Amdt 1

MINISTRY OF ~~SUPPLY~~ TECHNOLOGY - DLRD(A)/RRE

VALVE ELECTRONIC

CV2297

Specification MOS(A)/CV2297 Issue 3A Dated 4th January 1967 To be read in conjunction with K1001.	SECURITY Specification: UNCLASSIFIED Valve: UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Fixed-tuned TB Cell

PROTOTYPE - VX3154

MARKING

See K1001/4.

RATING

			Note
Max. Transmitter Peak Power	(kW)	250	A
Min. Transmitter Peak Power	(kW)	4	
Centre Frequency	(Mc/s)	3300	

DIMENSIONS AND CONNECTIONS

See Drawing on Page 4.

NOTE

A. At duty cycle not exceeding 0.001.

B. NATO Stock No: 5960-99-000-2297 ←

TESTS

To be performed in addition to those applicable in K1001

	Test Conditions	Test	Limits Min.	Limits Max.	No. Tested	Note
a	The cell shall be tested when inserted both ways into the mount. Test frequency 3300 ± 2 Mc/s.	Resonant Frequency (Mc/s)	3292	3308	100%	1,2
b	Test frequency shall be the resonant frequency measured in Test (a).	Equivalent Resistance	0.02	-	10%	1,3
c	Test frequency 3300 ± 12 Mc/s. Line shall be energised with not more than 4 kW peak RF; Tp = 0.5 µsec ± 10%, PRF = 1000 c/s ± 10%, measured immediately after cell. Test shall be performed after cell has been standing 7 days without discharge.	Arc Loss (db)	-	0.8	100%	1
d	Test frequency 3300 ± 12 Mc/s. Line shall be energised with a transmitter pulse of 180 ± 40 kW peak RF; Tp = 0.5 µsec ± 10% PRF = 1000 c/s ± 10%, with a 6 db pad between source and the valve under test. The simulated echo pulse shall be less than 10 mW peak RF and on the same frequency as the transmitter pulse. The test shall be performed using approved apparatus.	Recovery Time (µsecs) The time shall be measured from the trailing edge of the transmitter pulse at which the attenuation has risen to 3 db.	-	6	100%	1
e	Test frequency 3300 ± 12 Mc/s. Line to be energised with 180 ± 40 kW peak RF; Tp = 0.5 µsec ± 10% PRF = 1000 c/s ± 10%.	High Level Standing Wave Ratio	-	1.1	TA	1
f		Loaded Q	-	10.0	TA	1,4

NOTES

1. The valve shall be tested using the test mount shown in the Drawing on Page 5, with the guide terminated in a matched load.

2. The resonant frequency of the valve may be measured by comparing the phase of the reflection with that of a standard valve which is resonant at a known frequency within the range 3300 ± 8 Mc/s.

   With sufficient accuracy, the reactance is given by:-

$$X = \frac{2}{(1 + r)} \cdot \frac{\Delta f}{f_o} \cdot Q$$

   and this is related to the phase advance of the reflected wave by:-

$$X = -2\pi \frac{\Delta l}{\lambda g}$$

   So that $\Delta f = -(1 + r) \cdot \frac{\pi f_o}{Q} \cdot \frac{\Delta l}{\lambda g}$

   Hence

$$(\Delta f - \Delta f') = -(1 + r) \cdot \frac{\pi f_o}{Q} \quad \frac{(\Delta l - \Delta l')}{\lambda g}$$

