

TRADER SERVICE SHEETS

RECEIVER SERIES
(NUMBER TWENTY)

MODEL 284 in the Marconiphone 1934-5 range is a battery-operated table console receiver employing a straight 3-valve circuit which consists of a single tetrode H.F. amplifier, a grid leak triode detector with reaction, and an "economy" output pentode. A moving-coil speaker is fitted, and another distinctive feature in the design is the special tone-correcting L.F. transformer which compensates for high-note loss due to excessive reaction.

MARCONIPHONE

MODEL 284

3-VALVE BATTERY RECEIVER

CIRCUIT DESCRIPTION

Aerial input by way of aperiodic coupling coil **L1** to single tuned circuit, **L2, L3, C8**, which precedes tetrode H.F. amplifier (**V1, Marconi metallised S23**). Sensitivity controlled by filament rheostat **R3**. Tuned-secondary H.F. transformer coupling to triode grid leak detector (**V2, Marconi metallised HL2**). Primary, **L4, L5**; secondary **L8, L9** tuned by **C10**. Reaction applied by means of coils **L6, L7** and controlled by variable condenser **C11**. Provision for gramophone pick-up in grid circuit of **V2**. Anode circuit H.F. filtered by choke **L10** and condensers **C3, C4**. Resistance capacity coupling by **R1** and **C5** to auto-transformer **T1** which feeds output pentode (**V3, Marconi PT2**). Automatic tone-correction by **L11** and **C6**. **V3** feeds M.C. speaker by way of matching transformer **T2**.

DISMANTLING THE SET

Removing Chassis.—Remove four control knobs. The sensitivity control knob is held in place by a slotted screw and the others have grub screws. When replacing make sure that points of screws locate in slots in spindles. Remove back of cabinet (two screws). Remove speaker leads from sockets on chassis and detach earth lead. Release cables (L.T., H.T., G.B., and speaker) from clips on side and bottom of cabinet. Remove four screws fixing chassis to cabinet.

Do not forget to replace washers when re-assembling. Do not lay receiver on its face—**R3** may be damaged.

Removing Speaker.—The speaker can be removed without disturbing the chassis. Release leads from speaker terminal strip and unsolder black earth lead. When replacing connect yellow lead to terminal 3 and red to 5. Remove three cross-head screws from front of cabinet.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V2 anode resistance	50,000
R2	V2 grid leak	2,000,000
R3	Sensitivity control, variable ..	50

Condensers		Values (µF)
C1	V1 cont. grid decoupling ..	0.1
C2	V2 grid condenser	0.0002
C3	V2 anode H.F. by-passes	0.0005
C4		0.001
C5	L.F. coupling to T1	0.1
C6	T1 filter condenser	0.0005
C7	T2 primary by-pass	0.002
C8	Aerial circuit tuning	—
C9	Aerial circuit trimmer, pre-set	—
C10	H.F. transformer sec. tuning ..	—
C11	Reaction condenser, variable ..	0.0005

Other Components		Values (ohms)
L1	Aerial coupling coil	10.0
L2	Aerial tuning coils	2.5
L3		15.5
L4		6.0
L5	H.F. transformer pri. coils	9.0
L6		—
L7	Reaction coils	4.0
L8		—
L9	H.F. transformer sec. coils	2.5
L10		13.5
L11	V2 anode H.F. choke	95.0
L12	Speaker speech coil	—
T1	Intervalve trans.	Pri. 1500.0*
		Sec. 4250.0*
T2	Speaker input trans.	Pri. 825.0
		Sec. 1.0
S1-S3	Waveband switches, ganged ..	—
S4	H.T. switch	—
S5	L.T. switch	—

