

MINISTRY OF SUPPLY - D.L.R.D/R.R.E.

Specification MOS/CV.5117  <b>Issue 1 dated 16.4.59.</b>  To be read in conjunction with K1001 ignoring clauses 5.2, 5.3, and 5.8.	<table> <tr> <th colspan="2"><u>SECURITY</u></th></tr> <tr> <td><u>Specification</u></td><td><u>Valve</u></td></tr> <tr> <td>UNCLASSIFIED</td><td>UNCLASSIFIED</td></tr> </table>	<u>SECURITY</u>		<u>Specification</u>	<u>Valve</u>	UNCLASSIFIED	UNCLASSIFIED
<u>SECURITY</u>							
<u>Specification</u>	<u>Valve</u>						
UNCLASSIFIED	UNCLASSIFIED						

→ Indicates a change

<u>TYPE OF VALVE</u>	Magnetron	<u>MARKING</u>	
<u>CLASS</u>	Separate Magnet	to K1001/4	
<u>PROTOTYPE</u>	CV.192		
<u>RATINGS</u>	<u>DIMENSIONS AND CONNECTIONS</u>		
		<u>Notes</u>	
Heater Voltage	(V)	6.0	A B
Heater Current	(A)	1.25	
Max. Peak Anode Voltage	(kV)	25	C
Min. Peak Anode Voltage	(kV)	19	
Max. Peak Anode Current	(A)	24	
Min. Peak Anode Current	(A)	18	
Max. Peak Input Power	(kW)	500	
Max. Anode Input Power	(W)	400	
Max. Duty Cycle for above Rating		0.0008	
Max. Pulse Duration	( $\mu$ S)	1	
Max. Rate of Rise of Voltage	(kV/ $\mu$ S)	250	
Nominal Field Strength	(Oersteds)	1880	
Nominal Frequency	(Mc/s)	3300	
Max. Anode Temperature	( $^{\circ}$ C)	140	
<u>Notes</u>			
A. Heater voltage shall be applied for at least 2 minutes before the application of H.T.			
B. It may be possible to obtain an increased life by reducing the heater voltage under high input conditions. The manufacturer should be consulted.			
C. The temperature of the anode block shall not at any point exceed 140 $^{\circ}$ C.			
D. In use, the cathode lead side of the valve shall be adjacent to the North Pole of the magnet.			

ACCEPTANCE TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions			Limits		No. Tested	Notes
	Vh (V)	Mean Ia (mA)		Min.	Max.		
a	6.0	-	Heater Current (A)	1.0	1.5	100%	1
b	6.0	14.5	Va Peak (kV)	19	24	100%	2,3,4&5.
c	6.0	14.5	Peak Output Power (kW)	160	-	100%	2,3,4&5.
d	6.0	14.5	Frequency (Mc/s)	3288	3312	100%	2,3,4&5.
e	6.0	14.5	Frequency Pulling Figure (Mc/s)	-	7	100%	2,3,4&6.
f	6.0	14.5	Spectrum (Mc/s)	-	5	100%	2,3,4,5&7
g	6.0	Mean Current varied over range 12.5 - 15 mA	There shall be no mode change.	-	-	100%	2,3,4,5&8
h	6.0	Mean Current varied over range 12.5 - 15 mA.	Frequency Shift (Mc/s)	-	1	100%	2,3,4,5&9
j	6.0	see note 10	Instantaneous Start	-	-	100%	2,3,4,5&10
k	6.0	14.5	Starting Stability (%)	-	0.5	100%	2,3,4,5&11.
l	6.0	-	Cold Impedance Position of Minimum (Wavelengths)	-	0.05	T.A. only	3 & 12.

