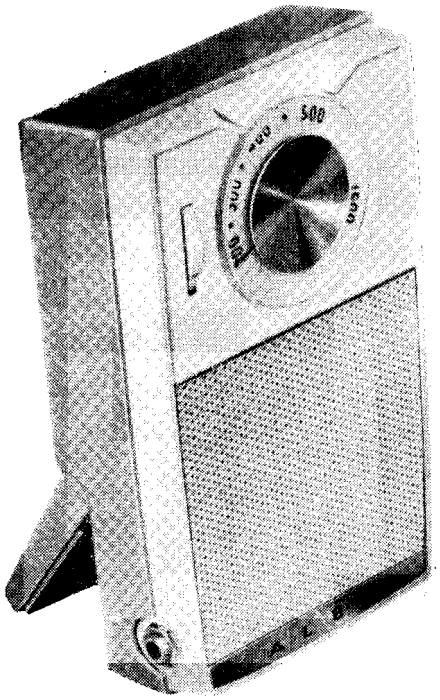
"TRADER" SERVICE SHEET

1573

ALBA 55 "SPRITE"

Portable Radio Receiver



CONTINUOUS coverage of the medium waveband with a switched l.w. position, tuning about 1,500m for reception of the B.B.C. Light programme, is given by the Alba 55 personal portable radio receiver. The circuit employs six transistors, a crystal diode and ferrite slab aerial. Output is from a 2¼in internal speaker or an earphone via a socket provided on the plastics case.

Release date and original price: April 1962 £8 3*s*, *optional hide carrying case* 18*s* 1*d*. *Purchase tax extra. Optional earphone* 10*s* 6*d*.

TRANSISTOR ANALYSIS

Transistor voltages given in the table in col. 3 were taken from information supplied by the manufacturer. They were measured on a model 8 Avometer using the 2.5V and 10V ranges. The volume control was set at maximum output and the tuning gang to a quiet position in the l.w. section. All voltages are negative with respect to chassis (battery positive).

Transistor Table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 OC44 ..	1·1	0·95	7·0
TR2 OC45 ..	0·6	0·7	7·0
TR3 OC45 ..	0·95	1·05	7·0
TR4 OC81D ..	0·95	0·9	8·4
TR5 OC81 ..	4·4	4·5	9·0
TR6 OC81 ..	—	0·15	4·4

