

### McMICHAEL MODEL 235 (Cont.)

inside to disconnect the internal speaker. The gramophone plug breaks the lead from the diode.

**Quick Tests.**—The output transformer is inside the chassis, and the terminals are inaccessible. First tests should be carried out on the valves.

**Removing Chassis.**—Pull off the knobs. Remove the four holding screws from underneath the cabinet and, after removing the rectifying valve, ease the chassis out, power-

#### VALVE READINGS

No Signal.				
Valve.	Type.	Electrode.	Volts.	M.a.
1	A.C. TP Met. (9)	anode*	190	3.4
		aux. grid*	185	2.5
		osc. anode*	90	6.7
2	MVS Pen (7)	anode	270	6.7
		aux. grid	200	
3	ACz Pen DD. (7)	anode	216	26
		aux. grid	230	6
		* Valve not oscillating due to capacity of leads.		

pack end first, so as to avoid damage to the band-pass coils.

**General Notes.**—Both the condensers C21 and C22 are the same value, and the

#### CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.0002
2	Series aerial	.00001
3	V1 grid	.001
4	Decoupling V1 grid	.1
5	Decoupling V1 anode	.1
6	Decoupling V1 aux. grid	.5
7	V1 cathode by-pass	.1
8	V1 osc. grid reservoir	.0002
9	L.W. track on osc.	.00125
10	M.W. track on osc.	*.0025
11	Decoupling V2 aux. grid	.1
12	Decoupling V2 grid	.1
13	V2 cathode by-pass	.1
14	L.F. coupling to V3 grid	.005
15	Decoupling H.T. line	.1
16	L.F. coupling to AVC diode	.0001
17	H.F. by-pass	.0001
18	V3 cathode by-pass	el. 25 (25v.)
19	Tone compensating V3	.002
20	Tone control circuit	.03
21	H.T. smoothing	8 el.
22	H.T. smoothing	8 el.

leads are red. The black is common negative.

**Replacing Chassis.**—Place the chassis carefully into the cabinet, H.F. end first, and replace the holding screws and knobs.

#### RESISTANCES

R.	Purpose.	Ohms.
1	Decoupling V1 grid	1 meg (4)
2	Decoupling AVC to V1	1 meg (4)
3	Decoupling V1 aux. grid	25,000 (1)
4	V1 osc. grid suppressor	1,000 (4)
5	V1 osc. grid leak	50,000 (4)
6	V1 cathode bias	1,000 (4)
7	Decoupling V1 anode	10,000 (1)
8	Decoupling V1 osc. anode	60,000 (1)
9	Decoupling V2 grid	.5 meg (4)
10	Decoupling V2 aux. grid	60,000 (1)
11	Diode load	.5 meg (4)
12	Volume control	var. .5 meg
13	V3 grid stabiliser	100,000 (4)
14	V2 cathode bias	250 (4)
15	Part of V3 bias ptr.	350 (1)
16	Part of AVC ptr.	.5 meg (1)
17	Part of AVC ptr.	.5 meg (1)
18	H.T. bleeder	40,000 (2)
19	V3 anode stabiliser	50 (1)
20	Tone control	var. 100,000
21	Part of V3 bias ptr.	150 (1)
22	L.S. field	2,500

Bracketed figures give wattage rating.

## FERRANTI 1935-6 ARCADIA

**Circuit.**—The combined first-detector-oscillator valve, VHT4 met. (V1), has a band-pass aerial coupling incorporating a suppressor circuit. Oscillator tuning is in the grid circuit, and bias is by A.V.C. and cathode limiting resistance. Coupling to the next valve is by band-pass I.F. transformer (frequency, 125 kc.).

The I.F. valve, VPT4 met. (V2), is also biased by A.V.C. and cathode resistance, and is followed by a second band-pass I.F. transformer.

The second detector and L.F. valve, H4D (V3), uses one diode anode for A.V.C. and the other for L.F. purposes. The volume control is the grid leak. The L.F. coupling

condenser is C13, which is connected to the grid leak by the link across the pick-up terminals at the back of the chassis.

Between the triode section of the H4D and

the output valve is a resistance-capacity filter with a special transformer to improve the response characteristic.

