"TRADER" SERVICE SHEET

838

COSSOR 481B

TWO-BAND BATTERY SUPERHET

A TWO-BAND battery superhet using a 2 V filament accumulator, the Cossor 481B is a 4-valve superhet for M.W. and L.W. operation.

The scale is calibrated with station names only, but for alignment purposes, small radial lines, or ticks, mark calibration points. The scale is marked as for a 471B receiver, but is correct for the 481B. No such model as 471B has been marketed.

Release date and original price: June, 1947, £14, plus £3 0s 3d purchase tax.

CIRCUIT DESCRIPTION

Bottom-coupled aerial input by **R1, C1** to single-tuned circuits **L1, C22** (M.W.) and **L2, C22** (L.W.) which precede triode-heptode valve **(V1, Cossor metallized 220TH)** operating as frequency changer with internal coupling.

Triode oscillator grid coils **L3** (M.W.) and **L4** (L.W.) are tuned by **C23.** Parallel trimming by **C24** (M.W.) and **C7** (L.W.); series tracking by **C6** (M.W.) and **C9, C25** (L.W.). Reaction coupling from anode, via **C8,** by coil **L5** on M.W., with additional capacitative coupling from the common impedance of trackers **C9, C25** on L.W.

Second valve **(V2, Cossor metallized 210VPA)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C4, L6, L7, C5** and **C12, L8, L9, C13.** All the tuning capacitors are fixed, and alignment is effected by varying the positions of the iron-dust cores.

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve **(V3, Cossor metallized 210DDT).** Audio frequency component in rectified output is developed across manual volume control **R9,** which is also the diode load resistor, and passed via A.F. coupling capacitor **C16** and C.G. resistor **R10** to grid of triode section, which operates as A.F. amplifier. I.F. filtering by **C14** and **R8** in diode circuit, and **C17** in triode anode circuit.

Second diode of **V3,** fed from **V2** anode via **C15,** provides D.C. potential which is developed across load resistor **R12** and fed back through a decoupling circuit as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R11, C18** and **R15,** via grid stopper **R16,** between **V3** triode and tetrode output valve **(V4, Cossor 220OT).** Fixed tone correction in tetrode anode circuit by **C19,** and provision for the connection of a low-impedance external speaker across the secondary winding of the output transformer **T1.**

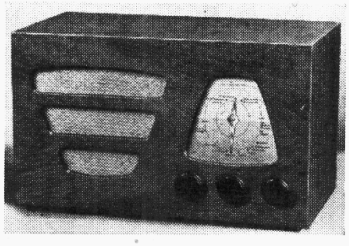
Fixed G.B. for all valves, and A.V.C. delay voltage, is obtained from the drop across resistors **R13, R14** in the H.T. negative lead to chassis. The fuse bulb **F1** protects the filaments in case of accidental application of the H.T. voltage to them.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from an H.T. battery reading 120 V on load. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

Valve		Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1	220TH	116	0·12	60	0.7
		Oscillator 77	1·0		
V2	210VPA	116	1·2	53	0.23
V3	210DDT	40	0·14	—	—
V4	220OT	114	2·8	116	0.6

