

'TRADER' SERVICE SHEETS

NUMBER THIRTY-ONE
(VOLUME TWO)

G.E.C. SUPERHET A.V.C.5

TABLE, CONSOLE & RADIOGRAM

For A.C. Mains

THE G.E.C. Superhet A.V.C.5 for A.C. mains is one of the 1934-5 models of the G.E.C. range. It is available in table, console and radiogram form, and except for a few differences in the radio-gram chassis the models are almost identical.

It is interesting to note that Osram AC/DC universal valves are employed (except in the case of the rectifier), and the heaters of these are connected in parallel and fed from a 13 V winding on the mains transformer.

CIRCUIT DESCRIPTION

Aerial input to coils **L1, L2**, which are coupled to primary of 2-stage inductively-coupled band-pass filter. Primary **L4, L5** tuned by **C22**; secondary **L7, L8** tuned by **C24**; coupling coil **L6**. First valve (**V1, Osram X30**) is a heptode functioning as frequency-changer with electron coupling. Oscillator grid coils **L9, L10** tuned by **C26**; tracking by **C3, C28** (L.W.) and **C4, C29** (M.W.); oscillator anode coil **L11**. Image rejection by small coil **L3** in cathode circuit of **V1**.

One variable-mu pentode intermediate frequency amplifier (**V2, Osram Catkin W30**) with tuned-primary tuned-secondary transformer couplings **L12, L13** and **L14, L15**. I.F. 125 KC S.

Diode second detector forming part of double diode triode (**V3, Osram DH30**) which also provides a form of amplified delayed automatic volume control, and L.F. amplification. L.F. component in output from the rectifier diode is

developed across load resistance **R8** and passed directly to the grid of the triode section by way of H.F. stopper **R7**. G.B. for radio amplification is obtained from the steady potential present across **R8** by reason of the carrier wave of a transmitter; on gramophone, the necessary voltage is provided by cathode resistance **R10**. Resistances **R12** and **R13** in **V3** cathode circuit, provide the high cathode to earth potential required for amplified delayed A.V.C. in conjunction with second diode of **V3**, its load resistance **R16**, and potential divider **R20, R21, R22, R23** across speaker field coil **L20**. A.V.C. voltage is applied to frequency-changer and I.F. valves through suitable decoupling circuits. Sensitivity switch **S9** increases fixed G.B. applied.

Resistance-capacity coupling to output pentode (**V4, Osram Catkin N30**), which has manual volume control **R14** in grid circuit. Tone compensation by fixed condenser **C16** and variable R.C. circuit **R18, C15**. Coupling to external high-resistance speaker by condenser

