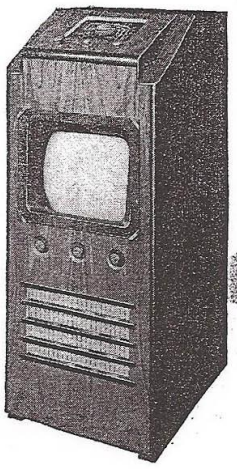
Cossor 1210 Vision and All-wave Console

Combined television and all-wave console receiver providing 12 by 9½ inch directly-viewed picture and using twenty valves. Price 53 gns.



The Cossor Model 1210 is a tall console model providing a large picture and all-wave radio.

Guide to Review

THERE are separate radio, vision and power chassis in the 1210, and this review is sectionalised accordingly.

ALL-WAVE SET CIRCUIT

THE input to the all-wave chassis, which also provides vision sound, is derived through the centre point of the vision dipole input and is taken to one of the four coupled aerial circuits through a conventional switch. These circuits provide the input to V1, an H.F. pentode. Further similar coupled circuits couple V1 to V2, a triode-hexode frequency changer.

The frequency changer is again connected quite conventionally, the output being taken through a permeability tuned transformer. Variable band-width is provided by a switch ganged with the tone control. In addition there is a further switched connection which widens the band in the television position, this being achieved by a damping resistance.

Coupling between V3 and V4, the double-diode triode, is through another permeability tuned transformer which has a special network brought into circuit in the vision position. This comprises a damping resistance and a resistance-capacity network.

In the most selective position—that is, with the extra coupling turns of the first transformer opposing—the peak given by the two transformers is of the order of 3 kc. In the next position, the extra turns assist coupling and the band is increased to about 11 kc. In the vision position the band is of the order of 50 kc.

The two diodes of V4 are used respectively for AVC and demodulation, the volume control providing part of the load. The delay voltage is taken from the common bias resistance which produces the bias for the triode section and also the output valve.

An ordinary resistance-capacity coupling is used between V4 and V5, a directly heated output triode. Tone is controlled on the anode side of V4.

Power supply is taken from a full-wave rectifier, V6, and smoothing is provided by the speaker field and electrolytic condensers.

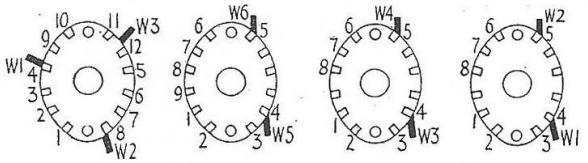
Wavechange Switches

The switching is very simple in this receiver as the all-wave and vision chassis are separately controlled. The vision set is controlled by a simple switch combined with the brilliance control.

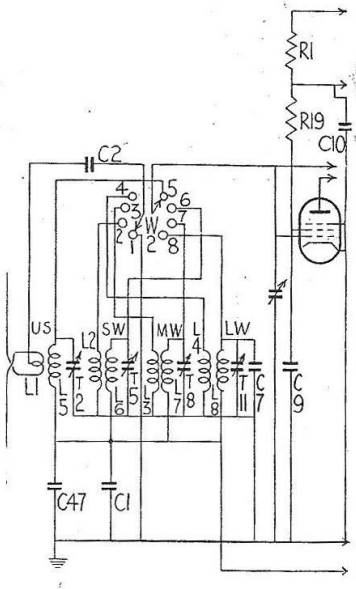
In the all-wave set there are four wafers. Three of these control, respectively, the aerial, HF and oscillator circuits. Each of these wafers carries two wipes.

There is a further wafer, mounted directly behind the click plate, which carries three wipes. The object of this is to alter the band width and frequency response in the television sound position. All the contacts are easily distinguished, and there should be no difficulty in locating any of them with the aid of the drawing. However, the main wafers switching the tuning coils are all mounted below the

(*Continued on page iv.*)



Left : the switch banks of the radio receiver. Chassis layouts adjoin the alignment notes on page iv.



