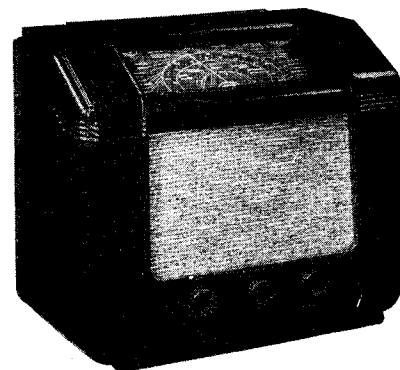


G.E.C. 3946 BATTERY ALL-WAVE 4



The BC.3946 by the General Electric Co., Ltd. is a thoroughly up-to-date three-band superhet battery four. It is listed, without batteries, at £8 18s. 6d.

CIRCUIT.—A set of H.F. transformer aerial coils constitute the input circuit of V1, an X22 frequency changer. An aerial shunt resistance R1 is included and a series aerial condenser is connected to an alternative socket for local station reception.

V1 is A.V.C. controlled, a grid-isolating condenser being used and the A.V.C. potentials fed direct to the signal grid. Regeneration modifier resistances are included in the oscillator anode circuits, R6 being shorted out on the short-wave band.

An iron-cored I.F. transformer, tuned to 456 kcs., feeds the amplifying valve V2, a W21 H.F. pentode. This valve is not A.V.C. controlled, but obtains bias from the bias potentiometer.

Another iron-cored transformer effects the coupling between V2 and the demodulating diode of V3, an HD22 double-diode triode. Connection from the secondary of the transformer to the demodulating diode load, R9, is made via an H.F. filter circuit. The rectified potentials are led via an L.F. coupling condenser to the manual volume

control, R10, and thence to the grid of the triode section of the valve.

The A.V.C. diode of V3 provides a potential that is fed back to the grid of V1 for automatic volume control.

V3 is resistance-capacity coupled to the KT21 output valve, V4. A tone compensator condenser is connected across the primary of the speaker transformer. Bias for this valve, V2 and V3 and the A.V.C. delay voltage, is obtained from a potentiometer connected between L.T. negative and H.T. negative. The potentiometer is shunted by a large capacity.

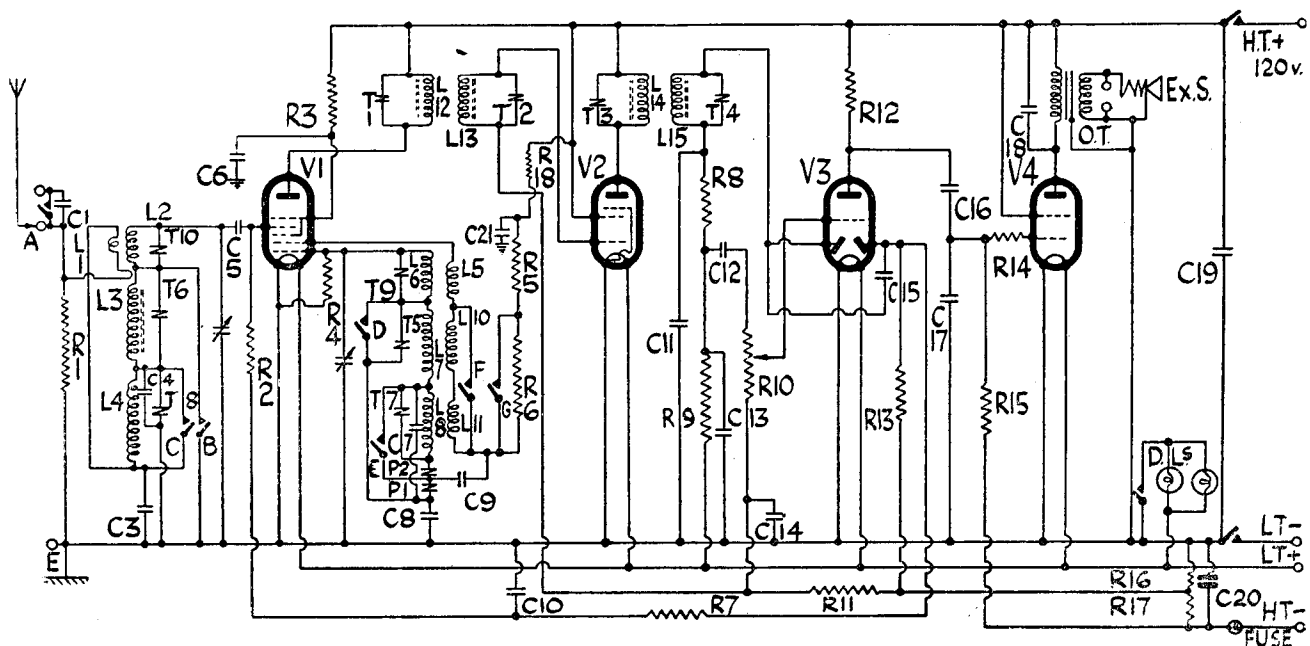
Chassis Inspection.—A false bottom on the base of the cabinet enables the underside of the chassis to be inspected and give access to the trimmers.

