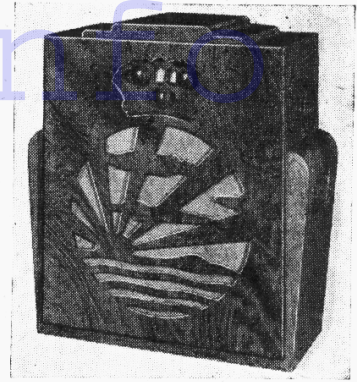


"TRADER" SERVICE SHEET  
719

PYE B4D  
"TWINTRIPLE"



TWIN RF stages and three tuned circuits inspire the title "Twintriple" for the Pye B4D. The receiver is a 4-valve, 2-band TRF portable using a reed-type speaker. Modifications in later models than ours are explained overleaf. The cabinet may have side handles (as illustrated) or a carrying strap.

Release date and original price: 1931; £23 2s., complete.

CIRCUIT DESCRIPTION

Tuned frame aerial input L1, L2, C15, with manual "fine" tuning by C14, to tetrode RF amplifying valve (V1, Mazda SG 215), which operates as a variable-mu type with gain control by variable potentiometer R4 which, with limiting resistor R3, is connected across the GB battery.

Tuned-anode coupling by L3, L4 and C16, via C5, between V1 and a second tetrode RF amplifier (V2, Mazda SG215), whose GB is fixed.

Tuned-anode coupling by L5, L6 and C18, via C9, between V2 and triode valve (V3, Mazda HL210) which operates as an anode bend detector. RF filtering by C10, L7, C11 in anode circuit. Jack-type socket provides for the connection of a gramophone pick-up, and when plug is inserted S4 opens, interrupting the LT supply to V1 and V2 and muting radio.

Transformer AF coupling by T1 between V3 and triode output valve (V4, Mazda P220). Provision for connection for high impedance external speaker which may be used with or without the high impedance reed-type internal

speaker, according to whether S5 is open or closed. Fixed tone correction by C13.

VALVE ANALYSIS

Valve voltages and currents given in the table below are approximations computed from various sources of information. They are based on the assumption that a new 126 V HT battery is used and all HT and GB tappings are as quoted overleaf, with the volume control at maximum and the frame terminals short-circuited, and that a high resistance voltmeter is used.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 SG215	115	2.5	60	0.8
V2 SG215	115	1.2	60	0.4
V3 HL210	110	0.1	—	—
V4 P220	106	4.0	—	—

COMPONENTS AND VALUES

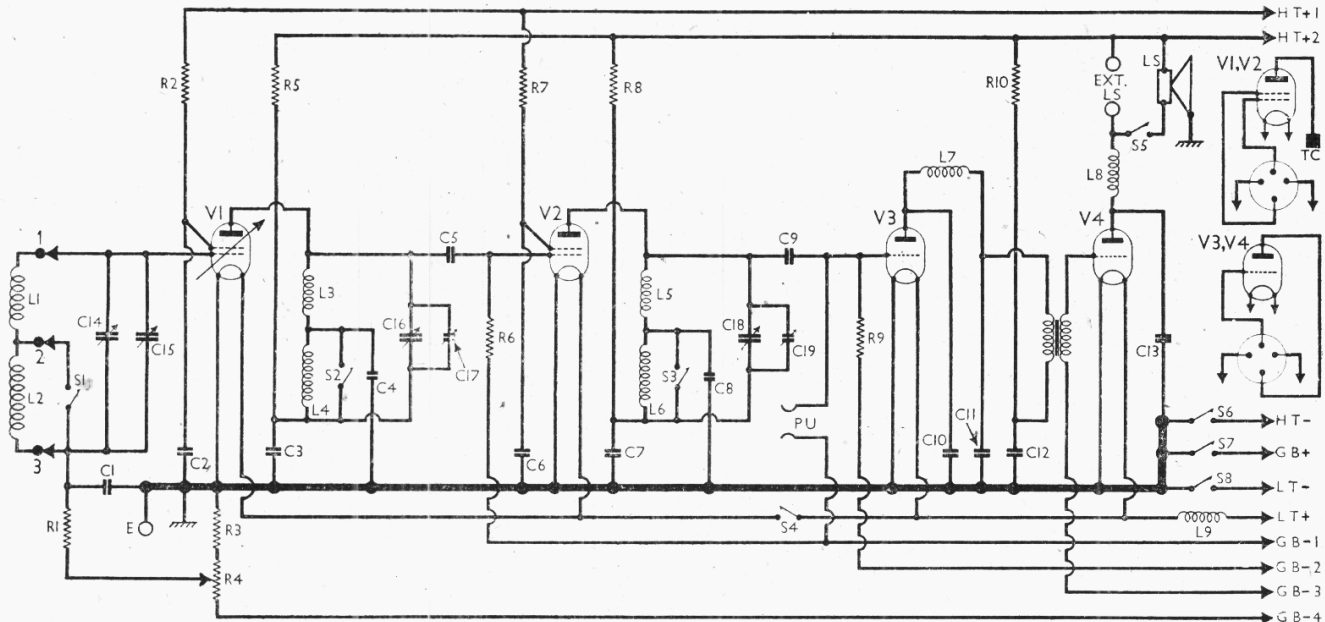
CAPACITORS		Values (µF)
C1	V1 CG decoupling ...	0.25
C2	V1 SG decoupling ...	0.25
C3	V1 anode decoupling ...	0.25
C4	V1 anode LW trimmer ...	0.000018
C5	RF coupling to V2 ...	0.0002
C6	V2 SG decoupling ...	0.25
C7	V2 anode decoupling ...	0.25
C8	V2 anode LW trimmer ...	0.000018
C9	V3 CG capacitor ...	0.0002
C10	} RF filter capacitors {	0.0003
C11		0.0003
C12	V3 anode decoupling ...	1.0
C13	Fixed tone corrector ...	0.002
C14†	Manual trimmer ...	—
C15†	Frame aerial tuning ...	—
C16†	V1 anode circuit tuning ...	—
C17†	V1 anode MW trimmer ...	—
C18†	V2 anode circuit tuning ...	—
C19†	V2 anode MW trimmer ...	—