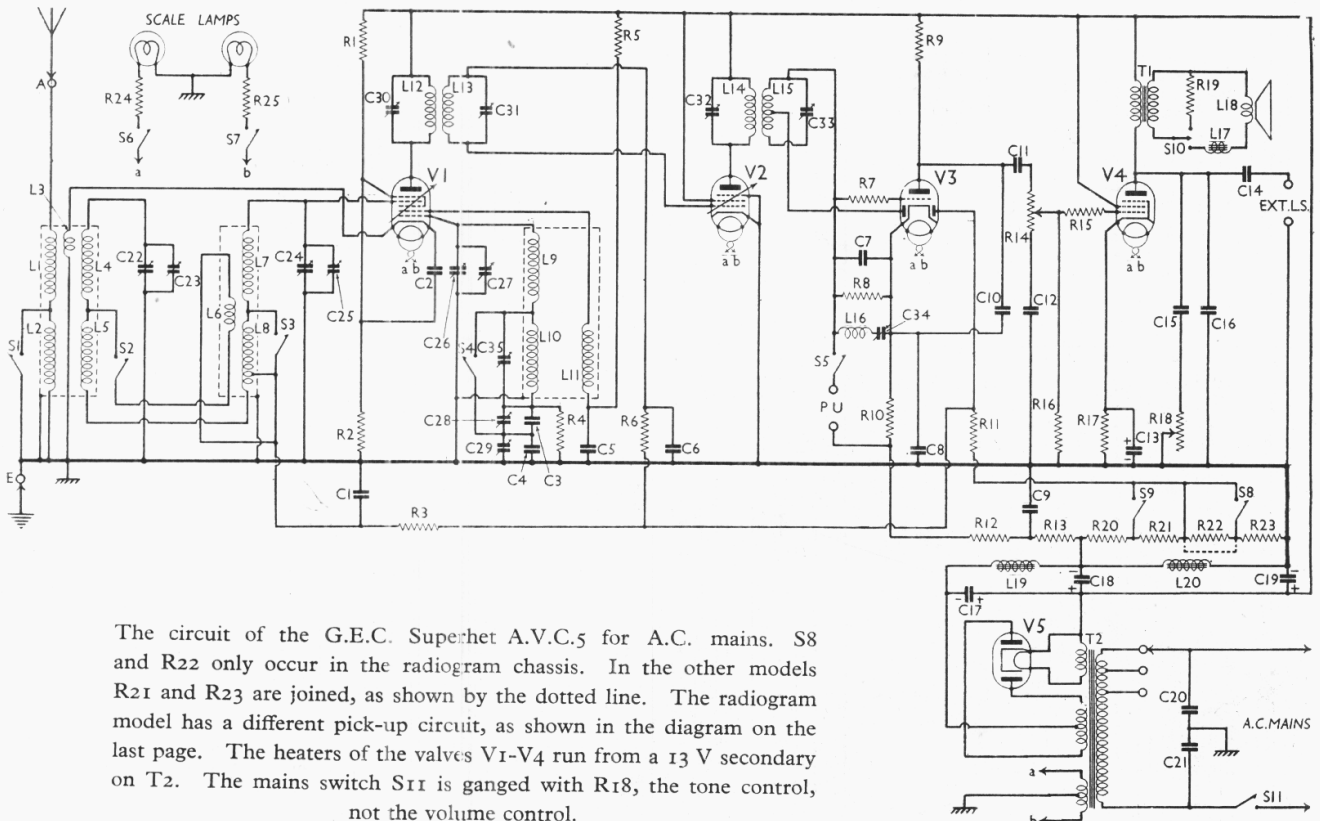
C14. Switch **S10** cuts out speech coil of internal speaker and connects artificial load **R19**.

H.T. current supplied by I.H.C. full-wave rectifying valve (**V5, Osram MU14**). Smoothing by speaker field winding **L20**, additional choke **L19**, and large capacity dry electrolytic condensers **C17, C18, C19**. Mains disturbance suppression by buffer condensers **C20, C21**.

DISMANTLING THE SET

Removing Chassis.—In the case of the table model, remove sensitivity switch knob from rear (pull off), remove back (3 screws) and thread off mains lead (if necessary). Remove the four control knobs at the front (pull off). Remove four screws from underside of cabinet holding chassis. Chassis can then be withdrawn sufficiently for normal repairs. To remove it entirely, unsolder the four loud-speaker leads from the tags on the speaker input transformer, which frees the chassis entirely. When replacing,

(Continued overleaf)



The circuit of the G.E.C. Superhet A.V.C.5 for A.C. mains. S8 and R22 only occur in the radiogram chassis. In the other models R21 and R23 are joined, as shown by the dotted line. The radiogram model has a different pick-up circuit, as shown in the diagram on the last page. The heaters of the valves V1-V4 run from a 13 V secondary on T2. The mains switch S11 is ganged with R18, the tone control, not the volume control.

G.E.C. SUPERHET A.V.C.5
(continued)

the colour code shown in our rear view of the speaker unit should be followed.

In the case of the console and radio-gram models, the control knobs, including the volume control at the front of the cabinet, should be pulled off, and the speaker leads unsoldered from the terminal strip on the speaker chassis. The chassis rests on wooden battens and is held by four nuts and bolts. To remove the radio-gram chassis entirely, the mains and earth leads must be removed from the motor, and the pick-up leads from the chassis. The latter are soldered to tags behind the left-hand pair of sockets at the back of the chassis.

