VALVE ELECTRONIC

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

CV2261

Specification AD/CV2261. Issue No. 5 dated 24.10.58. To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

← Indicates a change

TYPE OF VALVE: Magnetron, X-Band, packaged, pulsed, tunable. **CATHODE:** Indirectly heated; oxide-coated. **ENVELOPE:** Metal-glass. **PROTOTYPE:** VX4129	**MARKING** See K1001/4 Additional marking: Serial No. ..... See also Note 'E'

RATINGS		Note
Heater Voltage (V)	5.5	A
Heater Current (A)	1.37	
Nominal Frequency Range (Mc/s)	9050 to 9600	
Max. Mean Input Power (W)	150	B
Max. Frequency Pulling Figure (Mc/s)	15	C
TYPICAL OPERATING CONDITIONS		D
Peak Anode Voltage (kV)	14	
Peak Anode Current (A)	14	
Peak Output Power (kW)	60	

DIMENSIONS AND CONNECTIONS

See drawing on pages 4 & 5 ←

NOTES

A. The heater supply should be switched on for at least 3 minutes before H.T. is applied. Full heater power is required for starting only; during oscillation heater voltage should be reduced to $V_h = 5.5 (1-0.007 P_m)$ where P_m is mean input power in Watts.

B. When operating, the magnetron must be air-cooled so that the temperature of the block surface does not exceed 140°C.

C. See test (e).

D. These operating conditions apply for a pulse duration of 0.1 μS and a pulse repetition rate of 3000 pps. The rate of rise of the voltage pulse must not exceed 140 kV/μsec. (Measured as described in the Appendix, Page 3). ←

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

TESTS

To be performed in addition to those applicable in K1001, and after a holding period of at least 28 days. ←

	Test Conditions		Test	Limits		No. Tested	Note
	Vh (V)	Mean Ia (mA)		Min.	Max.		
a	5.5	-	Ih (A)	1.25	1.50	100%	
b	See Note 1	4	Lowest Operating Frequency. (Mc/s)	9050	9065	100%	2,3. ←
			Highest Operating Frequency (Mc/s)	9600	-	100%	
	Tests (c), (d), (e) and (f) shall be carried out at each of the following nominal frequencies:- 9050 Mc/s, 9190 Mc/s, 9320 Mc/s, 9460 Mc/s and 9600 Mc/s.						
c	See Note 1	4	Peak Va (kV)	11	15.5	100%	2,3. ←
d	See Note 1	4	Mean Power Output (W)	15 9	-	100%	2,3,6. ←
e	See Note 1	4	Frequency Pulling (Mc/s)	-	15	100%	2,4. ←
f	See Note 1	4	Moding (%)	-	1.0	100%	2,4,5. ←
g	See Note 1	4	Life at 9320 Mc/s (Hrs.)	500	-	1 in 30	2,3,7. ←

Amdt 3

NOTES

1. The valve shall be run for a period of not more than 3 mins. with Vh = 5.5 volts. At the end of that time the H.T. voltage shall be switched on and the heater voltage simultaneously reduced to the value specified in Note A. ← This heater voltage shall apply to all the tests except test (a).

2. The magnetron shall be tested in equipment which has been approved by the specifying authority. ← The pulse characteristics being:-

   tp = 0.1 /us. P.R.F. = 3000 pps.
   r.r.v. = 140kV//usec (min.). Measured as described in the Appendix - page 3.

3. The waveguide system shall be terminated in a resistive load giving a V.S.W.R. not greater than 1.1:1. ←

4. A mismatch producing a V.S.W.R. of 1.5 shall be moved through a distance of half a guide-wavelength. Continuous observation of the frequency spectra shall be made during this operation. ← Valves showing spectra with side lobes of power greater than 1/10 of that of the central lobe shall be rejected.

5. If the moding figures obtained at the five specified frequencies are all in excess of 0.75%, further moding figures shall be determined at four intermediate frequencies. The apparatus used to measure the moding is to ← be checked for accuracy before each valve is measured. Details of an arrangement for measuring the moding may be obtained from the Specifying Authority.

