

ELECTRONIC TUBE REFERENCE

17JR6

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Novar beam-power tube designed for horizontal-deflection amplification in low-B-plus black-and-white television receivers, with high pulse-voltage capability.

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	4.7
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	175 mA
<i>6JR6 electrical system; heater changed by 17JR6 sheet.</i>	

17JR6 — Beam Power Tube

A Novar-type beam power tube designed for horizontal- and vertical-deflection amplifier service in television receivers.

Overview

The **17JR6** is a beam power tube utilizing a Novar envelope and base. It is primarily designed for horizontal-deflection amplifier service in low B+ black-and-white television receivers, as well as vertical-deflection amplifier service. The 17JR6 is electrically identical to the [6JR6](#), [22JR6](#), and [33JR6](#) vacuum tubes, differing only in its heater ratings and characteristics.

Construction, Heater, and Pinout

The 17JR6 is constructed in a Novar glass envelope and requires a standard 9-contact Novar socket. It features a unipotential coated cathode and a heater designed for series-string or parallel operation.

Heater Ratings

- **Heater Voltage (AC/DC):** 16.8 V
- **Heater Current:** 0.6 A (with a tolerance of 0.600 ± 0.040 A)
- **Average Heater Warm-up Time:** 11 seconds
- **Heater-Cathode Voltage:**
 - **Peak value:** ± 200 V maximum
 - **Average value:** 100 V maximum

Pinout and Base Connections

The tube utilizes the **9QU** base pinout. There are two documented configurations for the connections of pins 8 and 9:

- **Configuration A:**
 - Pin 1: Grid No. 1
 - Pin 2: Grid No. 2
 - Pin 3: Cathode
 - Pin 4: Heater
 - Pin 5: Heater
 - Pin 6: Grid No. 3
 - Pin 7: Grid No. 2
 - Pin 8: Plate
 - Pin 9: Internal Connection (IC)
- **Configuration B:**
 - Pin 1: Grid No. 1
 - Pin 2: Grid No. 2
 - Pin 3: Cathode
 - Pin 4: Heater
 - Pin 5: Heater
 - Pin 6: Grid No. 3
 - Pin 7: Grid No. 2
 - Pin 8: Internal Connection (IC)
 - Pin 9: Plate

Interelectrode Capacitances

The approximate direct interelectrode capacitances of the 17JR6 are:

- **Grid No. 1 to Plate:** 0.7 pF
- **Grid No. 1 to Cathode, Heater, Grid No. 2, and Grid No. 3:** 22 pF
- **Plate to Cathode, Heater, Grid No. 2, and Grid No. 3:** 9 pF

Typical Characteristics and Operating Points

The 17JR6 can be operated in either triode or pentode configurations. Typical Class A/Class A1 characteristics are documented under specific operating conditions.

Triode Connection

When operated as a triode (with Grid No. 2 connected to the plate and Grid No. 3 connected to the cathode at the socket):

- **Plate Voltage:** 125 V

- **Grid-No. 2 Voltage:** 125 V
- **Grid-No. 1 Voltage:** -20 V
- **Amplification Factor:** 4.7
- **Grid-No. 1 Voltage for Plate Current of 1 mA:** -75 V

Pentode Connection

When operated as a pentode (with Grid No. 3 connected to the cathode at the socket), two primary operating conditions are established:

Parameter	Condition A	Condition B
Plate Voltage	50 V	130 V
Grid-No. 2 Voltage	125 V	125 V
Grid-No. 1 Voltage	0 V	-20 V
Peak Positive-Pulse Plate Voltage	6500 V	—
Plate Resistance (Approx.)	—	18,000 Ω
Transconductance	—	7000 μmhos
Plate Current	470 mA	45 mA
Grid-No. 2 Current	32 mA	1.5 mA to 1.6 mA
Grid-No. 1 Voltage for Plate Current of 1 mA	-75 V or -32 V	-32 V

Note: The plate and grid-No. 2 currents under Condition A are measured using a recurrent waveform method.

