BLUE SPOT
'BATTERY 3' RECEIVER

A PENTODE H.F. amplifier, a triode detector and a pentode output valve are employed in the Blue Spot " Battery Three " receiver. It is provided with an aerial series condenser (or selectivity control) and a reaction condenser, but there is no gain control as such. Sockets are fitted for an extension speaker, and the tuning dial, which is of the full-vision type, is illuminated.

CIRCUIT DESCRIPTION

Aerial input via variable series condenser **C6** (selectivity-volume control) to coupling coil **L1** (M.W.), and to tapping on L.W. coil via anti-break-through choke **L2**. Single-tuned circuit **L3, L4, C7** precedes variable-mu pentode H.F. amplifier (**V1, Osram metallised VP21 or Mullard metallised VP2**) operating with zero grid bias.

Tuned-secondary H.F. transformer coupling by **L5, L6, L8, L9** and **C10** to triode detector (**V2, Osram metallised HL2 or Mullard metallised PM1HL**) which operates on grid leak system with **C2** and **R2**. Reaction is applied from anode by coil **L7** and controlled by variable condenser **C9**. H.F. by-passing by condenser **C3**.

Series-fed transformer coupling by **T1** to "economy" output pentode (**V3, Osram PT2 or Mullard PM22A**). Tone correction in anode circuit by fixed condenser **C5**. Provision for connection of high-impedance external speaker across primary of internal speaker input transformer **T2**.

COMPONENTS AND VALUES

| Resistances		Values (ohms)
R1	V1 S.G. H.T. feed	100,000*
R2	V2 grid leak	1,000,000
R3	V2 anode decoupling	19,000
R4	Intervalve trans. sec. shunt	1,000,000

* With VP21 valve ; 19,000 O with VP2.

Condensers		Values (μF)
C1	V1 S.G. by-pass	0·1
C2	V2 grid condenser	0·0001
C3	V2 anode H.F. by-pass	0·0001
C4	V2 anode decoupling	0·5
C5	Tone compensator	0·005
C6†	Aerial series condenser (selectivity)	0·0005
C7†	Aerial circuit tuning	0·0005
C8‡	Aerial circuit trimmer	—
C9†	Reaction control	0·0005
C10†	H.F. transformer tuning	0·0005
C11‡	H.F. transformer trimmer	—

† Variable.   ‡ Pre-set.

Other Components		Values (ohms)
L1	Aerial coupling coil	3·0
L2	Aerial choke coil (L.W.)	5·25
L3	Aerial tuning coils	3·0
L4	"	33·0
L5	H.F. transformer primary	3·0
L6		12·5
L7	Reaction coil	10·0
L8	H.F. transformer secondary	3·0
L9		29·0
L10	Speaker speech coil	2·0
T1	Intervalve trans. { Pri.	850·0
	{ Sec.	10,000·0
T2	Speaker input trans. { Pri.	1,000·0
	{ Sec.	0·3
S1-S4	Waveband switches	—
S5	L.T. switch	—

DISMANTLING THE SET

Removing Chassis.—To remove the chassis from the cabinet, remove the three control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the cabinet bottom. Remove the escutcheon on the on-off switch from the side of the cabinet (two round-head wood screws) and remove it from the switch by taking off the lock-nut. The switch can then be passed into the cabinet through the hole in the side. The chassis can now be withdrawn to the extent of the speaker leads, which is enough for normal purposes.

