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VALVE TESTER, TYPE 4

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[Signature]

AIR MINISTRY

VALVE TESTER, TYPE 4

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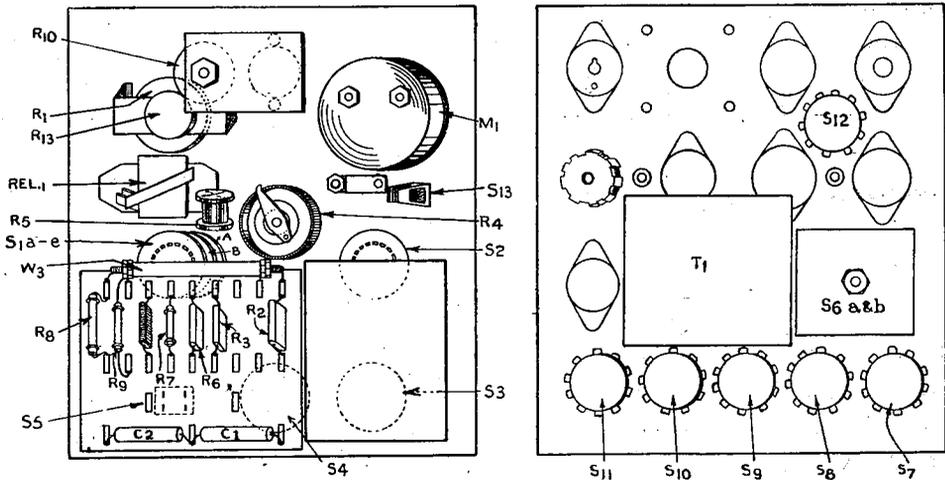
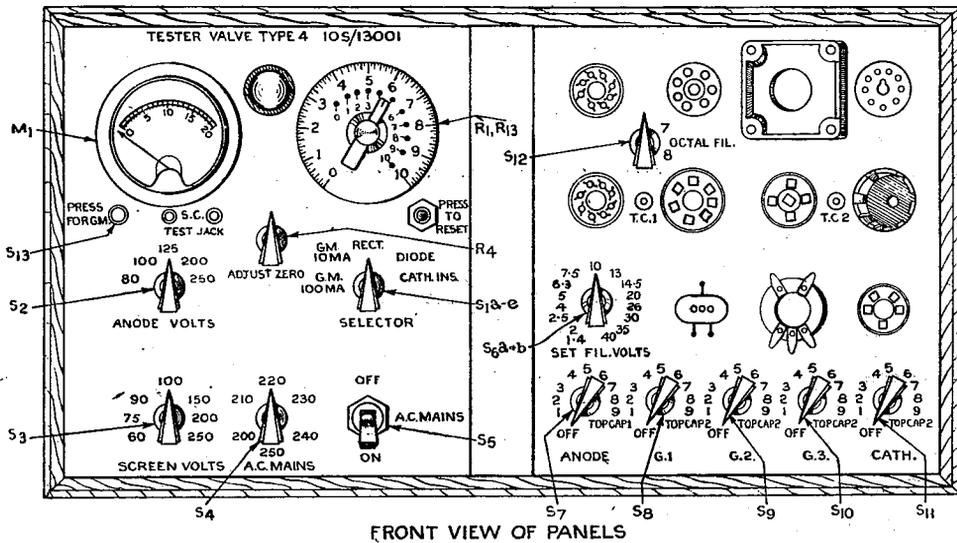


Fig. 1.—Front and rear views of panels

VALVE TESTER, TYPE 4

(Stores Ref. 10S/13001)

Introduction

1. The valve tester, type 4, has been designed to measure the mutual conductance (i.e. goodness) of valves, the emission of H.T. rectifiers and diodes, and also heater-cathode insulation of indirectly heated valves. The mutual conductance (Gm) may be measured at the following anode, screen and heater potentials:—

<i>Anode voltage</i>	<i>Screen voltage</i>	<i>Heater voltage</i>	
80	60	1.4	13.0
100	75	2.0	14.5
125	90	2.5	20.0
200	100	4.0	26.0
250	150	5.0	30.0
	200	6.3	
	250	7.5	35.0
		10.0	40.0

2. The instrument is entirely A.C. mains operated and an overload relay is connected in the mains input circuit as a precautionary measure. This relay switches off the mains to the valve tester in the event of the tester being seriously mishandled.

3. Provision is made for testing valves fitted with the following bases:—

British 4 and 5 pin; British 7 pin; British octal; UX medium 5 pin; UX medium 7 pin; International octal; Eight pin side contact for EF8 valves; Large British 4 pin; British 9 pin; Acorn holder; Diode holder.

A test for interelectrode shorts is also included.

4. The valve tester comprises two units which are housed in a substantial wooden case. General views of the tester are given in fig. 1.

GENERAL DESCRIPTION

5. A theoretical circuit diagram of the valve tester is shown on pages 14 and 15, in fig. 4. All the supplies to the particular valve under test are alternating and are provided by the mains transformer T_1 ; the appropriate voltages being selected by the switches S_{1A} , S_2 , and S_3 . The design of the instrument is such that the mutual conductances measured at the stated voltages are the same as would be obtained if the supplies were D.C.

6. The emission of rectifiers and diodes is measured at 100 volts and the meter M_1 is calibrated to indicate the correct emission at this D.C. voltage, minus the voltage drop across R_6 or R_7 , as the case may be. The resistances R_6 and R_7 are current limiting resistances connected in the anode circuit of the rectifier and diode valves respectively, to prevent damage to the valve through excessive emission.

7. The heater cathode insulation of valves is also measured at 100 volts D.C.

Principle of measurement of mutual conductance

8. Reference should now be made to the simplified theoretical diagram in fig. 2 by which mutual conductance measurement in this valve tester may be most easily understood.

9. All supplies to the valve under test are alternating voltages. The front of the measuring panel carries engraved knobs to enable correct anode and screen voltages to be selected. These voltages are chosen so as to give a reading of mutual conductance that would be obtained with the same D.C. supplies, i.e. the voltages shown are peak voltages and not r.m.s.

10. With the anode positive cycle, the grid of the valve is made slightly negative with respect to its cathode by the voltage which is induced into the secondary winding C of the transformer T₁. This voltage is applied to the grid of the valve via S₁₃ and the resulting unidirectional anode current is indicated on the meter M₁. This meter deflection is balanced out by the variable resistance R₄ which feeds a current of opposite sign from the T, transformer winding B to the meter and enables the meter deflection to be reduced to zero.

11. The Gm switch S₁₃ is then closed by pressing a button, thus making the grid positive in voltage with respect to the cathode and causing an increase in anode current. At the same time the circuit R₂, R₁ is connected to the anode. The increased anode current reading is again balanced to zero by varying R₁, which applies an equal and opposite current to that producing the meter deflection. The mutual conductance is read directly from a scale calibrated in milliamperes per volt on the variable resistance R₁.

12. It can be shown that the mutual conductance is determined by the voltages e₁, e₂ and the resistance R₂ in the following relationship:—

$$\text{Gm in milliamperes per volt} = \frac{e_1}{e_2} \times \frac{1000}{R_2}$$

Since the measurement depends on the ratio $\frac{e_1}{e_2}$ and not on their absolute value, this measurement is independent of the mains voltage and variations from this source do not affect the calibration. The anode current read on the meter is arbitrary as the wave form depends on the characteristics of the valve under test.

Heater-cathode insulation test circuit

13. A simplified theoretical circuit diagram of the heater-cathode insulation test circuit is shown in fig. 3. A source of 100 volts, which is rectified by the metal rectifier W₀, is applied across the heater and cathode of the valve under test, through the 1-megohm resistance R₀.

