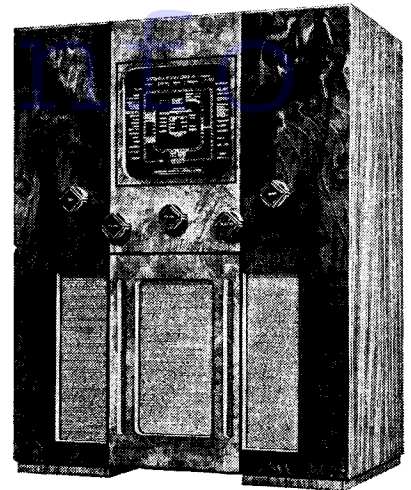


McMICHAEL 378 BATTERY SUPERHET



CIRCUIT.—The aerial is coupled to the grid of V1, an H.F. pentode, by a set of band-pass coils on the medium and long waves. A local-distance switch in the aerial circuit enables a 40-ohm resistance to be shunted between aerial and earth when receiving local stations.

On the short waves the aerial tuning section of the gang is switched so as to operate as the short wave oscillator tuning condenser. V2 is a triode valve working as a separate oscillator in the frequency-changing arrangement. It will be noticed that an H.F. choke is connected to each of the filament pins of V1.

The signal, converted to the I.F., passes by a transformer to the I.F. amplifier V3, an H.F. pentode. A second I.F.T. leads to the demodulating diode of V4, a double diode triode. The other provides A.V.C. for V1 and V3.

The coupling arrangements to the grid of the triode section of V4 include a volume control and connections for a pick-up. V4 is parallel-fed transformer coupled to V5, a double pentode output valve working in a Q.P.P. arrangement.

Pentode compensator condensers effect a fixed tone modification, and a variable resistance and fixed condenser connected across the two anodes of V5 enable tone to be controlled.

Battery power consists of a McMichael 120 volts H.T. battery and a 2 volt 25 a.h. accumulator. A grid bias battery is not required as the bias is automatic.

Chassis Removal.—Remove back of cabinet, disconnect and remove batteries. Remove the five control knobs from the front of the cabinet. These are of the spring fixing type.

Tilt the cabinet forward and remove the four chassis securing bolts and washers from the underside of the shelf. Unclasp the battery leads from the side of the cabinet.

The chassis can then be pulled out sufficient to enable the underside of the chassis to be inspected. For complete servicing the seven leads to the speaker must be removed. For the reverse process, counting from left to right from the back, the colours of the leads are: yellow, red, green, royal blue, white and then yellow.

The black lead is soldered to the speaker frame.

For operation outside the cabinet the speaker must be removed. Remove the wood bar from the back of the speaker and the four wood screws holding the clips securing it. When replacing the speaker, the transformer must be nearest the top.

VALVE READINGS

No signal. Volume maximum. M.W. band-
Min. cap. New batteries.

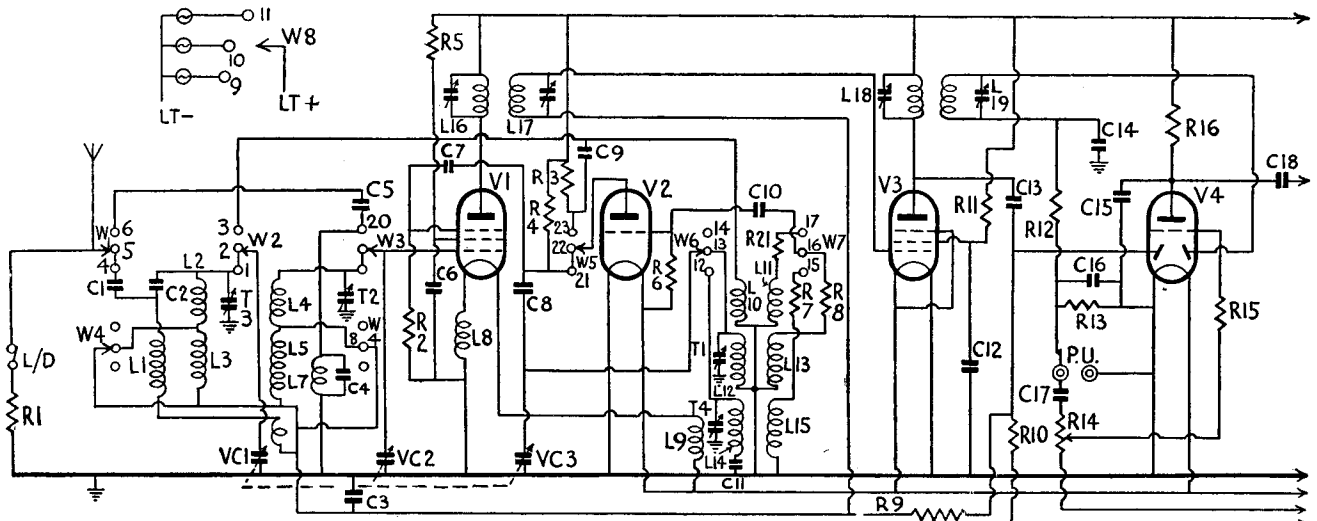
V.	Type.	Electrode.	Volts.	Ma.
1	Mazda V.P. 210 (7)	Anode ..	108	1.6
		Screen ..	39	.5
2	Cossor 220 P.A. (5)	Anode ..	24	1.1
		Screen ..	43	.4
3	Mazda V.P. 210 (7)	Anode ..	108	1.9
		Screen ..	43	.4
4	Mazda H.L.21/ D.D. (5)	Anode ..	52	.8
		Screen ..	106	1
5	Mazda Q.P. 230 (7)	Anode ..	106	2
		Screen ..	108	1
		Anode ..	106	2