VALVE READINGS

V.	Type.	Anode.	Screen.	Cathode.
1 ..	202VP ..	270 ..	112 ..	—
2 ..	203THA ..	270 ..	120 ..	5
		95 (osc)		
3 ..	202VPB ..	240 ..	120 ..	—
4 ..	202DDT ..	170 ..	— ..	—

WINDINGS

L.	Ohms.	Range.	Where measured.
1 ..	Low	TV ..	Dipole sockets.
2 ..	1 ..	SW ..	C2 and chassis.
3 ..	16 ..	MW ..	C2 and chassis.
4 ..	115 ..	LW ..	C2 and chassis.
5 ..	Low	TV ..	Aerial gang and C1.
6 ..	Low	SW ..	Aerial gang and C1.
7 ..	2.7 ..	MW	Aerial gang and chass's.
8 ..	36 ..	LW ..	Aerial gang and chass's.
9 ..	Low	TV ..	V1 anode and C11.
10 ..	.5 ..	SW ..	V1 anode and C11.
11 ..	5 ..	MW	V1 anode and C11.
12 ..	13 ..	LW ..	V1 anode and C11.
13 ..	Low	TV ..	V2 grid and C12.
14 ..	Low	SW ..	V2 grid and C12.
15 ..	2.7 ..	MW	V2 grid and C12.
16 ..	31 ..	LW ..	V2 grid and C12
17 ..	Low	TV ..	C23 and chassis.
18 ..	.5 ..	SW ..	C23 and chass's.
19 ..	1.7 ..	MW	C23 and chass's.
20 ..	3.2 ..	LW ..	C23 and chass's.
21 ..	Low	TV ..	Osc. gang and chassis.
22 ..	Low	SW ..	Osc. gang and chassis.
23 ..	3.6 ..	MW	Osc. gang and chassis.

Windings (continued)

24 ..	9.4 ..	LW ..	Osc. gang and chassis.
25 ..	3.5 ..	— ..	V2 anode and HT.
26 ..	3.5 ..	— ..	V3 grid and R13.
27 ..	3.5 ..	— ..	V3 anode and C35.
28 ..	3.5 ..	— ..	Signal diode and R11.
29 ..	1,250	— ..	Speaker plug pins 1 and 2
30 ..	260 ..	— ..	Speaker plug pins 5 and 6

RESISTANCES

		Ohms.
1 ..	V1 and V3 screen feed ..	15,000
2 ..	V1 AVC decouple	500,000
3 ..	V2 AVC decouple	500,000
4 ..	V2 cathode bias	300
5 ..	V2 osc. anode load	30,000
6 ..	Osc. grid leak	25,000
7 ..	IFT1 damping resistance ..	130
8 ..	V3 anode decouple	5,000
9 ..	IFT2 correction	20,000
10 ..	IFT2 damping	400
11 ..	Signal load (part)	500,000
12 ..	Volume control	500,000

10 MINUTE FAULT-FINDER — RADIO CHASSIS

Systematic tests of radio and vision sections are separated in this review, those for the latter being on page vii. Before testing, read notes on page v.

Power Test

Voltages : V6 cathode, 365; HT line, 270.

Resistance : Speaker field, 1,250 ohms (pins 1 and 2).

Total feed = 365 − 270 ÷ 1,250 = 76 ma.

Output Stage, V5

Inject 5 volts AF at V5 grid. If defective, check :—

Voltage : Anode, 260.

Resistances : Anode—HT, 260; grid—chassis, 550,000 ohms.

AF Stage, V4

Inject .5 volt AF at V4 grid. If defective, check :—

Voltage : Anode, 170.

Resistances : Anode—HT, 50,000; grid—chassis, 2,030,000 ohms.

Demodulation

Inject modulated 465-kc. signal at V3 anode. If defective, check :—

Resistances : L27, 3.5; L28, 3.15 ohms; diode-chassis, 1 megohm.

