VALVE ELECTRONIC

SERVICES VALVE TEST LABORATORY

CV 5008

SPECIFICATION AD/CV.5008 incorporating MIL-E-1/510D	SECURITY	
	SPECN.	VALVE
ISSUE NO. 3 DATED 1.11.63.	Unclassified	Unclassified
To be read in conjunction with K.1006.		

TYPE OF VALVE	Reliable Double Triode
CATHODE	Indirectly heated
ENVELOPE	Glass
PROTOTYPE	6080WA

MARKING

See K.1001/4

Additional marking 6080WA

BASE

Large wafer octal with metal sleeve

RATINGS

Absolute, unless otherwise stated

			NOTE
Heater voltage, nominal	(V)	6.3	
Heater current, nominal	(A)	2.5	
Max. heater-cathode voltage	(V)	300	
Max. D.C. anode voltage	(V)	250	
Max. peak forward anode voltage	(V)	3000	
Max. anode dissipation	(W)	13	A
Max. D.C. grid voltage	(V)	0	
Max. grid resistance	(Megohms)	1.0	A,B
Max. grid current	(mA)	5.0	A
Max. bulb temperature	(°C)	230	
Max. altitude	(ft)	60,000	

CONNECTIONS

Pin	Electrode
1	Grid 2
2	Anode 2
3	Cathode 2
4	Grid 1
5	Anode 1
6	Cathode 1
7	Heater
8	Heater

DIMENSIONS

See drawing page 6

MOUNTING POSITION

Any

NOTES

A. Each section.

B. For cathode bias operation; where fixed bias or fixed and auto-bias is used max. allowable grid resistance = 0.1 Megohms.

C. Notice to Designers

(a) The slope of one half of the valve is affected to some extent by the dissipation of the other half due to heat radiation.

(b) This valve may show at full dissipation considerable reverse anode current due to anode emission.

The test requirements given in specification MIL-E-1/510D
for JAN 6080WA shall apply

Amdt-1.

CV 5008

MIL-E-1/510D
20 December 1961
SUPERSEDING
MIL-E-1/510C
9 September 1960

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING

1/ JAN-6080WA, 6082WA
a b

This specification sheet forms a part of the latest issue of Military Specification MIL-E-1.

DESCRIPTION: Twin triode, low Mu

PIN CONNECTIONS AND DIMENSIONS: See figure 1

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Test code	Ef	Eb	Ec	Ehk	epy	Rk/k	Rg/g	Ic/g	Pp/p	TE	Alt
Unit:	a, b	V	Vdc	Vdc	v	V	ohms	Meg	mA	W	°C	ft
Maximum:	a	6.6	250	0	⁄300	3,000	---	(See note 1)	5.0	13	⁄230	60,000
	b	27.8	250	0	⁄300	3,000	---	(See note 1)	5.0	13	⁄230	60,000
Minimum:	a	6.0	---	---	-300	---	---	---	---	---	---	---
	b	25.2	---	---	-300	---	---	---	---	---	---	---
TEST CONDITIONS:	a	6.3	135	0	---	---	250	---	---	---	---	---
	b	26.5	135	0	---	---	250	---	---	---	---	---

PAR. NO.	TEST	TEST CODE	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS (SEE NOTE 2)						UNIT
							Min	LAL	Bogey	UAL	Max	ALD	
	General												
3.1	Qualification	a, b	Required for JAN marking	---	---	---	---	---	---	---	---	---	---
3.2.28	Reliable tubes	a, b	(See note 3)	---	---	---	---	---	---	---	---	---	---
3.6	Performance	a, b	(See note 4)	---	---	---	---	---	---	---	---	---	---
	Qualification inspection (see note 5)												
---	Cathode	a, b	Coated unipotential	---	---	---	---	---	---	---	---	---	---
3.4.3	Base connections	a, b	(See fig. 1)	---	---	---	---	---	---	---	---	---	---
4.8.20.3	Variable-frequency vibration (1)	a, b	Ecl = -7 Vdc; Rp = 2,000 ohms (see note 6)	---	---	Ep	---	---	---	---	100	---	mVac
	Acceptance inspection part 1 (production) (see note 7)												
4.7.5	Continuity and shorts tests (for reliable tubes)	a, b		0.4	II	---	---	---	---	---	---	---	---
4.9.1	Mechanical-production tests	a, b	(See fig. 1)	---	---	---	---	---	---	---	---	---	---

1/ To identify immediately those tests that are applicable to a given type or to several types, tube types are designated by letters.

