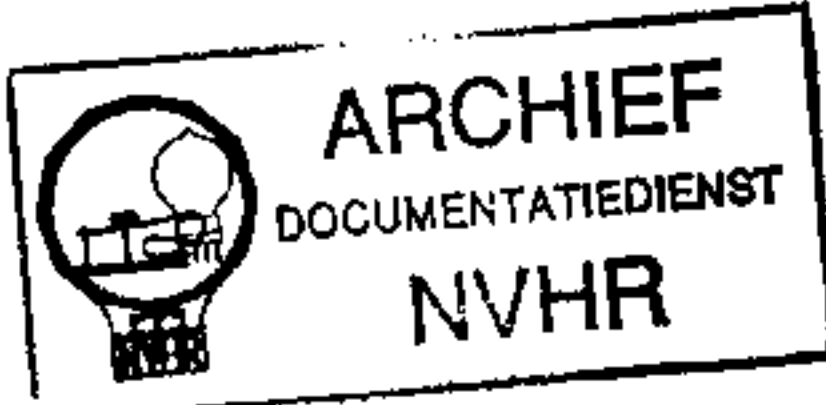


Ned. Ver. v. Historie v/d Radio



McMICHAEL 483

ALL-DRY BATTERY PORTABLE

COMPONENTS AND VALUES

MINIATURE "button" based valves are used in the McMichael 483 4-valve, 2-band, all-dry battery portable superhet.

Release date and original price (including batteries): November, 1947; £15 15s plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by L1, L2, C25 (M.W.) and L3, L4, C25 (L.W.), L2 (M.W.) and L3 (L.W.) being "loading" coils, to heptode valve (V1, Mullard DK91) operating as frequency changer with electron coupling.

Oscillator grid coils L5 (M.W.) and L6 (L.W.) are tuned by C26. Parallel trimming by C27 (M.W.) and C8, C28 (L.W.); series tracking by C7 (M.W.) and C6, C7 (L.W.). Reaction coupling from heptode anode to oscillator C.G. by L7 (M.W.) and L8 (L.W.).

Second valve (V2, Mullard DF91) is a variable-mu R.F. pentode operating as I.F. amplifier with tuned-transformer couplings.

Intermediate frequency 465 kc/s.

Diode second detector is part of single diode pentode valve (V3, Mullard DAF91). Audio frequency component in rectified output is developed across manual volume control R9, which is also the diode load resistor, and passed via A.F. coupling capacitor C17 and C.G. resistor R10 to grid of pentode section, which operates as A.F. amplifier. I.F. filtering by C15, R8, C16 in diode circuit.

D.C. potential developed across R9 is tapped off and fed back, via de-coupling circuits, as G.B. to F.C. and I.F. valves, giving A.V.C.

