

# MARCONIPHONE 366 SUPERHET SIX RADIOGRAM

**CIRCUIT.**—A six-valve A.C. superhet radiogram working on long, medium and three short-wave bands.

Signals are fed to V1, an H.F. pentode, through an inductively coupled aerial transformer with tuned secondary on long, medium and two of the short-wave bands. On the ultra short band signals are coupled direct to the grid of V2.

Coupling to V2 is as before by means of inductively coupled coils.

The output of V2 passes to V3, an H.F. pentode, through an I.F. transformer tuned to 460 kc., and then through a second I.F. transformer to V4, a double diode triode. One diode of this is used for demodulation and the other to supply A.V.C. bias to the preceding valves in the orthodox manner.

A resistance and capacity stage is employed to couple V4 to V5, the output pentode. Tone is controlled by a five-position switch which selects condensers of different sizes. A bass control is included which varies the size of the coupling condenser between V4 and V5.

The pick-up is connected via the volume control VR1 to the grid of V4.

On the ultra-short wave band no A.V.C. bias is applied to the frequency changer.

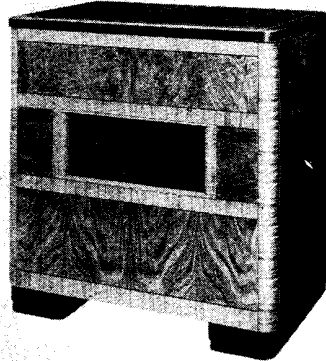
Mains equipment consists of transformer, full-wave rectifier, electrolytic condensers and the speaker field.

**Special Notes.**—The dial lamps of which there are two, rated at 6.2 v. .3 amp., are secured to the dial assembly by spring clips. These will be found one at the back and one at the front of the dial and are easily removed.

The external speaker connections are on the secondary of the output transformer and an extra speaker should have a speech coil impedance of about 4 ohms.

C67 and C68 are mounted on the back of the speaker.

The black and white panels shown in the



A "television band," two other short-wave ranges and the usual medium and long ranges, are covered by the Marconiphone 366 A.C. superhet six radiogram.

circuit diagram between the switch contacts indicate whether those particular contacts are open or closed in various positions. From top to bottom the positions are long, medium, 1st S.W., 2nd S.W. and 3rd S.W. A white panel indicates that the switch is open on that range; a black panel, closed.

**Exposing Chassis.**—Most of the work necessary on this receiver may be done without removing the chassis by unscrewing the two round-headed screws that will be found in the right-hand side of the control panel, and then pushing out the side panel of the cabinet.

Complete removal of the chassis, should it be considered necessary, is as follows: Remove the back and the side panel as above and then the five control knobs, which are secured by grub screws. Dis-

connect the leads from the mains transformer panel, making a careful note of their positions for reconnection, and the leads from the aerial and pick-up panel.

Remove the two remaining round-headed screws from the control panel and remove it, lifting the right-hand edge first. This will reveal the volume control panel, the wires to which should be disconnected, reconnection being as follows: 1, brown; 2, green; 3, yellow/black; 4, blank; 5, black.

After removing the four chassis fixing bolts from the side of the cabinet, the chassis can be withdrawn.

The speaker leads are connected as follows: tag 1 on chassis to tag 8 on speaker (red-yellow lead); 2 on chassis to 7 on speaker (red-black); 3 on chassis to 6 on speaker (red); 4 on chassis to speaker chassis (black).

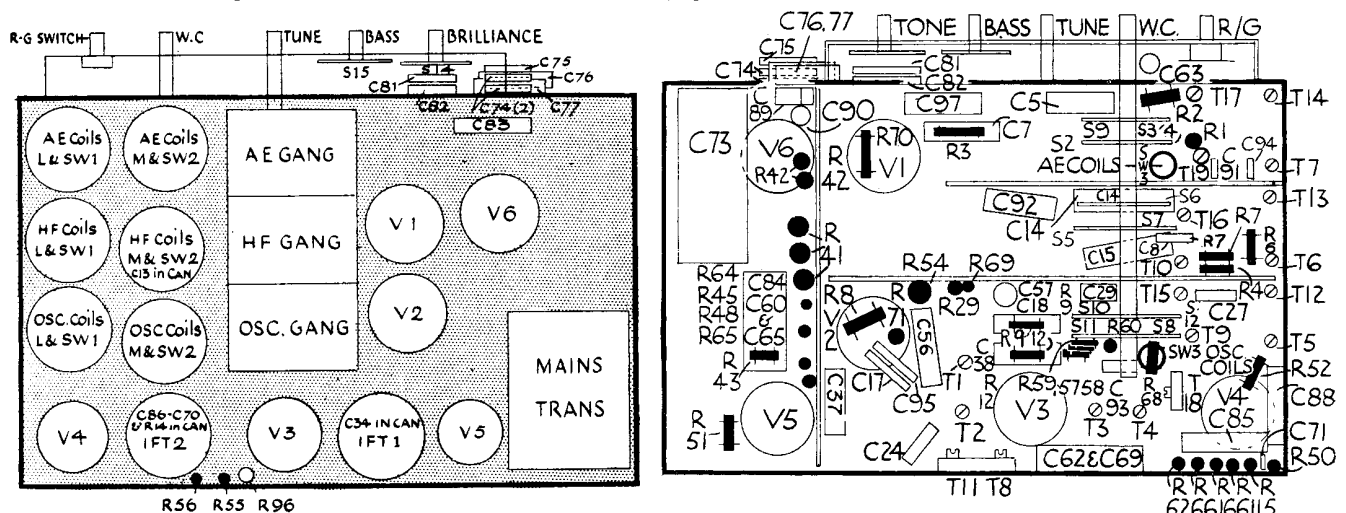
It is extremely important that the tubular electrolytic condensers on the speaker are kept in an upright position when the set is switched on, and that all the leads should be connected. Failure to do this may result in serious damage to the condensers.