† Variable. ‡ Pre-set.

RESISTORS		Values (ohms)
R1	V1 CG decoupling ...	1,000
R2	V1 SG decoupling ...	2,000
R3	V1 fixed GB resistor ...	2,000
R4	V1 gain control ...	25,000
R5	V1 anode decoupling ...	2,000
R6	V2 CG resistor ...	2,000,000
R7	V2 SG decoupling ...	2,000
R8	V2 anode decoupling ...	2,000
R9	V3 CG resistor ...	1,000,000
R10	V3 anode decoupling ...	2,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	} Frame aerial windings {	2.0
L2		26.0
L3		3.7
L4	} V1 anode tuning coils {	36.0
L5		3.7
L6	} V2 anode tuning coils {	36.0
L7		380.0
L8	RF filter choke ...	380.0
L9	V4 anode RF choke ...	Very low
L8	LT circuit RF choke ...	2,000.0†
T1	Speaker winding ...	1,000.0
T1	} Intervalve trans. {	Pri. 10,000.0
T1		Sec. —
S1-S3	Waveband switches ...	—
S4	Radio muting switch ...	—
S5	Speaker muting switch ...	—
S6-S8	Battery circuit switches ...	—

† 3,000Ω if V4 is a pentode.



Circuit diagram of the Pye B4D "Twintriple" battery transportable. S4 is operated by the pick-up jack, to mute radio.



**DISMANTLING THE SET**

**Removing Chassis.**—Remove the waveband switch knob (recessed grub screw) from side of case;

remove the metal strut from top right corner at rear inside case (one set-screw to corner of chassis and two wood screws to cabinet); from beneath the wooden shelf supporting the chassis remove two set-screws (with washers) holding chassis to shelf, and remove the cleat (three wood screws) holding the HT battery leads;

from above the chassis, remove two wood screws holding the top flange to the front of the cabinet (this requires a screwdriver with a narrow 7-in. blade);

from the Ext. LS panel, on side of case unsolder the black and red leads from chassis; from the lower (LW) frame unsolder two black leads from chassis, and from the MW frame unsolder the red lead. Unsolder the black speaker earthing lead from the tag beneath the upper chassis section.

To obtain access to all sections of the chassis, several screens, held by a large number of screws and nuts and bolts, must be removed.

When replacing, the centre frame lead goes to the upper tag on the LW frame. The red speaker lead goes to the end of the long speaker socket, with one white lead from the speaker; the black one goes to the tag on the short socket.

Do not omit to replace the felt washer on the speaker adjustment knob if it comes off.

**Removing Frame Aerials.**—First remove chassis as already described;

remove the external speaker panel on side of case (four wood screws with washers) leaving it attached to the two white speaker leads; remove chassis shelf (two wood screws in each end-support);

remove the two door lock catches from side of cabinet;

remove one long round-head wood screw from each corner-block on the frame.

The complete frame may now be eased out, care being exercised to avoid damaging the windings.

**Removing Speaker.**—Remove frames as already described;

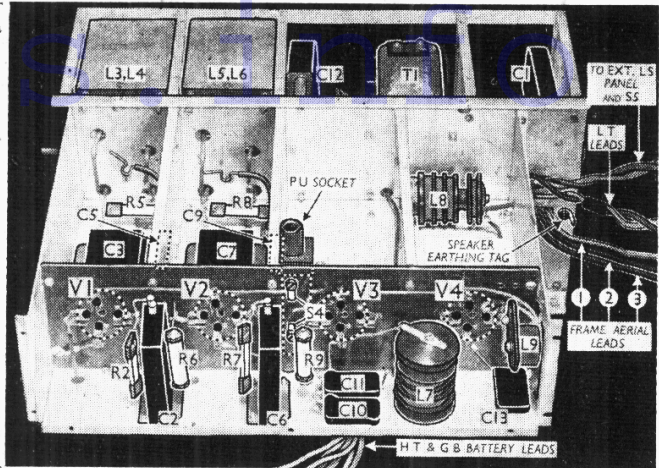
free the three brass strips (one wood screw each) and the speaker adjustment gear (one longer wood screw) from front of case; free the leads from the two cleats (two wood screws each) on front of case.

