

'TRADER' SERVICE SHEET

213

G.E.C. AC37

3-VALVE A.C. RECEIVER

THREE models of the G.E.C. AC37 3-valve (plus rectifier) A.C. receiver are made. The BC3730 is for mains of 190-250 V, 40-100 C/S, the BC3730L is for 110-130 and 210-230 V, 40-100 C/S, and the BC3731 is for 190-250 V, 25-100 C/S. In all models there is provision for an extension speaker and the wave-change switch has a third position for bringing a Droitwich rejector into circuit on the L.W. band.

This Service Sheet was prepared on a BC3730.

CIRCUIT DESCRIPTION

Aerial input via coupling coil (direct on M.W. and L.W.1; also via Droitwich rejector L1, C16 on L.W.2), to single tuned circuit L3, L4, C17 which precedes variable-mu tetrode R.F. amplifier (V1, Osram metallised VMS4B). Gain control by variable potentiometer R3 which varies the G.B. applied and also acts as an aerial-earth shunt.

Choke-fed tuned-grid coupling by L5, L7, C4, L6, L8 and C19 to tetrode detector (V2, Osram metallised VMS4) operating on the grid leak system with C7 and R7, R8. Reaction is applied by anode coil L9 and controlled by differential condenser C21. A slight negative bias, obtained by the voltage drop along R11, is applied to the C.G. in order to give smooth control of reaction. Part of the D.C. voltage developed across R7, R8 is tapped off at their junction and fed back through decoupling circuit as G.B. to R.F. amplifier in the manner of automatic volume

control circuits, to prevent overloading on local stations.

Resistance capacity coupling by R10, C8, R14 to pentode output valve (V3, Osram N41). R.F. filtering in C.G. circuit by stopper R15 and by-pass C11. Tone compensation in anode circuit by fixed condenser C13. Provision for connection of low impedance external speaker across the secondary of the internal speaker input transformer T1.

H.T. current is supplied by full-wave rectifying valve (V4, Osram U12). Smoothing by iron-cored choke L11 and dry electrolytic condensers C14, C15.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	V1 C.G. decoupling condenser	0.1
C2	V1 cathode by-pass	0.25
C3	S.G. decoupling condenser	0.1
C4	V1 anode to V2 grid coupling	0.000011
C5	H.T. blocking condenser	0.05
C6*	V2 anode decoupling	3.0
C7	V2 C.G. condenser	0.00005
C8	A.F. coupling to V3	0.02
C9	V2 cathode by-pass	0.5
C10	V2 S.G. decoupling condenser	0.5
C11*	V3 C.G. R.F. by-pass	0.0003
C12*	V3 cathode by-pass	35.0
C13	V3 anode tone corrector	0.01
C14*	H.T. smoothing condensers	7.0
C15*		7.0
C16†	Droitwich rejector tuning	—
C17†	Aerial circuit tuning	—
C18†	Aerial circuit trimmer	—
C19†	V2 grid circuit tuning	—
C20†	V2 grid circuit trimmer	—
C21†	Differential reaction control	—
C22†	Pre-set reaction control	—

* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES		Values (ohms)
R1	V1 S.G. potential divider	38,000
R2	V1 gain control	22,000
R3	V1 gain control	7,000
R4	V1 fixed G.B. resistances	220
R5	V1 C.G. decoupling	6,600
R6	V1 C.G. decoupling	229,000
R7	V2 grid leak	2,000,000
R8	V2 anode load resistance	1,000,000
R9	V2 anode decoupling	3,300
R10	V2 anode load resistance	22,000
R11	V2 G.B. resistance	99
R12	V2 S.G. potentiometer	77,000
R13	V3 C.G. resistance	33,000
R14	V3 C.G. R.F. stopper	220,000
R15	V3 C.G. R.F. stopper	55,000
R16	V3 anode circuit stabiliser	99
R17	V3 G.B. resistance	99

OTHER COMPONENTS		Approx. Values (ohms)	
L1	Droitwich rejector coil (total)	26.0	
L2	Aerial coupling coil	5.5	
L3	Aerial M.W. tuning coil	2.8	
L4	Aerial L.W. tuning coil	18.2	
L5	V1 anode M.W. R.F. choke	40.0	
L6	M.W. R.F. tuning coil	2.7	
L7	V1 anode L.W. R.F. choke	135.0	
L8	L.W. R.F. tuning coil	21.0	
L9	Reaction coil	0.3	
L10	Speaker speech coil	1.9	
L11	H.T. smoothing choke	650.0	
T1	Speaker input trans.	400.0	
T2	Mains trans.	(Pri. total)	0.8
		Heater sec.	0.08
		Rect. heat. sec.	0.12
		H.T. sec. (total)	480.0
S1-S4	Waveband switches	—	
S5	Mains switch, ganged R3	—	

