

Trader

SERVICE SHEET

3357

Roberts RT22

Portable radio



The Roberts RT22 is a small AM / FM battery-powered portable radio. Waveband coverage is long and medium wave AM, using an internal ferrite aerial, and the FM broadcast band on VHF, using an external telescopic aerial.

Controls are pushbutton for waveband selection, with a fourth cancelling on / off button. Volume and tuning controls are rotary. Four sliding pointers are provided for use with the tuning scale, for logging stations. All controls and the tuning scale are on the cabinet top escutcheon.

The RT22 is in conventional Roberts styling, having a padded leathercloth-covered cabinet with wood sides and a turntable base, with silver and black trim. A hinged carrying handle is fitted.

Brief Specification

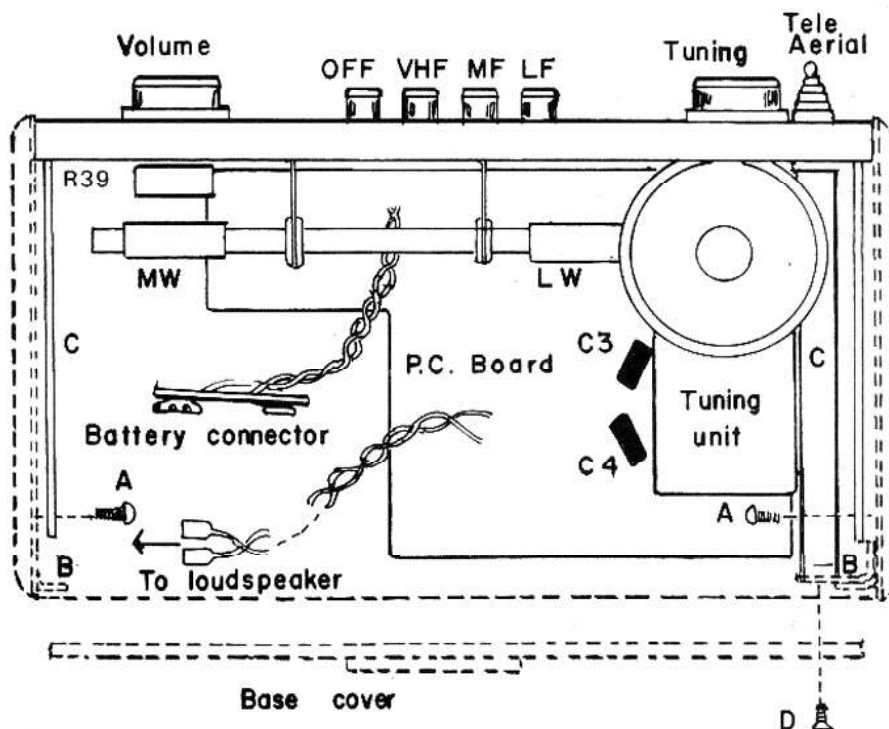
Power supply	One 9V PP9 (or equivalent) battery
Wavebands	AM: LW 150 to 265kHz (1130 to 2000m) MW 536 to 1620kHz (185 to 560m) FM: VHF 87.5 to 104MHz
Intermediate frequencies	AM: 470kHz FM: 10.7MHz
Transistors	11 } (see components list for details)
Diodes	3 }
Audio power output	450mW sinewave nominal maximum
Loudspeaker	3½ inch (85mm) diameter round, impedance 12 ohms

Dimensions and weight	<i>Height</i> ‡	<i>Width</i>	<i>Depth</i>	<i>Weight</i> *
‡ Handle raised	6¼ in	9⅝ in	3 in	3lb 5oz
* with battery	(106mm)	(245mm)	(75mm)	(1.5 kg)
Manufacturer and UK Service	Roberts Radio Company Ltd., Molesey Avenue, West Molesey, Surrey KY8 ORL 01-979 7474			

