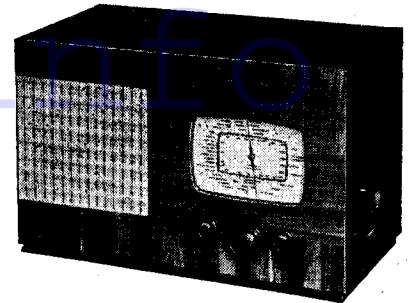


# COSSOR 394 THREE-VALVE BATTERY



The Coszor model 394 is a simple three valve, two-band battery receiver using the special Coszor superhet circuit with reaction on the I.F. coils.

**CIRCUIT.**—The aerial is connected through a fixed condenser to either the medium- or long-wave pre-selector circuit. These have iron-cored coils with separate coupling windings selected by the switch.

V1, a Coszor 201PGA frequency changer, has a conventional circuit arrangement. The first I.F. transformer is iron cored and fitted with regenerative windings, so that reaction can be introduced for increasing the selectivity. Reaction is controlled by a variable condenser mounted on the front of the receiver.

The second detector, V2, is a screen grid valve with condenser and leak rectification, and the anode circuit resistance-feeds an auto-coupled L.F. transformer of the high-permeability core variety.

The output of this transformer goes to the output valve V3, which feeds the speaker through a transformer.

High tension is obtained from a battery, and the negative H.T. return contains a

resistor from which bias is supplied for the grid of the last valve and also for controlling the gain on the first valve. This negative return circuit contains a miniature lamp as a fuse.

**Chassis Removal.**—The chassis is removed by taking off the three front knobs and the wave control knob at the side. The grub screw for this is accessible from the inside. The speaker is disconnected by a special miniature four-pin plug. The chassis itself is released by withdrawing the four chassis-holding bolts from the bottom of the cabinet.

**Special Notes.**—The medium-wave aerial coils and the oscillator coils for medium and long are mounted underneath the chassis. The long-wave aerial coils are on the top.

The I.F. transformer is a special type, with no trimming adjustment in the way of condensers. If anything should go wrong the wax seals must be broken and the transformers ganged by adjusting the cores as explained in Alignment Notes. These holes will be noticed on the side of the circular can on the top of the chassis.

The main trimmers for aerial and oscillator are mounted on the top of the ganged condenser on the chassis. There is a separate long-wave trimmer and long-wave paddler. These two are mounted on the side of the chassis near to the volume control. The two condensers are easily identified, as the long-wave paddler is the first one when looking at the bottom of the chassis, and it also has in parallel with it a fixed silver mica condenser.

It should be remembered that the set will not work with a plug in the extension

socket unless the socket is short circuited or has a speaker connected to it.

**Wave-change Switches.**—There are four main switches controlling the aerial winding, tuned input circuits, and anode and grid circuits of the oscillator section of the first valve. These are all provided on a 12-contact single wafer mounted at right angles at the side of the set.

It is important to note that on the back of this wafer there is a further switching operation, provided by another wipe and two contacts. These are at the back of contacts 3, 4 and 6, the wipe being behind contact 3. These contacts are shortened on the medium band.

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 fixed bias pot. (part) ..	5,000
2	Volume control .. .. .	50,000
3	V1 osc. grid return .. .. .	100,000
4	V1 screen decoupling .. .. .	70,000
5	V1 osc. anode load .. .. .	70,000
6	V2 grid leak .. .. .	5 meg.
7	V2 screen decoupling .. .. .	500,000
8	V2 anode load .. .. .	70,000
9	V3 grid stopper .. .. .	50,000
10	Series bias .. .. .	550

