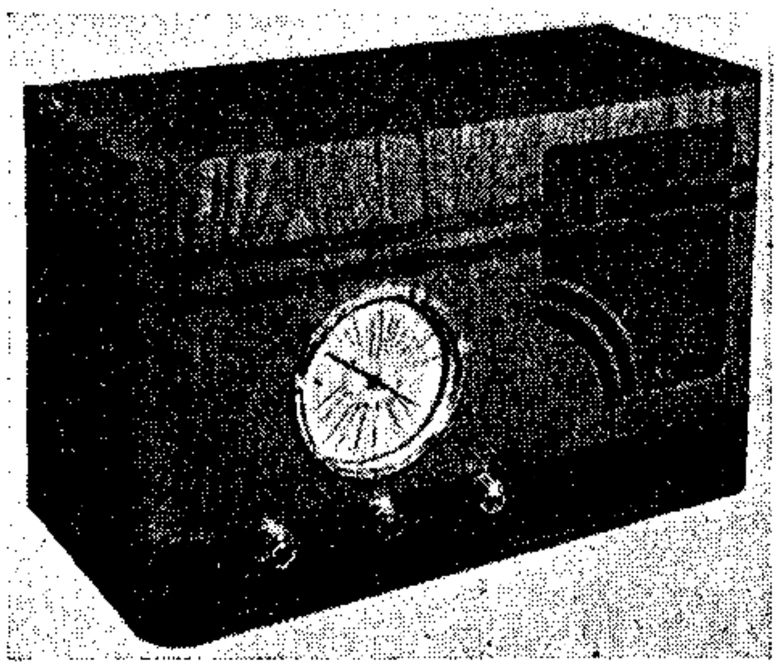
REVISED ISSUE OF
SERVICE SHEET No. 145

BURGOYNE FURY

BATTERY TRF RECEIVER and RADIOGRAM



The appearance of the Burgoyne Battery Fury table receiver.

A COMBINED GB potentiometer and reaction condenser form the gain control in the Burgoyne Battery Fury receiver, a 3-valve, 2-band TRF receiver.

The same chassis is employed in the radiogram version, but a separate volume control is fitted on the motor-board for gram. The cabinet is a console, like that of the AC/DC Fury Star, and a spring motor is employed.

Release dates and original prices: Table model, 1935, £5 19*s.* 6*d.* (*less batteries*); *radiogram*, 1936, £14 14*s. complete.*

CIRCUIT DESCRIPTION

Two alternative aerial input connections via choke coils **L2** (LW only) and **L3** to coupling coils **L4, L5. A1,** for normal use, has series condenser **C1,** while **A2,** with tuned rejector **L1, C10,** is for use when interference from Droitwich is experienced.

Single tuned circuit **L6, L7, C11** precedes variable-mu pentode RF amplifier **(V1, Tungsram metallised HP211** or **Mullard VP2).** Gain control by variable potentiometer **R2,** which varies GB applied.

Tuned-secondary transformer coupling by **L8, L11, C14** (MW), plus **L9, L12** (LW), between **V1** and triode detector valve **(V2, Tungsram LD210** or **Mullard PM1HL)** which operates on grid leak system with **C4** and **R3.** Reaction is applied from anode by coil **L10** and controlled by variable condenser **C13,** which is ganged with **R2.** RF filtering by choke **L13** and by-pass condenser **C5** in anode circuit. Provision for connection of gramophone pick-up in control grid circuit.

Parallel fed auto-transformer coupling by **R4, C6** and **T1** between **V2** and pentode output valve **(V3, Tungsram PP222** or **Mullard PM22A).** Fixed tone correction by **C8** in anode circuit.

GB potentials for **V1** and **V3** are obtained automatically from the drop along resistors **R6, R7** in common HT negative lead to chassis.

