

McMichael 391 AC All-Wave Five

Four valve, plus rectifier, three waveband table model super-het with manual tuning and variable selectivity. Suitable for 200-250 volt, 50-100 cycle AC mains, price £12 5s.

CIRCUIT OUTLINE

ON medium and long waves there is a bandpass input to V1, a triode-hexode frequency changer. A single coupled circuit is used on short waves.

The hexode section of V1 is coupled to V2, the IF amplifier, through a switched type of transformer, by means of which the band-width can be increased. The oscillator section of the mixer valve is conventional and calls for no comment. Both the mixer and the amplifier are controlled by AVC.

A normal type of IFT couples V2 to the diode section of V3, a double-diode triode. One diode is used for demodulation and the other for AVC. A resistance-capacity filter is used on the diode load

valve and the valve reinserted in the holder, the voltage measurement being made at the end of the wire.

There was no departure from the maker's specification in our model, and there should be little difficulty in identifying the components.

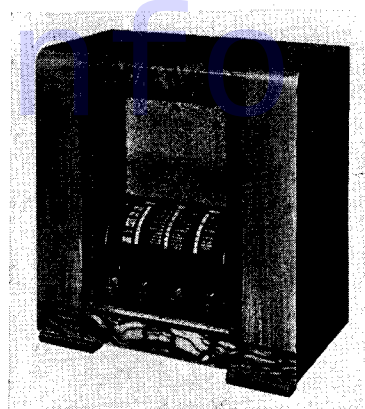
Wavechange Switches.

The wavechange switching is carried out by means of two wafers. The one nearer the front of the chassis carries the wipers which control the bandpass input coils and the single coupled SW circuits.

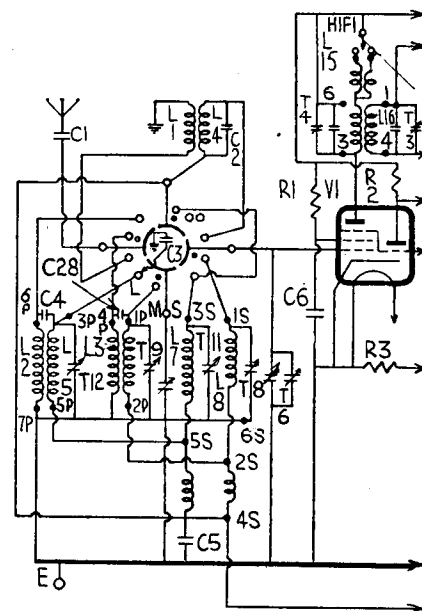
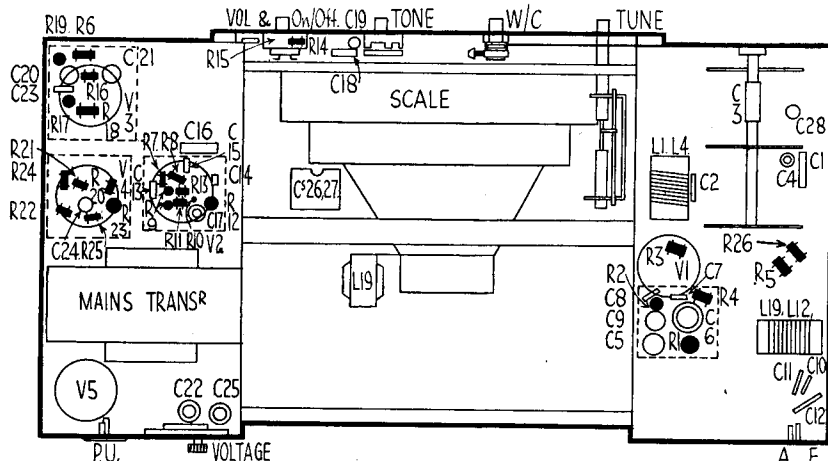
The second wafer carries three wipers, two of which control the oscillator circuits and the other the pilot lamps for the wave-range indicators.

The arrangement is quite conventional,

Continued on page 24



The top-of-chassis diagram, showing the trimmers, is with the alignment notes on page 24.



network, the potentials being taken through a coupling condenser to the grid of V3.

The anode and grid circuits of V3 are associated with a special switched feedback and tone-control circuit, which is also ganged with the first IET.

