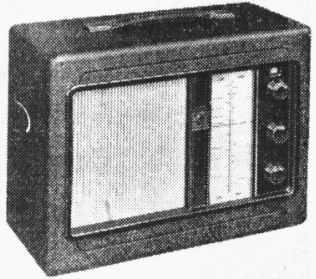


# MARCONIPHONE 891

# 468

## HMV 1403



The Marconiphone 891 all-dry battery portable. The HMV 1403 is electrically identical

THE Marconiphone 891 is a 4-valve superhet all-dry battery portable, covering the MW and LW bands. It has provision for the use of a combined HT and LT battery, or for separate HT and LT batteries. There is provision for the use of an external aerial and earth.

The HMV 1403 is electrically identical with the Marconiphone model. Release date, both models: March, 1940.

### CIRCUIT DESCRIPTION

Tuned frame aerial input L1, C20 (MW) or L1, loading coil L2 and C20 (LW) to heptode frequency changer (V1, Marconi X14). Provision for connection of external aerial via C1 and for external earth.

V1 oscillator CG coils L3 (MW) and L4 (LW) are tuned by C21 via tracker C6; parallel trimming by C22 (MW) and C8, C23 (LW); additional tracking on LW by C7. Reaction by coil L5 (MW) and common impedance of C7 (LW).

Second valve (V2, Marconi Z14) is a variable-mu pentode, operating as IF

amplifier with tuned-primary, tuned-secondary transformer couplings.

### Intermediate frequency 465KC/S.

Diode second detector is part of single diode triode valve (V3, Marconi HD14). Audio frequency output is developed across load resistances R6, R7, and passed via R8, C14 and manual volume control R9 to CG of triode section.

DC potential is tapped off at junction of R6, R7 and fed back as GB to FC and IF valves, giving AVC.

Resistance-capacity coupling by R10, C15 and R11 between V3 triode and pentode output valve (V4, Marconi N14). Fixed tone correction by C17. GB is obtained from drop along R12 in negative HT lead to chassis.

### COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Ext. aerial series condenser	0-000015
C2	AVC line decoupling	0-1
C3	1st IF transformer fixed	0-00015
C4	trimmer condensers	0-00015
C5	V1 osc. CG condenser	0-000075
C6	Osc. circuit MW tracker	0-0005
C7	Osc. circuit LW tracker	0-00035
C8	Osc. circ. LW fixed trimmer	0-00005
C9	V1 SG decoupling	0-05
C10	2nd IF transformer fixed	0-00015
C11	trimmer condensers	0-00015
C12	IF by-pass	0-0001
C13*	HT circuit reservoir	8-0
C14	AF coupling to V3 triode	0-05
C15	V3 triode to V4 AF coupling	0-05
C16*	Auto GB by-pass	15-0
C17	Fixed tone corrector	0-0035
C18†	Frame aerial LW trimmer	—
C19†	Frame aerial MW trimmer	—
C20†	Frame aerial tuning	—
C21†	Oscillator circuit tuning	—
C22†	Osc. circuit MW trimmer	—
C23†	Osc. circuit LW trimmer	—
C24†	1st IF trans. pri. tuning	—
C25†	1st IF trans. sec. tuning	—
C26†	2nd IF trans. pri. tuning	—
C27†	2nd IF trans. sec. tuning	—