VALVE ANALYSIS

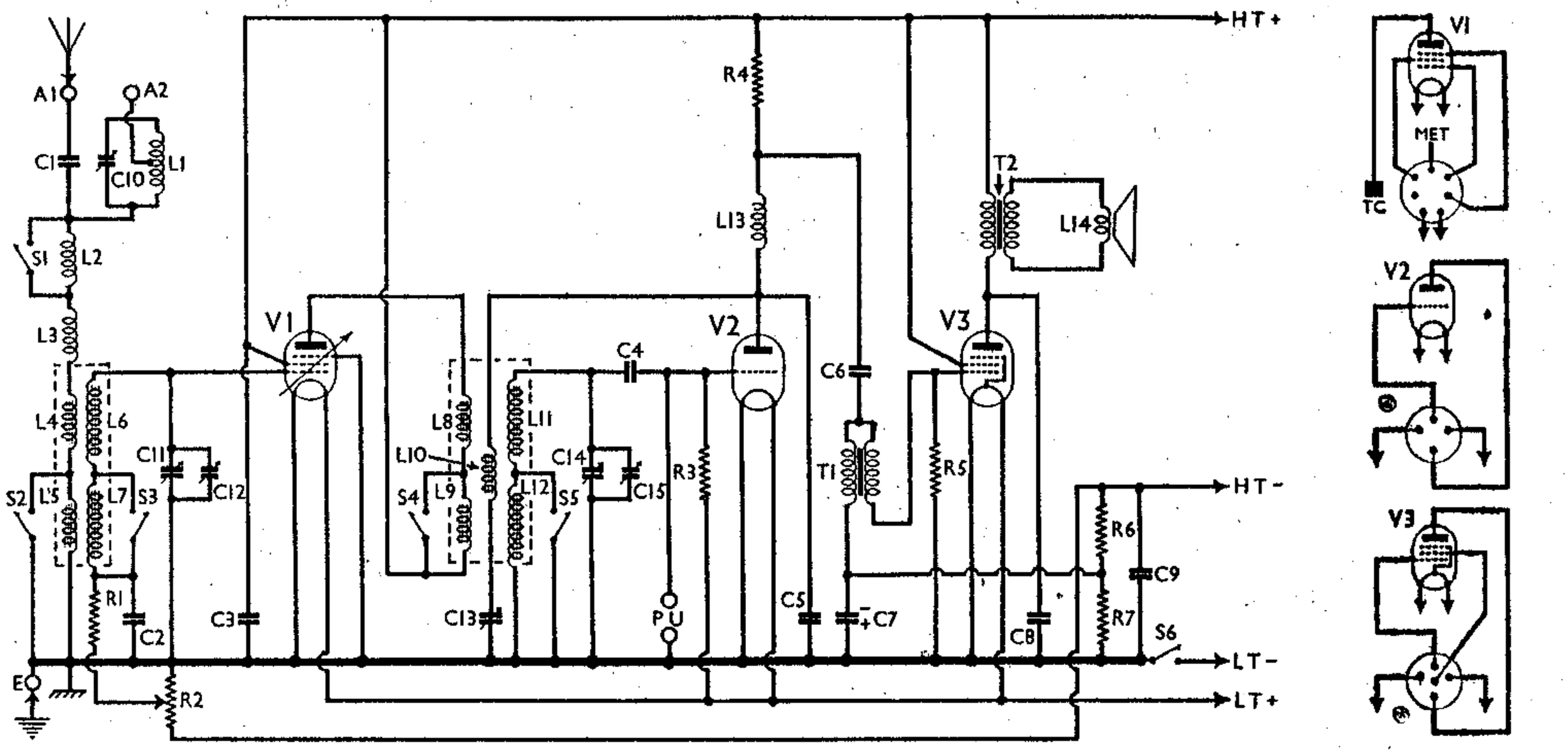
Valve voltages and currents given in the table below were obtained from a representative chassis operating with an HT battery reading 120 V. The gain control was advanced to the position where **R2** was at maximum gain (reaction condenser plates slightly in mesh), but there was no signal input. Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
HP211 ...	112	2·5	115	1·0
LD210 ...	60	1·6	—	—
PP222 ...	110	5·8	115	1·2

COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	Aerial series condenser ...	0·0002
C2	V1 CG decoupling ...	0·1
C3	HT circuit RF by-pass ...	0.1
C4	V2 CG condenser... ...	0·0003
C5	V2 anode RF by-pass ...	0·0002
C6	AF coupling to T1 ...	0·1
C7*	V3 CG decoupling ...	20·0
C8	Tone corrector	0·005
C9	GB circuit by-pass ...	0·1
C10‡	Droitwich rejector tuning	0·0001
C11†	Aerial circuit tuning ...	0·0005
C12‡	Aerial circuit MW trimmer	—
C13†	Reaction control	0·0005
C14†	RF transformer tuning ...	0·0005
C15‡	RF transformer trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Burgoyne Battery Fury TRF receiver. GB potentials are obtained automatically from the potential divider **R6, R7** in the HT negative lead. **L1, C10** is a Droitwich rejector, and **L2** suppresses MW break-through on the LW band.

