McMICHAEL 389 BATTERY SUPERHET

CIRCUIT.—On all wavebands the aerial is connected via an I.F. wavetrap, consisting of a screened coil with associated fixed condenser and trimmer, to transformer coils. An additional aerial coupling condenser C2 is provided on the medium band.

The signal grid of V1, a triode-hexode frequency changer, is isolated by C5 and is A.V.C. controlled on all bands. The oscillator section incorporates regeneration modifying resistances for each waveband, and it will be noted that the oscillator grid-leak is returned to positive filament. The oscillator anode coupling is effected by means of a coupling condenser C11, the load resistance being R4.

V1 is coupled to V2, an H.F. pentode operating as the I.F. amplifier, by means of a transformer tuned to 465 kcs. V2 is also A.V.C. controlled.

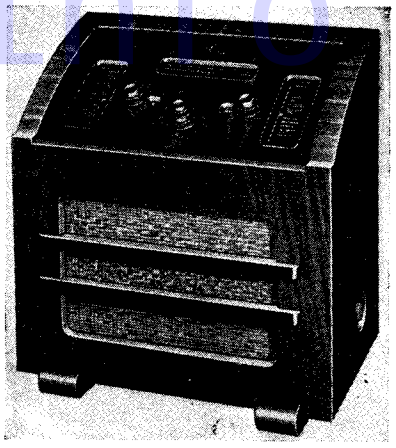
V2 is coupled to V3, a double-diode valve, by a further I.F. transformer of which only the primary is tuned. The Secondary is connected to the demodulating diode of V3 and also to the diode load R9 via an H.F. stopper network comprising R8 and C13 and C14. The other diode of V3, fed by C15, provides a D.C. potential that is fed back for A.V.C.

The rectified potentials pass via the L.F. coupling condenser C16 to the top of the manual volume control R13, and thence via a grid stopper resistance R14 to the output valve V4, a pentode. A pentode compensator condenser C18 is included and a fixed condenser and iron-cored choke in series across the primary of the speaker transformer effect a fixed modification of tone. Also connected across the primary of the transformer is an adjustable tone control arrangement, consisting of a variable resistance and a fixed condenser.

Bias for the output valve is obtained from two resistances connected between H.T. negative and L.T. negative. This potentiometer also provides an A.V.C. delay voltage.

Battery power consists of an Exide type CZH2-B 2-volt a.h. accumulator and a Drydex "Super" 120-volt H.T. battery.

Chassis Removal.—Remove the back of the cabinet and uncleat the L.T. cable from the chassis. Remove the two larger bolts from the wood control panel on the front of the cabinet.



Three scales, two with names and one calibrated in metres, form an unusual feature of the 8½ gn. model 389 by McMichael.

VALVE READINGS

No signal. Volume maximum. MW min. cap. New batteries.

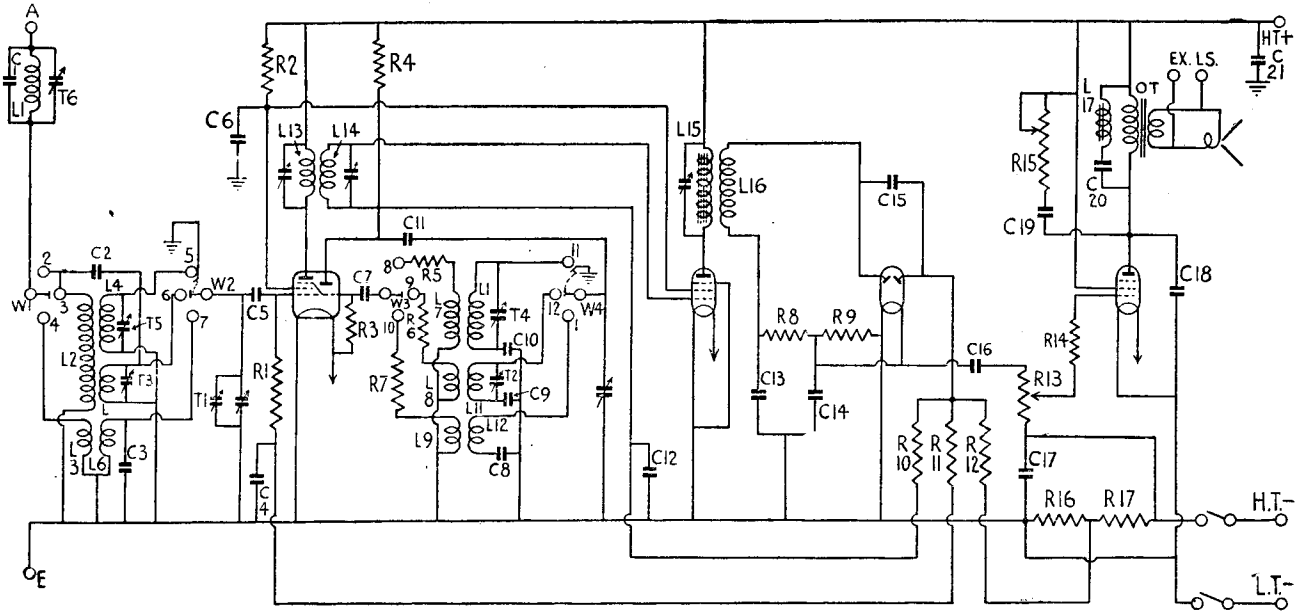
V.	Type.	Electrode.	Volts.	Ma.
	All Mazda.			
1	TP23 (7) ..	Anode ..	115	.6
		Screen ..	49	.7
		Osc. anode	50	4
2	VP 22 Met	Anode ..	115	1.5
	(Octal)	Screen ..	49	.4
3	DD/207 (5)..	Diodes only	—	—
4	Pen 24	Anode ..	112	4
	(Octal)	Screen ..	117	1.2

RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. feed ..	1 meg.
2	V1 screen decoupling ..	50,000
3	Osc. grid leak	25,000
4	Osc. anode load	17,000
5	Regeneration modifier ..	1,000
6	Regeneration modifier ..	1,000
7	Regeneration modifier ..	10
8	H.F. stopper	50,000
9	Demodulating diode load ..	1 meg.
10	V2 A.V.C. decoupling ..	1 meg.
11	V1 A.V.C. decoupling ..	1 meg.
12	A.V.C. diode load	1 meg.
13	Volume control	1 meg.
14	V4 grid stopper	100,000
15	Tone control	50,000
16	Bias potr. (part)	100
17	Bias potr. (part)	200

CONDENSERS

C.	Purpose.	Mids.
1	I.F. wavetrap	.0002
2	M.W. top aerial coupling ..	.000007
3	S.W. aerial fixed trimmer ..	.000017
4	V1 A.V.C. decoupling ..	.1
5	V1 grid isolator	.001
6	V1 screen decoupling ..	.1
7	Osc. grid	.0002
8	S.W. osc. fixed padder ..	.0035
9	M.W. osc. fixed padder ..	.0004823
10	L.W. osc. fixed padder ..	.000174
11	Osc. anode coupling ..	.0002
12	V2 A.V.C. decoupling ..	.1
13	H.F. by-pass	.0001
14	H.F. by-pass	.0001
15	A.V.C. diode coupling ..	.00001
16	L.F. coupling..	.01
17	Bias potr. shunt	50
18	Pentode compensator ..	.002
19	Tone control	.03
20	Tone control	.0015
21	H.T. reservoir	16



Auto-bias is among several refinements in the 389. The demodulator feeds the output valve direct.

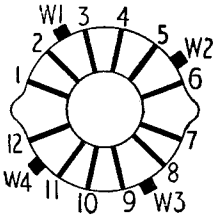
It will then be possible to tilt the control panel complete with chassis attached so that the top of the chassis is completely accessible. It will be noted that the panel and chassis swing on two supporting brackets.

To remove the speaker, four wood screws have to be undone and the leads to the speaker panel unsoldered. When replacing the leads, connect the yellow-red lead of the tone condenser and the yellow flex lead to the first tag, the blue lead to the second and third tags, the green to the fourth tag and the long systoflex lead and the red from the H.T. reservoir condenser C21 to the last tag. C21 is also connected to the tag on the left of the panel under the first tag. Also the red lead to C21 connects the H.T. lead to the tone resistance R15.

Special Notes.—A pair of sockets at the rear of the cabinet enable a low impedance permanent magnet speaker to be operated.

The I.F. filter, together with C1 in the aerial circuit, is contained in a screening can located on the side of the cabinet at the rear. The tone resistance R15, tone choke, tone condensers C19 and C20, and H.T. reservoir condenser C21 are all located at the side of the cabinet near the speaker. R8, R9, C13 and C14 are inside I.F. T2.

