

MINISTRY OF SUPPLY (R.R.E.)

Specification MOS/CV2362-2368 Issue 2. Dated 17th September, 1956. To be read in conjunction with K1001 ignoring clauses:- 5.2, 5.3, 5.8.	<u>SECURITY</u>	
	<u>Specification</u> Restricted	<u>Valve</u> Restricted

Type of Valve:-	Magnetron	<u>Marking</u>	
Cathode:-	Indirectly heated.	K1001/4 also	
Envelope:-	Metal glass	Serial No. ....	
Prototype:-	M525		
<u>RATING</u>		Note	<u>Base</u>
Heater Voltage (V)	8.5		None
Heater Current (A)	9.0		
Frequency CV2362 (Mc/s)	2750-2765		<u>Connections and Dimensions</u>
CV2363	2765-2780		
CV2364	2780-2795		See page 3
CV2365	2795-2810		<u>Packaging</u>
CV2366	2810-2825		
CV2367	2825-2840		See K1005
CV2368	2840-2855		
Max. Mean Input Power (KW)	4.5	A.C.	
Max. Permissible Mean Anode dissipation (KW)	3.0	A	
Max. Frequency Pulling for V.S.W.R. 1.5:1 (Mc/s)	7		
<u>TYPICAL OPERATING CONDITIONS</u>			
Peak Anode Voltage (KV)	36	A.B.C	
Peak Anode Current (A)	70		
Field strength (gauss)	1800		
Peak Power Output (MW)	1.1		

NOTES

- A. When in operation the anode must be cooled by a flow of water such that the outlet temperature does not exceed 90°C.
- B. The heater volts should be applied for at least 3 minutes before HT volts are applied.
- C. These operating conditions apply for a pulse length of 1.25 usecs. with a repetition rate of 1000 P.P.S. and assume operation of the valve into a load of V.S.W.R. not exceeding 1.5:1. Under these conditions the heater voltage should be reduced to 6.0 volts when the H.T. is applied.

To be performed in addition to those applicable in K1001

	Test Conditions			Tests	Limits		No. Tested	Note
	V <sub>h</sub>	Field (Gauss)	Peak I <sub>a</sub>		Min.	Max.		
a	8.5	0	0	I <sub>h</sub> (A)	8.0	10.0	100%	1.2.
b	See note 3	1800 $\pm$ 25	70	V <sub>a</sub> (KV)	34	38	100%	2.3.4.
c	ditto	ditto	ditto	Output Frequency (Mc/s)	2750 2765 2780 2795 2810 2825 2840	2765 2780 2795 2810 2825 2840 2855	100%	2.3.4.
d	ditto	ditto	ditto	Efficiency (%)	40		100%	2.3.4.
e	ditto	ditto	ditto	Frequency Pulling (Mc/s)		7	100%	2.3.4. 5.
f	ditto	ditto	ditto	Spectrum Width (Mc/s)		2.5	100%	2.3.4. 5.6.
g	ditto	ditto	Varied 60 to 80	Pulses missed from pi-mode (%)		$\frac{1}{2}$	100%	2. 4. 5.7.

NOTES

- The valve shall be run for a period of not less than 3 minutes with V<sub>h</sub> = 8.5v. 50 c.p.s. supply.
- For these tests the magnetron shall be water-cooled with a minimum water flow of 1 litre/minute at a maximum input temperature of 60°C.
- The modulator used for these tests shall be approved by R.R.E. and shall be either
  - The standard modulator of the Radar A.A. No.4 Mk.7 (1.25 uS 1000 P.P.S.)
  - A modulator having a pulse length of 2 uS and recurrence frequency 750 P.P.S.

The valve shall be run for a period of three minutes with V<sub>h</sub> = 8.5v. before the H.T. is applied. When the H.T. voltage is increased,

the heater voltage shall be simultaneously reduced progressively as full test conditions are obtained, for modulator (a) 6.0v; for modulator (b) 4.0v.