## CV. 5117

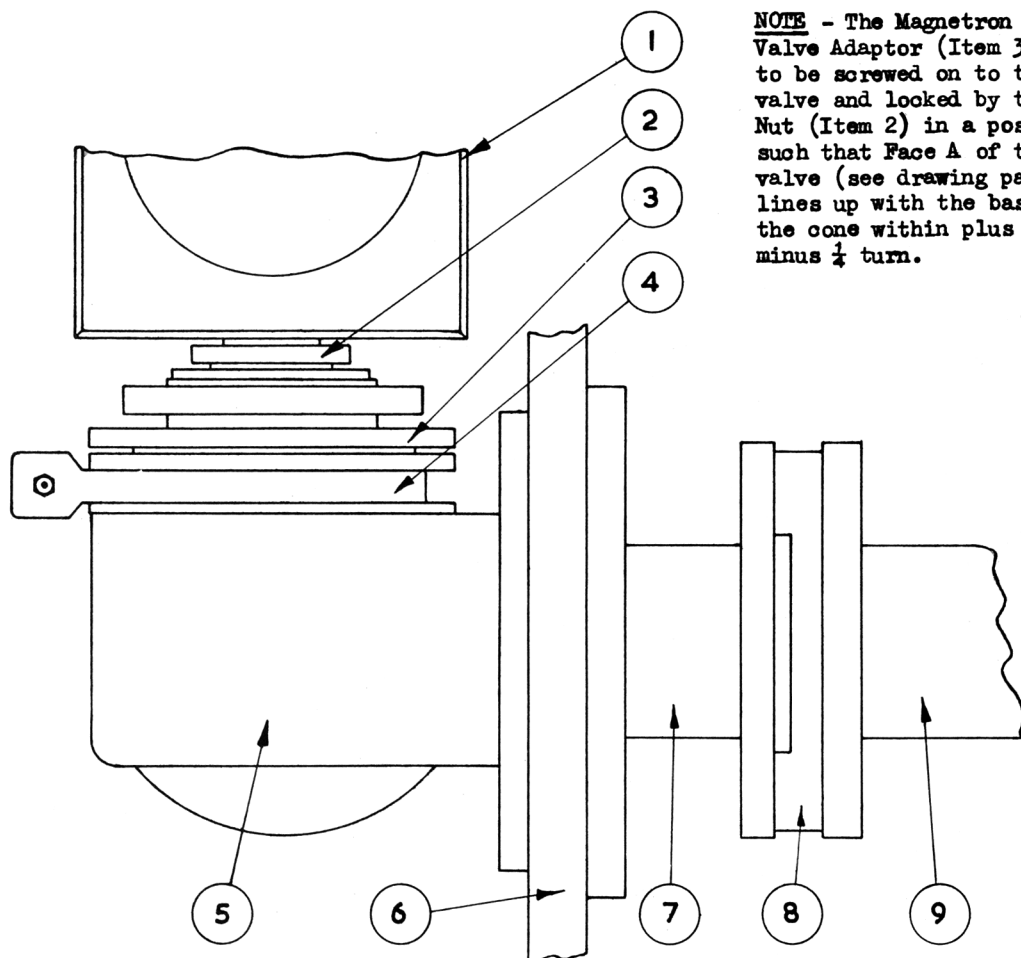
NOTES

1. The heater current shall be measured not less than 360 seconds after the application of heater voltage.
2. Heater voltage shall be applied for not more than 120 seconds before the application of H.T.
3. The valve shall be tested in the launching assembly shown on page 4 or alternatively, in an approved launching assembly.
4. Measured under the following conditions:- modulator pulse length  $0.5 \mu\text{s} \pm 10\%$ , duty cycle 0.000625, magnetic field strength  $1880 \pm 25$  oersteds. The rate of rise of the voltage pulse, measured as the maximum slope of the tangent to the leading edge, shall be not less than  $250 \text{ kV}/\mu\text{s}$  when the valve is operating at 23 amps peak current.
5. The waveguide shall be terminated in a resistive load giving a voltage standing wave ratio of better than 1.1.
6. Measured with a voltage standing wave ratio of not less than 1.5 varied through all phases.
7. The spectrum width shall not exceed  $5 \text{ Mc/s}$  at the  $\frac{1}{2}$  power points. The first side lobes shall be at least 6 db down.
8. There shall be no sign of missing pulses when viewed on a spectrum analyser or serious deterioration of the spectrum. There shall be no double traces of voltage or current observed on an oscilloscope.
9. The difference between the maximum and minimum frequencies in the range 12.5 - 15 mA shall not exceed  $1 \text{ Mc/s}$ . There shall be no sudden jumps in frequency.
10. The valve shall be stored for a minimum of 168 hours before carrying out this test. The valve shall start satisfactorily and run satisfactorily on instantaneous application of H.T. at a level such that the mean power input to the valve is greater than 300 watts.
11. This test shall follow immediately after test (j). Stable operation shall be demonstrated over 30 seconds of a test period not to exceed 4 minutes after the application of H.T. Stability is defined as:-

$$\frac{\text{Number of arcs}}{\text{Total number of magnetron pulses in test period}} \times 100\%$$

and shall not exceed 0.5%.

12. The voltage standing wave ratio shall be not less than 6. The distance of the minimum from the reference plane shall be within the specified limits at the frequency measured in test (d). The reference plane shall be located 0.05 wavelengths from the outer face of the window measured away from the valve.



**NOTE** - The Magnetron Valve Adaptor (Item 3) is to be screwed on to the valve and locked by the Nut (Item 2) in a position such that Face A of the valve (see drawing page 5) lines up with the base of the cone within plus or minus  $\frac{1}{4}$  turn.

- Item 1. Valve Electronic Type CV.5117. Magnetron Ref. No. 10CV/5117.
- Item 2. Nut. Drawing No. TR/A 750093.
- Item 3. Magnetron Valve Adaptor. Drawing No. TR/B 750101.
- Item 4. Clamp Assembly. Ref. 10AR/2222. Drawing No. TR/A 750095.
- Item 5. Waveguides Magnetron Launching Type 339. Ref. 10B/16324. Drawing No. TR/B 750010.
- Item 6. Casting Assembly. Drawing No. TR/C 750005. As an alternative, a spacer of thickness  $0.437" \pm 0.005"$  having an aperture of rectangular shape of dimensions  $2.500" \pm 0.003"$  by  $1.500" \pm 0.003$  may be used.
- Item 7. Waveguides Magnetron Matching Type 340. Ref. 10B/16325. Drawing No. TR/B 750018.
- Item 8. Windows Sealing (Waveguide) Ref. 10B/16391. Drawing No. TR/B 750130.
- Item 9. Waveguide of external dimensions  $2\frac{1}{2}" \times 1\frac{1}{4}"$ .

