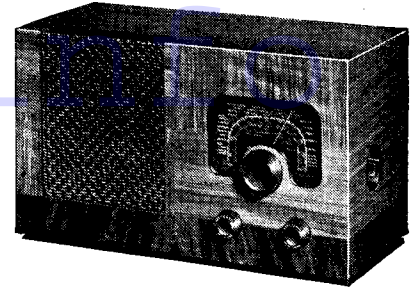


# COSSOR 390U A.C.-D.C. STRAIGHT THREE



A "straight" three valve plus rectifier chassis is utilised in this model 390U receiver by A. C. Cossor Ltd.

**CIRCUIT.**—Aerial coupling to the grid of V1, an H.F. amplifier, is by inductively coupled aerial coils. On the medium band an additional aerial-coupling condenser is brought into circuit. A 50,000-ohms resistance is connected across the primary coil.

The volume control consists of a variable resistance in the cathode circuit of V1, and operates so as to vary the bias.

A limiting cathode bias resistance R3 is included.

V1 is tuned anode coupled to V2, an H.F. pentode, that operates as the demodulator. Reaction is obtained from the anode of the valve in the usual manner by means of windings coupled to the inter-valve coils and is controlled by a variable condenser.

V2 is resistance capacity coupled to V3, an output tetrode. Across the primary of the speaker transformer is a fixed condenser and resistance to provide fixed modification of the tone. Connections are also brought out from the primary of the transformer for a high-impedance extension speaker outlet.

Mains equipment consists of an adjustable resistance, a half-wave rectifier V4, electrolytic smoothing condensers, and a smoothing choke (the speaker field coil). A pair of H.F. chokes in the mains

leads, together with a fixed condenser, operate as a mains disturbance suppressor.

**Chassis Removal.**—Remove back of cabinet (secured by four bolts) and the three grub-screw fixed control knobs. The wavechange knob at the side of the cabinet is removed by switching to M.W., loosening the grub screw on the extension rod accessible from the back of the cabinet, and then withdrawing.

Remove the four black paper discs from the base and then the four chassis-securing bolts from the holes thereby exposed. The single wood screw at the top of the wavelength dial must then be removed. It will be found necessary to remove V2 and V3 to effect this.

The chassis may then be withdrawn sufficiently for most service work. To completely withdraw chassis, remove the on-off switch from the side of the cabinet and remove the leads to the speaker panel.

From left to right, looking from the rear of the cabinet, the yellow lead is

## QUICK TESTS

Quick tests are available on the leads to the speaker transformer. Voltages measured between these and the chassis should be:—  
Blue lead, 182 volts.  
Red lead, 139 volts.  
Yellow, 150 volts.

## CONDENSERS

C.	Purpose.	Mfds.
1	Series aerial . . . . .	.00015
2	Aerial volume coupling . . . . .	.01
3	L.W. aerial fixed trimmer . . . . .	.000025
4	Chassis isolating . . . . .	.05
5	Aerial coupling . . . . .	.00001
6	V1 cathode bias shunt . . . . .	.1
7	V1 screen decoupling . . . . .	.1
8	Hum filter . . . . .	.0001
9	V2 grid condenser . . . . .	.0001
10	V2 screen decoupling . . . . .	.1
11	H.F. bypass . . . . .	.0002
12	H.F. bypass . . . . .	.0005
13	L.F. coupling . . . . .	.05
14	V3 grid shunt . . . . .	.0002
15	V3 cathode bias shunt . . . . .	.10
16	Pentode compensator . . . . .	.001
17	Tone modifier . . . . .	.01
18	H.T. line H.F. bypass . . . . .	.1
19	H.T. smoothing . . . . .	.8
20	H.T. smoothing . . . . .	.8
21	H.T. smoothing . . . . .	.82
22	Mains suppressor . . . . .	.1

