

BUSH PB55 SUG55

Six-valve, plus rectifier and cathode-ray tuning indicator, three-waveband superhet with push-button and manual tuning. PB55 is a table model and SUG55 a radiogram. Both have provision for connecting low-impedance extra loudspeakers and the table model has sockets for a 700-ohm pickup. Suitable for AC mains supply 200-250v, 40-100 cycles. Marketed by Bush Radio Ltd., Power Road, Chiswick, London, W4.

ON short-wave signals are fed via C1 and L1 to a tuned circuit L2, VC1 which feeds the HF amplifying pentode V1 to which AVC is applied. By means of R5 and C7 the signals are coupled to L5 and thence by the wavechange switch to the grid of the hexode frequency changer V2.

On medium and long waves signals from the aerial by-pass V1 and are coupled by L3 and L6 to the tuning coils L4, L7 which are tuned by VC2. From here the signals are applied via the switching

to the grid of V2. This valve is cathode biased by R7 and is AVC controlled.

The oscillator section employs tuned grid circuits L8, L10 and L12 with anode reaction coils L9, L11 and L13.

On push-button, trimmers T12-T19 may be switched across L4, L7, while in the oscillator stage coils L14-L21 may be brought into circuit across L12 which is the master oscillator coil for push-button station selection.

VALVE READINGS

Taken on 230v Mains, with volume control at maximum on manual tuning. No signal.

V	Type	Electrode	Volts	Ma
1	MVS Pen B Cossor	Anode Screen Cathode	130 90 Nil	6.3 1.7
2	TH4A or B Mullard	Anode Osc. anode Screen Cathode	270 65 65 1	2.4 4.5 5
3	VP4B Mullard	Anode Screen Cathode	250 100 Nil	4.7 1.6
4	TDD4 Mullard	Anode Cathode	110 2.5	2.2
5, 6	Pen B4 Mullard	Anode Screen Cathode	250 260 17.5	31 4
7	DW4/350 Mullard	Anodes	320 AC	each
T.1	TV4 Mullard	Anode Target Cathode	40 270 2.5	1 .4

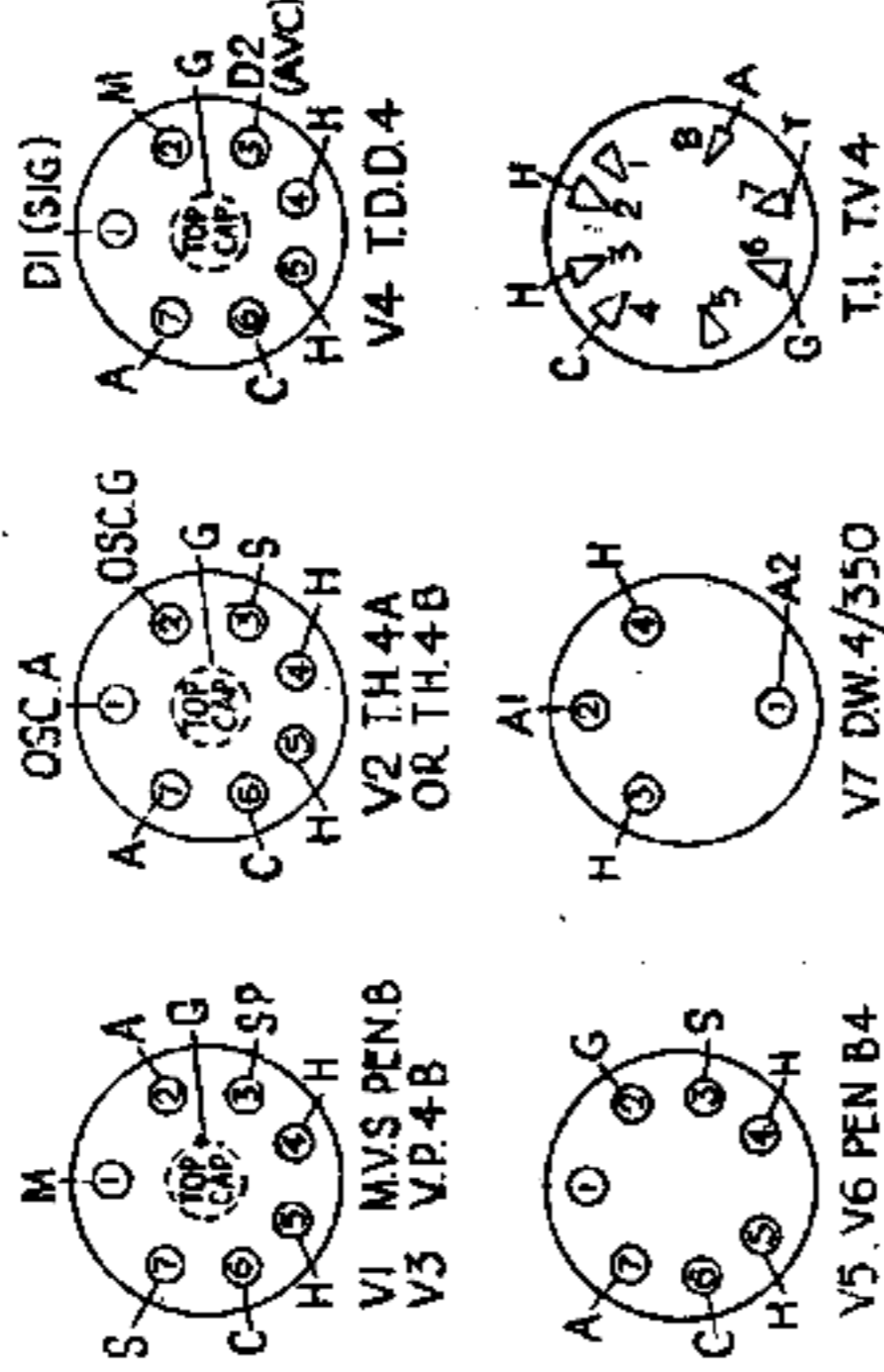
Pilot lamps, 6.2 v, .3 amps.

