

NUMBER 127

'TRADER' SERVICE SHEETS

COSSOR 378

3-VALVE A.C. RECEIVER

A HORIZONTAL cabinet encloses the Cossor 378 receiver, the chassis being on the right and the speaker on the left. The chassis is for operation on A.C. mains of 200-250 V, 40-100 c.p.s., and employs a variable-mu pentode H.F. amplifier, a pentode detector and a pentode output valve. Provision is made for a gramophone pick-up and an extension speaker.

CIRCUIT DESCRIPTION

Aerial input via series condenser C1 coupling coil L1 and small coupling condenser C2 to single tuned circuit L2, L3, C16 which precedes variable-mu pentode H.F. amplifier (V1, Cossor metallised MVS/Pen). Gain control by variable cathode resistance R4 which varies G.B. applied.

Tuned-primary transformer coupling by L4, L5, C18, L8, L9 to H.F. pentode detector (V2, Cossor metallised MS/Pen) which operates on grid leak system with R8, C7. Reaction is applied from anode by coils L6, L7 and controlled by variable condenser C20. Provision for connection of gramophone pick-up in grid circuit. On gram., switches S6 and S7 are open and G.B. is applied to V2 by reason of voltage drop along cathode resistance R11.

Resistance-capacity coupling by R10, C10, and R12 between V2 and directly-

H.T. current is supplied by full-wave rectifying valve (V4, Cossor 442BU). Smoothing by speaker field coil L12 and dry electrolytic condensers C14, C15.

DISMANTLING THE SET

A detachable bottom is fitted to the cabinet and upon removal (two bolts and washers) gives access to most of the under-chassis components.

Removing Chassis.—If it should prove necessary to remove the chassis from the cabinet, remove the back (six screws and washers) and the five control knobs (recessed grub screws, except that for the trimmer which is held by a screw passing through the centre of the spindle). Next remove the four bolts (with washers and lock washers) holding the chassis to the bottom of the cabinet and the two small round-head wood screws holding the top of the tuning dial to the front of the cabinet, and free the mains leads from the cleat on the side of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

When replacing, note that the three medium-sized knobs are marked with their purpose and must be placed on the correct spindles.

To free the chassis entirely, disconnect the speaker leads (screw terminals).

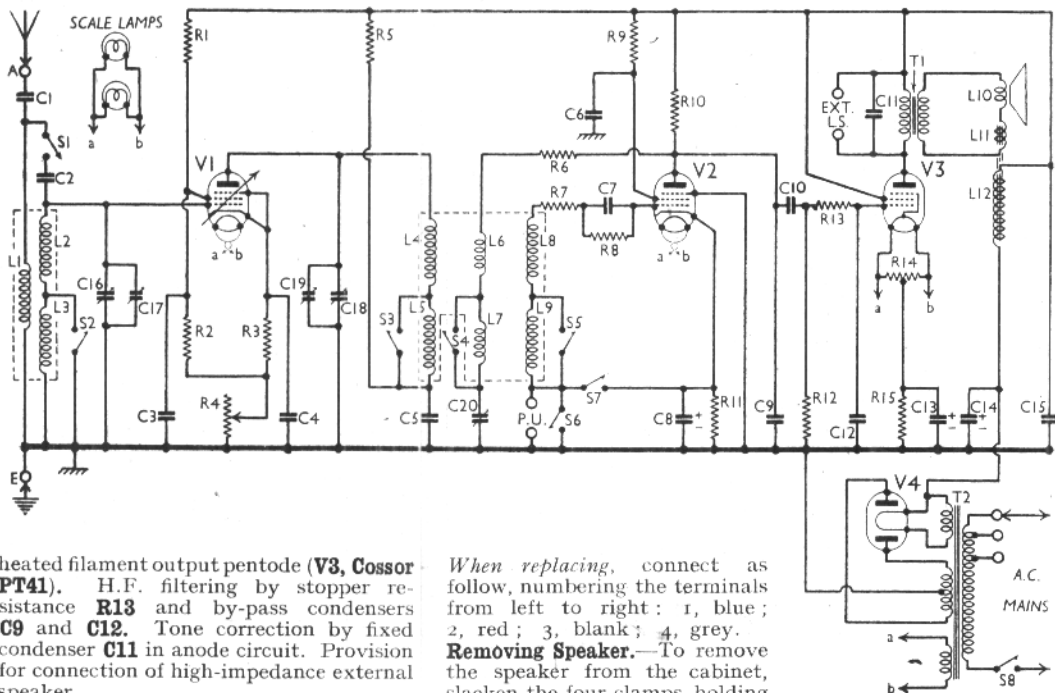
it to the sub-baffle (nuts and lock washers). *When replacing,* see that the transformer is at the top.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 S.G. H.T. potential divider	30,000
R2		40,000
R3	V1 fixed G.B. resistance	1,500
R4	V1 gain control	2,000
R5	V1 anode decoupling	10,000
R6	Reaction circuit stabiliser	300
R7	V2 C.G. circuit stabiliser	200
R8	V2 grid leak	1,000,000
R9	V2 S.G. H.T. feed	500,000
R10	V2 anode load	100,000
R11	V2 G.B. resistance (gram.)	1,000
R12	V3 C.G. resistance	500,000
R13	V3 C.G. H.F. stopper	100,000
R14	V3 filament potentiometer	25
R15	V3 G.B. resistance	300