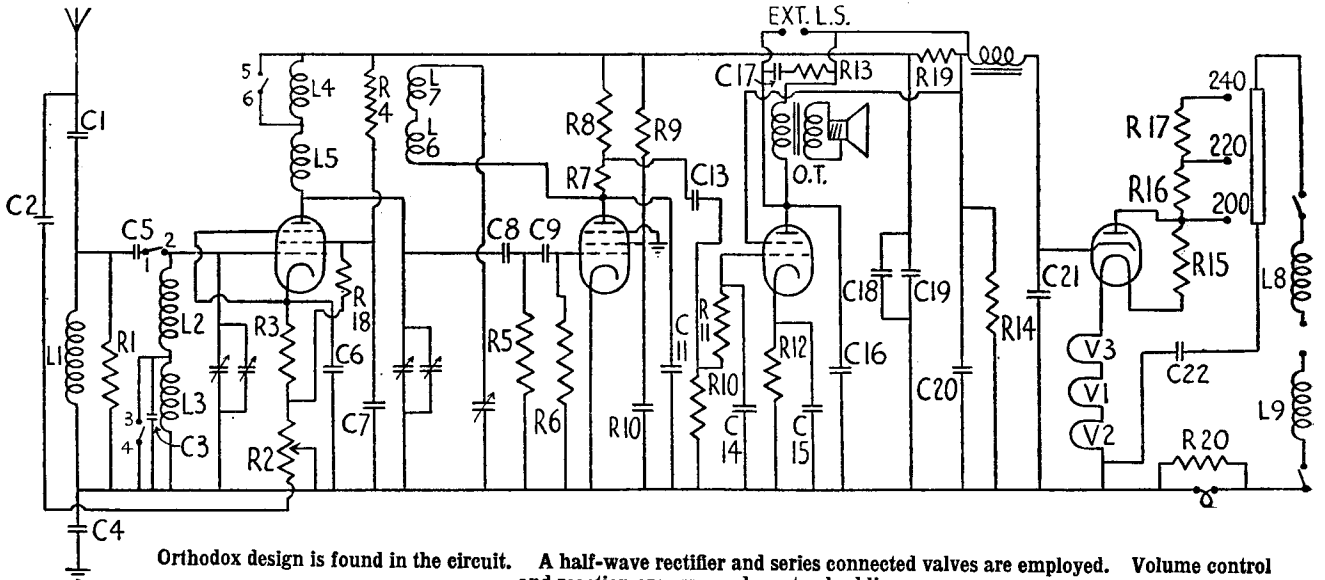
## RESISTANCES

R.	Purpose.	Ohms.
1	Aerial shunt . . . . .	50,000
2	Volume control . . . . .	12,000
3	V1 cathode bias (limiting) . . . . .	350
4	V1 screen potr. (part) . . . . .	25,000
5	Hum filter . . . . .	2 meg.
6	V2 grid leak . . . . .	2 meg.
7	V2 anode H.F. load . . . . .	10,000
8	V2 anode load . . . . .	100,000
9	V2 screen decoupling . . . . .	500,000
10	V3 grid leak . . . . .	500,000
11	V3 grid stopper . . . . .	100,000
12	V3 cathode bias . . . . .	200
13	Tone modifier . . . . .	10,000
14	H.T. bleeder . . . . .	3,000
15	Mains adjustment (part) . . . . .	350
16	Mains adjustment (part) . . . . .	60
17	Mains adjustment (part) . . . . .	63
18	V1 screen potr. (part) . . . . .	20,000
19	H.T. smoothing . . . . .	5,000
20	Dial lamp shunt . . . . .	70

## VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
<i>All Cossor.</i>				
1	13 VPA (7)	Anode . .	110	1.8
		Screen . .	40	.7
2	13 SPA (7)	Anode . .	20	.8
		Screen . .	15	.3
3	402 OT (7)	Anode . .	139	34.
		Screen . .	150	5.
4	40 SUA (5)	Cathode . .	182	—



Orthodox design is found in the circuit. A half-wave rectifier and series connected valves are employed. Volume control and reaction are arranged on standard lines.

For more information remember  
www.savoy-hill.co.uk

connected to the first terminal, red to the middle, and blue to the right-hand (third) terminal.

**Special Notes.**—A pair of sockets at the rear of the chassis enable an extension speaker to be operated. This should be of the permanent-magnet type with a matching transformer having an impedance of 8,000 ohms.

Under certain conditions the chassis is live and no direct connection should be made between chassis and earth.

There are two dial lights in screw-in holders located behind the dial. The holders are mounted in rubber formers designed to eliminate crackle. The bulbs are rated at 8 volts 1.6 watt, with MES bases (Cossor Cat. No. 222). Failure of these bulbs does not interfere with reception, although replacements should be effected as soon as possible.

As is usual practice with universal receivers, the heaters of the valves are in series. It will be noticed that part of

the mains resistance is in parallel with the dial lights.

C8 and R5, connected between the anode of V1 and the grid coupling condenser C9, operate so as to eliminate traces of hum.

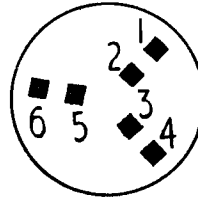
### Alignment Notes

Connect an output meter across the primary of the speaker transformer (the extension speaker sockets) with a 2-mfd. fixed condenser in one lead. Connect a service oscillator to the A. and E. sockets, preferably *via* a dummy aerial or fixed condenser.

Turn volume to maximum and adjust the reaction control to bring the receiver almost to the point of oscillation.

Tune set and oscillator to 214 metres (1,000 kc.) and adjust T1 and then T2 for maximum response, reducing the input from the service oscillator as the circuits come into line.

