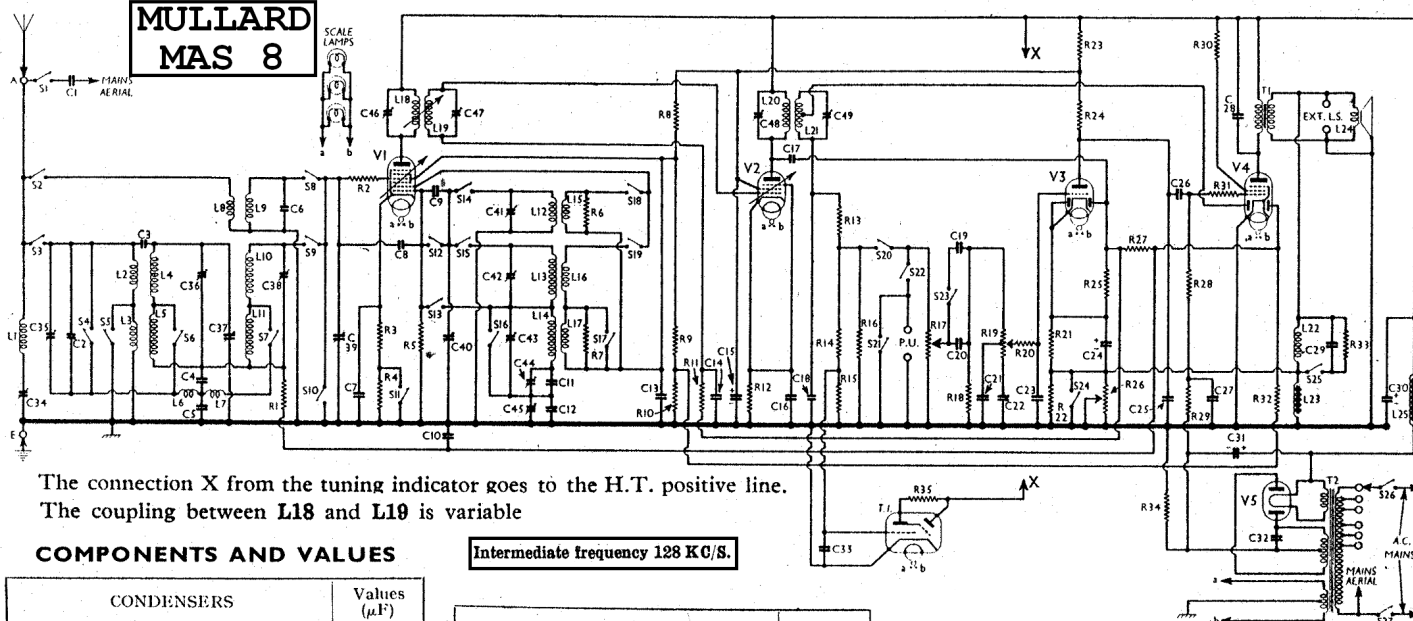


MULLARD MAS 8



The connection X from the tuning indicator goes to the H.T. positive line.
The coupling between L18 and L19 is variable

COMPONENTS AND VALUES

Intermediate frequency 128 KC/S.

CONDENSERS	Values (μF)
C1 Mains aerial condenser	0.0005
C2 Image suppresser (fixed)	0.00002
C3 M.W. and L.W. aerial coupling	0.0001
C4 Parts band-pass coupling	0.016
C5 Aerial circuit S.W. trimmer	0.025
C6 Aerial circuit S.W. trimmer	0.000004
C7 V1 cathode by-pass	0.05
C8 Small coupling	0.000002
C9 V1 osc. C.G. condenser	0.0001
C10 A.V.C. line decoupling	0.1
C11 Osc. circuit L.W. fixed tracker	0.00065
C12 Osc. circuit M.W. fixed tracker	0.001375
C13 V1 osc. anode decoupling	0.1
C14 V2 C.G. decoupling	0.05
C15 V2 S.G. and V3 triode anode decoupling	32.0
C16 V2 cathode by-pass	0.1
C17 Coupling to V3 A.V.C. diode	0.00003
C18 I.F. by-pass	0.00005
C19 Bass compensating condenser	0.004
C20 A.F. coupling to V3 triode	0.0005
C21 Parts of variable tone control filter	0.0004
C22 I.F. by-pass	0.0001
C23 V3 cathode by-pass	50.0
C24 I.F. by-pass	0.0004
C25 V3 triode to V4 A.F. coupling	0.0008
C26 V4 C.G. decoupling	0.1
C27 Fixed tone corrector	0.002
C28 Part of neg. feed-back circuit	0.05
C29 H.T. smoothing	32.0
C30 V5 anode R.F. by-pass	0.02
C31 T.I. C.G. decoupling	0.05
C32 Aerial I.F. filter tuning	0.0001
C33 Image suppression adjuster	0.00003
C34 Band-pass pri. M.W. trimmer	0.00003
C35 Band-pass primary tuning	0.00049
C36 Band-pass sec. M.W. trimmer	0.00003
C37 Band-pass secondary and S.W. aerial tuning	0.00049
C38 Oscillator circuit tuning	0.00049
C39 Osc. circuit S.W. trimmer	0.00003
C40 Osc. circuit M.W. trimmer	0.00003
C41 Osc. circuit L.W. trimmer	0.00003
C42 Osc. circuit L.W. tracker	0.00017
C43 Osc. circuit M.W. tracker	0.00017
C44 1st I.F. trans. pri. tuning	0.00017
C45 2nd I.F. trans. sec. tuning	0.00017
C46 2nd I.F. trans. pri. tuning	0.00017
C47 2nd I.F. trans. sec. tuning	0.00017