IF Stage, V3

Inject modulated 465-kc. signal V3 grid. If defective, check :—

Voltages : Anode, 240; screen, 120.

Resistances : Anode—HT, 5,000 ohms; grid-chassis, 3 meghoms.

Mixer Hexode, V2

Inject modulated 465-kc. signal at V2 grid. If defective, check :—

Voltages : Anode, 270; screen, 120; cathode, 5.

Resistances : L25, 3.5; L26, 3.5 ohms.

Oscillator Section, V2

Tune set to local station and connect aerial through 3 mmfd. to V2 grid. If no signals, connect generator to osc. grid and inject local frequency plus 465 kc. If signals are obtained, oscillator is faulty. Check :—

Voltages : Osc. anode, 95.

Resistances : Osc. anode—HT, 30,000; osc. grid—cathode, 25,000 ohms.

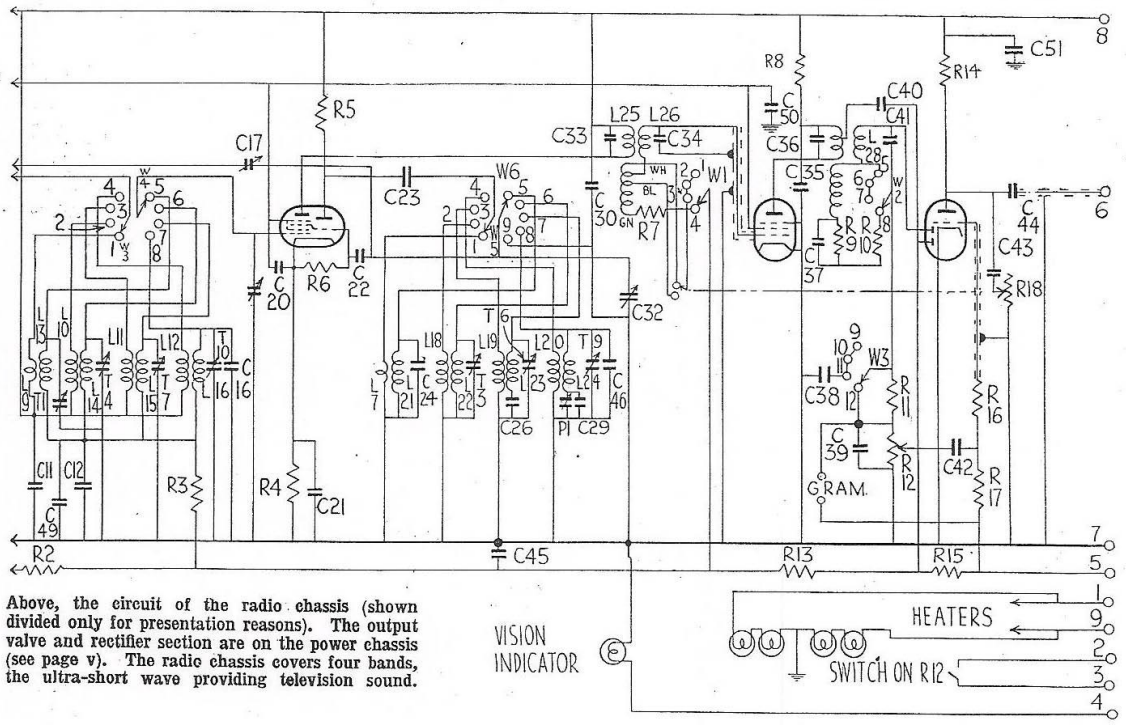
Signal Stage, V1

Tune set to 1 megacycle and inject that frequency at V1 grid. If defective, check :—

Voltages : Anode, 270; screen, 112.

Resistances : Screen—HT, 20,000 ohms; grid—chassis, 3.5 megohms.

Inject 1 megacycle at aerial terminals. If signals are still absent, check input coils and HF coils and switching.



Above, the circuit of the radio chassis (shown divided only for presentation reasons). The output valve and rectifier section are on the power chassis (see page v). The radio chassis covers four bands, the ultra-short wave providing television sound.

