MINISTRY OF SUPPLY - R.R.E.(South)

VALVE ELECTRONIC CV2295

Specification NOS(A)/CV2295 Incorporating MIL-E-1/212

Issue 1 Dated 23rd May, 1955.

To be read in conjunction with K1006. ← CHANGE

SECURITY	
Specification	Valve
UNCLASSIFIED	UNCLASSIFIED

← INDICATE CHANGE

TYPE OF VALVE - Double Beam Tetrode

CATHODE - Indirectly-heated

ENVELOPE - Glass - Unmetallised

PROTOTYPE - 3E29

MARKING

K1001/4

Additional Marking

3E29

RATING

			Note
Heater Voltage	(V)	6.3	B
Heater Current	(A)	2.25	
Max Anode Voltage	(kV)	5.0	C,D
Max Peak Pulsed Anode Voltage	(kV)	5.75	
Max Grid Voltage	(V)	-225	D,E
Max Peak Grid Voltage	(V)	250	
Max Peak Pulsed Grid Voltage	(V)	-600	
Max Screen Grid Voltage	(V)	850	D
Max Peak Anode Current	(A)	10.0	
Max Peak Grid Current	(A)	4.0	
Max Peak Screen Grid Current	(A)	3.5	
Max Anode Dissipation	(W)	15	F
Max Grid Dissipation	(W)	1.0	
Max Screen Grid Dissipation	(W)	3.0	
Max Heater-cathode Voltage	(V)	100	
Max Input Power	(W)	60	
Max Pulse Duration	(uS)	1.2	

BASE

B7A

BS.448 : B7A/1.1

CONNECTIONS

Pin	Electrode	
1	Heater	h
2	Control Grid	g1"
3	Screen Grid	G2
4	Cathode & Beam Plates	k,bp
5	Centre-tapped Heater	htap
6	Control Grid	g1'
7	Heater	h
TC1	Anode	a'
TC2	Anode	a"

TOP CAPS

See Drawing on Page 4

CAPACITANCES (pF) (Note F)

Cag[1] (max)	0.12
Cin (nom)	14.5
Cout (nom)	6.95

DIMENSIONS

See Drawing on Page 4

MOUNTING POSITION

Any

OUTLINE PAGES C+D

NOTES

A. All limiting values are absolute.

B. Centre-tapped 12.6V heater. Heaters may be operated in parallel or in series. Maximum variation of heater voltage shall be +10% and -5%.

C. Instantaneous anode voltage due to transient shall not exceed 5.75 kV.

D. The DC resistance of the supply shall be sufficiently large to limit the short-circuit current to 0.5A.

E. Instantaneous grid voltage due to transient shall not exceed -600V.

F. Each section.

CV2295

TESTS

To be performed in addition to the requirements of Specification JAN-3E29

Ref.	Test	Conditions		Min.	Max.	
4.10.4.1 F-6f(1)	Plate Current:	Eb = 5.0kVdc; Ec1 = -150 Vdc; Ec2 = 700 Vdc; Note 1	Ib:	-	100	uAdc
-	Pulsed Operation (1):	Eb = 1000 Vdc; Ec1 = +75 Vdc; Ec2 = 700 Vdc; tp = 6 usecs; Du = 0.0003 min; Note 2	ib:	5.0	-	a
			ic1:	-	0.5	a
-	Pulsed Operation (2):	Eb = 1000 Vdc; Ec1 = 0; Ec2 = 700 Vdc; tp = 6 usecs; Du = 0.0003 min; Notes 2 & 3	ib:	2.5	-	a
			Ic1:	-	50	uAdc
			ic2:	0	0.5	a

NOTES

1. Test shall be applied to each section in turn. Control grid of section not under test shall be connected to -100V.

2. Tested with both sections connected in parallel. Grid bias shall be adjusted in each case for Ibo i.e. Ib less than 100 uA.

3. Grid current shall be measured as a mean current having a maximum value of 50 uA.

CV 2295

DRAWING NOTES

Z. The axis YY' is defined as the axis of the base pin gauge described in Note 2.

W. The valve base should be capable of entering to a distance of 0.375", a flat plate gauge having six holes 0.080" ± 0.0005" and one holde 0.1450" ± 0.0005", all arranged on a 1.000" ± 0.0005" circle at specified angles on the outline. Angles to be within ± 5°. A hole 0.500" ± 0.01" at the centre of the pin circle is also required. The axis YY' is defined by the centre of this hole.