A triode output valve, LP4 (V4), is biased from a potentiometer across the speaker field which is in the negative H.T. lead.

Mains equipment consists of: Transformer and full-wave R4 rectifier, while smoothing is by speaker field and electrolytic condensers.

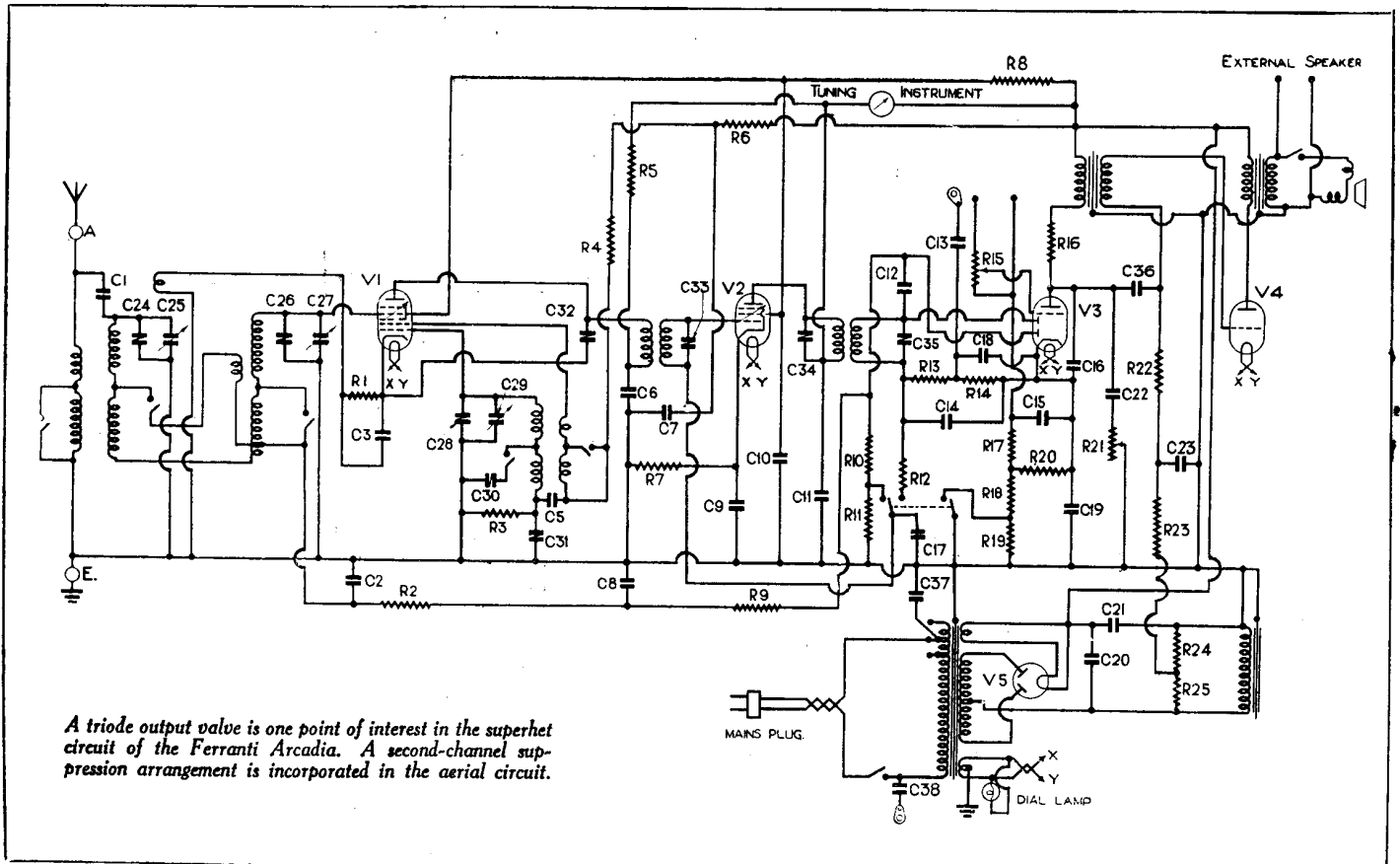
**Special Notes.**—The tone control circuit, C22, R21, is connected to the anode of V3 instead of to the output valve.

