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"TRADER" SERVICE SHEET

1678

DECCA TP99

Portable Transistor Radio Receiver

FACILITIES for earphone listening and feeding radio programmes to a tape recorder are provided on the Decca TP99 six-transistor (plus two diodes) portable radio receiver. A third socket allows the connection of a car type aerial to supplement the internal ferrite rod aerial.

The receiver comprises a printed circuit panel mounted on a metal chassis frame, and the whole can be removed from the case as a single unit, including external sockets, for servicing.

Waveband ranges are 187.3m—576.9m (m.w.) and 1,105—2,000m (l.w.). Waveband and on/off switching is by means of a press-button unit.

Release date and original price: May 1964 £13 11s 5d. Purchase tax extra.

TRANSISTOR ANALYSIS

Transistor voltages given in the table in col. 3 were taken from information supplied by the manufacturers. They are negative with respect to battery positive.

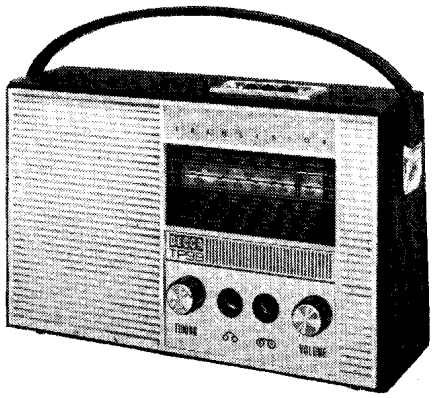
CIRCUIT DESCRIPTION

Signals induced in the ferrite rod aerial coils **L1** (l.w.) and **L3** (m.w.) are coupled via **S4** and **S5** to the base of **TR1** which operates as a self-oscillating mixer stage. Waveband switches are designated *m* or *l* to indicate the waveband on which they close. Aerial tuning components **C3, C4** and **C7** via **CH1** are common to both medium and long wavebands and are connected appropriately by **S1** and **S2**.

(*Continued overleaf, col.* 1)

Transistor Table

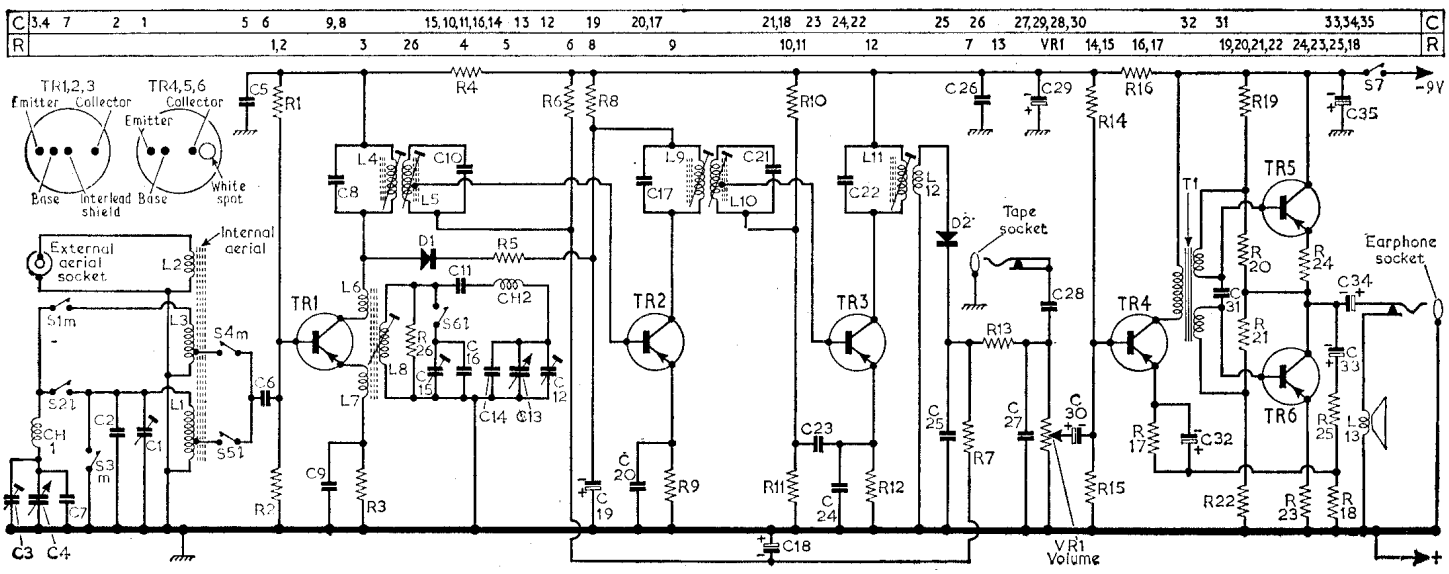
Transistor		Emitter (V)	Base (V)	Collector (V)
TR1	AF117	1·0	1·05	6·4
TR2	AF117	0·55	0·75	5·0
TR3	AF117	1·2	1·4	7·0
TR4	OC81D	1·45	1·3	8·5
TR5	OC81	4·5	4·6	9·0
TR6	OC81	0·13	0·14	4·4