Chassis Removal.—Remove back of cabinet and the three spring-fixed control knobs. Remove the four chassis-securing

VALVE READINGS					
No signals. Volume maximum. MW band.					
New batteries.					
V.	Type.	Electrode.	Volts.	Mfd.	
1	X22 ..	Anode ..	117	1.15	
		Screen ..	72	1.9	
		Osc. anode ..	58	1.4	
2	W21 ..	Anode ..	117	1.7	
		Screen ..	117	.6	
3	HD21 ..	Anode ..	67	.4	
4	KT21 ..	Anode ..	112	3.25	
		Screen ..	117	.7	

RESISTANCES		
R.	Purpose.	Ohms.
1	Aerial shunt	9,900
2	V1 A.V.C. feed	1 meg.
3	V1 screen decoupling	22,000
4	Osc. grid leak	99,000
5	Regeneration modifier	990
6	Regeneration modifier	33,000
7	V1 A.V.C. decoupling	440,000
8	H.F. stopper	55,000
9	Demodulating diode load	440,000
10	Volume control	1 meg.
11	V2 and V3 bias decoupling	99,000
12	V3 anode load	99,000
13	A.V.C. diode load	440,000
14	V4 grid stopper	33,000
15	V4 grid resistance	220,000
16	Bias potr. (part)	150
17	Bias potr. (part)	100
18	Osc. anode decoupling	5,500

CONDENSERS		
C.	Purpose.	Mfds.
1	Series aerial coupling .. .. .	.00002
3	Aerial pad .. .. .	.003
4	Aerial L.W. fixed trimmer .. .. .	.00002
5	V1 grid isolating .. .. .	.0005
6	V1 screen decoupling .. .. .	.25
7	L.W. osc. fixed trimmer .. .. .	.00004
8	Osc. fixed padder .. .. .	.00395
9	Osc. anode decoupling .. .. .	.005
10	V1 A.V.C. decoupling .. .. .	.05
11	H.F. by-pass .. .. .	.0001
12	L.F. coupling .. .. .	.02
13	H.F. by-pass .. .. .	.0001
14	V2 and V3 bias decoupling .. .. .	.25
15	A.V.C. diode coupling .. .. .	.00005
16	L.F. coupling .. .. .	.02
17	V4 grid shunt .. .. .	.0002
18	Pentode compensator .. .. .	.005
19	H.T. shunt .. .. .	.25
20	Bias potr. shunt .. .. .	.50
21	Osc. anode decoupling .. .. .	.5



The circuit parallels the orthodox mains superhet. Automatic bias, "beam" output and iron-cored I.F. coils are points of note.

bolts from the base and the two screws from the top of the wavelength dial assembly. The chassis can then be withdrawn to the extent of the speaker cable.

Special Notes.—A pair of terminals at the rear of the chassis enables a low-impedance (2 to 4 ohms) extension speaker to be connected.

A fuse on the front of the chassis deck is rated at 3.5 volts .15 amp. and has an M.E.S. base.

The two dial lights, intended for intermittent use, are switched on when the volume control is pressed downwards. They are rated at 2 volts .6 amp. and have M.E.S. bases.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer. Switch set to M.W. band and turn gang to maximum and volume to maximum. Short circuit oscillator tuning condenser by connecting point X (see under-chassis layout diagram) to chassis.

Connect a service oscillator to top grid cap of V1 (via a .1 mfd. condenser) and to chassis, leaving the normal connection still attached.

Tune service oscillator to 456 kcs. and adjust T1, T2, T3 and T4 in that order for maximum, reducing the input as the circuits come into line, so as to keep below the signal at which the A.V.C. begins to operate.

Signal Circuits.—Check that the scale is central in the clips, that the pointer is straight and that it coincides with the zero line on the scale when the gang condenser is at maximum capacity. Remove short circuit from gang.

Connect the service oscillator to the aerial and earth sockets via a dummy aerial. Only feed sufficient input to obtain reliable peaks in the output meter and progressively reduce the input as the circuits come into line.

Medium Waves.—Tune set and oscillator to 214 metres (1,400 kcs.) and adjust T5 and then T6 for maximum response.

Disconnect oscillator section of gang by unsoldering its lead at point X, and connect an external variable condenser between disconnected lead and chassis.

Tune service oscillator to 500 metres (600 kcs.), and adjust the external variable condenser and the receiver tuning control simultaneously for maximum.

Then disconnect the external variable condenser, re-connect the oscillator tuning condenser and, without touching the receiver tuning control, adjust P1 for maximum.

Repeat 214 metres operation to check calibration.

Long Waves.—Tune set and oscillator to 1,000 metres (300 kcs.), and adjust T7 and then T8 for maximum.

Re-connect external variable condenser as before, tune service oscillator to 1,818 metres (165 kcs.), and adjust receiver tuning control and external variable condenser simultaneously for maximum.

