

EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

TENTATIVE DATA

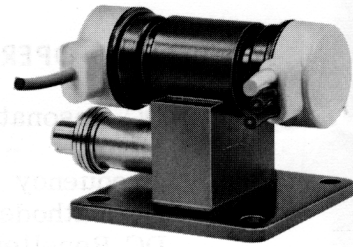
1K20XD-S

**X-BAND
REFLEX KLYSTRON**

The Eimac 1K20XD-S is a ceramic and metal, conduction-cooled reflex klystron designed for transmitter or local oscillator service in applications encountering severe vibration, shock or temperature extremes. This tube will deliver a typical output power of 120 milliwatts over the frequency range of 10,500 to 11,000 megacycles.

The stacked-ceramic construction results in an extremely rugged design and a low sensitivity to vibration.

Leads to the tube are permanently attached and protected by molded silastic rubber caps which permit operation at any altitude without flashover.



GENERAL CHARACTERISTICS

ELECTRICAL

Cathode:	Unipotential, oxide coated		
	Warm-up time	- - - - -	30 seconds
Heater:	Voltage	- - - - -	6.3 volts
	Current	- - - - -	1.0 ampere
Minimum Output Power (Load VSWR 1.15:1)		- - - - -	100 milliwatts
Frequency Range		- - - - -	10,500 to 11,000 megacycles

MECHANICAL

Operating Position	- - - - -	any
Mounting	- - - - -	UG-39/U waveguide flange
Cooling	- - - - -	conduction
Electrical Connections	- - - - -	flexible leads
RF Output Coupling	- - - - -	RG-52/U waveguide
Net Weight	- - - - -	4 ounces
Shipping Weight (Approximate)	- - - - -	2 pounds
Maximum Overall Dimensions:		
Height	- - - - -	1.50 inches
Width	- - - - -	1.63 inches
Length	- - - - -	2.50 inches

ENVIRONMENTAL

Maximum Ambient Temperature	- - - - -	150° C
Maximum Altitude	- - - - -	No limit
Maximum Non-Operating Shock* (11 ms Duration)	- - - - -	40 g
Maximum Operating Vibration** (20 to 2000 cps)	- - - - -	10 g
Maximum Operating Shock* (11 ms Duration)	- - - - -	40 g

*Based on a permanent frequency shift after drop of 2 megacycles.

**Based on a maximum peak-to-peak frequency deviation of 200 kilocycles.



MAXIMUM RATINGS

DC RESONATOR VOLTAGE*	- - - - -	450 MAX.	VOLTS
DC CATHODE CURRENT	- - - - -	45 MAX.	MA
RESONATOR DISSIPATION	- - - - -	25 MAX.	WATTS
PEAK REPELLER VOLTAGE*			
POSITIVE WITH RESPECT TO CATHODE	- - - -	0 MAX.	VOLTS
NEGATIVE WITH RESPECT TO CATHODE	- - - -	500 MAX.	VOLTS

TYPICAL OPERATION (Load VSWR less than 1.15:1)

DC Resonator Voltage*	- - - - -	400	volts
Mode	- - - - -	- - -	5-3/4
Frequency	- - - - -	10,750	megacycles
DC Cathode Current	- - - - -	40	milliamperes
DC Repeller Voltage*	- - - - -	-175	volts
DC Repeller Current	- - - - -	1	microampere
Power Output	- - - - -	120	milliwatts
Electronic Tuning (3 db bandwidth)	- - - - -	30	megacycles
Modulation Sensitivity ($\Delta E_r = \pm 3$ volts)	- - - - -	1.7	Mc/volt
Peak-to-Peak FM Deviation (10g, 20-2000 cps)	- - - - -	200	kilocycles
Residual FM	- - - - -	50	kilocycles

*All voltages referred to cathode.

APPLICATION

Cooling: At sea level this tube will not require forced air cooling when operated at its maximum rated dissipation with an ambient temperature less than 150° Centigrade. The waveguide flange connection will normally provide the required heat sink for conduction cooling. If an insulator is used between the tube and waveguide for DC isolation, forced air cooling may be required to maintain the ceramic-to-ceramic seal temperatures below the maximum rating of 250° Centigrade.

Resonator: The resonator of the 1K20XD-S is integral with the body of the klystron. For this reason it is often convenient to operate the resonator at chassis potential, with the repeller and cathode at appropriate negative potentials.

