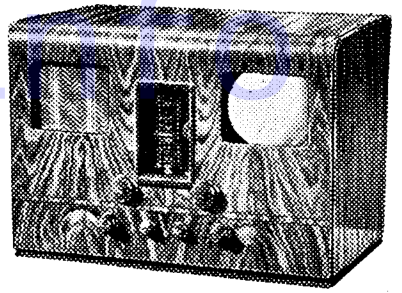
Marconiphone 707 Television Receiver



Sixteen valve, including rectifiers, television and three waveband broadcast receiver with seven inch magnetic tube, suitable for 200-250 volt, 50 cycle AC supplies, price £36 15s.

CIRCUIT OUTLINE

THE first amplifier valve, V1, derives its input either from the broadcast tuned circuits or the vision input transformer through the medium of switching. Tuned anode is employed on the broadcast bands and resistance-fed tuned grid on the vision band as the coupling to V2, the frequency changer.

The anode circuit of this valve contains either the first IFT or the sound and vision coupling. Both work into the grid circuit of V3, an HF tetrode. The anode circuit of this valve operates the second IFT on the broadcast band and the second sound and vision coupler on the vision band, the connections being controlled by switching.

On the broadcast band the secondary of the second IFT is taken to the grid circuit of V4, a double diode triode, in which one diode is used for signal demodulation and the other for AVC. The AVC controls the first three valves on the broadcast bands in the normal manner.

Coupling to V5, the output tetrode, is by resistance capacity, the output valve being provided with a feedback tone control.

Vision Amplifier

When the set is operating on the vision band, switching connects the output of V3 to the input of V7, the second vision IF amplifier, this valve also amplifying the vision sound. The sound coupling from V7 is by a transformer which is switched on the secondary side and goes to the signal diode of V4.

The last vision amplifier, V8, has a rejector circuit in the cathode tuned to the sound IF to keep the sound off the picture.

Tuned grid coupling is used between the last vision amplifier, V8, and the anode bend vision detector V9. Signal increase on the vision channel gives a negative voltage at the anode of V9. The cathode of the tube is therefore connected to this point and the grid is returned to R91 as a brilliance control.

Synchronising Separator

A complicated network is used on the anode bend detector, tube connection and V16 and V10 which control the synchronising. During picture modulation V16 is conductive and short-circuits R75. When a synch. pulse arrives V16 becomes non-conductive and a voltage appears across R75 which is connected to the input of V10. This valve acts as an amplifier and separator, the line oscillator being controlled from the screen circuit and the frame oscillator from the anode.

As a frame generator, use is made of V11, which is a screen grid valve with the anode and screen strapped and made to work as a blocking oscillator. The output of the oscillator is coupled through a condenser network to V12, a tetrode with the anode and screen strapped.

The line-scanning arrangement is similar, consisting of V13, a screen grid valve working as a blocking oscillator, and V14, a high-gain pentode working as the amplifier. The frame output is taken directly to the coils and the line output goes through a transformer with a form correction circuit on the secondary.

There are two high-tension supplies, one consisting of V6 and the usual associated smoothing circuit. This valve produces the normal HT for the entire chassis. The EHT is derived from V15, which has a bleeder network and the usual smoothing condensers and resistance. Switching is provided for cutting out the television section when the set is used on broadcast.

VALVE READINGS

V.	Type.	Electrode.	Volts (Vision)	Volts (B'cast)
1 ..	MSP4 ..	Anode ..	90	155
		Screen ..	105	105
2 ..	X41C ..	Anode ..	+	180
		Screen ..	90	90
		Osc. ..	95	100
3 ..	KTZ41 ..	Anode ..	+	155
		Screen ..	105	105
4 ..	MHD4 ..	Anode ..	103	95
5 ..	KT41 ..	Anode ..	275	245
		Screen ..	210	190
6 ..	U52 ..	Anodes ..	350 A.C.	—
		Heater ..	335	295
7 ..	KTZ 41 ..	Anode ..	155	—
		Screen ..	90	—
8 ..	KT41 ..	Anode ..	+	—
		Screen ..	150	—
9 ..	MS4B ..	Anode ..	235	—
		Screen ..	105	—
10 ..	KTZ63 ..	Anode ..	30	—
		Screen ..	40	—
11 ..	KTZ63 ..	Anode ..	45	—
		Screen ..	45	—
12 ..	KT63 ..	Anode ..	150	—
		Screen ..	150	—
13 ..	KTZ63 ..	Anode ..	30	—
		Screen ..	125	—
14 ..	KT63 ..	Anode ..	295	—
		Screen ..	305	—
15 ..	U17 ..	Anodes ..	1,800 A.C.	—
		Heater ..	2,570	—
16 ..	D42 ..	Anode ..	270	—

Pilot Lamps. 6 volts MES
Tube Emiscope 3/2

NOTE.—All valves are Marconi. Where a + is shown in the table it indicates that a voltage reading taken at that point would unbalance the set and give an unreliable reading.

CONSTRUCTIONAL FEATURES

THERE are several points which may give rise to a little confusion or difficulty. First of all, certain of the inductances, those used in the vision amplifier, are of the adjustable type. The adjustment points are shown on the chassis layouts—such, for example, as L18. These adjustment points will be found on both sides of the chassis.

The cans containing the vision sound couplers are provided with two trimmers, such as TT7, and it must not be thought that any trimmer indications are missing from the drawings.

In a magnetically focused tube the accuracy of the focus is entirely a matter of ampere-turns. In order to provide for any combination of tolerances in addition to fitting a variable control, there are optional resistances which can be put into circuit by a screw at the back of the chassis in a similar manner to an ordinary voltage adjustment.

Attention is drawn to the special smoothing circuit in which on the broadcast band the first condenser, that is C64, is reduced from 16 mfds. to 1 mfd. by substituting C65. This lowers the H.T. voltage to a correct working value which would otherwise be too high when the vision chassis load was removed. The condenser C64 is kept polarised by R66 so that switching over produces no surges.

It should be noted that, if desired, the ganging of the R.F. section of the vision receiver can be carried out by watching the screen image on a transmission. The contrast control can be used as an attenuator, and it can be adjusted so that the synch. just tends to slip. Increase in receiver output will make the synch. hold and decrease will cause it to slip further.

The short-wave padder C14 has a value of .005 in some models. In the manufacturers' part list and in certain receivers the capacity is .0035. In this case it will be found in parallel with C90 having a value of .0015, thereby making up the correct total amount.

