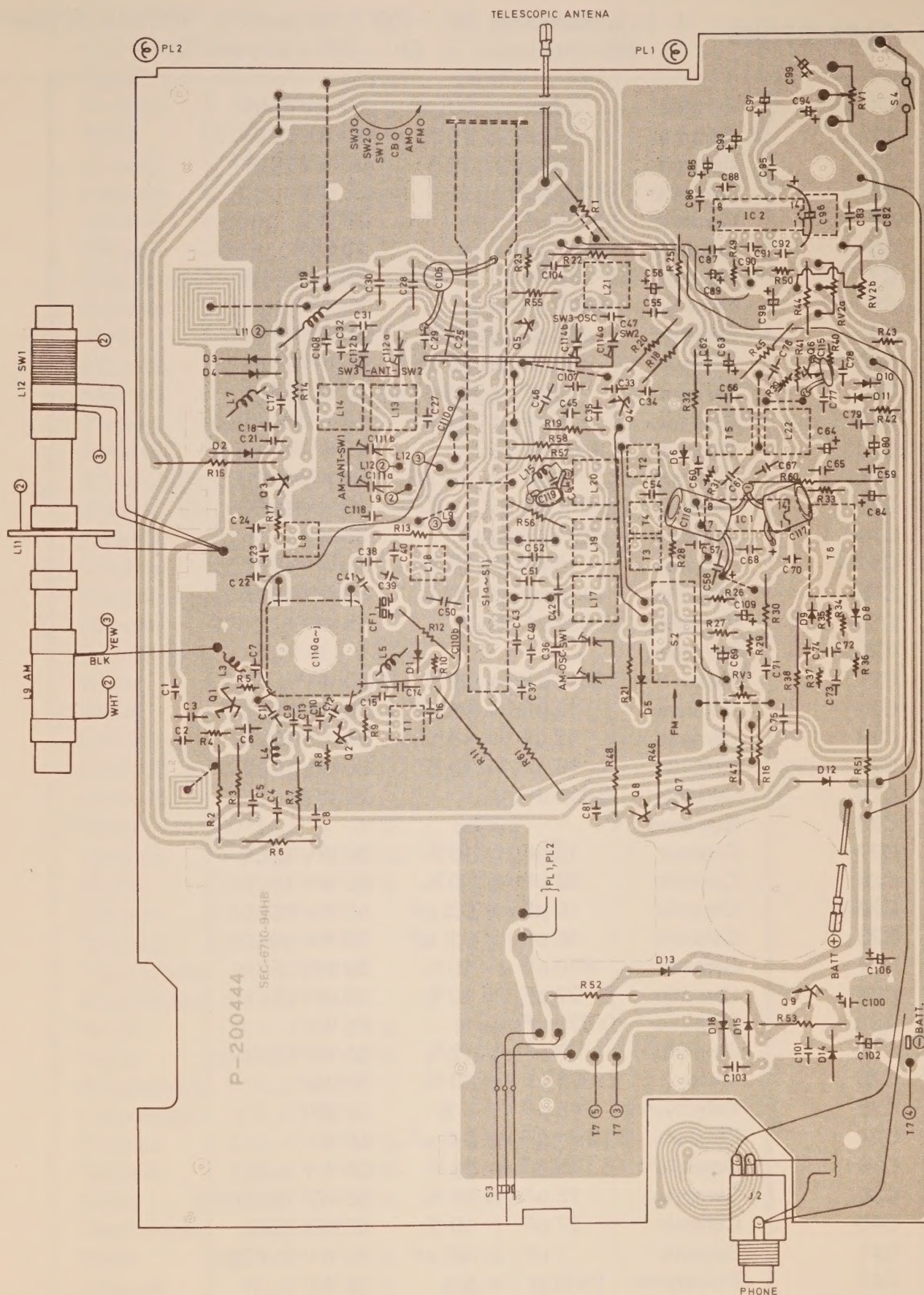
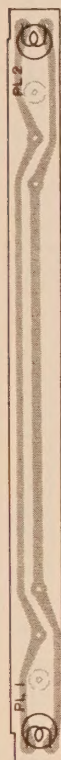
**NOTE:** All voltage values are indicated in volts with no signal, measured with V.T.V.M. (\*Squelch on/  
Squelch off, using E1 as ground point).

PRINTED CIRCUIT BOARD (TOP VIEW)



# PRINTED CIRCUIT BOARD (BOTTOM VIEW)

LAMP P.C.B.



