

"TRADER" SERVICE SHEET
1360

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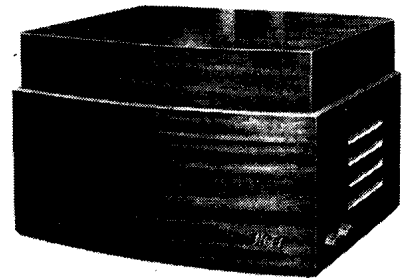
PYE BLACK BOX

High-quality Record Reproducer

DESIGNED as a high-quality table record reproducer, the Pye "Black Box" has been produced in several versions since it was originally marketed in March, 1954. Two of the early versions are covered in this *Service Sheet*, which was prepared from a sample of the Mark 2 version. This may be distinguished from the earlier version by the use of an ultra-linear push-pull output stage.

There are four models in each version. Model B.B.H. has a plain dark cabinet and an auto-changer; B.B.H.S. is similar but it has a single record player; B.B.H.C. is like the B.B.H. but it is housed in a Chinese lacquered cabinet; and B.B.H.C.S. is the lacquered model with a single record player.

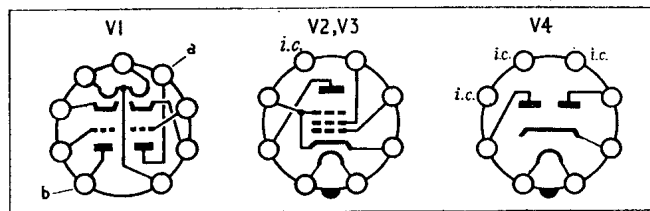
There is an export version of these models, but it is similar except for a tapping at 100V on the mains transformer primary. With this exception, all those



Resistors			Capacitors			Other Components*				
R1	1MΩ	C3	R14	470Ω	D3	T1	1,600·0 (total)	B2		
R2	1MΩ	C3	R15	100kΩ	C3				a	—
R3	39kΩ	C3	R16	27kΩ	C4				b	—
R4	100kΩ	C3	R17	10kΩ	C3				c	—
R5	1·8kΩ	C3	R18	1kΩ	D3	d	—			
R6	1·8kΩ	C3	Capacitors			T2	200·0 200·0 — 50·0	A2		
R7	220kΩ	C3	C1	0·002μF	C3				a	—
R8	2·2MΩ	C3	C2	0·04μF	C3				b	—
R9	†57kΩ	C4	C3	0·01μF	C3				c	—
R10	4·7kΩ	C4	C4	12μF	A1	d	—			
R11	†57kΩ	C4	C5	0·005μF	C3	S1	—	D3		
R12	1MΩ	D3	C6	0·005μF	C4	L1	3·0	—		
R13	1MΩ	C4	C7	25μF	A1	L2	3·0	—		
						Pilot lamp, 6·3V, 0·3A.				

*Approximate D.C. resistance in ohms.

†May be from 47kΩ to 68kΩ. High stability.



Diagrams of the valve base connections as seen from the free ends of the valve pins.

covered are designed to operate from A.C. mains only of 200-250V. There are later versions of the Black Box which are not covered in this *Service Sheet*.

