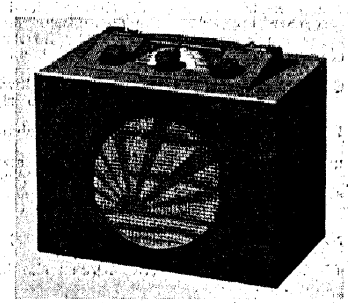
"TRADER" SERVICE SHEET

618

REVISED ISSUE OF SERVICE SHEET No. 277

PYE BABY Q BATTERY PORTABLE



THE Pye Baby Q is a 4-valve battery-operated portable receiver with a self-contained frame aerial. It has provision for the connection of an external aerial and earth, and there are also sockets for headphones.

This receiver is not to be confused with the Baby Q Senior and New Baby Q models, which are covered in our *Service Sheet* 534.

Release date and original price: March, 1937; £8 8s. *complete with batteries.*

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, L2, C11** to variable-mu RF pentode valve **(V1, Ever Ready metallised K50M)**, which operates as RF amplifier, with gain control by variable filament resistance **R1.** Provision for connection of external aerial via **C1,** if required.

Tuned anode coupling by **L5, L6, C14** between **V1** and triode detector valve **(V2, Ever Ready metallised K30K),** which operates on grid leak system with **C4** and **R4, R5.** Reaction is applied from anode via stabilising resistance **R3** by coils **L3, L4** and controlled by **C13.** RF filtering by **C5, R8** in anode circuit.

Resistance-capacity coupling, via **R8,** by **R7, C6** and **R9** between **V2** and triode AF amplifying valve **(V3, Ever Ready metallised K30K).** Fixed tone correction in anode circuit by **C7.**

Parallel-fed transformer coupling by **R10, C8** and **T1** between **V3** and pentode output valve **(V4, Ever Ready K70B** or **Mazda Pen220).** Fixed tone correction in anode circuit by **C9.** Provision for connection of headphones by plug and socket device across primary of transformer **T2.** When the plug is fully inserted switch **S3** opens, muting internal speaker.

GB potential for **V4** is automatically obtained from drop along **R11** in HT negative lead to chassis.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 gain control	15
R2	V1 anode HT feed ...	10,000
R3	Reaction circuit stabiliser	100
R4	V2 grid leak resistances ...	2,100,000
R5		2,100,000
R6	V2 anode decoupling ...	30,000
R7	V2 anode load	30,000
R8	RF stopper	110,000
R9	V3 CG resistance ...	1,100,000
R10	V3 anode load	50,000
R11	V4 auto-GB resistance ...	300

	CONDENSERS	Values (μF)
C1	External aerial series ...	0·000005
C2*	V1 anode decoupling ...	2·0
C3*	V2 anode decoupling ...	2·0
C4	V2 CG condenser ...	0·0001
C5	V2 anode RF by-pass ...	0·0002
C6	V3 CG condenser ...	0·01
C7	Fixed tone corrector ...	0·003
C8	AF coupling to T1 ...	0·1
C9	Fixed tone corrector ...	0·003
C10*	V4 auto-GB by-pass ...	20·0
C11†	Frame aerial tuning ...	—
C12‡	Frame aerial MW trimmer	—
C13†	Reaction control ...	—
C14†	V1 anode circuit tuning ...	—
C15‡	V1 anode MW trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Frame aerial windings ...		1·72
L2			23·3
L3	Reaction coils, total ...		8·75
L4			
L5	V1 anode circuit tuning coils		3·8
L6			11·7
L7	Speaker speech coil ...		3·0
T1	Intervalve trans.	Pri.	460·0
		Sec.	1,620·0
T2	Speaker input trans.	Pri.	1,000·0
		Sec.	0·5
S1, S2	Waveband switches ...		—
S3	Internal speaker switch		—
S4	HT circuit switch ...		—
S5	LT circuit switch ...		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new HT battery reading 93 V on load. The receiver was tuned to the lowest wavelength on the medium band, but there was no signal input, as the frame aerial connections were short-circuited.

The combined gain and reaction control was set so that the slider of the gain control was just at the clockwise end of the resistance winding, but the vanes of the reaction condenser were not in mesh. This position is easily determined by feel.