# ELECTRICAL PARTS LIST

| REF. NO.                                                                                                                                                                                                            | DESCRIPTION                                 | RS<br>PART NO. | MFR'S<br>PART NO. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|-------------------|
| <b>CAPACITORS</b> ( ) : typical value, UJ: $-750 \pm 120$ ppm/ $^{\circ}\text{C}$ , NPO: $0 \pm 60$ ppm/ $^{\circ}\text{C}$ ,<br>SL: $350-1000$ ppm/ $^{\circ}\text{C}$ , SH: $-330 \pm 60$ ppm/ $^{\circ}\text{C}$ |                                             |                |                   |
| C1                                                                                                                                                                                                                  | Ceramic 7 pF $\pm 0.5$ pF 50 WV (SL)        |                |                   |
| C2                                                                                                                                                                                                                  | Ceramic 27 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C3                                                                                                                                                                                                                  | Ceramic 12 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C4                                                                                                                                                                                                                  | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C5                                                                                                                                                                                                                  | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C6                                                                                                                                                                                                                  | Ceramic $0.01 \mu\text{F}$ 25 WV            |                |                   |
| C7                                                                                                                                                                                                                  | Ceramic 20-27(24) pF $\pm 10$ % 50 WV (SL)  |                |                   |
| C8                                                                                                                                                                                                                  | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C9                                                                                                                                                                                                                  | Ceramic 470 pF $\pm 10$ % 50 WV (SL)        |                |                   |
| C10                                                                                                                                                                                                                 | Ceramic 39 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C11                                                                                                                                                                                                                 | Ceramic 4 pF $\pm 0.5$ pF 50 WV (SL)        |                |                   |
| C12                                                                                                                                                                                                                 | Ceramic 5 pF $\pm 0.5$ pF 50 WV (NPO)       |                |                   |
| C13                                                                                                                                                                                                                 | Ceramic $0.01 \mu\text{F}$ 25 WV            |                |                   |
| C14                                                                                                                                                                                                                 | Ceramic 5 pF $\pm 0.5$ pF 50 WV (NPO)       |                |                   |
| C15                                                                                                                                                                                                                 | Ceramic 12-24(18) pF $\pm 10$ % 50 WV (NPO) |                |                   |
| C16                                                                                                                                                                                                                 | Ceramic $0.01 \mu\text{F}$ 25 WV            |                |                   |
| C17                                                                                                                                                                                                                 | Ceramic 75 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C18                                                                                                                                                                                                                 | Ceramic 150 pF $\pm 10$ % 50 WV (SL)        |                |                   |
| C19                                                                                                                                                                                                                 | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C20                                                                                                                                                                                                                 | Not used                                    |                |                   |
| C21                                                                                                                                                                                                                 | Mylar $0.0047 \mu\text{F} \pm 20$ % 50 WV   |                |                   |
| C22                                                                                                                                                                                                                 | Ceramic 5 pF $\pm 0.5$ pF 50 WV (SL)        |                |                   |
| C23                                                                                                                                                                                                                 | Ceramic 15 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C24                                                                                                                                                                                                                 | Ceramic 56 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C25                                                                                                                                                                                                                 | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C26                                                                                                                                                                                                                 | Not used                                    |                |                   |
| C27                                                                                                                                                                                                                 | Ceramic 15 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C28                                                                                                                                                                                                                 | Ceramic 56 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C29                                                                                                                                                                                                                 | Ceramic 10 pF $\pm 0.5$ pF 50 WV (SL)       |                |                   |
| C30                                                                                                                                                                                                                 | Ceramic 56 pF $\pm 0.5$ pF 50 WV (SL)       |                |                   |
| C31                                                                                                                                                                                                                 | Ceramic 470 pF $\pm 10$ % 50 WV (SL)        |                |                   |
| C32                                                                                                                                                                                                                 | Ceramic 27 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C33                                                                                                                                                                                                                 | Ceramic $0.022 \mu\text{F}$ 25 WV           |                |                   |
| C34                                                                                                                                                                                                                 | Ceramic 33 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C35                                                                                                                                                                                                                 | Mylar $0.022 \mu\text{F} \pm 20$ % 50 WV    |                |                   |
| C36                                                                                                                                                                                                                 | Polystyrene 240 pF $\pm 5$ % 35 WV          |                |                   |
| C37                                                                                                                                                                                                                 | Ceramic 0-5(0) pF $\pm 0.5$ pF 50 WV        |                |                   |
| C38                                                                                                                                                                                                                 | Ceramic 15 pF $\pm 10$ % 50 WV (UJ)         |                |                   |
| C39                                                                                                                                                                                                                 | Ceramic 15 pF $\pm 10$ % 50 WV (NPO)        |                |                   |
| C40                                                                                                                                                                                                                 | Ceramic 27 pF $\pm 10$ % 50 WV (SH)         |                |                   |
| C41                                                                                                                                                                                                                 | Ceramic 7 pF $\pm 0.5$ pF 50 WV (NPO)       |                |                   |
| C42                                                                                                                                                                                                                 | Polystyrene 1500 pF $\pm 5$ % 35 WV         |                |                   |
| C43                                                                                                                                                                                                                 | Ceramic 18 pF $\pm 10$ % 50 WV (SL)         |                |                   |
| C44                                                                                                                                                                                                                 | Polystyrene 3300 pF $\pm 5$ % 35 WV         |                |                   |
| C45                                                                                                                                                                                                                 | Ceramic 5 pF $\pm 0.5$ pF 50 WV (SL)        |                |                   |
| C46                                                                                                                                                                                                                 | Polystyrene 470 pF $\pm 5$ % 35 WV          |                |                   |

