

NUMBER FORTY-NINE  
(VOLUME TWO)

'TRADER' SERVICE SHEETS

G.E.C. SUPERHET A.C.4

wooden cross bar at the back of the cabinet may have to be removed to allow the speaker on its sub-baffle to be taken out.

THE G.E.C. Superhet A.C.4 is a table A.C. model employing three valves (plus valve rectifier). There is a heptode frequency changer, a screened pentode I.F. valve, while a double diode-output pentode performs the remaining operations. Two models are made, No. BC3640 for 100/250 V, 40/100 c.p.s. mains, and No. BC3640L for 110/130 and 210/230 V, 40/100 c.p.s. These only differ in respect of the mains transformer primary.

CIRCUIT DESCRIPTION

Aerial input by way of M.W. coupling coil and L.W. tap to primary of inductively-coupled band-pass filter. Primary L2, L3 tuned by C21; secondary L5, L6 tuned by C23.

First valve (V1, Osram metallised MX40) is a heptode operating as frequency-changer with electron coupling. Oscillator grid tuning coils L7, L8 tuned by C25; anode reaction coils L9, L10; tracking by means of specially-shaped tuning condenser plates and condensers C5, C28 on L.W. Image suppression by small coil L4 in V1 cathode circuit.

Second valve, a variable-mu H.F. pentode (V2, Osram metallised VMP4G) operates as intermediate frequency amplifier with tuned-primary tuned-secondary

potential which is developed across R17, R18, and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage is obtained from drop along V3 cathode resistances R15, R16.

Audio-frequency output from rectifier diode is developed across R11 and passed by way of condenser C12, manual volume control R12, condenser C13 and I.F. stopper R13 to grid of V3 pentode section. Fixed tone compensation in anode circuit by condenser C16; variable tone control by R.C. filter R20, C17. Provision for H.R. external speaker.

H.T. current is supplied by full-wave rectifying valve (V4, Osram U12). Smoothing by speaker field winding L17 and dry electrolytic condensers C19, C20.

