



## ELECTRONIC TUBE REFERENCE

# 16GY5

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

**1 SECTION**

CONSTRUCTION

**BEAMPOWER**

Beam-power tube specifically for television horizontal-deflection amplification, combining high transconductance, low plate resistance, and 18 W plate dissipation for pulsed line-output operation.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | —                 | BASE PINS            | 12            |
| NOMINAL HEATER      | 15.8 V / 600 mA   | PARALLEL HEATER      | — / —         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Similar       |

## SECTION RATINGS

|                                                                                             |                |
|---------------------------------------------------------------------------------------------|----------------|
| <b>SECTION 1</b> Beam Power                                                                 |                |
| PLATE RESISTANCE                                                                            | 11000 $\Omega$ |
| TRANSCONDUCTANCE                                                                            | 0.0091 S       |
| MAXIMUM SCREEN VOLTAGE                                                                      | 220 V          |
| MAXIMUM PLATE DISSIPATION                                                                   | 18 W           |
| MAXIMUM SCREEN DISSIPATION                                                                  | 3.5 W          |
| MAXIMUM CATHODE CURRENT                                                                     | 230 mA         |
| <i>Heater-variant reference sheet; electrical data explicitly cross-referenced to 6GY5.</i> |                |

## 16GY5 — Compactron Beam Power Pentode

The **16GY5** is a compactron beam-power pentode designed specifically for use as a horizontal-deflection amplifier in television receivers. It is part of a family of structurally identical tubes that includes the **6GY5** and **21GY5**, differing only in their heater ratings and characteristics. The 16GY5 requires a duodecar 12-contact socket for operation.

# Physical and Heater Characteristics

The 16GY5 features a compactron T-12 glass envelope construction with a button 12-pin base (E12-74 designation) and a C1-3 top cap. Its physical dimensions are:

- **Maximum Diameter:** 1.563 inches
- **Maximum Seated Height:** 3.250 inches
- **Maximum Overall Height:** 3.625 inches

The tube utilizes a coated unipotential cathode. The heater is designed for series-string television receiver applications and can be operated on either AC or DC.

| Heater Parameter     | 16GY5 Value      | <u>6GY5</u> Value | <u>21GY5</u> Value |
|----------------------|------------------|-------------------|--------------------|
| Heater Voltage       | 15.8 V           | 6.3 V             | 21 V               |
| Heater Current       | $0.6 \pm 0.04$ A | 1.5 A             | 0.45 A             |
| Average Warm-up Time | 11 s             | —                 | 11 s               |

The average heater warm-up time of 11 seconds is defined as the time required for the voltage across the heater to reach 80 percent of its nominal (bogey) value when starting from a circuit where four times the bogey heater voltage is applied in series with a resistance equal to three times the bogey heater voltage divided by the bogey heater current.

## Heater-Cathode Voltage Ratings

To ensure reliable operation and prevent insulation breakdown, the voltage between the heater and cathode must be kept within the following limits:

- **Heater Negative with Respect to Cathode:** 200 V maximum (total DC and peak)
- **Heater Positive with Respect to Cathode:** 100 V maximum DC, 200 V maximum (total DC and peak)

## Heater Power Calculation

Using the nominal ratings for the 16GY5 heater:

- **Input:** Heater Voltage ( $V_f$ ) = 15.8 V, Heater Current ( $I_f$ ) = 0.6 A
- **Calculation:**  $15.8 \text{ V} \times 0.6 \text{ A} = 9.48 \text{ W}$  of nominal heater power.

## Pinout and Basing

The 16GY5 utilizes the **12DR** duodecar basing arrangement. The connections, viewed from the bottom of the tube, are allocated as follows:

| Pin Number | Connection |
|------------|------------|
| 1          | Heater     |

| Pin Number | Connection                               |
|------------|------------------------------------------|
| 2          | No Connection                            |
| 3          | Grid No. 2 (Screen Grid)                 |
| 4          | Cathode and Grid No. 3 (Suppressor Grid) |
| 5          | Grid No. 1 (Control Grid)                |
| 6          | No Connection                            |
| 7          | Grid No. 2 (Screen Grid)                 |
| 8          | No Connection                            |
| 9          | Grid No. 1 (Control Grid)                |
| 10         | Cathode and Grid No. 3 (Suppressor Grid) |
| 11         | Grid No. 2 (Screen Grid)                 |
| 12         | Heater                                   |
| Top Cap    | Plate (Anode)                            |

Multiple pins are internally connected to the same electrodes (such as Grid No. 1, Grid No. 2, and the Cathode/Grid No. 3 assembly) to facilitate low-inductance wiring and flexible circuit layouts.

## Electrical Characteristics and Operating Points

The 16GY5 exhibits high transconductance and low plate resistance under typical Class A1 amplifier operating conditions.

