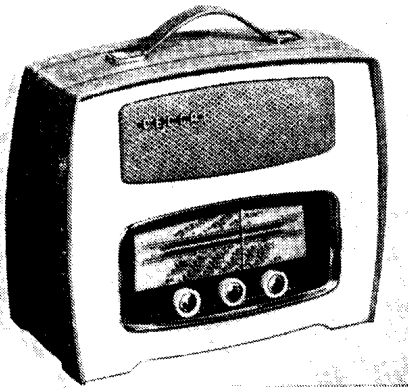


"TRADER" SERVICE SHEET  
**1425**

# DECCA TP22, TT33

## Transistor Portable and Table Models



USING a conventionally wired metal chassis, the Decca TP22 is a 2-band portable receiver employing 6 Ediswan transistors, two germanium diodes, a ferrite rod aerial, and an elliptical speaker. It is provided with a socket for the connection of an external aerial. The waveband ranges are 200-500m (M.W.) and 1,100-1,800m (L.W.).

Model TT33 is a table receiver which uses a similar chassis and circuit to the TP22.

Release date and original price; TP22, September 1959, £15 2s 1d; TT33, September 1959, £15 18s. Purchase tax extra.

### CIRCUIT DESCRIPTION

Aerial coils L1 and L2 are mounted on a length of ferrite rod to form an internal aerial. For M.W. operation, S1 is closed and L1 is tuned by the R.F. section of the tuning gang C2 and trimmer capacitor C3. For L.W. operation, S2 is closed and L2 is tuned by C2-C5.

TR1 operates as a self-oscillating mixer, local oscillations being produced by feedback between collector and emitter via low impedance windings L3, L4. Oscillator coil L5 is tuned by C12 and C14 on M.W. and,

in addition, by C7, C15 for L.W. operation. Base bias is provided by the potential divider R2, R3. Collector current is stabilized by R4.

I.F. amplification is provided by the earthed-emitter transistors TR2, TR3, with double-tuned transformer couplings L6, L7 and L8, L9. The amplified output of TR3 is coupled to germanium diode detector X2 via single-tuned transformer L10, L11. Neutralizing by R7, C18 and R12, C25. Base bias for TR2 and TR3 is obtained from the potential dividers R6, R14, R15, R16, and R10, R11 respectively. Collector currents are stabilized by emitter resistors R8 and R13.

Intermediate frequency 472kc/s.

The A.F. output of X2 is developed across the combined diode load and volume control R16, and is passed via electrolytic A.F. coupling capacitor C29 to the base of driver stage TR4. Filtering by R15, C28. The D.C. component of the rectified signal developed

across R15, R16 is fed via R14 to the base of TR2, giving automatic gain control.

Additional A.G.C. is provided by the variable damping effect of X1 on the primary of I.F. transformer L6, L7. Under weak signal conditions the voltage drop across R9 provides a reverse bias for X1. Under these conditions the impedance of X1 is high enough to have a negligible damping effect on L6. As the signal strength is increased, the positive A.G.C. bias reduces the collector current of TR2 and therefore the reverse bias on X1. The impedance of X1 is then reduced, thus increasing the damping on L6 and supplementing the normal A.G.C. action.

Output from TR4 is coupled via driver transformer T1 to TR5 and TR6, which operate in a single-ended push-pull output stage, with D.C. coupling to high impedance speech coil L12. Base bias is provided by the potential divider R22-R25. Collector

(Continued overleaf col. 1)

### Capacitors

C1	25pF	A2
C2	410pF	B2
C3	—	V2
C4	50pF	A1
C5	85pF	A1
C6	0.04µF	D3
C7	50pF	A1
C8	0.04µF	D3
C9	0.02µF	A1
C10	400pF	A1
C11	400pF	A1
C12	—	B1
C13	480pF	A1
C14	410pF	B1
C15	325pF	A1
C16	10µF	D3
C17	0.04µF	D3
C18	13pF	D4
C19	400pF	A2
C20	400pF	A2
C21	0.04µF	D3
C22	0.04µF	D4
C23	0.04µF	D4
C24	250pF	A2
C25	25pF	A2
C26	0.02µF	A2
C27	100µF	D4
C28	0.02µF	D4

C29	10µF	C3
C30	100µF	C3
C31	100µF	C4

### Resistors

R1	150kΩ	A2
R2	33kΩ	D3
R3	8.2kΩ	D3
R4	3.3kΩ	A1
R5	390Ω	D3
R6	56kΩ	D3
R7	3.3kΩ	D4
R8	680Ω	D4
R9	1kΩ	D3
R10	15kΩ	D4
R11	3.3kΩ	D4
R12	2.2kΩ	D4
R13	1kΩ	D4
R14	8.2kΩ	D4
R15	470Ω	D4
R16	5kΩ	C3
R17	330Ω	C3
R18	18kΩ	C4
R19	18kΩ	C3
R20	1kΩ	C4
R21	1kΩ	C3
R22	3kΩ	C4
R23	100Ω	C4
R24	3kΩ	C4

