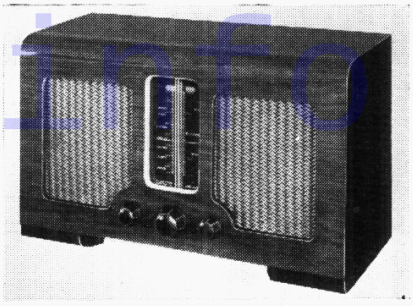
"TRADER" SERVICE SHEET

998

McMICHAEL 508U



TWIN speakers are fitted in the McMichael 508U, a compact 3-band superhet using four valves (and a rectifier) designed to operate from A.C. or D.C. mains of 190-250 V, 40-100 c/s in the case of A.C.

A useful feature in the chassis construction is the grouping of all the alignment adjustments at the rear of the chassis, where they can be comfortably reached without dismantling the set. If the chassis is removed, it comes out in a complete compact unit.

Release date and original price: September 1950, £14 14s. 6d. Purchase tax extra.

CIRCUIT DESCRIPTION

Input from self-contained frame winding or external aerial is coupled by coils **L2, L3** to single-tuned circuits **L4, C31** (M.W.) and **L5, C31** (L.W.) which precede triode-hexode valve **(V1, Mullard UCH42)** operating as frequency changer with internal coupling.

Triode oscillator grid coils **L6** (M.W.) and **L7** (L.W.) are tuned by **C32.** Parallel trimming by **C33** and **C11, C34** respectively; series tracking by **C12** and **C13.** Inductive reaction coupling by **L8** and **L9.**

Second valve **(V2, Mullard UF41)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C6, L10, L11, C7** and **C16, L12, L13, C18.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Mullard UBC41).** Audio-frequency component in rectified output is developed across **R11,** which acts as load resistor, and passed via **C21** to C.G. of triode section, which operates as A.F. amplifier. I.F. filtering in diode circuit by **C18, R10, C19,** and in triode anode circuit by **C23.**

Second diode of **V3,** fed from **V2** anode via **C20,** provides D.C. potential which is developed across load resistor **R17** and fed back via decoupling circuit to F.C. and I.F. valves, giving automatic gain control. Delay voltage, together with

(Continued overleaf)

