"TRADER" SERVICE SHEET

977

G.E.C. BC5243

THE G.E.C. BC5243 is a 4-valve (plus rectifier) 2-band superhet designed to operate from A.C. mains of 190-250 V, 40-100 c/s. The waveband ranges are 187-575 m and 1,000-2,000 m.

A frame aerial wound on the back cover may be plugged into the aerial and earth sockets. Some chassis are fitted with octal-based valves, and others with B7G-based valves. Some in-between chassis have a mixture of both types.

Release date and original price: July, 1950; £11 10s 3d. Purchase tax extra.

CIRCUIT DESCRIPTION

Frame aerial input via **C1** across common impedance of **C2** to tuned circuits **L2, C24** (M.W.) or **L3, C24** (L.W.). Provision is made for the connection of an external aerial and earth in place of the frame aerial **L1,** and modulation hum is bypassed by **R1.**

First valve **(V1, Osram X78)** is triode-hexode operating as frequency changer with internal coupling. Oscillator grid coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C25.** Parallel trimming by **C26** (M.W.) and **C8** (L.W.); series tracking by **C10** (M.W.) and **C9, C10** (L.W.). Reaction coupling from anode via **C11** across common impedance of tracker **C10.**

Second valve **(V2, Osram KTW61)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C5, L6, L7, C6** and **C14, L8, L9, C15.**

Intermediate frequency 470 kc/s

Diode signal detector is part of double diode triode valve **(V3, Osram DH63).** Audio frequency component in rectified output is developed across volume control **R7,** which is the diode load, and passed via **C17** to the grid of the triode section, which operates as A.F. amplifier. I.F. filtering by **C16** and **C18.**

D.C. potential developed across **R7** is fed back via decoupling resistor **R6** as grid bias to the F.C. and I.F. stages, giving automatic gain control.

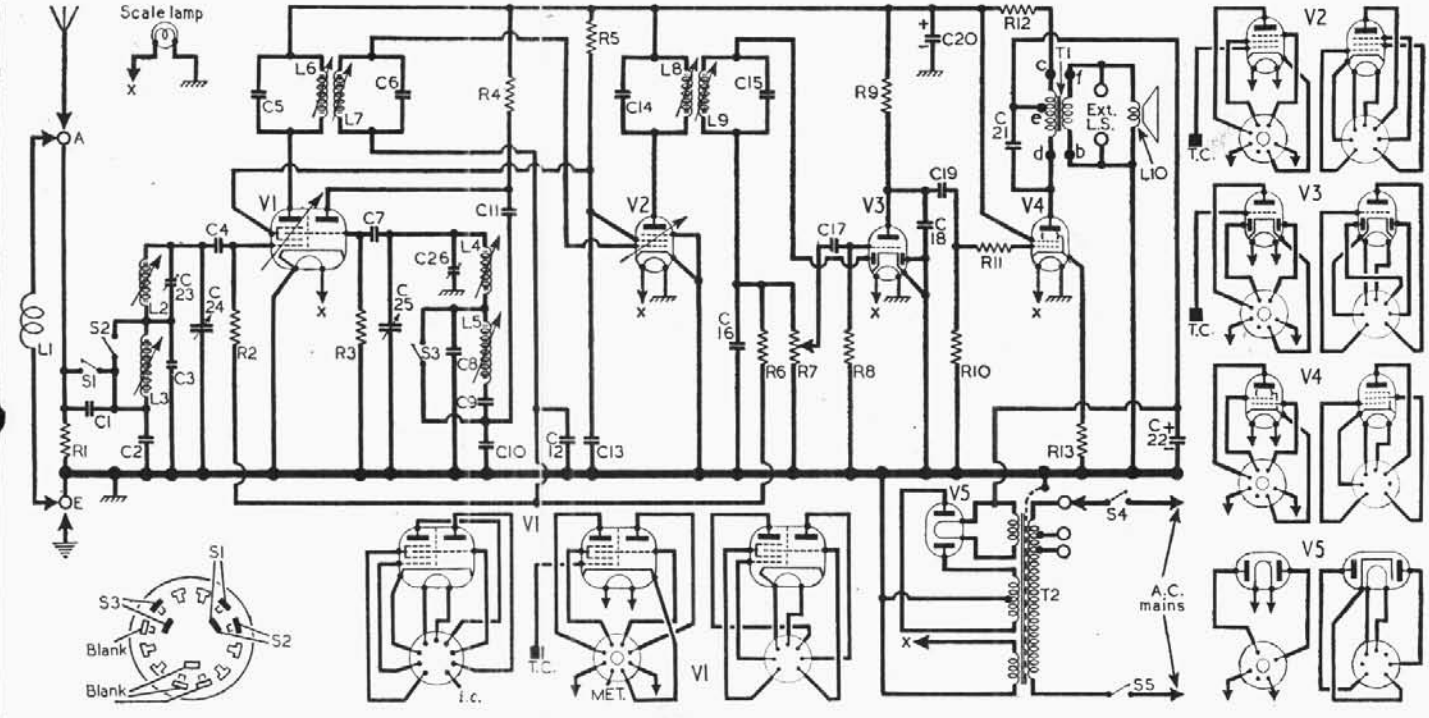
Resistance-capacitance coupling by **R9, C19, R10,** via stopper **R11,** between **V3** triode and control grid of beam tetrode output valve **(V4, Osram KT61).** Tone correction by **C21** in anode circuit, and by negative feed-back voltage developed across bias resistor **R13** in cathode lead to chassis. Provision is made for the connection of a low impedance external speaker across **T1** secondary winding.

