

R.G.D. Model 166 Push-button Five

Four valve, plus rectifier and tuning indicator, permeability press-button and manual tuned table model superhet operating on 200-250 volt, 50-100 cycle AC supplies, price 16 gns.

CIRCUIT OUTLINE

THE input to V1, a triode-hexode mixer, is taken through an IF trap either to the press-button unit or to the normal coupled aerial circuits, all of which are controlled by button switches.

The oscillator section is conventional and calls for no comment, the switching arrangement being similar to that used on the input circuits.

The intermediate frequencies from the anode circuit of V1 are coupled to the input of V2, an IF amplifier, by a permeability-tuned transformer. A similar transformer couples V2 to the diode section of V3, a double diode triode.

Here, only one diode is used for both signal demodulation and AVC, which controls V1 and V2 in the usual way.

A simple resistance-capacity filter is used between the diode load and the triode section of V3. The volume control is of the tapped type with a compensating network. Coupling between V3 and V4 is by means of the usual resistance-capacity arrangement.

The output valve V4 is fitted with a variable tone control on the anode circuit and a fixed compensating circuit.

Power is derived from V5, a full-wave rectifier, through the speaker field as a choke in conjunction with electrolytic smoothing condensers.

Finally, there is an ordinary tuning indicator on the AVC line.

Chassis Removal.

First of all remove the control knobs

from the front of the panel and then the press-button escutcheon. The chassis is held by four bolts which, after removal, enable it to be withdrawn.

The speaker is held by four clips secured by nuts and is easily removed if necessary. The connections are all made by a single strip, the colours of the leads being as follows: Red, blank, yellow, blank, black, blue.

Three leads also go to the internal speaker switch. These are blank, blank, yellow, white, red and black, blank.

SPECIAL NOTES

THE chassis examined was found to conform very closely to the makers' specification with one or two small exceptions. The two 5,000-ohm resistances used in the set were both found to be 4,700. The condenser C32 did not appear to be used.

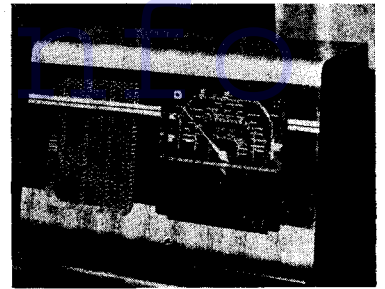
When ganging the set it should be particularly noted that a completely non-metallic tool should be used. If one is not available the manufacturers recommend the dealer to make one from bone or similar material about 4 inches long. The end should be tapered down to 2.5 millimetres by 0.5 millimetre. Such a ganging tool will fit the cores in the IF transformers.