Between V3 and V4, a beam output valve, resistance-capacity coupling is used, again provided with a feedback circuit between the anode and grid.

Power is derived from a V5, a full-wave rectifier, and the usual smoothing circuits consisting of the speaker field and electrolytic condensers.

CONSTRUCTIONAL FEATURES

OWING to the compact assembly of the components below each valveholder, it is not easy to make contact to the valve pins for voltage measurement.

If a test prod cannot be inserted and no adaptor is available, a piece of insulated wire can be twisted round the pin of the

VALVE READINGS

V.	Type.	Anode.	Screen.	Cathode
1	TH41	220	40	—
	(Osc) 80			
2	VP41	185	185	—
3	HL41DD	120	—	7
4	PEN45	210	220	7
5	UU6	—	—	282

(All Mazda)

Pilot Lamps, Ever Ready, 6.2 volt, .3 amp.

RESISTANCES

	Ohms.
1	V1 screen feed .. 40,000
2	Osc. anode load .. 40,000
3	Osc. grid leak .. 50,000
4	Het. volt control .. 100
5	MW het. volt control .. 2,000
6	V2 screen feed .. 2,500
7	IF filter .. 50,000
8	Signal diode load .. 500,000
9	AVC diode load (part) .. 500,000
10	AVC diode load (part) .. 500,000
11	V1 AVC decouple .. 500,000
12	V2 AVC decouple .. 500,000
13	Series bias .. 40
14	AF series .. 500,000
15	Volume control .. 1 meg.

Resistances (continued)

16	Feedback .. 40,000
17	V3 cathode bias (part) .. 1,300
18	V3 cathode bias (part) .. 1,800
19	V3 anode load .. 50,000
20	V4 grid stopper .. 100,000
21	V4 grid leak .. 500,000
22	Feedback .. 25,000
23	V4 anode stabiliser .. 50
24	V4 cathode bias .. 180
25	Feedback .. 250,000
26	LW het. volt control .. 2,000

CONDENSERS

	Mfds.
1	Aerial series .. .0002
2	SW input trimmer .. .00002
3	LW aerial coil short .. .001
4	LW aerial top couple .. .000015
5	V1 AVC decouple .. .25
6	V1 screen decouple .. .1
7	Osc. grid .. .0001
8	Osc. anode couple .. .0001
9	HT line shunt .. .1
10	LW padder .. .0001692
11	MW padder .. .0005075
12	SW padder .. .00035
13	AVC couple .. .0001
14	IF filter .. .0001

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

10-MINUTE FAULT-FINDER

McMICHAEL 391

Power Test.

Voltages : V5 anode, 282; HT line, 220.
Resistance : L20, 1,010 ohms.
Total feed = $282 - 220 \div 1,010 = 62$ ma.

Mains loading : 55 watts.

Output Stage, V4.

Inject 5 volts AF at grid. If defective, check :—

Voltages : Anode, 210; screen, 220; cathode, 7.

Resistances : Anode-HT, 350; grid-chassis, 525,000; cathode-chassis, 180 ohms.

LF Stage, V3.

Inject .5 volt AF at grid. If defective, check :—

Voltages : Anode, 120; cathode, 7.

Resistances : Anode-HT, 50,000; cathode-chassis, 3,100 ohms; grid-chassis, 1 megohm.

Demodulation.

Inject modulated 465 kcs. at anode. If defective, check :—

Resistances : Diode-chassis, 550,000; L18, 11; L17, 12 ohms.

IF Stage, V2.

Inject modulated 465 kcs. signal at V2 grid. If defective, check :—

Voltages : Anode, 185; screen, 185.

Resistances : Screen-HT, 2,500; anode-HT, 2,500.

Mixer Stage, V1.

Inject modulated 465 kcs. signal at grid.

If defective, check :—

Voltages : Anode, 220; screen, 40.

Resistances : Anode, 220; screen-HT, 40,000.