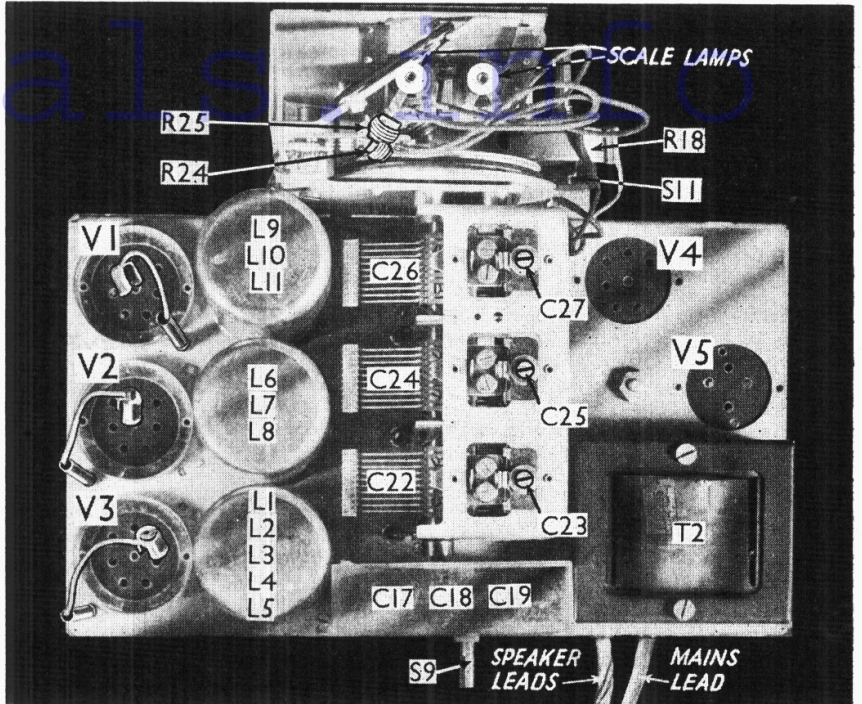
Removing Speaker.—If this is necessary, in the case of the console, undo the three nuts holding speaker to cabinet. The speaker switch must also be removed from its bracket, or its leads unsoldered. In the case of console and radio-gram models, remove speaker on its sub-baffle, which is held by six wood screws.

Do not forget that it will be necessary to re-connect the speaker temporarily when testing the chassis.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 S.G.'s pot. divider ..	50,000
R2		44,000
R3	V1 cont. grid decoupling ..	1,000,000
R4	V1 osc. grid resistance ..	99,000
R5	V1 osc. anode decoupling ..	22,000
R6	V2 cont. grid decoupling ..	1,000,000
R7	V3 grid H.F. stopper ..	220,000
R8	Rectifier diode load ..	500,000
R9	V3 anode resistance ..	77,000
R10	V3 G.B. resistance (gram. only)	990
R11	A.V.C. diode load ..	500,000
R12	Amplified A.V.C. circuit voltage-dropping resistances	25,000
R13		25,000
R14	Manual volume control, variable	500,000
R15	V4 grid H.F. stopper ..	99,000
R16	V4 grid resistance ..	330,000
R17	V4 G.B. resistance ..	350
R18	Tone control, variable ..	50,000
R19	Artificial output load ..	8
R20		66,000
R21		66,000
R22*	Pot. divider across speaker field ..	25,000
R23	Scale lamp voltage-dropping resistors	5,000
R24		20
R25		20
R26*	Gram. pick-up decoupling ..	220,000
R27*	Gram. pick-up shunt ..	15,000
R28*	Gram. pick-up series resistance	9,900

* In radio-gramophone only.



Plan view of the chassis. The screens of V1, V2 and V3 have been removed, together with the shield behind the scale.