Extension speaker impedance is 5 ohms, and the internal speaker can be silenced by removing the yellow plug from the third socket on the ELS panel.

Chassis Removal.

In servicing this receiver there is no need to remove the tube, focusing coil or scan coils. These units are screwed to the top of the cabinet and are connected to the chassis by multiple cables, terminating in plugs or sockets.

The leads from the speaker and extension speaker sockets must be unscrewed. After this, chassis removal is simple. The control knobs from the front are removed, the chassis retaining bolts released from the bottom of the cabinet, and the chassis withdrawn.

It should be noted that the "Contrast" and "Frame hold" knobs are of the

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ALIGNMENT . . . . . page 22

SYSTEMATIC TESTS — MARCONI 707

THE following systematic test routine incorporates both measurements and injection tests.

The locality of a fault is found rapidly by signal injection at each stage, working back from the output. When the faulty stage has been discovered, and only then, voltage and resistance measurements are employed to identify the faulty component.

As each injection test proves satisfactory, progress at once to the injection test on the next stage.

Power Test.—First ensure that the main working conditions are correct.

V6 anodes : 350 volts A.C.
V6 heater (on broadcast), 295; (vision), 335 volts.
V15 anodes : 1,800 volts A.C.
V15 heater : 2,570 volts.

If defective readings are obtained on the A.C. side, isolate the valves and check the transformers. Also check the resistances to chassis : V6, 82 ohms, and V15, 5,000 at each anode.

SOUND CHANNEL

Output Valve, V5.
Inject 2 volts AF at grid. If defective, check :—

Anode volts 245, on broadcast; screen volts 190.

Anode to HT resistance, 290 ohms; screen to HT, 10,000 ohms.

AF Stage, V4.
Inject 0.5 volts at grid. If defective, check :—

Anode volts, 95; anode resistance, 60,000 ohms; grid resistance, 2 megohms.

Broadcast IF, V3.
Inject 465 kcs. at V3 grid and trim T14 and T15. If defective, check :—

Anode volts, 155; anode resistance to chassis, 22,000 ohms; screen volts, 105; screen resistance to chassis, 16,000 ohms.

Mixer Hexode, V2.
Inject 465 kcs. at grid and trim T6 and T7. If defective, check :—

Anode volts, 180; anode resistance to chassis, 42,000 ohms; screen volts, 90; screen resistance to chassis, 21,000 ohms.

Oscillator, V2.
Connect generator tuned to any MW signal to V2 grid. If no signals are obtained, check :—

Oscillator anode volts, 95, and resistance to chassis, 62,000 ohms.

If still defective, connect aerial through 10 mmfds. to V2 grid and generator to osc. grid. Tune set to local station and tune generator to local station frequency plus 465 kcs.

If signal is still not obtained, fault is in input circuits.

Signal Stage, V1.
Connect generator to V1 and inject 300 metres signal. If defective, check :—

V1 anode volts, 155; anode resistance to chassis, 32,000 ohms; screen volts, 105; screen resistance to chassis, 17,000 ohms.

If still defective, check coil resistances and switching.

SCANNING UNIT

With the EHT rectifier removed, the line and frame generators can be tested for generation by headphones. *These must not be connected to the amplifiers V12 and V14.*

If the generators are not functioning, check the following :—

V11 anode volts, 45; screen volts, 45.

V12 anode volts, 150; resistance to chassis, 17,000 ohms.

V14 anode volts, 295; resistance to chassis, 7,500 ohms; screen volts, 305; resistance to chassis, 8,000 ohms.

If the synchronising fails, check V16 anode volts, 270, and resistance to chassis, 9,000 ohms.

If the focus is incorrect, check coil resistance, 9,320 ohms, and feed current, 24 ma.

VISION CHANNEL

Rectifier, V9.
Inject strong 8 mcs. signal at grid. If defective, check anode volts, 235; and screen volts, 105.

Amplifier, V8.
Inject 8 mcs. signal at grid. If defective, check anode volts roughly and screen volts, 150.

Amplifier, V7.
Inject 8.7 mcs. signal at grid. If defective, check anode volts, 155, and screen volts 90. Also inject 4.5 mcs. and check vision sound output. If defective check R25 adjustment and resistance, 0.2 ohms.

Amplifier, V3.
Inject 7.3 mcs. at grid and check anode volts roughly, and screen volts, 105.

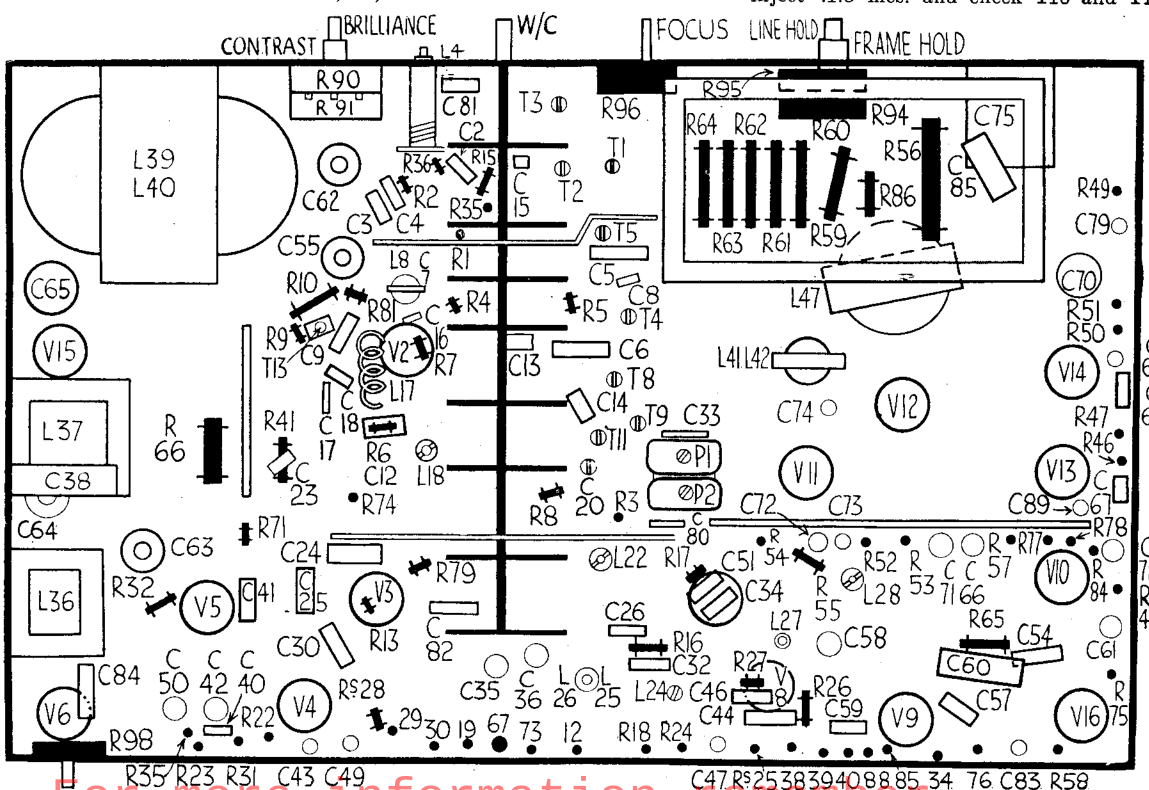
Oscillator, V2.
Inject 45 mcs. at grid and trim T13. If defective, check anode volts roughly, screen volts, 90, and osc. anode volts, 95.

