

ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

CV6076

Specification AD/CV6076 Issue No. 1. Dated 18.1.61. To be read in conjunction with K1001 and BS1409	<table border="1"> <tr> <th colspan="2">SECURITY</th></tr> <tr> <td><u>Specification</u></td><td><u>Valve</u></td></tr> <tr> <td>Unclassified</td><td>Unclassified</td></tr> </table>	SECURITY		<u>Specification</u>	<u>Valve</u>	Unclassified	Unclassified
SECURITY							
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<u>TYPE OF VALVE:</u> Voltage Tuned Oscillator (C band) with Permanent Magnet.				<u>MARKING</u> See K1001. The Serial Number shall be included.	
<u>CATHODE:</u> Indirectly heated.					
<u>ENVELOPE:</u> Glass enclosed in a metal shell.					
<u>PROTOTYPE:</u> VX7143					
<u>RATINGS</u> (All limiting values are absolute)				<u>BASE</u> 6 pin plug A.P.208646 (Note H)	
				<u>CONNECTIONS</u>	
				<u>PIN</u>	<u>ELECTRODE</u>
Heater Voltage (Nom.) (V) 6.3				A	Heater h
Heater Current (Max.) (A) 1.5					Heater h
Heater Current (Surge) (A) 4.0					Cathode k
Min. Total Tuning Range (Mc/s) 4000 to 7500				B	Anode a
Delay line Voltage (Min.) (V) 255				C	Delay line d1
Delay line Voltage (Max.) (V) 1500				D	Grid g
Cathode Current (Max.) (mA) 17					
Anode Voltage (Max.) (V) 300					
Anode Current (Max.) (mA) 3					
Negative Grid Voltage (Max.) (V) 200					
Power Output (Min.) (mW) 20					
				The power output terminal at the valve is an approved Type C jack socket for coaxial connection to a 50 ohm coaxial line cable (Note G)	
				<u>DIMENSIONS</u> See drawings on Pages 6 and 7	
<u>NOTES</u> See page 2.					

NOTES

- A. The H.T. voltages shall not be applied until at least two minutes after the application of the heater voltage. In all cases the delay line voltage must be applied before the anode voltage.
- B. The valve is tuned by varying the delay line voltage V_{d1} . The relationship between frequency and V_{d1} is approximately as given by the curve shown on page 8.
- C. The valve oscillates at a frequency of 4000 Mc/s at a delay line voltage not lower than 255V.
- D. The valve oscillates at a frequency of 7500 Mc/s at a delay line voltage not higher than 1350V.
- E. The valve must be air-cooled, via the air input provided. An air flow of 10 cu. ft./min. at $\frac{1}{2}$ " S.W.G. will be sufficient at 20°C. ambient.
- F. The magnetic field required to focus the electron beam is provided by a permanent magnet, which is an integral part of the valve. External magnetic fields or ferro-magnetic objects may distort the focussing field and cause noise and modulation. The valve should be kept at least 8" away from other magnets or ferrous objects if low noise output is required. It is recommended that the valve be stored in its crate, or in a similar stowage when it is not required to be in its associated equipment.
- G. The coaxial output from the valve, the cooler assembly, and the delay line are isolated from the shell which should be earthed. The insulation resistance between all electrodes and the shell with 2 kV d.c. applied is greater than 100 Megohms. The coaxial output is not isolated from the delay line and, if the cathode is to be run at earth potential, a suitable coaxial line isolator must be used.
- H. The base is rigidly attached to the metal shell and its pins are connected to the valve terminals by flexible leads.
- J. Joint Services Catalogue No. is:- 5960-99-037-2360.

TESTS

To be performed in addition to those applicable in K1001 Tests and in the specified order, unless otherwise agreed with the Inspecting Authority.

Test Conditions - Unless Otherwise Specified							
$V_h = 6.5V$ a.c. $V_g = 0$. $V_a = V_o$ (See Test b) Cooling Air:- 10 cu. ft./min. at $\frac{1}{2}$ " S.W.G. V.S.W.R. = 1.5 Max.							
	Test	Test Conditions	No. Tested	Symbol	Limits		Unit
					Min.	Max.	
a	Heater Current (After two minutes)		100%	I_h	0.8	1.0	A
b	<u>Oscillation at 4000 Mc/s</u> (i) Delay line Voltage (ii) Anode Voltage (iii) Anode Current (iv) Power Output	Adjust V_{d1} for test frequency. Adjust V_a for $I_k = 10$ mA. $V_a = V_o$ (Record value V_o) Notes 2 and 3.	100%	V_{d1} V_a I_a P_o	255 125 - 20	295 250 3 -	V V mA mW
c	<u>Oscillation at 5750 Mc/s</u> (i) Delay line Voltage (ii) Cathode Current (iii) Anode Current (iv) Power Output	Adjust V_{d1} for test frequency. Note 2.	100%	V_{d1} I_k I_a P_o	570 - - 20	690 13 3 -	V mA mA mW
d	<u>Oscillation at 7500 Mc/s</u> (i) Delay line Voltage (ii) Cathode Current (iii) Anode Current (iv) Power Output	Adjust V_{d1} for test frequency. Note 2.		V_{d1} I_k I_a P_o	1150 - - 20	1350 17 3 -	V mA mA mW
e	<u>Cut-Off</u> Power Output	Adjust V_{d1} over range necessary for 4000 - 7500 Mc/s. $V_a = 0$.	100%	P_o	-	0	mW
f	<u>Grid Insulation</u> Grid Current	V_{d1} as for test d. $V_g = -100V$.	100%	I_g	-	40	μA
g	<u>Noise</u> All frequencies 4000 to 7500 Mc/s.	Adjust V_{d1} Notes 4 and 11.	100%	$\frac{dB}{c.p.s.}$	150	-	dB
	Frequency Pulling At 4000, 5750 and 7500 Mc/s.		100%	Δf	-	10	Mc/s
		Notes 2 and 5.					

