

# McMICHAEL ALL-WAVE MODEL 371

**CIRCUIT.**—The aerial is coupled to the grid of V1, a triode-hexode frequency changer, through a set of self-variable coupling band-pass coils. The output of V1 passes by an I.F. transformer to the grid of V2, an H.F. pentode, working as I.F. amplifier.

The signal then passes via another I.F. transformer to the demodulating diode of V3, a double diode pentode. The other diode of V3 provides a D.C. potential that is fed to the preceding stages through the A.V.C. network.

The coupling arrangements to the grid of the pentode section of V3 include a manual volume control that varies the input. Between the anode of V3 and the chassis are connected a fixed condenser and a resistance and another condenser in parallel with these two components, to give modification of the tone.

Mains equipment consists of a transformer, full-wave rectifying valve, electrolytic smoothing condensers and smoothing choke consisting of the speaker field coil.

**Chassis Removal.**—The back of the cabinet is secured by two sliding clips. Remove the three control knobs on the front. These are of the spring-fixing type and are removed with a slight pull.

Turn the cabinet on its side and remove the four fixing bolts and washers on the base. Then place the cabinet upright again and remove the metal screen secured to the cabinet walls by three clips and unscrew the clip that carries the connection to the mains transformer for the purpose of earthing.

The chassis can then be removed, and is free to the extent of the leads to the mains transformer. To completely free the chassis these leads must be unsoldered. From left to right (looking from the back of the cabinet) the colours of the leads are: brown, red, yellow, dark blue, green and black. Alternatively, the speaker, electrolytic smoothing condensers and tone control can be removed, when the set can be operated outside the cabinet.

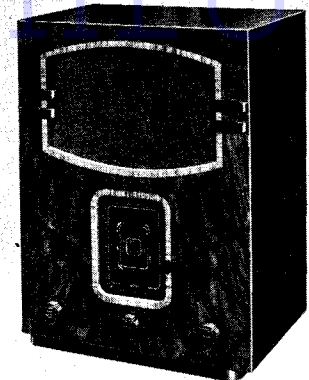
**Special Notes.**—C20 and R20 are located on the wiring near the speaker, and C16 and C17 are mounted on the speaker baffle board. The tone control is mounted on a metal bracket on the side of the cabinet.

There are two dial lights and three wavelength indication lights. The dial lights are located, one each side of the wavelength dial assembly, and the wavelength indication lights are to be found on the dial drum behind coloured celluloid strips. They are all rated at 6.2 volts, .3 amp.

The mains adjustment is located on the mains transformer, and takes the form of a wander plug adapted to fit into sockets marked with their respective values.

A pair of sockets at the rear of the chassis enable a pick-up to be connected. The makers state that for best results a high output crystal pick-up should be used.

An adjacent pair of sockets enable an external speaker to be operated. This should be of the permanent-magnet moving coil type with the resistance of some two ohms.



“Polychrome Flying Tuning”—a combination of colour indication and flywheel tuning—are distinctive features of the McMichael 371 all-wave A.C. three-valve plus rectifier superhet.

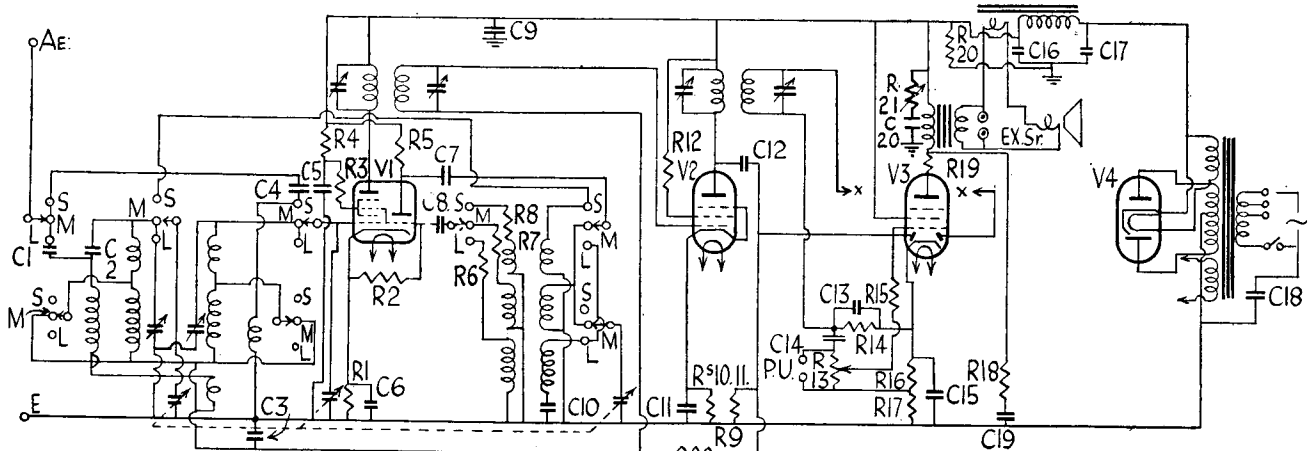
In the chassis diagram the resistance and condenser strips are drawn so as to show the various components.