Circuit diagram of the Blue Spot " Battery 3 " receiver. No scale lamp is shown, but actually one is connected in parallel with the filament circuit.
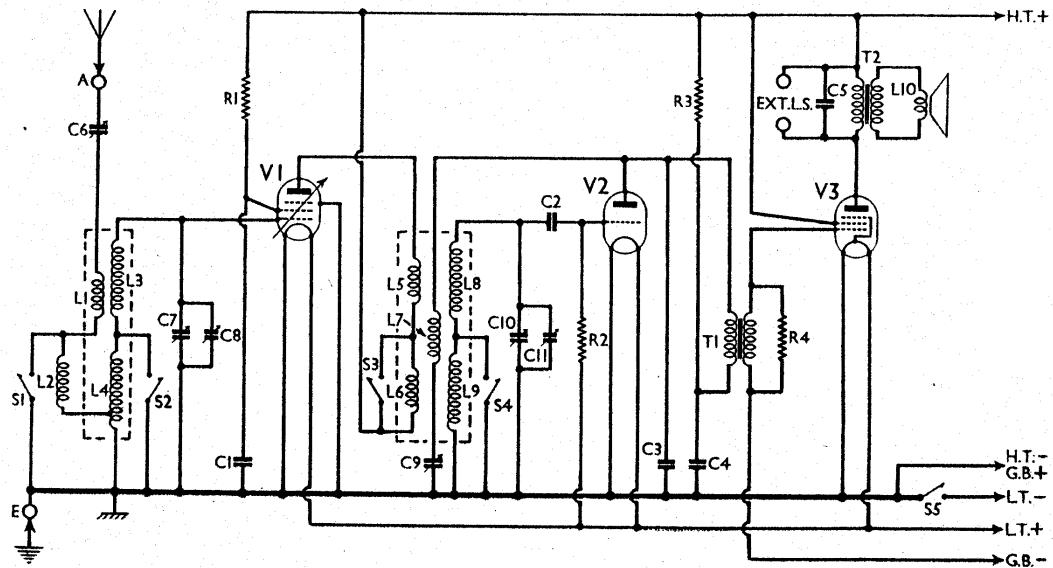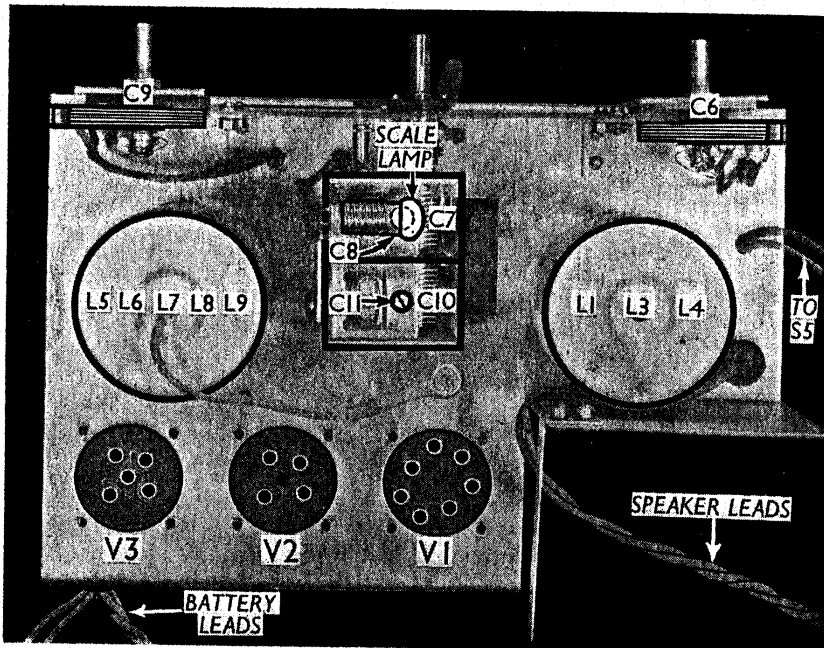
Plan view of the chassis. C6 is the aerial series condenser and C9 the reaction control. The filament switch, S5, is mounted at the side of the cabinet, two leads connecting it to the chassis.

Removing Speaker.—Three bolts hold the speaker to the sub-baffle, and it can be removed by running off the nuts on these. *When replacing,* see that the input transformer is on the left.