If still defective, examine L17 and switching.

Signal Stage, V1.
Inject 45 mcs. at input terminals. If defective, check :—

Anode volts, 90, and screen volts, 105.

If still defective, trim L4 and L8, also inject 41.5 mcs. and check T16 and T17.



Everything is carried on one chassis. This diagram, with the circuit diagram and component tables on pages 20 and 21, identifies all the components on the underside of the chassis. Top side diagram is on page 22 with alignment notes.

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(Continued from page 18.)

push-on type and may be extremely tight. Great care should therefore be exercised in removing them as there is a possibility of damaging either the knobs or the cabinet.

Wave Change Switches.

All the switching is carried out by a single switch with eight wafers. The diagram shows how these appear when looked at from the underside of the chassis with the click plate on the left.

The various wipes are indicated by letters. We have omitted any vacant contacts. It must be particularly noted that all but three wafers have anchor tags which are used as junction points. These are marked with an *X* on the drawing and these connections do not play any part in the switching operation.

It will be noted that in the Systematic Tests the test points are described and not indicated by reference to the circuit as previously.

Alignment Notes and top chassis layout diagram, page 22.

WINDINGS

L.	Ohms.	Range.	Where measured.
1	.1	SW	Æ gang and switch A
2	5.5	MW	Æ gang and switch A
3	21	LW	Æ gang and switch A
4	Low	TV	V1 grid and chassis.
5	.1	SW	V1 anode and switch H
6	.9	MW	V1 anode and switch H
7	1.6	LW	V1 anode and switch H
8	Low	TV	V2 grid and chassis
9	2	B—	V2 anode and HT.
10	2	B—	V3 grid and R30.
11	.1	SW	On tags.
12	5.6	MW	On tags.
13	4.5	LW	On tags.
14	1	SW	On tags.
15	2	MW	On tags.
16	3.25	LW	On tags.
17	Low	TV	On coil.
18 + 19	.8	TV	V3 grid and R74.
20	4	B—	V3 anode and HT
21	4	B	V4 signal diode and R21.
22+23	1.7	TV	Switch P and R12.
24+25	1	TV	C32 and R 80.
26	1.5	TV	R21 and V4 diode.
27	.2	TV	R27 and V8 cathode.
28	1.5	TV	V9 grid and chassis
29	14	TV	On tags.
30+31	5,000	—	On tags.
32	9,320	—	On tags.
33+34	10	—	On tags.
35	290	—	On ends
36	505	—	On tags.
37	53	—	On tags.
38	19	—	On leads.
39	7.25	—	On leads.
40	5,000	—	On tags.
41	730	—	On leads
42	525	—	On leads
43	6	—	On leads.
44	7.2	—	On leads.
45	230	—	On tags.
46	616	—	On tags.
47	160	—	On leads.

CONDENSERS

		Mfds.
1	Aerial series	.0000075
2	Input circuit padding	.05
3	V1 screen decouple	.1
4	V1 cathode shunt	.05
5	HF tune isolating	.1
6	V1 anode decouple	.1
7	HF coupling	.00035
8	HF coupling	.000035
9	V2 screen decouple	.05
10	IFT1 primary tune	.005
11	IFT1 secondary tune	.0005
12	V2 cathode shunt	.05
13	Osc. grid	.00005
14	SW padder	.0035
15	V1 grid	.000035

Condensers (continued)

16	USW osc. couple	.00005
17	USW osc. decouple	.0023
18	USW osc. tune	.000065
19	Osc. anode decouple	4
20	Osc. anode decouple	.05
21	V3 vision couple	.0023
22	H.T. line decouple	8
23	V3 gain control decouple	.05
24	AVC decouple	.23
25	V3 screen decouple	.05
26	V3 anode decouple	.05
29	AVC couple	.000075
30	V3 cathode	.1
31	V7 grid couple	.0023
32	V7 anode decouple	.05
33	MW fixed padder	.00035
34	V7 screen decouple	.05
35	V4 grid couple	.001
36	V4 grid couple	.01
37	V8 grid couple	.0023
38	Gain control decouple	50
39	HF filter	.0001
40	V4 anode shunt	.00035
41	V5 grid couple	.01
42	V4 bias decouple	50
43	V4 cathode shunt	.05
44	V4 screen	.05
45	LW osc. trimmer	.000023
46	V8 cathode shunt	.05
47	V8 anode decouple	.05
48	V9 grid couple	.0023
49	AVC decouple	.05
50	V5 cathode shunt	50
51	V7 cathode shunt	.05
52	V4 anode and V5 screen decouple	4
53	H.T. line decouple	4
54	V10 anode shunt	.0035
55	HT smoothing	32
56	V9 screen decouple	4
57	V9 screen decouple	.05
58	V9 cathode shunt	50
59	V9 cathode bypass	.05
60	Cathode pot. shunt	2
61	V10 grid couple	.23
62	HT smoothing	32
63	HT smoothing	16
64	HT smoothing	16
65	HT input shunt	1
66	Frame synch couple	.005
67	Line blocking condenser	.00023
68	Line synch	.00075
69	V14 couple	.005
70	V14 cathode shunt	1
71	Frame blocking	.05
72	V12 couple	.23
73	V12 couple	.1
74	V12 cathode shunt	35
75	Frame coil coupling	8
76	EHT smoothing	.1
77	EHT smoothing	.1
78	Brilliance shunt	8
79	Form correction	.023
80	LW osc. fixed padder	.00023
81	V1 heater shunt	.05
82	HT line decouple	.05
83	Synch feed shunt	10
84	Output feed back	.001
85	Line feed back	.00023
86	V3 sound couple tune	.00075
87	V7 sound couple tune	.00075
88	Sound rejector tune	.00023
89	V13 screen decouple	.1
90	Part of V14 when V14 is .0035.	.0015

