THIS VALVE MAY BE RADIOACTIVE To CLASS I (Section I Appendix XX) Add 2

MINISTRY OF AVIATION - DLRD/RRE

VALVE ELECTRONIC **CV6089**

Specification MOA/CV6089 Issue 1B dated 26th February 1963 To be read in conjunction with K1001 except where otherwise stated	SECURITY	
	Specification	Valve
	Unclassified	Unclassified

→ indicates a change

TYPE OF VALVE : Externally excited microwave pulsed attenuator

ENVELOPE : Silica

PROTOTYPE : VX9195

RATINGS and CHARACTERISTICS
(Not for Inspection Purposes)
All limiting values are absolute

			Note
Operating frequency range	Mc/s	2500 to 4000	A
Maximum Microwave incident power	(W)	200	B
Minimum Excitation pulse width	(μs)	2	C
Excitation Frequency	(Mc/s)	50	D
Peak Excitation power	(W)	100	

MARKING

See K1001/4
CV number and serial number on silica envelope. A red spot indicating correct orientation to be marked on seal off tip

EXCITATION

By R.F. applied to an external metal sleeve

DIMENSIONS

See drawing on page 4

MOUNTING POSITION

ANY

NOTES

A. The tube is intended to be mounted across a suitable waveguide iris dimensioned, so that the combination resonates at the desired frequency. Peak attenuation and bandwidth are determined by the Q value of the structure.

B. Except where the peak microwave power is spike leakage of less than 0.02 microseconds duration the tube should be preceded by a suitable power limiter for incident microwave peak power in excess of 200 watts.

C. The peak attenuation is developed coincident with the trailing edge of the R.F. excitation pulse. The excitation pulse should not exceed 5 μs duration.

D. The recovery time and attenuation is dependert upon the operating electron density in the tube which reaches its limited value in about 2 microseconds. After ionisation the limit is determined primarily by the impedance of the excitation source.

E. TYPICAL OPERATING CONDITIONS

The tubes may be used in a three or four element filter network designed for a 10% passband to a V.S.W.R. of 0.85. Under these conditions a minimum peak attenuation of 45 dB is obtained with a maximum recovery time of 30 microseconds to 3 dB. When operating with incident microwave power in excess of 200 watts peak the first element of the filter network should include a power limiter tube.

F. JOINT SERVICE CATALOGUE NUMBER 5960-99-037-2435

To be performed in addition to those applicable in K1001

TEST CONDITIONS: Unless otherwise specified

Excitation pulse (tp) /us: 3 ± 10%
Duty Cycle (Du) of excitation pulse: 0.003 ± 10%
Test Mount: Note 1
Test Circuit: Note 2

K1001	TEST	TEST CONDITIONS	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP A							
	v.s.w.r.	Note 1		100	-	0.95	-	Ratio
	Recovery Time (1) (to 3dB)	Notes 1 and 2		100	t	-	30	/us
	Peak Attenuation	Notes 1 and 2		100	-	22	-	dB
	Recovery Time (2)	Du = .00075 ± 10%			t_j	-	2	/us
	Attenuation Rise Time	Du = .00075 ± 10% Notes 1, 2 and 3			t_r	-	3	/us
	GROUPS B, C AND D Omitted							
	GROUP E	Note 4						
	Glass strain	No voltages		10%				
11.3	Fatigue	No voltages Note 5 Frequency, any within range 40-200 c/s. Min. peak acceleration = 5g Duration = 96 hours						
11.4	Shock	No voltages Hammer angle = 30° Applied along valve axis only						
	Temperature cycling	No voltages Three cycles between -40°C and 100°C						
	Post Fatigue Shock and Temperature Cycling Tests							
	Recovery time Peak Attenuation	Test and limits as in Group A						
	GROUP F Omitted							
	GROUP G	Note 6						
	Re-test after 28 days holding period							
	Recovery time Peak Attenuation	Test and limits As in Group A	1 1	100% 100%				

CV 6089

NOTES

1. The tube shall be tested in a mount having a loaded Q of 3.4 ± 5% at a frequency of 3650 Mc/s ± 10%: The mount shall be resonant at the test frequency, the V.S.W.R. being not less than 0.95. The mount shall be provided with a suitable monitor of excitation current which will be used in conjunction with standard tubes to check the output of the excitation oscillator before tests. A drawing of a suitable mount and current monitor circuit is shown on Page 5. A circuit of a suitable excitation oscillator for this mount is shown on Page. 6.

