

MAJESTIC SUPERHET MIDGET (Cont.)

and the L.S. field is included in the positive H.T. lead for smoothing with electrolytic condensers.

Special Remarks.—With the exception of the 6F7S valve and the mains rectification connections, there is little that should puzzle the engineer.

Though the set is compact, the components are readily accessible once the mains transformer has been removed (a simple job).

Quick Tests.—The only quick tests possible with the chassis in the cabinet are made by touching the top (grid) terminals on the metallised valves V1 and V2. In both cases this should produce a loud plop in the speaker.

Before any measurements can be taken, the chassis must be removed.

Removing Chassis.—Remove one screw underneath. Remove knobs (grub screw), three wood screws on flange at rear, and two nuts holding speaker to front of cabinet. Slide the chassis out.

In the absence of suitable adaptors, the only practical way of reaching the valve bases is by releasing the mains transformer.

To do this, undo the four nuts holding it to the back plate, lay the chassis on its back, and, without disconnecting any of the mains transformer leads, support it outside the chassis. The set can be tested quite conveniently in this manner.

General Notes.—The connections to the rectifier differ from our standard circuits.

The rectifier 6Z5 is indirectly heated, and H.T.+ is taken from the cathode, allowing the filaments (four in parallel) to be heated by the same filament winding that supplies the set filaments.

As one of the sides of the filament winding is connected to earth, the leads are very simple. They are:—Two red to rectifier anodes; two brown to fuse and mains switch; two black to set and rect. filaments; one black to earth.

There are three black leads, and it is necessary to test which is the centre tapping on the high voltage winding. This should show a resistance of 400 ohms to each red lead. This C.T. lead is connected to chassis as

H.T.—, as is one side of the filament.

The valve sockets (looking from underneath and counting clockwise) are:—

(V1) 6A7.S. Two large, filament; anode; aux grid, anode, grid, cathode. Input grid at top.

(V2) 6F7.S. Two large, filament; H.F. anode; aux grid; det. anode; det. grid; cathode; H.F. grid at top.

(V3) 4L. Two large, filament; anode; aux grid; grid; cathode.

Rectifier 6Z5. Two large, filament; blank; anode; cathode; anode.

With the exception of the V1 terminals, all the components can be reached with a small soldering iron. All components, coils, condensers, etc., can be obtained for replacement.

Replacing Chassis.—Before placing the chassis in the cabinet, make sure that none of the leads from the mains transformer are fouling the rotors of the gang condenser.

Lay the chassis in the cabinet and fit speaker nuts. Replace the three wood screws at the back. Using the control spindle as a lever, insert the screw underneath and replace the knobs.

LISSEN ALL-ELECTRIC THREE-VALVE RECEIVER

Circuit.—The H.F. valve, Lissen AC/SGV(V1) is preceded by a single-tuned circuit with a special coil and alternative aerial series condenser tapplings. The manual volume control is a variable resistance in the cathode lead. Choke filter is used as coupling to the grid coil of the detector.

The detector valve, Lissen AC/HL(V2), works with leaky grid rectification and employs reaction. A parallel-fed L.F. transformer couples this valve to the output. The reaction condenser is ganged with the volume control.

The output valve, Lissen PT425(V3), has a stabilising resistance in its grid circuit, and a wander plug and lead at the back of the set give optional tone selection by connecting a compensating condenser between the anode and earth. The moving-coil speaker is a permanent magnet model.

Mains rectification is by half-wave rectifier, U650, and smoothing is by choke and fixed condensers.

Special Notes.—It is worthy of note that the mains transformer is suitable for 100 to 125 volts and 200 to 250 volts.

The switch is included in a stout mains lead and the adaptor plug supplied is complete with two .5 amp. fuses (spares also supplied).

It is well to remember that these fuses are in the leads.

A 6 volt .3 amp. pilot lamp is used.

Quick Tests.—Voltages between output transformer terminals and chassis, 175 and 185 volts respectively.

As no field coil is involved it is immaterial which lead is connected to either of the outer terminals. The middle one is left free.

Between side terminal on pentode and chassis, 185 volts.

