MINISTRY OF SUPPLY - D.L.R.D.(A)/R.A.E.

VALVE ELECTRONIC

CV2353

Specification MOS(A)/CV2353 Issue 2 Dated 14.9.55 To be read in conjunction with BS448 and K1001 ignoring clauses 5.2, 5.3 and 5.8	SECURITY Specification: UNCLASSIFIED Valve: UNCLASSIFIED

TYPE OF VALVE - Velocity Modulated Oscillator with Tunable Internal Cavity Resonator having Co-axial line output

CATHODE - Indirectly Heated

ENVELOPE - Metal/Glass

PROTOTYPE - R6010

MARKING

See K1001/4

TOP CAP

B.S.448/CT2

BASE

B.S.448/B8G

RATING			Note
Heater Voltage	(V)	6.3	
Heater Current	(A)	0.9	
Max. Resonator Voltage	(V)	750	A,B,C,D
Normal Resonator Voltage	(V)	700	B,C
Reflector Voltage Range	(V)	-150 to -550	B,G,F
Grid Voltage Range at Va = 700V	(V)	0 to -150	B
Max. Resonator Dissipation	(W)	100	D
Min. R.F. Power Output	(W)	3.0	H
Mechanical Tuning Range	(Mc/s)	4400 to 4800	
Average Electronic Tuning Range	(Mc/s)	40	
Min. Electronic Tuning Range	(Mc/s)	20	E
Average Reflector Voltage Change between half power points	(V)	120	
Min. Electronic Tuning Slope $\frac{df}{dVr}$	(Mc/s/V)	0.18	
Max. Total Impedance in Reflector to Cathode circuit	(MΩ)	0.25	

There shall be no appreciable potential difference between heater and cathode.

CONNECTIONS

Pin	Electrode
1	Cathode
2	Internally Connected
3	Grid
4	Heater
5	Grid
6	Heater
7	Internally Connected
8	Grid
TC	Reflector
Metal Envelope	Resonator

DIMENSIONS

See drawings on pages 5,6,7

MOUNTING POSITION

Any
Note H

NOTES

See page 2.

Z.10541.R.

NOTES

A. Absolute Value.

B. The voltages quoted in this specification are relative to cathode. The valve is normally operated with the resonator at earth potential.

C. The resonator voltage must not be switched on until at least 60 seconds after the heater.

D. The temperature of the valve envelope should not at any point exceed 200°C, nor should that of the external metal parts at any point exceed 150°C. Forced air cooling of the resonator is necessary. A minimum flow of 5 cubic foot per minute is usually satisfactory.

E. Measured at half power points.

F. If a high impedance supply is used, the circuit must include a diode to prevent the reflector reaching a potential more positive than -150 Volts.

G. The reflector voltage required depends on the frequency of oscillation. Over the specified frequency range it will be within the limits stated.

H. The valve is mounted on a waveguide of internal dimensions 2" x 1" terminated by a matched load. A reflecting plunger mounted approximately $\frac{\lambda g}{4}$ from the coaxial output line should be adjusted for max. power.

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TESTS

To be performed in addition to those applicable in K.1001

	Test Conditions						Test	Limits Min.	Limits Max.	No. Tested	Note
	Vh (V)	Vg (V)	Vres (V)	Vref (V)	Ia mA	Freq. (Mc/s)					
a	6.3	0	0	0	0	0	Ih (A)	0.8	1.0	100%	1,2
b	6.3	Adjust	700	Adjust for max power	143	-	Vg	0	-150	100%	1,2
c	6.3	Adjust	700	Adjust for max. power	143	4400	(1) Power out-(W) put (2) Reflector (V) Voltage note value (3) Ir (μA)	3.0 -200 -30	- -500 +30	100% 100% 100%	1,2,5
d	6.3	As in test c	700	Adjust Vref less-ve for half power. Note value Vref.1 Adjust Vref more -ve for half power. Note value Vref.1	-	Note value (f1) Note value (f2)	(1) f1-f2 (Mc/s) (2) $\frac{f1-f2}{Vr2-Vr1}$ (Mc/s/V)	20 0.2	- -	100% 100%	4
e	6.3	Adjust	700	Adjust	143	4400	Electronic tuning linearity (1) $\frac{df}{dVr}$ (Mc/s/V) (2) Δf (Mc/s)	 0.18 10	 - -	 10% 10%	1, 2,3,4
f	As in test c					4800	As in test c				
g	As in test f	As in test d				4800	As in test d				
h	As in test e					4800	As in test e			100%	1,2,3,4
j	As in test c					4600	As in test c				
k	As in test j	As in test d				4600	As in test d				
l	As in test e					4600	As in test e				