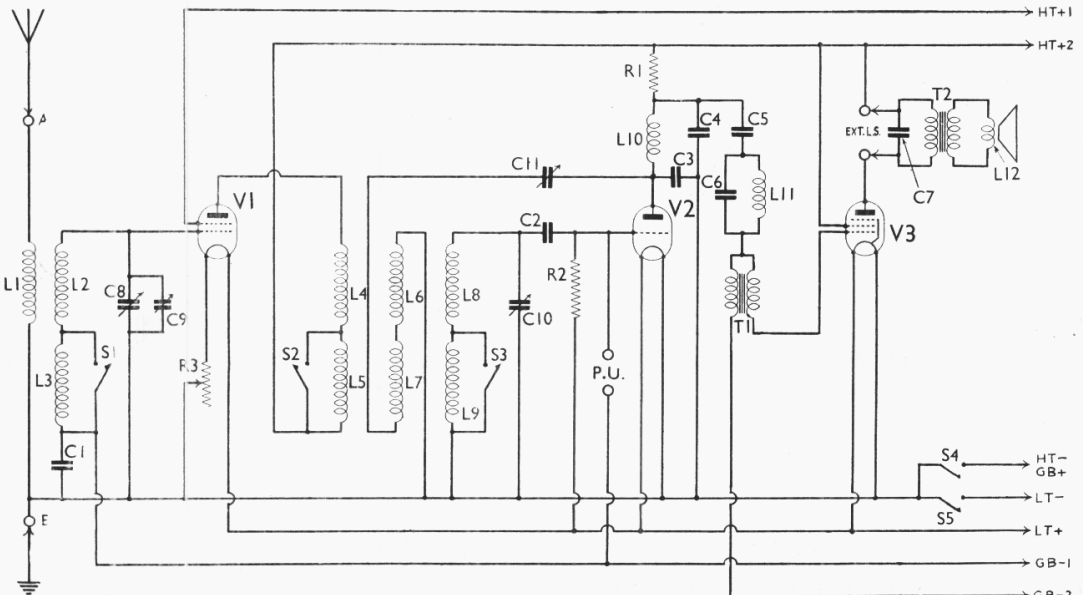
* Including filter choke L11.

VALVE ANALYSIS

All values given in the table overleaf were obtained from an average receiver with a new H.T. battery in use and the correct H.T. and G.B. voltages applied. The sensitivity control was at maximum. Voltages were measured on the 1,200 V scale of an Avometer with the chassis as negative, and the currents of **V1** and **V2** were taken with a milliammeter

(Continued overleaf)

The circuit diagram of the Marconiphone Model 284, 3-valve battery receiver. C6 and L11 are included in the screening can which contains the intervalve auto-transformer T1. C7 is mounted on the speaker input transformer T2.



MARCONIPHONE MODEL 284 (contd.)

inserted in the low H.F. potential ends of the circuits.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 S23*	114	1.5	60	0.75
V2 HL2	50	1.25	—	—
V3 PT2	106	3.75	114	1.25

* Or S21

GENERAL NOTES

Switches.—S1-S3 are the ganged wave-change switches forming part of an assembly which also embodies L.T. and H.T. switches S4, S5. One earthed contact is common to S3, S4 and S5, so that these three switches comprise only four contacts. The assembly is held in place by four screws and can easily be removed. Spare parts are available.

S1, S2 and S3 are all closed on the M.W. band and open on the L.W. band.

Coils.—These are of the unscreened type. The H.F. transformer, L4, L5, L8, L9, and the reaction coils, L6, L7, are carried on a former mounted on top of the chassis, while the aerial unit L1, L2, L3 is carried underneath. Both are very robustly constructed and should not give any trouble. The formers are supported on brackets which are each held in place by two screws.

Transformer T1.—This is of the auto-transformer type designed for parallel feed, and, together with its associated tone correction filter comprising condenser C6 and choke L11, it is sealed within a cylindrical screening box with black wax. Should a fault develop, it will be necessary to replace the complete unit, which is held in place by two screws.

Resistance R3.—This is a 50Ω variable wirewound rheostat operated by the sensitivity control. The element is wound on a flat former carried on brackets

just behind the tuning dial. Replacement is simple.

Condenser C7.—As this condenser is connected directly across the primary of the speaker input transformer T2 it is not seen in either chassis view, but is hidden inside the cloth bag covering the speaker.

Pick-up.—The recommended type is a Marconiphone Model 19, with a 5,000 Ω volume control connected in parallel, and a 10,000 Ω voltage dropping resistance in series. Two sockets are provided for pick-up reproduction. Since no pick-up switching is provided, the pick-up should be unplugged when receiving radio.

Extension Speaker.—This should preferably be of the low impedance type. It should be connected to terminals 1 and 2 on internal speaker transformer T2. A high impedance speaker can be connected across terminals 3 and 5,

that is, in parallel with the primary of T2.

Battery Voltages.—The correct H.T. and G.B. battery voltages for the 284 receiver are:—HT+2, 114 V; HT+1, 60 V; GB—2, 4.5 V for a PT2 marked V, W or X, and 3.0 V for a Y or Z valve; GB—1, 1.5 V. The total H.T. consumption is about 8.5 mA.

CIRCUIT ALIGNMENT

When new coils are fitted or when the wiring of the tuned circuits has been altered in any way, the trimmer C9 on the ganged condenser must be re-adjusted. It will be necessary for the seal to be broken, and after adjustment the screw should be sealed again.