## CONDENSERS

C.	Purpose.	Mfd.
1	L.W. and M.W. aerial coupling	.0002
2	L.W. and M.W. top coupling	.00001
3	V1 A.V.C. decoupling	.5
4	S.W. aerial coupling	.00005
5	V1 screen decoupling	.1
6	V1 cathode shunt	.1
7	Osc. anode coupling	.0001
8	Osc. grid	.0001
9	H.T. line decoupling	.1
10	L.W. osc. fixed padder	.00105
11	V2 cathode shunt	.1
12	A.V.C. diode coupling	.0001
13	H.F. bypass	.0001
14	L.F. coupling	.005
15	V3 cathode shunt	.25
16	H.T. smoothing	.8
17	H.T. smoothing	.8
18	Mains suppressor	.002
19	Tone control (part)	.03
20	Tone control (part)	.03

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	250
2	Osc. grid leak	50,000
3	V1 screen stabiliser	40
4	V1 screen decoupling	20,000
5	Osc. anode load	40,000
6	L.W. regeneration modifier	5,000
7	M.W. regeneration modifier	2,500
8	S.W. regeneration modifier	50
9	V1, V2, A.V.C. decoupling	500,000
10	V2 cathode bias	100
11	A.V.C. diode load	1 meg.
12	V2 screen stabiliser	40
13	Volume control	500,000
14	Demodulating diode load	500,000
15	H.F. stopper	100,000
16	V3 cathode bias (part)	150
17	V3 cathode bias (part)	500
18	Tone control (fixed)	50,000
19	V3 anode stabiliser	50
20	H.T. bleeder	40,000
21	Tone control (variable)	100,000
	Field coil	1,850



Band-pass coils with a “self variable” coupling circuit feed the first valve, the frequency changer, in the McMichael 371. An I.F. amplifier is followed by a combined double diode and output pentode valve.

## Circuit Alignment Notes

**I.F. Circuits.**—Connect a service oscillator between the top grid cap of V1 and chassis and an output meter across the primary of the speaker transformer. Turn the volume control to the maximum volume position. Switch the set to the medium waves and fully engage the vanes of the gang condenser.

Tune the service oscillator to 128 kcs. and adjust the trimmers of the I.F. trans-

formers, IFT1 and IFT2 respectively, until maximum response is indicated in the output meter. Reduce the input from the service oscillator as the circuits come into line to render the A.V.C. inoperative.

**Signal Circuits.**—Leave the output meter connected as before, but feed the output from the service oscillator to the aerial and earth sockets of the receiver. Only inject sufficient input from the service oscillator to obtain definite peaks in the output meter so as to render the A.V.C. inoperative.

Turn the gang to maximum capacity and adjust the drive, if necessary, so as to bring the leading edge to the pointer lights on each band.

**Medium Waves.**—Tune the set and the oscillator to 214 metres (1,400 kcs.) and adjust T1, T2 (on top of the band-pass coil) and T3 respectively for maximum response in the output meter.

(Continued in next column.)

## McMichael 371 on Test

**MODEL 371.**—Standard model for A.C. mains operation, 200-250 volts, 40-100 cycles. Price 11 gns.

**DESCRIPTION.**—Three-waveband, four valves, including rectifier, table model superhet.

**FEATURES.**—Full-vision "Polychrome" scale marked in waves and station calibration. Multi-colour light pointers, one for each band, and edge-on illuminated station names. Controls for tuning, wave selection and combined volume and on-off. Tuning control incorporates a flywheel drive that provides fine tuning for short waves, but permits the whole scale to be traversed by a spin of the tuning knob. Sockets for pick-up and external speaker.

**LOADING.**—70 watts.

### Sensitivity and Selectivity

**SHORT WAVES (16.5-50 metres).**—Sensitivity and selectivity up to standard for the valve combination employed. No appreciable drift. Sensitivity well maintained over the range covered.

