KOLSTER-BRANDES MODEL 381 (Cont.)

connection cause the valve anode voltages to be dependent on the actual mains voltage.

Quick Tests.—Use two metal clips to make contact in safety device. *Caution*: It is advisable to make sure that you are not making contact with anything that is earthed while working with these sets.

Voltages between the following leads and chassis on 220 A.C. supply:—Red and black, H.T. unsmoothed, 230 volts; black, H.T. smoothed by choke, 220 volts; blue, V4 anode, 140 volts; red, H.T. smoothed, 150 volts.

Removing Chassis.—Remove the knobs. The grub screws are covered with wax insulation and engage in cross-cut grooves in the spindles.

Remove the six wood screws from the black, wooden blocks underneath the cabinet and undo the chassis-holding screws. Slide the cardboard plate out from underneath the chassis and lift the chassis out.

General Notes.—Wiring colour code:—Red, H.T.; blue, anodes; green, grid; orange, screens or auxiliary grids; dark brown, heaters; light brown, cathodes; yellow, A.V.C.; black with red tracer, negative of smoothing circuits; black, earth (chassis).

In the wiring to the block electrolytic condenser on top of the chassis, the red leads are connected to C1 and C2, and the yellow leads to C10 and C22.

Ganging Frequencies.—I.F.T1 and I.F.T2, 130 kc.; osc., trimmer, 1,400 kc.; M.W. tracker, 600 kc.; L.W. tracker, 175 kc.

Pilot Lamps.—These can be reached easily by removing the back and sliding out the cardboard plate and sliding the holding clips downwards.

Replacing Chassis.—Lay chassis inside cabinet, replace cardboard, the four holding screws, the two black supports, and the knobs. Replace the insulating wax.

McMICHAEL DUPLEX TRANSPORTABLE

Circuit.—The H.F. valve, 215S.G. (V1), is preceded by the frame aerial, of which the long-wave section is short circuited for use on the M.W. band. Bias is obtained by taking the grid leak to a tapping on a potentiometer across the G.B. section of the battery, and the screen potential is taken from the low H.T. end of the decoupling resistance of the first L.F. valve.

Coupling to the next valve is by H.F. choke and condenser filter. Volume is controlled by a variable resistance in series with the positive lead to this valve.

The detector valve, HL2 (V2), operates as a leaky grid detector with swinging coil reaction. The grid leak is connected to the centre tap of a potentiometer across the L.T. Coupling to the next valve is by parallel-fed transformer, and a resistance, R6, is included in the circuit to act as an H.F. stopper.

The first L.F. valve, HL2 (V3), has the gramophone jack connected in its grid circuit and an additional H.F. stopper. Another parallel-fed transformer couples V3 to the next valve.

The driver valve, 215P (V4), is used in the conventional way, and is coupled to the output Class B valve, 240B (V5), by a typical driver transformer.

The anode circuits of V5 are stabilised by condensers between the anodes and H.T.+, and tone compensation is provided by a condenser and resistance in series between the anodes. The H.T. battery is by-passed by an 8 mfd. electrolytic condenser.

Both H.T.— and L.T.+ are broken by the switch.

Special Notes.—The H.T. battery is a special Grosvenor type SR490DL. Connections are: H.T.+, 99 volts; G.B.—, —6 volts.

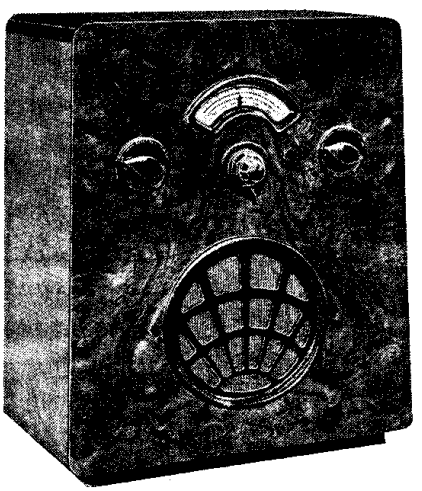
Quick Tests.—These consist in taking valve readings and observing the plops, and by connecting a P.U. to test from V3.