	Test	Test Conditions	No. Tested	Symbol	Limits		Unit
					Min.	Max.	
j	<u>Heater-Cathode Insulation</u>	$V_{d1} = 0$ $V_a = 0$ Note 6.	100%	I_{h-k}	-	500	μA
k	<u>Insulation Resistance</u> (i) Shell to lined collector (ii) Shell to cathode/heater (iii) Shell to Anode (iv) Shell to Grid	No operating voltages. 2 kV d.c. applied between test electrode and shell of valve.	100%	R_{coll} R_k R_a R_g	100 100 100 100	- - - -	M ohm M ohm M ohm M ohm
	<u>Life</u> Time Power Output	Adjust V_{d1} for 5750 Mc/s Notes 2 and 7.	T.A. and 2%	t P_o	1000 10	- -	Hours mW

NOTES

- Vibration tests (as agreed with the specifying authority) shall be carried out on the type approval samples, and a note on the performance of the valve under vibration conditions shall be included at a later date for the guidance of users.
- The frequency shall be set to within $\pm \frac{1}{2}\%$.
- The manufacturer to supply with each valve:
 - a frequency versus V_{d1} characteristic covering the range 4000 to 7500 Mc/s. There must be no frequency discontinuities over this tuning range.
 - a power output (P_o) versus V_{d1} characteristic covering the range of frequencies from 4000-7500 Mc/s. The power output shall not fall below 20 mW at any point in this range.
 - an anode modulation characteristic P_o/V_a taken at 4000, 5750 and 7500 Mc/s.
- The heater supply shall be d.c. or rectified and smoothed a.c. A broadband (non-balanced) mixer shall be used throughout noise tests. The noise output shall be indicated on a visual display. The following tests are to be made:-

The ratio of signal to average noise over 1 Mc/s bandwidth varied between 55 Mc/s and 65 Mc/s shall not be less than 150 dB/o.p.s.

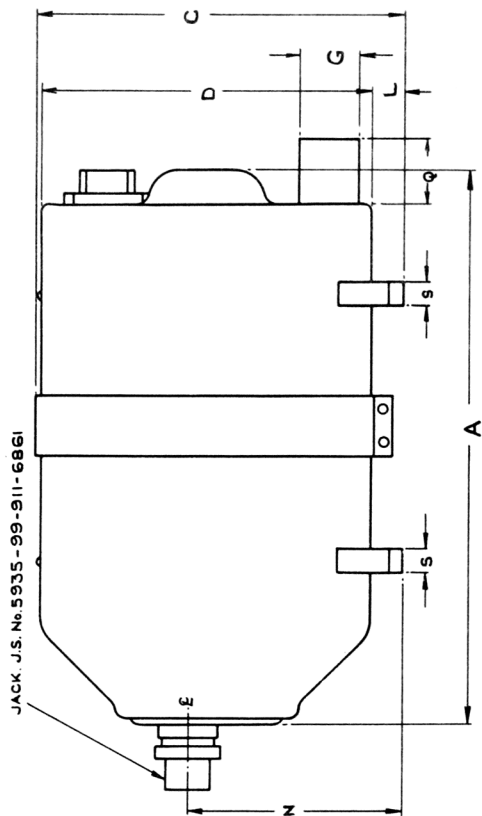
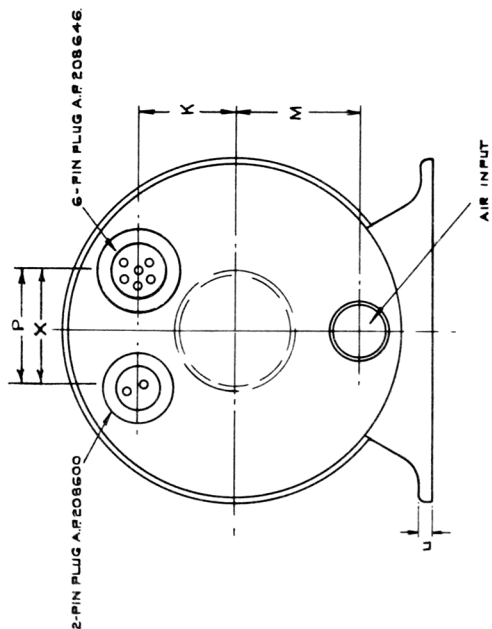
The time taken in this test for each sweep over the carrier range of 4000 to 7500 Mc/s shall not be less than two minutes.

