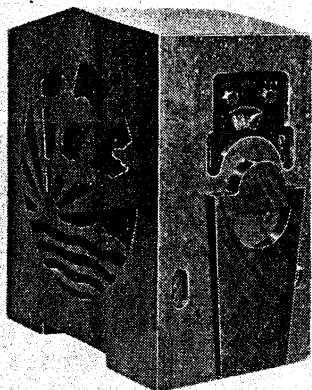


"TRADER" SERVICE SHEET

745

PYE MM TRANSPORTABLE AC SUPERHET



SEPARATE receiver and power unit chassis are used in the Pye MM, a 3-valve (plus metal rectifier) 2-band transportable TRF receiver designed for AC mains of 200-250 V, 40-100 c/s.

There are several versions of the chassis, and the salient differences between our sample and others are described overleaf.

Release date and original price: 1932; £17 17s.

CIRCUIT DESCRIPTION

Tuned frame aerial input L2, L3, C18 precedes tetrode RF amplifying valve (V1, Mazda clear AC/SG). "Fine" tuning by manual trimmer C19. Provision for connection of external aerial via coupling winding L1.

Tuned-anode coupling by L5, L6, C21

between V1 and triode detector valve (V2, Mazda metallised AC2/HL), which operates on grid leak system with C4, R4. Reaction coupling from anode by L4 and differential capacitor C20. RF filtering in anode circuit by C5, L7, C6. Provision for gramophone pick-up in CG circuit, GB being adjusted by opening switch S3, which short-circuits R5 on radio.

Parallel-fed transformer AF coupling by R7, C9 and T1 between V2 and pentode output valve (V3, Mazda AC/Pen). Tone correction by C10 across T1 secondary and C11, R8 in anode circuit.

HT current is supplied by Westinghouse metal rectifier MR1, which operates as voltage doubler with C16, C17. Smoothing by speaker field L10 and capacitors C14 (electrolytic) and C15. Gain control for V1 is obtained from drop along R11 and variable potentiometer R10 in negative HT lead to chassis. C20 is ganged with R10, but comes into operation only after R10 has reached maximum gain.

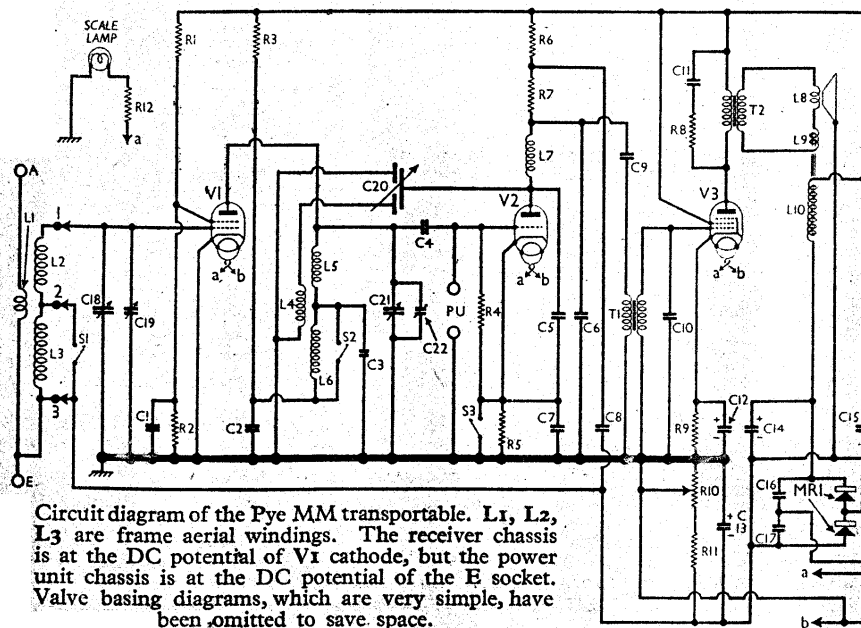
COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 SG HT feed pot.	25,000
R2	divider	10,000
R3	V1 anode HT feed	10,000
R4	V2 grid leak	250,000
R5	V1 (gram) GB resistor	500
R6	V2 anode decoupling	10,000
R7	V2 anode load	10,000
R8	Part tone corrector	8,500
R9	V3 GB resistor	250
R10	V1 gain control	350
R11	V1 fixed GB resistor	40
R12	Scale lamp ballast	6

CAPACITORS		Values (μF)
C1	V1 SG decoupling	0.5
C2	V1 anode decoupling	0.75
C3	V1 anode LW trimmer	0.00001
C4	V2 CG capacitor	0.001
C5	RF by-pass capacitors	0.001
C6		0.002
C7	V2 cathode by-pass	1.0
C8	V2 anode decoupling	3.0†
C9	AF coupling to T1	0.5
C10	Fixed tone correctors	0.0001
C11		0.01‡
C12*	V3 cathode by-pass	25.0
C13*	GB circuit by-pass	25.0
C14*	HT smoothing capacitors	7.0
C15		3.0
C16	Rectifier doubler capacitors	3.0
C17		3.0
C18†	Frame aerial tuning	—
C19†	Manual trimmer	—
C20†	Differential reaction control	—
C21†	V1 anode tuning	—
C22†	V1 anode MW trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.
§ Two 0.005 μF capacitors in parallel.
¶ 1 μF and 2 μF in parallel.