The following instructions for ganging are issued by the makers:—

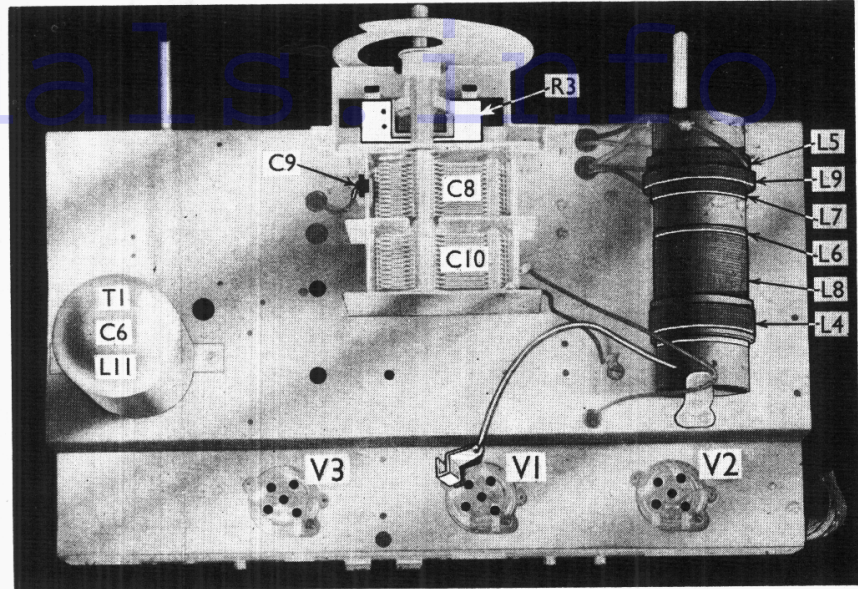
Ganging with an Oscillator.—The receiver must be operated on the M.W. band with the aerial lead-in wire coupled to the oscillator. It is important that some form of aerial and earth be used in order to preserve correct operating conditions.

Set the oscillator to 220 metres and tune the set to receive the signal. The reaction control must be turned to the point where the receiver is on the verge of oscillation.

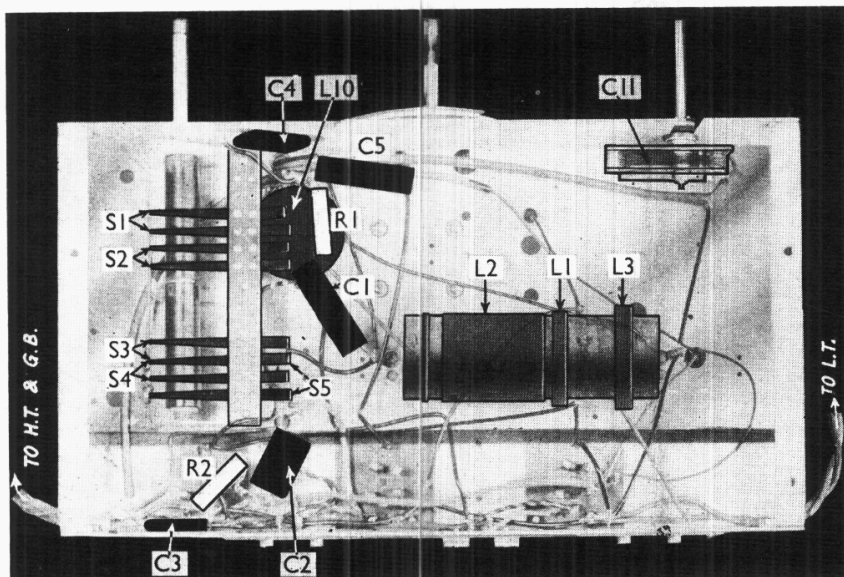
The slotted hexagon head on the trimmer C9 should be turned to the point where the signal is strongest.

The strength may be judged aurally, but greater accuracy can be attained by the use of an output meter. If a 0.2 mA D.C. milliammeter is available, this can be connected in the anode circuit of the detector valve V2. Alternatively a 0.3 V A.C. voltmeter connected across the secondary of the speaker input transformer (terminals 1 and 2) will function as an output meter.

Ganging on a Broadcast Signal.—Tune in a weak station at approximately 300 metres (preferably one which does not fade). Adjust trimmer as specified for oscillator ganging, bearing in mind that when a signal overloads the receiver the volume of sound falls. Do not use an output meter when ganging on a broadcast signal.



Plan view of the chassis, with the valves removed.



Under-chassis view of the receiver.