"TRADER" SERVICE SHEET

674

GEC GALA AND CARNIVAL RADIOGRAM

THE GEC Gala model BC3335 is a 3-valve (plus rectifier) 2-band TRF receiver designed for use with AC mains of 100-250 V, 40-80 c/s.

This *Service Sheet* also covers the BC3333 and 3334 table models, and the BC3338 Carnival radiogram, but it was prepared from a 3335 chassis. The differences are described overleaf.

Release date, all models : 1932.

Original prices : *BC3333 and BC3334*, £16 16*s*.; *BC3335*, £15 15*s*. *BC3338*, £25 4*s*.

CIRCUIT DESCRIPTION

Aerial input is via pre-set matching trimmer **C19** to single tuned circuit **L1** (MW), **L2** (LW) and **C21**, which precedes tetrode RF amplifying valve **(V1, Osram MS4B).**

Tuned-secondary RF transformer coupling by **L3, L7, C22** (MW), plus **L4, L8** (LW), between **V1** and RF tetrode detector valve **(V2 Osram MS4B),** which operates on the grid leak system with **C3, R7.** Anode reaction coupling via **C7, R10** by coils **L5, L6** and controlled by one side of variable series resistor **R1,** the other side of which shunts the aerial circuit, giving a double action.

Provision is made for the connection of a gramophone pick-up in CG circuit, and when in use **R8** automatically provides the required GB potential.

Parallel-fed AF transformer coupling by **R9, C8** and **T1** between **V2** and directly heated cathode pentode output valve **(V3, Osram PT4).** Filter circuit **L9, C12, C13, C14** eliminates heterodyne interference.

HT current is supplied by full-wave rectifying valve **(V4, Osram U14).** Smoothing by iron-cored choke **L12,** speaker field **L11,** and electrolytic condensers **C15, C16, C17.** Ballast loading to energise the speaker field is provided by **R14.**

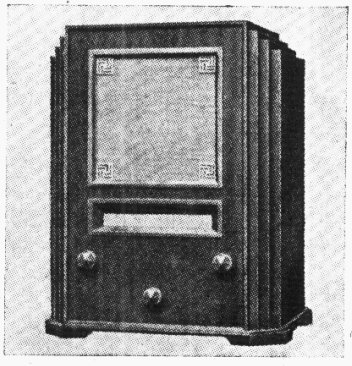
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)
R1	Gain control	8,000
R2	V1 anode and V1, V2 SG's HT feed potential divider	15,000
R3		30,000
R4		50,000
R5	V1 GB resistor	400
R6	V2 CG decoupling ...	100,000
R7	V2 grid leak	2,000,000
R8	V2 GB resistor	200
R9	V2 anode load	20,000
R10	Part reaction coupling ...	120
R11	V3 GB resistor	260
R12	V3 CG decoupling ...	100,000
R13	V3 SG HT feed	15,000
R14	HT circuit "bleeder" ...	45,000