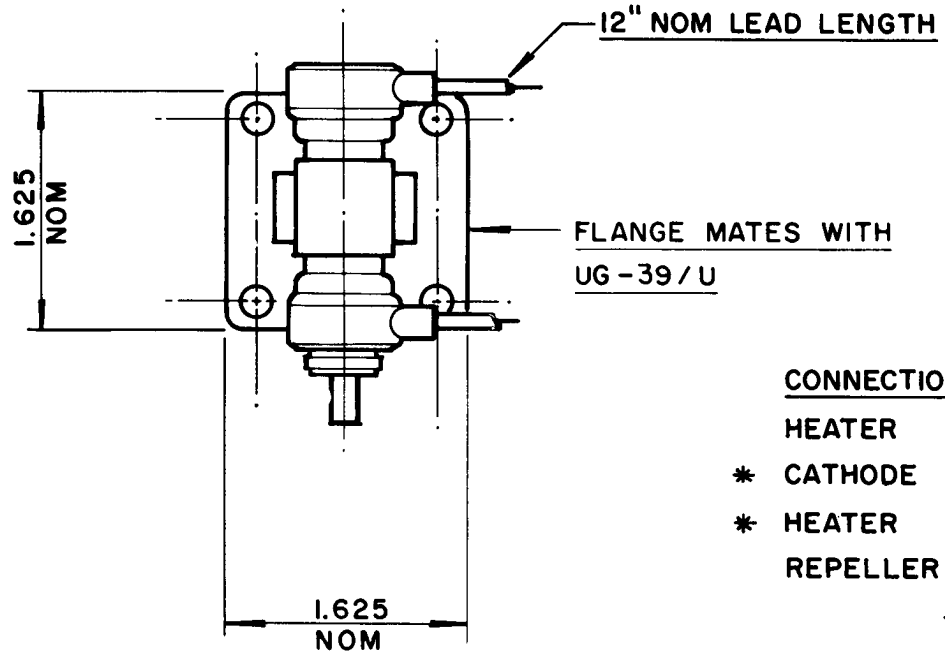
Cathode: The heater voltage should be maintained within $\pm 5\%$ of the rated value of 6.3 volts if variations in performance are to be minimized and the best tube life obtained.

The heater and cathode of the 1K20XD-S are internally connected. When the resonator of this tube is operated at chassis potential, the heater transformer must be insulated for the cathode-to-resonator voltage.

Mechanical Tuning: In the 1K20XD-S a fixed-tuned inner cavity is closely coupled through a ceramic window to a secondary cavity outside the vacuum. Mechanical tuning is accomplished by a capacitive slug in the secondary cavity with a tuning rate of approximately 150 megacycles per turn. This design allows repeated tuner cycling without damaging the vacuum seals. The maximum tuner torque is 40 inch-ounces.

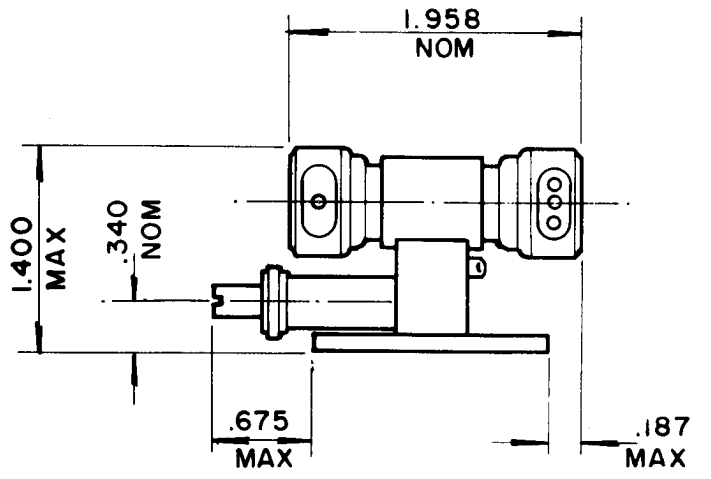
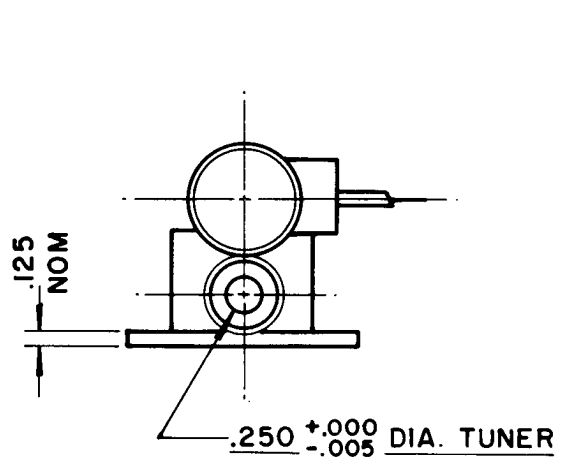
A clockwise rotation of the tuner will produce a decrease in frequency.

1K20XD-S



CONNECTIONS

- HEATER
 - * CATHODE
 - * HEATER
 - REPELLER
- * INTERNALLY CONNECTED





1K20XD-S TYPICAL OPERATING CHARACTERISTICS

Ers = 400 Vdc

Ik = 40 mA dc

5³/₄ MODE

