ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

VALVE ELECTRONIC

CV 6121

Specification AD/CV 6121 Issue 1 Dated 9th April 1963. To be read in conjunction with K1001/5	SECURITY Specification: Unclassified Valve: Unclassified

Type of valve - Pre T.R. U.H.F. (Plug in type) Consisting of 2 matched cells

Envelope - Metal and Glass

Prototype - VX 3348

MARKING

See K1001/5 and Note A

DIMENSIONS

See drawings on Page 9

RATING

(All limiting values are absolute)

			Note
Operating Frequency Range	Mc/s	100-500	C
Max. Peak R.F. Power	kW	225	
Max. Mean R.F. Power	kW	0.45	
Min. Peak R.F. Power	kW	1.0	
TYPICAL OPERATING PERFORMANCE			
Centre Frequency	Mc/s	220	D
Capacitance inner to outer connector	PF	5.5	E
Arc loss	dB	0.2	D.F
Firing Power	W peak	200	D.F
Total leakage Power	W peak	60	D.F
Recovery time to 6 dB	μ sec.	200	D.F

MOUNTING POSITION

Any

PACKAGING

See K1005 and Note B

NOTES

A. One cell from each valve shall be marked with the appropriate serial number and the suffix letter "A", the other cell with the same serial number and the suffix "B".

B. The cells shall be packed in matched pairs, and the package marked "CV 6121 (1 only) consisting of 2 matched cells".

C. The valve may be used in a hybrid or branched duplexer. The frequency of operation depends on the design of the mount. It can be conveniently mounted in a co-axial line. A typical low Q mount is Admiralty Pattern No. A.P.161002.

D. Valve mounted in Admiralty Pattern No. A.P.161002.

E. Measured on individual cells.

F. Measured under the test conditions stated overleaf.

G. The Joint Service Catalogue Number is 5960-99-037-3207.

TESTS

To be performed in addition to those in K1001.
All tests to be carried out at least 7 days after completion of manufacture.

	Test	Test Conditions	Insp. Level	LIMITS Min.	LIMITS Max.	Units	Notes	
a	D.C. Voltage	Current 25 ± 2 µA	100%	80	250	V	(1)(2)	
b	Capacitance	Inner to outer connector	100%	5.0	7.0	pF	(1)	
c	Firing Power	As shown on Page 5	100%	-	1000	W.Peak	(1)(3) (4)(5)	
d	Total Leakage Power	As shown on Page 6	100%	-	~~90~~ 120	W.Peak	(4)(5) (6)(7)	Amdt 1
e	Recovery Time	As shown on Page 7	100%	-	~~250~~ 300	µSec.	(4)(5) (6)(7) (8)	Amdt 1
f	Vibration Fatigue Post Vibration Fatigue Tests	No Voltages	4%				(1)(9) (10)(11) (12)(13)	
	D.C. Voltage	As Test (a)		70	260	V	(1)(2)	
	Capacitance	As Test (b)		4.8	7.2	pF	(1)	
g	Shock Post Shock Tests	No Voltages	Q.A.				(1)(9) (11)(12) (14)	
	D.C. Voltage	As Test (a)		70	260	V	(1)(2)	
	Capacitance	As Test (b)		4.8	7.2	pF	(1)	
h	Life Test		4%	500	-	Hrs.	(4)(5) (6)(7) (9)(10)	
	Life Test End Points (i)D.C. Voltage			70	260	V		
	(ii)Capacitance			4.8	~~12.0~~ 10	pF		Amdt
	(iii)Firing Power			-	1100	W.Peak	(15)	
	(iv)Total Leakage			-	~~100~~ 130	W.Peak		Amdt
	(v)Recovery Time			-	~~260~~ 310	µSec.		Amdt

CV 6121

Notes

1. The cells shall be tested individually.

2. The D.C. supply shall be 900 volts minimum connected via a suitable series current limiting resistance. A resistor of 10M ohms minimum shall be connected directly to the cell. Stray capacities across the cell must be kept to a minimum to avoid relaxation oscillation. The inner connector shall be negative with respect to the outer connector.