Alignment

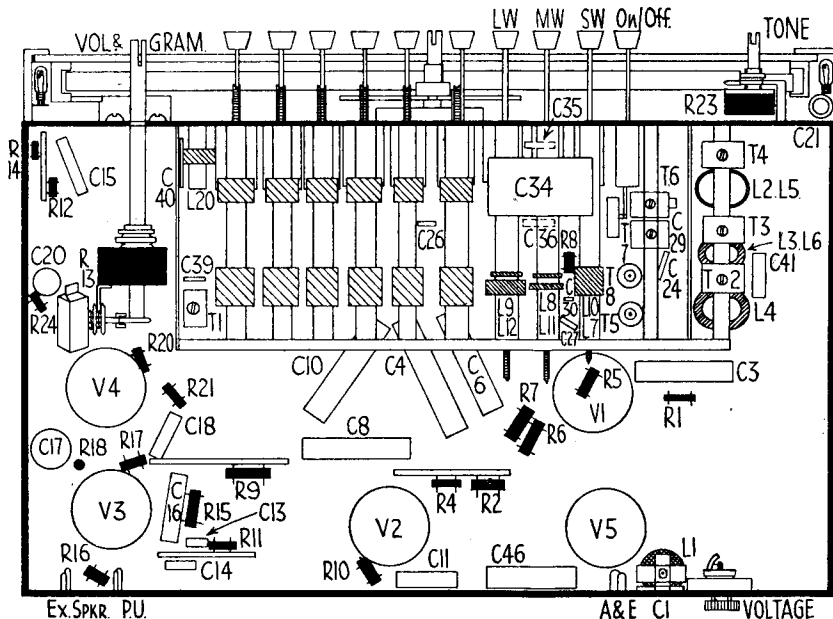
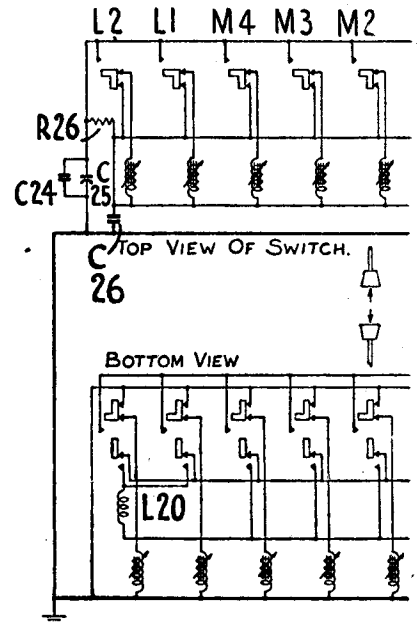
IF Circuit (465 kcs.).

Connect meter to set and generator to grid of V1 and adjust the cores of L16, L15, L14 and L13 for maximum, using a small input below the AVC level.

Continued on page 24



The model 166 by R.G.D. is a three-waveband four-valve, plus rectifier and tuning indicator, superhet. In addition to permeability station selection, there are push-buttons for wave changing.



This diagram shows how the parts are arranged below the chassis. Construction is straightforward, and the indication of resistors in solid black and condensers in outline aids identification.

VALVE READINGS

V.	Type.	Anode.	Screen.	Cathode.
1	TH41	250	105	2.7
2	VP41	75 (Osc.)	210	2.7
3	HL42DD	55		
4	PEN45	250	270	9
5	UU6			395
Pilot lamps, MES 6.2 volts .3 amp.				

RESISTANCES

	Ohms.	
1	C3 series	76
2	V1 screen feed	25,000
3	V1 grid return	500,000
4	V1 anode decouple	5,000
5	Osc. grid leak	50,000
6	V1 cathode bias	200
7	Osc. anode load	40,000
8	Het. volt control	100
9	V2 screen decouple	25,000
10	V2 cathode bias	270
11	IF filter	100,000
12	Tone compensation	1 meg.
13	Volume control	50,000

10-MINUTE FAULT-FINDER

R.G.D. 166

Power Tests.

Voltages : V5 cathode, 395; HT line, 270.

Resistance : L18, 1,200 ohms.

Total feed = 395 - 270 ÷ 1,200 = 104 ma.

Mains loading, 90 watts.

Output Stage, V4.

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

Voltages : Anode, 250; screen, 270; cathode, 9.

Resistances : Anode-HT, 460; cathode-chassis, 180; grid-chassis, 505,000 ohms.

AF Stage, V3.

Inject 1 volt AF at grid. If defective, check :—

Voltages : Anode, 55.

Resistances : Anode-HT, 70,000 ohms; grid-chassis, 3.5 megohms.

Demodulation, V3.

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

Resistances: L16, 3.8; L15, 3.8; diode-chassis, 600,000 ohms.

IF Stage, V2.

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

Voltages : Anode, 270; screen, 210; cathode, 2.7.

Resistances : Screen-HT, 25,000 ohms; grid-chassis, 1.5 megohms; cathode-chassis, 270 ohms.

Mixer Stage, V1.

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

Voltages : Anode, 250; screen, 105; cathode, 2.7.

