

ELECTRONIC VALVE SPECIFICATION AD/CV 2463,  
ISSUE 1 DATED SEPTEMBER, 1958

AMENDMENT NO.1

Page 8.

In Note W, fourth line,  
Amend "(Page 7)" to read "(Page 9)"

T.V.C. for A.S.R.E.

November, 1958.

N.44323R

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ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV2463  
ISSUE 1 DATED SEPTEMBER, 1958  
AMENDMENT NO. 2

Page 6. Delete clause "r" Mechanical Shock Test

March, 1960

Admiralty Surface Weapons Establishment

NK.16523/D

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV2463

ISSUE 1 DATED SEPTEMBER 1958

AMENDMENT NO.3

Page 7. Note S

Delete existing Note S and substitute the following:-

The face tilt shall be such that when the tube is rotated about the neck axis the total variation in the distance between the face plate and a fixed point on a plane perpendicular to the axis of rotation shall not exceed 3.50 mm, the point being at a distance of 100 mm from the axis of rotation.

December, 1960  
N.46652/D

ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV2463 ISSUE NO. 1 DATED SEPTEMBER 1958

AMENDMENT NO. 4

Page 1. In box headed "BASE", add following "edge"  
"or BS448/B12A".

Page 7. In Note "U" amend "1600 m.m. to read "1400 m.m."

Page 8. Amend the dimension "1600 MIN. RAD." (situated at the top of page, almost immediately below the "3" in CV2463) to read "1400 MIN. RAD."

July, 1963  
(196255)

TVC. for  
ASWE

CV2463

Specification AD/CV2463 Issue 1 Dated September, 1958. To be read in conjunction with K1001 and B.S.448.	<u>SECURITY</u>	
	<u>Specification</u> Unclassified	<u>Valve</u> Unclassified

<u>TYPE OF VALVE:-</u> Cathode Ray Tube <u>TYPE OF DEFLECTION:-</u> Magnetic <u>TYPE OF FOCUS:-</u> Magnetic <u>TYPE OF ELECTRON GUN:-</u> Triode <u>SCREEN:-</u> 009 Aluminium backed <u>PROTOTYPE:-</u> VCRX4,32 and VCRX4,33		<u>MARKING</u> See K1001/4	
		<u>BASE</u> B12A with metal shell and bakelite wafer with rounded edge. See drawing on Page 8	
<u>RATING</u>		<u>CONNECTIONS</u>	
(All limiting values are absolute)		<u>Pin</u>	<u>Electrode</u>
Heater Voltage (V)	6.3	1	h.
Heater Current (A)	0.6	2	g.
Maximum Anode Voltage (kV)	15.5	3	No pin
Minimum Anode Voltage (kV)	10	4	No pin
Max. Heater-Cathode Voltage (V)	150	5	No pin
Peak Beam Current (μA)	100	6	Internal connection
		7	External conductive coating. See Note E
<u>TYPICAL OPERATING CONDITIONS</u>		8	No pin
Anode Voltage (kV)	15	9	No pin
Grid Cut-off Voltage (V)	-60 to -140	10	Internal connection
Max. Grid Drive for $I_b = 20 \mu A$ (V)	29.6	11	k.
		12	h.
		S.C.	a.
<u>CAPACITANCES</u>		<u>SIDE CONTACT</u>	
Max. C <sub>g</sub> to all other electrodes (pF)	15	B.S.448. CT8	
Max. C <sub>k</sub> to all other electrodes (pF)	10		
<u>NOTES</u>		<u>DIMENSIONS</u>	
A. Heater current may be between 0.27 and 0.66A. B. Heater negative to Cathode. C. The screen does not contain Beryllium. D. To prevent damage to the screen the tube should always be operated at its minimum useful brightness. E. The electrode system shields the electron beam from charges on internal insulators. F. The external conductive coating, pin 7, should be connected at or near cathode potential. The inclusion of this coating is not compulsory, but it may be provided at the discretion of the manufacturer.		See drawings pages 8 and 9	

TESTS

To be performed in addition to those applicable in K1001.

