

"TRADER" SERVICE SHEET

670

MARCONIPHONE 260 and 285
COLUMBIA 1001 and 1003

BAND-PASS input and QPP output stages are used in the Marconiphone 260, a 4-valve 2-band TRF battery receiver. There is provision for a gramophone pick-up and an external speaker.

A modified form of 260 chassis, employing Ferrocart coils, is used in the Marconiphone 285, and both types of chassis, with further modifications, are to be found in the Columbia 1001 (or CQA) receivers. The Columbia 1003, a radiogram with a spring motor, uses the same types of chassis as does the 1001.

This Service Sheet was prepared from a Marconiphone 260, but the differences in other models are described overleaf.

Release dates and original prices: Marconiphone 260, 1933, £11 17s. 6d.; 285, 1934, £11 7s. 6d.; Columbia 1001, 1933, £11 11s.; 1003, 1933, £21. All complete with batteries.

CIRCUIT DESCRIPTION

Aerial input from socket A1 is via variable series resistor R1 and coupling coils L1, L2 to inductively coupled band-pass filter. Primary coils L3, L4 are tuned by C12; secondaries L5, L6 by C15. Coupling by mutual inductance of primary and secondary windings. Input from sockets A2 and A3 is via series condensers C1 and C2 to A1.

First valve (V1, Marconi metallised VS2) is a variable-mu tetrode operating as RF amplifier, with gain control by R4 which forms part of SG potential divider with R2, R3, and is ganged with R1.

Tuned-secondary RF transformer coupling by L7, L8 and L11, L12, C18 between V1 and triode detector valve (V2, Marconi metallised HL2) which operates on the grid leak system with C6 and R5. Reaction is applied from anode via C7 and coils L9, L10 and controlled by R4, which thus performs a dual function, reducing

the gain of V1 at the same time as it increases the resistance between L9, L10 and chassis. RF filtering by C8, L13 and C9. Provision for connection of a gramophone pick-up in control grid circuit.

Parallel-fed transformer coupling by R6, C10 and T1 between V2 and two pentode valves (V3, V4, Marconi PT2's) comprising a quiescent push-pull output stage, with independent SG leads for matching purposes.

Provision for connection of low-impedance external speaker across secondary of T2.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the makers' manual for a set operating with a new HT battery and with the volume control set to optimum gain, but with no input signal.

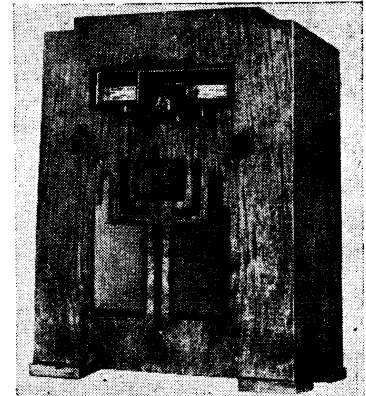
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VS2	145	1.0	50	0.6
V2 HL2	60	1.5	—	—
V3 PT2	166	1.2	†	0.5
V4 PT2	166	1.2	†	0.5

† Depends upon valve marking.

COMPONENTS AND VALUES

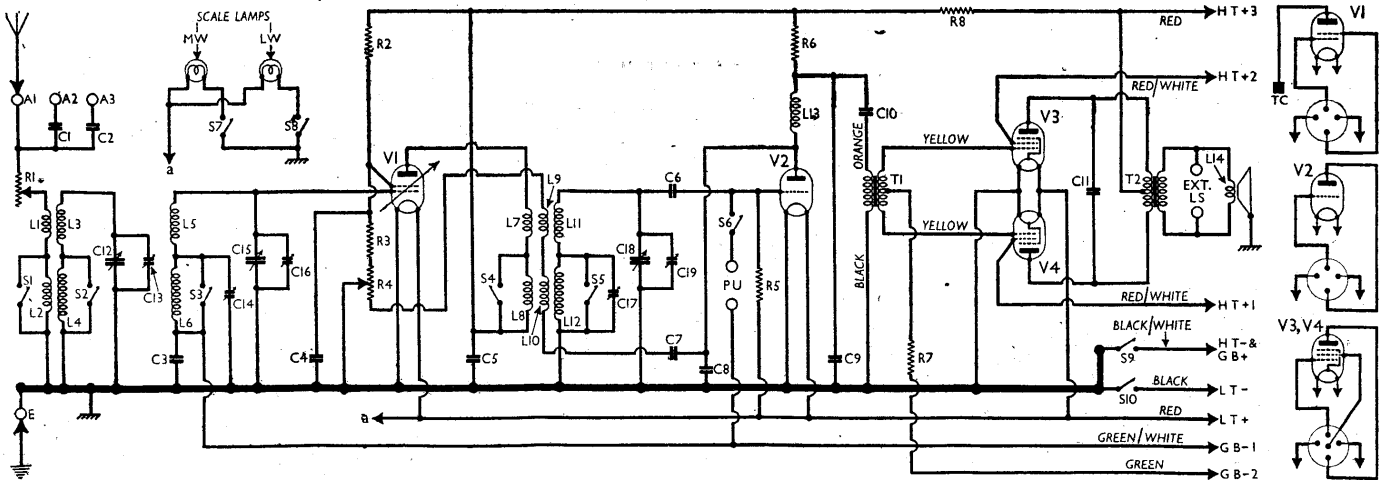
RESISTORS		Values (ohms)
R1	Aerial series resistor ...	14,000
R2	V1 SG HT feed potential ...	75,000
R3	divider ...	10,000
R4	Gain control ...	100,000
R5	V2 grid leak ...	2,000,000
R6	V2 anode load ...	50,000
R7	V3, V4 CG's decoupling ...	100,000
R8	V1, V2 HT feed... ...	7,500



