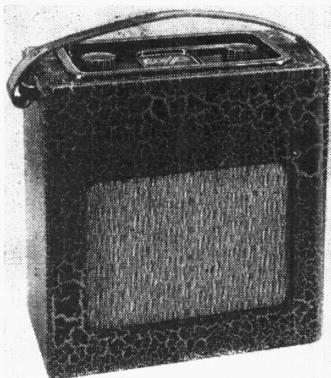


"TRADER" SERVICE SHEET  
**803**

# McMICHAEL 463

## ALL-DRY BATTERY PORTABLE



**C**ONVENIENT access to both sides of the chassis is attained upon removing the inner assembly in the McMichael 463, which is withdrawn as a complete unit. The set is 4-valve, 2-band, all-dry battery portable.

Release date and original price: May 6, 1946; £13 0s. plus £2 15s 11d purchase tax, complete with batteries.

### CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, L2, C24** (M.W.), **L3, L4, C24** (L.W.). **L2** (M.W.) and **L3** (L.W.) being loading coils, to heptode valve (**V1, Mullard metallized DK32**) operating as frequency changer with electron coupling.

**V1** oscillator grid coils **L5** (M.W.) and **L6** (L.W.) are tuned by **C25**; parallel trimming by **C26** (M.W.) and **C7, C27** (L.W.); series tracking by fixed capacitors **C6** (M.W.) and **C5, C6** (L.W.). Reaction coupling from anode by coils **L7** (M.W.) and **L8** (L.W.).

Second valve (**V2, Mullard metallized DF33**) is a variable-mu R.F. pentode operating as I.F. amplifier with tuned-primary, tuned-secondary transformer couplings **C2, L9, L10, C3** and **C11, L11, L12, C12, C13**.

### Intermediate frequency 465 kc/s.

Diode second detector is part of single diode triode valve (**V3, Mullard metallized DAC32**). Audio frequency component in rectified output is developed across manual volume control **R11**, which acts as diode load resistor, and passed via A.F. coupling capacitor **C16** to C.G. of triode section, which operates as A.F. amplifier. I.F. filtering by **C14, R8, C15** in diode circuit.

D.C. potential developed across **R11** is applied to the potential divider **R9, R10**, from the tapping on which it is fed back via decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R13, C18** and **R14** between **V3** triode and pentode output valve (**V4, Mullard DL35**). Fixed tone correction by **C20**. G.B. potential for **V4** is obtained from the drop along **R15** in the H.T. negative lead to chassis. H.T. circuit R.F. filtering by **C17**.

