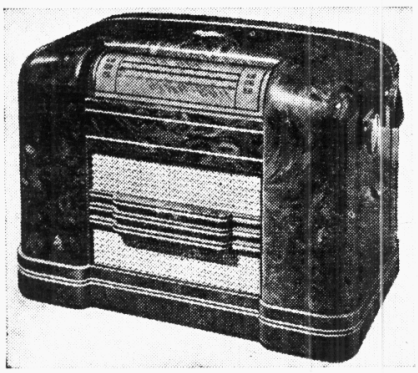
Supplement to The Wireless & Electrical Trader, October 5, 1940

"TRADER" SERVICE SHEET

487

MARCONIPHONE 911

3-BAND AC SUPERHET



The Marconiphone 911, which has a moulded cabinet.

THE Marconiphone model 911 is a 4-valve (plus valve rectifier) 3-band AC superhet, with a SW range of 16.5 to 50 m. It is suitable for use on 195 to 255 V, 50 to 100 C/S AC mains.

The receiver is fitted into a fairly small bakelite cabinet, the chassis being inverted. A 4-in. diaphragm energised loud speaker is used, and there is provision for connection of a gramophone pick-up.

The tuning scale is curved, and behind it rotates an illuminated translucent drum on which a spiral index line is printed.

Release date : August, 1940.

CIRCUIT DESCRIPTION

Aerial input via coupling circuits **C2, L1** (SW), **L2** (MW) and **C1, L3** (LW), which are permanently connected and require no switching, to single tuned circuits **L4, C22** (SW), **L5, C22** (MW) and **L6, C22** (LW).

First valve **(V1, Marconi metallised X63M)** is a heptode operating as frequency changer with electron coupling. Oscillator control grid coils **L7** (SW), **L8** (MW) and **L9** (LW) are tuned by **C24.** Parallel trimming by **C25** (MW) and **C11, C26** (LW); series tracking by **C8** (SW), **C9** (MW) and **C10** (LW); tracking adjustments by adjustable loops at the low potential ends of **L7** in the oscillator circuit and **L4** in the aerial circuit (SW) and adjustable iron-dust cores of **L8** and **L5** (MW), and **L9** and **L6** (LW), in the oscillator and aerial circuits respectively.

Reaction coupling by coil **L10** and common impedance of **C8,** via anode coupling condenser **C12** (SW), coupling coil **L11** (MW) and common impedance of tracker **C10** (LW).

Second valve **(V2, Marconi metallised KTW61M)** is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C27, L12, L13, C28** and **C29, L14, L15, C30.**

