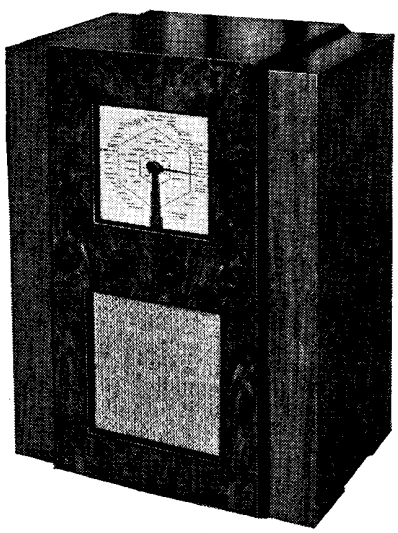
SERVICE ENGINEER

McMICHAEL MODEL 335 BATTERY SUPERHET

CIRCUIT.—The tuned frame aerial is connected direct to the grid of V1, an H.F. pentode. With an external aerial, a small fixed condenser, C1, is interposed.

This stage is inductively coupled to V2, a frequency changer. Couplings between V2 and V3, an H.F. pentode and V3 and V4, a double diode triode, are I.F. transformers tuned to 128.5 kc.



The McMichael 335 is a 9-stage battery superhet with a tuned frame aerial. The circuit, below, shows the arrangement. Provision is made for an external aerial, as indicated. Five valves are arranged in the usual manner; H.F., frequency changer, I.F., double-diode triode and output.

One diode of V4 is used to apply A.V.C. bias to the grids of the preceding valves in the orthodox manner. The L.F. output of V4 is passed to the output valve V5, a quiescent push-pull valve which is tone-controlled by R 19 and C 14.

The audio output of V5 then passes to the permanent magnet speaker through a matching transformer.

Special Notes.—The dial lamp is rated at 2 volts .6 amp. The holder is fixed on a block of wood and secured to a batten

(*Continued overleaf.*)

