



V1 to V4 are all of the 13V I.H. type, with their heaters wired in parallel. The model 640 is similar except that no pick-up terminals are fitted, while the 670 radiogram has certain differences which are explained under General Notes.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial coupling condenser	0.0005
C2	M.W. and L.W. aerial coupling	0.005
C3	V1 tet. anode decoupling	0.1
C4	Small coupling	Very low
C5	V1 cathode by-pass	0.1
C6	V1 osc. C.G. condenser	0.0001
C7	Osc. circuit L.W. fixed trimmer	0.00007
C8	V1 osc. anode decoupling	0.1
C9	V1, V2 S.G.'s decoupling	0.1
C10	V2 C.G. decoupling	0.1
C11	V2 cathode by-pass	0.1
C12	Coupling to V3 A.V.C. diode	0.00005
C13	A.F. coupling to V3 triode	0.02
C14	I.F. by-pass	0.0005
C15*	V3 cathode by-pass	25.0
C16	V3 triode to V4 A.F. coupling	0.02
C17	Fixed tone corrector	0.001
C18*	V4 cathode by-pass	25.0
C19*	H.T. smoothing	8.0
C20*		16.0
C21	Mains R.F. by-pass	0.01
C22†	Aerial circuit S.W. trimmer	—
C23†	Aerial circuit M.W. trimmer	—
C24†	Aerial circuit L.W. trimmer	—
C25†	Aerial circuit tuning	0.0005
C26†	Oscillator circuit tuning	0.0005
C27†	Osc. circuit M.W. tracker	—
C28†	Osc. circuit L.W. tracker	—
C29†	Osc. circuit S.W. trimmer	—
C30†	Osc. circuit M.W. trimmer	—
C31†	Osc. circuit L.W. trimmer	—
C32†	1st I.F. trans. pri. tuning	—
C33†	1st I.F. trans. sec. tuning	—
C34†	2nd I.F. trans. pri. tuning	—
C35†	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES		Values (ohms)
R1	Aerial circuit shunt	10,000
R2	V1 tetrode C.G. decoupling	100,000
R3	V1 tetrode fixed G.B.	250
R4	V1 tet. anode H.T. feed	5,000
R5	V1 osc. C.G. resistance	25,000
R6	V1 osc. anode H.T. feed	20,000
R7	V1, V2 S.G.'s H.T. feed poten-	20,000
R8	tial divider resistances	50,000
R9	V2 fixed G.B. resistance	250
R10	I.F. stopper	100,000
R11	Manual volume control	500,000
R12	V3 signal diode load	500,000
R13	V3 G.B. and A.V.C. delay	10,000
R14	V3 triode anode load	250,000
R15	A.V.C. line decoupling	500,000
R16	V3 A.V.C. diode load	500,000
R17	V4 C.G. resistance	100,000
R18	V4 G.B. resistance	400

RESISTANCES		Values (ohms)
R1	Aerial circuit shunt	10,000
R2	V1 tetrode C.G. decoupling	100,000
R3	V1 tetrode fixed G.B.	250
R4	V1 tet. anode H.T. feed	5,000
R5	V1 osc. C.G. resistance	25,000
R6	V1 osc. anode H.T. feed	20,000
R7	V1, V2 S.G.'s H.T. feed poten-	20,000
R8	tial divider resistances	50,000
R9	V2 fixed G.B. resistance	250
R10	I.F. stopper	100,000
R11	Manual volume control	500,000
R12	V3 signal diode load	500,000
R13	V3 G.B. and A.V.C. delay	10,000
R14	V3 triode anode load	250,000
R15	A.V.C. line decoupling	500,000
R16	V3 A.V.C. diode load	500,000
R17	V4 C.G. resistance	100,000
R18	V4 G.B. resistance	400

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial L.W. choke	16.5
L2	Aerial S.W. coupling coil	0.1
L3	Aerial S.W. tuning coil	0.05
L4	Aerial M.W. tuning coil	3.0
L5	Aerial L.W. tuning coil	13.0
L6	Osc. circuit S.W. tuning coil	0.05
L7	Osc. circuit M.W. tuning coil	3.5
L8	Osc. circuit L.W. tuning coil	7.25
L9	Oscillator S.W. reaction coil	0.1
L10	Oscillator M.W. reaction coil	2.7
L11	Oscillator L.W. reaction coil	4.4
L12	1st I.F. trans.	Pri. 7.5
L13		Sec. 7.5
L14	2nd I.F. trans.	Pri. 7.5
L15		Sec. 7.5
L16	Speaker speech coil	1.9
L17	Hum neutralising coil	0.05
L18	Speaker field coil	1,000.0
T1	Speaker input	Pri. 410.0
		Sec. 0.35
T2	Mains	Pri., total 29.0
		Heater sec. 0.5
		Rect. heat. sec. 0.2
	H.T. sec., total 200.0	
Sr-Sr16	Waveband switches	—
Sr17	Mains switch, ganged R11	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 220 V, using the 225 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 400 V scale of a model 7 Universal Avometer, chassis being negative.

S.W.—Switch set to S.W., tune to 17.6 m. on scale, feed in a 17.6 m. (17 MC/S) signal, and adjust C29, then C22, for maximum output. Check the adjustments and calibration at 50 m. (6 MC/S).

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 15D1	233 Oscillator anode	3.3	88	5.5
V2 9D2	145 6.6	7.0	88	1.7
V3 11D3	255	0.2	—	—
V4 7D5	103	32.0	255	5.5
V5 R2	242	—	—	—
	298†	—	—	—

† Each anode, A.C.

GENERAL NOTES

Switches.—S1-S16 are the waveband switches, ganged in three rotary units beneath the chassis, which are indicated in our under-chassis view, and shown in detail in the diagrams on this page, where they are drawn as seen looking in the directions of the arrows in the under-chassis view.

The table (col. 3) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed.

S17 is the Q.M.B. mains switch, ganged with the volume control R11.

Coils.—The choke L1 is in an unscreened unit beneath the chassis, while L2-L11 are in six tubular units in screened compartments beneath the chassis, each unit having a trimmer mounted on the top of it.

The I.F. transformers L12, L13 and L14, L15 are in two screened units on the chassis deck, with their associated trimmers.

Scale Lamp.—This is a Vita M.E.S. type, rated at 12-14 V, 3 W. Its holder fits on the speaker unit.

I.F. Stages.—Connect signal generator to control grid (top cap) of V1 and chassis, and feed in a 464 KC/S signal. Adjust C35, C34, C33 and C32 in turn for maximum output.

R.F. and Oscillator Stages.—M.W.—Connect signal generator to A and E sockets, and feed in a 214 m. (1,400 KC/S) signal. Switch set to M.W., tune to 214 m. on scale, and adjust C30, then C23, for maximum output. Feed in a 500 m. (600 KC/S) signal, tune it in, and adjust C27 (nut) for maximum output, rocking the gang slightly for optimum results.

L.W.—Switch set to L.W., tune to 1,200 m. on scale, feed in a 1,200 m. (250 KC/S) signal, and adjust C31, then C24, for maximum output. Feed in a 1,714 m. (175 KC/S) signal, tune it in, and adjust C28 (screw) for maximum output, while rocking the gang for optimum results.

KOLSTER-BRANDES

640, 650, 670