Removing Chassis.—Remove tuning knobs (grub screw) and wave-change switch lever. There is no need to remove the volume or reaction knobs.

Remove the four hexagonal screws at the ends of the valve compartment and the wooden chuck clamping the bottom of the battery compartment.

Remove the six screws from the board at the back of the latter, and unsolder the L.S. leads. (There is no need to mark these as the order of connection is the same as that on the L.S. transformer.)

(*Continued on opposite page.*)



A five-valve Class B battery receiver the Duplex Transportable by McMichael Radio Ltd. is completely self-contained.

VALVE READINGS

[V.C. max.]

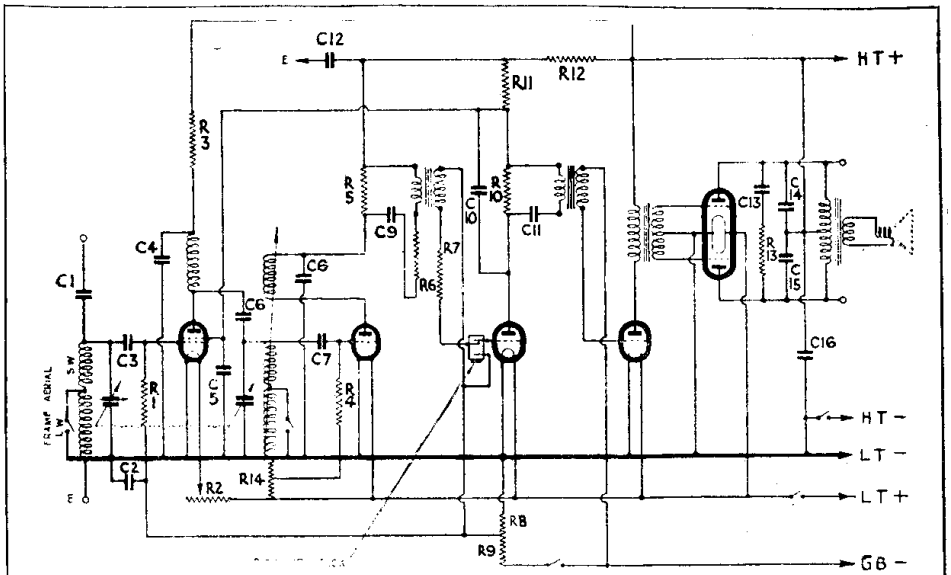
Valve.	Type.	Electrode.	Volts.	Ma.
1	215 S.G. ...	anode ...	98	1.5
		screen ...	35	
2	HL2 ...	anode ...	50	.5
3	HL2 ...	anode ...	30	.5
4	215P ...	anode ...	100	3.5
5	240B. ...	each anode	100	1

RESISTANCES

R.	Purpose.	Ohms.
1	V1 grid leak	.5 meg.
2	V1 rheostat	20
3	V1 anode decoupling	2,000
4	V2 grid leak	2 meg.
5	V2 anode coupling	30,000
6	H.F. stopper in transformer feed	20,000
7	H.F. stopper in V3 grid circuit...	.5 meg.
8	Bias ptr. for V1 and V3 ...	400
9	Bias ptr. for V1 and V3 ...	2,000
10	V3 anode coupling	30,000
11	Decoupling V3 anode and voltage dropping to V1 screen.	50,000
12	Voltage dropping to V2 and V3	10,000
13	Tone compensating circuit in V5 anodes.	10,000
14	Potentiometer across L.T. ...	250+250

CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.00003
2	Decoupling V1 grid	.25
3	V1 grid	.001
4	Decoupling V1 anode	1
5	V1 screen	1
6	H.F. feed to tuned grid coil ...	.001
7	V2 grid	.0002
8	V2 anode by-pass	.001
9	L.F. feed to transformer I ...	.5
10	V3 anode by-pass (to H.T.) ...	.001
11	L.F. feed to transformer II ...	.5
12	Decoupling H.T. to V2 and V3	1
13	Tone compensating circuit V5 anodes.	.002
14	Stabilising V5 anode	.002
15	Stabilising V5 anode	.002
16	Across H.T.	8 el.