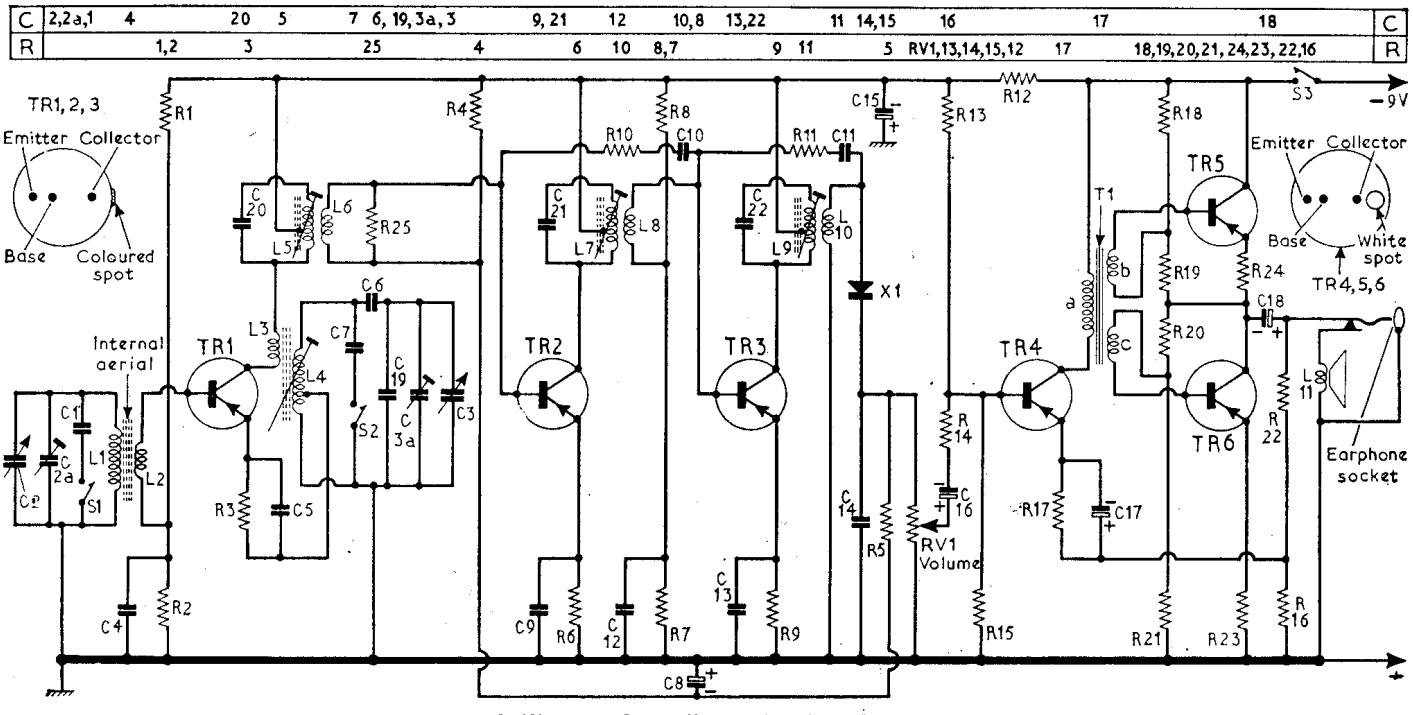
CIRCUIT DESCRIPTION

Signal input is by way of a ferrite slab on which the aerial tuning coil **L1** and coupling coil **L2** are wound to form an internal aerial. **L1** is tuned by **C2** and **C2a** on m.w. with **C1** in parallel on l.w.

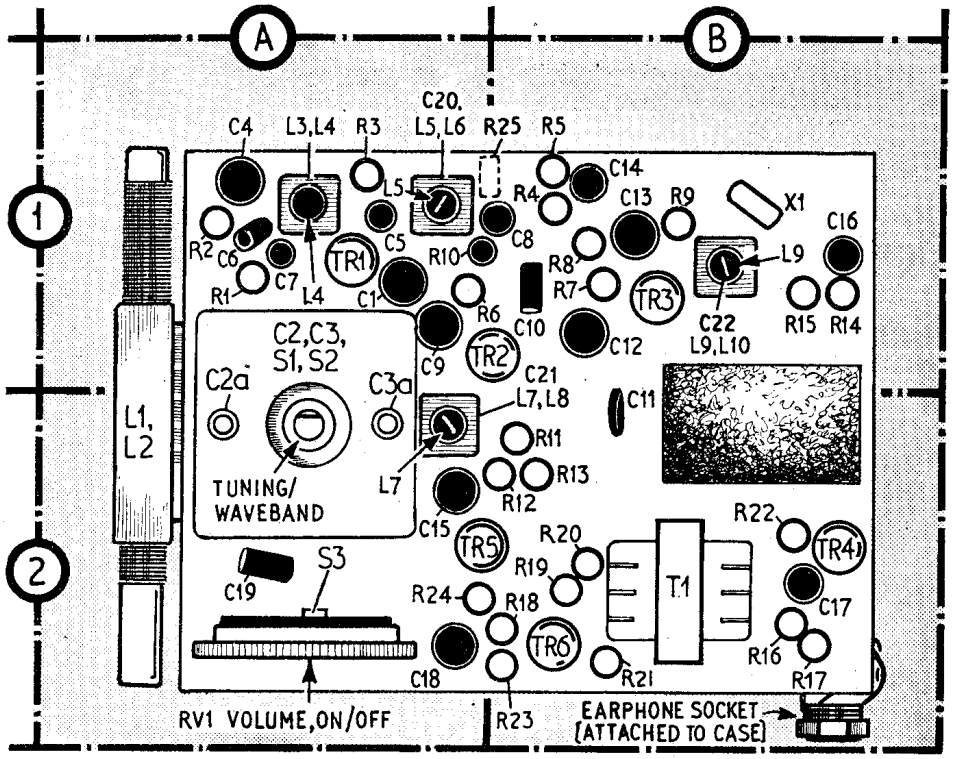
(*Continued overleaf col.* 1)