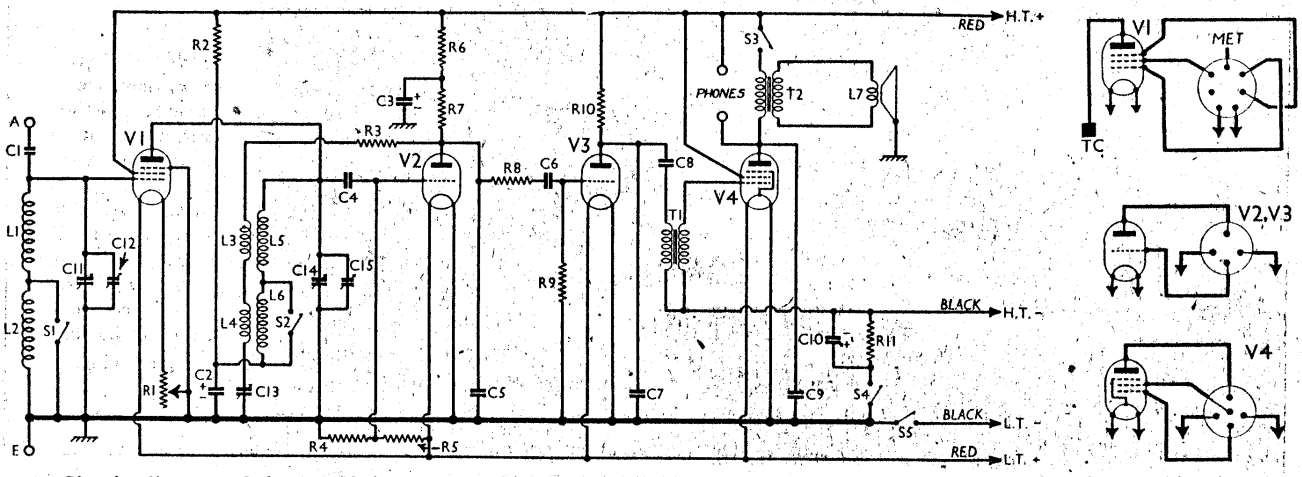
Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

If **V4** should become unstable, as in our case, when measurements are being made of its anode current, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from that electrode to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 K50M	70	1·3	90	0·4
V2 K30K	42	0·6	—	—
V3 K30K	50	0·6	—	—
V4 K70B	88	3·7	90	0·6

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull off);
remove two screws (with rectangular washers) holding the escutcheon;
remove nuts (with rectangular washers) from two screws holding the escutcheon and carrying handle, so that these last two may be removed, and remove the scale pointer;
withdraw valves from their holders, and disconnect frame aerial leads from their screw terminals;
remove the external aerial connecting panel (three wood screws);
unsolder from the headphone jack and earthing tag on the speaker frame the leads connecting them to chassis;
remove the four screws (with washers) holding the chassis to the metal flanges at sides of the carrying case, when the chassis may be withdrawn from the case.



Circuit diagram of the Pye Q battery portable. **R1** and **C13** are ganged and combined in a single gain control unit.

When replacing, connect the red lead to the further socket on the headphone jack, and the black braided lead to the nearer;
connect the black rubber-covered lead to the earthing tag on the speaker frame.
Connect the frame aerial leads as follows, numbering the terminals from left to right: 1, black; 2, yellow; 3, green.

Removing Speaker.—Remove the chassis as described previously;
unsolder from the speaker the red and black leads connecting it to the headphone jack;
slacken the two round-head screws holding the fibre insulating plates and swivel the plates away;
remove the four screws (with washers) holding the speaker to the sub-baffle.
When replacing, the transformer should be on the left.

GENERAL NOTES

Switches.—**S1** and **S2** are the waveband switches, and **S4, S5** the battery circuit switches, ganged together in a single rotary unit, mounted on the front member of the chassis. This in indicated in our plan chassis view, and the switches are shown in detail in the diagram, drawn looking from the rear of the top of the chassis, in col. 2.

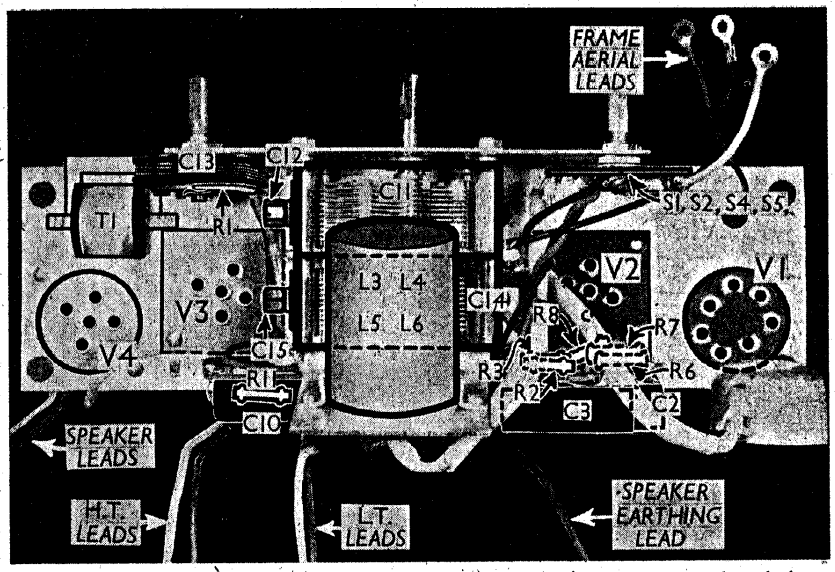
The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

Switch	Off	MW	LW
S1	C	C	—
S2	—	C	—
S4	—	C	C
S5	—	C	C

S3 is the internal speaker jack switch, incorporated in one of the "phone" sockets, which opens when headphone or external speaker plugs are fully inserted into the sockets. These, incidentally, are situated on a panel at the right-hand side of the cabinet. **S3,** therefore, is not shown in our chassis illustrations.

