ADMIRALTY SIGNAL ESTABLISHMENT

VALVE ELECTRONIC **CV1490**

(Formerly CV56D)

Specification AD/CV1490/Issue 5. Dated 13.4.46. To be read in conjunction with K1001, ignoring clauses :- 5.2, 5.3, 5.8.	SECURITY Specification: Confidential Valve: Unclassified

TYPE OF VALVE:- Magnetron. CATHODE:- Indirectly Heated, Oxide Coated. ENVELOPE:- Copper and Glass. PROTOTYPE:- E1325.	MARKING See K1001/4. Additional Marking :- Serial No. ..... See Also Note C.

RATING			Note
Heater Voltage (AC or DC)	(V)	6.0	E
Heater Current	(A)	1.25	
Approx. Nominal Wavelength	(cms)	10.15	
Max. Anode Dissipation	(W)	250	B
Typical Operating Conditions			
Peak Anode Voltage	(kV)	15	A
Peak Anode Current	(A)	15	A
Output Peak Power	(kW)	100	A

DIMENSIONS AND CONNECTIONS

See Page 4.

PACKING

See K1001/7.3.

NOTES

A. These figures are for pulse operation with :-

(i)	Recurrence frequency	:	500 pps.
(ii)	Pulse length	:	2 or 0.7 μSec.
(iii)	Pulse shape	:	Sensibly square.
(iv)	Field strength	:	1550 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 1550 ± 100 oersteds. This point will be checked at Type Approval.

E. Vh = 6.0 is running volts. At switching on, 4.5 V. is applied for the first 30 secs.

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 it is put into service.

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

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	6.0 AC or DC	-	Ih (A)	1.0	1.5	100%	E
b	6.0	15	Va peak (kV)	13.5	16.5	100%	1
c	6.0	15	Frequency (Mc/s)	2980	2940	100%	1,2
d	6.0	15	Peak Output Power (kW)	75	-	100%	1,3
	Output power is to be measured by an approved method.						
e	6.0	Ia peak to be varied from 10A. to 16 A. The change of frequency is to be observed.	Frequency Continuity	The frequency shall vary smoothly and without discontinuity and by not more than 5 Mc/s.		100%	1
f	Waveguide plunger adjusted to produce the maximum possible frequency change.		Frequency change with plunger movement (Mc/s)	-	35	5%	1

NOTES

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

Recurrence frequency	:	500 pps.
Min.pulse length	:	2 μSec.
Min.mark/space ratio	:	1/1000
Pulse shape	:	Sensibly square.
Field strength	:	1550 ± 15 oersteds.

No serious or continued flashing (internal or external) must occur during the tests. An approved method of test is described in the Appendix to this specification.

2. Grouping and Remeasurement. If, on a single remeasurement a valve falls within an adjacent group, action shall be taken according to the extent of the discrepancy :-

   (a) By not more than 6 Mc/s. The grouping remains unchanged.
   (b) By more than 20 Mc/s. Regroup accordingly.
   (c) By an amount between 6 and 20 Mc/s. Make threemore remeasurements. If the average of the four measurements shews a discrepancy of less than 6 Mc/s, the grouping remains unchanged; if more than 6 Mc/s, regroup accordingly.

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.

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APPENDIX

APPROVED METHOD OF TESTING

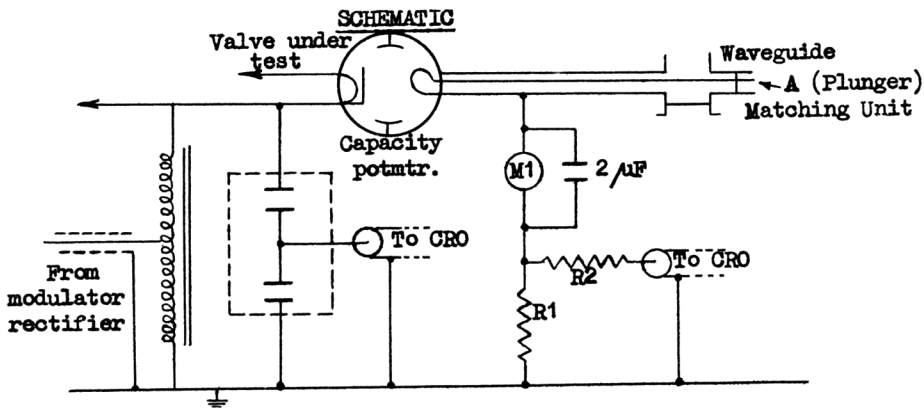
An approved method of testing CV1490 is described :-

1. THE TEST CIRCUIT. The circuit to be used is a Type 271 Mk.IV Transmitter and Modulator, modified to include the following additional components (see Schematic):-

1.1. A DC milliammeter M1 fitted between the output circuit and earth, for the measurement of mean Ia.

1.2. A resistance R1 or current transformer calibrated by A.S.E. fitted between the output circuit and earth for the measurement of peak Ia.

1.3. A resistance R2 whose value is within ± 20% of the surge impedance of the concentric cable.



NOTE:- A.S.E. will calibrate if necessary the capacity potentiometer.

2. OTHER TEST GEAR.

2.1. An A.S.E. water-load, modified by placing an ammeter of suitable range in series with the 500 cycle 0-50 A. ammeter.

