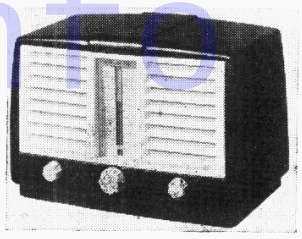
"TRADER" SERVICE SHEET

831

G.E.C. COMPACT

MODEL BC4835



THE G.E.C. "Compact" receiver BC4835 is a small table model with an attached aerial lead which may be wound on to the base when not in use. It is a 4-valve (plus rectifier and barretter) 3-band superhet designed to operate from A.C. or D.C. mains of 200-250 V 25-100 c/s in the case of A.C.

The BC4835 is housed in a black-bodied cabinet. Another "Compact" model, BC4835R, whose cabinet is coloured, is covered separately in *Service Sheet 830*.

Release date and original price: May, 1947: £14 14s plus £3 3s 3d purchase tax.

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)
R1	V1 hex. C.G. resistor ...	680,000
R2	V1 hex. anode decoupling	8,200
R3	V1 osc. C.G. resistor ...	100,000
R4	Oscillator circuit stabilizing resistors ...	68
R5	Oscillator circuit stabilizing resistors ...	470
R6	V1 osc. anode H.T. feed ...	5,600
R7	Osc. circuit stabilizer ...	10,000
R8	H.T. line decoupling ...	3,300
R9	V1, V2 S.G.'s H.T. feed ...	22,000
R10	V3 signal diode load ...	330,000
R11	I.F. stopper	1,000,000
R12	Manual volume control ...	1,000,000
R13	V3 triode anode load ...	100,000
R14	A.V.C. line decoupling ...	680,000
R15	V3 A.V.C. diode load ...	1,000,000
R16	V1, V2, V3 fixed G.B. and A.V.C. delay potential divider resistors	68,000
R17	V1, V2, V3 fixed G.B. and A.V.C. delay potential divider resistors	330,000
R18	V4 C.G. resistor	470,000
R19	V4 grid stopper	82,000
R20	V1, V2, V3, V4 G.B. resistor	220
R21	V5 anode surge limiter ...	100

	CAPACITORS	Values (μF)
C1	Aerial isolator	0·001
C2	Earth isolator	0·04§
C3	Aerial coupling capacitor	0·003
C4	V1 hex. C.G. capacitor ...	0·0005
C5	V1 hex. anode decoupling	0·05
C6	V1 osc. C.G. capacitor ...	0·0001
C7	Osc. M.W. fixed tracker ...	0·0001
C8	Osc. L.W. fixed trimmer ...	0·000039
C9	Osc. S.W. tracker ...	0·00395
C10	Reaction coupling ...	0·005
C11*	H.T. decoupling	16·0
C12	V1, V2 S.G.'s decoupling ...	0·05
C13	I.F. by-pass	0·0003
C14	V3 A.V.C. diode coupling	0·000022
C15	A.F. coupling to V3 triode	0·005
C16	Isolating capacitor ...	0·001
C17	V3 C.G. decoupling ...	0·25
C18	A.V.C. line decoupling ...	0·05
C19	I.F. by-pass	0·0003
C20	A.F. coupling to V4 C.G. ...	0·01
C21*	G.B. by-pass capacitor ...	25·0
C22	Fixed tone corrector ...	0·02
C23*	H.T. smoothing capacitors	16·0
C24*	H.T. smoothing capacitors	16·0
C25	Mains R.F. by-pass ...	0·01
C26‡	Aerial circ. S.W. trimmer	—
C27‡	Aerial circ. M.W. trimmer	—
C28‡	Aerial circ. L.W. trimmer	—
C29†	Aerial circuit tuning ...	—
C30†	Oscillator circuit tuning ...	—
C31‡	Osc. circ. S.W. trimmer ...	—
C32‡	Osc. circ. M.W. trimmer ...	—
C33‡	Osc. circ. L.W. trimmer ...	—
C34‡	Osc. circ. L.W. tracker ...	—
C35‡	Osc. circ. M.W. tracker ...	—
C36‡	1st I.F. trans. pri. tuning	—
C37‡	1st I.F. trans. sec. tuning	—
C38‡	2nd I.F. trans. pri. tuning	—
C39‡	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.
§ 2 × 0·02μf in parallel.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial circuit shunt ...	60·0
L2	Aerial S.W. coupling coil ...	0·36
L3	Aerial S.W. tuning coil ...	0·06
L4	Aerial M.W. tuning coil ...	2·46
L5	Aerial L.W. tuning coil ...	19·5
L6	Osc. S.W. tuning coil ...	0·06
L7	Osc. M.W. tuning coil ...	3·4
L8	Osc. L.W. tuning coil ...	7·7
L9	Osc. S.W. reaction coil ...	0·32
L10	1st I.F. trans. Pri. ...	7·0
L11	1st I.F. trans. Sec. ...	7·0
L12	2nd I.F. trans. Pri. ...	4·0
L13	2nd I.F. trans. Sec. ...	4·0
L14	Speaker speech coil ...	2·0
L15	Hum neutralizing coil ...	0·2
L16	Speaker field coil ...	750·0
T1	Speaker input trans. Pri. ...	270·0
T1	Speaker input trans. Sec. ...	0·3
S1-S4	Waveband switches ...	—
S5	Mains switch, ganged R12	—