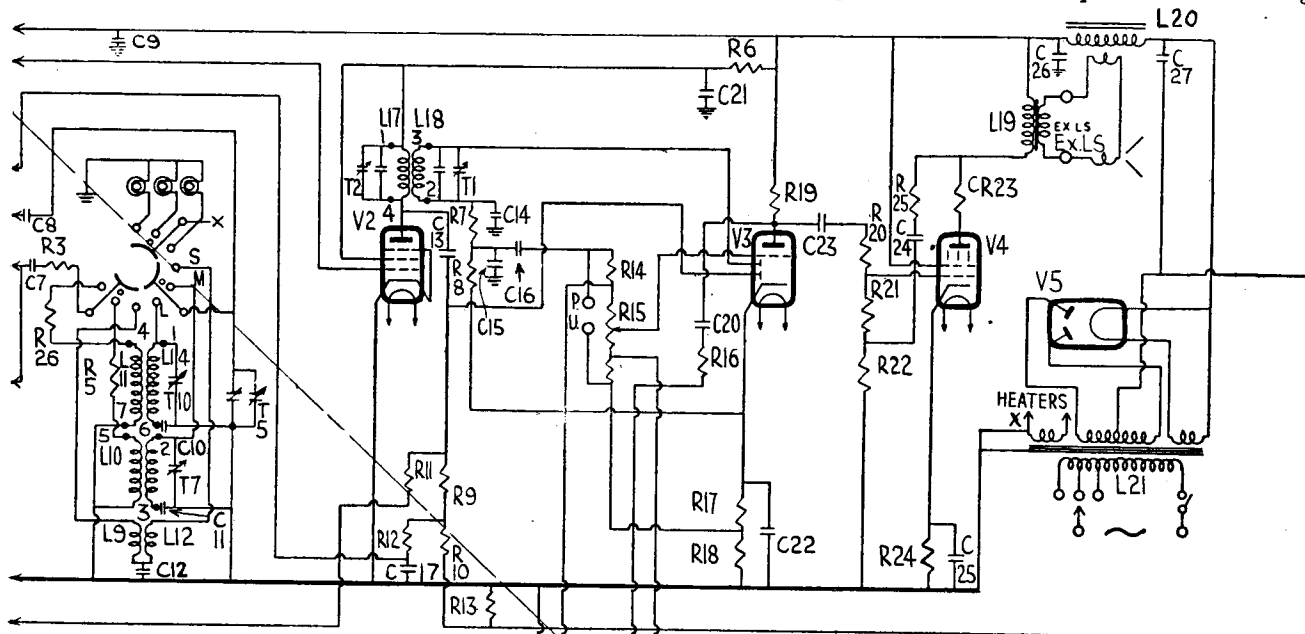
Oscillator Test.

If signals are still absent, tune to local station and inject that frequency plus 465 kcs. at osc. grid. If signals are received check oscillator circuits. If defective, check :—

Voltage : Osc. anode, 80.

Resistances : Osc. anode-HT, 40,000; osc. grid-chassis, 50,000.

If signals are still absent, check with oscillator and input coils and switching.



Condensers (continued)

15	..	IF filter	..	..	..	.0001
16	..	AF couple	..	..	..	.01
17	..	V2 AVC decouple	..	..	..	.1
18	..	Tone control	..	..	..	.001
19	..	Feedback	..	..	..	.015
20	..	Feedback	..	..	..	.1
21	..	V2 screen decouple	..	..	..	.1
22	..	V3 cathode shunt	..	..	..	.50
23	..	AF couple	..	..	..	.01
24	..	Feedback	..	..	..	.005
25	..	V4 cathode shunt	..	..	..	.50
26	..	HT smoothing	..	..	..	.16
27	..	HT smoothing	..	..	..	.8
28	..	MW aerial top couple	..	..	..	.000005

WINDINGS

(D.C. Resistances)

L.	Ohms.	Range.	Where measured.
1	..	Low	SW .. On tags.
2	..	76	LW .. On tags.
3	..	13	MW .. On tags.
4	..	Low	SW .. On tags.
5	..	23	LW .. On tags.
6	..	2.3	MW .. On tags.
7	..	22	LW .. On tags.
8	..	2	MW .. On tags.
9	..	Low	SW .. On tags.
10	..	2.3	MW .. On tags.
11	..	2.9	LW .. On tags.
12	..	Low	SW .. On tags.

