

EVER READY "SKY LEADER"

Also Covering the Berec "Demon"

PRESS-BUTTON wavechange is employed in the Ever Ready Sky Leader, six-transistor two-band portable receiver in a leather-coloured carrying case with a removable shoulder-strap. Waveband ranges are 187-555m and 1,110-1,870m. A similar chassis is employed in the Berec "Demon," and that receiver is also covered here, but this Service Sheet was prepared from a "Sky Leader."

Release date and original price, both models: May 1958; £15 8s 5d. Batteries and purchase tax extra.

CIRCUIT DESCRIPTION

Signal input from internal ferrite rod aerial is developed across L2 (M.W.) and L3 (L.W.) and coupled via low impedance coils L4 and L5 to base of first transistor TR1, which operates as self-oscillating frequency changer. A socket is provided for the connection of

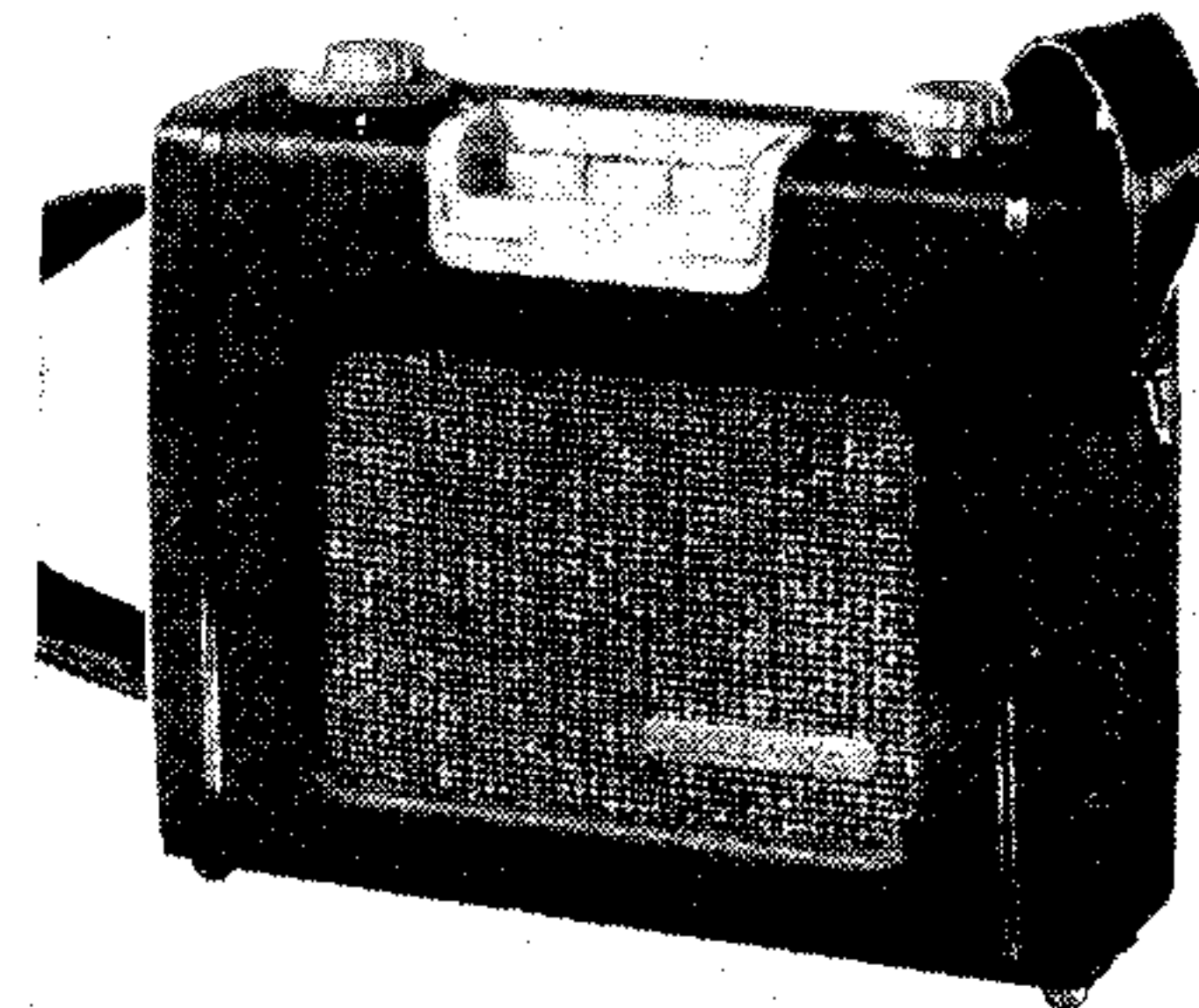
a standard car aerial, which is coupled to the ferrite rod via L1.