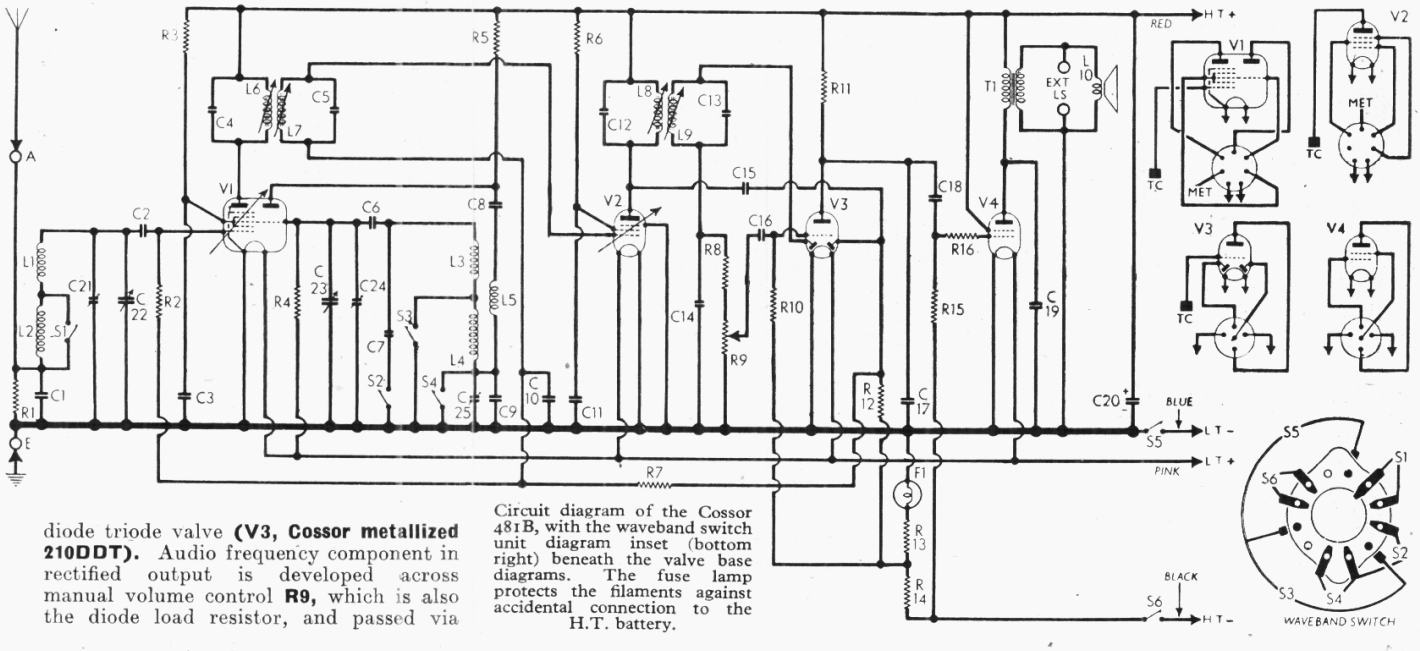
Voltages were measured on the 400 V scale of a Model 7 Avometer, chassis being the negative connection.



COMPONENTS AND VALUES

	CAPACITORS	Values (μF)	Location
C1	Aerial coupling ...	0·0027	J9
C2	V1 hept. C.G. ...	0·00056	B2
C3	V1 S.G. decoup. ...	0·1	L8
C4	1st I.F. trans. tuning ...	0·000053	A4
C5	1st I.F. trans. tuning ...	0·000058	A4
C6	M.W. tracker ...	0·000535	K7
C7	L.W. trimmer ...	0·000027	K6
C8	Reaction coupling	0·0001	K7
C9	L.W. tracker ...	0·00022	J7
C10	A.V.C. decoup. ...	0·05	I8
C11	V2 S.G. decoup....	0·1	I9
C12	2nd I.F. trans. tuning ...	0·00005	D4
C13	2nd I.F. trans. tuning ...	0·00007	D4
C14	I.F. by-pass ...	0·000047	J8
C15	A.V.C. coupling ...	0·00012	I8
C16	A.F. coupling ...	0·05	J8
C17	I.F. by-pass ...	0·00022	G9
C18	A.F. coupling ...	0·01	H8
C19	Tone corrector ...	0·001	G8
C20*	H.T. reservoir ...	8·0	H6
C21‡	Aerial M.W. trim.	—	A1
C22†	Aerial tuning ...	—	C3
C23†	Osc. tuning ...	—	C2
C24‡	Osc. M.W. trim. ...	—	A2
C25‡	L.W. tracker ...	—	A2