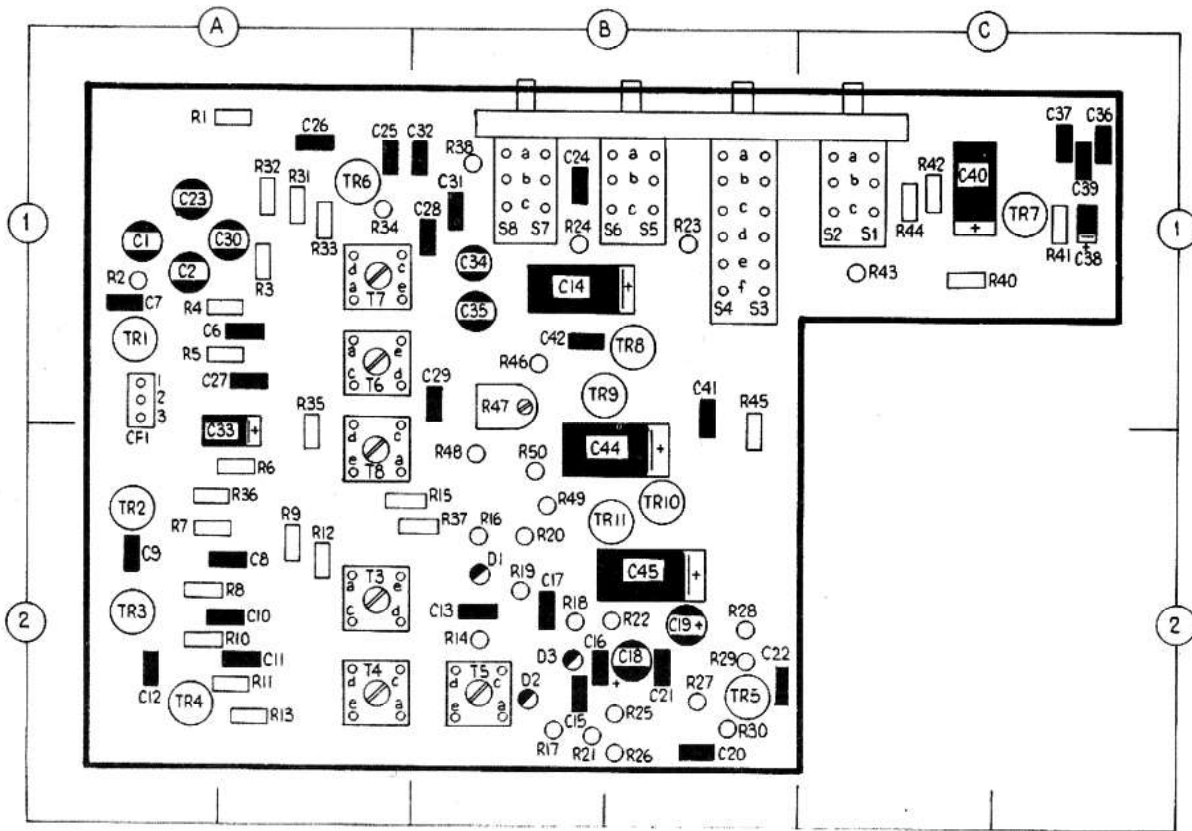
Dismantling

(see interior view diagram)

1. Remove bottom cover (ease out retaining flanges B).
2. Unplug and remove battery.
3. Release 2 screws A from inside cabinet sides to free chassis straps C.
4. Remove countersunk screw D from cabinet bottom to free telescopic aerial from bracket.
5. Carefully ease out complete chassis assembly through cabinet top to extent of leads.
6. To completely remove chassis from cabinet, unplug loudspeaker leads.
7. With chassis removed from cabinet, the speaker leads can be temporarily connected through the cabinet top (or a test bench speaker substituted), and the battery can be re-connected.



◀ Interior view



P.C. board

Alignment

Equipment required:

- AM signal generator, covering 150 to 1500kHz, modulated 400Hz, 30% FM signal generator.
- Sweep marker generator, sweeping 10MHz \pm 1MHz.
- Oscilloscope, sensitivity 100mV per division.
- Suitable output meter (VTVM).
- Input matching components as detailed in text.

Preliminaries

Allow test equipment to warm up before beginning alignment. Progressively reduce signal input level as circuits come into alignment to avoid agc action on AM, "Limiting" on FM.

Procedure

(See printed circuit and interior view diagrams for locations of coils, trimmers and test points.)

1. Connect meter, set to 10mA range, in series with link 1 on foil side of p.c. board. Adjust preset **R47** to minimum. Then after 1 minute at 20°C adjust **R47** to give reading of 1mA.
2. Check that there is a full 9V d.c. across capacitor **C45**, and that, with the tuning gang fully meshed, the tuning scale pointer coincides with the scale right hand end datum mark.

AM (select "MF")

I.F. Stages

Connect AM signal generator output across MW aerial coil primary **L3** (on ferrite aerial). Connect oscilloscope input between switch **S3** contact "a" and chassis. Tune generator to 470kHz, adjust AM, IFT's **T3**, **T8** and **T6**, in that order, for maximum amplitude of displayed response, with symmetrical response about 470kHz. During adjustment keep signal input level so as to maintain a display amplitude of about 5 divisions (500mV).

R.F. Stages

Inject r.f. signals from AM signal generator via inductive loop to ferrite aerial. Connect output meter across loudspeaker speech coil.

