

BUSH DAC 63 and RG 63 DC-AC, AC 63 DC-AC Auto and DUG 62

Four-valve, plus rectifier, three-waveband superhet with five station press buttons and press button wavechange. Table model, DAC 63; console, DUG 62; radiogram, RG 63 DC-AC; autoradiogram, RG 63 DC-AC Auto. For operation from DC or AC mains 180-260v, 40-80 cycles (table and console) or 200-250v, 25-60 cycles (radiograms). Made by Bush Radio Ltd., Power Road, Chiswick, London, W.4.

AERIAL input via isolating condenser C1 and L1 to tuned grid circuit L2, C4 (MW) via C2 and L3 to L4 C5 (SW), C3 and L5 to L6 C6 (LW). Waveband switching by S1 (MW), S2 (SW), S3 (LW). Pre-set station selection operated by S4-S8 connect trimmers in parallel with L2 (MW) and L6 (LW).

The hexode control grid of the frequency changer V1 is fed from the preselector

circuits and is AVC controlled. Triode oscillator grid coils L7 (MW), L9 (SW), and L11 (LW) tuned by VC2. Reaction to the SW circuits is via C15 to L10.

Waveband switching for the oscillator circuit by S9 (MW), S10 (SW), and S11 (LW). Pre-set station selection connected in parallel with the master oscillator coil L11 by switches S12-S16, tuning by variable iron cores in coils L13-L17. When the LW switch S11 is in the out position contacts 1 and 2 are shorted, thus the LW padder C17 is connected in series with C19 across L11, forming the additional trimmer for the pre-set stations.

IF transformer C9, L18, L19, C10 couples the hexode anode of V1 to the control grid of the pentode IF amplifier V2. A second IF transformer C26, L20, L21, C27 passes on the signal to the signal diode of the double diode triode V3.

The signal diode is fed from a tapping on L21 via C31; the load resistance being R11. The LF signal is passed via C32, the volume control VR1 and grid stopper R13 to the triode grid of V3. IF filter is by R9 and C29.

Gramophone pick-up input on the table model is applied through isolating condensers C33 and C34 to VR1 and chassis, but see notes at end of this review for differences in gram. models.

The AVC diode of V3 is fed from a tapping on L20 via C28. R17 is the load resistance, and AVC applied via R1, C7, R7, C25 as bias for V1 and V2. Delay voltage is obtained from the drop across cathode biaser R16.

The tuning indicator control grid is fed from V3 signal diode load R11 through the network R12, R10 and C30.

Resistance capacity coupling by R15, C37 and R18 is employed between the anode of V3 and the control grid of the pentode output valve V4. Variable tone control by C39 and VR2 in the anode circuit.

