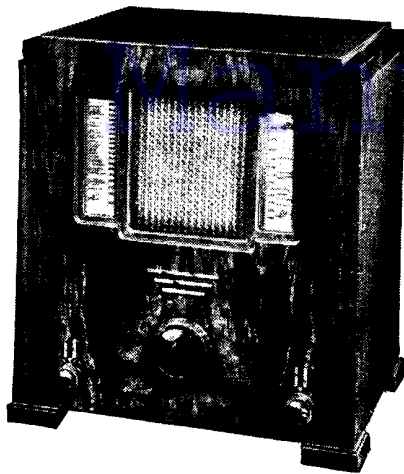


COSSOR MODEL 364



The Coszor 364 is an A.C. mains four-valve plus rectifier superhet and is typical of the latest designs.

lowed by a second band-pass I.F. transformer. The second detector is a simple diode,

DD4 (V3), used in the orthodox manner with the volume control as the diode load.

The output valve, MP/Pen (V4) has a grid stabilising resistance, and is tone compensated by a condenser across the primary of the output transformer.

Mains equipment consists of transformer, full wave 442B.U. rectifier, the speaker field

(Continued on next page.)

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	1 meg.
2	V1 cathode bias	50,000
3	Voltage dropping to V1, V2 aux. grids	25,000
4	V1 osc. anode coupling	50,000
5	V1 anode decoupling	5,000
6	V2 grid decoupling	1 meg.
7	Decoupling A.V.C. line	1 meg.
8	Decoupling V2 anode	5,000
*9	V.C. (diode load) .. .. .	.5 meg.
10	A.V.C. diode load	1 meg.
11	I.F. stopper	50,000
12	I.F. stopper	50,000
13	V4 cathode bias	130
14	V4 cathode decoupling	250
15	Delay (initial) bias resistor	25
16	V4 grid leak	2 meg.

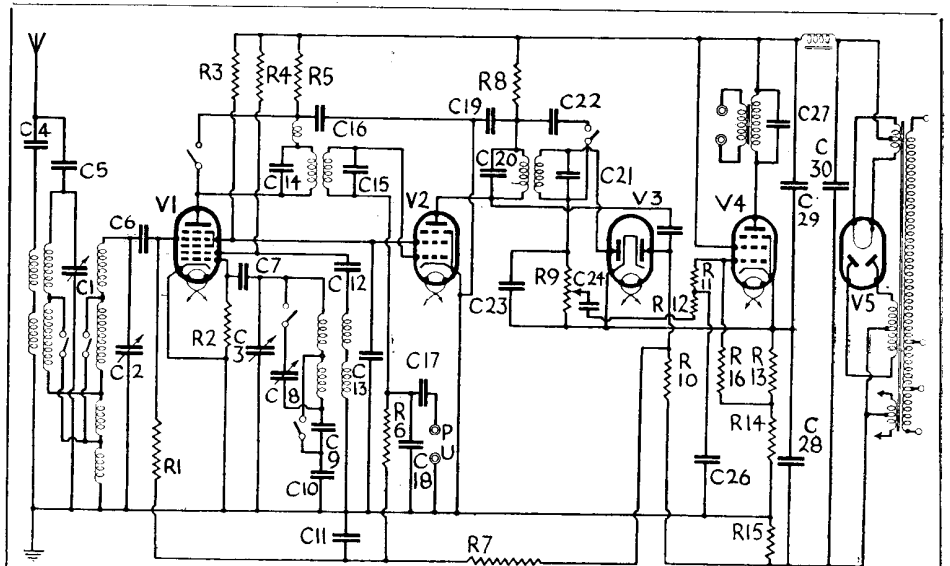
* See note on C23.

VALVE READINGS				
No signal. On medium waves.				
Valve.	Type.	Electrode.	Volts.	M.A.
1	41 MPG met.(7)	anode ..	215	2.1
		screen ..	100	
2	MVS Pen.met.(7)	osc.anode ..	105	2.4
		anode ..	200	5.5
3	DD4 ..	aux.grid ..	100	
		double diode ..		
4	42MP pen ..	anode ..	210	25
		aux. grid ..	235	5

Circuit.—The combined first detector-oscillator valve, 41MPG met. (V1), is preceded by a band-pass aerial coupling.

Tuning of the oscillator section is in the grid circuit, and bias is obtained from the A.V.C. line with initial delay bias provided by (R15). Coupling to the next valve is by band-pass I.F. transformer (frequency 128 kc.).

