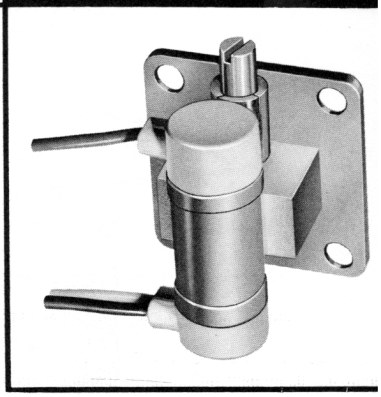
EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

TENTATIVE DATA

1K20XK

X-BAND
REFLEX KLYSTRON



The Eimac 1K20XK is a ceramic and metal, conduction-cooled reflex klystron designed for local oscillator service in applications encountering severe vibration, shock or temperature extremes. This tube will deliver a typical output power of 75 milliwatts over the frequency range of 9200 to 10,000 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	0.8 ampere
Typical Output Power (Load VSWR = 1.15:1)	75 milliwatts
Frequency Range	9200 to 10,000 megacycles

MECHANICAL

Operating Position	Any
Mounting	UG-39/U waveguide flange
Cooling	Conduction
Electrical Connections	Flexible leads
R-F Output Coupling	RG-52/U waveguide
Net Weight	4 ounces
Shipping Weight (Approximate)	2 pounds
Maximum Overall Dimensions:	
Height	1.40 inches
Width	1.63 inches
Length	2.28 inches

ENVIRONMENTAL

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

*Based on a permanent frequency shift after drop of 2 megacycles.
**Based on a maximum peak-to-peak frequency deviation of 100 kilocycles.

MAXIMUM RATINGS

DC RESONATOR VOLTAGE*	350 MAX. VOLTS
D-C CATHODE CURRENT	55 MAX. MA.
RESONATOR DISSIPATION	20 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 to 1)

D-C Resonator Voltage*	300	350	volts
Mode	5¾	5¾	
Frequency	9600	9600	megacycles
D-C Cathode Current	40	50	milliamperes
D-C Repeller Voltage*	−170	−155	volts
D-C Repeller Current	1	1	microampere
Power Output	70	90	milliwatts
Electronic Tuning (3 db bandwidth)	35	35	megacycles
Modulation Sensitivity ($\Delta E_r = \pm 3$ volts)	1.7	1.7	Mc/volt
Peak-to-Peak FM Deviation (10g, 20-2000 cps)	50	50	kilocycles
Residual FM	50	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 D-C isolation, forced-air cooling may be required to maintain the ceramic-to-metal seal temperatures below the maximum rating of 250° Centigrade.

Resonator: The resonator of the 1K20XK 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 ±5% of the rated value of 6.3 volts if variations in performance are to be minimized and best tube life obtained.

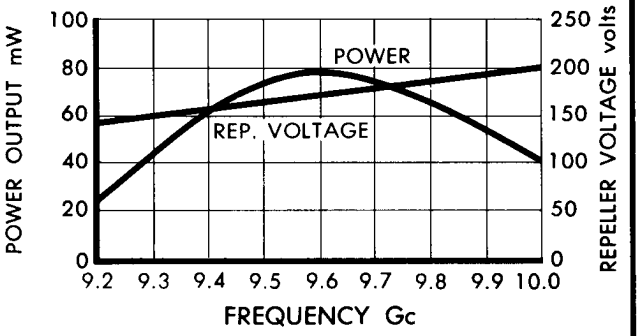
The heater and cathode of the 1K20XK are internally connected. When the resonator of this tube is operated at chassis potential, the heater transformer must be insulated for the cathode-to-resonator voltage.