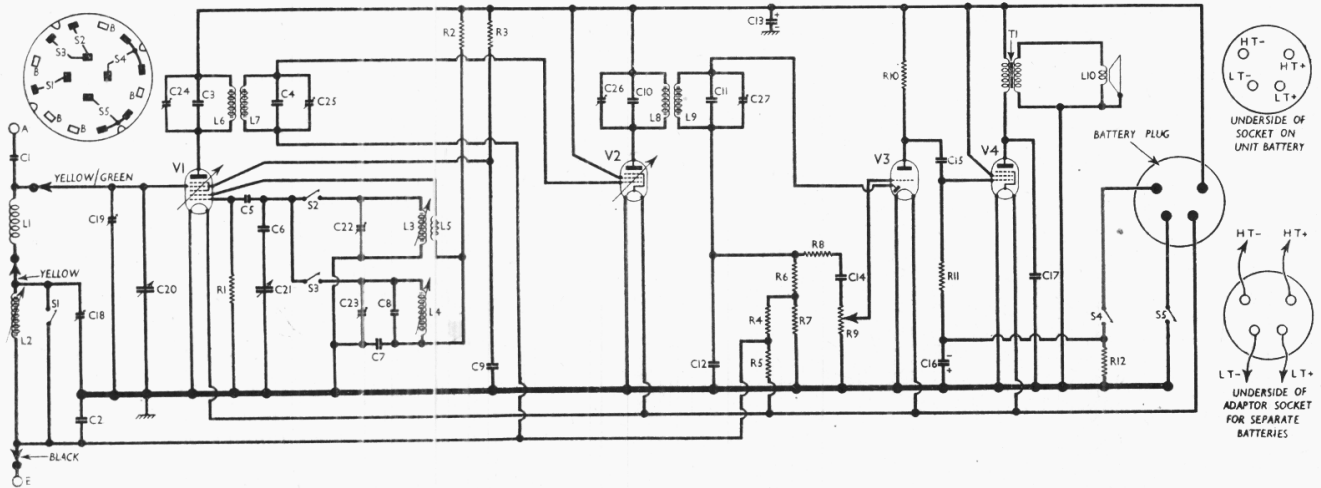
RESISTANCES		Values (ohms)
R1	V1 osc. CG resistance	150,000
R2	V1 osc. anode HT feed	7,500
R3	V1 SG HT feed	50,000
R4	Parts LT circuit potential divider	1,000,000
R5	divider	5,000,000
R6	V3 diode load resistances	230,000
R7		230,000
R8	IF stopper	50,000
R9	Manual volume control	2,000,000
R10	V3 triode anode load	1,000,000
R11	V4 CG resistance	2,300,000
R12	V4 auto GB resistance	1,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	Frame aerial winding	0-6
L2	Aerial LW loading coil	8-7
L3	Osc. circuit MW tuning coil	2-6
L4	Osc. circuit LW tuning coil	7-3
L5	MW reaction coil	2-2
L6	1st IF trans. Pri.	4-0
L7	Sec.	4-0
L8	2nd IF trans. Pri.	4-0
L9	Sec.	4-0
L10	Speaker speech coil	3-0
T1	Output trans. Pri.	540-0
	Sec.	0-4
S1-S3	Waveband switches	—
S4	HT circuit switch	—
S5	LT circuit switch	—

### DISMANTLING THE SET

**Removing Chassis.**—Remove the three control knobs (recessed screws); unsolder from frame aerial tags on back cover the three chassis leads; unsolder the two chassis leads from speaker tags; remove the four round-head screws (with lock-washers and clamp-plates) holding the chassis to the mounting blocks inside the carrying case. When replacing, connect the frame leads as follows, with the back cover turned

\* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Marconiphone 891 and HMV 1403. The switch diagram, drawn as seen looking from the rear of the top of the chassis, is inset at the top left-hand corner. The diagrams of the battery plug and sockets are as seen from the free ends of the pins or the undersides of the sockets

## MARCONIPHONE 891—continued

over to lie on top of case, and viewed from the rear;  
yellow lead to tag at upper left corner of panel;  
black lead to E socket tag on panel;  
yellow/green lead (threaded through hinge-strap) to C1 tag at lower right corner of panel.

Connect green speaker lead to tag marked +;  
connect black speaker lead to tag marked — and earthing tag (under fixing bolt).

**Removing Speaker.**—Unsolder leads and remove the three round-head fixing screws (with washers).

When replacing, the connecting panel should point towards the bottom left-hand corner of the case, and the earthing tag should be clamped under the head of the adjacent fixing screw.

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new battery, the HT section of which was reading 103 V on load. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but L1 was short-circuited.

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

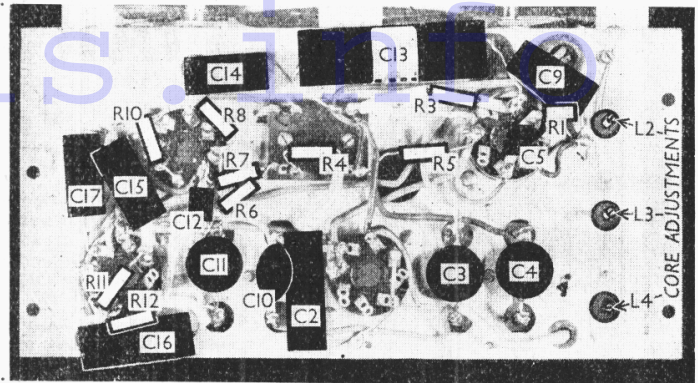
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X14	92 72	0.7 1.3	47	0.9
V2 Z14	92	1.3		
V3 HD14	15	0.03	92	0.3
V4 N14	89	4.6	92	1.1

### GENERAL NOTES

**Switches.**—S1-S3 are the waveband switches, and S4, S5 the battery circuit switches, ganged in a single rotary unit mounted on the section of the chassis carrying all the controls. The unit is indicated in our plan chassis view, and shown in detail in the diagram inset at the top left-hand of the circuit, where it is drawn as seen looking from the rear of the top of the chassis.