## CONDENSERS

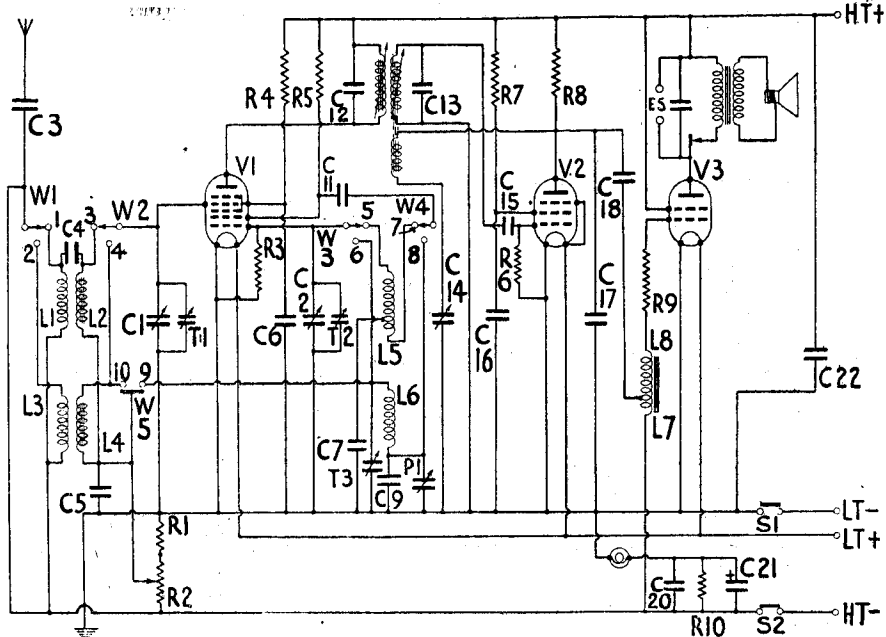
C.	Purpose.	Mfds.
3	Aerial series .. .. .	.0005
4	Aerial coupling .. .. .	.000015
5	V1 bias decoupling .. .. .	.1
6	V1 series decoupling .. .. .	.1
7	M.W. fixed paddler .. .. .	.000542
9	L.W. fixed paddler .. .. .	.0001
11	V1 osc. coupling .. .. .	.0005
12	I.F. T.1 primary fixed tune ..	.000047
13	I.F. T.1 screen fixed tune ..	.000065
14	Reactive control .. .. .	.00035
15	V2 grid .. .. .	.000025
16	V2 screen decoupling .. .. .	.1
17	V2 anode shunt .. .. .	.0002
18	L.F. transformer feed .. .. .	.05
19	V3 anode shunt .. .. .	.005
20	Series bias shunt .. .. .	.1
21	Series bias decoupling .. .. .	20
22	H.T. shunt .. .. .	2

## WINDINGS (D.C. RESISTANCES)

L.	Ohms.	Range.	Where measured.
1 ..	12.5	M.W.	W1 and P2.
2 ..	2	M.W.	Grid V1 and slider R2.
3 ..	180	L.W.	W1 and R2.
4 ..	21	L.W.	Grid V1 and slider R2.
5 ..	8	M.W.	Osc. grid and C11
6 ..	18.5	L.W.	C11 and Osc. grid
7 ..	1,400	—	Across tags
8 ..	3,400	—	Across tags
9 ..	18.5	—	Anode V1 and HT plus.
10 ..	19	—	Chassis and C15
11 ..	1	—	C14 and anode V2
O.T. prim. ..	1,190	—	On speaker tags.

## VALVE READINGS

V.	Type.	Electrode.	Volts.	Ma.
1	All Coszor. 210 PGA ..	Anode ..	116	.3
		Screen ..	34	1.0
		Osc. anode ..	39	.7
2	210 SPT ..	Anode ..	31	.7
		Screen ..	11	.2
3	220/OT ..	Anode ..	110	4
		Screen ..	116	1
Fuse	MES ..	—	3.5	150



A frequency-changer is coupled by an I.F. transformer to a screen-grid detector valve from which reaction is applied to the I.F. circuits. Bias is obtained automatically by the H.T. series resistor R10.

### Alignment Notes

**I.F. Circuits.**—Connect a signal generator, tuned to 465 kc., to the control grid of V1 with a .05 mfd. condenser in series. The lead on the top cap should be left in position on the valve.

The reaction condenser, C14, must be set at zero, and the wax securing the iron cores of the I.F. transformer can be softened by placing a heated screwdriver in the slots. The cores are then screwed in or out as required for maximum response in the output meter.

**Medium Waves.**—Connect the signal generator, tuned to 1,400 kc. (214 metres),

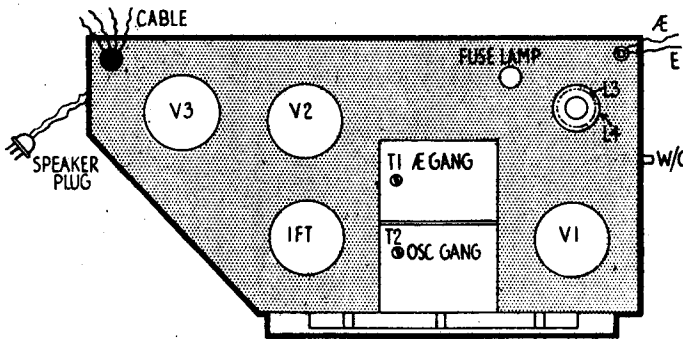
to the aerial lead and set the pointer on the receiver to 214 metres.

Adjust T2 and then T1 to obtain maximum signal. No padding is available on M.W., as a fixed padding condenser is used.