6. The apparatus used for power measurement shall be checked after every 100 ← valves tested, or once per month (whichever the shorter period) against a calorimetric method of measurement.

7. The life of a valve shall be considered to be terminated if its performance falls outside the limits of any one of the tests b-f. ← If the valve selected for life test passes the test, the lot shall be accepted. However, if this valve fails to pass the test, another valve from the same lot shall be life tested. If this second valve passes the test the lot shall be accepted; but if this valve also fails to pass the test, the lot shall be rejected. A rejected lot may be re-submitted for acceptance following a joint investigation by the contractor and the government authority concerned.

APPENDIX

MEASUREMENT OF RATE OF RISE OF VOLTAGE PULSE APPLIED TO CATHODE OF CV2261 MAGNETRONS

1. **Test Equipment to be Used**

   (i) An oil filled differentiator, drawings of which can be obtained from the specifying authority.

   (ii) A coaxial cable link between the output terminal of the differentiator and the input terminals of an oscilloscope. The cable shall not be greater than two feet in length, and must be impedance matched to the differentiator resistor. The connections between the input terminals of the C.R.O. and the Y plates should be direct, without other termination. Connection direct from the differentiator to the Y plates of the cathode ray tube of the C.R.O. is preferable.

   (iii) A connector between the magnetron cathode and the top cap of the differentiator shall not be greater than 18" in length.

   (iv) The total capacitance across the 68 ohm resistor in the differentiator when the test circuit connections are made, shall not exceed 75/u/u Fds. (i.e. Stray capacitance, the capacitance of the cable link to the C.R.O., and that presented at the input terminals of the C.R.O. itself).

2. **Procedure to be Adopted for Calibration of the Test Equipment**

   (i) The sensitivity of the C.R.O. deflection system to be accurately determined.

   (ii) Upon application of the voltage pulse (the rate of rise of which is to be measured) to the magnetron and differentiator, the amplitude of the pulse displayed on the C.R.O. is measured and converted to a voltage (V).

   The other characteristics of the voltage pulse must be as specified (See test C, page 2).

   (iii) Using $\frac{V \cdot 10^{-3}}{CR}$, the rate of rise of the pulse is then determined in kV/μsec. where:

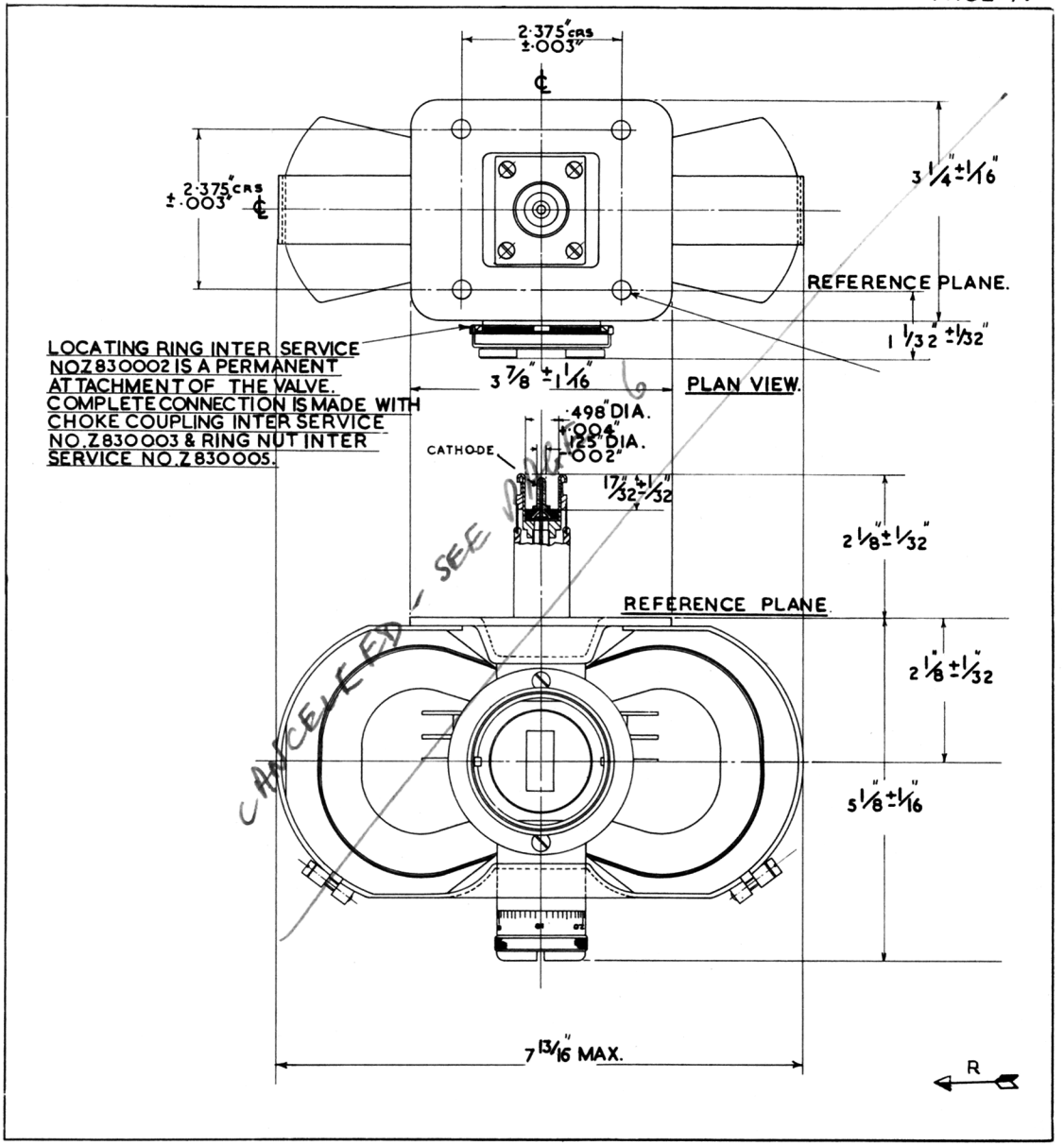
   C is the capacitance (in μFds) of the oil dielectric capacitor in the differentiator, known to within ± 2% accuracy.