The intermediate frequency signal from V2 is coupled by a special iron-cored transformer L22, L23. Variable selectivity is achieved by bringing into circuit a common bottom coupling condenser C17 on contrast and high fidelity positions of the switch.

L23 feeds the grid of the IF amplifier pentode V3 which is AVC controlled. A second IF transformer L24, L25 transfers the signal via C38 to the signal diode of the double diode triode V4.

R15 and R16 are the load resistances with filtering effected by R14 and C39. The low frequency signal is coupled via C40 to the volume control VR1 and thence via the grid stopper R18 to the grid of the triode section of V4.

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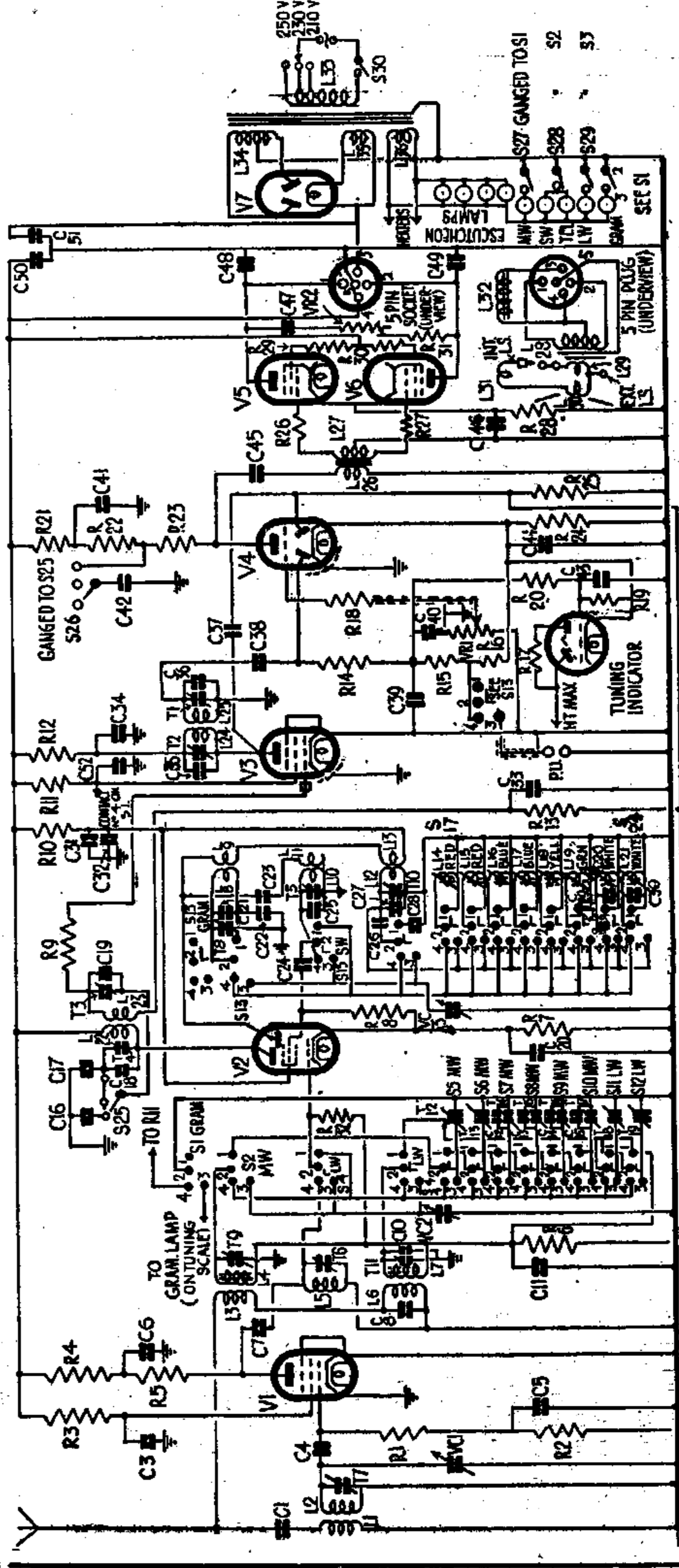
The Bush PB55 is a three-waveband superhet with push-buttons for stations and wave switching and with manual tuning. The valve bases (left) are drawn as seen with chassis inverted.