DISMANTLING THE SET

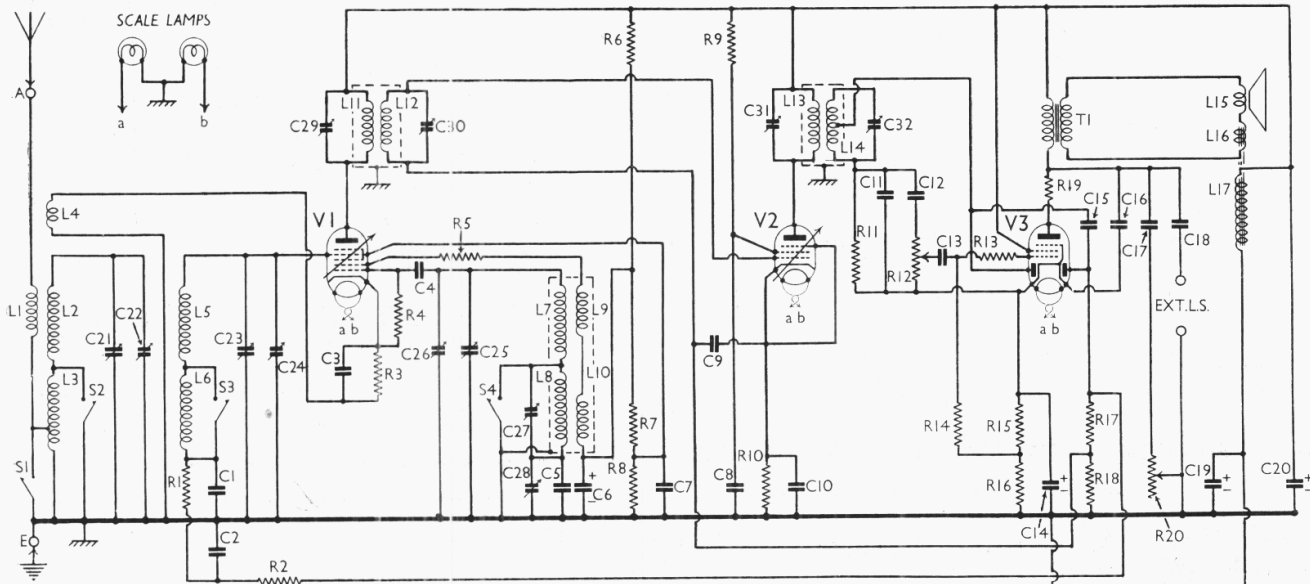
**Removing Chassis.**—Remove control knobs (pull off). Remove four C.H. bolts from underside of cabinet which hold chassis in position. Chassis may now be withdrawn to extent of speaker leads. This will generally be ample for most repairs. To remove chassis entirely, unsolder speaker leads from speaker terminal panel. The order of the wires, from the top of the panel to the bottom, is red and white; orange; black; red.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 pent. cont. grid decoupling	220,000
R2	V1 A.V.C. circuit decoupling	440,000
R3	V1 fixed G.B. resistance	500
R4	V1 oscillator grid resistance	99,000
R5	V1 osc. anode series resistance	2,500
R6	V1 S.G.'s and osc. anode H.T. supply potential divider	15,000
R7		22,000
R8		30,000
R9	V2 S.G. H.T. feed	77,000
R10	V2 fixed G.B. resistance	350
R11	V3 rectifier diode load	440,000
R12	Manual volume control	500,000
R13	V3 cont. grid I.F. stopper	77,000
R14	V3 grid resistance	440,000
R15	V3 G.B. and A.V.C. delay voltage resistances	90
R16		150
R17	V3 A.V.C. diode load	660,000
R18		330,000
R19	V3 anode circuit stabiliser	100
R20	Variable tone control	50,000

Condensers		Values (μF)
C1	V1 pent. cont. grid decoupling	0.05
C2	V1 A.V.C. circuit decoupling	0.05
C3	V1 cathode by-pass	0.05
C4	V1 oscillator grid condenser	0.0001
C5	Osc. L.W. tracker, fixed	0.0005
C6	V1 osc. anode decoupling	3.0
C7	V1 S.G.'s by-pass	0.05
C8	V2 S.G. by-pass	0.1
C9	V2 cont. grid decoupling	0.05
C10	V2 cathode by-pass	0.1
C11	I.F. by-pass	0.0003
C12	L.F. coupling to R12	0.02

(Continued on next page.)



Circuit diagram of the G.E.C. Superhet A.C.4

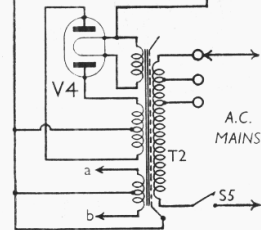
transformer couplings L11, L12 and L13, L14.

Intermediate frequency 125 KC/S.

Diode second detector forms part of double diode output pentode (V3, Osram DN41). Second diode, fed from centre-tap on second I.F. transformer secondary by way of condenser C15, provides D.C.

The 1st, 2nd, 4th and 6th tags are used for this purpose.

**Removing Speaker.**—This is removed on its sub-baffle by unscrewing the four C.H. screws, with spring and ordinary washers, holding the latter to the cabinet. Strips of wood keep the baffle at a slight distance from the actual cabinet front panel. The

