

ELECTRONIC TUBE REFERENCE

17KV6A

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Beam-power tube designed for high-voltage pulse and shunt-regulator applications in color television receivers, while retaining horizontal-deflection-family electrical characteristics.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9QU	BASE PINS	9
NOMINAL HEATER	16.8 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

9QU - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	–	G2 – Screen Grid	CONNECTED
PIN2	–	G1 – Control Grid	CONNECTED
PIN3	–	K – Cathode	CONNECTED
PIN4	–	H – Heater	CONNECTED
PIN5	–	H – Heater	CONNECTED
PIN6	–	G3 – Suppressor Grid	CONNECTED
PIN7	–	G2 – Screen Grid	CONNECTED
PIN8	–	–	IC
PIN9	–	P – Plate (Anode)	CONNECTED

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.0075 S
AMPLIFICATION FACTOR	4
MAXIMUM PLATE VOLTAGE	770 V
MAXIMUM SCREEN VOLTAGE	220 V
MAXIMUM PLATE DISSIPATION	20 W
MAXIMUM SCREEN DISSIPATION	4 W
MAXIMUM CATHODE CURRENT	200 mA
6KV6A electrical system; heater changed by 17KV6A sheet.	

17KV6A — Beam Power Tube

The **17KV6A** is a Novar-type beam power tube (also classified as a beam power pentode) designed primarily for high-voltage pulse- or shunt-regulator applications in color television receivers. It features a T-12 glass envelope with a 9-pin button base. The tube is electrically identical to the [6KV6A](#) and [22KV6A](#) except for its heater ratings, which are optimized for series-string heater chains requiring a nominal **16.8 V, 0.6 A** supply with a controlled warm-up time.

Construction, Mechanical Data, and Basing

The 17KV6A utilizes a **Novar T-12** construction with an exhaust tip located on the bottom of the envelope. It requires a standard 9-contact socket to accommodate its button 9-pin base (E9-88). The physical dimensions of the tube are:

- **Maximum Diameter:** 1.562 inches
- **Maximum Seated Height:** 3.000 inches
- **Maximum Overall Height:** 3.380 inches
- **Outline Designation:** 12-96 or 31D

The tube conforms to the **9QU** basing diagram, which assigns the internal electrodes to the following pin connections:

Pin Number	Electrode Connection
Pin 1	Grid No. 1 (G_1)
Pin 2	Grid No. 2 (G_2)
Pin 3	Cathode (K)
Pin 4	Heater (H)

Pin Number	Electrode Connection
Pin 5	Heater (<i>H</i>)
Pin 6	Grid No. 3 (<i>G</i> ₃)
Pin 7	Grid No. 2 (<i>G</i> ₂)
Pin 8	Internal Connection (<i>IC</i>) — <i>Do not use</i>
Pin 9	Plate (<i>P</i>)

Heater and Cathode Ratings

The heater of the 17KV6A is designed for series-string or parallel operation, with a controlled warm-up characteristic to minimize voltage surges in series-connected heater strings.

- **Heater Voltage (AC or DC):** 16.8 V
- **Heater Current:** 0.6 A (600 ± 40 mA)
- **Average Heater Warm-up Time:** 11 seconds

Heater-Cathode Voltage Limits

To prevent insulation breakdown between the heater and the cathode, the following maximum voltage limits must be observed:

- **Heater Negative with Respect to Cathode (Total DC and Peak):** 500 V max.
- **Heater Positive with Respect to Cathode (DC):** 100 V max.
- **Heater Positive with Respect to Cathode (Total DC and Peak):** 200 V max.
- **Average Heater-Cathode Voltage:** 100 V max.