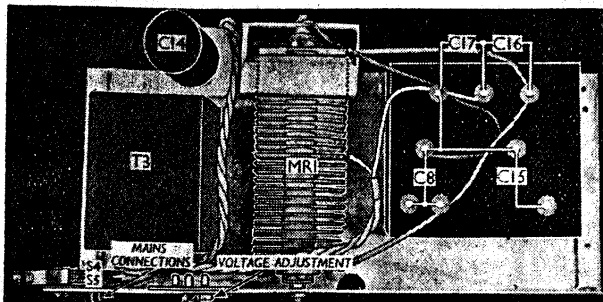
OTHER COMPONENTS		Approx. Values (ohms)
L1	Ext. aerial coupling	0.15
L2	Frame aerial windings	2.0
L3		24.0
L4	Reaction coil	9.5
L5	V1 anode tuning coils	4.0
L6		37.0
L7	V2 anode RF choke	300.0
L8	Speaker speech coil	1.23
L9	Hum neutralising coil	Very low
L10	Speaker field coil	2,500.0
T1	Intervalve trans. { Pri. ... 1,000.0 Sec. ... 10,000.0	
T2	Speaker input { Pri. ... 650.0 trans. { Sec. ... 0.2	
T3	Mains trans. { Pri., total ... 70.0 Heater, sec. ... 0.1 HT sec. ... 50.0	
S1, S2	Waveband switches	—
S3	PU GB switch	—
S4, S5	Mains switches	—



Circuit diagram of the Pye MM transportable. L1, L2, L3 are frame aerial windings. The receiver chassis is at the DC potential of V1 cathode, but the power unit chassis is at the DC potential of the E socket. Valve basing diagrams, which are very simple, have been omitted to save space.

DISMANTLING THE SET

Removing Chassis.—Unsolder from the two left hand tags on connecting panel projecting downwards from rear of chassis the two flexible red (heater) leads from the power unit;
remove the four 2BA bolts (with two clamp plates) holding power unit to bottom of cabinet, and withdraw power unit;
unsolder the three leads (four in early version), emerging from multiple cable, from capacitor block on power unit, first coding them.
Unsolder speaker leads from power unit and connecting panel on chassis, freeing power unit;
unsolder from tags on frame aerial the three leads from chassis;
remove one round-head wood screw holding the chassis superstructure to top of cabinet, and another from right-hand end of chassis;
remove two 2BA nuts from the mounting bracket just below the control panel, and the upper door-fastening screw lug, when chassis may be withdrawn right-hand end foremost.
(Continued overleaf)



Plan view of the power unit. The common connection of C8, C15, C17 goes to chassis of the unit, together with negative of MRI and C14.

When replacing, connect the red lead from V1 holder to the top frame aerial tag; the remaining red lead to the middle tag; and the black lead to the bottom tag. Connect the free end of the speaker transformer primary to the right-hand tag of the chassis connecting panel; the free field coil lead to the positive tag of C16 on power unit; and the common lead from field coil and transformer primary to positive of C15. If the leads from the receiver cable have not been coded, they must be traced. One goes from the junction of R6 and R7 to the positive tag of C8; a second from the HT busbar (R1, R3, R6) to the positive of C15; a third from the negative terminal of C13 to one of the common tags marked "E" on the capacitor block; and, in early versions only, a fourth from V3 screen to its decoupling capacitor tag.

GENERAL NOTES

Switches.—S1, S2 are the waveband switches, and S3 the gram switches, ganged in a 4-position assembly. The switches are indicated in our plan view of the receiver chassis, where the tags are identified. S1, S2 close on MW only; S3 closes on MW and LW; all three are open in both gram positions. S4, S5 are the QMB mains switches, ganged in a single unit mounted on the power unit. **Coils.**—L1, L2, L3 are the frame aerial windings, and are not shown in our illustrations. They are wound on a frame fitted in the front of the cabinet. On the left-hand (from rear) side of the frame are the three connecting tags for L2, L3, which correspond with the connections in the circuit diagram when numbered from top to bottom. L1 is connected to the A and E sockets on a separate panel. L4, L5, L6 are in a screened unit in the RF compartment of the chassis. The concentric adjustments projecting from the front (speaker) side of the unit control a brass drum and a brass disc for alignment purposes, but special instruments are required for resetting them, and they should not be disturbed. The same applies to the semi-fixed trimmer C3 inside the unit. L7 is an RF choke housed with R7, C6 and C9 inside a screened unit on the chassis deck. A screened lead runs from this assembly to C20, in another screened compartment near the control panel.

Scale Lamp.—This is an Osram MES type lamp rated at 4 V, 0.3 A. It is energised via a series resistor R12 from the heater circuit, and held in a rotary holder which can be turned to give access to the bulb, which can thus easily be replaced without removing chassis from cabinet. Until the holder is returned to its operating position, however, the bulb will not light, as a brass peg contacts a brass strip supplying the current only when the bulb has reached its lowest position, near the edge of the scale.

