

ELECTRONIC TUBE REFERENCE

17GJ5A

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Beam-power tube designed for high-efficiency television horizontal-deflection amplification, with controlled heater warm-up and high pulse-voltage capability.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9QK	BASE PINS	9
NOMINAL HEATER	16.8 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

9QK - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	–	G2 – Screen Grid	CONNECTED
PIN2	–	G1 – Control Grid	CONNECTED
PIN3	–	G3 – Suppressor Grid	CONNECTED
PIN3	–	K – Cathode	CONNECTED
PIN4	–	H – Heater	CONNECTED
PIN5	–	H – Heater	CONNECTED
PIN6	–	G1 – Control Grid	CONNECTED
PIN7	–	G2 – Screen Grid	CONNECTED
PIN9	–	–	IC
CAP1	A	P – Plate (Anode)	CONNECTED

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.0071 S
AMPLIFICATION FACTOR	4.4
MAXIMUM PLATE VOLTAGE	770 V
MAXIMUM SCREEN VOLTAGE	220 V
MAXIMUM PLATE DISSIPATION	17.5 W
MAXIMUM SCREEN DISSIPATION	3.5 W
MAXIMUM CATHODE CURRENT	550 mA
Reference-only sheet; parent electrical ratings not reproduced in supplied source.	

17GJ5A Beam Power Tube

A *Novar-type beam power pentode designed for high-efficiency horizontal-deflection-amplifier service in television receivers.*

Overview

The **17GJ5A** is a beam power tube of the Novar design, primarily intended for use in the horizontal-deflection-amplifier circuits of television receivers operating on 525-line, 30-frame systems. It is electrically identical to the [6GJ5A](#) and [12GJ5A](#) except for its heater ratings. It is also closely related to the [17GJ5](#), sharing identical electrical characteristics but differing in physical construction; the 17GJ5A features a shorter bulb and a base equipped with an exhaust tip at the bottom.

Physical Characteristics and Base

The 17GJ5A is constructed with a T-12 glass envelope and a Novar Button 9-Pin base (E9-88), which requires a standard Novar 9-contact socket. The physical dimensions of the tube are as follows:

- **Maximum Overall Height:** 3.505 inches
- **Maximum Seated Height:** 3.125 inches
- **Maximum Diameter:** 1.562 inches

Depending on the specific manufacturing variant, the tube may incorporate a top cap (types C1-2, C1-3, or C1-33) to facilitate the plate connection.

Heater Ratings and Pinout Configurations

Heater Specifications

The 17GJ5A features an indirectly heated cathode with the following heater ratings:

- **Heater Voltage (AC or DC):** 16.8 V
- **Heater Current:** 0.45 A (with a tolerance of 0.450 ± 0.030 A)
- **Average Warm-up Time:** 11 seconds
- **Peak Heater-Cathode Voltage:** ± 200 V max
- **Average Heater-Cathode Voltage:** 100 V max

Pinout Configurations

The physical connections of the 17GJ5A are documented in two distinct configurations depending on the envelope and top-cap arrangement:

Configuration A (9QK Pinout)

This configuration does not utilize a top cap, routing all active electrodes through the base pins:

- **Pin 1:** Grid No. 1 (G1)
- **Pin 2:** Grid No. 2 (G2)
- **Pin 3:** Cathode / Grid No. 3 (K, G3)
- **Pin 4:** Heater (H)
- **Pin 5:** Heater (H)
- **Pin 6:** Plate (P)
- **Pin 7:** Grid No. 2 (G2)
- **Pin 8:** Internal Connection (IC) — do not use
- **Pin 9:** Internal Connection (IC) — do not use

Configuration B (Top-Cap Plate Pinout)

This configuration utilizes a top cap for the plate connection, altering the pin assignments on the base:

- **Pin 1:** Grid No. 1 (G1)
- **Pin 2:** Grid No. 2 (G2)
- **Pin 3:** Cathode (K)
- **Pin 4:** Heater (H)
- **Pin 5:** Heater (H)
- **Pin 6:** Grid No. 1 (G1)
- **Pin 7:** Grid No. 2 (G2)
- **Pin 8:** No Connection (NC)
- **Pin 9:** Internal Connection (IC)
- **Top Cap:** Plate (P)

