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 General Post Office: E-in-C(s)

<u>Specification:</u> G.P.O./CV 5293 <u>Issue:</u> 1, April 1964 To be read in conjunction with K 1001, BS 1409.	<u>Security</u>	
	<u>Specification</u> Unclassified	<u>Valve</u> Unclassified

← Indicates a change

<u>Type of Valve:</u> Travelling wave amplifier <u>Cathode:</u> Indirectly heated <u>Envelope:</u> Glass <u>Prototype:</u> W7/3G	<u>Marking</u> See K 1001/4																																								
<p style="text-align: center;"><u>RATINGS and CHARACTERISTICS</u>                  (Not for Inspection purposes)  <u>ALL limiting values are absolute</u></p> <table border="0"> <tr> <td>Heater Voltage</td> <td>(V)</td> <td>6.3</td> </tr> <tr> <td>Heater Current (nom)</td> <td>(A)</td> <td>0.85</td> </tr> <tr> <td>First Anode Voltage, Va1 (nom)</td> <td>(kV)</td> <td>2</td> </tr> <tr> <td>Helix Voltage, Vhel (max)</td> <td>(kV)</td> <td>3.2</td> </tr> <tr> <td>Collector Voltage, Vcol (nom)</td> <td>(kV)</td> <td>Va2 + 0.05</td> </tr> <tr> <td>Collector Current, Icol (max)</td> <td>(mA)</td> <td>40</td> </tr> <tr> <td>First Anode Current, Ia1 (max)</td> <td>(mA)</td> <td>500</td> </tr> <tr> <td>Helix Current, Ihel (max)</td> <td>(mA)</td> <td>3</td> </tr> <tr> <td>Pre-heating time (min)</td> <td>(Sec)</td> <td>120</td> </tr> <tr> <td>Power Output</td> <td>(W)</td> <td>5</td> </tr> <tr> <td>Cold Transmission Loss (min)</td> <td>(db)</td> <td>50</td> </tr> <tr> <td>Air Cooling</td> <td>(cu.ft/min)</td> <td>15</td> </tr> <tr> <td>Min Frequency range of operation</td> <td>(Mc/s)</td> <td>3600 - 4200</td> </tr> </table>	Heater Voltage	(V)	6.3	Heater Current (nom)	(A)	0.85	First Anode Voltage, Va1 (nom)	(kV)	2	Helix Voltage, Vhel (max)	(kV)	3.2	Collector Voltage, Vcol (nom)	(kV)	Va2 + 0.05	Collector Current, Icol (max)	(mA)	40	First Anode Current, Ia1 (max)	(mA)	500	Helix Current, Ihel (max)	(mA)	3	Pre-heating time (min)	(Sec)	120	Power Output	(W)	5	Cold Transmission Loss (min)	(db)	50	Air Cooling	(cu.ft/min)	15	Min Frequency range of operation	(Mc/s)	3600 - 4200	<u>Base (Flying Leads)</u>	
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	<u>Connections</u>																																								
	<u>Lead</u>	<u>Colour</u>																																							
	<u>Electrode</u>																																								
	1	Yellow	1st Anode																																						
	2	Black	Heater and Cathode																																						
	3	-	I.C. to base flange																																						
	4	Green	Heater																																						
	Base Flange	-	2nd Anode and Helix																																						
	T.C.	-	Collector																																						
	<u>Dimensions</u> See Drawing on Page 4																																								
<p><u>NOTES</u> A. With a 15 mW Input or less</p>																																									

