

"TRADER" SERVICE SHEET

849

COSSOR 469

ALL-DRY BATTERY PORTABLE SUPERHET



SEVEN-PIN button-based valves are used in the Cossor 469, a 4-valve 2-band all-dry superhet portable with self-contained frame aerial and batteries. No provision for an external aerial.

Release date and original price: October, 1947, £13 15s plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by **L1, C14** (M.W.) and **L1, L2, C14** (L.W.), which precede heptode valve (**V1, Cossor 1R5**) operating as frequency changer with electron coupling.

V1 oscillator grid coils **L3** (M.W.) and **L3, L4** (L.W.) are tuned by **C15**. Parallel trimming by **C16** (M.W.) and **C17** (L.W.): series tracking by **C19** (M.W.) and **C18** (L.W.). Reaction coupling by anode coils **L5** (M.W.) and **L5, L6** (L.W.).

Second valve (**V2, Cossor 1T4**) is a variable- μ R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings.

Intermediate frequency 452 kc/s.

Diode second detector is part of single diode pentode valve (**V3, Cossor 1S5**). Audio frequency component in rectified output is developed across manual volume control **R7**, which also acts as diode load resistor, and passed via A.F. coupling capacitor **C7** and C.G. resistor **R8** to grid of pentode section, which operates as A.F. amplifier.

D.C. potential developed across **R6, R7** is applied to the potential divider **R4, R5**, from the tapping on which it is fed back, via a decoupling circuit, as G.B. to F.C. and I.F. valves, giving A.V.C.

Resistance-capacitance coupling by **R10, C9, R11** between **V3** pentode and pentode output valve (**V4, Cossor 3S4**), the filament sections of which are wired in parallel. G.B. potential for **V4** is obtained from the drop across **R12**.

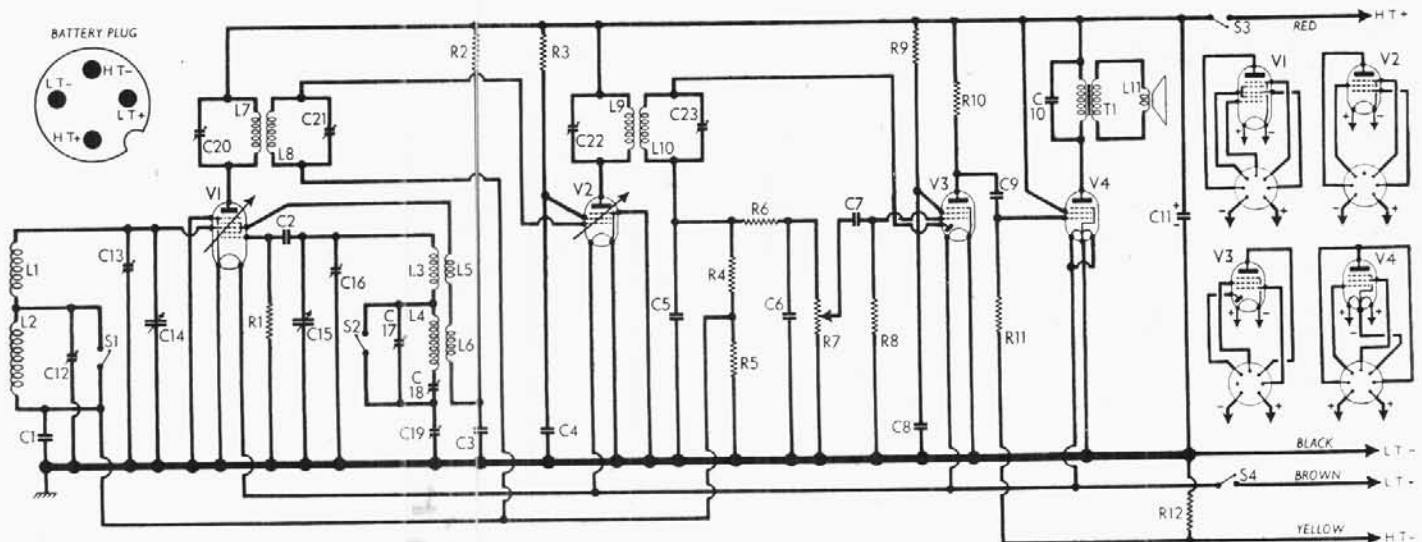
CAPACITORS		Values (μ F)	Location
C1	A.V.C. decoupling ...	0.05	G8
C2	V1 osc. C.G. ...	0.0001	J6
C3	Osc. H.T. decoup. ...	0.1	C3
C4	V2 S.G. decoup. ...	0.1	J8
C5	I.F. by-passes ...	0.00005	G8
C6		0.00005	E1
C7	A.F. coupling ...	0.001	F2
C8	V3 S.G. decoup. ...	0.1	H6
C9	A.F. coupling ...	0.001	G6
C10	Tone corrector ...	0.002	H5
C11*	H.T. reservoir ...	8.0	E3
C12†	Aerial L.W. trim. ...	0.0001	D2
C13†	Aerial M.W. trim. ...	0.00005	C2
C14†	Frame aerial tuning ...	0.000444	C2
C15†	Oscillator tuning ...	0.000444	C1
C16†	Osc. M.W. trim. ...	0.00005	D2
C17†	Osc. L.W. trim. ...	0.0001	E2
C18†	Osc. L.W. track ...	0.0006	B2
C19†	Osc. M.W. track ...	0.0006	C2
C20†	1st I.F. transformer {	0.0001	A3
C21†		tuning ...	0.0001
C22†	2nd I.F. transformer {	0.0001	F4
C23†		tuning ...	0.0001