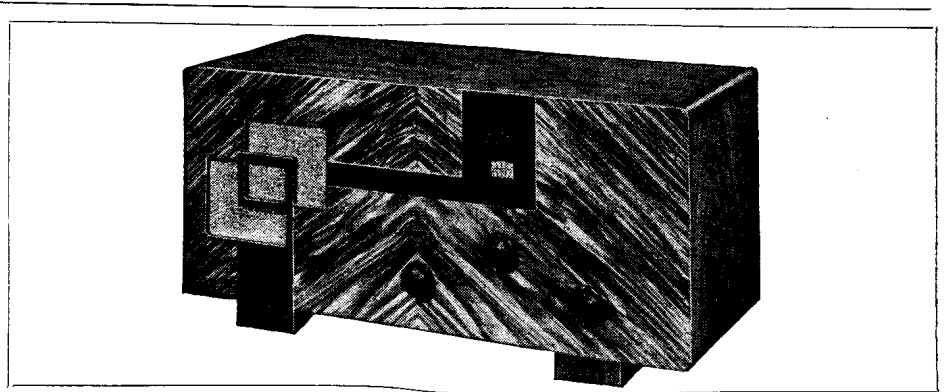
Removing Chassis.—Undo three control knobs (grub screws), undo two small screws underneath at the back (not the countersunk wood screws).

Undo two small countersunk screws next to the volume control spindle and the wave-change spindle.

Slide the chassis out. The leads are just long enough to avoid disconnecting the speaker.

General Notes.—The resistances and condensers in this set are rather misleading.

The yellow spaghetti type with green ends



are used in the small values, and the standard mica type in C16 and C12. R5, R9 and R10 are the usual Lissen grid leak type.

All the others are spaghetti, and, with the exception of R6 which is on the actual valve

Lissen, Ltd. will supply suitable replacement condensers if the numbers on the circuit are quoted

holder, are hidden behind the panel on the mains transformer.

To reach them undo two nuts holding panel to mains transformer and unsolder the following leads (see diagram):—Red from 1, black from 4, grey from 5, white from 7 and blue from 8.

The panel can then be eased up sufficiently to allow all the connections underneath to be reached.

The connections to the mains transformer are coded, but if a replacement is necessary the leads should be labelled for checking.

The terminals for the dual condenser block for C8 and C9 project underneath the base-plate near the end of the wave-change switch spindle. The terminals are; two nearer switch, C8; two nearer L.F. transformer, C9.

Connections to block condenser are:—Single terminal under panel, C15; single terminal under R10, earth. In row, from volume control end, (1) C14, (2) C11, (3) C13, (4) C10, and (5) C3. (C11 is between 2 and 3.)

All the components are bolted to the chassis and replacement is easy.

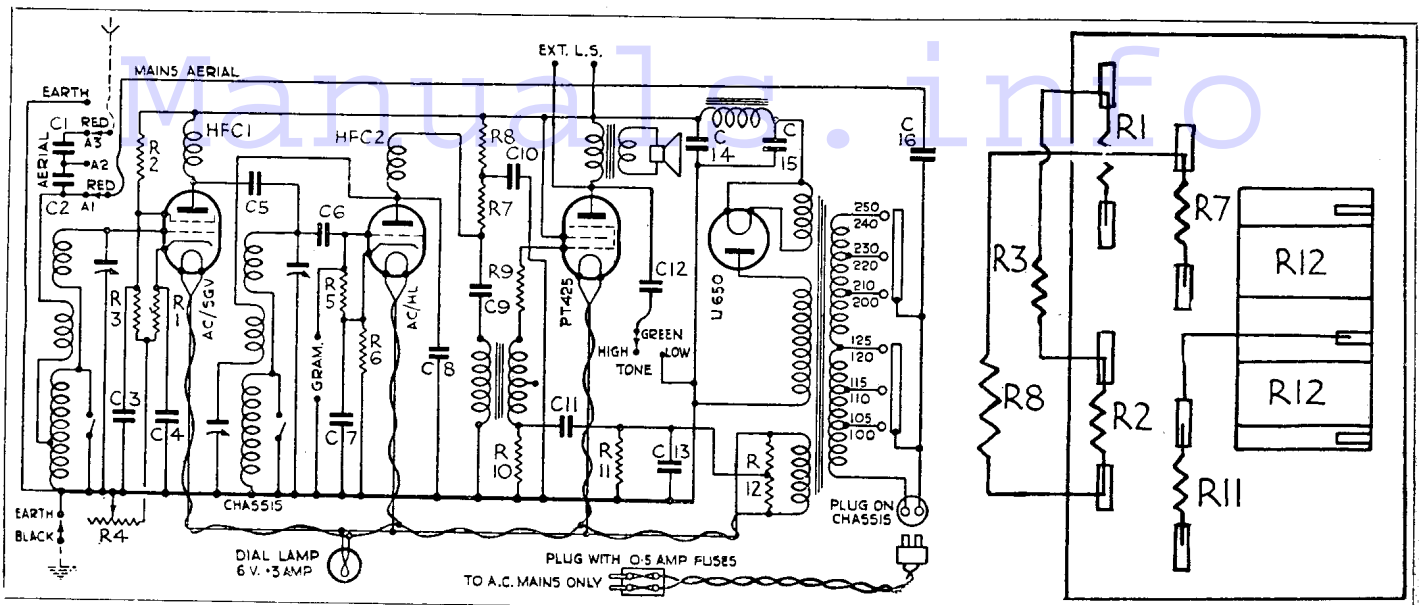
(See opposite page for circuit and chassis lay-outs.)

