A.C.-D.C. THREE BY G.E.C. (Cont.)

screws underneath and lift chassis out. The L.S. leads are sufficiently long to allow examination.

Special Notes.—With the mains switched on, it is advisable to make sure that the engineer is not earthed.

The lay-out and connections are straightforward.

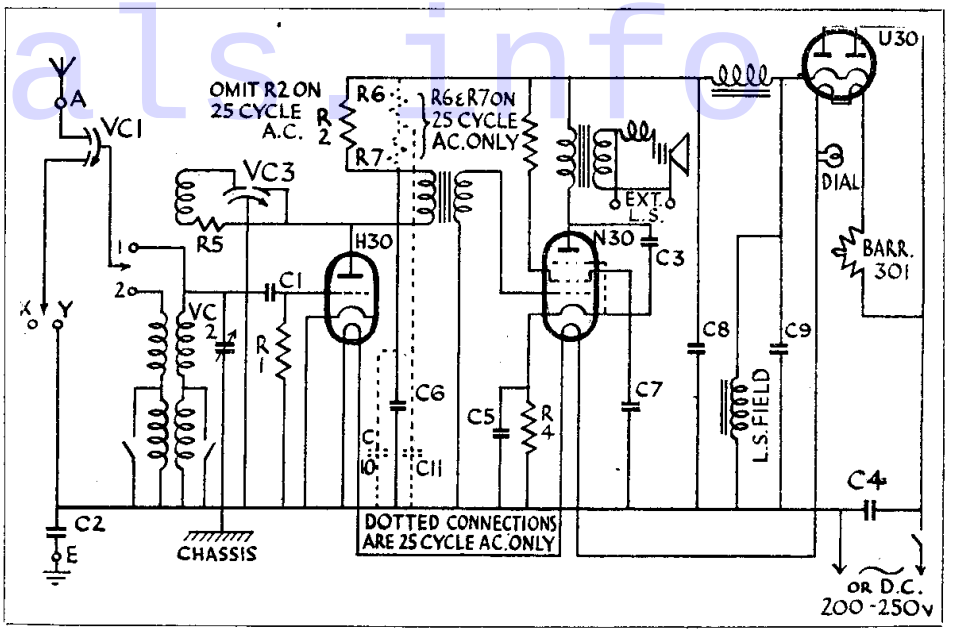
The wiring of the rectifier valve-holder is unusual, as the valve is actually a double half-wave rectifier with separate cathode pins and a centre tap to the filament. The connections are (counting heaters first and proceeding clockwise and looking from underneath): Heater, heater, anode 1, cathode 1, centre of heater, cathode 2, anode 2.

Owing to the fact that the voltages and currents of the valves vary with different voltages and types of supply, the tables contain the readings taken with the 200 and 250 volts for A.C. and for D.C.

The pilot lamp is the 6.5 volt .3 amp type.

Replacing Chassis.—Lay chassis inside cabinet, replace holding screws, and cover with insulating compound. When replacing the knobs, see that the hexagonal-headed screws are tightened so that they cannot be undone without the use of a spanner.

Do not leave the set in the customer's house with the back off.



The circuit of the General Electric Company's A.C.-D.C. Three. Remember when working on the set that whether the supply is A.C. or D.C. the chassis is probably at mains potential.

McMICHAEL S.M.C. DUPLEX FOUR PORTABLE

The S.M.C. Duplex portable introduced by McMichael Radio, Ltd., for the 1933-34 season is very similar to earlier models. Differences are mentioned under "Special Notes."

Circuit.—The H.F. valve, 215 S.G. (V1), is preceded by the frame aerial, of which the L.W. section is short circuited for use on M.W. Bias is obtained from a potentiometer in the negative H.T. lead (R11), and the grid circuit is decoupled. Coupling to the next valve is by H.F. choke and capacity feeding the tuned grid coil. Volume is controlled by a filament rheostat.