One H.F. amplifier is used in the McMichael Duplex Transportable. Magnetic reaction is applied to the H.F. coupling and two L.F. valves in addition to a Class B type follow the detector.

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.

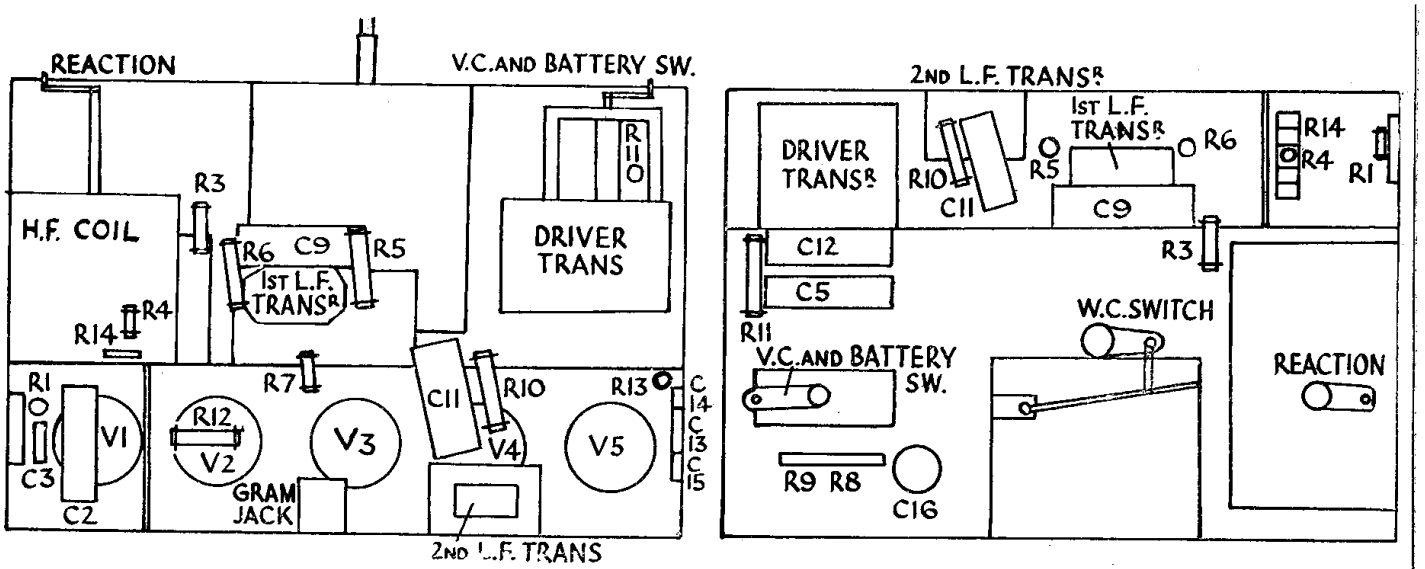
These are :—Lead from wave-change switch to centre tag on frame aerial, lead from tuning condenser to other end of M.W. winding.

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.

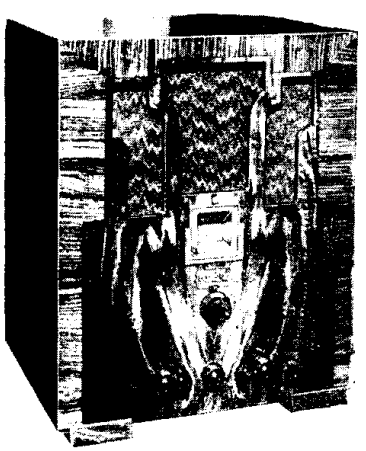
Replacing Chassis.—Replace screen underneath valve deck (see that VC and reaction levers are in correct positions to engage in the controls). Lift chassis carefully into cabinet. Replace holding screws with guiding templates. Resolder speaker leads in same order as on transformer and replace the panel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