

BUSH FOUR-VALVE MAINS SUPERHET

Circuit.—The first detector oscillator valve, SP4 (V1) is preceded by a band-pass aerial coupling. Reaction is applied in the cathode circuit, and coupling to the I.F. valve is by tuned secondary transformer (frequency 123KC). The potential for the aux-grid is derived from a potentiometer common to V1 and V2, and each is properly decoupled.

The I.F. valve, VP4 (V2), has a stabilising resistance, R21, immediately in its grid

circuit. Volume is controlled by varying the bias through a variable resistance, R19, which also lowers the efficiency of the aerial coil. Coupling to the next valve is a band-pass intermediate transformer.

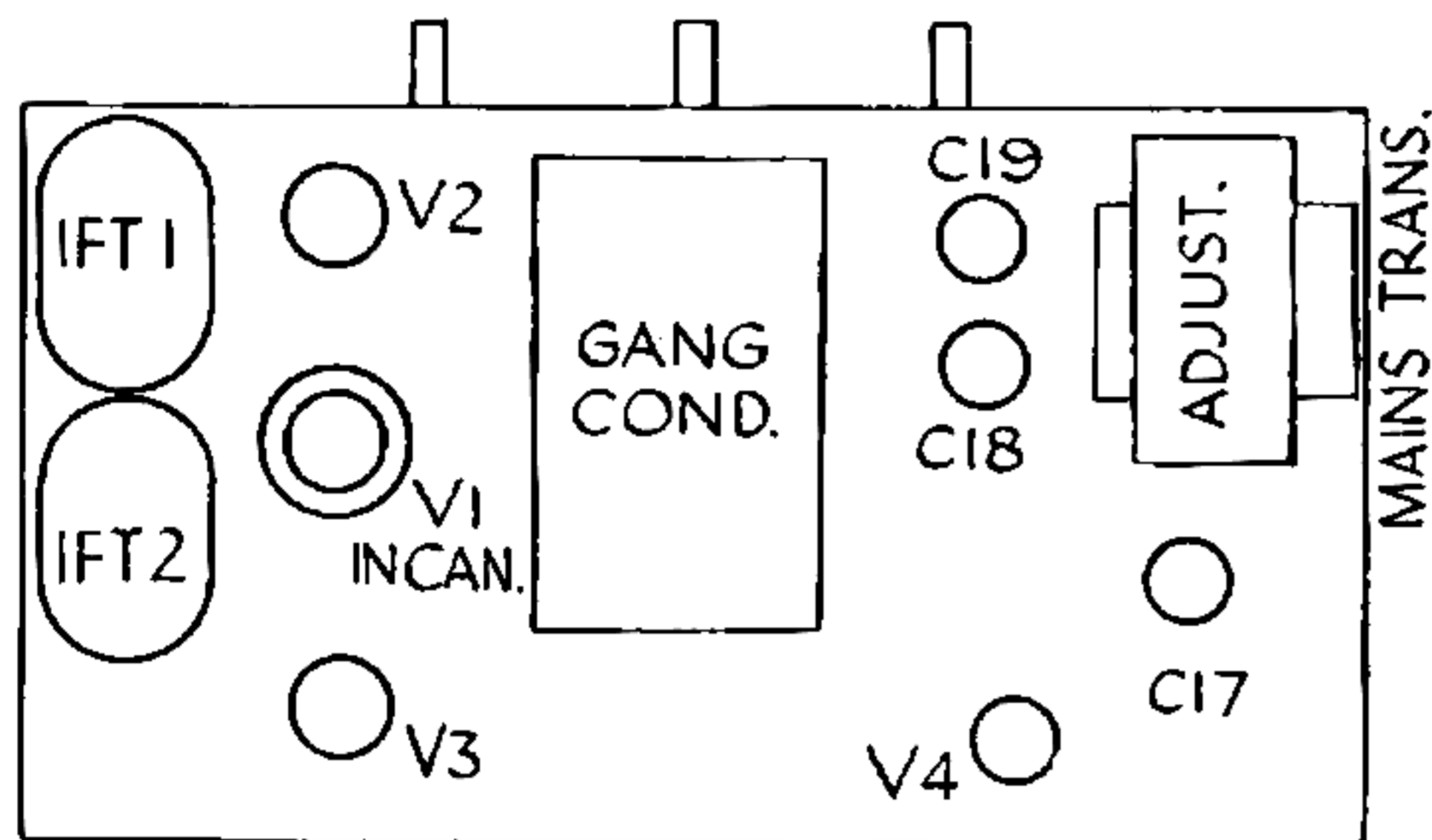
The second detector, 354V (V3), operates as an anode bend detector, and the pick-up jack is connected so that the output of the P.U. is fed to the grid through the secondary of I.F.T.2. The jack also connects the other pick-up lead to a point on the bias