The detector valve, HL210 (V2), works as a leaky grid detector with reaction applied to the grid coil by a rotating coil inside the tuned grid coil former. This is fed through a condenser C7 from the detector anode.

Optimum operating conditions are obtained by taking the grid return lead to the centre tapping of a potentiometer across the filaments.

L.F. coupling consists of a parallel fed transformer with the low (AC) potential end of the primary returned to the H.T. + line at the decoupling resistance.

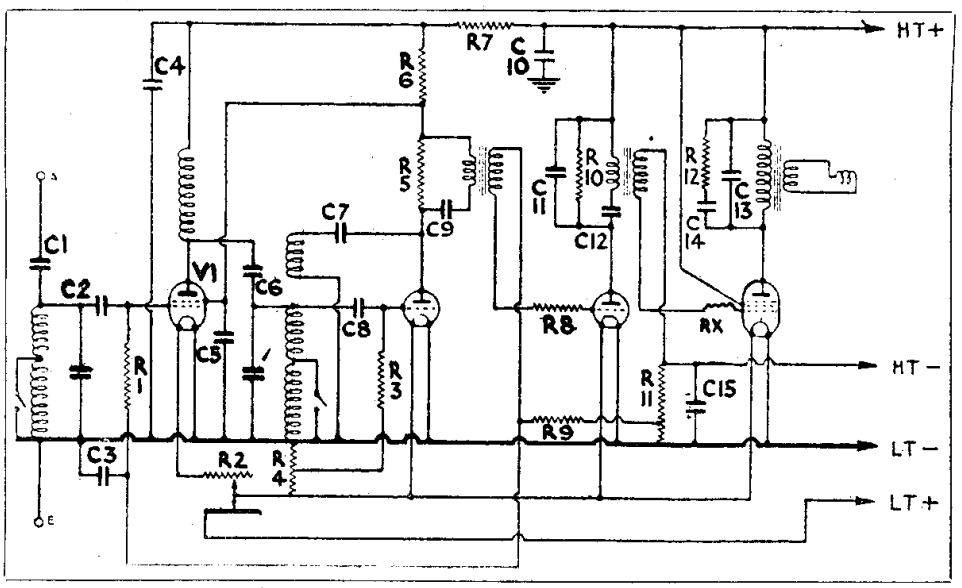
The L.F. valve, HL210 (V3), has an H.F. stopper in the grid circuit. Grid bias is obtained from the same tapping in the H.T. — potentiometer as V1. The L.F. coupling is another parallel fed transformer, but in this case a condenser C11 is connected across the coupling resistance (see special notes on previous models).

The output valve, Pen.220 (V4), is biased from the H.T. negative tapping and is tone compensated by a condenser across the primary of the output transformer and by a condenser in series with a resistance (C14, R12).

Special Notes.—The screen potential for V1 is obtained from the low H.T. potential end of the detector anode decoupling resistance.

In previous M.C. models the second L.F. transformer was used with "straight" coup-

(*Continued on next page.*)



H.F., detector, L.F. and pentode valves, constitute the basis of the straightforward circuit of the McMichael Four portable. Rx the grid stabiliser of V4 is 100,000 ohms.

McMICHAEL DUPLEX PORTABLE (Cont.)

ling and with a condenser across the primary, and the anode circuit of the pentode had an H.F. choke between the anode and the transformer. Also the grid circuit of the pentode had a grid stabilising resistance and the anode circuit had an H.F.C. between the anode and the transformer.

In still earlier models the speaker was of the moving-iron type and was used with a triode output valve.

Removing Chassis.—Undo the eight screws round the edge of the panel and, easing the panel slightly towards the back of the set, raise it up and stand the assembly on top of the valve compartment. This reveals most of the components.

To reach the underside of the valve compartment, remove two screws at each end and unsolder the three leads to the terminal strip on the right-hand side, the two leads to the condenser C13 on the left-hand side, and the carthing lead from the front screen. These leads are coloured underneath the systoflex and the connections as given in the diagram are R., red; W., white; and G., green.