PAR. NO	TEST	TEST CODE	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS (SEE NOTE 2)						UNIT
							Min	LAL	Bogey	UAL	Max	ALD	
	Acceptance inspection, part 1 (production) (see note 7) - Contd												
4.10.4.1	Plate current (1)	a, b	(See notes 8 and 9)	---	---	Ib	---	115	125	135	---	25	mAdc
4.10.4.1	Plate current (1)	a, b	(See notes 8 and 9)	0.65	II	Ib	100	---	---	---	150	---	mAdc
4.10.6.1	†Total grid current	a, b	Rg = 1.0 Meg; Rk = 125 (see notes 6 and 10)	0.65	II	Ic	0	---	---	---	-2.0	---	uAdc
4.10.8	Heater current	a		0.65	II	If	2.35	---	---	---	2.65	---	A
		b		0.65	II	If	0.55	---	---	---	0.65	---	A
4.10.9	Transconductance (1)	a, b	(See notes 8 and 9)	---	---	Sm	---	6,600	7,000	7,400	---	1,000	umhos
4.10.9	Transconductance (1)	a, b	(See notes 8 and 9)	0.65	II	Sm	6,000	---	---	---	8,200	---	umhos
4.10.15	Heater-cathode leakage	a, b	Ehk = +100 Vdc	0.65	II	Ihk	---	---	---	---	25	---	uAdc
			Ehk = -100 Vdc (see note 8)			Ihk	---	---	---	---	25	---	uAdc
	Acceptance inspection, part 2 (design)												
4.8	Insulation of electrodes	a, b	g to all	2.5	L6	R	200	---	---	---	---	---	Meg
			p to all (see note 8)			R	200	---	---	---	---	---	Meg
4.9.12.1	Low-pressure voltage breakdown	a, b	Pressure = 55±5 mm Hg; voltage = 500 Vac	6.5	(See note 11)	---	---	---	---	---	---	---	---
4.9.19.1	Low frequency vibration (2)	a, b	Rp = 2,000; Ec = -7 Vdc (see note 6)	6.5	Code G	Ep	---	---	---	---	50	---	mVac
4.10.4.1	Plate current (2)	a, b	Eb = 250 Vdc; Ec = -200 Vdc (see notes 8 and 9)	2.5	I	Ib	---	---	---	---	10	---	mAdc
4.10.9	Transconductance (2)	a	Ef = 5.7 V (see notes 8 and 9)	2.5	I	ΔSm Ef	---	---	---	---	10	---	%
		b	Ef = 23.9 V (see notes 8 and 9)	2.5	I	ΔSm Ef	---	---	---	---	10	---	%
4.10.11.1	Amplification factor	a, b	Rk = 250 ohms (see notes 8 and 9)	6.5	Code G	Mu	1.5	---	---	---	2.5	---	---
4.10.4.1	Plate current (1) (difference between sections)	a, b		2.5	I	Ib	---	---	---	---	25	---	mAdc

PAR. NO.	TEST	TEST CODE	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS (SEE NOTE 2)						UNIT
							Min	LAL	Bogey	UAL	Max	ALD	
	Acceptance inspection, part 3 (degradation) (see note 12)												
4.9.20.5	Shock test	a, b	Hammer angle = 30°; Ehk = ⁄100 Vdc; Ec = -7 Vdc; Rb = 2,000 ohms; Rk = 0 (see notes 6 and 13)	---	---	---	---	---	---	---	---	---	---
4.9.20.6	Fatigue test	a, b	G = 2.5 min; fixed frequency; F = 25 min, 60 max; apply only Ef	6.5	(See note 11)	---	---	---	---	---	---	---	---
---	Post shock and fatigue test end points	a, b	Vibration (2)	---	---	Ep	---	---	---	---	100	---	mVac
		a, b	Heater-cathode leakage										
			Ehk = ⁄100 Vdc	---	---	Ihk	---	---	---	---	50	---	uAdc
			Ehk = -100 Vdc			Ihk	---	---	---	---	50	---	uAdc
		a, b	Change in transconductance (1) of individual tubes	---	---	ΔSmt	---	---	---	---	10	---	%
		a, b	Grid current	---	---	Ic	---	---	---	---	-3.0	---	uAdc