potentiometer to allow the valve to work as a pure amplifier.

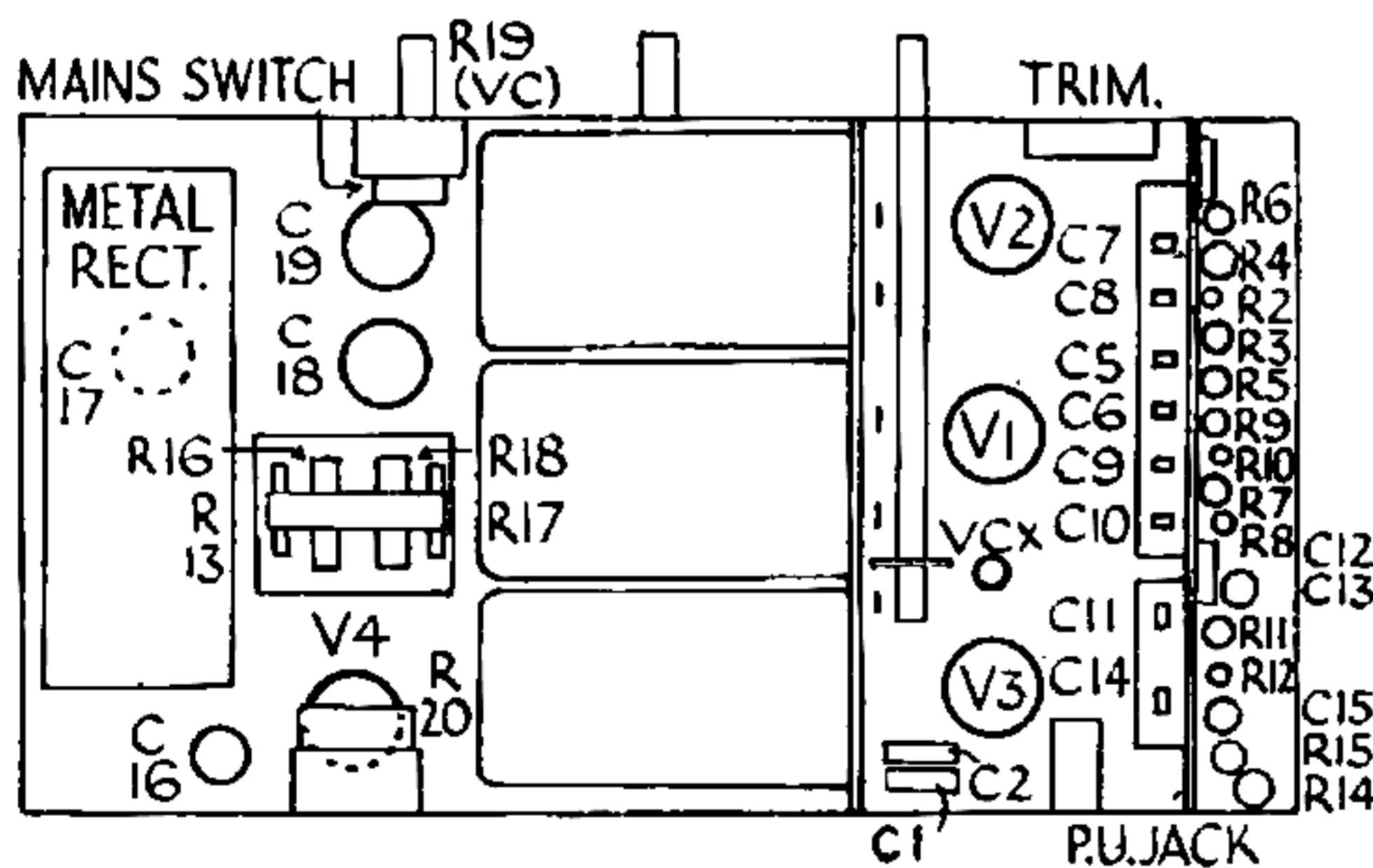
The anode circuit is decoupled from the H.T., and coupling to the output valve is by resistance capacity filter.

