

ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

Specification AD/CV3611 Incorporating MIL-E-1/770. Issue 1 Dated 5.12.62. To be read in conjunction with K.1006	<u>SECURITY</u> <table style="width: 100%; border: none;"> <tr> <td style="border: none; width: 50%; padding: 2px;"><u>Specification</u></td> <td style="border: none; width: 50%; padding: 2px;"><u>Valve</u></td> </tr> <tr> <td style="border: none; padding: 2px;">Unclassified</td> <td style="border: none; padding: 2px;">Unclassified</td> </tr> </table>	<u>Specification</u>	<u>Valve</u>	Unclassified	Unclassified
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<u>TYPE of VALVE:</u> Tunable Magnetron, Pulse type. <u>CATHODE:</u> Indirectly Heated. <u>ENVELOPE:</u> Metal-Glass. <u>PROTOTYPE:</u> 5586.	<u>MARKING</u> See K.1001/4 Additional marking, 5586.
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<u>RATING</u> (All limiting values are absolute)	<u>CONNECTIONS</u> See Note A below.																		
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 10%; text-align: center;"><u>Note</u></td> <td style="width: 60%;"></td> </tr> <tr> <td style="padding: 2px;">Heater Voltage (V)</td> <td style="text-align: center; padding: 2px;">16.0</td> <td rowspan="7" style="text-align: center; vertical-align: middle;">A</td> </tr> <tr> <td style="padding: 2px;">Heater Current (A)</td> <td style="text-align: center; padding: 2px;">3.1</td> </tr> <tr> <td style="padding: 2px;">Frequency Range (Mc/s)</td> <td style="text-align: center; padding: 2px;">2700 to 2900</td> </tr> <tr> <td style="padding: 2px;">Frequency Pulling (Max.)(Mc/s)</td> <td style="text-align: center; padding: 2px;">15</td> </tr> <tr> <td style="padding: 2px;">R.F. Bandwidth (Max.)(Mc/s)</td> <td style="text-align: center; padding: 2px;">2.5</td> </tr> <tr> <td style="padding: 2px;">Magnetic Field Strength (gauss)</td> <td style="text-align: center; padding: 2px;">2700</td> </tr> <tr> <td style="padding: 2px;">Output Power (Min.) (W)</td> <td style="text-align: center; padding: 2px;">400</td> </tr> </table>		<u>Note</u>		Heater Voltage (V)	16.0	A	Heater Current (A)	3.1	Frequency Range (Mc/s)	2700 to 2900	Frequency Pulling (Max.)(Mc/s)	15	R.F. Bandwidth (Max.)(Mc/s)	2.5	Magnetic Field Strength (gauss)	2700	Output Power (Min.) (W)	400	
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NOTES

A. The drawing 242-JAN shows connections and dimensions and also details regarding the magnetic field. Copies of this drawing can be obtained on application to the Specifying Authority.

NOTE

This specification refers to the American 5586 and only data and tests for this valve shall apply.

CV3611/1/B.

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MIL-E-1/770
16 July 1954

INDIVIDUAL MILITARY SPECIFICATION SHEET

ELECTRON TUBE, MAGNETRON, TUNABLE FREQUENCY, PULSE TYPE

JAN-5586, 5657

This specification sheet forms a part of the latest issue of Military Specification MIL-E-1.

Rating:	Ef	epy	ib	pl	Pi	tk	Du	tp	Anode T	Alt.
Absolute	V	kv	a	kw	W	sec	---	us	°C	ft.
Maximum:	16.0/10%	Note 1	70	Note 2	Note 3	---	.001	2.5	100	10,000
Minimum:	---	---	---	---	---	---	---	---	---	---

Pulsing Service Note 8

**Cathode: Oxide Coated Unipotential

For miscellaneous requirements see Paragraph 3.3 Inspection Instructions for Electron Tubes.

