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9 October 1970

Murphy B846

1955

Battery operated portable radio receiver

Introduction

Murphy B846 battery operated portable radio receiver uses seven transistors and a crystal diode. Styled in a two piece moulded plastics case, it has a padded covering of black plastics, and a full width rigid metal carrying handle. Designed to cover l.w. 1070-1900m (280-158kHz) and m.w. 187-570m (1605-525kHz) plus bandspread at high frequency end of m.w., b.s. 187-210m (1605-1430kHz). Reception is via either an internal ferrite rod aerial assembly or external aerial for which a socket is fitted at the side of the case. An audio output power of 1W is handled by a 15Ω, 6 x 4in elliptical loudspeaker. A normally closed jack is fitted for the connection of an earphone – 20 to 1000Ω impedance. Alternatively an external 15Ω loudspeaker may be used.

Circuit alignment

Equipment required. – An a.m. signal generator covering the range 158-1605 kHz, an audio output meter 15Ω impedance, one each 10pF and 0·1μF capacitors, and an 8·2kΩ resistor.

For i.f. alignment the chassis must be removed from case. Terminate output meter in a miniature jack plug and connect to receiver via the earphone jack. Rotate volume control to maximum, and tone control to maximum treble. Throughout the alignment procedure maintain the output at 50mW by attenuating the input signal as necessary. When adjusting i.f.t.s, the first, outer, peak is the correct one. All adjustments are for maximum output.

1. – Switch receiver to m.w. and tune to approximately 300m. Feed in a 470kHz a.m. signal via a 0·1μF capacitor to the junction **R1/C5.** Adjust **IFT3, IFT2** and **IFT1** in that order. Adjust each transformer once only. Disconnect signal generator.
2. – Check that cursor is in line with datum—right of the tuning scale – tuning gang at maximum capacitance.

If r.f. alignment is to be carried out under conditions of interference, the receiver may be temporarily desensitized by connecting an 8·2kΩ resistor between junction **R7/R11** and chassis. Connect signal generator to aerial socket via a 10pF capacitor.

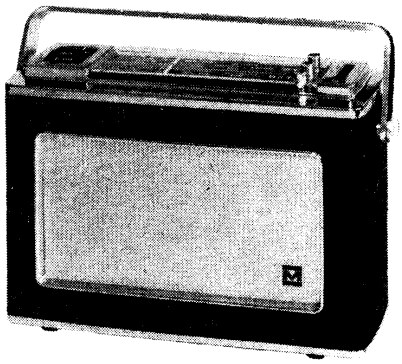
3. – Switch receiver to m.w. and tune to 500m. Feed in a 600kHz a.m. signal and adjust **L11/12/13.**
4. – Tune receiver to 200m and feed in a 1500kHz a.m. signal. Adjust **C14.**
5. – Repeat operations 3 and 4 and check calibration.
6. – Switch receiver to l.w. and tune to 1400m. Feed in a 214kHz a.m. signal and adjust **C16.**
7. – Switch receiver to b.s. and tune to letter 'm' in Luxembourg. Feed in a 1439kHz a.m. signal and adjust **L8/9/10.**
8. – Tune receiver to 'O' in 204m and feed in 1500kHz a.m. signal. Adjust **C40.**
9. – Switch receiver to m.w. and tune to 500m. Feed in a 600kHz a.m. signal and adjust position of **L2/3** on ferrite rod.
10. – Tune receiver to 200m and feed in a 1500kHz a.m. signal. Adjust **C1.**
11. – Repeat operations 9 and 10 until no further improvement can be obtained.
12. – Switch receiver to l.w., tune to 1400m and feed in a 214kHz a.m. signal. Adjust **C6.**
13. – Switch receiver to b.s., tune to 204m and feed in 1500kHz a.m. signal Adjust **C3.**

General notes

Dismantling. – Lay receiver face down on a non-scratch work surface, detach the base and remove battery. Release the two clips securing the two case half mouldings, then lift the back section clear.

Unscrew and remove the two 4BA nuts retaining the chassis to the loudspeaker pillars, then loosen the two PK screws securing the top edge of the chassis to the die-cast lugs of the top assembly. The chassis may now be lifted out to the extent of the loudspeaker leads.

Adjustment of **RV3.** – Replacement of components in the output stage may necessitate resetting **RV3.** This may be done by setting an Avo model 8 to the 50μA d.c. range and connecting it across **R30** (observe polarity).



With volume control at minimum, adjust **RV3** in accordance with meter reading against ambient temperature as follows: 18degC 9·24μA, 23degC 11·08μA, 28degC 12·8μA or 33degC 15·04μA.