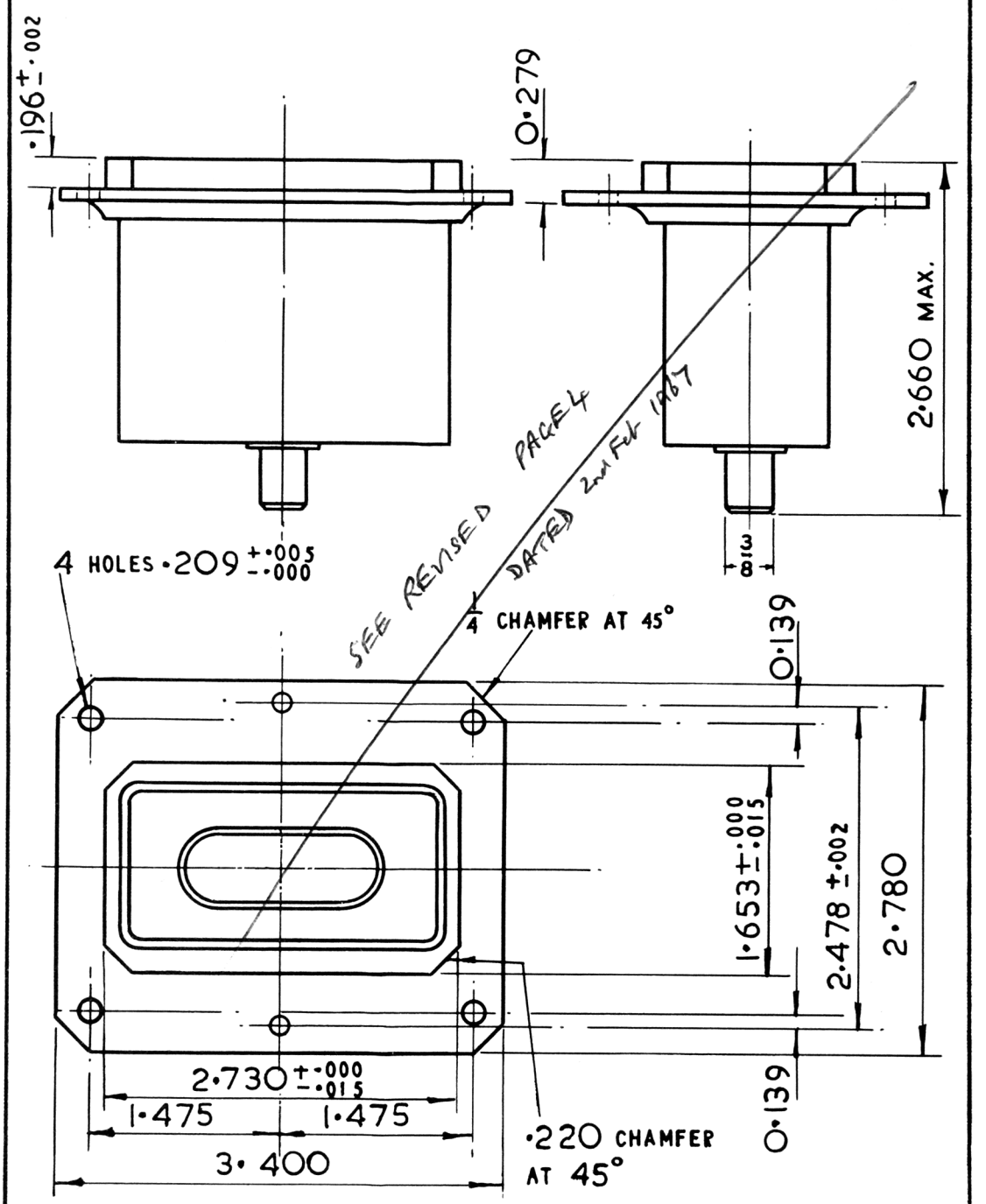
   where r is the resistance of valve
   f the difference between the test frequency and the resonant frequency of the valve under test
   f' the difference between the test frequency and the resonant frequency of the standard valve
   f_o the test frequency
   Δl the phase angle of the valve under test
   $\Delta l'$ the phase angle of the standard valve, both measured in the same units as
   λg, the guide wavelength
   r may be assumed to be approximately 0.03 and Q approximately 9.0, so that

$$(\Delta f - \Delta f') = -1.19 \times 10^3 \frac{(\Delta l - \Delta l')}{\lambda g} \text{ Mc/s.}$$