Resistances (continued)

13	V3 AVC decouple		2 meg.
14	V4 anode load		50,000
15	AVC diode load		1 meg.
16	V4 grid stopper		50,000
17	V4 grid leak		2 meg.
18	Tone control		100,000
19	V1 screen feed		5,000

CONDENSERS

		Mfds.
1	V1 AVC decouple	.05
2	Aerial couple	.0005
7	LW aerial shunt	.000015
9	V1 screen decouple	.001

Condensers (continued)

		Mfds.
10	Screen HT decouple	.1
11	V1 anode decouple	.05
12	V2 AVC decouple	.05
16	LW HF shunt	.000015
20	V2 screen decouple	.001
21	V2 cathode shunt	.04
22	Osc. grid	.0001
23	Osc. anode	.0002
24	Vision band osc. trimmer	.000055
26	MW padder	.00057
29	LW padder	.00012
30	HT line shunt	.1
33	IFT1 primary tune	.000225
34	IFT1 secondary tune	.000225
35	V3 anode decouple	.1

Condensers (continued)

		Mfds.
36	IFT2 primary tune	.00006
37	IFT2 correction	.002
38	Diode load shunt	.00005
39	Volume control shunt	.00002
40	AVC couple	.00005
41	IFT2 secondary tune	.000065
42	LF couple	.01
43	Tone control	.02
44	LF couple	.01
45	V3 AVC decouple	.05
46	SW osc. trimmer	.00004
47	V1 AVC decouple	.001
49	V2 AVC decouple	.001
50	V3 screen decouple	.01
51	HT line HF bypass	.0005

Cossor Radio Chassis

(*Continued from page ii.*)

rows of trimmers, and accordingly the soldered connections to the tags are not easily accessible.

Chassis Removal

The removal of the various chassis may appear at first sight rather difficult. If the following procedure is adopted, however, the process is quite simple.

First pull off the connecting plugs on the tube case and remove the focus sleeve. Then detach the focus magnet by removing the two retaining screws. Carefully supporting the tube, release the retaining springs on the canvas band, pull out the scan coil plug and slide the scan coil assembly off the tube neck. The tube can then be lifted out.

Remember to support the bulb neck evenly. On no account, when lifting the tube, move it by the neck in such a way that the weight of the bulb is raised by movement of the neck.

Disconnect the multiple plugs between all chassis and power pack, as well as the focus control plug. Then remove the three vision chassis control knobs from the front of the cabinet and the two retaining bolts from the wood strip at the back. The vision chassis can now be pulled out from the back. Note that the front is held by clips which do not require unscrewing.

The broadcast chassis can now be removed. Take off the three control knobs (held by grub screws) and release the slotted circular nut holding the slow-motion tuning control. Withdraw the latter and remove the fast-tuning knob by unscrewing the grub screw which will now be visible.

There are two wood screws holding the top of the tuning scale against the fascia board. These must be removed and then the chassis retaining bar is taken off by removing two large square nuts. Be careful to support the chassis as the bar is taken away, as the chassis may easily slide owing to the inclined mounting.

The power pack is now removed by tilting the cabinet so as to make the retaining bolts accessible. The two bolts near the back have removable nuts. These must be taken off and the bolts pushed through. The chassis is held at the front by a clip and at the side by a cabinet block. Removal is effected by pulling the chassis towards the back of the cabinet and then sideways.

If operating tests are required out of the cabinet the speaker must be released from the four retaining clips and the focus control unscrewed from the front of the cabinet.