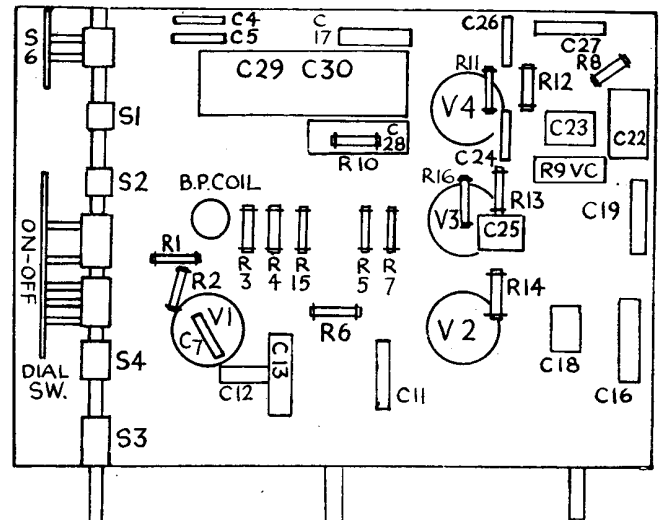
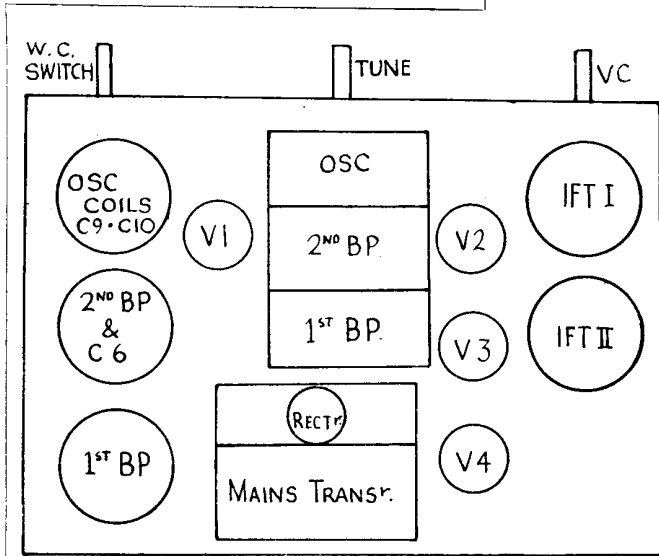
The I.F. valve, MVS Pen. met. (V2), is also biased from the A.V.C. line, and is fol-



The circuit is straightforward and employs only well-tried principles.

CONDENSERS		
C.	Purpose.	Mfd.
4	Series aerial coupling .. .. .	.0005
5	Series aerial coupling .. .. .	.000025
6	V1 grid .. .. .	.01
7	V1 osc. grid .. .. .	.0002
11	Decoupling V1 grid .. .. .	.005
12	Reaction feed from V1 osc. anode .. .. .	.01
13	V1, V2, aux. grid, by-pass .. .. .	.1
16	Decoupling V1 anode .. .. .	.1
17	Series with P.U. lead .. .. .	.01
18	Decoupling V2 grid .. .. .	.001
19	Decoupling V2 anode .. .. .	.01
22	Short-circuiting I.F.T. on "gram." .. .. .	.01
*23	I.F. by-pass from diode .. .. .	.0002
24	I.F. coupling .. .. .	.002
25	I.F. feed to A.V.C. diode .. .. .	.0001
26	I.F. by-pass from V4 grid .. .. .	.0001
27	Tone compensating V4 anode .. .. .	.005
28	V4 cathode by-pass	el. 25 (25)
29	H.T. smoothing	el. 8
30	H.T. smoothing	el. 8

* When R9 is 1 megohm, C23 should be .0001 mfd.



As usual in Coszor sets the rectifier is mounted on the main's transformer. Below the chassis the layout is tidy and all components are securely anchored and accessible.

COSSOR MODEL 364 (Contd.)

in the positive H.T. lead, and electrolytic condensers.

Pilot Lamps.—These are the 6.5 volt .3 amp type, No. 365, and are clipped on to brackets.

Quick Tests.—Between the terminals on the speaker transformer and chassis, counting from the bottom:—

- (1) Yellow lead, H.T. smoothed, 235 volts.
- (2) Blue lead, H.T. unsmoothed, 340 volts.
- (3) Red lead, V4 anode.
- (4) Blank, 210 volts.