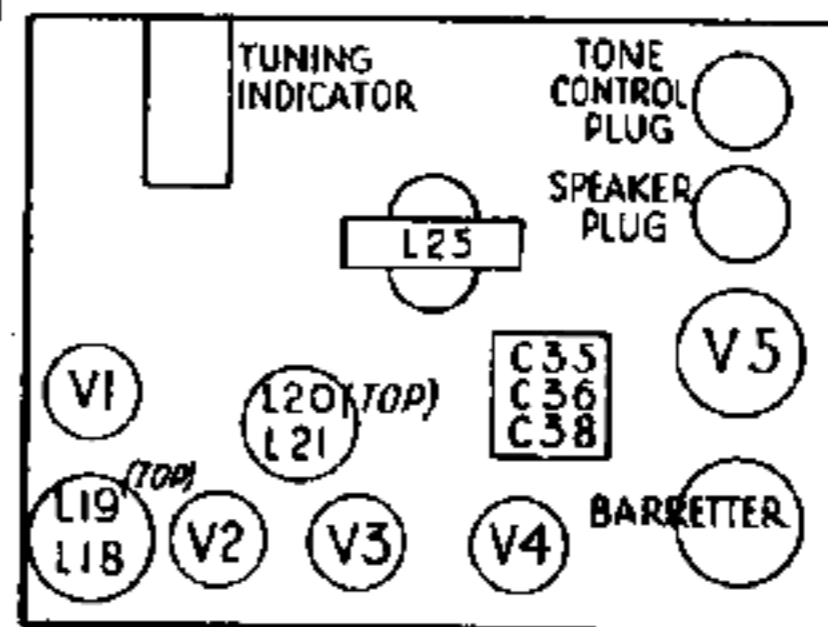
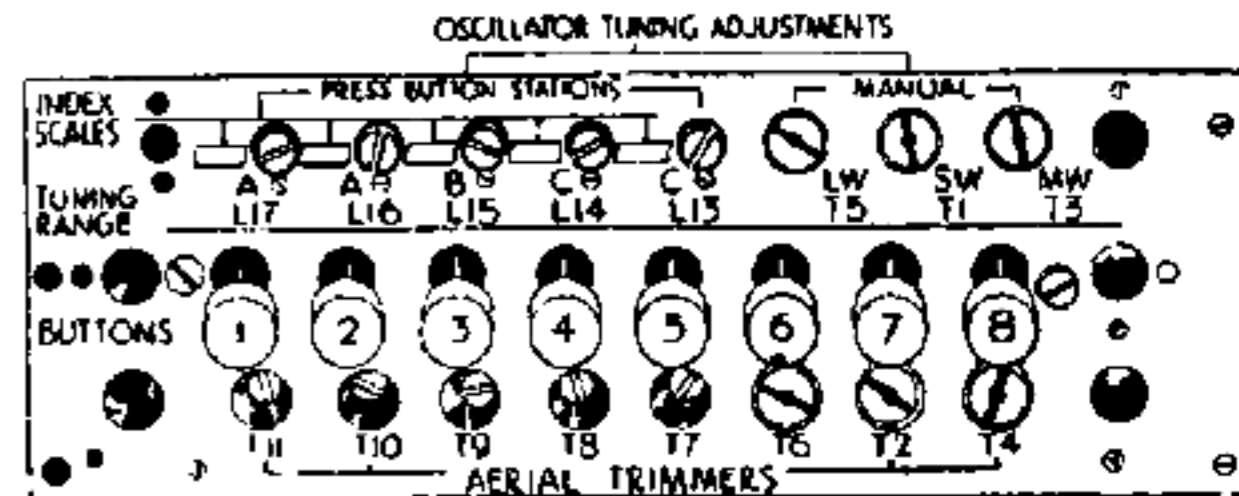
The full-wave rectifier V5 supplies HT current via smoothing choke L25, C40 and C41.

Valve heaters, scale and escutcheon lamps are in series with the barretter across the mains filter circuit L26, L27, C42. When the manual tuning buttons are in the "out" position, the scale lamps are shorted out by special switches S17 (MW), S18 (SW) and S19 (LW) ganged to these buttons. Mains on/off switch is at back of receiver.

GANGING

IF Circuits.—Tune receiver to 300m (MW manual tuning button No. 8). Set volume control to maximum and tone control to low.

Below, layout identifying major parts on the top of the chassis, and right, a diagram of the push-button assembly showing the trimmers.