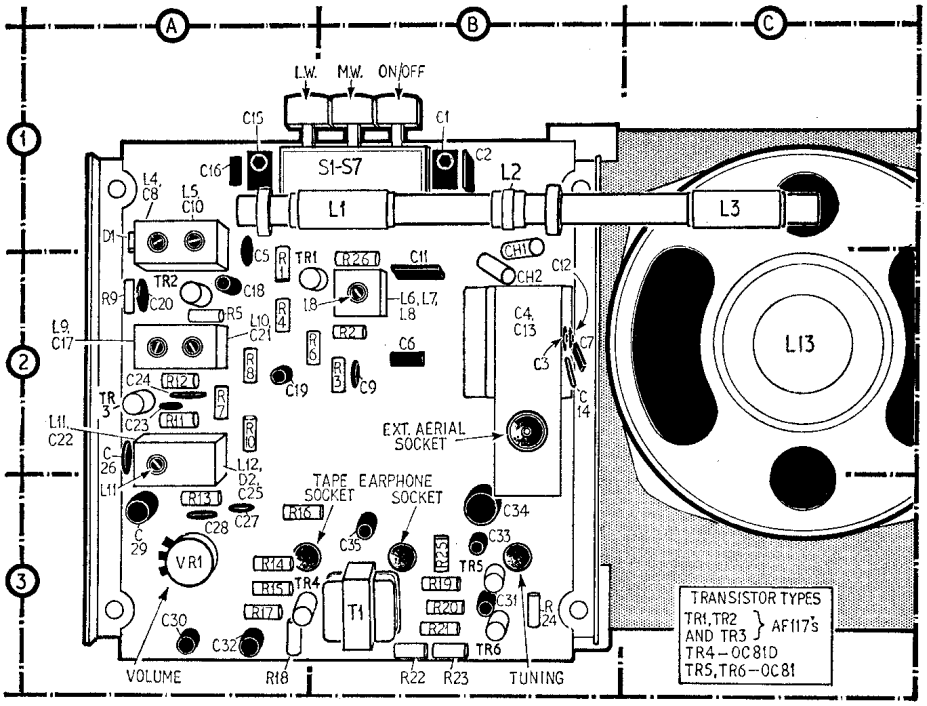
Appearance of the Decca TP99

COMPONENT VALUES AND LOCATIONS

Resistors		
R1	33kΩ	A2
R2	6·8kΩ	B2
R3	1kΩ	B2
R4	330Ω	A2
R5	680Ω	A2
R6	56kΩ	A2
R7	6·8kΩ	A2
R8	2·2kΩ	A2
R9	680Ω	A2
R10	18kΩ	A2
R11	4·7kΩ	A2
R12	680Ω	A2
R13	390Ω	A3
R14	56kΩ	A3
R15	18kΩ	A3
R16	680Ω	A3
R17	470Ω	A3
R18	2·2Ω	A3
R19	2·2kΩ	B3
R20	100Ω	B3
R21	2·2kΩ	B3
R22	100Ω	B3
R23	2·2Ω	B3
R24	2·2Ω	B3
R25	330Ω	B3
R26	470kΩ	B2
VR1	5kΩ	A3
Capacitors		
C1	25pF	B1
C2	75pF	B1
C3	25pF	B2
C4	410pF	B2
C5	0·22μF	A2
C6	0·01μF	B2
C7	8·2pF	B2
C8	560pF	A1
C9	0·02μF	B2
C10	560pF	A1
C11	362pF	B2
C12	25pF	B2
C13	340pF	B2
C14	15pF	B2
C15	25pF	A1
C16	280pF	A1
C17	270pF	A2
C18	10μF	A2
C19	2μF	A2
C20	0·22μF	A2
C21	270pF	A2
C22	250pF	A2
C23	0·02μF	A2
C24	0·22μF	A2
C25	0·01μF	A3
C26	0·22μF	A2
C27	0·02μF	A3
C28	0·22μF	A3
C29	500μF	A3
C30	50μF	A3
C31	0·01μF	B3
C32	100μF	A3
C33	50μF	B3
C34	500μF	B3
C35	100μF	B3
Coils		
L1	—	B1
L2	—	B1
L3	—	C1
L4	—	A1
L5	—	A1
L6	—	B2
L7	—	B2
L8	—	B2
L9	—	A2
L10	—	A2
L11	—	A2
L12	—	A2
L13	—	C2
Miscellaneous		
D1	0A91	A1
D2	0A91	A3
S1-S7	—	B1
T1	—	B3
CH1	—	B1
CH2	—	B2



Circuit diagram of the Decca TP99 two waveband portable radio receiver



View of the receiver from the rear showing component locations

Circuit Description—*continued*

L.w. coil **L1** is short-circuited on m.w. by the action of **S3.** Signals from the external aerial socket are coupled to the ferrite rod via **L2.**

Forward base bias for **TR1** is arranged by the choice of suitable values for **R1** and **R2** to which the base is connected at their junction, in conjunction with the emitter stabilizing resistor **R3.** Local heterodyne signals are developed by positive feedback from **TR1** collector to emitter via **L6** and **L7** through **L8,** the latter forming part of the oscillator tuned circuit. **L8** is tuned by **C11, C12, C13** and **C14,** with **C15** and **C16** added in parallel on l.w. Oscillator damping is provided by **R26.**