Clause	Test	Test Conditions	AQL %	Insp. Level	Limits		Units
					Min.	Max.	
a	<u>Capacitances</u> 1. Grid to all other electrodes. 2. Cathode to all other electrodes.	See K1001/5A.13.	6.5	II		15	pF
			6.5	II		10	pF
FOR ALL TESTS BELOW, $V_h = 6.3$ volts							
b	<u>Heater Current</u> 1. Limits 2. Deviation from manufacturer's nominal.			100%	0.27	0.66	A
				100%		$\pm 10\%$	
c	<u>Heater-Cathode Insulation Leakage Current</u>	$V_{hk} = -150$ volts See K1001/5A.3.3		100%		100	$\mu A$
FOR ALL TESTS BELOW, EXCEPT THOSE OF CLAUSES "f" AND "m", $V_a = 15$ kV							
d	<u>Grid Cut-off Voltage Numerical Value, <math>V_c</math></u> (Note value of $V_c$ for use in test "e")	Adjust for optimum focus. Adjust $V_g$ for out-off, see K1001/5A.10		100%	60	140	V
e	1. <u>Grid Drive Voltage <math>V_d</math></u> $V_d =$ change in $V_g$ from value $V_c$ noted in test "d"  2. <u>Grid Drive Factor</u> $= (V_d \text{ minus } 10) \div V_c$	Defocused beam, scanned, or deflected off usable screen area. Adjust $V_g$ to give $I_b = 20 \mu A$ .		100%		29.6	V
				100%		0.14	
f	<u>Screen Efficiency</u> Beam current for the specified light intensity	$V_a = 10$ kV Adjust $V_g$ for a light intensity of 0.7 candela using a defocused raster of the largest convenient size.		100%		30	$\mu A$

Clause	Test	Test Conditions	AQL %	Insp. Level	Limits		Units
					Min.	Max.	
g	<u>Line Width</u> Measured at the centre of the trace.	Adjust for optimum focus with focus coil positioned as shown in drawing on page 8		100%		0.3	mm
	(i)	(i) Linear line scan 200 mm long traced in 100 $\mu$ S: grid driven from cut-off by 100 $\mu$ S voltage pulses at PRF = 100 pps to give peak $I_b = 20 \mu$ A.					
	<u>OR</u>						
	(ii)	(ii) Adjust $V_g$ to give $I_b = 20 \mu$ A, and provide an inter-laced 405 line T.V. raster of line length 200 mm, with the frame scan expanded to facilitate line width measurement.				0.25	mm
h	<u>Position and Size of Unfocused Spot</u>	No focus or deflecting fields.	6.5	II		30	mm
	1. Deviation NU of spot centre U from point N at which neck gauge axis intersects the screen.	1. $V_g$ any convenient value to give a spot that will not damage the screen. Neck gauge as described on page 9					
	2. Unfocused spot diameter.	2. Grid pulsed to give peak $I_b = 20 \mu$ A with $T_p = 100 \mu$ S and PRF = 100 pps				5	mm
j	<u>Grid Insulation</u>			100%		14	$\mu$ A
	(i) Leakage current	(i) $V_g = -140V$					
	<u>OR</u>						
	(ii) Increase in voltmeter reading	(ii) See K1001/5A3.2 Resistor 10 megohms				100%	