V. Dimension "C" is measured by inserting the tube in the base pin gauge described in Note 2, and then lowering a gauge plate having a hole 2.063" - 0.000" + 0.003" in diameter until the plate rests on the seal flange at position XX'. The centre line of the hole shall be coincident with the axis YY' within 0.150". With the gauge plate parallel to the top surface of the base pin gauge, the dimension "C" is measured between the bottom surface of the gauge plate and the top surface of the base pin gauge. This distance shall be 0.844" min and 1.219" max.

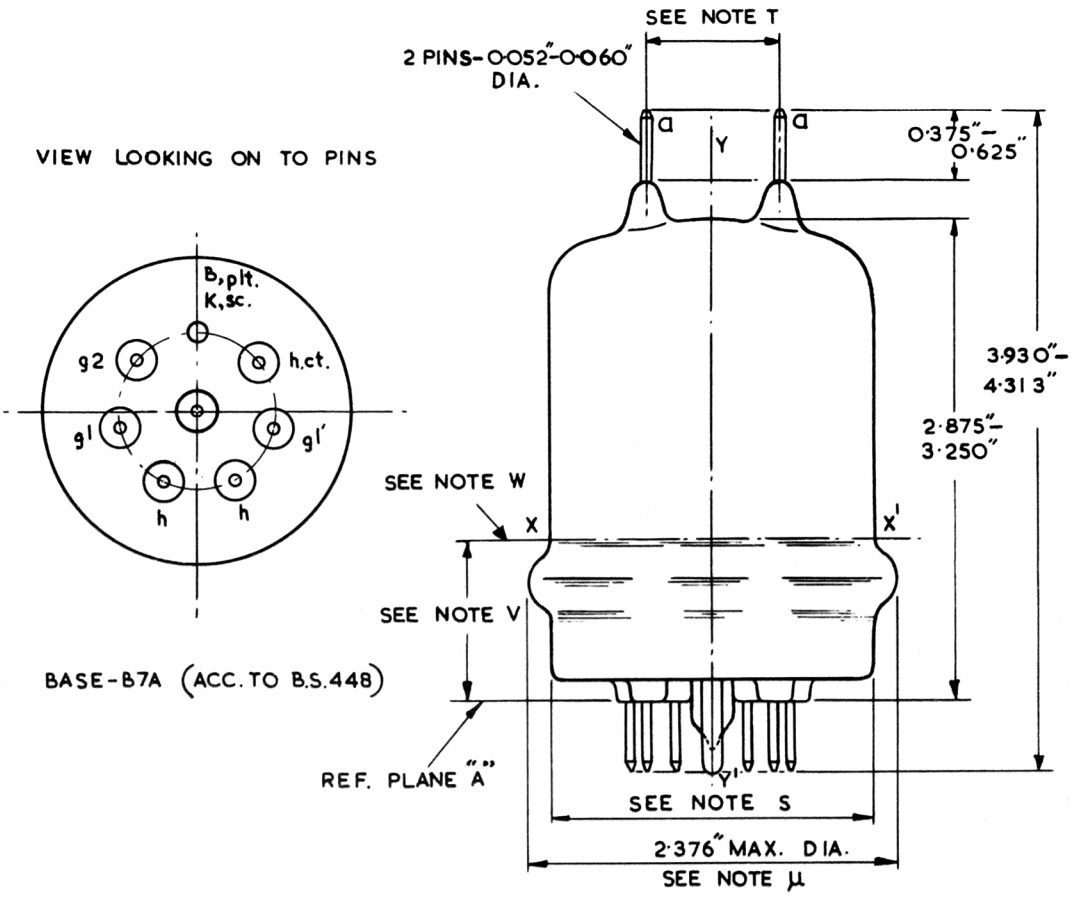
U. Minimum diameter of the valve-seal flange will be such that a ring gauge having I.D. = 2.125" + 0.003" - 0.000" and thickness of 0.125" ± 0.010" will not pass the flange when tried at any angle.

T. The anode-leads shall be capable of entering a flat gauge plate of 0.375" min. thickness having two holes 0.120" ± 0.0005" in diameter arranged 0.424" ± 0.001 from a point coincident with the axis YY'. The axes of the holes shall be parallel to YY' and the plane of the axes shall be 90° ± 5° from the plane through YY' and pin No. 4.

S. The valve shall be capable of entering a 2 inch diameter gauge for a distance of 11/32 of an inch measured from Ref. Plane "A".

For Marking Details see Sheet 1.

