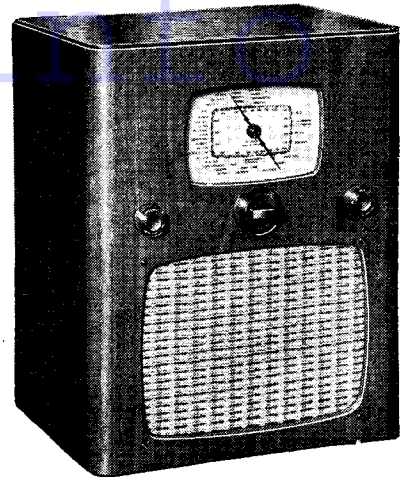


# COSSOR 393 BATTERY THREE VALVE



**CIRCUIT.**—The aerial input to the grid of V1, a variable-mu battery pentode operating as the H.F. amplifier, is via a series aerial condenser C1 and an aerial coupling condenser C2 and an aerial coils L1, L2 and L3. It should be noticed that the aerial circuit trimmer is adjusted on the aerial that is to be used with the receiver.

The volume control is a variable potentiometer that varies the grid bias to the grid of V1 and thereby the sensitivity of the valve. A separate H.T. lead, with by-passing condenser C4, feeds the screen of V1.

V1 is H.F. transformer coupled to the demodulator V2, a pentode operating on the grid leak principle. Connections for a pick-up are provided. Reaction, controlled by a variable condenser, is obtained from the anode of V2 by means of reaction windings in the usual way.

V2 is resistance capacity auto-transformer coupled to V3, a tetrode output valve. A tone modifier circuit is connected across the primary of the output transformer in the shape of C11 and R10.

Battery equipment consists of a standard capacity 120-volt H.T. battery, Cossor type 1120; a 9-volt grid bias battery, Cossor type 933; and a 2-volt accumulator Cossor type E.245. An H.T. reservoir condenser is connected across the H.T. battery and there is a fuse in the negative lead.

**Chassis Removal.**—Remove top back of cabinet, all batteries and the four control knobs. The tuning and reaction controls are secured by separate grub screws.

Next remove the four chassis securing bolts from the underside of the shelf. Owing to the small space between the speaker and one of the chassis securing bolts, it will probably be found necessary to remove the speaker. The chassis may then be withdrawn and operated, in conjunction with the speaker, outside the cabinet.

**Special Notes.**—A pair of sockets on the aerial and earth panel enable a pick-up with its own volume control to be connected.

Another pair of sockets enables an extension speaker of some 18,000 to 20,000 ohms impedance to be operated.

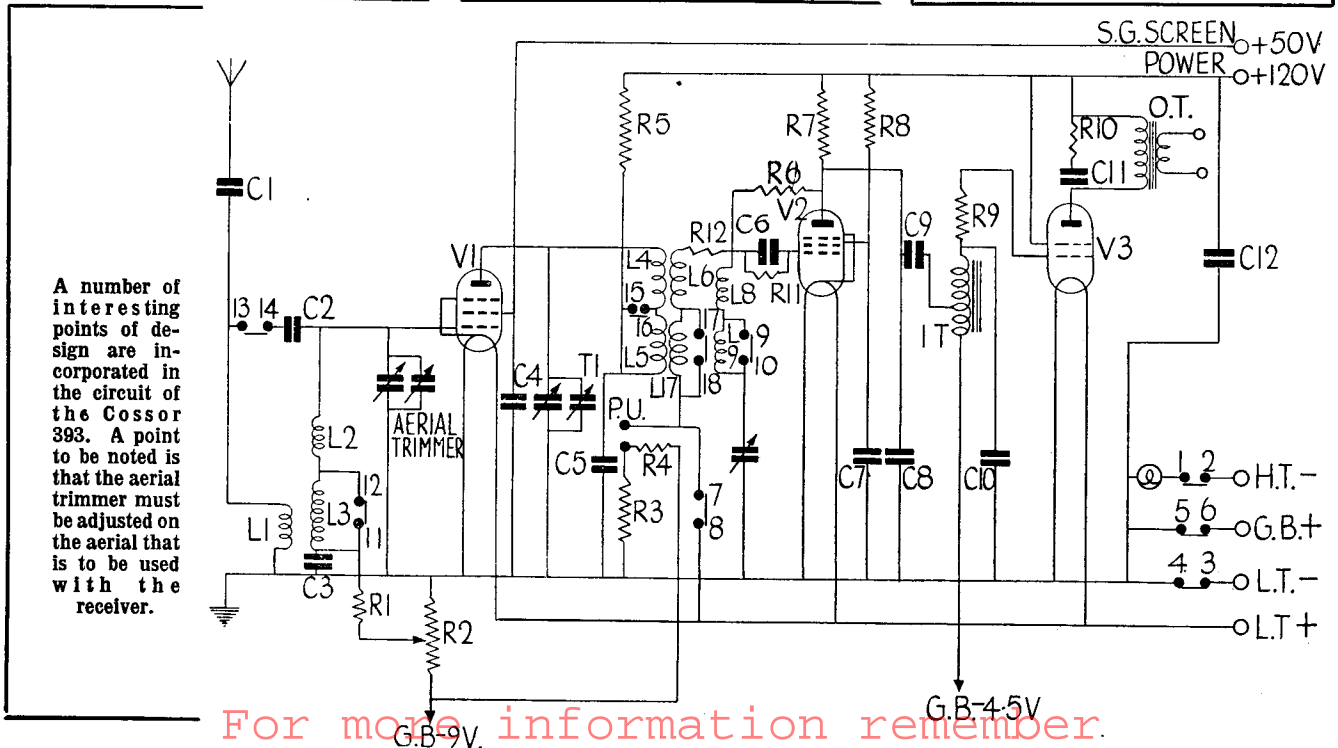
A small slotted black knob at the rear of the chassis enables the receiver to be matched to the aerial on which it is to be permanently used.

