



ELECTRON TUBE DEPARTMENT ■ COMPONENTS DIVISION
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, CLIFTON, NEW JERSEY

**X-399*
BACKWARD WAVE
AMPLIFIER
TUBE**

T E N T A T I V E

GENERAL CHARACTERISTICS

The X-399 is a C-band backward wave amplifier tube with a helical wave propagation structure employing continuous beam operation. The tube is designed for use as a narrow band medium noise r-f amplifier with a pass band that can be electronically tuned over the frequency range of 5700 to 8400 megacycles.

The X-399 is a glass envelope tube mounted in an aluminum capsule and requires a solenoid to focus the electron beam. Type "TNC" female r-f connectors are included as an integral part of the capsule.

ELECTRICAL DATA

Frequency Range	5700 - 8400 megacycles
Pass Band (3 db)	11 - 45 megacycles
Small Signal Gain	20 db minimum
Noise Figure	15 db maximum

MECHANICAL DATA

Mounting Position	Any
Capsule Length	16 inches
Capsule Diameter	7/8 inches
Net Weight	1 pound
R-F connectors	Type "TNC" female
D.C. Connections	Color Coded Flying Leads
Cooling	Not Required

*This number identifies a particular experimental tube design, such number and identification data being subject to change without notice. This tube is for experimental purposes only, carries no obligation for future manufacture and should not be used for design purposes without prior arrangement.

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MAXIMUM RATINGS

Heater Voltage	6.5 Volts dc maximum
Heater Current	2 Amperes maximum
Cathode Voltage	-250 to -1200 Volts maximum
Cathode Current	4 ma maximum
Focus Voltage	-10 to +10 Volts maximum)
Anode No. 1 Voltage	+5 to +80 Volts maximum)
Anode No. 2 Voltage	+5 to +150 Volts maximum) with respect
Anode No. 3 Voltage	+20 to +300 Volts maximum) to cathode
Anode No. 4 Voltage	+90 to +800 Volts maximum)
Anode No. 5 Voltage)	
Helix No. 1 Voltage)	
Helix No. 2 Voltage)	
Capsule Voltage)	
Collector Voltage	Zero Volts (Ground)
Focus Current	250 Volts maximum
Anode No. 1 Current	.2 ma maximum
Anode No. 2 Current	.2 ma maximum
Anode No. 3 Current	.2 ma maximum
Anode No. 4 Current	.2 ma maximum
Anode No. 5 Current	.2 ma maximum
Helix No. 1 Current)	
Helix No. 2 Current)	
Capsule Current)	.3 ma maximum
Collector Current	4 ma maximum
Solenoid Magnetic Field	900 Gauss maximum

TYPICAL OPERATION

Frequency (Center of Pass Band)	7000 megacycles
Pass Band (3 db)	28 megacycles
Small Signal Gain	22 db
Noise Figure	14 db
Heater Voltage	6.3 Vdc
Heater Current	1.9 Adc
Cathode Voltage	-640 Vdc with respect to ground
Cathode Current	2.0 ma
Focus Voltage	-6 Vdc)
Anode No. 1 Voltage	+10 Vdc) with respect to cathode
Anode No. 2 Voltage	+8 Vdc)
Anode No. 3 Voltage	+260 Vdc)
Anode No. 4 Voltage	+350 Vdc)
Anode No. 5 Voltage)	
Helix No. 1 Voltage)	
Helix No. 2 Voltage)	
Capsule Voltage)	
Collector Voltage	Zero Volts (Ground)
Focus Current	200 Volts with respect to ground.
	0 ma

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Anode No. 1 Current	.1 ma
Anode No. 2 Current	.08 ma
Anode No. 3 Current	.03 ma
Anode No. 4 Current	.02 ma
Anode No. 5 Current	.02 ma
Helix No. 1 Current)	
Helix No. 2 Current)	.03 ma
Capsule Current)	
Collector Current	1.7 ma
Magnetic Field	800 gauss

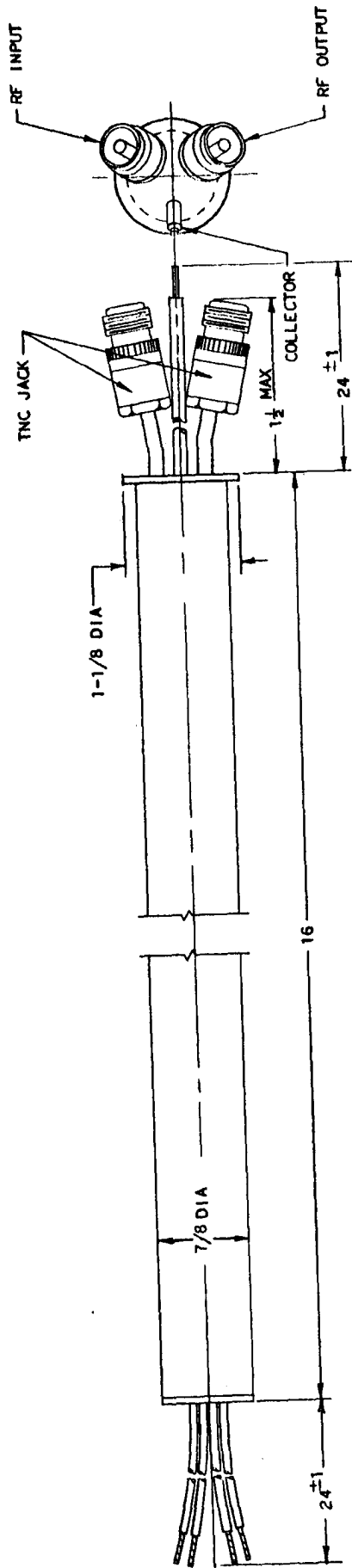
Additional information for specific applications can be obtained from the

Electron Tube Applications Section
ITT Components Division
P.O. Box 412
Clifton, New Jersey

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MAXIMUM WEIGHT
1 POUND

BACKWARD WAVE AMPLIFIER TYPE X-399

LEADS

HEATERS	- BROWN
CATHODE	- YELLOW
FOCUS	- GREEN
ANODE NO. 1	- BLUE
ANODE NO. 2	- GREY
ANODE NO. 3	- PURPLE
ANODE NO. 4	- WHITE
ANODE NO. 5	- GROUND-BLACK
AMPL. HELIX NO. 1	- RED
AMPL. HELIX NO. 2	- RED
COLLECTOR	- RED