"TRADER" SERVICE SHEET

1437

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 8*s* 5*d. Batteries and purchase tax extra.*

CIRCUIT DESCRIPTION

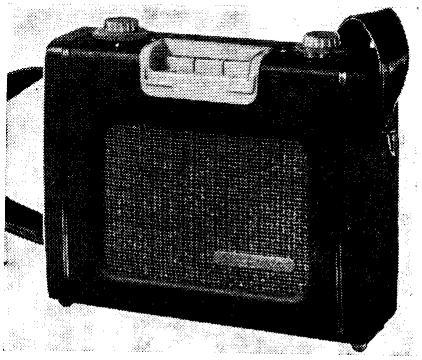
Signal input from internal ferrite rod aerial is developed across **L2** (M.W.) and **L3** (L.W.) and coupled via low impedance coils **L4** and **L5** to base of first transistor **TR1**, which operates as self-oscillating frequency changer. A socket is provided for the connection of a standard car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

Audio 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, 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.



Appearance of the Ever Ready "Sky Leader".

COMPONENT VALUES AND LOCATIONS

Resistors		
R1	56kΩ	B2
R2	10kΩ*	B1
R3	3·9kΩ*	F5
R4	68kΩ	E5
R5	680Ω	E5
R6	1·2kΩ	E5
R7	22kΩ	E5
R8	4·7kΩ	E5
R9	1kΩ	E5
R10	3·9kΩ	E5
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
Capacitors		
C1	20pF	A1
C2	157·2pF	A1
C3	60pF	B2
C4	0·1μF	B1
C5	0·01μF	F5
C6	200pF§	F5
C7	60pF	B2
C8	20pF	A1
C9	110·6pF	A2
C10	250pF†	B2
C11	8μF	B2
C12	0·1μF	E5
C13	56pF†	E5
C14	250pF†	B2
C15	0·1μF	E5
C16	0·1μF	E5
C17	18pF‡	E5
C18	250pF†	B2
C19	0·01μF	E5
C20	100μF	D6
C21	0·04μF	D5
C22	8μF	D5
C23	0·002μF	D5
C24	100μF	D6
C25	0·1μF	C2
C26	100μF	D5
Coils**		
L1	3·5	B1
L2	1·5	A1
L3	18·0	C1
L4	—	B1
L5	1·5	C1
L6	0·5	A2
L7	—	A2
L8	2·5	A2
L9	—	B2
L10	—	B2
L11	—	B2
L12	—	B2
L13	—	B2
L14	0·5	B2
L15	2·5	—
Miscellaneous**		
T1 a	500·0	C2
T1 b	50·0	C2
T1 c	50·0	C2
T2 a	2,900·0	C3
T2 b	2,900·0	C3
T2 c	0·2	C3
X1	OA70	E5
S1-S5	—	B3
S6	—	E5
S7	—	F5

***Approximate D.C. resistance in ohms.*

**±5 per cent.* †±2 *per cent.* ‡±½*pF.* §±10 *per cent.*

Note: *Unless otherwise indicated, all fixed resistors are rated at* ±10 *per cent.*

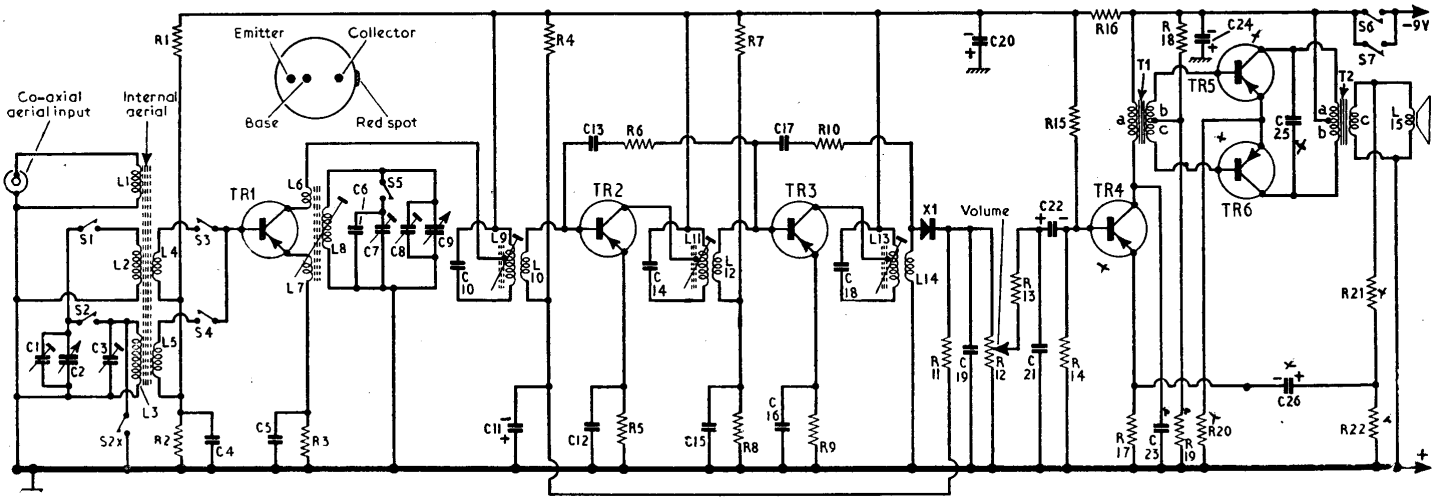
CIRCUIT ALIGNMENT

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)



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.

