

'TRADER' SERVICE SHEET

235

G.E.C. SP3

3-VALVE BATTERY RECEIVER

THREE pentodes are used in the G.E.C. SP3 3-valve battery receiver, in which reaction is pre-set and is adjustable by a control at the back of the chassis. The receiver has a combined on-off and wave-change switch with an indicator on the tuning scale showing the position of this switch. There is provision for using an extension speaker.

CIRCUIT DESCRIPTION

Aerial input via volume control potentiometer **R1**, coupling condenser **C1** and coupling coils **L1**, **L2** to single tuned circuits **L3**, **L4**, **C12**, which precede first valve (**V1**, Osram metallised **W21**), an R.F. pentode operating as signal frequency amplifier.

Tuned-secondary R.F. transformer coupling by **L5**, **L6** and **L8**, **L9**, **C15** between **V1** and detector valve (**V2**, Osram metallised **VP21**), an R.F. pentode operating on grid leak system with **C5** and **R4**. Reaction by coil **L7** from anode is controlled by semi-variable condenser **C13**; R.F. filtering by **C7**.

Resistance capacity coupling by **R5**, **C8**, and **R6** via R.F. stopper **R7** between **V2** and pentode output valve (**V3**, Osram **PT2** or **KT2**). Fixed tone correction in anode circuit by **C9**. Provision for connection of low-impedance external speaker across secondary of output transformer **T1**.

G.B. potentials are provided automatically by drop across resistances **R8** and **R9** in H.T. negative line. R.F. filtering in H.T. circuit by **C3**.

COMPONENTS AND VALUES

| RESISTANCES | | Values (ohms) |
|-------------|-----------------------------------|---------------|
| R1 | Aerial pot. manual volume control | 10,000 |
| R2 | V1 C.G. decoupling | 99,000 |
| R3 | V2 S.G. H.T. feed | 440,000 |
| R4 | V2 grid leak | 4,000,000 |
| R5 | V2 anode load | 99,000 |
| R6 | V3 C.G. resistance | 660,000 |
| R7 | V3 C.G. stopper | 440,000 |
| R8 | Automatic G.B. resistances | 500 |
| R9 | | 200 |

| CONDENSERS | | Values (μF) |
|------------|------------------------------------|-------------|
| C1 | Aerial coupling condenser | 0.005 |
| C2 | V1 C.G. decoupling | 0.005 |
| C3 | H.T. line R.F. by-pass | 0.25 |
| C4 | V2 C.G. decoupling | 0.005 |
| C5 | V2 C.G. condenser | 0.00025 |
| C6 | V2 S.G. decoupling | 0.25 |
| C7 | V2 anode R.F. by-pass | 0.0002 |
| C8 | A.F. coupling to V3 | 0.02 |
| C9 | V3 anode tone corrector | 0.002 |
| C10* | Automatic G.B. circuit by-pass | 35.0 |
| C11† | Aerial circuit M.W. trimmer | — |
| C12† | Aerial circuit tuning | — |
| C13† | Reaction control | — |
| C14† | R.F. transformer sec. M.W. trimmer | — |
| C15† | R.F. transformer sec. tuning | — |

* Electrolytic. † Variable. ‡ Pre-set.