Resistances : L14, 3.6; L13, 3.6; anode-HT, 5,000; screen-HT, 25,000 ohms; grid-chassis, 2 megohms

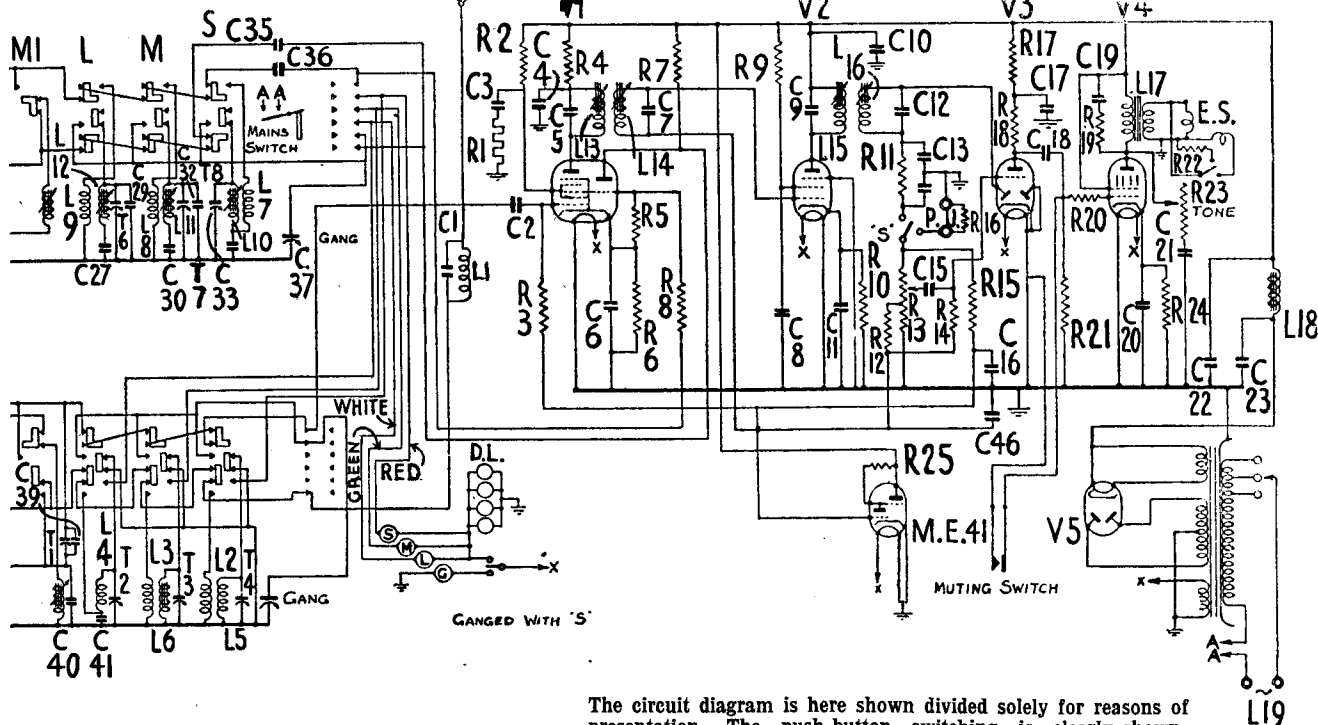
Oscillator Test.

Tune to local station and inject that frequency plus 465 kcs. at osc. grid. If defective, check :—

Voltage : Osc. anode, 75.

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

Check coils and switching.



The circuit diagram is here shown divided solely for reasons of presentation. The push-button switching is clearly shown, separate "practical" diagrams not being necessary. Basically, the circuit is quite conventional.

