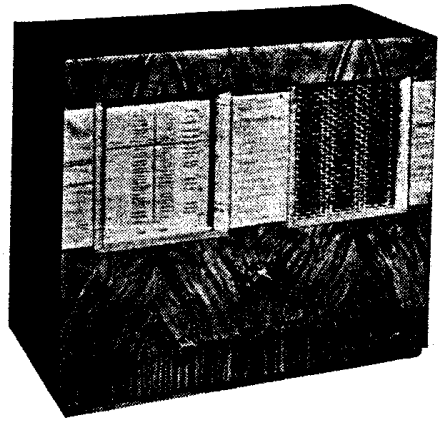
MARCONIPHONE 222 BATTERY FOUR



The Marconiphone model 222 is an all-wave battery superhet designed on modern lines and using the latest types of battery valve.

CIRCUIT.—A band-pass input filter precedes V1, the frequency changer, on medium and long waves, top and bottom capacity coupling being employed. On short waves a single tuned circuit is used.

Alternative aerial tags are provided, one including a resistance R1 for the better matching of long aerials to the set. The filter also includes an I.F. rejector consisting of CK1 and T5, and a balancing circuit, CK2 and C17, to ensure that the alignment remains constant over the entire tuning range.

Coupling to V2, a variable-mu screen grid, is through an I.F. transformer tuned to 465 kc. and through a second I.F. transformer to V2, a double diode triode.

Both the windings of the second I.F. transformer are centre tapped, that on the primary being coupled *via* C14 to the A.V.C. diode. The secondary tap goes to the demodulator diode.

One diode of V3 is used for demodulation, the rectifier output passing through a resistance and capacity stage, which incorporates the volume control, to the grid of the triode portion. The other diode supplies A.V.C. bias to the preceding valves in the orthodox manner.

Tone is controlled in the grid circuit of this valve by C19, C22 and a three-position switch.

The L.F. output of V3 is resistance and capacity coupled to the driver transformer which feeds the grids of V4, the QPP output pentode. This is coupled through a further transformer to the moving-coil speaker.

H.T. and grid bias are obtained from a combined 175 volt battery, the one specified being a Marconiphone 552. L.T. is supplied by an Exide CZG4 2-volt accumulator.

Special Notes.—Sockets on the back of the chassis provide connections for a pick-up which should have a D.C. resistance of more than 1,000 ohms, a Marconiphone being recommended. If this is used a 7,500 ohm resistance should be shunted across the pick-up terminals for correct matching.

A gramophone switching position is provided, so the pick-up may be permanently wired to the terminals.

Attention is drawn to the oscillator anode decoupling resistors, R4 and R5. On short waves R4 is shorted out, thus increasing the voltage on the oscillator anode.

The dial light is rated at 2 volt .1 amp., and is fixed to the dial assembly by means of a spring clip.

Removing Chassis.—Remove the control knobs from the front of the cabinet. The main tuning knob pulls off and the others are held by grub screws. Next remove four bolts from underneath the cabinet.

After the speaker and battery leads have been released from their cleat at the top of the cabinet, the chassis may be removed to the extent of the speaker leads.

Circuit Alignment Notes

I.F. Circuits.—Remove the connecting lead to the grid cap of V1, connect a .5 meg. resistance between the grid and the chassis, and short circuit the vanes of the oscillator gang condenser.

Connect a modulated oscillator tuned to 465 kc. to the grid cap of V1 *via* a .1 mfd. condenser and an output meter across the primary of the output transformer.

Trim T1, T2, T3 and T4 for maximum reading on the output meter.

Continue adjusting these trimmers until best results are obtained, reducing the oscillator output as the circuits are brought into line, so as to avoid bringing the A.V.C. into operation.

Remove the grid-leak and shorting strip.

I.F. Rejector.—Connect the oscillator, still tuned to 465 kc., to the aerial and earth terminals and trim T5 for *minimum* output.