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 17KV6A, measured without an external shield, are approximately:

- **Grid No. 1 to Plate:** 0.6 pF
- **Input (*G*₁ to *K*, *G*₃, *G*₂, *H*):** 22 pF
- **Output (*P* to *K*, *G*₃, *G*₂, *H*):** 9.0 pF

Electrical Characteristics and Typical Operation

The 17KV6A can be operated under different conditions. The published typical characteristics are divided into two distinct operating points:

Condition A (High-Current Low-Voltage State)

To prevent exceeding the maximum dissipation ratings during testing or operation at zero bias, measurements under this condition are performed using a recurrent waveform:

- **DC Plate Voltage:** 100 V
- **DC Grid No. 3 Voltage:** 0 V
- **DC Grid No. 2 Voltage:** 140 V
- **DC Grid No. 1 Voltage:** 0 V
- **DC Plate Current:** 440 mA
- **DC Grid No. 2 Current:** 30 mA

Condition B (Linear Amplifier State)

Under standard static conditions, the typical characteristics are:

- **DC Plate Voltage:** 140 V
- **DC Grid No. 3 Voltage:** 0 V
- **DC Grid No. 2 Voltage:** 140 V
- **DC Grid No. 1 Voltage:** -24.5 V
- **Triode Amplification Factor:** 4 (measured with Grid No. 3 connected to cathode, and Grid No. 2 connected to plate at the socket)
- **Plate Resistance (Approx.):** 6,000 to 10,000 Ω
- **Transconductance:** 6,000 to 10,000 μmhos
- **DC Plate Current:** 40 mA
- **DC Grid No. 2 Current:** 2.4 mA
- **Grid No. 1 Cutoff Voltage (for $I_b = 1 \text{ mA}$):** -42 V

The plate resistance and transconductance values exhibit ranges in the manufacturer specifications, with plate resistance documented at approximately 6,000 to 10,000 Ω and transconductance at 6,000 to 10,000 μmhos depending on the specific reference.

High-Voltage-Pulse Shunt Regulator Service

The primary application of the 17KV6A is as a shunt regulator in color television receivers operating in a standard 525-line, 30-frame system. Under the **Design-Maximum Rating System**, the absolute maximum ratings for this service are:

- **DC Plate Supply Voltage ($I_b = 0 \text{ mA}$):** 900 V max.
- **Peak Positive-Pulse Plate Voltage:** 6,500 V max.
- **Peak Negative-Pulse Plate Voltage:** 1,500 V max.
- **Peak Positive-Pulse Grid No. 2 Voltage:** 600 V max.
- **DC Grid No. 3 Voltage:** 75 V max.
- **DC Grid No. 2 Voltage:** 220 V max.
- **DC Grid No. 1 Voltage (Negative-bias value):** 250 V max.

- **Peak Negative-Pulse Grid No. 1 Voltage:** 330 V max.
- **Peak Cathode Current:** 950 mA max.
- **Average Cathode Current:** 275 mA max. (measured with a DC meter)
- **Grid No. 2 Input:** 2.0 W max.
- **Plate Dissipation:** 28 W max.
- **Envelope Temperature (at hottest point):** 240 °C max.

Operating Notes and Safety Precautions

- **Pulse Duration Limits:** The peak positive-pulse plate voltage rating of 6,500 V is only applicable when the pulse duration does not exceed 15% of one horizontal scanning cycle (which corresponds to 10 μ s in a 525-line, 30-frame system).
- **Short-Term Plate Dissipation:** Plate dissipation limits are rated at 28 W maximum, though some specifications permit short-term excursions up to 32 W, while others restrict short-term operation (up to 10 seconds) to 24 W, provided the maximum envelope temperature is not exceeded.
- **Grid Bias Protection:** Adequate circuit precautions must be taken to protect the tube from excessive current and damage in the event of a loss of Grid No. 1 bias.
- **Grid No. 1 Circuit Resistance:** For resistor-bias operation, the maximum allowable Grid No. 1 circuit resistance is 1.0 M Ω .

Related Designations

The **17KV6A** is part of a family of identical beam power tubes designed for different heater configurations. The **6KV6A** is the 6.3 V heater equivalent, while the **22KV6A** is the 22.4 V (or similar) heater equivalent. These tubes share identical mechanical dimensions, basing configurations, and electrical ratings, differing only in their heater voltage and current requirements.