CIRCUIT DESCRIPTION

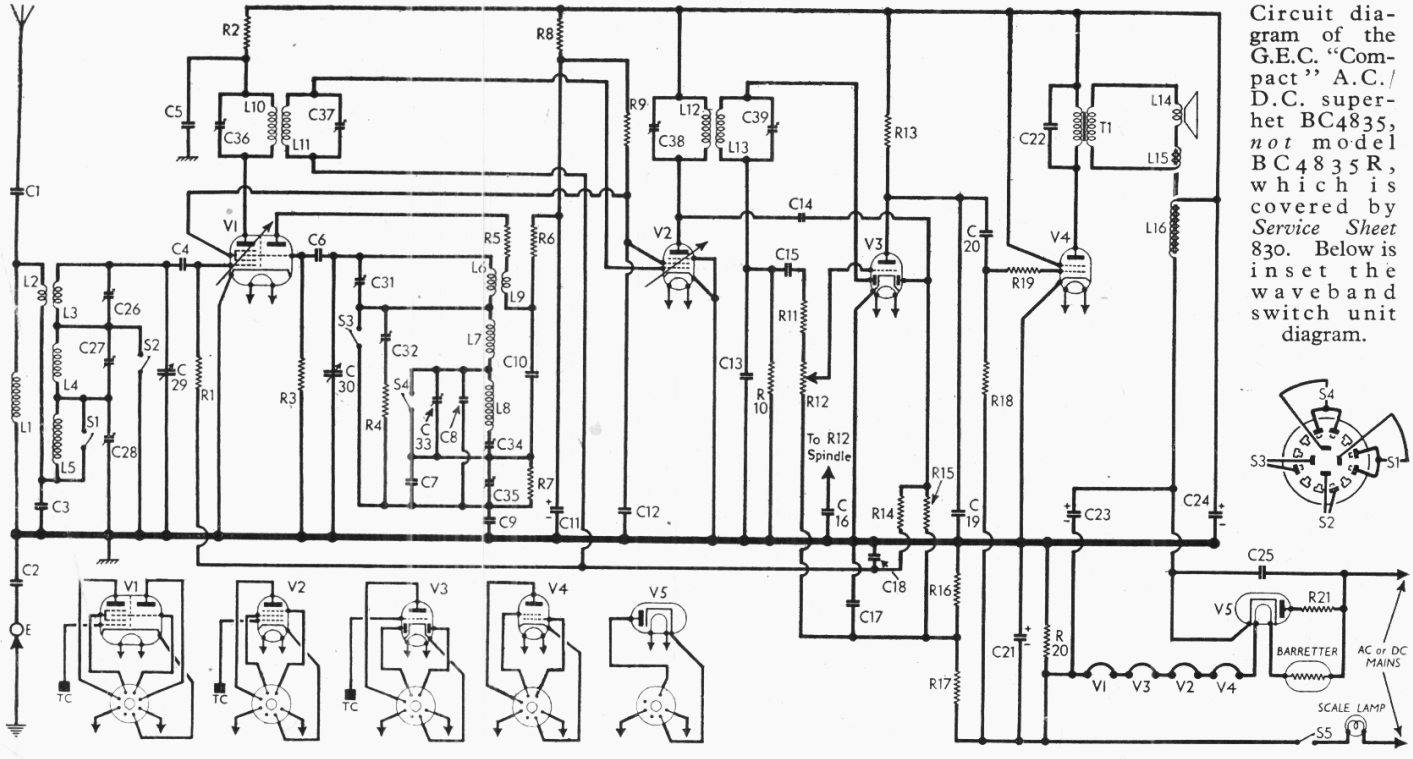
Input from attached aerial, via isolating capacitor **C1,** is developed across **L2, C3** in series, which are shunted by choke **L1** to prevent modulation hum.