RESISTANCES

		Ohms.
1	V1 screen feed	10,000
2	V1 cathode bias.	500
3	V1 anode decouple	10,000
4	V1 anode load	5,000
5	V2 grid return	500,000
6	V2 cathode bias.	230
7	Osc. grid leak	50,000
8	V2 anode load	35,000
9	Vision osc. decouple	5,000
10	Osc. anode decouple	50,000
11	V3 vision coupling shunt	5,000
12	V3 anode decouple	5,000
13	V3 cathode bias.	150
14	V7 vision couple	7,500
15	V1 grid return	230,000
16	V7 screen feed	10,000
17	V7 cathode bias.	230
18	V7 anode decouple	5,000
19	V4 HF filter	100,000
20	V8 vision couple shunt.	5,000
21	Demod. diode load	500,000
22	V4 cathode bias.	1,000
23	V4 anode load	50,000
24	V8 screen feed	100,000

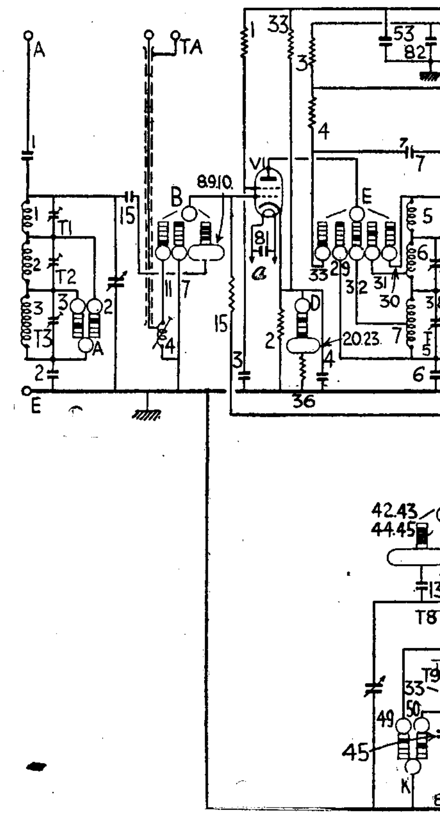
CIRCUIT AND

The diagram divides approximately into three sections. Along the centre is the vision channel from aerial to tube. As far as V3 this is common with the sound channel. The separate sound valves are V4 and V5 at the top.

The bottom part of the diagram comprises the time base section with, extreme left, part of the oscillator arrangements.

Switching is indicated in the conventional Marconiphone method, the sections of the ladder-like portions representing, from top to bottom, Gram., S., M., L. and T. positions.

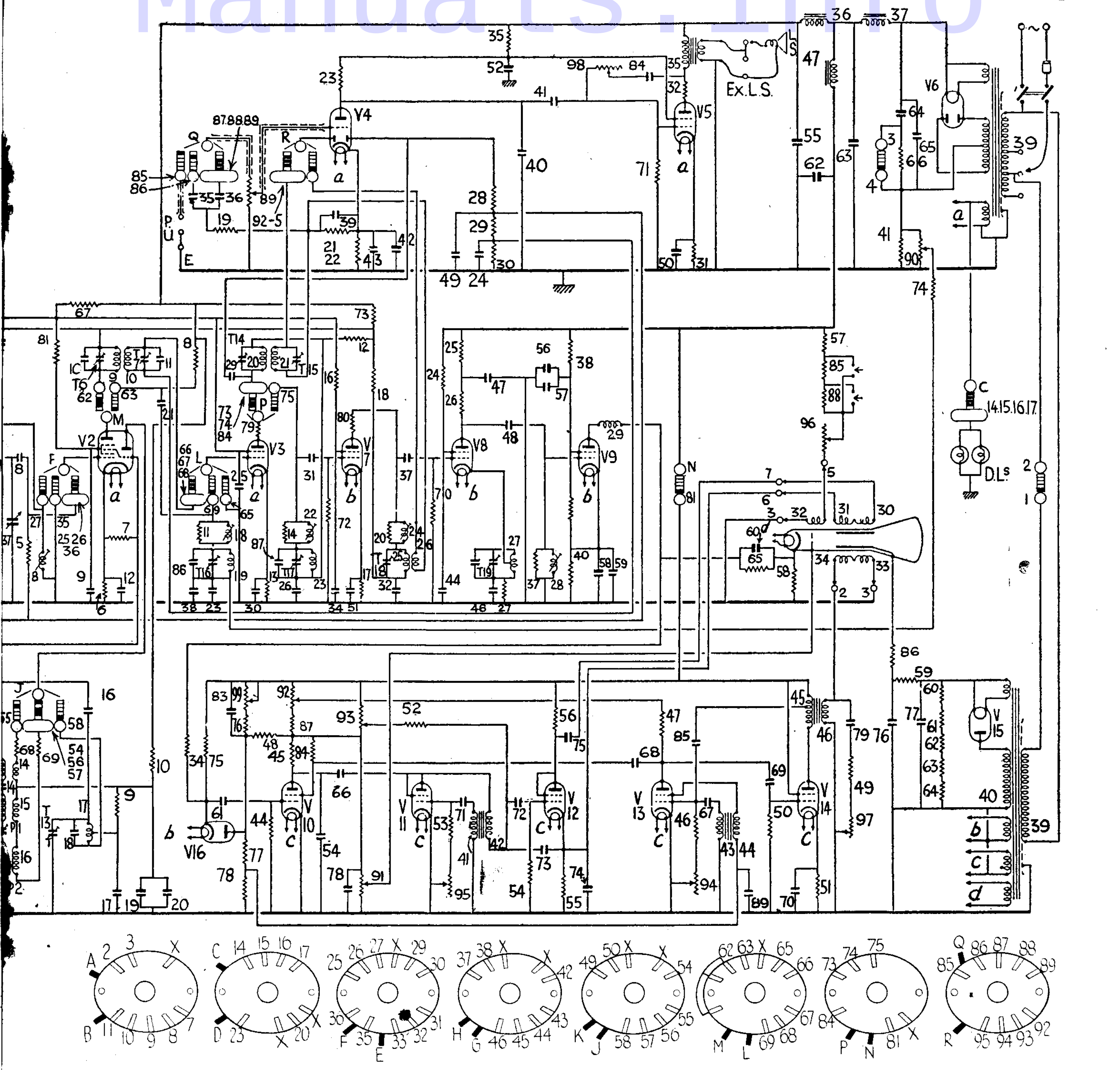
The diagram of the switch banks is lettered in accordance with the circuit, the section nearest the "click" plate being on the left.



