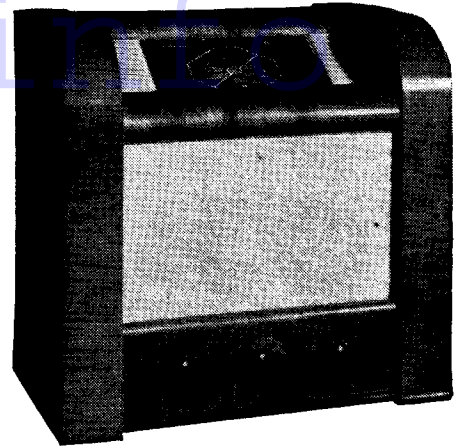


# G.E.C. BATTERY ALL-WAVE 4



The Battery All-wave 4 by G.E.C. is a three-band superhet with pentode output.

**CIRCUIT.**—There is a choice of two tappings for the aerial input, a small condenser being put in series with the aerial by one of the sockets. The aerial is coupled to the grid of V1, a heptode frequency changer, by a single-tuned circuit, a shunt resistance being connected across the aerial and earth sockets.

The signal, converted to a frequency of 456 kcs. then passes by an I.F. transformer (iron cored) to V2, an H.F. pentode, forming the I.F. amplifying stage.

The signal then passes by another I.F. transformer of similar construction to the demodulating diode of V3, a double diode triode, where the signal is rectified. The other diode provides a D.C. potential that is fed back to the previous valves to give A.V.C. The coupling arrangements to the grid of the triode section of V3 include a manual volume control.

V3 is resistance capacity coupled to V4, an output pentode, in the anode circuit of which is connected the speaker matching transformer. Across the primary of the transformer is connected a tone corrector condenser.

Battery power is supplied by a G.E.C. "Super," BB720 120 volts H.T. battery and a Genalex, BC120 L.T. accumulator of 20 a.h. (actual) capacity.

**Chassis Removal.**—Remove the back of the receiver (held by two sliding clips) and also unscrew the two wood bars at the

back of the cabinet. Then remove the three control knobs and tuning shaft bakelite push switch and metal spring contacts from the front of the cabinet. These knobs are of the spring-fixing type and are removed by a slight pull.

At the top (inside the cabinet) are two wood screws that secure the wavelength dial assembly supports. Remove these and then turn the cabinet up on its side so as to render the base accessible. The four fixing bolts and washers that secure the chassis to the cabinet can then be removed.

