Traveling Wave Tube LD-597A

Preliminary Data Sheet

The LD-597A is a CW traveling wave tube for operation over the frequency range 3.6 kMc to 4.2 kMc. The minimum gain is 33db at 6 watt output level with a typical saturation output of 14 watts.

It is recommended that the tube be operated in the periodic permanent magnet focusing mount, type LD-597A Mount, incorporated with waveguide input and output connectors fitted with matching devices. The collector electrode is depressed to approximately two thirds of the helix voltage and convection cooling is usually adequate when the mount is fixed with its axis vertical and air can circulate freely past the radiator. Forced air cooling is required if the ambient temperature exceed 55°C or the mount axis is horizontal.

Tubes are fully interchangeable in the approved mount and tube replacement is a relatively simple operation.

Feature

1. PPM Focused and Field Replaceable.
2. Depressed Collector Operation for Improved Efficiency.
3. Conduction and Natural Convection Cooling.

General Data

Physical

Dimensions	See Outline
Weight	Tube Envelope: 0.27 kg. (0.6 lb)
	LD-597A Mount: 4.4 kgs. (9.7 lbs)
Preforred Mounting Position ..	Vertical
Cathode	Oxide Coated, Unipotential
R.F. Connections ..... (on LD-597A Mount)	Reduced Height WR 229

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Electrical

Maximum Ratings	Min.	Max.
Collector Voltage (Eb)	1700 Vdc	2000 Vdc
Collector Current (Ib)	-	35 mAdc
Helix Voltage (Ew)	2600 Vdc	3000 Vdc
Helix Current (Iw)	-	1.5 mAdc
Accelerating Anode Voltage (Ea)	-	3500 Vdc
Accelerating Anode Current (Ia)	-	0.5 mAdc
Focusing Electrode Voltage (Ec)	-55 Vdc	-45 Vdc
Collector Dissipation	-	63 W
Collector Seal Temperature	-	180 °C
Mount Ambient Temperature Range	-10 °C	+55 °C
Cathode Heating Time	90 sec.	-

Typical Operation

Cold input and output match over 600 Mc band (adjusted for each tube envelope) VSWR: 1.25

Heater Current at 6.3 Volts ..... 0.7 A

Frequency	3.7 kMc	4.0 kMc	4.2 kMc
Eb	1700 Vdc	1700 Vdc	1700 Vdc
Ib	35 mAdc	35 mAdc	35 mAdc
Ew	2800 Vdc	2750 Vdc	2730 Vdc
Iw	0.14 mAdc	0.15 mAdc	0.15 mAdc
Ea	3110 Vdc	3110 Vdc	3110 Vdc
Ia	0.01 mAdc	0.01 mAdc	0.01 mAdc
Ec	-50 Vdc	-50 Vdc	-50 Vdc
RF Output power (3mW input level)	9.1 W	8 W	7.4 W
RF Saturated Output	15.6 W	14.6 W	14.2 W

Noise Figure (Small Signal, f = 4.17 kMc) ..... 25 db

Operating Instructions

The following instructions provide the basic information for installing and operating the LD-597A traveling wave tube.

1. Mounting Tube Envelope

Undo tube envelope positioning screws three on each side, and insert tube envelope into the mount so that the shielded flying leads fit into the notch provided in the mount, and set the envelope firmly in place by use of the clamping nut on the radiator.
Care should be taken to avoid radial force.

2. Impedance Matching

Adjust the input and output plungers by plunger adjusting tool accompanied by each LD-597A Mount.

Then adjust the impedance matching screws for a minimum cold VSWR. A cold VSWR of less than 1.4 to 1 will be attained over the frequency range 3.6 to 4.2 kMc.

3. Application of Voltage

3.1 Apply the heater voltage and allow a minimum warm-up period of 90 seconds.

3.2 Set the focusing electrode, collector and helix voltages according to the instructions on Test Performance Sheet accompanied by each LD-597A tube envelope shipped. It is recommended that the collector be kept at ground potential since it is connected to the tube mount internally.