14. The D.C. flowing through R₁₃ produces a potential across the grid of the magic eye indicator V₁. The value of this potential is controlled by the setting of R₁₃. With a short circuit from the valve heater to the cathode, the circuit resistance is 1 megohm and this is designated 0 on the scale of R₁₃. The resistance R₁₀ is made variable (pre-set adjustment), to cover variation in the sensitivity of the magic eye and is adjusted so that with the heater-cathode short circuited,

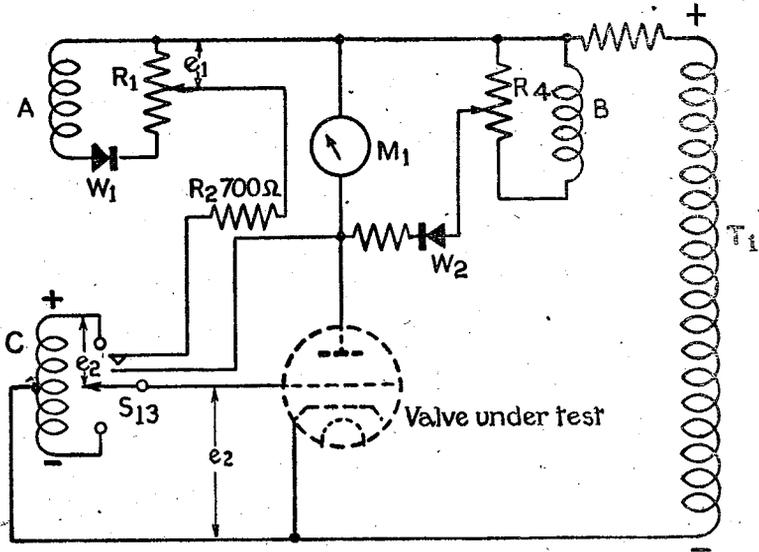


Fig. 2.—Circuit for measurement of mutual conductance

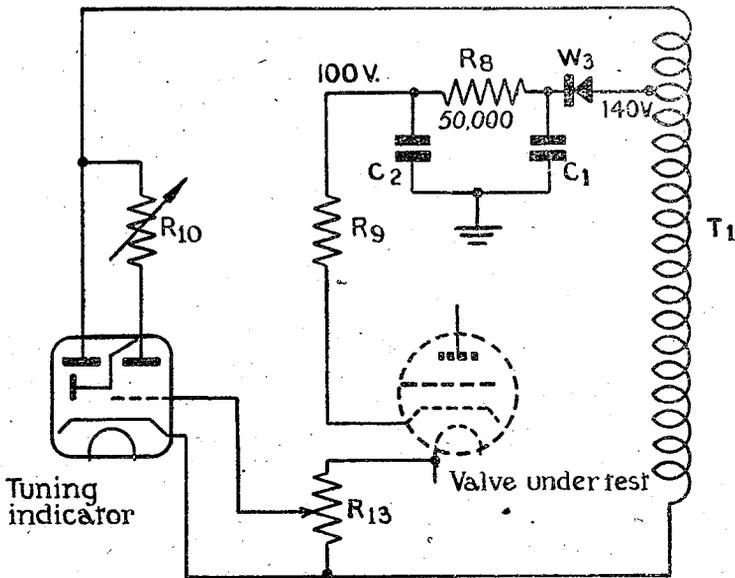


Fig. 3.—Cathode insulation test circuit

the dial reads zero. With higher values of heater-cathode resistance the current through R_{13} will be less, thus it will be necessary to increase the setting of R_{13} to obtain the same grid potential. This potential is chosen so as to just close the magic eye.

Switches and valve holders

15. The mutual conductance measurement circuit is connected to the anode of the valve under test by means of the switches S_{1A} , S_{1B} , and S_{1C} . The switches S_2 and S_3 select the anode and screen voltages respectively and S_{13} reverses the phase of voltage induced in winding L_3 (e_2) which is applied to the control grid of the valve.

16. The heater-cathode test circuit is connected to the appropriate valve via the switches S_{1D} and S_{1E} and when this circuit is in use the switches S_{1A} to S_{1E} will be in position 5, thus open-circuiting the Gm circuit.

17. The switches S_7 to S_{11} introduce either the mutual conductance or cathode test insulation circuits to the appropriate valve holder, the correct combination of switch settings being given in the appendix at the end of this publication.

18. Certain types of international octal valves have one side of their heaters connected to pin 8 instead of pin 7. To provide for this, the switch S_{12} connects one side of the valve tester heater wiring to pin 7 or pin 8, as required. This switch also changes over the valve tester cathode line to pin 8 or pin 7, whichever is not in use for the heater.

CONSTRUCTIONAL DETAILS

19. This valve tester, of which an illustration is shown in fig. 1, is conventional in construction. It comprises two units mounted in a wooden case. The left-hand panel accommodates the mutual conductance and cathode-heater test circuits, associated switching and the mains transformer T_1 which provides the test potentials for these circuits. The right-hand panel has mounted on it, the various test valve holders and also the switches S_7 to S_{12} . These switches connect the required test circuit to the appropriate valve holder. The tapped filament transformer T_2 is mounted on the underside of the panel and the switches S_{8A} and S_{8B} apply the required filament voltage to the valve under test.

OPERATION

20. These operational instructions should be used in conjunction with the front panel illustration in fig. 1. Set the main adjusting switch S_4 to the correct voltage and connect the valve tester to the mains. The mains supply should be between 200 and 250 volts, 40 to 100 cycles. Switches for the anode, screen grid, control grid, suppressor grid and cathode are provided, to enable correct connection to be made to any of the valve holders fitted. The appropriate switch should be set, in accordance with the information given in the appendix to the correct valve pins of the valve under test. Always set the switches to the positions listed in the Appendix before inserting the valve.

21. After having inserted the valve in the appropriate valve holder, a period of approximately one minute should be allowed to elapse before taking readings. This will allow the valve to reach stable operating conditions.

Mutual conductance test

22. (i) Set the filament switch S_{6a-b} to the heater voltage of the valve under test and set the selector switch S_{1a-e} to **Gm 100mA**.
- (ii) If it is known that the emission of the valve to be tested is less than 10mA, the switches S_{1a-e} may be set to the **Gm 10mA** position.
- (iii) Balance out the resulting meter reading by means of the balance control R_4 . This adjustment should be carefully made and the meter pointer brought back to zero.
- (iv) The key engraved **PRESS FOR GM** (S_{13}) should be pressed and the meter M_1 deflection balanced out by means of the pointer marked R_1, R_{13} . The reading given on this dial (outer scale) is the mutual conductance of the valve under test. Since the mutual conductance of the valve varies with the anode and screen voltages, ascertain that the test is made at the correct test voltage.

Heater-cathode insulation test

23. The heater-cathode insulation tests are effected as described below:—
 - (i) Set the selector switch (S_{1a-e}) to the position marked **CATH. INS.**
 - (ii) Slowly rotate the pointer R_1, R_{13} from zero, until the magic eye indicator V_1 just closes. This point should be carefully checked until experience is gained in operating this control.

The value indicated on the inner scale, by the pointed R_{13} , is the heater-cathode resistance in megohms. No change in the magic eye indication occurs if the pointed R_1, R_{13} is turned past the correct point and the correct position is when the magic eye just closes.

Rectifier and diode emission test

24. Rectifier and diode valves may be tested for emission as described below:—

- (i) Set the selector switch S_{1a-e} to either the **RECT** or **DIODE** position.
- (ii) The emission of the valve is then read directly from the meter M_1 scale. (20mA full scale for diodes and 200mA full scale for rectifiers.)

In full wave rectifiers the emission of each anode is measured in turn by moving the anode switch S_7 to the appropriate valve pin.

25. A relay is connected in the anode and screen circuits to protect the instrument from damage through incorrect handling. The small protruding knob marked **PRESS** to **RESET** should be level with the panel and, if for any reason the relay trips, the knob will project about $\frac{3}{16}$ in. above the panel. The relay is reset by pressing this knob down.

Short-circuit test

26. Two sockets are provided below the meter on the panel. If test prods are inserted in these sockets the cathode circuit of the magic eye indicator is opened and brought out to the test leads. The leads can be used for short-circuit testing

by setting the selector switch to CATH. INS., setting S_8 and S_{11} both to 2, and other switches to OFF, and adjusting R_1 , R_{13} so that the magic eye just closes when the test leads are being short-circuited together.

SERVICING

27. Apart from keeping the switch contacts clean and valve pins in good order, it is unlikely that any other form of servicing will be required. The switches are of the self-cleaning type and should not be interfered with unless they prove erratic in operation. If this occurs, they may be cleaned with a brush and if necessary reset to increase the contact pressure.

