

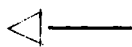
ELECTRONIC VALVE SPECIFICATION

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

Specification NOS(A)/CV2295      Incorporating MIL-E-1/212  Issue 1    Dated 23rd May, 1955.  To be read in conjunction with K1006.	<u>SECURITY</u>	
	<u>Specification</u> UNCLASSIFIED	<u>Valve</u> UNCLASSIFIED

TYPE OF VALVE - Double Beam Tetrode  CATHODE - Indirectly-heated  ENVELOPE - Glass - Unmetallised  PROTOTYPE - 3E29	<u>MARKING</u>  K1001/4  <u>Additional Marking</u>  3E29
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<u>RATING</u>	Note		<u>BASE</u> B7A		
Heater Voltage (V)	6.3	B	BS.448 : B7A/1.1		
Heater Current (A)	2.25	C, D			
Max Anode Voltage (kV)	5.0	D, E	<u>CONNECTIONS</u>		
Max Peak Pulsed Anode Voltage (kV)	5.75		Pin	Electrode	
Max Grid Voltage (V)	-225	D	1	Heater	h
Max Peak Pulsed Grid Voltage (V)	250		2	Control Grid	g1"
Max Peak Pulsed Grid Voltage (V)	-600		3	Screen Grid	g2
Max Screen Grid Voltage (V)	850	F	4	Cathode & Beam Plates	k, bp
Max Peak Anode Current (A)	10.0		5	Centre-tapped Heater	htap
Max Peak Grid Current (A)	4.0	TC1	6	Control Grid	g1'
Max Peak Screen Grid Current (A)	3.5		7	Heater	h
Max Anode Dissipation (W)	15	TC2	TC1	Anode	a'
Max Grid Dissipation (W)	1.0		TC2	Anode	a"
Max Screen Grid Dissipation (W)	3.0	<u>TOP CAPS</u>			
Max Heater-cathode Voltage (V)	100	See Drawing on Page 4			
Max Input Power (W)	60				
Max Pulse Duration (uS)	1.2				

<u>CAPACITANCES</u> (pF) (Note F)		<u>DIMENSIONS</u> See Drawing on Page 4
Cag <sup>1</sup> (max)	0.12	<u>MOUNTING POSITION</u> Any
Cin (nom)	14.5	
Comt (nom)	6.95	

<u>NOTES</u>
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.

Z.9522.R.

TESTS

To be performed in addition to the requirements of Specification JAN-3829

<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>		<u>Min.</u>	<u>Max.</u>	
4.10.4.1 F-6f(1)	Plate Current:	E <sub>b</sub> = 5.0kVdc; E <sub>c1</sub> = -150 Vdc; E <sub>c2</sub> = 700 Vdc; Note 1	I <sub>b</sub> :	-	100	uA <sub>dc</sub>
-	Pulsed Operation (1):	E <sub>b</sub> = 1000 Vdc; E <sub>c1</sub> = +75 Vdc; E <sub>c2</sub> = 700 Vdc; t <sub>p</sub> = 6 usecs; D <sub>u</sub> = 0.0003 min; Note 2	I <sub>b</sub> : I <sub>c1</sub> :	5.0 -	- 0.5	a a
-	Pulsed Operation (2):	E <sub>b</sub> = 1000 Vdc; E <sub>c1</sub> = 0; E <sub>c2</sub> = 700 Vdc; t <sub>p</sub> = 6 usecs; D <sub>u</sub> = 0.0003 min; Notes 2 & 3	I <sub>b</sub> : I <sub>c1</sub> : I <sub>c2</sub> :	2.5 - 0	- 50 0.5	a uA <sub>dc</sub> 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 I<sub>b0</sub> i.e. I<sub>b</sub> less than 100 uA.
3. Grid current shall be measured as a mean current having a maximum value of 50 uA.