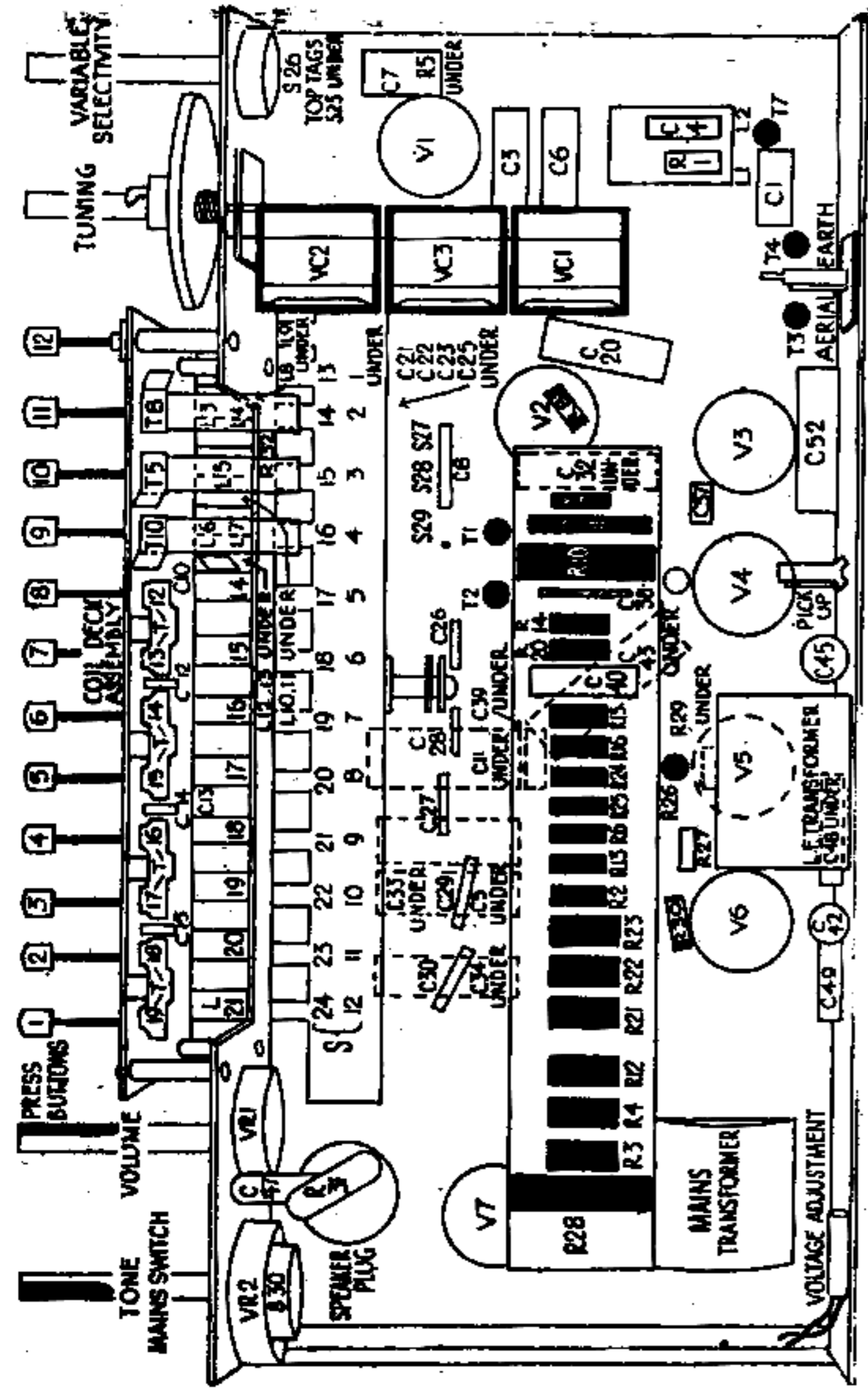
RESISTORS

R	Ohms	R	Ohms
1	500,000	18	100,000
2	1 meg	19	2 meg
3	100,000	20	2 meg
4	10,000	21	10,000
5	10,000	22	50,000
6	1 meg	23	5,000
7	100	24	1,000
8	30,000	25	1 meg
9	50	26	250,000
10	20,000	27	250,000
11	100,000	28	250
12	10,000	29	1,000
13	2 meg	30	1,000
14	250,000	31	2,000
15	250,000	32	5 meg
16	250,000	VR1	500,000
17	2 meg	VR2	50,000

CONDENSERS

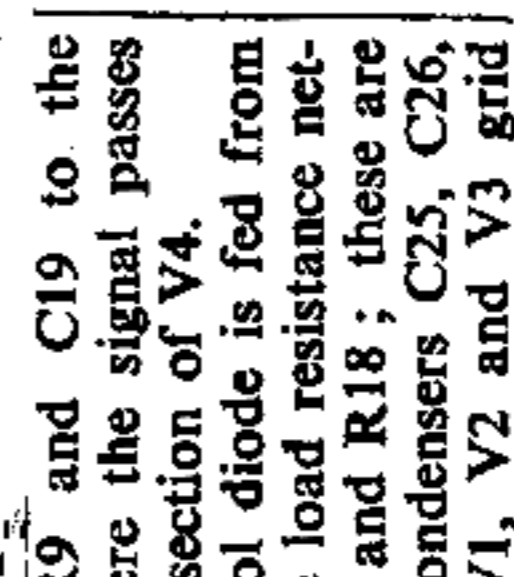
C	Mfd	C	Mfd
1	50 mmfd	27	130 mmfd
2	deleted	28	340 mmfd
3	.05	29	316 mmfd
4	.0001	30	316 mmfd
5	.05	31	2
6	.05	32	.05
7	.0001	33	.05
8	.0008	34	.05
9	deleted	35	180 mmfd
10	25 mmfd	36	180 mmfd
11	.5	37	.0001
12	60 mmfd	38	.0001
13	60 mmfd	39	.0001
14	160 mmfd	40	.01
15	250 mmfd	41	2
16	.01	42	.05
17	.01	43	.05
18	180 mmfd	44	.05
19	180 mmfd	45	.1
20	.05	46	.25
21	10 mmfd	47	.03
22	556 mmfd	48	.005
23	50 mmfd	49	.005
24	30 mmfd	50	.16
25	15 mmfd	51	.16
26	316 mmfd	52	.05