28. The magic eye indicator forms part of the measuring circuit for heater-cathode insulation and if it is necessary to replace it, the calibration should be checked. This is undertaken by short-circuiting the heater and cathode pins and rotating the pointer R_{13} to the point marked 0. At the rear of the panel will be found a variable resistance R_{10} with a saw cut across the spindle. This spindle should be adjusted until the eye just closes.

29. This adjustment may be checked by connecting a resistance across the heater and cathode pins of the magic eye tuning indicator and resetting the variable resistance if necessary. If this method is used, it is advisable to measure the value of the resistances used for checking purposes as the tolerance allowed on small carbon units is sometimes large.

APPENDIX 1
Valve data and valve tester switch positions

1e.—A number of spaces have been left blank in the emission and mutual conductance columns, due to the figures being unobtainable. This information will be given when available.

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks	
		Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode							
VR19	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.2		
VT20	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.0		
VR21	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	0.7		
VR22	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.9		
VT23	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.2		
VT23A	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.2		
VT25	L4	1	4	OFF	OFF	OFF	7.5	250	—	—	1.3		
VR27	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	0.7		
VR28	B4	T.C.1	2	1	OFF	OFF	2.0	125	60	—	1.1		
VR32	B7	$\left\{ \begin{array}{l} 7 \\ 3 \\ 7 \\ 3 \end{array} \right.$	1	6	OFF	OFF	OFF	2.0	100	—	—	1.1	Test each half separately
			2		OFF	OFF	OFF						
			2		OFF	OFF	OFF						
VR35	B7	3	2	6	OFF	OFF	2.0	200	150	—	1.6	Test each half separately	
VW36	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.9		
VR37	B5	1	2	OFF	OFF	5	4.0	100	—	—	1.9		
VR38	B5	1	2	OFF	OFF	5	4.0	100	—	—	1.7		
VU39	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	65	—	F.W. rectifier, Test each half separately	
VU39A	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	—		
VR40	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	5.4		
VR41	B4	T.C.1	2	1	OFF	OFF	2.0	125	90	—	0.9		
VW42	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	0.7		
VR44	B5	1	T.C.2	OFF	OFF	OFF	2.0	125	—	—	0.7		
VT45	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.1		
VT46	B5	1	2	5	OFF	OFF	4.0	250	200	—	2.1		
VI47	L4	1	4	OFF	OFF	OFF	6.3	250	—	—	4.0		
VW48	B4	T.C.1	2	1	OFF	OFF	2.0	125	75	—	0.8		
VR49	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	0.9		

DET 25

QP 21

M H F
+ 1 1
M H F
+ 1 1

6

HL2K
PEN280A

HA2

DET 19

DET 12
U12 U14

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup' ressor (Grid 3)	Cathode						
VT50	B4	1	2	OFF	OFF	OFF	2-0	100	—	—	1-1	
VT51	B5	1	2	5	OFF	OFF	2-0	125	100	—	1-5	
VT52	I.O.	3	T.C.2	4	OFF	8	6-3	250	90	—	3-0	Set "Octal Fil" to 7
VR53	I.O.	3	T.C.2	4	5	8	6-3	250	200	—	2-1	Set "Octal Fil" to 7
VR54	I.O.	{ 5 3	{ OFF OFF	{ OFF OFF	{ OFF OFF	{ 8 4	{ 6-3 —	{ — —	{ — —	{ 11 —	{ — —	Double Diode; set "Octal Fil" to 7; test each half separately
VR55	I.O.	3	T.C.2	OFF	OFF	8	6-3	200	—	—	2-0	Set "Octal Fil" to 7
VR56	I.O.	3	T.C.2	4	5	8	6-3	250	90	—	1-7	Set "Octal Fil" to 7
VR57	I.O.	3										Set "Octal Fil" to 7
VR57A	I.O.	3										Set "Octal Fil" to 7
VR59	AA	1	5	OFF	OFF	3	6-3	100	—	—	1-5	
VT60	USM5	T.C.1	3	2	OFF	4	6-3	125	75	—	3-0	
VT60A	USM5	T.C.1	3	2	OFF	4	6-3	125	75	—	3-0	
VT61	USM7	T.C.1	3	OFF	OFF	4	6-3	200	—	—	2-2	Test each half separately
		T.C.1	5									
VT61A	B5	T.C.1	1	OFF	OFF	5	13	250	—	—	2-4	Test each half separately
		T.C.1	2									
VT61B	USM7	T.C.1	3	OFF	OFF	4	6-3	200	—	—	2-2	Test each half separately
VT62	B4	T.C.1	T.C.2	OFF	OFF	OFF	7-5	250	—	—	1-3	
VU64	B4	1 and 2	OFF	OFF	OFF	OFF	4-0	—	—	65	—	F.W. rectifiers Test each half separately
VR65	M.O.	3	T.C.2	4	5	2	6-3	200	150	—	7-0	
VR65A	M.O.	3	T.C.2	4	5	2	4-0	200	150	—	7-0	
VR66	M.O.	3	5	OFF	OFF	2	6-3	100	—	—	5-4	
VR67	I.O.	3	5	OFF	OFF	8	6-3	100	—	—	1-8	Set "Octal Fil" to 7
VU71	I.O.	4 and 6	OFF	OFF	OFF	OFF	5-0	—	—	77	—	F.W. rectifiers; set "Octal Fil" to 8; test each half separately

Valve Type No.	Base (see below)	Electrical switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'essor (Grid 3)	Cathode						
VU71A	I.O.	4 and 6	OFF	OFF	OFF	OFF	5.0	—	—	94	—	F.W. rectifiers; set "Octal Fil" to 8; test each half separately
G 50 VU72	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	100	—	Half wave mercury rectifier
VT73	I.O.	4	T.C.2	OFF	OFF	8	6.3	200	—	—	1.5	Set "Octal Fil" to 7
VT74	I.O.	3	T.C.2	4	OFF	8	6.3	200	100	—	1.3	Set "Octal Fil" to 7
VT75	I.O.	3	5	4	OFF	8	6.3	125	60	—	4.3	Set "Octal Fil" to 7
VT75A	B7	T.C.1	2	7	3	6	4.0	250	200	—	4.7	
VT75B	B7	T.C.1	2	7	3	6	4.0	250	200	—	4.7	
VR78	MIDGET DIODE	T.C.1	OFF	OFF	OFF	2	4.0	—	—	7	—	Diode
K T 8 VT79	B5	T.C.1	2	1	OFF	5	6.3	125	75	—	3.4	
VT60	B7	T.C.1	1	3	2	OFF	5.0	200	90	—	2.7	
VT81	USM5	T.C.1	3	2	4	OFF	7.5	250	250	—	1.9	
VR82	B7	1	2	OFF	OFF	OFF	2.0	125	—	—	1.5	Test on triode section only
VR83	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	0.8	
VR91	B9G	3	7	2	4	6	6.3	125	75	—	3.3	
VR91A	B9G	3	7	2	4	6	6.3	125	75	—	3.3	
VR92	MIDGET DIODE	T.C.1	OFF	OFF	OFF	2	6.3	—	—	7	—	Diode
VR95	AA	T.C.1	7	1	5	3	6.3	200	100	—	1.9	
VR95A	AA	T.C.1	7	1	5	3	6.3	200	100	—	1.9	
X 6 6 VR99	I.O.	6	5	OFF	OFF	8	6.3	200	—	—	1.2	Set "Octal Fil" to 7 Test on triode section only
VR99A	I.O.	6	5	OFF	OFF	8	6.3	200	—	—	2.5	Test on triode section only

