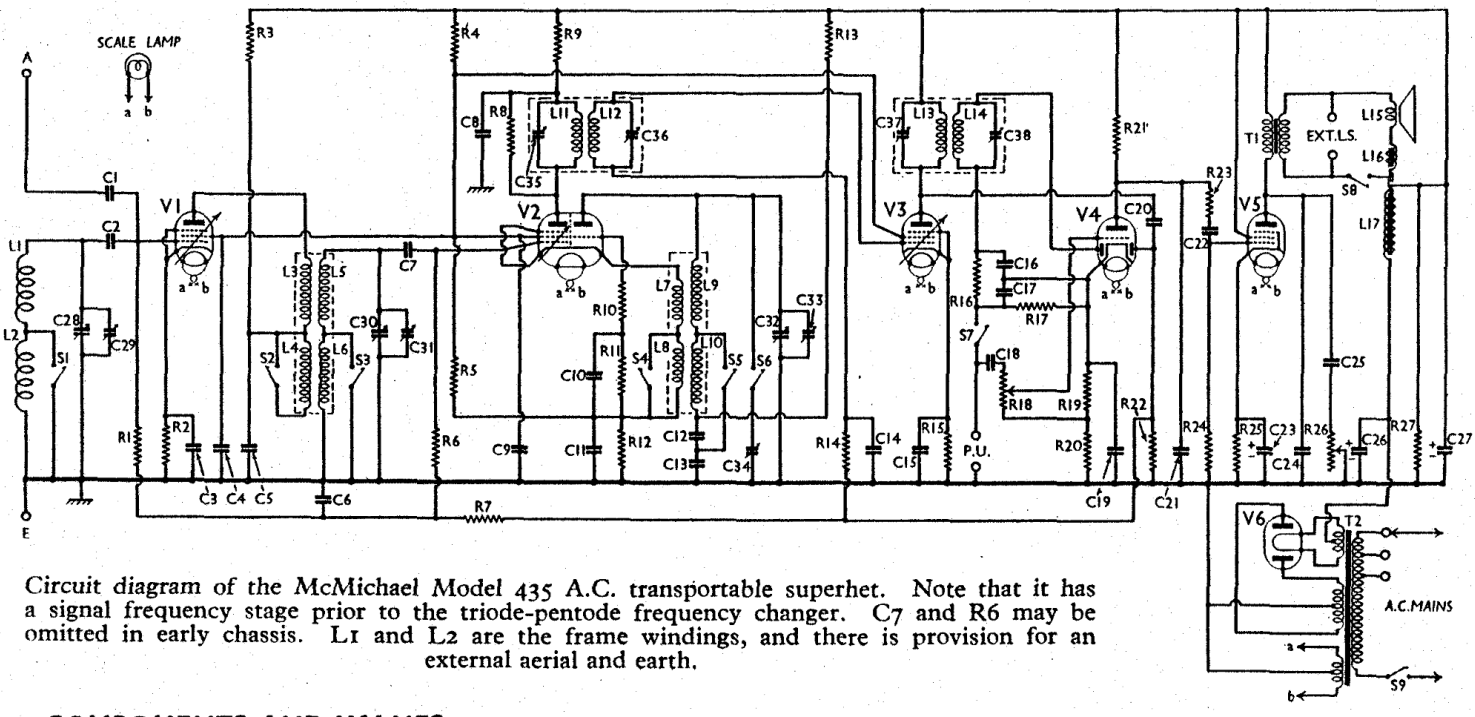
McMICHAEL - 435



Circuit diagram of the McMichael Model 435 A.C. transportable superhet. Note that it has a signal frequency stage prior to the triode-pentode frequency changer. C7 and R6 may be omitted in early chassis. L1 and L2 are the frame windings, and there is provision for an external aerial and earth.

COMPONENTS AND VALUES

	Condensers	Values (μF)
C1	External aerial coupling	0·00001
C2	V1 cont. grid condenser	0·01
C3	V1 cathode by-pass	0·1
C4	V1 S.G. by-pass	0·1
C5	V1 anode decoupling	0·1
C6	V1 and V2 A.V.C. line decoupling	0·1
C7	V2 pent. cont. grid condenser	0·0002
C8	V2 pent. anode decoupling	0·1
C9	V2 pent. S.G. by-pass	0·1
C10	V2 osc. grid condenser	0·0002
C11	V2 cathode by-pass	0·1
C12†	Osc. L.W. tracker	0·001258
C13†	Osc. M.W. tracker	0·0023
C14	V3 cont. grid decoupling	0·1
C15	V3 cathode by-pass	0·1
C16	I.F. by-passes	0·0002
C17	I.F. by-passes	0·0001
C18	L.F. coupling to V4 triode	0·1
C19	V4 cathode by-pass	0·5
C20	Coupling to V4 A.V.C. diode	0·0001
C21	V4 anode I.F. by-pass	0·001
C22	L.F. coupling to V5	0·01
C23*	V5 cathode by-pass	25·0
C24	Fixed tone compensator	0·002
C25	Part of variable T.C. filter	0·03
C26*	H.T. smoothing	8·0
C27*	H.T. smoothing	8·0
C28	Frame aerial tuning	—
C29‡	Frame aerial trimmer	—
C30	H.F. transformer tuning	—
C31‡	H.F. transformer trimmer	—
C32	Oscillator tuning	—
C33‡	Oscillator main trimmer	—
C34‡	Oscillator L.W. trimmer	—
C35‡	1st I.F. trans. pri. tuning	—
C36‡	1st I.F. trans. sec. tuning	—
C37‡	2nd I.F. trans. pri. tuning	—
C38‡	2nd I.F. trans. sec. tuning	—

