FERRANTI GLORIA SEVEN-VALVE CONSOLETTE

The clock model of the Gloria six-valve plus rectifier superhet made by Ferranti, Ltd., of Hollinwood, Lancs.

Circuit.—A single tuned aerial circuit with special I.F. and oscillator traps precedes the H.F. valve, VPT4 (V1). Bias is obtained from the A.V.C. diode and by a resistance in the cathode lead. Coupling to the first detector is by a tuned secondary transformer.

The oscillator valve, D4 (V2), has its grid circuit tuned, and injection to the first detector is by a coupling coil in series with its grid coil.

The first detector valve, VPT4 (V3), is biassed by A.V.C. and by a resistance in the cathode lead. It is coupled to the I.F. valve by a band-pass I.F. transformer (frequency, 125 kc.).

The I.F. valve, VPT4 (V4), obtains its bias from a different feed line from the A.V.C. diode anode, as well as from a resistance in the cathode lead. Coupling to the next valve is by a second band-pass I.F. transformer.

In the second detector and L.F. amplifier valve, H4D (V5), a double diode triode, one diode anode is used for signal rectification, while the second is fed from the first through a .001 condenser for providing the A.V.C. potential.

A D.C. load on the rectifying anode is formed by R12 and R20, and the L.F. feed to the triode section is through an I.F. stopper, R11, with by-pass condenser, C15, to the diode L.F. coupling condenser, C13.

The connection to the volume control (which forms the grid leak of the triode section) is by a lead with a wander plug.

The anode of the triode is coupled to the output valve by resistance capacity coupling, and a tone control in the form of a variable resistance in series with a fixed condenser is connected between the anode and earth.

The output valve, LP4 (V6), a triode, has a separate filament winding and bias is obtained from a potentiometer across the speaker field, which is in the negative H.T. lead.

Mains equipment consists of transformer, full-wave rectifier, R4, the field coil in the negative lead and two 8 mfd. electrolytic smoothing condensers.

Special Notes.—The tuning indicator consists of a milliampere meter in the anode circuit of the H.F. valve (V1).

For gramophone reproduction the wander plug is removed from the socket connected to the volume control and put in the other socket which is at a suitable bias potential.

Quick Tests.—To make these it is necessary to undo the clips on the insulating cover of the speaker transformer terminals.

(*Continued on opposite page.*)

VALVE READINGS

(V.C. maximum.)

Valve.	Type.	Electrode.	Volts.	M.A.
V 1	VPT4*	anode	240	2
V 2	D 4	anode	170	7-8
V 3	VPT4*	anode	220	1
V 4	VPT4*	anode	220	4.5
V 5	H4D	Triode anode.	125	.9
V 6	LP4	anode	235	48

* There are no accessible points at which screen measurements can be taken. The anode readings were taken by covering the valve next the one under test with the end screen of the three (there are three joined together).

CONDENSERS

C.	Purpose.	Mfd.
1	Mains aerial (2,000 volt test)	.0003
2	V 1 cathode	.25
3	Prevents short-circuiting bias through filter	.001
4	Aerial series	3 mmfd.
5	Prevents short circuiting bias to V 1	.0035
6	Decoupling tuning meter	.01
7	Feed to reaction coil V 2	.001
8	Preventing short circuiting A.V.C. bias to V 1 and V 3	.05
9	V 3 cathode	.25
10	Decoupling V 4 grid	.05
11	V 4 cathode	.25
12	H.F. by-pass	.00015
13	L.F. coupling from diode	.01
14	H.F. by-pass	.00015
15	H.F. by-pass	.00015
16	Feed to A.V.C. diode anode	.001
17	Decoupling V 5 grid	.25
18	H.F. by-pass anode V 5	.0003
19	Tone control circuit V 5	.01
20	L.F. coupling V 5 to V 6	.02
21	Decoupling H.T. to aux. grids	.5
22	Decoupling H.T. to H.F. and I.F. anodes	.25
23	Decoupling V 6 grid	.5
24	H.T. smoothing	8 el.
25	H.T. smoothing	8 el.