I.f. signals present in **TR1** collector are selected and coupled via the double-tuned transformer **L4/L5** to the first i.f. amplifier **TR2.** This is an a.g.c. controlled stage with d.c. output from the detector **D2** fed back to the base via **R7,** the d.c. level being a function of signal strength. On strong local signals the reduced collector current through **TR2** collector feed resistor **R8** due to a.g.c. action has the effect of removing the reverse bias on **D1,** taking the diode into the conducting region and heavily damping **L4.**

Amplified output from the second i.f. stage **TR3** is applied via **L11/L12** to the detector diode **D2** and rectified audio-signals are filtered by **R13** and **C27** and developed across the load resistor and volume control **VR1.** At this point a tape socket coupled via **C28** allows the detector output to be fed to the recording head of a tape recorder.

Audio signals from the slider of **VR1** are capacitively coupled via **C30** to the base of the driver **TR4** which feeds the bases of the push-pull output pair **TR5** and **TR6** with alternate half-cycles via the split-secondary transformer **T1** connected in its collector circuit. **TR5** and **TR6** are series connected and biased by the network **R19-R22** for operation in Class B. The high impedance loudspeaker **L13** forms the output load impedance. A switched earphone socket automatically disconnects the loudspeaker when the plug is inserted. A degree of output developed across **R18** is fed to **TR4** emitter as negative feedback.