Removing Chassis.—Remove the knobs (grub screw; two in tuning knob). Remove holding screws from underneath, and then release the speaker baffle by undoing the cleat holding the pilot lamps' cable, the pilot

lamps, and the six screws round the edge of the baffle (two are holding the speaker lead clips).

Remove the screw in the horizontal top of the tuning indicator frame and the screws holding the white dial covers. (In some models these are fastened by screws at the edges and in others by wood screws in the middle.)

Ease the chassis back a little, and then tilt it upwards from behind, and while sliding it out lift the front to clear the supports at the sides of the cabinet.

General Notes.—The mechanism of the "Thermometer" tuning system is simple.

The condensers C29 and C30 are in one block, of which the black or green lead is negative and the yellow and red leads are positive. It is immaterial which of these latter are used for H.T. unsmoothed.

The connections to the mains transformer (looking from underneath and in order from the left) are:—

- (1) R, junction of R10 and R15.
- (2) P, to on-off switch.
- (3) N, set heater.
- (4) To cable (mains adjustment).
- (5) M, H.T. unsmoothed (to C30 tag),
- (6) To cable.
- (7) L, other end of set heater winding.
- (8) To cable.

Replacing Chassis.—Ease the chassis inside the cabinet, holding it at an angle of 45 degrees.

Replace the dial frame screws and distance pieces (if any).

Replace the speaker baffle and cleat the leads. Replace the holding screws and the knobs.

ORR "FISHERMAN'S" RECEIVER

Circuit.—An H.F. valve, PM12A met. (V1), is preceded by a tuned secondary aerial transformer with a variable selectivity condenser in the aerial lead. The secondary coil is in three sections providing for wavelengths from 100-200 m., 200-550 m. and 1,000-2,000 m. The switching is between the low potential of the long-wave winding and each of the junctions of the windings.

Coupling to the next valve is by tuned anode coil, also with three sections. The anode circuit is decoupled.

The detector valve, PM1HL met. (V2), operates as a leaky-grid detector with differential reaction.

The last valve, PM22A met. (V3), has a grid stabilising resistance, and is tone-com-

pensated by a condenser between the anode and chassis

The speaker is a permanent-magnet moving-coil type.

Switching is between the negative side of the filament circuit and chassis, this being the common H.T.—, L.T.— and G.B.+ connection.

The pilot lamp is a 2.5-volt .2-amp type.

Batteries.—A 120-volt H.T. unit with a 72-volt tapping is provided.

Tappings are: H.T. + 1, 72v.; H.T. + 2, 120v.; G.B., 6v. or 9v.

Quick Tests.—These are best carried out by testing the valves.

Removing Chassis.—Remove two wood screws from flanges at the back of the chassis, remove the knobs (grub-screw), and lift the chassis out.

General Notes.—The construction of this set is particularly simple and the switch contacts are all accessible, so that no difficulty should be experienced.