H.T. current is supplied by full-wave rectifying valve **(V5, Osram U50)** and smoothed by **R12** and electrolytic capacitors **C20, C22,** residual hum being neutralized by passing the current through part of the primary winding of the output transformer **T1.**

COMPONENTS AND VALUES

	CAPACITORS	Values	Locations
C1	Aerial coupling	0·001μF	E4
C2	Aerial coupling	0·008μF	E3
C3	L.W. trimmer	82pF	E3
C4	V1 C.G.	100pF	E3
C5	1st I.F. trans. tuning	120pF	C2
C6	1st I.F. trans. tuning	120pF	C2
C7	V1 osc. C.G.	100pF	D4
C8	L.W. trimmer	100pF	D3
C9	L.W. tracker	200pF	D3
C10	M.W. tracker	375pF	D3
C11	Osc. anode coup.	0·005μF	D3
C12	A.G.C. decoupling	0·05μF	E4
C13	S.G. decoupling	0·05μF	E4
C14	2nd I.F. trans. tuning	120pF	B2
C15	2nd I.F. trans. tuning	120pF	B2
C16	I.F. by-pass	300pF	F4
C17	A.F. coupling	0·02μF	F4
C18	I.F. by-pass	500pF	F4
C19	A.F. coupling	0·02μF	G4
C20*	H.T. smoothing	32μF	B2
C21	Tone correction	0·01μF	F3
C22*	H.T. smoothing	16μF	B2
C23‡	M.W. trimmer	—	D3
C24†	Aerial tuning	—	C1
C25†	Oscillator tuning	—	C1
C26‡	Osc. trimmer	—	D3

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the G.E.C. BC5243 A.C. superhet, with the waveband switch inset below. Inset also are diagrams of the alternative valves, with three different types for V1. T1 connections are coded to agree with the markings in our plan view overleaf.

	RESISTORS	Values	Locations
R1	Aerial shunt ...	10kΩ	E4
R2	V1 C.G.	1MΩ	D4
R3	V1 osc. C.G. ...	100kΩ	D4
R4	V1 osc. anode ...	33kΩ	D4
R5	S.G. feed	100kΩ	E4
R6	A.G.C. decoupling	1MΩ	E4
R7	Volume control ...	1MΩ	G3
R8	V3 C.G.	10MΩ	F4
R9	V3 anode load ...	100kΩ	G3
R10	V4 C.G.	330kΩ	G3
R11	V4 grid stopper ...	10kΩ	G3
R12	H.T. smoothing ...	6·8kΩ	B1
R13	V4 G.B.	100Ω	G3