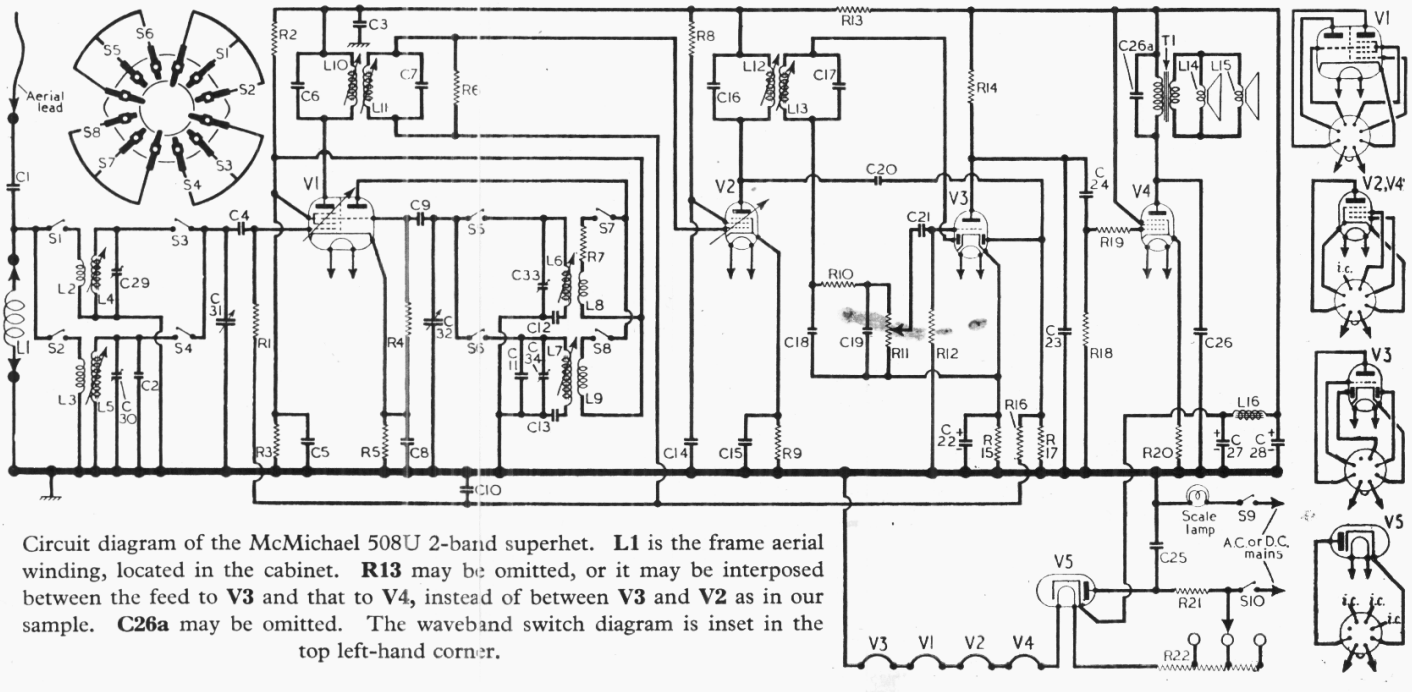
COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 hex. C.G. ...	470kΩ	E3
R2	V1 S.G. feed potential divider ...	12kΩ	E3
R3		27kΩ	E3
R4	V1 osc. C.G. ...	47kΩ	F4
R5	V1 fixed G.B. ...	220Ω	E3
R6	I.F. trans. shunt ...	1MΩ	E4
R7	Reaction stabiliser	470Ω	F4
R8	V2 S.G. H.T. feed ...	47kΩ	E4
R9	V2 fixed G.B. ...	220Ω	E4
R10	I.F. stopper ...	27kΩ	D4
R11	Volume control ...	250kΩ	E3
R12	V2 triode C.G. ...	2·2MΩ	D4
R13	H.T. feed	*1·1kΩ	E3
R14	V3 anode load ...	100kΩ	D4
R15	V3 G.B.	2·2kΩ	D4
R16	A.G.C. decoupling	470kΩ	D4
R17	A.G.C. diode load ...	1MΩ	D4
R18	V4 C.G.	470kΩ	D3
R19	Grid stopper ...	27kΩ	D4
R20	V4 G.B.	150Ω	D3
R21	Surge limiter ...	250Ω	G4
R22	Heater ballast ...	†1,250Ω	A2

*Made up of two 2·2kΩ resistors in parallel.
†tapped at 850Ω + 200Ω + 200Ω from V5 heater.

	CAPACITORS	Values	Locations
C1	Aerial isolator ...	0·005μF	B2
C2	L.W. trimmer ...	75pF	F4
C3	R.F. by-pass ...	0·1μF	E4
C4	V1 hex. C.G. ...	100pF	F3
C5	V1 S.G. decoup. ...	0·1μF	E4
C6	1st I.F. trans. tuning ...	125pF	B2
C7		125pF	B2
C8	V1 cath. by-pass ...	0·1μF	E4
C9	V1 osc. C.G. ...	100pF	F3
C10	A.G.C. line decoup.	0·1μF	E3
C11	L.W. trimmer ...	100pF	E4
C12	M.W. tracker ...	590pF	F4
C13	L.W. tracker ...	220pF	E4
C14	V2 S.G. decoup. ...	0·1μF	D4
C15	V2 cath. by-pass ...	0·1μF	E4
C16	2nd I.F. trans. tuning ...	125pF	C2
C17		125pF	C2
C18	I.F. by-passes ...	75pF	D4
C19		75pF	D3
C20	A.G.C. diode coup.	25pF	D4
C21	A.F. coupling ...	0·01μF	D4
C22*	V3 cath. by-pass ...	50μF	D4
C23	I.F. by-pass ...	500pF	D4
C24	A.F. coupling ...	0·01μF	D3
C25	R.F. filter	0·01μF	G3
C26	Tone corrector ...	0·005μF	D3
C26a		0·01μF	C2
C27*	H.T. smoothing ...	32μF	G3
C28*		32μF	G3
C29‡	M.W. trimmer ...	—	F4
C30‡	L.W. trimmer ...	—	F4
C31†	Aerial tuning ...	—	B1
C32†	Oscillator tuning ...	—	B1
C33‡	M.W. trimmer ...	—	F4
C34‡	L.W. trimmer ...	—	F4

