

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV2494
ISSUE NO. 1 DATED 5.1.59

AMENDMENT NO. 1

Page 5 Dimensions Table on Outline Drawing

Dimension R

Delete:- .130 MAX
Insert:- .150 MAX

August 1960

D.L.R.D.(T)

N33534/D

Specification MOS/ <u>CV2494</u> Issue 1 dated 5.1.59 To be read in conjunction with K.1006.	<u>SECURITY</u>	
	<u>Specification</u> UNCLASSIFIED	<u>Valve</u> UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Tunable Reflex Klystron Oscillator with Integral Tuning Cavity and Waveguide Output		<u>MARKING</u> See K.1001/4	
CATHODE	- Indirectly-heated	Additional Marking:- Serial No.	
ENVELOPE	- Shielded Metal Ceramic		
PROTOTYPE	- Va.201B		
<u>RATINGS</u> (Note A) (All limiting values are absolute)		<u>BASE</u> Moulded: colour coded leads See drawing on Page 5	Note
Heater Voltage	(V)	6.3	<u>CONNECTIONS</u> See drawing on Page 5
Heater Current	(A)	1.2	
Mechanical Tuning Frequency Range (Mode 6)	(Mc/s)	8,500 to 9,600	<u>DIMENSIONS</u> See drawing on Page 5
R.F. Power Output Range (Mode 5)	(mW)	40 to 120	
R.F. Power Output Range (Mode 6)	(mW)	12 to 66	<u>MOUNTING POSITION</u> Any
Min. R.F. Power Output (Mode 7)	(mW)	8	
Max. Resonator Voltage	(V)	350	C
Max. Resonator Current	(mA)	55	
Reflector Voltage Range	(V)	0 to -500	
Min. Electronic Tuning Range (Mode 5)	(Mc/s)	20	
Min. Electronic Tuning Range (Mode 6)	(Mc/s)	30	
Max. Heater - Cathode Voltage	(V)	45	
Max. Body Temperature	(°C)	200	
Max. Vibration (2 Minutes duration max.)	(g)	10	
Max. Shock (Short duration)	(g)	150	
Min. Operating Pressure	(mm.Hg)	70	

NOTES

- A. Caution to Electronic Equipment Design Engineers: Special attention should be given to the temperature of valves to be operated in Guided Weapons and Aircraft. Reliability will be seriously impaired if the maximum body temperature is exceeded. The life expectancy may be reduced if conditions other than those specified for life test are imposed on the valve and will be reduced appreciably if absolute maximum ratings are exceeded. Both reliability and performance will be jeopardized if Heater Voltage ratings are exceeded; life and reliability performance are directly related to the degree that regulation of the Heater Voltage is maintained at its centre-rated value. Under no circumstances should the heater voltage supply be allowed to deviate more than $\pm 10\%$ from the rated value.
- B. Clockwise rotation of the Tuner Shaft decreases the frequency.
- C. The Reflector Voltage must always remain negative with respect to the Cathode. If under A.F.C. working there is any possibility of the Reflector Voltage becoming equal to or more positive than the Cathode, a protective diode must be fitted to the Reflector.

/D.

NOTES (Contd.)

D. Load: For correct functioning of the valve the load should meet the following conditions:-

(a) At the frequency of operation the load should present a VSWR of less than 1.2 to the valve.

(b) Over the frequency ranges: 7,800 to 8,500 Mc/s and 9,600 to 10,500 Mc/s the load should present a VSWR of less than 1.5 to the valve.

Failure to meet condition (b) may result in the occurrence of spurious modes.

Description: Klystron, Reflex, Integral Tuning Cavity, Waveguide Output

Ratings:	Ef	Ers	Er	Irs	F	Altitude	Body Temp	Ehk
Absolute	V	Vdc	Vdc	mAdc	Mc	Feet	°C	V
Maximum:	6.3 ± 10%	350	0 to -500	55	---	No Limit	200	45
Test Cond: (Note 1)	6.3	300	---	---	9100 ± 3%	---	---	---

Base: Moulded; colour coded leads

Cathode: Coated Unipotential

Ref.	Test	Conditions	Min.	Max.
K1001/15	Type Approval			
4.5	Holding Period:	t=168 hours		
4.9.7	Moisture Vapourproof Pack:			
K1005	Carton Drop:			
4.9.2	Dimensions	Per Outline Drawing		
4.9.19	Vibration(1):	Er(Mode 5)/max Po G=10; F=20 to 1000 cps t=2 min	Δ F(p-p):	0.2 Mc
4.9.19	Vibration(2):	G=10; F=50 t=2 min; Note 2	Ir:	0 10 uAdc
---	Shock:	Er(Mode 5)/max Po G=100; Shock duration= 6 mSec 0.004 sec; Note 3	F:	1.5 Mc
4.10.8	Heater Current		If:	1.08 1.32 A
4.10.6.7.1	Total Reflector Current	Notes 4 & 5	Ir:	5 uAdc
4.10.1.1	Emission:	Er=5.7 V; Note 5	Δ Irs/Irs:	-15 %
---	Resonator Current:	Power Output(1)	Irs:	45 mAdc
4.10.7.3.2	Mechanical Tuning Range	Er(Mode 6)/Max Po	F:	8500 9000 Mc <i>9655</i>
4.15.1	Power Output(1):	Er(Mode 5)/max Po F=8500 Mc F=9600 Mc	Po:	40 120 mW 40 120 mW
4.15.1	Power Output(2):	Ers=250 v; Er(Mode 6)/ max Po; F=8500 Mc F=9600 Mc <i>9655</i>	Pe:	12 66 mW 12 66 mW
4.15.1	Power Output(3):	Ers=235 v; Er(Mode 7)/ max Po; F=9350 Mc	Po:	8 --- mW
4.10.5.4	Reflector Voltage(1):	Power Output(1) F=8500 Mc F=9600 Mc <i>9655</i>	Er:	-80 -135 Vdc -130 -185 Vdc
4.10.5.4	Reflector Voltage(2):	Power Output(2) F=8500 Mc F=9600 Mc	Er:	-40 -90 Vdc -85 -120 Vdc
4.10.5.4	Reflector Voltage(3):	Power Output(2) F=9400 Mc	Er:	-82 -115 Vdc
4.10.5.4	Reflector Voltage(4):	Power Output(3):	Er:	-30 -90 Vdc

