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ing speaker clamps. Slacken the outer screws and release the speaker.

Hold the carrying handle up and slide the chassis out.

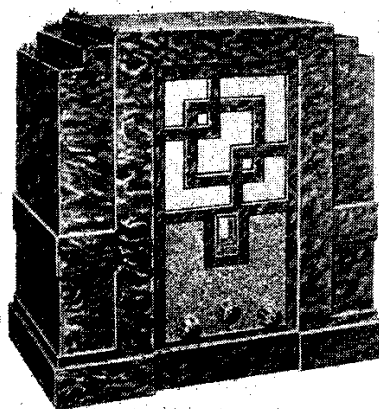
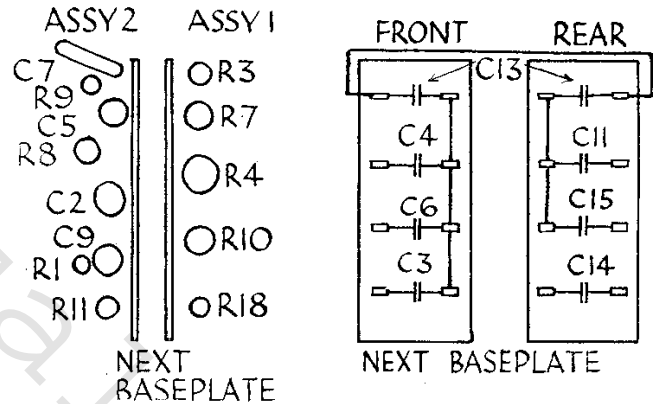
General Notes.—The connections on the two block condensers are given in the special diagram, as are the dispositions of the resistances on the two assemblies underneath the condensers.

If it is necessary to reach any of the rear valve-holders undo the two screws holding the back panel and ease the latter outwards to the extent of the leads.

Replacing Chassis.—See that the switch lever is in the same relative position as the escutcheon. Hold carrying handle up and slide chassis into cabinet. Replace screws on speaker clamps, rear panel and underneath. Pull mains lead through the wooden block.

Above are the layouts of the AP48 five-valve plus rectifier receiver by Varley.

On the right are given the details of the two assemblies indicated in the main layout above, and the connections of the block condensers.



In all eight valves are used in the S.T. receiver by Zetavox.

Circuit.—The H.F. valve, VMS4 (V1), is preceded by a tuned secondary aerial transformer. Bias is applied to the grid from the A.V.C. system and from a resistance in the cathode lead. Coupling to the first detector is by tapped tuned anode coil, followed by a second tuned grid coil.

The first detector valve, AC/S2 (V2), operates as a detector mixer with a separate oscillator. Coupling to the I.F. valve is by tuned band-pass I.F. transformer (frequency kc.).

VALVE READINGS				
(V.C. max., no signal. See special notes.)				
Valve.	Type	Electrode.	Volts.	M.A.
1	VMS4 (cat) ...	anode ...	155	9.3
		screen ...	80	
2	AC/S2 ...	anode ...	208	.5
		screen ...	80	
3	MHL4 ...	anode ...	80	5.5
4	VMS4 (cat) ...	anode ...	208	9.3
		screen ...	80	
5	MSG/LA ...	anode** ...	*	.35
		screen ...	0**	
6	MPT4 (cat.) ...	anode** ...	190	3.4
		aux. grid ...	180	4.5

* Anode bend detector, voltages are misleading. Test by current.
** See special notes, these readings are taken to chassis.
For the correct valve readings add 80 volts to each.

The oscillator valve, MHL4 (V3), operates with a tuned grid, and reaction is applied from a coil directly in the anode lead. The H.T. potential is derived from the screen feed to the other valves.

Another tapped band-pass I.F. transformer couples the I.F. valve VMS4 (V4) to the second detector, the tapping on the primary being used to supply the grid of an extra A.V.C. valve.

The second detector, MSG/LA (V5), operates as an anode bend detector, and provision is made for decreasing the bias by short-circuiting a portion of the cathode biasing resist-

ance for use on pick-up. Resistance capacity L.F. coupling is employed.

The output valve is an MPT4 (V6).

