

ELECTRONIC TUBE REFERENCE

17JM6A

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Beam-power tube designed for horizontal-deflection amplification in color and black-and-white television receivers, with controlled warm-up and high pulse ratings.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9QU	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

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	0.0071 S
MAXIMUM PLATE VOLTAGE	6500 V
MAXIMUM SCREEN VOLTAGE	220 V
MAXIMUM PLATE DISSIPATION	17 W
MAXIMUM SCREEN DISSIPATION	3.5 W
MAXIMUM CATHODE CURRENT	175 mA
<i>Horizontal-deflection beam-power section; supplied sheet defers non-heater electrical data to 6JM6A.</i>	

17JM6A — Compactron Beam Power Pentode

The **17JM6A** (also designated as **17JM6-A**) is a duodecar-type, compactron beam power pentode designed primarily for use as a horizontal-deflection amplifier in both color and black-and-white television receivers. It features a separate connection for its beam plates (Grid No. 3) to minimize "snivets" during television operation.

The 17JM6A is electrically identical to the [6JM6A](#) except for its heater ratings. It is also unilaterally interchangeable with the [17JM6](#), from which it differs by incorporating a lower knee in its plate characteristics.

Construction, Physical Dimensions, and Pinout

The 17JM6A is constructed using a T12 glass bulb (Compactron T-12) and requires a duodecar 12-contact socket. The physical dimensions of the tube are as follows:

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

Depending on the specific manufacturing layout and outline configuration (such as Outlines 39A, 16A, or 12-79), three distinct pinout configurations are documented under the 12FJ basing designation.

Pinout Configuration A

In this configuration, the plate is connected internally to Pin 11:

- **Pin 1:** Heater (H)
- **Pin 2:** Cathode (K)
- **Pin 3:** Grid No. 2 ([G2](#))
- **Pin 4:** Grid No. 3 (G3)
- **Pin 5:** Grid No. 1 (G1)

- **Pin 6:** No Connection (NC)
- **Pin 7:** No Connection (NC)
- **Pin 8:** Internal Connection (IC)
- **Pin 9:** No Connection (NC)
- **Pin 10:** Grid No. 3 (G3)
- **Pin 11:** Plate (P)
- **Pin 12:** Heater (H)

Pinout Configuration B

In this configuration, the plate is connected internally to Pin 7:

- **Pin 1:** Grid No. 1 (G1)
- **Pin 2:** Cathode (K)
- **Pin 3:** Grid No. 2 (G2)
- **Pin 4:** Grid No. 3 (G3)
- **Pin 5:** Heater (H)
- **Pin 6:** No Connection (NC)
- **Pin 7:** Plate (P)
- **Pin 8:** No Connection (NC)
- **Pin 9:** Internal Connection (IC)
- **Pin 10:** Grid No. 3 (G3)
- **Pin 11:** No Connection (NC)
- **Pin 12:** Heater (H)

Pinout Configuration C (Top Cap Plate Connection)

In this configuration, the plate is routed to a C1-3 top cap, and the base uses an E12-74 button 12-pin arrangement:

- **Pin 1:** Heater (H)
- **Pin 2:** Grid No. 3 (G3)
- **Pin 3:** Grid No. 2 (G2)
- **Pin 4:** Cathode (K)
- **Pin 5:** Grid No. 1 (G1)
- **Pin 6:** No Connection (NC)
- **Pin 7:** Internal Connection (IC)
- **Pin 8:** No Connection (NC)
- **Pin 9:** No Connection (NC)
- **Pin 10:** Grid No. 2 (G2)
- **Pin 11:** Grid No. 3 (G3)
- **Pin 12:** Heater (H)
- **Top Cap:** Plate (P)

Heater and Cathode Characteristics

The 17JM6A utilizes a coated unipotential cathode. The heater is designed for series-string television receiver applications and has the following ratings:

Parameter	Value
Heater Voltage (AC or DC)	16.8 V
Heater Current	0.45 A $\pm$ 0.03 A (450 mA)
Average Heater Warm-up Time	11 s

The average heater warm-up time is measured under specific conditions: applying four times the bogey heater voltage (67.2 V) to the heater in series with an external resistance equal to three times the bogey heater voltage divided by the bogey heater current (calculated as $3 * 16.8 \text{ V} / 0.45 \text{ A} = 112 \text{ ohms}$).