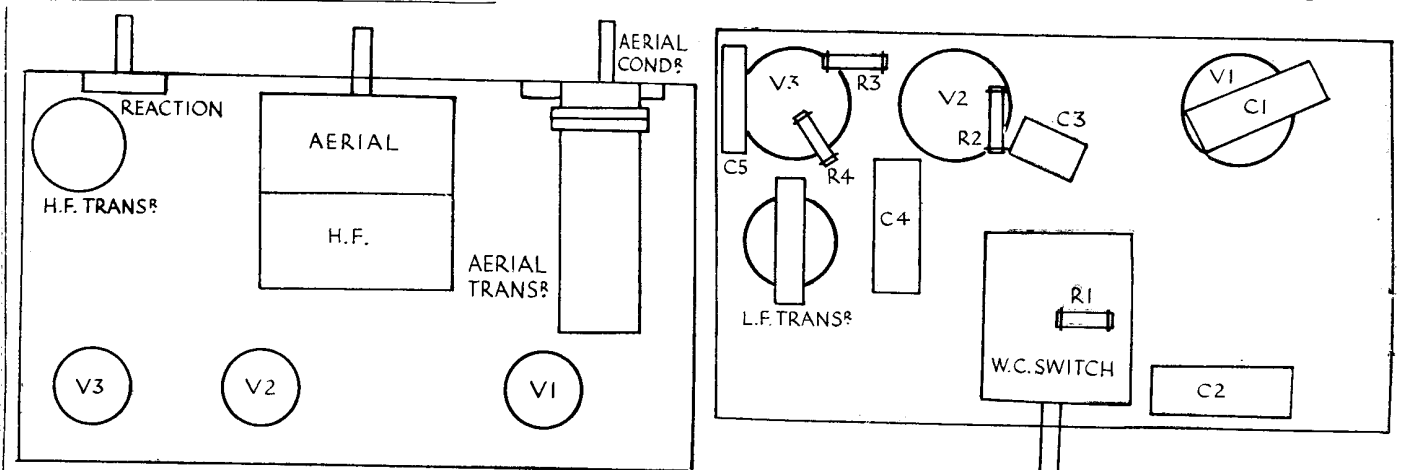
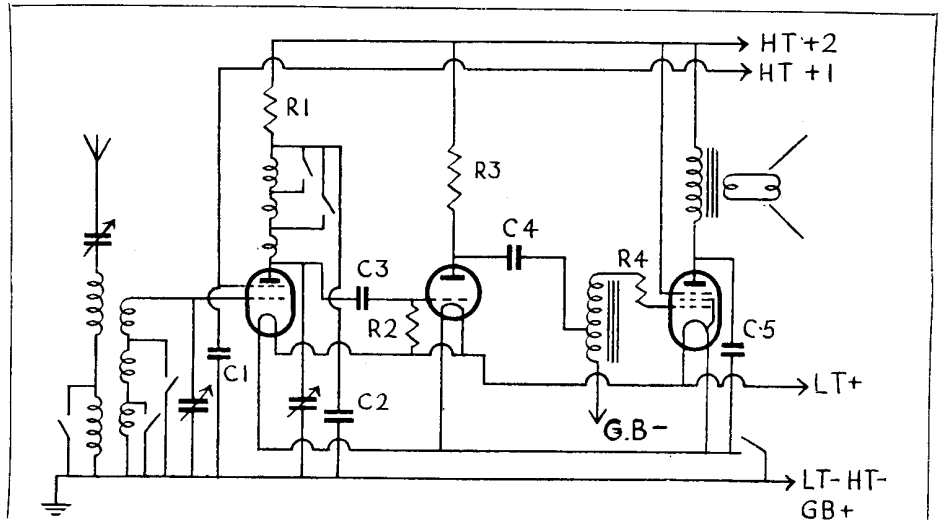
The connections to the L.F. transformer are:—

- Red lead, G.B.—, 6 volts;
- Yellow and green leads, joined, to C4;
- Black lead, to R4.

Replacing Chassis.—Lay the chassis inside the cabinet, replace the two wood screws and the knobs.

VALVE READINGS				
Valve.	Type.	Electrode.	Volts	M.A.
1	PM 12A met. (4)	anode ..	113	1.7
		screen ..	72	
2	PM 1HL met (4)	anode ..	117	2.2
3	PM 22A (5)	anode ..	117	
		aux. grid	120	

COMPONENTS			
R1	V1 anode decoupling ..	5,000 ohms	
R2	V2 grid leak ..	1 megohm	
R3	V2 anode L.F. coupling ..	40,000 ohms	
R4	V3 grid stabiliser ..	300,000 ohms	
C1	V1 screen by-pass ..	.1 mfd.	
C2	V1 anode decoupling ..	.2 mfd.	
C3	V2 grid reservoir ..	.00011 mfd.	
C4	L.F. filter to auto-trans- former	.1 mfd.	
C5	V3 tone compensating ..	.005 mfd.	



The Fishermen's set has a useful circuit for the shipping, medium and long wavebands and the construction is straightforward.

COSSOR 364 A.C. FOUR SUPERHET

CIRCUIT.—The combined first detector-oscillator valve, 41MPG met. (V1), is preceded by a band-pass aerial coupling.

Tuning of the oscillator section is in the grid circuit, and bias is obtained from the A.V.C. line with initial delay bias provided by (R15). Coupling to the next valve is by band-pass I.F. transformer (frequency 128 kc.).

The I.F. valve, MVS Pen met. (V2), is also biased from the A.V.C. line, and is followed by a second band-pass I.F. transformer.

The second detector is a simple diode, DD4 (V3), used in the orthodox manner with the volume control as the diode load.