R25	100Ω	C4
R26	6.8Ω	C4
R27	6.8Ω	C4
R28	470Ω	C4
R29	10Ω	C3

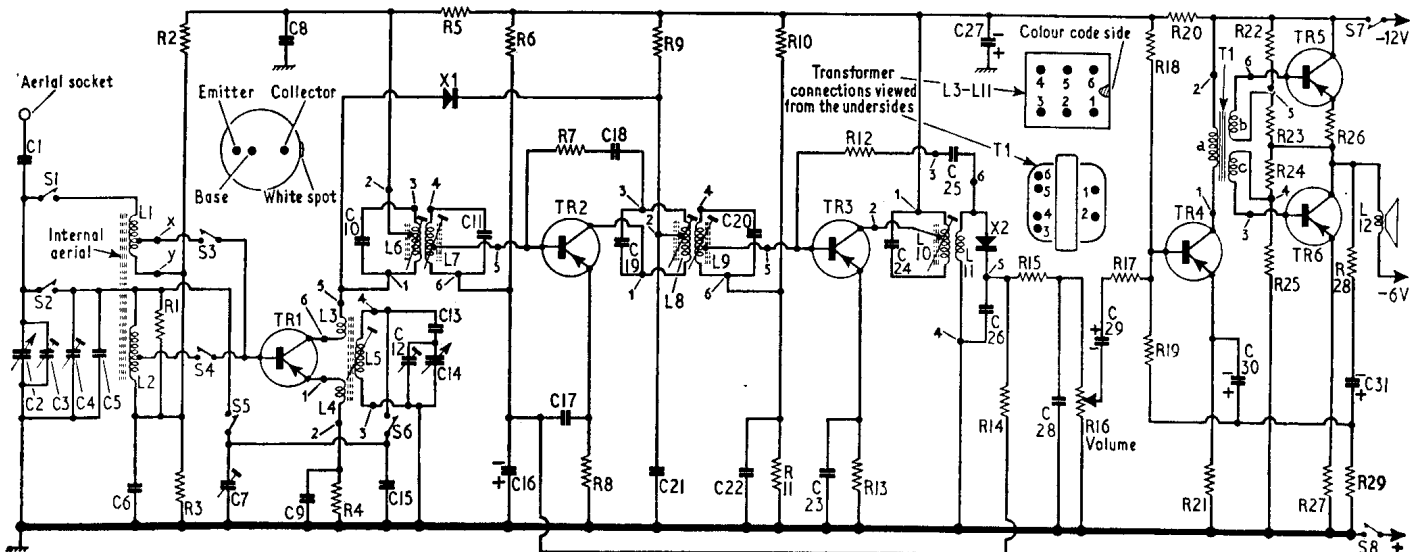
### Coils\*

L1	—	B2
L2	4.5	A2
L3	—	A2
L4	—	A2
L5	2.5	A2
L6	4.0	A1
L7	4.0	A1
L8	4.0	A2
L9	4.0	A2
L10	4.0	A2
L11	—	A2
L12	30.0	—

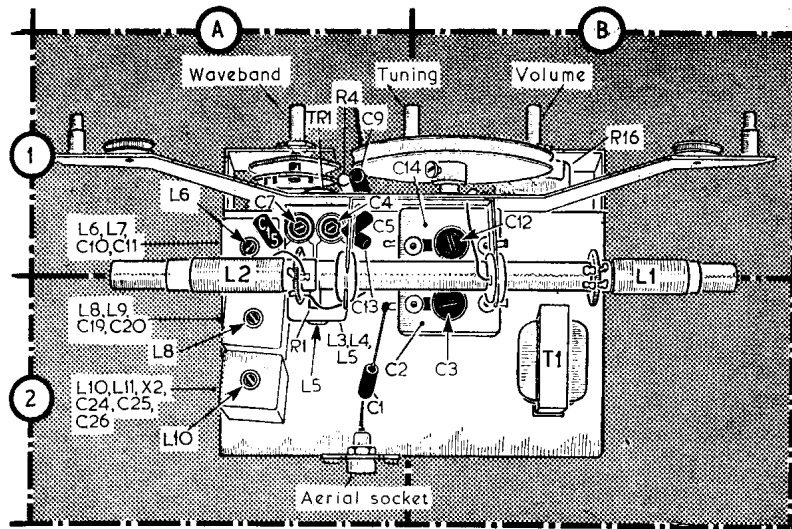
### Miscellaneous\*

T1	{ a 200.0 b 40.0 c 40.0 }	B2
X1	CG6E	D3
X2	CG12E	A2
S1-S8	—	D3

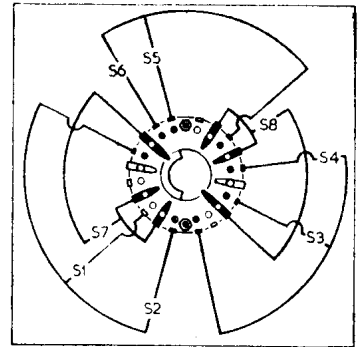
\*Approximate D.C. resistance in ohms.