A fuse in a screw-in holder at the rear of the chassis protects the valves from over-

VALVE READINGS				
No signal. Volume maximum. No reaction.				
MW. min. cap. New batteries.				
V.	Type.	Electrode.	Volts.	Ma.
1	All Cossor. 210 VPT ..	Anode ..	101	.1
		Screen ..	47	very low.
2	210 SPT ..	Anode ..	44	1
		Screen ..	12	.1
3	220 O.T. ..	Anode ..	110	7.1
		Screen ..	120	1.5

CONDENSERS		
C.	Purpose.	Mfds.
1	Series aerial ..	.0005
2	Aerial coupling ..	.000015
3	V1 grid decoupling ..	.1
4	V1 screen decoupling ..	.1
5	V1 anode decoupling ..	.1
6	V2 grid condenser ..	.0001
7	V2 screen decoupling ..	.1
8	V2 anode shunt ..	.0001
9	L.F. coupling ..	.1
10	V3 grid shunt ..	.0002
11	Tone modifier ..	.005
12	H.T. reservoir ..	2

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid decoupling ..	2 meg.
2	Volume control ..	50,000
3	Pick-up pot. (part) ..	100,000
4	Pick-up pot. (part) ..	500,000
5	V1 anode decoupling ..	10,000
6	Regeneration modifier ..	200
7	V2 anode load ..	50,000
8	V2 screen decoupling ..	500,000
9	V3 grid stopper ..	100,000
10	Tone modifier ..	30,000
11	V2 grid leak ..	2 meg.
12	V2 grid stabilising ..	200



loads. This bulb has an M.E.S. base and is rated at 3.5 volts .15 amp.

C2, the aerial coupling condenser, is inside the can housing the aerial coils.

The wavechange switches are of open construction, details of which are shown on the chassis drawing.

### Circuit Alignment Notes

An output meter may be connected across the primary of the speaker transformer if desired. Switch receiver to the M.W. band and set pointer to read 214 metres. Turn volume to maximum and set reaction control so that the receiver is nearly, but not quite, oscillating.

Connect a service oscillator tuned to 214 metres (1,400 kc.) to the A. and E. leads, and adjust the trimmer, T1, for maximum response. T1 is the trimmer at the side of the gang condenser.

The receiver should then be connected to the aerial on which it is to be permanently used, and the output meter and service oscillator removed.

Tune the receiver to a station below 250 metres and adjust both the reaction control and also the small slotted black knob at the rear of the chassis until maximum sensitivity is obtained. Once the optimum point for the trimmer is found this should not be readjusted.

WINDINGS (D.C. Resistances)			
Wind- ing.	Ohms.	Range.	Where measured.
L1	9	LW	C1 and chassis.
L2	2	MW	Grid V1 and R1 + C3.
L3	15	LW	Grid V1 and R1 + C3.
L4	2	MW	Top anode V1 and R5 + C5.
L5	15	LW	Top anode V1 and R5 + C5.
L6	1.6	MW	R12 and "7."
L7	14.5	LW	R12 and "7."
L8	1	MW	R6 and reaction con- denser.
L9	7	LW	R6 and reaction con- denser.
I.T.	1500+	—	Across tags.
	2030		
O.T.	1200	—	Across speaker wires.
prim.			