The output valve, PM24M (V4), is a directly heated pentode, and bias for it is derived from a potentiometer across the L.S. field which is in the negative H.T. lead.

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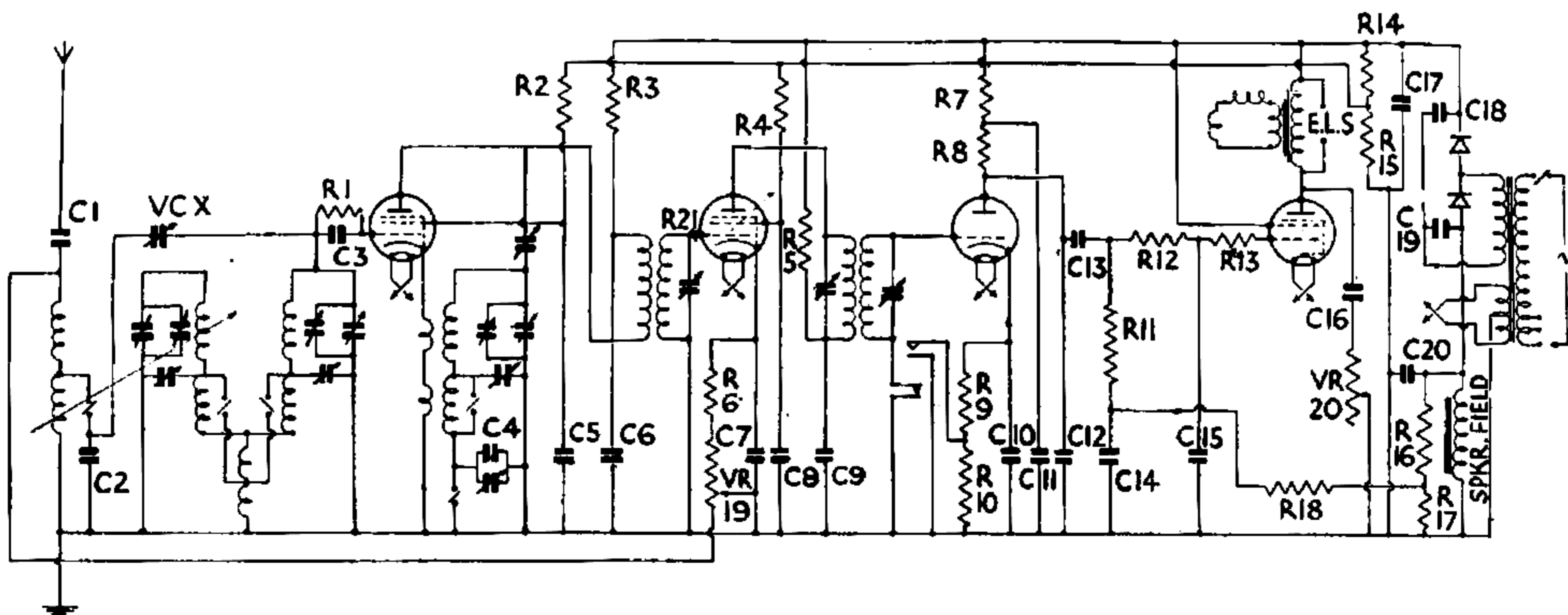
How the components and valves are arranged on the top of the S.A.C.4 receiver by Bush Radio, Ltd.