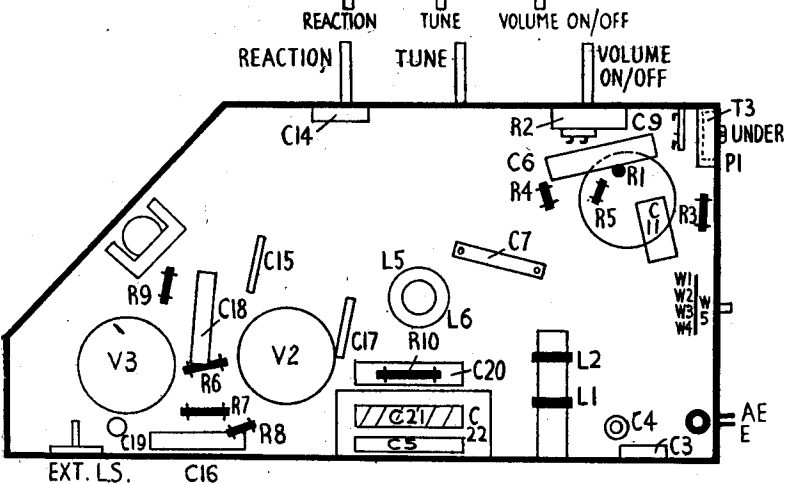
**Long Waves.**—To adjust the L.W. trimmer, T3, tune the signal generator to 250 kc. (1,200 metres), and set the pointer on the receiver to 1,200 metres.

Vary the trimmer and gang condenser setting until the point of maximum gain is found.

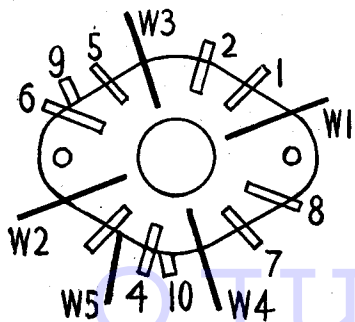
The L.W. padder, P1, is adjusted in a similar manner at 160 kc. (1,875 metres), and the trimming operation repeated at 1,200 metres.



On the top of the chassis (layout diagram on left) is a fuse bulb. Wave-change switch is on the side and connections are made by cables.



In this under-chassis layout diagram the electrolytic condenser is shown shaded. Construction is compact and straightforward.



The switch bank lettered to correspond to the circuit. W5 and contacts 9 and 10 are on the under side. See also switch details in text on opposite page.

## Cossor 394 on Test

**MODEL 394.**—For battery operation, requiring standard capacity H.T. battery type 1120 and 2-volt 45-a.h. accumulator, type E245. Price, 6 gns.

**DESCRIPTION.**—Three-valve, two-waveband table model superhet.

**FEATURES.**—Full-vision scale with "aeroplane" type pointer. Wave switch at side of cabinet and controls for tuning, volume and reaction (which is applied to the intermediate transformer) on the front. Scale calibrated in names and wavelengths. Switched extension speaker socket and leads for aerial and earth. Battery connection by a multiple cable. Valves held in position by rubber bands of special moulded type.

**LOADING.**—H.T., 7.2 ma.; L.T., 4 amp.

### Sensitivity and Selectivity

**MEDIUM WAVES (190-550 metres).**—Very good sensitivity and excellent selectivity for a small battery set. Gain is well maintained and is very appreciably improved by the intermediate frequency reaction.

**LONG WAVES (800-2,400 metres).**—Excellent gain and selectivity. All main stations easily received, with very little interference on Deutschlandsender.

### Acoustic Output

Sufficient volume for an ordinary room, with a very pleasing characteristic for a battery output. The tone is well balanced, with no undue prominence of top notes and the medium and lower registers are good for a small set.

### Replacement Condenser

AN exact replacement for the one electrolytic condenser in the 394 is available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18. This is for C21, and is unit 4,105, price 1s. 6d.

## Philco U429 Alignment Notes

Continued from page 60.)

**I.F. Circuits.**—Connect the output of a signal generator between the chassis and the control grid of V1 and tune oscillator

MEDIUM WAVES				
But-ton.	Range.	Osc. trimmer.	Aerial trimmer.	
1	180-280 metres (1,666.6-1,071.4 kcs.)	T.11	T.6	
2	280-420 metres (1,304.3-714.2 kcs.)	T.12	T.7	
3	300-550 metres (1,000/545.4 kcs.)	T.13	T.8	
LONG WAVES				
4	1,000-1,800 metres (300-166.6 kcs.)	T.14	T.9	
5	1,200-2,000 metres (250-150 kcs.)	T.15	T.10	

to 475 kc. Connect an output meter to the extension speaker jack.

Adjust T1 and T2 and then T3 and T4 for maximum output.

The input used must be small and must be progressively reduced as the receiver comes into line. A final check of T1 and T2, T3 and T4 should then be made.

**Wavetrap.**—In this receiver the long-wave tuning coil is used as a series rejector circuit when working on the medium band. Connect the signal generator to the aerial and earth sockets, adjust to 475 kc., and vary T5 until minimum response is obtained.

### Replacement Condenser

AN exact replacement is available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, for the block containing Cs 18, 19 and 20. This is unit number 1129, price 7s. 6d.