

# McMICHAEL MODEL 361 SUPERHET A.C. THREE

**CIRCUIT.**—A 3-valve superhet for A.C. mains, operating on medium and long wave-bands.

Aerial signals are fed through a series condenser and a coupling coil to an inductively coupled band pass filter, incorporating an image suppressor coil, to the grid of V1, the frequency changer.

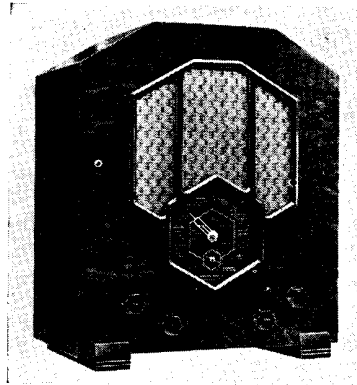
Signals are taken from V1 through an IF transformer tuned to 128.5 kcs. to V2, an H.F. pentode, and then through a second I.F. transformer to the diode portion of V3, a double diode output pentode. After rectification signals pass

through a resistance and capacity stage to the pentode section of V3.

One diode of V3 is used for demodulation and the other, which is fed from the anode of V2 via C14, supplies A.V.C. bias to the preceding valves in the orthodox manner.

Provision is made for a pick-up, which feeds directly into the pentode section of V3. Fixed tone correction is provided by C18, while C17 and RV2 act as a variable tone control.

Mains equipment consists of transformer, full wave rectifier, electrolytic condensers and the speaker field.



A giant tuning scale with a small vernier pointer is used in the McMichael 361 superhet A.C. three, which covers the standard medium and long wave-bands.

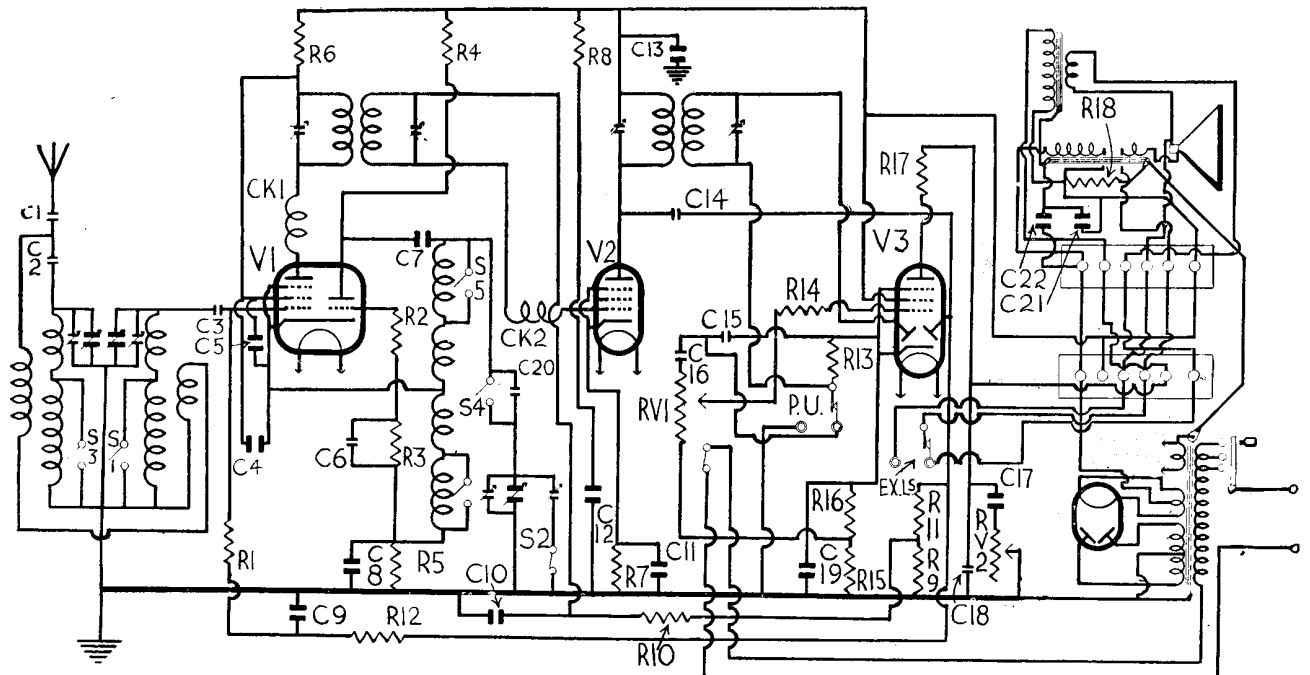
RESISTANCES			
R.	Purpose.	Ohms.	W.
1	V1 grid leak ...	1 meg.	½
2	V1 osc. harmonic suppressor ...	3,000	½
3	V1 osc. grid lead ...	50,000	½
4	V1 osc. anode load ...	60,000	1
5	V1 cathode bias ...	750	1
6	V1 anode and screen decoupling ...	5,000	1
7	V2 cathode bias ...	100	1
8	V2 screen decoupling ...	10,000	1
9	V3 A.V.C. diode load (part) ...	½ meg	½
10	V2 A.V.C. decoupling ...	½ meg	½
11	V3 A.V.C. diode load (part) ...	½ meg	½
12	V1 A.V.C. decoupling ...	1 meg	½
13	V3 demodulator diode load ...	½ meg	½
14	V3 grid stopper ...	100,000	—
15	V3 cathode bias ...	350	1
16	V3 cathode bias ...	150	1
17	V3 anode stabiliser ...	50	1
18	Speaker field bleeder ...	40,000	—
RV 1	Volume control ...	½ meg	—
RV 2	Tone control ...	100,000	—

