

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING

TYPE 7984

The complete requirements for procuring the electron tube described herein shall consist of this document and the latest issue of Specification MIL-E-1.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

DESCRIPTION: Pentode, rf beam power, compactron

Outline --- 12-56 (EIA)  
Base --- E12-74 (button 12 pin)  
Envelope --- T12  
Cathode --- Coated unipotential

Base connections:

Pin No.	---	1	2	3	4	5	6	7	8	9	10	11	12
Element	---	h	k,	a	a	a	k,	g2	k,	k,	g1	g2	h
			beam				beam		beam	beam			
			plate				plate		plate	plate			

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Ef	Eb	Ec2	Ec1	Ehk	Ib	Ic1	Pp	Pg2	Alt
Unit:	V	Vdc	Vdc	Vdc	v	mAdc	mAdc	W	W	ft
<u>Class C service:</u>										
Maximum:	15.0	600	250	---	+100	150	6.0	20	3.0	(See
Minimum:	12.0	---	---	-100	-100	---	---	---	---	note 1)
<u>Intermittent mobile service:</u>										
Maximum:	15.0	750	250	---	+100	180	6.0	35	3.0	(See
Minimum:	12.0	---	---	-100	-100	---	---	---	---	note 1)
<u>TEST CONDITIONS:</u>	13.5	200	125	-7.5	---	---	---	---	---	---

GENERAL:

Qualification - Not required

7984

FSC 5960

METHOD	REQUIREMENT OR TEST	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS		UNIT
						MIN	MAX	
	<u>Quality conformance inspection, part 1</u>							
1201	Short and discontinuity detection		0.4	II	---	---	---	---
1266	Total grid current	Ec1 = 0; Rg1 = 0.1 Meg; Rk = 75 ohms (see note 2)	0.65	II	Ic1	---	-4.0	μAdc
1256	Electrode current (1) (anode)		0.65	II	Ib	104	156	mAdc
---	Pulse cathode current (1)	Eb = 125 Vdc; Ec2 = 200 Vdc; Ec1 = -75 Vdc; egk = +20 v (see note 3)	0.65	II	ik	900	---	ma
1236	Power oscillation	Eb = 600 Vdc; Ec2 = 180 Vdc; Ib = 112 mAdc (max); Rg1 = 30,000 ohms; Ic1 = 2.0 to 2.5 mAdc; F = 15 MHz	0.65	II	Po	45	---	W
	<u>Quality conformance inspection, part 2</u>							
1211	Insulation of electrodes	g1 to all = -300 Vdc a to all = -500 Vdc	2.5	S3	R	10	---	Meg
1256	Electrode current (screen)		2.5	I	Ic2	---	9.0	mAdc
1306	Transconductance		2.5	I	Sm	10,200	17,200	μmhos
1256	Electrode current (2) (anode)	Eb = 600 Vdc; Ec2 = 180 Vdc; Ec1 = -60 Vdc	2.5	I	Ib	---	100	μAdc
---	Pulse cathode current (2)	Ef = 10.8 V; Eb = 125 Vdc; Ec2 = 200 Vdc; egk = +20 v (see note 3)	2.5	I	ik	400	---	ma
1301	Heater current		2.5	I	If	535	625	mA
1336	Heater-cathode leakage		2.5	I	Ihk	---	100	μAdc
1266	Grid emission	Ef = 16.2 V; Ec1 = -75 Vdc; Rg1 = 0.1 Meg (see note 4)	---	---	Isc1	---	4.0	μAdc
1031	Low-frequency vibration	Ec1 = -20 Vdc; Rp = 2,000 ohms	---	---	Ep	---	750	mVac
1331	Direct-interelectrode capacitance		6.5	Code E	{ Cg1p Cin Cout	{ --- 12.7 4.8	{ 0.21 18.9 7.2	{ pF pF pF