Return the set to its upright position, when the chassis can be removed from

## VALVE READINGS

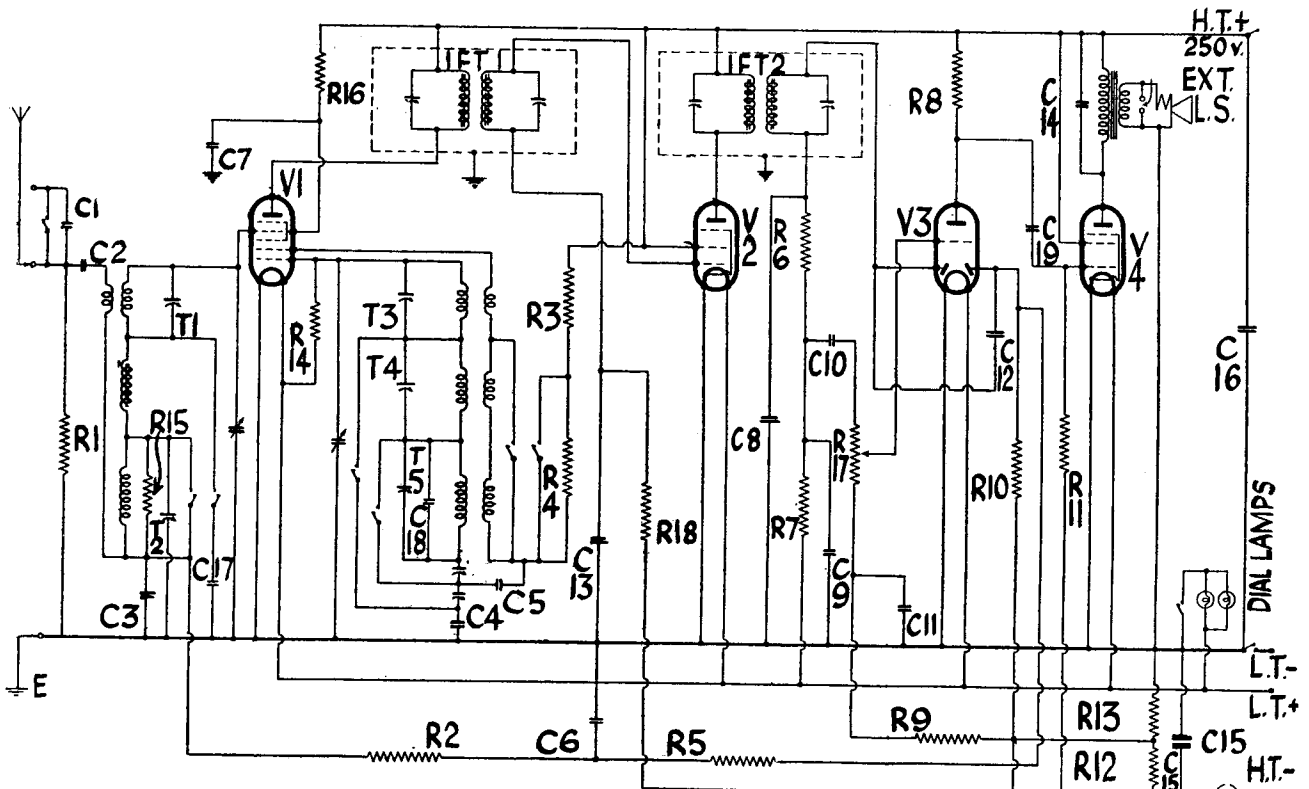
No signal. Volume maximum. New batteries. Measured with 1,000 ohm per volt meter.

V.	Type.	Electrode.	Volts.	Ma.
1	All Osram. X22 met. (7) ..	Anode ..	118	1.3
		Screen ..	60	1.9
		Osc. anode ..	45	Inaccess.
2	W21 met. (4) ..	Anode ..	118	1.6
		Screen ..	118	.5
3	HD22 (5) ..	Anode ..	25	.15
4	PT2 (5) ..	Anode ..	114	3.4
		Screen ..	118	Inaccess.

the cabinet to the extent of the speaker cable and is accessible for all service requirements.

The speaker can be removed if desired, or alternatively the leads to the speaker unsoldered. The black lead is soldered to the earthing tag on the speaker frame and also to the left hand tag on the bakelite strip on the speaker frame. The right-hand tag has the white lead soldered to it.

A pair of sockets at the back of the chassis enables an external speaker to be operated. This should be of the permanent magnet moving-coil type, and need not have its own matching transformer, the



A single tuned circuit feeds the frequency changer and the I.F. coils have iron dust cores. Bias is obtained by a resistance in the negative H. T. lead.

For more information remember

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speech coil being connected to the extension sockets. A fuse is incorporated in the receiver and located on the top of the chassis near the left-hand support of the wavelength dial assembly. It is mounted in a screw-in holder, and is an Osram bulb rated at 3.5 volts .15 amp.

There are two dial lights in the receiver, located one each side of the wavelength dial and mounted in screw-in holders. They are rated at 2.5 volts .2 amp.

To economise in L.T. current an arrangement is made to switch the lamps on when the tuning operation is in process. Normally the dial lights are not on, but when the tuning knob is grasped and a slight inward pressure is exerted on the disc behind the knob, the lamps light up.

### Alignment Notes

**I.F. Circuits.**—Set the wave selector switch to the medium waveband and the tuning control to the maximum setting of the gang condenser. Short-circuit the oscillator section of the gang and turn the volume control to the maximum position.

Connect modulated oscillator via a .1 mfd. condenser to top cap of V1 with the normal connections still attached. Connect an output meter across primary of output transformer (across tags of C14 under V4 valveholder).