Resistors			RV1	5kΩ	A2	C22	—§	B1
R1	56kΩ	A1	***Capacitors***			***Coils***		
R2	10kΩ	A1	C1	1,350pF	A1	L1	—	A2
R3	3·9kΩ	A1	C2	190pF	A2	L2	—	A2
R4	68kΩ	B1	C2a	10pF	C3	L3	—	A1
R5	8·2kΩ	B1	C3	190pF	A2	L4	—	A1
R6	680Ω	B1	C3a	10pF	C3	L5	—	A1
R7	4·7kΩ	B1	C4	0·04μF	A1	L6	—	A1
R8	22kΩ	B1	C5	0·01μF	A1	L7	—	A2
R9	1kΩ	B1	C6	210pF	A1	L8	—	A2
R10	1·2kΩ	A1	C7	160pF	A1	L9	—	B1
R11	3·9kΩ	B2	C8	8μF	B1	L10	—	B1
R12	680Ω	B2	C9	0·04μF	A1	L11	80Ω	—
R13	47kΩ	B2	C10	56pF	B1	***Miscellaneous***		
R14	3·3kΩ	B1	C11	18pF	B2	T1 a	410Ω	B2
R15	10kΩ	B1	C12	0·04μF	B1	T1 b	36Ω	
R16	5·6Ω	B2	C13	0·04μF	B1	T1 c	36Ω	
R17	1kΩ	B2	C14	0·01μF	B1	S1, S2	—	A1
R18	2·2kΩ	B2	C15	45μF	A2	S3	—	A2
R19	75Ω	B2	C16	8μF	B1	X1	OA90	B1
R20	2·2kΩ	B2	C17	32μF	B2			
R21	75Ω	B2	C18	45μF	A2			
R22	2·7kΩ	B2	C19	5pF	A2			
R23	5·6Ω	B2	C20	—§	A1			
R24	5·6Ω	A2	C21	—§	A2			
R25†	330Ω	B1						

†*Fitted in some receivers only.*
§*No value given.*



Circuit diagram of Alba 55 "Sprite" transistorized personal portable receiver



Front view of the printed panel giving the physical lay-out of components

Circuit Description—*continued*

TR1 operates as a self-oscillating mixer, the heterodyne signal being generated by feedback from collector to emitter via **L3** and **L4**. The oscillator frequency is determined by the resonant circuit **L4, C6, C19, C3a** and variable tuning capacitor **C3** on m.w. with the additional parallel capacitor **C7** on l.w., when **C3** is in its near maximum capacitance position. Base bias for **TR1** is derived from the potential divider **R1, R2** in conjunction with **R3, C5**.

The intermediate frequency signal selected by the single tuned coupling transformer **L5/L6** is at 470kc/s and is applied to the base of **TR2**. **TR2** and **TR3** comprise a two-stage i.f. amplifier section with the associated inter-stage coupling transformer **L7/L8**. The amplified output in **TR3** is developed across primary winding **L9** connected in its collector circuit and fed via the secondary **L10** to the detector diode **X1** which operates with slight forward bias to increase its sensitivity. **R10, C10** and **R11, C11** form feedback networks to neutralize the internal capacitances of **TR2** and **TR3**.

Rectified audio signals are developed across the combined load resistor and volume control **RV1** and the positive d.c. component is fed via **R5**, decoupled by **C8**, back to **TR2** base as a.g.c. bias.

From the slider of **RV1** the audio component is capacitance coupled via **C16** to the base of the driver **TR4** and output from the driver is applied via phase-splitting transformer **T1** to the bases of the output transistors **TR5** and **TR6**. These transistors operate in a single-ended class B circuit with the high impedance speech coil **L11** employed as the load impedance. They are connected in series across the battery source and their base bias is established by the network **R18, R19, R20** and **R21** in conjunction with **R23** and **R24**. Some collector current flows in the quiescent condition to prevent cross-over distortion.

Negative feedback is applied by coupling the emitter of **TR4** to the junction of **R16** and **R22**.