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks	
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode							
KTW62	VR100	I.O.	3	T.C.2	4	OFF	8	6.3	200	75	—	3.2	Set "Octal Fil" to 7 Set "Octal Fil" to 7 Set "Octal Fil" to 7- Test each half separately
MHLDB6	VR101	I.O.	3	T.C.2	OFF	OFF	8	6.3	200	—	—	2.4	
	VR102	I.O.	{ 6 3	{ 5 T.C.2	OFF	OFF	{ 8 4	6.3	125	—	—	3.4	
	VT104	B5	T.C.1	2	1	5	OFF	6.3	250	200	—	2.3	
ML6	VT105	B5	1	2	OFF	OFF	5	6.3	100	—	—	2.9	
	VR106	B7	2	T.C.2	7	3	6	12.0	200	100	—	1.2	
	VR107	B7	1	2	OFF	OFF	6	13.0	200	100	—	1.1	
	VR108	B7	2	T.C.2	7	3	6	13.0	100	100	—	1.3	
	VR109	B7	7	T.C.2	OFF	OFF	6	13.0	100	—	—	3.1	
	VU111	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	—	—	
	VU113	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	33	—	Half wave rectifier
	VR116	M.O.	3	T.C.2	4	5	2	6.3	250	200	52	—	Half wave rectifier
	VR117	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.3	
	VR117A	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.0	
KT2	VR118	B5	1	2	5	OFF	OFF	2.0	100	100	—	2.0	
	VR119	B5	1 and 2	OFF	OFF	OFF	5	4.0	—	—	11	—	Double Diode—test each half separately
	VU120	B4	T.C.1	OFF	OFF	OFF	OFF	2.0	—	—	20	—	Half wave rectifier
	VR122	B5	1	2	OFF	OFF	5	4.0	100	—	—	5.0	
	VR124	B7	T.C.1	2	7	3	6	4.0	200	100	—	1.5	
	VR125	B7	2	T.C.2	7	3	6	4.0	200	100	—	1.5	
	VR126	B7	2	T.C.2	7	3	6	4.0	200	100	—	1.0	
	VT127	M.O.	T.C.1	5	4	OFF	2	4.0	100	100	—	5.7	
	VR129	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.4	
	VR130	M.O.	3	5	OFF	OFF	OFF	2.0	100	—	—	1.0	
	VR130A	M.O.	3	5	OFF	OFF	OFF	2.0	100	—	—	1.0	
	VU133	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	55	—	Half wave rectifier

MS84

Valve Type No.	Base (see below)	Pitch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode						
VU134	B4	T.C.1	OFF	OFF	OFF	OFF	4-0	—	—	12	—	Half wave rectifier
VR135	I.O.	T.C.1	T.C.2	OFF	OFF	8	6-3	200	—	—	3-6	Set "Octal Fil" to 7
VR136	B9g	2	6	3	OFF	4	6-3	200	150	—	5-1	
VR137	B9g	4	2	OFF	OFF	3	6-3	200	—	—	4-7	
VT501	I.O.	T.C.1	4	5	3	8	6-3	200	100	—	3-4	Set "Octal Fil" to 7
VR502	I.O.	3	5	4	OFF	8	26-0	100	100	—	7-5	Set "Octal Fil" to 7
VR503	I.O.	3	5	4	OFF	8	26-0	200	100	—	10-0	Set "Octal Fil" to 7
VR505	B5	1	2	OFF	OFF	5	4-0	100	—	—	3-9	
VU508	B4	T.C.1	OFF	OFF	OFF	OFF	4-0	—	—	65	—	Half wave rectifier
AR5	B4	1	2	OFF	OFF	OFF	2-0	100	—	—	2-6	
AR8	M.O.	3	T.C.2	OFF	OFF	OFF	2-0	100	—	—	0-8	Test on triode section only
AR9	B4	1	2	OFF	OFF	OFF	2-0	125	—	—	0-7	
AR21	I.O.	3	T.C.2	OFF	OFF	8	6-3	200	—	—	2-0	Set "Octal Fil" to 7
ARD2	MIDGET DIODE	T.C.1	OFF	OFF	OFF	2	4-0	—	—	12	—	Diode
ARDD5	I.O.	{ 5 3 }	{ OFF OFF }	{ OFF OFF }	{ OFF OFF }	{ 8 4 }	6-3	—	—	11	—	Double Diode; set "Octal Fil" to 7; test each half separately
ARP3	B7	2	T.C.2	7	3	6	12-0	200	100	—	1-2	
ARP4	B7	T.C.1	2	7	3	OFF	2-0	125	100	—	1-1	
ARP12	M.O.	3	T.C.2	4	5	OFF	2-0	125	60	—	0-9	
ARP15	I.O.	3	T.C.2	4	OFF	8	6-3	200	100	—	1-0	Set "Octal Fil" to 7
ARP23	B7	T.C.1	2	7	3	6	4-0	200	100	—	2-4	
ARP34	I.O.	3	T.C.2	4	5	8	6-3	250	200	—	2-1	Set "Octal Fil" to 7
ARP35	B9g	3	7	2	4	6	6-3	125	75	—	3-3	
ARP36	M.O.	3	T.C.2	4	5	2	6-3	200	150	—	7-0	
ARP37	M.O.	{ 3 7 }	{ 5 6 }	4	1	OFF	2-0	100	100	—	2-0	Test each half separately

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9g	British 9-pin glass

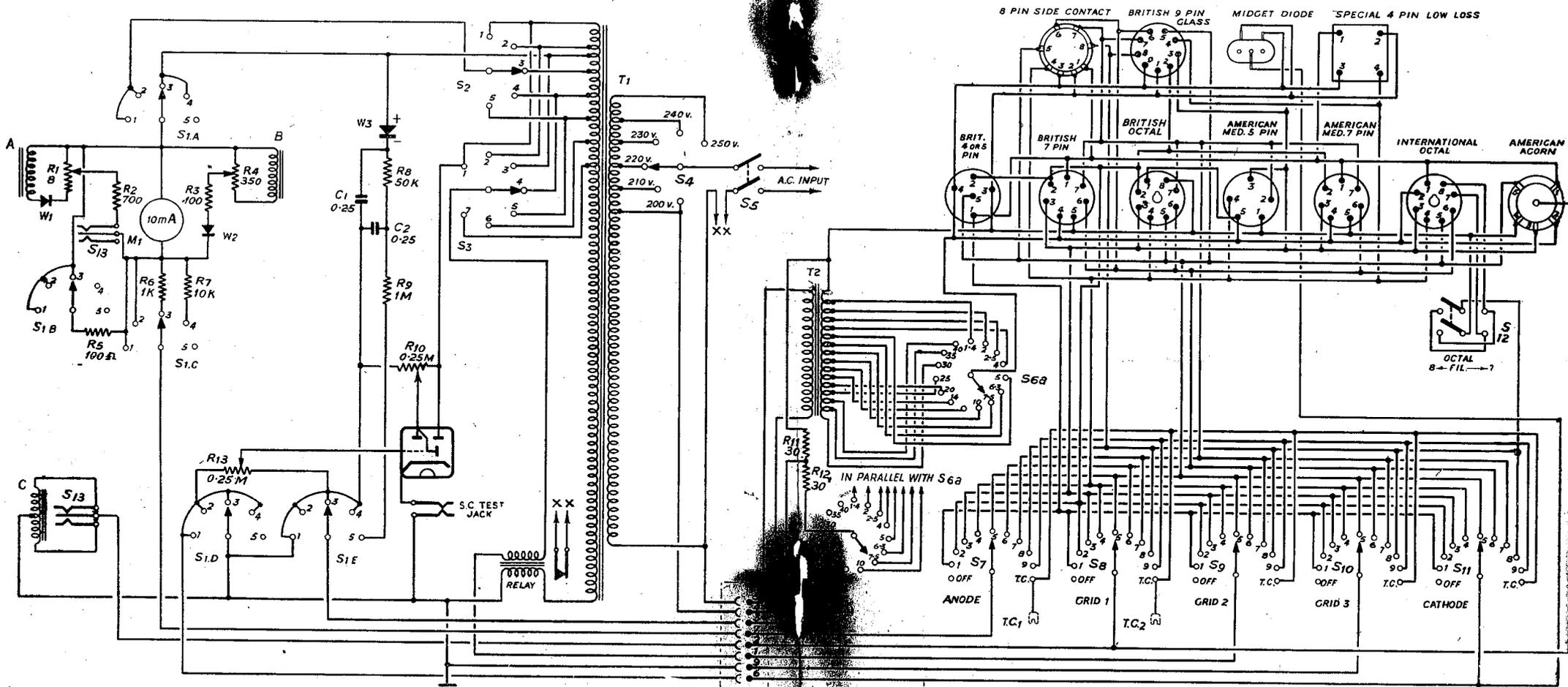


Fig. 4.—Valve tester, type 4, circuit

Note.—The valveholders are shown as viewed from top of panel.