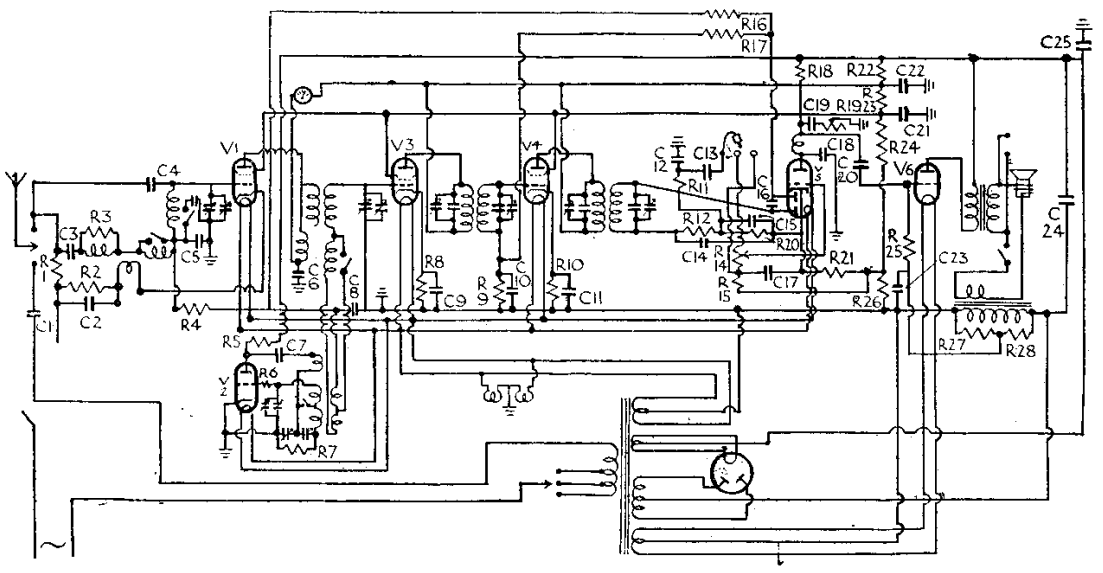
RESISTANCES

R.	Purpose.	Ohms.
1	Across aerial input	10,000
2	V 1 cathode bias	400
3	Across I.F. filter	5,000
4	Decoupling A.V.C. to V 1	.25 meg.
5	Voltage dropping to osc. anode	10,000
6	Osc. grid	2,500
7	Across osc. tracking condensers	100,000
8	V 3 cathode bias	7,000
9	Lower part of A.V.C. ptr. to V 4	1 meg.
10	V 4 cathode bias	500
11	H.F. stopper to V 5 grid (from diode)	.25 meg.
12	H.F. stopper to V 5 grid (from diode)	100,000
14	Volume control	1 meg. ptr.
15	Decoupling V 5 grid	100,000
16	A.V.C. lead to V 1 and V 3	1 meg.
17	Top of A.V.C. ptr. to V 4	1 meg.
18	V 5 anode L.F. coupling	100,000
19	Tone control (var)	.5 meg.
20	Part of load on diode	.5 meg.
21	V 5 cathode	3,500
22	*H.T. ptr. supply to V 1, V 2, V 3 and V 4	2,000
23	*H.T. ptr. supply to V 1, V 2, V 3 and V 4	7,340
24	*H.T. ptr. supply to V 1, V 2, V 3 and V 4	9,500
25	V 6 grid leak	.25 meg.
26	*Lower part of H.T. ptr.	1,100
27	Bias ptr. across L.S. field	120,000
28	Bias ptr. across L.S. field	200,000

