

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

CV3676

Specification AD/CV 3676 incorporating MIL-E-1/667D  Issue 1 Dated 15.10.58.  To be read in conjunction with K1006.	<table border="1"> <tr> <th colspan="2"><u>SECURITY</u></th></tr> <tr> <td><u>Specification</u></td><td><u>Valve</u></td></tr> <tr> <td>Unclassified</td><td>Unclassified</td></tr> </table>	<u>SECURITY</u>		<u>Specification</u>	<u>Valve</u>	Unclassified	Unclassified
<u>SECURITY</u>							
<u>Specification</u>	<u>Valve</u>						
Unclassified	Unclassified						

<u>TYPE OF VALVE</u>	Magnetron, fixed frequency, pulse type, with integral magnet.	<u>MARKING</u>  See K1001/4  Additional marking 2J42	
<u>CATHODE</u>	Indirectly heated.		
<u>ENVELOPE</u>	Metal-Glass		
<u>PROTOTYPE</u>	2J42		
<u>RATING</u>  (All limiting values are absolute)		<u>CONNECTIONS</u>  See drawing on Page 5	
		Note	
Heater voltage	(V)	6.3	A
Heater current	(A)	0.5	
Nominal Operating Frequency	(Mc/s)	9345 to 9405	
Frequency Pulling (Max).	(Mc/s)	15	
Max. Mean Input Power	(W)	82.5	B
		<u>DIMENSIONS</u>  See drawing on Page 5	
<u>NOTES</u>			
A. The heater shall be switched on at least 2 minutes before HT voltage is applied at an ambient temperature of greater than 0°C. At ambient temperatures between 0°C and - 55°C the heater shall be switched on for at least 3 minutes before HT is applied. See Note 1 on page 3 for heater conditions during periods of high anode dissipation.			
B. Cooling air shall be supplied sufficient to prevent the anode temperature exceeding 70°C.			

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MIL-E-1/867D  
17 April 1957  
SUPERSEDING  
MIL-E-1/867C  
14 May 1956

## INDIVIDUAL MILITARY SPECIFICATION SHEET

ELECTRON TUBE, MAGNETRON, FIXED FREQUENCY, PULSE TYPE, WITH INTEGRAL MAGNET

JAN-2J42

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

### Ratings: (Non-Simultaneous Values)

Absolute	Ef V	epy kv	ib a	pi kw	Pi W	tk sec.	Du ---	tp us	Anode T °C	rrv kv/us	Alt. ft
Maximum:	7.0	6.0	5.5	33	82.5	---	.0025	2.5	120	75 @ 4.5a	10,000
Minimum:	---	5.0	3.5	17.5	---	120 Note 1	---	---	---		

Mounting support: Face Plate

Mounting position: Any.

Cooling: Convection air cooled.

Weight: 3 pounds (approx.)

\*\*Cathode: Oxide Coated Unipotential

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

<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>	<u>Min.</u>	<u>Max.</u>
3.1	Qualification Approval:	Required for JAN Marking		
4.9.8	Salt Spray Corrosion:	Omit		
4.8	Electrode Insulation:	Omit		
4.5	Holding Period:	t = 168 hrs. (min.)		
4.9.18.1.8	Carton Drop:	(1) Package Group 9; Carton Size A		
4.9.19.1	*Vibration:	No voltages		
4.9.19.2	**Vibration:	No voltages		
4.9.2	Dimensions:	Per Outline		
4.16.1	**Cooling:	Note 2, 3		
4.9.13	Pressurizing	45 psi abs. (min.)		
4.10.8	Heater Current:	Ef = 6.3 V; Note 1; tk = 120 (min.)	If: .43	.60 A
4.16.3	<u>Oscillation (1):</u>			
---	Coupling:	UG-40A/U		
---	Standing Wave Ratio:	1.10 : 1 VSWR (max.)		
4.16.3.2	Heater:	Ef = 6.3 V; tk = 120 (max.): Note 1		
4.16.3.3	Pulse Characteristics:	tp = 1.0 $\angle$ .1 us; Du = .002; rrv = 75 kv/us (min.); Note 5		
4.16.3.4	Average Anode Current:	Ib = 9.0 mAdc		
4.16.3.5	Pulse Voltage:		epy: 5.3	5.7 kv