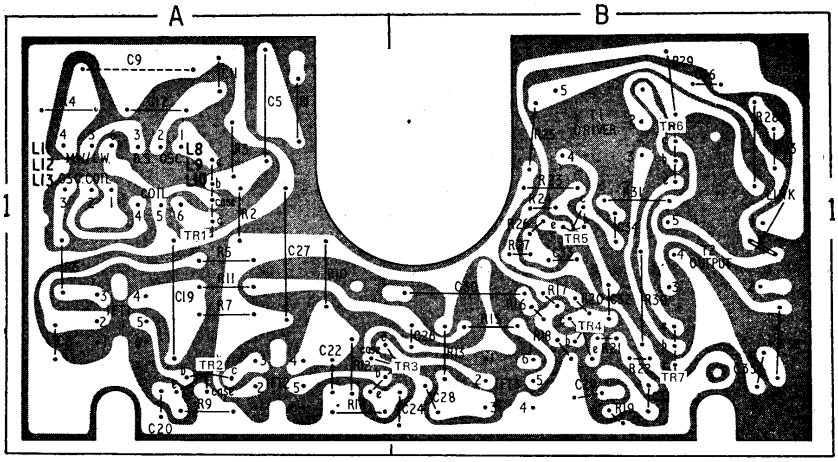
Drive cord replacement. – To replace drive cord, remove chassis from case as described under 'dismantling', then prepare approximately 36in of Terylene cord.

Carefully ease the cursor from its carrier then unscrew and remove the four Phillips head screws securing the scale plate to chassis. Lift the plate clear.

Withdraw the circlip located on the end of the tuning spindle, then loosen the grubsrews securing the capstan to the spindle and withdraw the tuning spindle complete with knob. Lift the capstan clear, noting the position of the nylon bearing to ensure its correct replacement.

Rotate tuning gang so that the capacitor vanes are approximately half meshed. Now from a point half way along the new length of cord, make a loop of one turn round the spigot contained within the drive drum, passing the cord ends out through the slots in the drum. Assemble the cord as shown in the illustration, then refit the capstan. Finally, pass the ends of the cord through the eyelet; knotting them under tension from the spring-loaded pulley mounted above the volume control.

When refitting the cursor, ensure that it registers with the datum marks on the right of the scale when the tuning gang is at maximum capacitance.



1955 Murphy B846

Resistors

R1	47Ω	A1
R2	33kΩ	A1
R3	6·8Ω	A1
R4	1·5kΩ	A1
R5	330Ω	A1
R6	330Ω	A1
R7	120kΩ	A1
R8	150kΩ	—
R9	680Ω	A1
R10	22kΩ	A1
R11	18kΩ	A1
R12	4·7kΩ	A1
R13	330Ω	B1
R14	1kΩ	A1
R15	560Ω	B1
R16	1·5kΩ	B1
R17	82kΩ	B1
R18	15kΩ	B1
R19	680Ω	B1
R20	5·6kΩ	B1
R21	68Ω	B1
R22	1kΩ	B1
R23	39kΩ	B1
R24	8·2kΩ	B1
R25	470Ω	B1
R26	56Ω	B1
R27	270Ω	B1
R28	3·9kΩ	B1
R29	150Ω	B1
R30	3·3Ω	B1
R31	10kΩ	B1
R32	150Ω	B1
RV1	10kΩ	—
RV2	5kΩ	—
RV3	5kΩ	B1

Capacitors

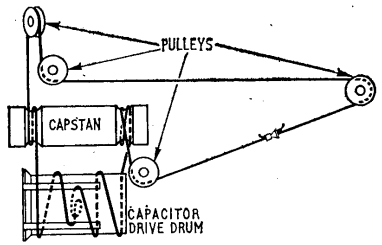
C1	30pF	—
C2a	343pF	—
C2b	177pF	—
C3	25pF	—
C4	27pF	—
C5	0·01µF	A1
C6	30pF	—
C7	82pF	—
C8	0·1µF	A1
C9	0·022µF	A1
C10	250pF	—
C11	47pF	A1
C12	140pF	A1
C13	250pF	—
C14	30pF	—
C15	0·047µF	—
C16	30pF	—
C17	310pF	—
C18	250pF	—
C19	10µF	A1
C20	0·1µF	A1
C22	0·1µF	A1
C23	220pF	—
C24	0·1µF	B1
C25	0·01µF	—
C26	0·01µF	B1
C27	100µF	A1
C28	0·1µF	B1
C29	0·47µF	B1
C30	10µF	B1
C31	100µF	B1
C32	10µF	B1
C33	100µF	B1
C34	0·1µF	B1
C35	0·1µF	B1
C36	200µF	B1
C39	47pF	—
C40	25pF	—
C41	100pF	—

