### GENERAL DATA

**Electrical:**
- Heater, for Unipotential Cathode:
  - Voltage: 10 ± 10% ac or dc volts
  - Current: 3.2 amp
  - Starting current: The maximum instantaneous starting current must never exceed 12 amperes, even momentarily.
- Minimum Cathode Heating Time: 5 minutes
- Frequency: 5400 ± 20 Mc
- Maximum Frequency Pulling at VSWR of 1.5/1: 10 Mc
- Maximum Frequency Change with Anode Temperature Change (After warmup): 0.15 Mc/°C

**Mechanical:**
- Dimensions and Terminal Connections: See Dimensional Outline

### Connector (For heater terminal and heater-cathode terminal)...
- UCINITE® No. 115364 with built-in capacitor, or equivalent

### Mounting Position...
- Any

### Air Flow:
- To Fins—An air stream should be directed along the cooling fins toward the body of the tube. The stream may be obtained from a rectangular nozzle about 3" x 1-1/2" located so that the plane through the 3" side is parallel with the plane of a cooling fin and so that the nozzle is centered on the body of the tube. Adequate flow should be provided so that the temperature of the anode block does not exceed 150°C.
- To Heater-Cathode Terminal—Adequate flow should be provided to maintain the temperature of the heater-cathode terminal below 165°C.

### Weight (Approx.)...
- 11-1/2 lbs

### PULSED OSCILLATOR SERVICE

**Maximum and Minimum Ratings, Absolute Values:**
- For Duty Cycle of 0.001 max.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEAK ANODE VOLTAGE</td>
<td>16 max. kv</td>
</tr>
<tr>
<td>PEAK ANODE CURRENT</td>
<td>(16 max. amp, 10 min. amp)</td>
</tr>
<tr>
<td>PEAK POWER INPUT*</td>
<td>256 max. kw</td>
</tr>
</tbody>
</table>

* Manufactured by UCINITE Division of United-Carr Fastener Corporation, Newtonville, Massachusetts.

* For atmospheric pressures greater than 40 centimeters of mercury at 25°C. Operation at pressures lower than 40 centimeters of mercury (altitudes higher than 16000 feet) may result in arcover with consequent damage to the tube.

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**MAY 1, 1955**

**TUBE DIVISION**

**RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY**

**TENTATIVE DATA 1**
MAGNETRON

AVERAGE POWER INPUT ........................................ 0.256 max. kw
PULSE DURATION ........................................ 2.2 max. μsec
OPERATION TIME IN ANY
100-MICROSECOND INTERVAL ................................ 5 max. μsec
RATE OF RISE OF VOLTAGE PULSE .......................... {120 max. kv/μsec
                                                  (80 min. kv/μsec
ANODE BLOCK TEMPERATURE ................................ 150 max.
HEATER-CATHODE TERMINAL TEMPERATURE .................. 165 max. °C
LOAD VOLTAGE STANDING-WAVE RATIO ...................... 1.5 max.

Typical Operation with Load Voltage Standing-Wave Ratio Equal To or Less Than 1.05

With Duty Cycle of 0.0008

Heater Voltage ........................................... See Operating Considerations
Magnetic Field ............................................. Supplied by permanent magnet
                       integral with tube
Peak Anode Voltage (Approx.) ........................... 15 kv
Peak Anode Current .................... 13.5 amp
Pulse Repetition Rate .................... 400 cps
Pulse Duration ........................................ 2 μsec
Maximum RF Bandwidth .................... 1.5 Mc
Peak Power Output ....................................... 85 kw

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

<table>
<thead>
<tr>
<th>Note</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td>1</td>
<td>2.8</td>
</tr>
<tr>
<td>Peak Anode Voltage</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Peak Power Output</td>
<td>2, 3</td>
<td>75</td>
</tr>
<tr>
<td>Pulses Missing From Total</td>
<td>2, 4</td>
<td>–</td>
</tr>
</tbody>
</table>

Note 1: With 10.0 volts ac on heater.
Note 2: With peak anode current of 13.5 amperes, and heater voltage reduced to 9.1 volts.
Note 3: With peak anode voltage of approximately 15 kilovolts, anode block temperature of approximately 100°C, and maximum VSWR equal to or less than 1.05.
Note 4: Pulses are considered to be missing if the energy level at the operating frequency is less than 70 per cent of the normal value at a VSWR of 1.5, and with VSWR phase adjusted to produce maximum instability.

