

### McMICHAEL DUPLEX TRANSPORTABLE (Cont.)

Lift out the chassis complete with the frame aerial.

**General Notes.**—To reach valve holders remove screen by undoing three screws on flange and four wood screws.

The lay-out and general wiring plan are obvious, and the only component that requires special mention is the H.F. coil assembly, which contains the H.F. coils, the H.F. choke, with C6, C7 and C8.

If any fault is traced definitely to this section, the complete container must be removed.

Removing H.F. coil container:—Unsolder the four leads from the earthing tag and the remaining leads from their other ends. To loosen the lead to R5 and C9 ease back the sistoflex to reveal the joint.

Undo the four screws on the back of the

screen behind the valves and, if the container will not clear the leads to the frame aerial unsolder these from the frame aerial tags. The container can then be eased out.

To reach the components, undo the four corner screws from the front and two at the end.

The condensers inside are C6 and C7, together alongside the coil, and C8 at the end.

To undo the coil it is necessary to release the reaction spindle by undoing the grub screw in the hole in the reaction coil former.

When assembling the receiver remember to take the S.G. anode lead through the hole.

When the unit is complete slip it carefully into position and push the S.G. anode lead through the rubber washer in the valve compartment screen. Replace the four holding screws and reconnect the leads.

These are:—Lead from wave-change switch

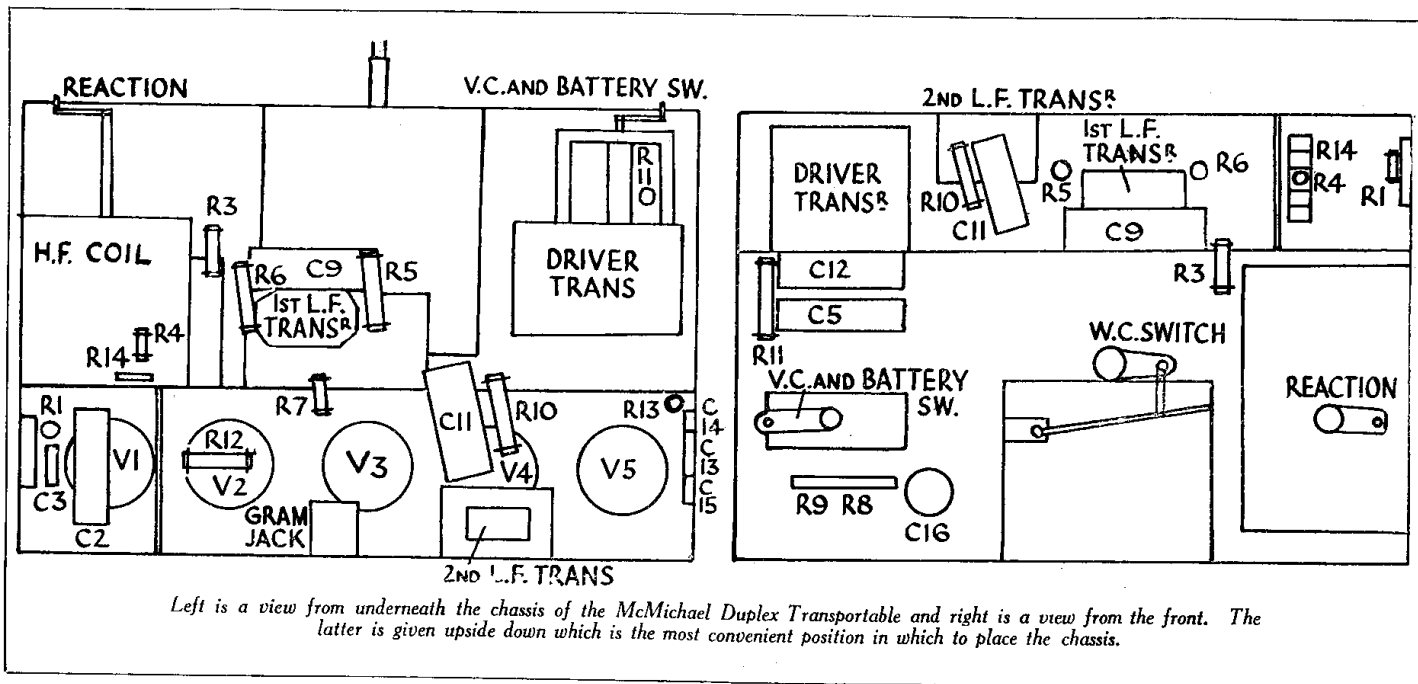
to centre tag on frame aerial, lead from tuning condenser to other end of M.W. winding.