Heater-Cathode Voltage Limits

- **Peak Value:** $\pm$ 200 V max
- **Average Value:** 100 V max
- **Heater Negative with Respect to Cathode (Total DC and Peak):** 200 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

Electrical Characteristics and Class A1 Operation

Direct Interelectrode Capacitances

The capacitances of the tube, measured without an external shield, are:

- **Grid No. 1 to Plate:** 0.6 pF
- **Input (Grid No. 1 to Cathode, Heater, Grid No. 2, Grid No. 3):** 16 pF
- **Output (Plate to Cathode, Heater, Grid No. 2, Grid No. 3):** 7 pF

Typical Operating Conditions

The 17JM6A can be operated in either pentode or triode configurations. In pentode operation, Grid No. 3 is connected directly to the cathode at the socket.

Parameter	Pentode Condition 1	Pentode Condition 2	Pentode Condition 3	Triode Connection
Plate Voltage	5000 V	55 V	250 V	150 V
Grid No. 2 Voltage	150 V	150 V	150 V	150 V (tied to plate)

Parameter	Pentode Condition 1	Pentode Condition 2	Pentode Condition 3	Triode Connection
Grid No. 1 Voltage	—	0 V	-22.5 V	-22.5 V
Plate Resistance (Approx.)	—	—	15,000 Ω	—
Transconductance	—	—	7,300 μ mhos	—
Plate Current	345 mA*	345 mA*	65 mA to 70 mA	—
Grid No. 2 Current	30 mA*	30 mA*	1.8 mA to 2.4 mA	—
Grid No. 1 Cutoff Voltage (Approx.)	-100 V (for $I_b = 1 \mu$ A to 1.0 mA)	—	-42 V (for $I_b = 1 \mu$ A to 1.0 mA)	—
Amplification Factor (M)	—	—	—	4.4

Note: Values marked with an asterisk are measured using a recurrent waveform method to avoid exceeding the maximum ratings of the tube.

Instantaneous Plate Knee Values

At the knee of the plate characteristic curve, under the conditions of $E_b = 55$ V, $E_{c2} = 150$ V, and $E_{c1} = 0$ V, the instantaneous currents are:

- **Plate Current (I_b):** 345 mA
- **Grid No. 2 Current (I_{c2}):** 30 mA

Horizontal-Deflection Amplifier Service and Ratings

The primary application of the 17JM6A is in the horizontal-deflection amplifier stage of television receivers operating under a 525-line, 30-frame system. The following design-maximum ratings must be observed:

Rating Parameter	Design-Maximum Limit
DC Plate Supply Voltage (Boost + DC Power Supply)	770 V max
Peak Positive-Pulse Plate Voltage	6500 V max
Peak Negative-Pulse Plate Voltage	1500 V max

Rating Parameter	Design-Maximum Limit
DC Grid No. 3 Voltage (Positive DC Beam Plate Voltage)	70 V max
DC Grid No. 2 Voltage	220 V max
DC Grid No. 1 Voltage (Negative-bias)	55 V max
Peak Negative-Pulse Grid No. 1 Voltage	330 V max
Average Cathode Current	175 mA max
Peak Cathode Current	550 mA to 650 mA max
Plate Dissipation	17.5 W max
Grid No. 2 Input (Dissipation)	3.5 W max
Grid No. 1 Circuit Resistance	1.0 M Ω max
Bulb Temperature (at hottest point)	220 $^{\circ}$ C max

Circuit Protection

The peak positive-pulse plate voltage rating of 6500 V is restricted to a maximum pulse duration of 15% of one horizontal scanning cycle (equivalent to 10 μ s in a standard 525-line, 30-frame system).

Additionally, because horizontal-deflection stages often operate with grid-leak bias, the tube requires an adequate cathode bias resistor or other protective means to limit plate and screen currents and prevent thermal runaway in the event that excitation is lost.

Qualitative Curve Observations

The average plate characteristics of the 17JM6A, when plotted for $E_{c1} = 0$ V at a 10% duty cycle, reveal several key performance traits:

- **Knee Behavior:** The plate current (I_b) curves exhibit a very sharp knee at low plate voltages, typically between 50 V and 75 V depending on the screen grid voltage (E_{c2}). This low-knee characteristic is a key design improvement over the original [17JM6](#), allowing for more efficient operation.
- **High-Current Capability:** For $E_{c2} = 200$ V, the plate current reaches approximately 580 mA above the knee.
- **Screen Grid Current Behavior:** The Grid No. 2 current (I_{c2}) peaks sharply at very low plate voltages below the knee. Once the plate voltage rises past the knee, the screen current drops rapidly to a low, stable level below 50 mA, minimizing screen grid dissipation during normal operation.