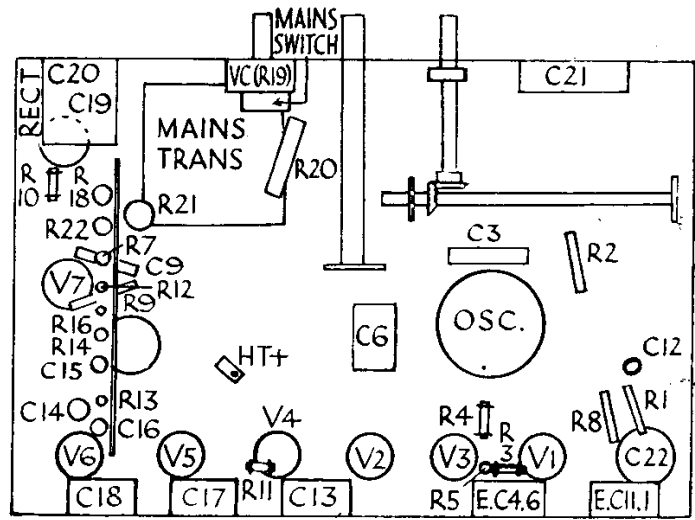
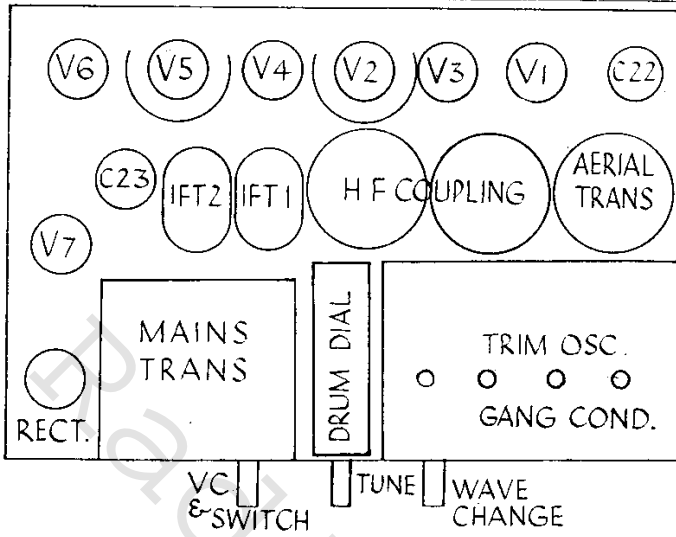
Mains equipment consists of transformer, full-wave rectifier UU120/350, with the speaker field in the positive H.T. lead with two electrolytic condensers for smoothing.

Special Notes.—In some models the cathodes of V1 and V4 are connected directly to chassis and the V6 auxiliary grid condenser (C19) is returned to cathode instead of H.T.—. In addition, the grid decoupling condenser (C18) may be connected across the bias resistor (R17) in the conventional manner. A .01 mfd. condenser may be connected as a tone compensator on V6.

Though the speaker field is in the positive H.T. lead, the chassis is not at H.T.— potential as the current for the first four valves passes through R19 and R20, and the voltage drop across these is registered between the cases of the electrolytic condensers (—) and chassis (+).

There are two negative A.C. sections in the set—(1) for V1, V2, V3 and V4, and (2) V5, V6 and V7. As the latter have a separate filament winding to which the cathode returns are suitably connected (H.T.—), the difference in potential between H.T.— and chassis allows the screening grid of V5 to be connected to chassis, i.e., at 85 volts positive

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The compact arrangement above the Zetavox chassis (left) necessitates the mounting of the oscillator coil underneath (right). R15 is under R7 and R17 is under R14

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with relation to cathode. This may at first cause some confusion in the readings.

R18 may be 5,000 ohms, and a 100,000 ohm "gram" volume control may be ganged with the radio volume control.

Quick Tests.—Between the terminals on speaker transformer and chassis (counting from top):—

(1) H.T. + unsmoothed by L.S. field, 290 volts

(2) V6, anode, 190 volts.

(4 and 5) Joined H.T. + smoothed, 210 volts.

Between casing of electrolytic condensers (-) and chassis (+) 90 volts neg.

Full H.T. unsmoothed between (1) and condenser casing, 380 volts.

Removing Chassis.—Undo knobs (grub screw). Remove four bolts underneath and lift chassis out. (Speaker leads are sufficiently long.)

General Notes.—Though differently braided wires are used, there is no coding.

