

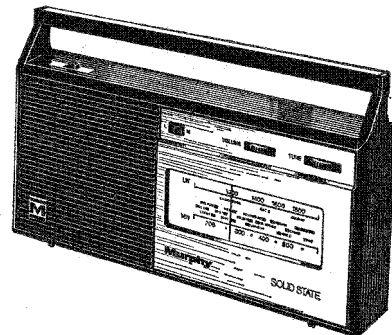
SERVICE INSTRUCTIONS

Murphy

MODEL B866

RADIO

RECEIVER



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SPECIFICATION

GENERAL

Model B866 is a battery operated portable receiver, using six transistors and is designed to cover the Long and Medium wavebands.

DIMENSIONS

Height: 165 mm (6.5 in.)
 Width: 276 mm (10.86 in.)
 Depth: 77 mm (3.03 in.)
 Weight: 1.23 kg (2.7 lb.)

CONTROLS

Top left: On/Off, slider type switch.
 Front (from right to left): Tuning and Volume controls, edge operated. Wavechange switch, slider type.

WAVEBANDS

L.W. band: 1090 to 1875 metres (160 to 275 kHz).
 M.W. band: 187 to 570 metres (1605 to 525 kHz).

BATTERY AND CONSUMPTION

Four 1½ volt cells, SP2 type or equivalent. Average battery consumption, 20 mA quiescent (25 mA normal listening level).

INTERMEDIATE FREQUENCY

470 kHz. Oscillator high with respect to signal frequency.

AUTOMATIC GAIN CONTROL

Two controlled stages.

POWER OUTPUT

600 mW at 1000 Hz, nominal.

LOUDSPEAKER

101×101 mm (4×4 in.) Impedance 4.5 ohms.

AERIAL

Internal ferrite rod aerial serves both bands.

DISMANTLING

REMOVAL OF CHASSIS

1. Remove the back cover and the battery.
2. Remove the five chassis fixing screws shown in Fig. 2.
3. Withdraw the chassis to the extent of the connecting leads.
4. For complete removal note and disconnect the connecting leads.
5. For reassembly reverse the above procedure.

REMOVAL OF MAIN PANEL

1. Remove the chassis as described in the 'removal of chassis' procedure.
2. Remove the Volume control panel and two screws located one on either side of the wavechange switch retaining the switch to the chassis.
3. Separate the heat sink shield from the heat sink clamp of the output transistors by removing the retaining screw.
4. Remove the panel fixing screw shown in Fig. 2.
5. Withdraw the panel to the extent of connecting leads.
6. For complete removal note and disconnect the connecting leads.
7. For reassembly reverse the above procedure taking care to replace the insulating washers on either side of the panel before replacing the fixing screw.

CIRCUIT ALIGNMENT

PRELIMINARY NOTES

1. Equipment required:
 - (a) An A.M. signal generator to cover 160 to 1605 kHz.
 - (b) A power output meter (0-1 watt). Impedance 4-5 ohms.
 - (c) 3+3 volts power supply source.
 - (d) Loop aerial (a loop of insulated wire, see Fig. 1).
 - (e) 0.22 μ F capacitor.
 - (f) Suitable tools for adjusting the iron dust cores.
2. Set the Volume control to maximum unless otherwise stated.
3. Disconnect the loudspeaker and connect a power output meter in its place.
4. The output of the receiver should be maintained at a level of 50 mW by reducing the input signal as necessary.
5. The signal generator should be switched on for about fifteen minutes before commencing alignment.

I.F. ALIGNMENT

1. Switch the receiver to the Medium waveband and set the tuning pointer to approximately 300 metres.
2. Set the signal generator to 470 kHz modulated 30% at 400 Hz. Connect the output via a 0.22 μ F capacitor to the base of transistor Tr 1.
3. Align L9/10, L5/6 and L4 in that order for maximum audio output. Repeat as necessary for maximum output.