The valve compartment can then be eased upwards.

Removing Frame Aerial and Speaker.—Remove the six screws round the outside of the lid and ease the assembly out from the top first.

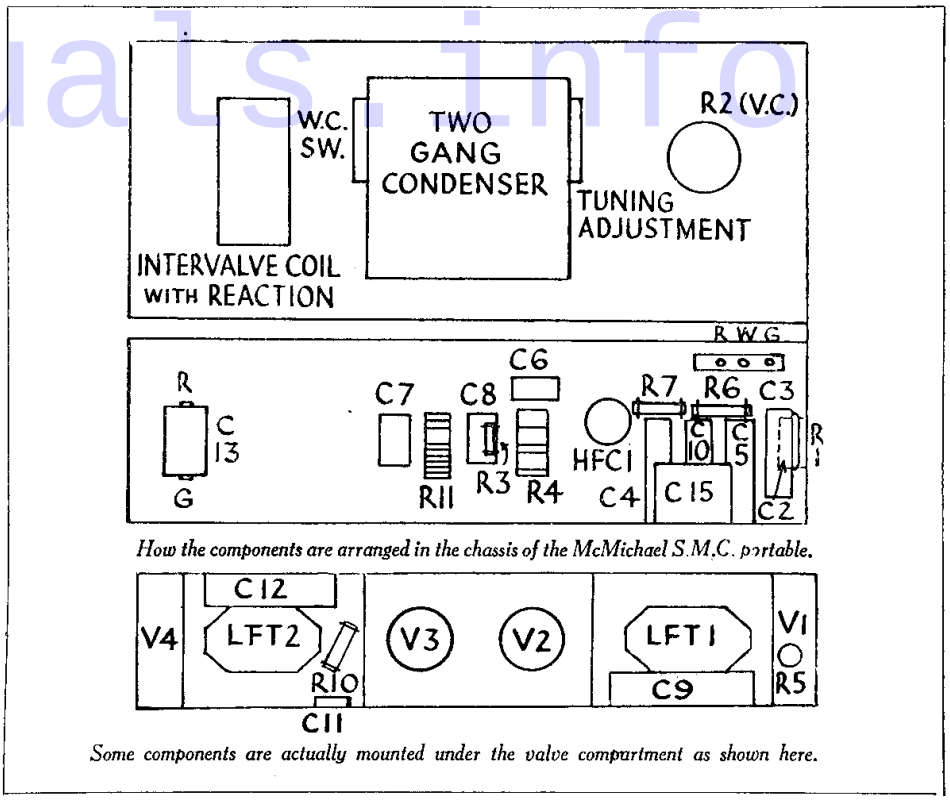
General Notes.—The volume control and the switch are in one unit, the switch being operated by the rheostat arm by means of pressing the contact spring outwards when in the minimum position. Owing to the comparatively long period taken for V1 filament to cool, there is a slight delay in the action of the control.

The tuned grid H.F. coil with the reaction coil are mounted on the panel as a one-hole fixing unit.

The sections of R11 (wire-wound) are 180 and 380 ohms respectively. The total current for the set flows through this resistance and the 180-ohm section is connected to chassis.

The tone compensating resistance and condenser R12 and C14 are inside the lid.

Replacing Chassis.—Lay valve compartment in position with panel on top. Resolder the three leads on the right (order—red, white, green, from the inside), and resolder the L.S. leads to C13 and the earthing lead for the screen, on the left-hand side. Replace the holding screws.



How the components are arranged in the chassis of the McMichael S.M.C. portable.

Some components are actually mounted under the valve compartment as shown here.

