RCA-5654 is a "premium" version of the sharp-cutoff pentode 6AK5. It is designed for use as an rf or if amplifier in high-frequency broad-band circuits of mobile and aircraft communications receivers and is especially constructed to give dependable performance under shock and vibration.

This tube features a grid-No.1 electrode treated to minimize grid emission, a pure-tungsten heater to give longer life under conditions of on-off switching, and a compact design in which special attention has been given to structural details which provide increased mount strength against shock and against vibration. In addition each tube is subjected to rigid controls and rigorous tests during manufacture to insure "premium" quality.

Like the 6AK5, the 5654 has high transconductance, low interelectrode capacitances, high input resistance, and high signal-to-noise ratio—features contributing to the suitability of this tube for rf and if applications.

**GENERAL DATA**

**Electrical:**
- Heater, Pure Tungsten, for Unipotential Cathode:
  - Voltage: 6.9 ± 10 volts
  - Current: 0.175 amperes
- Direct interelectrode Capacitances:
  - Grid No.1 to Plate: 0.020 max., μf
  - Input: 4.2, μf
  - Output: 2.85, μf

**Mechanical:**
- Mounting Position: Any
- Maximum Overall Length: 1-3/8
- Maximum Seated Length: 1-1/2
- Length from Base Seat to Bulb Top: 1-1/8 ± 3/32
- Maximum Diameter: 3/4
- Bulb: T-5-1/2
- Base: Small-Button Miniature T-5 (JETEC No. E7-1)

**AMPLIFIER - CLASS A**

**Maximum Ratings, Absolute Values:**
- PLATE VOLTAGE: 200 max., volts
- GRID-No.2 (SCREEN) VOLTAGE: 155 max., volts
- PLATE DISSIPATION: 1.85 max., watts
- GRID-No.2 INPUT: 0.55 max., watt
- CATHODE CURRENT: 20 max., ma

**PEAK HEATER-CATHODE VOLTAGE:**
- Heater positive with respect to cathode: 100 max., volts
- Heater negative with respect to cathode: 100 max., volts

**Typical Operation and Characteristics:**
- Plate voltage: 120 120 volts
- Grid-No.2 Voltage: 120 120 volts
- Cathode-bias Resistor: 180 180 ohms
- Plate Resistance (Approx.): 0.30 0.50 megohms
- Transconductance: 5000 5000 μhos
- Plate Current: 7.8 7.7 ma
- Grid-No.2 Current: 2.5 2.4 ma
- Grid-No.1 Voltage (Approx.) for plate current of 10 μamp: -8.5 -8.5 volts

**Maximum Circuit Values:**
- Grid-No.1-Circuit Resistance: 0.5 max., megohms

**Shock and Fatigue Tests:**
- Shock Test: Impact Acceleration: 500 max., g
  - Tubes are held rigid in three different positions in a Navy Type, High Impact (Flyweight) Shock Machine and are subjected to the specified impact acceleration.
- Fatigue Test: Vibrational Acceleration: 2.5 max., g
  - Tubes are rigidly mounted and subjected to the specified maximum vibrational acceleration at 60 cycles per second for 32 hours in each of three positions.

**Heater Cycling Life Test:**
- Cycles of intermittent operation at heater volts: 7.5: 2000 min.

**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>0.160</td>
<td>0.190</td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>-</td>
<td>- 0.020</td>
</tr>
<tr>
<td>Output Capacitance</td>
<td>-</td>
<td>- 2.45</td>
</tr>
<tr>
<td>Plate Current</td>
<td>3.25</td>
<td>1.2</td>
</tr>
<tr>
<td>Transconductance</td>
<td>6500</td>
<td>3500</td>
</tr>
</tbody>
</table>

Note 1: With 6.3 volts ac on heater.
Note 2: With plate voltage of 120 volts, grid-No.2 voltage of 120 volts, and grid-No.1 voltage of 2 volts.
Note 3: With plate voltage of 120 volts, grid-No.2 voltage of 120 volts, grid-No.1 voltage of 2 volts, and grid-No.1 resistor of 0.1 megohms.

▲ According to RTMA Standard ET-109A with external shield No.316.

**OPERATING NOTES**

The maximum ratings in the tabulated data for the 5654 are limiting values above which the serviceability of the 5654 may be impaired from the viewpoint of life and satisfactory performance. Therefore, in order not to exceed these absolute ratings, the equipment designer has the responsibility of determining an average design value for each rating below the absolute value of that rating by an amount such that the absolute values will never be exceeded under any usual condition of supply-voltage variation, load variation, or manufacturing variation in the equipment itself.
Fig. 1 - Average Plate Characteristics of 5654.

Fig. 2 - Average Characteristics of 5654.

Socket Connections
Bottom View

PIN 1: GRID NO. 1
PIN 2: CATHODE, GRID NO. 3, INTERNAL SHIELD
PIN 3: HEATER
PIN 4: HEATER
PIN 5: PLATE
PIN 6: GRID NO. 2
PIN 7: CATHODE, GRID NO. 3, INTERNAL SHIELD

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" I.D.