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode						
ARTH2	I.O.	6	5	OFF	OFF	8	6.3	100	—	—	1.9	Set "Octal Fil" to 7 Test on triode section only
AR1P2	M.O.	4	5	OFF	OFF	OFF	2.0	100	—	—	1.2	
AT15	B4	1	2	OFF	OFF	OFF	6.3	100	—	—	0.8	Test on triode section only
AT35	L4	1	4	OFF	OFF	OFF	7.5	250	—	—	1.1	
ATP4	M.O.	T.C.1	5	4	OFF	OFF	2.0	100	100	—	3.7	Test on triode section only
ATP5	B7	T.C.1	2	7	3	OFF	2.5	200	150	—	4.2	
ATP7	B7	T.C.1	2	7	3	OFF	6.3	200	200	—	4.4	Test on triode section only
ATS25	USM5	T.C.1	3	2	OFF	4	6.3	125	75	—	3.0	
AU5	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	40	—	Half wave rectifier Half wave mercury rectifier
AU6	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	100	—	
AU8	M.O.	T.C.1	OFF	OFF	OFF	1	2.0	—	—	12	—	Half wave rectifier Half wave rectifier
AU12	L4	1	OFF	OFF	OFF	OFF	6.3	—	—	65	—	
NR42	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.6	Half wave rectifier
NR47	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	5.4	
NR48	I.O.	3	T.C.2	OFF	OFF	8	6.3	200	—	—	2.0	Set "Octal Fil" to 7
NR70	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.4	
NR73	I.O.	3 & 6	4 & 5	OFF	OFF	8	6.3	200	—	—	1.9	Double Triode—test each half separately Set "Octal Fil" to 7
NR82	I.O.	6	5	OFF	OFF	8	6.3	200	—	—	1.2	
NR86	I.O.	3	T.C.2	4	OFF	8	6.3	—	—	—	—	Test on triode section only Set "Octal Fil" to 7
NR88	MIDGET DIODE	T.C.1	T.C.2	OFF	OFF	2	6.3	125	—	—	2.6	
NT58	B4	T.C.1	T.C.2	OFF	OFF	OFF	7.5	250	—	—	1.3	
NT58A												
NU13A	L4	1	OFF	OFF	OFF	OFF	6.3	—	—	—	—	Half wave rectifier
NU33	B4	T.C.1	OFF	OFF	OFF	OFF	2.0	—	—	20	—	

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode						
CV6	I.O.	T.C.1	T.C.2	OFF	OFF	8	6.3	200	—	—	3.6	Set "Octal Fil" to 7
CV9	B7	T.C.1	2	7	3	6	4.0	200	100	—	10.0	
CV18	USM7	T.C.1	3	OFF	OFF	4	6.3	200	—	—	2.2	Test each half separately
CV20	B4											
CV21	M.O.	3	T.C.2	4	5	2	4.0	250	200	—	2.0	
CV24	M.O.	3	5	OFF	OFF	2	4.0	100	—	—	2.3	
CV31	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	65	—	F.W. rectifier Test each half separately Half wave rectifier
CV54	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	68	—	
CV63	I.O.	T.C.1	T.C.2	OFF	OFF	8	6.3	125	—	—	6.4	
CV65	M.O.	3	5	4	OFF	OFF	2.0	100	100	—	3.0	
CV66	B9G	4	2	OFF	OFF	8	6.3	200	—	—	6.0	
CV72	B7	T.C.1	2	3	OFF	6	6.3	200	100	—	6.5	
CV73	B7	T.C.1	2	7	OFF	6	4.0	125	60	—	6.0	
CV78	139G	2	4	OFF	OFF	8	6.3	200	—	—	10.0	
CV84	B5	1	2	OFF	OFF	5	6.3	200	—	—	4.4	
CV118	M.O.	3	T.C.2	4	5	2	6.3	200	150	—	7.0	
CV121	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	53	—	
CV124	USM5	T.C.1	3	2	OFF	4	6.3	125	75	—	3.0	
CV171	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	0.8	
CV173	B9G	3	7	2	4	6	6.3	200	100	—	10.0	
CV185	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.4	
AC/HL	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.0	
AC/HL MET	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.0	
AC/HL/DD	B7	7	T.C.2	OFF	OFF	6	4.0	100	—	—	1.8	
C/2/HL MET	B5	1	2	OFF	OFF	5	4.0	100	—	—	4.4	
AC PEN	B7	7	2	3	OFF	6	4.0	100	100	—	1.7	
AC/2/PFN	B7	7	2	3	OFF	6	4.0	100	100	—	5.4	

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Stores Ref. Section 10E	Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
			Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode						
51	AC/5/PEN	B7	7	2	3	OFF	6	4.0	100	100	—	6.1	
187	AC/s2/PEN	B7	T.C.1	2	7	3	6	4.0	200	100	—	3.7	
155	AC/P4	B5	T.C.1	2	OFF	OFF	5	4.0	100	—	—	4.7	
301	AC/s2	B5	T.C.1	2	1	OFF	5	4.0	200	60	—	3.4	
492	AC/SP1	B7	T.C.1	2	7	3	6	4.0	250	200	—	1.8	
322	AC/SP3	B7	2	T.C.2	7	3	6	4.0	250	100	—	5.8	
154	AL60	B7	T.C.1	2	7	3	6	4.0	—	—	—	—	
279	BL63	I.O.	{ 6 5 3	T.C.2	OFF	OFF	{ 8 4	6.3	125	—	—	3.4	Set "Octal Fil" to 7
11540	D1	MIDGET DIODE	T.C.1	OFF	OFF	OFF	2	4.0	—	—	12	—	Test each half separately Diode
323	D42	B4	1	OFF	OFF	OFF	2	4.0	—	—	11	—	Diode
313	D63	I.O.	{ 5 3	OFF	OFF	OFF	{ 8 4	6.3	—	—	11	—	Set "Octal Fil" to 7; Double Diode. Test each half separately
413	DA30	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	4.6	
274	DD41	M.O.	{ 3 5	OFF	OFF	OFF	{ 2 7	4.0	—	—	12	—	Double Diode Test each half separately
141	DD207	B4	1 and 2	OFF	OFF	OFF	OFF	2.0	—	—	7	—	Double Diode Test each half separately
7312	DET1	L4	1	4	OFF	OFF	OFF	7.5	250	—	—	1.3	
8933	DETISW	L4	T.C.1	4	OFF	OFF	OFF	7.5	250	—	—	1.3	
8643	DET5	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	5.1	
11443	DET12	B4	T.C.1	T.C.2	OFF	OFF	OFF	7.5	250	—	—	1.3	
11442	DET19	USM7	T.C.1	{ 3 5	OFF	OFF	4	6.3	200	—	—	2.2	Test each half separately
None	DET25	L4	1	4	OFF	OFF	OFF	7.5	250	—	—	1.1	
219	DL63	I.O.	3	T.C.2	OFF	OFF	OFF	6.3	200	—	—	1.2	

