

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

17GW6

1 SECTION
CONSTRUCTION
BEAMPOWER

Power - TV Horizontal Output (sweep) electronic tube

Glass-octal beam-power tube designed for television horizontal-deflection amplification, with kilovolt pulse ratings and controlled heater warm-up.

GENERAL CHARACTERISTICS

BASE DESIGNATION	6AM	BASE PINS	8
NOMINAL HEATER	16.8 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

6AM - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – Pin 1	–	–	NC · verified
PIN2 – Pin 2	–	H – Heater	CONNECTED · verified
PIN3 – Pin 3	–	–	NC · verified
PIN4 – Pin 4	A	G2 – Screen Grid	CONNECTED · verified
PIN5 – Pin 5	A	G1 – Control Grid	CONNECTED · verified
PIN7 – Pin 7	–	H – Heater	CONNECTED · verified
PIN8 – Pin 8	A	BP – Beam-Forming Plate	CONNECTED · verified
PIN8 – Pin 8	A	K – Cathode	CONNECTED · verified

TERMINAL	SECTION	ELEMENT	STATUS
CAP1 – Top cap	A	P – Plate (Anode)	CONNECTED • verified

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.0071 S
AMPLIFICATION FACTOR	4.4
MAXIMUM PLATE VOLTAGE	700 V
MAXIMUM SCREEN VOLTAGE	220 V
MAXIMUM PLATE DISSIPATION	17.5 W
MAXIMUM SCREEN DISSIPATION	5 W
MAXIMUM CATHODE CURRENT	175 mA
<i>Reference-only sheet; parent electrical ratings not reproduced in supplied source.</i>	

17GW6 — Beam Power Pentode

Overview

The **17GW6** (often co-designated as the **17DQ6B**) is a glass-envelope beam power pentode designed primarily for service as a horizontal-deflection amplifier in high-efficiency deflection circuits of television receivers, including color television systems. It is characterized by its high zero-bias plate current, high plate-to-screen current ratio, and robust high-voltage ratings. The 17GW6 is electrically identical to the **6GW6** (or **6DQ6B**) and **12GW6** (or **12DQ6B**) except for its heater ratings.

Construction, Mechanical Specifications, and Pinout

The 17GW6 is typically constructed with a T-12 glass bulb and a short medium shell octal base (such as the JEDEC B5-190, B6-122, B6-148, B7-111, or B7-119 configurations) featuring external barriers. Some variants utilize a Novar base and envelope construction. The physical dimensions of the octal variant include a maximum diameter of 1.562 to 1.563 inches, a maximum seated height of 3.688 inches, and a maximum overall height of 4.250 inches (JEDEC outline 12-19). The tube features a skirted miniature top cap (C1-2 or C1-3) for the plate connection, which isolates the high-voltage anode pulses from the base pins. The tube can be mounted in any position.

The JEDEC 6AM basing diagram defines the pin connections as viewed from the bottom:

- **Pin 1:** No Connection (NC)

- **Pin 2:** Heater
- **Pin 3:** No Connection (NC) or Metal Collar / Internal Connection (MC) (omitted when the B5-190 base is used)
- **Pin 4:** Grid No. 2 (Screen Grid)
- **Pin 5:** Grid No. 1 (Control Grid)
- **Pin 7:** Heater
- **Pin 8:** Cathode and Grid No. 3 (Suppressor Grid)
- **Top Cap:** Plate

Heater Ratings

The 17GW6 features a coated unipotential cathode. The heater is designed for series-connected heater strings and has a controlled warm-up characteristic to ensure reliable operation in television receivers.

- **Heater Voltage (AC or DC):** 16.8 V
- **Heater Current:** 0.45 A (450 mA) $\pm$ 6% (or a supply limit of 450 $\pm$ 30 mA)
- **Average Heater Warm-up Time:** 11 seconds
- **Calculated Heater Power:** 16.8 V $\times$ 0.45 A = 7.56 W

Heater-to-cathode voltage limits are strictly defined to prevent insulation breakdown:

- **Heater negative with respect to cathode:** 200 V maximum (Total DC and Peak)
- **Heater positive with respect to cathode:** 200 V maximum (Total DC and Peak), with the DC component restricted to a maximum of 100 V.