3. The power to the test network shall be gradually increased from a low level and the power transmitted continuously monitored. The firing of the cell will be indicated by a rapid decrease in the power recorded by the monitor. The Firing Power is that power recorded by the monitor immediately before firing occurs.

4. The following conditions shall apply:-

Frequency	220 ± 5 Mc/s
Pulse Length	10 ± 1 uSec.
Repetition Frequency	200 ± 20 p.p.s.

The valve shall be mounted in Admiralty Pattern No. A.P.161002. Loads shall be matched to better than 0.90 v.s.w.r. A D.C. bias of 50-55 volts shall be applied between the inner and outer connector via a series resistor of 6.8 Kohms to each cell. The inner connector shall be negative with respect to the outer connector. This bias controls the recovery time and is not a primer supply. Current is drawn only during deionisation.

5. The Peak Power is calculated according to the formula:-

$$\text{Peak Power} = \frac{\text{Mean Power}}{\text{p.r.f. x Pulse Length}}$$

6. The cells shall be tested in pairs i.e. as a valve.

7. Incident Power on the valve shall be 225 ± 25 KW. Peak R.F. Power.

8. The time shall be measured from the trailing edge of the transmitter pulse until the insertion loss reaches a value of 6 dB greater than that immediately before the transmitter pulse. The receiver arm shall be matched to better than 0.90 v.s.w.r.

9. The life test shall be carried out during Qualification Approval on two valves. Both valves must be satisfactory at the end of the test.

10. The number of specimen CV6121 (comprising two cells) used for the life test, shall comprise 4% or the next whole number above 4% of the contract requirements. The tests shall be performed at regular intervals during the contract production period. CV6121 placed on life test shall be taken at random from the production batch. The criterion of acceptance shall be that not more than one failure occurs in any ten consecutive cells tested. During the initial period of any contract following a non-production period exceeding six months, CV6121 may be despatched without the accumulation of the ten cells provided there are no failures in the first five or not more than one in the first ten. If a failure occurs in the first five cells, delivery must await the results on the first ten. Where rejection is incurred, delivery shall cease and the Approval Authority shall be informed. The manufacturer may, at his discretion test additional specimens.

