MINISTRY OF SUPPLY - D.L.R.D.(T)/RRE Amdt 2 VALVE ELECTRONIC **CV2494**

Specification MOA/CV2494 Amdt 2 Issue 1 dated 5.1.59 To be read in conjunction with K.1006.	SECURITY Specification: UNCLASSIFIED Valve: UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Tunable Reflex Klystron Oscillator with integral Tuning Cavity and Waveguide Output

CATHODE - Indirectly-heated

ENVELOPE - Shielded Metal Ceramic

PROTOTYPE - VA.201B

MARKING
See K.1001/4

Additional Marking:-
Serial No. .....

RATINGS (Note A) (All limiting values are absolute)			Note
Heater Voltage	(V)	6.3	
Heater Current	(A)	1.2	
Mechanical Tuning Frequency Range (Mode 6)	(Mc/s)	8,500 to 9,660 Amdt 2	B
R.F. Power Output Range (Mode 5)	(mW)	40 to 120	
R.F. Power Output Range (Mode 6)	(mW)	12 to 66	
Min. R.F. Power Output (Mode 7)	(mW)	8	
Max. Resonator Voltage	(V)	350	
Max. Resonator Current	(mA)	55	
Reflector Voltage Range	(V)	0 to -500	C
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	(mms.Hg)	70	

BASE
Moulded: colour coded leads
See drawing on Page 5

CONNECTIONS
See drawing on Page 5

DIMENSIONS
See drawing on Page 5

MOUNTING POSITION
Any

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 ± 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.

See Issue 1A

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

Ratings:	Ef	Ers	Er	Irs	F	Altitude	Body Temp	Ebk
Absolute	V	Vdc	Vdc	mAdc	Mc	Feet	°C	V
Maximum:	6.3 ± 10%	350	0 to -600	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=~~150~~ 100; Shock duration= ~~0.004~~ 6msec; 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:	Ef=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	~~9600~~ 9655	Mc Amdt 2
4.15.1	Power Output(1):	Er(Mode 5)/max Po F=8500 Mc	Po:	40	120	mW
		F=~~9600~~ 9655 Mc Amdt. 2	Po:	40	120	mW
4.15.1	Power Output(2):	Ers=250 v: Er(Mode 6)/ max Po: F=8500 Mc	Po:	12	66	mW
		F=~~9600~~ 9655 Mc Amdt. 2	Po:	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	Er:	-60	-135	Vdc
		F=~~9600~~ 9655 Mc Amdt 2	Er:	-130	~~-165~~ -190	Vdc Amdt 2
4.10.5.4	Reflector Voltage(2):	Power Output(2) F=8500 Mc	Er:	-40	-90	Vdc
		F=~~9600~~ 9655 Mc Amdt 2	Er:	-85	~~-120~~ -125	Vdc Amdt 2
4.10.5.4	Reflector Voltage(3):	Power Output(2) F=9400 Mc	Er:	-62	-115	Vdc
4.10.5.4	Reflector Voltage(4):	Power Output(3):	Er:	-30	-90	Vdc

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See Issue 1A

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Ref.	Test	Conditions		Min.	Max.
4.15.3	※Electronic Tuning Range(1):	Er(Mode 5)/50% max Po			
		F=8500 Mc	F:	20	— Mc
		F=9600 Mc 9655 Amdt 2	F:	20	— Mc
4.15.3	※Electronic Tuning Range(2):	Ers=250 v Er(Mode 6)/50% max Po			
		F=8500 Mc	F:	30	— Mc
		F=9600 Mc 9655 Amdt 2	F:	30	— Mc
—	Modulation Sensitivity(1):	Power Output(1) ΔF=±2.5 Mc max	Coeff:	0.5	— Mc/v
—	※Modulation Sensitivity(2):	Power Output(2) Δ F=±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	ΔF/ΔEf:	—	1.5 Mc/v
—	※※Mechanical Tuning	F=8500 to 9600 9655 Mc Amdt 2 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

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Note 1: All oscillation tests except vibration and shock tests shall be made with the valve rigidly connected to a UG-39/U flange on appropriate RG-52/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 BL 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 9600 9700 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.