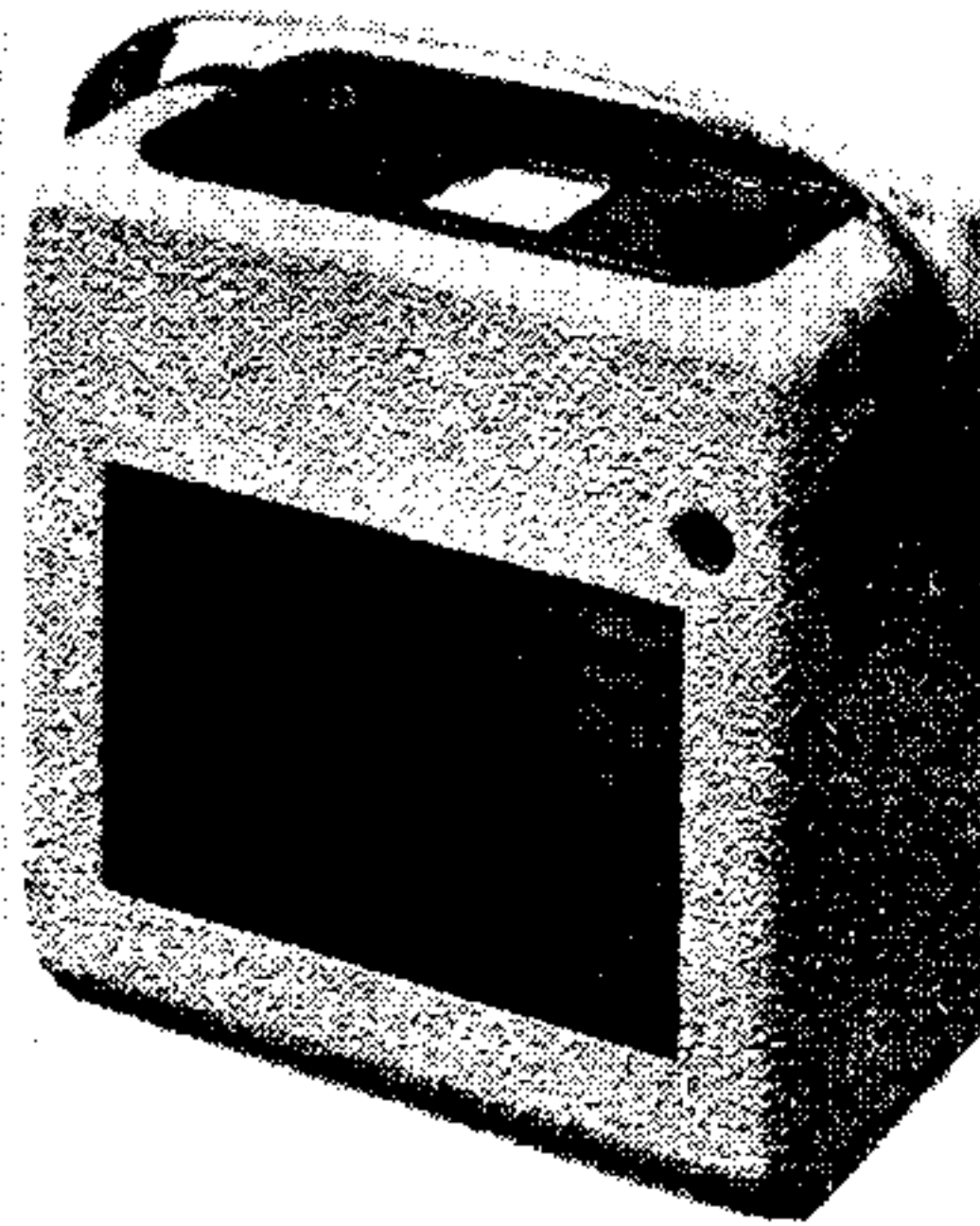
Resistance-capacitance coupling by R12, C19 and R13 between V3 pentode and pentode output valve (V4, Mullard DL92), the filament sections of which are strapped in parallel. Fixed tone correction by C20.

G.B. potential for V4 is obtained from the drop across R14 in the H.T. negative lead to chassis. H.T. circuit R.F. filtering by C9.

DISMANTLING THE SET

Removing Chassis.—Remove the two 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 suffi-

