

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.

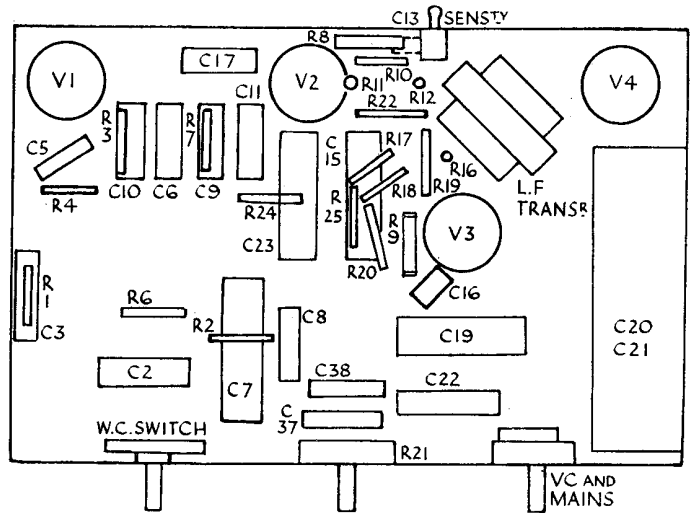
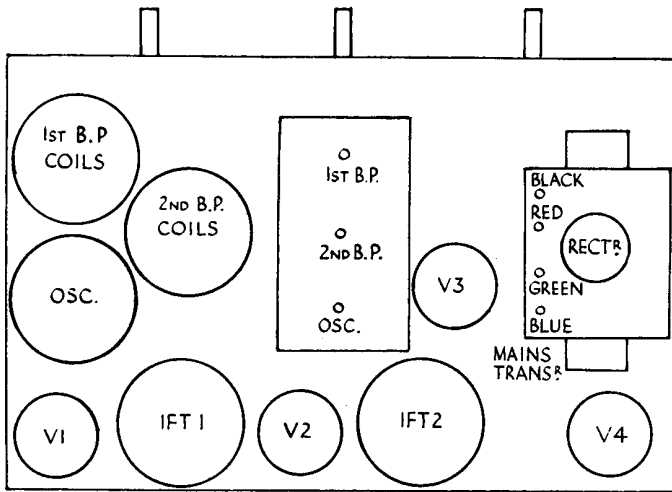
chassis counting from the back (note the polarity):—

- (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".

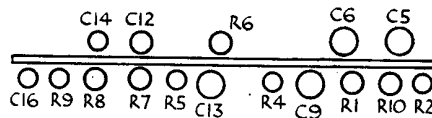
BURGOYNE TABLE RADIOGRAM

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.

EVER READY 5002 SUPERHET (Cont.)

CONDENSERS

C.	Purpose.	Mfd.
8	V1 grid decoupling	.1*
9	V1 aux. grid by-pass	.0002
10	V1 osc. grid	.0002
11	Decoupling tuning indicator	.2
12	Decoupling V1 anode	.1*
19	V1 osc. anode decoupling	.1*
20	V1 cathode	.1*
21	V2 grid decoupling	.1*
22	V2 cathode	.1*
23	V2 aux. grid by-pass	.1*
24	I.F. feed to A.V.C. diode	.0002
25	H.F. by-pass from diode	.0001
26	L.F. coupling	.1
27	H.F. by-pass	.0001
28	V3 cathode bias by-pass (A.V.C.)	50(12v.) el.
29	V3 cathode bias by-pass (A.V.C.)	25(25v.) el.
30	Decoupling A.V.C. line	.01*
31	Tone compensating V3 anode	.01
32	H.T. smoothing	16(450v.)el.
33	H.T. smoothing	8(440v.) el.

* Denotes non-inductive type. Bracketed figures give peak working voltage.

