

Ministry of Aviation DLRD/RRE

Specification MOA/CV 3599. Incorporating MIL-E-1/212	<u>SECURITY</u>	
Issue 1. Dated 26th April 1965	<u>Specification</u>	<u>Valve</u>
To be used in conjunction with K1006	Unclassified	Unclassified

Type of Valve : Double Beam Tetrode Cathode : Indirectly heated Envelope : Glass-unmetalised Prototype: 3E29				<u>MARKING</u> K1001/4 Additional Marking 3E29	
<u>RATINGS AND CHARACTERISTICS</u> Absolute, non simultaneous and not for Inspection purposes				<u>BASE</u> B7A BS448: B7A/1.1	
				<u>CONNECTIONS</u>	
Heater Voltage (V)	6.3	A	Pin	1	Heater h
Heater Current (A)	2.25			2	Control Grid g1 <sup>n</sup>
Max Anode Voltage (kV)	5.0	B,C		3	Screen Grid g2
Max Peak Pulsed Anode Voltage (kV)	5.75			4	Cathode & Beam k, bp
Max Grid Voltage (V)	-225	C,D			Plates
Max Peak Grid Voltage (V)	250			5	Centre tapped Heater h <sub>tap</sub>
Max Peak Pulsed Grid Voltage (V)	-600	C		6	Control Grid g1 <sup>n</sup>
Max Screen Grid Voltage (V)	850			7	Heater h
Max Peak Anode Current (A)	10.0			TC1	Anode a <sup>n</sup>
Max Peak Grid Current (A)	4.0			TC2	Anode a <sup>n</sup>
Max Peak Screen Grid Current (A)	3.5	E			
Max Anode dissipation (W)	15				
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 (μS)	1.2				
				<u>TOP CAPS</u> See Drawing on Page 4	
<u>CAPACITANCES</u> (Note F)				<u>DIMENSIONS</u> See Drawing on Page 4	
Cag' (max) (pf)	0.12			<u>MOUNTING POSITION</u> Any	
Cin (nom) (pf)	14.5				
Cout (nom) (pf)	6.95				

NOTES

- A. Centre tapped 12.6v heater. Heaters may be operated in parallel or in series. Maximum variation of heater voltage shall be +10% and -5%.
- B. Instantaneous anode voltage due to transient shall not exceed 5.75kV.
- C. The d.c. resistance of the supply shall be sufficiently large to limit the short-circuit current to 0.5A.
- D. Instantaneous grid voltage due to transient shall not exceed -600V.
- E. Each section
- F. NATO Stock No: 5960-99-000-3599

CV 3599

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Ratings:													tp	Alt
Absolute	Ef	Eb	Ecl	Ec2	Ehk	ecl	ib	ic2	icl	Pp	Pi	Pg2i		
Maximum:	V	Vdc	Vdc	Vdc	Vdc	v	a	a	a	W	W	W	W	uf
	Note 1	Note 2	Note 3	Note 4	100	250	10	3.5	4	15	60	3	1	1.2
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

\*\*Cathode: Coated Unipotential

\*Pin No. 1 2 3 4 5 6 7  
h 2gl 2 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=7150v; 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

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Army-Signal Corps  
Navy-Bureau of Ships  
Air Force  
PROCUREMENT SPECIFICATION  
MIL-E-1

## SPECIFICATION SHEET

MODULATOR, TRANSMITTING

3E29

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SHEET 1 OF 4

Other interest: Army-CMOT

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<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>		<u>Min.</u>	<u>Max.</u>	
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 = $\pm 10\%$ , $-5\%$ .					
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.					