Horizontal-Deflection Amplifier Service

For horizontal-deflection amplifier service in 525-line, 30-frame television systems, the 17JR6 is rated under the Design-Maximum system as follows:

Maximum Ratings

- **Plate Supply Voltage:** 770 V
- **Peak Positive-Pulse Plate Voltage:** 6500 V (with a pulse duration not exceeding 15% of one horizontal scanning cycle, or 10 μs)
- **Peak Negative-Pulse Plate Voltage:** 1500 V
- **Grid-No. 3 Voltage:** 75 V (a positive bias up to 30 V typical may be applied to minimize "snivets" interference)

- **Grid-No. 2 Voltage:** 220 V
- **Grid-No. 1 Voltage (Negative-bias value):** 55 V
- **Peak Negative-Pulse Grid-No. 1 Voltage:** 330 V
- **Peak Cathode Current:** 950 mA
- **Average Cathode Current:** 275 mA
- **Grid-No. 2 Input:** 3.5 W
- **Plate Dissipation:** 17 W (a bias resistor or other protective means is required in the absence of excitation)
- **Bulb Temperature (at hottest point):** 240 °C

Maximum Circuit Values

- **Grid-No. 1-Circuit Resistance:**
 - Cathode bias (with minimum cathode resistance of 100 Ω): 1 megohm
 - Grid-leak bias (with signal peak clamped to zero bias): 10 megohms
 - Fixed bias (where positive grid current is not drawn): 0.47 megohm
 - Grid-resistor-bias: 0.47 megohm
 - Plate-pulsed operation: 10 megohms

Vertical-Deflection Amplifier Service

When utilized in vertical-deflection amplifier service for 525-line, 30-frame television systems, the 17JR6 is subject to the following Design-Maximum ratings:

Maximum Ratings

- **DC Plate Voltage:** 425 V
- **Peak Positive-Pulse Plate Voltage (Absolute-Maximum Value):** 2000 V (with a pulse duration not exceeding 15% of the vertical scanning cycle, or 2.5 ms)
- **DC Grid-No. 3 and Diode-Plate Voltage:** -150 V
- **DC Grid-No. 2 Voltage:** 330 V
- **Peak Negative-Pulse Grid-No. 1 Voltage:** 150 V
- **Average Cathode Current:** 70 mA
- **Peak Cathode Current:** 250 mA
- **Average Diode-Plate (and Grid-No. 3) Current:** 1 mA
- **Plate Dissipation:** 10 W
- **Grid-No. 2 Input:** 2 W
- **Bulb Temperature (at hottest point):** 240 °C

Maximum Circuit Values

- **Grid-No. 1-Circuit Resistance:**
 - For grid-No. 1-resistor-bias or cathode-bias: 2.2 megohms

Qualitative Curve Analysis

The electrical behavior of the 17JR6 is characterized by distinct plate and grid-No. 2 relationships:

- **Plate and Grid-No. 2 Characteristics at Grid-No. 2 Voltage of 125 V:** The plate current (I_b) curves exhibit a sharp knee behavior below a plate voltage of 50 V. At a grid-No. 1 voltage (E_{c1}) of 0 V, the plate current rises steeply, reaching peak values between 300 mA and nearly 500 mA at plate voltages near 100 V. Conversely, the grid-No. 2 current (I_{c2}) is at its maximum at low plate voltages (reaching approximately 100 mA at zero plate voltage) and drops rapidly as the plate voltage exceeds 50 V.
- **Plate Characteristics at Grid-No. 1 Voltage of 0 V across varying Grid-No. 2 Voltages:** When evaluated with Grid No. 3 connected to the cathode and Grid No. 1 at 0 V, the plate current curves for various grid-No. 2 voltages (ranging from 50 V to 175 V) demonstrate that the knee voltage increases with higher grid-No. 2 potentials. Saturation levels are highly dependent on the grid-No. 2 voltage, with peak plate currents exceeding 800 mA to 900 mA when the grid-No. 2 voltage is set to 175 V and the plate voltage reaches 400 V.