RESISTANCES

R.	Purpose.	Ohms.
1	Voltage dropping to V1 aux. grid	25,000 (4)
2	V1 grid decoupling	.25 meg.(4)
3	V1 osc. grid leak	.1 meg. (4)
4	V1 anode decoupling	2,000 (4)
5	Across osc. coil	40,000 (4)
6	V1 cathode bias	1,000 (4)
7	Decoupling V1 osc. anode	100,000 (4)
8	Voltage dropping to V2 aux. grid	25,000 (4)
9	V2 cathode bias (wire)	600
10	V3 grid stabiliser	25,000 (4)
11	V.C.	.25 meg.
12	Diode load	.25 meg.(4)
13	V3 cathode bias (wire)	150
14	V3 cathode bias (wire)	750
15	A.V.C. potentiometer	.5 meg (4)
16	A.V.C. potentiometer	.25 meg. (4)
17	Decoupling A.V.C. line to V1	.5 meg.(4)
18	Decoupling A.V.C. line to V2	.5 meg.(4)
19	Tone compensating circuit	8,500 (4)
20	Voltage control of tuning indicator (wire)	3
—	Speaker field	6,650

V2: Grid, green; anode, screened lead.
V3: Grid, white; anode, brown and yellow; diode, yellow.

Rectifier: heaters, red; anodes, black.
The grid stabilising resistance of V3 (R10) is inside the screening cover of the valve.

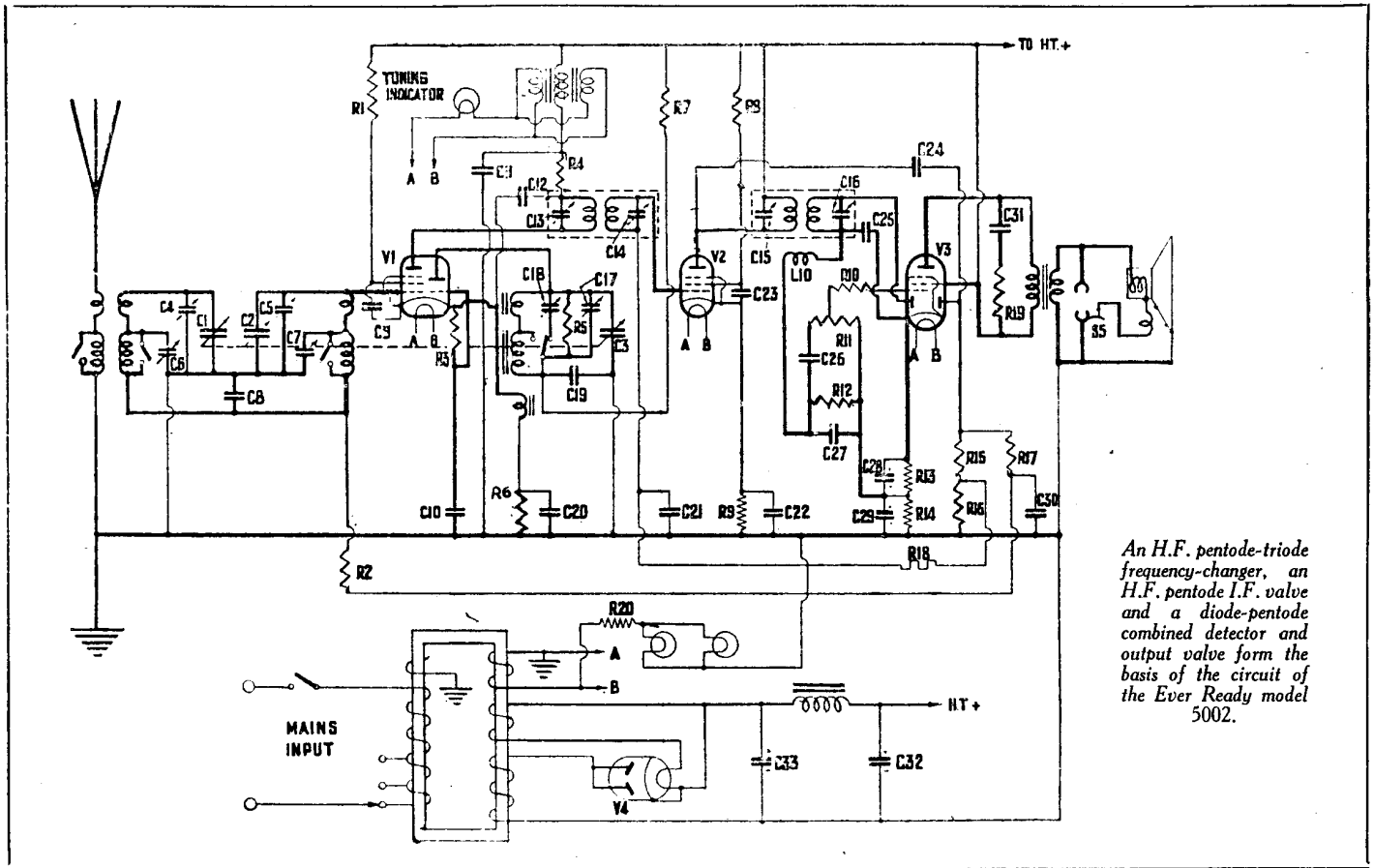
Switch Contacts, counting from the end of the chassis:—
1 and 2, S1; 3 and 4, S2; 5 and 6, S3; 7, 8 and 9, S4.