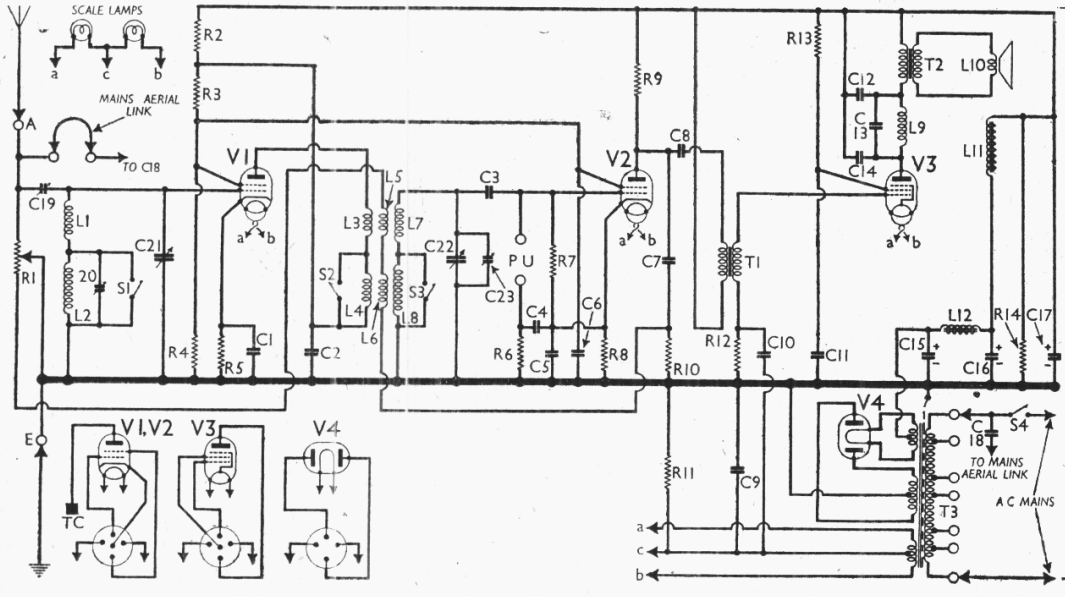
	CONDENSERS	Values (μF)
C1	V1 cathode by-pass ...	0·25
C2	V1 anode decoupling ...	0·25
C3	V2 CG condenser ...	0·0002
C4	V2 CG decoupling ...	0·25
C5	V2 cathode by-pass ...	0·25
C6	V1, V2 SG's decoupling ...	0·25
C7	Reaction coupling ...	0·001
C8	AF coupling to T1 ...	0·1
C9	V3 heater by-pass ...	1·0
C10	V3 CG decoupling ...	1·0
C11	V3 SG decoupling ...	1·0
C12	Heterodyne filter Condensers	0·003
C13		0·0005
C14		0·003
C15*	HT smoothing condensers	8·0
C16*		8·0
C17*		8·0
C18	Mains aerial coupling ...	0·001
C19‡	Aerial circuit trimmer ...	0·00005
C20‡	Aerial circ. LW trimmer	—
C21†	Aerial circuit tuning ...	—
C22†	RF trans. sec. tuning ...	—
C23‡	RF trans. MW trimmer ...	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial tuning coils ...	1·5
L2		14·0
L3	RF transformer primary coils	10·0
L4		30·0
L5	Reaction coupling coils, total	8·0
L6		
L7	RF transformer secondary coils	1·5
L8		14·0
L9	Heterodyne filter coil ...	880·0
L10	Speaker speech coil ...	2·5
L11	Speaker field coil	1,160·0
L12	HT smoothing choke ...	630·0
T1	Intervalve trans. Pri. ...	1,750·0
	Sec. ...	7,000·0
T2	Speaker input trans. Pri. ...	400·0
	Sec. ...	0·4
T3	Mains trans. Pri., total ...	26·0
	Heater sec. ...	0·1
	Rect. heat. sec.	0·1
	HT sec., total	1,000·0
S1-S3	Waveband switches ...	—
S4	Mains switch	—



The appearance of the GEC Gala table models.



Circuit diagram of the GEC Gala table receiver BC3335. The 25 c/s model BC3334, the 100 c/s model BC3333 and the Carnival radiogram model BC3338 are also covered, the differences being fully described overleaf under "BC3333/4 Modifications" and "Radiogram Modifications." A U-shaped link permits mains aerial connection to be made or disconnected easily. No hum neutralising coil is fitted to the speaker.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the makers' manual for a set operating normally on MW, without oscillating, and with no signal input.

Voltages were measured on a high resistance meter, with chassis as the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MS4B	190	3·1	80	1·0
V2 MS4B	190	4·4	80	1·0
V3 PT4	250	32·0	180	8·0
V4 U14	375†	—	—	—

† Each anode, AC.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed screws);

slacken the two screws (one at each end of the rear of the upper deck, on the side chassis members) which lock the chassis against pads on the sides of the cabinet, after freeing their lock-nuts;

remove two bolts (with lock-washers) holding the two upper corners of the speaker supporting flange to wood blocks on the sides of the cabinet;

remove the four bolts (with flat washers and lock-washers) holding the chassis to the bottom of the cabinet, when the chassis and speaker may be withdrawn as a single unit.

GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, contained in the screened tuning coil units. They are cam operated by the control spindle, the cams being formed by recesses in the spindle. The switches, which all open on LW and close on MW, cannot be seen in our chassis illustrations.

S4 is the QMB toggle mains switch, operated by the gain control spindle.

Coils.—The aerial coils **L1, L2** and the RF transformer and reaction coils **L3-L8** are in two screened units at the bottom of the chassis assembly. The cans can be withdrawn by a firm, gentle pull.

Scale Lamps.—These are two Osram MES types, connected in series across the two halves of the mains transformer LT secondary winding, their centre going to its centre-tap. Any such lamps rated at about 3.5 V, 0.3 A could be used as replacements, but they should both be of the same type.

External Speaker.—There is no provision for this, but a high impedance type (about 7,500 Ω) could be connected via isolating condensers of 1·4 μF across **T1** primary, or a low impedance type (about 4-6 Ω) could be connected directly across the secondary winding.

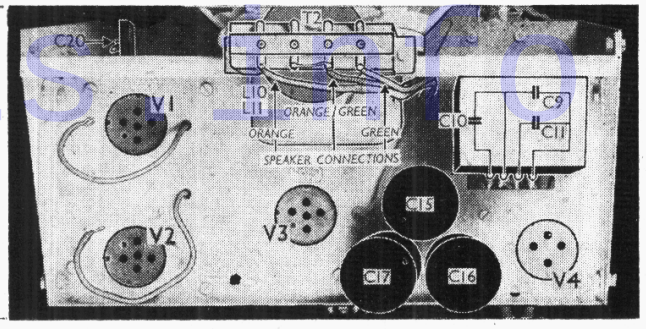
Condensers C15, C16, C17.—These are three dry electrolytics in separate tubular metal containers mounted on the chassis deck. The case is the negative connection of each. They are all of the same type, rated at 8 μF, 450 V peak working.