MW (select "MF")

1. Tune receiver to h.f. calibration mark on tuning scale, and signal generator to 1500kHz. Adjust MW oscillator trimmer **C30** and r.f. trimmer **C23** for maximum.
2. Retune receiver to I.f. calibration mark on scale, and signal generator to 560kHz. Adjust MW oscillator coil **T7** and aerial coil **L3** (on ferrite rod) for maximum.

LW (select "LF")

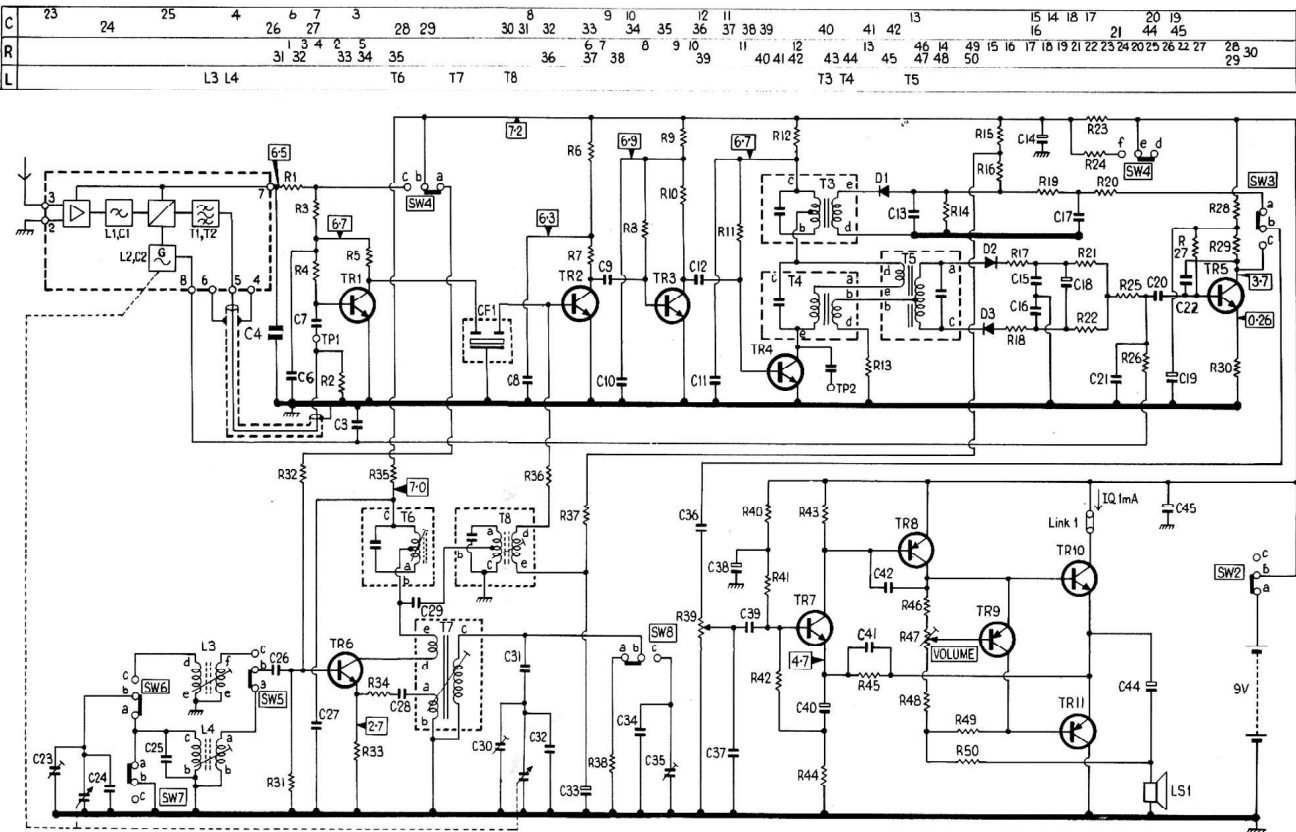
3. Tune receiver to h.f. calibration mark on scale and signal generator to 260kHz. Adjust LW oscillator trimmer **C35** for maximum.
4. Retune receiver to I.f. calibration mark, and signal generator to 156kHz. Adjust LW aerial coil **L4** for maximum.

FM (select "VHF")

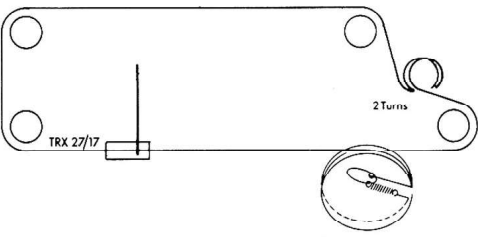
Note: Only the I.F. Stages can be aligned. The FM r.f. tuner is a sealed unit and no attempt should be made to disturb the settings.