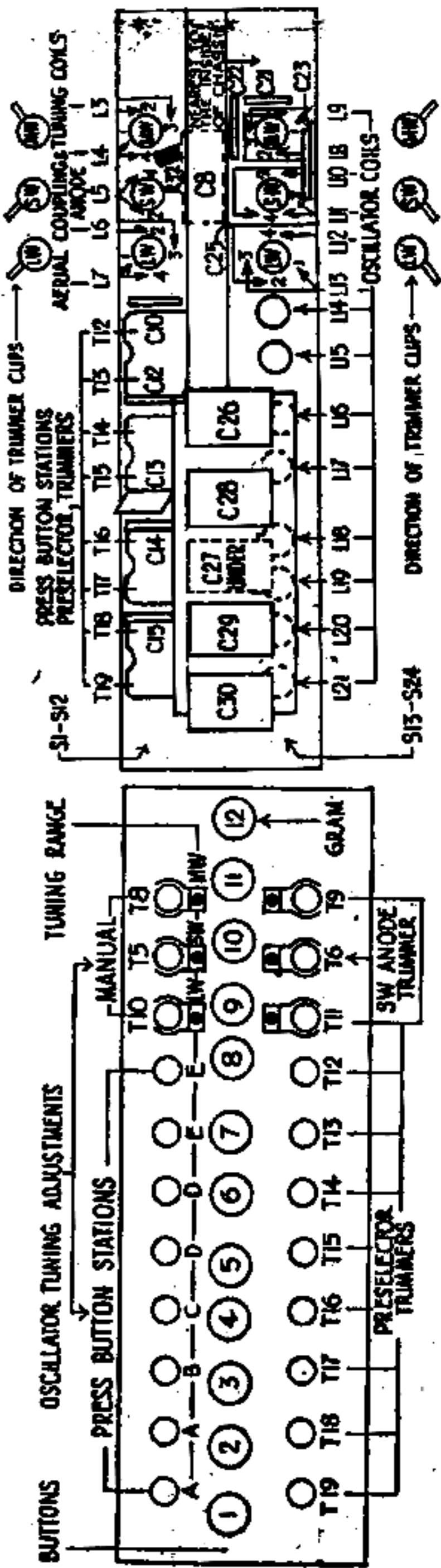


Above, details of the underside of the Bush chassis and (right) how parts are arranged on the top. Two further drawings at the bottom of the page give details of the push-button tuning unit and its associated trimmers.

An intermediate frequency transformer L14, L15, transfers the IF signal to the grid of the amplifying pentode V3 and a second IF transformer L16, L17 passes on the signal to the signal diode of the double-diode-triode V4. R8 is the signal load filtered by C21 with additional filtering by R9 and C19 to the volume control R10; from here the signal passes direct to the grid of the triode section of V4. The automatic volume control diode is fed from the anode of V3 via C23. The load resistance network comprises R15, R16, R17 and R18; these are all decoupled by appropriate condensers C25, C26, C27 and voltages applied to V1, V2 and V3 grid



A permanent degree of tone correction is effected by R12 decoupled by C42 and the signal is resistance-capacity coupled by R13 and C28 to the grid of the output pentode V5. R19 is the grid leak and R20 a grid stopper. Cathode bias is derived from R21 decoupled by C30. A permanent degree of tone correction is effected



by C31, while a variable tone control is provided by VC4 connected between the anode and grid circuits of V5. The output transformer L20, L21 couples V5 to the permanent-magnet moving-coil loudspeaker, of which L22 is the speech coil. The heater and HT circuits follow the usual lines with the half-wave rectifier, V6, in series in the HT supply. L23 and L24 are smoothing chokes and C33 the reservoir condenser filtered by C34; C32 is the smoothing condenser. The mains input passes through fuses and filter coils L25, L26 and their associated condensers C36, C37. The tuning indicator is operated from the AVC line in the usual way, while in the radiogram models a pick-up isolating transformer L18, L19 is incorporated in the grid circuit of V4. Extra loudspeaker sockets and switch are provided only in the radiograms. Also, in the latter models, shortwave filtering chokes L27, L28 are included in the motor supply circuit with interference suppressors C38, C39 across the brushes. R38 is the voltage adjustment variable resistance for the motor, which is of the low voltage (35 volts) universal type.