| REF. NO. | DESCRIPTION  |                           |             | RS<br>PART NO. | MFR'S<br>PART NO. |
|----------|--------------|---------------------------|-------------|----------------|-------------------|
| C47      | Ceramic      | 91 pF $\pm$ 5 %           | 50 WV (NPO) |                |                   |
| C48      | Not used     |                           |             |                |                   |
| C49      | Mylar        | 0.01 $\mu$ F $\pm$ 20 %   | 50 WV       |                |                   |
| C50      | Ceramic      | 330 pF $\pm$ 10 %         | 50 WV (SL)  |                |                   |
| C51      | Mylar        | 0.001 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C52      | Ceramic      | 470 pF $\pm$ 10 %         | 50 WV (SL)  |                |                   |
| C53      | Ceramic      | 330 pF $\pm$ 10 %         | 50 WV (SL)  |                |                   |
| C54      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C55      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C56      | Electrolytic | 100 $\mu$ F/6.3 V         |             |                |                   |
| C57      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C58      | Mylar        | 0.22 $\mu$ F $\pm$ 20 %   | 50 WV       |                |                   |
| C59      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C60      | Ceramic      | 7 pF $\pm$ 0.5 pF         | 50 WV (SL)  |                |                   |
| C61      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C62      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C63      | Electrolytic | 4.7 $\mu$ F/16 V          |             |                |                   |
| C64      | Electrolytic | 10 $\mu$ F/6.3 V          |             |                |                   |
| C65      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C66      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C67      | Ceramic      | 0.04 $\mu$ F              | 25 WV       |                |                   |
| C68      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C69      | Electrolytic | 10 $\mu$ F/6.3 V          |             |                |                   |
| C70      | Mylar        | 0.01 $\mu$ F $\pm$ 20 %   | 50 WV       |                |                   |
| C71      | Mylar        | 0.01 $\mu$ F $\pm$ 20 %   | 50 WV       |                |                   |
| C72      | Electrolytic | 3.3 $\mu$ F/16 V          |             |                |                   |
| C73      | Ceramic      | 0.01 $\mu$ F              | 25 WV       |                |                   |
| C74      | Ceramic      | 0.01 $\mu$ F              | 25 WV       |                |                   |
| C75      | Mylar        | 0.018 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C76      | Ceramic      | 20 pF $\pm$ 10 %          | 50 WV (SL)  |                |                   |
| C77      | Mylar        | 0.047 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C78      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C79      | Ceramic      | 0.022 $\mu$ F             | 25 WV       |                |                   |
| C80      | Electrolytic | 4.7 $\mu$ F/16 V          |             |                |                   |
| C81      | Electrolytic | 0.47 $\mu$ F/16 V         |             |                |                   |
| C82      | Mylar        | 0.1 $\mu$ F $\pm$ 20 %    | 50 WV       |                |                   |
| C83      | Mylar        | 0.047 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C84      | Electrolytic | 470 $\mu$ F/6.3 V         |             |                |                   |
| C85      | Electrolytic | 3.3 $\mu$ F/16 V          |             |                |                   |
| C86      | Ceramic      | 220 pF $\pm$ 10 %         | 50 WV (SL)  |                |                   |
| C87      | Ceramic      | 220 pF $\pm$ 10 %         | 50 WV (SL)  |                |                   |
| C88      | Mylar        | 0.0022 $\mu$ F $\pm$ 20 % | 50 WV       |                |                   |
| C89      | Electrolytic | 33 $\mu$ F/6.3 V          |             |                |                   |
| C90      | Mylar        | 0.001 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C91      | Ceramic      | 70 pF $\pm$ 10 %          | 50 WV (SL)  |                |                   |
| C92      | Mylar        | 0.001 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |
| C93      | Electrolytic | 100 $\mu$ F/6.3 V         |             |                |                   |
| C94      | Electrolytic | 1 $\mu$ F/16 V            |             |                |                   |
| C95      | Mylar        | 0.047 $\mu$ F $\pm$ 20 %  | 50 WV       |                |                   |

| REF. NO.              | DESCRIPTION                                       | RS<br>PART NO. | MFR'S<br>PART NO.       |
|-----------------------|---------------------------------------------------|----------------|-------------------------|
| C96                   | Electrolytic 47 $\mu$ F/6.3 V                     |                |                         |
| C97                   | Electrolytic 220 $\mu$ F/6.3 V                    |                |                         |
| C98                   | Electrolytic 220 $\mu$ F/6.3 V                    |                |                         |
| C99                   | Electrolytic 220 $\mu$ F/6.3 V                    |                |                         |
| C100                  | Electrolytic 100 $\mu$ F/10 V                     |                |                         |
| C101                  | Ceramic 0.04 $\mu$ F 25 WV                        |                |                         |
| C102                  | Electrolytic 470 $\mu$ F/10 V or 220 $\mu$ F/10 V |                |                         |
| C103                  | Ceramic 0.04 $\mu$ F 25 WV                        |                |                         |
| C104                  | Ceramic 0.022 $\mu$ F 25 WV                       |                |                         |
| C105                  | Ceramic 0.01 $\mu$ F 25 WV                        |                |                         |
| C106                  | Electrolytic 470 $\mu$ F/6.3 V                    |                |                         |
| C107                  | Ceramic 12 pF $\pm$ 10 % 50 WV (SL)               |                |                         |
| C108                  | Ceramic 91 pF $\pm$ 10 % 50 WV (SL)               |                |                         |
| C109                  | Electrolytic 1 $\mu$ F/16 V                       |                |                         |
| C110a-j               | Poly-Variable Capacitor 20 pF x 4, 266 pF x 2     | C-4643         | P-150023                |
| C111a, b              | Trimmer Capacitor                                 | C-0858         | P-160012                |
| C112a, b              | Trimmer Capacitor                                 | C-0858         | P-160012                |
| C113a, b              | Trimmer Capacitor                                 | C-0858         | P-160012                |
| C114a, b              | Trimmer Capacitor                                 | C-0858         | P-160012                |
| C115                  | Ceramic 330 pF $\pm$ 10 % 50 WV (SL)              |                |                         |
| C116                  | Electrolytic 220 $\mu$ F/6.3 V                    |                |                         |
| C117                  | Electrolytic 220 $\mu$ F/6.3 V                    |                |                         |
| C118                  | Ceramic 15 pF $\pm$ 10 % 50 WV (SL)               |                |                         |
| C119                  | Ceramic 330 pF $\pm$ 10 % 50 WV (SL)              |                |                         |
| C120                  | Ceramic 330 pF $\pm$ 10 % 50 WV (SL)              |                |                         |
| <b>CERAMIC FILTER</b> |                                                   |                |                         |
| CF1                   | Ceramic Filter                                    | C-0567         | P-140017<br>or P-140022 |
| <b>DIODES</b>         |                                                   |                |                         |
| D1                    | Varicap 1S2687                                    | DX-0302        |                         |
| D2                    | Silicon Diode WG713                               | DX-0543        |                         |
| D3                    | Germanium Diode 1N60                              |                |                         |
| D4                    | Germanium Diode 1N60                              |                |                         |
| D5                    | Germanium Diode 1N60                              |                |                         |
| D6                    | Germanium Diode 1N60                              |                |                         |
| D7                    | Silicon Diode WG713                               |                |                         |
| D8                    | Germanium Diode 1N60P                             | DX-0162        |                         |
| D9                    | Germanium Diode 1N60P                             | DX-0162        |                         |
| D10                   | Silicon Diode WG713                               | DX-0543        |                         |
| D11                   | Silicon Diode WG713                               | DX-0543        |                         |
| D12                   | Germanium Diode 1N60                              |                |                         |
| D13                   | Silicon Diode SR-1K-2 or 10E-1                    | DX-0475        |                         |
| D14                   | Zener Diode WZ065 or RD6.2EC                      | DX-0531        |                         |
| D15                   | Silicon Diode SR-1K-2 or 10E-1                    | DX-0475        |                         |
| D16                   | Silicon Diode SR-1K-2 or 10E-1                    | DX-0475        |                         |

