### Physical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathode</td>
<td>Coated unipotential</td>
</tr>
<tr>
<td>Base</td>
<td>Small button noval 9-pin</td>
</tr>
<tr>
<td>Bulb</td>
<td>T 6½</td>
</tr>
<tr>
<td>Maximum overall length</td>
<td>2-5/8 inches</td>
</tr>
<tr>
<td>Maximum seated height</td>
<td>2-3/8 inches</td>
</tr>
<tr>
<td>Bulb length excluding tip</td>
<td>2±3/32 inches</td>
</tr>
<tr>
<td>Maximum diameter</td>
<td>7/8 inches</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td>Basing connections - JETEC basing designation</td>
<td>9 Q</td>
</tr>
</tbody>
</table>

### Pin Designations
- Pin 1 - Hexode screen grids
- Pin 2 - Hexode control grid
- Pin 3 - Cathode and internal shield
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Internal connection
- Pin 7 - Hexode plate
- Pin 8 - Triode plate
- Pin 9 - Triode grid and hexode grid No. 3

### General Electrical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater voltage</td>
<td>6.3 volts</td>
</tr>
<tr>
<td>Heater current</td>
<td>0.23 amperes</td>
</tr>
</tbody>
</table>

### Direct interelectrode capacitances

<table>
<thead>
<tr>
<th>Capacitance Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexode grid No. 1 to all other electrodes</td>
<td>3.8 μF</td>
</tr>
<tr>
<td>Hexode plate to all other electrodes</td>
<td>9.2 μF</td>
</tr>
<tr>
<td>Between hexode grid No. 1 and hexode plate</td>
<td>max. 0.1 μF</td>
</tr>
<tr>
<td>Between hexode grid No. 1 and heater</td>
<td>max. 0.15 μF</td>
</tr>
<tr>
<td>Triode grid + hexode grid No. 3 to all other electrodes except triode plate</td>
<td>5.6 μF</td>
</tr>
<tr>
<td>Triode plate to all other electrodes except triode grid + hexode grid No. 3</td>
<td>2.4 μF</td>
</tr>
<tr>
<td>Between triode plate and triode grid + hexode grid No. 3</td>
<td>1.4 μF</td>
</tr>
<tr>
<td>Between hexode grid No. 1 and triode grid + hexode grid No. 3</td>
<td>max. 0.35 μF</td>
</tr>
<tr>
<td>Between hexode plate and triode grid + hexode grid No. 3</td>
<td>max. 0.2 μF</td>
</tr>
</tbody>
</table>

2.22.1949
Maximum ratings, Design center values

**Hexode section**

- Plate voltage (without current) 550 volts
- Plate voltage 250 volts
- Plate dissipation 1.5 watts
- Grid No.2 and 4 voltage (without current) 550 volts
- Grid No.2 and 4 voltage (anode current less than 1 ma) 250 volts
- Grid No.2 and 4 voltage (anode current = 3 ma) 125 volts
- Grid No.2 and 4 dissipation 0.3 watts
- Grid No.1 voltage at grid No.1 current = +0.3 μa -1.3 volts
- Cathode current 7 ma
- External resistance between grid No.1 and cathode 3 megohms
- External resistance between grid No.3 and cathode 3 megohms
- External resistance between heater and cathode 20 000 ohms
- Voltage between heater and cathode 50 volts

**Triode section**

- Plate voltage (without current) 550 volts
- Plate voltage 175 volts
- Plate dissipation 0.8 watts
- Grid voltage at grid current = +0.3 μa -1.3 volts
- Cathode current 6 ma
- External resistance between grid and cathode 3 megohms
- External resistance between heater and cathode 20 000 ohms
- Voltage between heater and cathode 50 volts

**Typical characteristics of the triode section**

- Plate voltage 100 volts
- Grid voltage 0 volts
- Plate current 10 ma
- Transconductance 2800 micromhos
- Amplification factor 22