Front, counting from top:—

- (1) to front switch.
  - (2) red, to C4 (1 mfd. next to compartment).
  - (3) to stator tag of front tuning condenser.
  - (4) to E earth tag.
- Underneath (counting from front):—
- (1) red, to V2 anode.
  - (2) to junction of R5 and C9.
  - (3) to junction of R4 and V2 grid lead.

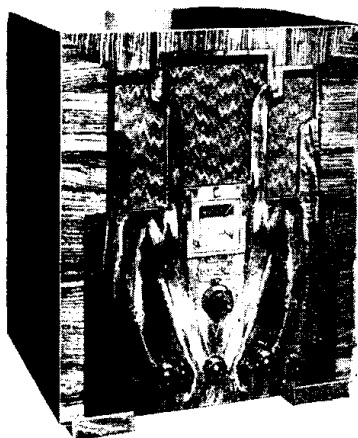
**Replacing Chassis.**—Replace screen underneath valve deck (see that VC and reaction levers are in correct positions to engage in the controls). Lift chassis carefully into cabinet. Replace holding screws with guiding templates. Resolder speaker leads in same order as on transformer and replace the panel at the back of the battery compartment.

Replace the wooden chuck on the bottom of the cabinet.



Left is a view from underneath the chassis of the McMichael Duplex Transportable and right is a view from the front. The latter is given upside down which is the most convenient position in which to place the chassis.

## C.B.4 BATTERY SET BY G.E.C.



The C.B.4 made by the General Electric Co Ltd. is a "straight" receiver with a class B output stage.

**Circuit.**—The H.F. valve, VS.24 met. (V1) is preceded by a tuned secondary aerial transformer. Variable-mu characteristics are used for controlling volume by means of a potentiometer across the G.B. battery with a series limiting resistance. An additional resistance R3 is connected across the G.B. battery so that it will discharge the battery proportionately to the H.T. Coupling to the next valve is by tuned secondary transformer. Both transformers have iron dust cores.

The detector valve, VP21 met. (V2), operates as a leaky grid detector with reaction. It is coupled to the next valve by straight resistance-capacity filter.

The driver valve, L21 (V3), has an H.F. stopping resistance in the grid circuit, and is coupled to the output valve by a driver transformer which has tone-compensating condensers connected across both the primary and the secondary.

The output valve, B21 (V4), operates with bias and is stabilised by condensers between each anode and chassis. The speaker is a small permanent-magnet type.

**Special Notes.**—Switching: L.T. —, H.T. + 1 and G.B. - 1 are broken.

Battery is a G.E.C. H.T. and G.B., 150 volts, No. L.259.

Connections are: H.T. + 1 (red) + 141 volts; H.T. + 2 (light blue), 58 volts; H.T. —, G.B. + (dark blue) to corresponding socket; G - 1 (yellow) - 9 volts; G - 2 (orange) - 6 volts.

L.T. leads are: White, positive; black, negative.

**Quick Tests.**—Total set current, no signal, 8 m.a. to 9 m.a. On moderate signal, 11 m.a. to 12 m.a.

**Removing Chassis.**—Remove two counter-sunk screws on battery platform and two flat-headed screws on back of compartment. Pull off the knobs and undo the three holding screws underneath. Remove the L.S. leads (these are labelled) and unsolder the earthing lead.

**General Notes.**—With the help of the lay-out diagram and the fact that all the small condensers and resistances are suspended in the wiring, the circuit is easily traced.

Switch contacts are towards the outside, and can be cleaned with a piece of tape.

Connections to the driver transformer:—  
(Continued on next page.)

C.B.4 BATTERY SET BY G.E.C. (Continued)

Orange to V3 anode; red to H.T. +; black to G.B. - 2 (anchored on the H.F. intervalve transformer); two green to V4 grids.