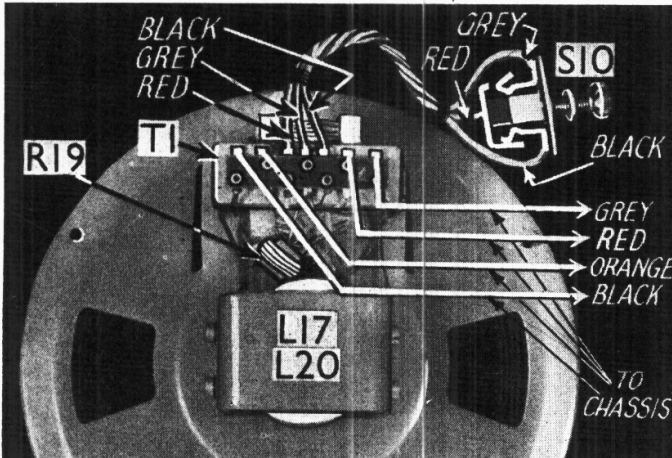
Condensers		Values (μF)	
C1	V1 cont. grid decoupling ..	0.05	
C2	V1 S.G. by-pass ..	0.05	
C3	Osc. L.W. tracker, fixed ..	0.0005	
C4	Osc. M.W. tracker, fixed ..	0.00115	
C5*	V1 osc. anode decoupling ..	0.1	
C6	V2 cont. grid decoupling ..	0.05	
C7	Rectifier diode reservoir ..	0.0003	
C8*	V3 cathode by-pass ..	0.5	
C9*	A.V.C. circuit delay voltage reservoir ..	0.5	
C10	V3 anode H.F. by-pass ..	0.002	
C11	L.F. coupling to V4 ..	0.02	
C12	Blocking condenser ..	0.1	
C13	V4 cathode by-pass, electrolytic ..	20.0	
C14*	Coupling to ext. speaker ..	0.2	
C15	Tone control condenser ..	0.02	
C16	Fixed tone compensator ..	0.001	
C17†	H.T. smoothing, electrolytics	6.0	
C18†		6.0	
C19†		6.0	
C20	Mains disturbance filter	0.01	
C21		0.01	
C22		Band-pass primary tuning ..	0.00038
C23		Band-pass pri. trimmer, pre-set ..	—
C24	Band-pass secondary tuning ..	0.00038	
C25	Band-pass sec. trimmer, pre-set ..	—	

Condensers (contd.)		Values (μF)
C26	Oscillator tuning ..	0.00038
C27	Osc. main trimmer, pre-set ..	—
C28	Osc. L.W. tracker, pre-set ..	—
C29	Osc. M.W. tracker, pre-set ..	—
C30	1st I.F. trans. pri. tuning ..	—
C31	1st I.F. trans. sec. tuning ..	—
C32	2nd I.F. trans. pri. tuning ..	—
C33	2nd I.F. trans. sec. tuning ..	—
C34	Part of I.F. filter circuit ..	—
C35	Osc. L.W. trimmer, pre-set ..	—
C36†	Gram. pick-up decoupling ..	0.05

* In condenser block on underside of chassis.
† In electrolytic block on chassis deck.
‡ In radio-gramophone only.

Other Components		Values (ohms)
L1	Aerial coupling coils ..	6.0
L2		100.5
L3	Image rejection coil ..	0.27
L4	Band-pass primary coils	5.3
L5		49.3
L6	Band-pass coupling coil ..	0.08
L7	Band-pass secondary coils	5.2
L8		49.5
L9	Oscillator grid coils ..	4.3
L10		27.0
L11	Oscillator anode coil ..	2.2
L12	1st I.F. transformer	Pri. 82.5
L13		Sec. 82.5
L14	2nd I.F. transformer	Pri. 82.5
L15		Sec. 82.5
L16	I.F. filter coil ..	38.5
L17	Speaker hum neutralising coil	0.16
L18	Speaker speech coil ..	3.1
L19	H.T. smoothing choke ..	400.0
L20	Speaker field coil ..	1,300.0
T1	Speaker input trans.	Pri. 300.0
		Sec. 0.35
T2	Mains trans.	Pri. total 38.0
		Heater sec. 0.6
		Rect. Heater sec. 0.12
		H.T. sec. 390.0
S1-S4	Waveband switches, ganged ..	—
S5	Radio-gramophone switch ..	—
S6	M.W. scale lamp switch ..	—
S7	L.W. scale lamp switch ..	—
S8*	R22 shorting switch ..	—
S9	Sensitivity switch ..	—
S10	Internal speaker switch ..	—
S11	Mains switch (ganged R18) ..	—

* In radio-gramophone only.



Rear view of part of the speaker unit, showing R19, S10, and the colour coding of the various wires.