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<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>		<u>Min.</u>	<u>Max.</u>	
4.16.3.6.1	Power Output:	t = 300 (max.);	Po:	14.0	—	W
4.10.7.3	Frequency:	Ta = 40 $\pm$ 10 °C Note 2, 3	F:	9345	9405	Mc
4.16.3.7	Spectrum Measurements:	Measurements shall be made at 7.5 and 9.0 mAdc				
	R. F. Bandwidth:		BW:	—	$\frac{2.5}{tp}$	Mc
	Minor Lobes:		Ratio:	6.0	—	db
4.16.5	Pulling Factor:		$\Delta F$ :	—	15	Mc
—	† Stability:	Note 4	MP:	—	.25	%
4.16.3	<u>Oscillation (2):</u>					
—	Coupling:	UG-40A/U				
—	Standing Wave Ratio:	1.10 : 1 VSWR (max.)				
4.16.3.2	Heater:	Ef = 6.3 V; tk = 120 (max.); Note 1				
4.16.3.3	Pulse Characteristics:	tp = 2.0 $\pm$ .2 us; Du = .001 rrv = 75 kv/us (min.) Note 5				
4.16.3.4	Average Anode Current:	Ib = 4.5 mAdc				
4.16.3.7	Spectrum Measurements:	Measurements shall be made at 3.5 and 4.5 mAdc				
	R. F. Bandwidth:		BW:	—	$\frac{2.5}{tp}$	Mc
	Minor Lobes:		Ratio:	6.0	—	db
—	*Stability:	Note 4	MP:	—	.25	%
4.9.14	**Thermal Factor:	Note 2, 3: Ta=40-70°C	$\Delta F/\Delta C$ :	—	-.25	Mc
4.9.15	**Low Temp. Operation:	Note 1				
4.16.4	*Non-Oscillating Characteristics:					
	Standing Wave Ratio		$\rho$ :	8.0	—	VSWR
	Position, Standing Wave Minimum:	Note 6	Distance:	13.5	22.5	mm
4.11	Life Test:	Group D; Osc. (2)	t:	250	—	hrs.
4.11.4	Life Test End Point:					
	Power Output:	Osc. (1); t = 300 (max.)	Po:	11.0	—	W
	Frequency:	Osc. (1)	F:	9345	9405	Mc
	R. F. Bandwidth:	Osc. (1)	BW:	—	$\frac{3.0}{tp}$	Mc
	Stability:	Osc. (2); Note 4	MP:	—	1.0	%

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## NOTES

- 1: The Cathode heating time shall be a minimum of 120 seconds at an ambient temperature of greater than 0° C, and a minimum of 180 seconds at temperatures between 0° C and -55° C.

For average pulse power inputs in excess of 25 watts, the heater voltage shall be reduced within 3 seconds after applying high voltage according to the following schedule:

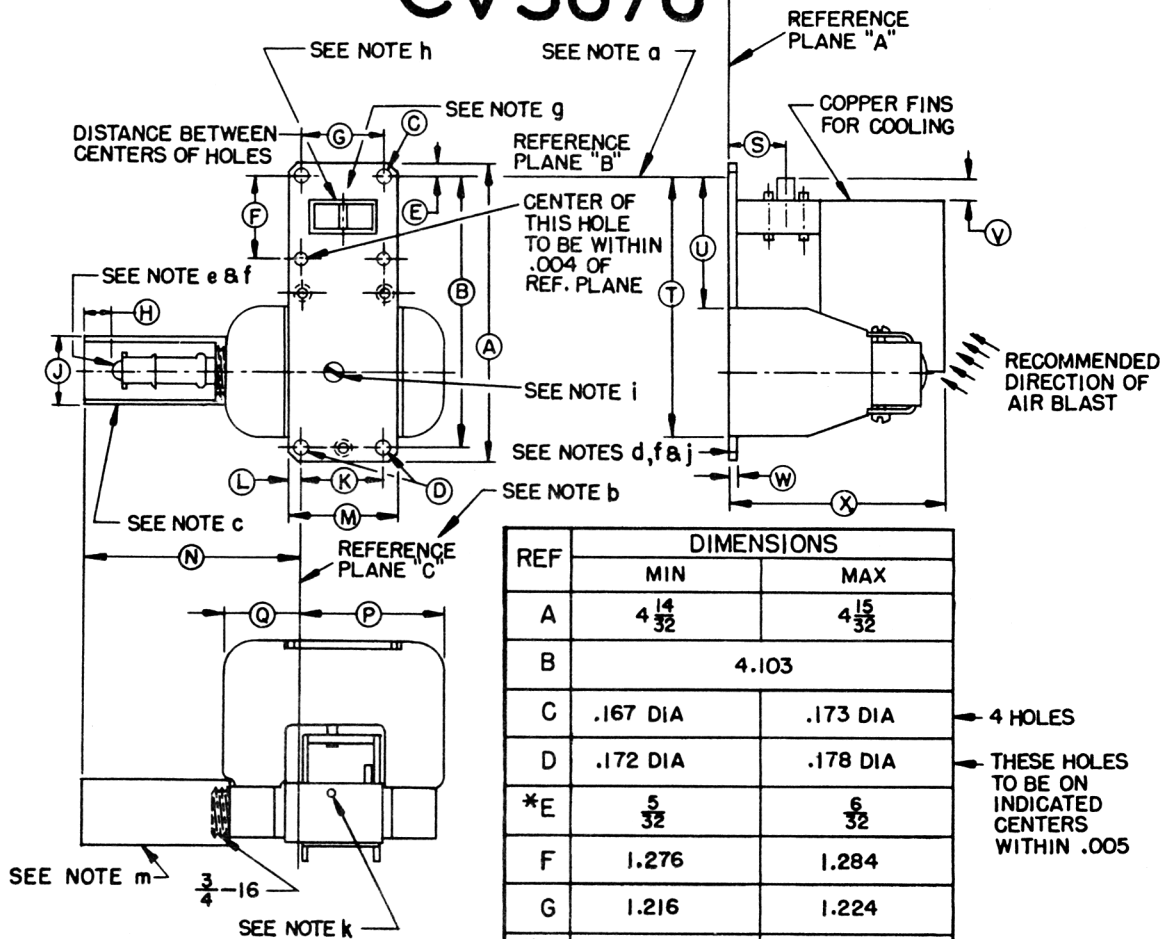
$$E_f = 6.3 \quad \frac{(1-P_i)}{180} \quad \text{Volts,} \quad \text{where}$$

$P_i$  = Average pulse power input in watts.

At no time shall the heater current be allowed to reach a surge value of 3 amperes.

- 2: The anode shall be cooled to the temperature specified by a suitable flow of air over the anode body, and wave guide attachment brackets which serve as cooling fins.
- 3: The anode temperature shall be measured at the point indicated on the outline drawing.
- 4: Stability shall be measured in terms of the average number of output pulses missing, expressed as a percentage of the number of input pulses applied during the period of observation. Pulses are considered to be "missing" if, due to any cause, their R.F. energy is less than 70% of the normal energy level in the frequency range of 9345 to 9405 megacycles. The number of missing pulses shall not exceed the amount specified, expressed as a percentage of the number of applied pulses, during any 5 minute interval of a 15 minute test period.
- 5: The rate of rise of voltage (rrv) shall be expressed in kilovolts per micro-second defined by the steepest tangent to the leading edge of the voltage pulse above 80 percent amplitude. Any capacitance used in viewing system shall not exceed 6.0 uuf.
- 6: The first standing wave minimum shall be located on the waveguide side of reference plane "A" and the measurement taken between these points. When this number is subtracted from one-half wave-guide wavelength, the remainder, (the length from point "A" to the minimum toward the tube), should fall within the limits specified.
- 7: Reference specification shall be of the issue in effect on the date of invitation for bid.