In the fully anti-clockwise position of the spindle ("Off"), all switches are

Under-chassis view. Note the core adjustments for L2, L3 and L4. R5 may consist of two resistors in series



open; in the mid-position (MW), S1, S2, S4 and S5 are closed; in the clockwise position (LW), S3, S4 and S5 are closed.

**Coils.**—L1 is the frame aerial winding, attached to the back of the cabinet. L2; L3, L5 and L4 are in three un-screened tubular units on the chassis deck. These coils are iron-cored, the adjustments being indicated in our under-chassis view. The IF transformers L6, L7 and L8, L9 are in two screened units on the chassis deck, with their associated fixed and variable trimmers.

**Batteries.**—Marconiphone B140 combined dry HT and LT battery is recommended. The 4-pin battery plug fits the socket of this battery. Alternatively, separate HT and LT batteries may be employed. Marconiphone B628 90V HT battery and a 1.5V bell cell are suitable. In this case the battery plug is inserted into the adaptor socket mounted inside the cabinet, and the leads from this socket are connected to the batteries as follows: Black lead, yellow plug, HT negative; red lead, yellow plug, HT positive 90V; thick black lead, LT negative (to side lead of bell cell); thick red lead, LT positive 1.5V (to centre terminal of bell cell).

**Battery Plug Connections.**—The colour coding of the leads to the battery plug is: LT negative, black/yellow; LT positive, red; HT negative, black/green; HT positive, black/red.

**Valve Connections.**—Base connections of the valves used in this set were given in a table at the end of Service Sheet 460 (April 13, 1940).

**Resistance R5.**—This may consist of two 2.3MO resistances in series.

**Condenser C1.**—This is mounted inside the back of the cabinet, between the external aerial socket and one end of the frame aerial.

### CIRCUIT ALIGNMENT

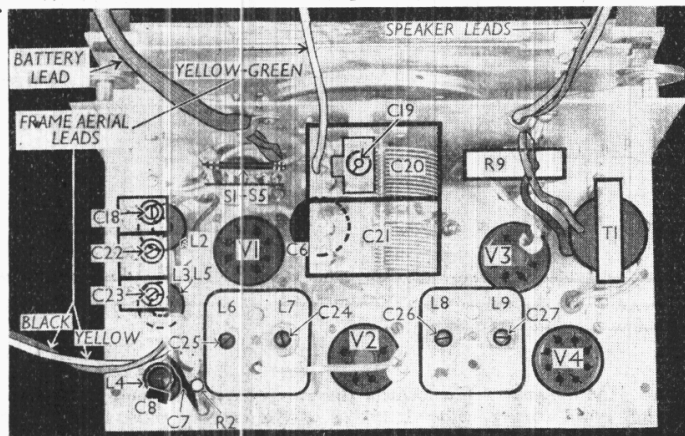
When aligning the set, having removed the chassis from the cabinet, and also the back of the cabinet on which is mounted the frame (leaving the leather hinges on the back), the frame, battery and chassis must be placed on the bench in their correct relative positions. The space between the frame and the battery must be  $\frac{1}{2}$  in., and the chassis must be arranged correctly relative to both. The frame leads must also be arranged as they would be in the cabinet.

**IF Stages.**—Connect signal generator via a 0.1 $\mu$ F condenser to control grid (top cap) of V2, and chassis. Leave existing connection in place. Turn gang to minimum and volume control to maximum. Feed in a 465 KC/S signal, and adjust C27, then C26, for maximum output. Transfer signal generator to control grid (top cap) of V1, and adjust C25, then C24, for maximum output. Repeat these adjustments.

**RF and Oscillator Stages.**—With gang at maximum, pointer should be under small mark on MW scale above 570m calibration. The signal generator should be connected with its earthy lead to receiver chassis, and the "hot" lead (not more than 6 in. long) left free.

**MW.**—Switch set to MW, tune to 200m on scale, feed in a 200m (1,500 KC/S) signal, and adjust C22 for maximum output. Feed in a 225m (1,333 KC/S) signal, tune it in, and adjust C19 for maximum output. Feed in a 520m (377 KC/S) signal, tune it in, and adjust core of L3 for maximum output, while rocking the gang for optimum results. Repeat the MW adjustments.

**LW.**—Switch set to LW, tune to 800m on scale, feed in an 800m (376 KC/S) signal, and adjust C23 for maximum output. Feed in a 1,350m (222.2 KC/S) signal, tune it in, and adjust C18 for maximum output, rocking the gang slightly for optimum results. Feed in a 1,900m (158 KC/S) signal, tune it in, and adjust cores of L4 and of L2 for maximum output, while rocking the gang for optimum results. Repeat the LW adjustments.



Plan view of the chassis. A diagram of the switch unit is inset in the circuit diagram overleaf.