Supplement to The Wireless & Electrical Trader, April 11, 1942

"TRADER" SERVICE SHEET

565

PYE Q BATTERY PORTABLE

'P' and 'Q' Series

TWO versions were made of the Pye Q receiver, a "P" series and a "Q" series, but the sample used in the production of this *Service Sheet* was one of the "P" series. The differences in the "Q" series are described under "'Q' Series Modifications" overleaf.

Release date: 1932.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L2, L3, C9** precedes a tetrode RF amplifier **(V1, Mazda SG215).** Gain control by variable resistance **R1** in filament circuit. Provision for connection of external aerial and earth via coupling coil **L1.**

Tuned anode coupling by **L5, L6** and **C12** between **V1** and triode valve **(V2, Mazda HL2),** which operates as leaky grid detector with **C4** and **R3.** Reaction is applied from anode via coil **L4,** and controlled by differential condenser **C11.** RF filtering by **C11, L7** and **C5** in anode circuit.

Resistance-capacity coupling by **R4, C6, R5** between **V2** and triode AF amplifying valve **(V3, Mazda HL2),** which is in turn transformer coupled via **T1** to pentode output valve **(V4, Mazda Pen 220).** Fixed tone correction by **C7, R7, C8** in anode circuit. Connecting plugs from internal cone speaker may if desired be removed and replaced by those of a high resistance external speaker.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those given in the maker's manual. They are based on the assumption that the recommended voltages exist at the various battery plugs, that the volume control is midway between maximum and minimum, that the current at HT+4 plug is 6 mA, and that voltages are measured with a high resistance meter, chassis being negative.

As the voltages quoted for the "P" and "Q" series are not alike, two values are quoted for each electrode, that in *italics* being for the "Q" series. No current values are quoted for the "P" series, so that all current readings are in italics, and refer to the "Q" series only, although the values for the "P" series would not be very different.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 SG215	122 *120*	*1·5*	63 *65*	*0·4*
V2 HL2	47 *44*	*0·5*	—	—
V3 HL2	122 *60*	*0·8*	—	—
V4 Pen 220	115 *110*	*4·4*	*	*

*Depends on position of HT + 3 plug.

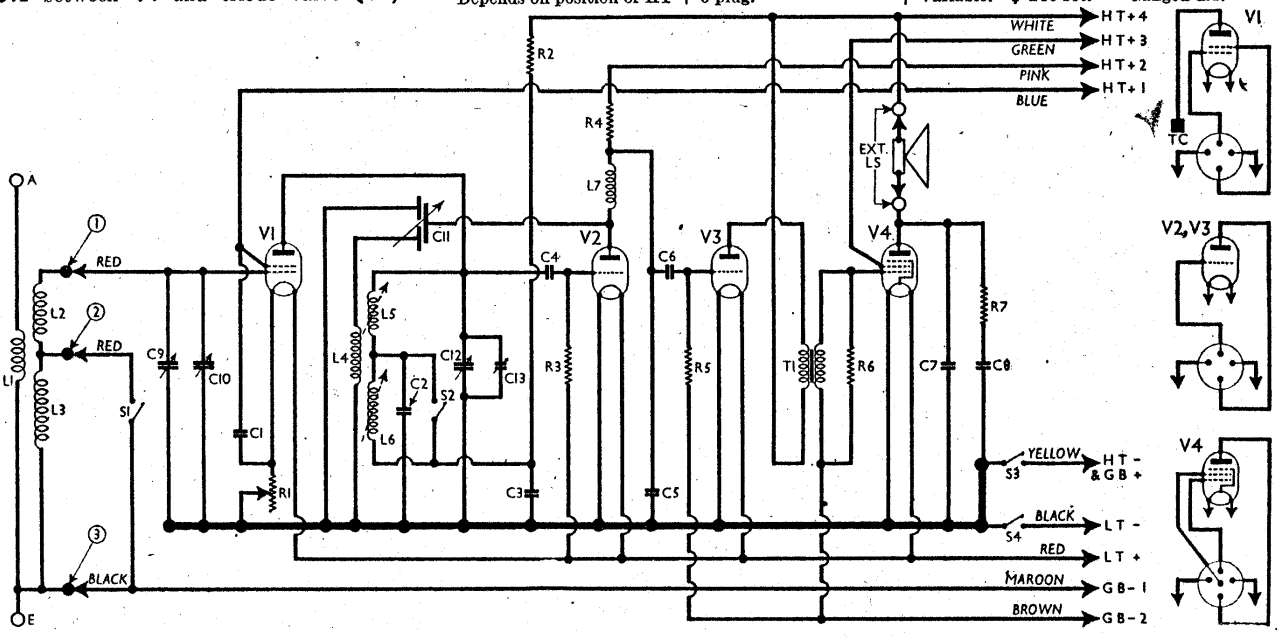
COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1*	V1 gain control	25
R2	V1 anode HT feed ...	2,000
R3	V2 grid leak	500,000
R4	V2 anode load	25,000
R5	V3 CG resistance... ...	250,000
R6	T1 secondary shunt ...	250,000
R7	Part fixed tone corrector	25,000

