ADMIRALTY SIGNAL & RADAR ESTABLISHMENT

VALVE ELECTRONIC **CV991**

(Formerly CV191A)

Specification AD/CV991/Issue 3. Dated 20.4.48. To be read in conjunction with K1001, ignoring clauses:- 5.2, 5.3, 5.8.	SECURITY	
	Specn.	Valve
	Restricted	Unclassified

→ Indicates a change.

TYPE OF VALVE:- Magnetron with pre-plumbed waveguide output.

CATHODE:- Indirectly heated, oxide coated.

ENVELOPE:- Copper and Glass.

PROTOTYPE:- First E1494, then E1542.

MARKING

See K1001/4.
Additional Marking:-
Serial No. .....
See also Note C.

RATING			Note
Heater Voltage (AC or DC)	(V)	3.0	E
Heater Current	(A)	2.5	
Approx. Nominal Wavelength	(cm)	3.14	C
Max. Frequency Pulling	(Mc/s)	15	H
Max. Anode Dissipation	(W)	150	B
Typical Operating Conditions			
Peak Anode Voltage	(kV)	15.5	A
Peak Anode Current	(A)	10	A
Output Peak Power	(kW)	27	A

DIMENSIONS AND CONNECTIONS

See Pages 3 and 4.

PACKAGING

See K1005.

NOTES

A. These figures are for pulse operation with:-

(i)	Recurrence frequency	:	1500 pps.
(ii)	Pulse length	:	½ μSec.
(iii)	Pulse shape	:	Sensibly square.
(iv)	Field strength	:	3250 oersteds. (See Note D).

B. During operation and testing, air must be blown through a suitable fitting enclosing the cooling fins of the anode so that the block temperature does not rise above 140°C.

C. No technical information shall appear on the valve or packing.

D. The valve is expected to operate with any field in the range 3250 ± 150 oersteds. This point will be checked at Type Approval.

E. If the input power is sufficiently high, Vh = 3.0 V. may be required for starting only, and during operation may be reduced or switched off. Vh must be applied for at least 1.5 mins. before Va is applied.

→ **F.** The magnetron shall be processed so as to ensure, as far as possible, that only brief ageing (of the order of 5 mins. or less) is necessary when maximum Va is instantaneously applied, as in service.

G. In use, the cathode lead side of the valve shall be adjacent to the north pole of the magnet.

H. See test 'c' (ii).

TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions		Test	Limits		No. Tested	Notes
	Vh (V)	Ia (A) (peak)		Min.	Max.		
a	3.0 (AC or DC)		Ih (A)	2.0	3.0	100%	
b	3.0	10.0	Va peak (kV)	12.5	17.5	100%	1,2
c	3.0	10.0	(i) Frequency (Mc/s)	9820	9900	100%	1,2, C.
	A sliding slug, which in any position in the waveguide introduces a voltage S.W.R. of 1.5:1, followed by a matched termination, shall be used; it shall be used in the output waveguide near the magnetron. The frequency change which occurs as the slug is moved, so as to move the S.W. pattern through at least $\lambda g/2$ at the magnetron, shall be noted.		(ii) Frequency pulling (Mc/s)	-	15		
d	3.0	10.0	Efficiency (Power out/ Power in).	15%	-	100%	1,2, 3.
	Efficiency is to be measured by an approved method.						
e	3.0	Ia peak to be varied from 5 to 12 A. The change of frequency is to be observed.	Frequency Continuity	The frequency shall vary smoothly and without discontinuity.		A small %	1,2