GANGING
IF Circuits.—Switch receiver to LW. Set gang condenser to maximum capacity, volume control to maximum and tone control to minimum top (fully clockwise). Inject a signal of 465 kc into grid of V2 via a 0.1 mfd condenser (leaving receiver grid lead connected). Adjust T1, T2, T3 and T4 in that order for maximum output. **SW Band.**—Switch receiver to SW and inject a

signal of 18 metres (16.66 megacycles) into the A and E sockets. Tune in signal and adjust T5 and T6 for maximum output while rocking gang condenser. Inject a 50 metres (6 megacycles) signal and tune it in on receiver. Adjust inductance of L1, L4 or L8 if necessary (see Note). Return to 18 metres and carefully readjust T6, at the same time rocking the gang. **Note.**—If any of the tuning coil assemblies have to be replaced or repaired, the inductance of L1, L4 or L8 respectively will have to be adjusted. The adjustment of inductance can be done satisfactorily only by using a tuning wand. The oscillator coil, L8, requires the most careful adjustment. To make these adjustments proceed as follows:—

First adjust T5 and T6 as described above. Insert the ferrocart end of the tuning wand into the coil assembly affected. If the output reading falls, leave the coil untouched, but if it increases, adjust the inductance by moving the loop of wire which will be found running across the inside of the coil former up or down until the output reading falls when the ferrocart end is inserted. Insert the brass end of the wand into the coil assembly. If the output reading falls leave the coil untouched, but if it rises adjust the inductance as above until the reading falls upon the insertion of the wand. Repeat both adjustments until the output reading falls when either end of the wand is inserted in the coil. A strip of insulating material with a "nick" cut in it will facilitate the above adjustments. The can of the coil may be removed to identify the loop but it must be fixed securely for the actual alignment adjustments. **Re-adjust T6** while rocking gang. **MW Band.**—Switch receiver to MW. Inject a signal of 205 metres (1,463 kilocycles) and set receiver to 205 m mark on scale (indicated by spot). **Note.**—If the scale has been replaced or the pointer disarranged it will be necessary to reset the pointer. To do this turn gang condenser to minimum and set pointer horizontal to the left at this position. Adjust T7 for maximum output. Inject a 225 metres (1,333.3 kc) signal and tune it on receiver. Adjust T8 and T9 in that order for maximum output. Inject a signal of 530 metres (566 kc) and tune in signal on receiver. Adjust T10 for maximum output, at the same time rocking gang. Return to 205 metres and check setting of T7. **LW Band.**—Switch receiver to LW, gang condenser at minimum. Inject a signal of 725 metres (413.8 kc.) and adjust T11 for maximum output. Inject an 850 metres (353 kc) signal and tune it in on receiver. Adjust T12 and T13 for maximum output. Inject an signal of 1900 metres (157.9 kc) and tune it in on receiver. Adjust T14 for maximum output, while rocking gang. **Re-check setting of T11** at 725 metres.

WINDINGS

L	Ohms	L	Ohms
1	.1	19	1.4
2	.05	20	2
3	.6	21	2
4	1.3	22	4
5	.05	23	4
6	.30	24	4
7	14	25	4
8	1.6	26	350
9	1.1	27 (total)	5,000
10	.1	28	(see below)
11	.2	29	17+2+2
12	3	30	125+125
13	2.2	31	.1
14	.7	32	.1
15	.7	33	.1
16	1	34	.1
17	1	35	.1
18	1.2	36	.1

LOUDSPEAKERS

ROLA TYPE 10-Z (P.B. 55).	Ohms
L28	700 ohms
L29	.6 "
L30	2.3 "

CELESTION TYPE E10P/CT 8343 (ALTERNATIVE P.B.55).	Ohms
L28	500 ohms
L29	.8 "
L30	2.1 "

CELESTION TYPE E12DA (SUG 55).	Ohms
L28	700 ohms
L29	.5 "
L30	4.5 "