

NUMBER FIFTY  
(VOLUME TWO)

# TRADER SERVICE SHEETS

## PYE MODEL T/Q

### 4-VALVE BATTERY PORTABLE

frame to the front of the cabinet. It is necessary to insert the screwdriver through the hole in the outer frame member in order to reach the top left-hand screw. Take care not to damage the windings as the frame is withdrawn.

#### COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 anode decoupling ..	5,000
R2	V1 cont. grid decoupling ..	110,000
R3*	V1 gain control (volume) ..	2,500
R4	Parts of G.B. potential divider	300
R5		600
R6	V2 grid leak ..	2,100,000
R7	V2 anode decoupling ..	30,000
R8	V2 anode resistance ..	30,000
R9	V3 grid resistance ..	510,000
R10	V3 anode resistance ..	50,000
R11	Part of V4 impedance corrector	16,000
R12	Part of G.B. pot. divider ..	150

\*Ganged with reaction condenser Cr8.

Condensers		Values (μF)
C1	V1 cont. grid decoupling ..	0.1
C2	V1 S.G. by-pass ..	0.5
C3	V1 anode decoupling ..	0.1
C4	H.F. coupling to T.G. circuit	0.00005
C5	V2 grid condenser ..	0.00005
C6	V2 anode decoupling ..	0.5
C7	V2 anode H.F. by-passes	0.0002
C8		0.001
C9	L.F. coupling to V3 ..	0.025
C10	L.F. coupling to T1 ..	0.1
C11	Part of V4 impedance corrector	0.0025
C12	H.T. reservoir ..	8.0
C13	Frame aerial tuning ..	—
C14	Frame aerial trimmer ..	—
C15	Grid circuit tuning ..	—
C16	Grid circuit main trimmer ..	—
C17	Grid circuit L.W. trimmer ..	—
C18*	Reaction condenser ..	—

\* Ganged with gain control R3.

**T**HE Pye T/Q receiver is a 4-valve portable receiver of the battery-operated type, fitted in a vertical wooden case, with carrying handle and turntable. The circuit comprises a screened pentode H.F. stage, triode detector, triode L.F. valve and pentode output valve. The frame aerials are fitted inside the cabinet, and a moving-coil speaker is employed.

#### CIRCUIT DESCRIPTION

Tuned frame aerial input **L2, L3, C13** to variable-mu pentode H.F. amplifier (**V1, Ever Ready metallised K50M**). External aerial and earth coupling by small winding **L1**. **V1** gain control by potentiometer **R3** which varies G.B. applied.

Choke-fed tuned-grid coupling by **L4, C4, L5, L6** and **C15** to triode detector (**V2, Ever Ready metallised K30C**), which operates on grid leak system with **C5** and **R6**. Reaction, applied to grid coils by coil **L7**, is controlled by condenser **C18**. This is ganged with gain control **R3** in such a manner that no reaction is applied until **V1** G.B. is at minimum. Efficient H.F. by-passing in **V2** anode circuit by choke **L8** and condensers **C7, C8**.

Resistance-capacity coupling to triode audio-frequency amplifier (**V3, Ever Ready metallised K30C**), which obtains its G.B. voltage from a tapping on the **R12, R4, R5** bias potential divider.

Parallel-fed transformer coupling by **R10, C10** and **T1** to output pentode valve (**V4, Ever Ready K70B**). Fixed impedance correction network **R11, C11** in anode circuit across primary of output transformer **T2**. Electrolytic condenser **C12** across main H.T. supply, serves as reservoir.

