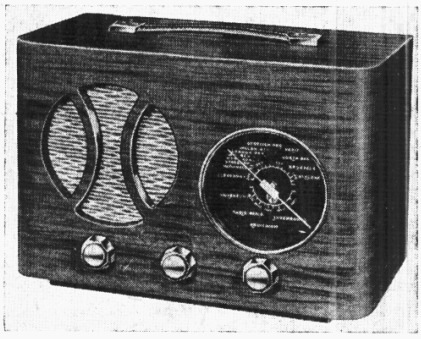
Supplement to The Wireless & Electrical Trader, January 2, 1943

"TRADER" SERVICE SHEET

602

PYE MITE

AC/DC TRANSPORTABLE



COMPACT in design, the Pye "Mite" is a 3-valve (plus rectifier) 2-band TRF receiver for operation on AC or DC mains of 200-250 V, 25-100 C/S in the case of AC.

Its style follows midget receiver practice, and a line cord mains lead is used, but the circuit is more elaborate, and the components used are British.

Release date: 1939.

CIRCUIT DESCRIPTION

Input from attached aerial via isolating condenser **C1** and coupling coil **L1** to single tuned circuit **L2, L3, C16,** which precedes variable-mu RF amplifying valve **(V1, Mullard Amerty 6K7G).** Gain control by dual-action potentiometer which works in conjunction with **R4** to form a potential divider across the HT circuit. As the control is advanced, the slider moves downwards in our circuit diagram, reducing the damping effect across the aerial circuit, at the same time reducing the positive potential of **V1** cathode, since the slider is connected to chassis.

R3 limits the excursion of the cathode potential in the negative direction when the slider reaches the bottom of **R1** (maximum gain), so that the cathode can never reach chassis potential. Reaction adds a third phase of action, and occurs as a result of the inherent instability of the receiver when the gain control is at maximum.

Tuned-anode coupling by **L4, L5, C18,** via **C6,** between **V1** and another RF pentode valve **(V2, Mullard Amerty 6J7G)** which operates as detector on the grid leak system with **C6** and **R6.** RF filtering by **C8** in anode circuit.

Resistance-capacity coupling by **R8, C9** and **R10, R11,** via grid stopper **R9,** between **V2** and pentode output valve **(V3, Mullard Amerty 25A6G).** Fixed tone correction by **C11** in anode circuit.

When the receiver is operating on AC mains, HT current is supplied by IHC half-wave rectifying valve **V5,** which on DC mains behaves as a low resistance. The valve may be a **25Z4G,** as shown by the solid lines in our diagram, or **25Z6G,** with its two sections connected in parallel as shown by the additional dotted portion in our diagram. The holder is so wired that either valve may be used.

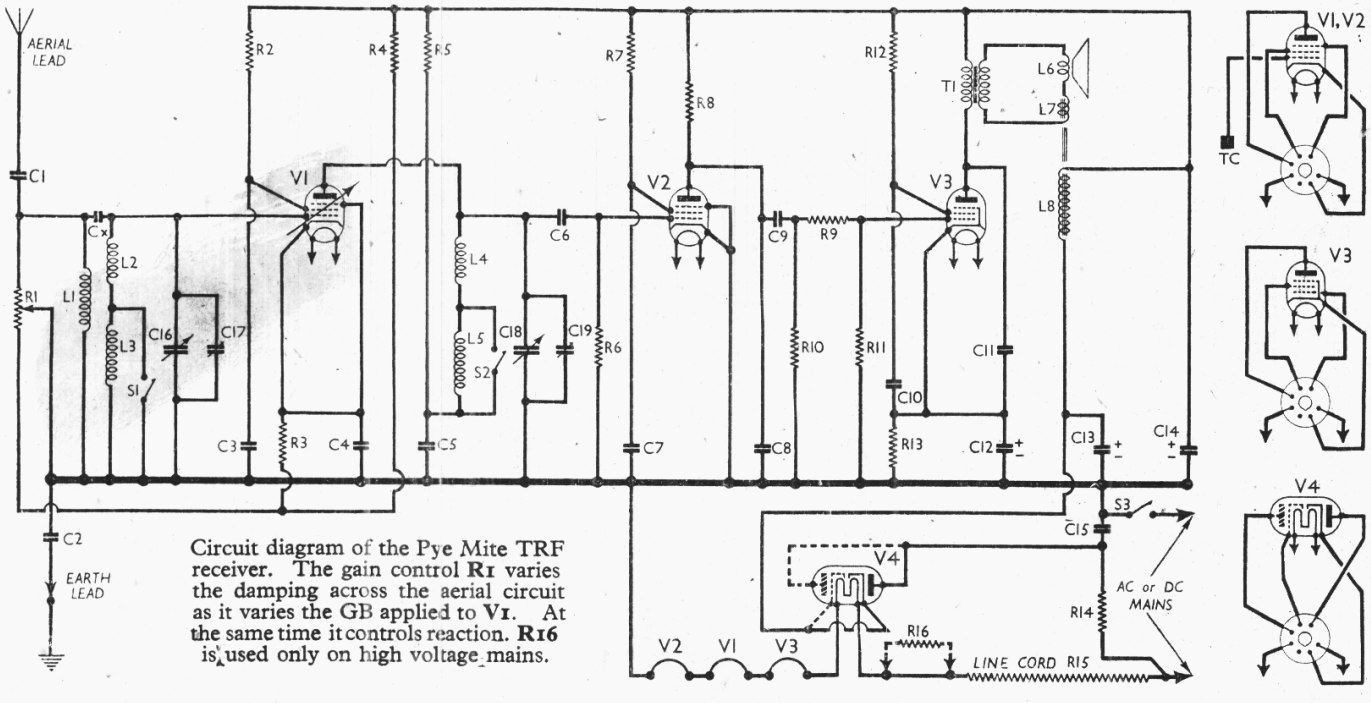
Valve heaters, together with line cord ballast resistance **R15,** are connected in series across mains input. An additional series resistance **R16** may be inserted in place of the high voltage link for use on mains of 250 V.

COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	Mains isolating condensers	0·001
C2	Mains isolating condensers	0·05
C3	V1 SG decoupling ...	0·1
C4	V1 Cathode by-pass ...	0·1
C5	V1 anode decoupling ...	0·1
C6	V2 CG condenser... ...	0·00015
C7	V2 SG decoupling ...	0·1
C8	RF by-pass	0·0003
C9	V2 to V3 AF coupling ...	0·01
C10	V3 SG decoupling - ...	0·1
C11	Fixed tone correcter ...	0·01
C12*	V3 cathode by-pass ...	10·0
C13*	HT smoothing condensers	16·0
C14*	HT smoothing condensers	8·0
C15	Mains RF by-pass ...	0·01
C16†	Aerial circuit tuning ...	—
C17‡	Aerial circ. MW trimmer	—
C18†	V1 anode circuit tuning	—
C19‡	V1 anode circ. MW trimmer	—
Cx	Aerial "top" coupling ...	Very low

* Electrolytic. † Variable. ‡ Pre-set.

	RESISTANCES.	Values (ohms)
R1	Gain control	10,000
R2	V1 SG HT feed	100,000
R3	V1 fixed GB resistance ...	450
R4	Part gain control pot. ...	50,000
R5	V1 anode HT feed ...	15,000
R6	V2 grid leak	1,000,000
R7	V2 SG HT feed	1,000,000
R8	V2 anode load	250,000
R9	V3 grid stopper	40,000
R10	V3 CG resistances ...	1,000,000
R11	V3 CG resistances ...	1,000,000
R12	V3 SG HT feed	10,000
R13	V3 GB resistance ...	450
R14	HT surge limiter ...	100
R15	Heater circuit ballast ...	530
R16	High voltage ballast ...	60



Circuit diagram of the Pye Mite TRF receiver. The gain control R1 varies the damping across the aerial circuit as it varies the GB applied to V1. At the same time it controls reaction. R16 is used only on high voltage mains.

OTHER COMPONENTS			Approx. Values (ohms)
L1	Aerial coupling coil	...	11·0
L2, L3	Aerial circuit tuning coils		3·0 + 11·0
L4, L5	V1 anode circuit tuning coils		3·5 + 11·0
L6	Speaker speech coil	...	2·0
L7	Hum neutralising coil	...	0·1
L8	Speaker field coil	...	900·0
T1	Speaker input trans.	Pri.	200·0
		Sec.	0·1
S1, S2	Waveband switches	...	— —
S3	Mains switch, ganged R1		— —

VALVE ANALYSIS

Valve voltages and currents given in the table below are those given in the makers' manual, and they represent conditions to be expected in an average receiver when it is operating on AC mains of 220 V, with the gain control at maximum, but with no signal input.

Voltages were measured with 1,000 ohms-per-volt meter, chassis being the negative connection.

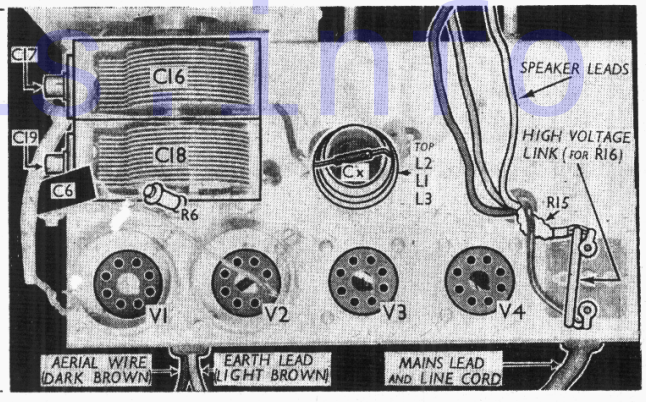
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6K7G	130	4·5	73	1·2
V2 6J7G	40	0·7	25	0·1
V3 25A6G	203	34·0	139	6·4
V4 25Z4G	240†	53·0*	—	—

† Cathode to Chassis, DC. * Cathode current, DC.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws); remove the two round-head screws holding the chassis to the bottom of the cabinet. Chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes. To free chassis entirely, unsolder the leads from the panel on the speaker input transformer. *When replacing*, connect the speaker leads as follows, numbering the tags from top to bottom: 1 and 2 (joined together), black; 3, no external connection; 4, yellow; 5, red.