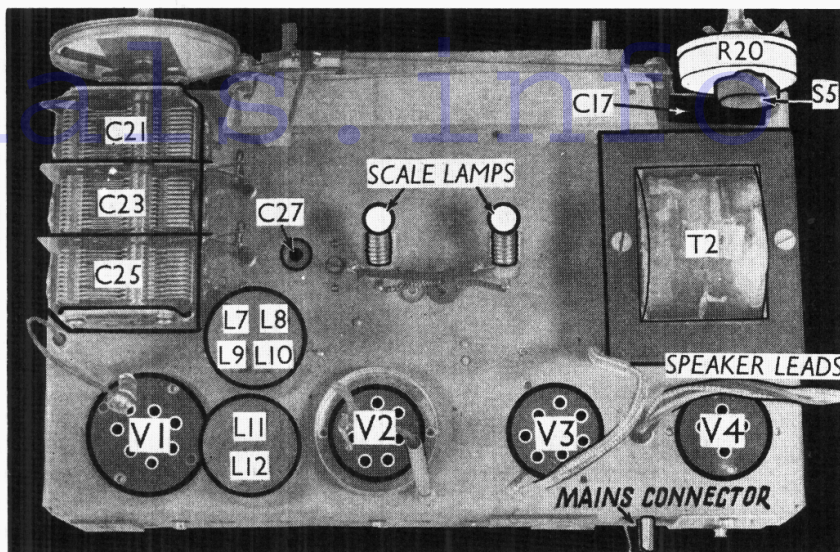


Condensers (contd.)		Values ( $\mu F$ )
C13	L.F. coupling to V3	0.02
C14	V3 cathode by-pass	50.0
C15	Coupling to V3 A.V.C. diode	0.0001
C16	V3 anode fixed tone control peusator	0.003
C17	Variable tone control condenser	0.02
C18	External speaker coupling	0.1
C19	H.T. smoothing	7.0
C20		7.0
C21	Band-pass primary tuning	—
C22	Band-pass primary trimmer	—
C23	Band-pass secondary tuning	—
C24	Band-pass secondary trimmer	—
C25	Oscillator tuning	—
C26	Oscillator main trimmer	—
C27	Oscillator L.W. trimmer	—
C28	Oscillator L.W. tracker, pre-set	—
C29	1st I.F. trans. pri. tuning	—
C30	1st I.F. trans. sec. tuning	—
C31	2nd I.F. trans. pri. tuning	—
C32	2nd I.F. trans. sec. tuning	—

Other Components		Values (ohms)	
L1	Aerial M.W. coupling coil	1.6	
L2	Band-pass primary coils	4.0	
L3		17.0	
L4	Image suppression coil	0.25	
L5	Band-pass secondary coils	3.0	
L6		17.0	
L7	Oscillator tuning coils	3.8	
L8	Oscillator anode coils	11.5	
L9		2.5	
L10	1st I.F. trans. Pri.	82.0	
L11		82.0	
L12	2nd I.F. trans. Pri.	82.0	
L13	2nd I.F. trans. Sec.	82.0	
L14		82.0	
L15	Speaker speech coil	1.0	
L16	Hum neutralising coil	0.005	
L17	Speaker field coil	1.400	
T1	Speaker input trans. Pri.	400	
		Sec.	0.8
	Pri. total	41.0	
T2	Mains trans. Heater sec.	0.08	
		Rect. fil. sec.	0.12
		H.T. sec.	54.0
S1-S4	Waveband switches, ganged	—	
S5	Mains switch, ganged R20	—	

**VALVE ANALYSIS**

The voltage and current readings listed in the table are those given by the G.E.C. for an average chassis working with the



Plan view of the chassis. The two coil units shown contain the oscillator and first I.F. coils. The remaining coils are beneath the chassis.

aerial disconnected and the tuning scale pointer set at the top of the M.W. band. All receiving valve voltages were measured with an electrostatic voltmeter from cathode in each case, but similar results should be obtained with a low-consumption meter of the moving-coil type. The usual precautions against instability may be necessary when measuring currents of V1 and V2.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 MX40*	250	3.0	75	2.0
V2 VMP4G	250	4.0	74	2.5
V3 DN41	230	32.0	245	8.0
V4 U12	320†	—	—	—

\* Osc. anode (G2) 150V 1.5 mA.  
† A.C., each anode to chassis.

