GEC 3646

Four-valve, two waveband superhet battery receiver with provision for pickup and extra loudspeaker. Manufactured by General Electric Co., Ltd., Kingsway, London, WC2.

COUPLING coil L1 and tapping on the long-wave coil L3 feed the aerial input to the primaries of the band-pass tuning circuit tuned by VC1 and VC2. The secondaries of the band-pass filter unit feed directly into the control grid of V1, the heptode frequency changer.

The oscillator grid circuit comprises L6 (MW) and L7 (LW) tuned by VC3, R1 and C2 being the grid leak and condenser. Reaction is applied from the oscillator anode via R2 through the reaction windings L8 and L9. The oscillator anode and the screen of V1 derive their HT from the same HT line which is decoupled by C4.

The IF signals are transferred by the intermediate frequency transformer L10, L11 to the IF amplifying valve V2, the screen of which is connected to the HT via R4 decoupled by C6.

The second intermediate transformer L12, L13 couples V2 to V3, the double diode triode.

The secondary of L13 is tapped and the signal from this tapping feeds the signal diode of V3. The signal load resistance is R8 filtered by C8 and the LF signal is applied via C9 to the volume control R9.

The pickup sockets are arranged across this circuit, and as no switching is provided the receiver must be tuned to a silent part of the waveband when record reproduction is required.

The AVC diode of V3 is fed from the anode of V2 through C7 the AVC load being R5 and R6, which are returned to a tapping on the bias network R14, R15, in order to obtain delay volts. The grid circuit of V1 is connected for full AVC voltage via the decoupling components C1 and R3, while V2 grid circuit has AVC applied from the junction of R5 and R6 with C5 acting as decoupler.

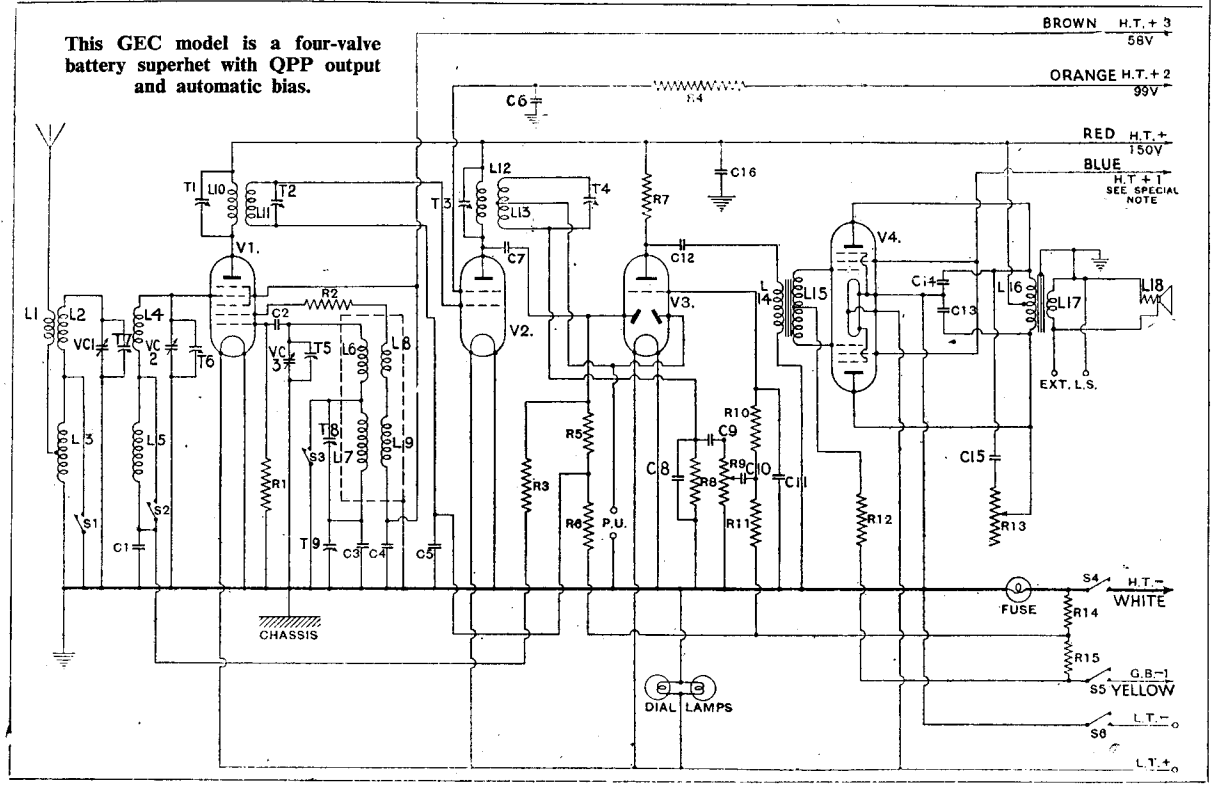
The LF signals from the volume control R9 are fed via C10 to the grid of the triode section of V3 which is biased from the junction of R14, R15. Grid decoupling is affected by R10, R11 and C11.