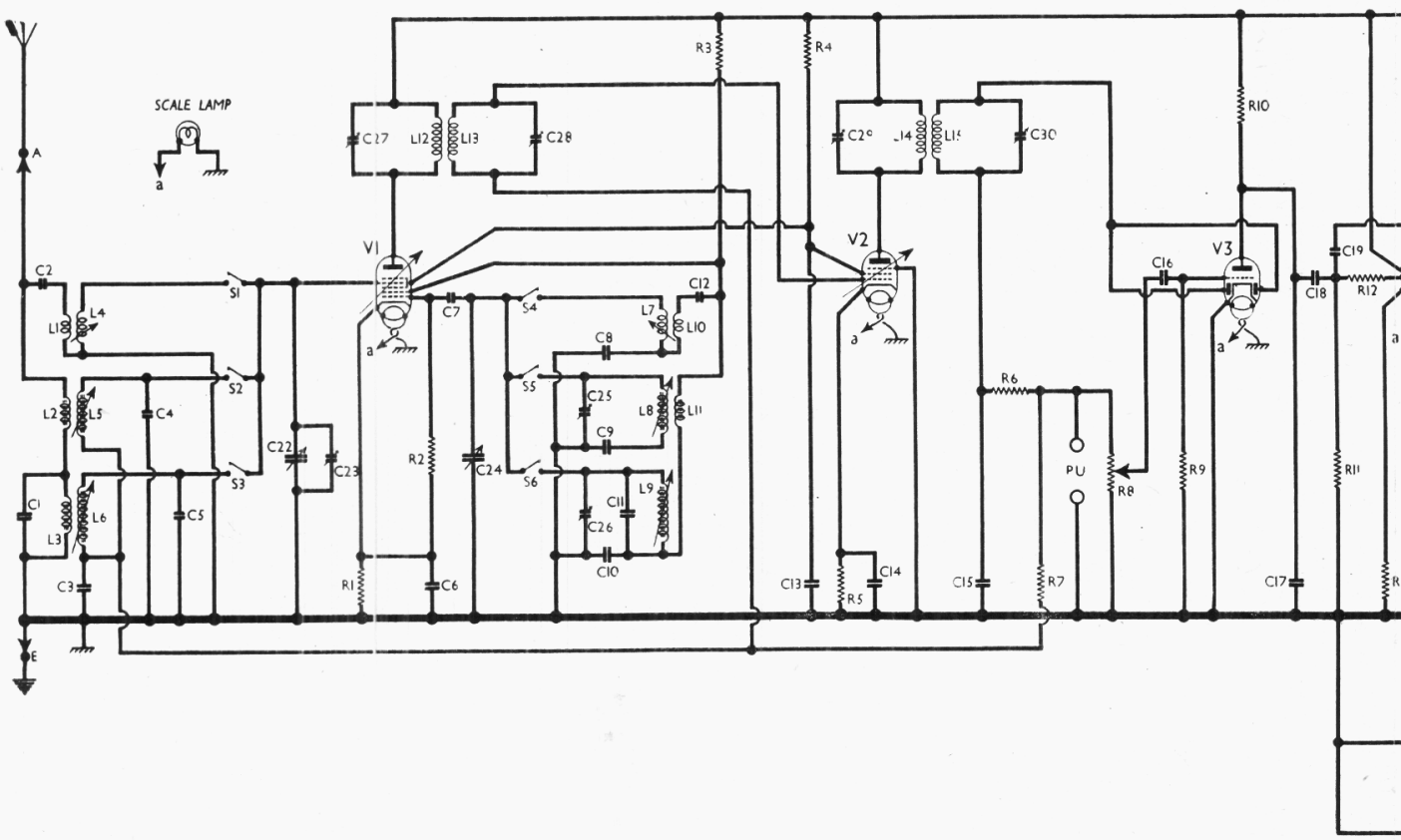
Intermediate frequency 465 KC/S.

Diode second detector is part of double diode triode valve **(V3, Marconi DH63** or **metallised DH63M),** whose diode anodes are strapped together to operate as a single diode. Audio frequency component in rectified output is developed across the manual volume control **R8,** which also operates as load resistance, and passed via the audio frequency coupling condenser **C16** and grid resistance **R9** to control grid of triode section, which operates as audio frequency amplifier.

IF filtering by **C15** and **R6** in the diode circuit and **C17** in triode anode circuit. Provision for connection of gramophone pick-up across **R8.**

DC potential developed across **R8** is fed back through decoupling circuit as GB to FC (except on SW) and IF valves, giving automatic volume control. GB for triode section of **V3** is obtained from drop, due to grid current, across the high valued CG resistance **R9.**

Resistance-capacity coupling by **R10, C18** and **R11,** via grid stopper **R12,** between **V3** triode and tetrode output valve **(V4, Marconi KT61).** Fixed tone correc-



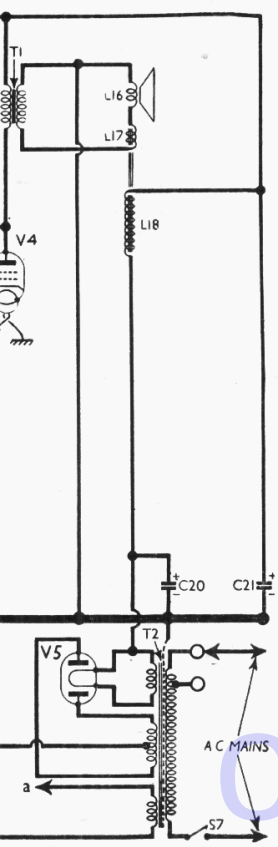
tion by degenerative effect of **C19** between anode and control grid, while the omission of the conventional cathode by-pass condenser across **R13** introduces a measure of negative feed-back.