	RESISTORS	Values (ohms)
R1	V1 CG decoupling	500,000
R2	V1 gain control	5,000
R3	V2 grid leak	2,000,000
R4	V2 anode load	30,000
R5	V3 CG circuit shunt ...	250,000
R6	Automatic GB resistors ...	150
R7		400*

* May be 700 O.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Droitwich rejector coil, total	32·0
L2	Aerial choke coil (LW) ...	24·0
L3	Aerial choke coil	8.7
L4	Aerial coupling coils ...	0·6
L5		4·7
L6	Aerial tuning coils ...	2·5
L7		10·5
L8	RF transformer primary	1·2
L9		4·6
L10	Reaction coil	2·1
L11	RF transformer secondary	2·0
L12		10·0
L13	V2 anode RF choke ...	200·0
L14	Speaker speech coil ...	2·4
T1	Intervalve trans. Pri. ...	1,800·0
	Sec. ...	4,000·0
T2	Speaker input trans. Pri. ...	700.0
	Sec. ...	0·3
S1-S5	Waveband switches ...	—
S6	LT circuit switch	—

DISMANTLING THE SET

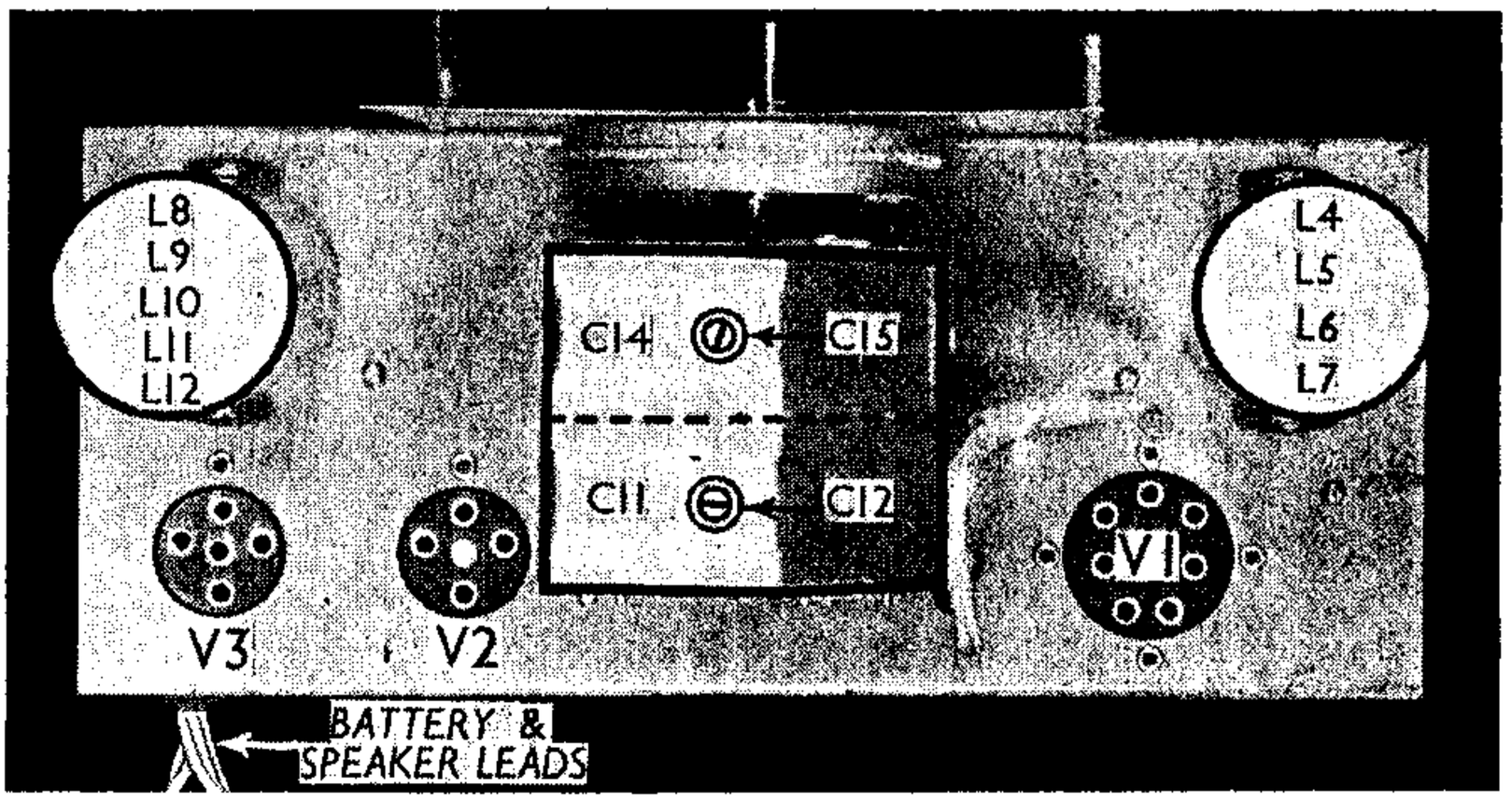
Removing Chassis.—Remove the three control knobs (recessed grub screws) from the front of the cabinet;

