

Circuit diagram of the Ultra 48 3-band superhet. A stage of signal frequency amplification is used in front of the triode-hexode frequency changer. C20 may be connected across the primary of T1, instead of being taken from the top of R21 to chassis. Intermediate frequency 456 KC/S.

COMPONENTS AND VALUES

RESISTANCES	Values (ohms)
R1	V1 C.G. decoupling ... 1,000,000
R2	V1 S.G. H.T. feed ... 30,000
R3	Sensitivity control circuit ... 2,000
R4	V1 fixed G.B. resistance ... 138
R5	V1 and V2 fixed G.B. resistance ... 1,000
R6	V1 anode decoupling ... 4,000
R7	V2 hexode C.G. resistance ... 1,000,000
R8	V2 hexode S.G.'s H.T. feed ... 30,000
R9	V2 fixed G.B. resistance ... 200
R10	V1 and V2 A.V.C. line decoupling ... 1,000,000
R11	V2 osc. C.G. resistance ... 25,000
R12	V2 osc. anode resistance ... 40,000
R13	V2 osc. C.G. S.W. stabiliser ... 60
R14	V3 C.G. decoupling ... 1,000,000
R15	V3 fixed G.B. resistance ... 30
R16	Manual volume control ... 1,000,000
R17	V4 signal diode load ... 500,000
R18	V4 pentode C.G. I.F. stopper ... 1,000
R19	V4 G.B. and A.V.C. delay voltage resistances ... 138
R20	V4 pentode anode stabiliser ... 60
R21	V4 A.V.C. diode load ... 250,000
R22	
R23	

CONDENSERS	Values (μF)
C1	V1 C.G. decoupling ... 0.05
C2	V1 S.G. by-pass ... 0.5
C3	V1 cathode by-pass ... 0.1
C4	V1 anode decoupling ... 0.01
C5	V1 and V2 A.V.C. line decoupling ... 0.05
C6	V2 hexode C.G. condenser ... 0.0001
C7	V2 hexode S.G.'s by-pass ... 0.1
C8	V2 cathode by-pass ... 0.5
C9	V2 osc. C.G. condenser ... 0.0001
C10	V2 osc. anode condenser ... 0.0001
C11	Osc. S.W. tracker ... 0.004
C12	Osc. L.W. trimmer ... 0.0001
C13	V3 C.G. decoupling ... 0.05
C14	V3 cathode by-pass ... 0.1
C15	A.F. coupling to V4 pentode ... 0.01
C16	I.F. by-pass ... 0.0002
C17	V4 cathode by-pass ... 50.0
C18*	V4 A.V.C. diode feed ... 0.0002
C19	Tone corrector ... 0.01
C20	H.T. smoothing ... 8.0
C21*	
C22*	
C23	Aerial S.W. trimmer ...
C24	Aerial M.W. trimmer ...
C25	Aerial L.W. trimmer ...
C26	Aerial circuit tuning ...
C27	V1 anode S.W. trimmer ...
C28	V1 anode M.W. trimmer ...
C29	V1 anode L.W. trimmer ...
C30	V1 anode circuit tuning ...
C31	Osc. S.W. trimmer ...
C32	Osc. M.W. trimmer ... 0.0006
C33	Osc. M.W. tracker ...
C34	Osc. L.W. trimmer ... 0.0003
C35	Osc. L.W. tracker ...
C36	Osc. circuit tuning ...
C37	1st I.F. trans. pri. tuning ...
C38	1st I.F. trans. sec. tuning ...
C39	2nd I.F. trans. pri. tuning ...
C40	2nd I.F. trans. sec. tuning ...

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial M.W. coupling coil ... 2.0
L2	Aerial L.W. coupling coil ... 80.0
L3	Aerial S.W. tuning coil ... 0.1
L4	Aerial M.W. and L.W. coils ... 4.1
L5	
L6	
L7	V1 anode circuit tuning coils ... 4.1
L8	
L9	Osc. S.W. grid coil ... 12.0
L10	Osc. anode S.W. tuning coil ... 0.1
L11	Osc. M.W. grid coil ... 1.0
L12	Osc. anode M.W. tuning coil ... 3.7
L13	Osc. L.W. grid coil ... 1.0
L14	Osc. anode L.W. tuning coil ... 11.0
L15	1st I.F. trans. (Primary) ... 4.2
L16	1st I.F. trans. (Secondary) ... 4.2
L17	2nd I.F. trans. (Primary) ... 4.2
L18	2nd I.F. trans. (Secondary) ... 4.2
L19	Speaker speech coil ... 2.0
L20	Hum neutralising coil ... 0.1
L21	Speaker field coil ... 930.0
T1	Output trans. (Pri. total) ... 325.0
	Heater sec. ... 0.18
	Rec. heat. sec. ... 23.0
	H.T. sec. total ... 0.14
T2	Mains trans. ... 492.0
S1-17	Waveband switches ...
S18	Sensitivity switch ...
S19	Mains circuit switch, ganged ...
R16	

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 3) are those measured in our receiver when it was operating on mains of 220 V, using the 200-220 V tapping on the mains transformer. The set was tuned to the lowest wavelength on the medium band and both the volume and sensitivity controls were at maximum (the latter down) but there was no signal input.

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 AC/VP1	265	3.6	235	0.8
V2 AC/TH1*	285	2.5	180	2.8
V3 AC/VP1	285	23.0	285	6.3
V4 AC/2Pen-DD	270	30.0	285	7.5
V5 6U3	345†			

* Oscillator anode, 100 V, 3.6 mA.

† Each anode, A.C.

GENERAL NOTES

Switches.—S1-S17 are the wavechange switches, ganged in three rotary units beneath the chassis, and indicated in our under-chassis view. The arrows show the directions in which the units are seen in the diagrams on page VIII. Note that some of the tags are blank, and there is a fourth setting of the control knob. The table (page VIII), gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C, closed.

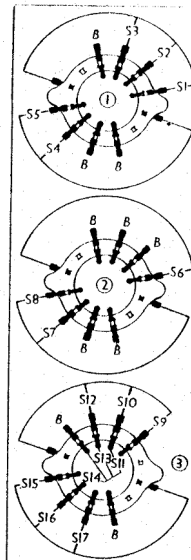
S18 is the Q.M.B. sensitivity switch, which closes when the knob is depressed.

S19 is the Q.M.B. mains switch, ganged with the volume control R16.

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

Coils. L1-L5, L6-L8, L9-L14 and the I.F. transformers L15, L16 and L17, L18 are in five screened units on the chassis deck. The trimmers in the first three units are reached through holes near the bottom of the cans. Their positions are roughly indicated by arrows in the plan chassis view. The I.F. trimmers are at the tops of their respective cans. Most of the units also contain one or more condensers and resistances, which may be identified by their marked values or colour coding.

Scale Lamps. These are two Osram 4.5 V 0.3 A M.E.S. types, wired in parallel and run from a tapping on the T2 heater secondary.



The three switch units, seen from the underside of the chassis, looking in the direction of the arrows in the under-chassis view. S11, S13 and S14 are formed by a shorting plate fitted to the rotor of the third unit. The fourth (fully clockwise) position of the control knob is not used.