## ALIGNMENT NOTES

**I.F. Circuits.**—Set the bass control to minimum, treble control to maximum, tune the receiver to the centre of the medium waveband and short circuit the oscillator section of the gang condenser.

Inject a signal of 460 kc. to the grid cap of V2 and adjust T1, T2, T3 and T4 for maximum reading on an output meter, which should be connected across the external speaker terminals.

**Calibration.**—With the gang condenser plates fully meshed the pointer should coincide with the 25 and 75 calibration marks on the dial; if not, then move it to



Left is the top of the chassis used in the Marconiphone 366 radiogram, while right is the underside view. All resistances are shown in solid black.

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# MARCONIPHONE 366 SUPERHET SIX RADIOGRAM

(Continued from opposite page)

agree. The receiver should be calibrated accurately before starting the ganging, as the 46 metre index mark is used as a ganging point.

**Long Waves.**—Adjust the receiver to the ganging point and inject a signal of 750 metres to the aerial and earth terminals, and adjust T5 for maximum deflection.

Inject and tune in a signal of 775 metres and while rocking the gang condenser adjust T6 and T7 for maximum.

Inject and tune in a signal of 1,700 metres and adjust T8 while rocking the gang condenser.

If there is any tendency for the receiver to become unstable during the above adjustments, a 2,000-ohm resistance should be included in the cathode lead to V2.

**Medium Waves.**—Adjust the receiver to the ganging point and inject a signal of 185 metres; adjust T9 for maximum reading on output meter.

Inject and tune in a signal of 205 metres, adjusting T10 and T19 for maximum.

Inject and tune in a signal of 500 metres, rock the gang condenser, and trim T11 for maximum.

Repeat the above until no further improvement results.

**Short Wave 1.**—Set receiver to 46 metres and inject a signal of that wavelength; adjust T12 for maximum.

Inject and tune in a signal of 50 metres,

rock the gang condenser and trim T12 and T14.

Check the above for accuracy.

**Short Wave 2.**—With the pointer at ganging point inject a signal of 16.7 metres and adjust T15 for maximum reading. Two peaks will be found while adjusting this trimmer; the one nearer minimum capacity is the correct.

Inject and tune in a signal of 17.8 metres, rock the gang condenser and adjust T16 and T17 for maximum.

Check the above two or three times. The adjustment of T16 is very critical.

**Short Wave 3.**—Inject a signal of 16 metres, and having set T18 to approximately half capacity, tune in the signal. Two tune points will be found, and the one using greater capacity of the tuning condenser should be used.