| REF. NO.                   | DESCRIPTION                                              | RS<br>PART NO.     | MFR'S<br>PART NO.    |
|----------------------------|----------------------------------------------------------|--------------------|----------------------|
| <b>INTEGRATED CIRCUITS</b> |                                                          |                    |                      |
| IC1<br>IC2                 | LA1201(C)<br>LA4100                                      | MX-3207<br>MX-3216 |                      |
| <b>JACKS</b>               |                                                          |                    |                      |
| J1<br>J2                   | EXTernal ANT Jack<br>HEADPHONE Jack                      | J-0695<br>J-0685   | P-190075<br>P-190073 |
| <b>COILS</b>               |                                                          |                    |                      |
| L1                         | FM Filter Coil (Printed in P.C.B.)                       |                    | P-200444             |
| L2                         | FM ANT. Coil (Printed in P.C.B.)                         |                    | P-200444             |
| L3                         | FM RF Coil HR4-4½ TI                                     | CA-4727            | P-340047             |
| L4                         | FM IF Trap Coil VL4-14½ TI                               | CA-3574            | P-340018             |
| L5                         | FM OSC. Coil HL5-2½ TI                                   | CA-4728            | P-340050             |
| L6                         | CB Loading Coil 2.5 µH                                   | CA-3727            | P-380093             |
| L7                         | CB ANT. Coil 27 MHz                                      | CA-3665            | P-110070             |
| L8                         | CB RF Coil                                               | CA-3577            | P-340029             |
| L9                         | AM ANT Coil AC-081                                       | CA-3864            | P-110081             |
| L10                        | Not used                                                 |                    |                      |
| L11                        | AM ANT Coil AC-081 (P-200458)                            | CA-3864            | P-110081             |
| L12                        | SW1 ANT Coil AC-081                                      | CA-3864            | P-110081             |
| L13                        | SW2 ANT Coil AC-082                                      | CA-3862            | P-110082             |
| L14                        | SW3 ANT Coil AC-083                                      | CA-3863            | P-110083             |
| L15                        | SW2 Coil HL4-5½ TI                                       |                    | P-340064             |
| L16                        | SW1 Coil HL4-5½ TI                                       |                    | P-340064             |
| L17                        | AM OSC. Coil OC-071                                      | CA-4903            | P-120071             |
| L18                        | CB OSC. Coil 7C038                                       | CA-4636            | P-120038             |
| L19                        | SW1 OSC. Coil OC-072                                     | CA-3859            | P-120072             |
| L20                        | SW2 OSC. Coil OC-073                                     | CA-3860            | P-120073             |
| L21                        | SW3 OSC. Coil OC-074                                     | CA-3861            | P-120074             |
| L22                        | AM IFT Coil OA-043                                       | CA-3601            | P-130043             |
| <b>PILOT LAMPS</b>         |                                                          |                    |                      |
| PL1<br>PL2                 | Pilot Lamp 4.2 ø 8 V 30 mA<br>Pilot Lamp 4.2 ø 8 V 30 mA | L-0683<br>L-0683   | P-240078<br>P-240078 |
| <b>TRANSISTORS</b>         |                                                          |                    |                      |
| Q1                         | Transistor 2SC930(C)                                     |                    |                      |
| Q2                         | Transistor 2SC930(D)                                     |                    |                      |
| Q3                         | Transistor 2SC929(C)                                     |                    |                      |
| Q4                         | Transistor 2SC668(D)                                     |                    |                      |
| Q5                         | Transistor 2SC668(D)                                     |                    |                      |
| Q6                         | Transistor 2SC930(D)                                     |                    |                      |
| Q7                         | Transistor 2SC536(F)                                     |                    |                      |