3. The equivalent resistance is obtained from the VSWR at the resonant frequency as follows:-

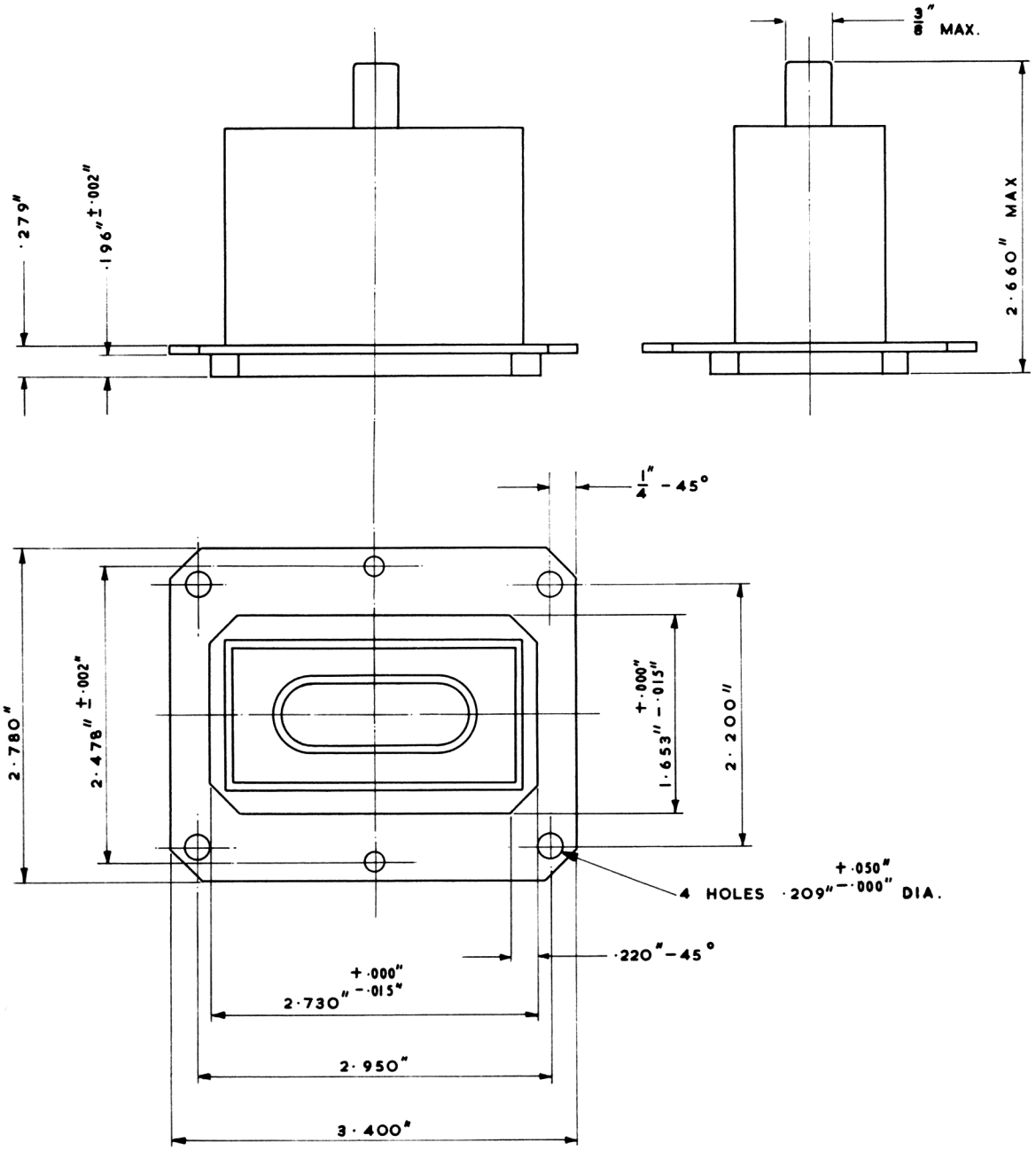
$$r = \frac{1}{S - 1}$$ where S is the VSWR (greater than unity)