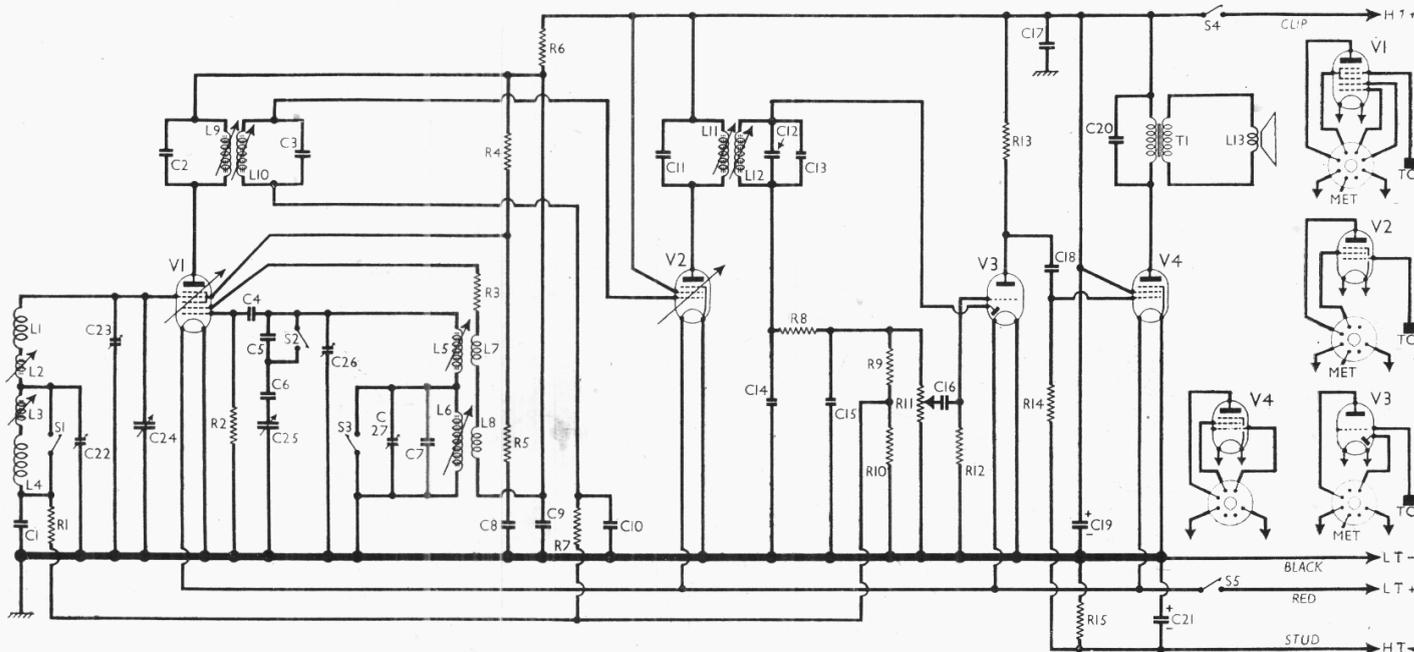
### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a set of new batteries. The receiver was tuned to the lowest wavelength on the M.W. 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 Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 DK32	78	0.33	34	0.6
	Oscillator			
V2 DF33	68	1.6	82	0.2
V3 DAC32	82	1.1	—	—
V4 DL35	32	0.04	82	1.1
	78	5.7	—	—

### COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 pent. C.G. decoupling	2,200,000
R2	V1 osc. C.G. resistor	220,000
R3	Osc. reaction stabiliser	5,600
R4	V1 S.G. H.T. feed	68,000
R5	V1 S.G. stabiliser	12,000
R6	V1 H.T. decoupling	1,000
R7	V2 C.G. decoupling	2,200,000
R8	I.F. stopper	47,000
R9		2,200,000
R10	A.V.C. feed pot. divider	1,000,000
R11	Manual volume control	1,000,000
R12	V3 triode C.G. resistor	4,700,000
R13	V3 triode anode load	330,000
R14	V4 C.G. resistor	1,000,000
R15	V4 G.B. resistor	680



Circuit diagram of the McMichael 463 all-dry battery portable superhet. **L1, L4** are the frame windings, and **L2, L3** iron-dust core-d tuning coils.