2.2. Wavemeter G93 will be provided and calibrated by A.S.E.

3. TEST PROCEDURE.

3.1. Fit the valve in the transmitter and set the plunger "A" at 2.1.

3.2. Adjust Va to give peak Ia = 15 A.

3.3. Adjust plunger to give maximum power output.

3.4. Move plunger 1 cm. towards valve.

3.5. Re-adjust Va to restore Ia = 15 A., and without further adjustments, observe :-

(i) Va peak for test 'b'.

(ii) Peak Power = $\left(\frac{\text{Mean power x Peak Ia}}{\text{Mean Ia}}\right)$ for test 'd'.

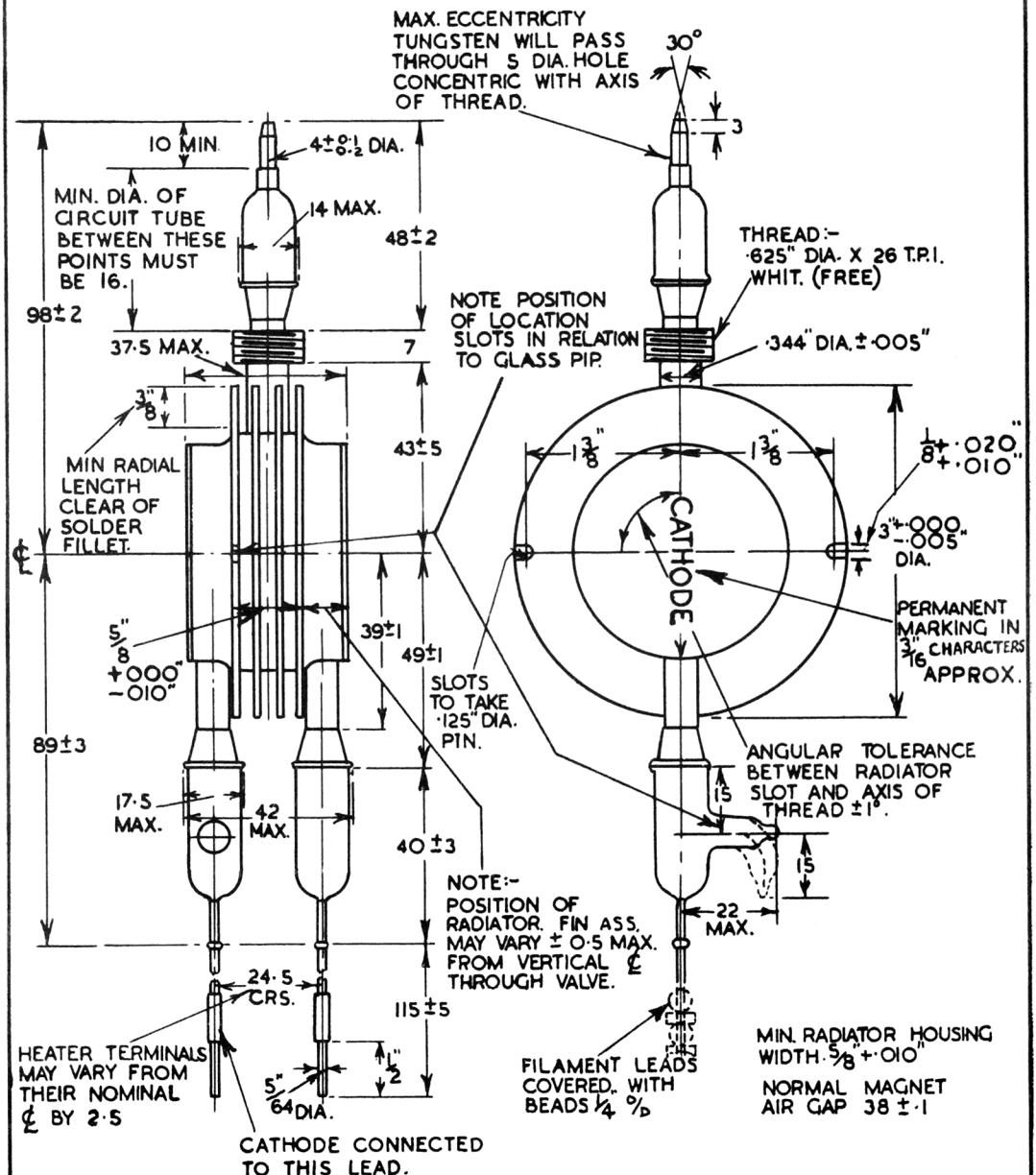
(iii) Measure frequency for test 'c'.

(iv) Perform test 'e'.

NOTE:- If test 'd' is not passed, the valve may be retested with the plunger set for maximum power output, but with other conditions unaltered.

(v) Perform test 'f' when necessary.

4. CHECK TEST. The current pulse length (Tp) and repetition frequency (PRF) shall be observed. If the duty cycle given by Tp x PRF does not agree with that given by $\frac{\text{Ia mean}}{\text{Ia peak}}$ to within 10%, the measuring apparatus concerned shall be checked.



ALL DIMENSIONS IN MILLIMETRES EXCEPT WHERE OTHERWISE STATED.

GAUGES:-
ALL VALVES ARE TO BE CHECKED IN A·S·E· GAUGE Nº 481.