**Replacing Chassis.**—Lay chassis inside

cabinet, resolder earthing lead. Replace three holding screws underneath and press on the knobs, the marked one in the middle of the small ones. Replace battery shelf and screen.

**VALVE READINGS**

No signal, no reaction, and new H.T. battery.

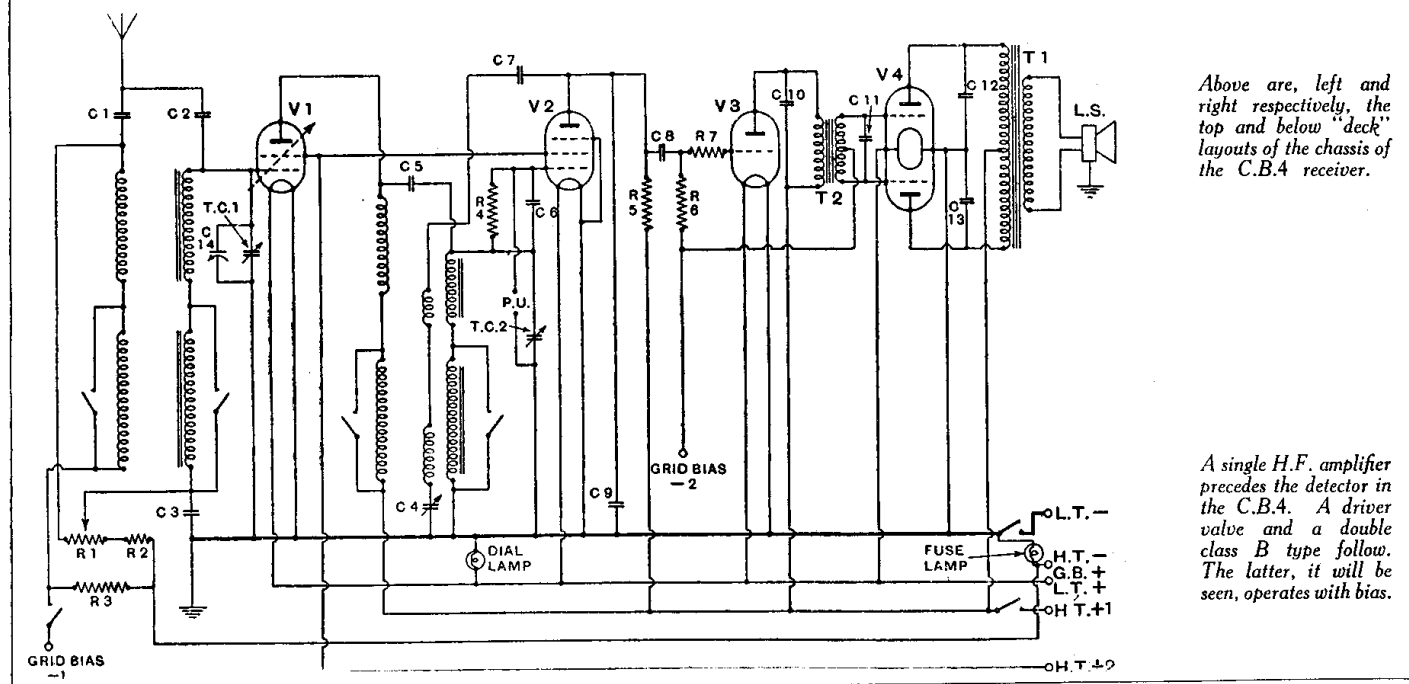
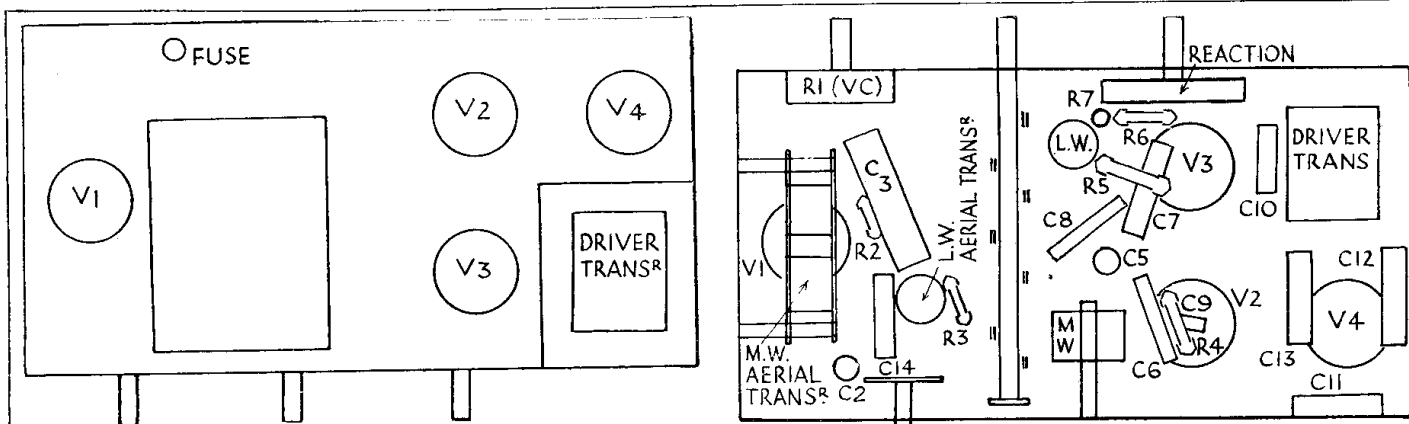
Valves	Type.	Electrode.	Volts.	M.A.
1	VS24 met. (4)	anode .. screen ..	140 58	2.3
2	VP21 met. (7)	anode .. aux. grid ..	50 58	2.5
3	L21 (4)	anode ..	140	1.75
4	B21 (7)	each anode	140	1