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Frame aerial ...	Very low	—
L2	Aerial tun. coils ...	2·0	E3
L3		18·0	E3
L4	Oscillator tun. coils	3·0	D3
L5		8·0	D3
L6	1st. I.F. trans. Pri.	9·5	C2
L7	1st. I.F. trans. Sec.	9·5	C2
L8	2nd I.F. trans. Pri.	9·5	B2
L9	2nd I.F. trans. Sec.	9·5	B2
L10	Speech coil ...	3·0	—
T1	Primary, c-e ...	24·0	B1
	Primary, c-d ...	436·0	
	Secondary ...	0·6	
T2	Primary, total ...	32·0	A2
	H.T. sec., total ...	325·0	
	Rect. heater sec. ...	Very low	
	6.3V heater sec. ...	Very low	
S1-S3	Waveband switches	—	E3
S4, S5	Mains sw., g'd. R7	—	G3

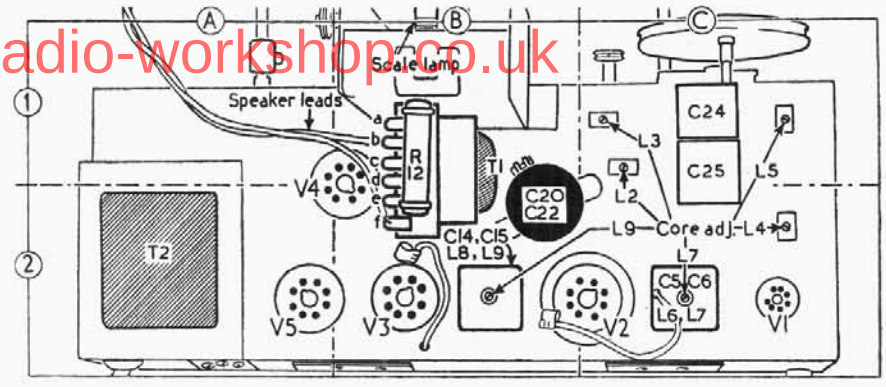
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 220 V. The receiver was tuned to the highest wavelength end of M.W., and the volume control set at maximum, but there was no signal input.

Voltage measurements were made with an Avo Electronic Testmeter, which introduces no appreciable voltage drop, and allowances must be made for the current taken by other meters.

Valve	Anode V	Anode mA	Screen V	Screen mA	Cath. V
V1 X78	200	0·26	33	0·7	—
	Oscillator 96	2·8			
V2 KTW61	200	3·9	33	0·9	—
V3 DH63	100	1·1	—	—	—
V4 KT61	295	32·0	200	5·0	4
V5 U50	265†	—	—	—	310

† A.C., each anode.



Plan view of the chassis, showing most of the alignment adjustments. **T1** connecting tags are coded to agree with the circuit diagram overleaf.

GENERAL NOTES

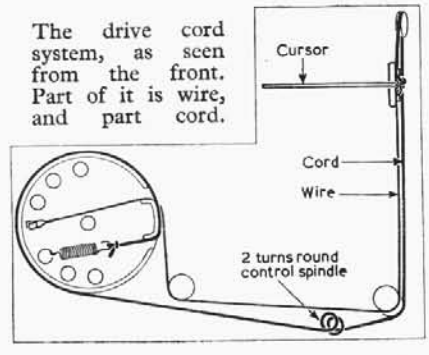
Switches.—**S1-S3** are the waveband switches, ganged in a single two-position rotary unit beneath the chassis. This is indicated in our under-chassis illustration, and shown in detail in the diagram inset in the circuit where it is viewed in the direction of the arrow in our under-chassis drawing. In the M.W. position (knob anti-clockwise) **S2** and **S3** close; in the L.W. position, only **S1** closes.

S4, S5 are the Q.M.B. double-pole mains switches, ganged with the volume control **R7**.

Scale Lamp.—This is an Osram M.E.S. type, with a small clear spherical bulb, rated at 6.5 V, 0.3 A. Its type number is OS75.