The mains switch is at the end of the spindle.

The output transformer is inside the chassis and the connections (counting the tags from the front) are—

- (1) Earthed side of secondary.
- (2) Other end of secondary,
- (3) Junction of R19 and C31,
- (4) H.T. end of primary,
- (5) V3 anode primary.

Replacing Chassis.—Lay the chassis inside the cabinet, replace two wood screws on condenser brackets, replace holding screws and knobs, and re-connect the speaker plug.



An H.F. pentode-triode frequency-changer, an H.F. pentode I.F. valve and a diode-pentode combined detector and output valve form the basis of the circuit of the Ever Ready model 5002.

BURGOYNE UNIVERSAL "FURY"

Circuit.—The H.F. valve, VP13A met. (V1), is preceded by a single-tuned aerial coil, but the aerial lead contains a choke to prevent break-through on the long wave-band and also a Droitwich wavetrap (see "Special Notes").

Volume is controlled by the variable- μ characteristic of the valve. The following coupling is an H.F. transformer with reaction.

The next valve, an SP13 met. (V2), operates as a semi-power-grid detector, and is resistance-capacity coupled to the output pentode, a Pen. 3520 (V3). This has both grid and anode tone-compensating condensers and a grid stabilising resistance.

Mains equipment includes a half-wave 1 D5 rectifier, which rectifies A.C., and acts as a resistance on D.C. The speaker field is used with electrolytic condensers for smoothing,

and the heater supply current is controlled by a Philips C1 baretter.

Special Notes.—There is no mains switch on the receiver.

Where Droitwich does not spread too much the No. 2 aerial tapping should be used,

VALVE READINGS				
Universal valves. 230 volts A.C. mains. V.C. max.				
Valve	Type.	Electrode.	Volts.	M.A.
1	VP13A met.	anode	160	4.2
		aux. grid	120	—
2	SP13 met.	anode	80*	.6
		aux. grid	40*	—
3	Pen 3520	anode	150	33
		aux. grid	160	7.5

* Misleading readings due to high values of resistances.

but within the swamp area the receiver should be tuned to Droitwich and the wavetrap adjusted for minimum signal by means of the screw below the aerial and earth sockets.

Quick Tests.—Be careful of a live earth lead when testing this receiver.

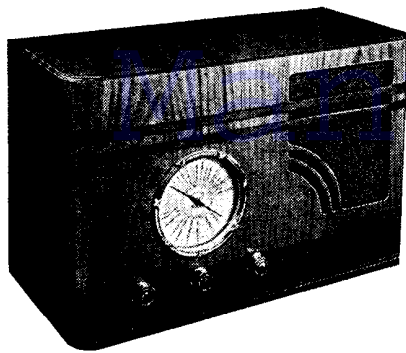
Voltages between the terminals on the speaker transformer and chassis (i.e., head of one of the bolts):

- Left (1) Grey, V3 anode ... 150 volts.
- (2) Red, H.T. smoothed ... 160 volts.
- (3) Black, H.T. unsmoothed 250 volts.

