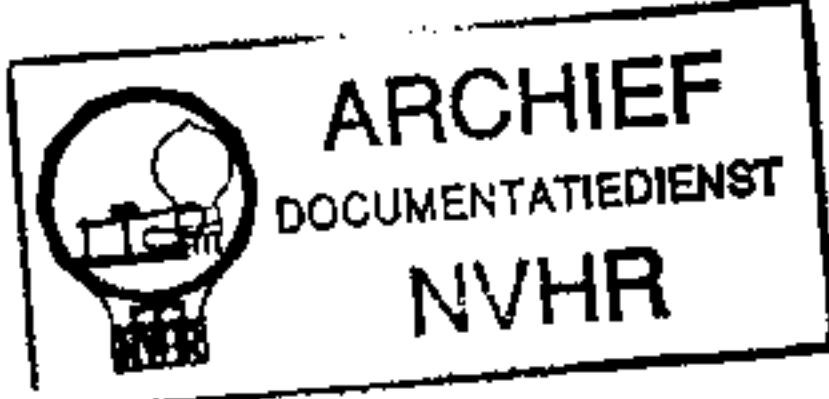
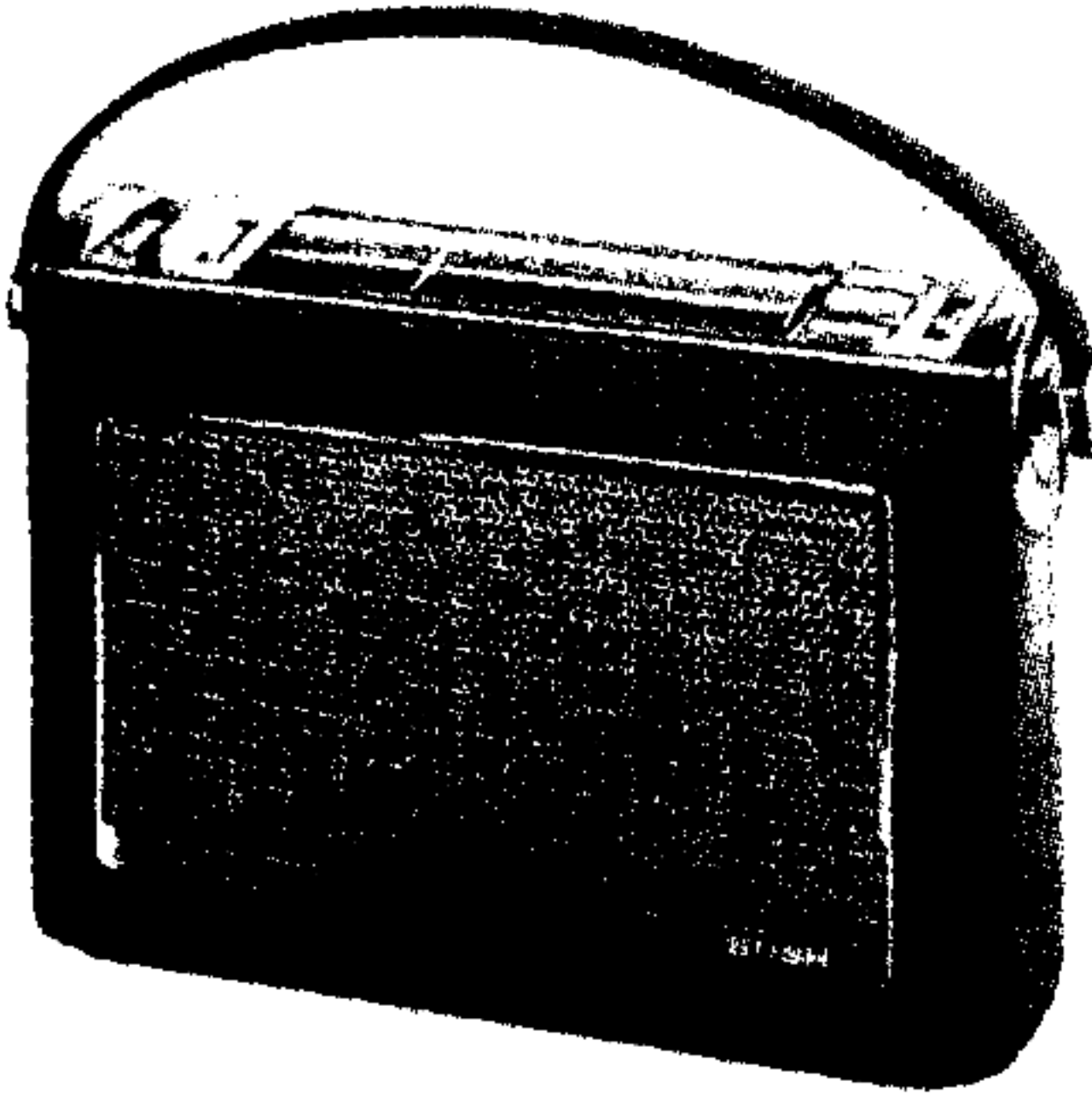