**RESISTANCES**

R.	Purpose.	Ohms.
1	Volume control ..	50,000
2	Bias limiting resistance ..	6,600
3	Exhausting G.B. battery ..	990
4	V2 grid leak ..	2 meg.
5	V2 anode coupling ..	33,000
6	V3 grid leak ..	220,000
7	H.F. stopper. V3 grid ..	100,000

**CONDENSERS**

C.	Purpose.	Mfd.
1	Series aerial ..	.003
2	Coupling to grid coil (semi-variable)	.000006
3	Preventing short circuit of bias	.25
4	Reaction ..	.0005
5	Part of H.F. transformer coupling	.000011
6	V2 grid reservoir ..	.0001
7	Series with reaction tuning	.002
8	L.F. coupling V2 to V3	.01
9	V2 anode by-pass ..	.0005
10	Across primary of driver transformer	.0005
11	Across secondary of driver transformer	.002
12	Stabilising V4 anodes ..	.003
13		.003
14	Trimmer of aerial tuner	Variable



Above are, left and right respectively, the top and below "deck" layouts of the chassis of the C.B.4 receiver.

A single H.F. amplifier precedes the detector in the C.B.4. A driver valve and a double class B type follow. The latter, it will be seen, operates with bias.

LISSEN 8093 A.C. MAINS THREE

**Circuit.**—The H.F. valve AC/SGV. met. (V1) is preceded by a band-pass aerial tuner employing link coupling. Aerial series condensers are used for both aerial tappings. Volume is controlled by a variable resistance in series with a fixed resistance in the cathode lead. Coupling to the next valve is by H.F. choke filter.

The detector valve AC/HL met. (V2) operates as a semi-power-grid detector with reaction. Cathode bias is provided for gramophone reproduction and coupling to

the next valve is by parallel-fed transformer. The anode circuit contains an H.F. filter and is decoupled from the H.T.

The output pentode AC/PT (V3) is tone compensated by a condenser connected by a wander lead to the low potential side of the filter condenser for an external speaker.

Mains equipment consists of transformer full-wave UU41 rectifier and an L.F. choke in the positive lead for smoothing. The speaker field is connected across the unsmoothed H.T.

**Special Notes.**—The special mains plug with the set contains a fuse in each lead, and there is also a fuse in the H.T. negative lead. This latter is mounted on the mains adjustment panel behind the transformer.

**Quick Tests.**—Between the terminals on the L.S. transformer and chassis:—

- (1) white, 275 volts H.T. unsmoothed.
- (2) blue, 252 volts H.T. smoothed.
- (3) blue, 245 volts V3 anode.

Note that, as the choke is in the negative (Continued on opposite page.)