During all adjustments use the lowest injected signal that gives a reliable peak indication. If too great a signal is injected the A.V.C. will operate.

Tune the oscillator to 456 kcs. and adjust the trimmers IPT1, IPT2, IPT3 and IPT4 respectively for maximum response, reducing the input from the oscillator as the circuits come into line.

**Signal Circuits.**—Remove the short circuit from the oscillator section of the gang and connect the service oscillator to the aerial and earth sockets of the set via a dummy aerial or fixed condenser. Leave the output meter connected as before.

**Short Waves.**—Tune the set and oscillator to

17.6 metres (17 mcs.) and adjust T3 and T1 respectively for maximum, using the lower capacity peak. On some receivers slight pulling is experienced when the aerial trimmer T1 is adjusted. The tuning control should be rocked slightly to compensate for this.

**Medium Waves.**—Disconnect the oscillator section of the gang by unsoldering its lead and connect an external variable condenser between the disconnected lead and chassis. Tune the oscillator to 214 metres (1400 kcs.) and adjust the external variable condenser and receiver tuning control simultaneously to give a maximum reading.

Then disconnect the external variable condenser and reconnect the oscillator section of the gang. Without altering the tuning control setting, adjust the trimmer T4 for maximum.

Disconnect the oscillator section and reconnect the external condenser as before. Tune the service oscillator to 500 metres (600 kcs.) and adjust the set tuning control and external condenser for maximum response.

Disconnect the variable condenser and reconnect the oscillator section of the gang and, without altering the setting of the tuning control, adjust P1 for maximum response.

Repeat the 214 metres operation to ensure correct calibration.

**Long Waves.**—Tune set and oscillator to 1,000 metres (300 kcs.) and adjust T5 and T2 for maximum in this order.

Disconnect the oscillator section and reconnect the variable condenser as before. Tune the oscillator to 1,818 metres (165 kcs.) and adjust the tuning control and variable condenser simultaneously for maximum.

Disconnect the variable condenser and reconnect the oscillator section and, without altering the tuning control, adjust P2 for maximum response.

Repeat the 1,000 metres operation to ensure correct calibration.

## G.E.C. Battery 4 on Test

**MODEL BC3846.**—Standard model for battery operation, requiring a Genelec BC120 2-volt accumulator and a G.E.C. "Super" BB720 120-volt H.T. battery. Price 10½ gns.

**DESCRIPTION.**—Four-valve, three-waveband battery superhet. Table model.

**FEATURES.**—Full-vision scale with name and wave calibration. Controls for tuning, volume and wavechange. Extension speaker sockets.

**LOADING.**—H.T., 11.4 ma.; L.T., .65 amp.

### Selectivity and Sensitivity.

**SHORT WAVES (16-50 metres).**—Reasonable sensitivity, best at the beginning of the range. Tuning easy and no drift.

**MEDIUM WAVES (200-550 metres).**—Good sensitivity and selectivity. Local station spread on adjacent channels only. Well maintained gain and good background.

**LONG WAVES (1,000-2,100 metres).**—Representative performance with all main stations easily received. Slight overlap on Deutschland-sender.

### Acoustic output

Good, crisp tone, well balanced on speech and music, with noticeable low-note radiation. Sufficient output for ordinary room.