The oscillator circuit is tuned by L8, C9, with trimmers C8 (M.W.) and C6, C7 (L.W.). Reaction coupling between collector and emitter by L6 and L7. Intermediate frequency is tuned in collector circuit by primary of I.F. transformer L9, L10 and passed to base of TR2, which with TR3 forms the I.F. amplifier, with tuned-primary inter valve and output transformers L11, L12 and L13, L14. Neutralizing by feed-back network R10, C17 and R6, C13.

Intermediate frequency 470kc/s.

Audic frequency output from diode detector X1 is developed across volume control R12 and passed via electrolytic capacitor C22 to A.F. amplifier TR4 which drives the class B push-pull output stage comprising TR5, TR6.

Base bias stability is achieved by using potential dividers and emitter bias resistors,



Appearance of the Ever Ready "Sky Leader".

suitably by-passed, for all transistors. The bias potential divider for TR2 embraces the volume control in addition to R4, R11 so that the positive-going D.C. component in R12 which results from signal rectification is applied to TR2 base, reducing its gain on strong signals and thus providing A.G.C.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch receiver to M.W., and turn gang to maximum capacitance. Turn volume control to maximum. Connect an output meter across the secondary of T2. Disconnect the earthing side of C4 from chassis, and connect signal generator output to the free end via a 5.6Ω resistor, and to chassis.

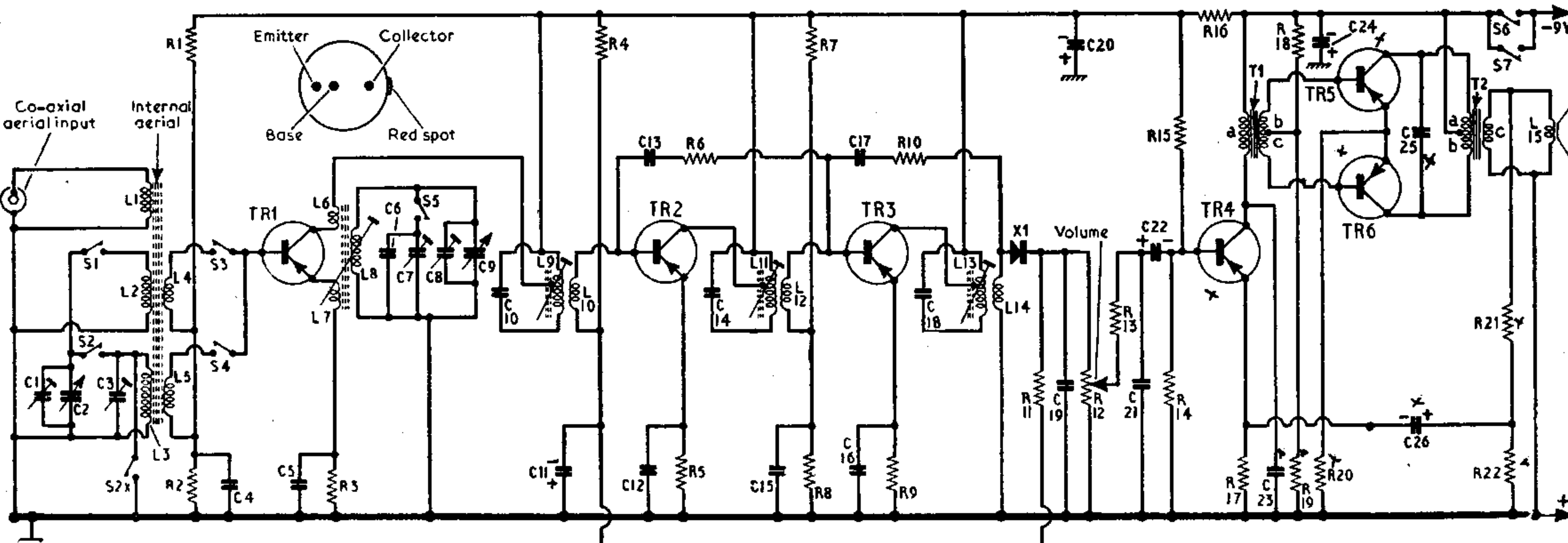
Feed in a modulated 470kc/s signal and adjust the cores of L9, L11 and L13, using a non-metallic trimming tool, for maximum output, reducing the signal generator output as the signals come into line to avoid A.G.C. action. Then repeat this operation, keeping input signal as low as possible.

