**6A28**

**MEDIUM-MU TRIODE—**

**SEMIREMOTE-CUTOFF PENTODE**

**9-PIN MINIATURE TYPE**

### GENERAL DATA

**Electrical:**

Heater, for Unipotential Cathodes:
- Voltage: 6.3 ac or dc volts
- Current: 0.45 amp

Direct Interelectrode Capacitances:

**Triode Unit:**
- Grid to plate: 1.7 µf
- Grid to cathode, internal shield & heater: 2 µf
- Plate to cathode, internal shield & heater: 1.7 µf

**Pentode Unit:**
- Grid No.1 to plate: 0.02 µf
- Grid No.1 to cathode, grid No.2, grid No.3 & internal shield & heater: 6.5 µf
- Plate to cathode, grid No.2, grid No.3 & internal shield & heater: 2.2 µf
- Triode grid to pentode plate: 0.027 max. µf
- Pentode grid No.1 to triode plate: 0.020 max. µf
- Pentode plate to triode plate: 0.045 max. µf

### Characteristics, Class A₁ Amplifier:

<table>
<thead>
<tr>
<th></th>
<th>Triode Unit</th>
<th>Pentode Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Supply Voltage</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Grid-No.2 Supply Voltage</td>
<td>-</td>
<td>150</td>
</tr>
<tr>
<td>Grid-No.1 Voltage</td>
<td>-6</td>
<td>-</td>
</tr>
<tr>
<td>Cathode-Bias Resistor</td>
<td>-</td>
<td>180</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>19</td>
<td>-</td>
</tr>
<tr>
<td>Plate Resistance (Approx.)</td>
<td>5750</td>
<td>300000</td>
</tr>
<tr>
<td>Transconductance</td>
<td>3300</td>
<td>6000</td>
</tr>
<tr>
<td>Plate Current</td>
<td>13</td>
<td>9.5</td>
</tr>
<tr>
<td>Grid-No.2 Current</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Grid-No.1 Voltage (Approx.) for plate current of 10 µamp</td>
<td>-19</td>
<td>-</td>
</tr>
<tr>
<td>Grid-No.1 Voltage (Approx.) for transconductance of 10 µmhos</td>
<td>-</td>
<td>-12.5</td>
</tr>
</tbody>
</table>

### Mechanical:

- Mounting Position: Any
- Maximum Overall Length: 2-3/16"  
- Maximum Seated Length: 1-15/16"  
- Length, Base Seat to Bulb Top (Excluding tip): 1-9/16" ± 3/32"

*Without external shield.

*See next page.*

MAR. 1, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, MARRISON, NEW JERSEY

TENTATIVE DATA 1
**Medium-Mu Triode—Semiremote-Cutoff Pentode**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Pentode Plate</th>
<th>Pin 6</th>
<th>Pentode Grid No.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 2</td>
<td>Pentode Grid No.2</td>
<td>Pin 7</td>
<td>Triode Cathode</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Pentode Cathode</td>
<td>Pin 8</td>
<td>Triode Plate</td>
</tr>
<tr>
<td>Pin 4</td>
<td>Heater</td>
<td>Pin 9</td>
<td>Triode Grid</td>
</tr>
<tr>
<td>Pin 5</td>
<td>Pentode Grid No.3, Internal Shield, Heater</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Amplifier—Class A**

**Maximum Ratings, Design-Center Values:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Triode Unit</th>
<th>Pentode Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>300 max.</td>
<td>300 max.</td>
</tr>
<tr>
<td>Grid-No.3 (Suppressor) Voltage</td>
<td></td>
<td>See Operating Considerations</td>
</tr>
<tr>
<td>Grid-No.2 (Screen) Supply Voltage</td>
<td></td>
<td>300 max.</td>
</tr>
<tr>
<td>Grid-No.2 Voltage</td>
<td></td>
<td>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</td>
</tr>
</tbody>
</table>

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**Grid-No.1 (Control-Grid) Voltage:**
- Positive bias value: 0 max.
- Plate Dissipation: 2.5 max.