R7 is the coupling resistance for the LF signal in the anode circuit of V3, the signals passing via C12 to the primary of the push-pull intervalve transformer L14, L15.

The centre tap of L15 is taken via the grid stopper R12, to the maximum grid bias line. The outers of L15 feed the two grids of the QPP double pentode valve V4, the anodes of which are connected via the primary L16 of the output transformer to the HT positive line. This line also feeds the anodes of all the other valves and is decoupled by C16.

The anode circuit of V4 has a certain amount of fixed tone correction by C13 and C14, while variable tone control is affected by C15 and tone control R13. L17 is the secondary winding of the output transformer to which are connected the low impedance permanent magnet speaker and extra loudspeaker sockets.

This GEC model is a four-valve battery superhet with QPP output and automatic bias.



GANGING

IF Circuits.—Switch to MW, tune to 550 metres, and adjust volume control to maximum. Short circuit oscillator reaction coil by temporarily connecting together the ends of R2 and C4. Inject a signal of 125 kcs. to the control grid (top cap) of VI. Adjust T1, T2, T3 and T4 to give maximum reading on an output meter, keeping the input low to prevent AVC action.

MW Band.—Switch to MW and check that the pointer is the same distance from the nearest edge of the scale at either end of its travel. Inject and tune in a 214-metres signal to the aerial socket via a dummy aerial and adjust T5, T6, and T7 for maximum output.

LW Band.—Disconnect VC3 by unsoldering the lead to the stator plates and connect an external variable condenser between the disconnected lead and chassis. Tune service oscillator to 300 kcs and adjust receiver tuning control and external variable condenser simultaneously to give maximum output. Disconnect external variable condenser and reconnect VC3. Adjust T8 for maximum output.

Repeat the above procedure employing a 165-kcs signal, but adjust T9 instead of T8 for maximum output.

CONDENSERS

C	Mfds	C	Mfds
1	.05	9	.02
2	.0001	10	.02
3	.0005	11	.0001
4	.25	12	.25
5	.05	13	.001
6	.1	14	.001
7	.0001	15	.005
8	.0001	16	.25

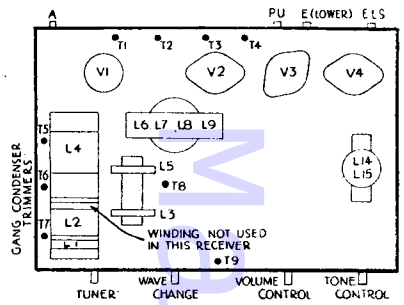
RESISTANCES

R	Ohms	R	Ohms
1	99,000	9	500,000
2	2,000	10	99,000
3	1 meg	11	1 meg
4	77,000	12	99,000
5	330,000	13	50,000
6	220,000	*14	75
7	55,000	15	600
8	440,000		

*Two 150-ohms. resistances in parallel.

WINDINGS

L	Ohms	L	Ohms
1	1.6	10	82
2	4	11	82
3	17 (Tap 5.4)	12	82
4	3.9	13	82
5	17	14	632
6	3.8	15	1470+1900
7	11.5	16	640+750
8	4.8	17	.96
9	4.8	18	1.9



Simplified diagram of underside of the 3646 chassis, indicating the trimmer positions.

VALVE READINGS

V	Type	Electrode	Volts	Ma
1	X21	Anode	150	.5
		Screen	50	1.2
		Osc. anode	50	1.2
2	VS24	Anode	150	1.6
		Screen	55	.4
3	HD22	Anode	80	.9
4	QP21	Anode	150	1.5–4.0
		Screen	See note.	

NOTE: For valves marked V 132v
" " " W 140v
" " " X 147v

IF Stage Causes Whistle

A COMMON fault in the latest type of HMV receiver (the 418 model and later version) is whistling on the edge of a station, and whistling where weak stations are normally received. This appears to be oscillation on the IF stages and can be cured by fitting a fixed resistor in the plate circuit.

The value may vary from 50,000 to 250,000 ohms. De-tuning the IF trimmers will also effect a cure, but in this case the loss of signal strength is great.

* * *

A set was being tested for weak reception generally, and it was found that when one IF valve was removed the anode voltage to it was increased enormously. If was thought that the valve was passing excessive current and faulty, but replacement effected no cure.

Testing for anode current (since the bias voltage normally on the valve was small and would not indicate very much) showed this to be low. There was obviously a high resistance in the anode circuit and the IF coil was tested and showed a resistance of very high value, instead of 80 ohms. Rewinding and replacement repaired the set.—D.L.