On S.W., where the impedance of **C3** is negligible, the signal is developed mainly across **L2** and passed to single-tuned circuit **L3, C29.**

On M.W. and L.W., coupling is mainly capacitative from **C3,** which is common to the aerial and single-tuned circuits **L4, C29** (M.W.) and **L5, C29** (L.W.).

First valve **(V1, Osram metallized X76M)** is a triode-hexode operating as frequency changer

(Continued overleaf)



Circuit diagram of the G.E.C. "Compact" A.C./D.C. superhet BC4835, *not* model BC4835R, which is covered by *Service Sheet* 830. Below is inset the waveband switch unit diagram.

Circuit Description—*continued*

with internal coupling. Oscillator grid coils **L6** (S.W.), **L7** (M.W.) and **L8** (L.W.) are tuned by **C30**. Parallel trimming by **C31** (S.W.), **C32** (M.W.), and **C8, C33** (L.W.); series tracking by **C9** (S.W.), **C7, C35** (M.W.) and **C34** (L.W.). Reaction coupling by **L9** (S.W.) and across the impedance of the trackers on M.W. and L.W.

Second valve **(V2, Osram W76)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned primary, tuned secondary transformer couplings **C36, L10, L11, C37** and **C38, L12, L13, C39.**

Intermediate frequency 456 kc/s.

Diode second detector is part of double diode triode valve **(V3, Osram DH76).** Audio frequency component in rectified output is developed across load resistor **R10** and passed via A.F. coupling capacitor **C15,** I.F. stopper **R11,** and manual volume control **R12,** to C.G. of triode section which operates as A.F. amplifier. I.F. filtering by **C13** and **R11** in diode circuit, and **C19** in triode anode circuit.

Second diode of **V3,** fed from **V2** anode via **C14,** provides D.C. potential which is developed across load resistor **R15** and fed back through a decoupling circuit as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R13, C20** and **R18,** via grid stopper **R19,** between **V3** triode and tetrode output valve **(V4, Osram KT76).** Fixed tone correction by **C22** in tetrode anode circuit.

When the receiver is operated from A.C. mains, H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Osram U76)** which, with D.C. mains, behaves as a low resistance. Smoothing by speaker field **L16** and electrolytic capacitors **C23, C24.** Mains R.F. filtering by **C25** and earth isolation by **C2.**

The voltage drop across **R20** in the H.T. negative lead to chassis is applied as G.B. to **V4,** and via the potential divider **R16, R17** as A.V.C. delay voltage and fixed G.B. to **V1, V2** and **V3.**

Valve heaters, together with scale lamp and current regulating barretter **(Osram 161),** are connected in series across mains input.