Resistances (continued)

14	..	V3 grid leak	..	..	2 meg.
15	..	AVC decouple	..	..	2 meg.
16	..	Pick-up shunt	..	..	50,000
17	..	V3 anode decouple	..	..	20,000
18	..	V3 anode load	..	..	50,000
19	..	Tone correction	..	..	5,000
20	..	V4 grid stopper	..	..	5,000
21	..	V4 grid leak	..	..	500,000
22	..	Output dummy load	..	..	5
23	..	Tone control	..	..	25,000
24	..	V4 cathode bias	..	..	180
25	..	Tuning indicator feed	..	..	1 meg.
26	..	Press button volt control	..	..	25,000

CONDENSERS

1	..	IF trap tune	..	..	.0002
2	..	V1 grid	..	..	.0001
3	..	V1 screen decouple	..	..	.1
4	..	V1 anode decouple	..	..	.1
5	..	IFT1 primary tune	..	..	.0002
6	..	V1 cathode decouple	..	..	.04
7	..	IFT1 secondary tune	..	..	.0002
8	..	V2 screen decouple	..	..	.1
9	..	IFT2 primary tune	..	..	.0002
10	..	HT line shunt	..	..	.1
11	..	V2 cathode shunt	..	..	.04
12	..	IFT2 secondary tune	..	..	.0002

Condensers (continued)

13	..	IF filter	..	..	.00015
14	..	IF filter	..	..	.0001
15	..	AF couple	..	..	.01
16	..	AVC decouple	..	..	.04
17	..	V3 anode decouple	..	..	.8
18	..	AF couple	..	..	.04
19	..	Tone compensation	..	..	.001
20	..	V4 cathode decouple	..	..	50
21	..	Tone control	..	..	.1
22	..	HT smoothing	..	..	16
23	..	HT smoothing	..	..	16
24	..	Press button osc. tune	..	..	.00037
26	..	Osc. couple	..	..	.0008
27	..	LW padder	..	..	.00016
29	..	LW fixed trimmer	..	..	.00005
30	..	MW padder	..	..	.00049
32	..	MW fixed trimmer	..	..	.000025
34	..	SW padder	..	..	.003
35	..	Osc. anode couple	..	..	.0001
36	..	Osc. grid	..	..	.0001
39	..	Press-button input	..	..	.00025
40	..	Press button input	..	..	.0015
41	..	LW input	..	..	.01
46	..	V2 AVC decouple	..	..	.1

WINDINGS

L.	Ohms.	Range.	Where measured.
1	..	2.3	.. On tags.
2	..	Low	.. SW L1 and chassis.
3	..	5.5	.. MW L1 and chassis.
4	..	12	.. LW C2 and C41.
5	..	Low	.. SW C2 and chassis.
6	..	1.9	.. MW C2 and chassis.
7	..	Low	.. SW C36 and C34.
8	..	23	.. MW C36 and C30.
9	..	52	.. LW C36 and C27.
10	..	Low	.. SW C35 and C34.
11	..	1.3	.. MW C35 and C30.
12	..	3.4	.. LW C35 and C27.
13	..	3.6	.. V1 anode and R4.
14	..	3.6	.. V2 grid and C46.
15	..	3.8	.. V2 anode and HT line.
16	..	3.8	.. Signal diode and R11.
17	..	460	.. V4 anode and HT line.
18	..	1,200	.. On tags.
19	..	20	.. V4 anode and HT line.
20	..	11	.. Mains plug.
20	..	11	.. On tags.

McMichael 391 AC Five

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and the diagrams in the circuit are sufficiently like the actual banks to make everything clear.

Chassis Removal.

Removal of the chassis in this set is very simple, because it is not necessary to take off the control knobs. The chassis itself and the metal front panel are built as a composite assembly, which is released as follows:—

There are two metal clips inside the front of the cabinet held by wood screws, which simply require slackening so that the clips can be rotated.

The chassis-retaining bolts are then removed and the chassis can be taken out of the case. This requires a little care, as it is necessary to pull the chassis forward and tilt it slightly, after which it must be very carefully withdrawn.

Alignment Notes

IF Circuits (465 kcs.).

Connect generator to grid of V1 through isolating condenser and output meter to set.