Operation	Waveband	Sig. Gen. Freq. (mod. 30% 400 Hz)	Tuning Pointer Setting	Adjust for Maximum Output
OSCILLATOR				
1	M.W.	600 kHz	500 metres	L7/8
2	M.W.	1500 kHz	200 metres	C14 †
3	L.W.	214 kHz	1400 metres	C15 †
Repeat operations 1 to 3 until calibration is correct.				
AERIAL				
4	M.W.	600 kHz	500 metres	L1/2
5	M.W.	1500 kHz	200 metres.	C3 †
6	L.W.	214 kHz	1400 metres	L11/12

Repeat operations 4 to 6 until tracking is correct.

† NOTE: C3, C14 and C15 are wire type trimmers and are adjusted by winding or unwinding as may be required.

R.F. ALIGNMENT

NOTES: (a) Ensure that the tuning pointer is in line with the datum marks on the right hand side of the tuning scale with the tuning gang fully meshed.

(b) The output from the signal generator should be coupled by a 10 in. diameter loop of wire in series with a resistor of a value to match the output impedance of the generator. The loop should be placed about two feet from the receiver with its plane at right angles to the ferrite rod aerial. See Fig. 1.

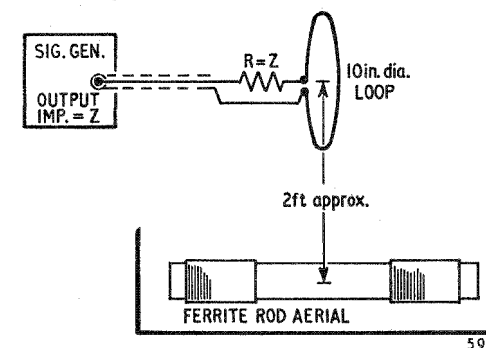


Fig. 1. Signal Generator coupling.

(c) Ensure that the signal output of the receiver is maintained at a level of 50 mW by reducing the input signal as necessary. Follow the procedure below:

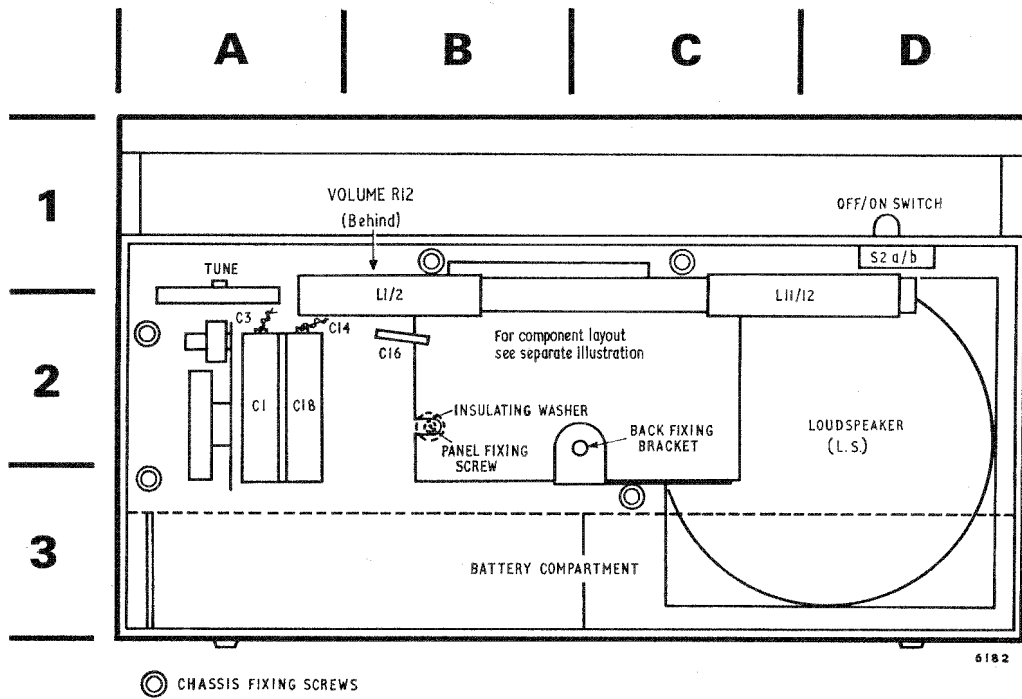


Fig. 2. Chassis—General view.