OUTLINE (SEE NOTES PAGE C)



CV2295

JAN-3E29

Ratings:

	Ef	Eb	Ecl	Ec2	Ehk	ecl	ib	ic2	icl	Pp	Pi	Pg2i	Pgli	tp	Alt
Absolute Maximum:	V	Vdc	Vdc	Vdc	Vdc	v	a	a	a	W	W	W	W	uf	ft
	Note 1	Note 2	Note 3	Note 4	100	250	10	3.5	4	15	60	3	1	1.2	10,000
Pulsed	6.3or12.6	5000	-225	850	100	250	1.5	0.5	0.6	15	85	3	1	7.0	
(Values for both units in parallel)	6.3or12.6	5000	-225	850											
Test Cond:	6.3	400	adj.	225	--	--	--	--	--	--	--	--	--	--	

Dimensions: As per outline

**Catnode: Coated Unipotential

**Pin No.	1	2	3	4	5	6	7
	h	2gl	g2	k,g3	hct	lgl	h

Ref.	Test	Conditions		Min.	Max.	
3.1	Qualification Approval:	Required for JAN Marking				
4.5	Holding Period:	t=72 hours				
4.9.18.1.7 F-6a(3g)	Carton Drop:	(d); Package Group 1; Carton Size M				
4.9.19.3 F-6b(3)	*Bump:	Angle=20°				
4.9.19.1	*Vibration (1):	Eb=250Vdc;Ecl/Ib=10mAdc; RL=2000;Ec2=225Vdc;Note 5	Ep:	---	800	mVac
4.9.19.1	**Vibration (2):	F=50cps;Amp=0.04 in.; t=900; No Voltages				
4.10.15 F-6q	*Heater-Cathode Insulation:	Both filaments energized	Ihk:	---	175	uAdc
4.10.8 F-6i	*Heater Current:		If:	2.0	2.5	A
4.10.4.1 F-6f(1)	Plate Current:	Eb=250Vdc;Ec2=175Vdc; Ecl=-11Vdc;Note 5	Ib:	38	82	mAdc
4.10.4.3 F-6f(3)	Screen Current:	Eb=250Vdc;Ec2=175Vdc; Ecl=-11Vdc;Note 5	Ic2:	0	10	mAdc
4.10.5.2 F-6f(9)	Grid Voltage:	Ec/Ib=200uAdc	Ecl:	---	-55	Vdc
4.10.6.1 F-6g(1)	†Grid Current:	Ecl/Ib=50mAdc;t=30; Note 5	Icl:	---	-4.0	uAdc
---	†Pulsed Operation:	Ebb=5.0kVdc;Ecl=-225Vdc; Ec2=850Vdc;egl=+150v; RL=400;Note 6	ib:	9.0	---	a
4.10.4 F-6p	*Capacitance:	Note 7	Cglp:	---	0.12	uuf
			Cgl,hkg2:	12.8	16.2	uuf
			Cp,hkg2:	5.25	8.75	uuf

APPROVED 20 May 1953 REVISED

CUSTODIANS:
Army–Signal Corps
Navy–Bureau of Ships
Air Force

PROCUREMENT SPECIFICATION
MIL-E-1

SPECIFICATION SHEET

MODULATOR, TRANSMITTING 3E29

MIL-E-1/212

SHEET 1 OF 4

Other interest: Army-CMOT Navy-AMCMdOrS

CV2295

Ref.	Test	Conditions		Min.	Max.	
4.11 F-4	Life Test:	Group B; Pulsed Operation; Note 8	t:	500	---	hrs
4.11.4 F-4b	Life Test End Point:	Pulsed Operation Test	ib:	7.5	---	a

Note 1. Heaters may be operated in parallel or in series. Maximum variation of Ef -/10%, -5%.

Note 2. Instantaneous plate voltage due to transient shall not exceed 5750 volts. The DC resistance of the supply must be sufficiently large to limit the short circuit current to 0.5 ampere.

Note 3. Instantaneous grid voltage due to transient shall not exceed -600 volts. The DC resistance of the supply must be sufficiently large to limit the short circuit current to 0.5 ampere.

Note 4. The DC resistance of the supply must be sufficiently large to limit the short circuit current to 0.5 ampere.

Note 5. Test each unit separately. Bias unit not under test to -100 Vdc.