Technical Summary

The **17JR6** is a high-performance **Novar beam power tube** designed for demanding television deflection applications. Featuring a **16.8 V, 0.6 A** heater with a controlled 11-second warm-up time, it is optimized for series-string or parallel heater circuits. The tube is capable of handling high peak positive-pulse plate voltages up to **6500 V** in horizontal-deflection service and **2000 V** in vertical-deflection service. With its high peak cathode current capability (up to **950 mA** in horizontal service) and robust plate dissipation ratings (up to **17 W**), the 17JR6 provides reliable performance in low B+ black-and-white television receivers.

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	175 mA	HorizontalDeflection
Plate dissipation	17.5 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
Heater Voltage (ac/dc) 6.3 16.8 22	33 V	Published in approved 33JR6 target datasheet entry; Section1
Heater Current 1.6 0.6 0.45	300 mA	Published in approved 33JR6 target datasheet entry; Section1
(Average) 11 11	11 seconds	Published in approved 33JR6 target datasheet entry; Section1
Grid No.1 to Plate	0.7 pF	Published in approved 33JR6 target datasheet entry; Section1
–	0 V	Published in approved 33JR6 target datasheet entry; Section1
–	18000 Ω	Published in approved 33JR6 target datasheet entry; Section1
Plate Current 470J	45 mA	Published in approved 33JR6 target datasheet entry; Section1
32t	1.5 mA	Published in approved 33JR6 target datasheet entry; Section1
current of	1 mA	Published in approved 33JR6 target datasheet entry; Section1
current of 1 mA	-32 V	Published in approved 33JR6 target datasheet entry; Section1
3 600 -GR 0-No	2 V	Published in approved 33JR6 target datasheet entry; Section1
Plate Supply Voltage	770 V	Published in approved 33JR6 target datasheet entry; Section1
Peak Positive-Pulse Plate Voltage#	6500 V	Published in approved 33JR6 target datasheet entry; Section1
Peak Negative-Pulse Plate Voltage	1500 V	Published in approved 33JR6 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.3 Voltage	75 V	Published in approved 33JR6 target datasheet entry; Section1
Grid-No.2 Voltage	220 V	Published in approved 33JR6 target datasheet entry; Section1
Grid-No.1 Voltage, Negative-bias value	55 V	Published in approved 33JR6 target datasheet entry; Section1
Peak Negative-Pulse Grid-No.1 Voltage	330 V	Published in approved 33JR6 target datasheet entry; Section1
Peak Cathode Current	950 mA	Published in approved 33JR6 target datasheet entry; Section1
Plate Dissipation*	17 W	Published in approved 33JR6 target datasheet entry; Section1
Bulb Temperature (At hottest point)	240 °C	Published in approved 33JR6 target datasheet entry; Section1
I00&)	1 MΩ	Published in approved 33JR6 target datasheet entry; Section1
Grid-leak bias (with signal peak clamped to zero bias)	10 MΩ	Published in approved 33JR6 target datasheet entry; Section1
Fixed bias (where positive grid current is not drawn)	0.47 MΩ	Published in approved 33JR6 target datasheet entry; Section1
# Pulse duration must not exceed 15% of one horizontal scanning cycle (	10 microseconds	Published in approved 33JR6 target datasheet entry; Section1
ference; a typical value for this voltage is	30 V	Published in approved 33JR6 target datasheet entry; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
and Grid No.3	22 pF	Published in approved 33JR6 target datasheet entry; Section1
and Grid No.3	9 pF	Published in approved 33JR6 target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 (Screen-Grid) Voltage 125 125 125	125 V	Published in approved 33JR6 target datasheet entry; Section1

TUBE TINKER

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