HT current is supplied by full-wave rectifying valve **(V5, Marconi U10).** Smoothing by speaker field **L18** and electrolytic condensers **C20** and **C21.**

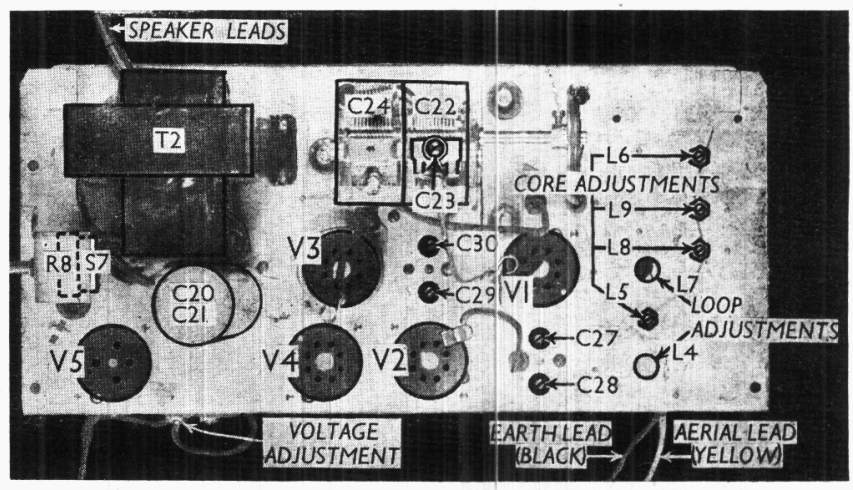
COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	Aerial circuit LW shunt...	0·0005
C2	Aerial SW coupling ...	0·000035
C3	V1 pentode CG decoupling	0·1
C4	Aerial circ. MW trimmer	0·000005
C5	Aerial circ. LW trimmer	0·000035
C6	V1 cathode by-pass ...	0·05
C7	V1 osc. CG condenser ...	0·000075
C8	Osc. circ. SW tracker ...	0·005
C9	Osc. circ. MW tracker ...	0·00043
C10	Osc. circ. LW tracker ...	0·0002
C11	Osc. circ. LW fixed trimmer	0·00015
C12	Osc. SW reaction coupling	0·00005
C13	V1, V2 SG's decoupling...	0·05
C14	V2 cathode by-pass ...	0·05
C15	IF by-pass	0·0001
C16	AF coupling to V3 triode	0·001
C17	IF by-pass	0·00023
C18	V3 triode to V4 AF coupling	0·005
C19	Fixed tone corrector ...	0·000023
C20*	HT smoothing condensers	8·0
C21*	HT smoothing condensers	16·0
C22†	Aerial circuit tuning ...	—
C23‡	Aerial circ. MW trimmer	—
C24†	Oscillator circuit tuning...	—
C25‡	Osc. circuit MW trimmer	—
C26‡	Osc. circuit LW trimmer	—
C27‡	1st IF trans. pri. tuning...	—
C28‡	1st IF trans. sec. tuning...	—
C29‡	2nd IF trans. pri. tuning	—
C30‡	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Marconiphone 911. It will be noted that much of the alignment is carried out by inductance adjustments, either by movable iron cores or by the end turns of coils. The circuit is entirely straightforward. **C19** is a tone corrector.



Plan view of the chassis. Note the five trimmer adjustments, four core adjustments and two loop adjustments. **R8** and **S7** are mounted on a bracket.

	RESISTANCES	Values (ohms)
R1	V1 fixed GB resistance ...	350
R2	V1 osc. CG resistance ...	50,000
R3	V1 osc. anode HT feed ...	23,000
R4	V1, V2 SG's HT feed ...	35,000
R5	V2 fixed GB resistance ...	350
R6	IF stopper	50,000
R7	AVC line decoupling ...	2,300,000
R8	Manual volume control ; V3 signal diode load ...	500,000
R9	V3 triode CG resistance ...	10,000,000
R10	V3 triode anode load ...	500,000
R11	V4 CG resistance	500,000
R12	V4 grid stopper	50,000
R13	V4 GB resistance	100

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW coupling coil ...	0·25
L2	Aerial MW coupling coil ...	24·0
L3	Aerial LW coupling coil ...	70·0
L4	Aerial SW tuning coil ...	Very low
L5	Aerial MW tuning coil ...	2·5
L6	Aerial LW tuning coil ...	19·0
L7	Osc. circ. SW tuning coil ...	Very low
L8	Osc. circ. MW tuning coil...	3·0
L9	Osc. circ. LW tuning coil ...	7·5
L10	Oscillator SW reaction ...	0·4
L11	Oscillator MW reaction ...	2·0
L12	1st IF trans. Pri.... ...	9·0
L13	1st IF trans. Sec. ...	7·0
L14	2nd IF trans. Pri.... ...	4·5
L15	2nd IF trans. Sec. ...	4·5
L16	Speaker speech coil ...	4·0
L17	Hum neutralising coil ...	0·2
L18	Speaker field coil	950·0
T1	Output trans. Pri.	390·0
	Output trans. Sec.	0·5
T2	Mains trans. Pri., total ...	43·0
	Mains trans. Heater sec. ...	0·2
	Mains trans. Rect. heat. sec.	0·3
	Mains trans. HT sec., total	860·0
S1-S6	Waveband switches ...	—
S7	Mains switch, ganged R8 ...	—