Note 6. Use rectangular wave modulation. Pulse width = 1 microsecond (approx.). Repetition rate = 1250 pulses per second (minimum). Preheating time =120 seconds, Ef=7.0 volts (only). Screen and plate voltages at maximum values to be applied simultaneously. Tap tube during test and reject for prolonged arcs. Test circuit shall be as per Figure 1.

Note 7. Test each unit separately. Tie unit not under test to ground. The Cgp shall be measured with a shield 3/4" high and 2-3/8" I.D.

Note 8. Forced air-cooling required.

Note 9. Reference specification shall be of the issue in effect on the date of invitation for bid.

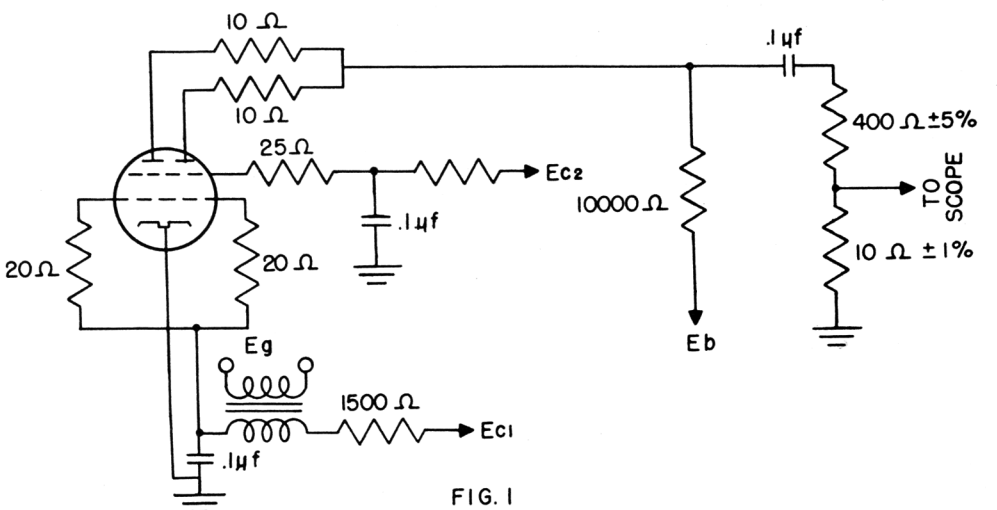


FIG. 1

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CUSTODIANS:
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Air Force

PROCUREMENT SPECIFICATION
MIL-E-1

SPECIFICATION SHEET

MODULATOR, TRANSMITTING 3E29

MIL-E-1/212

SHEET 2 OF 4

Other interest: Army-CMOT Navy-AMCMdOrS

Drawing Notes

Note 1: The axis YY' is defined as the axis of the base pin gauge described in Note 2.

*Note 2: The tube base should be capable of entering to a distance of 0.375 a flat-plate gauge having six holes 0.0800±0.005 and one hole 0.1450 ±.0005 all arranged on a 1.000±0.0005 circle at specified angles on the outline. A 0.500±0.01 hole at the center of the pin circle is also required. The axis YY' is defined by the center of this hole.

*Note 3: Dimension "C" is measured by inserting the tube in the base-pin gauge described in Note 2 and then lowering a gauge plate having a hole 2.063 - 0.000 +0.003 in diameter until the plate rests on the seal flange at position XX'. The center-line of the hole shall be coincident with the axis YY' within 0.150. With the gauge plate parallel to to top surface of the base pin gauge, the dimension "C" is measured between the bottom surface of the gauge plate and the top surfaces of the base pin gauge. This distance shall be 0.844 minimum and 1.219 maximum.

*Note 4: Minimum diameter of the tube-seal flange will be such that a ring gauge having I.D. of 2.125 (Min.) to 2.128 (Max.) and thickness of 0.125 ±0.010 will not pass the flange when tried at any angle.

*Note 5: The plate leads shall be capable of entering a flat plate gauge of .375 min. thickness having two holes .120 ±.0005 in diameter arranged .424 ± .001 from a point coincident with the axes Y-Y'. The axis of the holes shall be parallel to YY' and the plane of these axes shall be 90° ±5 from the plane thru Y-Y' and pin No. 4.