11. Each cell tested shall be mounted in a clamping jig clamped in a manner similar to that shown on page 8.

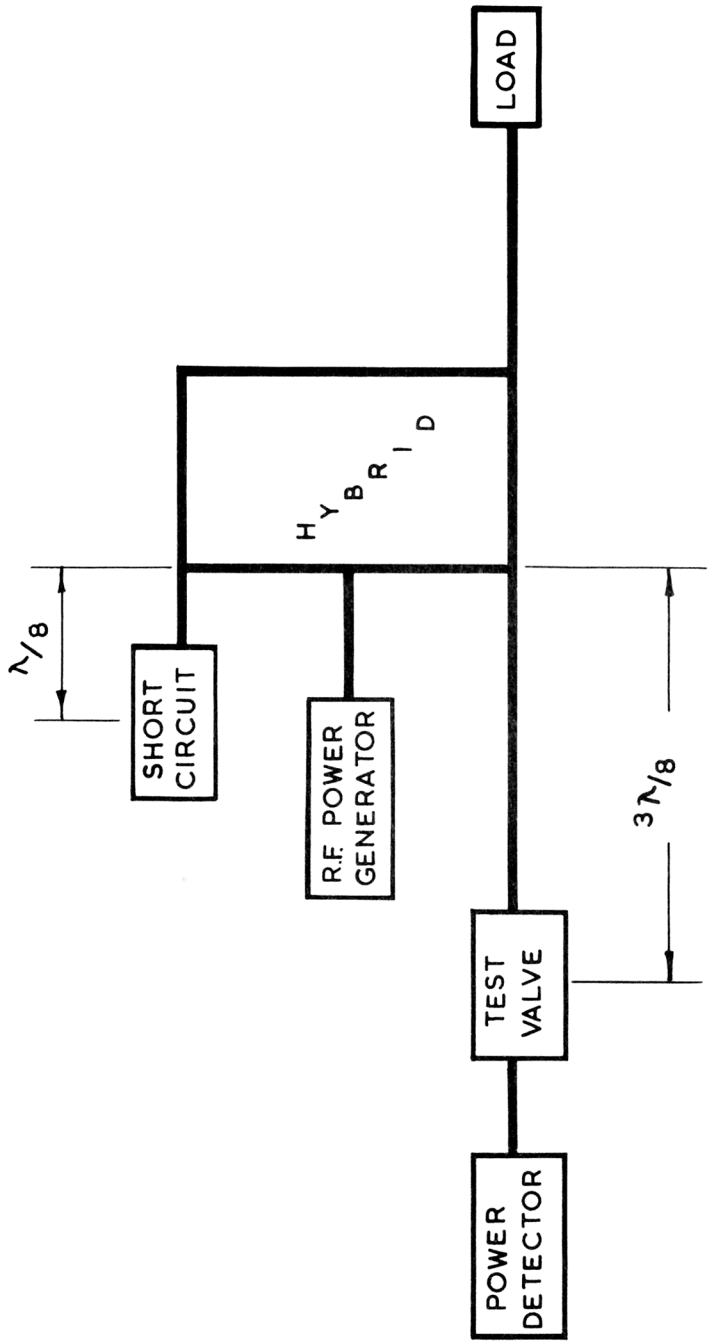
12. The test shall be applied once in the plane of the main axis, having the inner connector at the bottom, and once in a plane perpendicular to the main axis of the cell.

13. The amplitude of vibration shall be not less than ± .060 inches. During testing of normal production batches the frequency of vibration shall be 30 c/s and the duration one hour. During Qualification Approval tests the frequency shall be changed in steps of one c/s