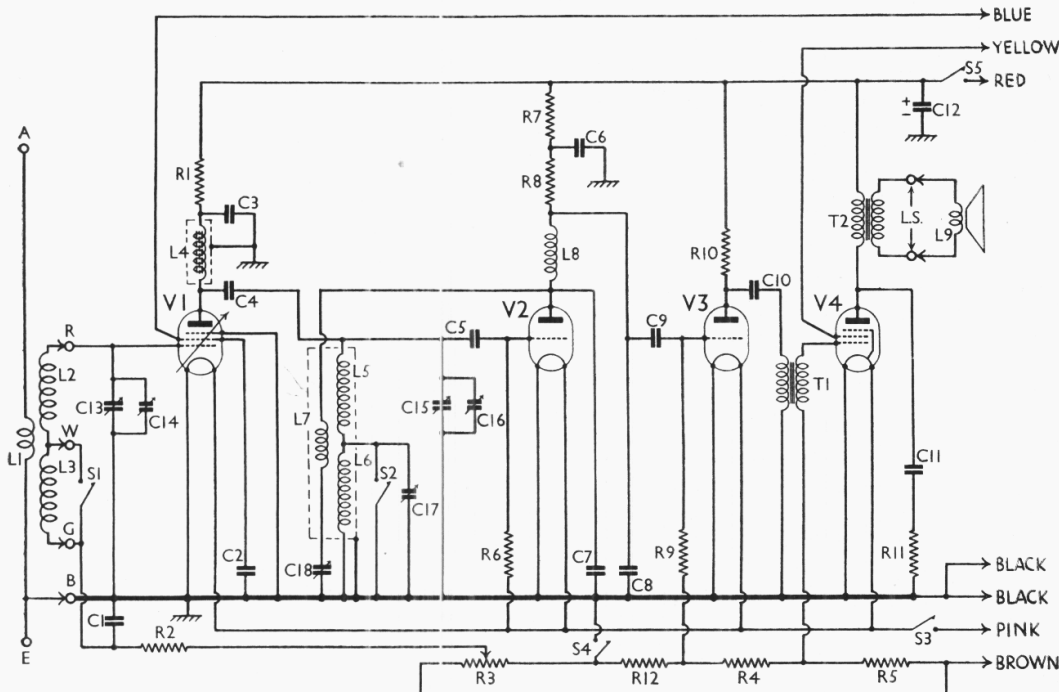
#### DISMANTLING THE SET

**Removing Chassis.**—Take out the batteries, then remove control knobs (pull off). Disconnect the four frame aerial leads from the terminal strip on the chassis. Unplug the speaker leads from the sockets at the rear of the chassis. Two wood screws, passing through metal collars in rubber bushes, hold the chassis to the front of the cabinet. Remove these screws. Two ornamental screws and brass sleeves, also passing through rubber bushes in the chassis, support it at the sides of the cabinet. Unscrew and remove the sleeves, and the chassis can then be withdrawn.

*When replacing,* the frame aerial leads should be re-connected as indicated by the colour coding in our plan chassis view.

**Removing Speaker.**—Unscrew the four nuts holding the speaker chassis to its sub-baffle.

**Removing Frame Aerials.**—Four wood screws, one at each corner, hold the



The circuit diagram of the Pye T/Q battery portable receiver. Coils L1, L2 and L3 are the frame aerial windings, L1 being the coil for external aerial and earth coupling. The letters R, W, G and B refer to the connections of the frame aerial to the receiver.

Other Components		Values (ohms)
L1	External aerial coupling coil	0.2
L2	Frame aerial windings	1.8
L3		20.8
L4	V1 anode H.F. choke	660.0
L5	Tuned-grid coupling coils	2.2
L6		16.0
L7	Reaction coil	2.4
L8	V2 anode H.F. choke	350.0
L9	Speaker speech coil	1.7
T1	Intervalve transformer	Pri. 790.0
		Sec. 4.560
T2	Output transformer	Pri. 840.0
		Sec. 0.3
S1-S2	Waveband switches, ganged	—
S3	Filament switch	—
S4	G.B. switch	—
S5	H.T. switch	—

### VALVE ANALYSIS

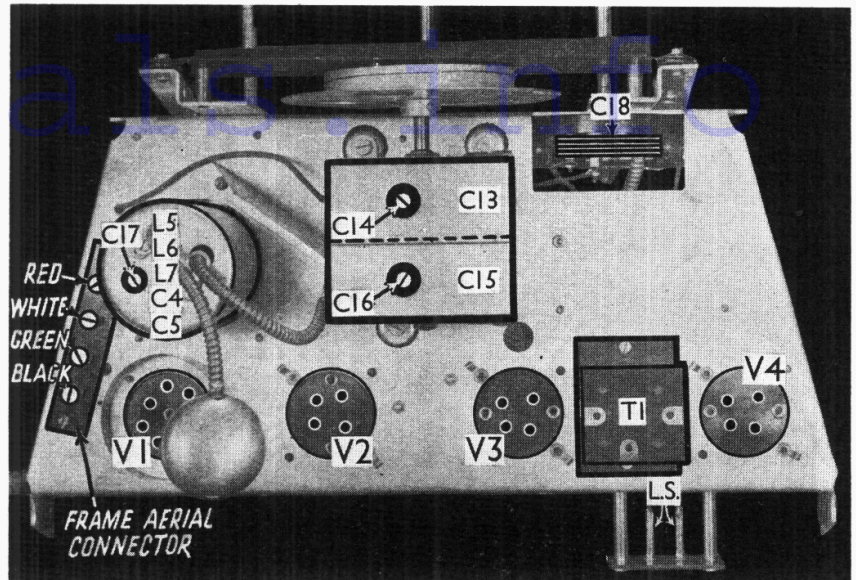
The voltage and current readings listed in the table are those given by Pye for an average chassis working with a new H.T. battery, under no signal conditions with the volume control **R3** at maximum, but with no reaction. The voltage applied to the auxiliary grid of **V4** will depend on the letter marked on the valve, and hence upon the position of the yellow plug in the battery.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 K50M ..	122	0.9	90	0.2
V2 K30C ..	62	1.1	—	—
V3 K30C ..	77	1.0	—	—
V4 K70B ..	127	4.5	127.5*	0.7

\* In our receiver.