Resistances (continued)

25	V8 anode decouple	5,000
26	V8 anode load	10,000
27	V8 cathode shunt	230
28	AVC diode load (part)	500,000
29	AVC diode load (part)	500,000
30	AVC diode load (part)	500,000
31	V5 cathode bias.	100
32	V5 anode stopper	50
33	V1 cathode pot. (part)	35,000
34	V9 anode load	5,000
35	V4 anode and V5 screen decouple	10,000
36	V1 bias pot. (part)	150
37	V9 vision coupling shunt	5,000
38	V9 screen pot. (part)	50,000
39	V9 screen pot. (part)	35,000
40	V9 cathode bias.	500
41	Series bias	25
44	V10 grid leak	230,000
45	V10 anode load	23,000
46	V13 grid leak	35,000
47	V13 anode load	500,000
48	V10 HT pot. (part)	35,000
49	Form correction	600
50	V14 grid leak	500 000

SWITCH DIAGRAMS MARCONI 707



Resistances (continued)

51	V14 cathode bias	350
52	V11 anode load	1 meg.
53	V11 grid lead	75,000
54	V12 grid leak	1 meg.
55	V12 cathode bias	750
56	V2 anode load	10,000
57	Focus feed (part)	23,000
58	Tube cathode pot. (part)	50,000
59	EHT smoothing	350,000
60	EHT bleeder (part)	1 meg.
61	EHT bleeder (part)	1 meg.
62	EHT bleeder (part)	1 meg.
63	EHT bleeder (part)	1 meg.
64	EHT bleeder (part)	1 meg.
65	Tube bias pot. (part)	230,000
66	C64 polarising	15,000
67	HT line volt drop	23,000
68	SW het. voltage control	100
69	MW and LW het. volt control	100
70	V8 grid leak	100,000
71	V5 grid leak	150,000
72	V7 grid leak	100,000
73	HT line volt drop	10,000
74	Gain control decouple	5,000
75	Synch load	10,000
76	V17 anode feed pot. (part)	1,500
77	V16 anode feed pot. (part)	230,000
78	V13 anode pot. (part)	23,000
79	V3 anode stabiliser	50
80	V7 anode stabiliser	50
81	V2 screen feed	5,000
84	Time base HT pot. (part)	1 000
85	Focus feed (part)	750
86	Tube anode feed	150,000
87	V10 anode feed pot. (part)	50,000
88	Focus pot. (part)	750

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(Continued from page 18.)

push-on type and may be extremely tight. Great care should therefore be exercised in removing them as there is a possibility of damaging either the knobs or the cabinet.

Wave Change Switches.

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The various wipes are indicated by letters. We have omitted any vacant contacts. It must be particularly noted that all but three wafers have anchor tags which are used as junction points. These are marked with an X on the drawing and these connections do not play any part in the switching operation.

It will be noted that in the Systematic Tests the test points are described and not indicated by reference to the circuit as previously.

Alignment Notes and top chassis layout diagram, page 22.

WINDINGS

L.	Ohms.	Range.	Where measured.
1	.1	SW	Æ gang and switch A
2	5.5	MW	Æ gang and switch A
3	21	LW	Æ gang and switch A
4	Low	TV	V1 grid and chassis.
5	.1	SW	V1 anode and switch H
6	.9	MW	V1 anode and switch H
7	1.6	LW	V1 anode and switch H
8	Low	TV	V2 grid and chassis
9	2	B—	V2 anode and HT.
10	2	B—	V3 grid and R30.
11	.1	SW	On tags.
12	5.6	MW	On tags.
13	4.5	LW	On tags.
14	1	SW	On tags.
15	2	MW	On tags.
16	3.25	LW	On tags.
17	Low	TV	On coil.
18 + 19	.8	TV	V3 grid and R74.
20	4	B—	V3 anode and HT
21	4	B	V4 signal diode and R21.
22+23	1.7	TV	Switch P and R12.
24+25	1	TV	C32 and R 80.
26	1.5	TV	R21 and V4 diode.
27	.2	TV	R27 and V8 cathode.
28	1.5	TV	V9 grid and chassis
29	14	TV	On tags.
30+31	5,000	—	On tags.
32	9,320	—	On tags.
33+34	10	—	On tags.
35	290	—	On ends
36	505	—	On tags.
37	53	—	On tags.
38	19	—	On leads.
39	7.25	—	On leads.
40	5,000	—	On tags.
41	730	—	On leads
42	525	—	On leads
43	6	—	On leads.
44	7.2	—	On leads.
45	230	—	On tags.
46	616	—	On tags.
47	160	—	On leads.

CONDENSERS

		Mfds.
1	Aerial series	.0000075
2	Input circuit padding	.05
3	V1 screen decouple	.1
4	V1 cathode shunt	.05
5	HF tune isolating	.1
6	V1 anode decouple	.1
7	HF coupling	.00035
8	HF coupling	.000035
9	V2 screen decouple	.05
10	IFT1 primary tune	.005
11	IFT1 secondary tune	.0005
12	V2 cathode shunt	.05
13	Osc. grid	.00005
14	SW padder	.0035
15	V1 grid	.000035

Condensers (continued)

