UHF MEDIUM-MU TRIODE
"PENCIL TYPE" WITH EXTERNAL PLATE RADIATOR

GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
Voltage (AC or DC):
Under Transmitting Conditions ..... 6.0 ± 10% volts
Under Standby Conditions ..... 6.3 max. volts
Current at 6.0 Volts ..... 0.280 amp
Amplification Factor ..... 27
Transconductance, for dc plate current of
27 milliamperes and dc plate voltage
of 200 volts ..... 7000 µmhos
Direct Interelectrode Capacitances:
With External Shield Without External Shield
Grid to Plate ..... 1.5 1.7 µF
Grid to Cathode ..... 2.9 µF
Plate to Cathode ..... 0.08 max. µF

Mechanical:
Terminal Connections:
H: Heater
K: Cathode Cylinder
(Adjacent to heater lead terminals)
G: Grid Flange
(P: Plate Cylinder
(Between glass sections)
(With integral radiator)
Mounting Position
Dimensions and Terminal Connections
Radiator
Cooling:
In many applications, the 6263 does not require forced-air cooling.
The radiator in combination with a connector having adequate heat
conduction capability will generally provide adequate cooling under
conditions of free circulation of air. The cooling must be sufficient
to limit the plate-seal temperature to 175°C. When conditions do
not provide adequate circulation of air, provision should be made to
direct a blast of cooling air from a small blower through the radi-
tor fins. The quantity of air should be sufficient to limit the
plate-seal temperature to 175°C. See curves.
Incoming Air Temperature ..... 40 max. °C
Plate-Seal Temperature (Measured
on Plate Seal) ..... 175 max. °C
Weight (Approx.) ..... 24 grams (0.85 oz)
Socket for Heater Leads : Cinch No. 54A16325, or equivalent

A flat plate shield 1-1/4" diameter located parallel to the plane of the
grid flange and midway between the grid flange and the radiator plate
terminal. The shield is tied to the cathode.

MARCH 1, 1954 TUBE DEPARTMENT TENTATIVE DATA 1
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without amplitude modulation

Maximum Ratings, Absolute Values:

For Pressures down to 46 mm of Hg

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CCS#</th>
<th>ICAS##</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC PLATE VOLTAGE</td>
<td>330 max.</td>
<td>400 max. volts</td>
</tr>
<tr>
<td>DC GRID VOLTAGE</td>
<td>-100 max.</td>
<td>-100 max. volts</td>
</tr>
<tr>
<td>DC PLATE CURRENT</td>
<td>40 max.</td>
<td>55 max. ma</td>
</tr>
<tr>
<td>DC GRID CURRENT</td>
<td>25 max.</td>
<td>25 max. ma</td>
</tr>
<tr>
<td>DC CATHODE CURRENT</td>
<td>55 max.</td>
<td>70 max. ma</td>
</tr>
<tr>
<td>PLATE INPUT</td>
<td>13 max.</td>
<td>22 max. watts</td>
</tr>
<tr>
<td>PLATE DISSIPATION</td>
<td>8 max.</td>
<td>13 max. watts</td>
</tr>
<tr>
<td>PEAK HEATER—CATHODE VOLTAGE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater negative with respect to cathode</td>
<td>90 max.</td>
<td>90 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>90 max.</td>
<td>90 max. volts</td>
</tr>
</tbody>
</table>

Typical Operation as Oscillator in Cathode-Drive

Circuit at 500 Mc:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plate Voltage</td>
<td>300</td>
</tr>
<tr>
<td>DC Grid Voltage</td>
<td>-30</td>
</tr>
<tr>
<td>DC Plate Current</td>
<td>35</td>
</tr>
<tr>
<td>DC Grid Current (Approx.)</td>
<td>11</td>
</tr>
<tr>
<td>Usefull Power Output (Approx.)</td>
<td>5</td>
</tr>
</tbody>
</table>

Typical Operation as RF Power Amplifier in Cathode-Drive

Circuit at 500 Mc:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Plate Voltage</td>
<td>300</td>
</tr>
<tr>
<td>DC Grid Voltage</td>
<td>-48</td>
</tr>
<tr>
<td>DC Plate Current</td>
<td>35</td>
</tr>
<tr>
<td>DC Grid Current (Approx.)</td>
<td>13</td>
</tr>
<tr>
<td>Driver Power Output (Approx.)</td>
<td>2.2</td>
</tr>
<tr>
<td>Usefull Power Output (Approx.)</td>
<td>7</td>
</tr>
</tbody>
</table>

Maximum Circuit Values (CCS or ICAS Conditions):

Grid—Circuit Resistance .... 0.1 max. megohm

PLATE-MODULATED RF POWER AMPLIFIER - Class C Telegraphy

Carrier conditions per tube for use with a max. modulation factor of 1.0

Maximum Ratings, Absolute Values:

For Pressures down to 46 mm of Hg

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC PLATE VOLTAGE</td>
<td>275 max.</td>
</tr>
</tbody>
</table>

Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

See next page.
### DC GRID VOLTAGE
-100 max. -100 max. volts

### DC PLATE CURRENT
33 max. 46 max. ma

### DC GRID CURRENT
25 max. 25 max. ma

### DC CATHODE CURRENT
50 max. 60 max. ma

### PLATE INPUT
9 max. 15 max. watts

### PLATE DISSIPATION
5.5 max. 9 max. watts

#### PEAK HEATER-CATHODE VOLTAGE:
- Heater negative with respect to cathode: 90 max. 90 max. volts
- Heater positive with respect to cathode: 90 max. 90 max. volts

