

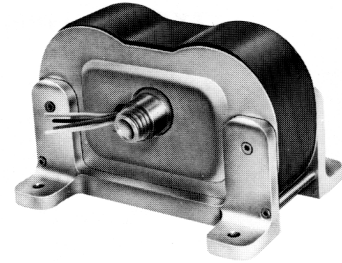
EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

TENTATIVE DATA
X-1081
L-BAND
PACKAGED
VOLTAGE
TUNABLE
MAGNETRON

The Eimac X-1081 is a ruggedized, ceramic and metal, packaged voltage-tunable magnetron capable of delivering a minimum output power of 10 watts into a 50-ohm termination over the frequency range of 900-1200 megacycles.

Eimac's three terminal VTM circuit has been used in this tube to give a more uniform output circuit with the added advantage of one third more heat dissipating area extending out of the VTM envelope.

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 characterizing of this magnetron simplifies programming the frequency sweep, by eliminating the complicated compensating networks required by other voltage tunable oscillators.

The X-1081 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 - - - - - | 30 | seconds |
| Heater: | Voltage (AC or DC) - - - - - | 6.3 | volts |
| | Current - - - - - | 1.0 | ampere |
| Minimum Output Power | - - - - - | 10 | watts |
| Frequency Range | - - - - - | 900 to 1200 | megacycles |

MECHANICAL

| | | | |
|--------------------------------------------------|-----------|-----------|-----------------------|
| Operating Position | - - - - - | - - - - - | any |
| Cooling | - - - - - | - - - - - | forced air |
| Electrical Connections | - - - - - | - - - - - | flexible leads |
| RF Output Coupling | - - - - - | - - - - - | Type N, or TNC female |
| Net Weight, including magnet and circuit: | - - - - - | - - - - - | 3.2 pounds |
| Shipping Weight | - - - - - | - - - - - | 10 pounds |
| Maximum Overall Dimensions (Magnet and Circuit): | | | |
| Height | - - - - - | - - - - - | 3 inches |
| Width- | - - - - - | - - - - - | 3-3/8 inches |
| Length | - - - - - | - - - - - | 4-1/2 inches |

MAXIMUM RATINGS

| | | | |
|--------------------------|-----------|------|--------------|
| Anode Voltage* | - - - - - | 2400 | volts |
| Cathode Current- | - - - - - | 30 | milliamperes |
| Injection Anode Voltage* | - - - - - | 800 | volts |
| Injection Anode Current | - - - - - | 1 | milliampere |

TYPICAL OPERATION (X-1081 Circuit Assembly, Load VSWR = 1.15:1)

| | | | | |
|-------------------------|-----------|------|------|--------------|
| Frequency Range | - - - - - | 900 | 1200 | megacycles |
| Anode Voltage* (Note 1) | - - - - - | 1800 | 2380 | volts |
| Cathode Current- | - - - - - | 15 | 18 | milliamperes |
| Typical Power Output | - - - - - | 10 | 12 | watts |
| Anode FM Sensitivity | - - - - - | | .55 | Mc/volt |
| Injection Anode Voltage | - - - - - | | 400 | volts |
| Injection Anode Current | - - - - - | | 0.5 | milliampere |
| Heater Voltage (AC) | - - - - - | | 6.3 | volts |
| Heater Current (AC) | - - - - - | | 0.8 | ampere |

*All voltages referred to the cathode.

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

APPLICATION

Cooling: To insure long life and best operation, sufficient cooling air is required to maintain the magnet temperature below 70° C.

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 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-1081 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.

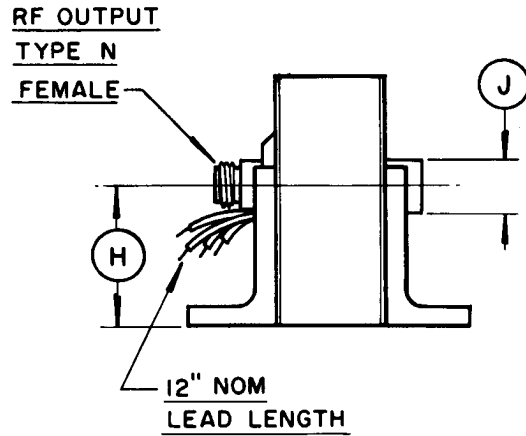
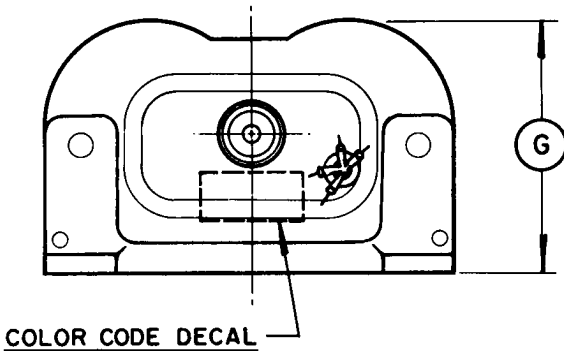
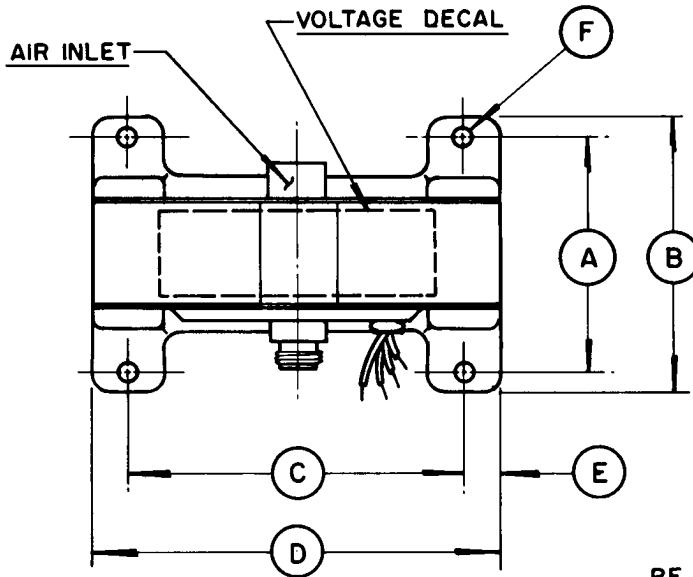
Temperature Stability: The permanent magnet for the X-1081 has been temperature stabilized to minimize frequency changes caused by variations in the ambient temperature. The temperature/frequency coefficient for the X-1081 package is typically .02% of the operating frequency per degree Centigrade. Thus, for an operating frequency of 1000 megacycles, the temperature/frequency coefficient is typically 200 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 tube. The frequency versus tuning voltage curve for the X-1081 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.

DIMENSIONS IN INCHES
DIMENSIONAL DATA

| REF. | MIN. | MAX. | NOM. |
|------|-------|-------|---------|
| A | | | 2.875 |
| B | | | 3.375 |
| C | 3.980 | 4.010 | |
| D | | | 4.875 |
| E | | | .437 |
| F | | | .196 D. |
| G | | 3.031 | |
| H | | | 1.656 |
| J | | | .680 D. |
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CONNECTIONS

- GROUND - GREEN
- HEATER - WHITE
- HEATER CATHODE - BLACK
- INJECTION ANODE - YELLOW

X1081 VTM