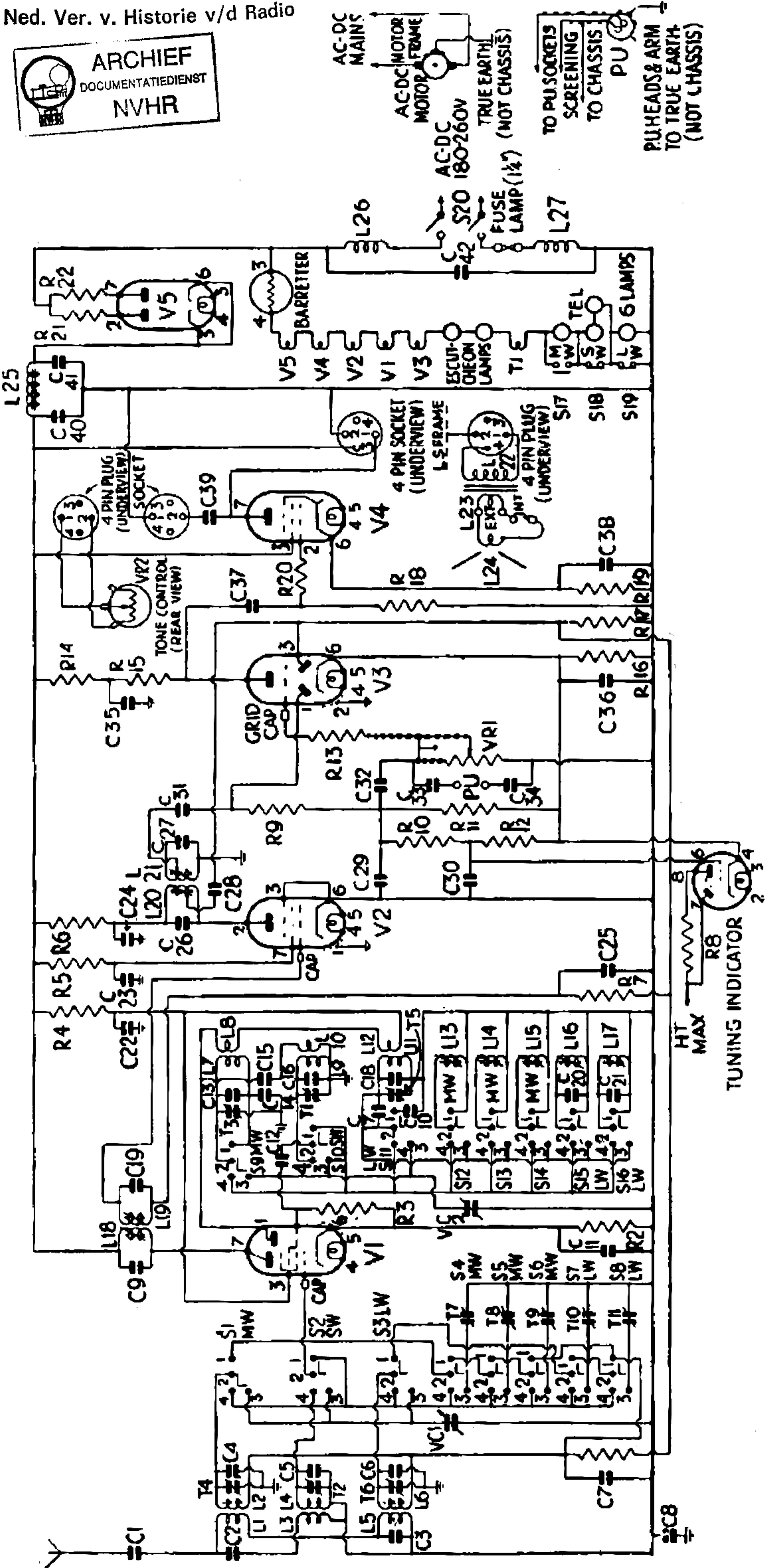
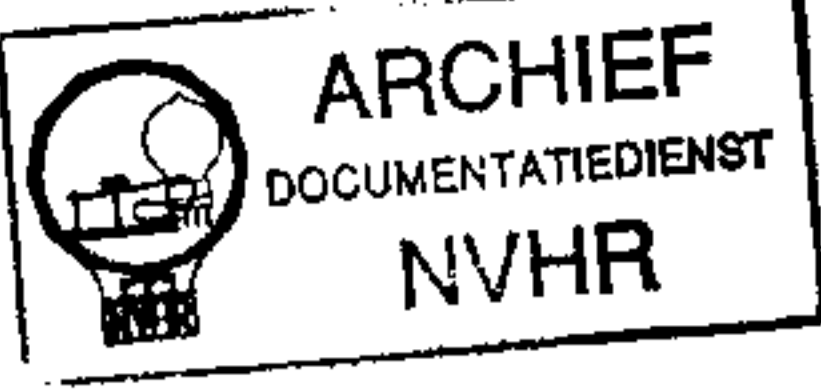
Inject a 465 kc signal into the control grid of V2. Adjust the core of L21 (underside of chassis; adjust through hole in metal cover on resistance panel) for maximum output.