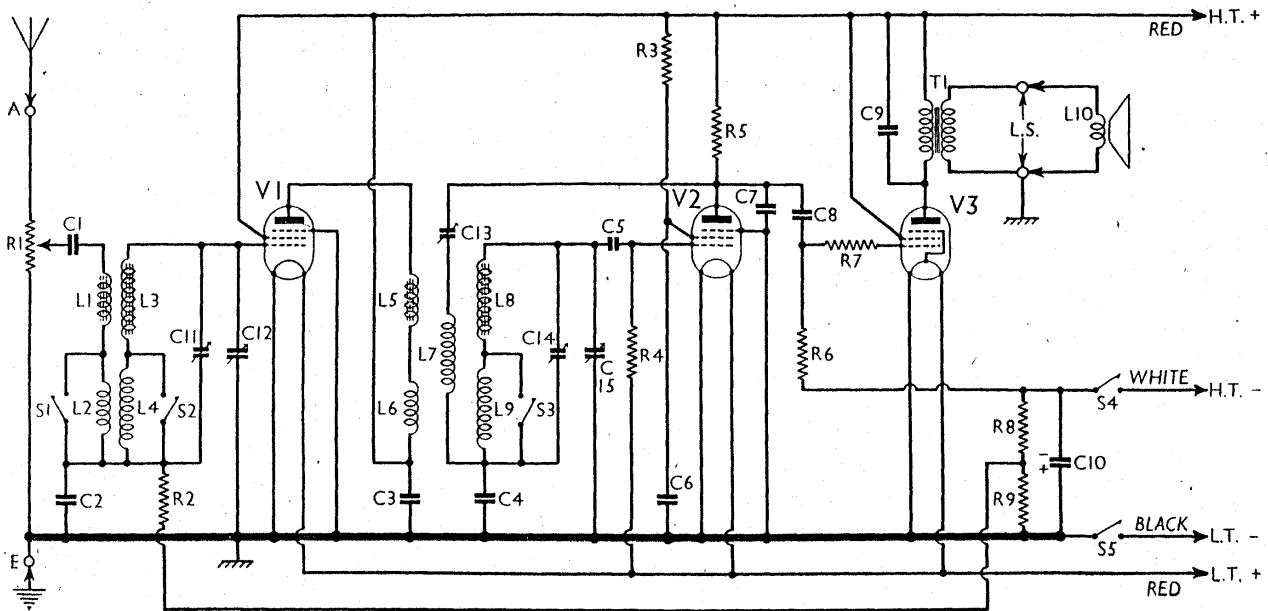
| OTHER COMPONENTS | | Approx. Values (ohms) |
|------------------|----------------------------------|-----------------------|
| L1 | Aerial coupling coils | 0.2 |
| L2 | | 3.4 |
| L3 | | 2.2 |
| L4 | Aerial circuit tuning coils | 19.0 |
| L5 | | 0.5 |
| L6 | R.F. transformer primary coils | 4.5 |
| L7 | | 0.5 |
| L8 | R.F. transformer secondary coils | 2.2 |
| L9 | | 17.5 |
| L10 | Speaker speech coil | 2.25 |
| T1 | Output trans. { Pri. | 870.0 |
| | { Sec. | 0.6 |
| S1-S3 | Waveband switches | — |
| S4 | H.T. circuit switch | — |
| S5 | L.T. circuit switch | — |

DISMANTLING THE SET

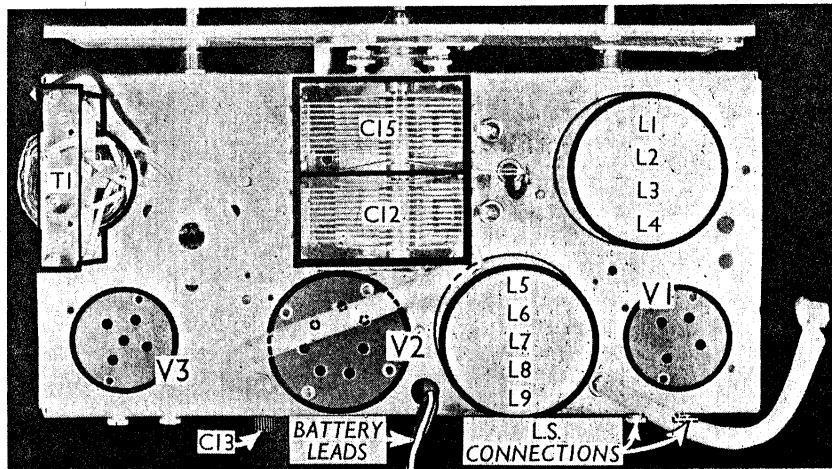
Removing Chassis.—If it is desired to remove the chassis from the cabinet, remove the three control knobs (pull off) and the three bolts (with washers) holding the chassis to the bottom of the cabinet. Now free the speaker leads from the two cleats on the side of the cabinet, when the chassis can be withdrawn to the extent of the leads, which is adequate for normal purposes.