| REF. NO.                                                             | DESCRIPTION                           | RS<br>PART NO. | MFR'S<br>PART NO. |
|----------------------------------------------------------------------|---------------------------------------|----------------|-------------------|
| Q8                                                                   | Transistor 2SC536(F)                  |                |                   |
| Q9                                                                   | Transistor 2SC1317(Q), (R) or 2SC509  |                |                   |
| <b>RESISTORS</b> ( ): typical value, UZ: Radial Type, PZ: Axial Type |                                       |                |                   |
| R1                                                                   | Carbon PZ 1.2 M $\Omega$ ½ W          |                |                   |
| R2                                                                   | Carbon PZ 330 $\Omega$ ¼ W            |                |                   |
| R3                                                                   | Carbon PZ 1 K $\Omega$ ¼ W            |                |                   |
| R4                                                                   | Carbon UZ 82 K $\Omega$ ¼ W           |                |                   |
| R5                                                                   | Carbon UZ 47–330(150) $\Omega$ ¼ W    |                |                   |
| R6                                                                   | Carbon PZ 47 $\Omega$ ¼ W             |                |                   |
| R7                                                                   | Carbon PZ 2.2 K $\Omega$ ¼ W          |                |                   |
| R8                                                                   | Carbon UZ 390 K $\Omega$ ¼ W          |                |                   |
| R9                                                                   | Carbon UZ 47–330(100) $\Omega$ ¼ W    |                |                   |
| R10                                                                  | Carbon UZ 100 K $\Omega$ ¼ W          |                |                   |
| R11                                                                  | Carbon PZ 470 K $\Omega$ ¼ W          |                |                   |
| R12                                                                  | Carbon PZ 330 $\Omega$ ¼ W            |                |                   |
| R13                                                                  | Carbon PZ 150–270(150) $\Omega$ ¼ W   |                |                   |
| R14                                                                  | Carbon PZ 330 $\Omega$ ¼ W            |                |                   |
| R15                                                                  | Carbon PZ 56 K $\Omega$ ¼ W           |                |                   |
| R16                                                                  | Carbon PZ 3.3 K $\Omega$ ¼ W          |                |                   |
| R17                                                                  | Carbon UZ 100 $\Omega$ ¼ W            |                |                   |
| R18                                                                  | Carbon PZ 390 K $\Omega$ ¼ W          |                |                   |
| R19                                                                  | Carbon PZ 22 $\Omega$ ¼ W             |                |                   |
| R20                                                                  | Carbon PZ 1.5 K $\Omega$ ¼ W          |                |                   |
| R21                                                                  | Carbon PZ 820 $\Omega$ ¼ W            |                |                   |
| R22                                                                  | Carbon PZ 150 K $\Omega$ ¼ W          |                |                   |
| R23                                                                  | Carbon UZ 5.6 K $\Omega$ ¼ W          |                |                   |
| R24                                                                  | Carbon 0–820(0) $\Omega$ ¼ W          |                |                   |
| R25                                                                  | Carbon PZ 47 $\Omega$ ¼ W             |                |                   |
| R26                                                                  | Carbon UZ 1.8 K $\Omega$ ¼ W          |                |                   |
| R27                                                                  | Carbon UZ 10 K $\Omega$ ¼ W           |                |                   |
| R28                                                                  | Carbon UZ 4.7 K $\Omega$ ¼ W          |                |                   |
| R29                                                                  | Carbon UZ 10 K $\Omega$ ¼ W           |                |                   |
| R30                                                                  | Carbon PZ 680 $\Omega$ ¼ W            |                |                   |
| R31                                                                  | Carbon UZ 330 $\Omega$ ¼ W            |                |                   |
| R32                                                                  | Carbon PZ 22 K $\Omega$ ¼ W           |                |                   |
| R33                                                                  | Carbon UZ 560 $\Omega$ ¼ W            |                |                   |
| R34                                                                  | Carbon UZ 1 K $\Omega$ ¼ W            |                |                   |
| R35                                                                  | Carbon UZ 1 K $\Omega$ ¼ W            |                |                   |
| R36                                                                  | Carbon UZ 10 K $\Omega$ ¼ W           |                |                   |
| R37                                                                  | Carbon UZ 10 K $\Omega$ ¼ W           |                |                   |
| R38                                                                  | Carbon PZ 47 $\Omega$ ¼ W             |                |                   |
| R39                                                                  | Carbon UZ 270 K $\Omega$ ¼ W          |                |                   |
| R40                                                                  | Carbon UZ 560 $\Omega$ ¼ W            |                |                   |
| R41                                                                  | Carbon UZ 2.7 K $\Omega$ ¼ W          |                |                   |
| R42                                                                  | Carbon UZ 1 K $\Omega$ ¼ W            |                |                   |
| R43                                                                  | Carbon UZ 5.6–8.2(6.8) K $\Omega$ ¼ W |                |                   |
| R44                                                                  | Carbon PZ 2.7 K $\Omega$ ¼ W          |                |                   |