Stores Ref. Section 10E	Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
			Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode						
9439	DW4	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	4	—	F.W. rectifier
105	EA50	MIDGET DIODE	T.C.1	OFF	OFF	OFF	2	6.3	—	—	12	—	Test each half separately
11400	EB34	I.O.	{ 5 3	OFF	OFF	OFF	8	6.3	—	—	11	—	Double Diode; set "Octal Fil" to 7; test each half separately
				OFF	OFF	OFF	4						
11401	EBC33	I.O.	3	T.C.2	OFF	OFF	8	6.3	200	—	—	2.0	Set "Octal Fil" to 7
453	ECC31	I.O.	3 & 6	4 & 5	OFF	OFF	8	6.3	200	—	—	1.9	Double Triode—test each half separately
None	ECH35	I.O.	6	5	OFF	OFF	8	6.3	100	—	—	1.9	Set "Octal Fil" to 7
49	EF8	SIDE	8	T.C.2	7	5	4	6.3	250	250	—	1.5	
		CONTACT											
11402	EF36	I.O.	3	T.C.2	4	5	8	6.3	250	90	—	1.7	Set "Octal Fil" to 7
11399	EF39	I.O.	3	T.C.2	4	5	8	6.3	250	200	—	2.1	Set "Octal Fil" to 7
92	EF50	B9G	3	7	2	4	6	6.3	125	75	—	3.3	
11403	EK32	I.O.	3										Set "Octal Fil" to 7
11398	EL32	I.O.	3	T.C.2	4	OFF	8	6.3	250	90	—	3.0	Set "Octal Fil" to 7
10527	FC13c	B7	1	2	OFF	OFF	6	13.0	200	100	—	1.1	Test as pentode
CV31	FW4/500	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	—	—	F.W. rectifier
													Test each half separately
11530	GU5	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	100	—	Half wave mercury rectifier
11530	GU50	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	100	—	Half wave mercury rectifier
140	H30	B7	7	T.C.2	OFF	OFF	6	13.0	100	—	—	4.0	
11531	H63	I.O.	4	T.C.2	OFF	OFF	8	6.3	200	—	—	1.5	Set "Octal Fil" to 7
96	HA2	AA	1	5	OFF	OFF	3	6.3	100	—	—	1.5	
76	HL2	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.1	
10945	HL2K	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.1	
10542	HL21DD	B5	1	T.C.2	OFF	OFF	OFF	2.0	125	—	—	1.1	

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode						
HL23	M.O.	3	5	OFF	OFF	OFF	2·0	100	—	—	1·0	Test on triode section only
HL23DD	M.O.	3	T.C.2	OFF	OFF	OFF	2·0	100	—	—	0·8	
HL41	M.O.	3	5	OFF	OFF	2	4·0	100	—	—	2·3	F.W. rectifier Test each half separately
HL41DD	M.O.	3	T.C.2	OFF	OFF	2	4·0	100	—	—	1·7	
IW3A	B4	1 and 2	OFF	OFF	OFF	OFF	4·0	—	—	84	—	
KT2	B5	1	2	5	OFF	OFF	2·0	100	100	—	1·7	
KT8	B5	T.C.1	2	3	1	OFF	5	6·3	125	75	—	3·4
KT31	B7	7	T.C.2	1	3	OFF	6	26·0	200	150	—	10·0
KT32	I.O.	3	5	4	OFF	8	26·0	—	—	—	—	Set "Octal Fil" to 7
KT33	I.O.	3	5	4	OFF	8	26·0	—	—	—	—	
KT33c	I.O.	3	5	4	OFF	8	26·0	—	—	—	—	Set "Octal Fil" to 7
KT41	B7	7	2	3	OFF	6	4·0	200	200	—	—	8·0
KT42	B7	7	2	3	OFF	6	4·0	200	100	—	—	1·7
KT44	B7	T.C.1	2	7	3	6	4·0	250	200	—	—	4·7
KT44r	B7	T.C.1	2	7	3	6	4·0	250	200	—	—	4·7
KT61	I.O.	3	5	4	OFF	8	6·3	125	75	—	—	5·8
KT63	I.O.	3	5	4	OFF	8	6·3	200	100	—	—	1·7
KT66	I.O.	3	5	4	OFF	8	6·3	—	—	—	—	Set "Octal Fil" to 7
KTW61	I.O.	3	T.C.2	4	5	8	6·3	200	75	—	—	3·9
KTW62	I.O.	3	T.C.2	4	OFF	8	6·3	200	75	—	—	3·2
KTW63	I.O.	3	T.C.2	4	OFF	8	6·3	—	—	—	—	Set "Octal Fil" to 7
KTW73M	I.O.	3	T.C.2	4	OFF	8	6·3	200	100	—	—	1·0
KTZ41	B7	2	T.C.2	7	OFF	6	4·0	250	100	—	—	6·8
KTZ63	I.O.	3	T.C.2	4	OFF	8	6·3	200	100	—	—	1·3
KTZ73	I.O.	3	T.C.2	4	OFF	8	6·3	200	100	—	—	1·0
L21	B4	1	2	OFF	OFF	OFF	2·0	100	—	—	—	1·2
L21/DD	B5	1	T.C.2	OFF	OFF	OFF	2·0	100	—	—	—	1·3
												Test triode section only

Valve Type No.	Base (see below)	Electrode switch positions				Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)						
L63	I.O.	3	5	OFF	OFF	8	6.3	100	—	1.8	Set "Octal Fil" to 7
L410	B4	1	2	OFF	OFF	OFF	4.0	100	—	1.3	
LP2	B4	1	2	OFF	OFF	OFF	2.0	100	—	2.6	Army type
LS5	B4	1	2	OFF	OFF	OFF	6.3	100	—	0.8	
LS6A	B4	1	2	OFF	OFF	OFF	6.3	100	—	1.7	Army type
MH4	B5	1	2	OFF	OFF	5	4.0	100	—	1.9	
MH41	B5	1	2	OFF	OFF	5	4.0	—	—	—	Set "Octal Fil" to 7
MHL4	B5	1	2	OFF	OFF	5	4.0	100	—	1.7	
MHLD6	I.O.	3	T.C.2	OFF	OFF	8	6.3	—	—	—	Set "Octal Fil" to 7
MKT4	B7	7	2	3	OFF	6	4.0	100	100	—	
ML4	B5	1	2	3	OFF	5	4.0	100	—	—	2.8
ML6	B5	1	2	OFF	OFF	5	6.3	—	—	—	2.0
MPT4	B7	7	2	3	OFF	6	4.0	100	100	—	
MPT42	B7	T.C.1	2	7	3	6	4.0	100	100	—	4.7
MS4B	B5	T.C.1	2	1	OFF	5	4.0	200	90	—	2.2
MSP4	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.7
MSP41	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.7
MSPEN	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.4
MSPEN (MET)	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.4
MSPENB (MET)	B7	2	T.C.2	7	3	6	4.0	200	100	—	2.4
MSPEN.T.	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.4
MVSPEN	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.0
MVSPENB	B7	2	T.C.2	7	3	6	4.0	200	100	—	2.0
MU12/14	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	F.W. rectifier
P2	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	Test each half separately
P41	M.O.	3	5	OFF	OFF	2	4.0	100	—	—	5.4

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sub'essor (Grid 3)	Cathode						
P410	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	1.0	Test pentode section only
P610	B4	2	OFF	OFF	OFF	OFF	6.3	100	—	—	1.4	
P625	B4	1	2	OFF	OFF	OFF	6.3	100	—	—	1.7	
PA1	B5	1	2	OFF	OFF	5	4.0	100	—	—	5.0	
PA40	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	6.7	
PEN A4	B7	7	2	3	OFF	6	4.0	200	100	—	5.9	
PEN B4	B7	7	2	3	OFF	6	4.0	100	100	—	8.3	
PEN13C	B7	7	2	3	OFF	6	13.0	100	100	—	4.4	
PEN25	M.O.	3	5	4	OFF	OFF	2.0	100	100	—	3.0	
PEN44	M.O.	3	5	4	OFF	2	4.0	100	100	—	7.4	
PEN45	M.O.	3	5	4	OFF	2	4.0	100	100	—	6.1	
PEN45DD	M.O.	3	T.C.2	4	OFF	2	4.0	100	100	—	6.1	
PEN46	M.O.	T.C.1	5	4	OFF	2	4.0	100	100	—	5.7	
PEN220	B5	1	2	5	3	OFF	2.0	100	100	—	1.7	
PEN220A	B5	1	2	5	OFF	OFF	2.0	125	100	—	1.5	
PEN383	M.O.	3	5	4	OFF	2	40.0	100	100	—	8.1	
PMIHL	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.0	
PMILF	B4	1	2	OFF	OFF	OFF	2.0	150	—	—	0.6	
Pm2DX	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	1.2	
Pm4DX	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	1.4	
Pm12M	B4	T.C.1	2	1	OFF	OFF	2.0	125	90	—	0.9	
Pm22A	B5	1	2	5	OFF	OFF	2.0	100	100	—	1.7	
Pm24D	B5	1	2	5	OFF	OFF	4.0	100	100	—	2.7	
Pm200	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.4	
Pp5/400	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	5.4	
Pt15	B5	T.C.1	2	1	5	OFF	6.3	250	200	—	2.3	
Pt25H	B5	1	2	5	OFF	OFF	4.0	250	200	—	4.0	
Pt425	B5	1	2	5	OFF	OFF	4.0	100	100	—	1.4	
PX4	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	4.1	