Inductors*

L1	2·5Ω	—
L2	—	—
L3	—	—
L4	11·5Ω	—
L5	1·5Ω	—
L6	9·0Ω	A1
L7	9·0Ω	A1
L8	1·6Ω	A1
L9	—	A1
L10	—	A1
L11	—	A1
L12	—	A1
L13	3·5Ω	A1
L14	9·0Ω	A1
L15	—	A1
L16	9·5Ω	B1
L17	1·75Ω	B1
T1a	120Ω	B1
T1b	100Ω	B1
T2a	5Ω	B1
T2b	1·3Ω	B1
LS	15Ω	—

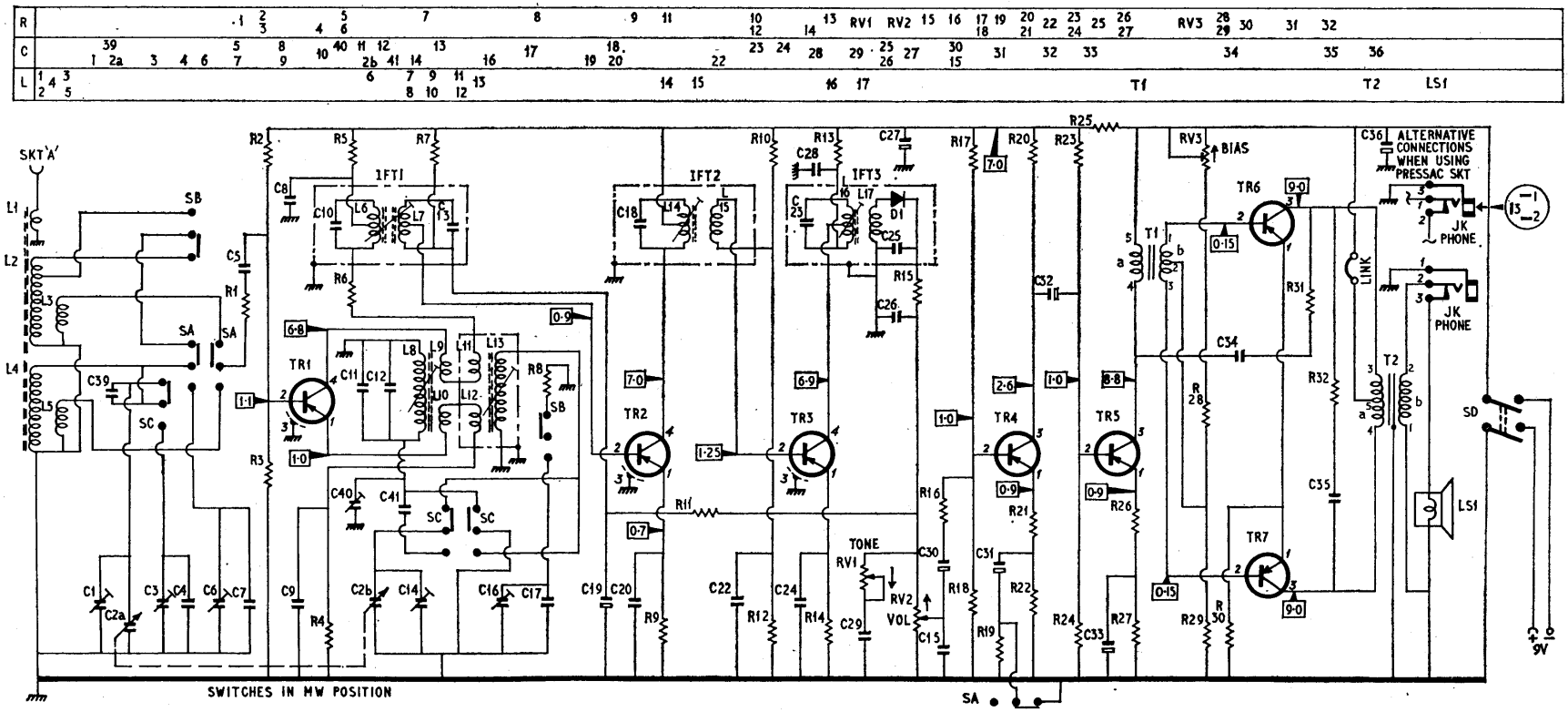
Semiconductors

TR1	AF117	A1
TR2	AF117	A1
TR3	AF117	A1
TR4	OC71	B1
TR5	AC128	B1
TR6	AC128	B1
TR7	AC128	B1
D1	OA90	B1



Transistor analysis

Voltages indicated on the circuit diagram are negative with respect to chassis. They were measured with a model 8 Avometer under quiescent conditions with volume control at minimum.



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