NOTES

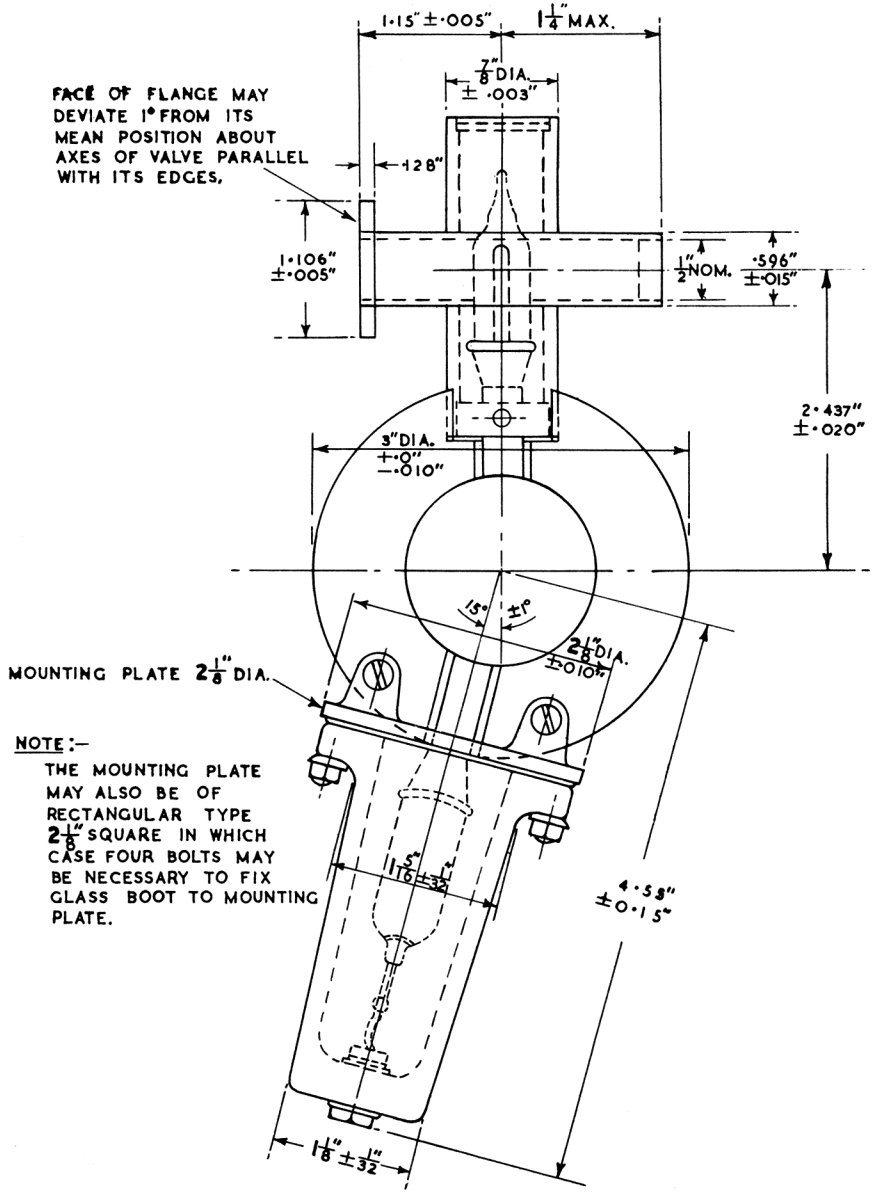
1. The valve is to be pulse tested, according to the above table (tests 'b' to 'e'), in an approved circuit, and with the following test conditions :-

1.1.	Recurrence frequency	:	1500 pps. } or other
1.2.	Min. Pulse length	:	0.5 µSec. } approved figures.
1.3.	Min. mark/space ratio	:	1/1300.
1.4.	Pulse shape	:	Sensibly square.
1.5.	Field strength	:	3250 ± 30 oersteds.