remove from the flange on the rear chassis member the three wood screws holding the chassis to the base of the cabinet.

The chassis may now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes; or if the leads are unsoldered it may be freed entirely.

Removing Speaker.—Remove the nuts from the four bolts holding the speaker to the sub-baffle on the front of the cabinet.

When replacing, the transformer should be at the bottom.



Plan view of the chassis. The tuning coils in the screened containers are all dust-iron cored. The only trimmers are those shown on the gang.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, and **S6** is the LT circuit switch, ganged together in a single unit beneath the chassis. The unit is indicated in our under-chassis view, where the connections are identified. When the control is in the "Off" position, all the switches are open; in the MW position they are all closed; and in the LW position, **S6** is closed, and the remainder are open.

Coils.—L1 and **L2** are in an unscreened unit beneath the chassis, **L2** being nearer to the chassis. **L1** in our receiver is centre tapped. **L3** is unscreened and beneath the chassis, as is also choke **L13.**

L4-L7 and **L8-L12** are in two screened units on the chassis deck.

External Speaker.—There is no provision made for this, but one of high impedance (about 20,000 Ω) could be connected across the primary of **T2,** that is, across the two tags on the internal speaker panel to which the leads from the chassis are connected. Alternatively, a low impedance speaker (about 4 Ω) could be connected across the secondary winding.

Batteries.—A 2 V LT cell of at least 10 AH is recommended, while the HT battery should have a voltage of 120 V. GB potentials are obtained automatically.