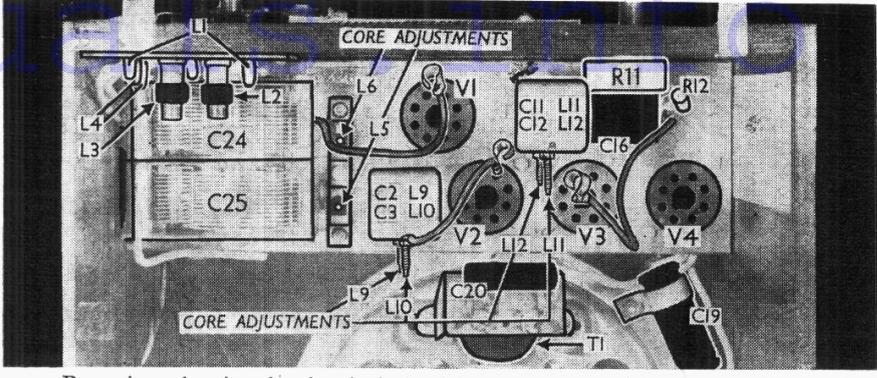
CAPACITORS		Values ( $\mu$ F)
C1	V1 pent. C.G. decoupling	0.05
C2	1st I.F. transformer tuning capacitors	0.0001
C3	1st I.F. transformer tuning capacitors	0.0001
C4	V1 osc. C.G. capacitor	0.0001
C5	Osc. L.W. tracker	0.00062
C6	Osc. M.W. tracker	0.00062
C7	Osc. L.W. fixed trimmer	0.00019
C8	V1 S.G. decoupling	0.05
C9	V1 H.T. decoupling	0.05
C10	V2 C.G. decoupling	0.05
C11	2nd I.F. transformer tuning capacitors	0.0001
C12	2nd I.F. transformer tuning capacitors	0.0001
C13	2nd I.F. transformer tuning capacitors	0.000005
C14	I.F. by-pass capacitors	0.000033
C15	I.F. by-pass capacitors	0.000033
C16	A.F. coupling to V3	0.0005
C17	H.T. circuit R.F. by-pass	0.05
C18	A.F. coupling to V4	0.001
C19*	H.T. reservoir capacitor	4.0
C20	Fixed tone corrector	0.01
C21*	V4 G.B. by-pass	25.0
C22†	Aerial L.W. trimmer	—
C23†	Aerial M.W. trimmer	—
C24†	Aerial circuit tuning	—
C25†	Oscillator circuit tuning	—
C26†	Oscillator M.W. trimmer	—
C27†	Oscillator L.W. trimmer	—

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

OTHER COMPONENTS		Approx. values (ohms)
L1	Frame aerial M.W. winding	0.9
L2	Aerial M.W. "loading" coil	1.1
L3	Aerial L.W. "loading" coil	3.0
L4	Frame aerial L.W. winding	10.2
L5	Osc. M.W. tuning coil	2.1
L6	Osc. L.W. tuning coil	3.4
L7	Osc. M.W. and L.W. reaction coils, total	4.0
L8	Osc. M.W. and L.W. reaction coils, total	4.0
L9	1st I.F. trans. Pri.	9.5
L10	1st I.F. trans. Sec.	9.5
L11	2nd I.F. trans. Pri.	10.25
L12	2nd I.F. trans. Sec.	11.75
L13	Speaker speech coil	2.6
T1	Speaker input trans.	450.0
S1-S3	Waveband switches	0.3
S4	H.T. circuit switch	—
S5	L.T. circuit switch	—

**DISMANTLING THE SET**

**Removing Chassis.**—Remove the control knobs (recessed grub screws) and the waveband switch escutcheon (two round-head wood screws); remove the control panel escutcheon by turning the two hexagonal spindle bushes sufficiently for their associated tongues to clear the latching clips inside the case; from inside the battery compartment remove the four countersunk-head wood screws holding the vertical members of the frame to the sides of the carrying case; slide out the assembly from the case bottom edge first to clear the control spindles. To gain access to the chassis underside, remove the paxolin cover (three countersunk-head



Rear view, showing the chassis deck. The tags of L1 and L4 are indicated.

wood screws). The chassis need not be dismantled.

When replacing, if the waveband indicator plate has been removed from the switch spindle it should be replaced so that its bottom corner just clears the top edge of the sub-baffle when the switch is in the "off" position, while the end of the switch spindle should be flush with the front of the plate.

In some cases, in order to secure correct register of the waveband indicator in the viewing aperture, a triangular piece of paxolin is inserted between the assembly and the case. When fitting the four wood screws, the set should be laid face down on the bench, when the apex of the paxolin packing piece can be conveniently inserted between the appropriate pair of wood screws before they are tightened.