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REF	DIMENSIONS	
	MIN	MAX
A	4 $\frac{14}{32}$	4 $\frac{15}{32}$
B	4.103	
C	.167 DIA	.173 DIA
D	.172 DIA	.178 DIA
*E	$\frac{5}{32}$	$\frac{6}{32}$
F	1.276	1.284
G	1.216	1.224
*H		$\frac{1}{4}$
*J		1.00
K	1.220	
*L	$\frac{3}{16}$	$\frac{7}{32}$
*M	1 $\frac{39}{64}$	1 $\frac{41}{64}$
*N	2 $\frac{11}{16}$	3 $\frac{3}{16}$
*P		2 $\frac{3}{16}$
*Q		1 $\frac{3}{16}$
**S	$\frac{3}{4}$	1
*T		4.00
*U	1 $\frac{15}{16}$	
*V		$\frac{3}{8}$
**W		$\frac{1}{8}$
*X		3 $\frac{5}{16}$

- NOTE a: REFERENCE PLANE "B" PASSES THROUGH THE CENTERS OF THE TWO TOP HOLES OF THE MOUNTING PLATE AS SHOWN AND IS PERPENDICULAR TO PLANE "A".
- NOTE b: REFERENCE PLANE "C" PASSES THROUGH THE UPPER LEFT HOLE ON MOUNTING PLATE AS SHOWN AND IS MUTUALLY PERPENDICULAR TO PLANES "A" AND "B".
- \*NOTE c: THE AXIS OF THE FILAMENT LEAD PROTECTOR MUST BE WITHIN 5° OF A NORMAL TO REFERENCE PLANE "C".
- NOTE d: WITH SURFACE "A" RESTING ON A FLAT SURFACE PLATE, A FEELER GAUGE .020 THICK & 1/8 WIDE SHALL NOT ENTER MORE THAN 1/8 AT ANY POINT.
- \*NOTE e: THE CLEARANCE BETWEEN THE INSIDE SURFACE OF THE PROTECTOR AND THE 3/8 DIAMETER CYLINDRICAL SURFACE OF THE STANDARD SINGLE CONTACT MINIATURE BAYONET LAMP BASE SHALL NOT BE LESS THAN 1/8.
- \*\*NOTE f: ALL METAL SURFACES EXCEPT SURFACE "A" AND THE BAYONET BASE SHALL BE PAINTED BLACK.
- NOTE g: THIS AREA IS GASKETED FOR PRESSURIZING WAVE GUIDE OUTPUT AS WITH COUPLER ARMY-NAVY DESIGNATION UG-40/U AND IS THE AREA TO BE TESTED PER MIL-E-1 PAR. 4.19.13.
- NOTE h: THE POSITION OF WAVE GUIDE HOLE IS NOT SPECIFIED ON THIS DRAWING SINCE TUBES ARE TESTED AND USED INTO COUPLER ARMY-NAVY DESIGNATION UG-40/U. (SEE NOTE g).
- \*\*NOTE i: SOFT SOLDER TO BE USED. AS AN ALTERNATE, TIP OF SCREW MAY BE SOLDERED.
- \*\*NOTE j: SURFACE "A" AND INTERIOR SURFACES OF WAVE GUIDE SHALL BE PLATED 10 MS1 OF GOLD OR 30 MS1 SILVER BUT NEED NOT BE PLATED IF THE PARTS ARE MADE OUT OF MONEL OR EQUIVALENT CORROSION RESISTANT MATERIALS.
- NOTE k: ANODE TEMPERATURE MEASURED AT THIS POINT.
- NOTE m: THE FILAMENT LEAD PROTECTOR SHALL NOT BE USED TO SUPPORT ANY CAP FITTING. THIS PROTECTOR IS A DETACHABLE SLEEVE OF A NON-CONDUCTING MATERIAL. ←