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**Ratings:**

Absolute Maximum:	Ef	Eb	Ecl	Ec2	Ehk	ecl	ib	ic2	icl	Pp	Pi	Pg2i	Pgli	tp	Alt
	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 (Values for both units in parallel)	6.3or12.6	5000	-225	850	100	250	1.5	0.5	0.6	15	85	3	1	7.0	
	6.3or12.6	5000	-225	850											

Test Cond: 6.3 400 adj. 225 --- --- --- --- --- --- --- ---

Dimensions: As per outline **\*\*Cathode: Coated Unipotential**

\*Pin No.

1	2	3	4	5	6	7
h	2g1	g2	k, g3	hct	lg1	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	Cg1p: ---	0.12 uuf
			Cg1, 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	<b>SPECIFICATION SHEET</b>		MIL-E-1/212	
	MODULATOR, TRANSMITTING 3E29		SHEET 1 OF 4	
PROCUREMENT SPECIFICATION MIL-E-1				

Other interest: Army-CMOT Navy-AMCMdOrS

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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  $E_f$  -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,  $E_f$  = 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  $C_{gp}$  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.

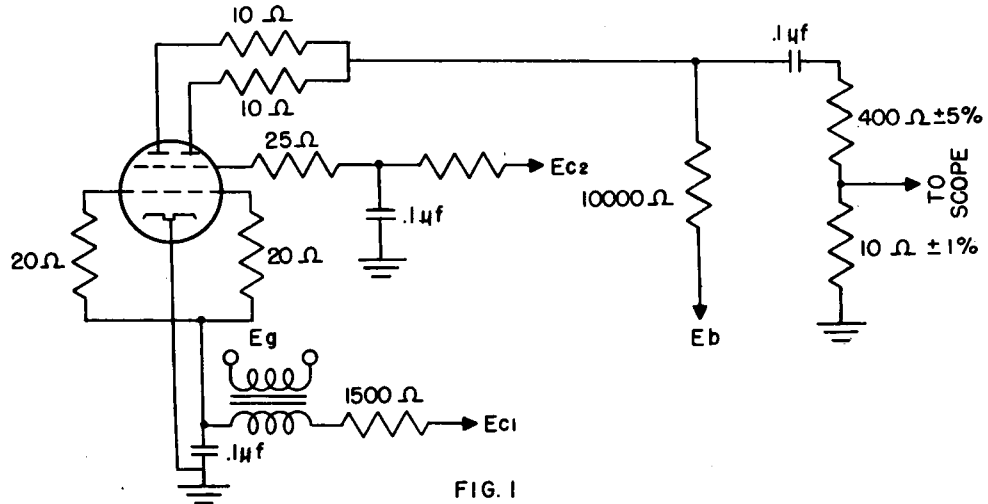


FIG. 1

CUSTODIANS: Army-Signal Corps Navy-Bureau of Ships Air Force	<b>SPECIFICATION SHEET</b>		MIL-E-1/212
	MODULATOR, TRANSMITTING		
PROCUREMENT SPECIFICATION MTL-E-1	3E29		SHEET 2 OF 4

Other interest: Army-CMOT

Navy-AMCMdOrS

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JAN-3E29

## 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  $\pm$  0.005 and one hole 0.1450  $\pm$  0.005 all arranged on a 1.000  $\pm$  0.005 circle at specified angles on the outline. A 0.500  $\pm$  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  $\pm$  0.003 in diameter until the plate rests on the seal flange at position XI'. 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  $\pm$  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  $\pm$  0.005 in diameter arranged .424  $\pm$  .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°  $\pm$  5 from the plane thru Y-Y' and pin No. 4.