1. Connect FM generator via sweep marker, set to sweep 10.7MHz, deviated 1MHz, to test point TP1 (remove screened lead to VHF tuner). Connect oscilloscope input via diode probe to test point TP2 (Tr4 collector). Adjust FM final IF **T4** for maximum amplitude and symmetry of response on display.
2. Transfer oscilloscope input to between junction **R25/R26** and chassis. Adjust FM discriminator **T5** until the straight part of the "S" curve centre passes through zero at 10.7MHz, level -3dB.

- Components**
- Resistors**
- R1 1500 A1
 - R2 500 A1
 - R3 4700 A1
 - R4 820k A1
 - R5 500 A1
 - R6 1k A2
 - R7 3900 A2
 - R8 330k A2
 - R9 220 A2
 - R10 220 A2
 - R11 330k A2
 - R12 4700 A2
 - R13 150 A2
 - R14 100k A2
 - R15 120k B2
 - R16 27k B2
 - R17 3900 B2
 - R18 3900 B2
 - R19 2.7k B2
 - R20 1k B2
 - R21 5.6k B2
 - R22 5.6k B2
 - R23 4700 B1
 - R24 4700 B1
 - R25 1k B2
 - R26 820k B2
 - R27 2.7M B2
 - R28 3.9k B2
 - R29 4.7k B2
 - R30 3900 B2
 - R31 15k A1
 - R32 18k A1
 - R33 2.7k A1
 - R34 15k A1
 - R35 1500 A1
 - R36 220 A2
 - R37 39k B2
 - R38 150k B1
 - R39 10k B2
 - R40 15k C1
 - R41 150k C1
 - R42 27k C1
 - R43 2.7k C1
 - R44 180 C1
 - R45 1.5k B1
 - R46 4700 B1
 - R47 4700 B1
 - R48 2200 B2
 - R49 150 B2
 - R50 3300 B2
- Capacitors**
- C1 Trimmer A1
 - C2 Trimmer A1
 - C3 100nf } On
 - C4 100nf } tuner
 - C5 100nf } agood
 - C6 10nf A1
 - C7 10nf A1
 - C8 100nf A2
 - C9 10nf A2
 - C10 10nf A2
 - C11 10nf A2
 - C12 10nf A2
 - C13 10nf B2
 - C14 220F B1
 - C15 330F B2
 - C16 330F B2
 - C17 4.7F B2
 - C18 4.7F B2
 - C19 4.7F B2
 - C20 100nf B2
 - C21 10nf B2
 - C22 68pf B2
 - C23 Trimmer A1
 - C24 6.8F B1
 - C25 82F A1
 - C26 10nf A1
 - C27 10nf A1
 - C28 10nf B1
 - C29 8.2F B1
 - C30 Trimmer A1
 - C31 330F B1
 - C32 15F B1
 - C33 2.2F A2
 - C34 220F B1
 - C35 6.8F B1
 - C36 100nf C1
 - C37 10nf C1
 - C38 4.7F C1
 - C39 100nf C1
 - C40 100F C1
 - C41 10F B1
 - C42 680F B1
 - C43 470F B2
 - C44 220F B2
- Transistors**
- T1 BF194B A1
 - T2 BF195C A2
 - T3 BF195D A2
 - T4 BF195D A2
 - T5 BC148B B2
 - T6 BF194B A1
 - T7 BC148 C1
 - T8 BC158 B1
 - T9 BC158 B1
 - T10 BC338 B2
 - T11 BC328 B2
- Diodes**
- D1 AA119 B2
 - D2 AA119 B2
 - D3 AA119 B2
- Other components:**
- L1, L2, L3, L4 Inductors
 - SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8 Switches
 - TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9, TR10, TR11 Transistors
 - D1, D2, D3 Diodes
 - CF1, CF2, CF3, CF4, CF5, CF6, CF7, CF8, CF9, CF10, CF11, CF12, CF13, CF14, CF15, CF16, CF17, CF18, CF19, CF20, CF21, CF22, CF23, CF24, CF25, CF26, CF27, CF28, CF29, CF30, CF31, CF32, CF33, CF34, CF35, CF36, CF37, CF38, CF39, CF40, CF41, CF42, CF43, CF44, CF45 Capacitors
 - R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50 Resistors
 - LS1 Loudspeaker
 - TRX 27/17 Transformer



Complete circuit



Dial cord routing