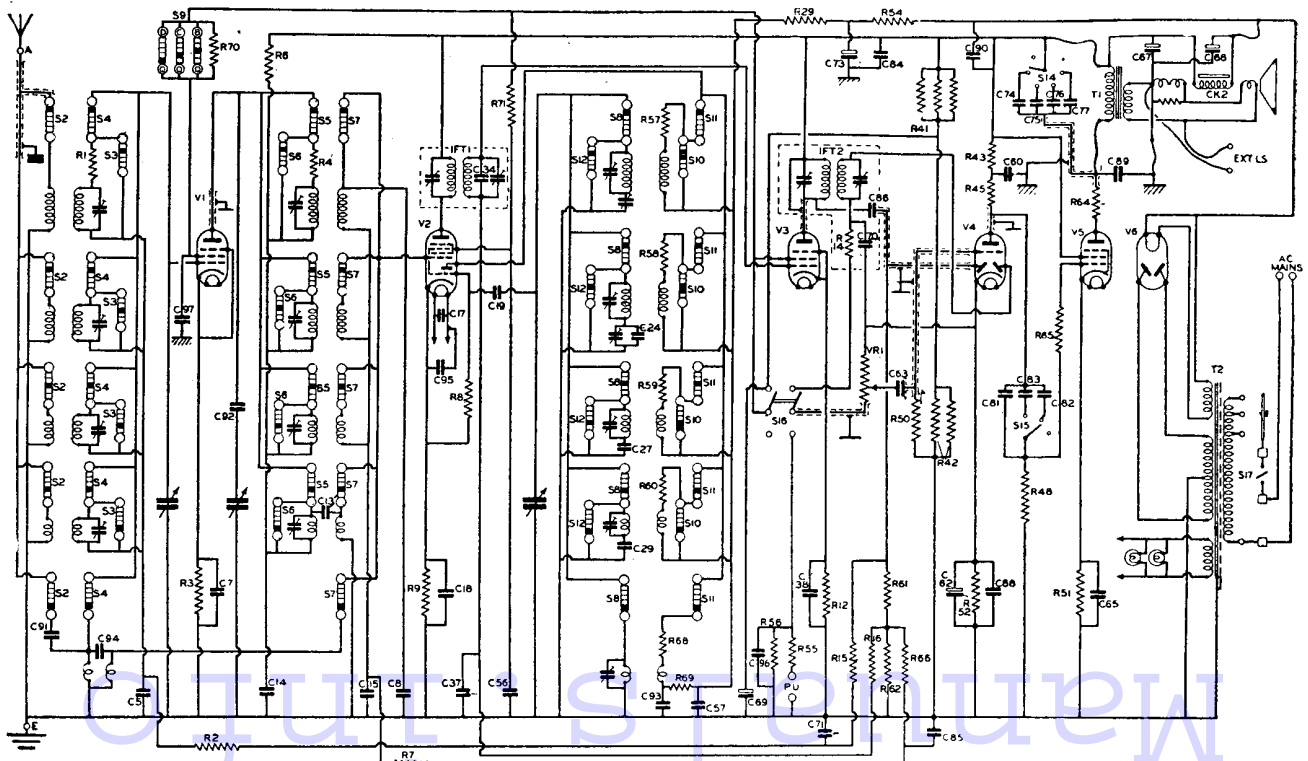
The inductance of the oscillator coil must now be adjusted for maximum output. This is done by altering the length of the lead from the coil to the chassis. This lead is divided into two parts, and the joint should be adjusted until maximum output is obtained and then resoldered.

Set the pointer to 7 metres, and inject a signal of this wavelength. Adjust T18 for maximum output, while rocking the gang condenser. If two peaks are found, that involving greater capacity should be used.

## CONDENSERS

C.	Purpose.	Mfds.
5	V1 A.V.C. decoupling ..	.05
7	V1 cathode bias shunt ..	.1
8	Long wave loading ..	.0003
13	H.F. coupling (s.w.2) ..	.000005
15	V1 anode decoupling ..	.1
17	V2 A.V.C. decoupling ..	.05
18	V2 heater shunt ..	.002
19	V2 cathode bias shunt ..	.1
24	V2 osc. grid ..	.00005
27	Medium wave padding ..	.00035
29	Short wave 1 padding ..	.00184
34	Short wave 2 padding ..	.00285
37	I.F.T.1 secondary circuit (part)	.0001
38	V3 A.V.C. decoupling ..	.05
56	V3 cathode bias shunt ..	.1
57	V2 screen decoupling ..	.1
60	V2 osc. anode decoupling ..	.05
62	V4 anode decoupling ..	.5
63	V4 cathode bias shunt ..	.4
65	L.F. coupling ..	.05
66	V5 cathode bias shunt ..	.1
67	H.T. smoothing ..	16
68	H.T. smoothing ..	8
69	V1, V2 and V3, screen decoupling potr. ..	.4
70	H.F. filter ..	.00035
71	V1 A.V.C. H.F. by-pass ..	.001
73	V2 osc. anode decoupling ..	8
74	Tone control ..	.0023
75	Tone control ..	.005
76	Tone control ..	.02
77	Tone control ..	.05
81	L.F. coupling and tone filter	.001
82	L.F. coupling and tone filter	.0015
83	L.F. coupling and tone filter	.05
84	V2 and V3 anode decoupling	.23
85	V2 A.V.C. decoupling ..	.05
86	A.V.C. diode coupling ..	.0001
88	V4 cathode bias shunt ..	.1
89	Pentode compensating ..	.0023
90	H.T. decoupling ..	.05
91	Series aerial (s.w.3) ..	.00001
92	H.F. gang, H.T. isolator ..	.1
93	V2 osc. anode decoupling (s.w.3)	.0023
94	S.W.3 top coupling ..	.000023
95	V2 heater by-pass ..	.0023
96	Pick-up potr shunt ..	.01
97	V1 screen decoupling ..	.1

(Other Tables on page 48.)



