MINISTRY OF AVIATION - RRE

VALVE ELECTRONIC **CV6108**

Specification MOA/CV6108 Issue 1 dated 5th July, 1962. To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

TYPE OF VALVE - Package magnetron with flying leads, fixed frequency

CATHODE - Indirectly heated

PROTOTYPE - CV2281, M537A

Superseded by Issue 1A

RATING

Non simultaneous
All limiting values are absolute
(Not for inspection purposes)

			Note
Initial heater voltage,	Volts r.m.s.	6.3 ± 10%	A
Heater current at Vh = 6.3,	Amps r.m.s.	0.5	
Max. heater surge current,	Amps r.m.s.	3.0	
Max. mean input power	Watts	82.5	
Max. peak input power	kW	33	
Max. duty cycle	ratio	0.0025	C
Max. pulse length,	µsec.	2.5	C
Max. rate of rise of voltage pulse	kV/µsec.	75	D
Max. anode temperature	°C	140	B
Max. VSWR	ratio	1.5/1	
Max. altitude	ft.	10,000	
Max. Waveguide pressure	psi A	45	

DATA - 1

Frequency limits	kmc/s	8.77-8.85	
Peak pulse anode voltage	kV	5 - 6	
Tube heating time	secs.	120	A

DATA - 2, "Burst Operation"

Note E

Burst duration,	milliseconds	40
Burst frequency	c/s	2
PRF during burst	kc/s	50
Pulse length	µsec.	0.45
Peak anode current	Amps	4 - 5.5
Max. rate of rise of voltage pulse	kv/µs	80

MARKING

K1001/4 with serial number

DIMENSIONS

See page 8
See also gauge on page 10

CONNECTIONS

see below

Cathode - Yellow lead
Heater - Green lead
Alternative Code
Cathode - lead + black sleeve
Heater - lead without sleeve

And 5 1

MOUNTING POSITION

Any

SUPPORT

Face plate

WEIGHT

3lbs. approximately

JOINT SERVICE CATALOGUE NO.

5960-99-037-2968

COUPLING FLANGE

Z 830051, WG.16

CONNECTIONS
Cathode - Green lead or neutral coloured lead with green sleeve
Heater - Yellow lead or neutral coloured lead with yellow sleeve

RATING AND DATA NOTES

A. HT should not be applied until 120 seconds after application of heater voltage for ambient temperatures above 0°C, and not until 180 seconds for ambient temperatures between 0°C and -55°C.

The heater voltage should be reduced within three seconds of applying the HT for mean power inputs greater than 25 watts, according to the formula:-

$$Vh = 6.3 \left(1 - \frac{\text{mean power input}}{180}\right) \pm 0.6 \text{ Volts r.m.s.}$$

The heater current surge should never exceed 3.0 Amps r.m.s.

B. The anode may be cooled as necessary by a flow of air over the anode body and guide attachment brackets which serve as cooling fins. The preferred direction of the air blast, and the point at which the anode temperature should be measured are shown on page 8.

C. These ratings apply for equally spaced pulses.

D. The rate of rise of voltage is, for rating purposes only, $\frac{dv}{dt}$ MAX measured above the 80% level of the magnetron peak pulse anode voltage.

E. This is a set of simultaneous operating conditions.

F. The CV6108 replaces the CV2281 and is used in ARI 5851 and ARI 5885. The relative positions of the magnetron and the aperture for the cathode support in the bulkhead screens is shown on page 9.

Superseded by Issue 1A

TESTS

To be carried out in addition to those applicable in K1001

TEST CONDITIONS: unless otherwise specified, notes 1, 10

Parameter	Units	Osc. 1		Osc. 2		Osc. 3 BURST		Note
		Min.	Max.	Min.	Max.	Min.	Max.	
Initial heater voltage	Volts RMS	6.3		6.3		6.3		3
Tube heating time	secs	-	120	-	120	-	-	
Run heater voltage	Volts r.m.s.	4.5		6.3		4.5		3
Pulse length	μsecs	0.9	1.1	1.8	2.2	0.4	-	
Duty cycle	ratio	0.002		0.001		0.0016	-	
Pulse repetition rate	kc/s	-	-	-	-	47.5	52.5	
Duration of BURST	milliseconds	-	-	-	-	38	42	
Rate of rise	kv/μs	75	-	75	-	80	-	2
Mean anode current	mA	9	-	4.5	-	-	-	
Peak anode current	A	-	-	-	-	4.75	5.5	
VSWR at output flange	ratio	-	1.05	-	1.05	-	1.05	

Superseded by Issue 1A

This page was blank

TESTS (Contd.)