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CUSTODIANS: Army-Signal Corps Navy-Bureau of Ships Air Force PROCUREMENT SPECIFICATION MIL-E-1	<b>SPECIFICATION SHEET</b>	MIL-E-1/212
	MODULATOR, TRANSMITTING 3E29	SHEET 3 OF 4

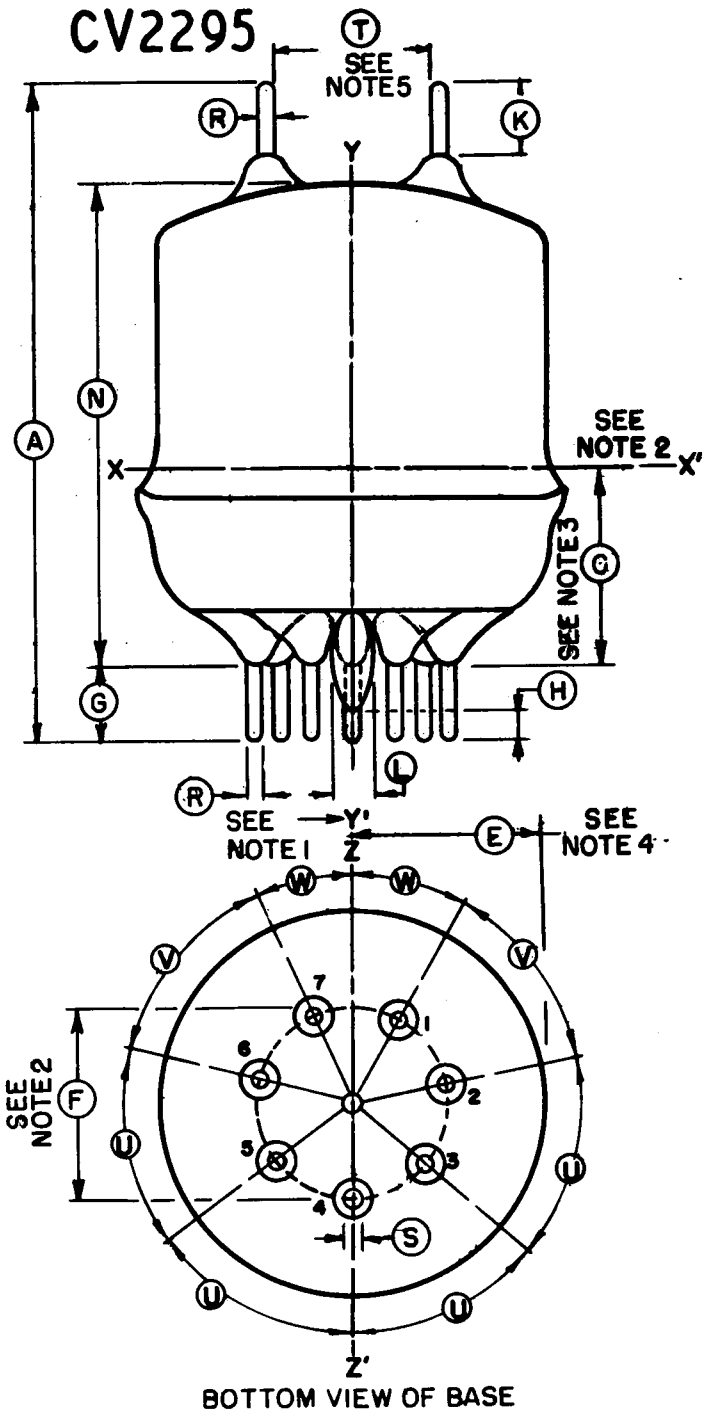
Other interest: Army-CMOT

Navy-AMCMdOrS

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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	<b>SPECIFICATION SHEET</b>		MIL-E-1/212
	PROCUREMENT SPECIFICATION MIL-E-1	MODULATOR, TRANSMITTING 3E29	SHEET 4 OF 4

Other interest: Army - CMOT Navy - AMCMdOrS

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  $0.080" \pm 0.0005"$  and one hole  $0.1450" \pm 0.0005"$ , all arranged on a  $1.000" \pm 0.0005"$  circle at specified angles on the outline. Angles to be within  $\pm 5^\circ$ . A hole  $0.500" \pm 0.01"$  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  $0.125" \pm 0.010"$  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  $0.120" \pm 0.0005"$  in diameter arranged  $0.424" \pm 0.001"$  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  $90^\circ \pm 5^\circ$  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)