at intervals of 10 minutes over a range of 5 to 30 c/s, i.e. a total of 26 steps in 260 minutes.

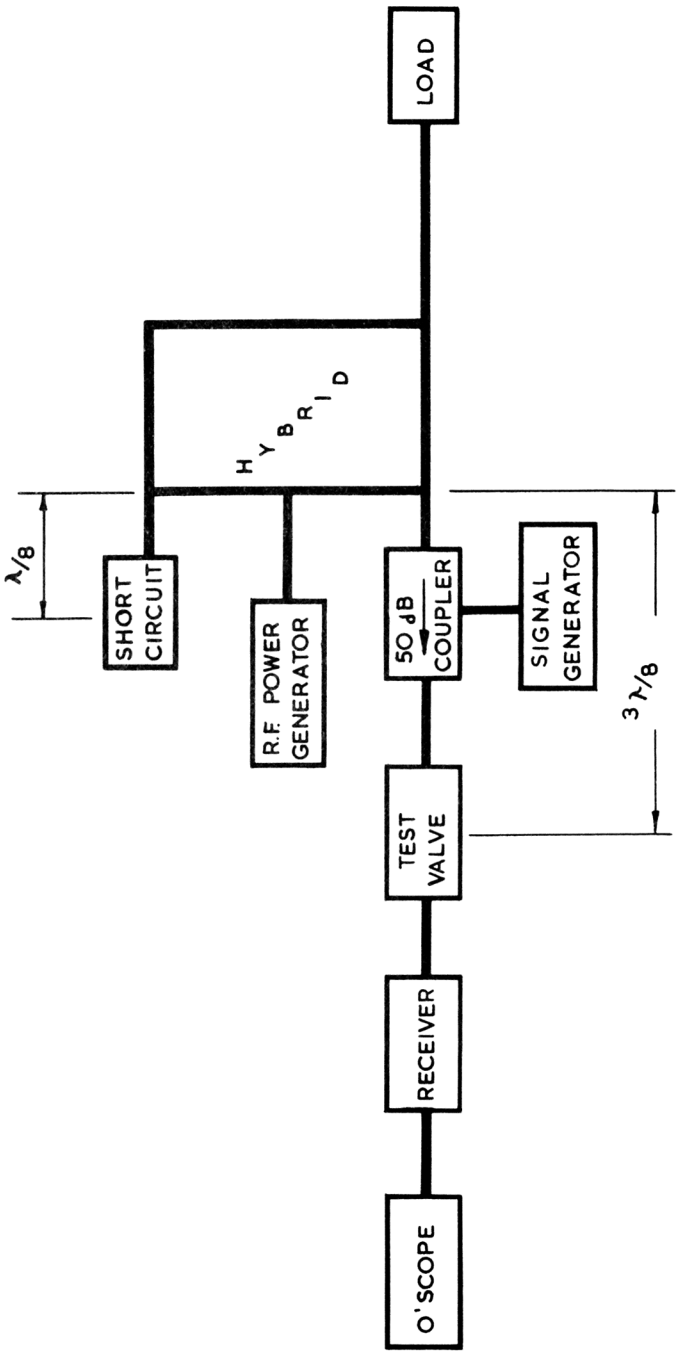
14. The cell shall be mounted centrally on the platform of the Packaging Information Drop-Test Machine specified in DEF 133 Appendix II. The machine shall be set for a drop height of 54 inches, the ram extension to be 5½ inches. The table loading is 4 lbs. approximately. These conditions correspond to an initial shock of approximately 50g for a duration of 30 to 50 mSecs. Diminishing shock from the table recoil shall be considered as part of the test.