VALVE ANALYSIS

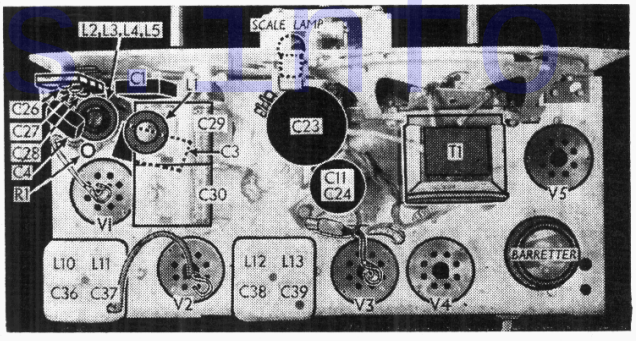
Valve voltages and currents given in the table below are those quoted by the manufacturers. Their chassis was operating from A.C. mains of 230 V and tuned to 300 m, but there was no signal input.

Voltages were measured with an 0-1,000 V meter having an internal resistance of 500 ohms-per-volt, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X76M	166 (Oscillator 115)	1·2 (4·2)	65	2·8
V2 W76	180	4·5	65	1·2
V3 DH76	117	0·45	—	—
V4 KT76	170	38·0	180	7·0
V5 U76†	223	—	—	—

† Cathode to chassis, 227 v., D.C.

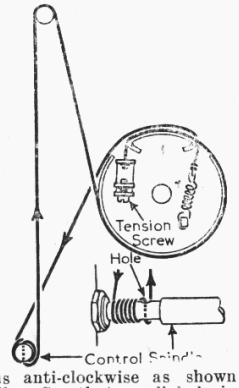
Plan view of the chassis. The attached aerial is connected to a tag of **L2**, but it emerges from a hole beneath the chassis as indicated in the illustration below.



DRIVE CORD REPLACEMENT

Remove tuning scale, waveband indicator and tuning ribbon; turn gang to minimum, when drum should be in position shown in sketch, where it is viewed from the front. 30in of cord is sufficient.

Tie one end of cord securely to the spring, and hook spring to anchor tag, take cord through gap as shown and down to control spindle,



Sketch of the cord drive system, as seen from the front with the gang at minimum. Inset is a side view of the control spindle, showing the turns round and through it.

winding on six turns anti-clockwise as shown in side view of spindle. See that small hole in spindle is vertical, then thread cord downwards through it, continuing with a further half-turn anti-clockwise and up over top pulley and back to drum, tying off with a knot inside finishing bracket. Tension may then be adjusted by screw. Attach tuning ribbon clamp and adjust as explained in "Circuit Alignment."

GENERAL NOTES

Switches.—**S1-S4** are the waveband switches, ganged in a rotary unit beneath the chassis. This is indicated in our under-chassis view, and shown in detail in the diagram inset in the circuit diagram overleaf. In the M.W. position (knob fully anti-clockwise) **S1** and **S4** close; in the next position (S.W.), all are closed; and on L.W. all are open.

Scale Lamp.—This is an Osram type "S," with a small clear spherical bulb and an M.E.S. base. Its Cat. No. is O.S.75 and it is rated at 6.5 V 0.3 A. A spare bulb is kept in a holder mounted on the back cover of the receiver.

Capacitor C16.—As a protection against accidental shock all control spindles are insulated from chassis. To eliminate hand-capacity effects, therefore, the volume control spindle is "earthed" by **C16.**

DISMANTLING THE SET

Almost unimpeded access to the under-side of the chassis may be obtained upon removal of the bottom cover (two cheese-head screws).