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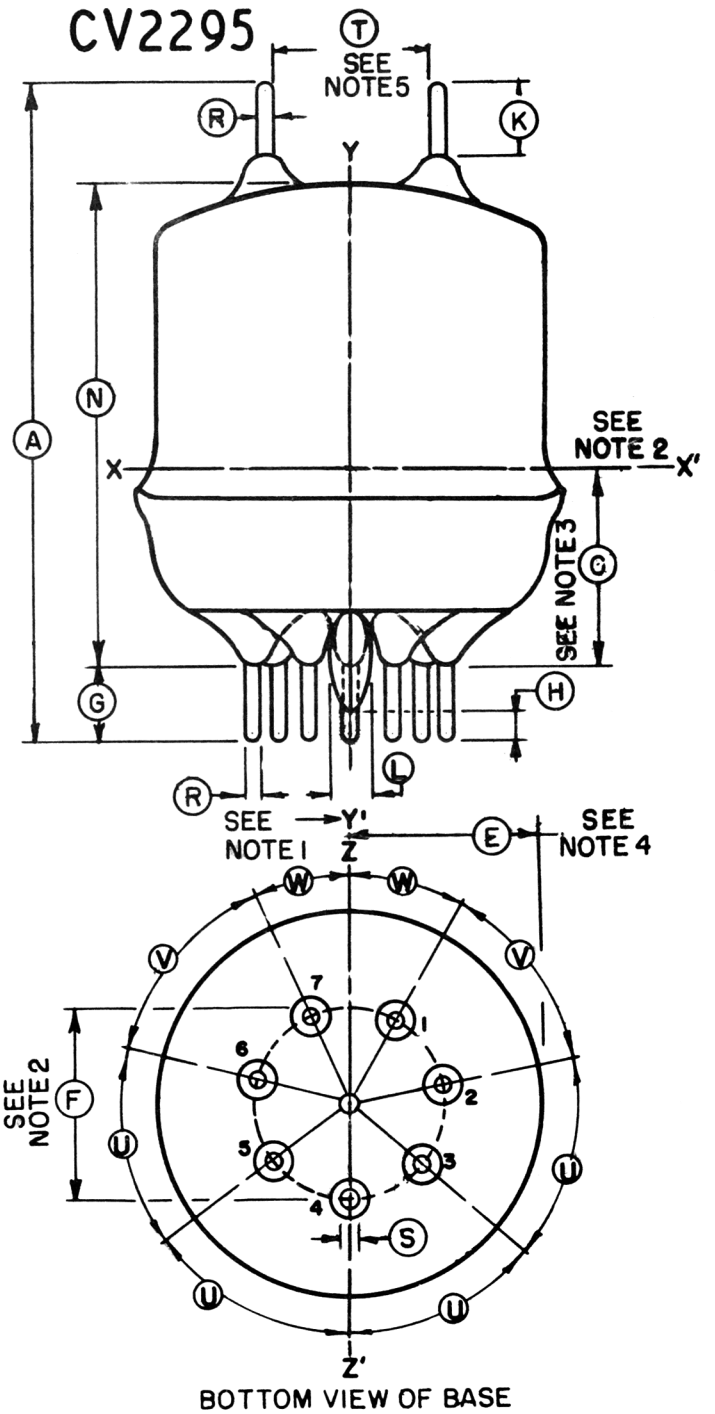
CV2295



BOTTOM VIEW OF BASE

REF	DIMENSIONS
*A	3.930 MIN 4.313 MAX
*E	1.188 MAX
**G	.375 MIN .500 MAX
**H	0 MIN
**K	.375 MIN .625 MAX
**L	.375 MAX
**N	2.875 MIN 3.250 MAX
**R	.052 MIN .060 MAX
**S	.122 MIN .128 MAX
U	51°± 5'
V	52°±5'
W	26°±5'

DIMENSIONS ARE IN INCHES

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CUSTODIANS:
Army–Signal Corps
Navy–Bureau of Ships
Air Force

PROCUREMENT SPECIFICATION
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SPECIFICATION SHEET

MODULATOR, TRANSMITTING 3E29

MIL-E-1/212

SHEET 4 OF 4

Other interest: Army - CMOT Navy - AMCMdOrS

ELECTRONIC VALVE SPECIFICATION

SPECIFICATION MOS(A) CV.2295

Issue 1 23rd May, 1955

Amendment No. 1

PAGE A

1. Underneath the line below "To be read in conjunction with K.1006" insert:- ◁—— Indicates a change.

PAGE A

2. Page A (No. of Pages 2 + 4) amend to read (No. of Pages) 4 + 4 ◁——

3. (i) Below "MOUNTING POSITION" add another heading "OUTLINE" and insert see "Pages C & D."

   (ii) Indicate in margin with an arrow.

4. Insert after Page B new Pages C & D attached herewith.

Royal Radar Establishment.

N57232/D