Clause	Test	Test Conditions	AQL %	Insp. Level	Limits		Units
					Min.	Max.	
k	<u>Useful Screen Area Diameter</u> through the geometrical centre of the screen.	Adjust for optimum focus and any convenient light intensity, and use a raster which covers the whole screen.		100%	200		mm
l	<u>Persistence</u> Decay time to 0.014 foot lamberts for screen at 15°C. The minimum acceptable decay time at any screen temperature between 15°C and 30°C which is "n" degrees above 15°C is $208 \times (1-0.04)^n$ seconds.	Screen to be scanned with a raster of convenient size. No focus field. Adjust Vg for a screen brightness of 2 foot lamberts. Excitation time 120 secs. $\pm$ 15 secs.	6.5	II	208		Secs.
m	<u>Flash Over and Stray Emission</u> Any flashover or stray emission can be ignored during the first 5 seconds when any emission shall be deflected off the screen. During the remaining 5 seconds there shall be no deflecting field and the tube shall be rejected if flash-over or stray emission causes visible screen excitation during this period.	Va = 18 kV. Vg = -170V Preheat cathode at Vh 6.3V for 10 minutes. The tube to be held with the screen horizontal and uppermost. Focus field as in clause g. The tube to be viewed for 10 seconds in a dark room or box whilst the neck of the tube is tapped with an approved forked rubber-covered wooden hammer at a minimum of 4 taps per second.		100%			

TESTS (Contd.)

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Clause	Test	Test Conditions	AQL %	Insp. Level	Limits		Units
					Min.	Max.	
n	<p><u>Blemishes</u> (Stones, bubbles and screen defects)</p> <p>1. Limit size</p> <p>2. Number of Size A, including a maximum of 5 between 0.75 and 1.0 mm.</p> <p>3. Separation between those of Size A.</p> <p>4. Separation between those of Size B or Size A and B.</p> <p>5. Number of blemishes of Size A and, or, B within a circle 25 mm dia. located anywhere on the useful screen area. (See Note 2)</p>	<p>With an unfocused raster covering the useful screen area.</p> <p>Blemishes:-</p> <p>Size A. 0.5 to 1.0 mm dia.</p> <p>Size B. 0.37 to 0.5 mm dia.</p> <p>Ignore those of size less than 0.37 mm. dia. See Note 1.</p>		100%		1.0	mm
					15	10	mm
					5		mm
						5	
o	<p><u>Glass Face Plate Quality</u></p> <p>Both surfaces of the glass face plate must be smooth and polished and free from all surface contour variations, such as "orange-peel" variations, that would be apparent to the unaided eye.</p>			100%			

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TESTS (Contd.)

Clause	Test	Test Conditions	AQL %	Insp. Level	Limits		Units
					Min.	Max.	
p	<u>Climatic Test of External Coating</u> There shall be no sign of blistering or flaking of any external conductive coating.	K1001/10.1		T.A.			
q	<u>Spot Movement</u> At any time during a period of 8 hours the spot shall not move by more than 1 mm from its original position.	No focus or de-flecting fields. Vg any convenient value as in test 'h' above.		T.A.			
r	<u>Mechanical Shock Test</u> The tube shall be subjected to an acceleration of approximately 60 g peak and 30 g mean for at least 30 milliseconds along the neck axis and, also in two mutually perpendicular directions normal to the neck axis. Clauses d, e, h and m shall be satisfied before and after this test.			T.A.			

NOTES

1. If two or more blemishes are separated by a distance not greater than the maximum dimension of the largest blemish in the group, then the group of blemishes shall be considered as one blemish of dimension equal to the maximum overall dimension of the group.
2. Vent-pip blemishes may be ignored provided that there are no more than four of them and that they appear only on or outside the periphery of the minimum acceptable useful screen area.