The speaker leads in the Lissen All-Electric Three are long enough to enable the set to be tested with the speaker in the cabinet and the chassis outside.

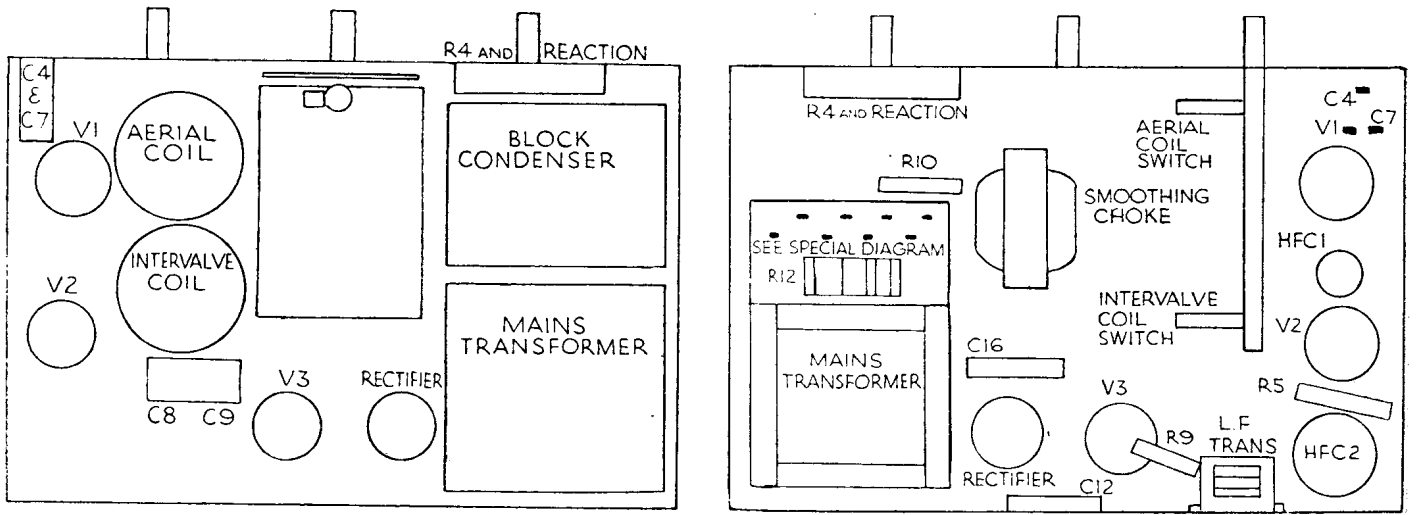
VALVE READINGS					
Valve.	Type.	Purpose.	Electrode.	Volts	MA
V1 ...	AC/SGV	SG, HF	anode ...	183	2.9
			screen ...	75	
V2 ...	AC/HL	Det. ...	anode ...	60	2.4
			anode ...	175	1.7
V3 ...	P.T. 425	output	anode ...	175	1.7
			aux. grid	185	2.3

Warning.—The volume control and reaction condenser are ganged and as the maximum position makes the set oscillate the control should be turned anti-clockwise till the set just ceases to oscillate. At this point the variable resistance is at zero position.