15. The end points are to be tested as given in tests 'a', 'b', 'c', 'd' and 'e'.

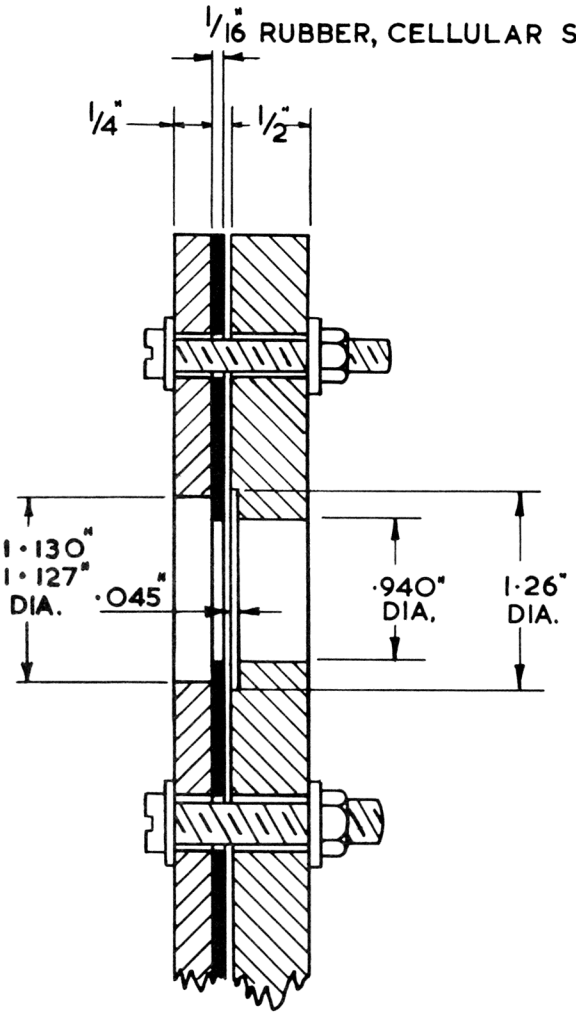
FIRING POWER TEST EQUIPMENT



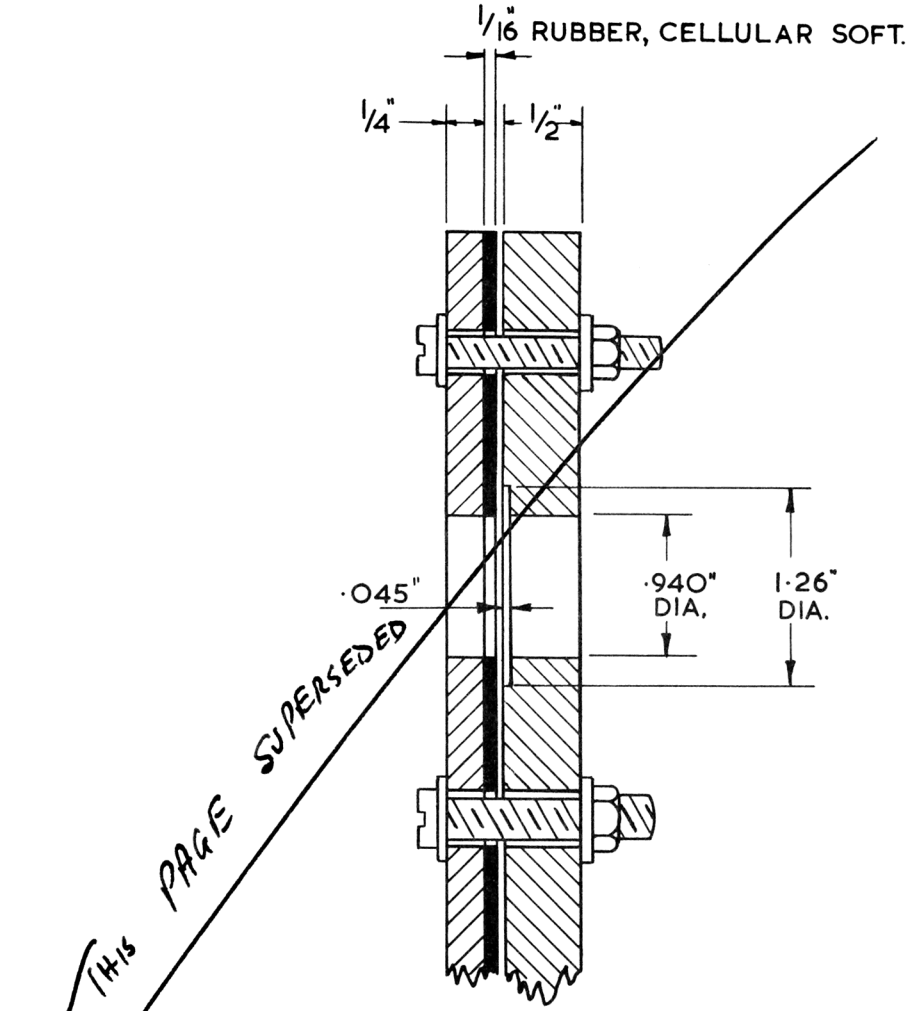
TOTAL LEAKAGE – POWER TEST EQUIPMENT



RECOVERY – TIME TEST EQUIPMENT



CLAMPING JIG FOR SHOCK AND VIBRATION TEST.