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

Valve Types.—These receivers may be equipped with a complete set of octal-based valves or a complete set of B7G-based valves. Others, like our sample, may use a mixture of octals and B7Gs. **V1** may be an X61M, an X78 or an X79; **V2** may be a W61, a KTW61 or a W77; **V3** may be a DH63 or a DH77; **V4** may be a KT61 or an N78; **V5** may be a U50 or a U78. Base diagrams are shown for all types.



The drive cord system, as seen from the front. Part of it is wire, and part cord.

Drive Cord Replacement.—The total length of cable in our sample was 40⅜in overall when made up, consisting of 15⅜in of wire and 25¼in of cord, the two pieces being tied together where they meet at the cursor carriage. The course they take is shown in the sketch (col. 2), where the system is drawn as seen from the front with the gang at maximum.

CIRCUIT ALIGNMENT

I.F. Stages.—These adjustments may be carried out with the chassis in the cabinet upon disconnecting the frame aerial and removing the back and base covers. Switch set to L.W., tune to 2,000 m and turn volume control to maximum. Connect signal generator, via a 0.1 μF capacitor in the "live" lead, to control grid of **V2** and chassis.

Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L9** (location reference B2) and **L8** (F4) for maximum output. Transfer "live" input lead to control grid of **V1**, and adjust the cores of **L7** (C2) and **L6** (E4) for maximum output. During these adjustments, reduce the input as the circuits come into line to avoid A.G.C. action.

R.F. Stages.—To make these adjustments accessible, the chassis should be withdrawn from the cabinet and placed on the bench, and as the tuning scale remains in the cabinet, alignment is carried out with reference to the printed scale on the metal bracket carrying the cursor carriage. Readings on this scale are taken against the top edge of the cursor carriage, and with the gang at maximum capacitance the scale should read 90. Transfer signal generator leads to **A** and **E** sockets, leaving the frame aerial disconnected.

M.W.—Switch set to M.W., tune to 70.0 on substitute scale, feed in a 500 m (600 kc/s) signal and adjust the cores of **L4** (C2) and **L2** (C1) for maximum output. Tune to 10.5 on scale, feed in a 214.3 m (1.4 Mc/s) signal and adjust **C26** (D3) and **C23** (D3) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 32.5 on scale, feed in a 1,304 m (230 kc/s) signal and adjust the cores of **L5** (C1) and **L3** (C1) for maximum output. Repeat these adjustments.

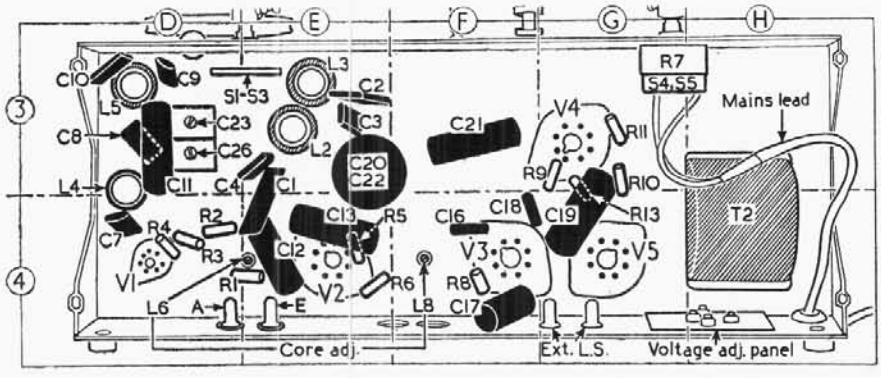
DISMANTLING THE SET

Access to Underchassis.—Remove back cover, held by two self-tapping screws and two 4BA bolts, and withdraw base cover.

Removing Chassis.—Remove the control knobs (pull off);
remove four 2BA chassis bolts (with washers) accessible through holes in the cabinet base flange;
withdraw chassis and unsolder speaker leads. The black speaker lead should go to the speech coil tag which is connected to the magnet.

Removing Speaker.—Remove four 4BA bolts (with plain washers and lock washers) securing edge of speaker to cabinet.

When replacing, the speech coil tags should be at the top.



Under-chassis view. In some chassis the valve holders will be mainly B7G types.

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