RESISTANCES		
R	Purpose.	Ohms.
1	V1 bias limiting resistance ...	800
2	Top part of screen ptr. V1 ...	15,000
3	Lower part of screen ptr. V1 ...	10,000
4	Manual volume control ...	4,500
5	V2 grid leak ...	2 meg.
6	V2 cathode bias for "gram" ...	500
7	LF filter coupling to transformer ...	25,000
8	V2 anode decoupling ...	25,000
9	Stabiliser, grid V3... ...	80,000
10	V3 grid decoupling ...	80,000
11	Bias resistance for V3 ...	800
12	Set filament ptr. (artificial centre tap) ...	100
—	Smoothing choke ...	725
—	Intervalve transformer, Primary ...	1,250
—	Intervalve transformer, Secondary ...	10,000
—	Output transformer, Primary ...	700



A straight circuit comprising screen-grid, detector and pentode valves is utilised in the Lissen mains "three." On the right are the connections of the spaghetti resistances which may have to be unsoldered when servicing the receiver.



On the top of the Lissen chassis (left) the components are easily recognisable, and the pilot lamp is accessibly mounted. Underneath, the construction is straightforward but for the resistance panel.

R.G.D. 702 SIX-VALVE RADIOGRAM

Circuit.—The H.F. valve VMS4B (V1) is preceded by an aerial transformer with tuned secondary. It is coupled to the first detector by another tuned secondary transformer. The m.a. meter which forms the tuning indicator is included in the anode lead.

A separate oscillator MHL4 (V2) is coupled to the cathode circuit of the first detector.

The first detector VMS4 (V3) works as an anode bend rectifier with cathode bias. It is coupled to the I.F. valve by a band-pass I.F. transformer (I.F. frequency 110 k.c.).

The I.F. valve VMS4 (V4) is biased from a tapping on the A.V.C. potentiometer. It is coupled to the A.V.C. diode by a condenser from the primary of the second band-pass intermediate transformer, while the other diode is fed from the secondary of the I.F. transformer in the conventional way.

The second detector, a double-diode-triode MHD4 (V5) has the triode grid-lead in the form of a variable resistance which acts as volume control. The grid lead includes an

H.F. stopper, R10. In the anode circuit the coupling consists of a resistance in series with a tone correction assembly with C11. A low value of coupling resistance is necessitated and the associated condenser is relatively high C5 of .1 mfd. With R8 at 175,000 ohms as the grid leak of the output valve resistance-capacity coupling ensures a straight line response.

The output valve PP 3/250 (V6) has an anti-parasitic oscillation resistance, R9, in its grid circuit and a tone control across the primary of the output transformer. The speech coils of the two speakers are wired in series.

The mains equipment consists of a transformer and a full wave valve rectifier, UU 120/350, with a very thorough smoothing circuit. In addition to a smoothing choke and associated condensers the 1,000 ohm field coil of the larger speaker is included in the smoothing with an 8 mfd. electrolytic condenser.

The 6,500 ohm field of the small speaker forms a potentiometer across H.T. with the

resistance R4, and provides the screen potential for the H.F. and I.F. valves.

A separate filament winding is provided for the output valve, which provides its own bias. To prevent modulation hum a .01 condenser is connected between one side of the mains and earth.

Special Notes.—The circuit of V5 (double-diode-triode) was modified in the instrument we dismantled. We give our version of that part of the set in a different diagram, from which it will be seen that the A.V.C. diode is actually fed from the secondary of the second I.F. transformer, and that, in the circuit to the other diode, the resistances and condensers are connected differently. The values are below the diagram.

In this set the output transformer is inside the chassis, and one end of the speech coil circuit is returned to earth.

The visual indicator is in the form of a m.a. meter in the anode lead to the H.F. valve, and, as the variable volume control (Continued on next page.)