To free the chassis entirely, disconnect the speaker leads from the terminals at the back of the chassis.

Removing Speaker.—To remove the speaker from the cabinet, remove the four cheese-head screws (with washers and spring washers) holding the sub-



Circuit diagram of the G.E.C. SP3 3-valve battery receiver. Automatic G.B. is used.



Plan view of the chassis. The knob for adjusting C13 is indicated.

baffle to the front of the cabinet and remove the three counter-sunk head screws (with nuts, spring washers and washers) holding the speaker to the sub-baffle. When replacing, see that the terminal panels are at the bottom.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new H.T. battery reading 128 V on load. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

| Valve | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|------------|-------------------|--------------------|--------------------|---------------------|
| V1 W2r .. | 122 | 1.8 | 122 | 0.6 |
| V2 VP2r .. | 38 | 0.8 | 20 | 0.2 |
| V3 PT2 .. | 120 | 3.0 | 122 | 0.6 |

GENERAL NOTES

Switches.—S1-S5 are the waveband and battery circuit switches, in a single rotary unit beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagram on the right, where it is seen looking from the rear of the underside of the chassis.

The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C closed.

| Switch | Off | M.W. | L.W. |
|--------|-----|------|------|
| S1 | O | C | O |
| S2 | O | C | O |
| S3 | O | C | O |
| S4 | O | C | C |
| S5 | O | C | C |

Coils.—L1-L4 and L5-L9 are in two screened units on the chassis deck. The cans are not removable, but the coil units can be removed from the underside of the chassis by undoing the screws which

fix the paxolin strips carrying them to the chassis.

Trimmers C11, C14.—These are beneath the chassis, mounted on the paxolin strips carrying the coil units, and are indicated in our under-chassis view.

Reaction Control.—This is a semi-variable condenser, C13, adjustable by a knob projecting through a hole in the rear of the chassis.

External Speaker.—Two terminals are provided at the rear of the chassis for a low impedance (2-4 O) external speaker.

Batteries.—L.T., 2 V 45 AH accumulator cell, Genalex No. B.C.145. H.T., 120 V dry battery, G.E.C. Black Label, No. B.B.720. Grid bias is automatic.

Battery Leads and Voltages.—Black lead, spade tag, L.T. negative; red lead, spade tag, L.T. positive 2 V; white lead, black plug, H.T. negative; red lead and plug, H.T. positive, +120 V.

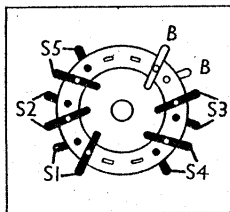
Valve V3.—In early models this is a PT2 output pentode. Later it may be replaced by a KT2 output tetrode.

CIRCUIT ALIGNMENT

Switch set to M.W., tune to 214 m. on scale, and connect signal generator to A and E terminals via a dummy aerial. Feed in a 214 m. (1,400 KC/S) signal, and adjust C11 and C14 for maximum output, keeping input low.

To adjust the pre-set reaction, connect normal aerial and earth to receiver,

The waveband switch unit, looking from the rear of the underside of the chassis.



set volume control to maximum, tune receiver to 214 m. and screw up knob of C13, at rear of chassis, until receiver just oscillates. Then unscrew C13 half a turn.

Under-chassis view. The switch unit is indicated, and shown in detail in Col. 3. C11 and C14 are trimmers, while C13 is the pre-set reaction control.