On 230v. AC, vol control max, no signal.

VALVE READINGS

| V | Type | Electrode | Volts | Max |
|------------------|-------------------|--------------|-------|------------|
| 1 | 302THA Cossor | Anode | 260 | 1 |
| | | Screen | 60 | 1.6 |
| | | Osc anode | 60 | 4.8 |
| | | Cathode | 1 | — |
| 2 | VP13C Mullard | Anode | 195 | 6.5 |
| | | Screen | 140 | 2.6 |
| | | Cathode | Nil | Nil |
| 3 | TDD13C Mullard | Anode | 120 | 2.3 |
| | | Cathode | 2.3 | — |
| 4 | PEN36C Mullard | Anode | 220 | 33 |
| | | Screen | 260 | 5.2 |
| 5 | Mullard UR3C | Cathode | 12 | — |
| | | Cathode | 260 | 58 |
| Tuning indicator | | Triode anode | 30 | Very small |
| Mullard TV6 | | Target anode | 260 | 1 |
| | | Cathode | 2.8 | — |

Pilot Lamps, 6.2v, .3 amps.
Barretter: Phillips' Type C1.



TO PU SOCKETS
SCREENING
TO CHASSIS

PU HEADS & ARM
TO TRUE EARTH
(NOT CHASSIS)

AC-DC MOTOR MOTOR FRAME

AC-DC 180-260V

TRUE EARTH (NOT CHASSIS)

FUSE LAMP (L27)

V5 BARRETTER

V4

V2

V1

V3

ESCUT-CHRON LAMPS

T1

16W 19W 6W 6W

4 PIN SOCKET (UNDERVIEW)

L-S FRAME

4 PIN PLUG (UNDERVIEW)

S17

S18

S19

VR2 TONE CONTROL (REAR VIEW)

R20

V4

GRID CAP

V3

R9

V2

HT MAX

R8

TUNING INDICATOR

HT MAX

R8

TUNING INDICATOR

C8

BUSH DAC 63

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Inject signal into control grid of V1, and adjust core of L19 (top of coil can) for maximum output. Adjust the core of L18 (underside of chassis) for maximum output.

Recheck the four adjustments with the signal generator still connected to the control grid of the V1.

Manual Tuning Circuits (Buttons 6, 7, and 8).—Before trimming check the position of the tuning pointer. With the vanes fully meshed the centre of the pointer should coincide with the top of the wavelength lines on the scale. Remove the escutcheon plate from the front of the cabinet by means of the two fixing screws if the chassis has not been removed.

It is important to see that the celluloid protection plate over the adjustments is fixed into position after servicing.

SW Band.—With volume at max., press the SW button No. 7, set pointer to 18 metres.

Inject a 18m signal via dummy aerial

and adjust T1 and T2 for maximum output. Check calibration on 50m (6.00 mc).

MW Band.—Press MW button (No. 8), set pointer to 300m. Inject a 300m signal, and adjust T3 and T4 for maximum output.

Check calibration on 500m.

LW Band.—Press LW button No. 6; set pointer to 1,500m. Inject a 1,500m signal, and adjust T5 and T6 for maximum output. Check calibration on 1,900m.

Adjustment of the LW oscillator trimmer T5 (painted red) will affect the tuning of the pre-selected stations (buttons 1 to 5) after manual circuit adjustments; therefore the oscillator adjustments L13 to L17 must be readjusted.