Very little adjustment should have been necessary unless some components have been replaced, but if more drastic treatment is rendered necessary the cores should be unscrewed some distance before making the adjustments. They should then be made as

(Continued overleaf, col. 1)

COMPONENT VALUES AND LOCATIONS

Resistors			Capacitors			Coils**			Miscellaneous**		
R1	56kΩ	B2	C1	20pF	A1	L1	3.5	B1	T1	a	500.0
R2	10kΩ*	B1	C2	157.2pF	A1	L2	1.5	A1	T1	b	50.0
R3	3.9kΩ*	F5	C3	60pF	B2	L3	18.0	C1	T1	c	50.0
R4	68kΩ	E5	C4	0.1μF	B1	L4	—	B1	T2	a	2,900.0
R5	680Ω	E5	C5	0.01μF	F5	L5	1.5	C1	T2	b	2,900.0
R6	1.2kΩ	E5				L6	0.5	A2	T2	c	0.2
R7	22kΩ	E5				L7	—	A2	X1		OA70
R8	4.7kΩ	E5							S1-S5		—
R9	1kΩ	E5							S6		—
R10	3.9kΩ	E5							S7		—
R11	8.2kΩ	E5									
R12	5kΩ	C1									
R13	1.2kΩ	D5									
R14	10kΩ	D5									
R15	33kΩ	D5									
R16	680Ω	D5									
R17	470Ω	D5									
R18	4.7kΩ*	D5									
R19	100Ω*	D5									
R20	4.7Ω	C2									
R21	680Ω	C3									
R22	10Ω	C3									



Circuit diagram of the Ever Ready "Sky Leader" together with a diagram of the transistor connections.

Circuit Alignment—continued

before, to the first peak reached as the cores are screwed in.

I.F. Sensitivity.—If a 470kc/s signal, modulated 30 per cent, is now fed in via C4, not more than 150µV should be needed to produce an output of 50mW.

I.F. Bandwidth.—Under the same conditions as for I.F. sensitivity, the bandwidth should be between 7kc/s and 14kc/s for a 6dB loss.

Disconnect signal generator and reconnect the free lead of C4 to chassis. Open gang half way, connect signal generator output to L1, and readjust L9 for maximum output.

R.F. and Oscillator Stages.—Couple the signal by means of a coil of wire connected across the signal generator output. The coil should contain 20 turns of 20-24 S.W.G. wire wound with a 4in diameter and 2½in long. The coil should be placed in the same plane as and parallel to the coils on the ferrite rod, at a distance of about two feet, and it should not be allowed to move once its position is fixed, so as to permit sensitivity measurements.