The magnetic field specified is to be measured at the centre of the magnet gap. The variation within a cylinder  $1\frac{1}{2}$ " dia. 2" long situated centrally and coaxial with the poles shall not exceed 10% overall. The north pole of the magnet shall be adjacent to the cathode lead of the valve.

4. The tests shall be carried out with the valve feeding direct through an approved coupling section into waveguide of internal dimensions of 2.84" x 1.34" terminated in a load of V.S.W.R. of better than 1.1:1.

5. Matching adjusted to give V.S.W.R. = 1.5:1, and phase varied through  $180^{\circ}$ .

6. The figure quoted is for testing with a pulse length of 1.25 usec. (see note 3a). If a 2usec. pulse is employed the max. spectrum width should be 1.5 Mc/s. The spectrum width is to be measured at  $1/4$  power. The spectrum shall be contained within the specified limits for a period of at least 1 second.

7. The mismatch used for this test shall be located not more than 5 feet from the magnetron.

The valve is required to have a Missing Pulse Ratio of less than the maximum value specified for all phases of the specified Mismatch.

A Pulse is defined as missing if it has energy within the band 2750-2855 Mc/s which is more than 2 dB down on a normal pulse.

The Missing Pulse Ratio is defined as the ratio of Missing Pulses to input pulses to the magnetron, averaged over an interval of 60 secs.

### Test Procedure

With the anode current set to the specified value on "matched" load as in test 'b', the Mismatch shall be introduced and the phase adjusted to the position giving the maximum mean anode current. The Missing Pulse Ratio shall then be measured over an interval of at least 60 sec.

The phase of the Mismatch shall be varied through  $360^{\circ}$  (one half guide-wavelength) and then set to the position showing the maximum value of the Missing Pulse Ratio. If the value of the phase is then less than  $45^{\circ}$  different from value for the previous measurement and provided that the previous value of the Missing Pulse Ratio did not exceed 0.2%, this will be regarded as evidence of satisfactory performance.

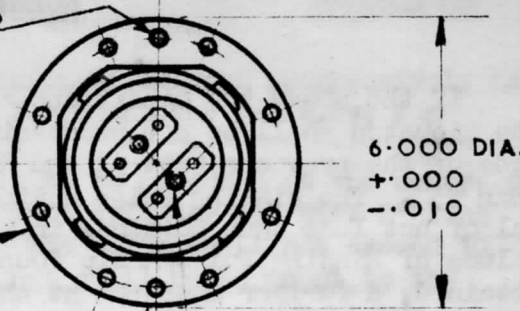
NOTES (Contd)

If the above two conditions are not satisfied the phase of the mismatch shall be set successively to two values one on each side of the previous setting and differing from it by not more than  $15^{\circ}$ . The Missing Pulse Ratio shall be measured over an interval of not less than 60 secs. in each position. If either of the values of Missing Pulse Ratio found exceeds the value previously obtained, a further measurement shall be made following the same procedure but in a single position beyond that giving the greater reading. The process shall be repeated until a value of Missing Pulse Ratio is found which is less by at least 0.1% than the highest figure found.

This test shall be carried out using the modulator specified in Note 3a.