Medium Waves.—Connect the oscillator via a dummy aerial to the aerial and earth sockets, and adjust T6 to approximately half capacity.

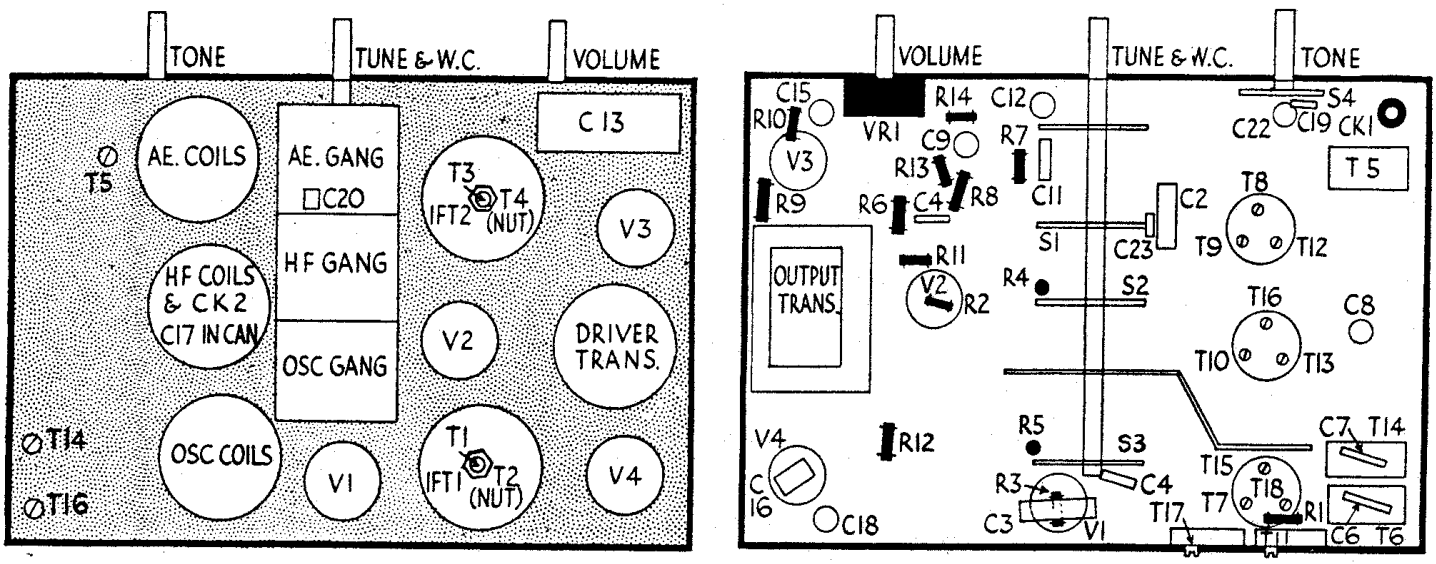
Set the gang condenser to a fraction of a turn of the tuning knob short of minimum, inject a signal of 195 metres (1,540 kc.) and trim T7 for maximum output.

Inject and tune in a signal of 210 metres

VALVE READINGS

No signal. Volume maximum. New batteries.

V.	Type.	Electrode.	Volts.	Ma.
	All Marconi.			
1	X21 met. (7)	Anode ..	162	2.5
		Screen ..	72	2.6
		Osc. anode	60	1.65
2	VS24 met. (5)	Anode ..	163	3.15
		Screen ..	71	1.
3	HD22 met. (5)	Anode ..	80	.55
4	QP21 (7) ..	Anode 1 ..	162	.65
		Screen ..	166	.32
		Anode 2 ..	162	.65



Constructional details of the 222 are given by these chassis layouts. The "top deck" diagram is tinted (left) and the underside arrangement is shown on the right.

(1,420 kc.) and adjust T8, T9 and T10 for maximum.

Inject and tune in a signal of 520 metres (575 kc.), rock the gang condenser and adjust T6 for maximum.

Repeat the above until no further improvement results.