Adjust generator to 465 kcs. and trim T1, T2, T3 and T4 in that order for maximum, using a small input always below the AVC value.

Short Waves (16.5-52 metres).

Connect generator to set through dummy aerial. Tune generator to 18.5 mcs. and turn set gang to minimum. Adjust T5 for maximum.

At a frequency of 16.2 mcs. adjust T6 for maximum.

There is no padding operation.

Medium Waves (190-550 metres).

Set gang to minimum and adjust oscillator, T7, at 1,580 kcs.

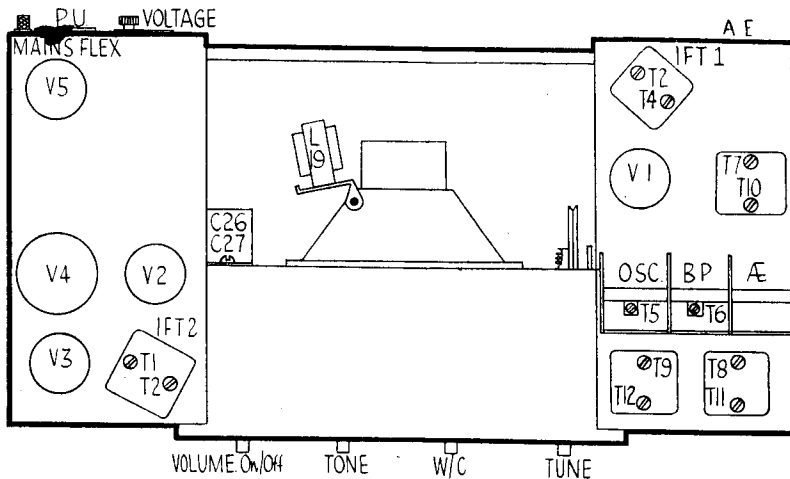
Tune set and generator to 1,400 kcs. (214 metres) and adjust T8 and T9 for maximum.

There is no padding operation.

Long Waves (1,100-2,000 metres).

Set gang to minimum and adjust oscillator, T10, at 272.73 kcs. (1,100 metres).

Trim at this frequency, adjusting T11 and T12 for maximum.



The surface layout diagram of the somewhat unorthodox McMichael chassis. The underside layout is on page 18.

R.G.D. Model 166 AC Five

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Medium Waves (195 to 550 metres).

Connect the generator through dummy aerial to the input of the set and tune set and generator to 220 metres and adjust T3 and T7 for maximum.

Tune set and generator to 500 metres and adjust the core of L11 for maximum, simultaneously rocking the gang for maximum.

Then re-trim at 220 metres.

Long Waves (800-2,000 metres).

Tune set and generator to 1,000 metres and adjust T2 and T6 for maximum.

Tune set and generator to 2,000 metres and adjust L12 for maximum, simultaneously rocking the gang.

Re-trim the set at 1,000 metres.

Short Waves (16.5 to 50 metres).

Tune set and generator to 16.5 metres and adjust T4 and T8 for maximum.

Tune set and generator to 50 metres and adjust the core of L10, simultaneously rocking the gang.

Re-trim at 16.5 metres.

IF Trap Adjustment.

Inject a 465 signal at the aerial and adjust the core of L1 for minimum.