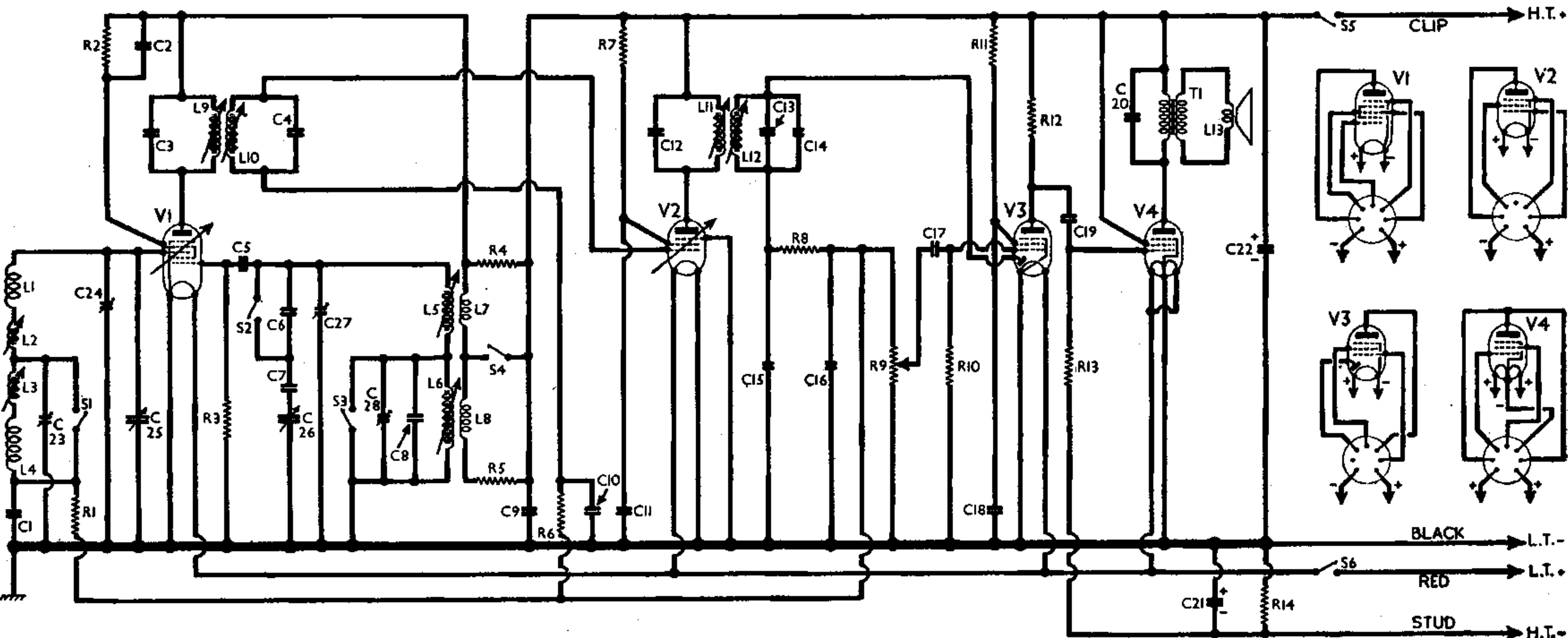
ciently for their associated tongues to clear the latching clips inside the case; from inside the battery compartment remove the four countersunk-head wood screws holding the vertical members of the frame to the sides of the carrying case; slide out the assembly from the case, bottom edge first to clear the control spindles. **When replacing,** the waveband indicator plate should be fitted so that its bottom corner clears the top edge of the sub-baffle by about 1/8 in. when the switch is in the "off" position. A paxolin washer is fitted on the switch spindle, behind the indicator plate. **Removing Speaker.**—Remove the assembly as previously described; unsolder the two speaker leads at the outer tags on input transformer; remove the upper right-hand speaker fixing nut and lift off the clip retaining C22; 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.



RESISTORS		Values (ohms)	Locations
R1	V1 pent C.G. ...	2,200,000	K4
R2	V1 S.G.'s H.T. feed	15,000	I3
R3	V1 osc. C.G. ...	100,000	J5
R4	} Oscillator stabilizers ... {	18,000	I4
R5		470	J4
R6	V2 C.G. de coup ...	2,200,000	H5
R7	V2 S.G. H.T. feed	39,000	G4
R8	I.F. stopper ...	270,000	G4
R9	Volume control ...	1,000,000	D1
R10	V3 pent. C.G. ...	8,200,000	D1
R11	V3 S.G. H.T. feed	2,700,000	G4
R12	V3 pent. anode load	1,000,000	G4
R13	V4 C.G. resistor ...	4,700,000	E4
R14	V4 G.B. resistor ...	680	F4