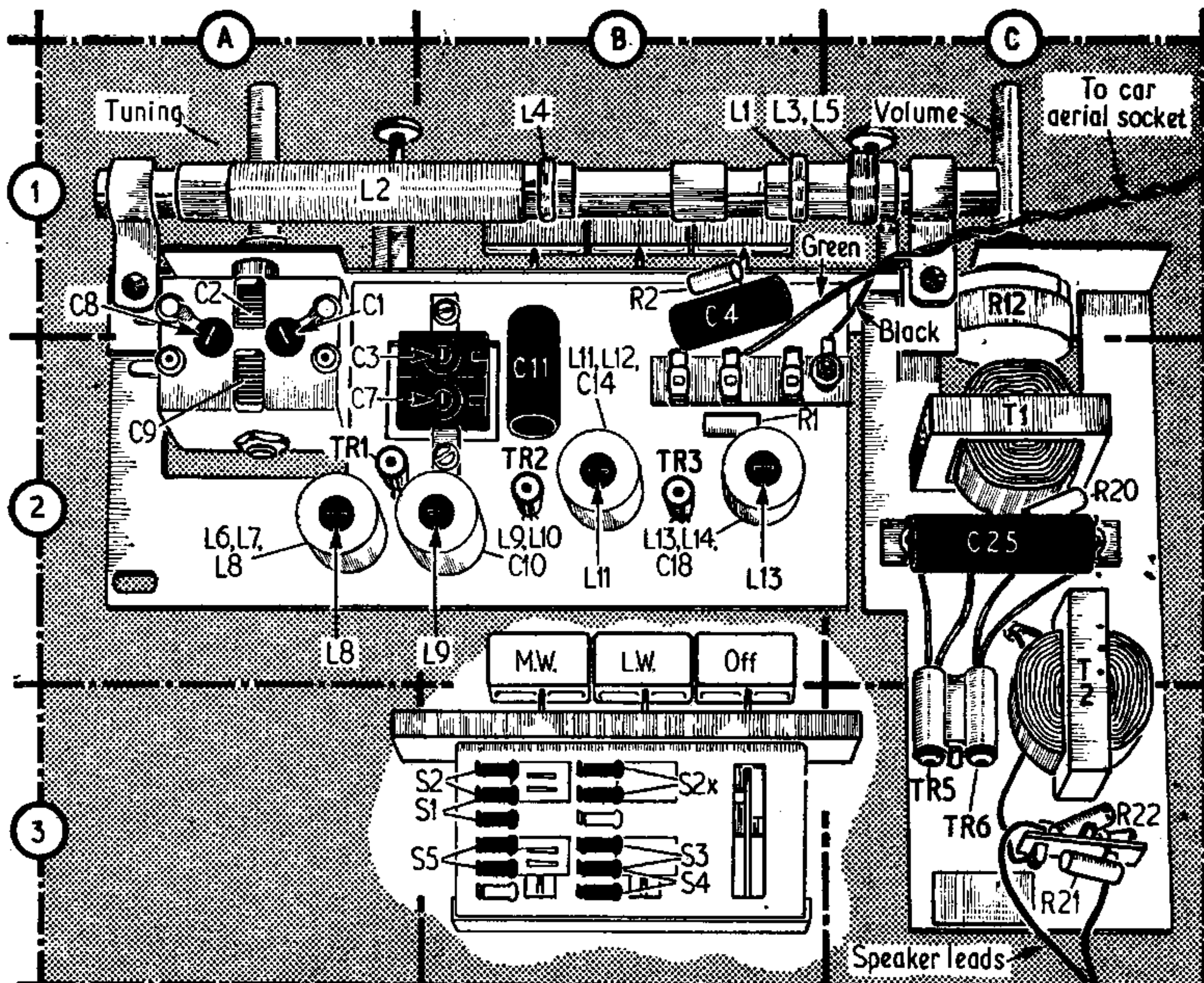
M.W.—Tune receiver to 500m (5 on scale), feed in a 500m (600kc/s) signal, and adjust the core of L8 for maximum output. Tune to 230m (mark on scale), feed in a 230m (1,304kc/s) signal, and adjust C8, then C1, for maximum output. Return to 500m, feed in a 600kc/s signal, and readjust L8 for maximum output while rocking the gang for optimum results. Then repeat the adjustments at 230m.