Removing Speaker.—Remove chassis, then remove the two nuts (with lock-washers) holding the speaker to the sub-baffle. *When replacing*, the speaker should be on the right. The leads, if unsoldered, should be connected as described above.



Plan view of the chassis. **Cx** is made up of enamelled wire. The wire link which takes the place of **R16** in low voltage models is clearly indicated. **C6** and **R6** are mounted on a panel fixed to one end-plate of the gang assembly.

GENERAL NOTES

Switches.—**S1, S2** are the waveband switches, in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view and shown in detail in the diagram below. Both switches are closed on MW, and open on LW.

S3 is the QMB mains switch, ganged with the gain control **R1.**

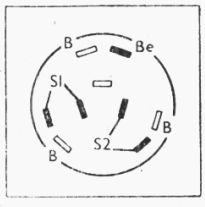


Diagram of the waveband switch unit, as seen from the rear of the underside of the chassis.

Coils.—**L1-L3** are wound on an unscreened tubular former mounted on the chassis deck. A small condenser, **Cx,** composed of enamelled wire, fits across the top of the unit. **L4, L5** are on a similar former mounted horizontally beneath the chassis.

External Speaker.—No provision is made for this, but a high-impedance (about 5,000 O) type could be connected, via a pair of high-voltage rating condensers of about 0.1 μF or more each, across the primary of transformer **T1.**

Heater Circuit Ballast.—The main heater circuit ballast resistance **R15** is of the "line cord" type. It is housed in the mains lead, and is satisfactory for mains of 200-235 V. A subsidiary resistance of 60 O, rated at 6 watts, should be connected in place of the high-voltage link shown in our plan view for operation on mains of 240-250 V.

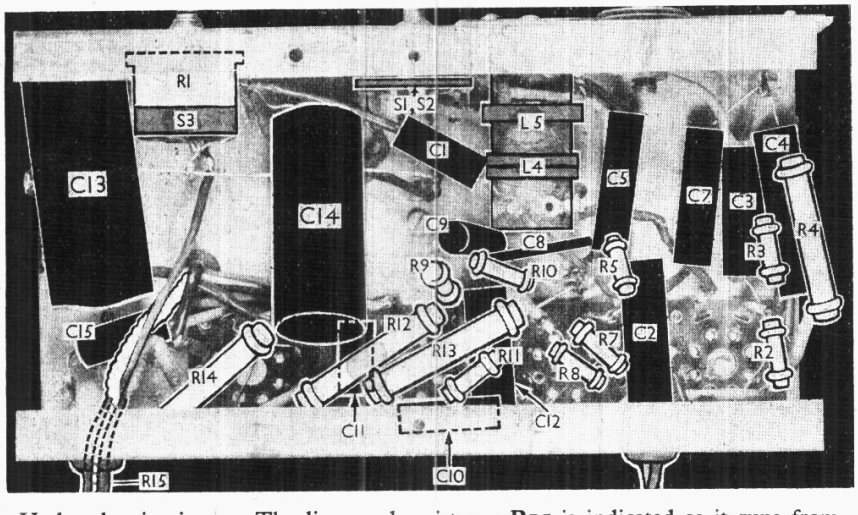
Valve V4.—The makers' information shows this as a **25Z6G,** which is of the voltage-doubler type, with its two halves connected in parallel. Our sample was fitted with the half-wave type **25Z4G.** Either valve may be used without rewiring the holder, the only difference being that pins 3 and 4, although wired, are not used. The valve base diagram given overleaf for **V4** is correct for the **25Z4G** if the left-hand section of the valve (shaded in our diagram) is omitted.

Chassis Divergencies.—The second **V3** CG resistance **R11** was not shown in the makers' circuit diagram, but was present in our chassis. **C10** was shown in the makers' diagram returned to chassis, instead of to **V3** cathode. Also, **C8** was given as a 0.003 μF tubular paper condenser, whereas in our chassis it was a 0.0003 μF silvered mica type. A different speaker unit from the original appears to have been used in our chassis, as the makers give DC resistance values as follow: **T1,** pri. 128 O; **L6,** 5 O; **L8,** 629 O. The serial number of our chassis was MCF 1393.

CIRCUIT ALIGNMENT

With the gang at minimum, the pointer should be horizontal. Adjustment is a simple matter, as the pointer is soldered to a disc having a peg which is a friction fit in a hole in the end of the gang spindle. Connect signal generator leads to the ends of the **A** and **E** leads.

Switch set to MW (anti-clockwise), tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust **C17** and **C19** for maximum output, while adjusting the gain control for optimum results. Repeat the operation until no improvement can be obtained. There are no LW adjustments, but the calibration should be checked at several points on both wavebands.



Under-chassis view. The line cord resistance **R15** is indicated as it runs from the hole in the chassis deck and into the mains lead. A diagram showing the waveband switch unit in detail appears above in column 2.

Printed in Great Britain by The Cornwall Press Ltd., Paris Garden, S.E.1.