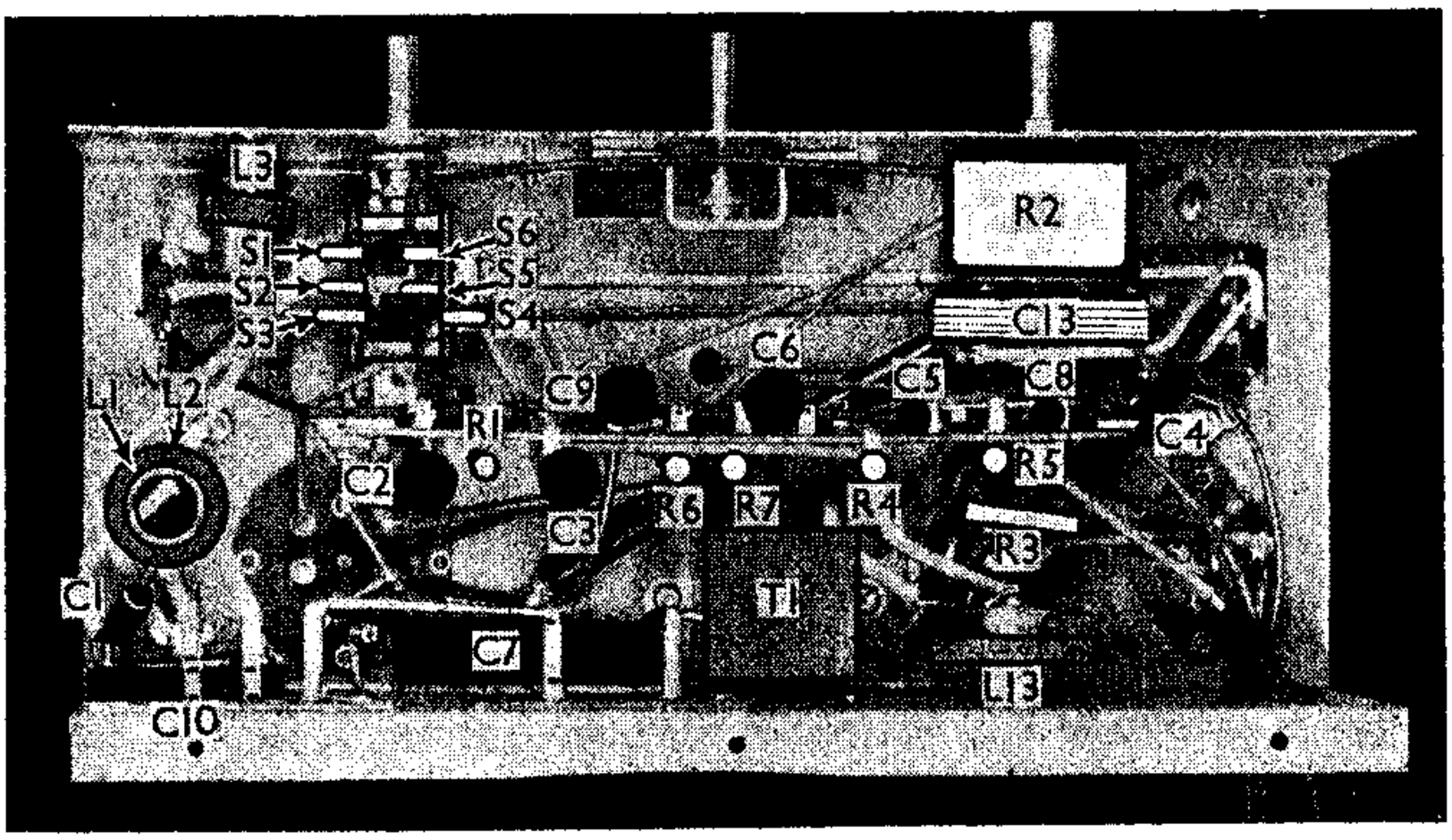
Battery Leads and Voltages.—Black spade tag, LT negative; Red spade tag, LT positive 2 V.; Black plug, HT negative; Red plug, HT positive 120 V.

Condenser C7.—This is a tubular dry electrolytic (20 μF, peak volts 6 V). Note that owing to its position in the GB circuit its *positive* connection goes to chassis, not the negative, as is more usual.

Transformer T1.—IP and IS on this transformer are joined, and go to one end of **C6.** OP goes to the negative of **C7** and **R6** and **R7.** OS goes to **R5** and the grid of **V3.**

Condenser C10.—The Droitwich rejector tuning condenser is adjustable through a hole on the rear of the chassis.

Chassis Divergencies.—C1 may be 0.0001 μF instead of 0.0002 μF. **L1** may not be centre-tapped in some chassis, the whole of the coil being in series with the aerial lead to **L2.** **L3** may not occur in early chassis. **R7** may be 700 O in some chassis, instead of 400 O.



Under-chassis view. **R2** and **C13** are ganged to form a combined gain control. The switch connections are individually identified.

CIRCUIT ALIGNMENT

Connect signal generator leads via a suitable dummy aerial (a 0.0002 μF condenser will do) to **A1** and **E** sockets.

Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C15** for maximum output. Now adjust the gain control to a point just short of oscillation, readjust **C15,** and so on in turn for maximum output. Then adjust **C12** for maximum output.

Check calibration at 300 m (1,000 kc/s) and 500 m (600 kc/s), and at several points on the LW band.

Should it be desired to adjust the Droitwich rejector, this is best done by adjusting **C10** for minimum output, while receiving the interfering station, using the aerial with which the set normally operates.

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