Electrical Characteristics and Operating Points

The electrical characteristics of the 17GW6 are documented under several distinct operating conditions, including typical Class A1 pentode operation, low-voltage zero-bias pentode operation, and triode-connected operation.

Typical Pentode Operation (Class A1)

- **Plate Voltage:** 250 V
- **Grid No. 2 Voltage:** 150 V
- **Grid No. 1 Voltage:** -22.5 V
- **Plate Current:** 65 mA to 70 mA
- **Grid No. 2 Current:** 1.8 mA to 2.1 mA
- **Plate Resistance (Approximate):** 15,000 to 18,000 ohms
- **Transconductance:** 7,100 to 7,300 μ hos
- **Grid No. 1 Cutoff Voltage (for plate current of 1 mA):** -42 V (approximate)

Low-Voltage Pentode Operation (Zero Bias)

To evaluate the tube's performance at the "knee" of its characteristic curve without exceeding maximum dissipation ratings, measurements are taken using a recurrent waveform method (or short intervals of maximum 2 seconds):

- **Plate Voltage:** 60 V
- **Grid No. 2 Voltage:** 150 V
- **Grid No. 1 Voltage:** 0 V
- **Plate Current:** 345 mA to 390 mA
- **Grid No. 2 Current:** 27 mA to 32 mA

Triode-Connected Operation

When Grid No. 2 is connected directly to the plate:

- **Plate Voltage:** 150 V
- **Grid No. 2 Voltage:** 150 V
- **Grid No. 1 Voltage:** -22.5 V
- **Amplification Factor (Mu-Factor, G2 to G1):** 4.4

Horizontal-Deflection Service and Maximum Ratings

In horizontal-deflection-amplifier service (such as in a 525-line, 30-frame television scanning system), the 17GW6 is subjected to severe pulse voltages. The maximum ratings are established under the Design-Maximum system:

- **DC Plate Supply Voltage (Boost + DC Power Supply):** 770 V maximum
- **Peak Positive-Pulse Plate Voltage:** 6500 V maximum (with a pulse duration not exceeding 15% of one horizontal scanning cycle, or a maximum of 10 μ s)
- **Peak Negative-Pulse Plate Voltage:** 1500 V maximum
- **DC Grid No. 2 Voltage:** 220 V maximum
- **DC Grid No. 1 Voltage:** -55 V maximum
- **Peak Negative-Pulse Grid No. 1 Voltage:** 330 V maximum
- **Peak Cathode Current:** 550 mA to 610 mA maximum
- **Average Cathode Current:** 175 mA maximum
- **Plate Dissipation:** 17.5 W to 18 W maximum (stages operating with grid-resistor bias require a cathode-bias resistor or other protective means to safeguard the tube in the absence of drive/excitation)
- **Grid No. 2 Input:** 3.5 W to 3.6 W maximum
- **Bulb Temperature (at hottest point):** 220 °C to 240 °C maximum
- **Maximum Grid No. 1 Circuit Resistance:** 1.0 M Ω (for grid-resistor-bias operation)

Interelectrode Capacitances

The direct interelectrode capacitances of the 17GW6 are measured without an external shield:

- **Grid No. 1 to Plate:** 0.5 pF
- **Input (Grid No. 1 to Cathode, Heater, Grid No. 2, and Grid No. 3):** 15.0 pF to 17 pF
- **Output (Plate to Cathode, Heater, Grid No. 2, and Grid No. 3):** 7.0 pF

Analysis of Characteristic Curves

The average plate characteristics of the 17GW6 demonstrate its high-efficiency design. When plotting plate current and Grid No. 2 current against plate voltage (from 0 to 400 V) under rated heater voltage and a 10% duty cycle, several key behaviors emerge:

- **Sharp Knee:** The plate current curves exhibit a very sharp knee at low plate voltages, typically around 50 V. Below this knee, the plate current rises rapidly. Above the knee, the plate current flattens out, showing high plate resistance.
- **Zero-Bias Performance:** At a Grid No. 1 voltage of 0 V and a Grid No. 2 voltage of 150 V, the plate current reaches a peak of nearly 390 to 400 mA. If the Grid No. 2 voltage is increased to 200 V, the peak plate current can exceed 500 mA.
- **Grid No. 2 Current Behavior:** The Grid No. 2 (screen) current is highly dependent on plate voltage. It peaks sharply at very low plate voltages (below 50 V), reaching approximately 100 mA to 150 mA when the plate voltage is near 0 V and Grid No. 1 is at 0 V. As the plate voltage increases past the knee, the screen current drops rapidly to a low, stable level (typically around 27 mA to 32 mA), minimizing screen grid dissipation during normal conduction cycles.

Technical Summary

The **17GW6** is a high-performance, octal-base beam power pentode designed specifically for horizontal-deflection-amplifier service in television receivers. Featuring a 16.8 V, 0.45 A heater with a controlled 11-second warm-up time, it is optimized for series-string power supplies. With its ability to handle peak positive plate pulses up to 6500 V, peak cathode currents up to 610 mA, and a plate dissipation of up to 18 W, the 17GW6 provides the high peak currents and high-voltage insulation required for driving magnetic deflection yokes. Its electrical characteristics are identical to the [6GW6](#) and [12GW6](#) families, offering a robust solution for television sweep circuits.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Tung Sol

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

1961 TUNG SOL

Section 1 · Beam Power

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
TransconductancePublished	7100 μ S	—



SOURCE OPERATING CONDITIONS

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	16.8 V	—
Heater current	450 mA	—
Typical plate voltage	250 V	—
Typical screen-grid voltage	150 V	—
Typical grid 1 voltage	-22.5 V	—
Maximum DC plate supply voltage	770 V	—
Maximum plate dissipation	17.5 W	—
Maximum DC grid 2 voltage	220 V	—
Typical plate current	70 mA	—
Typical screen-grid current	2.1 mA	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak negative pulse plate voltage	1500 V	HorizontalDeflection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	15000 ohm	—
Transconductance	7100 uS	—


SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1966 Tung Sol Electronic Tubes 3 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 3 OF 4

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak positive pulse plate voltage	6500 V	HorizontalDeflection;Pulse
Peak negative pulse plate voltage	1500 V	HorizontalDeflection;Pulse
Plate current	70 mA	HorizontalDeflection
Grid 2 current	2 mA	HorizontalDeflection
Grid 1 voltage	-22 V	HorizontalDeflection
GRID #	17 pF	Published datasheet
PLATE TO CATHODE S GRID #	7 pF	Published datasheet
DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS	9 mA	Published datasheet
AVERAGE CHARACTERISTICS	450 V	Published datasheet
HEATER WARNYUP TIME*	11 s	Published datasheet
HEATER NEGATIVE WITH RESPECT TO CATHODE	200 V	Published datasheet
HEATER POSITIVE WITH RESPECT TO CATHODE	200 V	Published datasheet

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC GRID #	220 V	Published datasheet
DC GRID #	-55 V	Published datasheet
DESIGN MAXIMUM VALUES - SEE EIA STANDARDS	9 mA	Published datasheet
PEAK NEGATIVE-PULSE GRID #	3 V	Published datasheet
PEAK	55 mA	Published datasheet
AVERAGE I _b	5 mA	Published datasheet
PLATE DISSIPATION	5 W	Published datasheet
GRID #	3.5 W	Published datasheet
GRID #	1 ohm	Published datasheet
GRID #	15 V	Published datasheet
CONNECTED TO GRID #	2 V	Published datasheet
GRID #	1 V	Published datasheet
TRANSCONDUCTANCE [g _m]	1 μS	Published datasheet
GRID #	2.1 mA	Published datasheet