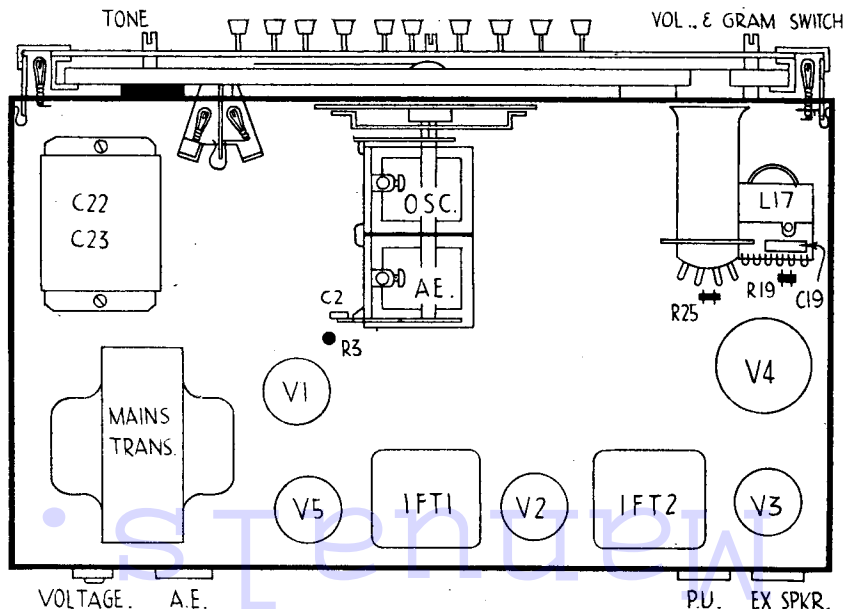
Press Buttons

PRESS in button No. 6 and inject 322 metres. Adjust the core of the coil connected to this button. Proceed by

lowering the frequency of the injected oscillator, simultaneously screwing in the core of the coil until screwing in the core further will only increase the frequency again. Then turn back two turns and inject 916 kcs., adjusting T1 and T5 for maximum.

Coil Coverage.

- Button 1.—1,400-2,000 metres.
- Button 2.—1,050-1,550 metres.
- Button 3.—320-550 metres.
- Button 4.—270-460 metres.
- Button 5.—255-420 metres.
- Button 6.—195-325 metres.



Top-of-chassis layout diagram of the R.G.D. model 166, identifying valves and other parts. Instructions for adjusting both the push-buttons and alignment are on this page.