Removing Chassis.—Remove the three control knobs (pull-off), and the bottom cover as previously described;

with a long-bladed screwdriver remove the black-painted cheese-head screws (with washers) securing the speaker mounting plate to the front of the cabinet;

remove the four cheese-head screws (two long, two short, with washers) holding the chassis to the moulded flange on the cabinet.

The chassis may now be withdrawn, complete with speaker, but in order to avoid damage to the windings of the oscillator coil, the four chassis-retaining screws should be refitted to the chassis.

When replacing, the two shorter chassis-retaining screws must be used to secure the front of the chassis to the flange on the base of the cabinet.

Do not omit to replace the black-painted screws above the gang and to the right of the speaker.

Note that the front edge of the bottom cover fits into grooves at the front of the cabinet, and that the distance pieces on the bottom cover go inside, holding it off the side flanges.

CIRCUIT ALIGNMENT

Connect signal generator, via a 0.001 μF capacitor in the "live" lead, to control grid (top cap) of **V1** and to the receiver **E** socket. Switch set to L.W., tune to 2,000 m on scale, and turn the volume control to maximum.

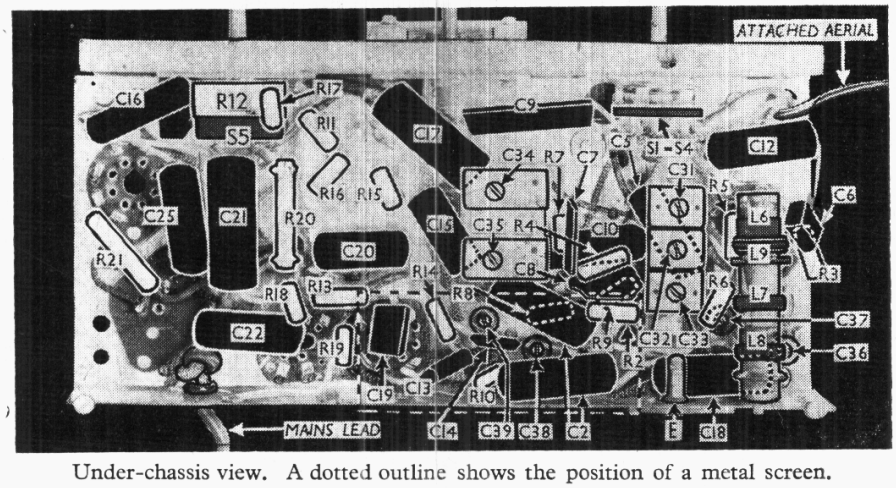
Feed in a 456 kc/s (657.8 m) signal and adjust **C39, C38, C37** and **C36** in that order for maximum output, keeping the input low to avoid A.V.C. action.

R.F. and Oscillator Stages.—Transfer signal generator "live" output lead to remote end of attached aerial, connecting it via a suitable dummy aerial. With the gang at minimum capacitance the junction of the two-colour ribbon indicator should be horizontal and appear $\frac{1}{32}$in below the bottom edge of the register window.

S.W.—Switch set to S.W., tune to 16.7 m (spot on scale), feed in a 16.7 m (17.96 Mc/s) signal, and adjust **C31,** then **C26,** for maximum output, choosing the setting of **C31** involving the lesser trimmer capacitance. The final adjustment to **C26** should be accompanied by slight readjustment of the gang, to obtain maximum output.

M.W.—Switch set to M.W., tune to 214 m (spot on scale), feed in a 214 m (1,400 kc/s) signal, and adjust **C32,** then **C27,** for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust **C35** for maximum output while rocking the gang. Finally, repeat the 214 m adjustments.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C33,** then **C28,** for maximum output. Tune to 1,818 m (spot on scale), feed in a 1,818 m (165 kc/s) signal, and adjust **C34** for maximum output while rocking the gang. Finally, repeat the 1,000 m adjustments and reseal all trimmers with a suitable compound.



Under-chassis view. A dotted outline shows the position of a metal screen.

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