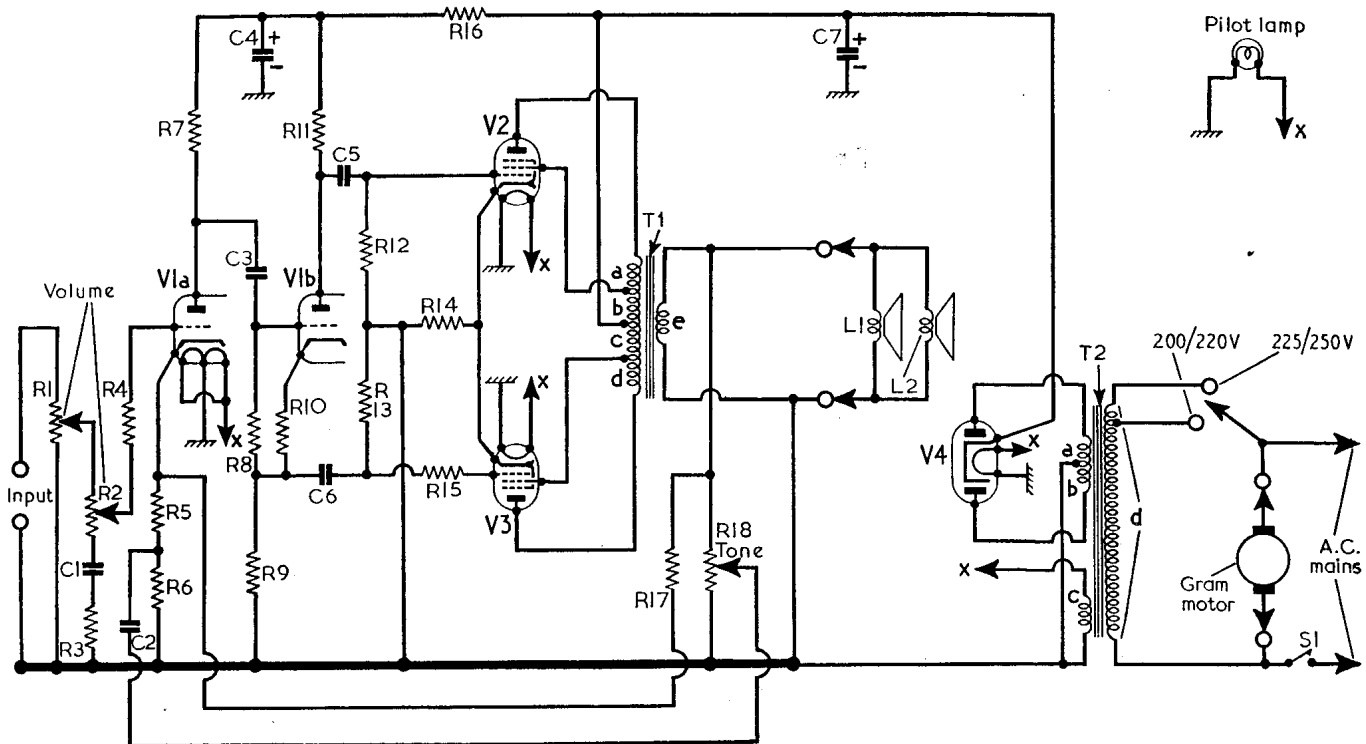
Release dates and original prices, both versions: B.B.H., March 1954, £31 0s 1d; B.B.H.S., September 1954, £29 8s 3d; B.B.H.C., March 1954, £50 1s 8d; B.B.H.C.S., September 1954, £48 9s 10d. Purchase tax extra.

CIRCUIT DESCRIPTION

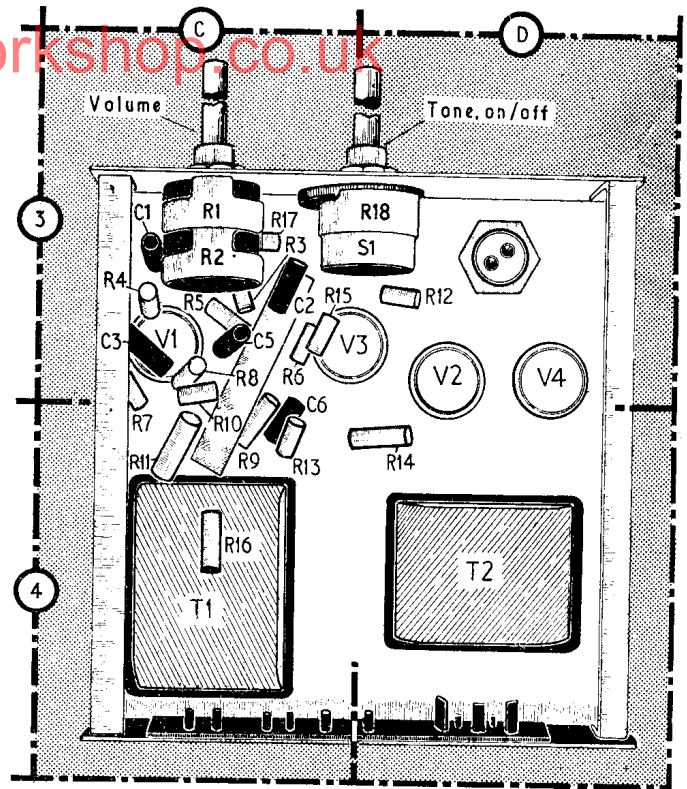
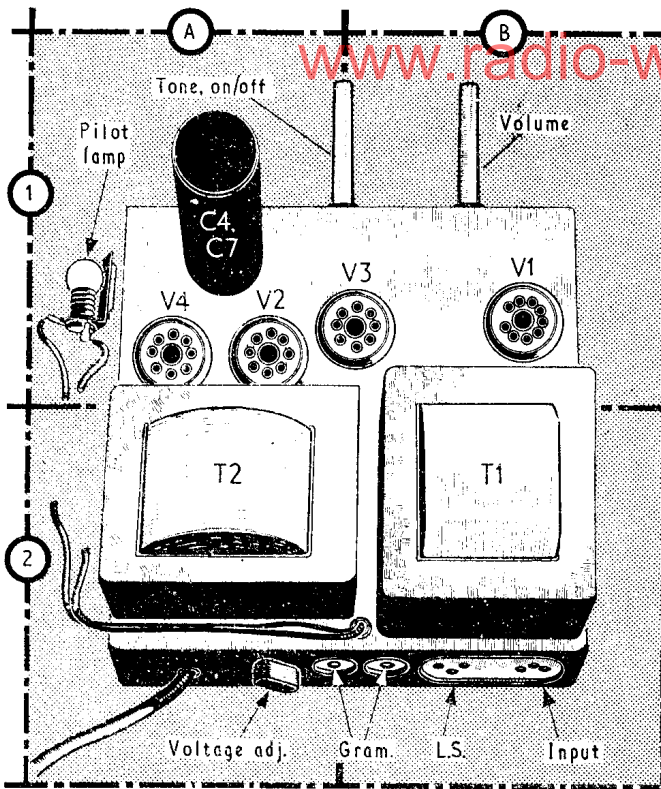
Output of crystal pick-up is developed across volume control R1, and fed via R4 to the control grid of V1a, which operates as a pre-amplifier. R2 is ganged with R1 and together with C1, R3 forms a tone compensated volume control circuit.