CV6108

Test	Test Conditions	Limits		Units
		Min.	Max.	
GROUPS B, C, D	No tests			
GROUP E	Mechanical and environmental tests at the inspection levels indicated			
Vibration	No voltages. AQL = 6.5% Inspection level I. Note 15			
GROUP F	Life and survival tests at the inspection level indicated			
Life	Oscillation 2. Note 8	250		hrs.
Life test end points	Tests:-			
	(b) Stability (1)		0.5	%
	(c) Stability (2)		0.5	%
	(e) Spectrum (1)		3/tp	Mc/s
	(f) Side lobes (1)	6		db
	(g) Mean power	12.5		Watts
	(h) Frequency	8770	8830	Mc/s
Life, burst condition	Oscillation 3, Note 9	12		hrs.
Life, burst condition test end point	Tests (b) - (j) inclusive same limits			
Shelf life in pack.	No voltages, Note 12	To be agreed		
GROUP G	No tests in this group			
GROUP H	Qualification Approval tests			
Life	Oscillation 2.	1000		hrs.
Life test end points	Tests:-			
	(b) Stability (1)		1.0	%
	(c) Stability (2)		1.0	%
	(e) Spectrum (1)	6	3/tp	Mc/s
	(f) Side lobes (1)	6		db
	(g) Mean power	12.5		Watts
	(h) Frequency (1)	8770	8830	Mc/s
Low temperature operation	Anode temperature -55°C initially, Osc 1, Note 13			
Low pressure operation	Osc. 1, Ambient pressure = 500 m.m. hg. Note 16			

Superseded by Issue 1A

NOTES

1. The test conditions are at the discretion of the manufacturer providing that the limits, which are in absolute units, are complied with.

2. This is $\frac{dv}{dt}$ measured at the onset of RF oscillations.

3. Measured with meters calibrated to B.S.I. grade 1 industrial standards.

4. This shall be the first test after the holding period. EHT to be applied 120 seconds maximum after switch on of heater. The phase of the VSWR shall be adjusted to obtain maximum current. This test shall terminate eight minutes after switching on the heater.

5. This shall follow stability 1 test and shall terminate seventeen minutes after switching on the heater. The phase of the VSWR shall be adjusted for minimum current for this test.

6. Pulses are defined as missing if their energy is less than 70% of the normal level in the frequency range 8770 - 8830 mc/s. The number of missing pulses shall not exceed the number specified, expressed as a percentage during any consecutive five minute period within the duration of the test.

7. Measured at point specified on outline drawing.

8. The number of tubes to be life tested shall not be less than one per month. At the option and at the expense of the manufacturer, additional tubes may be life tested to the same conditions, and the failure data shall be based on the total for test.

   In calculating the average life of a life test group of tubes, the life of each tube shall be determined by adding to the hours at the last life test end point passing test, either 10% of the hours specified as the minimum life, or one half of the hours between the last life test end point passing test and the life test end point failure test whichever value is smaller. At the conclusion of the time specified for life test, the average life of the life test group of tubes placed on test shall be not less than 80% of the number of hours specified.

9. 25% of the tubes shall be tested. If no failures the remainder shall be run for one hour. If any failures all valves must be run for twelve hours.

10. The oscillation 3 conditions may be obtained by using one of the modulators as in ARI 5851 and ARI 5885. Adjust mains input to 115 volts, and then, provided that the pulse voltage is within the specified limits, and the valve is not moding, the peak current should be set within the limits by altering the input voltage for the EHT supply to the modulator valve.

11. Two alternative methods of test are acceptable.

    (a) There shall be no double current or pulse voltage traces as seen on an oscilloscope.

    (b) The number of missing pulses, as defined in note 6 shall not exceed 1%, ignoring the first 10% of the burst.

12. 5% of the production shall be set aside for shelf life tests. The target is one year initially, leading to three years.

CV6108

NOTES (Contd.)

13. The anode shall be at -55°C. EHT shall be applied three minutes max. after the heater, and the valve shall then operate satisfactorily.