### Direct Interelectrode Capacitances

The unshielded capacitances of the 16GY5 are:

- **Grid No. 1 to Plate:** 0.7 pF
- **Input (g1 to h + k + g3):** 22 pF
- **Output (p to h + k + g2 + g3):** 9 pF

### Typical Class A1 Operating Points

The tube can be operated in either a standard pentode configuration or a triode configuration (where Grid No. 2 is tied directly to the plate).

| Parameter                                                       | Pentode Connection<br>(Low Voltage) | Pentode Connection<br>(High Voltage) | Triode Connection |
|-----------------------------------------------------------------|-------------------------------------|--------------------------------------|-------------------|
| Plate Voltage                                                   | 60 V                                | 130 V                                | 130 V             |
| Grid No. 2 Voltage                                              | 130 V                               | 130 V                                | 130 V             |
| Grid No. 1 Voltage                                              | 0 V                                 | -20 V                                | -20 V             |
| Plate Current                                                   | 410 mA                              | 50 mA                                | —                 |
| Grid No. 2 Current                                              | 24 to 26 mA                         | 1.75 mA                              | —                 |
| Transconductance                                                | —                                   | 9100 $\mu$ hos                       | —                 |
| Plate Resistance<br>(Approx.)                                   | —                                   | 11000 $\Omega$                       | —                 |
| Amplification Factor                                            | —                                   | —                                    | 4.7               |
| Grid No. 1 Cutoff<br>Voltage (approx. for $I_b$<br>= 1 mA)      | —                                   | -33 V                                | —                 |
| Grid No. 1 Cutoff<br>Voltage (approx. for $I_b$<br>= 1 $\mu$ A) | —                                   | -33 V                                | —                 |

At the instantaneous plate knee point where the plate voltage is 60 V, Grid No. 2 is at 130 V, and Grid No. 1 is at 0 V, the plate current reaches 410 mA, while the Grid No. 2 current is between 24 mA and 26 mA. This high-current capability at low plate voltages is a critical characteristic for horizontal-deflection service.

## Horizontal-Deflection Service Ratings

When used as a horizontal-deflection amplifier in a 525-line, 30-frame television system, the 16GY5 must be operated within strict Design-Maximum limits to prevent thermal and electrical breakdown.

### Maximum Ratings

- **DC Plate Supply Voltage (Boost + DC Power Supply):** 770 V
- **Peak Positive-Pulse Plate Voltage:** 6500 V (The pulse duration must not exceed 15% of one horizontal scanning cycle, equivalent to 10 microseconds)
- **Peak Negative-Pulse Plate Voltage:** 1500 V
- **DC Grid No. 2 (Screen Grid) Voltage:** 220 V
- **Grid No. 2 Dissipation:** 3.5 W
- **DC Grid No. 1 (Control Grid) Voltage:** -55 V
- **Peak Negative-Pulse Grid No. 1 Voltage:** 330 V

- **Plate Dissipation:** 18 W
- **Peak Cathode Current:** 800 mA
- **Average Cathode Current:** 230 mA
- **Bulb Temperature (at hottest point):** 220 °C
- **Maximum Grid No. 1 Circuit Resistance:** 1.0 Megohm

In stages operating with grid-leak bias, an adequate cathode-bias resistor or other protective means must be employed to safeguard the tube against excessive dissipation in the event that excitation is lost.

## Technical Summary

The **16GY5** is a high-performance, duodecar-based compactron beam power pentode optimized for horizontal-deflection amplifier service in television receivers. Featuring a 15.8 V, 0.6 A heater with controlled warm-up characteristics, it is designed for integration into series-string heater circuits. The tube's physical design incorporates a T-12 envelope, a 12DR pinout configuration, and a top-cap plate connection to handle high peak positive-pulse voltages up to 6500 V. With a peak cathode current capability of 800 mA and a plate dissipation rating of 18 W, the 16GY5 delivers the robust current-handling capacity required for demanding television deflection systems.



## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1968 General Electric Co

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1968 GENERAL ELECTRIC CO

## Section 1 · Beam Power

| OTHER                          |                 |                  |
|--------------------------------|-----------------|------------------|
| PARAMETER                      | PUBLISHED VALUE | CONDITION / NOTE |
| HeaterOrFilamentVoltageNominal | 15.8 V          | —                |
| HeaterOrFilamentCurrentNominal | 600 mA          | —                |



## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1975 RCA RC30

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1975 RCA RC30

## Section 1 · Beam Power

| CHARACTERISTIC      |                 |                   |
|---------------------|-----------------|-------------------|
| PARAMETER           | PUBLISHED VALUE | CONDITION / NOTE  |
| Plate voltage       | 130 V           | PentodeConnection |
| Screen-grid voltage | 130 V           | PentodeConnection |
| Grid No.1 voltage   | -20 V           | PentodeConnection |
| Plate current       | 50 mA           | PentodeConnection |
| Screen-grid current | 1.75 mA         | PentodeConnection |

| OTHER                             |                 |                      |
|-----------------------------------|-----------------|----------------------|
| PARAMETER                         | PUBLISHED VALUE | CONDITION / NOTE     |
| DC plate supply voltage           | 770 V           | HorizontalDeflection |
| Peak positive-pulse plate voltage | 6500 V          | HorizontalDeflection |

| PARAMETER                         | PUBLISHED VALUE | CONDITION / NOTE     |
|-----------------------------------|-----------------|----------------------|
| Peak negative-pulse plate voltage | <b>1500 V</b>   | HorizontalDeflection |
| DC screen-grid voltage            | <b>220 V</b>    | HorizontalDeflection |
| DC grid No.1 voltage              | <b>-55 V</b>    | HorizontalDeflection |
| Peak cathode current              | <b>800 mA</b>   | HorizontalDeflection |
| Average cathode current           | <b>230 mA</b>   | HorizontalDeflection |
| Plate dissipation                 | <b>18 W</b>     | HorizontalDeflection |
| Screen-grid input                 | <b>3.5 W</b>    | HorizontalDeflection |

## TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

[Catalog](#)
[Tube types](#)
[Full books](#)
[Blog](#)
[Feedback & corrections](#)

© 2026 Tube Tinker