MINISTRY OF SUPPLY, D.L.R.D./R.A.E.

VALVE ELECTRONIC **CV 2419**

SPECIFICATION M.O.S./CV.2419	SECURITY	
	SPECIFICATION	VALVE
Issue 2 Dated 1.12.58		
To be read in conjunction with K.1001, BS.448 and BS.1409.	Unclassified	Unclassified

→ Indicates a change

TYPE OF VALVE:	Cathode Ray Tube.
TYPE OF DEFLECTION:	Electrostatic.
TYPE OF FOCUS:	Electrostatic.
ENVELOPE:	Glass, internally coated with conductive coating.
SCREEN:	BY8.
PROTOTYPE:	CV 2280.

MARKING

See K.1001/4

BASE

BS.448/B12B.

CONNECTIONS

Pin	Electrode	
1	Cathode	k
2	Grid	g
3	Heater	h
4	Heater	h
5	Anode 2	a2
6	Anode 3 and Int.Coating	a3+m
7	Y2	y2
8	X2	x2
9	Anode 1	a1
10	X1	x1
11	Y1	y1
12	Omitted	NP
Side Contacts	Anode 4	a4
	Anode 5	a5

RATING
(All limiting values are absolute)

			NOTE
Heater Voltage	(V)	4.0	
Heater Current	(A)	1.0	
Max. Fifth Anode Voltage	(kV)	7.0	
~~Max~~. Fourth Anode Voltage	(kV)	~~5~~	B
Max. Third Anode Voltage	(kV)	3.0	

TYPICAL OPERATING CONDITIONS

Fifth Anode Voltage	(kV)	6.5
Fourth Anode Voltage	(kV)	4.0
Third Anode Voltage	(kV)	2.5
Second Anode Voltage	(V)	175
First Anode Voltage	(kV)	2.0
X-Plate Sensitivity	(mm/V)	0.095
Y-Plate Sensitivity	(mm/V)	0.095

SIDE CONTACTS

BS.448/CT7

DIMENSIONS

See Drawing on page 4.

MOUNTING POSITION

Any.

NOTES

A. The tube shall be adequately free from microphony see K.1001/11.5.

B. The voltage applied to a4 must be less than the voltage applied to a5 but a secondary emission effect may be observed if this difference in voltage exceeds 1kV.

To be performed in addition to those applicable in K.1001.

→ Except where otherwise stated, symmetrical deflecting voltages shall be applied to the Y plates and asymmetrical deflecting voltages to the X plates.

	Test Conditions							Test		Limits Min.	Limits Max.	No. Tested
a	See K.1001/AIII							Capacitances (pF) Each X or Y plate to all other electrodes One X plate to one Y plate Grid to all other electrodes		- - -	15 4.0 21	5% (5)
	Vh	Va5 (kV)	Va4 (kV)	Va3 (kV)	Va2 (V)	Va1 (kV)	Vg (V)					
b	4.0	0	0	0	0	0	0	Heater Current	(A)	0.9	1.1	5% (10)
c	4.0	6.5	5.0	2.5	Adjust for optimum focus	2.0	Adjust to cut-off	Negative Vg.	(V)	-	120	100%
d	4.0 Adjust Vg to give a light output of 0.1 candelas through a C2 filter.	6.5	5.0	2.5	As in C	2.0	-	(1) Negative Vg (2) Change in value of Vg from test 'c' (3) Within the range of Vg from cut-off to specified light output, the beam current shall increase continuously	(V) (V)	1.0 - -	- 20 -	100% 100% 100%
e	4.0 DEFLECTION With a 10 kc/s line of length 55mm in the X and Y directions successively, the line width is to be measured at the centre of the trace. GRID The grid shall be pulsed positively from cut-off with amplitude equal to the value obtained in test (d2), the nominal values of pulse duration and recurrence being 100μsec. and 100c/s respectively.	6.5	5.0	2.5	Adjust for optimum focus	2.0	-	(1) Line width (2) Va2	(mm) (V)	- -	1.0 250	100% 5% (10)
f	4.0 Recommended alternative methods:- See K.1001/5A.3.2 Resistor = 5 megohms	6.5	5.0	2.5	Any convenient value	2.0	-120	Grid Insulation (1) Leakage Current (2) Increase in voltmeter reading	(μA)	- -	24 100%	100% 100%
g	4.0 See K.1001/5A.3.3 100V applied between heater and cathode, the former being negative.	0	0	0	0	0	0	Heater-Cathode Insulation Leakage Current	(μA)	-	200	100%
→ h	4.0	6.5	5.0	2.5	Adjust for optimum focus	2.0	Any convenient value	Deflection Sensitivities (1) X-Plate (2) Y-Plate	(mm/V) (mm/V)	187/Va3 200/Va3	238/Va3 250/Va3	5% (10)
→ j	4.0	6.5	5.0	2.5	Adjust for optimum focus	2.0	Any convenient value	Deviation of Spot from Centre of Screen	(mm)	-	5.0	100%

TESTS (Contd.)