#### Typical Operation in Cathode-Drive Circuit at 500 Mc:
- DC Plate Voltage: 275 320 volts
- DC Grid Voltage: -42 -52 volts
- DC Plate Current: 35 35 ma
- DC Grid Current (Approx.): 13 12 ma
- Driver Power Output (Approx.): 2 2.4 watts
- Useful Power Output (Approx.): 6.7* 8* watts

#### Maximum Circuit Values (CCS or ICAS Conditions):
- Grid-Circuit Resistance: 0.1 max. megohm

### CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Note</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td>1</td>
<td>0.260</td>
<td>0.300</td>
</tr>
<tr>
<td>Grid-to-Plate Capacitance</td>
<td>-</td>
<td>1.45</td>
<td>1.95</td>
</tr>
<tr>
<td>Grid-to-Cathode Capacitance</td>
<td>-</td>
<td>2.45</td>
<td>3.35</td>
</tr>
<tr>
<td>Plate-to-Cathode Capacitance</td>
<td>-</td>
<td>-</td>
<td>0.08</td>
</tr>
<tr>
<td>Plate Current</td>
<td>1,2</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Transconductance</td>
<td>1,2</td>
<td>5600</td>
<td>8400</td>
</tr>
<tr>
<td>Useful Power Output</td>
<td>3,4</td>
<td>6.5</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note 1:** With 6.0 volts ac or dc on heater.
**Note 2:** With dc plate voltage of 200 volts, cathode resistor of 100 ± 1% ohms, and cathode bypass capacitor of 1000 µF.
**Note 3:** With 5.4 volts ac or dc on heater.
**Note 4:** With dc plate voltage of 350 volts, grid resistor adjusted to give a dc plate current of 50 milliamperes in a cavity-type oscillator operating at 500 megacycles per second and having an efficiency of about 75 percent.

**"** Corresponds to altitude of about 60000 feet.

# Continuous Commercial Service.
## Intermittent Commercial and Amateur Service.

- From a grid resistor, or from a suitable combination of grid resistor and fixed supply or grid resistor and cathode resistor.
- This value of useful power is measured at load of output circuit having an efficiency of about 75 percent.
Operating Frequency

The 6263 can be operated as an rf power amplifier and oscillator with full ratings at frequencies up to 500 megacycles per second and with reduced ratings at frequencies as high as 1700 megacycles per second.

NOTE 1: MAX. ECCENTRICITY OF \( \phi \) (AXIS) OF RADIATOR-CORE CAP OR GRID-TERMINAL FLANGE WITH RESPECT TO THE \( \phi \) (AXIS) OF THE CATHODE TERMINAL IS 0.015".
NOTE 2: TILT OF PLATE-TERMINAL FIN OF RADIATOR WITH RESPECT TO ROTATIONAL AXIS OF CATHODE CYLINDER IS DETERMINED BY CHUCKING THE CATHODE TERMINAL, ROTATING THE TUBE, AND GAUGING THE TOTAL TRAVEL DISTANCE OF THE PLATE-TERMINAL FIN PARALLEL TO THE AXIS AT A POINT APPROXIMATELY 0.020" INWARD FROM THE STRAIGHT EDGE OF THE PLATE-TERMINAL FIN FOR ONE COMPLETE ROTATION. THE TOTAL TRAVEL DISTANCE WILL NOT EXCEED 0.035".

NOTE 3: TILT OF GRID-TERMINAL FLANGE WITH RESPECT TO ROTATIONAL AXIS OF CATHODE TERMINAL IS DETERMINED BY CHUCKING THE CATHODE TERMINAL, ROTATING THE TUBE, AND GAUGING THE TOTAL TRAVEL DISTANCE OF THE GRID-TERMINAL FLANGE PARALLEL TO THE AXIS AT A POINT APPROXIMATELY 0.020" INWARD FROM ITS EDGE FOR ONE COMPLETE ROTATION. THE TOTAL TRAVEL DISTANCE WILL NOT EXCEED 0.025".

COOLING REQUIREMENTS

$E_p = 6.0 \text{ VOLTS}$

MAX. PLATE-SEAL TEMPERATURE = 175°C
CURVES WERE TAKEN WITH AIR FLOW DIRECTED
AS SHOWN ON SKETCH

AIR DUCT
OPENING
$\frac{1}{32}'' \times \frac{1}{32}''$

MAX. ALLOWABLE
TEMPERATURE RISE WITH
INCOMING-AIR TEMP. OF 40°C

<table>
<thead>
<tr>
<th>PLATE DISSIPATION-WATTS</th>
<th>PLATE-SEAL TEMPERATURE RISE ABOVE INCOMING-AIR TEMPERATURE-°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>120</td>
</tr>
</tbody>
</table>

OCT. 13, 1953
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-8120
AVERAGE CONSTANT-CURRENT CHARACTERISTICS

$E_g = 6.0$ VOLTS
$I_c =$GRID MILLIAMPERES.
$I_b =$PLATE MILLIAMPERES

GRID VOLTS ($E_g$) vs. PLATE VOLTS ($E_b$)