Electrical Characteristics and Class A1 Operation

Direct Interelectrode Capacitances

The approximate direct interelectrode capacitances of the 17GJ5A are:

- **Grid No. 1 to Plate:** 0.26 pF
- **Grid No. 1 to Cathode, Heater, Grid No. 2, and Grid No. 3:** 15 pF
- **Plate to Cathode, Heater, Grid No. 2, and Grid No. 3:** 6.5 pF

Typical Operating Points

The tube can be operated under Class A1 conditions in either a triode-connected or pentode-connected configuration. Typical operating parameters are outlined below:

Parameter	Triode Connection	Pentode Connection (Low Voltage)	Pentode Connection (Normal)
Plate Voltage	150 V	60 V	250 V
Grid-No. 2 Voltage	150 V	150 V	150 V
Grid-No. 1 Voltage	-22.5 V	0 V	-22.5 V
Plate Resistance (Approx.)	—	—	15,000 Ω
Transconductance	—	—	7,100 μmhos
Plate Current	—	390 mA*	70 mA
Grid-No. 2 Current	—	32 mA*	2.1 mA
Mu-Factor (<u>G2</u> to G1)	4.4	—	—
Grid-No. 1 Voltage for $I_b = 1 \text{ mA}$	—	—	-42 V

Note: The low-voltage pentode characteristics are measured using a recurrent waveform method to prevent exceeding the maximum ratings of the tube during testing.

Horizontal-Deflection Amplifier Service

When operated in a 525-line, 30-frame television receiver system, the 17GJ5A must be operated within its Design-Maximum Ratings to ensure reliability and longevity.

Design-Maximum Ratings

- **DC Plate Supply Voltage:** 770 V
- **Peak Positive-Pulse Plate Voltage:** 6,500 V (The pulse duration must not exceed 15% of a horizontal scanning cycle, or 10 μs)
- **Peak Negative-Pulse Plate Voltage:** 1,500 V
- **DC Grid-No. 2 Voltage:** 220 V

- **DC Grid-No. 1 Voltage:** -55 V
- **Peak Negative-Pulse Grid-No. 1 Voltage:** 330 V
- **Peak Cathode Current:** 550 mA
- **Average Cathode Current:** 175 mA
- **Plate Dissipation:** 17.5 W
- **Grid-No. 2 Input:** 3.5 W
- **Maximum Bulb Temperature (Hottest Point):** 240 °C

Circuit Constraints and Protection

- **Grid-No. 1-Circuit Resistance:** For grid-resistor-bias operation, the maximum allowable resistance is 1.0 MΩ.
- **Excitation Protection:** A bias resistor or other protective circuitry is strictly required to protect the tube from excessive current and thermal damage in the event that the drive excitation is lost.

Average Characteristics Curves

For circuit design and load-line analysis, the average characteristics curves of the 17GJ5A are identical to those of the [6GW6](#) vacuum tube.

Technical Summary

The **17GJ5A** is a robust, high-efficiency Novar beam power pentode designed specifically for television horizontal-deflection-amplifier service. Operating with a 16.8 V, 0.45 A heater, it provides high peak current capabilities (up to 550 mA peak cathode current) and can withstand peak positive plate pulses up to 6,500 V. Its physical design features a compact T-12 envelope with an exhaust tip on the base, and it is available in both standard 9QK pinout and top-cap plate configurations. By adhering to the specified design-maximum ratings and implementing necessary excitation loss protection, the 17GJ5A delivers reliable performance in demanding high-voltage deflection circuits.