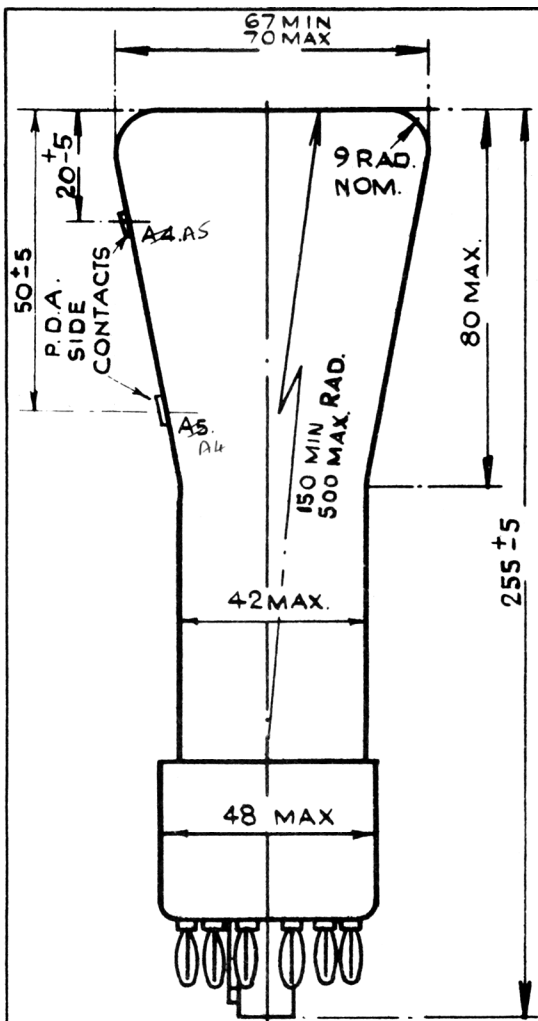
CV2419

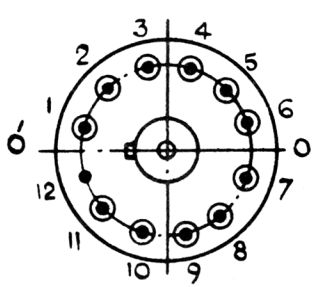
	Test Conditions							Test	Limits		No. Tested
	Vh	Va5 (kV)	Va4 (kV)	Va3 (kV)	Va2 (V)	Va1 (kV)	Vg (V)		Min.	Max.	
k	4.0	6.5	5.0 4.0	2.5	Adjust for optimum focus	2.0	Any convenient value	Useful Screen Area Diameter (mm)	50	-	100%
	Deflection to cover stated circle centred on centre of screen.										
l	4.0	6.5	5.0 4.0	2.5	Adjust for optimum focus	2.0	Any convenient value	Angle between X and Y axis of deflection (Note 2)	89°	91°	100%
m	4.0	6.5	5.0 4.0	2.5	Adjust for optimum focus	2.0	Any convenient value	(1) Orientation of Y axis of deflection relative to OO' on drawing (2) Orientation of diameter line through snap terminals relative to Y axis.	- -	±10° ±10°	100% 100%
n	4.0	6.5	5.0 4.0	2.5	Adjust for optimum focus	2.0	-	Afterglow Time taken for brightness to decay to 0.55% of initial value. secs. (Note 1)	12	-	100%
	Adjust Vg to give a raster brightness of 1.75 foot Lamberts when viewed through a C2 filter.										

NOTES

1. This test may be performed using Test Set Type 331 fitted with an N4 filter. The specified limit applies.

2. To be measured with symmetrical deflection applied to both X and Y plates.





NOTES

1. VIEWING THE SCREEN OF THE TUBE WITH THE KEY OF THE BASE UPPERMOST, A POSITIVE POTENTIAL APPLIED TO PIN X_2 SHALL DEFLECT THE SPOT TO THE RIGHT, AND A POSITIVE POTENTIAL APPLIED TO PIN Y_2 SHALL DEFLECT THE SPOT DOWNWARDS.
2. THE INTERNAL CONDUCTIVE COATINGS SHALL BE OF SUCH DIMENSIONS THAT THEY FUNCTION EFFECTIVELY BUT DO NOT OBSCURE THE USEFUL SCREEN AREA.

ALL DIMENSIONS IN MILLIMETRES.

ELECTRIC VALVE SPECIFICATIONS

SPECIFICATION CV2419 ISSUE 2 DATED 1st DECEMBER 1958

AMENDMENT NO.1

Page 1. Under heading RATING Delete "Max" in "Max. Fourth Anode Voltage"
Delete 4,5kv and substitute "Note B".

At bottom of page, insert NOTE B as follows:-

B. The voltage applied to a4 must be less than the voltage applied to a5 but a secondary emission effect may be observed if this difference in voltage exceeds 1.5kv.

Pages 2 and 3 Under Column headed "Test Conditions"

Amend Va4 voltage in each case to read 5kv.
(this applies to test clauses b,c,d,e,f,h,j,k,l,m and n)

N.16336 /Page 4

Page 4 Outline Drawing near top left hand corner:-

Interchange P.D.A. side contact references to read a5 nearest to screenface and a4 nearest to tube base.

Royal Aircraft Establishment.

February 1960

VAAS
26/4/60

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOS/CV2419
ISSUE 2 DATED 1st DECEMBER, 1958

AMENDMENT NO. 2

Page 2 Clause b Heater Current Test

Amend figure under Va4
from 5kV (as in Amdt. No. 1)
to 0 (as originally)

April, 1960
N.16861

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

Jan 11'60