*Ganged C11.

	CONDENSERS	Values (μF)
C1	V1 SG decoupling ...	0·25
C2	V1 anode LW trimmer ...	Very low
C3	V1 anode decoupling ...	1·0
C4	V2 CG condenser... ...	0·0002
C5	RF by-pass	0·002
C6	V2 to V3 AF coupling ...	0·25
C7	Parts of fixed tone cor-	0·002
C8	rector	0·005
C9†	Frame aerial tuning ...	—
C10†	Frame manual trimmer ...	—
C11†	Differential reaction condenser*	—
C12†	V1 anode tuning	—
C13‡	V1 anode MW trimmer ...	—

† Variable. ‡ Pre-set. * Ganged R1.



Circuit diagram of the Pye Q. This diagram is that of the "P" series, but the differences in the "Q" series are described under "'Q' Series Modifications" overleaf. The frame aerial connections are coded to agree with the markings in the front chassis view overleaf.

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OTHER COMPONENTS			Approx. Values (ohms)
L1	Ext. aerial coupling	...	0·15
L2	Frame aerial windings	...	2·0
L3			28·0
L4	Reaction coupling coil	...	9·0
L5	V1 anode MW tuning	...	3·5
L6	V1 anode LW tuning	...	35·0
L7	RF filter choke	...	380·0
T1	Intervalve trans. Pri.	...	1,000·0
	Sec.	...	10,000·0
L3S	Speaker winding	...	2,500·0
S1, S2	Waveband switches	...	—
S3	HT circuit switch	...	—
S4	LT circuit switch	...	—

DISMANTLING THE SET

Removing Chassis.—Withdraw the speaker plugs from their sockets at rear of chassis, and unsolder the speaker earthing lead from its tag on the right of the sockets;
unsolder from the tags on the frame aerial assembly below the control panel the three leads from chassis;
remove one round-head wood screw holding the top of the vertical chassis structure to the top of the carrying case, and one similar screw from the right-hand end of the chassis;
remove two 2BA nuts from the bracket underneath the chassis below the control panel;
withdraw the chassis with the right-hand end foremost.

When replacing, connect the red lead from **V1** CG pin to the top tag on the frame assembly; the second red lead to the middle tag; and the black lead to the bottom tag.

GENERAL NOTES

Switches.—The four waveband and battery switches are ganged and operated by a single four-position control. The switches are indicated individually in our plan view of the chassis. **S1** and **S2** are entirely insulated from the chassis frame. The insulated tags of **S3** and **S4** are connected to chassis when the receiver is switched on. This happens when the control is turned to L (LW) or S (MW); in the two intermediate positions all the switches are open.

Coils.—**L1, L2, L3** are the frame windings, and are not shown in our illustrations. They are wound on a frame fitted in the front of the carrying case. At the left-hand (from rear) bottom corner of the frame are the three connecting tags, which correspond with those shown in the circuit diagram when numbered from top to bottom.

