

# COSSOR 348 A.W. MAINS THREE

**CIRCUIT.**—The aerial is coupled by a series condenser and an H.F. transformer to the grid of V1, a triode hexode. The circuit arrangement on short waves is such that the triode hexode operates as a frequency changer, and converts the signal to the I.F. of medium wavelength. On medium and long waves, the triode-hexode valve operates as an H.F. amplifier, and the receiver becomes a "straight" set with reaction. The oscillator grid is then shorted to earth via a fixed condenser and cathode bias return.

The volume control is connected in the cathode circuit of V1 and varies the amount of bias.

V1 is tuned anode coupled via an H.F. transformer with reaction windings to V2, an H.F. pentode, which is the demodulating valve. Reaction is obtained from the anode of this valve in the usual manner via a reaction coil on the H.F. transformer and variable condenser coupling to the earth line.

V2 is resistance capacity coupled to V3, a triode valve, forming the output stage. A fixed tone compensator condenser is connected across the primary of the speaker transformer.

Mains equipment consists of transformer, a full-wave rectifying valve, smoothing choke (speaker field) and electrolytic smoothing condensers.

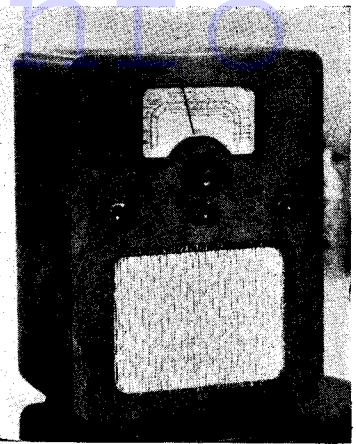
**Chassis Removal.**—First remove the back of the cabinet. This is secured by six screws that fix on metal brackets. The chassis base is not covered by a base-board in the usual manner. With the

back of the cabinet removed, the underside of the chassis is accessible to a slight extent for inspection.

Remove the five control knobs from the front of the cabinet. They are of the grub-screw fixing type. The tuning control has two knobs, the smaller of which is removed by unscrewing the screw observed on the front of the shaft, the larger by pulling.

Take out the four fixing bolts and washers securing the chassis to the division inside the cabinet. Remove the two woodscrews securing the wavelength dial assembly to the inside of the cabinet. The chassis can then be taken out of the cabinet to the extent of the speaker leads.

To remove these from the speaker, un-



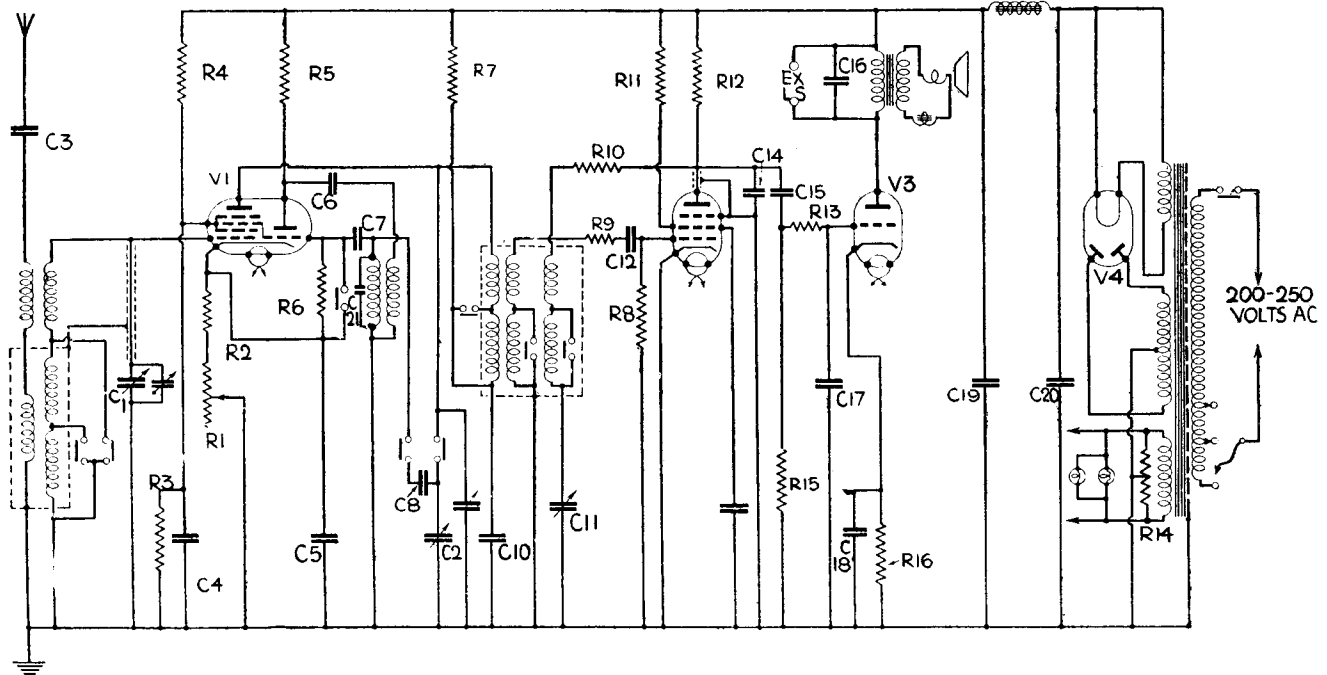
Cosser's model 348, an A.C. all-wave three that is superhet on short-waves and a "straight" on medium and long. It retails at £6 19s. 6d.