RESISTANCES

R.	Purpose.	Ohms.
1	V1 grid leak	.5 or .44 meg.
2	Volume control rheostat ...	26.5
3	V2 grid leak	2 meg.
4	V2 grid return ptr.	250+250
5	V2 anode coupling	30,000
6	V2 anode decoupling	50,000
7	V1 and V2, H.T. decoupling ...	10,000
8	V3 grid stopper	.5 meg.
9	V3 grid decoupling	.5 meg.
10	V3 anode coupling	30,000
11	Bias ptr. in H.T.—lead	180+380
12	Part of tone compensating circuit.	5,000

CONDENSERS

C.	Purpose.	Mfd.
1	Aerial series condenser	.00003
2	V1 grid	.001
3	V1 grid bias decoupling ...	.25
4	H.T. decoupling to V1 and V2 ...	1
5	V1 screen and V2 anode decoupling	1
6	H.F. feed to tuned grid coil ...	.001
7	Reaction feed	.001
8	Detector grid condenser ...	.0002
9	L.F. feed to first L.F. transformer	.5
10	Between H.T. + and chassis ...	1
11	H.F. by-pass anode V3	.001
12	L.F. feed to second L.F. transformer	.5
13	Tone compensating circuit, anode V4	.005
14	Tone compensating circuit, anode V4	.003
15	Across bias ptr.	10 el.

VALVE READINGS

V.C. max.

Valve.	Type.	Electrode.	Volts.	M.A.
1	215 S.G. ...	anode ...	103	.85
		screen ...	60	
2	HL210* ...	anode ...	38	.7
3	HL210 ...	anode ...	88	.9
4	Pen. 220 ...	anode ...	116	4
		aux. grid	120	.8

* Short or screened leads should be used as otherwise valve will oscillate and register between .2 and .4 m.a.

PORTADYNE CLASS B SUPERHET

Circuit.—The combined first detector-oscillator PM12M (clear) (V1) is preceded by a band pass tuner. Coupling for reaction is obtained by coils in each of the L.T. leads with the anode coil in series with the primary of the first band pass I.F. transformer (intermediate frequency 112 KC).

The I.F. valve S215VM met. (V2) is biased from a potentiometer across the G.B. battery which acts as a volume control. Coupling to the second detector is by a second band pass I.F. transformer.

The second detector L2DD met. (V3) is a double diode triode. The diode anodes are strapped together for rectification and the L.F. is taken from the low H.F. potential end of the IFT2 secondary. The diode load is formed by R4 and C6. C8 is the L.F. coupling condenser to the grid of the triode section. Bias for this part of the valve is taken from a G.B. tapping. Coupling to the next valve is by resistance capacity filter R5 and C9.

The driver valve PM2DX has an H.F. stopper in its grid circuit and the same bias potential is used as for V3. Coupling to the output stage is by a Class B transformer.

The output valve PD220A is a Class B valve operating with applied bias. The anode circuits are stabilised by means of a single condenser C12.

Special Notes.—Battery connections: HT and GB combined C.A.V. HTD112. GB —1, 3 v.; GB —2, 4.5 v.; GB —3, 13.5 v. HT +1, 40 v.; HT +2, 60 v.; HT +3, 123 v. The local-distance switch, underneath the cabinet, operates by connecting a 30 ohm resistance across the aerial input. The switch should be "in" for full sensitivity.

Quick Tests.—Practically the full H.T. battery voltage should be recorded at the anodes of the screen grid valves and any trouble can be partially localised by noting the response in the speaker.

Removing Chassis.—Unsolder leads to local-distance switch underneath cabinet and remove holding screws. Remove the control knobs, noting that W.C. switch has two grub screws. Remove three screws from battery switch plate and lift the chassis out. The L.S. leads are sufficiently long to allow examination.

General Notes.—The wiring is straightforward and with the help of the lay-out diagram the H.T. and grid circuits are easily followed. The switch contacts can be reached from the end of the chassis.

The small coil suspended over the band pass M.W. coils is a second channel sup-

(*Continued on opposite page.*)