Ned. Ver. v. Historie v/d Radio



BUSH TR130

Transistor Portable Radio Receiver



COVERING medium and long wavebands and pre-tuned selection of Radio Luxembourg (208m), Bush TR130 is a battery operated portable radio receiver. A press-button operated waveband switch and manual tone control are featured.

Waveband ranges are 187-570m (m.w.) and 1,070-1,900m (l.w.) with reception on both bands by means of an internal ferrite rod aerial. A fitted socket permits the connection of a car type external aerial, and a second socket enables the output to be fed to an earphone or external loudspeaker.

CIRCUIT ALIGNMENT

Alignment can be carried out with the chassis left in its case, but the back cover should be removed.

During alignment the signal input level should be adjusted to maintain a receiver output of 50mW (20mW if the loudspeaker is left in circuit). If an output meter is connected with the loudspeaker still in circuit, care should be taken to ensure that the power output from the receiver does not rise to a level sufficiently high to damage the output transistors (70mW). For r.f. alignment under conditions of interference, the receiver may be temporarily desensitised by connecting an 8.2kΩ resistor between the junction of R7 and R11 and chassis.

Equipment Required.—An a.m. signal generator modulated 30 per cent at 400c/s; an

(Continued overleaf, col. 1)

Transistor Table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 AF117	0.95	1.1	6.65
TR2 AF117	0.6	0.85	7.15
TR3 AF117	0.9	1.2	7.0
TR4 OC71	0.75	0.8	2.7
TR5 OC81D	1.05	1.1	8.65
TR6 OC81	0.02	0.16	9.0
TR7 OC81	0.02	0.16	9.0

Measured on a model 8 Avometer with no signal input and the volume control set at zero

Resistors		
R1	47Ω	B2
R2	33kΩ	B2
R3	6.8kΩ	B2
R4	1.5kΩ	B2
R5	330Ω	B2
R6	330Ω	C1
R7	120kΩ	B2
R8	150kΩ	C1
R9	680Ω	B2
R10	22kΩ	B2
R11	18kΩ	B2
R12	4.7kΩ	B2
R13	330Ω	B2
R14	1kΩ	B2
R15	560Ω	B2
R16	1.5kΩ	B2
R17	82kΩ	B2
R18	15kΩ	A2
R19	680Ω	A2
R20	5.6kΩ	A2
R21	68Ω	A2
R22	1kΩ	A2
R23	39kΩ	A2
R24	8.2kΩ	A2
R25	470Ω	A2
R26	56Ω	A2
R27	270Ω	A2
R28	3.9kΩ	A2
R29	150Ω	A2
R30	3.3Ω	A2
R31	10kΩ	A2
R32	150Ω	A2
RV1	10kΩ	A1
RV2	5kΩ	A2
RV3	5kΩ	A2