**MEDIUM WAVES (200-550 metres).**—Good gain and average selectivity. Local stations spread over some adjacent channels. Gain well maintained.

**LONG WAVES (850-2,000 metres).**—Sensitivity good, reasonable selectivity. Difficulty experienced in receiving Deutschlandsender.

### Acoustic Output

Ample output for an ordinary room, with well balanced tone and crisp, clean attack. Little colouration on speech. Tone control not too vigorous in action.

(Continued from column 2)

**Long Waves.**—Tune both the set and oscillator to 1,000 metres (300 kcs.) and adjust T4 for maximum response in the output meter.

**Short Waves.**—There are no separate trimmers provided for adjustment on this band.

### Replacement Condensers

**EXACT** replacements are available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18, for two of the condensers in the McMichael 371.

For the block containing Cs 16 and 17 there is unit list number 3,763 at 6s. 6d., and for C15 there is unit 2,918 at 1s. 9d.

### BACKGROUND GROWL

**A** WHISTLE or growl background may be due to the fact that the I.F. stage is oscillating.

Other likely causes are excessive regeneration in the oscillator stage owing to incorrect potentials, faulty by-pass condensers, high resistance in grid circuits or faulty bias resistors.

Sometimes parasitic oscillation in the oscillator circuit modulates the injected signal at an audio frequency.

## VALVE READINGS

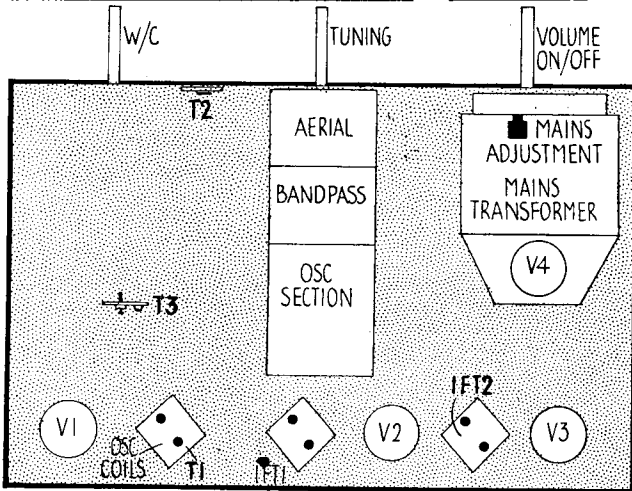
No Signal. Volume Maximum. 200 volts A.C. Mains

V.	Type.	Electrode.	Volts.	Ma.
1	All Mazda. AC/TH1 met. (7)	Anode ..	220	3.3
		Screen ..	95	6.7
		Osc.anode	70	4.
2	AC/VP2 met. (7)	Anode ..	235	6.5
		Screen ..	242	4.
3	AC2PenDD(7)	Anode ..	200	25.
		Screen ..	220	6.
4	UU4 (4)	Filament	345	—

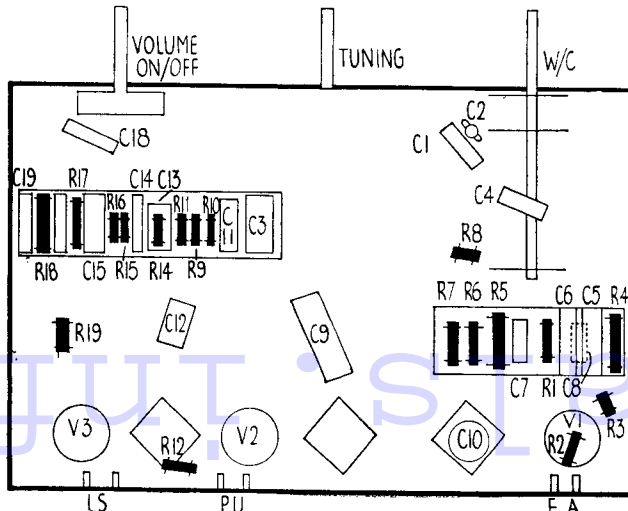
## QUICK TESTS

Quick tests are available on this receiver on the speaker leads. Volts measured between these and the chassis should be:—

Brown lead, 345 volts, unsmoothed H.T.  
Yellow lead, 205 volts, smoothed H.T.  
Red lead, 218 volts, smoothed H.T.



As these layouts show, the construction of the McMichael 371 is particularly clean and straightforward. The "tinted" diagram on the left identifies the top-of-chassis components and the valves.



Right, is the layout diagram for the underside of the 371 chassis. The two resistance - condenser assemblies are drawn tilted to facilitate reference.