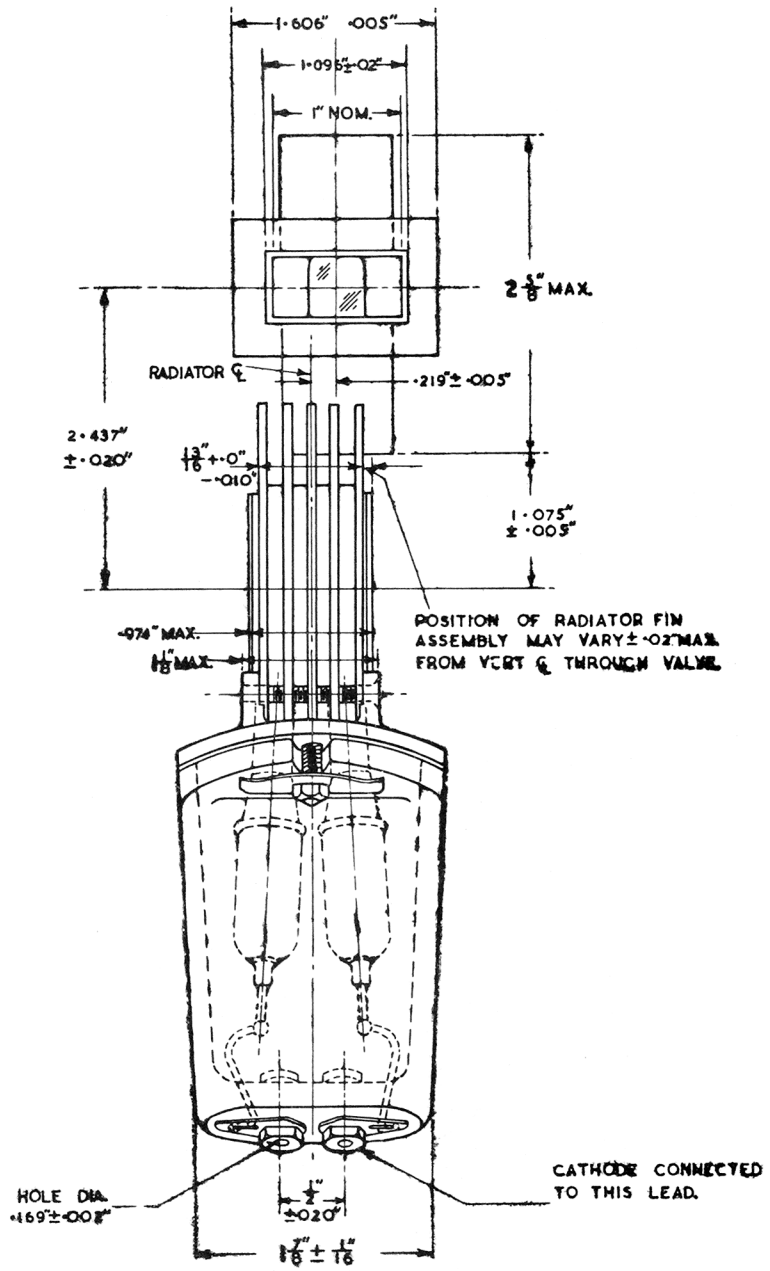
2. No serious or continued flashing (internal or external) must occur during the tests.

3. The apparatus used for the measurement of output power is to be checked after every 500 valves tested, or once a month (whichever is the shorter period) against the calorimetric method of measurement.

FIG. 1



MIN. WIDTH OF RADIATOR HOUSING 13/16" +·010"
NORMAL MAGNET AIR GAP = ·984" MIN.


1·606" ·005"
1·095"±·02"
1" NOM.
2 1/8" MAX.
RADIATOR ℄
·219"± ·005"
2·437" ± ·020"
13/16" +·0" −·010"
1·075" ± ·005"
POSITION OF RADIATOR FIN ASSEMBLY MAY VARY ± ·02" MAX. FROM VERT ℄ THROUGH VALVE
·974" MAX.
1 1/8" MAX.
HOLE DIA. ·169"±·008"
1/2" ±·020"
CATHODE CONNECTED TO THIS LEAD.
1 7/8" ± 1/16"