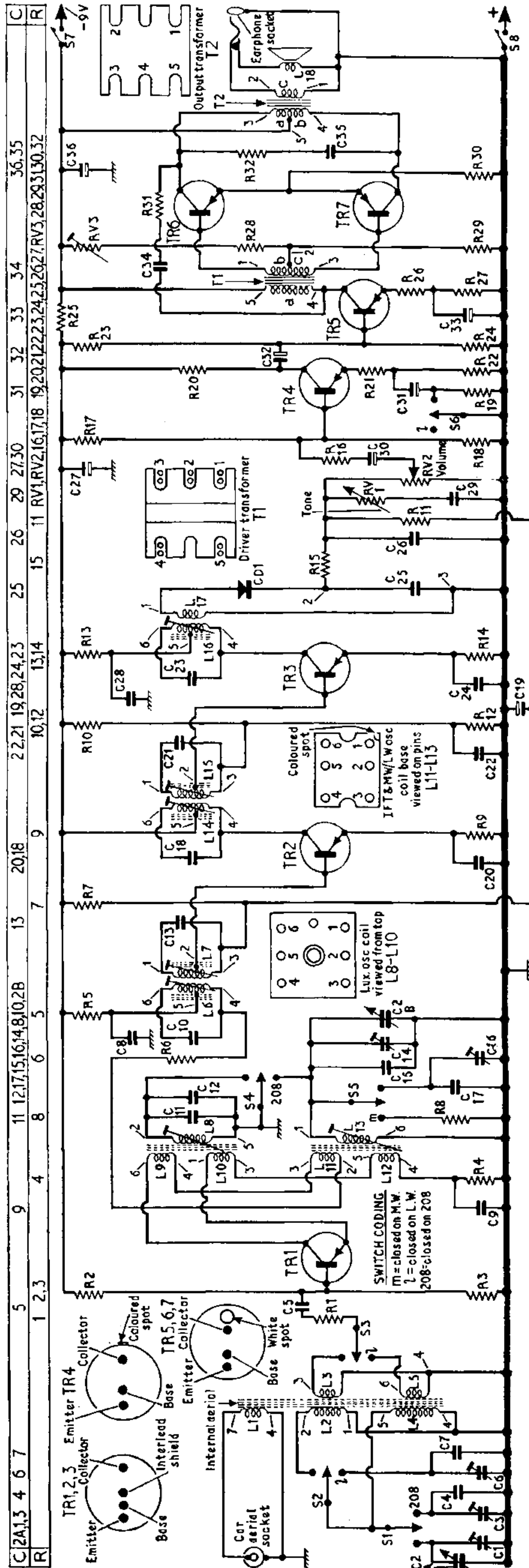
Capacitors		
C1	30pF	B1
C2A	343pF	B1
C2B	177pF	B1
C3	25pF	C1
C4	18pF	C1
C5	0.01μF	B2
C6	30pF	B1
C7	82pF	B1
C8	0.1μF	B2
C9	0.022μF	B2
C10	200pF	C2
C11	47pF	B2
C12	270pF	B2
C13	200pF	C2
C14	30pF	B1
C15	10pF	B2
C16	30pF	B1
C17	310pF	B1
C18	200pF	B2
C19	8μF	B2
C20	0.1μF	B2
C21	200pF	B2
C22	0.1μF	B2
C23	200pF	A2
C24	0.1μF	B2
C25	0.01μF	A2
C26	0.01μF	B2
C27	100μF	B2
C28	0.1μF	B2
C29	0.47μF	A2
C30	8μF	B2
C31	120μF	A2
C32	8μF	A2
C33	100μF	A2
C34, C35	0.1μF	A2
C36	160μF	A2