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## TESTS

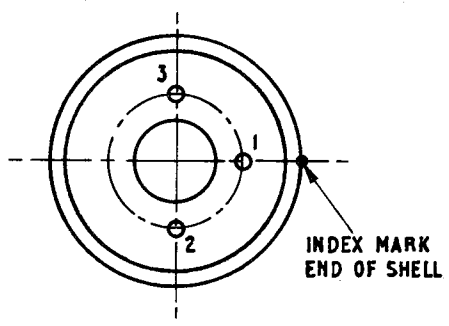
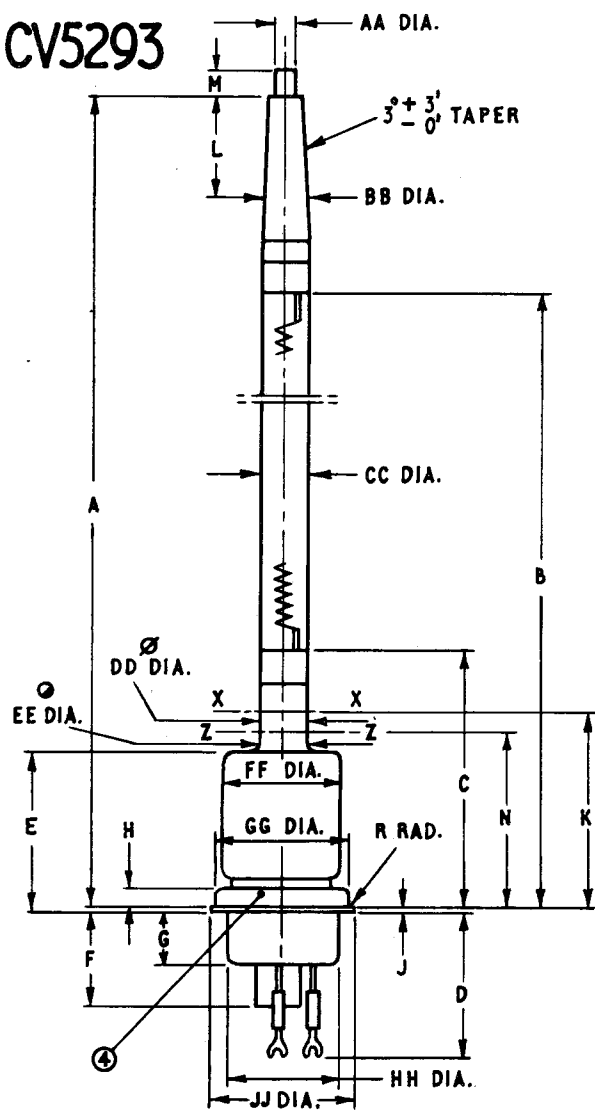
To be performed in addition to those applicable to K 1001

Test Clause	Test Conditions					Test & Units	Limits		Insp. Level
	Vh (Volts)	Va2 (Volts)	Va3 (Volts)	Ia3 (mA)	Deflector coils current ILa, ILB(mA)		Min	Max	
a See Note 1	6-3					Heater Current (amps)	0-7	0-9	100%
b See Notes 1, 2, 9	6-3	3000	3050	40	I optimum < 70 mA	Ia2 Focusing current (mA)	-	3-0	100%
c See Notes 1 & 9	6-3	3000	3050	40	I optimum	Ia1 current (mA)	-	300	100%
d See Notes 1, 9	6-3	3000	3050	40	I optimum	Gun impedance (Volts)	1750	2250	100%
e See Notes 1, 3, 9	6-3	3000	3050	47	I optimum	No oscillation should be detected	-	-	100%
f See Notes 4, 5	6-3	Record	Va2 +50	40	I optimum	Optimum Va2 (Volts)	2800	3100	100%
g See Notes 1, 9	6-3	Va2 Opt.	Va2 + 50	40	I optimum	Input for 5W output (mW)	-	15	100%
h See Notes 1, 6, 9	6-3	Va2 Opt.	Va2 + 50	40	I optimum	Max. power output (Watts)	7-0	-	100%
i See Notes 1, 7, 9	6-3	Va2 Opt.	Va2 + 50	40	I optimum	Band of output match to 5% Voltage reflection points	15 Mc/s	-	100%
k See Notes 1, 9	6-3	Va2 Opt	Va2 + 50	40	I optimum	Band of Input match to 5% Voltage reflection points	15 Mc/s	-	Q.A. only
l See Notes 1, 8, 9	0	0	0	0		Cold attenuation (db)	50	-	100%