Compact grouping of the resistances and condensers is a feature of the below-chassis design of the Bush S.A.C.4.

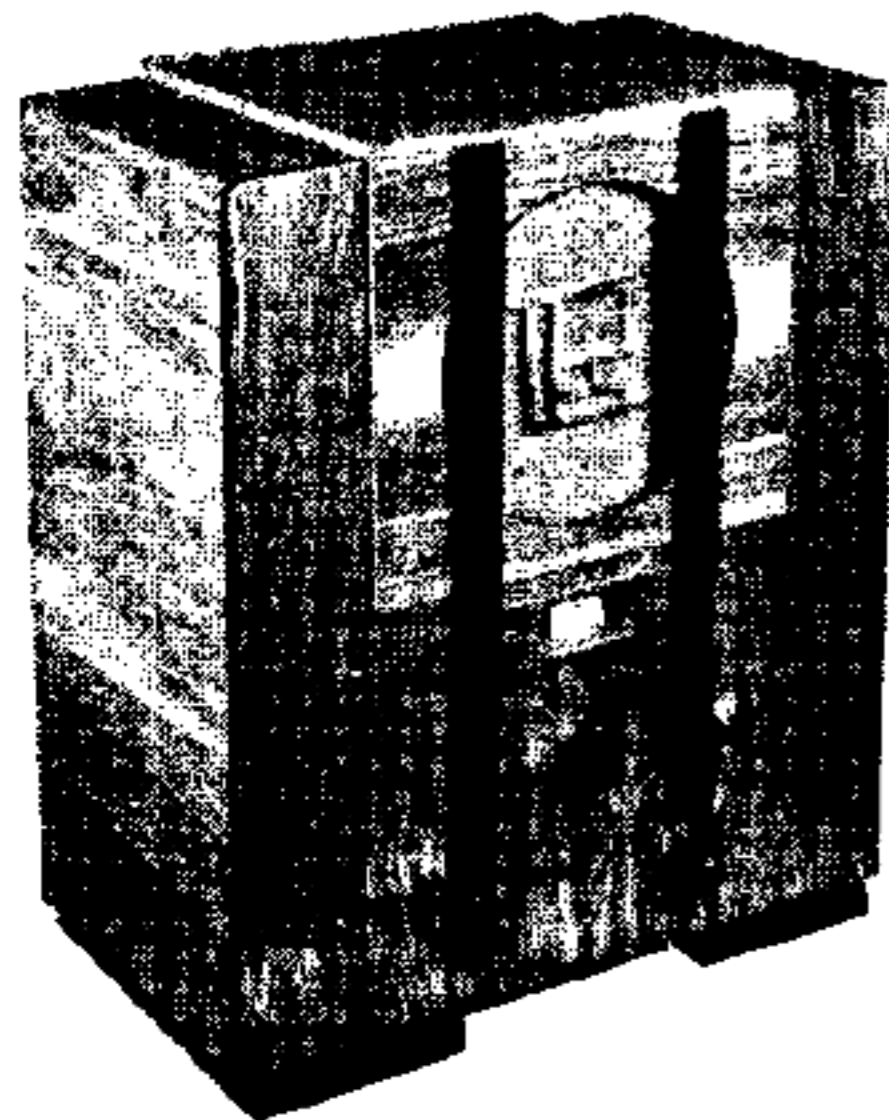
RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	.5 meg.
2	V1 aux. grid decoupling	.1 meg.
3	V1 anode decoupling	10,000
4	V2 aux. grid decoupling	10,000
5	V2 anode decoupling	10,000
6	V2 cathode bias	250
7	V3 anode decoupling	20,000
8	V3, V4, LF coupling	50,000
9	V3 cathode bias ptr.	1,000
10	V3 cathode bias ptr.	7,000
11	V4 grid leak	.5 meg.
12	V4 grid stabiliser	.1 meg.
13	V4 grid stabiliser	.1 meg.
14	Top part of aux. grid ptr.	10,000
15	Lower part of aux. grid ptr.	10,000
16	Part of bias ptr. across LS field	.5 meg.
17	Part of bias ptr. across LS field	.1 meg.
18	Decoupling grid circuit V4	.5 meg.
19	Var. vol. control, cathode V2	15,000 var.
20	Var. tone control, anode V4	20,000 var.
21	Grid stabiliser V2	250