4. The loaded Q is the Q of the cell when loaded by the waveguide impedance.

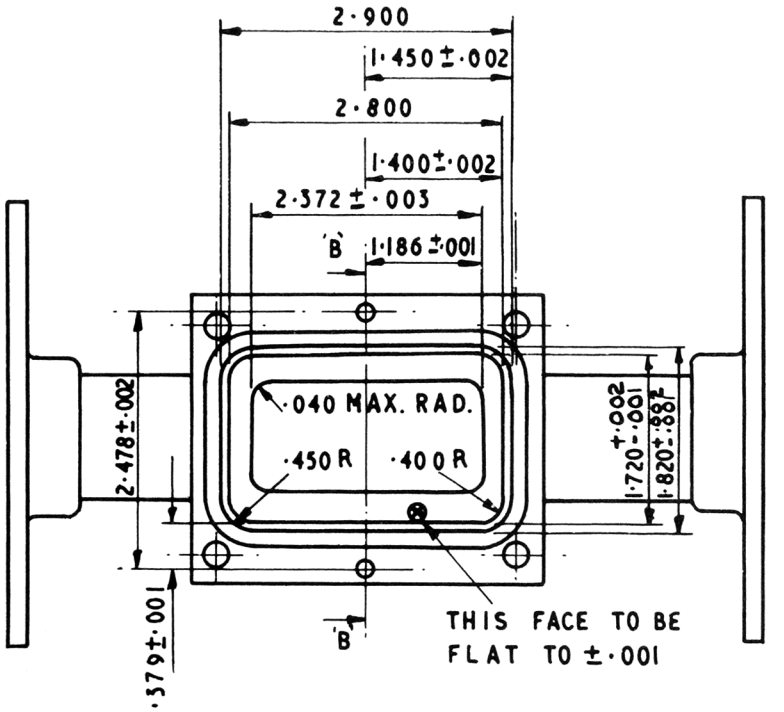


ALL DIMENSIONS IN INCHES.

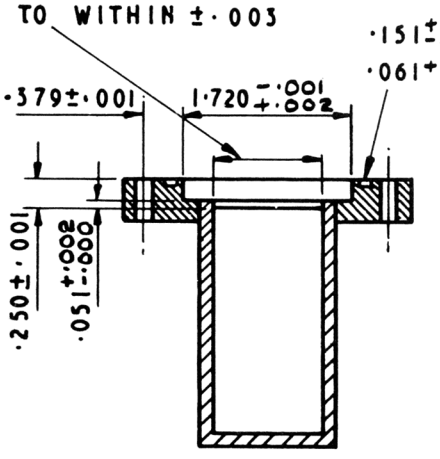
OUTLINE DRAWING
(THIRD ANGLE PROJECTION)



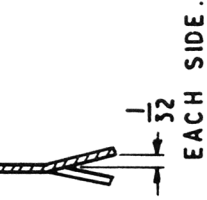
CV2297



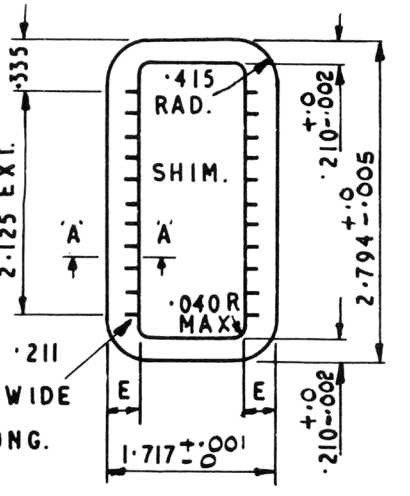
CUT-OUT MUST COINCIDE WITH INSIDE FACE OF GUIDE TO WITHIN ± ·003



SECTION OF MOUNT ON ℄ "B B"



ENLARGED SECTION ON "A A"



11 CUTS AT ·211 PITCH 1/64 WIDE AND 5/32 LONG.

E DIM = ·296 +·000 −·002

BERYLLIUM COPPER, SOFT ·004 THICK CU-BE-250 OR MALLORY 73.

ALL DIMENSIONS IN INCHES.,

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION MOS(N) CV2297
ISSUE 3A DATED 4th JANUARY 1967.
AMENDMENT NO:1

Page 1 Delete: "Ministry of Supply"
Insert: "Ministry of Technology"

Page 4 Cross out but do not remove existing outline drawing.
Insert: New Outline Drawing dated 2nd Feb.1967

4th April 1967 T.V.C. for R.R.E.