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias, variable ...	12,000
2	V1 cathode bias, fixed ...	100
3	V1 screen potr. (part) ...	2 meg.
4	V1 screen potr. decoupling (part) ...	50,000
5	Oscillator anode load ...	10,000
6	Oscillator grid leak ...	50,000
7	V1 anode decoupling ...	10,000
8	V2 grid leak ...	1 meg.
9	Reaction smoothing ...	200
10	Regeneration modifier (reaction) ...	300
11	V2 screen decoupling ...	500,000
12	V2 anode load ...	100,000
13	V3 grid stopper ...	100,000
14	V1, V2, V3 filaments centre tap ...	25
15	V3 grid leak ...	500,000
16	V3 cathode bias ...	300

## CONDENSERS

C.	Purpose.	Mfds.
3	Series aerial ...	.0005
4	V1 screen decoupling ...	.1
5	V1 cathode shunt ...	.1
6	Oscillator anode coupling ...	.00005
7	Oscillator grid ...	.00005
8	S.W. osc. modifier ...	1,200 mmfds.
10	V1 anode decoupling ...	.1
12	V2 grid ...	.0001
13	V2 screen decoupling ...	.1
14	H.F. by-pass ...	.0002
15	L.F. coupling ...	.01
16	Tone compensator ...	.005
17	H.F. by-pass ...	.0002
18	V3 cathode shunt ...	50
19	H.T. Smoothing ...	4
20	H.T. Smoothing ...	6
21	Oscillator grid fixed trimmer ...	—



Note the arrangement whereby V1, a triode-hexode, operates as a mixer on the 17.25 to 52.5 band, but as an H.F. amplifier on M. and L. waves with the oscillator grid earthed through a fixed condenser and cathode bias return. The other valves are an H.F. pentode, a triode output and a full-wave rectifier.

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screw the three nuts holding the connections from the set to the speaker transformer. For the reverse process it may be noted that the order of connections from the top terminal is blue, red and yellow.

**Special Notes.**—There are two dial lights mounted in screw-in holders clamped on each side of the dial assembly. They are each rated at 6.5 volts .3 amp. Care should be taken during replacement that the spaghetti sleeving fully insulates the holders from the metal chassis.

A pair of sockets at the rear of the chassis enable an external speaker to be used. This should be of the permanent-magnet type with its own matching transformer with a resistance of 3,000 ohms impedance. The makers recommend a Cossor type 695.

### QUICK TESTS

Quick tests are available on this receiver on the speaker transformer. Volts measured between this and the chassis should be:—

- Blue lead, 310 volts, unsmoothed H.T.
- Red lead, 205 volts, smoothed H.T.
- Yellow, 210 volts, smoothed H.T.

## Circuit Alignment Notes

Connect a service oscillator tuned to a frequency of 1,000 kc. (300 metres) to the aerial and earth terminals, and turn the pointer of the receiver to coincide with the 300 metres on the wavelength dial.