3.3 Switch on all voltages. Accelerating anode voltage should be about 1750 volts.

3.4 Adjust tube position carefully to optimize current transmission by observing the helix current.

3.5 Apply the specified rf drive and adjust accelerating anode voltage until the rated collector current is reached, keeping the helix voltage at the value specified.

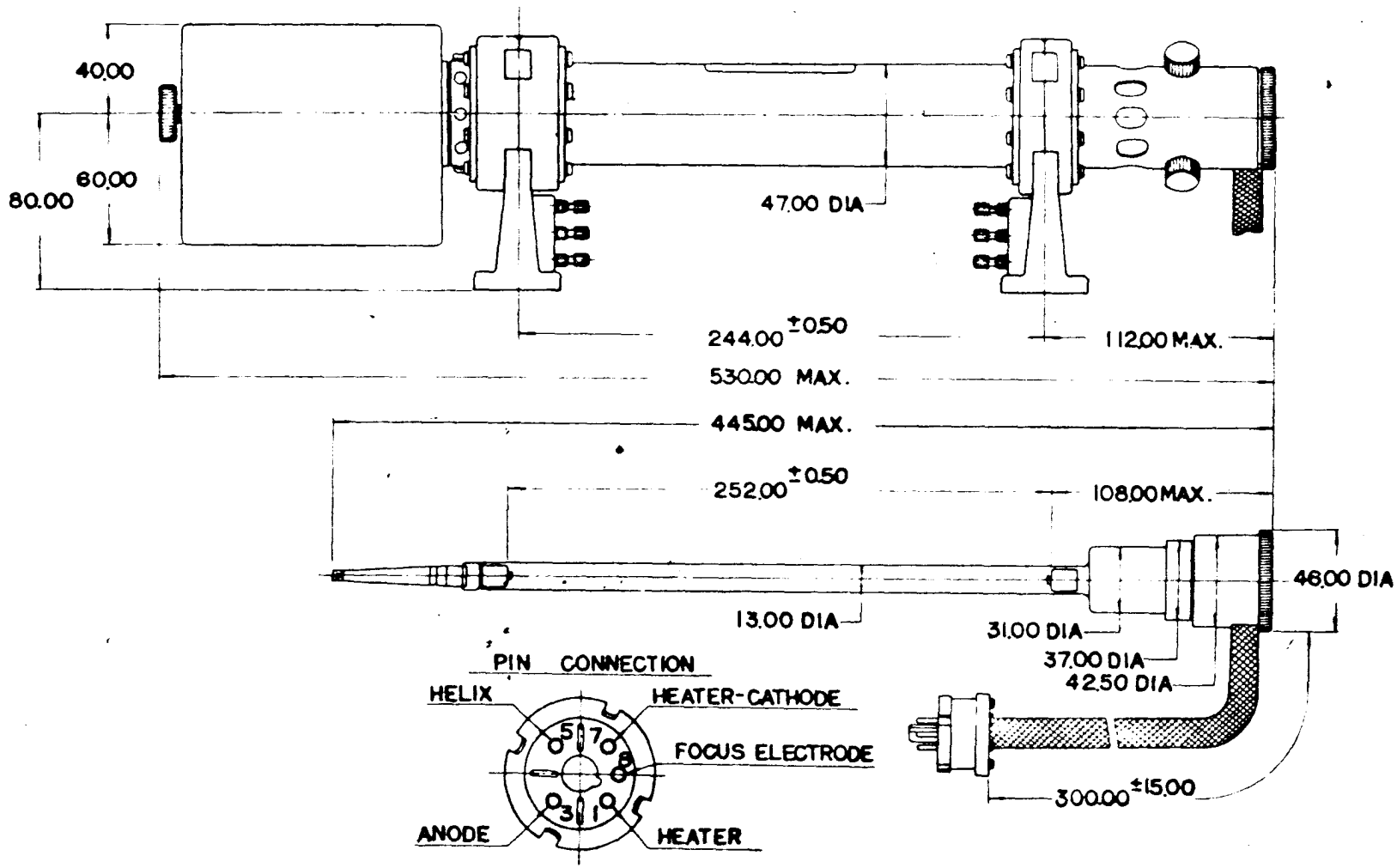
3.6 Adjust the helix voltage for maximum power output. The helix voltage should never be made to exceed 3000 volts or fall below 2600 volts. If the helix voltage is above or below this range, the tube may be damaged by poor current transmission.
The collector voltage should never be depressed below 1700 volts with respect to the cathode.