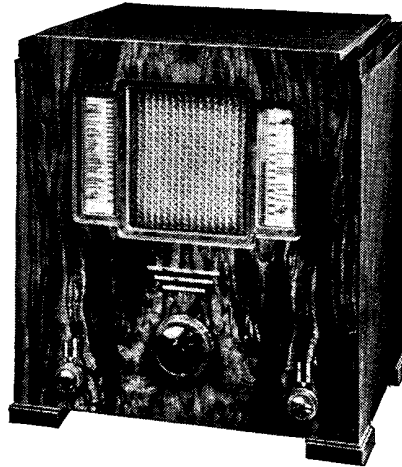
The output valve, 42MP/Pen (V4), has a grid stabilising resistance, and is tone compensated by a condenser across the primary of the output transformer.

Mains equipment consists of transformer, full wave 442B.U. rectifier, the speaker field in the positive H.T. lead, and electrolytic condensers.

Pilot Lamps.—These are the 6.5 volt

.3 amp type, No. 365, and are clipped on to brackets.

Removing Chassis.—Remove the knobs



(grub screw; two in tuning knob). Remove holding screws from underneath, and then release the speaker baffle by undoing the cleat holding the pilot lamps' cable, the pilot lamps, and the six screws round the edge of the baffle (two are holding the speaker lead clips).

Remove the screw in the horizontal top of the tuning indicator frame and the screws holding the white dial covers. (In some models these are fastened by screws at the edges and in others by wood screws in the middle.)

Ease the chassis back a little, and then tilt it upwards from behind, and while sliding it out lift the front to clear the supports at the sides of the cabinet.

General Notes.—The mechanism of the "Thermometer" tuning system is simple.

(Continued on next page.)

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	1 meg.
2	V1 cathode bias	50,000
3	Voltage decoupling of V1,V2 aux. grids.	25,000
4	V1 osc. anode coupling ..	50,000
5	V1 anode decoupling	5,000
6	V2 grid decoupling	1 meg.
7	Decoupling A.V.C. line ..	1 meg.
8	Decoupling V2 anode	5,000
*9	V.C. (diode load) .. .. .	.5 meg.
10	A.V.C. diode load	1 meg.
11	I.F. stopper	50,000
12	I.F. stopper	50,000
13	V4 cathode bias	130
14	V4 cathode decoupling ..	250
15	Delay (initial) bias resistor	25
16	V4 grid leak	2 meg.

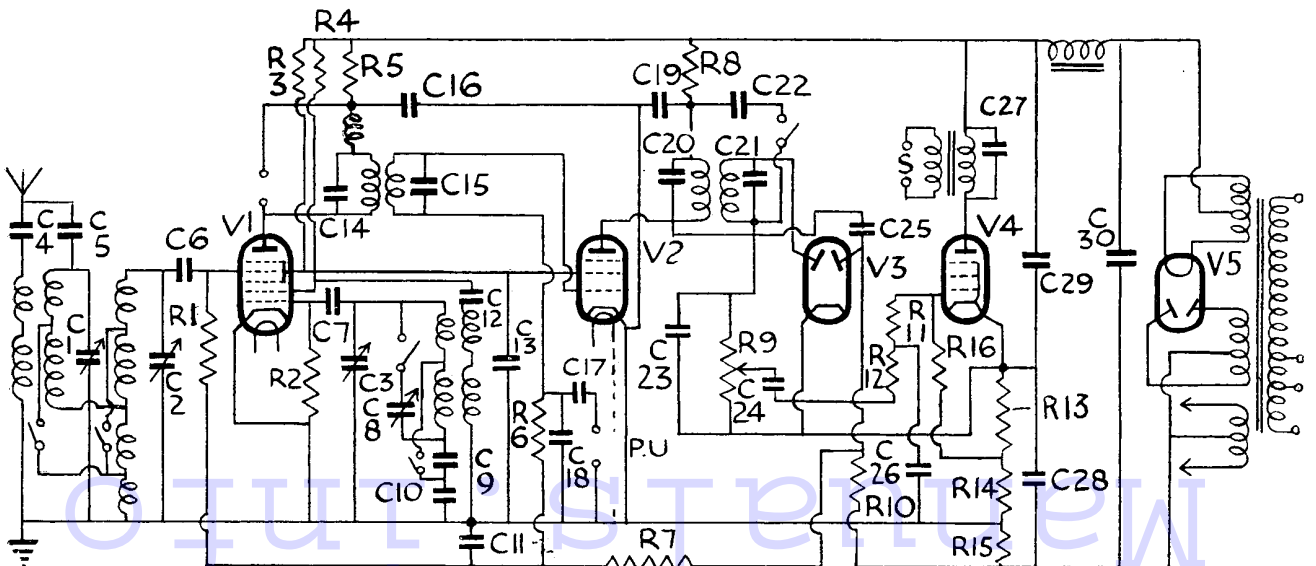
*See note on C23.