2. The recovery time shall be measured with reference to the trailing edge of the R.F. excitation pulse. The time in microseconds shall be taken as the longest indicated by the pulse jitter. The peak attenuation shall be measured within the period and up to 1 μsec after the trailing edge of the excitation pulse. A recovery time curve for an average tube is shown on page 4.

3. The attenuation curve for the tube under test shall be displayed on a suitable C.R.O. and shall be observed for a period of not less than 20 seconds. ←

   The rise time shall be defined for the purpose of this specification as being the time delay measured from the trailing edge of the excitation pulse to the moment when the attenuation characteristic has reached a value which is ± 0.2dB from the maximum value obtained. At no time during the observation period shall the limit be exceeded. ←

   This test shall be repeated following a notation of the valve, in its mount, through an angle of 90°. ←

4. The sample size used for the purpose of the tests contained in Group E shall comprise of 10% of the lot size taken to the nearest whole number above the 10% value. Where the production rate is less than 30 per calendar month, a lot shall be considered as comprising the total production of that month.

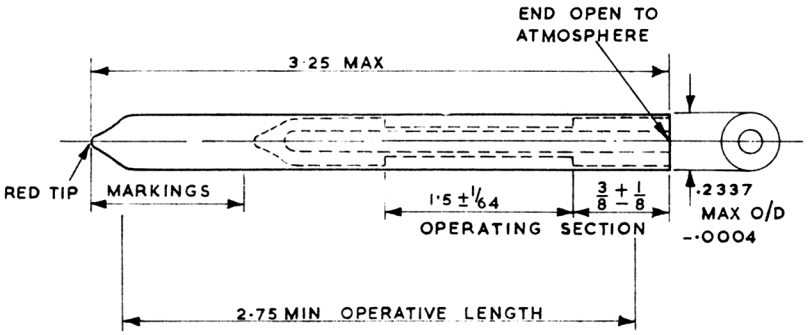
   The criteria for acceptance shall be that not more than one failure shall occur in any ten consecutive samples tested. At the start of a contract following a non-production period exceeding six months, valves may be despatched without waiting for the accumulation of the ten samples, provided that the results of the tests made do not preclude acceptance under the criterion. Where rejection is incurred shipment shall cease and the Approval Authorities informed. ←

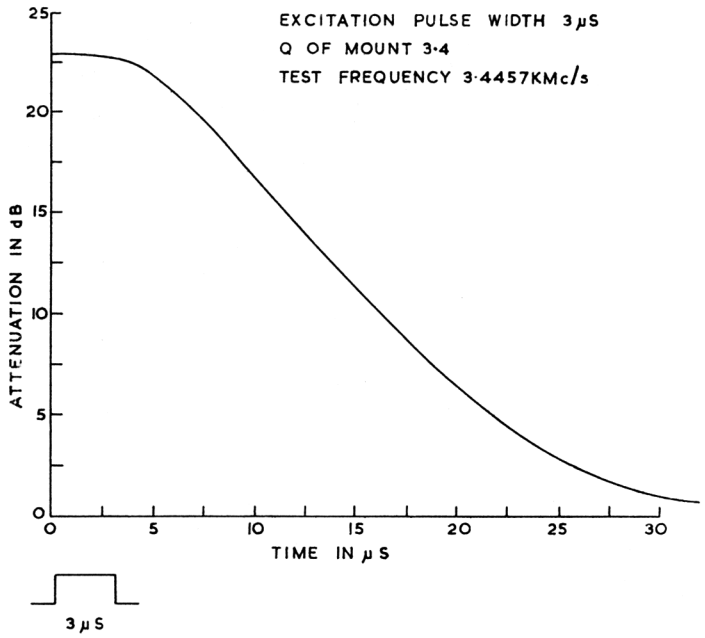
   The manufacturer may, at his discretion, test additional valves or apply more than one test to each sample. Of the samples taken for the Group E tests, at least half shall be subjected to either the Fatigue or Shock test; taken in equal proportion.