**Grid-No.2 Input:**
- For grid-No.2 voltages up to 150 volts... 0.5 max. watt
- For grid-No.2 voltages between 150 and 300 volts... See Grid-No.2 Input Rating Chart at front of Receiving Tube Section

**Peak Heater-Cathode Voltage:**
- Heater negative with respect to cathode: 200 max. volts
- Heater positive with respect to cathode: 200#max. volts

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*The pentode unit is provided with a separate base pin for the cathode and for grid No.3 and internal shield which are connected internally to one of the heater leads. This arrangement facilitates the use of an unbypassed cathode resistor to minimize changes in input resistance and input capacitance with bias without causing oscillation which otherwise might occur if grid No.3 were internally connected to the cathode. The dc component must not exceed 100 volts.*

*$^*$: See next page.

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TENTATIVE DATA 1
**Maximum Circuit Values:**

<table>
<thead>
<tr>
<th></th>
<th>Triode</th>
<th>Pentode</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grid-No.1-Circuit Resistance:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For fixed-bias operation.</td>
<td>0.5 max.</td>
<td>0.25 max. megohm</td>
</tr>
<tr>
<td>For cathode-bias operation.</td>
<td>1.0 max.</td>
<td>1.0 max. megohm</td>
</tr>
</tbody>
</table>

**OPERATING CONSIDERATIONS**

Because grid No.3 is connected within the tube to one side of the heater (pin No.5), it is important that pin No.5 be connected to ground to maintain grid No.3 at ground potential. If this precaution is not observed and pin No.5 is connected to the ungrounded side of the heater supply, grid No.3 will operate at the heater-supply voltage. As a result, tube characteristics will be changed. Furthermore, if an ac heater supply is used, ac voltage will be applied to grid No.3 with resulting amplitude modulation of the grid-No.3 voltage.

- The heater-cathode voltage should not exceed the value of the operating cathode bias. If the heater-cathode voltage exceeds the operating cathode bias value, grid No.3 will be made negative with respect to cathode, and thus possibly cause a change in tube characteristics.

- If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT

E_p = 6.3 VOLTS

PLATE MILLIAMPERES

0 2 4 6 8 10 12 14

PLATE VOLTS

0 100 200 300 400 500

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AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT

Eₚ = 6.3 VOLTS
GRID-N = 3 VOLTS = 0
GRID-N = 2 VOLTS = 150

PLATE MILLIAMPERES

GRID-AN VOLTS = X / 10
GRID-AN VOLTS = \frac{X}{10}

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92CM - 8525
AVERAGE CHARACTERISTICS
PENTODE UNIT

$E_f = 6.3 \text{ VOLTS} \quad \text{PLATE VOLTS} = 200$

GRID-NR3 VOLTS = 0

EC2 = GRID-NR2 VOLTS

ECC2 = GRID-NR2 SUPPLY VOLTS

GRID-NR1 VOLTS

GRID-NR2 MILLIAMPERES

-20 -15 -10 -5 0

0.1 1 2 3 4 5 6 7 8 9 10

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92CM-8521
6AZ8

AVERAGE CHARACTERISTICS
PENTODE UNIT

$E_f = 6.3$ VOLTS PLATE VOLTS = 200
GRID-№3 VOLTS = 0
$E_{C2} =$ GRID-№2 VOLTS
$ECC2 =$ GRID-№2 SUPPLY VOLTS

GRID-№1 VOLTS

TRANSCONDUCTANCE - MICROMHOS

FEB. 2, 1955
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92CM-8522
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
AVERAGE CHARACTERISTICS
PENTODE UNIT

$E_f = 6.3$ VOLTS  PLATE VOLTS = 200
GRID-N$\# 3$ VOLTS = 0
$E_{C2} =$ GRID-N$\# 2$ VOLTS
$E_{CC2} =$ GRID-N$\# 2$ SUPPLY VOLTS

GRID-N$\# 1$ VOLTS

PLATE MILLIAMPERES

-20 -15 -10 -5 0