Circuit diagram of the Decca TP22. Details of the transistor, coil and transformer connections are included.



Left: Plan view of the chassis.



Right: Diagram of the switch unit S1-S8 as seen in location D3.

**Circuit Description—continued**

currents are stabilized by R26 and R27. Negative feedback is applied from L12 to the base of TR4 via R28, C31, R29 and R19.

**CIRCUIT ALIGNMENT**

**Equipment Required.**—A signal generator, modulated 30 per cent at 400c/s and an A.C. voltmeter for use as output meter.

- 1.—Switch the receiver to M.W. Turn the volume control to maximum and set the tuning gang to maximum capacitance. Connect the output meter across the speaker speech coil L12. Connect the signal generator live lead to the tapping on L1 (location reference B2), and its earthy lead to the junction of R3, C6.
- 2.—Feed in a modulated 472kc/s signal and adjust the cores of L10 (A2), L9 (D4), L8 (A2), L7 (D4) and L6 (A1) for maximum output, progressively reducing the signal generator output as the circuits come into line.
- 3.—Check that with the tuning gang at maximum capacitance the cursor coincides with the datum marks at the right-hand ends of the tuning scales.
- 4.—Loosely couple the signal generator output to the ferrite aerial rod. Tune the receiver to 600kc/s. Feed in a modulated 600kc/s signal and adjust the core of L5 (location reference A2) for maximum output.
- 5.—Tune the receiver to 1,500kc/s. Feed in a modulated 1,500kc/s signal and adjust C12 and C3 (location references B1, B2) for maximum output.
- 6.—Tune the receiver to 600kc/s. Feed in a 600kc/s signal and slide L1 (location reference B2) along the ferrite rod for maximum output. If considerable adjustment of L1 is required repeat operations 4, 5 and 6.
- 7.—Switch the receiver to L.W. and tune it to 250kc/s. Feed in a modulated 250kc/s

signal and adjust C7 and C4 (location reference A1) for maximum output. As oscillator pulling may occur when adjusting C7, care should be taken to adjust C7 and C4 at the correct tracking point.

- 8.—Tune the receiver to 170kc/s. Feed in a modulated 170kc/s signal and slide L2 (location reference A2) along the ferrite rod for maximum output. Repeat operation 7 if considerable adjustment of L2 is required.

**GENERAL NOTES**

**Switches.**—S1, S3 and S5 close on M.W.; S2, S4 and S6 close on L.W.

**Transistors.**—Replacement transistors are supplied by the manufacturers' spares department in two packages which are identified as type R.F.1 and type L.F.1. The R.F.1 package contains one XA102 and two XA101 transistors; the L.F.1 package contains one XB103 and a matched pair of XC101 transistors.

The manufacturers recommend that if a fault develops in one of the R.F./I.F. transistors TR1, TR2 or TR3, all three should be replaced. Similarly, should it become necessary to replace one of the A.F. transistors TR4, TR5 or TR6, all three should be replaced.

**Warning.**—Transistors may be permanently damaged if the full negative voltage is connected to their bases, or if continuity measurements are made with the transistors in circuit. They may also be damaged by

the application of excessive heat. If a transistor has to be removed or replaced, the soldering or unsoldering operation should be completed as quickly as possible using an earthed soldering iron. A heat shunt, such as a pair of pliers, should be clamped across the transistor lead between the transistor and the soldering iron during the soldering or unsoldering of its leads. Take care to avoid scratching the paint on glass-cased transistors.

**Drive Cord Replacement.**—About 38in of nylon-braided glass yarn is required for a new drive cord. It should be run as indicated in the sketch in cols. 1, 2, where it is drawn as seen when viewed from the front of the chassis with the tuning scale and backing plate removed and with the gang at minimum capacitance.

**Batteries.**—The batteries recommended by the manufacturers are two Ever Ready Lantern type 996's, rated at 6V each, connected in series.

**Transistor Analysis**

Collector current readings given in the table below are those derived from the manufacturers' information. They were measured on a high-resistance meter, the positive terminal being connected to the collector in each case. The use of a meter with an internal resistance lower than 10,000Ω/V can give rise to misleading readings. The receiver must be switched off before unsoldering the collector lead and connecting the milliammeter in circuit. See "Warning" under "General Notes," col. 2.

Transistor	Collector (mA)
TR1 XA102	0.3
TR2 XA101	1.2
TR3 XA101	1.2
TR4 XB103	2.8
TR5 XC101	2.1
TR6 XC101	2.1

Right: Underside view of the chassis.

Below: Diagram of the tuning drive system.