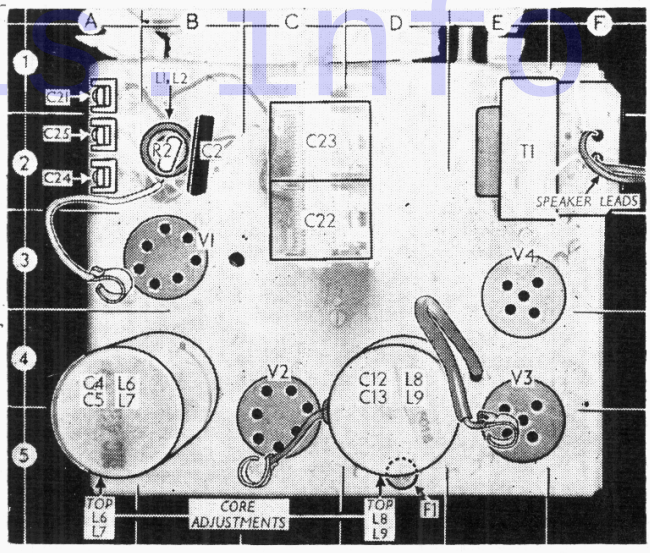
* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Cossor 481B, with the waveband switch unit diagram inset (bottom right) beneath the valve base diagrams. The fuse lamp protects the filaments against accidental connection to the H.T. battery.

	RESISTORS	Values (ohms)	Location
R1	Aerial coupling ...	12,000	I9
R2	V1 hept. C.G. ...	1,000,000	B2
R3	V1 S.G. feed ...	68,000	J8
R4	V1 osc. C.G. ...	47,000	L7
R5	Osc. H.T. feed ...	27,000	K8
R6	V2 S.G. feed ...	120,000	K8
R7	A.V.C. decoupling	3,300,000	I8
R8	I.F. stopper ...	47,000	I8
R9	Volume control ...	1,000,000	H6
R10	V3 triode C.G. ...	2,200,000	I8
R11	V3 anode load ...	270,000	H8
R12	A.V.C. diode load...	2,200,000	I8
R13	Fixed G.B. and	150	J8
R14	A.V.C. delay ...	400	J8
R15	V4 C.G.	1,000,000	I8
R16	Grid stopper ...	100,000	H8

	OTHER COMPONENTS	Approx. Values (ohms)	Location
L1	Aerial tuning coils	2·8	B2
L2	Aerial tuning coils	32·0	B2
L3	Osc. tuning coils ...	2·0	K6
L4	Osc. tuning coils ...	11·0	K6
L5	Reaction coil ...	6·5	K6
L6	1st I.F. Pri. ...	8·0	A4
L7	1st I.F. trans. Sec. ...	13·0	A4
L8	2nd I.F. Pri. ...	18·0	D4
L9	2nd I.F. trans. Sec. ...	16·0	D4
L10	Speech coil ...	2·75	—
T1	Output Pri. ...	625·0	E2
	Output trans. Sec. ...	0·4	E2
S1-S4	W/band switches...	—	K6
S5,S6	Battery switches ...	—	K6
F1	150 mA fuse bulb...	—	D5



Plan view of the chassis. It is important that a screening cap provided should be fitted to the top of **V2**.

GENERAL NOTES

Switches.—All the switches **S1-S6** are ganged in a three-position rotary unit which is indicated in our under-chassis view and shown in detail in the diagram inset in the bottom right-hand corner of our circuit diagram overleaf. **S1, S3, S4, S5** and **S6** close in the centre position (M.W.), and **S2, S5** and **S6** close in the fully clockwise position (L.W.). The fully anti-clockwise position is "Off."

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (about 4 Ω) external speaker.

Fuse Bulb F1.—This is located at the rear of the chassis deck, and is included to protect the valve filaments in case the H.T. battery is accidentally connected to them. Replacements should be of the common scale lamp type, with an M.E.S. base, but should be rated at 150 mA. The makers' part number is 335.