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	6GJ5A	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
For fixed-bias operation 2.2	2.2 MΩ	Published in approved 17GJ5A target datasheet entry; Section1
For cathode-bias operation 2.2	2.2 MΩ	Published in approved 17GJ5A target datasheet entry; Section1
DC Plate Supply Voltage	770 V	Published in approved 17GJ5A target datasheet entry; Section1
Peak Positive-Pulse Plate Voltage*	6500 V	Published in approved 17GJ5A target datasheet entry; Section1
Peak Negative-Pulse Plate Voltage	1500 V	Published in approved 17GJ5A target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Grid-No.2 Voltage	220 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Grid-No.1 Voltage	-55 V	Published in approved 17GJ5A target datasheet entry; Section1
Peak Negative-Pulse Grid-No.1 Voltage	330 V	Published in approved 17GJ5A target datasheet entry; Section1
Peak Cathode Current	550 mA	Published in approved 17GJ5A target datasheet entry; Section1
Average Cathode Current	175 mA	Published in approved 17GJ5A target datasheet entry; Section1
Plate Dissipation*	17.5 W	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.2 Input	3.5 W	Published in approved 17GJ5A target datasheet entry; Section1
For grid-resistor-bias operation*	1 MΩ	Published in approved 17GJ5A target datasheet entry; Section1
# Pulse duration must not exceed 15% of a horizontal scanning cycle (	10 microseconds	Published in approved 17GJ5A target datasheet entry; Section1
Heater Current 4.1 5.6 6.3	8 V	Published in approved 17GJ5A target datasheet entry; Section1
Peak Heater-Cathode 0.6 0.45 0.41	300 mA	Published in approved 17GJ5A target datasheet entry; Section1
Plate-Supply Voltage 600	600 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Plate Voltage 140	275 V	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.2 (Screen-Grid) Supply Voltage	600 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Grid-No.2 Voltage	275 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Grid-No.1 (Control-Grid) Voltage	-50 V	Published in approved 17GJ5A target datasheet entry; Section1
Cathode Current 22	20 mA	Published in approved 17GJ5A target datasheet entry; Section1
Plate Dissipation 1.8	2.4 W	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.2 Input*	0.55 W	Published in approved 17GJ5A target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Plate Voltage 100	170 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Grid-No.2 Voltage	120 V	Published in approved 17GJ5A target datasheet entry; Section1
DC Grid-No.1 Voltage -3	-1.2 V	Published in approved 17GJ5A target datasheet entry; Section1
voltage to	100 V	Published in approved 17GJ5A target datasheet entry; Section1
receivers to	50 V	Published in approved 17GJ5A target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage (ac/dc) 6.3 12.6	16.8 V	Published in approved 17GJ5A target datasheet entry; Section1
Heater Current 1.2 0.6	450 mA	Published in approved 17GJ5A target datasheet entry; Section1
Heater Warm-up Time (Average) 11	11 seconds	Published in approved 17GJ5A target datasheet entry; Section1
Grid No.1 to Plate	0.26 pF	Published in approved 17GJ5A target datasheet entry; Section1
Plate Voltage 150 60	250 V	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.2 Voltage 150 150	150 V	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.1 Voltage -22.5 0	-22.5 V	Published in approved 17GJ5A target datasheet entry; Section1
Plate Resistance (Approx.)	15000 Ω	Published in approved 17GJ5A target datasheet entry; Section1
Transconductance	7100 μS	Published in approved 17GJ5A target datasheet entry; Section1
390"	70 mA	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.1 Voltage for plate current of	1 mA	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.1 Voltage for plate current of 1 mA	-42 V	Published in approved 17GJ5A target datasheet entry; Section1
Plate Resistance (Approx.)	0.35 MΩ	Published in approved 17GJ5A target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Current 15	10 mA	Published in approved 17GJ5A target datasheet entry; Section1
Grid-No.2 Current	3 mA	Published in approved 17GJ5A target datasheet entry; Section1
For fixed-bias operation 0.5	1 MΩ	Published in approved 17GJ5A target datasheet entry; Section1
For cathode-bias operation 0.5	2.2 MΩ	Published in approved 17GJ5A target datasheet entry; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate to Cathode, Heater, Grid No.2, and Grid No.3	6.5 pF	Published in approved 17GJ5A target datasheet entry; Section1

TUBE TINKER

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