L4, L5, L6 are in a screened container in the RF compartment of the chassis. An adjusting screw, which projects from the front (speaker side) of the chassis, controls a brass drum and a brass disc for alignment adjustments.

L7, together with the other components **R4, C5, C6** in **V2** anode circuit, is mounted on the chassis deck and enclosed in a metal screen.

External Speaker.—Two sockets marked "LS" are provided at the rear of the chassis. Normally they are occupied by the plugs of the internal cone speaker, but these can be withdrawn and replaced by those of a high impedance (about 15,000 O) external speaker.

Volume Control.—This is a dual unit, comprising **R1** and **C11**, which are ganged. **R1** reaches its minimum resistance position when the control has advanced about half way from minimum volume setting. **C11** is a differential condenser, one set of fixed vanes being connected directly to chassis.

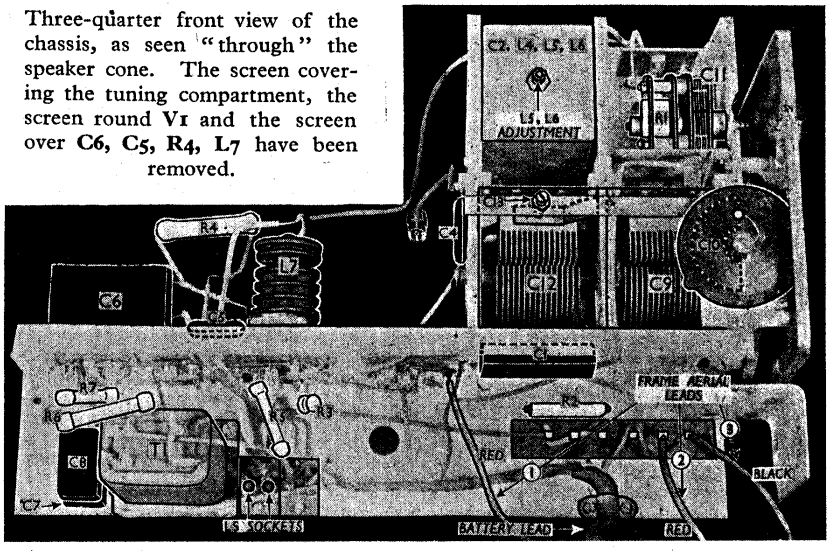
Condenser C2.—This is a very small condenser, consisting of a slotted disc fitted over a slotted section of the platform on which **L4-L6** are mounted. Its capacity can be varied by adjusting the relative positions of the slots.

Condenser C10.—This consists of a brass plate moulded into the trimmer control knob disc. The chassis forms the earthed plate.

Battery Leads.—Black lead, spade tag, LT−; red lead, spade tag, LT+2V. HT leads: HT+1 (blue), 66V; HT+2 (pink), 72V; HT+4 (white), 126V; the HT+3 (green) lead should be inserted in the socket at which the current at HT+4 is 6 mA. GB leads: GB−1 (maroon), −1.5V; GB−2 (brown), −3V (or −1.5 if HT voltage is low). The yellow lead is the common HT− and GB+ lead.

Chassis Divergency.—The maker's diagram shows one side of **C1** connected to chassis, whereas in our sample it was taken to the negative filament lead of **V1**. This alteration may, of course, have been made since the receiver left the works.

Three-quarter front view of the chassis, as seen "through" the speaker cone. The screen covering the tuning compartment, the screen round **V1** and the screen over **C6, C5, R4, L7** have been removed.



"Q" SERIES MODIFICATIONS

Whether a given "Q" receiver is one of the "P" or "Q" series may easily be determined from the serial number, which is stamped on the rear chassis member. If the last letter of the prefix to the number is P it is the one, or if it is the other the letter is Q. Thus: FFP2251 would be one of the "P" series; FFQ2251 would be one of the "Q" series.