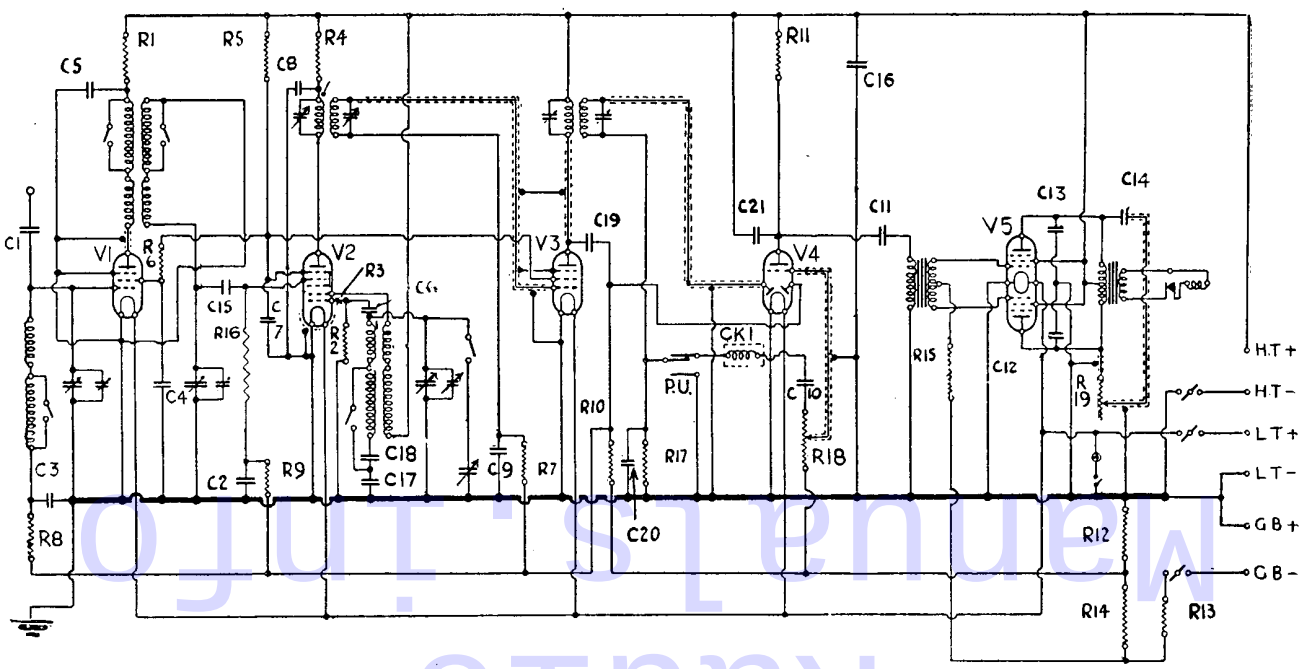
RESISTANCES

R.	Purpose.	Ohms.
1	V1 anode decoupling ..	5,000 (1)
2	V2 oscillator grid leak ..	30,000 (½)
3	V2 oscillator grid stopper ..	4,000 (½)
4	V2 anode decoupling ..	5,000 (1)
5	V2 screen decoupling ..	50,000 (½)
6	V1 screen decoupling ..	5,000 (½)
7	V3 A.V.C. decoupling ..	.5 meg (¼)
8	V1 A.V.C. decoupling ..	.5 meg (¼)
9	V2 A.V.C. decoupling ..	.5 meg (¼)
10	V4 A.V.C. diode load ..	2 meg (¼)
11	V4 anode coupling ..	50,000 (1)
12	Part of bias potentiometer	350 (1)
13	Part of bias potentiometer	350 (1)
14	Part of bias potentiometer	2,000 (½)
15	Q.P.P. stabiliser	100,000 (½)
16	V2 grid	.5 meg (¼)
17	V4 demodulator diode ..	.25 meg (¼)
18	Volume control	.5 meg
19	Tone control	.1 meg

Bracketed figures denote wattage.

CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.00001
2	V2 A.V.C. decoupling ..	.1
3	V1 A.V.C. decoupling ..	.1
4	V1 screen decoupling ..	.1
5	V1 anode decoupling ..	.1
6	V2 oscillator grid ..	.002
7	V2 screen decoupling ..	.1
8	V2 anode decoupling ..	.1
9	V3 A.V.C. decoupling ..	.1
10	L.F. coupling	.1
11	L.F. coupling	.5
12	V5 anode decoupling ..	.002
12	V5 anode decoupling ..	.002
14	Tone control	.01
15	V2 grid	.0002
16	H.T. decoupling	4
17	Medium-wave padder ..	.0023
18	Long-wave padder ..	.001258
19	A.V.C. feed	.0001
20	V4 demodulator diode shunt	.0001
21	V4 anode shunt	.001



McMICHAEL 335 SUPERHET BATTERY PORTABLE (Continued)

(*Continued from previous page.*)

in the top of the cabinet by a spring clip. To remove it the leads must also be released from the cleat on the side of the tuning dial.

The external speaker is connected on the low resistance side of the output transformer, and should have a speech coil impedance of 5 ohms.

In some models, as in the one reviewed, R3, R16 and C15 are not used.

Exposing Chassis.—Remove batteries and the board separating the speaker from the batteries. This is secured by four wood screws.

Remove the board from underneath the chassis. This is a push fit, and will pull out without difficulty. The underside of the chassis will then be accessible for the usual inspection and test.

Removing Chassis.—Should it be necessary to remove the chassis from the cabinet the procedure is as follows :—

Remove the batteries and two boards as above, pull off the four knobs from the front of the cabinet. These are secured by spring clips. Take out two bolts passing through the frame aerial, and the bottom of the cabinet, and four wood screws in the back of the chassis. Unsolder the seven wires from the speaker transformer.