CONDENSERS

C.	Purpose.	Mfds.
1	M.W. and L.W. aerial coupling ..	.0002
2	Top band pass coupling ..	.00001
3	A.V.C. decoupling ..	.5
4	S.W. aerial coil fixed trimmer ..	.00005
5	S.W. aerial coupling ..	.00005
6	V1 screen decoupling ..	.1
7	Injection condenser ..	.0001
8	M.W. and L.W. osc. anode coupling ..	.0001
9	Osc. anode coupling S.W. ..	.0002
10	Osc. grid ..	.0002
11	L.W. oscillator fixed padder ..	.0000108
12	V3 screen decoupling ..	.1
13	A.V.C. diode coupling ..	.0001
14	H.F. by-pass ..	.00005
15	V4 anode H.F. by-pass ..	.0003
16	H.F. by-pass ..	.0001
17	L.F. coupling ..	.005
18	L.F. coupling ..	.1
19	Pentode compensator ..	.001
20	Pentode compensator ..	.001
21	Tone control ..	.01
22	H.T. reservoir ..	8
23	V5 bias decoupling ..	50

RESISTANCES

R.	Purpose.	Ohms.
1	Aerial shunt ..	40
2	V1 suppressor grid return ..	2 meg.
3	S.W. osc. anode load ..	5,000
4	M.W. and L.W. osc. anode load ..	60,000
5	V1 screen decouplings ..	100,000
6	Oscillator grid leak ..	50,000
7	M.W. regeneration modifier ..	1,000
8	L.W. regeneration modifier ..	1,000
9	A.V.C. decoupling ..	500,000
10	A.V.C. diode load ..	1 meg.
11	V3 screen decouplings ..	100,000
12	H.F. stopper ..	50,000
13	Demodulating diode load ..	500,000
14	Volume control ..	1 meg.
15	V4 grid stopper ..	100,000
16	V4 anode load ..	50,000
17	Tone control ..	100,000
18	Auto bias ..	100
19	Auto bias ..	20
20	Auto bias ..	800
21	S.W. regeneration modifier ..	50



For more information remember
www.savoy-hill.co.uk

Special Notes.—A pair of sockets at the rear of the chassis enable an external speaker to be operated. The speaker should be of the permanent magnet type with an impedance of some two ohms. A special plug is supplied with the receiver whereby the internal speaker may be cut out if the plug fitting the sockets is pushed right home.

A similar pair of sockets at the rear of the chassis enable a pick-up to be connected. A special plug also fits the pick-up sockets. When it is pushed right home the radio stages are cut off.

There are three dial lamps that also operate as waveband indication lights. Only one of the lamps is switched on at any time. These are rated at 2 volts 1 amp. and have M.E.S. bases.

In our particular chassis R3 was found to be 15,000 ohms and R21 to be 40 ohms.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer and a service oscillator between the grid of V1 and chassis. Switch set to M.W. and fully mesh the vanes of the gang. Set volume control to maximum and tone control to the "high" position.

Tune oscillator to 128.5 kc. and adjust the trimmers of I.F.T.2 and then I.F.T.1 for maximum response, reducing the input from the oscillator as the circuits come into line to prevent the A.V.C. working.

Signal Circuits.—Connect the service oscillator to the A and E sockets, preferably via a dummy aerial or fixed con-

denser. Only feed sufficient input from the service oscillator to obtain definite peaks in the output meter so as to keep the A.V.C. inoperative.