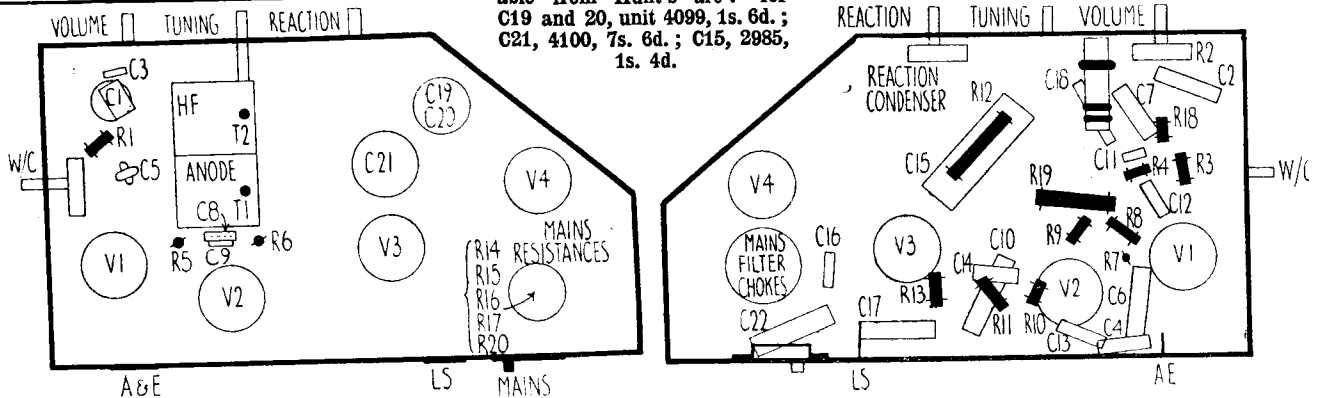
Best results will be obtained by adjusting the reaction control to its most sensitive position and reducing the input from the oscillator as the circuits come into line, thereby leaving the volume control of the receiver at maximum.



Left, are switch details of the 390U and below are diagrams identifying the components both on top (left) and underneath the chassis.

Condenser replacements available from Hunt's are: for C19 and 20, unit 4099, 1s. 6d.; C21, 4100, 7s. 6d.; C15, 2985, 1s. 4d.

WINDINGS (D.C. Resistances)			
Winding.	Ohms.	Range.	Measured between.
L1 ..	18.4	—	C1 and chassis.
L2 ..	9.5	MW	Grid V1 and chassis.
L2+L3	36	LW	Grid V1 and chassis.
L4 ..	8	MW	Anode V1 and HT line.
L4+L5	36.3	LW	Anode V1 and HT line.
L6+L7	5.6	—	Anode V2 and reaction condenser.
L8 ..	7.3	—	Across ta gs.
L9 ..	7.3	—	Across ta gs.
Field ..	380	—	Outside tags speaker panel.
O.T. prim.	380	—	LH and middle tags speaker panel.



### PILOT U357 THREE-BAND FIVE

(Continued from page ii.)

dummy aerial or fixed condenser of .0002 mfd., only feeding sufficient input to obtain definite peaks in the output meter.

**Medium Waves.**—Tune set and oscillator to 200 metres (1,500 kc.) and adjust T1 and then T2 for maximum.

Tune oscillator to 500 metres (600 kc.), tune in on receiver and adjust P1 for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

**Long Waves.**—Tune set and oscillator

to 800 metres (375 kc.) and adjust T3 and then T4 for maximum response.

Tune oscillator to 2,000 metres (150 kc.), tune in on receiver and adjust P2 for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

**Short Waves.**—Tune set and oscillator to 16.6 metres (18 mc.) and adjust T5 and then T6 for maximum response.

The short-wave padding is fixed.

**Whistle Filter.**—A whistle filter is incorporated. This is for eliminating a whistle sometimes experienced when receiving Luxembourg. The trimmer T7 should be adjusted when the receiver is actually receiving the station to reduce or eliminate the whistle.

## Cossor 390U on Test

**MODEL 390U.**—Standard model for A.C.-D.C. mains, 200-250 volts, 40-100 cycles. Price, 6 gns.

**DESCRIPTION.**—Three-valve, plus rectifier, two-band "straight" receiver with reaction. Midget table model.

**FEATURES.**—Full-vision scale calibrated in station names and metres. Large tuning control allowing quick searching and easy adjustment. Other controls for reaction, volume, separate master switch and wave selection switch at sides of cabinet. Small compact cabinet, with speaker at side of chassis. Sockets for extension L.S.

**LOADING.**—66 watts.

**Sensitivity and Selectivity.**

**MEDIUM WAVES (200-560 metres).**

—The gain is high and selectivity is reasonably good, although with a large aerial within 15 miles of the local station the spread is noticeable. Careful handling of the volume and reaction controls enable a useful number of stations to be received without difficulty. Reaction is free from overlap.

**LONG WAVES (880-2,100 metres).**—Adequate gain and useful selectivity. All main stations well received without interference.

**Acoustic Output**

Volume is representative and the tone is crisp and clean with very little speech colouration and reasonable low-note radiation.

### Push-Pull Output Circuits

**PUSH-PULL** output circuits can prove puzzling. For example, if one valve is removed the output drops only slightly. Removal of one valve reduces the load on the H.T. supply with the result that the H.T. rises. This increased anode voltage results in a bigger output from the valve still in circuit.

Even if the H.T. did not rise and the output was halved, the acoustic drop in volume would be only 3 db. As each half of a push-pull circuit is complete in itself distortion is not necessarily caused by the removal of one valve.—R. N.