L.W.—Switch receiver to L.W., set the gang to minimum capacitance, feed in a 270kc/s signal, and adjust C7 for maximum output. Tune receiver to 1,400m (mark on scale between 13 and 15), feed in a 214kc/s signal, and adjust C3 for maximum output.

MODIFICATIONS

There have been three versions, or runs, of the chassis. The first up to serial No. SLR 005867, the second to SLR 028309, and the third from SLR 028310 onwards. Our sample receiver was of the latest chassis, and this Service Sheet is based on it.

The differences in the immediately preceding chassis are as follows: TR4 was an OC71, and TR5, TR6 were OC72s; R21 was 470Ω, R18 was 5.1kΩ, R20 was 10Ω and C25 was



Rear view of the chassis with, below it, a view of the hidden side of the press-button switch unit showing contacts S1-S5. Transistor TR4 is located on the other side of the audio chassis.

0.04. These differences were introduced to increase the output from about 200mW to some 300mW.

In the earliest chassis the aerial circuit was different, L2 and L3 being connected in series with a short-circuiting switch across L3, on M.W. In addition, most of the resistors were rated at ±5 per cent tolerance. Exceptions were R13, R22 (±10 per cent) and R12 (±20 per cent).

In some early chassis plug-in transistors were used, and it should be borne in mind then that the collector lead was actually sol-

dered to its socket tag, and must be unsoldered before it can be removed.