The Marconiphone 260. The 285 has a horizontal cabinet. The Columbia 1003 radiogram is in a console cabinet.

CONDENSERS		Values (μF)
C1	A2 series condenser ...	0.0003
C2	A3 series condenser ...	0.0001
C3*	V1 CG decoupling ...	0.1
C4*	V1 SG decoupling ...	0.1
C5*	HT SG decoupling ...	1.0
C6	V2 CG condenser ...	0.0002
C7	V2 circuit reservoir ...	0.0002
C8	Reaction coupling ...	0.0002
C9	RF filter condensers ...	0.001
C10*	AF coupling to T1 ...	0.1
C11	Fixed tone corrector ...	0.002
C12†	Band-pass pri. tuning ...	—
C13†	B-P pri. LW trimmer ...	—
C14†	B-P sec. LW trimmer ...	—
C15†	Band-pass sec. tuning ...	—
C16†	B-P sec. MW trimmer ...	—
C17†	RF trans. LW trimmer... ..	—
C18†	RF trans. sec. tuning ...	—
C19†	RF trans. MW trimmer... ..	—

* In condenser block. † Variable. ‡ Pre-set.



Circuit diagram of the Marconiphone 260 battery TRF receiver. R4 progressively reduces V1 SG voltage and increases the series resistance of the reaction circuit as it is turned "down." The differences in the 285 chassis, and in some Columbia models are described overleaf.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils ...	2.5
L2		8.5
L3		2.5
L4	Band-pass primary coils	13.5
L5		2.5
L6	Band-pass secondary coils	13.5
L7	RF trans. primary coils...	6.0
L8		9.0
L9		4.0
L10	Reaction coils, total ...	4.0
L11	RF trans. secondary coils	2.5
L12		13.5
L13		90.0
L14	V2 anode RF choke ...	4.0
T1	Speaker speech coil ...	465.0
T2	trans. (Pri., total ...)	7,800.0
	trans. (Sec., total ...)	800.0
S1-S5	Waveband switches ...	1.0
S6	Pick-up switch ...	—
S7, S8	Scale lamp switches ...	—
S9	HT circuit switch ...	—
S10	LT circuit switch ...	—

DISMANTLING THE SET

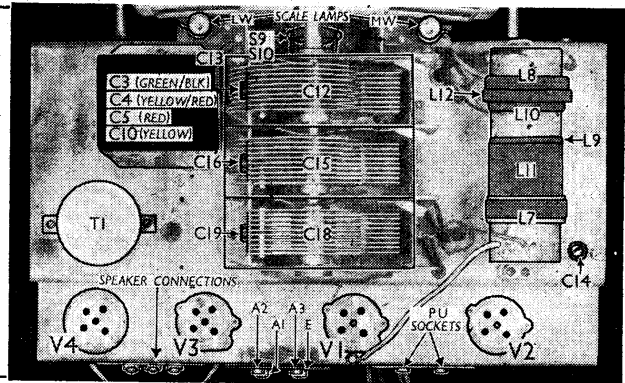
Removing Chassis.—Remove the battery switch knob, concentric with the tuning knob (centre-screw); remove the remaining three knobs (recessed grub screws); free the three speaker leads from their terminals at rear of chassis; remove the four chassis fixing bolts (with washers).
When replacing, the numbers 3, 4, 5 on the speaker panel should be connected to terminals with corresponding numbers on the speaker transformer.
Do not omit to replace the speaker earthing tag on one of the chassis fixing screws.
Removing Speaker.—First remove the chassis, then remove the three ornamented-headed screws from the front of the cabinet.
When replacing, the transformer should be on the left.

GENERAL NOTES

Switches.—S1-S8 are the waveband, pick-up and scale lamp switches, ganged in a barrel-type assembly beneath the chassis. The switches are identified in our under-chassis view and their action is shown in the table below for the three control settings, starting on MW and turning the control clockwise. A dash indicates open, and C, closed.

Switch	MW	Gram	LW
S1	C	—	—
S2	C	—	—
S3	C	—	—
S4	C	—	—
S5	C	—	—
S6	C	C	—
S7	—	C	—
S8	—	C	C

Plan view of the chassis. The colour coding of the leads from the condenser block C3, C4, C5, C10 is indicated. C10 has a yellow lead from each side, while the common negative lead of C3, C4, C5 is black. In model 285, C3 is not in the block.



S9, S10 are the battery circuit switches, in a special rotary unit mounted concentrically with the tuning control spindle. The connecting tags for the unit, which emerge beneath the chassis deck, are indicated in our under-chassis view.

