

Intermediate frequency 465 KC/S.

Circuit diagram of the Bush SW43 receiver. The numbers in circles refer to the speaker plug and socket connections, while inset on the right is a diagram of the underside of the socket.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 hexode C.G. decoupling ..	1,000,000
R2	V1 fixed G.B. resistance ..	100
R3	V1 osc. C.G. resistance ..	30,000
R4	V1, V2 S.G. and V1 osc. anode H.T. feed ..	20,000
R5	V2 C.G. decoupling ..	5,000,000
R6	V2 C.G. stabiliser ..	250
R7	V1 hex., V2 anodes decoupling ..	5,000
R8	I.F. stopper ..	250,000
R9	V3 signal diode load ..	1,000,000
R10	Manual volume control ..	500,000
R11	V3 C.G. I.F. stopper ..	100,000
R12	V3 G.B. resistance; A.V.C. delay ..	1,000
R13	V3 triode anode decoupling ..	10,000
R14	V3 triode anode load ..	50,000
R15	A.V.C. line decoupling ..	1,000,000
R16	V3 A.V.C. diode load ..	1,000,000
R17	Variable tone control ..	100,000
R18	V4 C.G. resistance ..	500,000
R19	V4 C.G. I.F. stopper ..	100,000
R20	V4 G.B. resistance ..	150
R21	Part of fixed T.C. circuit ..	10,000

CONDENSERS		Values (μF)
C1	Band-pass bottom coupling ..	0.06
C2	Band-pass M.W. top coupling ..	0.0000014
C3	Band-pass L.W. top coupling ..	0.0000024
C4	V1 cathode by-pass ..	0.1
C5	V1 osc. C.G. condenser ..	0.00005
C6	Osc. circuit M.W. fixed tracker ..	0.0004
C7*	Osc. anode, V1, V2 S.G.'s decoupling ..	2.0
C8	Osc. anode, V1, V2 S.G.'s R.F. by-pass ..	0.1
C9	V2 C.G. decoupling ..	0.1
C10	V1 hex. and V2 anodes decoupling ..	0.1
C11	I.F. by-pass ..	0.0001
C12	V3 signal diode coupling ..	0.0001
C13	A.F. coupling to V3 triode ..	0.005
C14	V3 A.V.C. diode coupling ..	0.0001
C15*	V3 cathode by-pass ..	50.0
C16*	V3 triode anode decoupling ..	2.0
C17	Part of variable T.C. circuit ..	0.02
C18	Feed-back tone corrector ..	0.5
C19*	V4 cathode by-pass (S.W. only) ..	50.0
C20*	H.T. smoothing ..	8.0
C21	V3 to V4 A.F. coupling ..	0.03
C22	Part of fixed tone corrector ..	0.02
C23*	H.T. smoothing ..	16.0
C24†	Band-pass pri. M.W. trimmer ..	0.00004
C25†	Band-pass pri. L.W. trimmer ..	0.00007
C26†	Band-pass primary tuning ..	—
C27†	Aerial circuit S.W. trimmer ..	0.00004
C28†	Band-pass sec. M.W. trimmer ..	0.00004
C29†	Band-pass sec. L.W. trimmer ..	0.00007
C30†	Band-pass sec. and S.W. aerial tuning ..	—
C31†	Oscillator circuit tuning ..	—
C32†	Osc. circuit M.W. tracker ..	0.0003
C33†	Osc. circuit L.W. tracker ..	0.0003
C34†	Osc. circuit S.W. trimmer ..	0.00004
C35†	Osc. circuit M.W. trimmer ..	0.00009
C36†	Osc. circuit L.W. trimmer ..	0.000275
C37†	1st I.F. trans. pri. tuning ..	0.0003
C38†	1st I.F. trans. sec. tuning ..	0.0003
C39†	2nd I.F. trans. pri. tuning ..	0.0003
C40†	2nd I.F. trans. sec. tuning ..	0.0003

* 0.0000025 in our chassis.

† Electrolytic.

‡ Variable.

§ Pre-set.

