

# MURPHY B861

# 1998

## Personal portable radio receiver

### Introduction

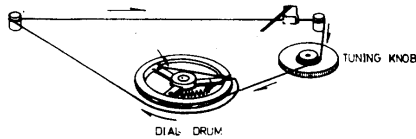
Murphy Minim, model B861, is a take anywhere pocket portable radio, incorporating seven transistors and two semiconductor diodes.

Wavebands covered are l.w. 1000-2000m (300-150kHz) and m.w. 187-583m (1604-515kHz), reception via an internal ferrite rod aerial assembly.

Output of 160mW is handled with a 2½in diameter loudspeaker, impedance 8Ω. Power is supplied by a 6V battery made up with four type HP7 cells.

### Circuit alignment

**Equipment required.** – An a.m. signal generator, an r.f. coupling coil and an



8Ω impedance output meter terminated in a miniature jack-plug.

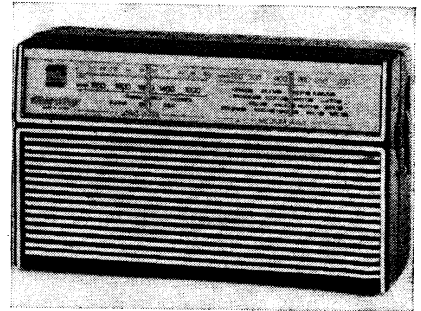
Connect output via earphone jack and rotate volume control to maximum. Maintain audio output at approximately 50mW by attenuating input signal level. Loosely couple signal generator to ferrite rod aerial assembly via r.f. coupling coil. All signals are fed via this source.

1. – Switch receiver to m.w. and rotate tuning gang to maximum capacitance. Feed in a 470kHz a.m. signal and adjust **T1**, **T2** and **T3** in that order for maximum output.

2. – Feed in a 505kHz a.m. signal and adjust **L3** for maximum output.

3. – Rotate tuning gang to minimum capacitance and feed in a 1605kHz a.m. signal. Adjust **TC3** for maximum output.

4. – Repeat operations 2 and 3 until frequency range is correct.