RESISTANCES	Values (ohms)
R1 V1 pent. C.G. decoupling	100,000
R2 V1 pent. C.G. stopper	32
R3 V1 fixed G.B. resistance	250
R4 Radio muting on gram.	2,500
R5 V1 osc. C.G. resistance	50,000
R6 Osc. circuit S.W. reaction damping	10,000
R7 Osc. circuit L.W. reaction damping	10,000
R8 Parts V1, V2 S.G.'s, V1 osc. anode, V3 triode anode H.T. feed; V4 A.V.C. delay diode (pos. bias pot.)	25,000
R9 V2 C.G. decoupling	32,000
R10 V2 fixed G.B. resistance	50,000
R11 Part V4 signal diode load	2,000,000
R12 T.I. C.G. feed potentiometer	5,000,000
R13 Part V4 signal diode load	1,600,000
R14 Manual volume control	600,000
R15 V3 triode C.G. and parts variable tone control	350,000
R16 V3 G.B. resistance	800,000
R17 Neg. feed-back coupling	320,000
R18 Part of pot. with R8, R9, R10	160,000
R19 V3 triode anode load	3,200
R20 V3 A.V.C. diode load	20
R21 Variable neg. feed-back control, ganged R10	12,300*
R22 V3 A.V.C. diode to V4 delay diode coupling	100,000
R23 V4 C.G. resistance	500,000
R24 V4 C.G. decoupling	200
R25 V4 S.G. H.T. feed resistance	1,000,000
R26 V4 grid stopper	400,000
R27 V4 delay diode load	320,000
R28 Part neg. feed-back circuit	1,000
R29 V4 auto-G.B. resistance	9,000,000†
R30 T.I. anode H.T. feed	800
R31	125
R32	2,000,000

* Approx. value. One 20,000 Ω and one 32,000 Ω in parallel.
† One 5 MO and one 4 MO in series.

GENERAL NOTES

Switches.—S1 is the mains aerial switch, operated by a lever mounted at the rear of the chassis near the aerial and earth sockets. With the switch lever up, one side of C1 is connected to the aerial circuit. With the lever down, C1 is disconnected. In addition, the rotor contact of the switch is earthed in this position (not shown in our circuit diagram).

S2-S22 and S24, S25 are the waveband and radio-gram switches, ganged in four rotary units beneath the chassis. Three of these are operated by a common shaft, while the fourth is controlled by a flexible cable linked up with the other three units. They are all indicated in our under-chassis view, and shown in detail in the diagrams on page VIII, where they are as seen looking from the rear of the underside of the chassis.

The table (page VIII) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed. The fourth unit really only has three positions, as it does not move when the control is rotated from M.W. to L.W. or vice-versa.

S23 is the bass compensator switch, operated by a lever at the rear of the chassis. When the lever is up, S23 is closed, and when it is down it is open.

S26, S27 are the Q.M.B. mains switches, ganged in a rotary unit and normally operated by a knob at the right hand side of the cabinet. They are therefore not shown in our chassis illustrations.

Coils.—L1; L2-L5; L10, L11; L13, L14, L16, L17

and the I.F. transformers L18, L19 and L20, L21 are in six screened units on the chassis deck. All but the fourth of these have a trimmer at the top of their cans; the fourth has two trimmers. The L20, L21 unit has a shielding cap over its trimmer.