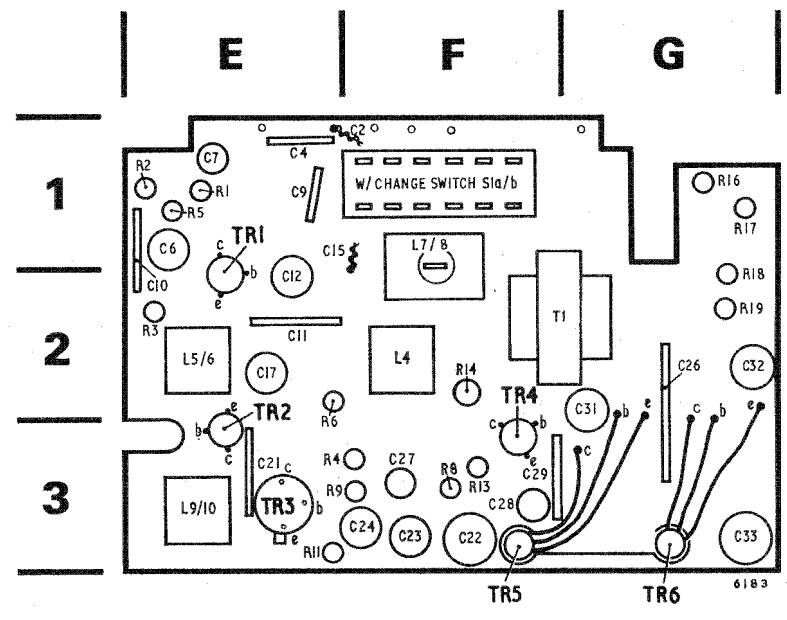
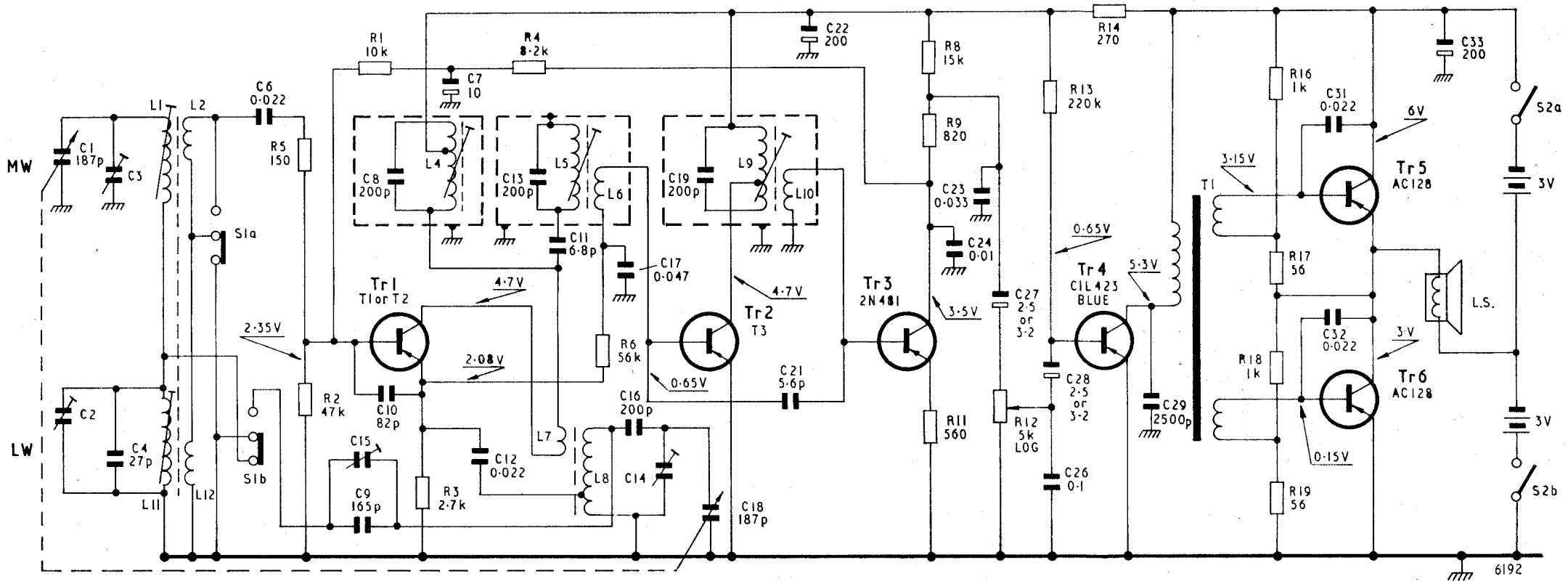