Re-connect oscillator tuning condenser

G.E.C. 3946 on Test

MODEL 3946.—For battery operation, requiring a Genelex B.C.120 H.T. battery and a G.E.C. Super B.B.820 accumulator. PRICE.—£8 18s. 6d.

DESCRIPTION.—Four-valve, three-band, table model battery superhet.

FEATURES.—Full-vision scale, calibrated in metres and station names and coloured as to waveband. Controls for concentric tuning, wave selection, and combined volume, master switch and dial lights switch control. Volume and wave selection controls operate indicators on scale. Terminals for low-impedance speaker. Alternative aerial socket. Fuse on chassis deck.

LOADING.—H.T., 11 ma.; L.T., .65 amp.

Sensitivity and Selectivity

SHORT WAVES (16-50 metres).—Very good sensitivity for a battery set, well maintained over the band. Easy handling.

MEDIUM WAVES (200-550 metres).—Representative gain and selectivity with small local station spread and a good background.

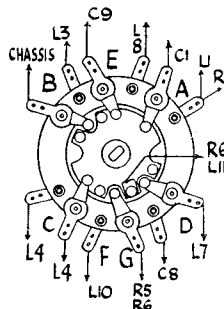
LONG WAVES (1,000-2,000 metres).—Similar performance to medium band. All main stations easily received. Only slight interference on Deutschlandsender.

Acoustic Output

Ample volume for an ordinary room, with well-balanced tone. Little colouration on speech and good radiation of high frequencies.

WINDINGS (D.C. Resistances)

L.	Ohms.	Range.	Where measured.
1	.4	Any	C1+R1 & C3.
2	Below .1	S.W.	Aerial gang and chassis.
2+3	2.3	M.W.	Aerial gang and C3.
2+3+4	25.6	L.W.	Aerial gang and C3.
5	.4	S.W.	Osc. anode and R6.
6	Below .1	S.W.	Osc. grid and P2.
6+7	2.7	M.W.	Osc. grid and P2.
6+7+8	11	L.W.	Osc. grid and P2.
5+10	1.6	M.W.	Osc. anode and R6.
5+10+11	4.3	L.W.	Osc. anode and R6.
12	7	Any	Anode V1 and HT+.
13	7	Any	Grid V2 and R11.
14	4	Any	Anode V2 and HT+.
15	4	Any	Tags.
O.T. prim.	1,570	Any	Tags.

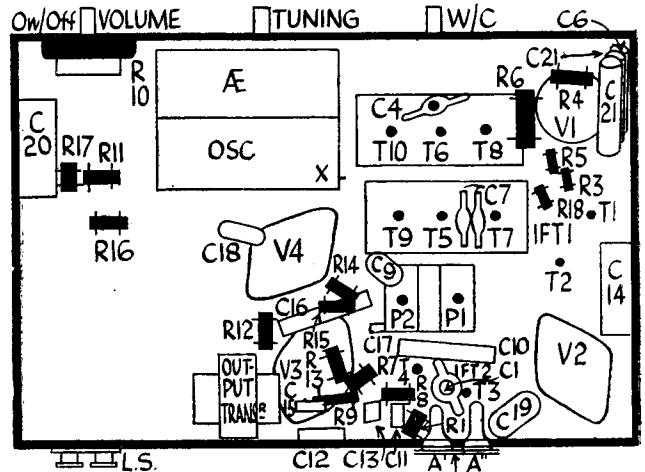
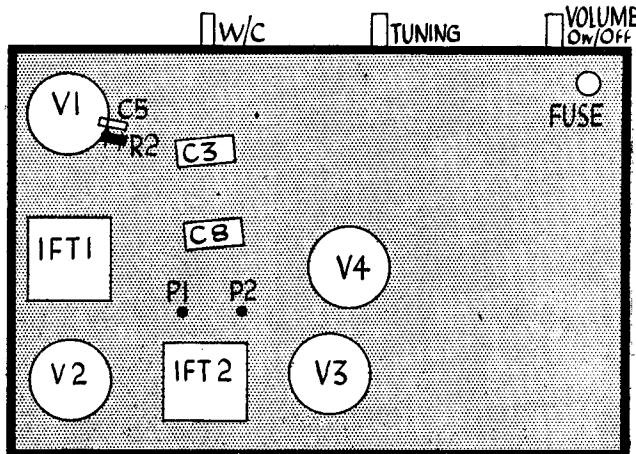


The single switch bank with contacts numbered to correspond with the circuit and with the connections indicated.

and without touching the receiver tuning control adjust P2 for maximum.

Repeat 1,000 metres operation to check calibration.

Short Waves.—Tune set and oscillator to 16.7 metres (18 mcs.), screw T9 right up and then unscrew until the lowest capacity peak is heard. Then adjust T10 for maximum sensitivity.



The variable condenser and all the trimmers except the padders are under the chassis. The top "deck" layout diagram is on the left.