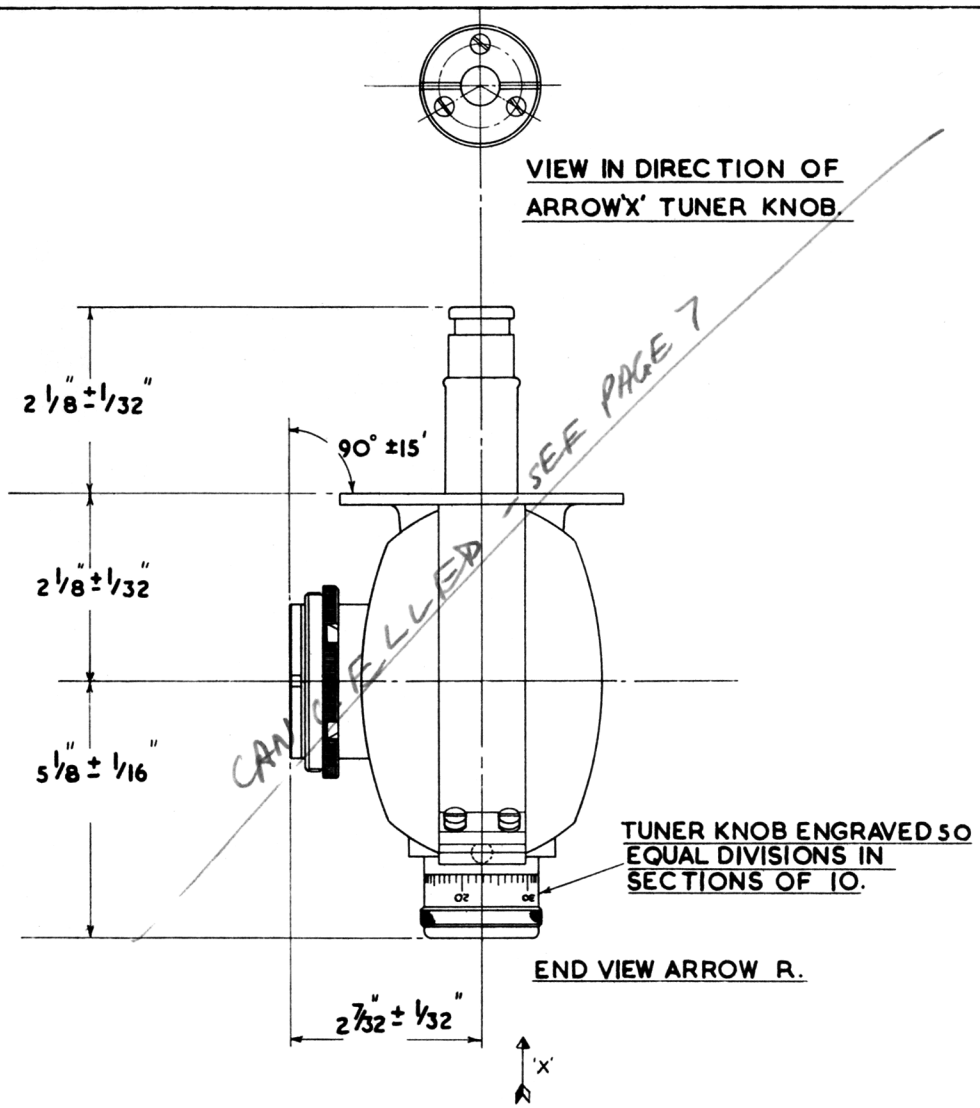
   R is the resistance (in ohms) of the differentiator resistor known to within ± 1% accuracy.