2.22.1949 2.
Operating characteristics of the triode section as oscillator

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>250</th>
<th>250 volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate resistor</td>
<td>33 000</td>
<td>33 000 ohms</td>
</tr>
<tr>
<td>Grid resistor</td>
<td>22 000</td>
<td>47 000 ohms</td>
</tr>
<tr>
<td>Grid current</td>
<td>350</td>
<td>200 μa</td>
</tr>
<tr>
<td>Plate current</td>
<td>5.1</td>
<td>4.8 ma</td>
</tr>
<tr>
<td>Oscillator voltage</td>
<td>8</td>
<td>8 volts$_{\text{rms}}$</td>
</tr>
<tr>
<td>Effective transconductance</td>
<td>600</td>
<td>550 micromhos</td>
</tr>
</tbody>
</table>

Operating characteristics of the hexode section as frequency converter

Supply and hexode plate voltage | 250 volts |
R1 (see circuit diagram) | 27 000 ohms |
R2 (see circuit diagram) | 27 000 ohms |
Cathode resistor | 180 ohms |
Grid No.3 and triode grid resistor | 22 000 ohms |
Grid No.3 and triode grid current | 350$^+$ μa |
Grid No.1 voltage | -2  -29 volts |
Grid No.2 and 4 voltage | 85   124 volts |
Plate current | 3.0  - ma |
Grid No.2 and 4 current | 3.0  - ma |
Conversion conductance | 750  7.5 micromhos |
Plate resistance | min. 1 min. 5 megohms |
Equivalent noise resistance | 75 000 - ohms |

$^+$) If the oscillator grid resistor is chosen to 47 000 ohms, the grid current has to be adjusted to 200 μa.

2.22.1949
Plate voltage = 250 volts
Osc. grid resistor = 22 (or 47) kohms
Osc. grid current = 350 (or 200) \mu\text{amps}

Supply voltage = 250 volts
Screen grid potentiometer = 27+27 kohms

Grid No.1 voltage (volts)
Plate current (micro-\text{amps})
Plate voltage = 250 volts
Osc. grid resistor = 22 (or 47) kohms
Osc. grid current = 350 (or 200) μamps

Supply voltage = 250 volts
Screen grid potentiometer = 27 + 27 kohms

Conversion conductance (micro-mhos)

Grid No. 1 voltage (volts)

9.12.1948
Plate and supply voltage = 250 volts
Screen grid potentiometer = 27+27 kohms
Osc. grid resistor = 22 (or 47) kohms
Osc. grid current = 350 (or 200) μamps

Equivalent noise resistance
Plate current
Conversion conductance
Plate resistance
Screen grid current
Conversion conductance
Plate resistance

Grid No.1 voltage (volts)

9.12.1948
Plate and supply voltage = 250 volts
Screen grid potentiometer = 27+27 kohms
Osc. grid resistor = 22 kohms
Grid No.1 voltage = -2 volts

Oscillator grid current (micro-amps)
Oscillator voltage (volts r.m.s.)
Conversion conductance
Plate resistance (megohms)
Plate resistance
Oscillator voltage
Conversion conductance

9.12.1948
D.
Plate and supply voltage = 250 volts
Screen grid potentiometer = 27+27 kohms
Osc. grid resistor = 47 kohms
Grid No.1 voltage = -2 volts
Supply voltage = 250 volts
Triode plate resistor = 33 kohms
Osc. grid resistor = 22 kohms

Oscillator voltage (volts r.m.s.)

Triode plate current (milli-amps)

Effective triode transconductance (micro-ohms)

Oscillator grid current (micro-amps)

9.12.1948
F.
Supply voltage  
= 250 volts

Triode plate resistor  
= 33 kohms

Osc. grid resistor  
= 47 kohms

Oscillator voltage (volts r.m.s.)

Oscillator grid current (micro-amps)

Triode plate current (milli-amps)

Effective triode transconductance (micro-mhos)

9.12.1948

G.
Supply voltage
= 250 volts

Screen grid
potentiometer
= 27+27 kohms

Osc. grid resistor
= 22 (or 47) kohms

Osc. grid current
= 350 (or 200) \mu\text{amps}

Cross modulation = 1%

Interfering input voltage (milli-volts r.m.s.)

Conversion conductance (micro-mhos)