NOTES

1. Tests a to l inclusive to be carried out in a circuit approved by the Type Approval Authority. Tests should not commence until 2 minutes after the valve heater has been switched on.
2. With Va1 set to give 2/3rds of Va2, Va2 should be gradually increased to 3000V, I<sub>LA</sub> and I<sub>LB</sub> being adjusted for minimum I<sub>a2</sub> and Va1 being finally adjusted to give I<sub>a3</sub> = 40 mA. I<sub>a2</sub> should not be permitted to be greater than 4 mA.
3. On making this test Va2 and Va3 shall be swept at 50 c/s by 200 V.R.M.S. and the output from a crystal shall be viewed on an oscilloscope as the vertical deflection, with a voltage of the same phase and frequency providing the horizontal deflection. I<sub>a3</sub> shall be adjusted to 47 mA and the matching flags mistuned. Oscillations, if present, are apparent on the oscilloscope trace. During this test the circuit shall be lightly tapped with a 5/8" diameter paxolin rod 6" long. The free end of the rod must travel a distance of 3".
4. Valves shall satisfy tests f to l at all frequencies in the band 3600-4200 Mc/s.
5. This test shall be carried out with an input less than 5 mW, with the matching flags adjusted for maximum gain. The output may be viewed on the oscilloscope or as a crystal current.
6. I<sub>a2</sub> should be observed during this and the previous test. Should it rise above 3 mA and be impossible to reduce by varying I<sub>LA</sub> and I<sub>LB</sub> the tube must be rejected.
7. For tests j and k, with 25 mW input power, the output and input matches are adjusted for minimum voltage reflection.
8. During this test the circuit shall be lightly tapped with a 5/8" diameter paxolin rod 6" long. The free end of the rod must travel a distance of 3".
9. Focus Coil Current I<sub>L</sub> = 300 mA.

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INPUT CHOKE SPIGOT, INDEX MARK & PIN No.1 WILL NOT DEVIATE FROM A COMMON  $\phi$  BY MORE THAN 15° IN EITHER DIRECTION

DIAMETERS AA, CC, DD, EE, FF, LIE ON THE  $\phi$  OF BB & GG AND DEFINE THE MAXIMUM LIMITS OF THE ENVELOPE

⊗ DENOTES:- SOLDER IS RETAINED WITHIN THIS LIMIT  
 \* DIM. CC DIA. APPLIES BETWEEN LINE X-X AND COLLECTOR END OF BULB  
 ∅ DIM. DD DIA. APPLIES BETWEEN X-X & Z-Z  
 ⊙ DIM EE DIA. APPLIES BETWEEN LINE Z-Z & TOP OF BULB



LEAD	COLOUR	ELECTRODE
1	YELLOW	1 <sup>ST</sup> ANODE
2	BLACK	HEATER & CATHODE
3	GREEN	HEATER
4	—	2 <sup>ND</sup> ANODE & HELIX

NOTE :- BASIC FIGURES ARE INCHES

DIM	MILLIMETRES	INCHES	DIM	MILLIMETRES	INCHES
A	372.54 ± 0.63	14.667 ± 0.025			
B	317.07 ± 0.038	12.483 ± 0.015			
C	72.59 ± 0.89	2.858 ± 0.035	AA	8.25 MAX.	0.328 MAX.
D	50.8 ± 1.58	2.000 ± 0.062	BB	10.92	0.430
E	44.57 MAX.	1.55 MAX.	CC	13.46 MAX.	0.530 MAX.
F	25.4 MAX.	1.000 MAX.	DD	14.47 MAX.	0.570 MAX.
G	19.1 MAX.	3/4 MAX.	EE	15.87 MAX.	0.625 MAX.
H	4.75 MIN.	0.187 MIN.	FF	34.67 MAX.	1.365 MAX.
J	0.51 ± 0.08	0.020 ± 0.003	GG	36.20 ± 0.18	1.425 ± 0.007
K	50.69 MAX.	1.990 MAX.	HH	33.3 MAX.	1 5/16 MAX.
L	23.81 ± 1.59	15/16 ± 1/16	JJ	38.35 ± 0.25	1.510 ± 0.010
M	6.35 ± 0.76	0.250 0.030	KK	36.32 MAX.	1.430 MAX.
N	47.36 MAX.	1.865 MAX.			
R	0.30 MAX.	0.012 MAX.			