The circuit of the Marconiphone Model 366 all-wave radiogram. An explanation of the switch symbols is given in the text under Special Notes. Condenser table above; resistances and valve readings are on the next page.

MARCONIPHONE 366  
RADIOGRAM (Cont.)

# Two Volumes of Service Data on American Receivers

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid circuit modifier (l.w.) ..	100
2	V1 A.V.C. decoupling ..	100,000
3	V1 cathode bias ..	150
4	V1 anode circuit modifier ..	100
6	V1 anode decoupling ..	5,000
7	V2 A.V.C. decoupling ..	100,000
8	V2 osc. grid leak ..	50,000
9	V2 cathode bias ..	150
12	V3 cathode bias ..	150
14	Demodulator diode load ..	50,000
15	V1 A.V.C. decoupling ..	1.5 meg.
16	V3 A.V.C. decoupling ..	1 meg.
29	V2 osc. anode feed ..	15,000
41	V1, V2 and V3 screen decoupling potr. ..	23,000
42	V1, V2 and V3 screen decoupling potr. ..	7,500
43	V4 anode decoupling ..	50,000
45	V4 anode load ..	35,000
48	V5 grid leak ..	230,000
50	V4 grid leak ..	1 meg.
51	V5 cathode bias ..	100
52	V4 cathode bias ..	1,000
54	V2 osc. anode decoupling ..	35,000
55	Pick-up potentiometer ..	23,000
56	Pick-up potentiometer ..	50,000
57	Regeneration modifier (l.w.) ..	15,000
58	Regeneration modifier (m.w.) ..	2,300
59	Regeneration modifier (s.w.1) ..	500
60	Regeneration modifier (s.w.2) ..	150
61	A.V.C. diode load part ..	350,000
62	A.V.C. diode load part ..	230,000
64	V4 anode stabiliser ..	500
65	V5 grid stopper ..	1,000
66	V2 A.V.C. decoupling ..	750,000
68	Regeneration modifier (s.w.3) ..	6
69	V2 osc. anode feed ..	5,000
70	V1 screen decoupling ..	230,000
71	V2 screen decoupling ..	23,000
VR	Volume control ..	250,000

**R**ETAILERS dealing extensively in service on American receivers will find a great deal of useful information in two publications from the States.

One takes the form of a loose-leaf binder containing service notes, while the other is a bound volume containing not only service notes but practical and theoretical notes of a general kind.

The binder, the *Field Service Data Book* (Radio and Technical Publishing Co., New York), is by Alfred A. Ghirardi. It contains notes on a large number of receivers, valve data, and even electrical diagrams of cars for the car-radio installer.

"Case-histories," being a record of symptoms in various sets and their most

usual cause, is a useful section. Useful formulae are given.

Such headings as "Intermediate Frequencies" and "Dial-light Data" give an indication of the "routine" contents. Incidentally, over 5,200 models are listed in the I.F. data section.

There are seven parts in the *Official Radio Service Handbook*, a thousand-page volume by J. T. Bernsley (Gernsbach Publications, New York).

Circuit theory and analysis are dealt with first, and this part includes an analysis of commercial circuits, which outlines unusual divergencies from standard practice.

A long section is devoted to test gear. It gives fundamental requirements and principles, lists the apparatus available from various manufacturers and discusses the best methods of using instruments. Useful tips and a chapter on unusual experiences are given.

Cross sections of commercial sets are given under such headings as valves used, volume control data and condenser replacements. Then each set is gone through.

The books are available from Holiday and Hemmerdinger, of Holmer Works, Dolefield, Manchester, 3. *Field Service Data* is 14s. post free, and *Modern Radio Servicing*, 18s., or 29s. 6d. the two.

VALVE READINGS				
No signal. Volume maximum. 200 volt A.C. mains. Medium waves.				
V.	Type.	Electrode.	Volts.	Ma.
1	(All Marconi) VMP4G Met.(7)	Anode ..	240	.5
		Screen ..	20	.6
2	X41 Met. (7) ..	Anode ..	240	2.4
		Screen ..	45	2.4
		Osc. anode ..	80	4.8
3	VMP4G Met. (7)	Anode ..	240	4.4
		Screen ..	65	2.1
4	MHD4 Met. (7)	Anode ..	85	2
		Screen ..	205	36
5	N41 (7) ..	Anode ..	240	6.9
		Screen ..	240	6.9
6	U12 ..	Filament	245	—

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