When the back of the cabinet is removed it will be noticed that the underside of the chassis is very conveniently exposed for service requirements without removing a single screw or bolt. Coupled with this desirable feature, the removal of two bolts enables the control and panel and chassis to be swung on pivots so that the top of the chassis can be conveniently serviced.



Left, the switch details. The chassis (diagrams below), being mounted on a swivel, is accessible while in the cabinet.

Alignment Notes

I.F. Circuits.—Connect service oscillator between the top grid cap of V1 and chassis and an output meter across the primary of the speaker transformer. Switch set to M.W. band and turn gang to maximum capacity. Turn volume control to maximum and tone control to "high."

Tune the oscillator to 465 kc. and adjust the trimmer of I.F.T.2 and then the trimmers of I.F.T.1 for maximum response, reducing the input from service oscillator as the circuits come into line in order to keep the A.V.C. inoperative.

Signal Circuits.—Connect the oscillator to the A. and E. sockets of the receiver, preferably *via* a dummy aerial or fixed condenser. Only feed sufficient input from the oscillator to give reliable peaks in the output meter.

Short Waves.—Inject a signal of 20 metres (15 mc.), tune in on receiver, and adjust T1 for maximum response.

The short wave padding is fixed, but check calibration throughout the range covered.

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

The medium wave padding is fixed, but check calibration, compensating is necessary.

Long Waves.—Tune set and oscillator to 1,000 metres (300 kc.) and adjust T4 and then T5 for maximum.

The long wave padding is fixed, but check calibration and compensate if necessary.

I.F. Wavetrap.—Switch set to long waves. Inject a fairly strong 465 kc. signal, tune in signal on receiver and adjust T6 for *minimum* response.

Replacement Condensers

Exact replacement condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, S.W.18, for C17 and C21. These are units 2915 and 2575 respectively at 1s. 9d. and 2s. 9d. each.

WINDINGS (D.C. Resistances)

Winding.	Ohms.	Range.	Measured between.
L1 ..	6.4	Any	Coil tags.
L2 ..	14.2	LW	W1 and chassis.
L3 ..	below .1	SW	W1 and chassis.
L4 ..	19	LW	W2 and chassis.
L5 ..	1.8	MW	W2 and chassis.
L6 ..	below .1	SW	W2 and chassis.
L7 ..	4.5	LW	Coil side R5 and chassis.
L8 ..	3.5	MW	Coil side R6 and chassis.
L9 ..	5.6	SW	Coil side R7 and chassis.
L10 ..	8.6	LW	W4 and coil side C10.
L11 ..	2.2	MW	W4 and coil side C9.
L12 ..	.1	SW	W4 and coil side C8.
L13 ..	12.6	Any	Anode V1 and HT + plug.
L14 ..	12.6	—	Top grid V2 and R10.
L15 ..	3.3	—	Anode V2 and R10.
L17 ..	323	—	L.H. tag spkr.panel and top tag C20.
O.T.prim	687	—	Outside tags speaker panel.

McMichael 389 on Test

MODEL 389.—Standard model for battery operation requiring an Exide type CZH2-B 2-volt 20-ah. accumulator and a Drydex Super 120-volt H.T. battery. Price, 8½ gns.

DESCRIPTION.—Four-valve, three-band, battery operated table model superhet.

FEATURES. — Three wavelength scales with separate pointers. Separate medium and long wave scales calibrated in station names only. The other scale calibrated for all wavebands in metres. Controls for tuning, tone, wave selection and combined volume and master switch. Wave selection and volume controls operate indicators on panel. Pilot light above calibrated scale. Sockets for extension L.S. Underside of chassis quickly accessible by removing back of cabinet whilst removal of two bolts enables the chassis to be swung on a pivot.

LOADINGS.—H.T., 12.1 ma.; L.T., .8 amp.

Sensitivity and Selectivity

SHORT WAVES (16.5-50 metres).—Representative gain and selectivity. Easy tuning and no drift trouble.

MEDIUM WAVES (200-550 metres).—Good gain, representative selectivity with small local station spread. Few noticeable whistles.

LONG WAVES (850-2,000 metres).—Adequate gain and selectivity. All mains stations easily received. No undue interference on Deutschlandsender.

Acoustic Output

Well-balanced tone for a battery receiver, good top response and reasonable low-note radiation. Little coloration on speech and generally pleasing reproduction.