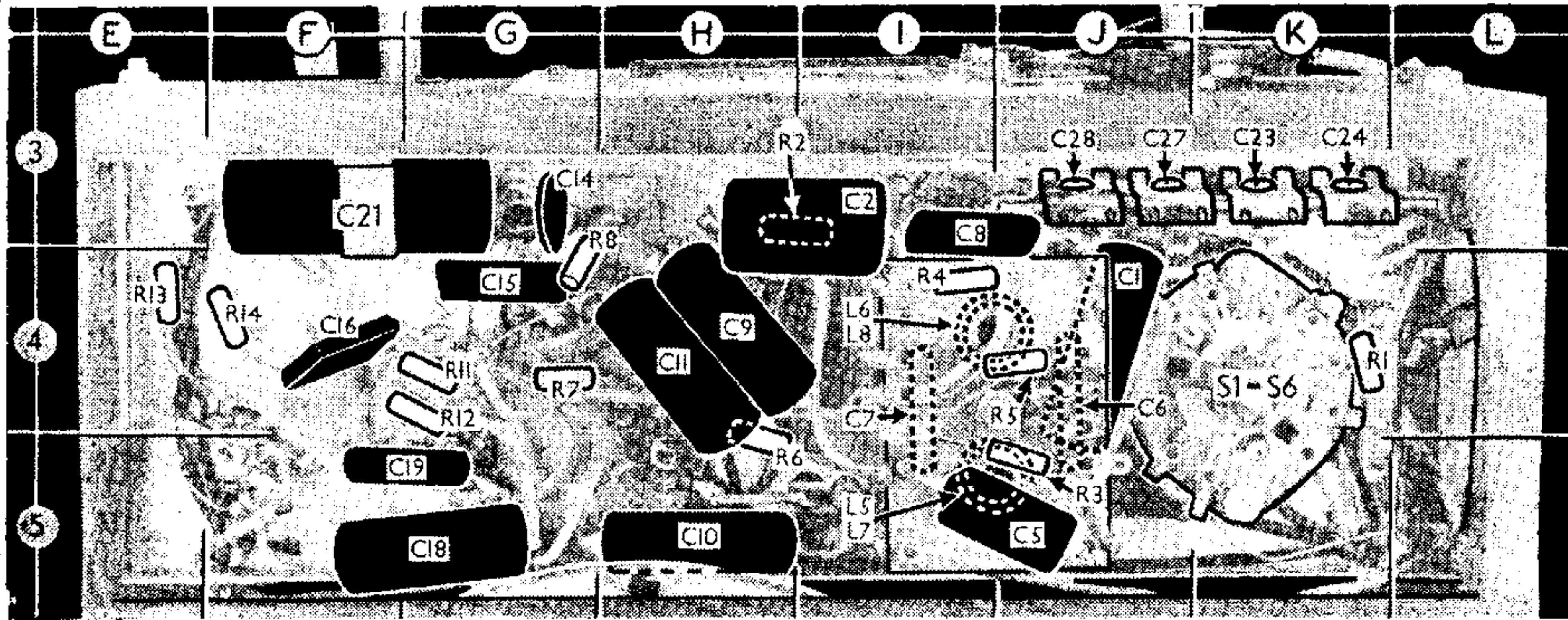
CAPACITORS		Values (μF)	Locations
C1	V1 C.G. decoup. ...	0.05	J4
C2	V1 S.G.'s by-pass	0.00025	I3
C3	} 1st I.F. transformer tuning ... {	0.0001	B1
C4		0.0001	B1
C5	V1 osc. C.G. ...	0.0001	J5
C6	} Osc. M.W. and L.W. trackers ... {	0.00062	J4
C7		0.00062	I4
C8	Osc. L.W. trim. ...	0.00025	I3
C9	H.T. R.F. by-pass	0.1	H4
C10	V2 C.G. decoup ...	0.05	H5
C11	V2 S.G. decoup ...	0.1	H4
C12	} 2nd I.F. transformer tuning {	0.0001	C1
C13		0.0001	C1
C14	} I.F. by-passes ... {	0.000005	G3
C15		0.000033	G4
C16	0.000033	F4	
C17	A.F. coupling ...	0.0005	D1
C18	V3 S.G. decoup ...	0.1	G5
C19	A.F. coupling ...	0.001	F5
C20	Tone corrector ...	0.01	C2
C21*	G.B. by-pass ...	25.0	F3
C22*	H.T. reservoir ...	4.0	D2
C23 †	Aerial L.W. trim ...	—	K3
C24 †	Aerial M.W. trim ...	—	K3
C25 †	Frame aerial tuning	—	A1
C26 †	Oscillator tuning ...	—	A1
C27 †	Osc. M.W. trim ...	—	J3
C28 †	Osc. L.W. trim ...	—	J3

* Electrolytic. † Variable. ‡ Pre-set.