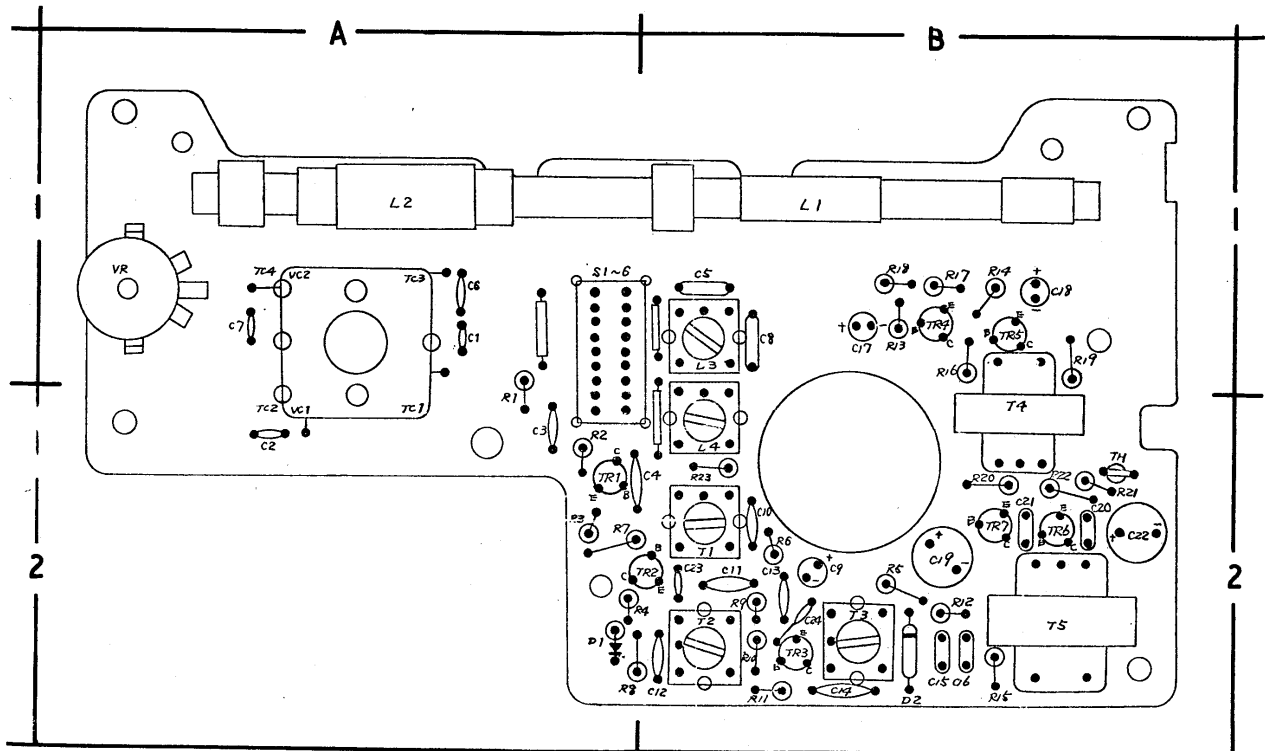


Appearance of Murphy Minim, a two waveband portable with wrist strap.

5. – Tune receiver to 500m on scale and feed in a 600kHz a.m. signal. Adjust position of **L1** on ferrite rod.

6. – Tune receiver to 214m on scale and feed in a 1400kHz a.m. signal. Adjust **TC1** for maximum output.

7. – Repeat operations 5 and 6 until calibration is correct.



Printed in Great Britain by George Rose Printers, Zion Road, Thornton Heath, Surrey, and Published by I.P.C. Electrical-Electronic Press Ltd., Dorset House, Stanford Street, London, S.E.1.

<b>Resistors</b>	<b>Capacitors</b>	<b>VC2</b> — A1	
R1 15kΩ A1	C1* 4pF A1	TC1 — A2	
R2 5.6kΩ A2	C2* 40pF A2	TC2 — A2	
R3 2.2kΩ A2	C3 0.01μF A2	TC3 — A1	
R4 3.9kΩ A2	C4 0.01μF A2	TC4 — A1	
R5 5.6kΩ B2	C5 260pF B1		
R6 56kΩ B2	C6* 10pF A1	<b>Inductors</b>	
R7 560Ω A2	C7* 65pF A1	L1 — B1	
R8 1kΩ A2	C8 100pF B1	L2 — A1	
R9 47kΩ B2	C9 4.7μF B2	L3 — B1	
R10 10kΩ B2	C10 0.02μF B2	L4 — B2	
R11 680Ω B2	C11 0.04μF B2	L5 8Ω —	
R12 6.8kΩ B2	C12 0.02μF B2	T1 — B2	
R13 4.7kΩ B1	C13 0.02μF B2	T2 — B2	
R14 330Ω B1	C14 0.04μF B2	T3 — B2	
R15 100kΩ B2	C15 0.01μF B2	T4 — B2	
R16 3.9kΩ B1	C16 0.01μF B2	T5 — B2	
R17 470Ω B1	C17 1μF B1		
R18 390Ω B1	C18 10μF B1	<b>Miscellaneous</b>	
R19 120Ω B1	C19 220μF B2	D1 1N34A A2	
R20 4.7kΩ B2	C20 0.01μF B2	D2 1N34A B2	
R21 330Ω B2	C21 0.01μF B2	TH MT-250 B2	
R22 5.6Ω B2	C22 100μF B2		
R23* 270kΩ B2	C23 3pF B2		
R24 820kΩ —	C24 3pF B2		
VR — A1	VC1 — A2		

8. — Switch receiver to l.w. and rotate tuning gang to maximum capacitance. Feed in a 140kHz a.m. signal and adjust **L4** for maximum output.

9. — Rotate tuning gang to minimum capacitance and feed in a 310kHz a.m. signal. Adjust **TC4** for maximum output.

10. — Repeat operations 8 and 9 until frequency range is correct.

11. — Tune receiver to 1715m on scale and feed in a 175kHz a.m. signal. Adjust position of **L2** on ferrite rod for maximum output.

12. — Tune receiver to 1200m on scale and feed in a 250kHz a.m. signal. Adjust **TC2** for maximum output.

13. — Repeat operations 11 and 12 until calibration is correct. Disconnect and remove test equipment.

### Transistor analysis

Transistor voltages given in the table were obtained from data supplied by the manufacturers. They were measured under quiescent conditions with an electronic voltmeter and are all negative with respect to emitter supply line for the transistor.

### Transistor table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 2SA354B	1.6	1.5	5.3
TR2 2SA353A	0.5	0.65	4.5
TR3 2SA353C	0.7	1.1	5.3
TR4 2SB75A	0.4	0.5	1.5
TR5 2SB75B	1.3	1.5	4.9
TR6 2SB77C	0.02	0.18	6.0
TR7 2SB77C	0.02	0.18	6.0

Quiescent current 11mA