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the McMichael 508U 2-band superhet. **L1** is the frame aerial winding, located in the cabinet. **R13** may be omitted, or it may be interposed between the feed to **V3** and that to **V4,** instead of between **V3** and **V2** as in our sample. **C26a** may be omitted. The waveband switch diagram is inset in the top left-hand corner.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	Frame aerial ...		—	—
L2	Aerial coupling coils		0·2	G4
L3			0·3	F4
L4	Aerial tuning coils		2·5	G4
L5			15·0	F4
L6	Oscillator tun. coils		3·5	F4
L7			7·0	F4
L8	Oscillator reaction coils		1·6	F4
L9			2·6	F4
L10	1st I.F. trans.	Pri.	6·0	B2
L11		Sec.	6·0	B2
L12	2nd I.F. trans.	Pri.	6·0	C2
L13		Sec.	6·0	C2
L14	Speech coils ...		2·75	A1
L15			2·75	C1
L16	H.T. smoothing choke		240·0	A2
T1	Primary		400·0	C1
	Secondary		0·2	
S1-S8	Waveband switches		—	E3
S9, S10	Mains sw. g'd R11		—	E3

Circuit Description—*continued*

G.B. for triode section, is obtained from the drop along **R15.**

Resistance-capacitance coupling by **R14, C24** and **R18** between **V3** triode and pentode output valve **(V4, Mullard UL41),** whose output is fed to twin speakers connected in parallel. Fixed tone correction by **C26** and **C26a.** Feed-back is introduced by the omission of a cathode by-pass capacitor.

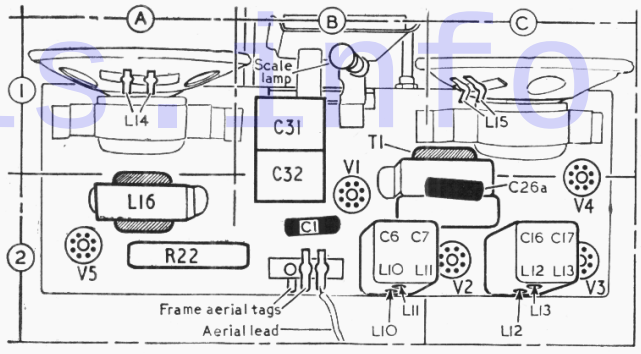
H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Mullard UY41)** which with D.C. mains behaves as a low resistance. Smoothing is effected by iron-cored choke **L16** and electrolytic capacitors **C27, C28.** Valve heaters, together with ballast resistor **R22** and scale lamp, are in series across the mains input circuit.

CIRCUIT ALIGNMENT

All alignment adjustment heads face the rear of the chassis and can be adjusted while the chassis is in the cabinet. If the chassis is removed, the tuning scale comes out with it.

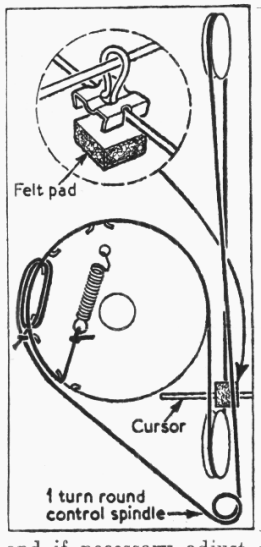
I.F. Stages.—Connect signal generator, via a 0.1 μF capacitor, to control grid (pin 6) of **V1** and chassis, and turn the gang and volume control to maximum. Feed in a 470 kc/s (638.3 m) signal, and adjust the cores of **L13** and **L12** (location reference C2) and **L11, L10** (B2) for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum capacitance, the cursor should cover the two datum dots just below the bottom of the scales. Transfer signal generator leads to **A** and **E** sockets. All adjustments are found at location reference F4.