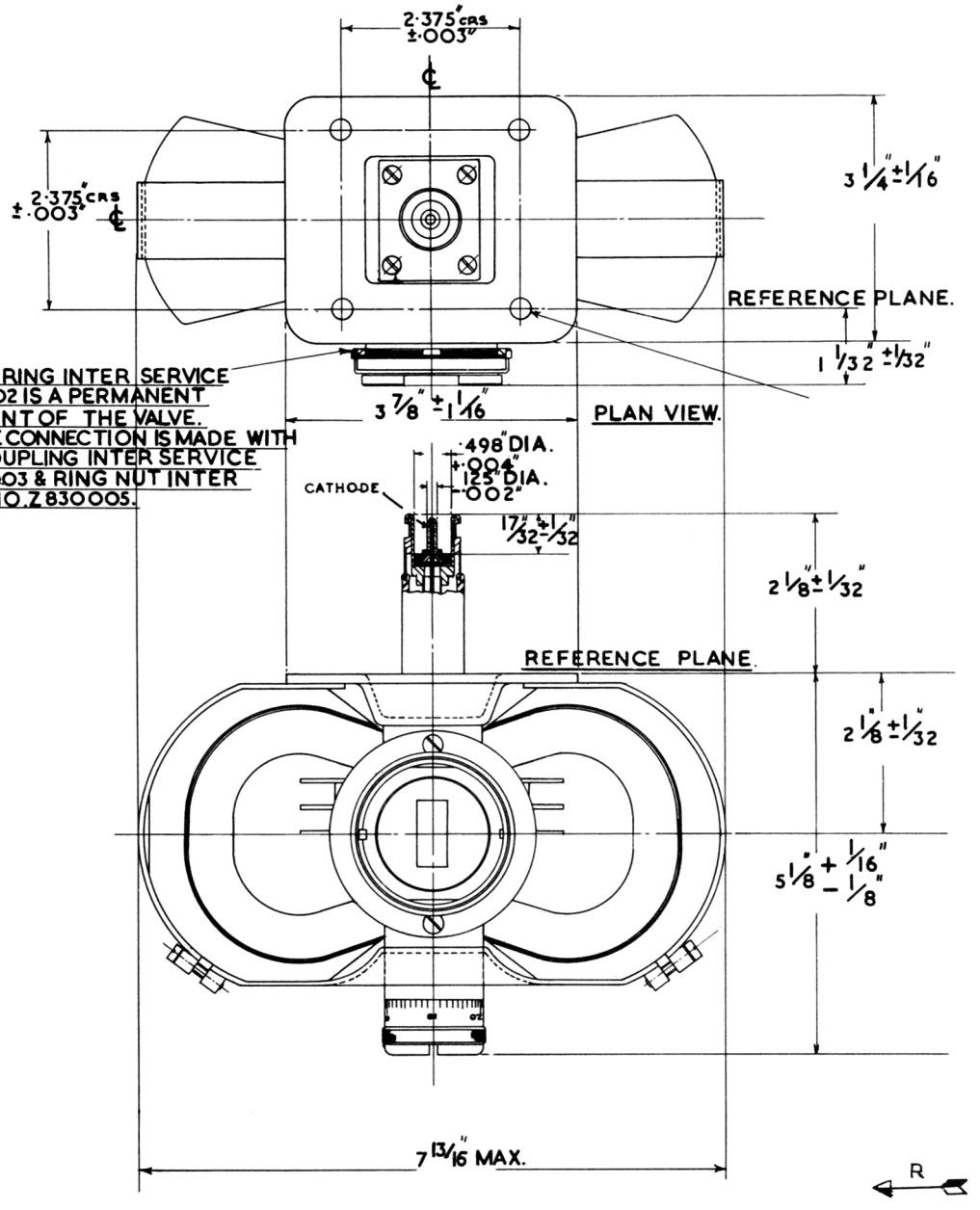
3. **Frequency of Measurement of r.r.v.**