Batteries and Leads.—L.T., 2 V, 45 A.H. accumulator cell, for which red and black spade tags on red (transparent) and blue leads are provided. H.T., 120 V dry battery of standard dimensions, in which only the two extreme positive and negative sockets are needed; grid bias is automatic. The black lead and plug is the negative connection, and the red lead and plug the positive (120 V) connection.

Chassis Divergencies. — The values quoted for **R5** and **R14** were those in our chassis, but in later versions **R5** may be 47,000 Ω and **R15** may be 330 Ω or 470 Ω. **C9** is quoted as 0.00022 μF, but other values may be required in some cases according to the range accommodated by **C25.**

Drive Cord Replacement.—This is very straightforward and does not require a sketch. The cord goes over the drive drum, making altogether about ¾ of a turn, and goes 1½ times round the control spindle. Twenty-four inches of cord is ample, and leaves plenty to spare for knotting.

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator leads to control grid (top cap) of **V1** and chassis, leaving existing connector in position. Switch set to M.W. and turn gang and volume control to maximum. Feed in a 465 kc/s (645.16 m) signal, and adjust the cores of **L9, L8, L7** and **L6** (location references D5 and A5), in that order, for maximum output. Repeat these adjustments.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the tips of the pointer should coincide with the horizontal line dividing the two-colour scale. Transfer signal generator leads to **A** and **E** sockets, via a suitable dummy aerial.

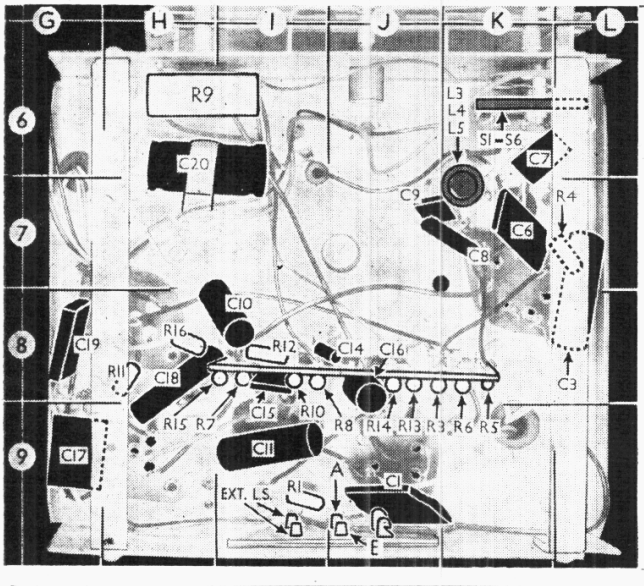
M.W.—Switch set to M.W., tune to radial line on scale adjacent to "West Regional" calibration dot, feed in a 214.3 m (1,400 kc/s) signal, and adjust **C24** (A2), then **C21** (A1), for maximum output. Feed in a 519 m (577 kc/s) signal, tune it in, and check that pointer coincides with radial line on scale above "B.B.C. Third" calibration dot at high wavelength end of the scale.

L.W.—Switch set to L.W., tune to radial line on scale below "Moscow" calibration dot, feed in a 1,875 m (160 kc/s) signal, and adjust **C25** (A2) for maximum output. Feed in a 1,154 m (260 kc/s) signal, tune it in, and check that pointer coincides with "Oslo" calibration dot on scale.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws);
lift off the metal screening cover from **V2**;
remove the four cheese-head screws (with metal washers) securing the chassis to the base of the cabinet;
slide out the chassis to the extent of the speaker leads, lifting the rear edge first in order to free the top of the scale from the wooden locating strip behind it.

Removing Speaker.—Unsolder the two plastic-covered leads connecting it to chassis, and remove the four cheese-head screws (with lock washers) securing it to the sub-baffle.
When replacing, the connecting panel should be at the top.



Under-chassis view. Most of the small components are mounted on the group board near the centre of the chassis. The **E** socket and the **Ext. L.S.** socket diagonally opposite to it on the rear panel may be transposed.

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