16	USW osc. couple	.00005
17	USW osc. decouple	.0023
18	USW osc. tune	.000065
19	Osc. anode decouple	4
20	Osc. anode decouple	.05
21	V3 vision couple	.0023
22	H.T. line decouple	8
23	V3 gain control decouple	.05
24	AVC decouple	.23
25	V3 screen decouple	.05
26	V3 anode decouple	.05
29	AVC couple	.000075
30	V3 cathode	.1
31	V7 grid couple	.0023
32	V7 anode decouple	.05
33	MW fixed padder	.00035
34	V7 screen decouple	.05
35	V4 grid couple	.001
36	V4 grid couple	.01
37	V8 grid couple	.0023
38	Gain control decouple	50
39	HF filter	.0001
40	V4 anode shunt	.00035
41	V5 grid couple	.01
42	V4 bias decouple	50
43	V4 cathode shunt	.05
44	V4 screen	.05
45	LW osc. trimmer	.000023
46	V8 cathode shunt	.05
47	V8 anode decouple	.05
48	V9 grid couple	.0023
49	AVC decouple	.05
50	V5 cathode shunt	50
51	V7 cathode shunt	.05
52	V4 anode and V5 screen decouple	4
53	H.T. line decouple	4
54	V10 anode shunt	.0035
55	HT smoothing	32
56	V9 screen decouple	4
57	V9 screen decouple	.05
58	V9 cathode shunt	50
59	V9 cathode bypass	.05
60	Cathode pot. shunt	2
61	V10 grid couple	.23
62	HT smoothing	32
63	HT smoothing	16
64	HT smoothing	16
65	HT input shunt	1
66	Frame synch couple	.005
67	Line blocking condenser	.00023
68	Line synch	.00075
69	V14 couple	.005
70	V14 cathode shunt	1
71	Frame blocking	.05
72	V12 couple	.23
73	V12 couple	.1
74	V12 cathode shunt	35
75	Frame coil coupling	8
76	EHT smoothing	.1
77	EHT smoothing	.1
78	Brilliance shunt	8
79	Form correction	.023
80	LW osc. fixed padder	.00023
81	V1 heater shunt	.05
82	HT line decouple	.05
83	Synch feed shunt	10
84	Output feed back	.001
85	Line feed back	.00023
86	V3 sound couple tune	.00075
87	V7 sound couple tune	.00075
88	Sound rejector tune	.00023
89	V13 screen decouple	.1
90	Part of V14 when V14 is .0035	.0015

RESISTANCES

		Ohms.
1	V1 screen feed	10,000
2	V1 cathode bias	500
3	V1 anode decouple	10,000
4	V1 anode load	5,000
5	V2 grid return	500,000
6	V2 cathode bias	230
7	Osc. grid leak	50,000
8	V2 anode load	35,000
9	Vision osc. decouple	5,000
10	Osc. anode decouple	50,000
11	V3 vision coupling shunt	5,000
12	V3 anode decouple	5,000
13	V3 cathode bias	150
14	V7 vision couple	7,500
15	V1 grid return	230,000
16	V7 screen feed	10,000
17	V7 cathode bias	230
18	V7 anode decouple	5,000
19	V4 HF filter	100,000
20	V8 vision couple shunt	5,000
21	Demod. diode load	500,000
22	V4 cathode bias	1,000
23	V4 anode load	50,000
24	V8 screen feed	100,000