   (i) At monthly intervals.

   (ii) Any change to the modulator or r.r.v. test equipment shall be followed by recalibration (if necessary) and measurement of r.r.v. The measurement to be repeated at monthly intervals thereafter.


2·375" CRS ±·003"
℄
2·375" CRS ±·003"
℄
3 1/4" ±1/16"
REFERENCE PLANE.
1 1/32" ±1/32"
LOCATING RING INTER SERVICE NO. Z830002 IS A PERMANENT ATTACHMENT OF THE VALVE. COMPLETE CONNECTION IS MADE WITH CHOKE COUPLING INTER SERVICE NO. Z830003 & RING NUT INTER SERVICE NO. Z830005.
3 7/8" ±1 1/16"
PLAN VIEW.
·498" DIA. +·004" ·125" DIA. -·002"
CATHODE
17/32" ±1/32"
2 1/8" ±1/32"
REFERENCE PLANE.
2 1/8" ±1/32"
5 1/8" ±1/16"
7 13/16" MAX.
R
CANCELLED - SEE


VIEW IN DIRECTION OF ARROW 'X' TUNER KNOB.
2 1/8" ± 1/32"
90° ±15'
2 1/8" ± 1/32"
5 1/8" ± 1/16"
CANCELLED - SEE PAGE 7
TUNER KNOB ENGRAVED 50 EQUAL DIVISIONS IN SECTIONS OF 10.
END VIEW ARROW R.
2 7/32" ± 1/32"
'X'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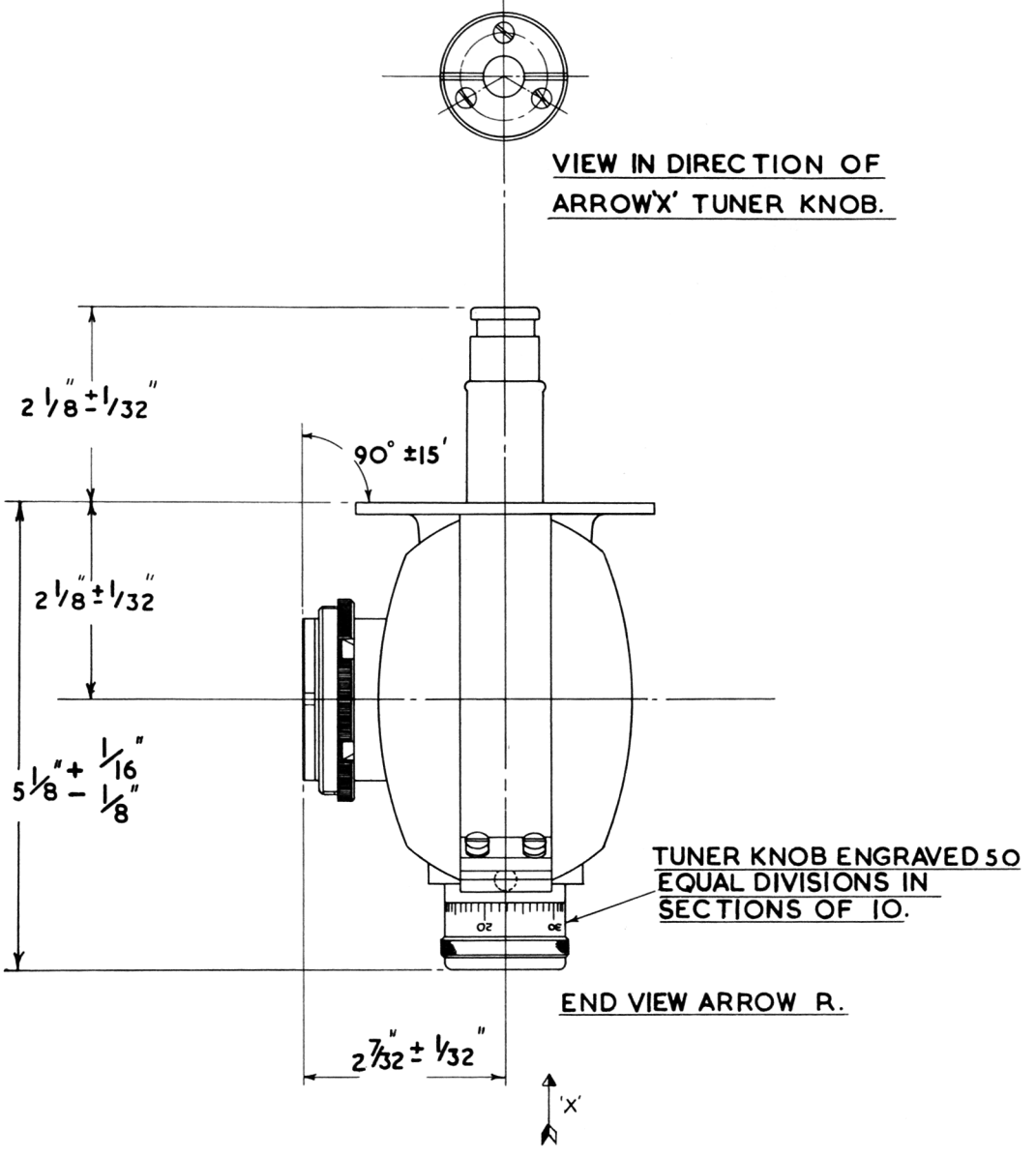
2 1/8" ±1/32"
REFERENCE PLANE.
2 1/8" ±1/32"
5 1/8" + 1/16" - 1/8"
7 13/16" MAX.
R

C.V.2261
C.V.2262



SPECIFICATION AD/CV 2261
ISSUE NO.5 DATED 24.10.58

AMENDMENT No.1

Insert new Pages 6 and 7 attached.

Endorse existing Page 4 "Cancelled - see Page 6".
existing Page 5 "Cancelled - see Page 7".

Page 1. Top left-hand corner
Amend No. of pages from "5" to "7"

November 1960
N.34356

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

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV2261

ISSUE NO. 5 DATED 24.10.58.

AMENDMENT NO. 2

Page 3 2(iii) 1st line

Amend "$\frac{V}{CR}$" to "$\frac{V\ 10^{-3}}{CR}$"

2(iii) 3rd line

Amend "(Fds)" to "(μFds)"

January, 1961 ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

NC 47053

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV2261 ISSUE NO.5 DATED 24.10.58
AMENDMENT NO.3

Page 2 Test (d)

Mean Power Output (W). In "Limits, Min" column delete "9" and substitute "15"

March 1963

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

N.175385

JAH
28/3/63