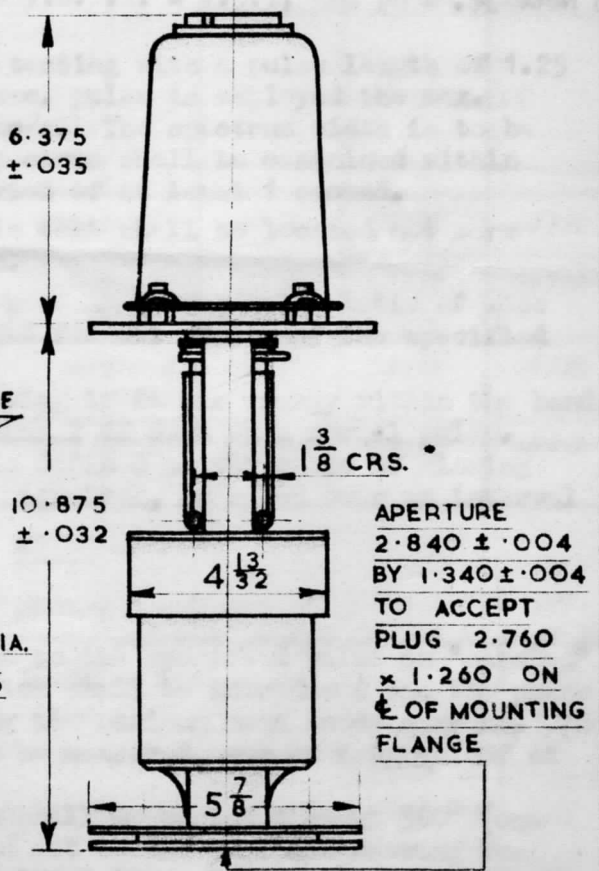
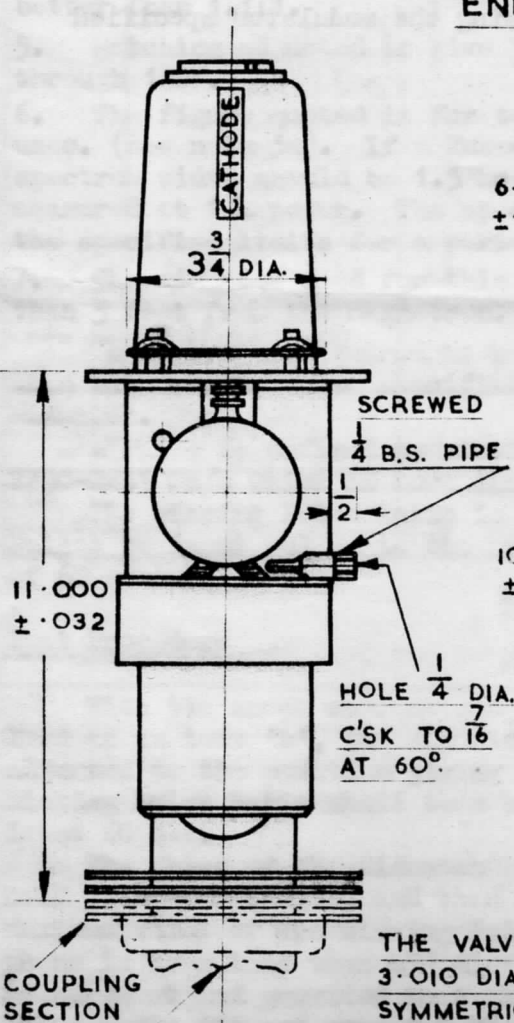
ALL DIMENSIONS ARE IN INCHES  
 HOLE  $\cdot 312$  DIA.  $+ \cdot 003$

HOLE TO CLEAR 8 STUDS  
 $0\cdot 250$  DIA. EQUALLY SPACED  
 ON  $5\cdot 500$  P.C.D. AND WITHIN  
 $0\cdot 005$  OF NOMINAL POSITION  
 WITH THE VALVE LOCATED  
 BY DOWEL PINS  $0\cdot 307$  DIA.  
 AND  $0\cdot 245$  DIA SPACED  
 $5\cdot 500 \pm 0\cdot 002$  APART.



HOLE  $\cdot 250$  DIA.  
 $+ \cdot 003$   
 END VIEW.

HOLE TAPPED  
 $\frac{1}{4}$  B.S.F. x  $\frac{1}{4}$  DEEP.



THE VALVE IS TO FIT BETWEEN MAGNET POLES  
 $3\cdot 010$  DIA. AND  $2\cdot 125$  APART LOCATED  
 SYMMETRICALLY WITH RESPECT TO THE DOWEL  
 HOLES IN THE MOUNTING FLANGE AND  $2\cdot 500$   
 FROM THE REFERENCE FACE.

N-10 WAVEGUIDE