VALVE ANALYSIS

Measurements of valve voltages and currents given in the table below were taken with the reaction and aerial series condensers at minimum and with 120 V H.T. and 4.5 V G.B. obtained from new batteries. There was no signal input.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 VP21	120	2·9	50	0·6
V2 HL2	70	2·0	—	—
V3 PT2	115	4·5	120	0·9

GENERAL NOTES

Switches.—S1-S4 are the wavechange switches, ganged in a single rotary unit, operated by a horizontal lever projecting through the front of the chassis and the cabinet. When the lever is pushed to the *right* (M.W.), all the switches are closed, while with the lever to the *left* (L.W.), they are all open.

S5 is the Q.M.B. L.T. switch, fitted at the left-hand side of the cabinet.

Coils.—These, with the exception of L2, are in two screened units on the chassis deck. L2 is in two sections on a tubular former mounted beneath the chassis, below the L1, L3, L4 unit.

Scale Lamp.—This is an Osram M.E.S.

type, rated at 2.5 V, 0.2 A. It is wired in parallel with the filament circuit, the leads being taken to the filament sockets of the V3 valve-holder. The lamp is not shown in our circuit diagram.

External Speaker.—This should be of the high resistance type, and should be connected to the sockets provided at the rear of the chassis.

Battery Leads and Voltages.—The red and black rubber covered leads with

spade tags are the L.T. positive and negative respectively.

The H.T. battery should be a 108 or 120 V type with grid bias. The black lead and plug are the combined H.T. negative and G.B. positive, the green lead and plug is G.B. 4.5 V negative, and the red lead and plug is H.T. 108 to 120 V positive. The space available for the H.T. and G.B. battery is about 10 ins. by 5¾ ins. by 3 ins.

Alternative Valves. — V1, Osram metallised VP21 or Mullard metallised VP2 ; **V2,** Osram metallised HL2 or Mullard metallised PM1HL ; **V3,** Osram PT2 or Mullard PM22A.

Resistance R1.—This has a value of 100,000 Ω where **V1** is a VP21. Where a VP2 is used, **R1** becomes 19,000 Ω.
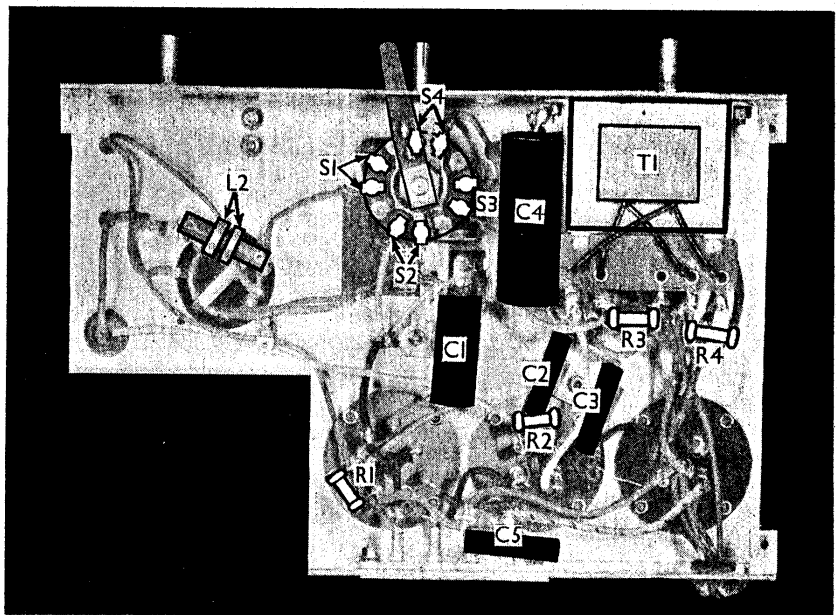
Under-chassis view. L2 is the L.W. aerial choke coil, in two sections. Note the switch unit, S1-S4, operated by a lever projecting through the front of the chassis.