## Cossor 393 on Test

**MODEL 393.**—Standard model for battery operation requiring a Cossor type E.245 2-volt accumulator, a Cossor 933 9-volt bias battery and a Cossor 1120 120-volt standard capacity H.T. battery. Price 5 gns. without batteries.

**DESCRIPTION.**—Two-band, three-valve "straight" receiver with tetrode output.

**FEATURES.**—Full-vision, airplane type scale calibrated in metres and station names. Speaker located below chassis. Controls for volume, tuning with concentric reaction knob and combined wave selection and master switch. Sockets for a high impedance L.S. and a pick-up. Fuse bulb at rear of chassis deck.

**LOADING.**—H.T., 9.6. ma.; L.T., .38 amp.

### Sensitivity and Selectivity

**MEDIUM WAVES (200-560 metres).**—Very good gain and adequate selectivity. Main stations easily received. Careful control of volume and reaction enables useful separation to be obtained.

**LONG WAVES (800-2,000 metres).**—Very good gain and excellent selectivity. A medium-sized aerial enables Deutschlandsender to be received with very little interference and other stations come in well.

The reaction control works excellently without any overlap on both wavebands.

### Acoustic Output

Tone very well balanced for battery receiver, with ample volume for a reasonable-sized room. No undue top cutting and very little colouration.

### Replacement Condenser

**A**N exact replacement condenser for C12 is the Hunt's Type 3479 at 1s. 9d. This is available from A. H. Hunt, Ltd., of Garratt Lane, London, S.W.18.

### Aerials at Fault

**A** FAULT not always easy to diagnose on account of its misleading symptoms is an aerial lead in which has broken inside its insulation. This applies particularly to battery receivers.

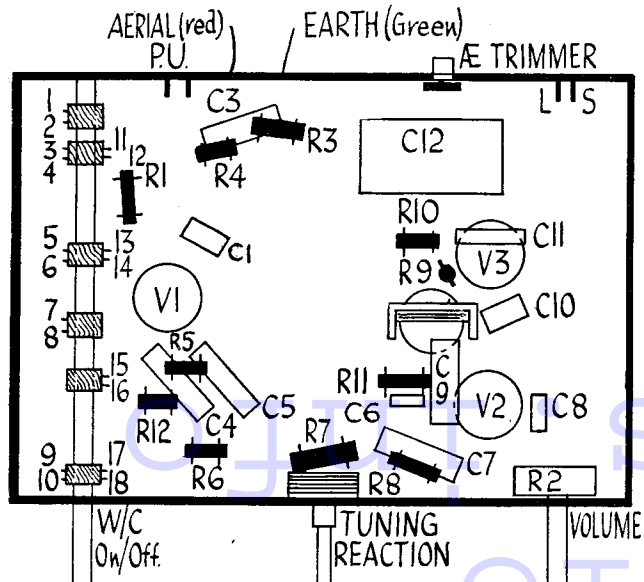
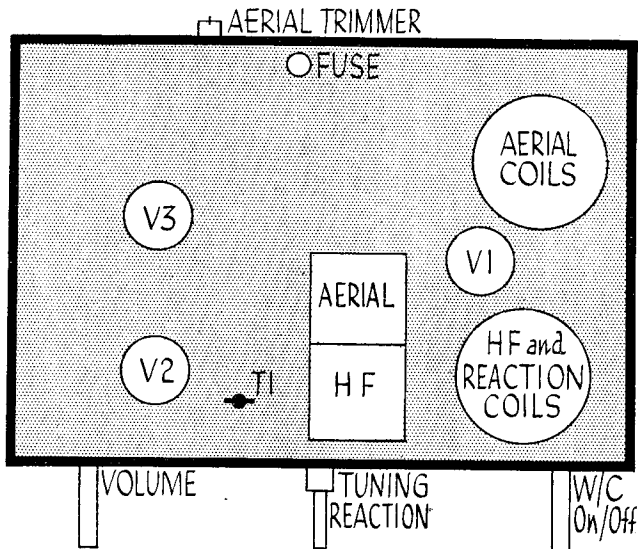
It is surprising the number of houses where this fault arises, especially where the wire runs through a door or window.

The usual symptoms are loss of volume and the number of stations that can be received.

When out on service calls I always carry a long insulated lead so that I can test the lead in with an ohmmeter.

A good way to spot this fault is to tune the set to a weak signal and then place a finger on the aerial terminal of the set. A broken lead in is indicated by the signals becoming louder as the finger touches the terminal. This simple test, however, is only effective if the break is comparatively near the set.—S. R.

Neat component layout is a feature of the Cossor 393. On the right is shown the arrangement of the upper side of the chassis.



Left, the component arrangement of the underside of the Cossor 393 chassis. This is simply arranged and should facilitate any service or replacement operations.