



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

**X-401*
BACKWARD WAVE
AMPLIFIER
TUBE**

T E N T A T I V E

GENERAL CHARACTERISTICS

The X-401 is an X-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 8,000 to 12,700 megacycles.

The X-401 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	8,000 to 12,700 megacycles
Pass Band (3 db)	16-65 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 -1450	Volts maximum	
Cathode Current	4	ma maximum	
Focus Voltage	-10 to +10	Volts maximum)	
Anode No. 1 Voltage	5 to 100	Volts maximum)	with respect to cathode
Anode No. 2 Voltage	5 to 150	Volts maximum)	
Anode No. 3 Voltage	30 to 300	Volts maximum)	
Anode No. 4 Voltage	70 to 800	Volts maximum)	
Anode No. 5 Voltage)			
Helix No. 1 Voltage)			
Helix No. 2 Voltage)			
Capsule Voltage)			
Collector Voltage	250	Volts maximum	
Focus Current	.2	ma 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)	.3	ma maximum	
Capsule Current)			
Collector Current	4	ma maximum	
Solenoid Magnetic Field	1000	Gauss maximum	

Zero Volts (Ground)

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TYPICAL OPERATION

Frequency (Center of Pass Band)	10,000 megacycles
Pass Band (3 db)	40 megacycles
Small Signal Gain	25 db
Noise Figure	13 db
Heater Voltage	6.3 Vdc
Heater Current	1.9 Adc
Cathode Voltage	-650 Vdc with respect to ground
Cathode Current	2.0 ma
Focus Voltage	-8 Vdc)
Anode No. 1 Voltage	+20 Vdc)
Anode No. 2 Voltage	+18 Vdc)with respect to ground
Anode No. 3 Voltage	+80 Vdc)
Anode No. 4 Voltage	+230 Vdc)
Anode No. 5 Voltage)	
Helix No. 1 Voltage)	
Helix No. 2 Voltage)	
Capsule Voltage)	
Collector Voltage	200 Volts with respect to ground
Focus Current	0 ma
Anode No. 1 Current	.10 ma
Anode No. 2 Current	.03 ma
Anode No. 3 Current	.02 ma
Anode No. 4 Current	.02 ma
Anode No. 5 Current	.01 ma
Helix No. 1 Current)	
Helix No. 2 Current)	
Capsule Current)	
Collector Current	1.7 ma
Magnetic Field	900 Gauss

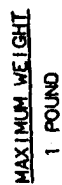
Additional information for specific applications can be obtained from the

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

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BACKWARD WAVE AMPLIFIER
TYPE X-401

HEATERS
CATHODE
FOCUS
ANODE NO. 1
ANODE NO. 2
ANODE NO. 3
ANODE NO. 4
ANODE NO. 5
AMPL. HELIX NO. 1
AMPL. HELIX NO. 2
COLLECTOR

- BROWN
- YELLOW
- GREEN
- BLUE
- GREY
- PURPLE
- WHITE
- GROUND-BLACK
- RED