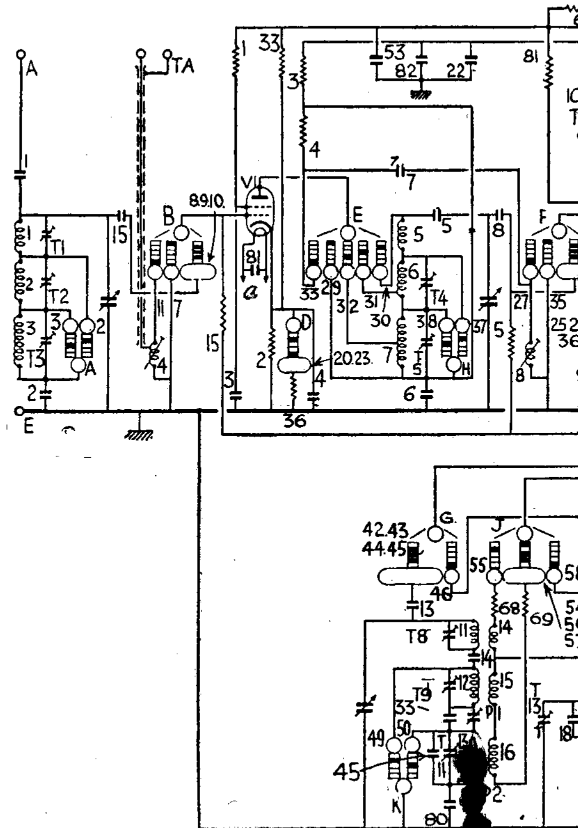
CIRCUIT AND SWITCH DIAGRAMS

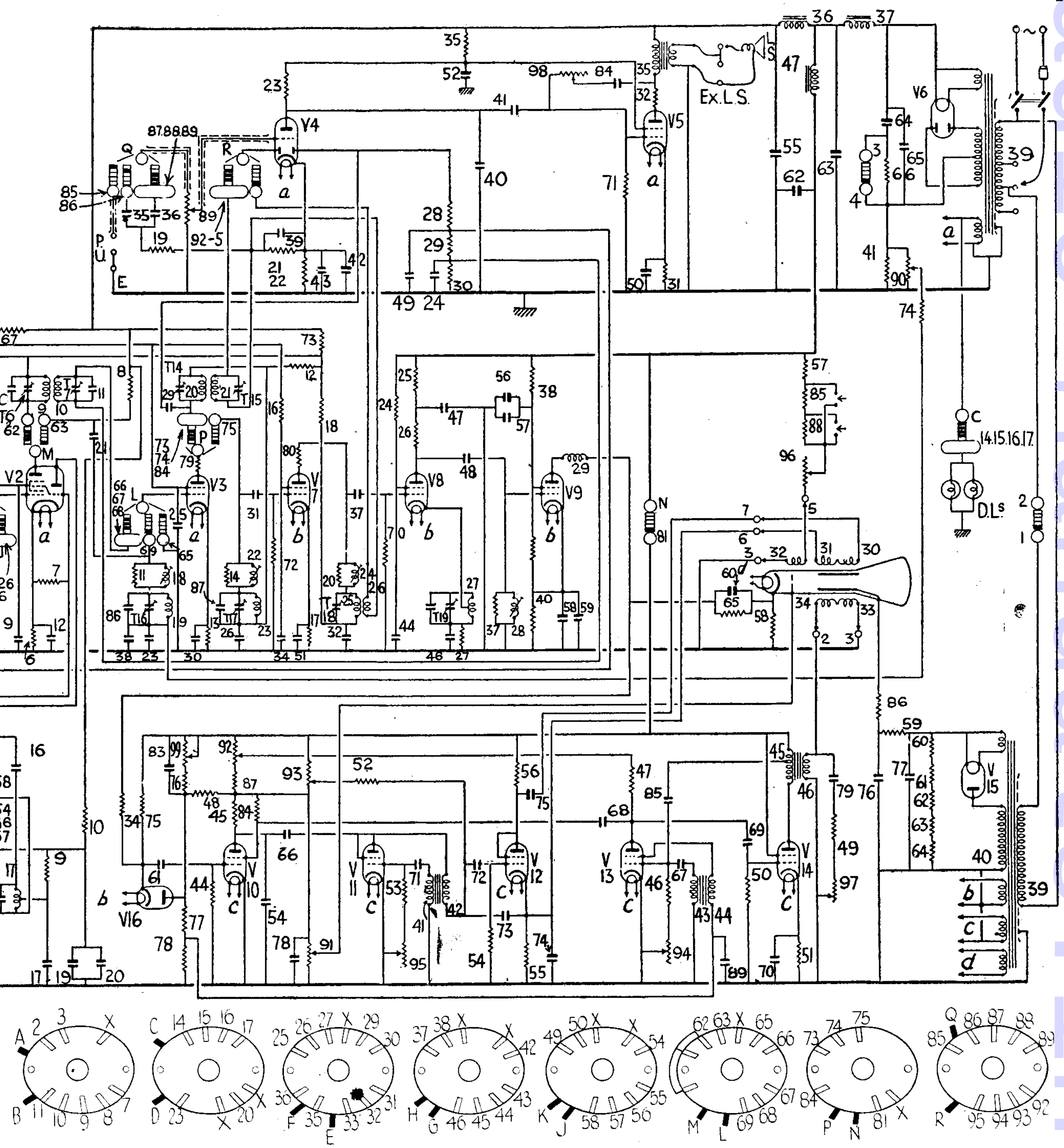
The diagram divides approximately into three sections. Along the centre is the vision channel from aerial to tube. As far as V3 this is common with the sound channel. The separate sound valves are V4 and V5 at the top.

The bottom part of the diagram comprises the time base section with, extreme left, part of the oscillator arrangements.

Switching is indicated in the conventional Marconiphone method, the sections of the ladder-like portions representing, from top to bottom, Gram., S., M., L. and T. positions.

The diagram of the switch banks is lettered in accordance with the circuit, the section nearest the "click" plate being on the left.





Resistances (continued)

25	V8 anode decouple	5,000
26	V8 anode load	10,000
27	V8 cathode shunt	230
28	AVC diode load (part)	500,000
29	AVC diode load (part)	500,000
30	AVC diode load (part)	500,000
31	V5 cathode bias	100
32	V5 anode stopper	50
33	V1 cathode pot. (part)	35,000
34	V9 anode load	5,000
35	V4 anode and V5 screen decouple	10,000
36	V1 bias pot. (part)	150
37	V9 vision coupling shunt	5,000
38	V9 screen pot. (part)	50,000
39	V9 screen pot. (part)	35,000
40	V9 cathode bias	500
41	Series bias	25
44	V10 grid leak	230,000
45	V10 anode load	23,000
46	V13 grid leak	35,000
47	V13 anode load	500,000
48	V10 HT pot. (part)	25,000
49	Form correction	600
50	V14 grid leak	500 000

Resistances (continued)

51	V14 cathode bias	350
52	V11 anode load	1 meg.
53	V11 grid lead	75,000
54	V12 grid leak	1 meg.
55	V12 cathode bias	750
56	V2 anode load	10,000
57	Focus feed (part)	23,000
58	Tube cathode pot. (part)	50,000
59	EHT smoothing	350,000
60	EHT bleeder (part)	1 meg.
61	EHT bleeder (part)	1 meg.
62	EHT bleeder (part)	1 meg.

Resistances (continued)

63	EHT bleeder (part)	1 meg.
64	EHT bleeder (part)	1 meg.
65	Tube bias pot. (part)	230,000
66	C64 polarising	15,000
67	HT line volt drop	23,000
68	SW het. voltage control	100
69	MW and LW het. volt control.	100
70	V8 grid leak	100,000
71	V5 grid leak	150,000
72	V7 grid leak	100,000
73	HT line volt drop	10,000
74	Gain control decouple	5,000

Resistances (continued)

75	Synch load	10,000
76	V17 anode feed pot. (part)	1,500
77	V16 anode feed pot. (part)	230,000
78	V13 anode pot. (part)	23,000
79	V3 anode stabiliser	50
80	V7 anode stabiliser	50
81	V2 screen feed	5,000
84	Time base HT pot. (part)	1 000
85	Focus feed (part)	750
86	Tube anode feed	150,000
87	V10 anode feed pot. (part)	50,000
88	Focus pot. (part)	750

MARCONI 707 ALIGNMENT INSTRUCTIONS

SOUND CHANNEL

IF Circuits (Frequency 465 kcs.).

Set the receiver to LW, connect an output meter and connect the generator through a 0.1 mfd. condenser to the grid of V2.

Adjust T6, T7, T14, and T15 in that order for maximum, using a low input below the AVC value.

If instability results, remove the can from IFT1 and move C10 and C11 nearer to the coils which they tune.

Short Waves (16.5 to 52 metres).

Connect the generator to the aerial and earth, and tune the gang to minimum on the SW band. Inject a signal of 16.7 metres (17.96 mcs.) and adjust T8 for maximum.

Tune set and generator to 50 metres (6 mcs.) and adjust the inductance loops of L1, L5 and L11 for maximum. The loops are inside the coil formers and may be adjusted with an insulating strip with a nick in it.

Tune set and oscillator to 18 metres (16.66 mcs.) and adjust T1, simultaneously rocking the gang.

Check at 16.7 and 18 metres.

Medium Waves (200 to 550 metres).

Tune set and oscillator to 195 metres (1,538.5 kcs.) with gang at minimum and adjust T9 for maximum.

Tune set and oscillator to 225 metres (1,333.3 kcs.) and adjust T2 and T4.

Tune set and generator to 530 metres and adjust P1 for maximum, simultaneously rocking the gang.

Check at 195 metres.

Long Waves (750 to 2,000 metres).