3.7 Readjust tube position for the best current transmission, and then lock the tube envelope firmly to the tube mount by envelope positioning screws.

3.8 From the economical point of view, it is recommended that the collector current be kept as small as possible compatible with the satisfactory operating performance of LD-597A.

4. Dismantling Tube Envelope

After the power source is cut off, loosen all envelope positioning screws. Turn the clamping nut on the radiator in CCW several times and pull out tube envelope carefully from the mount after clamping nut has been completely disengaged.



NOTES

DIMENSIONS ARE IN MILLIMETERS.

版数	年 月 日	承認
1	38-9-7	

特に指定なきは普通公差とす	尺度 / 才三角法
部品表	
仕様書番号	
組立図番	

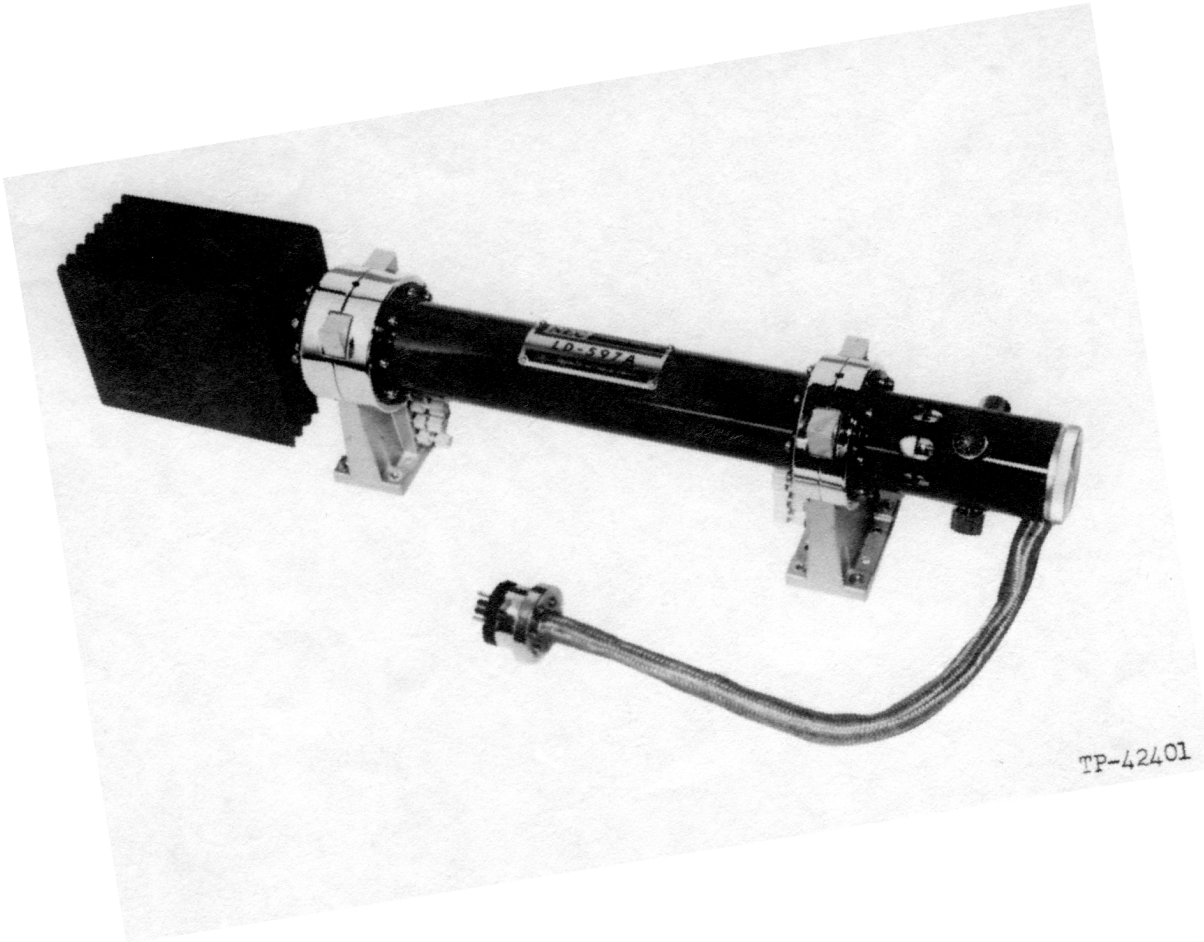
素材名	所要寸度	仕上および処理
技術担当 / 技術承認 / 設計製図 / 査閲 / 承認		