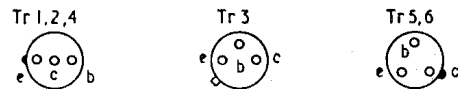
Fig. 3. Component layout.

For component locations, see Parts Lists on page 5.



NOTE:

1. All values of resistance in ohms and all values of capacitance in microfarads unless otherwise stated.
2. Switches shown in M.W. position.
3. Voltages indicated are approximate and negative with respect to chassis. Measured with a 20,000 ohms per volt meter under no signal conditions.



BOTTOM VIEW OF TRANSISTORS

Fig. 4. Circuit diagram B866.

PARTS LIST

CAPACITORS

Ref.	*Location	Value (μ F) (pF)	Rating (volts)	Part Number
C1	See variable capacitors			
C2	See variable capacitors			
C3	See variable capacitors			
C4	E1	27	500	AP57431
C5	—			
C6	E1	0.022	160	AP57441
C7	E1	10	16	AP57434
C8	Part of L4			
C9	E1	165	100	AP57438
C10	E2	82	500	AP57432
C11	E2	6.8	500	AP57447
C12	E2	0.022	160	AP57441
C13	Part of L5			
C14	See variable capacitors			
C15	See variable capacitors			
C16	B2	200	100	AP57437
C17	E2	0.047	160	AP57442
C18	See variable capacitors			
C19	Part of L9			
C20	—			
C21	E3	5.6	500	AP57446
C22	F3	200	6.4	AP57433
C23	F3	0.033	160	—
C24	F3	0.01	160	AP57439
C25	—			
C26	G2	0.1	160	AP57440
C27	F3	3.2	64	AP57435
C28	F3	3.2	64	AP57435
C29	F3	2500	100	AP57436
C30	—			
C31	G2	0.022	160	AP57441
C32	G2	0.022	160	AP57441
C33	G3	200	6.4	AP57433

VARIABLE CAPACITORS

Ref.	*Location	Value (pF)	Function	Part Number
C1	A2	187	Tuning capacitor ganged with C18	AP57443
C2	F1	0 to 18	L.W. aerial trimmer (wire wound)	AP57445
C3	A2	0 to 5	M.W. aerial trimmer (wire wound)	AP57445
C4 to C13	see 'capacitor' list			
C14	A2	0 to 18	M.W. oscillator trimmer (wire wound)	AP57445
C15	E1	0 to 25	L.W. oscillator trimmer (wire wound)	AP57789
C16 and C17	see 'capacitor' list			
C18	A2	187	Tuning capacitor ganged with C1	AP57443
C19 to C33	see 'capacitor' list			

RESISTORS

Ref.	*Location	Value (ohms)	Rating (watts)	Part Number
R1	E1	10k	0.125	AP57458
R2	E1	47k	0.125	AP57460
R3	E2	2.7k	0.125	AP57456
R4	E3	8.2k	0.125	AP57457
R5	E1	150	0.125	AP57451
R6	E3	56k	0.125	AP57461
R7	—			
R8	F3	15k	0.125	AP57459
R9	E3	820	0.125	AP57454
R10	—			
R11	E3	560	0.125	AP57453
R12	See variable resistor			
R13	F3	220k	0.125	AP57449
R14	F2	270	0.125	AP57452
R15	—			
R16	G1	1k	0.125	AP57455
R17	G1	56	0.125	AP57473
R18	G2	1k	0.125	AP57455
R19	G2	56	0.125	AP57473

VARIABLE RESISTORS

Ref.	*Location	Value (ohms)	Function	Part Number
R1 to R11	see 'resistors' list			
R12	B1	5k log.	Volume control	AP57450†
R13 to R19	see 'resistors' list			
†Complete with knob.				