OTHER COMPONENTS

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial M.W. coupling coil ..	0.8
L2	Aerial L.W. coupling coil ..	48.0
L3	Band-pass primary coils {	2.2
L4		16.0
L5	Aerial S.W. coupling coil ..	0.25
L6	Aerial circuit S.W. tuning coil ..	0.05
L7	Band-pass secondary coils {	2.2
L8		16.0
L9	Osc. circuit S.W. tuning coil ..	0.05
L10	Osc. anode S.W. reaction ..	0.3
L11	Osc. circuit M.W. tuning coil ..	1.5
L12	Osc. anode M.W. reaction ..	1.3
L13	Osc. circuit L.W. tuning coil ..	2.5
L14	Osc. anode L.W. reaction ..	2.0
L15	1st I.F. trans. { Pri. ..	2.3
L16		2.3
L17	2nd I.F. trans. { Pri. ..	2.3
L18		2.3

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L19	Speaker speech coil ..	1.8
L20	Hum neutralising coil ..	0.17
L21	Speaker field coil ..	600.0
T1	Speaker input trans. { Pri. ..	250.0
	Sec. ..	0.4
	Pri. total ..	18.0
T2	Mains trans. { Heat. sec. total ..	0.1
	Rect. heat. sec. ..	0.1
	H.T. sec. total ..	225.0
S1-S19	Waveband switches ..	—
S20-22	Scale lamp switches ..	—
S23	Mains switch, ganged R10 ..	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 41STH*	230	2.0	70	4.5
V2 MVS/ Pen/B	230	3.4	70	1.1
V3 TDD4	103	2.6	—	—
V4 PenB4	245	68.0	265	9.3
V5 DW4/350	308†	—	—	—

* Oscillator anode 70 V, 3.7 mA.

† Each anode, A.C.

our receiver when it was operating on mains of 230 V, using the 230 V tapping on the mains transformer. The receiver

was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

GENERAL NOTES

Switches.—S1-S19 and S20-S22 are the wavechange and scale lamp switches, ganged in three rotary units beneath the chassis. The units are indicated in our under-chassis view, and are shown in detail in the diagrams on the right, as seen looking at the underside of the chassis, from the rear.

The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C closed.

Switch	S.W.	M.W.	L.W.
S1	C	O	O
S2	O	C	O
S3	O	O	C
S4	O	O	O
S5	C	O	O
S6	C	O	O
S7	O	O	C
S8	O	O	O
S9	C	O	O
S10	O	C	O
S11	O	O	C
S12	C	O	O
S13	C	O	O
S14	C	O	O
S15	C	O	O
S16	C	O	O
S17	O	C	O
S18	O	O	C
S19	C	O	O
S20	O	O	O
S21	O	C	O
S22	O	O	C

S23 is the Q.M.B. mains switch, ganged with the volume control R10.

Coils.—The signal frequency and oscillator coils are in a partitioned screened unit, with the wavechange switches, and several other components. This unit projects above and below the chassis deck. The coils and trimmers are indicated in detail in our side-chassis view, the metal side plate of the unit having been removed. In all there are eight coil formers, each carrying one or two coils, and six of them having trimmers at their ends.

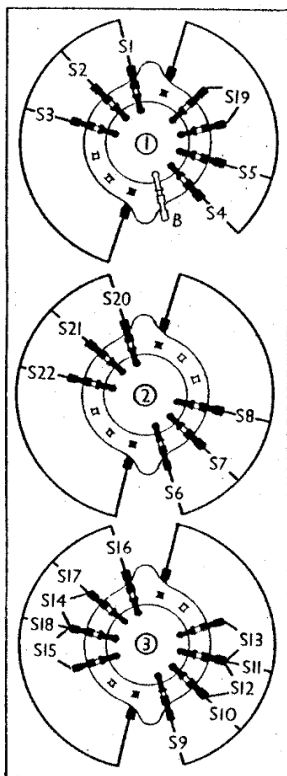
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The I.F. transformers **L15**, **L16** and **L17**, **L18** are in two screened units on the chassis deck, with their associated trimmers.