"RADIO MARKETING" SERVICE MAN'S MANUAL

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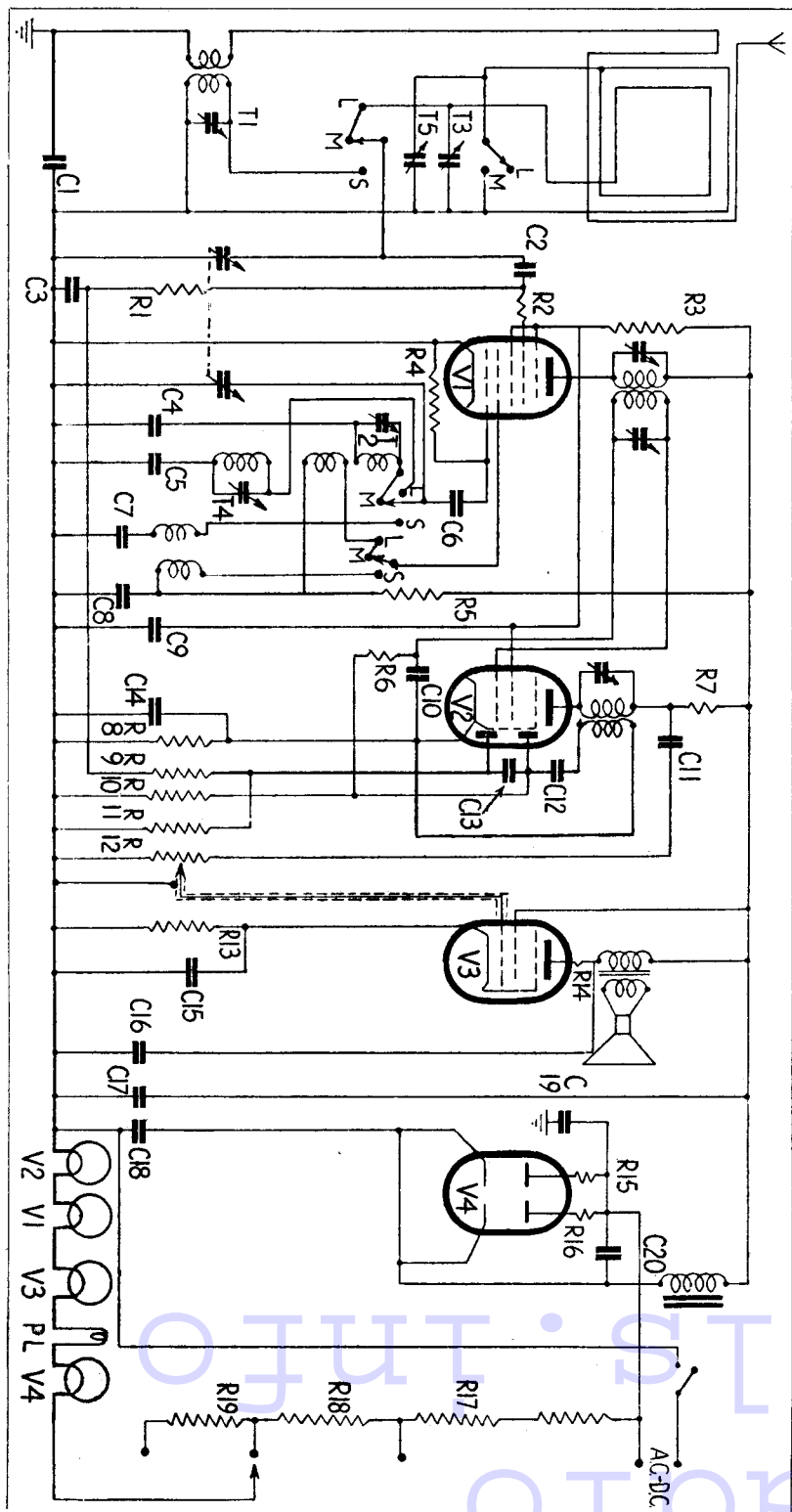
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DECCA AWD47

Three-valve, plus half-wave rectifier, three waveband transportable with M. and L.W. frame aeriads. Made by Decca Radio and Television, Ltd., 1-3, Britton Road, London, S.W.9.

Circuit.—There are loop serials 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 resistor R14 and shunt with the condenser C16. V4 is a full-wave rectifier with striped anodes and cathodes with H.F. stopper resistors and condensers, C19 and C20, X15 and X16.

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

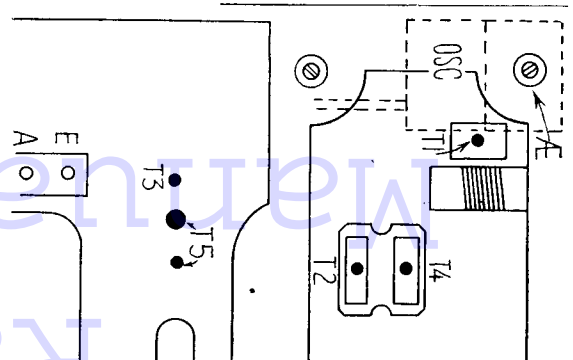
C.	Mf/s.	C.	Mf/s.
1	.01	10	.0002
2	.0001	11	.001
3	.02	12	.0002
4	.821 mfdts.	13	.0001
5	.385 mfdts.	14	.50
6	.0001	15	.1
7	.006	16	.01
8	.1	17, 18,	.82
9	.8	19, 20,	.02

VALVE VOLTAGES

V.	Type.	Anode.	Screen.	Cathode.
1	X65	205	50	1.5
2	6B84	50	50	0.5
3	KT35C	195	210	270 D.C.
4	U31	—	—	—

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	1.40
5	50,000	14	100
6	2 meg.	15	100
7	50,000	16	100
8	300	17	430
9	.5 meg.	18	70



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 I.F. amplifier as well as incorporating the diodes.