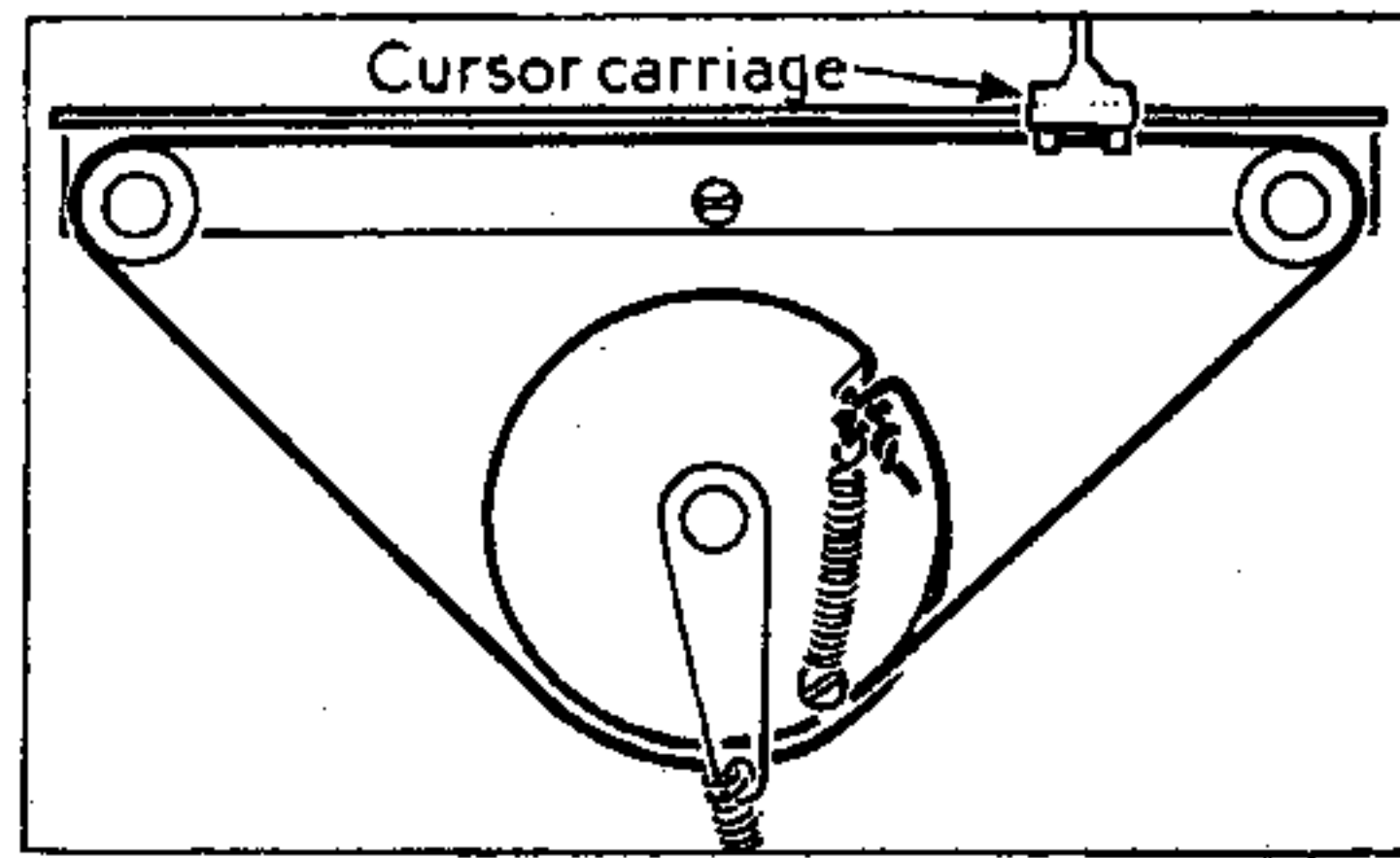
Circuit diagram of the McMichael 483 all-dry portable battery superhet. L1 and L4 are the frame aerial windings.

Front view, showing the chassis underside after removal of the paxolin cover and waveband indicator plate. The oscillator coils L5, L7 and L6, L8 are concealed behind a group board on the left of the waveband switch unit S1-S6.



OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	M.W. frame winding	0.8	A1
L2	M.W. "loading" coil	1.1	A1
L3	L.W. "loading" coil	3.0	A1
L4	L.W. frame winding	10.1	A1
L5	Oscillator tuning coils	2.1	I5
L6		3.5	I4
L7	Oscillator reaction coils	1.1	I5
L8		1.4	I4
L9	1st I.F. trans.	10.0	B1
L10		10.0	B1
L11	2nd I.F. trans.	10.0	C1
L12		10.0	C1
L13	Speech coil	2.3	—
T1	Speaker input trans.	480.0	C2
S1-S4	W/band switches...	—	K4
S5	H.T. circuit switch	—	K4
S6	L.T. circuit switch	—	K4

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.



Sketch of the tuning drive, seen from above the assembly, with the gang at maximum capacitance.

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" connected by means of 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.

Valves.—The Mullard "91" valve series is used, with the American 7-pin "button" base. Filament ratings are 1.4 V, 0.05A for V1, V2 and V3 and 1.4 V, 0.1 A (or 2.8 V, 0.05 A) for V4. All valves are fitted with sprung retainers, and V1 and V3 also have metal screening covers.

Drive Cord Replacement.—The self-explanatory sketch (col. 2) shows the course taken by the drive cord, as seen when viewing the top of the assembly. Twenty inches of fishing line provides sufficient length, with a margin for tying off.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 DK91	82	0.4	53	2.0
V2 DF91	82	2.2	47	0.9
V3 DAF91	3	0.07	6	0.02
V4 DL92	77	7.1	82	1.5

GENERAL NOTES

Switches.—S1-S4 are the waveband switches, and S5, S6 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. 3), being viewed in the same direction in each case. All switches close on M.W. and S1, S2, S3 and S4 open on L.W.