External Speaker.—No provision is made for an external speaker, but a low impedance (about 2 Ω) type could be connected across the secondary of T2. A high impedance speaker (about 10,000 Ω) may be connected to the second tag from the left (chassis) and the tag on the extreme right (V3 anode), on the connecting panel which projects downwards below the rear member of the chassis, via a 2 μF or larger isolating capacitor.

Volume Control.—This is a dual unit, in a screened compartment above C18, in which R10 and C20 are driven by a common spindle. Starting from minimum gain and turning clockwise, R10 reaches minimum resistance at about 90 degrees, at which point the C20 begins to increase reaction coupling. Maximum gain is reached at 180 degrees.

Trimmer C19.—This consists of a semi-circular brass plate embedded in the control knob disc, the chassis casting forming the earthed plate.

Capacitor C14.—This is a TCC wet electrolytic in a metal tubular container mounted on the power unit. It is rated at 7 μF, 460 V max. DC working.

DIVERGENT CHASSIS

Basically there are two versions of the Pye MM, the original production, which bears serial number initials like FBA, FGA, FDA, etc., and a later version whose initials were FGM, FHM, FIM, etc. The modifications appear to have been introduced gradually, however, and there are intermediate versions. Our sample chassis bore the letters FFA, so that it belongs to the original class, but its circuit agrees almost completely with the later class.

In the original circuit, R1 and R2 were 60,000 Ω

and 40,000 Ω respectively, but otherwise the RF and detector stages were as in our sample.

The greatest difference was in the AF stage. Transformer T1 was connected as an auto transformer, the two windings being connected in series and C9 being connected to their junction. It is as though the chassis end of T1 secondary in our diagram were disconnected from chassis and joined instead to the C9 end of the primary. C10 was omitted, and instead of C11, R8, a small iron-cored choke and a 0.005 μF capacitor in series with a 0.002 μF capacitor across them, was connected between anode and cathode of V3. V3 screen was fed via a 2,000 Ω resistor, with a 1 μF decoupling capacitor going down to HT negative.

Divergences in the early models included a "bleeder" resistor of 60,000 Ω across C15, while C14 (then not electrolytic) was in the capacitor block with C15. Its "positive" tag emerged between those of C15 and C8 in our view of the power unit.

In the later version, R9 becomes 325 Ω, and C7 becomes a 25 μF electrolytic. R8, C11 may be connected between V3 anode and cathode. The positions of components are changed as compared with the arrangement in our sample. C7 is beside C12, and R7 and R9 are on either side of them. Also, C11 and C10 are transposed on the chassis.

VALVE ANALYSIS

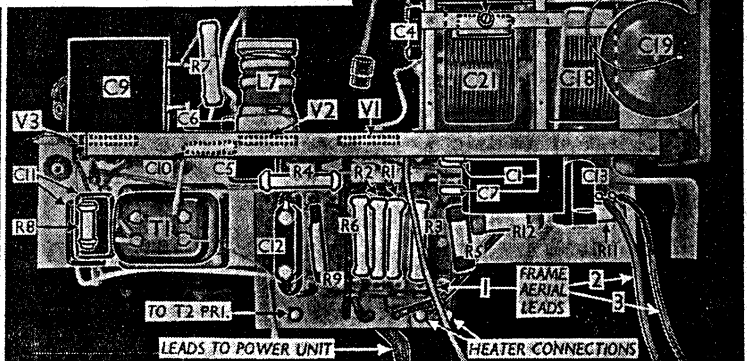
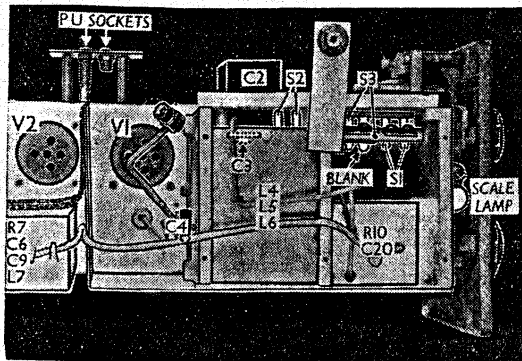
Valve voltages and currents given in the table below are those quoted by the makers. They are approximate values for a receiver with the volume control at maximum, with no signal input, voltages being measured with a high resistance meter, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 AC/SG	172	2.1	50	0.66
V2 AC2/HL	100	5.0	—	—
V3 AC/Pen	190	26.5	205	5.3

Across rectifier MB1 315V, DC.
Across HT secondary winding 194V, AC.
Total HT current 46 mA.

CIRCUIT ALIGNMENT

Since the inductance and trimmer adjustments in the L4-L6 unit are unlikely to get out of adjustment, and can in any case be reset correctly only at the factory, and C19 is a manual control, there is virtually no alignment needed beyond the adjustment of C22 as required.



Plan view (left) of the forward half of the receiver chassis, showing part of the screening compartment for V2 anode circuit components R7, L7, C6, C9, and the waveband switches in another compartment. On the right is a front (speaker side) view of the chassis, with V2 anode circuit compartment screen and the tuning compartment screen removed.