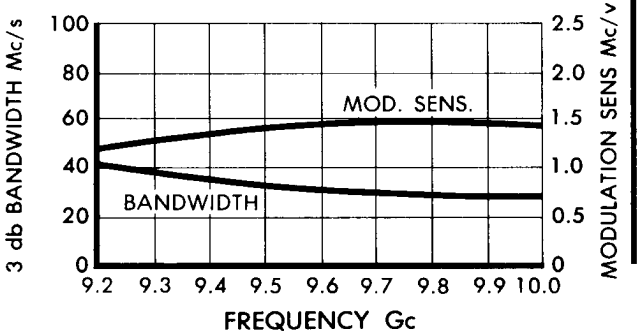
Mechanical Tuning: In the 1K20XK a fixed-tuned inner cavity is closely coupled through a ceramic window to a secondary cavity outside the vacuum. Mechanical tuning is accomplished by a capacitive slug in the secondary cavity with a tuning rate of approximately 150 megacycles per turn. This design allows 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.

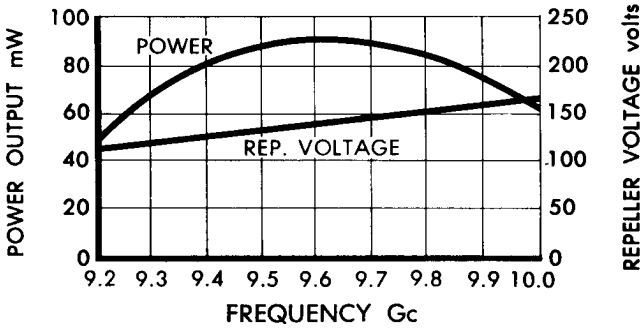
IK20XK TYPICAL OPERATING CHARACTERISTICS