5. The Valve shall be vibrated in the horizontal plane only.

6. This test excludes any life test equipment.

OUTLINE DRAWING



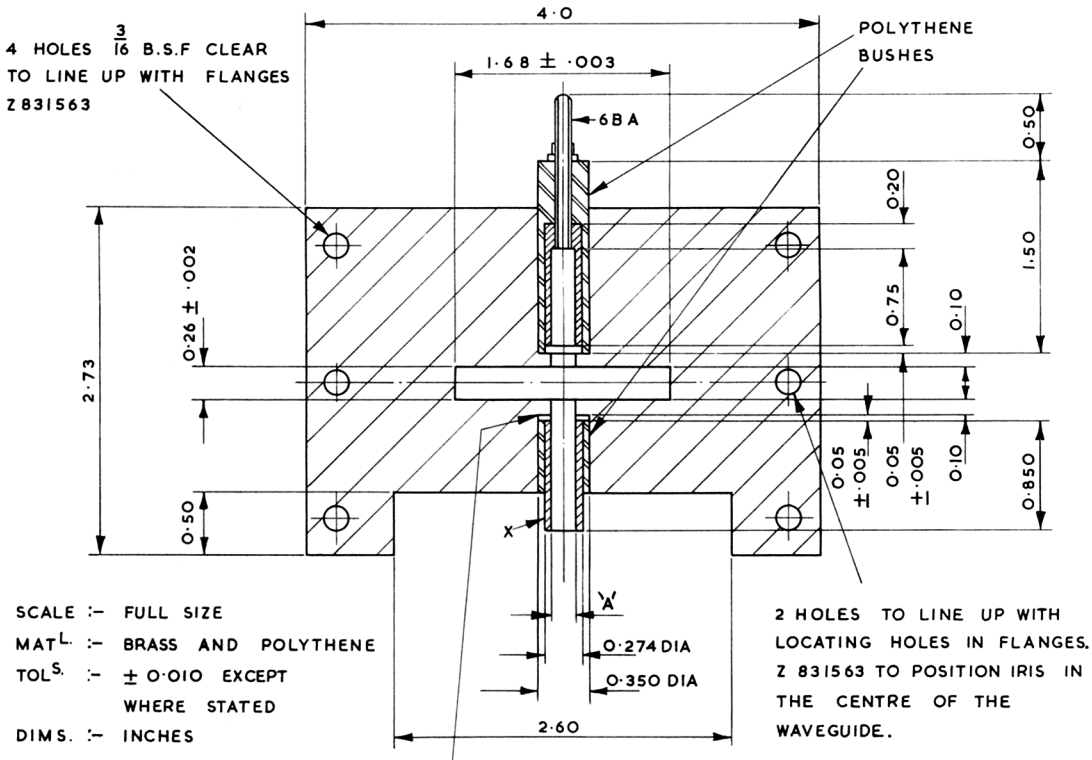


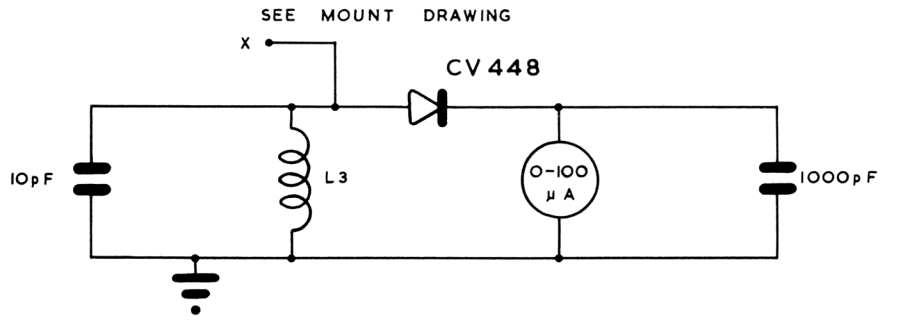
RECOVERY TIME CURVE
FOR AVERAGE CV6089

DIMENSIONS IN INCHES

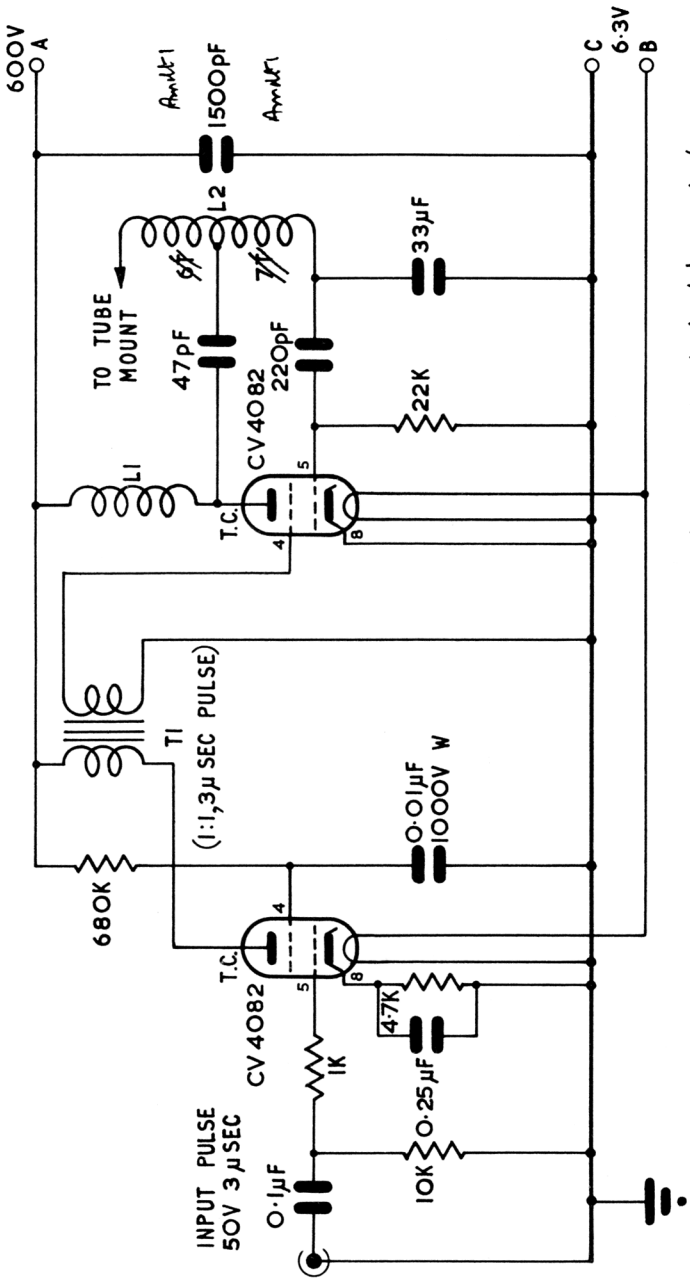
CV 6089

CV 6089 TEST MOUNT





MONITOR CIRCUIT



Ampl.1 Note: The tap on L2 shall give optimum match to the tube under test

EXCITATION OSCILLATOR

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV.6089 ISSUE 1B DATED 26th FEBRUARY, 1963

AMENDMENT No.1

Page 6 Exitation Oscillator Circuit Diagram

(i) Delete the "6T" and "7T" associated with the Inductor circuit reference L2.

(ii) Insert the following note:-

"The tap on L2 shall give optimum match to the tube under test".

June 1963 T.V.C. for R.R.E.

(163867)

5/6/63

ELECTRONIC VALVE SPECIFICATIONS.

SPECIFICATION MOA/CV6089, ISSUE 1B, DATED 26th February 1963.

AMENDMENT No.2.

Page 1. Top of Page.

Amend the note to read "THIS VALVE MAY BE RADIOACTIVE TO CLASS 1 (See K1001 Appendix XX)".

October 1966

TVC for RRE

M. 445216

22/2/66