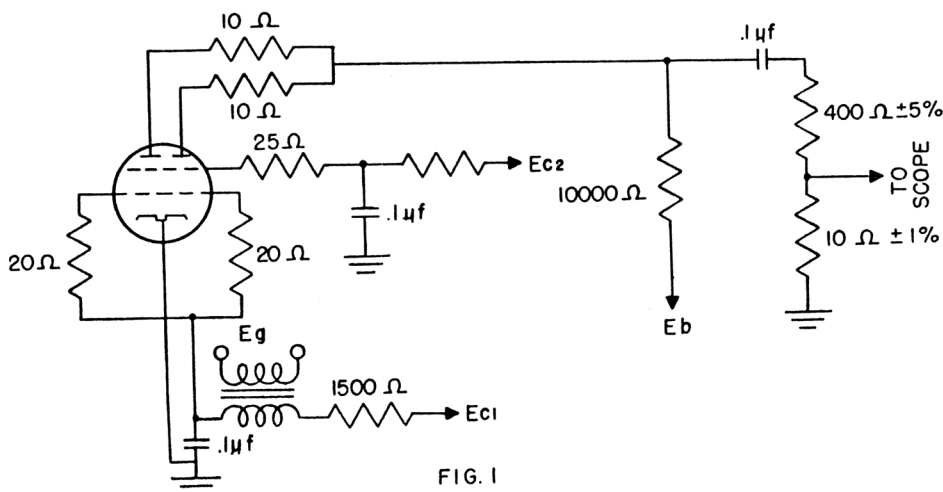


FIG. 1

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PROCUREMENT SPECIFICATION  
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MODULATOR, TRANSMITTING

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## 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  $\pm$  0.0005 all arranged on a 1.000  $\pm$  0.0005 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 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  $\pm$  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  $\pm$  0.0005 in diameter arranged .424  $\pm$  .001 from a point coincident with the axis 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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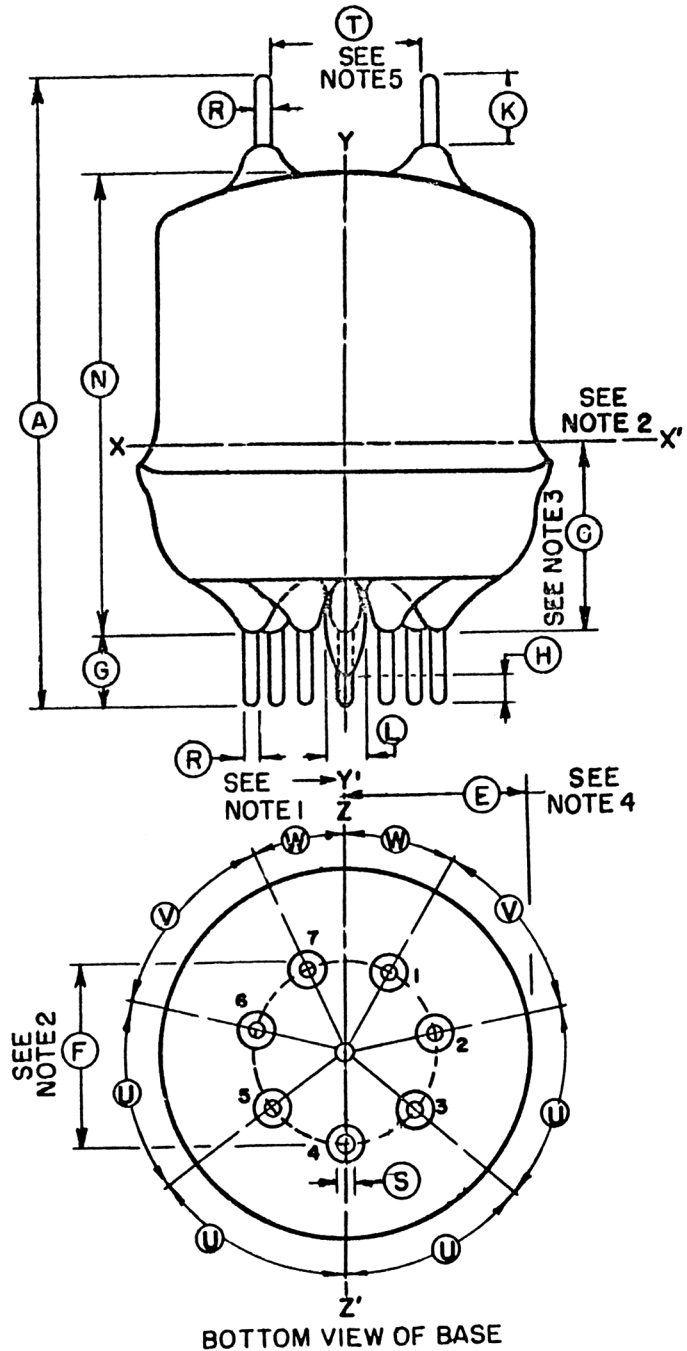
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REF	DIMENSIONS
*A	3.930 MIN 4.313 MAX
*E	1.189 MAX
**G	.375 MIN .500 MAX
**H	0 MIN
**K	.375 MIN .625 MAX
**L	.375 MAX
**N	2.875 MIN 3.250 MAX
**R	.052 MIN .060 MAX
**S	.122 MIN .128 MAX
U	51° ± 5'
V	52° ± 5'
W	26° ± 5'

DIMENSIONS ARE IN INCHES



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