### GENERAL NOTES

**Battery Connections.**—The batteries fitted are a 2 V L.T. cell, type Pye T/Q, manufactured by Ever Ready, and a 127½ V H.T. plus 9 V G.B. battery,



Plan view of the chassis. Note the coding for the frame aerial connector. C4 and C5 are included inside the coil screen with L5-L7, and C17, the L.W. trimmer.

type Pye T/Q, also manufactured by Ever Ready. The H.T. and G.B. connections for a new battery are H.T. + (Red), 127½ V; H.T. + (Blue), 90 V; G.B. - (Brown), -9 V; H.T. - (Black), H.T. -. The yellow lead is plugged into one of the H.T. sockets marked A, B, C or D, according to the letter stamped on the pentode **V4**. If a non-lettered replacement valve is fitted, remove all the valves except **V4** from the set, and connect a milliammeter in series with the H.T. + (Red) lead. Switch on the set, and adjust the yellow plug until 4.5 mA is shown on the meter, with a new H.T. battery in use.

**Coils.**—**L1**, **L2** and **L3** are the frame aerial windings. To check them up, **L1** is between the sockets for external

aerial and earth, **L2** is between the red and white frame leads (R and W on the circuit diagram), and **L3** is between the white and green leads (W and G).

**L5-L7** are in the screened unit on top of the chassis, the screen also containing the L.W. trimmer **C17** and the two small fixed condensers **C4**, **C5**. The two chokes, **L4**, **L8** are seen in the under-chassis view.

**Switches.**—These are in one unit, clearly indicated in the under-chassis view. On the M.W. band, all switches are closed, while on the L.W. band, **S1** and **S2** are open, and **S3**, **S4**, **S5** closed.

**External Speaker.**—This should be of the low resistance type (about 2 Ω), and may be paralleled with the internal speaker by plugging into the socketed plugs used for the latter.

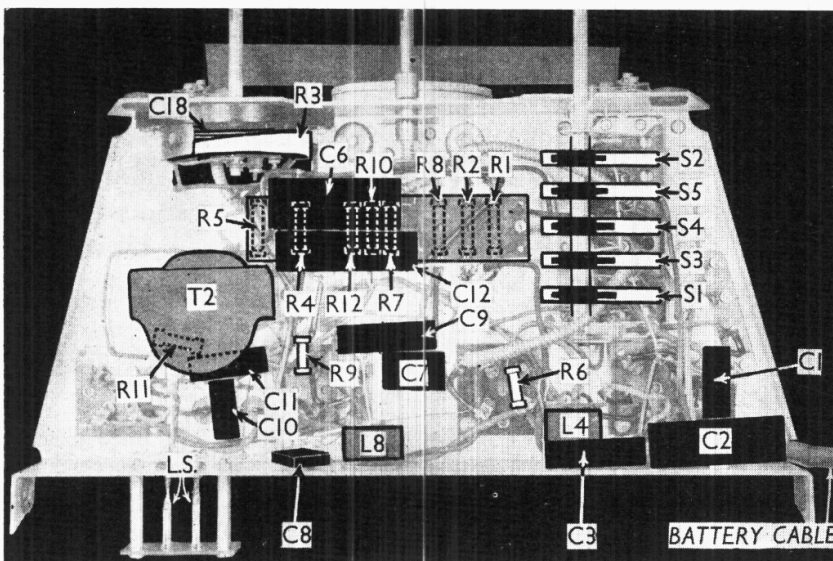
**Resistance R12.**—This resistance is included in all chassis after the first 20 or so, and provides a small bias for **V3**. It was not included in the makers' original circuit diagram, **R9** being returned to chassis. **R4** is now 300 Ω, instead of 500 Ω as it was in the first few chassis.

### CIRCUIT ALIGNMENT

First of all, see that the pointer of the scale coincides with the end line at the higher wavelength end of the tuning scale when the moving vanes of the condenser are fully meshed.

A rod inserted through the hole in the side of the condenser cover and pushed against the fixed vanes will allow the moving vanes to be felt when they are fully meshed. If necessary, loosen the scale and slide it to the correct position.

Rotate the gang condenser to the minimum stop, and couple a modulated oscillator, tuned to 202 m. to the frame aerial. See that the switch is at M.W., and adjust **C14** and **C16** for maximum output. Now set the switch at L.W., feed in a signal of 825 m., and adjust **C17** for maximum output.



Under-chassis view. C18 and R3 are the reaction condenser and gain control, ganged together and operated by the volume control knob. Most of the resistances are shown dotted, and are beneath a paxolin strip, above which are the condensers C6, C12. L4 and L8 are H.F. chokes. All the switches are clearly indicated.