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode						
PX25	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	5.4	
QP21	B7	{ 7 3	{ 1 2	6	OFF	OFF	2.0	200	150	—	1.6	Test each half separately
QP25	M.O.	{ 3 7	{ 5 6	4	1	OFF	2.0	100	100	—	2.0	Test each half separately
QP230	B7	{ 7 3	{ 1 2	6	OFF	OFF	2.0	200	150	—	1.6	Test each half separately
RK34	USM7	T.C.1	{ 3 5	OFF	OFF	4	6.3	200	—	—	2.2	Test each half separately
RK39	USM5	T.C.1	3	2	OFF	4	6.3	125	75	—	3.0	
RL7	B9G	2	6	3	OFF	4	6.3	200	150	—	5.1	
RL16	B9G	4	2	OFF	OFF	3	6.3	200	—	—	4.7	
RL18	MIDGET	T.C.1	T.C.2	OFF	OFF	2	6.3	125	—	—	2.6	Naval type
	DIODE											
RL37	B9G	4	2	OFF	OFF	8	6.3	—	—	—	—	
S23	B4	T.C.1	2	1	OFF	OFF	2.0	125	75	—	0.8	
S410	B4	T.C.1	2	1	OFF	OFF	4.0	125	90	—	0.6	
S610	B4	T.C.1	2	1	OFF	OFF	6.0	125	90	—	0.7	
SG215	B4	T.C.1	2	1	OFF	OFF	2.0	125	75	—	0.8	
SP2	B7	T.C.1	2	7	3	OFF	2.0	200	150	—	1.3	
SP4B	B7	2	T.C.2	7	3	6	4.0	100	100	—	2.0	
SP41	M.O.	3	T.C.2	4	5	2	4.0	200	150	—	7.0	
SP42	M.O.	3	T.C.2	4	5	2	4.0	200	100	—	6.1	
SP141	M.O.	3	T.C.2	4	1	OFF	1.4	100	90	—	0.6	
SP210	B7	T.C.1	2	7	3	OFF	2.0	125	100	—	1.1	Army type
SU2150	B4	T.C.1	OFF	OFF	OFF	OFF	2.0	—	—	20	—	Half wave rectifier
SU2150A	B4											
TDD2A	B5	1	T.C.2	OFF	OFF	OFF	2.0	100	—	—	0.8	Test on triode section only
TH4A	137	1	2	OFF	OFF	6	4.0	200	—	—	2.0	Test on triode section only

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'essor (Grid 3)	Cathode						
TH41	M.O.	4	5	OFF	OFF	2	4.0	100	—	—	3.6	Test on triode section only
TP25	M.O.	4	5	OFF	OFF	OFF	2.0	100	—	—	1.2	Army type
TSP4	B7	2	T.C.2	7	3	6	4.0	100	100	—	3.4	
U14	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	—	F.W. rectifier Test each half separately
U15	L4	1	OFF	OFF	OFF	OFF	6.3	—	—	—	—	Army type
U17	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	68	—	Half wave rectifier
U18	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	—	—	F.W. rectifier Test each half separately
U22	M.O.	T.C.1	OFF	OFF	OFF	1	2.0	—	—	—	—	Army type
U31	I.O.	5	OFF	OFF	OFF	8	26.0	—	—	65	—	Half wave rectifier
U52	I.O.	4 and 6	OFF	OFF	OFF	OFF	5.0	—	—	94	—	F.W. rectifiers; set "Octal Fil" to 8; test each half separately
UU4	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	—	F.W. rectifier Test each half separately
UU5												
UU6	M.O.	3 and 5	OFF	OFF	OFF	OFF	4.0	—	—	43	—	Full wave rectifier
UU7	M.O.	3 and 5	OFF	OFF	OFF	OFF	4.0	—	—	65	—	Full wave rectifier
UU8	M.O.	3 and 5	OFF	OFF	OFF	OFF	4.0	—	—	28	—	Full wave rectifier
V226	B7	T.C.1	2	7	3	OFF	6.3	200	200	—	4.4	Army type
V245	B7	T.C.1	2	7	3	OFF	2.5	200	150	—	4.2	
V248A	M.O.	T.C.1	5	4	OFF	OFF	2.0	100	100	—	3.7	
V455A	M.O.	3	T.C.2	4	5	2	6.3	250	200	—	2.3	
V960	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	68	—	Half wave rectifier
V1111	M.O.	T.C.1	5	4	OFF	2	4.0	100	100	—	5.7	
V1120	B7	T.C.1	2	3	OFF	6	6.3	200	100	—	6.5	
V1120B	B7	T.C.1	2	7	OFF	6	4.0	125	60	—	6.0	
V1907	B4	T.C.1	OFF	OFF	OFF	OFF	4.0	—	—	40	—	Half wave rectifier
VMP4G	B7	T.C.1	2	7	3	6	4.0	200	100	—	2.7	

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode						
VMS4	B5	T.C.1	2	1	OFF	5	4.0	200	90	—	2.0	
VP2	B7	T.C.1	2	7	3	OFF	2.0	100	100	—	1.0	
VP2B	B7	2	T.C.2	6	3	OFF	2.0	100	60	—	1.2	
VP4	B7	T.C.1	2	7	3	6	4.0	200	60	—	1.9	
VP13c	B7	2	T.C.2	7	3	6	13.0	200	200	—	3.4	
VP23	M.O.	3	T.C.2	4	5	OFF	2.0	125	60	—	0.9	
VP41	M.O.	3	T.C.2	4	5	2	4.0	250	200	—	2.0	
VP210	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	1.0	
W31	B7	T.C.1	2	7	3	6	13.0	200	75	—	2.0	
X24	B7	1	2	OFF	OFF	OFF	2.0	125	—	—	1.5	Test on triode section only
X31	B7	1	2	OFF	OFF	OFF	13.0	200	—	—	2.0	Test on triode section only
X41	B7	1	2	OFF	OFF	6	4.0	200	—	—	2.0	Test on triode section only
X56	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.1	
X65	I.O.	6	5	OFF	OFF	8	6.3	200	—	—	1.2	Set "Octal Fil" to 7 Test on triode section only
X66												
Z21	{B4 B7	{T.C.1 T.C.1	2	1	3	OFF OFF	2.0	200	100	—	1.0	
ZA2	AA	T.C.1	7	1	5	3						
3B/102B	B5	1	2	OFF	OFF	5	6.3	—	—	—	—	
4D1	B7	7	T.C.2	OFF	OFF	6	13.0	100	—	—	3.1	
4SH	B7	2	T.C.2	7	3	5	4.0	200	100	—	1.0	
4XP	B4	1	2	OFF	OFF	OFF	4.0	100	—	—	4.1	
5U4G	I.O.	4 and 6	OFF	OFF	OFF	OFF	5.0	—	—	94	—	F.W. rectifiers Set "Octal Fil" to 8 Test each half separately
5Z4G	I.O.	4 and 6	OFF	OFF	OFF	OFF	5.0	—	—	88	—	Set "Octal Fil" to 8 F.W. rectifier Test each half separately