Removing Chassis.—Undo the knobs (grub screw) and remove the one-hole fixing nut of the wave-change switch.

Remove the three wood screws from the flange at the back of the chassis.

(Continued on opposite page.)



An "aeroplane" type tuning dial is a distinguishing feature of the Burgoyne "Fury" receiver.

BURGOYNE A.C.-D.C. FURY (Cont.)

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 cathode bias	400
2	Top part of V1 aux. grid ptr.	10,000
3	V2 grid leak	.5 meg.
4	Voltage dropping to V2 aux. grid	1 meg.
5	V2 anode L.F. coupling	.1
6	V2 anode decoupling	10,000
7	V3 grid stabiliser	50,000
8	V3 grid leak	.25 meg.
9	V3 cathode bias	100
10	Lower part of V1 aux. grid	30,000
11	Volume control	5,000
—	Speaker field	2,150

CONDENSERS		
C.	Purpose.	Mfd.
3	Earth isolating	.1
5	V1 aux. grid by-pass	.1
6	V1 cathode by-pass	.1
9	V2 aux. grid by-pass	.1
10	V2 grid reservoir	.0001
11	V2 anode H.F. by-pass	.0005
12	L.F. coupling	.01
13	Decoupling V2 anode	.1
14	Tone compensating, V3 grid	.001
15	V3 cathode by-pass	50* el.
16	Tone compensating, V3 anode	.005
17	H.T. smoothing	12* el.
18	H.T. smoothing	8* el.
19	Across rectifier	.01
20	Series with pick-up	.1

* In one block.

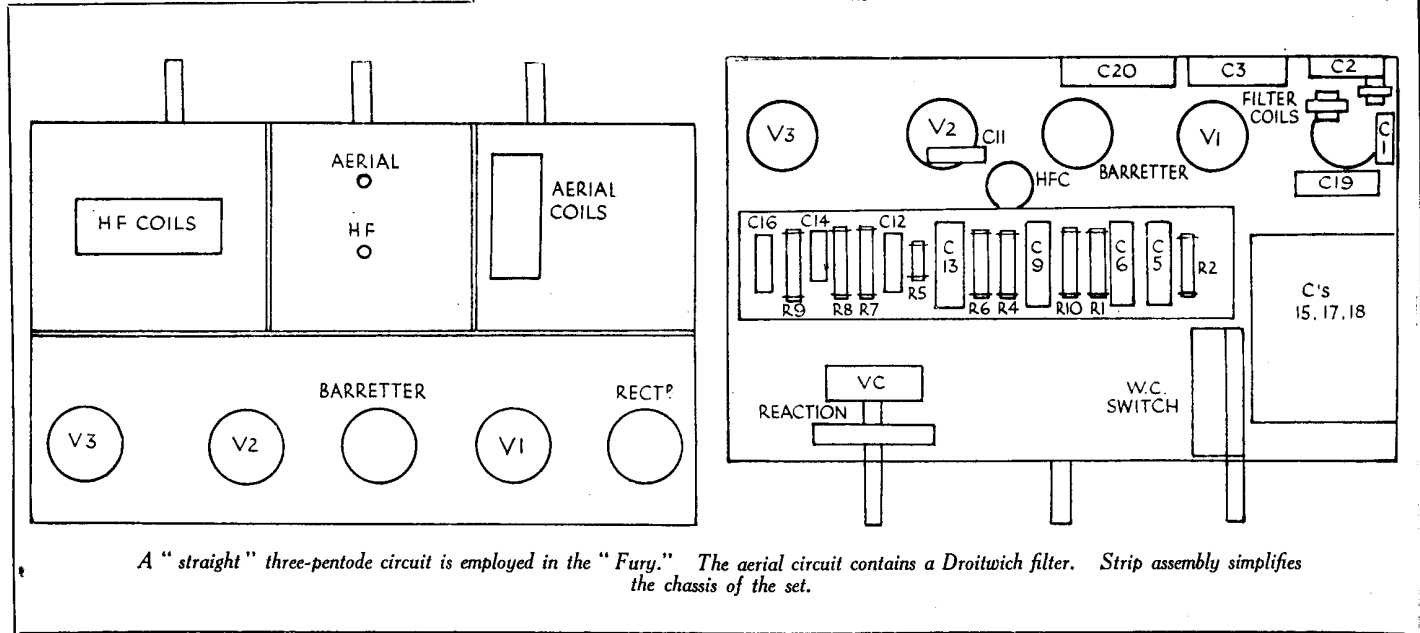
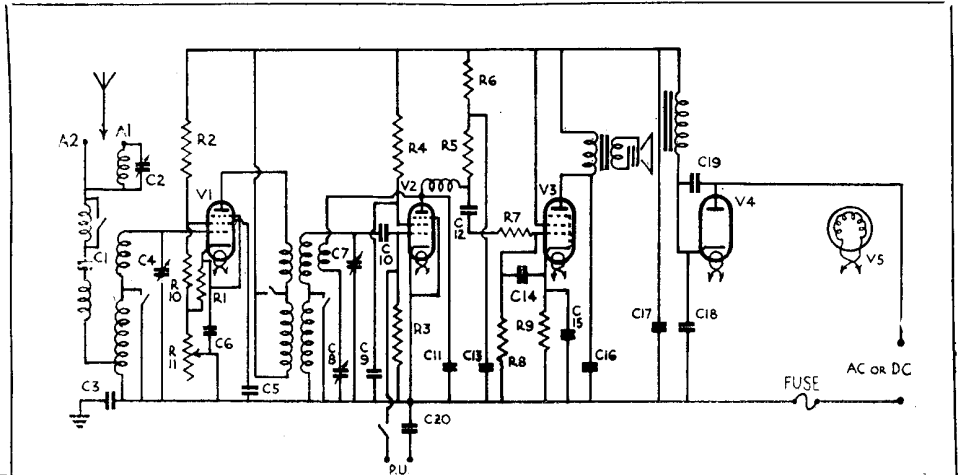
General Notes.—The block condenser is a special type containing 8, 12 (350 volt peak), and a 50 mfd. (12 volt peak) electrolytic condensers.