DISMANTLING THE SET

Removing Chassis.—To remove the chassis from the cabinet, remove the four control knobs (pull off) and the four bolts holding the chassis to the bottom of the cabinet. Now free the two scale lamps from the clips securing them, when the chassis can be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

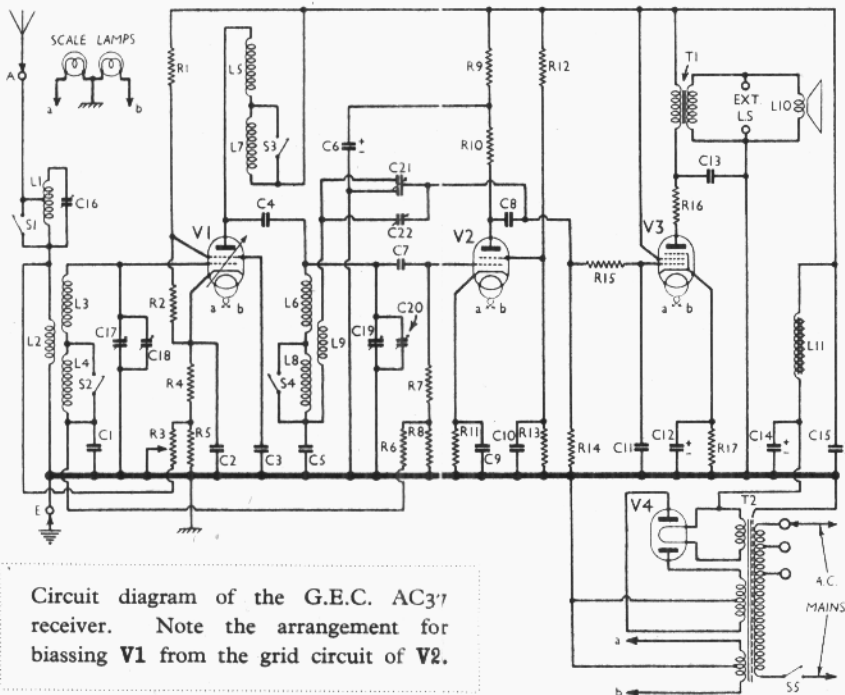
To free the chassis entirely, unsolder the speaker leads and when replacing, connect the black lead to the right-hand tag and the white lead to the left-hand.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, remove the six screws (with washers) holding the sub-baffle to the cabinet front. The speaker can then be removed from the sub-baffle by removing the three countersunk-head screws (with nuts, spring washers, washers and presspahn washers) holding it to the sub-baffle.

When replacing, see that the terminal panel is at the bottom and note that of the six screws holding the sub-baffle to the cabinet front, two are shorter than the others. These should go at the bottom.

VALVE ANALYSIS

Valve voltages and currents given in the table (p. III) are those measured in our receiver when it was operating on mains 230 V, using the 230-250 V tapping on



Circuit diagram of the G.E.C. AC37 receiver. Note the arrangement for biasing V1 from the grid circuit of V2.

the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. 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 VMS 4B	240	4.3	75	0.6
V2 VMS4	130	3.7	45	1.4
V3 N4r	230	33.0	240	8.1
V4 U1z	270†	—	—	—

†Each anode A.C.

GENERAL NOTES

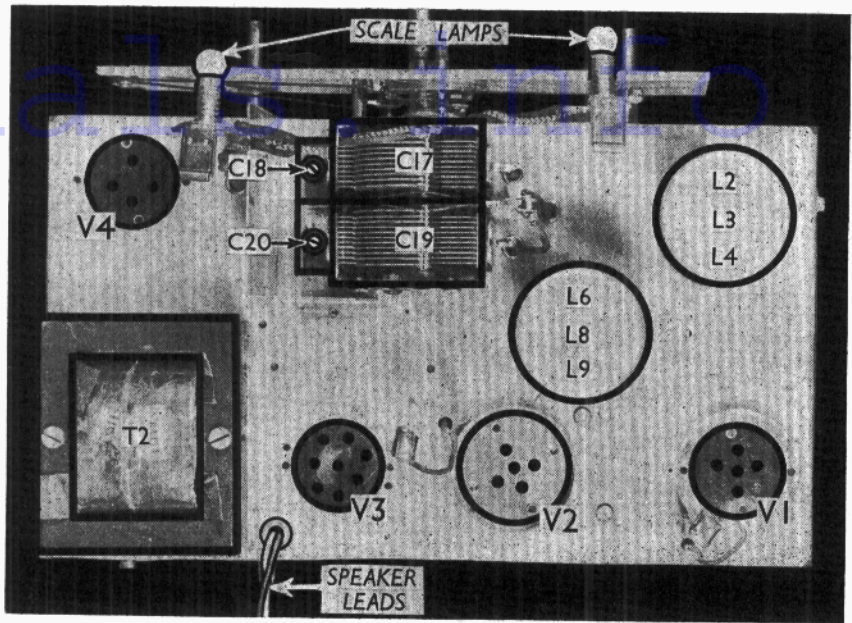
Switches.—S1-S4 are the wavechange and Droitwich rejector switches, in a single rotary unit beneath the chassis. The positions of the individual switches are indicated in our under-chassis view. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. The L.W.2 position switches in the Droitwich rejector. O indicates open, and C closed.