	Test Conditions						Test	Limits		No. Tested	Note
	Vh (V)	Vg (V)	Vres (V)	Vref (V)	Ia mA	Freq. (Mc/s)		Min.	Max.		
m	5.8	As in test b				-	Ia	observe value		100%	1, 2
n	6.8	As in test b				-	Change in Ia from value in test (m) (%)	-	15	100%	1, 2
p	Electrical re-test after 28 days holding period. As in test c					4600	As in test c				6
q	6.3	As in test c				4600	Microphony	-	-	T.A.	7

NOTES

1. The valve shall be tested when mounted on a 2" x 1" internal waveguide by means of a mounting plate. A reflecting plunger shall be adjusted for maximum output from a power monitoring device, such as a small probe and crystal.

2. The valve shall be run under normal operating conditions for a minimum period of 15 minutes before carrying out tests (a) to (n).

3. The electronic tuning slope $\frac{df}{dVr}$ shall be measured with a frequency increment not exceeding 1 Mc/s. Note shall be taken of the minimum value of this slope, and the frequency range (Δf) over which the slope does not exceed the minimum value by more than 20%. Over this range the $\frac{df}{dVr}$ characteristics shall not depart by more than the accuracy of measurement from a smooth curve. It should be noted that the value of Vr giving minimum slope is usually about 20 volts more positive than that required for maximum power output.

4. The mechanical tuning shall be set in tests (d) and (e) as for test (c); in tests (g) and (h) as for test (f); and in tests (k) and (l) as for test (j).

5. The frequency shall be adjusted by means of the mechanical tuning with the reflector voltage and reflecting plunger adjusted simultaneously for maximum power.

6. That part of Ir due to the ion current shall not have increased from the original value by more than the expected error of measurement.

7. The valve shall be mounted on a short length of waveguide, which is vibrated in a direction parallel to the output tube of the valve. The frequency of vibration shall be within the range 20 to 300 c/s, and the peak acceleration shall not exceed "g". Under these conditions the peak frequency deviation of the R.F. output shall not exceed 150 kc/s/g.