* Electrolytic. † Variable. ‡ Pre-set.

COMPONENTS AND VALUES

RESISTORS		Values (ohms)	Location
R1	V1 osc. C.G. ...	100,000	J6
R2	Osc. H.T. feed ...	22,000	C3
R3	V2 S.G. H.T. feed ...	180,000	J7
R4	A.V.C. potential {	10,000,000	G8
R5		divider ...	4,700,000
R6	I.F. stopper ...	47,000	G7
R7	Volume control ...	680,000	F1
R8	V3 pent. C.G. ...	10,000,000	E2
R9	V3 S.G. H.T. feed ...	3,300,000	G7
R10	V3 pent. anode load ...	1,000,000	G7
R11	V4 C.G. resistor ...	3,300,000	G6
R12	V4 G.B. resistor ...	1,200	G6

OTHER COMPONENTS		Approx. Values (ohms)	Location	
L1	Frame aerial {	1.4	A2	
L2		windings ...	20.0	A2
L3		Oscillator circuit ...	1.4	B1
L4	tuning coils ...	5.5	B2	
L5	Osc. circuit reaction {	3.5	B1	
L6		coils ...	7.5	B2
L7	1st I.F. trans. {	25.0	B3	
L8		Sec. ...	25.0	B3
L9	2nd I.F. trans. {	25.0	F4	
L10		Sec. ...	25.0	F4
L11	Speech coil ...	2.5	—	
T1	Output trans. {	650.0	D4	
		Sec. ...	0.25	D4
S1-S4	W/band and battery switches ...	—	B2	



Circuit diagram of the Cossor 469 all-dry superhet, with the battery plug diagram (top left corner) as seen from the free ends of pins.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the manufacturers. Voltages were measured with a 1,000 ohms-per-volt meter, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 1R5	80	0.32	45	1.3
V2 1T4	80	0.55	30	0.24
V3 1R5	10	0.08	10	0.02
V4 3S4	78	4.3	80	1.3

DISMANTLING THE SET

The chassis, speaker and frame aerial may be removed from the carrying case as a complete assembly, and the construction is such that once this has been done free access may be gained to all components. Great care should be exercised in removing and replacing the assembly in order to avoid scratching the top of the case.

Removing assembly.—Remove the three control knobs (recessed grub screws), the battery, and the valves (screening covers are removed by pressing them toward the chassis, twisting anti-clockwise for a quarter turn, and then pulling out).

Remove four round-head wood screws, securing the left and right edges of the chassis to vertical wooden members.

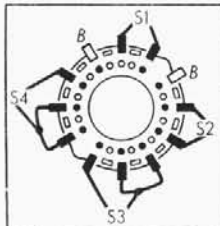
Holding the chassis by the speaker transformer mounting bracket, lift it sufficiently for the bottom edge of the frame aerial to clear the bottom of the carrying case, and withdraw the assembly very carefully, tilting slightly to enable the lower edge of the frame to emerge first.

If the assembly binds on the inside of the case, the screws of the four frame aerial retaining brackets should be loosened very slightly. Do not remove screws.

When replacing, hold the assembly as previously described and insert it in the case, chassis section first, until it comes into contact with the wooden supporting members, then lift and tilt the chassis to locate the control spindles in their respective holes in the top of the case.

Replace and tighten the four wood screws on the left and right edges of the chassis, after noting that there is adequate clearance between the scale plate and the top of the case. Ensure that the frame aerial supporting brackets are in contact with the sides of the

Right: Front view of the chassis, with speaker removed. The course of the tuning drive cord is clearly indicated. Below: Diagram of the S1-S4 switch unit as seen from the rear of chassis.



case, and tighten their fixing screws if they have been previously loosened.

Removing speaker.—Remove the assembly as previously described, and then unsolder the two leads from the speech coil connecting panel.