The amplified output of V1a is de-

(Continued overleaf col. 1)



Circuit diagram of the Pye Black Box, Mark 2. For variations in the earlier version see "Chassis Divergencies" overleaf, col. 1.



Plan view of the amplifier unit. This unit is fixed by four screws through the base of the cabinet. The pilot lamp flood-lights the table on which the instrument stands.

Illustration of the underside of the amplifier unit. The control knobs are situated on the right side of the cabinet as shown in our picture overleaf.

Circuit Description—continued

veloped across R7 and fed via coupling capacitor C3 to the control grid of V1b, which operates as a cathode follower phase splitter, with negative current feedback through R9.

Signals of opposite polarity are developed across R11, R9 and fed via coupling capacitors C5, C6 to the control grids of pentode output valves V2, V3, which operate in an ultra-linear push-pull output circuit. Coupling to dual speakers L1, L2 via output transformer T1. Negative voltage feedback via R17, R18, R5, R6 and C2, with R18 employed as tone control.

H.T. current is supplied by full-wave I.H.C. rectifying valve V4. Smoothing by C7, R16 and C4.

CHASSIS DIVERGENCIES

In the early version of this record reproducer, power output valves V2 and V3 are triode-connected and a conventional centre-tapped push-pull output transformer T1 is employed.

R14 is 560Ω, and a 0.01μF capacitor is connected in parallel with R17.

R5 is omitted, and R6 is 4.7kΩ. C2 and R17 are connected to V1a cathode.

R2 is omitted, and C1 is connected to a tapping on the volume control R1. R3 is 15kΩ, and C1 is 0.01μF.

STYLUS REPLACEMENT

Replacement of pick-up stylus (auto-change model).—The procedure for changing styli is as follows: Lift the pick-up arm vertically from its rest to the fullest extent, taking care not to

strain the arm in any way. With the forefinger ease the stylus up free of the plastics front locating groove; grip the stylus between thumb and forefinger, and gently pull with an upward and outward movement. Do not use force to free it from the plastics anchoring pad at the rear, or the centre hole will be enlarged.

Insert the new stylus through the hole in the rear pad, taking care to ensure that the stylus is seated well down in both the rear pad and the front locating groove.

No attempt should be made to interfere with the crystal cartridge.

Replacement of stylus (single player model).—The procedure for changing styli is as follows: select the stylus to be renewed and detach the crystal pick-up head, which is the plug-in type. L represents LP records (33½ and 45 r.p.m.) and N Normal or Standard records (78 r.p.m.).

The stylus is screwed to the crystal cartridge by a small screw, and this should be removed with a suitable screwdriver.

Hold the pick-up head firmly between thumb and forefinger (with the selector knob pointing outwards) and place the thumbnail under the head of the stylus. Lever up the head of the stylus so that it is free of the plastics support and with a steady pull in an outward direction release the square tail of the stylus. Care must be taken to avoid applying any undue pressure to the plastics support. It is most important that the two claws close over each side of the plastics support. The tail should now be gently pressed

downwards into the cavity provided and the screw replaced.

No attempt should be made to interfere with the crystal cartridge.

VALVE ANALYSIS

Valve voltages and currents given in the first table are those derived from the manufacturers' information for the Mark 2 record reproducer. They were measured with a Model 8 Avometer, chassis being the negative connection in every case. The record reproducer was operating from A.C. mains of 235V with the mains adjustment set at the 225-250V tapping.

Mark 2 Version

Valve	Anode		Cath.	
	(V)	mA	V	
V1 ECC83	a	140	0.5	1.35
	b	236	0.4	26.0
V2 EL42		270	16.0	17.6
V3 EL42		270	16.0	17.6
V4 EZ41		250 ¹	—	280.0 ²

¹ Each anode, A.C.

² Cathode current 37mA.

The table below gives valve readings for the earlier model.

Valve	Anode		Cath.	
	(V)	(mA)	(V)	
V1 ECC83	a	177	0.32	1.8
	b	235	0.46	33.0
V2 EL42		270	16.0	18.4
V3 EL42		270	16.0	18.4
V4 EZ41		250 ¹	—	280.0 ²

¹ Each anode, A.C.

² Cathode current 33mA.