* Electrolytic. ‡ Pre-set.
† Two condensers in parallel.

	Resistances	Values (ohms)
R1	V1 cont. grid resistance	500,000
R2	V1 fixed G.B. resistance	1,000
R3	V1 anode decoupling	10,000
R4	V1, V2, and V3 S.G.'s H.T. potential divider.	30,000
R5	V1, V2, and V3 S.G.'s H.T. potential divider.	20,000*
R6†	V2 pent. cont. grid resistance	500,000
R7	V1 and V2 A.V.C. line decoupling	500,000
R8	1st I.F. trans. pri. shunt	250,000
R9	V2 pent. anode decoupling	10,000
R10	V2 osc. harmonic suppressor	2,000
R11	V2 osc. grid resistance	50,000
R12	V2 fixed G.B. resistance	1,000
R13	V2 osc. anode decoupling	60,000
R14	V3 cont. grid decoupling	500,000
R15	V3 fixed G.B. resistance	1,000‡
R16	I.F. stopper	250,000
R17	V4 signal diode load	250,000
R18	Manual volume control	500,000
R19	V4 G.B. and A.V.C. delay voltage resistances	500
R20	V4 G.B. and A.V.C. delay voltage resistances	2,000
R21	V4 anode load	100,000
R22	V4 A.V.C. diode load	500,000§
R23	V5 grid I.F. stopper	100,000
R24	V5 grid resistance	500,000
R25	V5 G.B. resistance	500
R26	Variable tone control	100,000
R27	H.T. supply ballast	40,000

* May be 10,000 O. ‡ May be 5,000 O.
† May not appear in some chassis.
§ May be 2,000,000 O.

	Other Components	Values (ohms)
L1	Frame aerial windings	2·5
L2	Frame aerial windings	21·0
L3	H.F. transformer primary	3·8
L4	H.F. transformer primary	9·2
L5	H.F. transformer secondary	4·7
L6	H.F. transformer secondary	12·0
L7	Oscillator coupling coils	1·8
L8	Oscillator coupling coils	2·5
L9	Oscillator tuning coils	4·0
L10	Oscillator tuning coils	9·6
L11	1st I.F. trans. Pri.	42·0
L12	1st I.F. trans. Sec.	42·0
L13	2nd I.F. trans. Pri.	42·0
L14	2nd I.F. trans. Sec.	42·0
L15	Speaker speech coil	1·5
L16	Hum neutralising coil	0·1
L17	Speaker field winding	2,000·0
T1	Speaker input trans. Pri.	360·0
T1	Speaker input trans. Sec.	0·25
T2	Mains trans. Pri. total	25·0
T2	Mains trans. Heater sec.	0·02
T2	Mains trans. Rect. fil. sec.	0·05
T2	Mains trans. H.T. sec.	580·0
S1-S6	Waveband switches	—
S7*	Gram. pick-up switch	—
S8*	Internal speaker switch	—
S9	Mains switch, ganged R18	—

* Operated by special plugs.

VALVE ANALYSIS

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 AC/VP1*	270	1·9	100	0·7
V2 AC/TP	260	1·2	100	0·2
V3 AC/VP1	280	1·7	100	0·5
V4 AC/HL/DD	75	2·0	—	—
V5 MPT4	275	28·0	290	5·3
V6 442BU	365†	—	—	—

* Osc. anode (G2) 140 V, 2·2 mA.
† Each anode, A.C.

Readings of valve voltages and currents given in the table above were measured with the receiver operating on A.C. mains of 225 V, using the 220 V tap on the mains transformer, in accordance with the maker's instructions. The volume control was at maximum and there was no signal input. Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

GENERAL NOTES

Switches.—S1-S6 are the waveband switches, ganged together in one unit. On the M.W. band, all switches, except **S6,** are *closed*. On the L.W. band, all switches, except **S6,** are *open*. **S6** is *open* on the M.W. band, and *closed* on the L.W. band.

S7 is the pick-up jack-switch, normally closed, which opens when the pick-up plug is inserted. **S8** is the internal speaker jack-switch, normally closed, which opens and switches off the internal speaker when an external speaker plug is pushed fully home.

S9 is the Q.M.B. mains switch, ganged with the volume control, **R18.**