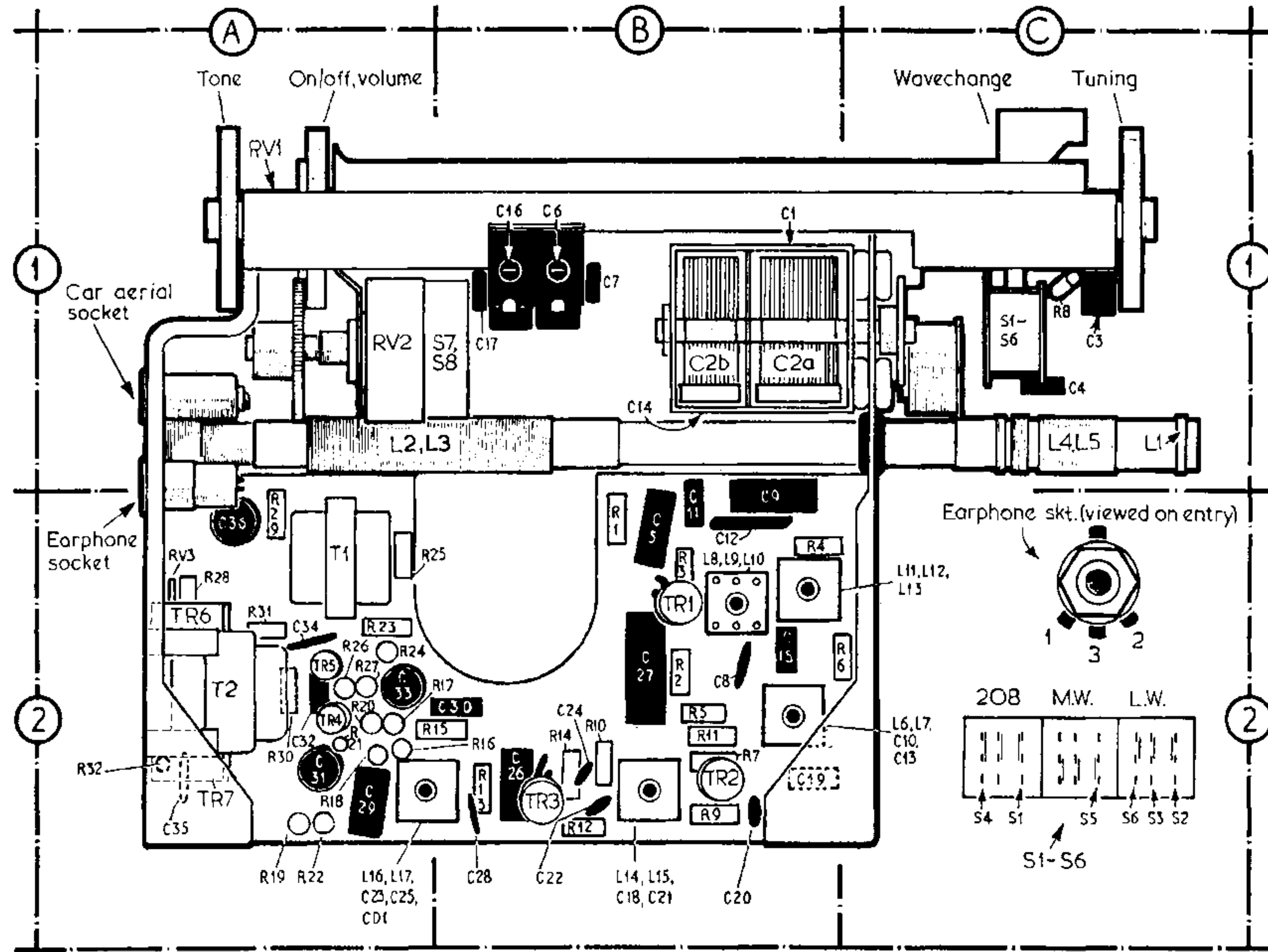
Coils*		
L1	2.5Ω	C1
L2, L3	—	A1
L4	11.0	C1
L5	1.4	C1
L6, L7	8.5	C2
L8	1.5	B2
L9	—	B2
L10	—	B2
L11, L12	—	C2
L13	3.3	C2
L14, L15	8.5	B2
L16	8.8	A2
L17	1.5	A2
L18	15.0	†

Miscellaneous		
CD1	OA90	A2
S1-S6	—	C2
S7, S8	—	A1

Transformers*			
T1	a	100.0	A2
	b	45.0	
	c	45.0	
T2	a	2.5	A2
	b	2.5	
	c	2.5	
	c	1.1	

* Approximate d.c. resistance in ohms.
† Loudspeaker.





Front view of the chassis giving component locations. Waveband switch connections, shown in location reference C2, are drawn as seen from the right-hand side of the chassis with the m.w. button depressed. Connections to coils and transformers are provided on the circuit diagram overleaf

Circuit Alignment—continued

audio output meter with a 0-100mW range and an impedance to match 15Ω; one 10pF capacitor and one 0.1μF capacitor, and a non-metallic trimming tool.