L6, L7; L8, L9 and L12, L15 are on three small unscreened tubular formers beneath the chassis. L22, L23 and L25 are also beneath the chassis.

Scale Lamps.—These are three Philips M.E.S. types with frosted tubular bulbs, type 8042-07.

CIRCUIT ALIGNMENT

I.F. Stages.—Adjust band-width and volume controls to maximum (knob in upper right hand corner), and switch set to L.W. Short-circuit R5, C10, C14 and L23, which puts the oscillator, A.V.C. and feed-back circuits out of action.

Connect signal generator to control grid (top cap) of V1, via a 0.32 μF condenser, and chassis, and feed in a 128 KC/S signal. Shunt L18 with a 10,000 Ω resistor and a 0.1 μF condenser connected in series from anode of V1 to chassis. Shunt L21 with a 25,000 Ω resistor. Adjust C48 and C47, then C48 again, for maximum output. Remove damping.

Shunt L19 with a 10,000 Ω resistor and a 0.1 μF condenser connected in series from the grid of V2 to chassis. Shunt L20 with a 25,000 Ω resistance and a 0.1 μF condenser in series from the anode of V2 to chassis.

Adjust C49 and C46, then C49 again, for maximum output. Remove damping and the short circuits across R5, C10, C14 and L23. Seal the trimmers.

R.F. and Oscillator Stages.—Earth the chassis, and

L.W.—Switch set to L.W., and feed in a 395 KC/S (760 m.) signal. Connect a 0.1 μF condenser from oscillator grid of V1 to chassis. Connect up auxiliary receiver as on M.W., and tune set under alignment for maximum output. Disconnect aux. receiver, remove 0.1 μF condenser from oscillator grid of V1 and re-connect output meter to set being aligned. Adjust C43 for maximum output.

Feed in a 160 KC/S (1,875 m.) signal, connect 0.1 μF condenser from osc. grid of V1 to chassis, and connect aux. receiver again. Adjust set being aligned for maximum output. Disconnect aux. receiver, remove 0.1 μF condenser and re-connect output meter to set being aligned. Adjust C44 for maximum output.

S.W.—Switch set to S.W., and turn condenser to bear on jig. Feed in a 17 MC/S (17.6 m.) signal to aerial socket via a S.W. artificial aerial, and adjust C41 for maximum output. If two tuning positions are found, use that requiring the higher trimmer capacity.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 223 V, using the 220 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.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 FC4	248	0.6	50	2.8
V2 VP4B	50	1.2	—	—
V3 TDD4	248	8.0	150	2.7
V4 Pen4DD	62	0.7	—	—
V5 DW2	237	29.0	248	8.2
T.I. TV4	260†	0.1	—	—
	18	0.5	—	—
	248	0.5	—	—

† Each anode, A.C.

OTHER COMPONENTS	Approx. Values (ohms)
L1 Aerial I.F. filter coil	125.0
L2 Aerial band-pass coupling coils	27.0
L3	110.0
L4 Band-pass primary coils	6.0
L5	23.0
L6 Band-pass coupling coils	1.5
L7	1.5
L8 Aerial S.W. coupling coil	3.0
L9 Aerial S.W. tuning coil	0.05
L10 Band-pass secondary coils	6.0
L11	23.0
L12 Osc. circuit S.W. tuning coil	0.05
L13 Osc. circuit M.W. tuning coil	11.0
L14 Osc. circuit L.W. tuning coil	30.0
L15 Oscillator S.W. reaction	0.75
L16 Oscillator M.W. reaction	3.5
L17 Oscillator L.W. reaction	8.0
L18 1st I.F. trans. Pri.	130.0
L19 2nd I.F. trans. Sec.	130.0
L20 2nd I.F. trans. Pri.	130.0
L21 2nd I.F. trans. Sec., total	180.0
L22 Parts of negative feed-back circuit	150.0
L23 Speaker speech coil	2.5
L24 H.T. smoothing choke	3.5
L25	350.0
T1 Output transformer Pri.	400.0
T2 Mains trans. Heater sec.	0.6
	0.05
	0.175
	330.0
S1 Mains aerial switch	—
S2-S19 Waveband switches	—
S20-22 Radio-gram change switches	—
S23 Bass compensator switch	—
S24, 25 Negative feed-back switches	—
S26, 27 Ganged mains switches	—