LD-597 A
OUTLINE DRAWING

SB-67290

配布先

日本電気株式會社



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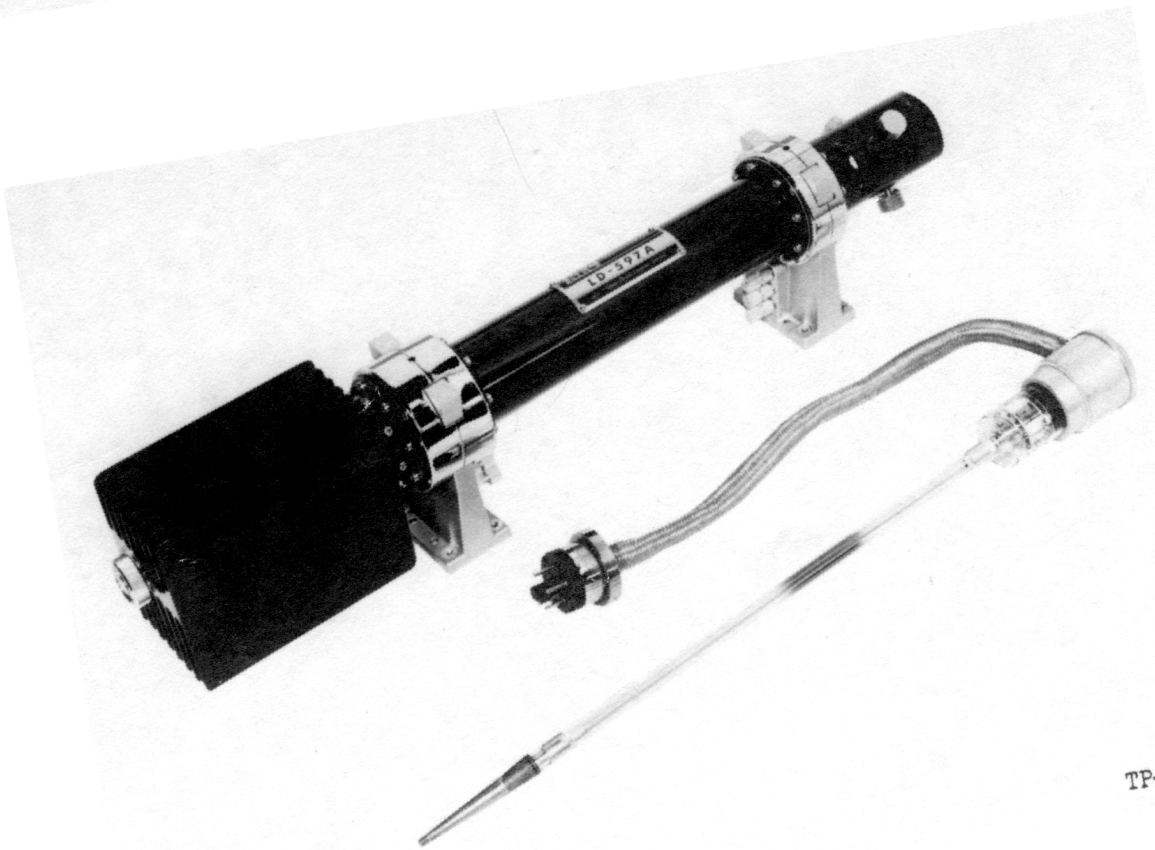

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