14. Measure distance between first standing wave minimum and reference plane Subtract this from $\lambda g/2$.

15. Vibration at right angles to the cathode support, 25 ± 2 c/s with amplitude ± 0.040" min. for 60 seconds. Tube must repass all tests (b) - (j) inclusive.

A lot shall consist of 111 valves or one month's production whichever is greater. A valve having one or more defects shall count as one defective. Reduced inspection may be allowed after five 'successive' lots have been accepted Normal inspection shall be used and continued until reduced or tightened inspection is required.

16. The pressure in the waveguide is at the discretion of the manufacturer. There shall be no signs of voltage breakdown.

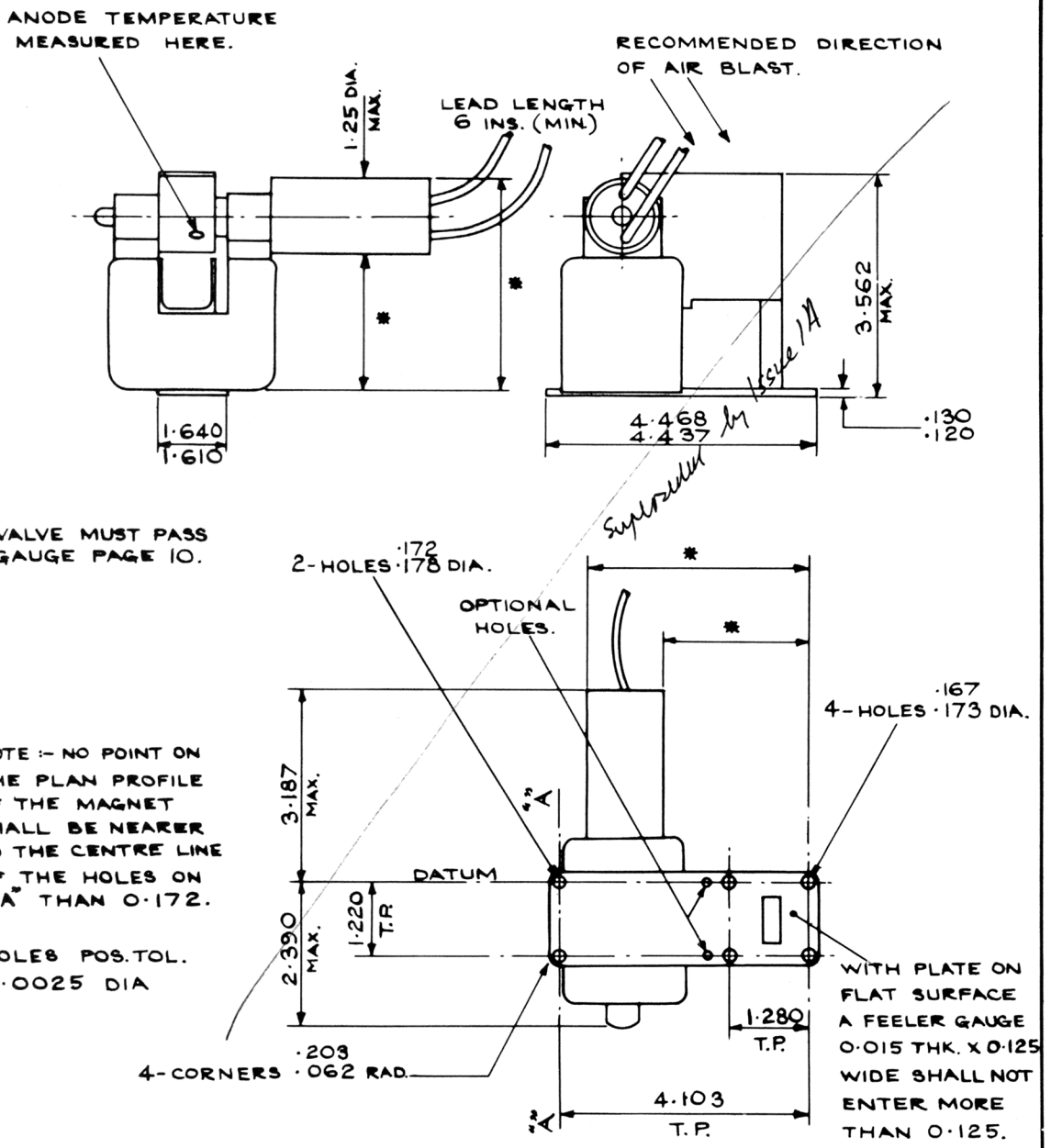
17. Tests (b) Stability (1),
(c) Stability (2),
(g) Mean Power,
(j) Pulse Voltage)
may be carried out before and shall be carried out at the conclusion of the holding period. All other tests may be carried out either prior to or after the holding period.