The leads are: 12 mfd., red; 8 mfd., yellow; 50 mfd., green. The negative (black) is common to all three.

The layout and connections are particularly simple, and tracing the components is facilitated by the resistance condenser panel.

Replacing Chassis.—Lay the chassis inside the cabinet, replace the three screws on the rear flange and screw the nut on to the switch.

After replacing the knobs cover the grub screws with the plastic insulating compound.



A "straight" three-pentode circuit is employed in the "Fury." The aerial circuit contains a Droitwich filter. Strip assembly simplifies the chassis of the set.

HALCYON 6701 SUPERHET

Circuit.—The first detector, MS4B plain (V1), is used with a separate oscillator, MH4 plain (V2), and is preceded by a band-pass aerial coupling.

Bias is obtained from a cathode resistance common to V1 and V2. The coupling to the first I.F. valve is by band-pass I.F. transformer (frequency 110 kc.).

The first I.F. valve, VMS4 met. (V3), is biased by cathode resistance and A.V.C., and is followed by a second band-pass I.F. transformer. The tuning meter is connected in the anode circuit of this valve only.

The second I.F. valve is another VMS4 met.

(V4), and is followed by a third I.F. transformer.

The second detector and L.F. valve, MHD4 met. (V5), is used for L.F. purposes and A.V.C., the two diode anodes being fed through condensers from the secondary of the I.F. transformer.

In the coupling to the triode section, R14 and R15 are H.F. stoppers, R16 the load, and C13 the coupling condenser.

The following coupling is by resistance-capacity filter with anode decoupling of V5 by L.F. choke.

The output valve, MPT4 Cat. (V6), is tone-

compensated by a condenser across the primary of the output transformer, and another condenser can be connected in parallel by means of a switch at the back of the chassis.

Mains equipment consists of: Transformer; full-wave (MU12) indirectly heated rectifier; the speaker field, which is in the positive H.T. lead; and electrolytic condensers.

Special Notes.—The pilot lamps are 4 v. .3 amp types.

The receiver is assembled as two chassis, one containing the power pack and the other the set. These are connected by a cable and