Technical Summary

The **17JM6A** is a high-performance compactron beam power pentode designed for television horizontal-deflection service. Operating with a **16.8 V, 0.45 A** heater, it features a separate beam plate connection to suppress snivets and a low-knee plate characteristic for high efficiency. With a peak positive-pulse plate voltage rating of **6500 V**, a plate dissipation limit of **17.5 W**, and a transconductance of **7,300 μ mos** under typical Class A1 conditions, the 17JM6A provides robust and reliable operation in demanding television deflection circuits.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1964 RMA EIA

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

1964 RMA EIA

Section 1 · Beam Power

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	16.8 V	—
Heater Current	450 mA	—
Heater Warm-up Time	11 s	—
Electrical Characteristics Reference	6JM6A text	SuppliedSheetStatesIdenticalExceptHeaterCharacteristics



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)	16.8 V	Published in approved 17JM6A target datasheet entry; Section1
Heater Current	450 mA	Published in approved 17JM6A target datasheet entry; Section1
Heater Warm-up Time (Average)	11 seconds	Published in approved 17JM6A target datasheet entry; Section1
Grid-No.1-Circuit Resistance	1 MΩ	Published in approved 17JM6A target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Plate Supply Voltage	770 V	Published in approved 17JM6A target datasheet entry; Section1
Peak Positive-Pulse Plate Voltage*	6500 V	Published in approved 17JM6A target datasheet entry; Section1
Peak Negative-Pulse Plate Voltage	1500 V	Published in approved 17JM6A target datasheet entry; Section1
DC Grid-No.3 Voltage	70 V	Published in approved 17JM6A target datasheet entry; Section1
DC Grid-No.2 Voltage	220 V	Published in approved 17JM6A target datasheet entry; Section1
DC Grid-No.1 Voltage, Negative-bias value	55 V	Published in approved 17JM6A target datasheet entry; Section1
Peak Negative-Pulse Grid-No.1 Voltage	330 V	Published in approved 17JM6A target datasheet entry; Section1
Average Cathode Current	175 mA	Published in approved 17JM6A target datasheet entry; Section1
Peak Cathode Current	550 mA	Published in approved 17JM6A target datasheet entry; Section1
Plate Dissipation**	17.5 W	Published in approved 17JM6A target datasheet entry; Section1
Grid-No.2 Input	3.5 W	Published in approved 17JM6A target datasheet entry; Section1
# Pulse duration must not exceed 15% of a horizontal scanning cycle (	10 microseconds	Published in approved 17JM6A target datasheet entry; Section1
Heater Voltage (ac/dc) 6.3 12.6	16.8 V	Published in approved 17JM6A target datasheet entry; Section1
Heater Current 1.2 0.6	450 mA	Published in approved 17JM6A target datasheet entry; Section1
Heater Warm-up Time (Average) 11	11 seconds	Published in approved 17JM6A target datasheet entry; Section1
Heater Voltage (ac/dc) 6.3	18.9 V	Published in approved 17JM6A target datasheet entry; Section1
Heater Current 0.45	150 mA	Published in approved 17JM6A target datasheet entry; Section1
Plate Voltage 300	300 V	Published in approved 17JM6A target datasheet entry; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate	0.6 pF	Published in approved 17JM6A target datasheet entry; Section1
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3	16 pF	Published in approved 17JM6A target datasheet entry; Section1
Plate to Cathode, Heater, Grid No. 2, and Grid No	3 pF	Published in approved 17JM6A target datasheet entry; Section1
Grid No.1 to Plate	0.34 pF	Published in approved 17JM6A target datasheet entry; Section1
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3	16 pF	Published in approved 17JM6A target datasheet entry; Section1
Plate to Cathode, Heater, Grid No.2, and Grid No.3	7 pF	Published in approved 17JM6A target datasheet entry; Section1
Grid No.1 to Plate	0.01 pF	Published in approved 17JM6A target datasheet entry; Section1
Shield	5.5 pF	Published in approved 17JM6A target datasheet entry; Section1
Shield	3.4 pF	Published in approved 17JM6A target datasheet entry; Section1
Grid to Plate	1.7 pF	Published in approved 17JM6A target datasheet entry; Section1
and Internal Shield	3.2 pF	Published in approved 17JM6A target datasheet entry; Section1
and Internal Shield	2.2 pF	Published in approved 17JM6A target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage 5000 55 250	150 V	Published in approved 17JM6A target datasheet entry; Section1
Grid-No.2 (Screen-Grid) Voltage 150 150 150	150 V	Published in approved 17JM6A target datasheet entry; Section1
Grid-No.1 (Control-Grid) Voltage – 0 –22.5	-22.5 V	Published in approved 17JM6A target datasheet entry; Section1
Plate Resistance (Approx.)	15000 Ω	Published in approved 17JM6A target datasheet entry; Section1
Plate Current – 345*	65 mA	Published in approved 17JM6A target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 Current – 30*	1.8 mA	Published in approved 17JM6A target datasheet entry; Section1
current of 1 #A – 100 –	-42 V	Published in approved 17JM6A target datasheet entry; Section1