Switch	M.W.	L.W.1	L.W.2
S1	C	C	O
S2	C	O	O
S3	C	O	O
S4	C	O	O

S5 is the Q.M.B. mains switch, ganged with the gain control, R3.

Coils.—L1 and L5, L7 are unscreened units beneath the chassis. L2, L4 and L6, L8, L9 are in two screened units on the chassis deck. The screens are not removable, but the coil assemblies can be withdrawn from beneath the chassis after the wiring has been disconnected, by undoing the screws of the brackets holding the units in position.

Scale Lamps.—These are two Osram M.E.S. types, rated at 3.5 V, 0.3 A. They are connected in series across the heater winding of T2, the common



Plan view of the chassis. L1, L5 and L7 are beneath the chassis.

connection between them being earthed.

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

Condensers C8, C14, C15.—These are three dry electrolytics in a single carton beneath the chassis, having a common negative (black) lead. The yellow lead is the positive of C8, (3 μF) the red lead emerging next to it is the positive of C15 (7 μF) and the outer red lead the positive of C14 (7 μF).

Condensers C9, C10.—These are two 0.5 μF paper condensers in a single carton beneath the chassis. The black lead is common, the pink-white lead is the other connection of C9, and the blue-white the other connection of C10.

Condenser C4.—This is a small R.F. coupling condenser of the disc type.

CIRCUIT ALIGNMENT

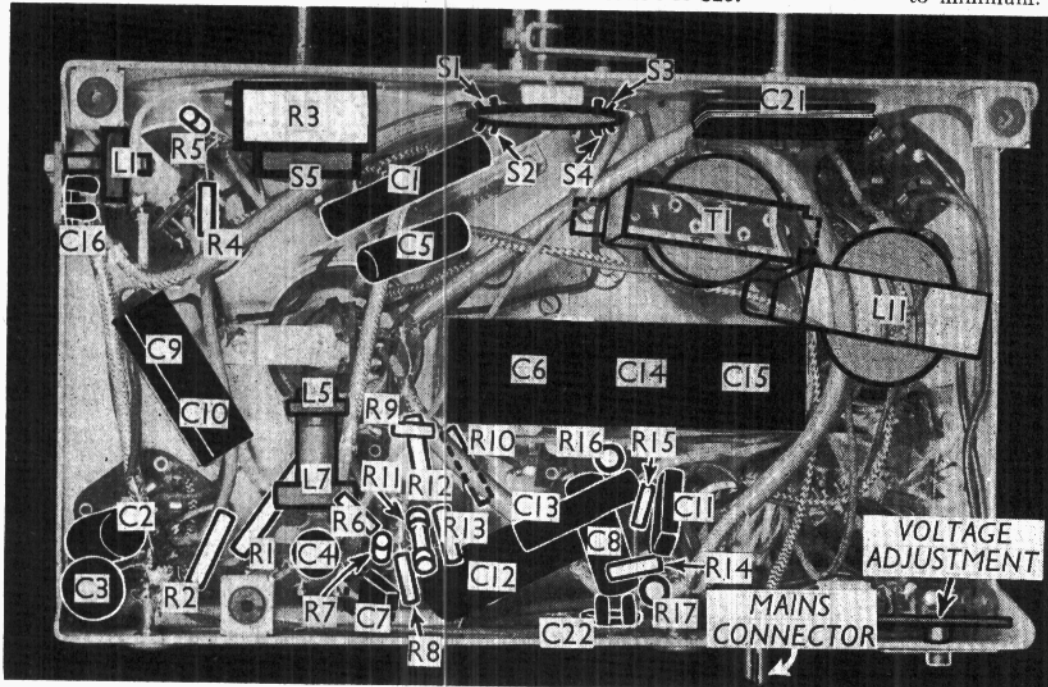
First see that pointer indicates 550 m. with gang fully meshed. Now tune to 214 m. on scale, turn gain control to maximum and reaction to minimum, and inject a 214 m. (1,400 KC/S) signal via a dummy aerial into A and E sockets. Adjust C18 and C20 for maximum output.

Droitwich Rejector.—Switch set to L.W.2 position, inject a 200 KC/S (1,500 m.) signal, tune it in, then adjust C16 for minimum output.

Pre-set Reaction.—Connect a normal aerial and earth, and turn reaction control to minimum. Adjust C22 until receiver

just oscillates near the bottom of the M.W. band. Reduce capacity of C22 by half a turn, checking for instability over both wavebands.

Finally, seal all trimmers with cellulose cement.



Under-chassis view. The four switches on the rotary unit are clearly marked. C16 and C22 are adjusted from the side and back of the chassis respectively.