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull-off) from the sides of the cabinet;

remove the two round-head screws (with lock-washers) holding the rear member of the chassis to the cabinet.

The chassis may now be withdrawn from the cabinet to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unsolder from the tags on the speaker the four leads connecting it to chassis.

When replacing, connect the leads as follows, numbering the tags from left to right as viewed from the rear of the cabinet :

1, yellow;
2, black;
3, no external connection;
4, red/black;
5, red.

Removing Speaker.—Remove the three round-head screws (with washers) holding the speaker to the sub-baffle.

When replacing, the connecting tags should be at the bottom;

One thick spacing washer should be fitted to each fixing screw, between the speaker frame and the threaded fixing bush in the sub-baffle.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 233 V, using the 224-255 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium wave band, and the volume control was at maximum, but there was no signal input.

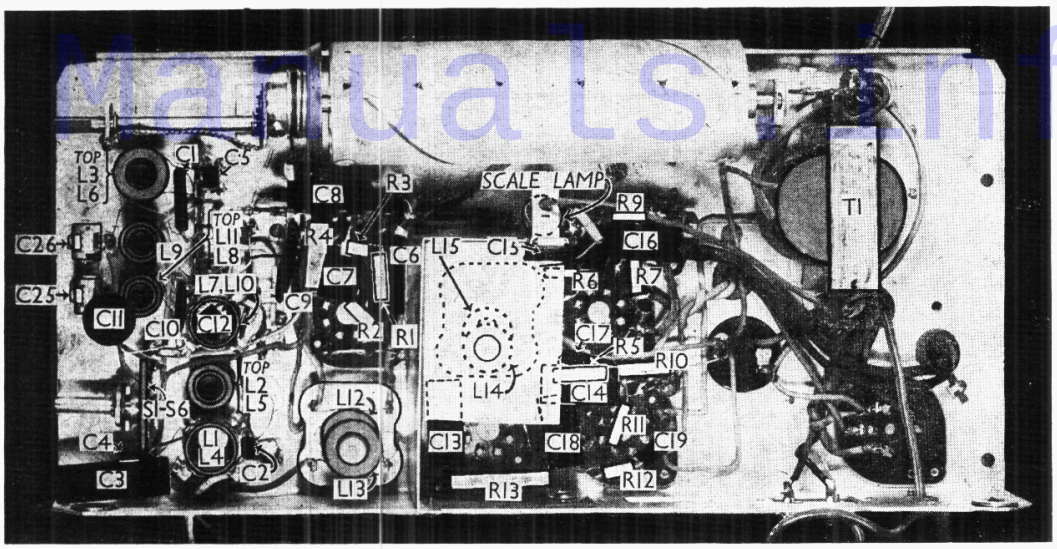
Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X63M	260 Oscillator 150	2·5 4·5	80	3·0
V2 KTW61M	260	6·0	80	2·0
V3 DH63	65	0·4	—	—
V4 KT61	245	38·0	260	7·0
V5 U10	345†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1—S6 are the waveband switches, in a single rotary unit beneath the chassis, with its spindle projecting at one side. The unit is indicated in our under-chassis view, and shown in detail in



Under - chassis view. A diagram of the **S1-S6** switch unit is in col. 1. **C25** and **C26** are adjustable from the side of the chassis, the remaining alignment adjustments being reached from the chassis deck.

the diagram below, where it is drawn as seen looking from the **T1** end of the underside of the chassis. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

S7 is the QMB mains switch, ganged with the volume control **R8.**

Coils.—L1, L4; L2, L5; L3, L6; L7, L10; L8, L11 and **L9** are in six unscreened tubular units beneath the chassis. The adjustments for the iron cores of **L5, L6, L8** and **L9** are on the chassis deck, and are indicated in the plan chassis view, as are also the holes through which the loop adjustments of **L4** and **L7** are accessible.