| REF. NO.               | DESCRIPTION                |    |                    | RS<br>PART NO. | MFR'S<br>PART NO. |
|------------------------|----------------------------|----|--------------------|----------------|-------------------|
| R45                    | Carbon                     | PZ | 10 KΩ ¼ W          |                |                   |
| R46                    | Carbon                     | PZ | 6.8 KΩ ¼ W         |                |                   |
| R47                    | Carbon                     | PZ | 100 Ω ¼ W          |                |                   |
| R48                    | Carbon                     | PZ | 4.7 KΩ ¼ W         |                |                   |
| R49                    | Carbon                     | UZ | 150 Ω ¼ W          |                |                   |
| R50                    | Carbon                     | PZ | 2.2 KΩ ¼ W         |                |                   |
| R51                    | Carbon                     | PZ | 47 Ω ¼ W           |                |                   |
| R52                    | Carbon                     | PZ | 33 Ω ½ W           |                |                   |
| R53                    | Carbon                     | PZ | 560 Ω ½ W          |                |                   |
| R54                    | Carbon                     | PZ | 2.2 MΩ ½ W         |                |                   |
| R55                    | Carbon                     | PZ | 4.7 KΩ ¼ W         |                |                   |
| R56                    | Carbon                     | PZ | 560 Ω ¼ W          |                |                   |
| R57                    | Carbon                     | PZ | 1.5 KΩ ¼ W         |                |                   |
| R58                    | Carbon                     | PZ | 330–560(330) Ω ¼ W |                |                   |
| R59                    | Carbon                     |    | 0–330(0) Ω ¼ W     |                |                   |
| R60                    | Carbon                     | PZ | 22 Ω ¼ W           |                |                   |
| R61                    | Carbon                     | PZ | 390 KΩ ¼ W         |                |                   |
| SPEAKER                |                            |    |                    |                |                   |
| SPKR                   | Speaker 4 ohms             |    |                    |                | P-270053          |
| SWITCHES               |                            |    |                    |                |                   |
| S1a–j                  | Band Selector Switch       |    |                    | S-1293         | P-180253          |
| S2                     | Band Selector Switch       |    |                    | S-7346         | P-180254          |
| S3                     | Dial LIGHT Switch          |    |                    | S-0768         | P-180193          |
| S4                     | Power Switch (with VOLUME) |    |                    | P-1667         | P-170217          |
| TRANSFORMERS           |                            |    |                    |                |                   |
| T1                     | FM IFT 7F-013              |    |                    | CA-7253        | P-140013          |
| T2                     | FM IFT 7F-029              |    |                    | CA-7516        | P-140029          |
| T3                     | AM IFT 7A-041A             |    |                    |                | P-130041A         |
| T4                     | AM IFT 7A-042A             |    |                    |                | P-130042A         |
| T5                     | FM IFT 10F-011             |    |                    | CA-7254        | P-140011          |
| T6                     | FM IFT 10F-019             |    |                    | CA-7517        | P-140019          |
| T7                     | Power Transformer          |    |                    |                | P-100385          |
| VARIABLE RESISTORS     |                            |    |                    |                |                   |
| RV1                    | VOLUME 10KD (with S4)      |    |                    | P-1667         | P-170217          |
| RV2a, b                | SQUELCH/TONE 10KB/20KA     |    |                    | P-1841         | P-170271          |
| RV3                    | Semi-Fixed Resistor 50KB   |    |                    | P-1840         | P-170270          |
| PRINTED CIRCUIT BOARDS |                            |    |                    |                |                   |
|                        | Printed Circuit Board      |    |                    |                | P-200444          |
|                        | Lamp Supply Board          |    |                    |                | P-200300          |
|                        | Printed Coil Board         |    |                    |                | P-200458          |