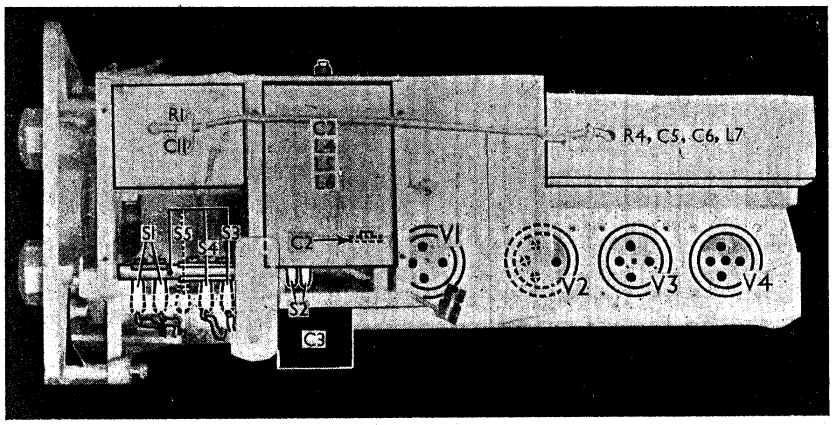
Several departures from the foregoing particulars of the "P" series, with which the rest of this *Service Sheet* dealt exclusively, are found in the "Q" series. The manual trimmer **C10** is discarded, and in its stead **C13** becomes a rotary disc-type variable condenser. It is operated by a similar edge-wise disc as previously contained **C10**, and is driven by a spring-loaded drive cord. The control, therefore, takes up the same position on the control panel.

The intervalve transformer **T1** is parallel-fed, a 50,000 O resistance being connected between **V3** anode and HT+4; **T1** primary is connected at one end via a 0.25 μF condenser to **V3** anode, and at the other to chassis. **R6** becomes 1,000,000 O. The DC resistances of **T1** become: primary, 720 O; secondary, 4,200 O.

C7, C8 and **R7** retain their original values, but **C7** is connected across the speaker sockets.

Finally, there are modifications in the grid bias circuit. **T1** secondary still goes to the GB−2 lead, but the lower end of **R5** is separated from it, and is taken instead to the junction of two resistances which form a potential divider across the GB section of the battery. That is, from GB−2 to chassis. This necessitates an additional switch to break the GB circuit when the receiver is switched off, and this is inserted between the potential divider and chassis. The position of the switch in the chassis is indicated by broken lines in our plan view and numbered **S5**.

The potentiometer consists of a 375 O resistance (at the GB−2 end) and a 125 O resistance (at the **S5**, or chassis, end). They are calculated to discharge the GB section of the battery at the same rate as the HT section. They are fitted on the inside of the rear member of the chassis, near the circular hole through which the speaker adjusting screw protrudes.



Plan view of the chassis, with all screens in position.

CIRCUIT ALIGNMENT

The only alignment operation normally possible is the adjustment of **C13**, the remainder being made on an adjustment bridge at the works. Further, **C13** should be adjusted while the chassis is in its carrying case.

As this will normally be impossible, since the trimmer screw is inaccessible, it will be necessary first to remove the chassis fixing screws and nuts as described under "Dismantling the Set," extending the speaker leads if necessary, and swivel the chassis round in the case until **C13** can be reached, leaving the frame aerial leads and batteries connected.

Couple the signal generator via a turn of wire round the case, or, if more convenient, to **A** and **E** sockets, set the volume control to a position just short of oscillation, set the manual trimmer **C10** so that the indications on its edge (horizontal lines) register at 1 (about half-way between maximum and minimum).

With the gang at minimum, the pointers on the scale panel should register with the lines at the extreme minimum ends of the scales, marked 220 m on the MW scale. Feed in a 220 m (1,364 KC/S) signal, and adjust **C13** for maximum output, slacking off the volume control as necessary to prevent the receiver from oscillating. The **L5, L6** adjustment should not be disturbed.

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