Condensers		Values (μF)
C1	Aerial series condenser	0.0005
C2	Aerial coupling	0.000015
C3	V1 S.G. by-pass	0.1
C4	V1 cathode by-pass	0.1
C5	V1 anode decoupling	0.1
C6	V2 S.G. by-pass	0.1
C7	V2 C.G. condenser	0.0001
C8*	V2 cathode by-pass	50.0
C9	V2 anode H.F. by-pass	0.0002
C10	V2 to V3 L.F. coupling	0.01
C11	Tone corrector	0.005
C12	V3 C.G. H.F. by-pass	0.0002
C13*	V3 cathode by-pass	50.0
C14*	H.T. smoothing	6.0
C15*		4.0
C16†	Aerial circuit tuning	0.0005
C17†	Aerial circuit trimmer	—
C18†	H.F. transformer tuning	0.0005
C19†	H.F. transformer trimmer	—
C20†	Reaction control	0.0003

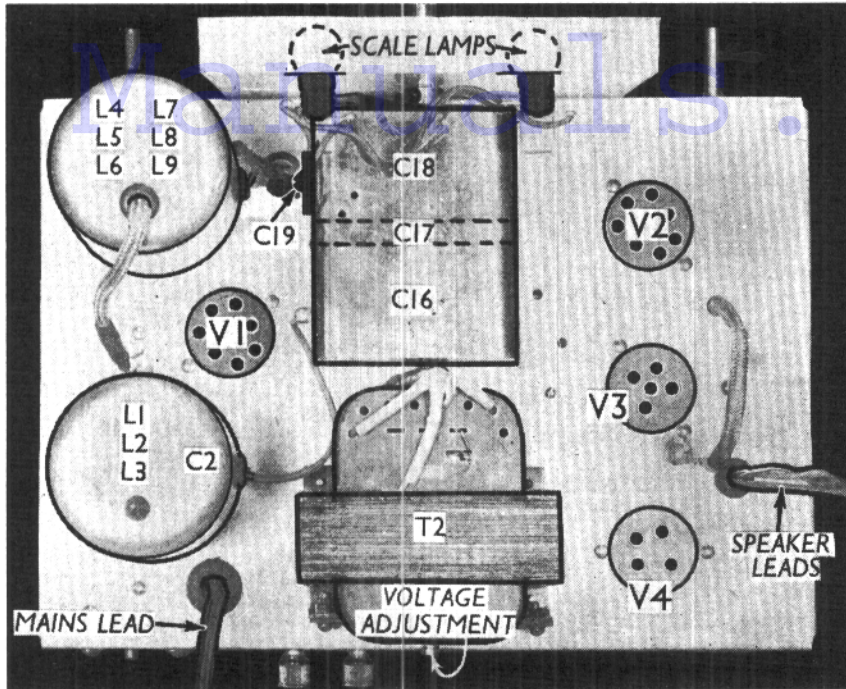
* Electrolytic. † Variable. ‡ Pre-set.



heated filament output pentode (V3, Cossor PT41). H.F. filtering by stopper resistance R13 and by-pass condensers C9 and C12. Tone correction by fixed condenser C11 in anode circuit. Provision for connection of high-impedance external speaker.

When replacing, connect as follow, numbering the terminals from left to right: 1, blue; 2, red; 3, blank; 4, grey. **Removing Speaker.**—To remove the speaker from the cabinet, slacken the four clamps holding

Circuit diagram of the Cossor 378 3-valve A.C. receiver. Note that S1 closes on M.W., and thus gives extra aerial coupling by C2. S6 and S7 are provided for pick-up switching and bias for V2 on Gram. Since V3 is directly heated, the centre-tapped potentiometer R14 is fitted across its filament.



Plan view of the chassis. C17, the trimmer of C16, is an air dielectric variable condenser included in the main ganged unit. C19, the trimmer of C18, is of the usual pre-set type. The L1-L3 unit also contains the coupling condenser C2.

settings, O indicating open, and C closed.

