

"TRADER" SERVICE SHEET

641

MULLARD VALVE REPLACEMENT GUIDE

THE tables below and overleaf are those published by The Mullard Wireless Service Co., Ltd., as a guide to dealers as to what Mullard valves are recommended as emergency substitutes for other Mullard valves which are unobtainable.

The makers wish to make it clear that the substitute suggested is not necessarily guaranteed to give precisely the same service as the original, but that the recommendations are offered with the object of keeping receivers going during difficult periods. They point out that the variety of equipment, in any case, makes it impossible to give any guarantee as to performance, and also that the recommendations are subject to local conditions. The right is reserved to make additions and alterations to the recommendations without notice.

The valves for which replacements are recommended are arranged in alphabetical and numerical order throughout in the first column of the tables, the second column giving a code letter for its basing. The recommended substitute is given in

the third column, and its base code letter in the fourth column. An asterisk against a valve in the first column indicates that no substitute is recommended. The fifth column is devoted to hints as to modifications required upon substitution, including the pin numbers of the electrodes of the new valve where a change of holder or wiring is necessary.

The base associated with the code letter is obtained from the list in col. 3. Only five of these are to be found in the whole list of recommended substitutes, and diagrams of these appear at the foot of the tables overleaf, showing the pin numbers in each case. These are the numbers referred to in the remarks column of the tables, where the associated electrode is indicated immediately beneath the pin number to facilitate re-wiring. "TC" indicates a top cap connection.

The electrode concerned is represented by a code of symbols, and a list of these appears also in col. 3. The service sheets referred to in one or two cases under "Remarks" are special publications obtainable from the manufacturers.

TYPE OF BASE

- A - British 4-pin
- B - Continental 6-pin
- C - Continental 7-pin
- E - American 7-pin
- G - American 4-pin
- H - British 3-pin
- Hlv - Midget deaf-aid
- J - American 6-pin
- K - American Octal
- M - British 7-pin
- N - Continental 5-pin
- O - British 5-pin
- P - British 8 side-contact
- R - British 9-pin
- V - British 5 side-contact
- W - Continental 5-pin
- ES - Edison Screw

ELECTRODE SYMBOLS

- A, A1, A2 - Anodes
- Ao - Oscillator Anode
- D, D1, D2 - Diode Anodes
- F - Filament
- H - Heater
- G - Grid (Grids marked G1, G2, etc., G1 being nearest the cathode)
- Go - Oscillator grid
- K, K1, K2 - Cathodes
- M - Metallising
- S - Screen

ORIGINAL TYPE	BASE	SUBSTITUTE TYPE	BASE	REMARKS
AC054	A	AC044	A	
AC064	A	AC044	A	Redesign circuit. There is no valve which will directly replace these valves, and full working conditions of the AC044 should be studied before substitution is made.
AC084	A	AC044	A	
AC084N	A	AC044	A	
AC104	A	AC044	A	
AZ2	P	DW4/500	A	No circuit change. DW4/500 - Va 500, Ia 120 mA Pin No: 1 2 3 4 Connection: A A F F
AZ3	P	IW4/350	A	No circuit change. Pin No: 1 2 3 4 Connection: A A F F
AZ32	K	DW4/500	A	No circuit change. Pin No: 1 2 3 4 Connection: A A F F
AZ33	K	IW4/350	A	No circuit change. Pin No: 1 2 3 4 Connection: A A F F
CL6	P	CL4	P	Change bias resistance to 170Ω Raise Vg2 to 200 v.
CL36	K	CL4	P	As above. Pin No: 1 2 3 4 5 6 7 8 TC Conn: - H H K& - - G2 A G1 G3
CY2	P	UR3C	M	No circuit change. Pin No: 1 2 3 4 5 6 7 Connection: - A1 K1 H H K2 A2
CY32	K	UR3C	M	No circuit change. Pin No: 1 2 3 4 5 6 7 Connection: - A1 K1 H H K2 A2

(Continued next column)

ORIGINAL TYPE	BASE	SUBSTITUTE TYPE	BASE	REMARKS
D025	A	D026	A	Add series filament resistance 1Ω 10 watts, no further change.
DW30	A	DW4/500	A	Add series filament resistance of approx. 1.7Ω, 10 watts, no further change.
DW4/350	A	DW4/500	A	No change.
EAB1	P	EB34	K	Redesign circuit. See service sheet.
EB4	P	EB34	K	No circuit change. Pin No: 1 2 3 4 5 6 7 8 Connection: M&S H D1 K1 D2 H K2
*EBF1	P			
*EBF2	P			
*EBF32	K			
ECH2	P	ECH3	P	No change. ECH3 If 0.2A.
ECH33	K	CCH35 ECH35	K	For AC/DC Receivers—CCH35. For A/C Receivers—ECH35.
EFM1	P	EF9	P	Redesign circuit } See special without tuning indicator. } service sheet.
EH2	P	ECH3	P	Use Hexode section only in extreme cases.
EK3	P	EK2	P	Raise screen volts to 200. EK2 If=0.2A.
EL5	P	EL35	K	EL35 Vg2 250 v max. Change bias resistance to 180Ω. Pin No: 1 2 3 4 5 6 7 8 Connection: - H A G2 G1 - H G3 &K
EL6	P	EL35	K	EL35 Vg2 250v max. Change bias resistance to 180Ω. Pin No: 1 2 3 4 5 6 7 8 Connection: - H A G2 G1 - H G3 &K