**GENERAL NOTES**

**Switches.**—S1-S3 are the waveband switches, and S6-S8 the battery switches, ganged together in a three-position assembly distributed along the upper deck of the chassis. S1-S3 close on MW only, and S6-S8 open in the "off" position only.

S4 is a separate LT switch feeding the filaments of V1 and V2, and forms part of the jack-type pick-up adaptor. When the

Three-quarter under-chassis view from rear, after removing all outer screens, the lowest of which carries the E socket. The frame aerial leads are numbered to agree with the circuit diagram.



pick-up plug is inserted, S4 opens to mute radio. S5 is another jack-type switch, associated with the external speaker sockets. It opens only when the plug is pushed right home.

**Coils.**—L1, L2 are the frame aerial windings, on a two-section frame mounted in the front of the cabinet. The smaller section has the LW winding. L3, L4 and L5, L6 are V1 and V2 anode tuning coils, in screened containers in the upper section of the chassis. A damping adjustment in the tops of the cans is set at the works and should not be disturbed. The waveband switches S2 and S3 run beneath the cans.

**External Speaker.**—A twin-socket plug is provided on the side of the cabinet for the connection of a high-impedance (about 12,000 Ω) external speaker, to which is attached a special plug to operate the internal speaker muting switch. When the plug is half-way in, both speakers operate; when the plug is pushed right home, S5 opens to mute the internal speaker.

**Trimmers C4, C8.**—These consist each of a small metal disc with radial slots in it which can be made to register or otherwise with slots in the metal platform to which they are held by a central screw.

Thus, if the disc is turned, the capacitance is varied, but since any adjustment must be carried out with the screen off, this is done with special instruments at the works, and should not require subsequent adjustment, so that it may be regarded as fixed.

**Batteries.**—Accumulator: 2 V, 40 AH celluloid non-spillable; HT: 126 V; GB: 9 V.

**Battery Leads and Voltages.**—Two leads emerging from the chassis over the accumulator compartment are provided for the accumulator. The HT and GB leads are all red (positive) or black (negative) and they emerge in a bundle beneath the chassis shelf. If the marked plugs become detached from the leads, therefore, continuity tests will have to be made to identify the leads.

The voltages are as follows: HT positive 1, 60 V; HT positive 2, 126 V; GB negative 1, -1.5 V; GB negative 2, -4.5 V; GB negative 3, -4.5 or -6 V as required; GB negative 4, -9 V. The GB -3 plug has a socket in it to take a second plug if needed.

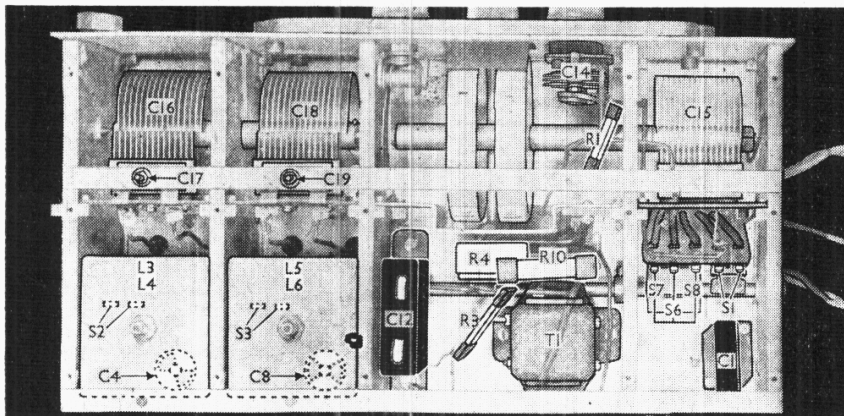
**Chassis Divergencies.**—Originally, the P220 was standard for the output valve, but the user was recommended to use a P240 to improve the performance, at the expense of a 25 per cent. reduction in HT battery life. GB -3 tapping then went to -9 V.

Later, a pentode valve (Mazda Pen 220) replaced the triode. The resistance of the speaker winding in such cases is 3,000 Ω instead of 2,000 Ω, and GB -3 plug goes in the -3 V socket. The external speaker impedance becomes 20,000-30,000 Ω. The pentode screen HT feed is brought out to a separate HT plug marked HT +2, which goes into an HT battery socket between 90 V and 105 V, according to desired HT current economy. The 126 V tapping therefore becomes HT +3.

Another alteration introduced later was to return the earthy ends (rotors) of C14, C15, C16 and C18 directly to chassis.

**CIRCUIT ALIGNMENT**

As the adjustments at the tops of the RF coil cans and trimmers C4, C8 cannot be reset without special instruments, there remain only the two trimmers C17 and C19 to set. These should be adjusted for maximum output at 200 m (1,500 kc/s). C14 is adjusted by a control knob as required by the user.



Plan view of the top deck. S1, S2 are beneath the RF coil cans, and C4, C8 are inside the cans. S6, S7, S8 all return to chassis, although this is not shown.