Adjustment of the MW aerial tuning trimmer T4 will necessitate readjustment of the MW pre-set station trimmers T7 to T9. Also, any adjustment of the LW aerial tuning trimmer T6 will affect the tuning of the LW pre-set station trimmers T10 and T11.

Pre-set Station Buttons 1 to 5.—Connect the aerial and earth to their sockets. It may be found helpful to ascertain the nature of the desired programme by first tuning the station on the manual tuner.

Press the button allocated to the particular station. Turn the core adjustment (clockwise for increase in wavelength) above the button so that index mark coincides approximately with the wavelength required. Then carefully rotate the core for maximum output.

Adjust the aerial tuning trimmer below the button (clockwise for increase in wavelength) for maximum output.

Finally make a careful readjustment of each tuned circuit. The remainder of the tuned circuits associated with each button should be adjusted in the same manner as outlined above.

Console Modifications.

Same chassis as in table model, minus "Teleflie" and tuning indicator and associated components. A larger speaker is fitted.

RG and Auto RG

C33, C34, deleted. PU (700 ohms) connected via radiogram switch to top of VR1 and chassis via 5-pin plug and socket. Mains on/off switch incorporated with VR2. Mains input via pins three and four of 4-pin plug associated with VR2.

The set is a DC-AC model with careful HF filtering in the mains leads.

WINDINGS

| L | Ohms |
|----|------|
| 1 | .5 |
| 2 | 1 |
| 3 | .05 |
| 4 | .05 |
| 5 | 30 |
| 6 | 14 |
| 7 | 1.5 |
| 8 | 1 |
| 9 | .05 |
| 10 | .1 |
| 11 | 2.7 |
| 12 | 2.3 |
| 13 | 2 |
| 14 | 2 |
| 15 | 2.3 |
| 16 | 4 |
| 17 | 4 |
| 18 | 4 |
| 19 | 4 |
| 20 | 4 |
| 21 | 4 |
| 22 | 650 |
| 23 | .5 |
| 24 | 2.5 |
| 25 | 200 |
| 26 | 6 |
| 27 | 6 |

CONDENSERS

| C | Mfds | C | Mfds |
|----|----------|----|---------|
| 1 | .005 | 22 | .05 |
| 2 | 50 mmfd | 23 | .05 |
| 3 | .0008 | 24 | .05 |
| 4 | 5 mmfd | 25 | .05 |
| 5 | 5 mmfd | 26 | .00015 |
| 6 | 30 mmfd | 27 | .00016 |
| 7 | .5 | 28 | 50 mmfd |
| 8 | .005 | 29 | .0001 |
| 9 | .00015 | 30 | .05 |
| 10 | .00015 | 31 | .0001 |
| 11 | .05 | 32 | .005 |
| 12 | 30 mmfd | 33 | .03 |
| 13 | 10 mmfd | 34 | .1 |
| 14 | 556 mmfd | 35 | 2 |
| 15 | 50 mmfd | 36 | 50 |
| 16 | 15 mmfd | 37 | .03 |
| 17 | 316 mmfd | 38 | 50 |
| 18 | 130 mmfd | 39 | .03 |
| 19 | 340 mmfd | 40 | 24 |
| 20 | 316 mmfd | 41 | 16 |
| 21 | 316 mmfd | 42 | .01 |

RESISTANCES

| R | Ohms | R | Ohms |
|----|---------|-----|---------|
| 1 | 1 meg | 13 | 100,000 |
| 2 | 250 | 14 | 10,000 |
| 3 | 30,000 | 15 | 50,000 |
| 4 | 30,000 | 16 | 1,000 |
| 5* | 50,000 | 17 | 1 meg |
| 6 | 10,000 | 18 | 500,000 |
| 7 | 1 meg | 19 | 300 |
| 8 | 2 meg | 20 | 100,000 |
| 9 | 250,000 | 21 | 75 |
| 10 | 2 meg | 22 | 75 |
| 11 | 500,000 | VR1 | 500,000 |
| 12 | 2 meg | VR2 | 50,000 |

*100,000 ohms on RG models.