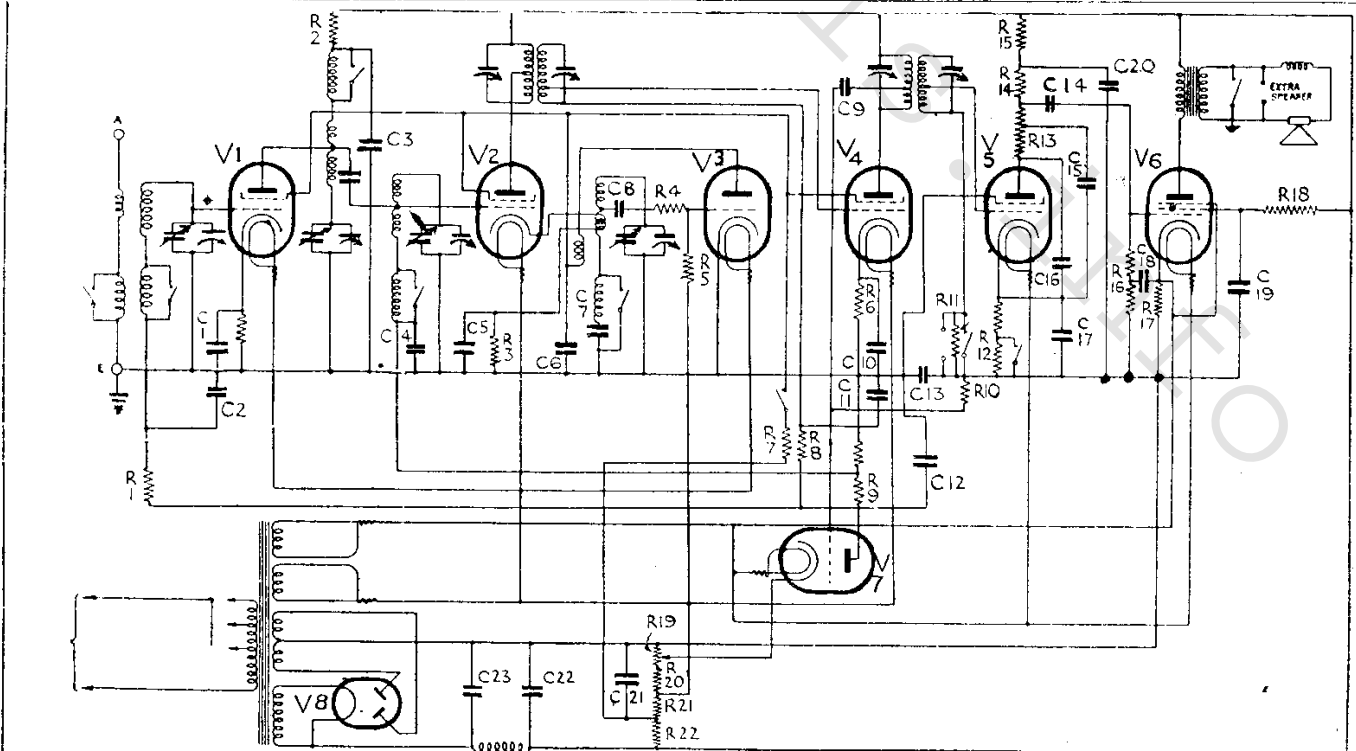
Replacing Chassis.—Lay chassis inside cabinet. Replace bolts and knobs.

RESISTANCES		
R.	Purpose.	Ohms.
1	Decoupling A.V.C. to V 1 ...	5,000
2	Decoupling V 1 anode ...	5,000
3	V 2 cathode bias ...	7,000
4	V 3 grid stabiliser ...	2,000
5	V 3 grid leak ...	100,000
6	V 4 cathode* ...	300
7	Decoupling H.T. to screens ...	2,000
8	Decoupling A.V.C. to V 4 ...	5,000
9	A.V.C. ptr. V 7 (tapped) ...	.25 + .15 meg.
10	V 7 grid leak ...	2 meg.
11	Across P.V. connections ...	.25 meg.
12	V 5 cathode bias (tapped) ...	7,000 + 3,000
13	V 5 anode H.F. filter (tapped) ...	5,000 + 5,000
14	V 5 anode L.F. coupling ...	100,000
15	V 5 anode L.F. decoupling ...	50,000
16	V 6 grid leak and decoupler (tapped) ...	.3 + .2 meg.
17	V 6 cathode bias ...	300
18	V 6 aux. grid decoupling ...	13,500
19	Volume control part of H.T. ptr. ...	450
20	Part of H.T. ptr. ...	1,000
21	Part of H.T. ptr. ...	2,700
22	Part of H.T. ptr. ...	3,000
	L.S. field Magnavox 144 ...	1,000
	Output transformer primary ...	675

* Omitted in some models.

CONDENSERS		
C.	Purpose.	Mfd.
1	*V 1 cathode ...	.1
2	Decoupling A.V.C. to V 1 ...	.1
3	V 1 anode decoupling ...	.1
4	Decoupling A.V.C. to V 2 ...	.1
5	V 2 cathode ...	.1
6	Decoupling V 3 anode ...	.5
7	L.W. pad on osc. ...	.001
8	Feed to V 3 grid ...	.00075
9	L.F. Feed to A.V.C. valve ...	.0001
10	*V 4 cathode ...	.1
11	Decoupling A.V.C. to V 4 ...	.01
12	H.F. by-pass from A.V.C. anode ...	.01
13	Between H.T. and chassis ...	.5
14	L.F. coupling V 5 to V 6 ...	.01
15	H.F. by-pass anode V 5 ...	.0015
16	Additional by-pass anode V 5 } HF filter	.0003
17	V 5 cathode ...	.5
18	Decoupling grid V 6** ...	.5
19	V 6 aux. grid** ...	.5
20	V 5 anode decoupling ...	.5
21	Decoupling H.T. to screens ...	4 el.
22	H.T. smoothing ...	8 el.
23	H.T. smoothing ...	7 el.

* Omitted on some models.
** See special notes.



The standard circuit of the Zetavox S.T. receiver. Modifications are dealt with under "Special Notes."