TRANSISTORS

Ref.	*Location	Type	Function	Part Number
Tr1	E1	T1 or T2	Mixer/Oscillator	AP57464
Tr2	E2	T3	I.F. amplifier	AP57465
Tr3	E3	2N481	Detector	AP57463
Tr4	F2	CIL 423 (Blue Spot)	Driver	AP57466
Tr5	F3	AC128	Complementary pair } output stage	AP57462
Tr6	G3	AC128		

INDUCTORS AND TRANSFORMERS

Ref.	*Location	Description	D.C. Resistance (ohms)	Part Number
L1	B2	M.W. aerial coil	1.1	AP57470†
L2			less than 0.5	
L3			—	
L4	F2	1st I.F.T. (Blue)	4.2	AP57387
L5	E2	2nd I.F.T. (Black)	Pri. 4.4	AP57385
L6			Sec. less than 0.5	
L7	F1	M.W. Osc. coil	Pri. less than 0.5	AP57471
L8			Sec. 4	
L9	E3	3rd I.F.T. (white)	Pri. 4.7	AP57386
L10			Sec. less than 0.5	
L11	C2	L.W. aerial coil	10	AP57470†
L12			1.4	
T1	F2	Driver	Pri. 180 Sec. (Tr.5) 51 Sec. (Tr.6) 46	AP57469

†NOTE: M.W., L.W. aerial coils complete with ferrite rod.

CHASSIS

Title	Description	Part Number
Cord drive	nylon	AP57370
Dial, scale	printed	AP57395
Drum, moulded	for drive cord	AP57407
Heat sink	for output transistors	AP47388
Knob	tuning	AP57398
Pointer	scale	AP57380
Printed circuit board	complete	AP59790
Pulley	drive	AP57383
Spring	drive cord	AP57379
Step pulley	nylon	AP57413
Switch (S1 A-B)	slider	AP57415
Switch (S2 A-B)	on/off	AP57416

CABINET

Title and Description	Part Number
Cabinet back	AP57392
Cabinet front	AP57391
Screw, back fixing	AP57422
Trim, large	AP57405
Trim, decorative, top	AP57412
Trim, for on/off switch	AP57406
Window, for cabinet front	AP58582

MISCELLANEOUS

Title and Description	Part Number
Battery tube	AP57396
Contact - ve side, battery	AP57378
Contact + ve side, battery	AP57467
Felt pad for loudspeaker	AP57377
Loudspeaker	AP57376

CORD DRIVE

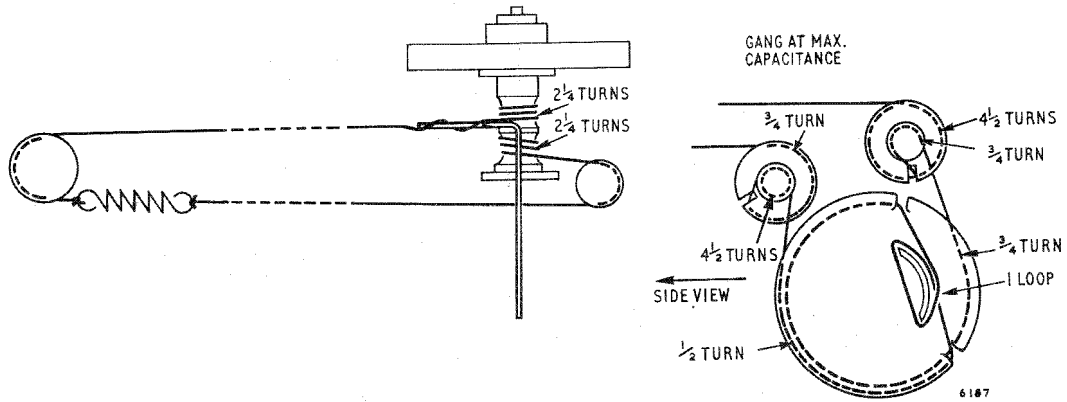
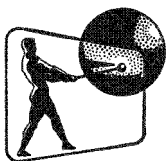


Fig. 5. Cord drive details.

MODIFICATIONS

THE SERVICE DEPARTMENT



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