### Replacement Condenser

A. H. Hunt, Ltd., produce a replacement condenser for C15. List number 2,970, this unit retails at 1s. 10d.

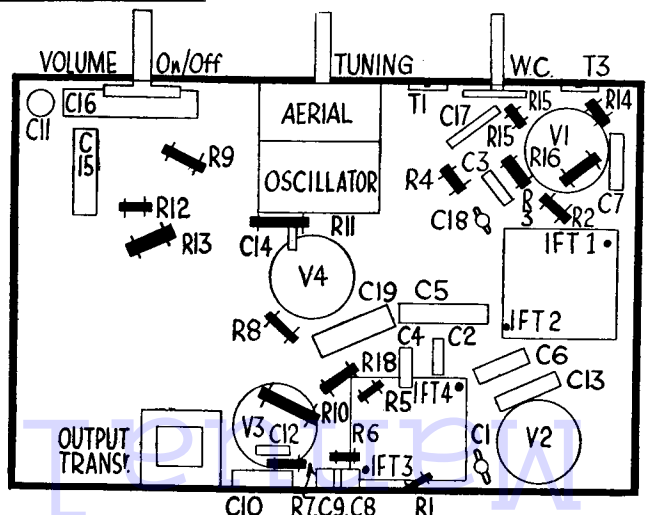
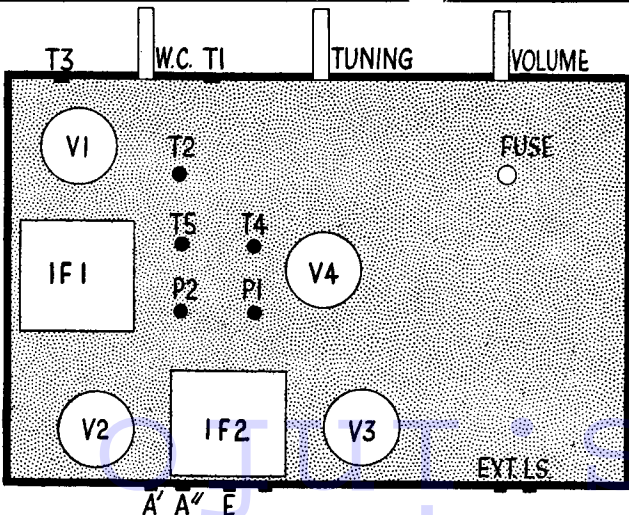
The I.F. of the G.E.C. Transportable Five, reviewed on pages 5 and 6 of July SERVICE MAN'S MANUAL is 125 kc. T10 and T7 should be transposed in the text matter.

### RESISTANCES

R.	Purpose.	Ohms.
1	Aerial shunt . . . . .	9,900
2	V1 A.V.C. decoupling . . . . .	220,000
3	Osc. anode decoupling (part) . . . . .	6,600
4	Osc. anode decoupling (part) . . . . .	33,000
5	V1 A.V.C. decoupling . . . . .	440,000
6	Demodulating diode load (part) . . . . .	55,000
7	Demodulating diode load (part) . . . . .	440,000
8	V3 anode load . . . . .	220,000
9	V3 grid bias decoupling . . . . .	99,000
10	A.V.C. diode load . . . . .	440,000
11	V4 grid leak . . . . .	660,000
12	Bias potr. (part) . . . . .	220
13	Bias potr. (part) . . . . .	150
14	Osc. grid resistance . . . . .	99,000
15	Aerial coil L.W. shunt . . . . .	440,000
16	V1 screen decoupling . . . . .	22,000
17	Volume control . . . . .	1 med.
18	V2 bias decoupling . . . . .	1 meg.

### CONDENSERS

C.	Purpose.	Mfcs.
1	Series aerial . . . . .	.00002
2	Aerial coupling . . . . .	.005
3	V1 A.V.C. decoupling . . . . .	.003
4	Osc. fixed padder . . . . .	.004
5	Osc. anode decoupler and regeneration modifier . . . . .	.005
6	A.V.C. decoupling . . . . .	.05
7	V1 screen decoupling . . . . .	.25
8	H.F. bypass . . . . .	.0001
9	H.F. bypass . . . . .	.0001
10	L.F. coupling . . . . .	.02
11	V3 bias decoupling . . . . .	.25
12	A.V.C. diode coupling . . . . .	.00005
13	V2 bias decoupling . . . . .	.02
14	Pentode compensator . . . . .	.002
15	Bias shunt . . . . .	.35
16	H.T. shunt . . . . .	.25
17	C3-S.W. supplementary condenser . . . . .	.1
18	L.W. osc. fixed trimmer . . . . .	.00002
19	L.F. coupling . . . . .	.005



These chassis layout diagrams of the top (left) and underside (right) of the G.E.C. chassis enable all parts and trimmers to be identified. Resistors are shown in solid black, condensers in outline.