PAR. NO.	TEST	TEST CODE	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	ALLOWABLE DEFECTIVES PER CHARACTERISTIC		SYMBOL	LIMITS		UNIT
						First sample	Combined samples		Min	Max	
	Acceptance inspection, part 3 (life) (see note 12)										
4.11.7	Heater-cycling life test	a	Ef = 7.5 V; Ehk = 300 Vdc; Eb = Ec = 0; 1 min on, 4 min off (see note 14)	---	---	---	---	---	---	---	---
		b	Ef = 31.8 V; Ehk = 300 Vdc; Eb = Ec = 0; 1 min on, 4 min off (see note 14)	---	---	---	---	---	---	---	---
4.11.4	Life-test end points (heater-cycling)	a, b	Heater-cathode leakage								
			Ehk = ⁄100 Vdc	---	---	---	---	Ihk	---	50	uAdc
			Ehk = -100 Vdc					Ihk	---	50	uAdc
4.11.3.1(a)	Stability life test	a, b	Rk = 125; Rg/g = 1.0 Meg; Ehk = ⁄300 V; TA = room (see note 15)	1.0	Code I	---	---	---	---	---	---

PAR NO	TEST	TEST CODE	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	ALLOWABLE DEFECTIVES PER CHARACTERISTIC		SYMBOL	LIMITS		UNIT
						First sample	Combined samples		Min	Max	
	Acceptance inspection, part 3 (life) (see note 12) - Contd										
4.11.4	Life-test end points (stability) (1 hour)	a, b	Change in transconductance (1) of individual tubes	---	---	---	---	ΔSm t	---	10	%
4.11.3.1 (b)	Survival-rate life test	a, b	Stability life-test conditions, or equivalent (see notes 16 and 17)	---	II	---	---	---	---	---	---
4.11.4	Life-test end points (survival rate) (100 hours)	a, b	Inoperatives	0.65	---	---	---	---	---	---	---
			Transconductance (1)	1.0	---	---	---	Sm	5,800	---	umhos
4.11.5	Intermittent life-test operation	a, b	Stability life-test conditions; TE = 230° C min (see notes 18 and 19)	---	---	---	---	---	---	---	---
4.11.4	Life-test end points (intermittent) (1,000 hours)	a, b	(See note 20)								
		a, b	Inoperatives (see note 21)	---	---	1	3	---	---	---	---
		a, b	Grid current	---	---	1	3	Ic	0	-10	uAdc
		a, b	Transconductance (2)	---	---	1	3	ΔSm Ef	---	10	%
		a, b	Combined defectives	---	---	2	5	---	---	---	---
		a, b	Heater-cathode leakage								
			Ehk = +100 Vdc	---	---	1	3	Ihk	---	25	uAdc
			Ehk = -100 Vdc	---	---	1	3	Ihk	---	25	uAdc
		a	Heater current	---	---	1	3	If	2.35	2.75	A
		b	Heater current	---	---	1	3	If	0.550	0.665	A
		a, b	Transconductance (1)	---	---	1	3	Sm	5,500	---	umhos
		a, b	Insulation of electrodes								
			g to all	---	---	1	3	R	100	---	Meg
			p to all	---	---	1	3	R	100	---	Meg
		a, b	Combined defectives	---	---	3	6	---	---	---	---
4.9.18 and 4.9.18.1.1	Container drop		Required								
5.	Preparation for delivery		(See note 22)								

NOTES:

1. Maximum grid-circuit resistance:
   a. 1.0 megohm for cathode-bias operation.
   b. 0.1 megohm for fixed-bias operation.
   c. 0.1 megohm for combined fixed- and cathode-bias operation.
2. Variable sampling procedures. See 4.1.1.2.7.

NOTES:

3. For purposes of acceptance inspection, use applicable reliable paragraphs.

4. In addition to the paragraphs specified hereon, the following tests and requirements listed in 3.6 shall apply: 3.3, 3.3.1, 3.4.1, 3.4.2, 3.7, 3.7.7, 3.8, 4.1, 4.3, 4.4, 4.5, 4.6, 4.7, 4.9.2, 4.9.3, 4.9.4, 4.9.5, 4.9.5.1, 4.9.8, 4.9.20.1, 4.9.20.2, and 4.9.21.