CONDENSERS		
C.	Purpose.	Mfd.
1	Series aerial ...	.0002
2	Aerial coupling ...	.00001
3	V1 grid ...	.001
4	V1 screen and anode decoupling ...	.1
5	V1 screen and anode decoupling ...	.2
6	V1 osc. grid ...	.0002
7	V1 osc. anode feed ...	.1
8	V1 cathode bias shunt ...	.1
9	V1 A.V.C. decoupling ...	.1
10	V2 A.V.C. decoupling ...	.1
11	V2 cathode bias shunt ...	.1
12	V2 screen decoupling ...	.1
13	H.T. shunt ...	.1
14	A.V.C. diode coupling ...	.0001
15	H.F. by-pass ...	.0001
16	L.F. coupling ...	.005
17	Tone control ...	.03
18	Pentode compensating ...	.002
19	V3 cathode bias shunt ...	.25
20	Long wave osc. tracking ...	.00108
21	H.T. smoothing ...	8
22	H.T. smoothing ...	8

### QUICK TESTS

Quick tests are available on this receiver on the terminals strip on the speaker transformer. Volts measured between this and the chassis should be—

F	355 Unsmoothed H.T.
1	220 Smoothed H.T.
2	—
3	—
4	—
F	235 Smoothed H.T.



Circuit details of the McMichael 361. The colour coding of the speaker leads is given on the next page under the heading "Removing Chassis." Also on the next page are alignment notes and chassis layouts.

For more information remember

# McMICHAEL MODEL 361 SUPERHET THREE FOR A.C. MAINS

**Special Notes.**—The external speaker terminals are on the secondary of the output transformer, and the extra speaker should have a speech coil impedance of about 2 ohms.

The dial lamp is rated at 6.2 volts 3 amps., and is secured to the dial assembly by means of a spring clip.

C21, C22 and R18 are on the speaker sub-baffle.

**Removing Chassis.**—Take off the four knobs (spring clips), and then remove four bolts from underneath; the chassis is now free and can be removed by tilting it slightly from the back, so as to clear the spigots which secure the cabinet back and also to enable the scale assembly to clear the bottom of the speaker chassis. The chassis may be removed far enough for all the usual tests and replacements without disconnecting the speaker leads, though should this be considered necessary, reconnection is as follows, reading from left to right: F, Brown lead; 1, Yellow lead; 2, Black lead; 3, Green lead; 4, White

lead; F, Red lead; and a blue lead to the frame.

## ALIGNMENT NOTES

**Calibration.**—With the condenser vanes fully out, the large pointer should be exactly on the “&” in “Bournemouth & Plymouth,” and the little pointer dead on 200 metres; if this is not so, loosen the pointer by means of the grub screws and adjust them.

**I.F. Circuits.**—Connect a modulated oscillator tuned to 128.5 kcs. to the grid of V1, and an output meter across the external speaker terminals. Shunt the oscillator section of the gang condenser with a .1 mid. condenser.

Adjust T1, T2, T3 and T4 for maximum reading on the output meter.

Remove the shunt condenser.