The IF transformers **L12, L13** and **L14, L15** are also in two units beneath the chassis. The first is unscreened, while the second is partly enclosed by metal screening plates. The IF trimmers are adjustable from the chassis deck, and are indicated in the plan chassis view.

External Speaker.—No provision is made for this, but a low impedance (4-5 O) type could be connected across the speech coil tags of the internal speaker.

Scale Lamp.—This is an Osram MES type, rated at 6.5 V, 0.3 A. It has a tubular bulb.

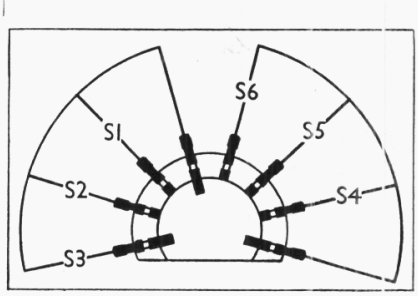
Condensers C20, C21.—These are two dry electrolytics in a single metal can on the chassis deck, the can being the common negative connection. The plain tag beneath the chassis is the positive of **C20,** while the red spotted tag is the positive of **C21.**

Trimmers.—Apart from the core and inductance adjustments, and the IF trimmers, reached from the chassis deck, there is one trimmer on the gang condenser, and two, mounted beneath the chassis, and reached from the side near the wave-change switch spindle.

Hum.—Where complaints of hum are being investigated and before the more usual causes of it are examined, the following inspection should be carried out. In a few instruments of early production the mains lead to the switch was run through a hole in the chassis which also carries the volume control leads. In all instruments where this condition is met the mains lead to the switch must be disconnected, withdrawn from its position and taken through a hole in the chassis adjacent to the output transformer through which passes heater and mains transformer voltage adjusting wiring. The lead must then be dressed well away from the volume control leads, and the modification will reduce any hum due to this cause to a standard level.

Switch Table

Switch	SW	MW	LW
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	C	—	—
S5	—	C	—
S6	—	—	C



Switch diagram, looking from the T1 end of the underside of the chassis.

CIRCUIT ALIGNMENT

IF Stages.—Switch set to MW, and turn gang condenser and volume control to maximum. Connect signal generator via a 0.1 μF condenser to control grid (top cap) of **V2** and to chassis. Feed in a 465 KC/S signal and adjust **C30,** then **C29,** for maximum output. Transfer signal generator to top cap of **V1** (via the 0.1 μF condenser), and adjust **C28,** then **C27,** for maximum output.

RF and Oscillator Stages.—Since it is necessary to set the gang by the scale (which is fixed to the cabinet), the chassis should be kept in the cabinet, but not fixed. Most of the trimmers are easily accessible, and for those that are not, it is possible, after setting the gang, to slide the chassis back until they can be reached. Connect signal generator to **A** and **E** leads, via a suitable dummy aerial.

MW.—Switch set to MW, tune to 210 m on scale, feed in a 210 m (1,428 KC/S) signal, and adjust **C25,** then **C23,** for maximum output. Tune to 510 m on scale, feed in a 510 m (588 KC/S) signal, and adjust cores of **L8** and **L5** for maximum output. Repeat the 210 m adjustments.

LW.—Switch set to LW, tune to 1,000 m on scale, feed in a 1,000 m (300 KC/S) signal, and adjust **C26** for maximum output. Tune to 1,850 m on scale, feed in an 1,850 m (162 KC/S) signal, and adjust core of **L9** for maximum output. Repeat the 1,000 m adjustment, then feed in a 1,400 m (214 KC/S) signal, tune it in, and adjust core of **L6,** while rocking the gang for optimum results.

SW.—Switch set to SW, tune to 50 m on scale, feed in a 50 m (6 MC/S) signal, and adjust loop of **L7** for maximum output. Then, while rocking the gang very slightly, adjust loop of **L4** for maximum output. Repeat both SW adjustments.

Service Sheet Index

Radio Servicemen who want to look up quickly just what receivers have been covered by *The Trader* series of Service Sheets should consult the new index which appears on pages 6 and 7 this week.

The index lists each of the 487 sheets which have been published to date, and it includes in most cases equivalent models made by associated manufacturers.

It should be pointed out that while reprints of most of the sheets are obtainable from *The Trader* offices, a few (marked by asterisks * in the index) are out of print.