Several changes have been made in the colour coding of these seven wires, so we give full details of the connections :—

Top " F," to C 13; 4, to fixed blade of extension L.S. switch; 3, to extension L.S. socket without a blade; 2, to moving blade of extension L.S. switch; 1, to H.T.+; Lower F, to C12.

The seventh wire is to the framework of the transformer from earth. (The theoretical diagram is coded to agree with the above.)

The chassis and frame aerial will now slide out of the cabinet easily, provided care is used in manœuvring the frame.

ALIGNMENT OF CIRCUITS

I.F. CIRCUITS.—Connect a modulated oscillator tuned to 128.5 kc. to the cap of V2, an output meter across the external speaker terminals (leaving internal speaker in circuit) and a 0.1 mfd. fixed condenser across the oscillator section of the gang condenser to swamp out local oscillation.

Adjust T1, T2, T3 and T4 for maximum reading on output meter. When accurately trimmed remove swamp condenser.

Medium-wave Band.—Connect modulated oscillator to aerial and earth terminals, leaving the output meter across the extension speaker terminals.

(1) Tune oscillator and receiver to 214 metres and adjust T5, and T6 for maximum reading on output meter.

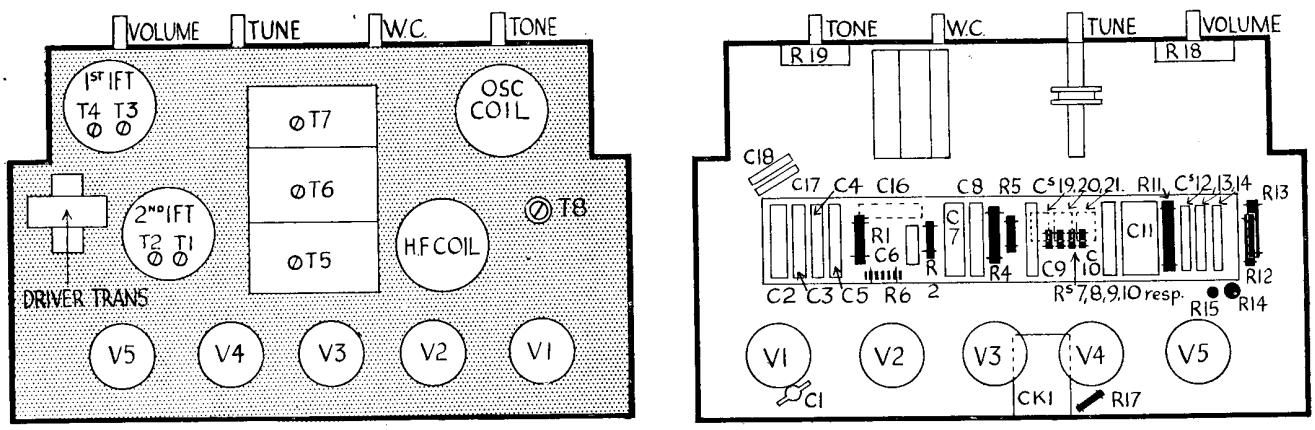
Note.—T7 should not be touched, its correct position is at minimum.

Long-wave Band.—Tune oscillator and receiver to 1,000 metres and adjust T8 for maximum deflection.

VALVE READINGS

No signal. Volume at maximum. Tone brilliant. New batteries.

V.	Type.	Electrode.	Volts.	Ma.
1	Mazda VP215 (7 Met)	anode ..	102	1
		screen ..	32	.25
2	Mullard FC2 (7 Met)	anode ..	102	.55
		screen ..	34	.7
		osc. anode	118	.6
3	Mazda VP215 (7 Met)	anode ..	118	1
		screen ..	34	.25
4	Mazda HL2100	anode ..	48	.7
5	Osram QP21 (7)	1 anode	118	2.5
		1 screen	120	1.6
		2 anode	118	2.5
		2 screen	120	1.6



The layout of the chassis of McMichael's 335 battery portable five is clearly shown in these drawings. That on the left, with a "tinted" ground, shows the top; on the right is the underside.