Long Waves.—Tune the receiver and the oscillator to 850 metres (354 kc.). The gang condenser should be just short of minimum capacity as in the medium wave notes.

Trim T11 for maximum reading on the output meter.

Inject and tune in a signal of 1,100 metres (273 kc.) and adjust T12 and T13 for maximum.

Inject and tune in a signal of 1,900 metres (158 kc.), rock the gang condenser and adjust T14 for maximum.

Repeat until no further improvement is possible.

Short Waves.—Connect the oscillator to the A1 socket via a 400-ohm non-inductive resistance.

Set the gang condenser almost to minimum, as for medium and long waves.

Inject a signal of 18 metres (16.54 megacycles), carefully adjust T15 for maximum output, then rock the gang condenser slightly and adjust T16 for maximum output.

Inject and tune in a signal of 50 metres (6 megacycles), rock the gang condenser and trim T17 for maximum.

Soldering Irons

WHILE most service shops have an electric soldering iron in almost continual use, this iron is generally of a small type, which, although excellent for use on wire work, is absolutely useless for soldering on large surfaces, such as metal chassis, as the metal conducts the heat away too rapidly.

A large iron is, therefore, a very useful addition to the tool kit, as it enables this type of work to be done very speedily and results in clean and efficient soldering. The use of an iron which is just too small for the job results in a very "sticky" looking joint.

It is not suggested that the larger iron be used for wire work.

CONDENSERS

C.	Purpose.	Mfd.
2	Band pass coupling	035
3	V1 screen decoupling	.1
4	V1 oscillator grid	.00023
6	Medium wave osc. padding	.00035
7	Long wave osc. padding	.00023
8	V1 osc. anode coil isolator	.1
9	A.V.C. potentiometer decoupling.	.1
10	H.F. filter	.0001
11	H.F. filter	.00023
12	L.F. coupling	.1
13	V3 anode decoupling	2
14	A.V.C. diode coupling	.00023
15	L.F. coupling	.1
16	Pentode compensating	.0015
17	Balancing circuit shunt	.00015
17	Balancing circuit shunt	.000035
18	H.T. shunt	.1
19	Tone control	.0023
20	Band pass top coupling	.0000023
22	Tone control	.01
23	Aerial coupling (s.w. only)	.00015

RESISTANCES

R.	Purpose.	Ohms.
1	Series aerial	75,000
2	V1 screen decoupling	5,000
3	V1 osc. grid leak	100,000
4	V1 osc. anode load (L. and M.W.).	35,000
5	V1 osc. anode load (L. and M.W.).	10,000
6	A.V.C. decoupling potentiometer.	500,000
7	Demodulator diode load filter	23,000
8	V3 grid leak	1 meg.
9	V3 anode decoupling	7,500
10	V3 anode load	100,000
11	A.V.C. diode load	500,000
12	V4 grids stabiliser	230,000
13	V1 A.V.C. decoupling	100,000
14	A.V.C. decoupling potentiometer.	500,000
VR1	Volume control	—

Marconi 222 on Test

MODEL 222.—Standard model for battery operation using Marconiphone type B552 H.T. battery and an Exide type CZG4, 2-volt accumulator. Price 13 gns.

DESCRIPTION.—A three-waveband, four-valve battery superhet model in walnut-finished cabinet.

FEATURES. — Full-vision, vertical straight-line scale with name and wavelength calibration. Concentric tuning knob. Switch-selected tone control. Optional aerials. Sockets for pick-up.

LOADING.—H.T., 13 ma.; L.T., 9 amp.