**GENERAL NOTES**

**Coils.**—The signal frequency coils L1-L6 are unscreened, and are mounted beneath the chassis on two cylindrical formers. The second I.F. transformer L13, L14 is in a screened can, also beneath the chassis. On top of the chassis are the oscillator coils L7-L10 and the first I.F. transformer L11, L12. Both units are in screened cans.

**Switches.**—S1-S4 are the waveband switches, in a single unit. They are all closed on the M.W. band and open on the L.W. band, and are indicated in the under-chassis view. S5 is the mains switch, ganged with R20, the tone control.

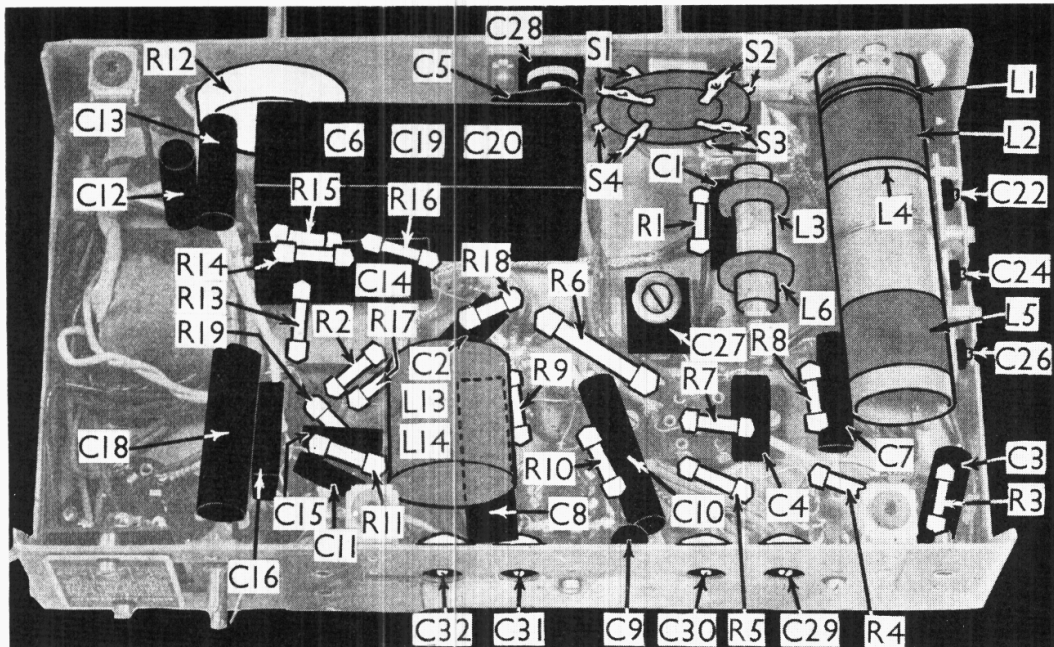
**Scale Lamps.**—Two of these are fitted, and they are of the Osram M.E.S. type, rated at 3.5 V, 0.3 A.

**External Speaker.**—This should be of the high resistance type (7,000-10,000  $\Omega$ ).

**Trimming Condensers.**—All of these, with the exception of C27, are disposed round the front, side and back of the chassis. C27 is adjusted through a hole in the top of the chassis.

**Condensers C6, C19, C20.**—These are three electrolytics in one unit, with a common negative (black) lead. The yellow lead is the positive of C6 (3 $\mu F$ ), the red lead next to it is the positive of C19 (7 $\mu F$ ) and the remaining red lead the positive of C20 (7 $\mu F$ ).

**V3 Connections**—The connections of the double diode-pentode were given in Service Sheet No. 19 (Vol. 1), p. 13.



Under-chassis view. C6, C19, C20 are three electrolytics in one unit. Note the trimmers disposed round the chassis sides. The wavechange switch unit is clearly indicated.