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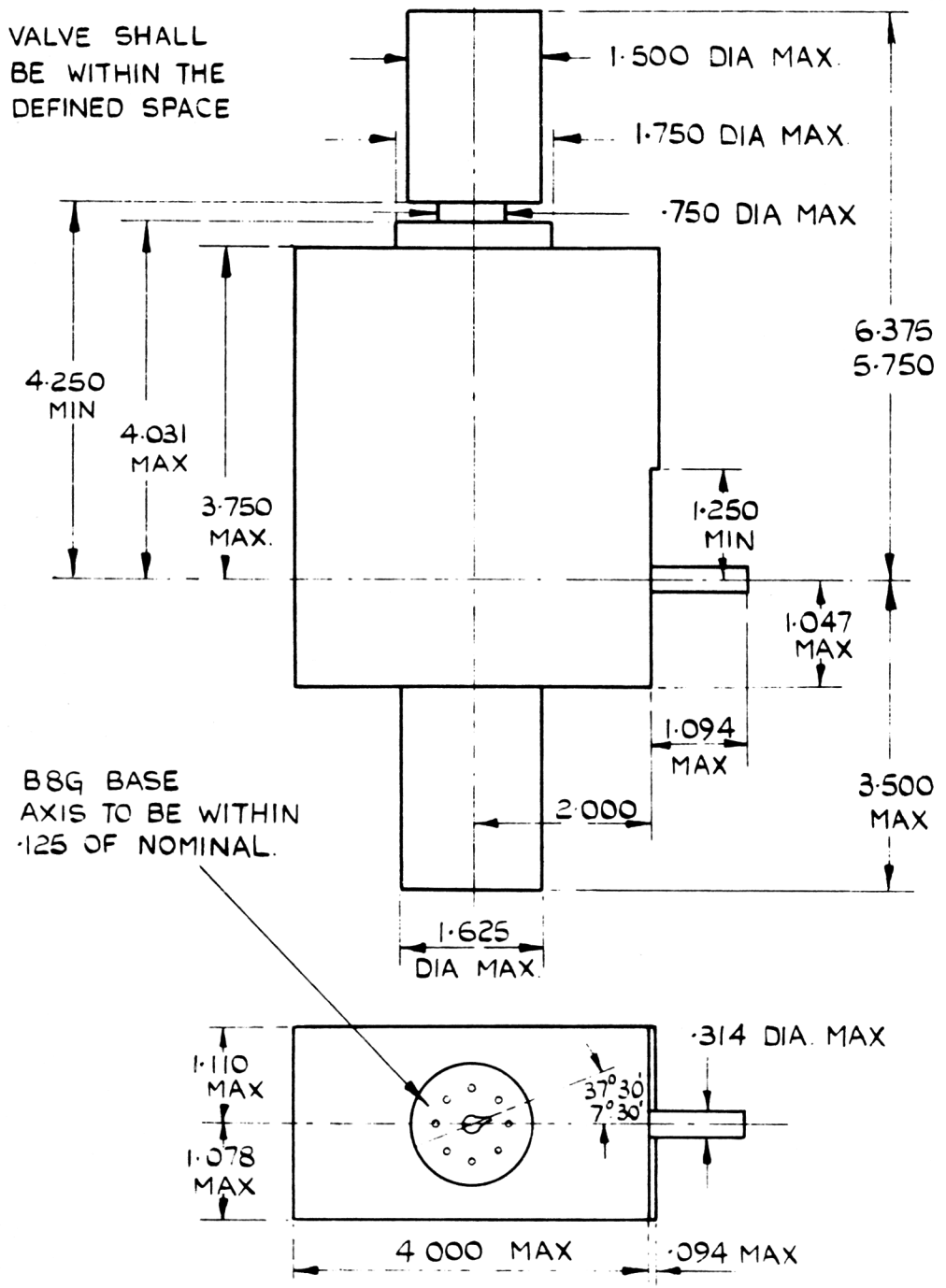
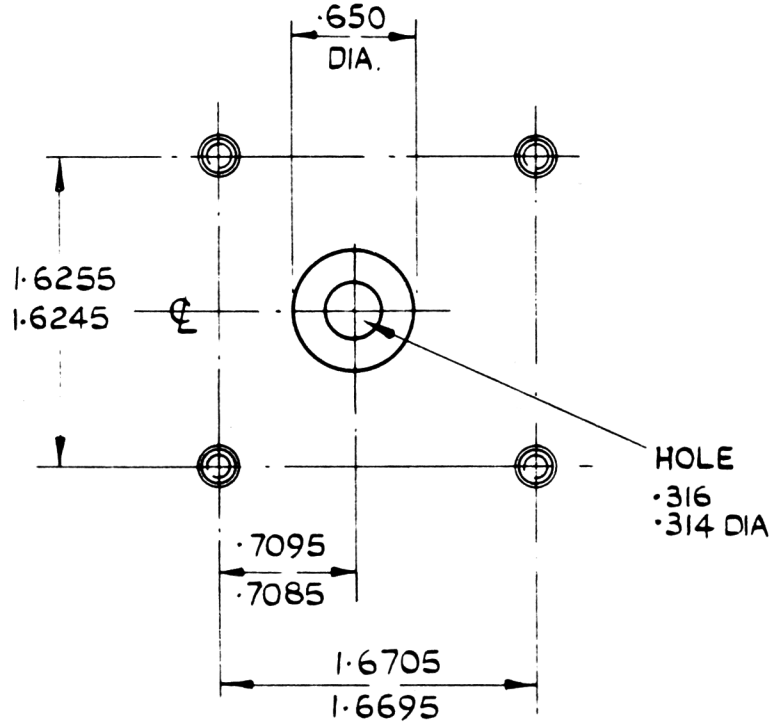
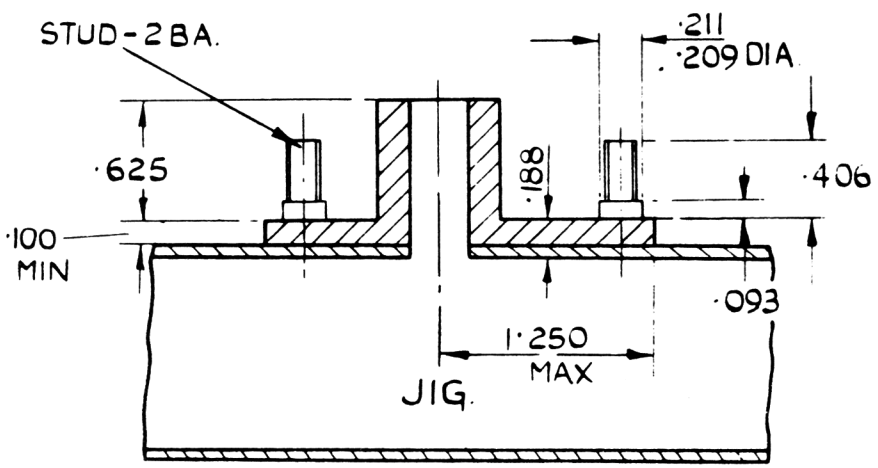