Connect an output meter across the primary of the speaker transformer. Turn the reaction control to about half-way, but not so that the set oscillates.

Adjust C9, which will be found accessible through a hole in the front of the chassis, and the small trimmer knob in the centre of the main tuning control for maximum response.

The medium waveband should now be found to be correctly adjusted as to calibration.

The circuit of the receiver is so arranged that when the medium waveband is correctly calibrated the long and short bands will be brought into line without any further adjustments.

## Cossor 348 on Test

**MODEL 348.**—Standard model for A.C. mains operation. 200-250 volts, 40-100 cycles. Price 7 gns.

**DESCRIPTION.**—Three-waveband, four-valve, including rectifier, table model mains receiver, which operates as a "straight" set on medium and long waves and as a superhet on short waves.

Controls provide for tuning, volume, reaction and wave selection. Illuminated scale calibrated in wavelengths and station names. Sockets for external speaker.

**LOADING.**—52 watts.

### Sensitivity and Selectivity

**SHORT WAVES (17.25-52.5 metres).**—Careful handling enables a useful number of short-wave programmes to be obtained.

**MEDIUM WAVES (200-560 metres).**—Performance comparable with an ordinary straight three set, with appreciable spread of local stations when tested near London. Useful number of programmes easily received.

**LONG WAVES (826-2,000 metres).**—Good gain and selectivity. Deutschlandsender receivable with some interference.

### Acoustic Output

Representative for the valve combination with no undue colouration and well balanced output.

### Replacement Condensers

Two exact service replacement condensers for the Cossor 348 are available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18. These are: for Cs 19 and 20, unit list number 3655, price 5s.; for C18, unit 2915, 1s. 9d.

### VALVE READINGS

No signal. Short wave band. Volume maximum. Reaction minimum. 200 volts, A.C. mains.

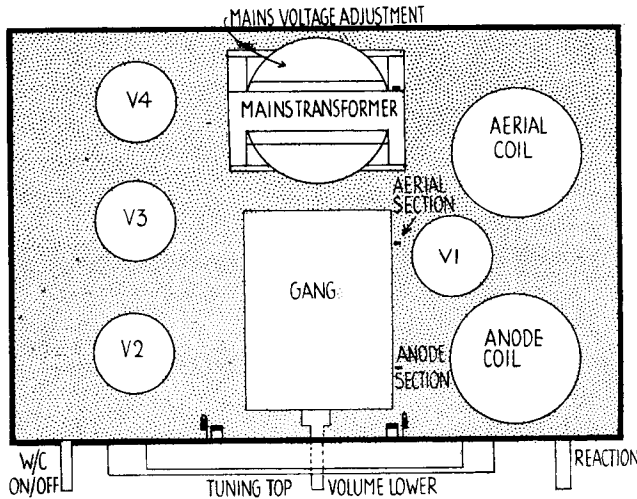
V.	Type.	Electrode.	Volts.	Ma.
1	All Cossor. 41 STH Met. (7)	Anode ...	200	1.2
		Osc. anode ...	130	9
		Screen ...	125	3
2	MSPen. Met. (7)	Anode ...	60	2.4
		Screen ...	25	5
3	41 MP (5)	Anode ...	205	27
4	442BU (4)	Filament ...	310	—

## PROTECTING THE VALVE

**I**N battery portable receivers the output valve is frequently coupled to the previous valve by a low frequency transformer. Frequently the secondary winding of these transformers becomes "open"—either through a mechanical fracture or as the result of corrosion.

If the break occurs some distance from the grid end of the winding, the set will probably keep working, although signals will be reduced in strength and quality.

When servicing this fault, it is a wise precaution to wire a high resistance across the secondary of the transformer. This will ensure that the grid circuit will never become open again.



Layout of the components on the top of the chassis of the Cossor Model 348 is shown in the "tinted" diagram on the left. Care should be taken with the dial-lamp holder insulation. (See Special Notes on this page.)

Underside view of the chassis of the 348. A pair of sockets at the rear enable an extension speaker to be used. The trimmer C9 is accessible through a hole in the front of the chassis. All resistances are in solid black.