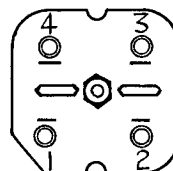
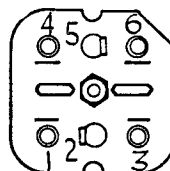
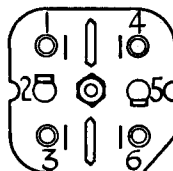
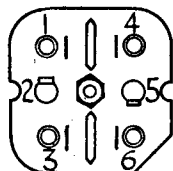
The circuit diagram is shown divided only for reasons of presentation. The High Fidelity switch controls a tone circuit and IFT1 band width. Below are diagrams identifying coil tags and for use when measuring windings resistances.

B.P. PRIMARY, AND

B.P. SECONDARY.

IFT 1

IFT 2



Windings (continued)

13	..	2.4	..	MW	On tags.
14	..	9	..	LW	On tags.
15	..	5.7	..	..	V1 anode and HT.
16	..	2.8	..	..	V2 grid and C17.
17	..	12	..	..	V2 anode and C21.
18	..	11	..	..	Signal diode and C14.
19	..	300	..	..	V4 anode and HT.
20	..	1,010	..	..	On tags.
21	..	26	..	..	Mains plug.

Replacement Condensers

EXACT replacement electrolytics are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18.

For the block containing C26 and C27 there is unit list number 2540B, price 8s. 9d., and for either of the bias tubulars C22 or C25 there is unit 2915, price 1s.9d.

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

"RADIO MARKETING"

GP Walker
985725.

VOL. 15.

JULY, 1940.

SERVICE MAN'S MANUAL

Published twice yearly by
"Electrical Trading and Radio
Marketing," Odhams Press Ltd., 92,
Long Acre, London, W.C.2 (Temple
Bar 2468), at 5s. a year (two issues)
or 2s. 6d. for single copies, post free.

DECCA AWD47

Three-tube, plus half-wave rectifier, three waveband transposable with M. and L.W. frame aerials. Suitable A.C. or D.C. supplies. Made by Decca Radio and Television, Ltd., 1-3, Britton Road, London, S.W.9.

Circuit.—There are loop aerials for M.W. and L.W., and an external aerial lead coupling to the frames and also energising a S.W. transformer coil. There are trimmers for each of the aerial windings. A V.C. is supplied to V1, the frequency-changer, through R1, C2 being a D.C. stopper. The oscillator section is straightforward with anode coupling coils and fixed padders. A trimmer-tuned I.F. transformer feeds V2, the I.F. amplifier, and a similar I.F. transformer

energises two diodes incorporated in the V envelope. V2 is used in a reflex arrangement. R10 is the diode load and the I.F. voltages are applied through R6 to the grid of V2. After amplification they are developed by R7 and fed through C11 to the volume control R12. V3 is an output pentode with an anode stopper resistance R14 and shunt tune the condenser C16. V4 is a full-wave rectifier with striped anodes and cathodes with H.F. stopper resistances and condensers, C19 and C20, R15 and R16.

GANGING

I.F. CIRCUITS.—Adjust I.F. trimmers at 380 kc/s. M.W. BAND.—Inject 200 metres and adjust T2. Adjust T3 at 220 m. Paddling is fixed. L.W. BAND.—Adjust T4 at 1,200 m. and T5 at 1,300 m. Paddling is fixed. S.W. BAND.—Adjust T1 while rooking gang. There are no oscillator adjustments.

CONDENSERS

C.	Mf/s.	C.	Mf/s.
1	.01	10	.0002
2	.0001	11	.001
3	.02	12	.0002
4	.021 mfd.	13	.0001
5	.385 mfd.	14	.1
6	.0001	15	.50
7	.006	16	.01
8	.1	17, 18,	.32
9		19, 20,	.02

VALVE VOLTAGES

V.	Type.	Anode.	Screen.	Cathode.
1	X65	205	50	—
2	6B84	50	50	1.5
3	KT35C	195	210	9.5
4	U31	—	—	250 D.C.

RESISTANCES

R.	Ohms.	R.	Ohms.
1	.5 meg.	10	.5 meg.
2	.40	11	1 meg.
3	100,000	12	.5 meg.
4	50,000	13	140
5	50,000	14	100
6	2 meg.	15	100
7	50,000	16	100
8	300	17	430
9	.5 meg.	18	70
		19	

Instead of the usual chassis layout diagram we give two details showing the trimmer positions. The circuit includes an interesting reflex arrangement, V2 being both an I.F. and L.F. amplifier as well as incorporating the diodes.