CIRCUIT ALIGNMENT

Equipment Required.—An a.m. signal generator; an 0.1μF capacitor; a narrow-bladed screwdriver-type trimming tool; an r.f. coupling loop and a dummy tuning scale for alignment of the aerial and oscillator circuits. The dummy tuning scale may be constructed by tracing the scale on to a piece of paper and pasting the paper on to stiff card.

1.—Remove the printed circuit panel from the case as described under "Dismantling." Rotate the tuning gang to a quiet spot at the l.f. end of the medium waveband and set the volume control at maximum output.

2.—Connect the signal generator via the 0.1μF capacitor to the base of **TR1** (see sketch at the foot of page). Feed in a 30 per cent modulated 470 kc/s signal and adjust the cores of **L9, L7** and **L5** in that order for maximum audio output, and repeat until there is no further improvement.

3.—Fix the dummy tuning scale to the tuning gang by screwing it to one of the fixing holes. Place the coupling loop about a foot away from the receiver in the same axis as the ferrite slab aerial coil and connect the signal generator across the ends of the loop.

4.—Tune receiver to the 500m mark, feed in a 600 kc/s signal and adjust the core of **L4** for maximum output. Then slide **L1** along the ferrite slab for maximum output.

5.—Tune receiver to the 200m mark, feed in a 1,500 kc/s signal and adjust **C3a** and **C2a** for maximum output. Repeat for maximum output with correct calibration at both points.

6.—Rotate the tuning gang to the 1,500m section and check that the B.B.C. Light programme is being received.

GENERAL NOTES

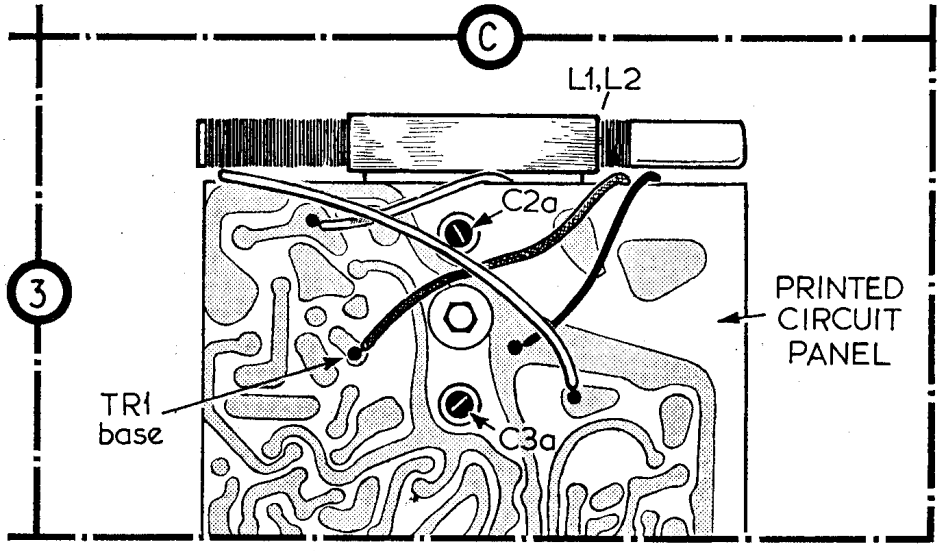
Dismantling.—Two slots are located in the bottom end of the case. Inserting a coin in the rear slot and twisting, opens the hinged cover of the battery compartment. Using the same method with the forward slot releases the rear section of the case allowing it to be removed to give access to the foil side of the printed panel.

To completely remove the panel, first pull off the tuning knob. On some models this will expose a countersunk screw which should be removed.

Next remove the Phillips head screw which secures the printed panel to a pillar in the case moulding.

Ease the panel out of the two spring clips at the speaker end of the casing when it can be withdrawn to the extent of the speaker leads.

Battery.—9V Ever-Ready PP3 or equivalent.



A section of the foil side of the panel showing the signal injection point for alignment and adjustments to **C2a** *and* **C3a**

Printed in Great Britain by Cornwall Press, Ltd., Paris Garden, Stamford Street, London, S.E.1, and Published by Iliffe Electrical Publications, Ltd., Dorset House, Stamford Street, London, S.E.1.