Amdt 2

Superseded by Issue 1A

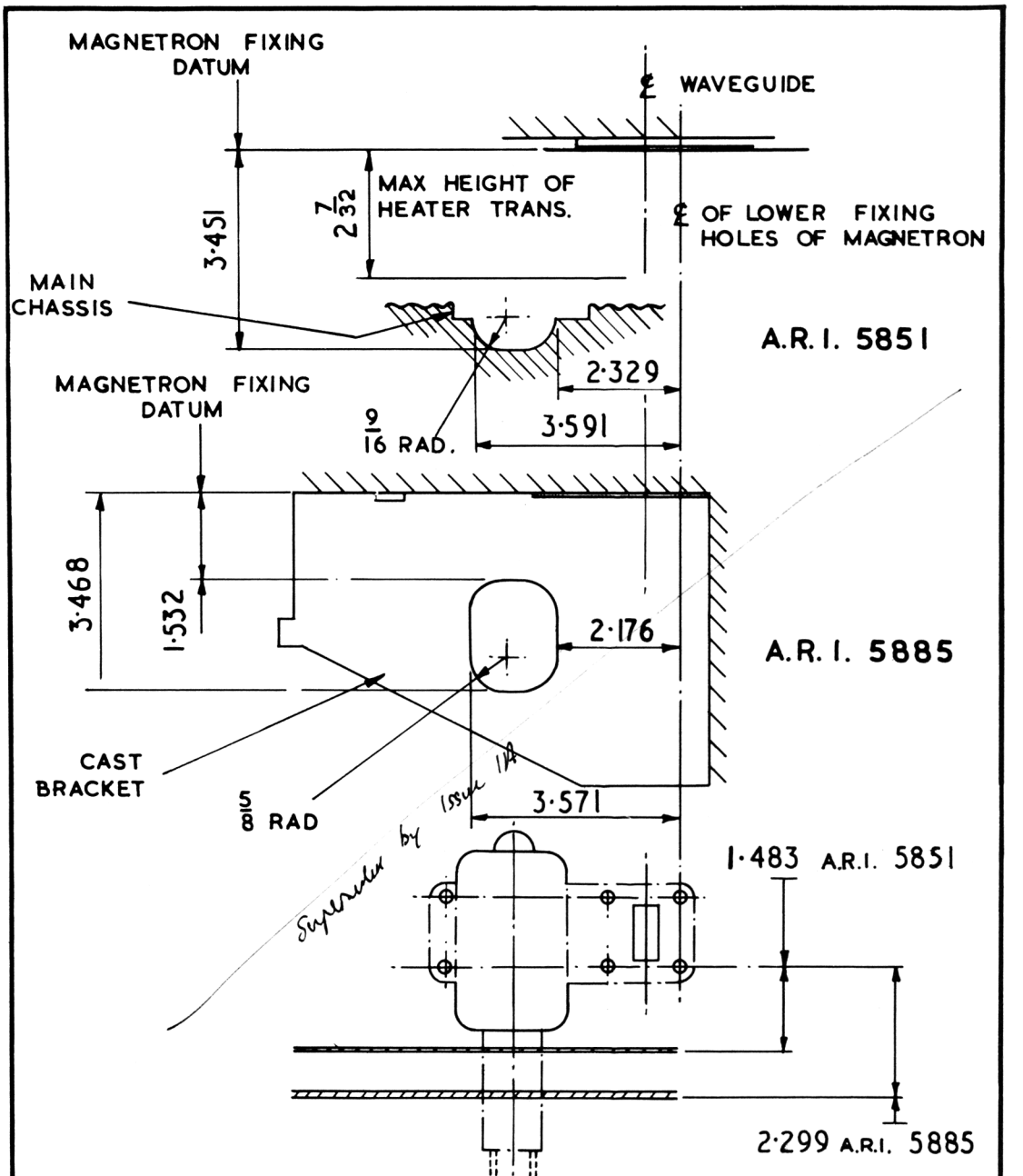
OUTLINE.