NOTES (Contd.)

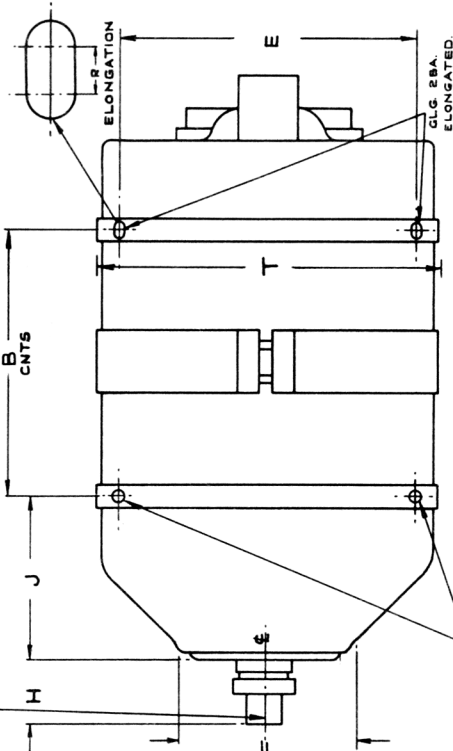
5. The pulling frequency is the difference between the max. and min. frequencies recorded, when a mismatch placed in the output section is varied through all phases. The v.s.w.r. of the mismatch shall lie between 1.5 - 1.6 at each microwave frequency.
6. The maximum permissible leakage current to apply in this case for the Heater - Cathode Leakage Test (K1001 - paragraph 5.3) shall be 500 μ A.
7. The life of a valve shall be considered terminated when, at any frequency in the range 4000 - 7500 Mc/s, the performance of the valve falls outside any one of the limits specified, with the following exceptions:- Tests b, c, and d. P_o shall be 10 mW. Test b, max. anode voltage shall be 300V.

The test and release sequence, and the procedure to be adopted in the event of failure in life testing, will be decided by the purchasing authority.

For production contract orders of less than 50 valves, the quantity of valves for life test shall be decided by the purchasing authority.

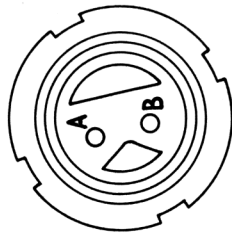


CLG OF JACK TO BE WITHIN $\pm \frac{1}{4}$ FROM CLG OF SHELL IN THIS PLANE

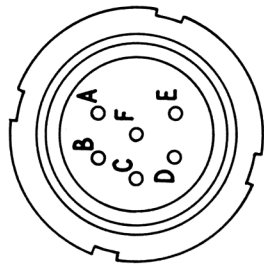


DIM	MILLIMETRES	INCHES	DIM	MILLIMETRES	INCHES
A	247.7 MAX.	$9\frac{3}{4}$ MAX.	L	12.7 ± 1.6	$\frac{1}{2} \pm \frac{1}{16}$
B	106.4 ± 1.6	$4\frac{1}{16} \pm \frac{1}{16}$	M	44.4 ± 1.6	$\frac{1\frac{3}{4} \pm \frac{1}{16}}$
C	152.4 MAX.	G MAX.	N	88.8 ± 6.4	$3\frac{1}{2} \pm \frac{1}{4}$
D	136.5 DIA. MAX.	$5\frac{3}{8}$ DIA. MAX.	P	42.8 ± 1.6	$1\frac{11}{16} \pm \frac{1}{16}$
E	120.6 ± 0.13	$4\frac{3}{4} \pm 0.005$	Q	23.8 ± 1.6	$\frac{1\frac{1}{8} \pm \frac{1}{16}}$
F	76.2 DIA. MAX.	3 DIA. MAX.	R	3.2 ± 0.13	$\frac{1}{8} \pm 0.005$
G	$25.4 \text{ DIA. } \pm 0.8$	1 DIA. $\pm \frac{1}{32}$	S	12.7 ± 0.8	$\frac{1}{2} \pm \frac{3}{32}$
H	22.2 APPROX.	$\frac{7}{8}$ APPROX.	T	133.4 ± 0.8	$5\frac{1}{4} \pm \frac{1}{2}$
J	68.3 ± 1.6	$2\frac{11}{16} \pm \frac{1}{16}$	U	6.4 ± 0	$\frac{1}{4} \pm 0$
K	41.3 ± 1.6	$1\frac{5}{8} \pm \frac{1}{16}$			

NOTE BASIC DIMENSIONS ARE INCHES.



DETAIL OF 2-PIN PLUG
A.P. 208600.



DETAIL OF 6-PIN PLUG
A.P. 208646.

CONNECTIONS

A.P. 208646. 6-PIN PLUG
PIN ELECTRODE

A HEATER
B HEATER
C CATHODE
D 1ST ANODE
E LINE
F GRID

A.P. 208600. 2-PIN PLUG.

A } MAGNET SUPPLY
B } PIN A TO BE EARTHED