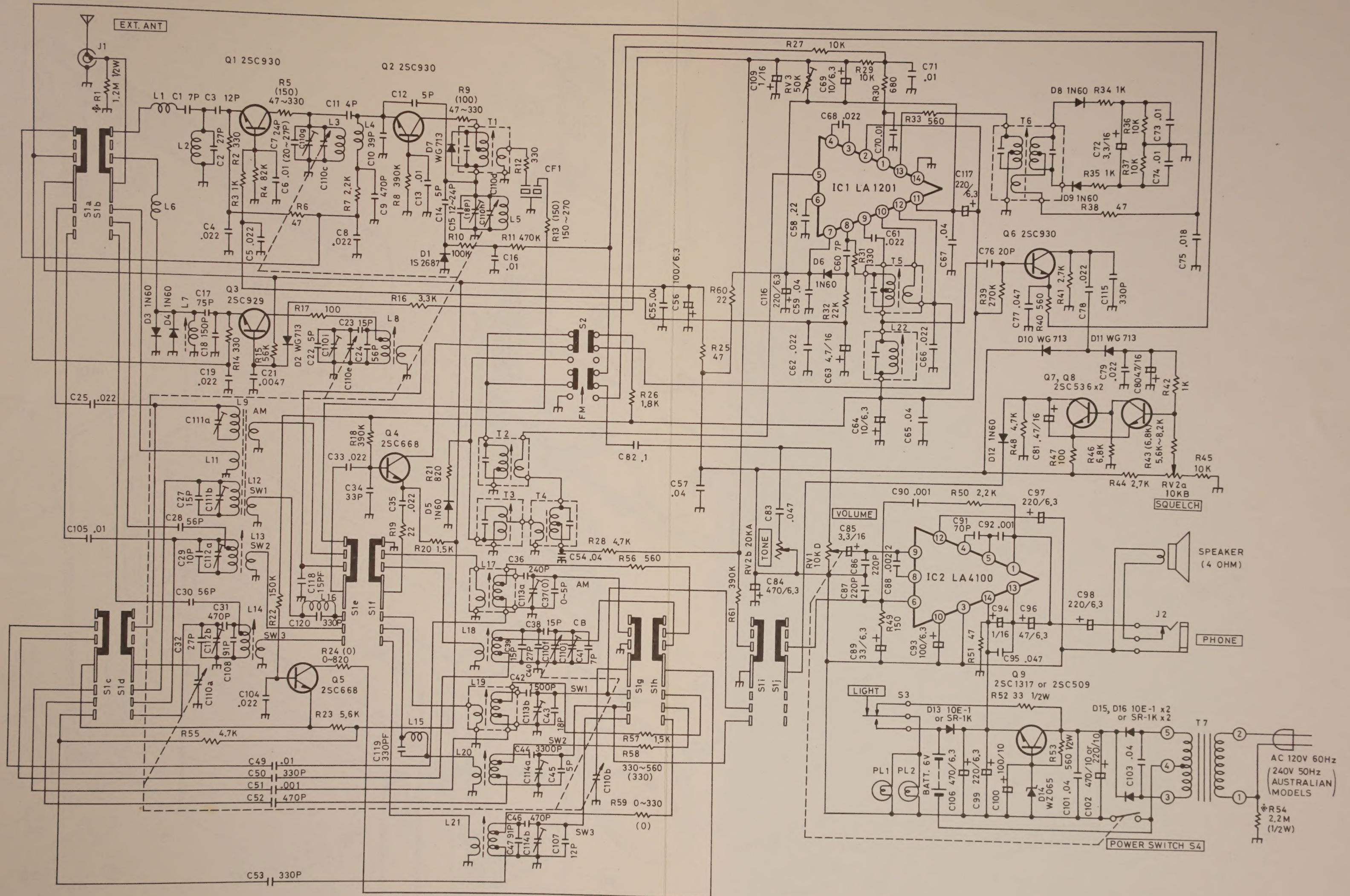
# EXPLODED VIEW PARTS LIST

| REF. NO. | DESCRIPTION                  | RS<br>PART NO. | MFR'S<br>PART NO. |
|----------|------------------------------|----------------|-------------------|
| 1        | Name Plate (for USA only)    | HB-7045        | P-730199          |
| *1       | Name Plate (for CANADA only) |                | P-730200          |
| 2 a, b   | Cabinet                      | Z-3138         | P-600095          |
| 2 a      | Front Cabinet                |                |                   |
| 2 b      | Battery Cover                | DB-0220        |                   |
| 3        | Battery Contact              | HB-2408        | P-410617          |
| 4        | Rear Cabinet                 | Z-3834         | P-600098          |
| 5        | FM Rod Antenna               | A-0285         | P-330015          |
| 6        | Lug Terminal                 |                | P-320075          |
| 7        | Cushion                      | HB-4790        | P-820322          |
| 8        | Battery Spring               | RB-5434        | P-440068          |
| 9        | AC Line Cord                 | W-1401         | P-310024          |
| 10       | ANT Coil (AM, SW1)           | CA-3864        | P-110081          |
| 11       | Bar Antenna Holder           | HB-2897        | P-610395          |
| 12       | Pulley                       | D-0326         | P-430025          |
| 13       | Band Indicator               | D-1235         | P-710054C         |
| 14       | Spring B                     | RB-5474        | P-440074          |
| 15       | Pointer                      | D-1234         | P-610406A         |
| 16       | Dial Base                    | HB-2908        | P-610401          |
| 17       | Panel Lamp                   | L-0683         | P-240078          |
| 18       | Lamp P.C.B.                  |                | P-200300          |
| 19       | Mirror Plate                 | HB-2911        | P-710082          |
| 20       | Pulley C                     | D-0269         | P-430007          |
| 21       | Shaft A for Pulley C         | HB-2389        | P-420197          |
| 22       | Large Pulley 76              | D-0359         | P-430031          |
| 23       | Shaft                        | D-3242         | P-420244          |
| 24       | Gang Plate                   |                | P-480175          |
| 25       | Shaft                        | RT-1175        | P-420272          |
| 26       | Leaf Switch (Dial light)     | S-0768         | P-180193          |
| 27       | Clamp Connector              | H-3305         | P-320006          |
| 28       | Power Transformer (T7)       | TA-0562        | P-100385          |
| 29       | Transformer Bracket          | HB-2907        | P-410832          |
| 30       | Strain Relief                | HB-0598        | P-480010          |
| 31       | Headphone Jack               | J-0685         | P-190073          |
| 32       | Double Pulley                | D-0243         | P-430010          |
| 33       | Shaft for Double Pulley      | D-3196         | P-430032          |
| 34       | TUNING & FINE TUNING Shaft   | D-3197         | P-420229          |
| 35       | Handle Bracket               | HB-7044        | P-610516          |
| 36       | Handle                       | H-6194         | P-610402          |
| 37       | Handle Plate                 | HB-7043        | P-710141          |
| 38       | Dial Scale                   | G-0324         | P-640173          |
| 39       | Dial Window                  | D-5208         | P-640123          |
| 40       | Side Plate (R)               | Z-3840         | P-710136          |
| 41       | Side Plate (L)               | Z-3839         | P-710135          |
| 42       | Speaker Bracket              |                | P-410278          |
| 43       | Speaker                      | S-4642         | P-270053          |
| 44       | Band Selector Knob           | K-2796         | P-650187A         |
| 45       | Speaker Net                  | HB-2912        | P-660116          |
| 46       | Panel                        | Z-3835         | P-710137          |

\* For CANADIAN Models Only

| REF. NO. | DESCRIPTION           | RS<br>PART NO.        | MFR'S<br>PART NO. |
|----------|-----------------------|-----------------------|-------------------|
| 47       | Panel C               | Z-3838                | P-710134          |
| 48       | Spring                | RB-5621               | P-440091          |
| 49       | Dial LIGHT Knob       | K-2797                | P-650186A         |
| 50       | Panel B               | Z-3837                | P-710133          |
| 51       | Panel A               | Z-3836                | P-710132          |
| 52       | TUNING Knob           | K-2201                | P-650183          |
| 53       | FINE TUNING Knob      | K-2798                | P-650184A         |
| 54       | Bushing               |                       | P-610407          |
| 55       | VOLUME Knob           | K-2799                | P-650258          |
| 56       | SQUELCH Knob          | K-2800                | P-650259          |
| 57       | TONE Knob             | K-2801                | P-650260          |
| 58       | Printed Circuit Board |                       | P-200444          |
| 59       | Coil P.C.B.           |                       | P-200458          |
| 60       | Beacket               |                       | P-411445          |
| 61       | Cushion               |                       | P-680178          |
| F1       | Tapping Screw         | 3 $\phi$ x 55 PT II   |                   |
| F2       | Tapping Screw         | 3 $\phi$ x 18 PT II   |                   |
| F3       | Tapping Screw         | 3 $\phi$ x 12 PT II   |                   |
| F4       | Tapping Screw         | 3 $\phi$ x 10 PT II   |                   |
| F5       | Nut                   | 2N                    |                   |
| F6       | Screw                 | 2 $\phi$ x 14 P       |                   |
| F7       | Screw                 | 2.6 $\phi$ x 6 P      |                   |
| F8       | Screw                 | 2.6 $\phi$ x 4 P      |                   |
| F9       | Washer                | 2.6 W                 |                   |
| F10      | Screw                 | 2 $\phi$ x 10 P       |                   |
| F11      | Screw                 | 2 $\phi$ x 5 P        |                   |
| F12      | Triple Screw          | 3 $\phi$ x 6 P        |                   |
| F13      | Tapping Screw         | 3 $\phi$ x 8 PT II    |                   |
| F14      | E Ring                | 2.5 $\phi$            |                   |
| F15      | Nut                   | 3 N                   |                   |
| F16      | Spring Washer         | 3 SW                  |                   |
| F17      | Washer                | 3 W                   |                   |
| F18      | Screw                 | 3 $\phi$ x 12 P       |                   |
| F19      | Tapping Screw         | 3 $\phi$ x 10 PT-PLAX |                   |
| F20      | Tapping Screw         | 3 $\phi$ x 12 PT-PLAX |                   |