5. All tests listed hereon shall be performed during qualification inspection; however, these tests are normally performed during qualification inspection only.

6. Tie k1 to k2; g1 to g2; and p1 to p2.

7. The AQL for the combined defectives for attributes in acceptance inspection, part 1 (production), excluding inoperatives and mechanical, shall be 1 percent.

8. Test each unit separately.

9. Both units shall be operating.

10. With both units operating, Ic is the sum of I1c and I2c.

11. This test shall be performed on the initial lot and thereafter on a lot approximately every 30 days. When one lot has passed the 30-day rule shall apply. In the event of lot failure, the lot shall be rejected and the suceeding lots shall be subjected to this test until a lot passes. Standard MIL-STD-105, sample size code letter F, shall apply.

12. Destructive tests. Tubes subjected to the following destructive tests are not to be delivered on contract or order:

4.9.20.5	Shock test.
4.9.20.6	Fatigue test.
4.11.5	Intermittent life-test operation.
4.11.7	Heater-cycling life test.

13. A grid resistor of 0.1 megohm shall be added; however, this resistor shall not be used when a thyratron-type short indicator is employed.

14. The no-load to steady-state full-load regulation of the heater-voltage supply shall be not more than 3.0 percent. This test shall be made on a lot-by-lot basis.

15. Stability life test. See 20.2.5.1 of appendix C.

16. Survival-rate life test. See 20.2.5.2 to 20.2.5.2.4, inclusive, of appendix C.

17. Equivalent conditions for survival-rate life test. See 20.2.5.2.5 of appendix C.

18. Intermittent life test. See 20.2.5.3 of appendix C.

19. Envelope temperature is defined as the highest temperature indicated when using a thermocouple of No. 40 B&S or smaller diameter elements placed in contact with the envelope. Envelope temperature requirement will be satisfied if a tube, having bogey Ib (±5 percent) under normal test conditions, is determined to operate at or above the minimum specified temperature at any position on the life-test rack.

20. Order for evaluation of life-test defects. See 4.11.3.1.2.

21. An inoperative, as referenced in life test, is defined as a tube having one or more of the following defects: discontinuity, permanent shorts, or air leaks. (See 4.7.5.)

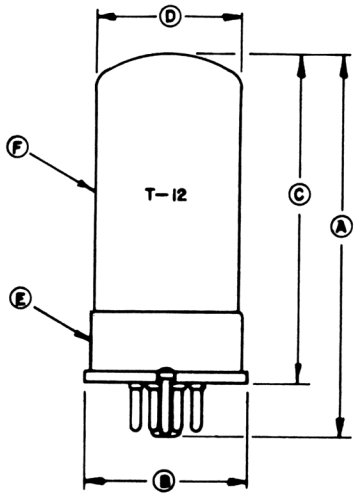
22. Tubes shall be packaged and packed, as specified in the contract or order, in accordance with Specification MIL-E-75. Package group MIL-E-75/1, package size F, and rough handling test (d) shall apply.

23. Referenced documents shall be of the issue in effect on the date of invitation for bids.

Custodians:
Army - SigC
Navy - Ships
Air Force - WADD

Preparing activity:
Navy - Ships
(Project 5960-1250)

CV 5008



PIN CONNECTIONS

Pin No.	Element
1	g2
2	p2
3	k2
4	g1
5	p1
6	k1
7	h
8	h

DIM.	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL	LIMITS	
			Min	Max
QUALIFICATION INSPECTION				
E	Base: B8-98			
F	Envelope: T-12			
ACCEPTANCE INSPECTION, PART 2 (DESIGN)				
A	6.5	L6	---	4.063
B	6.5	L6	---	1.719 dia
C	6.5	L6	3.125	3.500
D	6.5	L6	1.438 dia	1.563 dia

ALL DIMENSIONS IN INCHES.

Figure 1. Outline drawing.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV5008 ISSUE NO.3 DATED 1.11.63.

AMENDMENT NO.1

(i) Page A. Amend 'No. of pages' to read '2 + 6'.

(ii) Reverse Side of Page 'A' insert 'Page B' and below this insert

"The test requirements given in Specification MIL-E-1/510D, for JAN 6080WA shall apply."

T.V.C. for S.V.T.L.

March, 1964

(222058) JAMS 28/5/64