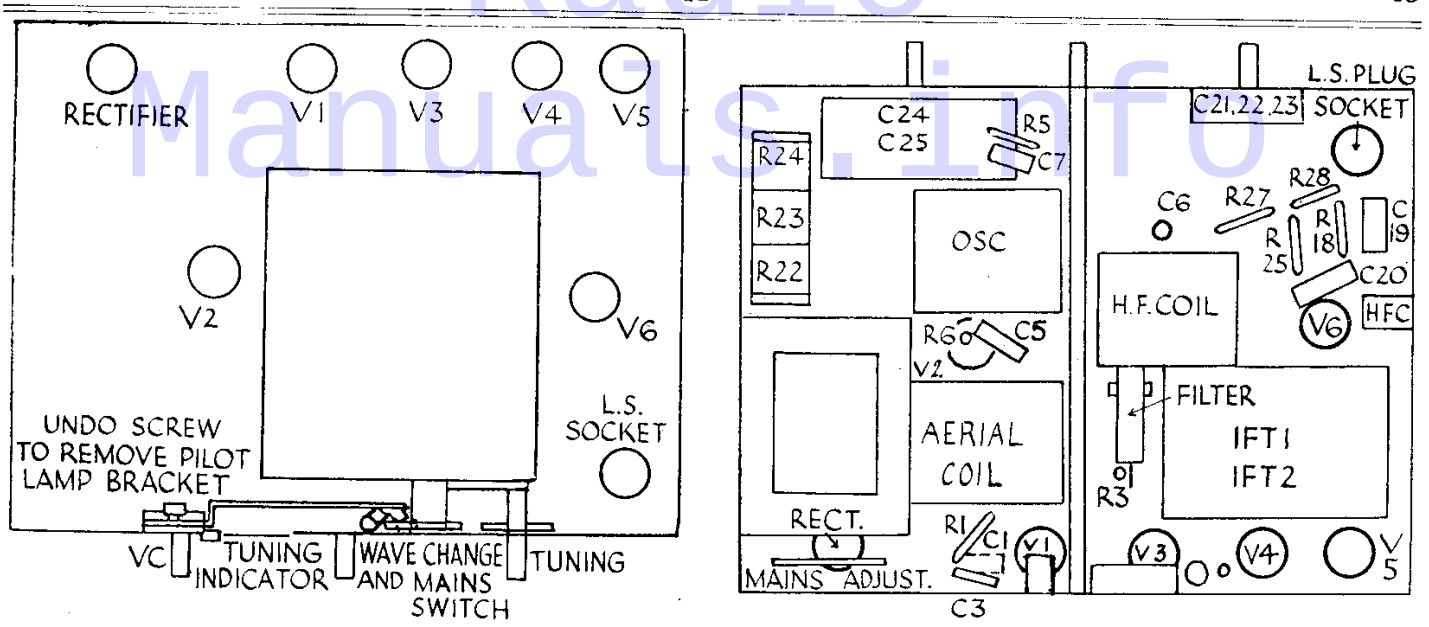
* Wire wound on one former.

CALIBRATION SCHEME.

Subscribers may have their oscillators and own standard components calibrated at The Broadcaster laboratory. The charges are the lowest possible. Write for details.



The number of resistances and condensers in the Ferranti Gloria shows that no expense has been spared to ensure complete H.F. and L.F. stability. A separate oscillator is used and a double-diode-triode provides A.V.C.



The top of the Ferranti Gloria chassis is very "clean" and the underneath layout is also comparatively simple as the A.V.C. components are bundled and waxed.

Voltages between the terminals and chassis, counting from left and looking from the rear :—

(1) Green, H.T.+smoothed, 250 volts pos.
(2) Black, V6 anode, 235 volts pos.
(3) Blue, H.T.−unsmoothed, 115 volts neg.
(4) Red, chassis.

Removing Chassis.—In clock model undo the clock leads from the porcelain connector. Remove speaker plug from the chassis, pull off the knobs and remove four screws underneath.

Lift chassis out, taking care not to damage the dial. It is advisable to refix the rubber buffers if these have become detached.

General Notes.—The tone control resistance, R19, is mounted on the cabinet underneath the speaker. The switch on the speaker disconnects the internal speaker if required when an external reproducer is in use.

Resistances are RMA colour coded.

Condensers are coded as follows :—Red, .05 mfd.; yellow, .02 mfd.; black, .06 mfd.; blue, .004 mfd.; green, .01 mfd.

The majority of the valve holders are inaccessible, but many of the small components can be reached.

Trouble is not likely to develop in either of the "bundles" of condensers and resistances under the double-diode-triode valve (V5), as these are mainly associated with the A.V.C. system. However, should a defect be definitely traced to one of them, the set should be returned to the makers.