Technical Summary

The **17KV6A** is a high-performance **Novar beam power tube** designed for demanding high-voltage shunt regulator and pulse applications in color television receivers. Featuring a robust **28 W plate dissipation** rating, a peak positive-pulse plate voltage capability of **6,500 V**, and a high peak cathode current limit of **950 mA**, it is well-suited for high-stress television circuitry. Its **16.8 V, 0.6 A** heater with an 11-second warm-up time makes it ideal for series-string heater designs.

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	—
Heater current	600 mA	—
Heater warm-up time	11 s	ControlledWarmup
Maximum DC plate voltage	770 V	HorizontalDeflection
Peak positive-pulse plate voltage	6500 V	HorizontalDeflection
Maximum screen voltage	220 V	HorizontalDeflection
Average cathode current	200 mA	HorizontalDeflection
Plate dissipation	20 W	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Screen voltage	150 V	ClassA
Plate current	70 mA	ClassA
Plate resistance	15000 ohm	ClassA
Transconductance	7500 uS	ClassA

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.26 pF	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Television horizontal-deflection amplifier	—

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
regulator applications in color television receivers.	11 s	Other;PublishedValue1
regulator applications in color television receivers.	11 s	Other;PublishedValue2
Average value	160 V	Other;PublishedValue1
Average value	100 V	Other;PublishedValue2
Average value	100 V	Other;PublishedValue3
DC Plate Supply Voltage (lb =	0 mA	MaximumRating;PublishedValue1
DC Plate Supply Voltage (lb =	900 mA	MaximumRating;PublishedValue2
Peak Negative-Pulse Plate Voltage	1500 V	MaximumRating
Peak Positive-Pulse Grid-No	2 V	MaximumRating;PublishedValue1
Peak Positive-Pulse Grid-No	600 V	MaximumRating;PublishedValue2
DC Grid-No	2 V	MaximumRating;PublishedValue1
DC Grid-No	220 V	MaximumRating;PublishedValue2
DC Grid-No.1 Voltage, Negative-bias value	250 V	MaximumRating
Peak Negative-Pulse Grid-No.1 Voltage	330 V	MaximumRating
Peak Cathode Current	950 mA	MaximumRating
Average Cathode Current	275 mA	MaximumRating
Plate Dissipation]	28 W	MaximumRating
For grid-No.1-resistor-bias operation	1 megohm	MaximumCircuitValue

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	900 V	Section1;Promoted
Maximum Screen Voltage	140 V	Section1;Promoted
Maximum Plate Dissipation	28 W	Section1;Promoted
Maximum Screen Dissipation	2 W	Section1;Promoted
Maximum Cathode Current	275 mA	Section1;Promoted

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate	0.1 pF	Capacitance
and Grid No	3 pF	Capacitance;PublishedValue1
and Grid No	2 pF	Capacitance;PublishedValue2
and Grid No	3 pF	Capacitance;PublishedValue1
and Grid No	1 pF	Capacitance;PublishedValue2

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	100 V	Characteristic;PublishedValue1
Plate Voltage	140 V	Characteristic;PublishedValue2
Grid-No	3 V	Characteristic;PublishedValue1
Grid-No	0 V	Characteristic;PublishedValue2
Grid-No	0 V	Characteristic;PublishedValue3
Grid-No	2 V	Characteristic;PublishedValue1
Grid-No	140 V	Characteristic;PublishedValue2
Grid-No	140 V	Characteristic;PublishedValue3
Grid-No.1 (Control-Grid) Voltage	0 V	Characteristic;PublishedValue1
Grid-No.1 (Control-Grid) Voltage	-24.5 V	Characteristic;PublishedValue2
–	10000 ohm	Characteristic
Transconductance –	6000 uS	Characteristic
Plate Current ««	40 mA	Characteristic
Grid-No.1 Voltage for plate current of	1 mA	Characteristic;PublishedValue1
Grid-No.1 Voltage for plate current of	-42 mA	Characteristic;PublishedValue2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	6000 μ S	Section1;Promoted

TUBE TINKER

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