Coils.—The aerial and band-pass coils L1-L6 are in two tubular units beneath the chassis, one unit mounting the MW windings and the other the LW windings. The RF transformer and reaction windings L7-L12 are on a single tubular unit mounted on the chassis deck. The RF filter choke L13 is mounted against the underside of the chassis deck, near the switch assembly.

Scale Lamps.—These are two Osram MES types, with clear spherical bulbs. Any 2V low-consumption lamps are suitable as replacements.

External Speaker.—Of the five screw terminals on the speaker input transformer T1, the row consisting of two terminals, numbered 1 and 2, are connected to the ends of the secondary winding and are provided for the connection of a low-impedance (6-10 Ω) external speaker. The other row (of three terminals) numbered 3, 4 and 5 are the primary connections.

Condenser C11.—This is mounted on T2 on the speaker assembly, and does not appear in our chassis illustrations.

Batteries.—HT, Marconiphone type B550 175 V combined HT and GB battery. LT, 2V, 45AH accumulator.

Battery Leads and Voltages.—Black lead, spade tag, LT-; red lead, spade tag, LT+ 2V; black/white lead, HT- and GB+; red lead and plug, HT+3, 166V; green/white lead, black plug,

GB-1, -1.5V; green lead, black plug, GB-2, -9V. The two red/white leads with red plug (both marked HT+2) are our HT+1 and HT+2 leads from the output valve screen grids. Each emerges from a hole just behind its own valve, and should be connected to the HT battery according to the lettering V, W, X, Y or Z according to the mark on each valve. When properly connected, the quiescent anode current of each valve should be 1.2 mA.

Marconiphone Model 285.—This is virtually a model 260 adapted for use with Ferrocart iron-cored coils. Band-pass coupling becomes capacitive, L4 and L6 being returned to chassis via C3, which is a 0.04 μF tubular beneath the chassis, not in the block. An additional pre-set condenser is connected between the top of L3 and the top of L5, and C13, now mounted on the rear of the gang; is adjusted by a thumb-screw which projects from rear of chassis.

The RF transformer is replaced by tuned-anode coupling, V1 anode going directly to the top of L11; L7, L8 are omitted, and L12 is returned to HT+ via S4, now a radio muting switch on gram, breaking HT supplies to V1 anode and S8.

The circuit changes result in small changes in the switch connections, and tuning coil DC resistance values are modified. The tuning coils all become 1.5 Ω (MW) and 11.5 Ω (LW), while L1 and L2 are 5 Ω and 21 Ω respectively. L9, L10 and L13 are unaltered, although iron-cored, but R3 is deleted. C8 and C9 become 0.0005 μF each, C6 becomes 0.0001 μF, and there are other minor changes in component values and positions in chassis.

CIRCUIT ALIGNMENT

Correct signal generator leads via a suitable dummy aerial to A1 and E sockets. See that the adjusting screw of C19 is fairly well slackened off.

MW.—Switch set to MW, feed in a weak 220 m (1,364 kc/s) signal, tune it in, and adjust C13 for maximum output. Now adjust C16 for maximum output, adjusting the volume control so as to maintain the receiver on the verge of oscillation. C19 should not be adjusted.

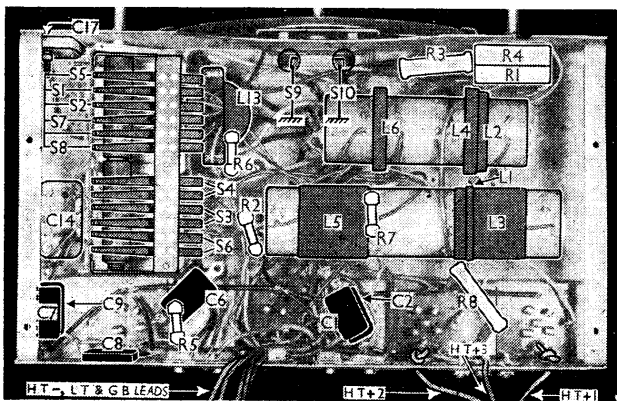
LW.—Switch set to LW, feed in a 1,200 m (250 kc/s) signal, and adjust C14, then C17, for maximum output. Return to MW and repeat all adjustments in same order.

COLUMBIA 1001, 1003

Generally speaking, the chassis in the two Columbia models is like that in the Marconiphone 260. In early models, however, there were a few small differences.

The "free" end of R1 was connected to chassis in some cases, while in others aerial input control was effected by connecting a 0.01 μF condenser between the aerial and R4. The value of R1 may be 85,000 Ω or perhaps 100,000 Ω in some chassis. In early chassis, also, an RF decoupling choke was included in the lead to V1 screen grid.

Further modifications occurred in later models, but their effect was to convert the chassis from an equivalent of the Marconiphone 260 to an equivalent of the 285, particulars of which have already been given above.



Under-chassis view. C11 is not seen in this or the plan view, as it is mounted on the speaker. In model 285, several components occupy different positions. Coils L1-L6 are in two circular units in front of V1 and V3.