**Quick Tests.**— Voltages between the inner terminals on the rectifier panel and

(Continued on opposite page.)

#### VALVE READINGS

No signal.				
Valve.	Type.	Electrode.	Volts.	M.a.
1	VHT4 met.(7)	anode	250	2
		screen	90	4
		osc. anode	90	1.5
2	VPT4 met. (7)	anode	250	4.5
		aux. grid	90	2
		anode	180	2
3	H4D	anode	180	2
4	LP4	anode	245	48



A triode output valve is one point of interest in the superhet circuit of the Ferranti Arcadia. A second-channel suppression arrangement is incorporated in the aerial circuit.

### FERRANTI ARCADIA SUPERHET (Cont.)

fier platform and remove the four holding screws from underneath the cabinet.

**General Notes.**—The "Q" switch at the back of the chassis changes the grid potential of V2 from the A.V.C. potentiometer to that of the cathode of V3, from which it is decoupled by R12. Simultaneously, the resistance R19 is connected in series with V3

cathode resistance, increasing the positive potential of the cathode with relation to the chassis.

Note that the V3 grid decoupling resistance R17 is connected to R20 and R18, maintaining constant bias on V3 grid.

**Replacing Chassis.**—Lay the chassis inside the cabinet, replace the holding screws, reconnect the speaker leads, and replace the knobs.



The 1935-6 model of the Arcadia receiver recently released by Ferranti Ltd., is a three-valve superhet incorporating the well-known "All-in" dial.

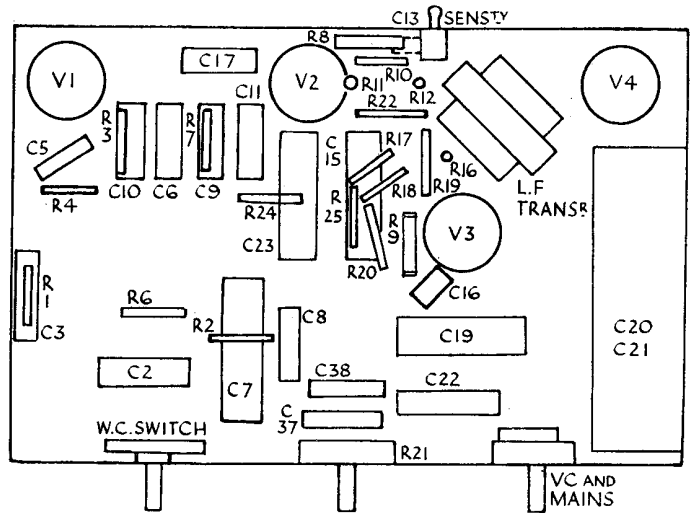
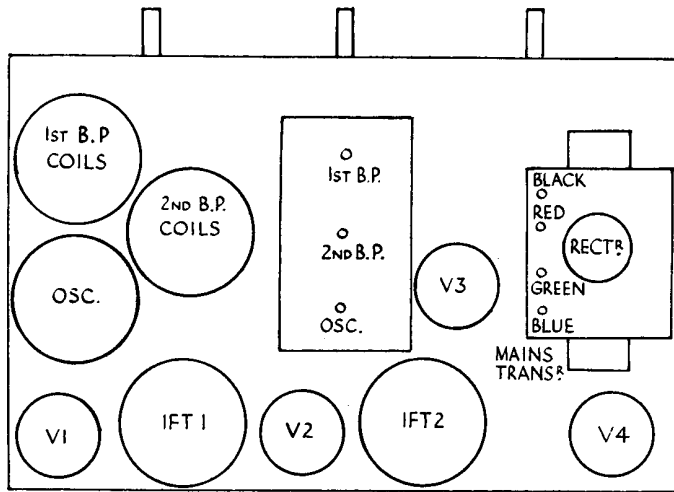
chassis counting from the back (note the polarity):—

- (1) Blue, H.T. —, 110 volts negative;
- (2) Green, V4 anode, 245 v. positive;
- (3) Red, H.T. smoothed, 255 v. positive;
- (4) Black, chassis, 0.