Tune set and generator to 725 metres (413.8 kcs.) and adjust T11 for maximum.

Tune set and generator to 800 metres (375 kcs.) and adjust T3 and T5 for maximum.

Tune set and generator to 1,900 metres (157.9 kcs.) and adjust P2 for maximum, simultaneously rocking the gang.

Check at 725 metres.

VISION CHANNEL

The vision sound channel is adjusted similarly to the broadcast sound transmission. The vision channel is adjusted with a DC milliammeter in the anode lead of V9. This is inserted in the top cap lead.

Tune oscillator to 4.5 mcs. and connect to top cap of V2. Adjust T17 and T16 for maximum sound output. Adjust T19 (rejector circuit) for *minimum* output on the *vision* output meter.

Tune generator to 8 mcs. and adjust L28 for maximum vision.

Tune generator to 8.7 mcs. and adjust L24 for maximum vision.

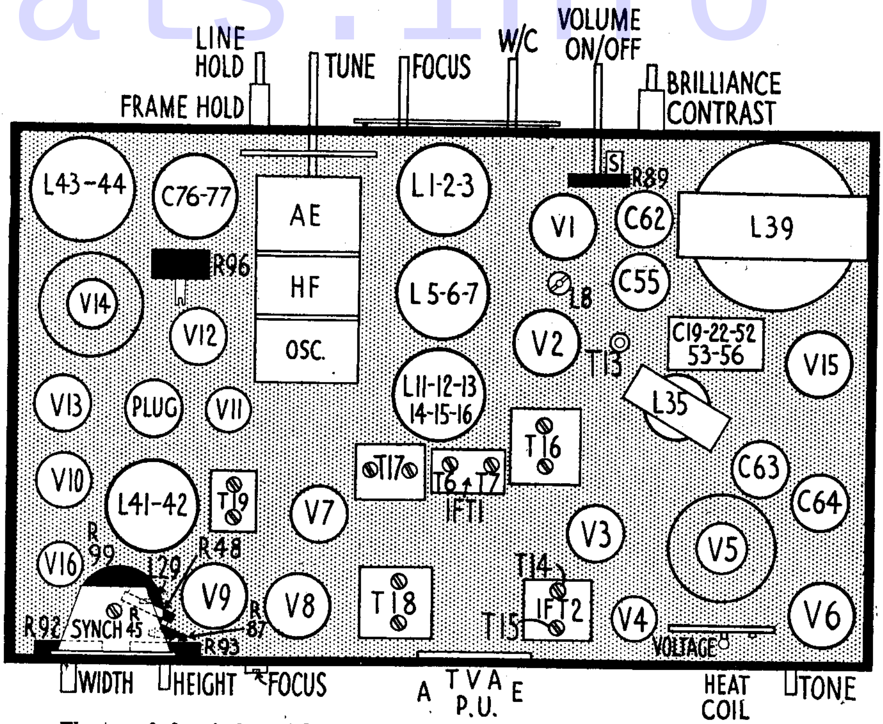
Tune generator to 7.3 mcs. and adjust L23 for maximum vision.

Tune generator to 8 mcs. and adjust L18 for maximum vision. Then tune L28 again for maximum.

Tune generator to 4.5 mcs. and adjust T19 for *minimum* on vision output. Next adjust T18 for *maximum* on sound output.

Set generator to 8.7 mcs. and tune L24 for maximum vision output.

Retune generator to 4.5 mcs. and adjust T17 for maximum sound output.



The top-of-chassis layout diagram of the Marconiphone 707 identifying the valves, coils and many of the trimmers. The underside chassis layout is on page 19.

Tune generator to 7.3 mcs. and tune L22 for maximum vision output.

Set generator to 4.5 mcs. and adjust T16 for maximum sound output.

Set generator to 8 mcs. and adjust L18 for maximum vision output.

Check the band width of the IF circuits as follows. Switch off generator and note milliammeter reading. Adjust generator to 8 mcs. and adjust attenuator to give substantially 3 m.a. more than with the generator switched off. Then increase generator to give double the input and note that at 8.5 mcs. and 7.5 mcs. the milliammeter readings are not less than 3 m.a. greater than with the oscillator switched off. If this is not so, the entire ganging process must be repeated.

The whole sequence of operations should be carried out at maximum gain, that is with the contrast control fully advanced.

Next connect the generator to the input terminals and tune to 41.5 mcs. adjusting T13 for maximum sound output. Tune generator to 45 mcs. and adjust L4 and L8 for maximum vision response. An entirely non-metallic tool should be used for this adjustment.

Replacement Condensers.

EXACT electrolytic replacements are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18.

The list numbers and list prices are: for C60, unit 2407, 2s. 3d.; for either C42 or C58, 2972, 2s. 3d.; C38, 1517, 2s. 9d.; C78, 3813, 2s. 6d.; either C55 or C62, 3998, 9s. 6d.; either C63 or C64, 2530, 6s. 6d.; C83, 3723, 1s. 6d.; C50, 2972, 2s. 3d.; C74, 1807, 2s. 3d.; C75, 3625, 3s. 6d., and for the block containing C22, 53, 56, 52 and 19, unit 1518, price 10s. 6d.

Making an Input Attenuator

TOO much signal strength sounds a strange trouble, but it is nevertheless a real one in districts near to Alexandra Palace. One way of overcoming the trouble is to use a small length of wire inside the house as an aerial. This is a thoroughly bad idea because it may lead to mis-match and also to interference troubles.

The proper method is to use an attenuator. It is no good using a variable resistance to cut down the input because, while it will certainly cut the input down, it will unbalance the feeder and a host of difficulties will arise. The correct characteristic impedance, which is of the order of 65 to 70 ohms must be maintained.

The simplest attenuator to make is a T pad, consisting of three resistances in the form of a letter T. The base of the T is earthy and the feed comes in on one top limb and the other limb is taken to the set. The attenuator must be so designed that both the feeder and the set "look in" to the correct impedance.

As an example, a single stage attenuator satisfying these conditions would consist of top limbs of 28 ohms and a shunt or vertical limb of 112 ohms. These resistances should be within about 10 per cent. and must be non-inductive. Composition carbon types should be used. They can be neatly fixed on a small strip of paxolin and make a very compact unit which can be mounted just inside the cabinet. This will overcome the overloading trouble without mis-match; there will be no picture "ring" and no increased interference with a twin line due to unbalance.