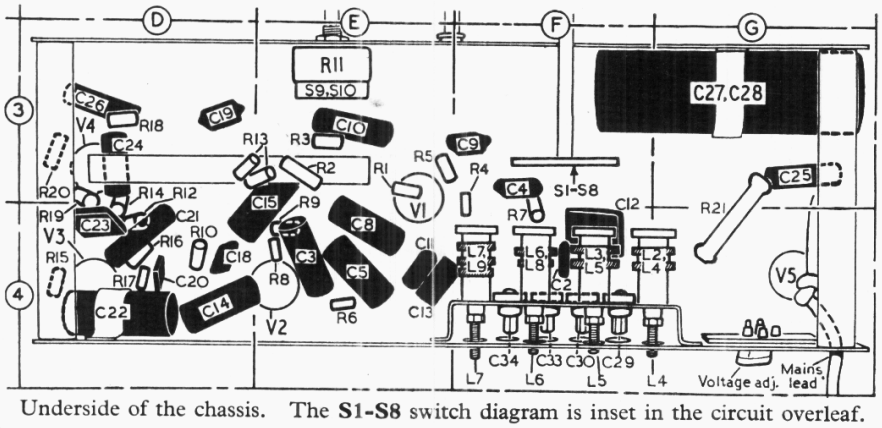
Plan view of the chassis. The frame aerial leads to the tag shown at the rear hang down centrally from the top of the cabinet.

M.W.—Switch set to M.W., tune to 190 m on scale, feed in a 190 m (1,579 kc/s) signal, and adjust **C33** and **C29** for maximum output. Check calibration at 500 m, and if necessary adjust the cores of **L6** and **L4** while feeding in a 600 kc/s signal.



Sketch of the tuning drive system, as seen from the rear of the chassis, neglecting obstructions, when the gang is at maximum capacitance.

L.W.—Switch set to L.W., tune to 900 m on scale, feed in a 900 m (333.4 kc/s) signal, and adjust **C34** and **C30** for maximum output. Check calibration at 1,800 m, and if necessary adjust the cores of **L7** and **L5** for maximum output while feeding in a 166.7 kc/s signal.



Underside of the chassis. The **S1-S8** switch diagram is inset in the circuit overleaf.

DISMANTLING THE SET

Remove the three control knobs from the front of the cabinet, and unsolder the two leads of the frame aerial from the two left-hand tags on panel at the rear of the chassis. The right-hand tag carries the external aerial lead;

remove the four countersunk-head wood screws holding the wooden cover to the base of the cabinet, lift away the cover and remove the two cheese head bolts (with washers) thus revealed.

The complete receiver may now be withdrawn as a single unit.

When replacing, note that the large control knob goes on the centre (tuning) spindle. Before the knob is fitted, see that the thick felt washer on the spindle plugs the large hole round it.

GENERAL NOTES

Switches.—**S1-S8** are the waveband switches, ganged in a single 2-position rotary unit beneath the chassis. This is indicated in our underside view of the chassis, and shown in detail in the diagram inset in the top left-hand corner of our circuit diagram overleaf, where it is drawn as seen from the rear of an inverted chassis. All the odd-numbered switches close for M.W. (control knob clockwise), and all the even-numbered ones for L.W.

S9, S10 are the Q.M.B. mains switches, ganged with the volume control **R11.**

Scale Lamp.—This is an Osram lamp, with a small clear spherical bulb, rated at 6.5 V, 0.3 A.

External Speaker.—No provision is made for this, but one of low impedance (about 2-3 Ω) could be connected in parallel with the twin internal speakers provided that sufficient care was taken to isolate it adequately, as the chassis of this receiver is "live" to the mains.

Drive Cord Replacement.—About eight feet of high-quality flax fishing line, plaited and waxed, is required for a new drive cord. It should be run as shown in the sketch in col. 2, where it is drawn as seen from the rear of the chassis when the gang is at maximum.

If a start is made by tying one end firmly round one of the peripheral sections, and taking the cord down to the control spindle, finishing up by tying off to the tension spring, the cord can be pulled against the gang stop to prevent it from slipping off. Before finally tensioning the cord, the cursor loop should be made. The method is shown inset in our sketch.

VALVE ANALYSIS

Valve voltages given in the table below are those quoted in the makers' manual. They were measured with an Avo Model 7 meter, using the 400 V range for voltages higher than 10 V, and the 10 V range for those lower than that.

The receiver was tuned to 550 m, with no signal input, and was connected to A.C. mains of 240 V. The negative meter lead was connected to chassis.

Valve	Anode (V)	Screen (V)	Cath. (V)
V1 UCH42	162 (Oscillator) 70	70	1·5
V2 UF41 ...	162	80	1·5
V3 UBC41...	75	—	1·1
V4 UL41 ...	145	162	8·5
V5 UY41 ...	—	—	182·0

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