Alignment

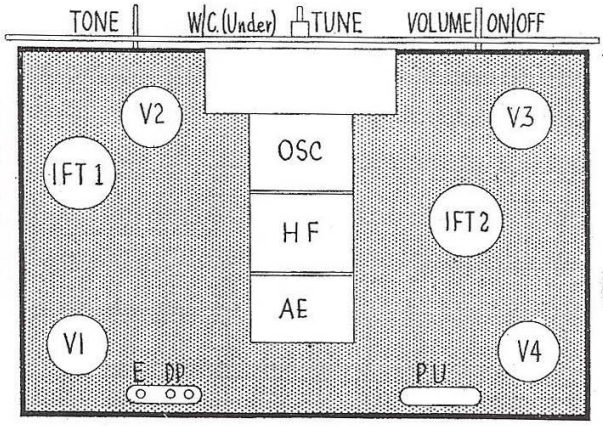
IF Circuits (465 kcs.)

CONNECT generator to grid of V2 and output meter to set. Adjust generator to 465 kcs., and turn selectivity control to greatest selectivity position.

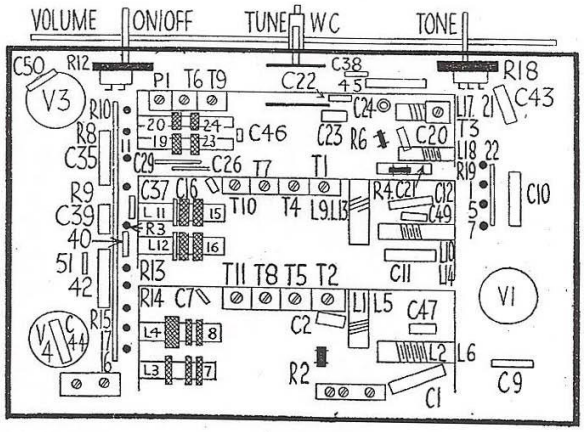
Normally no trimming is required, but should an IFT have been replaced it must be trimmed for maximum output by adjusting the cores.

Short Waves

Connect generator to aerial and earth through dummy aerial and tune set and generator to 18 mcs.

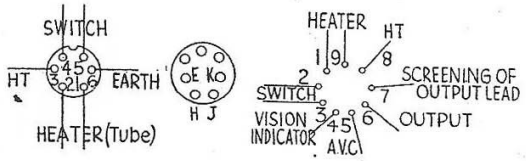


Right : the upper side layout diagram of the A.W. chassis. A note about the vertical wires with bent ends on the gang is given under "Vision Image Rejector" on this page.



Left : diagram identifying parts underneath the A.W. chassis. The trimmers are accessibly grouped in aerial, H.F. and oscillator compartments. Alignment notes are on this page.

First diagram on right shows radio connection sockets as viewed from inside of valve base. Centre, connections to C.R. tube viewed from back. Extreme right, connections to vision chassis plug, looking at cover side.



Adjust T3, T4, and T5 for maximum, using an input always below the AVC value.

Medium Waves

Tune set and generator to 1,400 kcs. (214 metres) and adjust T6, T7, and T8 for maximum. There is no padding operation on this band.

Long Waves

Tune set and generator to 250 kcs. (1,200 metres) and adjust T9, T10 and T11 for maximum.

Tune set and generator to 160 kcs. (1,875 metres and adjust P1 for maximum. Repeat the sequence of operations, until no improvement results.

Ultra-short Waves (Vision sound).

Inject a frequency of 41.5 mcs. and rotate gang to the zone marked sound on the scale and adjust this for maximum. Then adjust T1 and T2 for maximum.

Vision Image Rejector

When the sound and vision chassis are ganged it may be found feed back from the oscillator is causing a screen image. This can be brought to minimum by means of the special balancing capacity composed of two vertical wires with bent ends, mounted on the top of the gang.

Slight bending of the top of the wires by a non-conductive rod should remove the image from the screen. These wires are factory adjusted and should not normally require adjustment.

Replacement Condensers

EXACT electrolytic replacements are available from A. H. Hunt, Ltd., makers of the original units.

Unit number 4175 lists at 6s. 9d. and unit 2860A at 7s. 3d. For C3 (power chassis) there is unit 2723, 1s. 6d. A paper condenser for C4 or C5 (power chassis) is available in unit 4718, 5s.