

**EITEL-McCULLOUGH, INC.**  
SAN CARLOS, CALIFORNIA

TENTATIVE DATA

**X-1084**

UHF  
PACKAGED

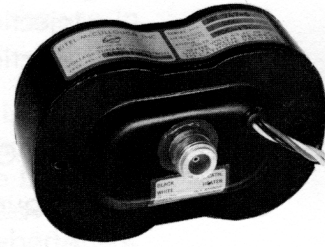
VOLTAGE TUNABLE  
MAGNETRON

The Eimac X-1084 is a ruggedized, ceramic and metal packaged voltage-tunable magnetron capable of delivering a minimum output power of 30 milliwatts into a 50-ohm termination over the frequency range of 300 to 600 megacycles.

The electron injection design incorporated in this magnetron minimizes back-bombardment of the indirectly heated EMA cathode with resultant long life. This design also reduces output power variation across the tuning range by limiting the cathode current variation resulting from anode voltage changes.

The extremely linear tuning characteristic of this magnetron simplifies programming and frequency sweep, by eliminating the complicated compensating networks required by other voltage tunable oscillators. In addition, the injection anode may be programmed to provide some leveling action on the output power during the frequency sweep.

The X-1084 circuit assembly has been designed for use with this tube to cover the specified frequency range and includes the permanent magnet and rf circuitry. Electrical connections to the tube are completed by means of flexible leads.



**GENERAL CHARACTERISTICS**

**ELECTRICAL**

Cathode: Unipotential, EMA	
Warm-up time . . . . .	60 seconds
Heater: Voltage (AC or DC) . . . . .	6.3 volts
Current . . . . .	.8 ampere
Minimum Output Power . . . . .	30 milliwatts
Frequency Range . . . . .	300 to 600 megacycles

**MECHANICAL**

Operating Position . . . . .	any
Cooling . . . . .	conduction
Electrical Connections . . . . .	flexible leads
RF Output Coupling . . . . .	TNC Female
Net Weight, including magnet and circuit . . . . .	3.2
Shipping Weight . . . . .	10 lbs.
Maximum Overall Dimensions (Magnet and Circuit):	
Height . . . . .	3 inches
Width . . . . .	2 inches
Length . . . . .	4½ inches



MAXIMUM RATINGS

Anode Voltage* . . . . .	1800 volts
Cathode Current . . . . .	10 milliamperes
Dissipation . . . . .	18 watts
Injection Anode Voltage* . . . . .	+ 500 volts
Injection Anode Current . . . . .	.5 milliamperes

TYPICAL OPERATION (Load VSWR = 1.15:1)

Frequency Range . . . . .	300	600 megacycles
Anode Voltage* (Note 1) . . . . .	800	1550 volts
Cathode Current . . . . .	1	3 milliamperes
Typical Power Output . . . . .	50	200 milliwatts
Anode FM Sensitivity . . . . .		.40 Mc/volt
Injection Anode Voltage . . . . .		200 volts
Injection Anode Current . . . . .		0.05 milliamperes
Heater Voltage (AC) . . . . .		6.3 volts
Heater Current (AC) . . . . .		0.8 amperes

\*All voltages referred to the cathode.

Note 1. The operating frequency is determined by the Anode Voltage.

**Anode:** The operating frequency is determined by the anode voltage. The anode is mounted in direct electrical contact with the external circuit. Therefore, it is often convenient to operate the anode at chassis potential, with the cathode and the injection anode at appropriate negative potentials.

**Cathode:** The cathode and one leg of the heater are internally connected. Therefore, the heater supply must be insulated for the maximum tuning voltage.

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. Either alternating or direct current may be used to energize the X-1084 heater in most applications as a result of the advanced counter-wound helical heater package. In applications where residual FM at the power supply frequency must be held to an absolute minimum, it is recommended that direct current be used for the heater.