Ref.	Test	Conditions		Min.	Max.
4.15.3	Electronic Tuning Range(1):	Er(Mode 5)/50% max Po F=8500 Mc F=9600 Mc	F: F:	20 20	— Mc — Mc
4.15.3	Electronic Tuning Range(2):	Er=250 v Er(Mode 6)/50% max Po F=8500 Mc F=9600 Mc	F: F:	30 30	— Mc — Mc
—	Modulation Sensitivity(1):	Power Output(1) $\Delta F = \pm 2.5$ Mc max	Coeff:	0.5	— Mc/v
—	Modulation Sensitivity(2):	Power Output(2) $\Delta F = \pm 2.5$ Mc max	Coeff:	1.0	— Mc/v
4.15.7	Hysteresis:	Er(Mode 5)/max Po		—	50 %
4.15.8	Temperature Coefficient	Er(Mode 5)/max Po TA=25° to 95°C	Coeff:	+0.05	-0.10 Mc/°C
—	Low Pressure	Er(Mode 5)/max Po; t=10 sec; Note 6	F:	—	2 Mc
—	Heater Voltage Coefficient	Power Output(2) Ef=5.7 to 7.0 V F=8500 Mc	$\Delta F/\Delta Ef$:	—	1.5 Mc/v
—	Mechanical Tuning	F=8500 to 9600 Mc Tuner Torque		—	50 in.oz.
4.11	Life Test:	Group C	t:	500	— hrs.
4.11.4	Life Test End Point	Power Output(1)	Po:	32	— mW

Note 1: All oscillation tests except vibration and shock tests shall be made with the valve rigidly connected to a UC-39/U flange on appropriate RG-62/U waveguide equipment and the load VSWR for the valve shall be less than 1.1.

Note 2: The Reflector Current shall be recorded with a Brush Model HL 202 recorder or equivalent. There shall be no Reflector Current bursts greater than the limit shown.

Note 3: The valve shall be given 5 shocks in each of 3 planes. The frequency shift, after shock in any one plane, shall not exceed the value specified.

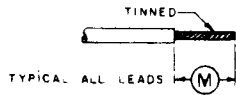
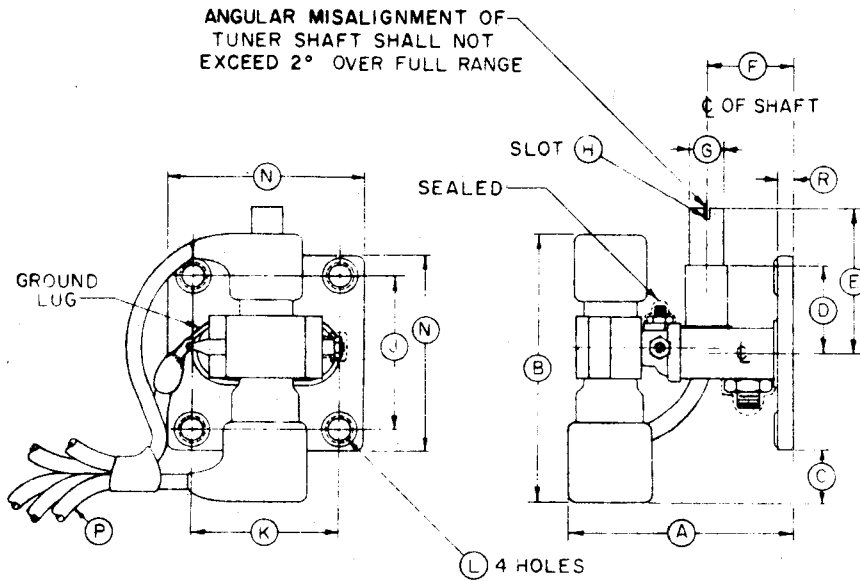
Note 4: After two minutes with all voltages applied, Total Reflector Current shall not exceed the specified limits.

Note 5: The valve shall not be oscillating during the test.

Note 6: The frequency shall be stabilized at a pressure of 70 mm of Hg. The pressure shall be increased to 760 mm of Hg and the frequency at 760 mm of Hg read within the time specified. The resulting frequency change shall not exceed the limit specified.

Note 7: Within the specified mechanical tuning range any spurious modes which exist shall be outside the frequency range of 8450 to 9650 Mc. Any spurious modes which exist shall not interfere with or cause frequency discontinuities of the operating mode above the half power points of the operating mode.

CV2494



CABLE CONNECTIONS	
(2) YELLOW	HEATER
GREEN	CATHODE
GREY	REFLECTOR
TAN	B+

REF	DIMENSIONS	
A	1.937 MAX	
B	2.500 MAX	
C	.490 MAX	
D	.812 MAX	
E	1.500 MAX	
F	.720 NOM	
G	.281 MAX	.278 MIN
H	.040 WIDE x .100D _P NOM	
J	1.284 MAX	1.276 MIN
K	1.224 MAX	1.216 MIN
L	.219 DIA NOM WITH .185 DIA NOM REMOVABLE INSERTS	
M	.500 MAX	.250 MIN
N	1.640 MAX	1.610 MIN
P	18" NOM	
R	.130 MAX	.105 MIN