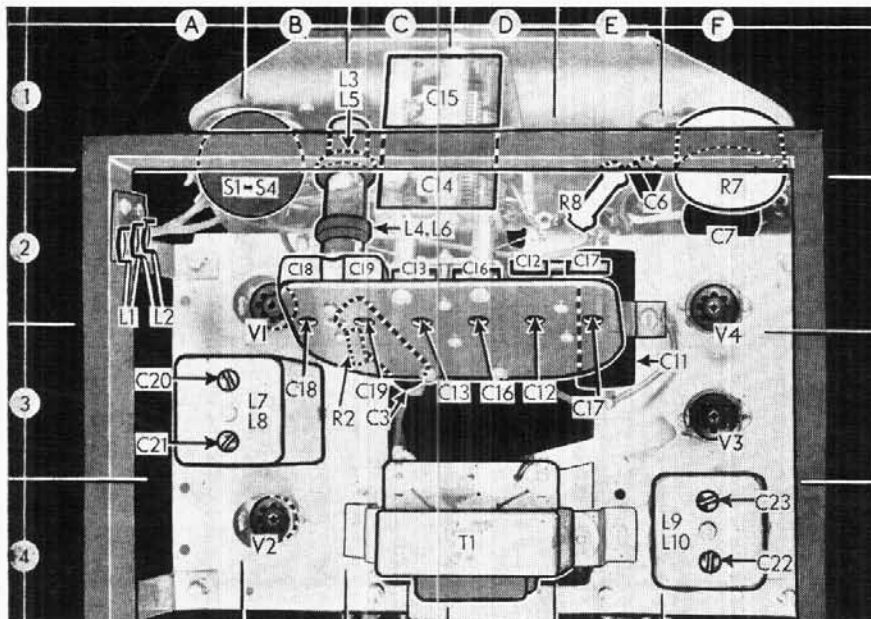
Remove the two cheese-head screws and the two screws (with nuts) securing the speaker to its mountings.

When replacing, the connecting panel should be located directly above the speaker transformer.

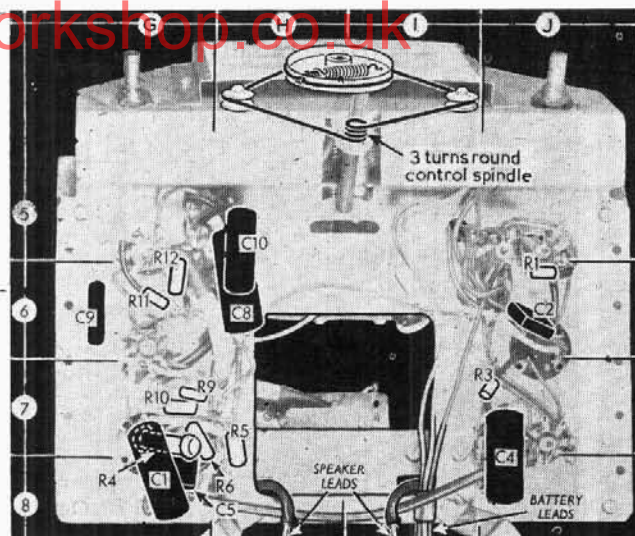
GENERAL NOTES

Switches.—S1-S4 are the waveband and battery switches, in a single rotary unit on the control panel. The unit is indicated in our rear chassis view, and shown in detail in the diagram above.

Drive Cord Replacement.—Inset in the front chassis illustration is a sketch of the drive cord as seen from the front above the control panel, after removing the scale, when the gang is at maximum.



Rear chassis view. The valve holders have collars to hold the retaining covers.



Battery.—This is an Ever Ready "Batrymax" type B103, whose H.T. and L.T. sections are rated at 90 V and 1.5 V respectively. A diagram of the connecting plug, seen from the free ends of the pins, is inset beneath the circuit diagram overleaf, from which the polarity of the pins can be determined.

Valves.—These have the American 7-pin "Button" base. Filament ratings are 1.4 V, 0.05 A for V1, V2 and V3, and 1.4 V, 0.1 A (or 2.8 V, 0.05 A) for V4. All four are provided with bayonet-fitting metal screening covers.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., short-circuit C15 (location reference C1), turn volume control to maximum and connect signal generator leads to control grid (pin 6) of V1 and chassis. Feed in a 452 kc/s (663.7 m) signal and adjust C23, C22, C21 and C20 (F4, A3) in that order, for maximum output. Remove short-circuit from C15.

R.F. and Oscillator Stages.—Owing to the interdependence of certain adjustments, it is important that the procedure to be described should be closely followed. With the gang at maximum the pointer should be horizontal. Couple the signal generator output by means of a loop of wire about 12in from, and in the same plane as, the receiver frame aerial.

M.W.—Switch set to M.W., tune to 214 m (calibration line) on scale, feed in a 214 m (1,400 kc/s) signal and adjust C16 (D2), then C13 (C2) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust C19 (C2), whilst rocking the gang, for maximum output. Repeat the 214 m and 500 m adjustments until no improvement results.

L.W.—Switch set to L.W., tune to 1,700 m (calibration line) on scale, feed in a 1,700 m (176.5 kc/s) signal and adjust C18 (B2) for maximum output. Tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal and adjust C17 (E2), then C12 (D2) for maximum output. Repeat the 1,700 m and 1,000 m adjustments until no improvement results.