

Intermediate frequency 465 KC/S.

Circuit diagram of the McMichael 362 3-band A.C. superhet. S25 and S26 are jack switches. Alignment is accomplished by fixed tracking condensers and variable trimmers on all bands.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	Aerial series resistance (L.W.)	3,000
R2	V1 C.G. resistance	1,000,000
R3	V1 C.G. decoupling	1,000,000
R4	V1 S.G. H.T. feed	10,000
R5	V1 fixed G.B. resistance	100
R6	V2 hexode C.G. decoupling	1,000,000
R7	V2 hexode S.G. H.T. feed	50,000
R8	V2 fixed G.B. resistance	200
R9	Osc. C.G. resistance	50,000
R10	Osc. C.G. series resistance (S.W.)	100
R11	Osc. C.G. series resistance (M.W.)	2,500
R12	Osc. C.G. series resistance (L.W.)	4,500
R13	Osc. anode resistance	40,000
R14	V3 C.G. decoupling	500,000
R15	V3 S.G. H.T. feed	10,000
R16	V3 fixed G.B. resistance	100
R17	V4 signal diode load	500,000
R18	Manual volume control	500,000
R19	V4 C.G. I.F. stopper	100,000
R20	V4 G.B. and A.V.C. delay voltage resistances	150
R21	V4 anode circuit stabiliser	350
R22	V4 anode circuit stabiliser	50
R23	V4 A.V.C. diode load	500,000
R24	V4 A.V.C. diode load	500,000
R25	Variable tone control	100,000
R26	H.T. smoothing	500
R27	H.T. circuit ballast	40,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial S.W. coupling coil	0.25
L2	Aerial S.W. tuning coil	Very low
L3	Aerial M.W. coupling coil	2.0
L4	Aerial M.W. tuning coil	3.5
L5	Aerial L.W. coupling coil	23.0
L6	Aerial L.W. tuning coil	28.0
L7	H.F. trans. S.W. pri.	0.25
L8	H.F. trans. S.W. sec.	Very low
L9	H.F. trans. M.W. pri.	2.0
L10	H.F. trans. M.W. sec.	3.5
L11	H.F. trans. L.W. pri.	7.5
L12	H.F. trans. L.W. sec.	28.0
L13	V2 hexode S.G. S.W. choke	Very low
L14	Osc. S.W. grid coil	7.5
L15	Osc. S.W. tuning coil	Very low
L16	Osc. M.W. grid coil	1.5
L17	Osc. M.W. tuning coil	2.2
L18	Osc. L.W. grid coil	2.0
L19	Osc. L.W. tuning coil	5.0
L20	1st I.F. trans. Pri.	4.5
L21	1st I.F. trans. Sec.	4.5
L22	2nd I.F. trans. Pri.	4.5
L23	2nd I.F. trans. Sec.	4.5
L24	Speaker speech coil	2.0
L25	Hum neutralising coil	0.2
L26	Speaker field coil	1,500.0
T1	Output trans. Pri.	450.0
	Output trans. Sec.	0.5
	Output trans. Pri. total	23.0
T2	Mains trans. Heater sec.	0.05
	Mains trans. Rect. heat. sec.	0.1
	Mains trans. H.T. sec. total	420.0
S1-24	Waveband switches	—
S25	Gram. pick-up switch	—
S26	Int. speaker switch	—
S27	Mains switch, ganged R18	—

CONDENSERS		Values (μF)
C1	Aerial series condenser	0.0002
C2	Aerial circuit L.W. trimmer	0.00005
C3	V1 C.G. condenser	0.001
C4	V1 C.G. decoupling	0.1
C5	V1 C.G. decoupling	0.005
C6	V1 S.G. by-pass	0.1
C7	V1 cathode by-pass condensers	0.1
C8	V1 cathode by-pass condensers	0.01
C9	H.F. trans. sec. L.W. trimmer	0.00005
C10	V2 hexode C.G. decoupling	0.1
C11	V2 hexode S.G. by-pass	0.1
C12	V2 cathode by-pass	0.1
C13	Osc. C.G. condenser	0.001
C14	Osc. C.G. series condenser (S.W.)	0.0001
C15	Osc. C.G. series condenser (M.W.)	0.0001
C16	Osc. S.W. tracker	0.00354
C17	Osc. M.W. tracker	0.000618
C18	Osc. L.W. trimmer	0.000075
C19	Osc. L.W. tracker	0.000216
C20	Osc. anode condenser	0.0001
C21	V3 C.G. decoupling	0.1
C22	V3 S.G. by-pass	0.1
C23	V3 cathode by-pass	0.1
C24	I.F. by-pass	0.0001
C25	L.F. coupling to V4 pentode	0.005
C26	H.T. supply H.F. by-pass	0.1
C27*	V4 cathode by-pass	25.0
C28	V4 A.V.C. diode feed	0.0001
C29	Fixed tone corrector	0.002
C30	Part of T.C. filter	0.03
C31*	H.T. smoothing	8.0
C32*	H.T. smoothing	8.0
C33†	Aerial circuit S.W. trimmer	—
C34†	Aerial circuit M.W. trimmer	—
C35†	Aerial circuit L.W. trimmer	—
C36†	Aerial circuit tuning	—
C37†	H.F. trans. sec. S.W. trimmer	—
C38†	H.F. trans. sec. M.W. trimmer	—
C39†	H.F. trans. sec. L.W. trimmer	—
C40†	H.F. trans. sec. tuning	—
C41†	Osc. circuit S.W. trimmer	—
C42†	Osc. circuit M.W. trimmer	—
C43†	Osc. circuit L.W. trimmer	—
C44†	Osc. circuit tuning	—
C45†	1st I.F. trans. pri. tuning	—
C46†	1st I.F. trans. sec. tuning	—
C47†	2nd I.F. trans. pri. tuning	—
C48†	2nd I.F. trans. sec. tuning	—

\* Electrolytic. † Variable. ‡ Pre-set.