THIRD ANGLE PROJECTION.



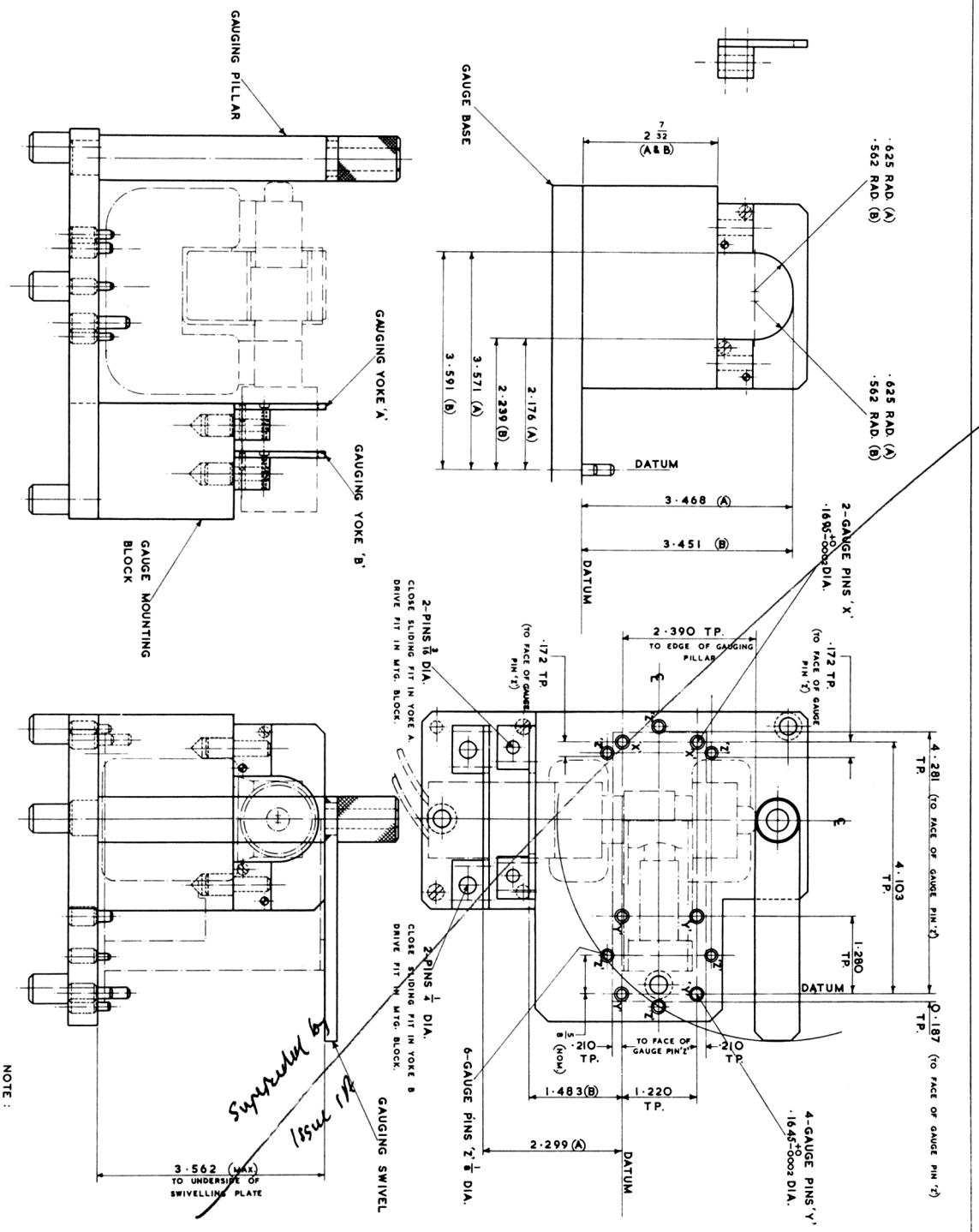
THIS DRAWING TO BE READ IN CONJUNCTION WITH GAUGE PAGE 10.

DIMENSIONS IN INCHES.



MAGNETRON MOUNTING POSITION LIMITING CONDITIONS.

DIMENSIONS IN INCHES.



ALL DIMENSIONS IN INCHES

NOTE :
ALL GAUGE PINS POS. TOL. ·0005 DIA.