BC3333/4 MODIFICATIONS

The chassis of the BC3334 is identical with that of the BC3335 except that a special type of mains transformer is employed, so that the receiver may be operated from 25-80 c/s mains.

The chassis of the BC3333 is like that of the BC3335 with two circuit alterations, for operation on mains of 40-100 c/s. A 15 Ω variable potentiometer, fixed to the upper chassis deck behind the mains transformer, is connected across the **V1-V3** heater secondary of the mains transformer, its slider going to the junction of **C9, C10** and **R11.** The two leads forming the centre-tap of the winding, while still joined together, are disconnected from the condenser block.

Then there is a 4,000 Ω 1 watt resistor inserted in the HT positive line between **R9** and **R13,** with an additional decoupling condenser of 0.25 μF connected between the top of **R9** and chassis.



Plan view of the chassis. The colour coding of the speaker connecting leads is indicated, while the connections in the condenser block are shown diagrammatically.

RADIOGRAM MODIFICATIONS

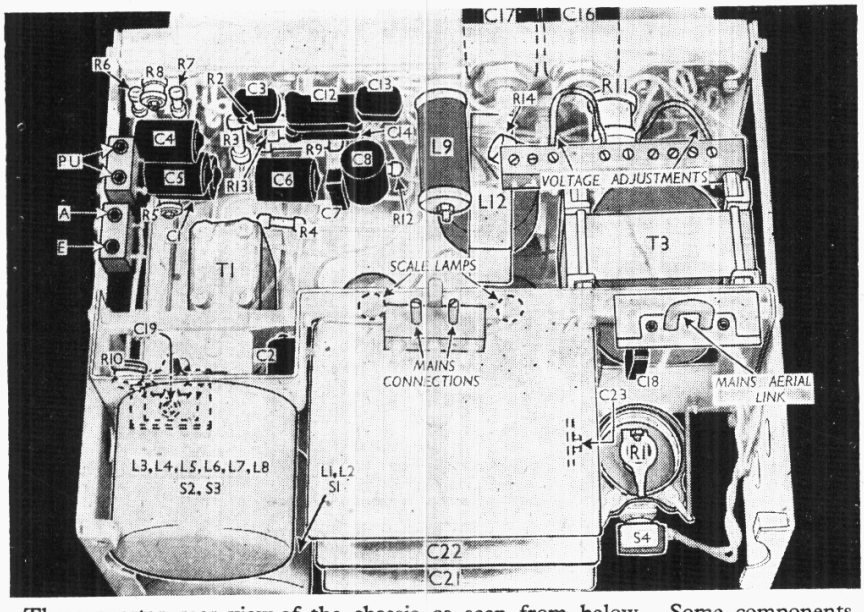
The principal differences between the BC3335 and the "Carnival" radiogram BC3338 consist of the addition of a pick-up input filter, with gram switching and a volume control, and provision for the connection of an external speaker.

A 0.003 μF condenser and 10,000 Ω resistor in series are shunted across the pick-up input, the input then being taken via a 100,000 Ω limiter to a 25,000 Ω volume control. The slider of the control and the "bottom" of the input circuit are then connected to the same points in the circuit as the PU sockets in our circuit diagram for the BC3335.

The external speaker sockets are connected between the "top" end of **L9,** via a 1 μF condenser, and chassis.

There are, in addition, considerable differences in chassis layout. While the upper deck remains more or less as we show it, the remainder of the chassis below that is comparatively shallow. The **A** and **E** and external LS sockets and mains connections are three blocks mounted on the base of the cabinet, which is an upright console, and the speaker is mounted on the cabinet, midway between base and chassis.

The gram volume control is ganged with **R1,** but an additional control is fitted, just below the tuning control, with a push-pull action to switch to radio (knob in) or gram (knob out).



Three-quarter rear view of the chassis, as seen from below. Some components are hidden, but their positions are all indicated. The waveband switches are inside the coil units.

CIRCUIT ALIGNMENT

When the receiver leaves the factory, **C1** is adjusted to 0.00002 μF, which occurs at about half a turn from maximum. It may be adjusted to obtain the optimum compromise between selectivity and sensitivity, according to local conditions, but after adjusting it alignment should be checked.

MW.—Switch set to MW, feed in to **A** and **E** sockets, via a dummy aerial, a weak 250 m (1,200 kc/s) signal, tune it in, and adjust **C23** and the gain control in turn for maximum output short of oscillation.

LW.—Switch set to LW, feed in a 1,000 m (300 kc/s) signal, tune it in, and adjust **C20** for maximum output.

Finally, connect the aerial with which it will be used and check whether **C1** requires adjustment. If it does, repeat circuit alignment.

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