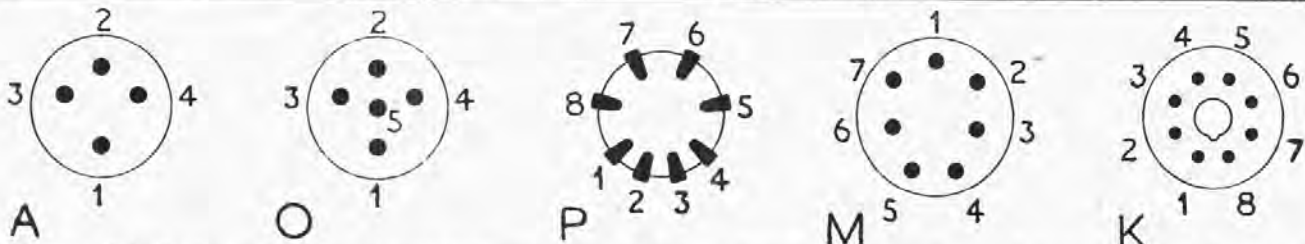
(Continued overleaf)

\* No recommended substitute.

ORIGINAL TYPE	BASE	SUBSTITUTE TYPE	BASE	REMARKS	ORIGINAL TYPE	BASE	SUBSTITUTE TYPE	BASE	REMARKS
EL36	K	EL36	K	EL36 Vg2 250v max. Change bias resistance to 180 Ω.	*8D20	M	—	—	—
*EM1	P	—	—	—	*8G20	O	—	—	—
*EM2	P	—	—	—	*8P20	O	—	—	—
*EM3	P	—	—	—	SP40	P	SP4B	M	No circuit change. Pin No: 1 2 3 4 5 6 7 TC Connection: M A G3 H H K G2 G1
*EM4	P	—	—	—	84V	A/O	84VB	O	No circuit change. Pin No: 1 2 3 4 5 TC Connection: G2 G1 H H K A
*EZ2	P	—	—	—	84VA	O	84VB	O	No change.
*EZ3	P	—	—	—	TDD2	O	TDD2A	O	Change grid bias to -1.5 volts. Not suitable as Class B driver.
*HL20	O	—	—	—	TDD13	P	TDD13C	M	No circuit change. Pin No: 1 2 3 4 5 6 7 TC Connection: D1 M D2 H H K A G1
IW3	A	IW4/350	A	No change.	TH4A	M	TH4B	M	No change.
MM4V	O	84VB	O	No change. Volume control will not be so gradual in operation.	*TH13C	M	—	—	—
Pen4V	O	Pen4VA	O	Change Grid bias to -22 volts. No change with automatic bias.	TH22C	M	TH30C	M	No change.
Pen4VB	M	PenA4	M	No change.	TH62	K	CCH35 ECH35	K	For AC/DC Receivers CCH35. For AC Receivers ECH35. No change.
*Pen13	P	—	—	—	TT4A	O	TT4	O	Change bias to -10.0v. Anode load 10,000 Ω.
*Pen13C	M	—	—	—	*TV4	P	—	—	—
*Pen20	O/M	—	—	—	*TV4A	P	—	—	—
Pen28	P	CL4	P	Change bias resistance to 170 Ω. CL4 Vg2-200 volts.	*TV6	P	—	—	—
PM1A	A	PM2HL	A	No change.	UR1	P	GY1	P	No change.
PM1HF	A	PM2HL	A	No change.	UR2	P	UR3C	M	No circuit change. Pin No: 1 2 3 4 5 6 7 Connection: - A1 K1 H H K2 A2
PM1HL	A	PM2HL	A	No change.	UR3	P	UR3C	M	No circuit change. Pin No: 1 2 3 4 5 6 7 Connection: - A1 K1 H H K2 A2
PM1LF	A	PM2HL	A	Change grid bias to -1.5 volts.	VM4V	O	84VB	O	No change. Volume control will not be so gradual in operation.
PM2	A	PM2A	A	Change grid bias to -6.0 volts.	*VM20	O	—	—	—
PM2DL	A	PM2DX	A	No change.	*VP20	O	—	—	—
*PM4	A	—	—	—	054V	O	AC004	A	Redesign circuit.
*PM4DX	A	—	—	—	*2D2	O	—	—	—
PM12	A	PM12M	A	Raise Vg2 to 90 volts.	2D4	O	2D4A	O	No circuit change. Pin No: 1 2 3 4 5 Connection: D2 D1 H H K 2D4A has no top cap.
PM12A	A	PM12M	A	Raise Vg2 to 90 volts.	2D13	V	2D13C	O	No circuit change. Pin No: 1 2 3 4 5 Connection: D2 D1 H H K
*PM13	A/O	—	—	—	104V	O	TT4	O	Anode load 10,000 Ω.
PM22	A/O	PM22A	A/O	Change grid bias at Va = Vg2. 135 volts to -4.5 volts, and anode load to approx. 19,000 Ω.	154V	A†	164V	O	No circuit change. Pin No: 1 2 3 4 5 Connection: A G1 H H K
PM24	A/O	PM24A	O	Pin No: 1 2 3 4 5 Connection: A G1 H H K G2 No circuit change.	484V	O	354V	O	Change grid bias to -4.5 volts or bias resistance to 700 Ω.
PM24B	O	PM24M	O	Redesign circuit. PM24M, Va = Vg2 = 250v. max.					
PM24C	O	PM24M	O	Redesign circuit. PM24M, Va = Vg2 = 250v. max.					
*PM25	A/O	—	—	—					
*PM26	O	—	—	—					
PM202 } PM252 }	A	PM2A	A	Anode load = 7,000 Ω. Change bias to -6.0v.					
SD4	M	TDD4	M	Redesign circuit. See service sheet. (Continued next column)					

\* No recommended substitute.

† Cathode connected to side terminal.



Diagrams of the five bases concerned, viewed from the free ends of the pins, showing the pin numbers as they appear under "Remarks."