Double thermometer tuning scales with a simple mechanism are used in the Cosmor 364, a superhet four for A.C. mains, with band-pass aerial and I.F. stages.

VALVE READINGS				
No signal. On medium waves.				
Valve.	Type.	Electrode.	Volts.	M.A.
1	41 MPG met.(7)	anode ..	215	2.1
		screen ..	100	
		osc. anode	105	2.4
2	MVS Pen.met.(7)	anode ..	200	5.5
		aux. grid	100	
3	DD4 ..	double diode.		
4	42MP pen	anode ..	210	25
		aux. grid	235	5

CONDENSERS		
C.	Purpose.	Mfd.
4	Series aerial coupling ..	.0005
5	Series aerial coupling ..	.000025
6	V1 grid .. .. .	.01
7	V1 osc. grid .. .. .	.0002
11	Decoupling V1 grid .. ..	.005
12	Reaction feed from V1 osc. anode.	.01
13	V1, V2, aux. grid shunt ..	.1
16	Decoupling V1 anode .. ..	.1
17	Series with P.U. lead .. ..	.01
18	Decoupling V2 grid .. ..	.001
19	Decoupling V2 anode .. ..	.01
22	Short-circuiting I.F.T. on "gram."	.01
*23	I.F. shunt from diode .. ..	.0002
24	L.F. coupling .. .. .	.002
25	I.F. feed to A.V.C. diode ..	.0001
26	I.F. shunt from V4 grid ..	.0001
27	Tone compensating V4 anode	.005
28	V4 cathode shunt	el. 25(25V.)
29	H.T. smoothing	el. 8
30	H.T. smoothing	el. 8

*When R9 is 1 megohm, C23 should be .0001 mfd.



Four valves and a rectifier are used in the Cosmor 364 A.C. superhet, the sequence being detector-oscillator, I.F. amplifier, diode and output. As explained in the tables above, the value of C23 is dependent on the total value of the volume control R9, which is also the diode load.

COSSOR MODEL 364 SUPERHET

A.C. FOUR (Continued)

The condensers C29 and C30 are in one block, of which the black or green lead is negative and the yellow and red leads are positive. It is immaterial which of these latter are used for H.T. unsmoothed.

The connections to the mains transformer (looking from underneath and in order from the left) are:—

- (1) R, junction of R10 and R15.
- (2) P, to on-off switch.
- (3) N, set heater.
- (4) To cable (mains adjustment).
- (5) M, H.T. unsmoothed (to C30 tag).
- (6) To cable.
- (7) L, other end of set heater winding.
- (8) To cable.

Replacing Chassis.—Ease the chassis inside the cabinet, holding it at an angle of 45 deg.

Replace the dial frame screws and distance pieces (if any).

Replace the speaker baffle and cleat the leads. Replace the holding screws and the knobs.

The chassis lay-out diagrams in SERVICE ENGINEER reviews are designed for easy reference. The plan of the top of the chassis is instantly recognisable by the "tint." Resistances are shown in solid black and condensers in outline. This halves the time required to identify a component.

QUICK TESTS

Quick tests are available between the terminal strip on the speaker and chassis. From the bottom the readings should be:—

- (1) Yellow lead, H.T. smoothed, 235 volts.
- (2) Blue lead, H.T. unsmoothed, 340 volts.
- (3) Red lead, V4 anode, 210 volts.
- (4) Blank.

The arrangement of the components on the top of the Cossor 364 chassis is shown in the "tinted" drawing (below, left). Under-chassis components are shown in the right hand drawing, resistors being solid black.

ALIGNMENT NOTES

First disconnect A.V.C. diode.

I.F. Circuit.—(1) Connect modulated oscillator tuned to 128 kc. to the control grid of V2 and earth and output meter across speaker terminals. Adjust trimmers on I.F.T.2 for maximum.

(2) Connect modulated oscillator to control grid of V1 and short oscillator grid to earth. Adjust trimmers on I.F.T.1 for maximum.