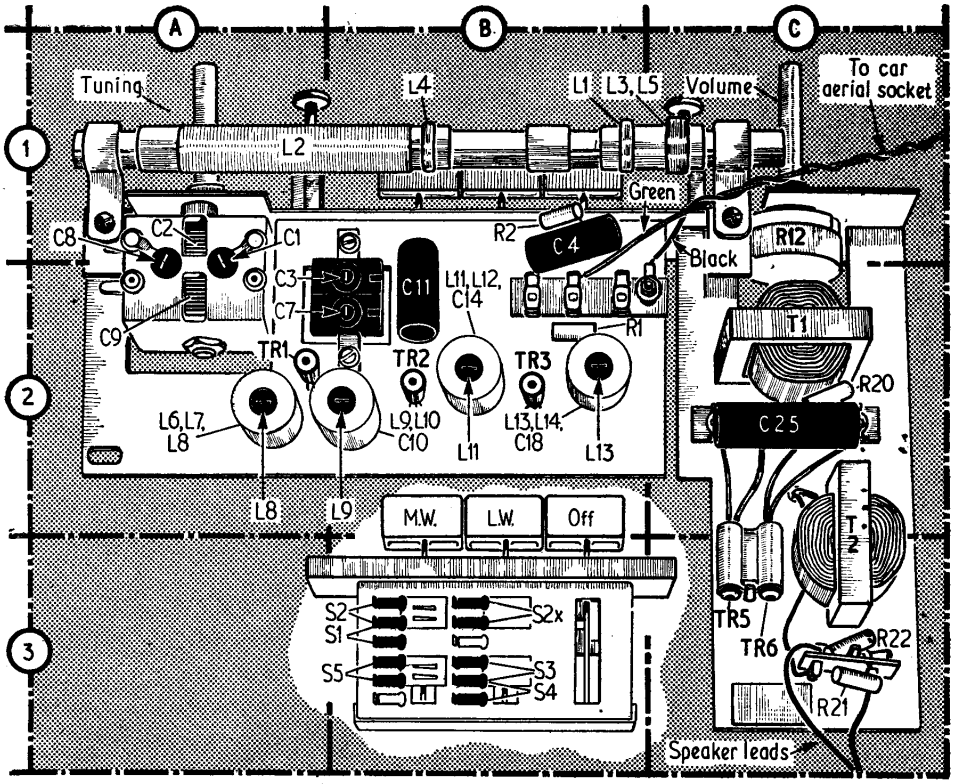
I.F. Bandwidth.—Under the same conditions as for I.F. sensitivity, the bandwidth should be between 7kc/s and 14kc/s for a 6dB loss.

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 2⅜in 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.



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.*

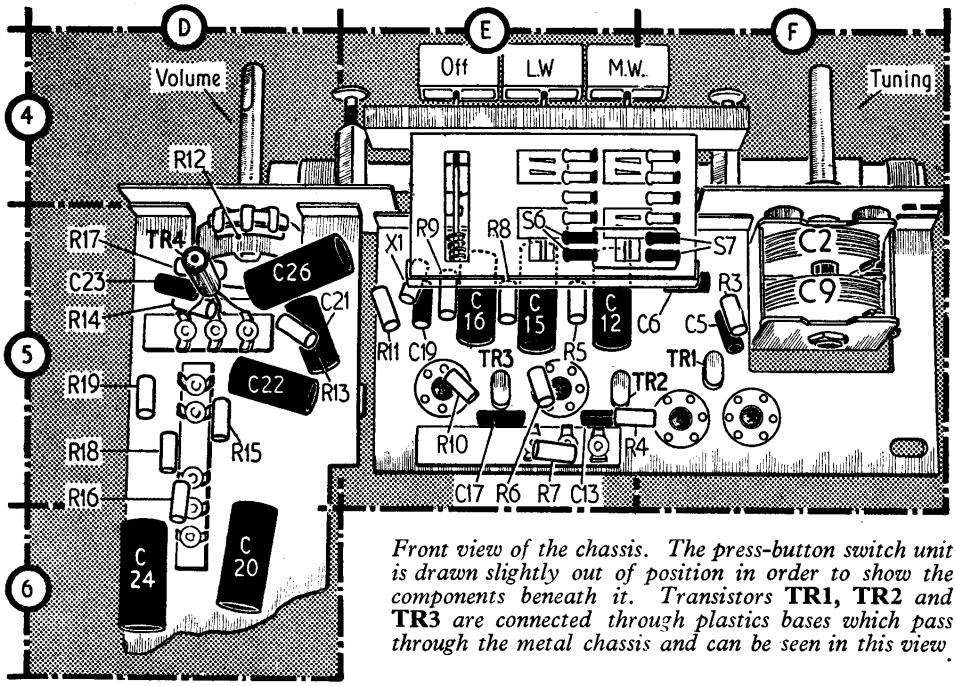
MODIFICATIONS

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 0.04. These differences were introduced to increase the output from about 200mW to 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 soldered to its socket tag, and must be unsoldered before it can be removed.



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.*

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.

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