CONDENSERS		
C.	Purpose.	Mfd.
1	Series aerial	.003
2	Suppressor circuit	.001
3	V1 grid condenser	.0005
4	Padding on LW of osc.	.0015
5	V1 aux. grid decoupling	.1
6	V1 anode decoupling	.1
7	V2 cathode	.1
8	V2 aux. grid decoupling	.1
9	V2 anode decoupling	.1
10	V3 cathode	.1
11	V3 anode decoupling	.5
12	V3 anode by-pass	.001
13	V3, V4 LF coupling	.005
14	V4 grid decoupling	.5
15	V4 grid, HF by-pass	.0005
16	Tone compensating anode V4	.06
17	HT smoothing	8 el.
18	Voltage doubler circuit	6 el.
19	Voltage doubler circuit	6 el.
20	Decoupling bias ptr.	.06



Detector-oscillator, intermediate-frequency, second detector and output pentode valves go to form the orthodox circuit of the S.A.C.4.

BUSH FOUR-VALVE MAINS SUPERHET (Cont.)



Bush Radio's S.A.C.4 is a good example of the modern, efficient four-valve superhet. It is a straightforward service proposition.

An H.F. stopper and a stabilising resistance with the necessary by-pass condenser, C15, are included in the grid circuit. Tone compensation is used with a fixed condenser in series with a variable resistance between the anode and earth.

Mains equipment consists of a transformer and a full-wave metal rectifier used as a voltage doubler with electrolytic doubler and smoothing condensers.

Quick Tests.—Between the rear terminals on the L.S. transformer and chassis :—

VALVE READINGS

Valve	Type.	Electrode.	Volts.	M.A.
1	SP4	anode ...	240	.7
		aux. grid ...	60	—
2	VP4	anode ...	217	2.4
		aux. grid ...	105	—
3	354V	anode ...	*	.2-.3
4	PM24M	anode ...	250	29
		aux. grid ...	265	4.5

* Anode bend detector, entirely erroneous readings may be obtained.

Top (F). Valve anode, 250 volts positive.
Bottom (K). H.T. smoothed, 265 volts positive.

Rear. Electrolytic condenser case, C18 (between mains transformer and gang condenser), 85 volts positive.

Front. Electrolytic condenser case, C19, 110 volts negative.

Removing Chassis.—Undo the knobs (grub screws). Remove four screws from underneath, loosen clip holding speaker leads and lift the chassis out.

General Notes.—Small components are mounted on two panels, the majority being on the long one at the end. The layout diagram indicates the positions the respective resistances and condensers occupy.

Switch contacts are open towards the outside and can be cleaned by a piece of tape.

The small ebonite former with the round-headed screw is the small condenser, VCX.

Replacing Chassis.—Slide chassis into cabinet. Replace four screws and clip the speaker leads. Replace knobs.