**Removing Chassis.**—Pull off the knobs, release the speaker connectors from the recti-

CONDENSERS		
C.	Purpose.	Mfd.
1	Coupling aerial coil to 1st B.P. coil	.000016
2	Band pass coupling	.05
3	V1 cathode by-pass	.05
5	V1 osc. anode by-pass	.01
6	V1 anode decoupling	.1
7	V1 osc. anode decoupling	2
8	Decoupling A.V.C. to V1	.002
9	V2 cathode by-pass	.1
10	V2 aux. grid. by-pass	2
11	V2 anode decoupling	.1
12	I.F. coupling to A.V.C. diode	.00015
13	L.F. coupling to V3	.02
14	H.F. by-pass	.00015
15	V3 grid decoupling	.25
16	V3 anode H.F. by-pass	.0003
17	Decoupling A.V.C. to V2	.05
18	H.F. by-pass	.00015
19	V3 cathode by-pass	2 or 6
20	H.T. smoothing	8
21	H.T. smoothing	8
22	Tone control circuit	.05
23	V4 grid decoupling	.25
36	L.F. coupling V3 to V4	.02
37	H.F. by-pass from mains	.002
38	Mains aerial	.002

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 cathode bias	800
2	Decoupling A.V.C. to V1	250,000
3	V1 osc. grid leak	50,000
4	V1 osc. anode decoupling	100,000
5	V1 osc. anode decoupling	1,000
6	V1 osc. anode decoupling	30,000
7	V2 cathode bias	450
8	Voltage drooping to V1 and V2 aux. grids	25,000
9	Decoupling A.V.C. line	1 meg.
10	A.V.C. diode load ptr.	4 meg.
11	A.V.C. diode load ptr.	1 meg.
12	Decoupling Q.A.V.C. to V2	250,000
13	H.F. stopper	100,000
14	Diode load	.5 meg.
15	Volume control	1 meg.
16	V3, L.F. coupling	40,000
17	Decoupling V3 grid	100,000
18	V3 cathode bias for delay	8,500
19	V3 cathode bias for Q.A.V.C.	5,000
20	V3 cathode bias	1,700
21	Tone control ptr.	.5 meg.
22	V4 grid leak	250,000
23	V4 grid decoupling	60,000
24	V4 bias ptr.	100,000
25	V4 bias ptr.	250,000
—	Speaker field	1,600



The Arcadia has been designed with service requirements borne in mind. Consequently the arrangement of parts is logical and "clean".

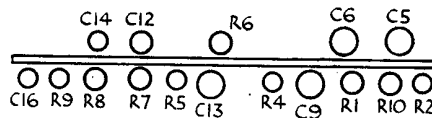
## BURGOYNE TABLE RADIOGRAM

This radiogram contains a modified version of the Burgoyne "Fury" chassis, which was dealt with in the July, 1935, issue of the SERVICE ENGINEER. The only alteration is the lay-out of the components on the resistance-condenser assembly. The accompanying drawing shows the components as rearranged.

Removing the chassis is a little complicated, but if the following order is followed, the operation can be performed quite simply:—

Remove the knobs (insulated grub screws) and undo the fixing nut on the W.C. switch.

Remove the back of the cabinet and the speaker baffle. Undo the switch at the side of the cabinet and release the leads from the cleats. Remove the three wood screws from the flange at the back of the chassis, and remove the valves.



In the radiogram version of the Burgoyne Fury receiver the components are arranged in the above order on the resistance-condenser assembly.

The chassis can then be eased out by sliding it backwards as far as it will go and then tilting it forwards at the top to allow it to clear the gramophone motor.

To carry out valve tests, it is necessary only to remove the back and the speaker baffle.

To reassemble the set, slide the chassis

into the cabinet, replace the three holding wood screws in the flange, with the earth lead under the left-hand one.

Replace the switch and clean the leads. Replace the wave-change bush and the knobs.

Lay the speaker baffle face downwards and insert the aerial, earth and pick-up leads into their sockets, and, after replacing the baffle, screw the back on to the cabinet.

When hum is troublesome on radio and not on pick-up, the detector stage is probably situated in a strong field originating from a mains component. Usually the trouble will disappear when the earthing of the cores of transformers and chokes is checked. Occasionally the trouble-maker can be found by connecting the detector valve by loose leads and moving it over the other components.