Sensitivity and Selectivity

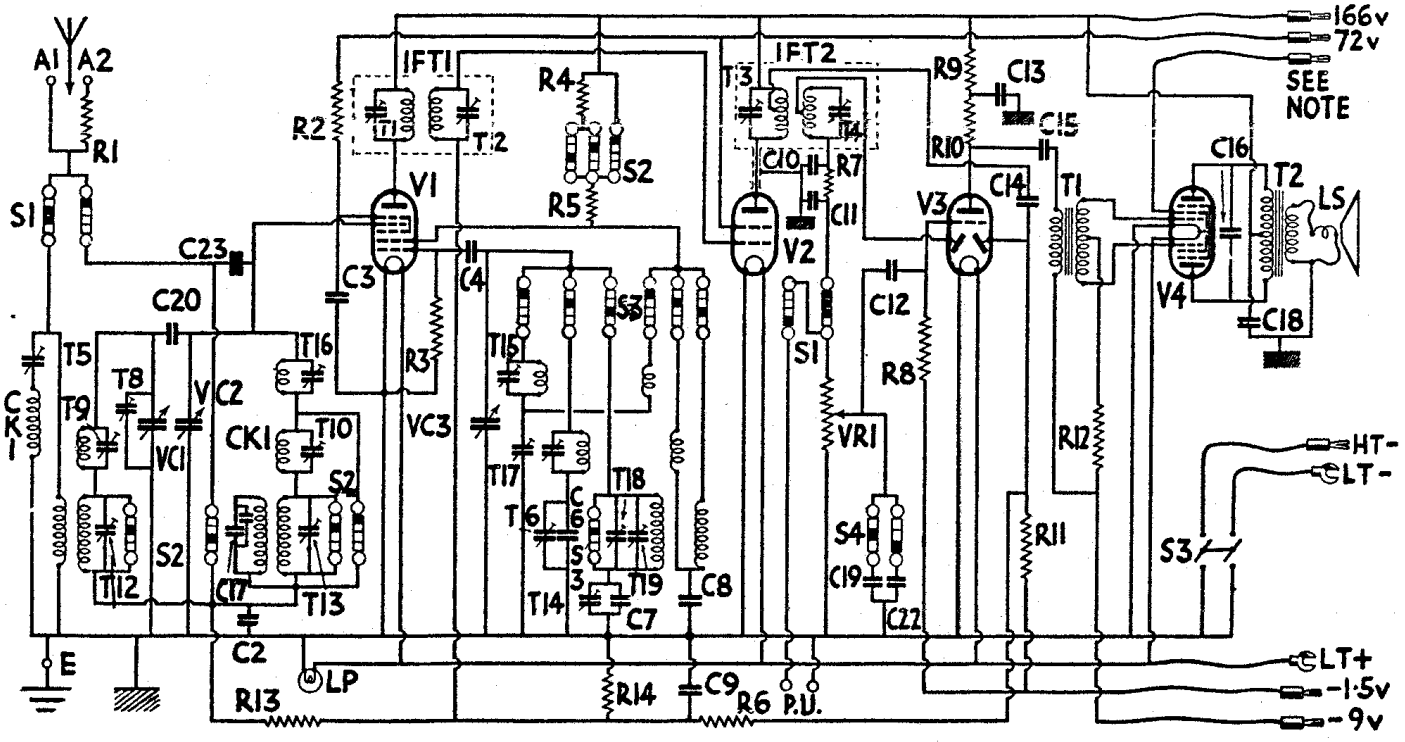
SHORT WAVES (17-51 metres).—Good gain, well maintained over waveband. Easy control. No noticeable drift.

MEDIUM WAVES (195-585 metres).—Gain fairly well maintained, selectivity good with locals spreading on adjacent channels only. Quiet background. Fairly accurate tuning scale.

LONG WAVES (835-2,100 metres).—Very good gain with excellent selectivity. Suspicion of overloading on Luxembourg on large aerial causing break through on adjacent channels. Deutschlandsender received with little interference.

Acoustic Output

Very well balanced and ample for ordinary room. The QP21 valve gives an output comparable with a small mains receiver and the tone does not suffer by the use of Q.P.P.



Heptode, double-diode triode and double-pentode (Q.P.P.) valves are employed in the Marconiphone 222. The I.F. amplifier is a screen-grid type. The output valve screen is adjusted according to the letter on the valve.