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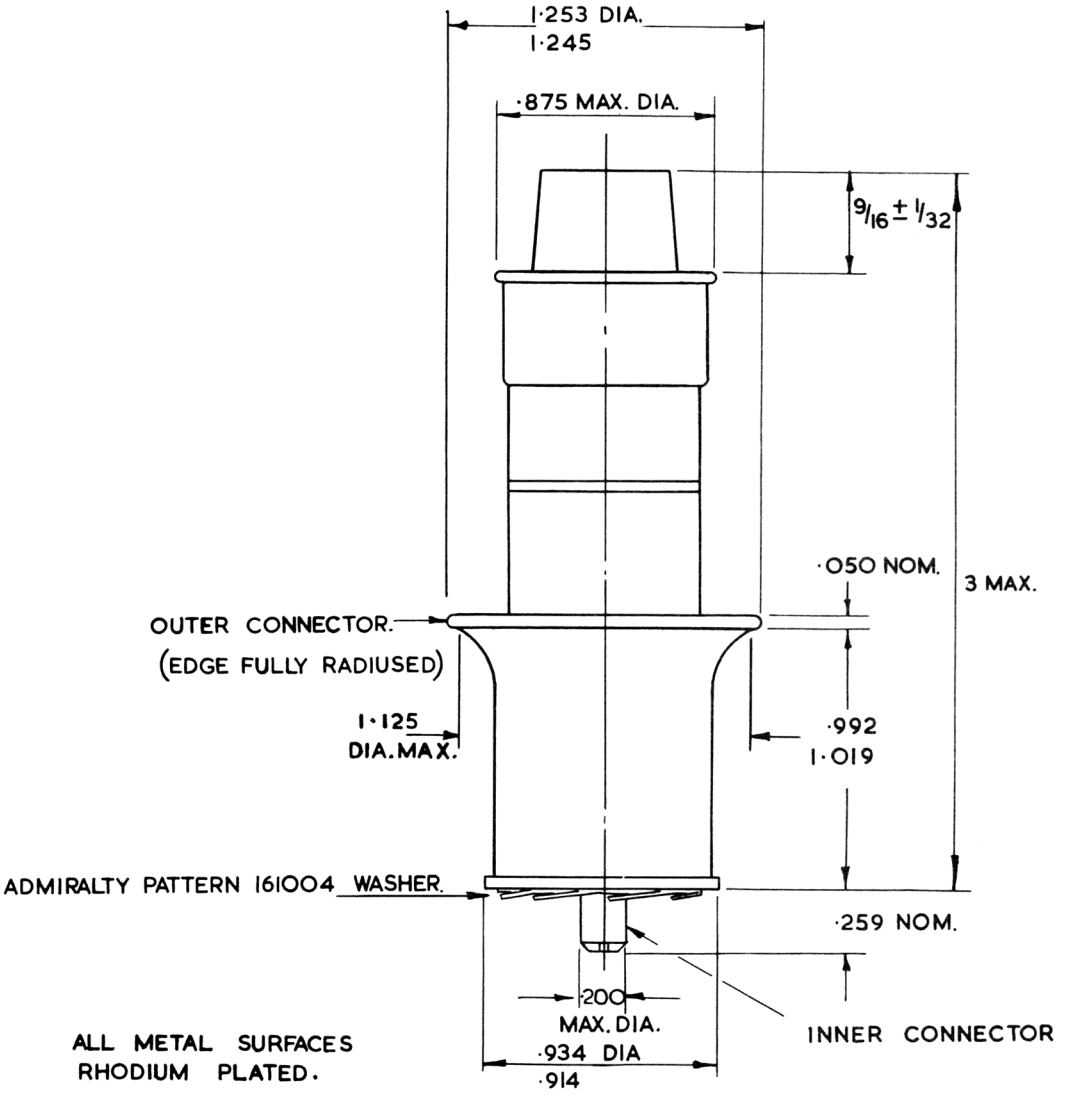
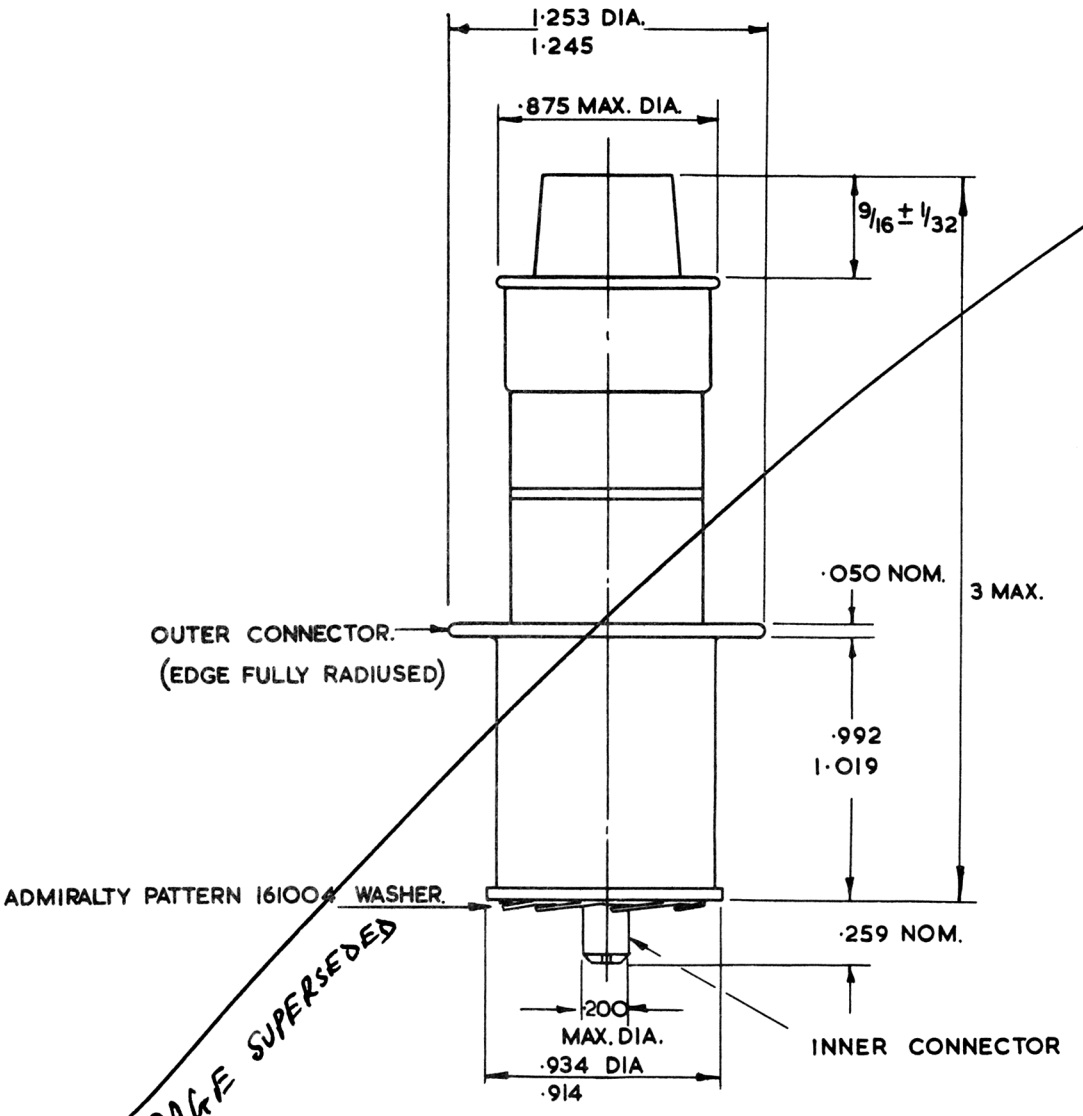


CELL OUTLINE



CELL OUTLINE

THIS PAGE SUPERSEDED

ELECTRONIC VALVE SPECIFICATION
SPECIFICATION AD/CV6121, ISSUE 1, DATED 9th April 1963
AMENDMENT NO. 1

Page 2

(a) Test clause 'd': In column headed "LIMITS MAX." delete "90" and substitute "120".

(b) Test clause 'e': In column headed "LIMITS MAX." delete "250" and substitute "300".

(c) Test clause 'h': Amend entry in column headed "LIMITS MAX." as follows:-
Sub-clause (ii) Capacitance Delete "12.0" and substitute "10".
Sub-clause (iv) Total Leakage Delete "100" and substitute "130"
Sub-clause (v) Recovery Time Delete "260" and substitute "310"

(d) Pages 8 and 9: Cancel (but do not remove) existing pages 8 and 9 and substitute new pages 8 and 9, dated November 1964, attached hereto.

November 1964
NM.190471

T.V.C. for A.S.W.E.

AAS 12/65