- 1.—Switch receiver to m.w. and tune to about 300m. Connect to signal generator via a 0.1μF capacitor to the junction of R1 and S3 and switch on for about 15 minutes before alignment is commenced. Connect the audio output meter in place of the loudspeaker. A convenient method is to connect the meter via the earphone socket using the correct type of plug.
- 2.—Turn the volume control to maximum and feed in a 470kc/s 30 per cent modulated signal. Adjust the cores of L16, L15, L14, L7 and L6 in that order once only for maximum audio output. Note: the outer tuning peak is the correct one for these adjustments.
- 3.—Fully mesh the tuning gang and check that the cursor lines up with the datum mark at the l.f. end of the tuning scale. Connect the signal generator via a 10pF capacitor to the car aerial socket.
- 4.—Tune receiver to 500m. Feed in a 600kc/s signal and adjust the core of L13 for maximum output.
- 5.—Tune receiver to 200m. Feed in a 1,500 kc/s signal and adjust C14 for maximum output.
- 6.—Repeat operations 4 and 5 and check calibration at both points.
- 7.—Switch receiver to l.w. and tune to 1,400m. Feed in a 214kc/s signal and adjust C16 for maximum output.
- 8.—Switch receiver to "208" and feed in a 1,439kc/s signal, modulated 80 per cent at 5kc/s, at a level of 1mV. Adjust the core of L8 for minimum output. As the core is screwed through the correct tuning point, the output will rise on either side of minimum. Finally check the tuning against the broadcast signal from "Radio Luxembourg".
- 9.—Switch receiver to m.w. and tune to 500m.

Feed in a 600kc/s signal and adjust L2 for maximum output.

- 10.—Tune receiver to 200m. Feed in a 1,500kc/s signal and adjust C1 for maximum output.
- 11.—Repeat operations 9 and 10 for optimum gain at both points.
- 12.—Switch receiver to l.w. and tune to 1,400m. Feed in a 214kc/s signal and adjust C6 for maximum output.
- 13.—Switch receiver to "208". Feed in a 1,439kc/s signal and adjust C3 for maximum output.

Ferrite Rod Aerial Coils.

The ferrite rod aerial coils are unlikely to require adjustment but, if necessary, L2 may be adjusted for maximum output, as required in operation 9, by sliding the former along the ferrite rod. L.w. coil L4 should not be moved.

If the ferrite aerial rod is replaced, the coils should be set as follows with the receiver in its cabinet.

- 1.—Ensure that the original sleeving is

retained between the formers and the rod, and set the m.w. coil former $\frac{1}{8}$ in from its end of the rod and the l.w. former 1in from the other end of the rod.

- 2.—Switch receiver to l.w. and tune to 1,700m. Feed in a 176kc/s modulated signal at the car aerial socket and adjust L4 for maximum output.
- 3.—Tune receiver to 1,200m. Feed in a 250kc/s signal and adjust C6 for maximum output.
- 4.—Carry out alignment of the m.w. coil L2 as given previously in operations 9 and 10. Finally seal the coil formers with wax.

GENERAL NOTES

Dismantling.—To remove the chassis from the case, first pull off the case bottom after turning the two fasteners. Remove and disconnect the battery.

Place the receiver with the speaker grill downwards, separate the two halves of the case moulding, and lift off the top half.

Unscrew two 4BA nuts retaining the chassis at the bottom edge and loosen the two screws securing the top edge to the scale surround, then lift out the chassis to the extent of the speaker leads.

Output Balance Adjustment.—The replacement of components in the output stage may necessitate resetting the output balance by adjustment of preset resistor RV3.

Connect the receiver to a 9V power supply and connect a model 8 Avometer across R30 (positive terminal to chassis). Adjust RV3 for a meter reading of 23mV, corresponding to a current of 7mA through R30.

Drive Cord Replacement.—A 36in length of new cord is required as replacement. Remove the cursor, scale backing plate, tuning capstan and the two halves of the nylon bearing. Fit the new cord by first looping the mid-point of the cord round the drum spigot. Before replacing the capstan, assemble the cord as shown in the sketch, finally tying off the ends with an eyelet while maintaining tension against the tension pulley. Refit the cursor carriage, backing plate and cursor, then place the chassis in the case and adjust the cursor to line up with the datum marks on the right of the scale with the tuning gang fully meshed.

Battery.—9V Ever Ready PP9 or any non-metal cased equivalent.