Ref.	Test	Conditions	Min.	Max.
3.1	Qualification Approval:	Required for JAN Marking		
4.5	Holding Period:	t _h 168 hours		
4.6	Insulation of Electrodes:	Omit		
4.9.18.1.8	Carton Drop:	(1) Package Group 9; Carton Size I		
4.9.8	**Salt Spray Corrosion:	Omit		
4.9.19.1	**Vibration:	No voltage		
4.9.19.2	**Vibration:	No voltage		
4.9.2	Dimensions:	Per drawing 242-JAN		
3.7.1.3	Marking:			
4.16.1	**Cooling:			
4.9.13	Pressurizing:	40 to 45 lbs/sq. in. (absolute)		
4.10.8	Heater Current:	Ef=16.0V	If: 2.8	3.4 A
4.16.3	<u>Oscillation(1):</u>			
---	Coupling:	Per drawing 242-JAN		
4.16.3.1	Magnetic Field:	H=2700 gauss; Coil No. 400; Pulse Tip 1.8 in. ± .005; Note 4 - .000		
4.16.3.2	Heater:	t _h 120(max) at Ef=16.0V; Ef=10.0V for test		
4.16.3.3	Pulse Characteristics:	tp=0.9 to 1.1 us; Du=.0005; trv=0.1 to 0.2 us		
4.16.3.4	Average Anode Current: Standing Wave Ratio:	I _a 35mA dc S=1.15/1 (max)		
4.16.3.5	Pulse Voltage:	F1, F2, F3; Note 5	5586 epy: 27 32 kv 5657 epy: 27.5 32.5 kv	

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Ref.	Test	Conditions	Min.	Max.
4.16.3.6.2	Power Output:	$t_m=300(\text{max})$; F1, F2, F3; Note 5	Po: 400	— W
4.10.7.3	Frequency:	Note 6	5586 F: 2700 5657 F: 2900	2900 Mc 3100 Mc
4.16.3.7	$\frac{1}{2}$ R.F. Bandwidth:		Bandwidth: —	2.5 Mc
4.16.5	*Pulling Factor:	I_{b20} to 35mAde	ΔF : —	15 Mc
4.16.7	Stability:	Note 7		
4.16.3	<u>Oscillation(2):</u>			
—	Coupling:	Per drawing 242-JAN		
4.16.3.1	Magnetic Field:	$H_m=2700$ gauss; Coil No. 400; Pole Tip 1.8 in. $\pm .005$ $-.000$; Note 4		
4.16.3.2	Heater:	$t_h=120(\text{max})$ at $E_f=16.0V$; $E_f=10.0V$ for test		
4.16.3.3	Pulse Characteristics:	$t_p=1.8$ to $2.2\mu s$; D_{02} .0006; t_{rr} 0.1 to 0.2 μs		
4.16.3.4	Average Anode Current: Standing Wave Ratio:	I_{b20} 35mAde $\sqrt{1.15/1}(\text{max})$		
4.16.3.6.2	Power Output:	$t_m=300(\text{max})$; F1; Note 5	Po: 400	— W
4.9.14	**Temperature Coefficient:	F1, F2, F3; $T_m=60^\circ C-90^\circ C$; Note 5	ΔF : —	.07 Mc/ $^\circ C$
4.9.15	**Low Temperature:	$t_h=180(\text{max})$; F2; Note 5		
4.16.7	Stability:	Note 7		
4.11	Life Test:	Group D; Osc. (1)	t: 500	— hrs
4.11.4	Life Test End Point:	Osc. (1)	Po: 320 Bandwidth: —	— W 2.5 Mc

Note 1: $e_{pp}=30kv$ for 5586; 32.5 kv for 5657.

Note 2: $p_{i20}=2000$ kv for 5586; 2200kv for 5657.

Note 3: $P_{i20}=1200W$ for 5586; 1300W for 5657.

Note 4: The magnetic field should be calibrated in accordance with the following procedure:

- a. With a conventional 1/8 inch pole piece attached to the pole face of the magnet opposite the magnetron tuner as per drawing 242-JAN, figure (a), the magnetic gap should be 1.800 inches.
- b. The magnetic field should then be adjusted for 2700 gauss at the center of the gap.
- c. Remove the conventional 1/8 inch pole piece and replace it with the distortion pole piece shown in figure (b) on drawing 242-JAN.

Note 5: F1=2700Mc for 5586; 2900Mc for 5657.
F2=2800Mc for 5586; 3000Mc for 5657.
F3=2900Mc for 5586; 3100Mc for 5657.

Note 6: Mechanical tuning. The tube must cover the indicated frequency band.

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Note 7: The tube is considered to be operating stably when the average current is constant, showing no appreciable kicks which are accompanied by flicker in a neon lamp used as an indicator of rf output, or by wide variations in the oscilloscope trace of input current or voltage. Stable operation shall be demonstrated over the last 30 seconds of a test interval not to exceed 5 minutes.

Note 8: During high voltage operation, it is essential to operate the heater according to the following schedule:

Pi (watts)	Ef (Volts)
1000 - 1200	8
800 - 1000	10.5
600 - 800	13
400 - 600	15
Less than 400	16

The above schedule is valid only for repetition rates of 300 pps or greater.

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