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
CURRENT OPERATION	3 mA	Published datasheet
DC PLATE -SUPPLY VOLTAGE (BOOST +OC POWER SUPPLY)	770 V	Published datasheet
PEAK POSITIVE -PULSE PLATE VOLTAGE V _p	6500 V	Published datasheet
PEAK NEGATIVE -PULSE PLATE VOLTAGE	1500 V	Published datasheet
PLATE VOLTAGE CO Z	5 V	Published datasheet
GRID #1 VOLTAGE 0 -Z	2.5 V	Published datasheet
PLATE RESISTANCE (A PPROX.) [r _p]	15000 ohm	Published datasheet
PLATE CURRENT -	-390 mA	Published datasheet
PLATE CURRENT OF I _b MA	4 V	Published datasheet
OF THE VOLTAGE PULSE MUST NOT EXCEED	15 V	Published datasheet



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 RCA HB3 Binder 5 of 7

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

1971 RCA HB3 BINDER 5 OF 7

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	16.8 V	AC or DC at rated heater current
Heater current	450 mA	Nominal current
Warm-up time	11 s	Average
Reference parent type	6GW6	Electrical characteristics same except heater



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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum pulse duration	200 microseconds	Published in approved 17GW6 target datasheet entry; Section1
be reduced to 100 mAwith a maximum pulse duration of	400 microseconds	Published in approved 17GW6 target datasheet entry; Section1
Heater Voltage (ac/dc) 6.3 12.6	16.8 V	Published in approved 17GW6 target datasheet entry; Section1
Heater Current 1.2 0.6	450 mA	Published in approved 17GW6 target datasheet entry; Section1
Heater Warm-up Time (Average) 11	11 seconds	Published in approved 17GW6 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Plate Supply Voltage	770 V	Published in approved 17GW6 target datasheet entry; Section1
Peak Positive-Pulse Plate Voltage*	6500 V	Published in approved 17GW6 target datasheet entry; Section1
Peak Negative-Pulse Plate Voltage	1500 V	Published in approved 17GW6 target datasheet entry; Section1
DC Grid-No.2 (Screen-Grid) Voltage	220 V	Published in approved 17GW6 target datasheet entry; Section1
DC Grid-No.1 (Control-Grid) Voltage	55 V	Published in approved 17GW6 target datasheet entry; Section1
Peak Negative-Pulse Grid-No.1 Voltage	330 V	Published in approved 17GW6 target datasheet entry; Section1
Peak Cathode Current	550 mA	Published in approved 17GW6 target datasheet entry; Section1
Average Cathode Current	175 mA	Published in approved 17GW6 target datasheet entry; Section1
Plate Dissipation*	17.5 W	Published in approved 17GW6 target datasheet entry; Section1
Grid-No.2 Input	3.5 W	Published in approved 17GW6 target datasheet entry; Section1
Bulb Temperature (At hottest point)	240 °C	Published in approved 17GW6 target datasheet entry; Section1
Grid-No. 1-Circuit Resistance, for grid-resistor-bias operation	1 MΩ	Published in approved 17GW6 target datasheet entry; Section1
# Pulse duration must not exceed 15% of a horizontal scanning cycle (	10 microseconds	Published in approved 17GW6 target datasheet entry; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No	3 pF	Published in approved 17GW6 target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage 150 60	250 V	Published in approved 17GW6 target datasheet entry; Section1
C.rid-No.2 Voltage 150 150	150 V	Published in approved 17GW6 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No. 1 Voltage -22.5 0	-22.5 V	Published in approved 17GW6 target datasheet entry; Section1
Plate Resistance (Approx.)	15000 Ω	Published in approved 17GW6 target datasheet entry; Section1
Grid-No.2 Current 32"	2.1 mA	Published in approved 17GW6 target datasheet entry; Section1
1 mA	-42 V	Published in approved 17GW6 target datasheet entry; Section1