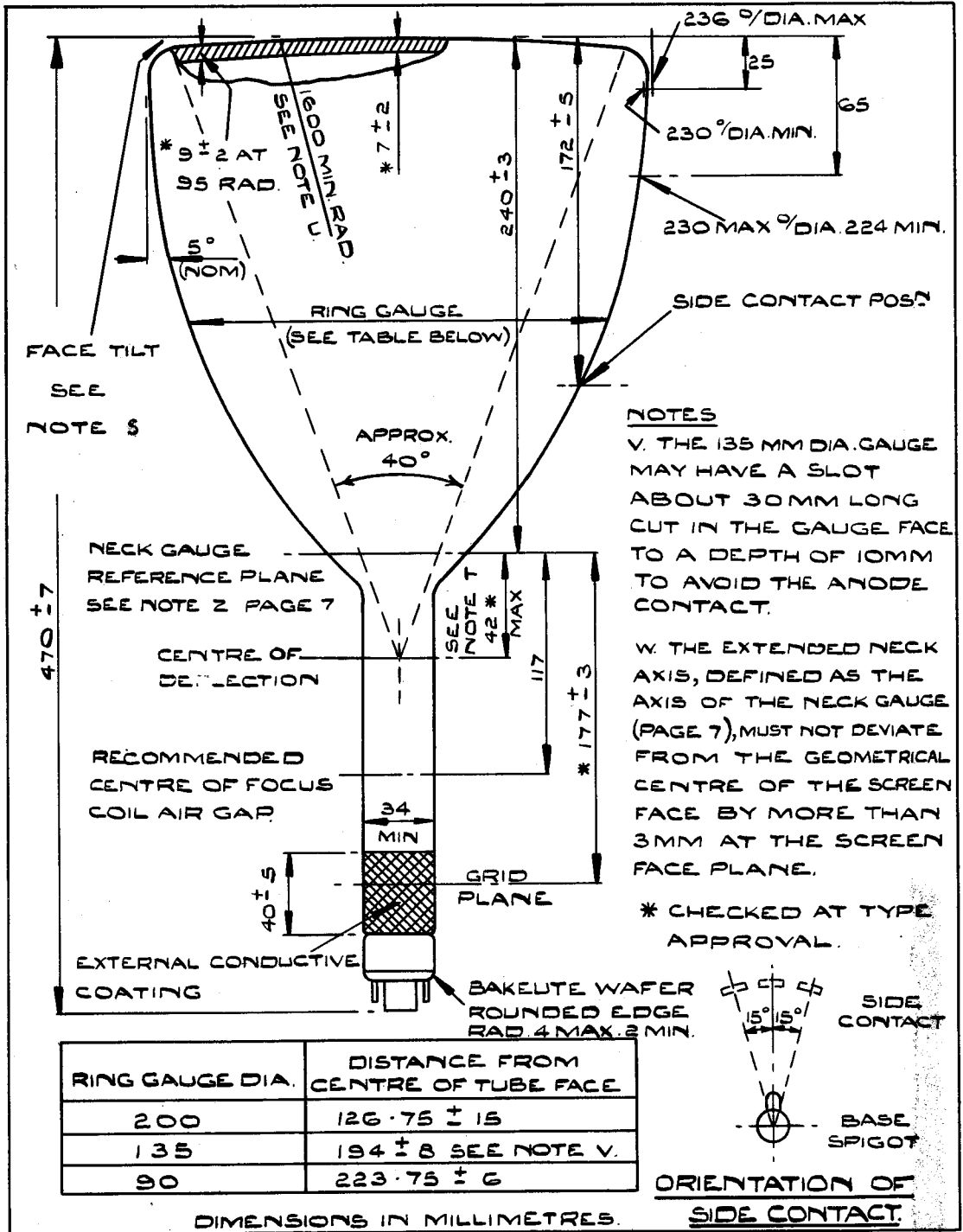
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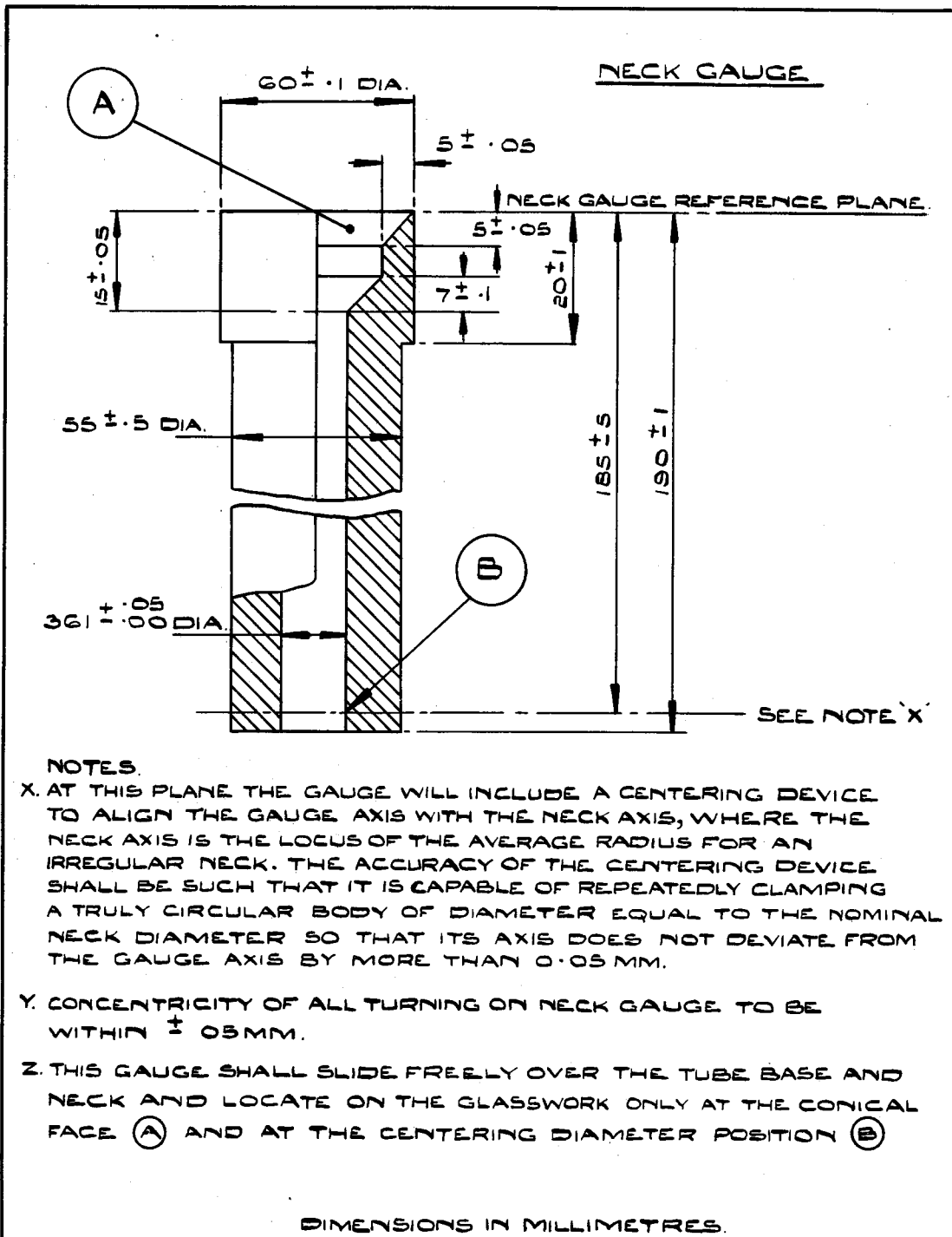
DRAWING NOTES

- S. The face tilt shall be such that when the tube is rotated about the neck axis the variation in the distance from the face plate to a fixed point on a plane perpendicular to the neck axis shall not exceed 1.75 mm, the point being at a radial distance of 100 mm from the axis of rotation.
- T. The centre of deflection is the point on the neck axis where deflection appears to take place for the extreme positions of scan. In general, this is not at the centre of the physical length of the deflection coil.
- U. The radius of screen curvature of 1600 mm minimum shall apply over a diameter of 208 mm centred on the geometrical centre of the screen.

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CV2463/1/8



CV2463/1/9