**Removing Speaker.**—Remove the assembly as previously described; unsolder the two speaker leads at the input transformer;

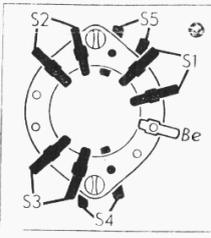


Diagram of the switch unit, as seen in the front (underside) view of the chassis below.

remove the upper right-hand speaker fixing nut and lift off the clip retaining C19; if the four countersunk-head wood screws securing the sub-baffle to the vertical frame members are now removed the speaker and sub-baffle may be removed as one unit. When replacing, the input transformer should be at the top.

**GENERAL NOTES**

**Switches.**—S1-S3 are the waveband switches, and S4, S5 the battery switches, ganged in a

rotary unit on the front (under) side of the chassis. This is indicated in our front chassis illustration, and shown in detail in the diagram (col. 2), being viewed in the same direction in each case. S1, S2 and S3 all close on M.W. and open on L.W.

**Coils.**—L1 and L4 are the frame aerial windings, and L2, L3 their respective loading coils, mounted on the frame connecting panel. Their core adjustments, although accessible, are set at the factory, and should not be disturbed. The oscillator coils L5-L8 are indicated in our front view of the chassis, where they are obscured by a connecting panel. Their core adjustments are indicated in our rear view, on the chassis deck.

**Batteries.**—The L.T. battery is a 1.5 V Ever Ready "Alldry 32" with a non-reversible 2-pin plug and socket. The H.T. battery is an Ever Ready "Batrymax" type B117, of layer construction, rated at 90 V. It has non-interchangeable snap fastener connectors.

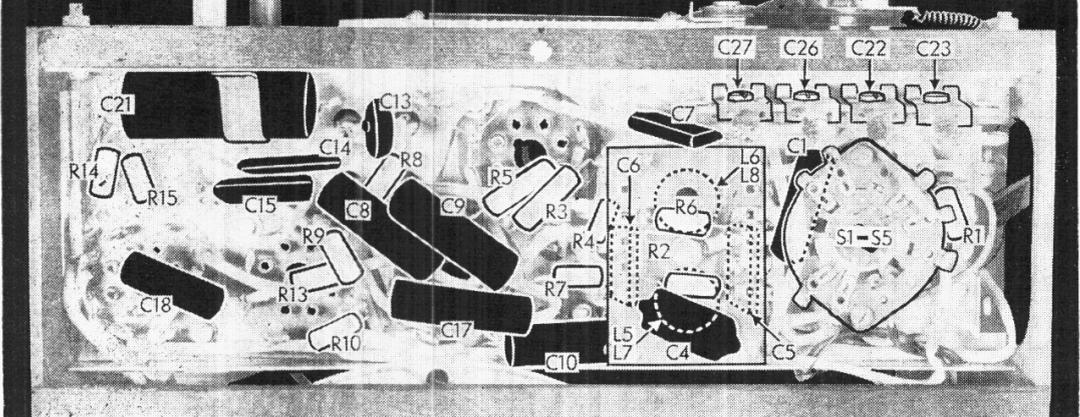
**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Connect signal generator leads to control grid (top cap) of V1 and chassis, turn the volume control to maximum, slacken the lock-nuts, feed in a 465 kc/s (645.16 m) signal, and adjust the cores of the two I.F. transformers for maximum output. Tighten lock-nuts.

**R.F. and Oscillator Stages.**—Couple signal generator output via a loop of wire near the frame assembly, which must be removed from the carrying case. With the gang at minimum, the pointer should cover lower edge of "McMichael Radio Ltd." lettering.

**M.W.**—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust C26, then C23, for maximum output. Check calibration at 500 m (600 kc/s) and if necessary adjust the core of L5. Then repeat the 200 m adjustments.

**L.W.**—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust C27 and C22 for maximum output. Check calibration at 2,000 m (150 kc/s) and if necessary adjust the core of L6. Then repeat the 1,000 m adjustments.



Rear view, showing the underside of the chassis as seen after removing the cover plate and waveband indicator. The S1-S5 switch unit is shown in detail in the diagram in col. 2. above.