METHOD	REQUIREMENT OR TEST	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS		UNIT
						MIN	MAX	
	<u>Quality conformance inspection, part 3</u>							
1506	Heater-cycling life	Ef = 18.2 V; Ehk = +135 Vdc; Eb = Ec2 = Ec1 = 0; 1 min "on", 1 min "off"	2.5	Code G	t	1,440	---	cycles
---	Heater-cycling life-test end point	Heater-cathode leakage	---	---	Dhk	---	175	$\mu$ Adc
---	Life-test provisions	Group A: Ef = 13.5 V; Eb = 400 Vdc; Ec2 = 400 Vdc; Rg1 = 15,000 ohms; Rg2 = 13,000 ohms; F = 125 MHz; Ib = 150 mAdc (max); Ic1 = 3.0 to 5.0 mAdc (see note 5)	---	---	---	---	---	---
---	Life-test end points (500 hours)	Pulse cathode current (1) Power oscillation	---	---	ik Po	720 40	---	ma W

## NOTES:

- See "Reduced pressure (altitude) voltage breakdown characteristics in basic document.
- This test to be performed at the conclusion of the holding period.
- The grid pulse shall be a square-wave meeting the pulse shape requirement of Method 1296 and, in addition, the maximum amplitude shall occur within the first 20 percent of tp; tp = 100  $\mu$ s and prr = 1,000 pps. The pulse shall be applied to the grid by means of a driving circuit which produces the specified peak pulse voltage directly at the grid terminal with respect to the cathode. Grid resistance, not exceeding 50 ohms, may be inserted to prevent oscillation, providing readjustment of grid drive is made to maintain the specified pulse amplitude directly at grid terminal. The average peak-cathode current obtained during tp shall be within specified limits.
- Prior to this test, tubes shall be preheated a minimum of 5 minutes at the conditions indicated below. The 3-minute test is not permitted. Test at specified conditions within 3 seconds after preheating. Grid emission shall be the last test performed on the sample selected for the grid-emission test.

Ef	Ecc1	Eb	Ec2	Rg1
V	Vdc	Vdc	Vdc	Meg
18.2	-7.5	200	125	0.1

- The tubes shall be life tested in a self-excited push-pull oscillator circuit.

## Custodians:

Army - EL  
Navy - EC  
Air Force - 85

## Review activities:

Army - EL  
Navy -  
Air Force - 11, 85  
DSA - ES

## User activities:

Army - WC  
Navy - AS, OS, MC, CG, SH  
Air Force - 19

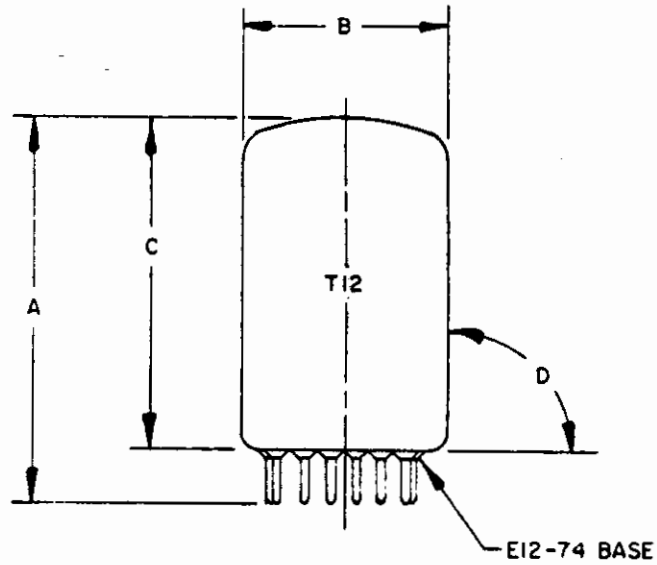
## Preparing activity:

Army - EL

## Agent:

DSA - ES

(Project 5960-2401-87)



Ltr	Dimensions in inches with metric equivalents (mm) in parentheses	
	Minimum	Maximum
Quality conformance inspection, part 1 (see note a)		
A		2.88 (73.15)
B		1.50 (38.10)
C		2.50 (63.50)
D	88°	92°

**NOTES:**

- a. Unless otherwise specified, the AQL for all tests listed under quality conformance inspection, part 1, shall be 1.0 percent, inspection level of II.
- b. Maximum diameter of bulb shall apply from base seat to bulb top line.

**FIGURE 1. Outline drawing of electron tube 7984.**