CIRCUIT ALIGNMENT

Equipment Required.—An a.m. signal generator; an a.c. voltmeter and a 1kΩ resistor.

1.—Switch receiver to m.w. and fully close the tuning gang. Turn the volume control to maximum output. Set the voltmeter to read 2.5V a.c. and connect it across the loudspeaker.
2.—Connect the signal generator across the m.w. aerial coil **L3** and feed in a 472kc/s modulated signal. Adjust the cores of **L4, L5, L9, L10** and **L11** for maximum output, reducing the signal input as the circuits come into line to prevent a.g.c. action. Repeat until there is no further improvement.
3.—Connect the signal generator to the external aerial socket via a 1kΩ resistor. With the receiver switched to m.w., tune to 500m on the scale. Feed in a 600kc/s signal, and adjust **L8** and **L3** for maximum output.
4.—Tune receiver to 200m. Feed in a 1,500kc/s signal and adjust **C12** and **C3** for maximum output.
5.—Repeat operations 3 and 4.
6.—Switch receiver to l.w. and tune to 1,750m on scale. Feed in a 170kc/s signal and adjust **C15** and **L1** for maximum output.

Note: When adjusting **C15,** a degree of oscillator pulling may be experienced. Care should be taken to adjust **L1** and **C15** for maximum signal at the correct tracking point.

7.—Tune receiver to 1,250m. Feed in a 240kc/s signal and adjust **C1** for maximum output.
8.—Repeat operations 6 and 7.

GENERAL NOTES

Dismantling.—To remove the chassis from its case, first remove the back cover by giving half-a-turn to two screw heads at the top, and withdrawing the bottom edge from the slot in the base.

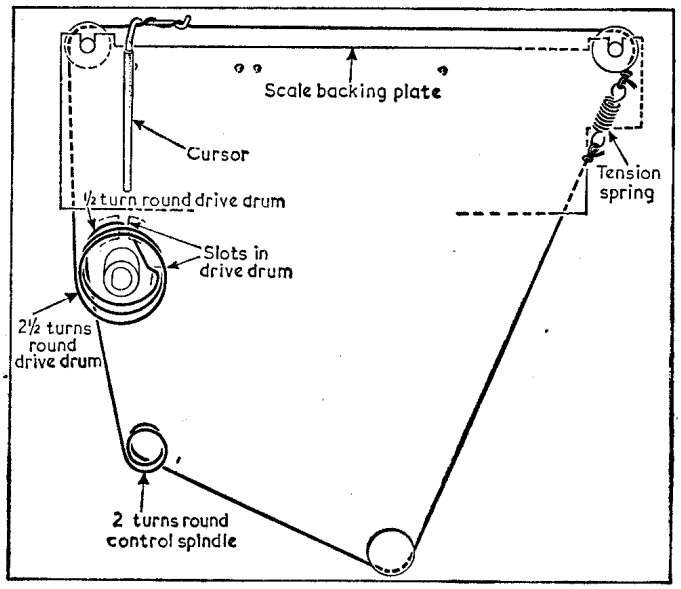
Remove the battery.

Pull off the front control knobs.

Note the colour code and pull off the leads from the loudspeaker terminals.

Take out two hexagon-head screws from the bottom corners of the panel and withdraw the chassis bottom edge first, clearing two top chassis flanges from slots in the switch escutcheon moulding.

Battery.—Ever Ready PP9, Vidormax VT9 or equivalent.



Scale drive assembly as seen from the front, with the gang at maximum. When replacing the drive cord it is important that the tension spring is located in the position shown to prevent the spring fouling the bottom pulley when the gang is rotated to the opposite end of its traverse

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