VALVE BASE ABBREVIATIONS

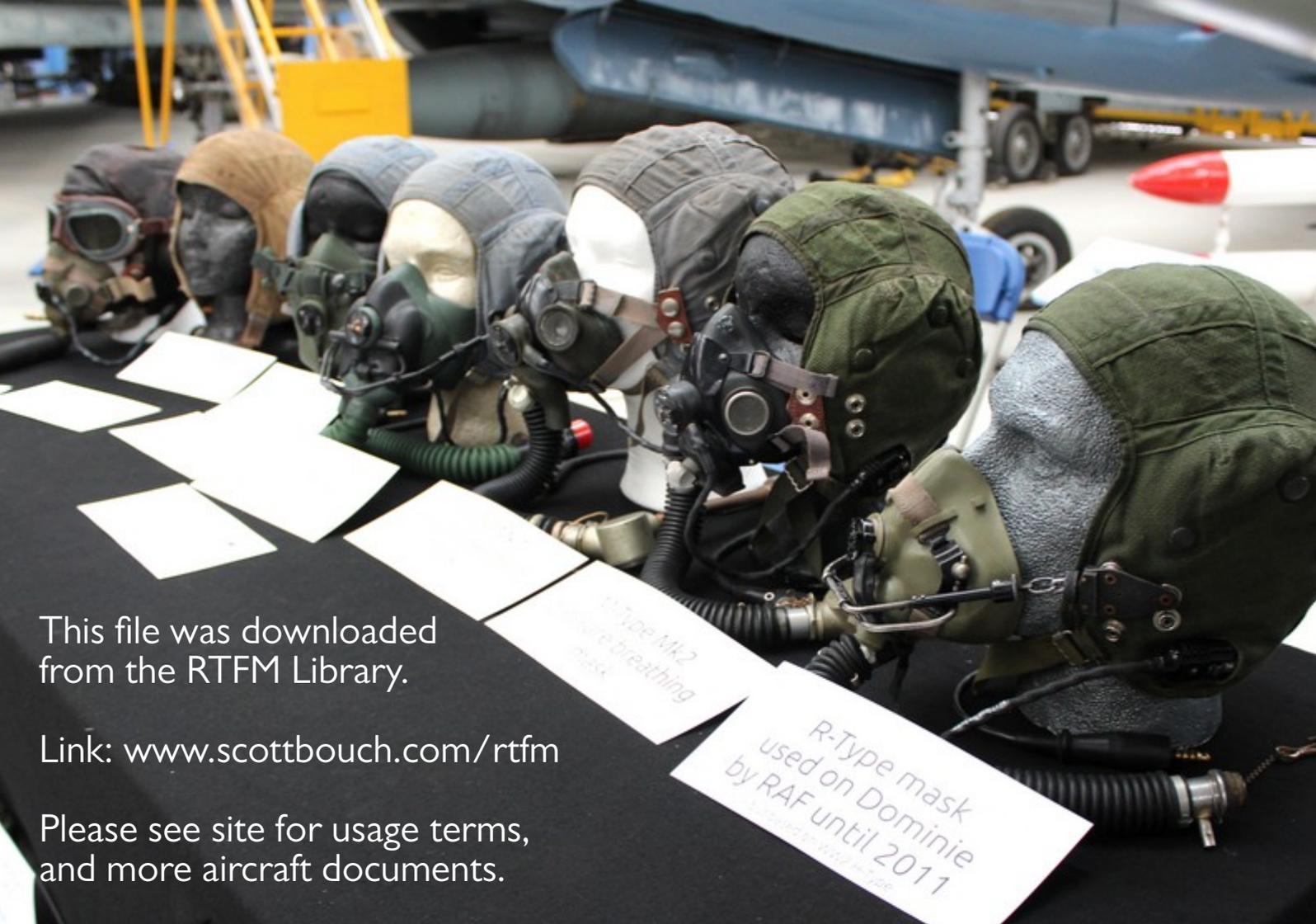
B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Sup'pressor (Grid 3)	Cathode						
6X5G	I.O.	3 and 5	OFF	OFF	OFF	8	6.3	—	—	93	—	Set "Octal Fil" to 7
8D2	B7	2	T.C.2	7	3	6	13.0	100	100	—	1.3	
9D2	B7	2	T.C.2	7	3	6	12.0	200	100	—	1.2	
11D3	B7	7	T.C.2	OFF	OFF	6	13.0	100	—	—	0.8	Test on triode section only
15D2	B7	1	2	OFF	OFF	6	13.0	—	—	—	—	Test on triode section only
41FP	B5	1	2	OFF	OFF	5	4.0	100	—	—	3.6	
41MHL	B5	1	2	OFF	OFF	5	4.0	100	—	—	3.0	
41MP	B5	1	2	OFF	OFF	5	4.0	100	—	—	5.0	
6N7	I.O.	3 and 6	4 and 5	OFF	OFF	8	6.3	200	—	—	1.9	Double Triode—test each half separately
6N7G	I.O.	3 and 6	4 and 5	OFF	OFF	8	6.3	200	—	—	1.9	Double Triode—test each half separately
41MPT	B7	T.C.1	2	7	3	6	4.0	100	90	—	3.0	
41MTL	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.0	
41MXP	B5	1	2	OFF	OFF	5	4.0	100	—	—	5.0	
41STH	B7	1	2	OFF	OFF	6	4.0	200	—	—	2.0	Test on triode section only
42MPT	B7	T.C.1	2	7	3	6	4.0	100	90	—	4.6	
42OT	B7	7	2	3	OFF	6	4.0	100	100	—	4.7	
42OTDD	B7	2	T.C.2	7	OFF	6	4.0	100	100	—	4.7	Test on triode section only
43IU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	65	—	Full wave rectifier
44IU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	65	—	
45IU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	65	—	Full wave rectifier
76	USM5	2	3	OFF	OFF	4	6.3	100	—	—	2.0	
164V	B5	1	2	OFF	OFF	5	4.0	100	—	—	2.7	
21ODDT	B5	1	T.C.2	OFF	OFF	OFF	2.0	100	—	—	0.8	Test on triode section only
21OHF	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.0	
21OHL	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	0.8	
21OLF	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	0.7	
21OSPT	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	0.9	

VALVE BASE ABBREVIATIONS

B4	British standard 4-pin	B5	British standard 5-pin
B7	British standard 7-pin	IO	International Octal
MO	British Octal (Mazda)	AA	American Acorn
USM5	American medium 5-pin	L4	Special 4-pin low loss
USM7	American medium 7-pin	B9G	British 9-pin glass

Valve Type No.	Base (see below)	Electrode switch positions					Filament Volts Setting	Anode Volts Setting	Screen Volts Setting	Emission (Diodes and Rectifiers) mA	Mutual conductance mA/v	Remarks
		Anode	Grid (Grid 1)	Screen (Grid 2)	Suppressor (Grid 3)	Cathode						
210VPA	B7	T.C.1	2	7	3	OFF	2.0	125	75	—	0.8	
210VPT	B7	T.C.1	2	7	3	OFF	2.0	125	60	—	0.8	
2155G	B4	T.C.1	2	1	OFF	OFF	2.0	125	75	—	0.8	
215P	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	1.2	
220P	B4	1	2	OFF	OFF	OFF	2.0	100	—	—	2.0	
220PA	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.9	
220TH	B7	1	2	OFF	OFF	OFF	2.0	125	—	—	1.5	Test on triode section only
220VSG	B4	T.C.1	2	1	OFF	OFF	2.0	125	60	—	1.1	
230XP	B4	1	2	OFF	OFF	OFF	2.0	125	—	—	2.2	
240B	B7	{ 7 3 }	{ 1 2 }	OFF	OFF	OFF	2.0	100	—	—	1.0	Test each half separately
405BU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	72	—	Test each half separately
442BU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	—	F.W. rectifier
460BU	B4	1 and 2	OFF	OFF	OFF	OFF	4.0	—	—	84	—	Test each half separately
807	USM5	T.C.1	3	2	OFF	4	6.3	125	75	—	3.0	
954	AA	T.C.1	7	1	5	3	6.3	200	100	—	1.9	
955	AA	1	5	OFF	OFF	3	6.3	100	—	—	1.5	
956	AA	T.C.1	7	1	5	3	6.3	100	100	—	1.2	
1852	I.O.	8	4	6	3	5	6.3	200	100	—	8.0	
1853	I.O.	8	4	6	3	5	6.3	200	200	—	3.7	
4033A	B5	1	2	OFF	OFF	5	6.3	250	—	—	8.0	
4052A	USM5	{ T.C.1 T.C.1 }	{ 3 5 }	OFF	OFF	4	6.3	200	—	—	2.2	Test each half separately
4074A	USM7	{ T.C.1 T.C.1 }	{ 3 5 }	OFF	OFF	4	6.3	200	—	—	2.2	Test each half separately
4307	B7	T.C.1	1	3	2	OFF	5.0	200	90	—	2.7	
4671A	AA	1	5	OFF	OFF	3	6.3	100	—	—	1.5	
4672	AA	T.C.1	7	1	5	3	6.3	200	100	—	1.9	



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