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 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 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 AC/VP1	240	12.0	200	3.1
V2 AC/TH1*	240	1.1	55	3.2
V3 AC/VP1	240	11.0	200	2.9
V4 AC/2Pen/DD	225	29.0	240	6.1
V5 UU3	350†	—	—	—

\* Oscillator anode, 70 V, 4.9 mA.  
† Each anode, A.C.

GENERAL NOTES

**Switches.**—S1-S24 are the wavechange switches, in three ganged rotary units beneath the chassis, indicated in our under-chassis view by numbers in circles and arrows. The latter show the directions in which the units are viewed in the diagrams on page VIII.

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

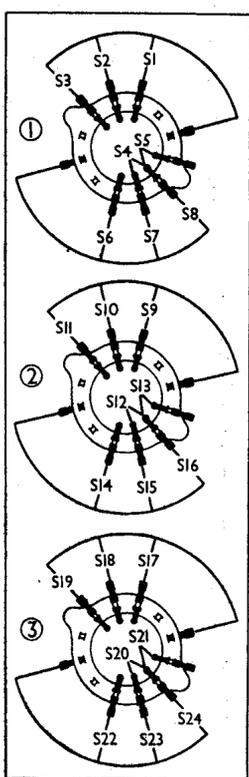
Switch	S.W.	M.W.	L.W.
S1	C	O	O
S2	O	C	O
S3	O	O	C
S4	C	O	O
S5	O	C	O
S6	C	O	O
S7	O	C	O
S8	O	O	C
S9	C	O	O
S10	O	C	O
S11	O	O	C
S12	C	O	O
S13	O	C	O
S14	C	O	O
S15	O	C	O
S16	O	O	C
S17	C	O	O
S18	O	C	O
S19	O	O	C
S20	C	O	O
S21	O	C	O
S22	C	O	O
S23	O	C	O
S24	O	O	C

**S25** and **S26** are two jack switches, at the rear of the chassis, for pick-up and internal speaker switching respectively. The switches are normally closed but when the pick-up or external speaker twin plug is fully inserted, the appropriate switch opens.

**S27** is the Q.M.B. mains switch, ganged with the volume control, **R18**.

**Coils.**—**L1-L6**, **L7-L12**, **L14-L19** and the I.F. transformers **L20**, **L21** and **L22**, **L23** are in five screened units on the chassis deck. Each of the first three units contains three trimmers, reached through holes in the side of the screen, and numbered from top to bottom in our plan chassis view. Each of these units also contains one or more fixed condensers. The I.F. transformers have their trimmers at the tops of the screens, the second

transformer unit also containing **C28**. **L13** is a small single layer choke, beneath the chassis.



**Condensers C17, C18, C19.**—These are all inside the third (oscillator) coil unit. **C17** is the larger of the two flat ceramic cased types, **C19** the smaller, and **C18** the small cup-type ceramic at the top of the unit.

**Scale Lamp.**—This is an Osram 6.2 V, 0.3 A M.E.S. type.

**External Speaker.**—Two sockets are provided at the rear of the chassis for the connection of a low resistance

Switch diagrams, looking at the underside of the chassis in the directions indicated by the arrows in the under-chassis view.

external speaker (20). By pushing the plug of this speaker fully in, **S26** opens, and the internal speaker is disconnected.

**Condensers C31, C32.**—These are two 8μF dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The red lead going to the right hand tag on **T1** is the positive of **C31**, and the red lead to the second tag

from the right is the positive of **C32**. **Resistances R26, R27.**—These are mounted on the speaker unit. **R26** is the larger of the two (green body).

**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Connect a 0.1 μF or larger swamp condenser across the oscillator section of the gang (**C44**). Switch set to M.W., lift off thimble cap of **V2** and connect in its place one lead from the signal generator, the other going to chassis. Feed in a 465 KC/S signal, and adjust **C48**, **C47**, **C46** and **C45**, in that order, for maximum output, keeping the input low to avoid A.V.C. action. Finally check by moving the generator over a range of about 5 KC/S each side of the 465 KC/S setting, watching the output meter to see whether a symmetrical tuning curve has been obtained. Remove swamp condenser, and replace **V2** cap.

**H.F. and Oscillator Stages.**—Switch set to L.W., tune to 1,000 m. on scale, and inject a 300 KC/S (1,000 m.) signal into the A and E sockets. Adjust **C43**, then **C39** and **C35** for maximum output.

Switch set to M.W., and tune until upper end of pointer just coincides with lower edge of "RAD. LYONS" (214 m.) Inject a 1,400 KC/S (214 m.) signal, and adjust **C42**, **C38** and **C34** for maximum output.

Switch set to S.W., and tune to 19 m. on the scale. Inject a 15.79 MC/S (19 m.) signal and adjust **C41** for maximum output. The correct peak is that obtained with **C41** nearer minimum (slacker screw position). Then adjust **C37** and **C33** for maximum output.

As there may be interaction between the various circuits on the S.W. band, repeat the adjustments until the maximum output reading is obtained at the correct tuning point on the scale.