TRANSISTOR ANALYSIS

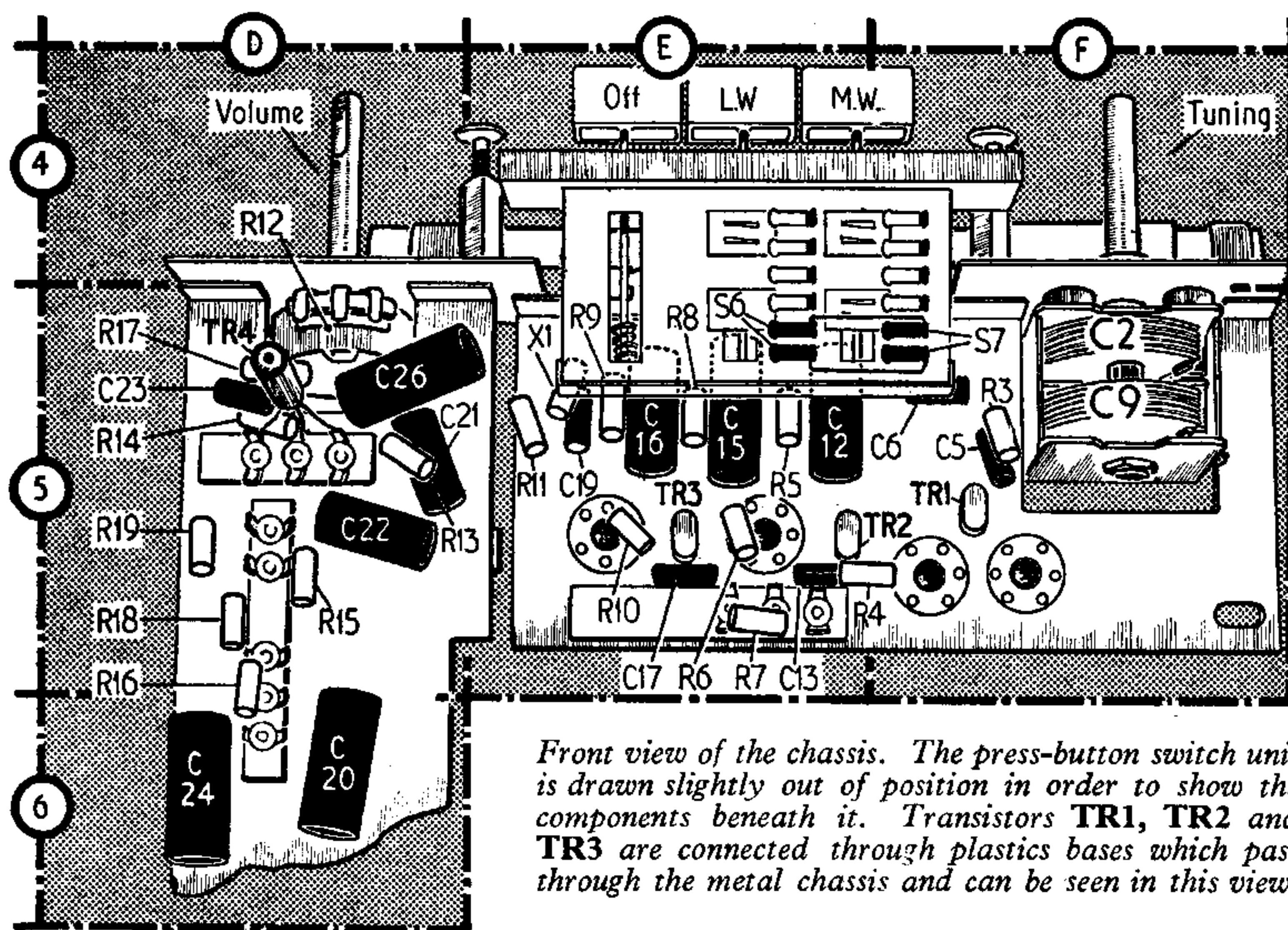
Voltages given in the table below were derived from the manufacturers' information. They were measured with an electronic voltmeter, chassis being the positive connection throughout. Tolerances are given as ±10 per cent, and misleading indications are likely to result if a meter of less than 20,000 ohms per volt is used. Total current under no-signal conditions is 8.9mA, with 50mW output it is 26mA, and with 200mW output it is 45mA.

Transistor	Collector (V)	Base (V)	Emitter (V)
TR1 OC44	7.2	1.08	0.95
TR2 OC45	7.2	0.77	0.6
TR3 OC45	7.16	1.19	1.025
TR4 OC78D	7.87	1.4	1.23
TR5 OC78	†	0.17	0.03
TR6 OC78	†	0.17	0.03

† Matched pair; total collector current = 2.47mA.

DISMANTLING

- Remove the volume control knob (pull-off);
- remove the (small) fine tuning knob (pull-off), and then the coarse tuning knob beneath it which carries the scale, taking care that the whole of the knob, together with its boss or sleeve is removed in one piece. The sleeve extends about an inch into the cabinet and it may easily be broken off. The best method is to align the flat on the fine tuning spindle, with the flat on the ring which surrounds the hole in the centre of the scale disc, so that the flats of the concentric spindles are in line, then lever the knob off from the bottom of the sleeve with a screwdriver.
- Unsolder the two leads from the car aerial socket, and two more from the speaker;
- remove the two ornamental-headed screws from the top of the case, between scale and control knobs;
- remove the wood-screw holding the bottom right-hand corner of the chassis to the case (viewed from rear) and the self-tapping screw holding the bottom left hand corner.



Front view of the chassis. The press-button switch unit is drawn slightly out of position in order to show the components beneath it. Transistors TR1, TR2 and TR3 are connected through plastics bases which pass through the metal chassis and can be seen in this view.