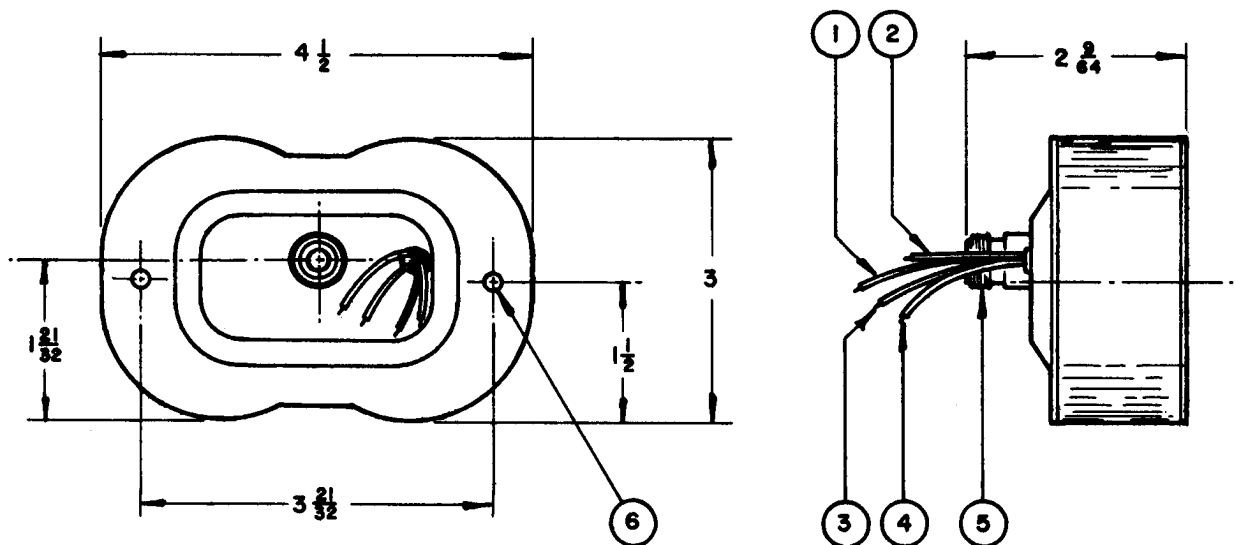
**Proximity of Ferrous Materials:** To minimize variations in performance, ferrous materials should be kept at least 6 inches from the magnetron package. Modulation of the tube may be produced by rotating ferrous materials and such parts as fans, shafts and couplings should be placed as far from the magnetron package as possible. Transformers and chokes should not be placed in such close proximity to the tube that their stray magnetic fields will interfere with the magnetron operation.



**Temperature Stability:** The permanent magnet for the X-1084 has been temperature stabilized to minimize frequency changes caused by variations in the ambient temperature. The temperature/frequency coefficient for the X-1084 package is typically .008 of the operating frequency per degree Centigrade. Thus, for an operating frequency of 500 megacycles, the temperature/frequency coefficient is typically 40 kilocycles per degree Centigrade. A positive change in temperature will always produce a positive change in frequency.

**Linearity:** The voltage/magnetic-field/frequency relationship of a magnetron is theoretically linear and this linearity is observed in practical tubes. The frequency versus tuning voltage curve for the X-1084 is a straight line with a positive slope and may be easily programmed for the desired frequency sweep. Tests of the fine grain linearity curve show a deviation from a straight line of approximately 3-5 parts per thousand over a 20 megacycle bandwidth.

**Special Applications:** For any additional information concerning this tube or its application, write to Microwave Product Manager, Eitel-McCullough, Inc., San Carlos, California, telephone LYtell 1-1451, Cable: EIMAC.



6	3/16 DIA. MOUNTING HOLES (2) REQ'D
5	FEMALE TNC CONNECTOR
4	GROUND LEAD (GREEN)
3	HEATER LEAD (WHITE)
2	HEATER CATHODE LEAD (BLACK)
1	INJECTION ANODE LEAD (YELLOW)