**Medium waves.**—Connect the oscillator to the aerial and earth terminals, and tune it and the receiver to 214 metres.

Trim T5 for maximum reading on the output meter, using a weak signal. Two peaks will be found when adjusting this

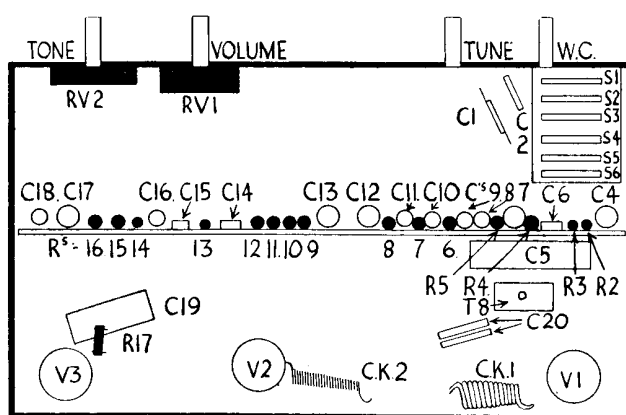
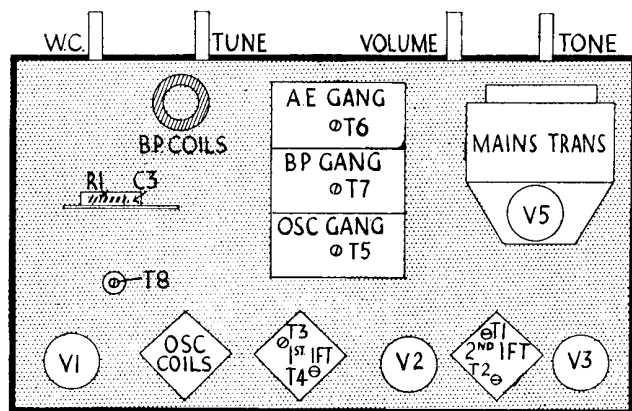
trimmer; the one nearer minimum capacity is the correct one.

With the oscillator still at 214 metres, trim T6 and T7 for maximum reading.

If the set is badly out of gang, difficulty may be experienced in reganging at 214 metres. In this case the set should be roughly aligned at 300 metres, afterwards tuning to 214 metres for accurate ganging.

**Long waves.**—Switch the receiver to long waves, and inject and tune in a signal of 1,000 metres. Trim T8 for maximum reading on the output meter.

VALVE READINGS				
No signal.		Volume maximum.		200 volt A.C. mains.
V.	Type.	Electrode.	Volts.	M/..
1	All Mazda.	Anode ...	210	5.5
	AC/TP (9) ...	Screen ...	210	2
	Met ...	Osc. anode ...	105	2
2	AC/VP1 (7)	Anode ...	235	13.5
	Met ...	Screen ...	207	3
3	AC/Pen/DD (7)	Anode ...	220	33
		Screen ...	235	6.8
4	UU3 (4) ...	Filament ...	355	—



Chassis layouts of the McMichael 361. That on the left, shown “tinted,” is the top view; on the right is the underside view. All resistances, variable or fixed, are shown in solid black.

## Service and Laboratory Receiver Testing

NOVICE and skilled man alike will find much useful information in *Testing Radio Sets*, a third and revised edition of which has been published by Chapman and Hall. The author is J. H. Reyner, B.Sc., A.C.G.I., D.I.C., A.M.I.E.E.

The subject of the book is not restricted to servicing but covers all branches of receiver testing. The first half deals with general “trouble-shooting” technique, and the second part with laboratory and factory testing.

### Methodical Approach

“Success in trouble-shooting,” says the author, “depends essentially upon a methodical approach to the problem, and hence the first part of this work is concerned with a detailed analysis of methods of attack. A great deal of the first section

has been rewritten to bring it in line with modern technique while still following the aim adopted in previous editions of presenting a reasoned statement of the basic principles rather than a collection of rule-of-thumb tests.”

This section starts with a brief outline of the reason a system is necessary and of the equipment required. Following chapters then deal with general testing methods, L.F. tests, tuning tests, H.F. tests, mains apparatus, short wave and superhet receivers, and finally “Some Curious Faults.”

In the second half of this book, dealing with “Laboratory Tests”—and it should be mentioned that in many respects the modern service shop should be in effect a laboratory—the latest types of equipment

necessary for analysing superhets are dealt with.

These pages describe in detail the nature and use of H.F. oscillators and signal generators, L.F. oscillators and apparatus for component testing.

Measurements of sensitivity, selectivity, fidelity and output are dealt with in addition to the aligning and tracing of superhet circuits.

One chapter is devoted to the use of cathode ray tubes for waveform analysis, modulation measurement, response curves and valve characteristics.

The book is clearly written and well illustrated throughout. It is available at 11s., post free, from the Technical Book Department, Odhams Press Ltd., Arne Street, W.C.2.

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