OPERATING CONSIDERATIONS

The waveguide output flange is designed for use with a standard 1" x 2" rectangular waveguide such as that designated by RETMA as WR 187, or that having the JAN designation RG-49/U, and mates with flanges such as Airtron® No. B54626 or equivalent.

It is essential that the input circuit be designed so that if arcing occurs the energy per pulse delivered to the tube cannot greatly exceed the normal energy per pulse. To satisfy this requirement, it is recommended that pulser of the discharging-network type be used.

* Manufactured by Airtron, Inc., Linden, N. J.

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As soon as the 6521 begins to oscillate, the heater voltage should be reduced to 9.1 volts when it is operated under the typical operating conditions shown in the tabulated data. For other operating conditions, the heater voltage \( E_f \) should be reduced depending on the average power input \( P_i \) to the tube as follows:

<table>
<thead>
<tr>
<th>( P_i ) (watts)</th>
<th>( E_f ) (volts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 90</td>
<td>10.0</td>
</tr>
<tr>
<td>90 to 130</td>
<td>9.9</td>
</tr>
<tr>
<td>130 to 180</td>
<td>9.5</td>
</tr>
<tr>
<td>180 to 220</td>
<td>9.1</td>
</tr>
<tr>
<td>220 to 256</td>
<td>8.9</td>
</tr>
</tbody>
</table>
Reference plane I is defined as that plane against which the waveguide output flange abuts.

Reference plane II is defined as that plane perpendicular to reference plane I and touching the surface of the flange for alternate mounting.

Reference plane III is defined as that plane perpendicular to reference plane I and passing through the exact centers of holes 'A' and 'B'.

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NOTE 1: The axis of the heater-cathode terminal will be within the confines of a cylinder whose radius is 3/64" and whose axis is perpendicular to reference plane II at the specified location.

NOTE 2: When resting on a smooth surface, this flange surface shall have a flatness such that a 0.050" thickness gauge 1/8" wide shall not enter between the two surfaces, and it shall be perpendicular to reference plane I within ± 2°.

NOTE 3: The tolerances include angular as well as lateral deviations.

NOTE 4: With the waveguide output flange resting on a plane surface, a 0.005" thickness gauge 1/8" wide shall not enter between the two surfaces.

NOTE 5: No part of the tube support fastened to the flange for alternate mounting should extend within the surface of a cylinder whose radius is 3/4" and whose axis is perpendicular to reference plane II at the specified location.

NOTE 6: These dimensions define extremities of the 0.169" internal diameter of the cylindrical heater terminal.

NOTE 7: These dimensions define extremities of the 0.540" internal diameter of the cylindrical heater-cathode terminal.

NOTE 8: No part of the connector device for the heater and heater-cathode terminals should bear against the underside of this lip.

NOTE 9: The heater terminal and heater-cathode terminal are concentric within 0.010".

NOTE 10: Connection to the anode may be made through the mounting bosses, the flange for alternate mounting, or the waveguide output flange.
TYPICAL STABILIZATION CHARACTERISTICS

ANODE VOLTS (APPROX.) = 15000
PEAK ANODE AMPERES = 13.5
PULSE DURATION: 2 MICROSECONDS
PULSE REPETITION RATE: 400 PPS
CATHODE WARMUP TIME: 5 MINUTES

ANODE TEMPERATURE — °C

FREQUENCY—Mc
TUBE DIVISION

FEB. 4, 1955
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8527
FREQUENCY: 5400 Mc

RECOMMENDED OPERATING REGION

VOLTAGE STANDING-WAVE RATIO

LINE LENGTH FEET

FEB. 4, 1955
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6528