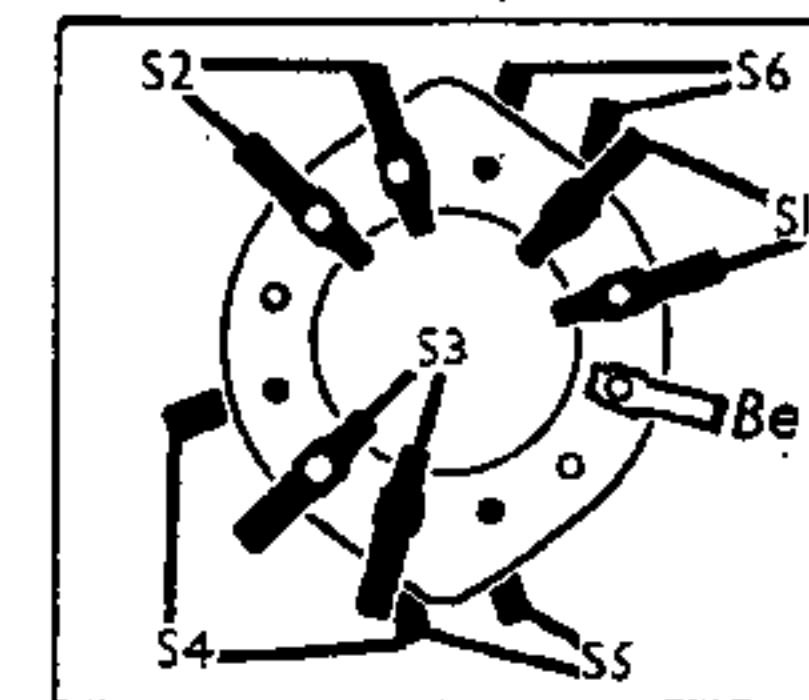
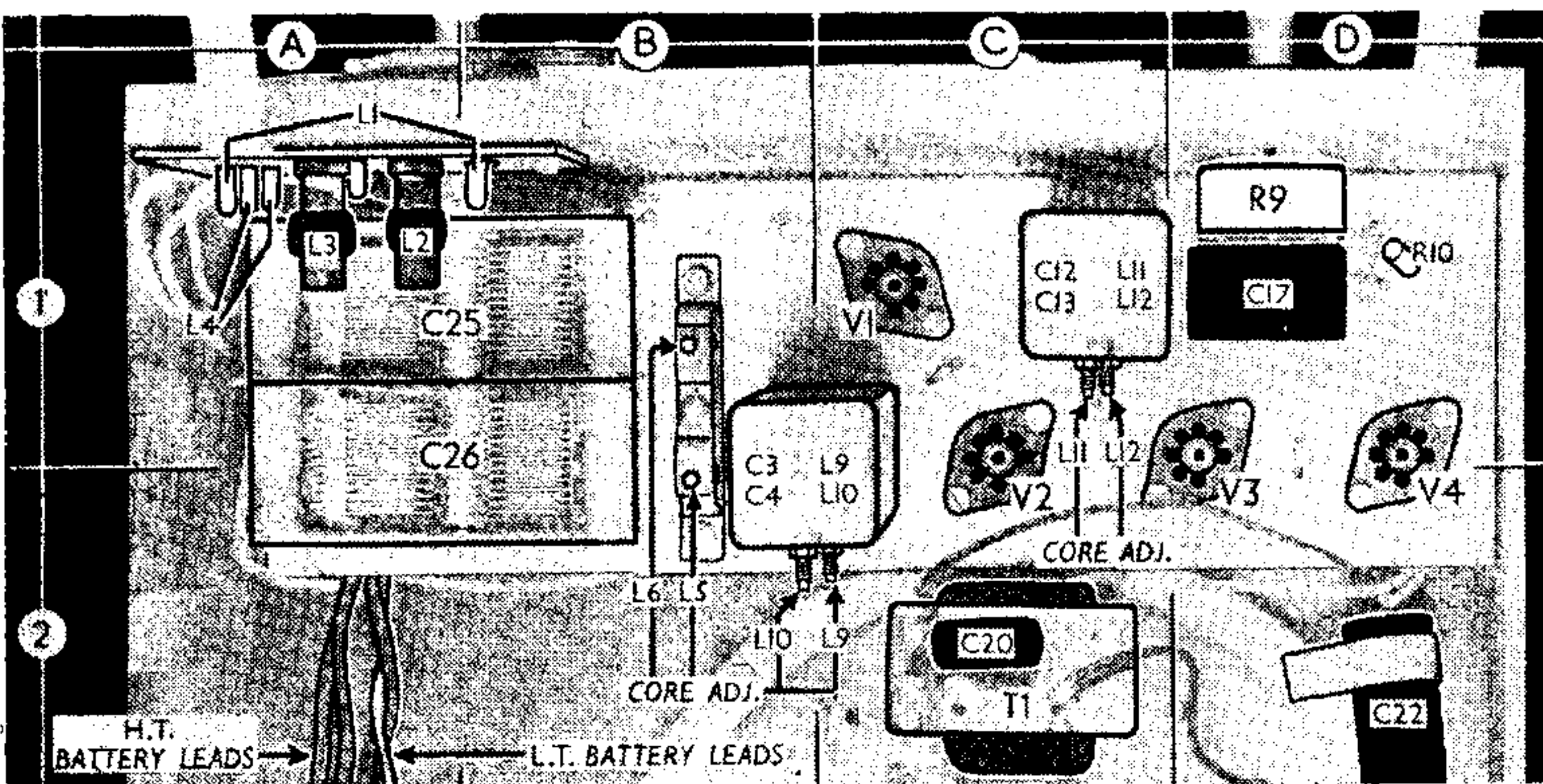


Diagram of the waveband switch unit, as seen in the front view of the chassis (above).



Rear view, showing the chassis deck and indicating all the core adjustments involved in circuit alignment.

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator leads to control grid (pin 6) 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 L9, L10, L11 and L12 (location references B2, C1) 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 capacitance, the pointer should cover the lower edge of the "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 C27 (J3), then C24 (K3) for maximum output. Check calibration at 500 m (600 kc/s) and, if necessary, correct any error by adjustment of the core of L5 (B2). Then repeat the 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 C28 (J3), then C23 (K3), for maximum output. Check calibration at 2,000 m (150 kc/s) and, if necessary, correct any error by adjustment of the core of L6 (B1). Then repeat the adjustments.