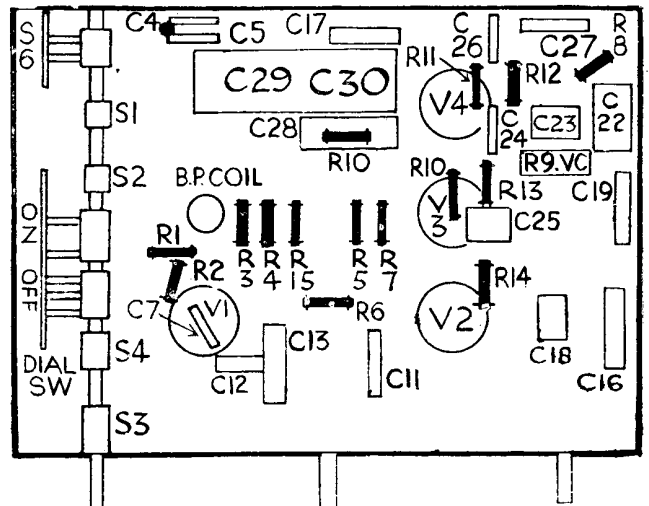
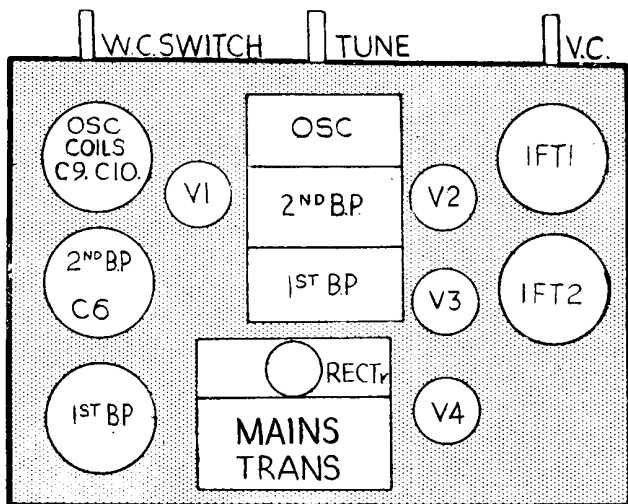
(3) Check the above adjustments.

Medium-wave Band.—(1) Connected oscillator tuned to 214 metres to aerial and earth terminals through a .0002 mfd. condenser. Tune set to 214 metres, and tune oscillator trimmer for maximum response.

(2) Adjust signal frequency trimmers for maximum.

(3) Check adjustments at 500 metres.

Long-wave Band.—Tune oscillator and receiver to 1,000 metres and adjust long-wave padder (in osc. coil can) for maximum.



TECHNICAL TERMS IN "THE SERVICE ENGINEER"

In order to settle any doubts that may have arisen, through lack of standardisation, as to the proper meanings and implications of some of the definitions used in SERVICE ENGINEER reviews, we give here the derivations and meanings of some of these terms.

Decoupling Resistance.—Any resistance included in the feed circuit to the anode or screen of a valve, actually functions as a decoupling device with its associated condensers, and we accordingly adopt the term used by the majority of set makers.

Grid Stoppers.—All series resistors adjacent to grids of valves are referred to by this term. "Grid stabiliser," a frequently used term, is not always a true definition, since a resistance adjacent to a

grid is frequently used as a stopper, but has no effect on stability.

Demodulator and Demodulator Load.—When a double-diode valve is employed it is common for one diode to be used as a second detector—"demodulator," the other being the source of A.V.C. voltage. In order to avoid confusion we employ the term demodulator instead of second detector, and the resistance associated with the demodulator diode is accordingly named.

grid is frequently used as a stopper, but has no effect on stability.

Demodulator and Demodulator Load.—When a double-diode valve is employed it is common for one diode to be used as a second detector—"demodulator," the other being the source of A.V.C. voltage. In order to avoid confusion we employ the term demodulator instead of second detector, and the resistance associated with the demodulator diode is accordingly named.

"Part of."—When dealing with a complicated network used for a particular purpose such as operating a special Q circuit, we employ the term "part of" in connection with individual resistances. This indicates to the non-technical that they must look for something unusual; a purely technical term might give such a reader the impression that here was an orthodox feature about which he should know.

Shunt Condensers.—There are occasions when the function of a condenser is a little obscure; particularly so when a condenser is in shunt with some part of a circuit. In many cases such condensers are called "by-pass," an ambiguous term, since any condenser must act as a by-pass at some frequencies, but need not at others. Accordingly we employ the term "shunt."