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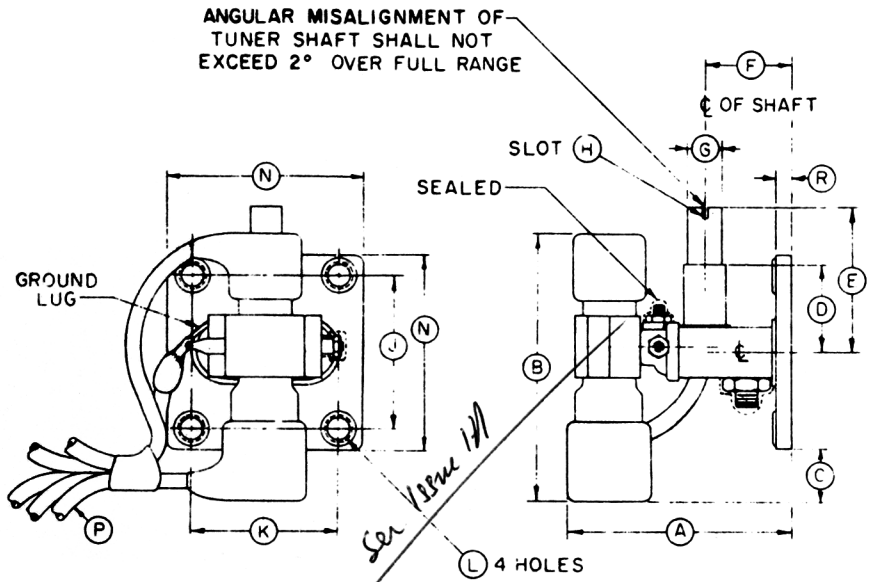

CABLE CONNECTIONS	
(2) YELLOW	HEATER
GREEN	CATHODE
GREY	REFLECTOR
TAN	B+

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 .100 DP 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~~ .150 MAX .105 MIN

Amdt 1

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV2494
ISSUE NO. 1 DATED 5.1.59

Superseded by Issue 1A

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

16/9/60

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV2494

ISSUE NO. 1 DATED 5.1.59

Superseded by Issue 1A

AMENDMENT NO. 2

Page 1 — 2nd Line — Amend Specification Authority to read 'MINISTRY OF AVIATION - D.L.R.D.(T)/R.R.E.'

3rd Line — Amend title to read 'Specification MOA/CV2494'

'RATINGS' 'Mechanical Tuning Frequency Range (Mode 6)' Amend figures in ratings column to read '8500 to 9655'

Page 3 — 'Mechanical Tuning Range' test Amend figure in 'Max' column to read '9655'

'Power Output (1)' test Amend figure in 3rd line of 'Conditions' column to read '9655'

'Power Output (2)' test Amend figure in 3rd line of 'Conditions' column to read '9655'

(40480)

/'Reflector

'Reflector Voltage (1)' test Amend figure in 3rd line of 'Conditions' column to read '9655' and on this same line amend figures in 'MIN' and 'MAX' columns to read '-130' and '-190' respectively.

'Reflector Voltage (2)' test Amend figure in 3rd line of 'Conditions' column to read '9655' and on this same line amend figures in 'MIN' and 'MAX' columns to read '-90' and '-125' respectively.

Page 4 — 'Electronic Tuning Range (1)' test Amend figure in 3rd line of 'Conditions' column to read '9655'

'Electronic Tuning Range (2)' test Amend figure in 4th line of 'Conditions' column to read '9655'

'Mechanical Tuning' test Amend 2nd figure in 'Conditions' column to read '9655'

'Note 7' At end of first sentence amend to read '.....8450 to 9705 Mc/s.

June, 1962.

D.L.R.D.(T)/R.R.E.

AHH 13/6/62

ELECTRONIC VALVE SPECIFICATIONS

Specification M.O.A./CV.2494 Issue 1 Dated 5.1.59

Superseded by Issue 1A

Amendment No.3

Page 3 Shock Test Column headed "Conditions"

(1) Delete "G = 150" and Substitute "G = 100"
(2) Delete "Shock Duration = 0.004 secs. and Substitute "Shock Duration = 6 mSecs."

T.V.C. for
RRE

September, 1962.

(147122)