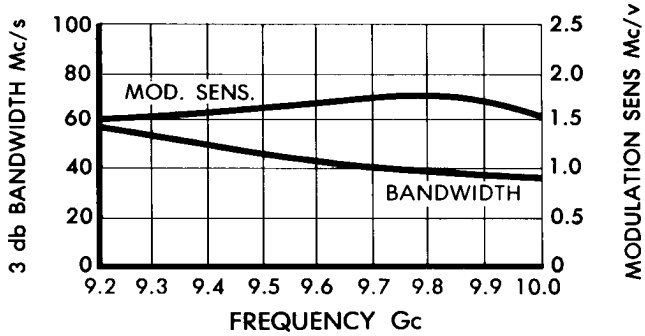
E_{RS} = 350 Vdc
I_K = 50 mAdc
5¾ MODE



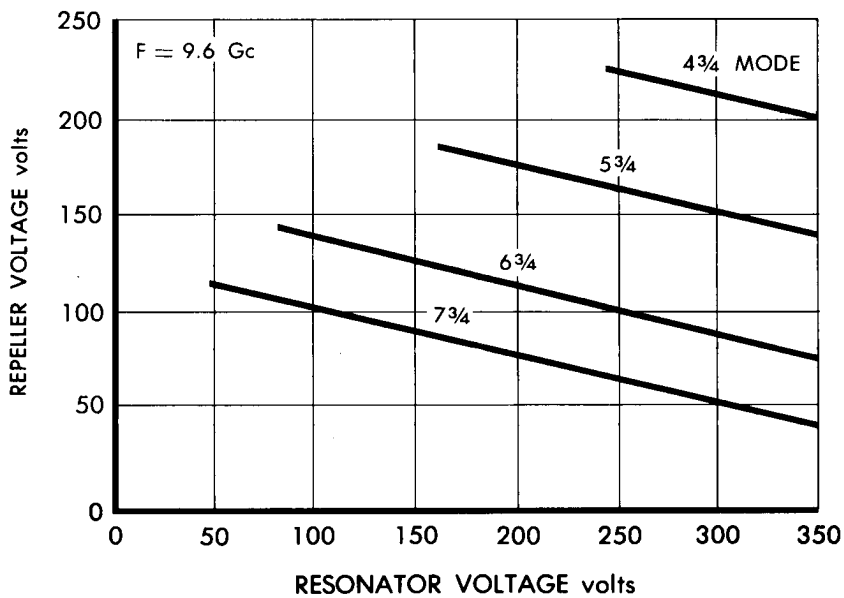


E_{RS} = 300 Vdc
I_K = 40 mAdc
5¾ MODE

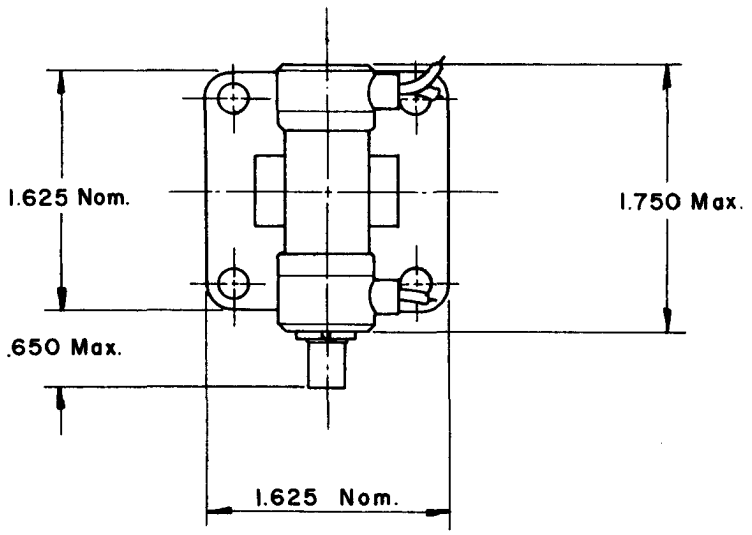




MODE CHARACTERISTICS

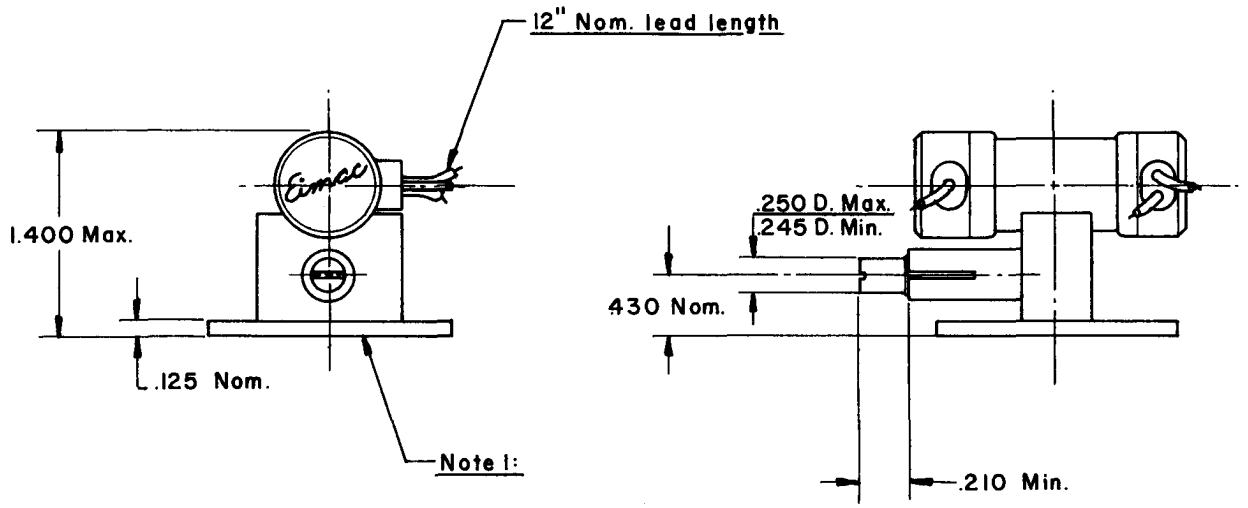


1K20 XK



NOTE:

1. Mates with UG-39/U flange for RG-52/U waveguide

CONNECTIONS

1. REPELLER - RED
2. CATHODE - BLACK
3. HEATER - WHITE