Coils.—**L1** and **L2** are the frame aerial windings, brought out to three screw terminals on a small panel inside the cabinet. **L3-L6** are in a screened unit mounted above the gang condenser by means of a plate screwed to the rear gang plate.

Headphones.—Two sockets are provided at the right-hand side of the cabinet for a pair of high resistance (8,000 Ω) headphones, or an extension speaker. By pushing the plugs fully home, **S3** opens and mutes the internal speaker.



Plan view of the chassis. A diagram of the switch unit appears in col. 2 below.

Condenser C1.—This is a very small condenser, formed of one enamelled wire spirally wound over another. It is situated inside the cabinet between the external aerial socket and the screw terminal forming the top connection of **L1.**

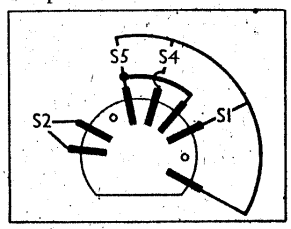


Diagram of the switch unit, seen from the rear of the deck of the chassis.

Resistance R1.—This is combined with the reaction control **C13.** For the first half of the travel of the slider, **R1** decreases in value. When the minimum value of **R1** is reached, the slider passes over a thick copper track, and reaction is then applied by the increasing capacity of **C13** during the remainder of the travel of the control.

Batteries.—LT, 2 V 20 AH celluloid-cased jelly acid cell, marked "LT battery for Baby Q," reference number 88022. HT, 90 V HT battery, marked "For Baby Q," size 8¾in. by 5¼in. by 8in. GB is automatic.

Battery Leads and Voltages.—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; black lead and plug, HT negative; red lead and plug, HT positive 90 V.

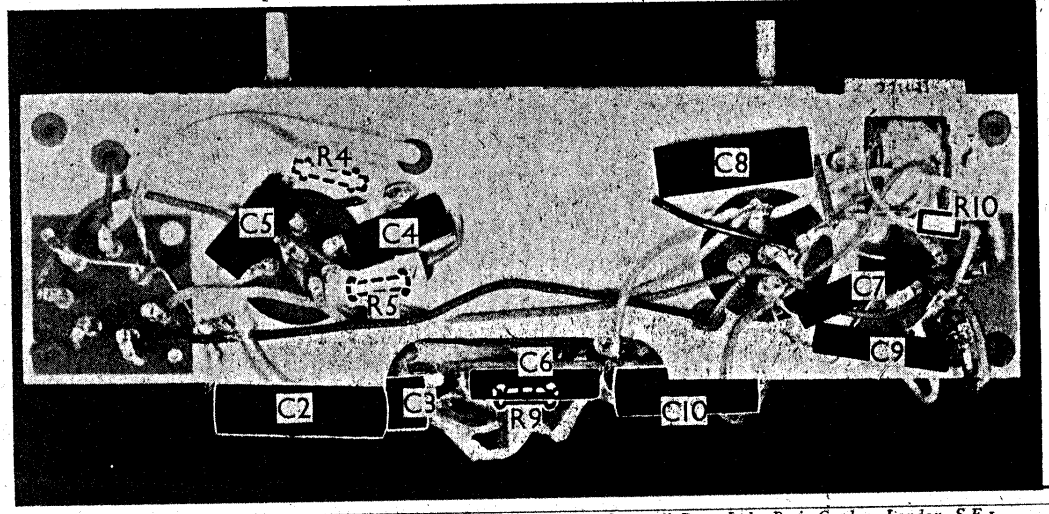
CIRCUIT ALIGNMENT

Scale Adjustment.—With the chassis in its case, rotate the tuning control clockwise until pointer is at high wavelength end of scale. Push the flat end of a pencil or rod against the condenser vanes and rock the gang until it can be felt that the rotor vanes are fully in mesh with those of the stator. The pointer should now be located at the mark at the top end of the LW scale. If not, adjust it by removing the control knob and inserting a fine screwdriver between the escutcheon plate and the tuning spindle. The pointer is fitted with a friction collar to the spindle.

RF Circuits.—All adjustments should be made with the chassis in the case, and the volume control midway between minimum and maximum positions.

Connect signal generator via a dummy aerial to the external **A** and **E** sockets and feed in a 210 m (1,425 KC/S) signal. Switch set to MW, tune to 210 m on scale, and adjust **C15** and **C12** for maximum output.

Check calibration at 550, 900 and 1,900 m.



Under-chassis view. Some components shown here appear also in the plan view above. **R4, R5,** shown in this view, and some resistances in the plan view, shown dotted, are enclosed in insulating sleeving.

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