Switch	Off	M.W.	L.W.	Gram.
S1	C	C	O	O
S2	C	C	O	C
S3	O	C	O	C
S4	O	C	O	C
S5	O	C	O	C
S6	O	C	C	O
S7	O	C	C	O
S8	O	C	C	C

The rotor of the switch unit can easily be removed, enabling the contacts to be properly cleaned.

Coils.—The tuning coils L1-L3 and L4-L9 are in two screened units on the chassis deck. The L1-L3 unit also contains the coupling condenser C2.

Scale Lamps.—These are two Osram M.E.S. types, rated at 6.5 V, 0.3 A, and wired in parallel.

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (8000 Ω) external speaker. The Cossor model 595 is recommended.

Condenser C17.—Note that the aerial circuit trimmer, C17, is not of the usual pre-set type, but is an air dielectric type included in the gang condenser, and operated by a knob concentric with the main tuning knob.

Condensers C14, C15.—These are two dry electrolytic condensers in a single rectangular metal cased unit beneath the chassis, having a common negative (black) lead. The yellow lead is the positive of C15 (4 μ F) and the red the positive of C14 (6 μ F).

Resistance R14.—This is a 25 Ω wire-wound centre tapped resistance acting as a hum neutraliser for V3, which has a directly-heated filament.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, S6 and S7 the pick-up switches and S8 the mains switch. They are all ganged together in a single unit beneath the chassis. The table (col. 3) gives the switch positions for the various control

Other Components	Approx Values (ohms)
L1 Aerial coupling coil ...	9.0
L2 Aerial tuning coils ...	1.5
L3 Aerial tuning coils ...	13.5
L4 H.F. transformer primary ...	2.0
L5 H.F. transformer primary ...	14.0
L6 Reaction coils ...	0.6
L7 Reaction coils ...	3.5
L8 Reaction coils ...	1.2
L9 H.F. transformer secondary ...	13.5
L10 Speaker speech coil ...	2.0
L11 Hum neutralising coil ...	0.1
L12 Speaker field coil ...	2,500.0
T1 Speaker input trans. (Pri. Sec.)	825.0
T2 Mains trans. (Pri. total Heater sec. Rect. fil. sec. H.T. sec. total)	0.3 70.0 0.2 1,500.0
S1-S5 Waveband switches	—
S6, S7 Gram. pick-up switches	—
S8 Mains switch	—

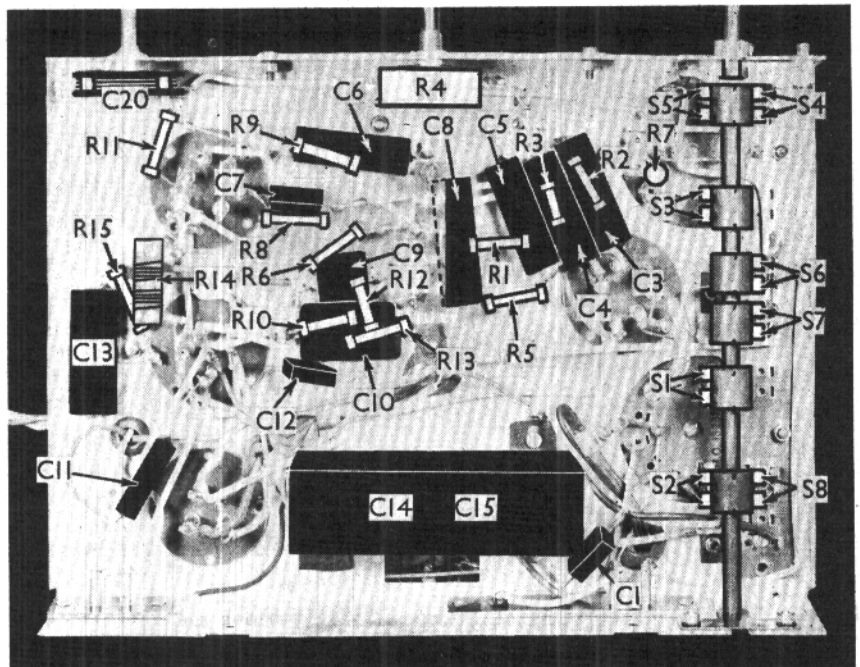
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 220 V tapping on the mains transformer. The volume control was at maximum and the reaction control was at minimum but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 MVS/Pen	175	2.1	100	0.6
V2 MS/Pen	50	1.4	30	0.3
V3 PT41	180	30.0	205	7.0
V4 442BU	315†	—	—	—

† Each anode, A.C.



Under-chassis view. All the switches are clearly marked. R14 is a centre-tapped wire-wound resistance