Scale Lamps.—These are three Ever Ready M.E.S. types, rated at 6.2 V, 0.3 A. They are switched by **S20-S22**.

External Speaker.—Provision is made, by a panel at the top of the back of the cabinet, for the use of a low impedance (20) external speaker. The internal speaker speech coil may be disconnected by a plug and socket device, also on the panel.

The external speaker impedance is the



Switch diagrams, looking from the rear of the underside of the chassis. The positions of the units are shown by numbers in circles and arrows in our under-chassis view on page VII.

same for the SUG43, but for the SUG43G and the RG43 it should be 100, since a different internal speaker is used in these models.

Condensers C7, C15, C16, C19.—These are two 2 μ F and two 50 μ F dry electrolytics in a single carton on the chassis deck. The black lead is the common negative of **C7** and **C16** (2 μ F) and the brown the common negative of **C15** and **C19**. The red lead to **V2** valveholder is the positive of **C7**, and the red lead to the junction of **R13**, **R14** is the positive of **C16**. The yellow lead to the junction of **R9** and **R12** is the positive of **C15**, and the yellow lead to **S19** on the first switch unit is the positive of **C19**.

Condensers C20, C23.—These are two dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The yellow lead is the positive of **C20** (8 μ F) and the red the positive of **C23** (16 μ F).

Condensers C32, C33.—These two pre-set trackers are mounted at the rear of the chassis, and are adjustable through two holes. **C32** is nearer the chassis deck.

Speaker Plug and Socket.—The speaker is connected to the receiver by a 4-pin plug, with a socket on the chassis. Only three of the pins are used. The connections and a diagram of the underside of the socket are included in our circuit diagram. The "grid" pin of the plug (pin 2 in our diagram) is blank. The red wire from the speaker goes to the "anode" pin (pin 1), the blue wire to pin 3, and the yellow wire to pin 4.

Chassis Divergency.—The makers' circuit diagram shows a 0.1 μ F tubular condenser connected across the speaker field. This is not present in our chassis, and is not shown in our circuit diagram.

CIRCUIT ALIGNMENT

I.F. Stages.—When adjusting a primary winding, connect a 15,000 Ω resistance and a 0.1 μ F condenser in series between the grid end of the secondary to earth, and when adjusting a secondary connect them from the anode end of the primary to earth.

Switch set to M.W., and tune to about 300 m. Connect signal generator to control grid (top cap) of **V2** and chassis. Feed in a 465 KC/S signal and adjust **C40** and **C39** for maximum output.

Transfer generator to top cap of **V1** and chassis, and adjust **C38** and **C37** for maximum output. Re-check all adjustments.

R.F. and Oscillator Stages.—S.W. Connect generator to **A** and **E** sockets, switch set to S.W., tune to 18 m. on scale, and feed in an 18 m. (16.67 MC/S) signal. Adjust **C34** for maximum output, using the peak which requires the lesser trimmer capacity. Adjust **C27** for maximum output. Check calibration at 50 m.

M.W.—Switch set to M.W., tune to 200 m. on scale, feed in a 200 m. (1,500 KC/S) signal, and adjust **C35** for maximum output on the peak requiring the lesser trimmer capacity. Tune to 300 m. on scale, feed in a 300 m. (1,000 KC/S) signal, and adjust **C28** and **C24** for maximum output.

Feed in a 500 m. (600 KC/S) signal, tune it in, and adjust **C32** for maximum output, rocking the gang for optimum results. Re-check at 300 m.

L.W.—Switch set to L.W., tune to 1,300 m. on scale, feed in a 1,300 m. (230.7 KC/S) signal, and adjust **C36** for maximum output. Tune to 1,500 m. on scale, feed in a 1,500 m. (200 KC/S) signal and adjust **C29** and **C25** for maximum output. Feed in an 1,800 m. (166.7 KC/S) signal, tune it in, and adjust **C33** for maximum output, rocking the gang for optimum results. Re-check at 1,300 m.