DIMENSIONS IN INCHES.





VALVE SHALL FIT ONTO JIG BY MEANS OF 4 CAPTIVE SCREWS

DIMENSIONS IN INCHES
LIMITS UNLESS OTHERWISE STATED TO BE ±.005

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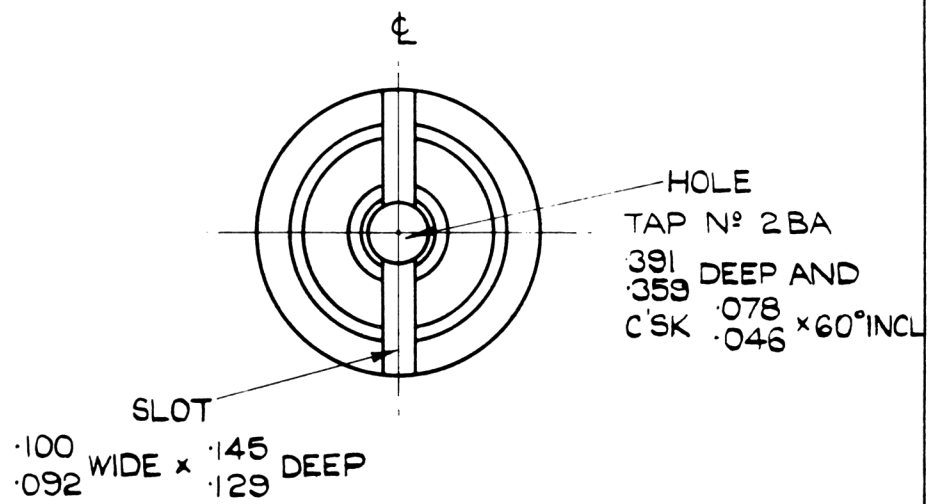

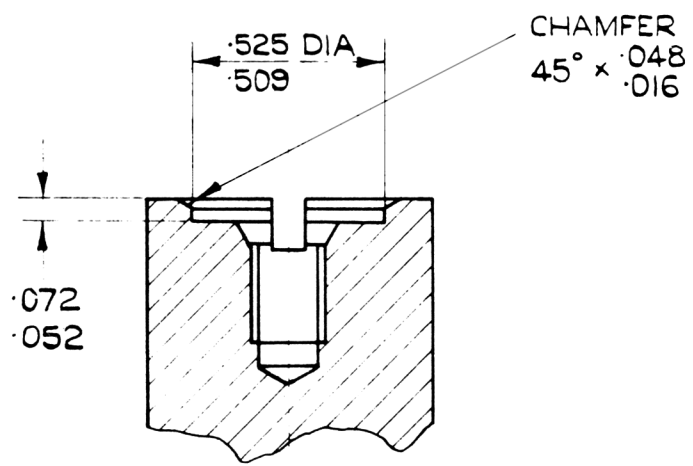

AXIS TO BE WITHIN ·032 OF NOMINAL POSITION.

TUNER COUPLING

DIMENSIONS IN INCHES