The leads to the condenser block, C21, C22, C23, are :—Yellow, C22; red, C21; green, C23.

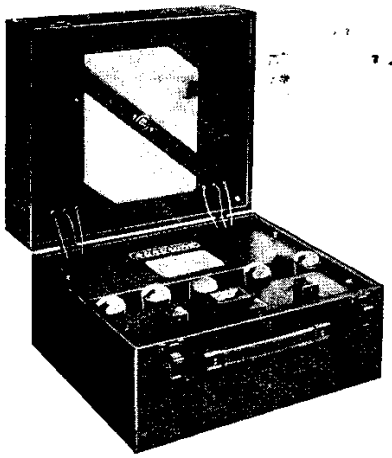
Coded wiring to mains transformer :—

2 Green, set fil.; yellow and green stripe, C.T.; 2 black and yellow check, rect. fil.; red, C.T. (H.T.+); 2 red, rect. anodes; yellow and black stripe, C.T. (H.T.−); 2 yellow, V6 fil.; yellow with black stripes, C.T.

In replacing the pilot lamp bracket the dial must be turned to Midland Regional approximately to allow the lamps to clear the sector plots.

Replacing Chassis.—Lift chassis carefully into position, and, before fixing any of the screws, make sure that the rubber supports (blocks) are in position. Replace the knobs and plug in the L.S. supply. Clip the insulating cover of the L.S. transformer if this has been loosened for quick tests.

FIVE-VALVE PORTABLE BY BURGOYNE WIRELESS



A typical 2 H.F.-detector-2 L.F. receiver—the Portable Five by Burgoyne Wireless (1930), Ltd.

Circuit.—The first H.F. valve, PM1HF (V1), is preceded by a frame aerial in which the long-wave section is short-circuited for use on the medium waves. The long-wave section remains at high H.F. potential.

The switch operating the wave changing and battery switching and also changes over a tapping on the medium-wave winding to allow reaction on the long. H.F. choke coupling is used.

The second H.F. valve, another PM1HF (V2), is coupled to the detector by another H.F. choke and condenser filter.

A PM1HL (V3) operates as a leaky grid detector, with reaction fed back to the frame aerial. A 5 : 1 ratio L.F. transformer couples the anode to the next valve.

The L.F. valve PM1LF (V4) is coupled by a 3 : 1 ratio L.F. transformer to the triode output. This, a PM2 (V5) feeds a moving iron speaker.

Special Notes.—The construction of this set is particularly neat, and all components are accessible, including the switch.

Quick Tests.—Removing H.T. − lead should produce a loud plop in the speaker. If it does not, test battery voltages and examine the leads.

The removal of H.T. + 3, H.T. + 1 and H.T. + 2 plugs should produce progressively louder plops. If they do not, take the valve readings, noting particularly the current.

When only a faint click is heard in these tests, adjust the speaker knob till it is loudest.

Before removing the chassis in this set it is advisable to make sure whether the trouble lies in the lid compartment, containing the frame aerial and the speaker, or in the chassis.

When battery voltages are correct and valve readings are normal, but only thin reproduction can be heard from the stations usually received, the trouble probably lies in the speaker.

If loud plops are heard on removing the battery plugs and the valve readings are correct, but no signals are heard even with reaction, the frame aerial is probably disconnected.

If, however, a voltage reading cannot be obtained at any one of the valve anode sockets, the component in the anode circuit must be tested for continuity from the anode socket to the H.T. + lead to that valve.

When the current reading is high for any valve, the G.B. supply should be tested and

(*Continued on next page.*)

VALVE READINGS

Battery connections :—HT+1, 86 to 54 v.; HT+2, 45 to 54 v.; HT+3, 99 v.; GB—1, —4.5 v.; GB—2, —9 v.

Valve	Type.	Electrode.	Volts.	M.A.
1	PM1 HF ...	anode ...	54*	1
2	PM1 HF ...	,, ...	54*	1
3	PM1 HL ...	,, ...	50*	.9
4	PM1 LF ...	,, ...	98	1
5	PM2	,, ...	93	2.1

* Depending on HT tappings used.