Medium Waves.—Tune set and oscillator to 214 metres (1,400 kc.) and adjust first T1 and then T2 and T3 respectively for maximum response.

The medium-wave padding is fixed, but check for calibration by injecting a signal of 500 metres (600 kc.) and compensate if necessary.

Long Waves.—Tune set and oscillator to 1,000 metres (300 kc.) and adjust T4 for maximum response.

The long-wave padding is fixed.

Short Waves.—There are no separate trimming adjustments for the short-wave range.

Replacement Condensers

Two exact replacement condensers for the 378 are available from A. H. Hunt, Ltd. These are: for C23, unit 2915, 1s. 9d., and for C22, unit 3477, 1s. 9d.

WINDINGS

Winding.	Ohms.	Winding.	Ohms.
L1+L6	10.8	L12+L13	5
L2	2.8	L14	14
L3	15	L15	4.6
L4	3.3	L16	62.8
L5	10.7	L17	61.4
L7	4	L18	60
L8	2	L19	61
L9	2	L20	730
L10	2	L21	5,000
L11	5.6	L22	606

McMichael 378 on Test

MODEL 378.—Standard model for battery operation, requiring a 120-volt H.T. battery and a 2-volt, 25-a.h. accumulator. Price, £13 2s. 8d.

DESCRIPTION.—A five-valve battery-operated superhet covering three wave ranges.

FEATURES.—Full-vision scale marked in station names and metres. Semi-flywheel tuning operating an illuminated pointer. Combined volume control and master switch. Tone control. Local station switch in aerial circuit. Socket for external speaker and pick-up.

LOADING.—H.T., 10.5 ma.; L.T., 0.91 amp.

Sensitivity and Selectivity

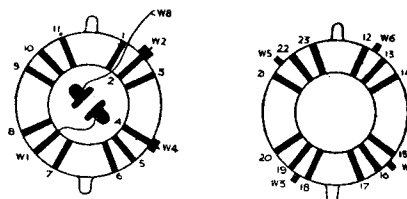
SHORT WAVES (19-50 metres).—Average tone and selectivity. Very easy handling and good stability, with freedom from drift.

MEDIUM WAVES (200-550 metres).—Representative gain and selectivity for the valve combination. Local stations spread on adjacent channels. Gain well maintained.

LONG WAVES (900-2,000 metres).—Adequate gain and good selectivity. Deutschlandsender being very free from interference.

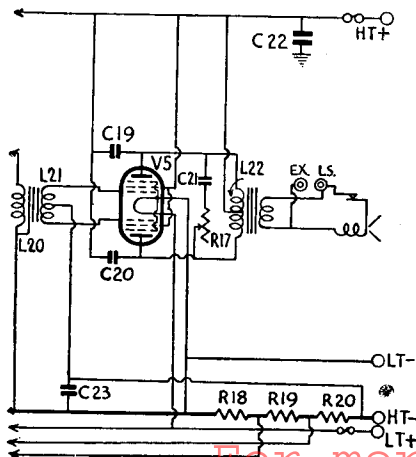
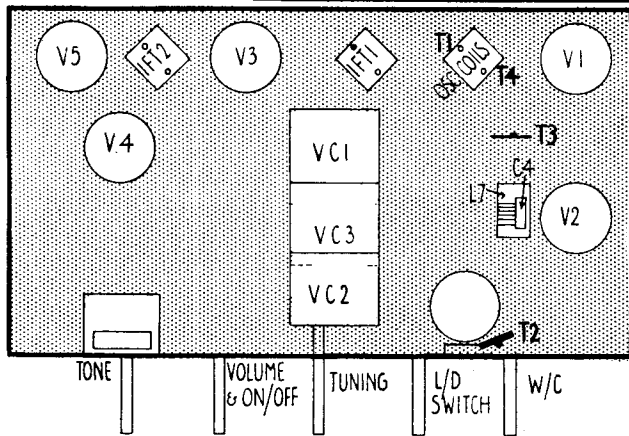
Acoustic Output

Adequate volume for an ordinary room, with a good characteristic. Nicely balanced and crisp, clean speech. Tone controls not too vigorous in action.



The two switch banks of the 378—see also under-chassis diagram.

Right: the top "deck" layout diagram of the McMichael 378 showing the logical placing of the parts. Note the positions of the trimmers.



Left is the circuit diagram which, simply for convenience, is shown in two parts. For the oscillator there is a separate triode valve (V2). On the right is the under-chassis layout diagram.