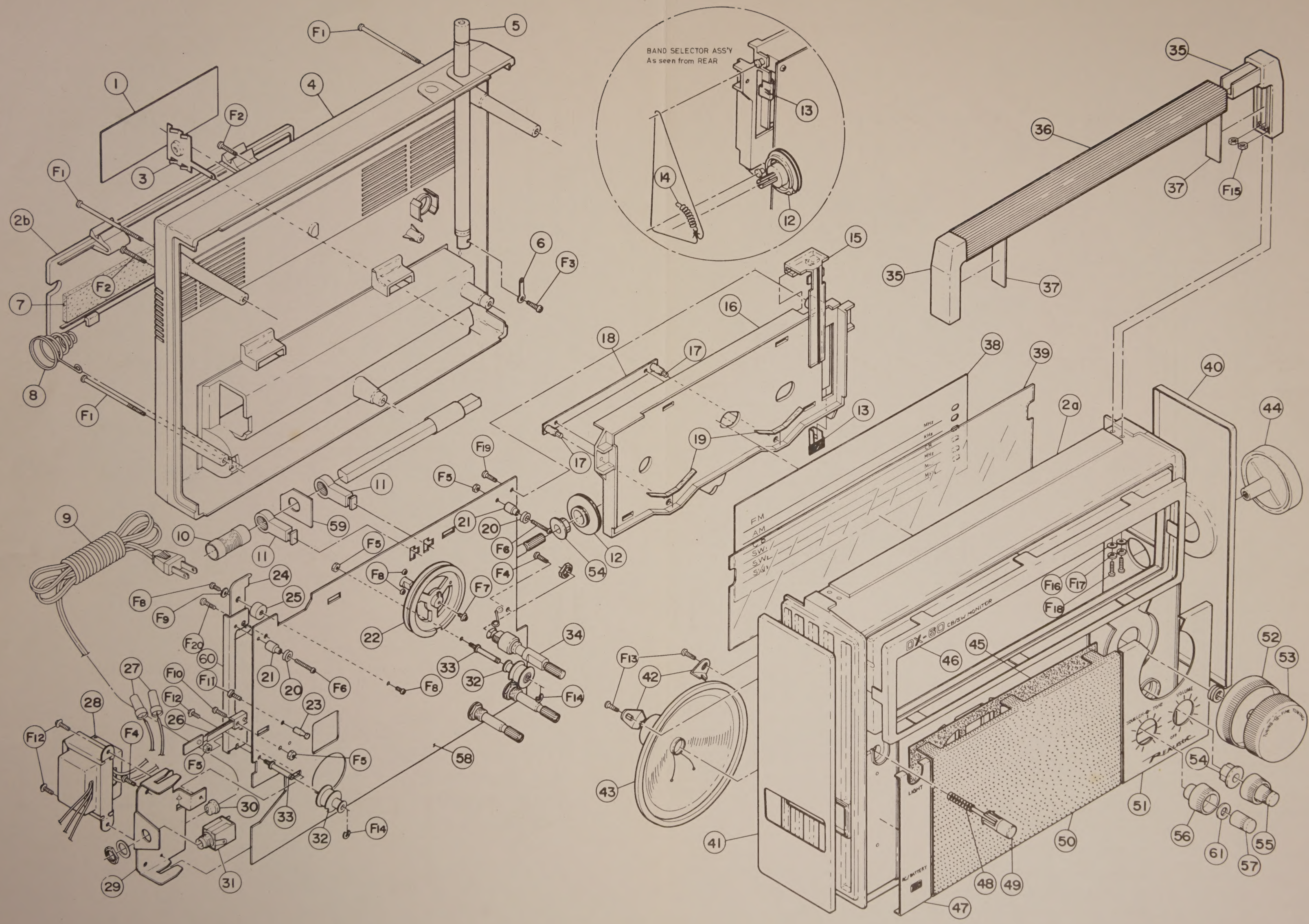
## SCHEMATIC DIAGRAM



NOTES

- 1) ALL RESISTOR VALUES ARE INDICATED IN "OHM". ( $K=10^3$  OHM,  $M=10^6$  OHM)
- 2) ALL CAPACITOR VALUES ARE INDICATED IN " $\mu F$ ". ( $P=10^{-6}$   $\mu F$ )
- 3) ✳ FOR AUSTRALIAN MODELS, R1 AND R54 ARE NOT USED.
- 4) BAND SWITCH IS SET TO FM.

EXPLODED VIEW





RADIO SHACK  A DIVISION OF TANDY CORPORATION

U.S.A.: FORT WORTH, TEXAS 76102

CANADA: BARRIE, ONTARIO L4M 4W5

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TANDY CORPORATION

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AUSTRALIA

280-316 VICTORIA ROAD  
RYDALMERE, N.S.W. 2116

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BELGIUM

PARC INDUSTRIEL DE NANINNE  
5140 NANINNE

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U. K.

BILSTON ROAD, WEDNESBURY  
WEST MIDLANDS WS10 7JN