

ELECTRONIC TUBE REFERENCE

17BJP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

P4 cathode-ray display tube documented for high-voltage direct-view operation, using magnetic deflection and manufacturer-specified beam focusing and control arrangements appropriate to type 17BJP4.

GENERAL CHARACTERISTICS

BASE DESIGNATION	B6-63	BASE PINS	6
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	16000 V
MAXIMUM SCREEN VOLTAGE	550 V
CRT-specific anode, focus, deflection and optical data retained as parameters rather than forced into ordinary plate/screen fields.	

17BJP4 — Electrostatic-Focus Magnetic-Deflection Cathode Ray Tube

The **17BJP4** is a direct-view rectangular glass picture tube designed for television receiver applications. It features low-voltage electrostatic focusing, a 90-degree magnetic deflection system, and an aluminized screen. The electron gun is designed to operate without requiring an external ion-trap magnet.

Construction and Optical Characteristics

The 17BJP4 is constructed with a rectangular glass bulb and an external conductive coating that provides a regular-band type grounding contact area near the reference line. The screen utilizes an aluminized P-4 sulfide-type phosphor, which produces a white fluorescent and phosphorescent color with short persistence.

To improve picture contrast under ambient light, the tube is equipped with a gray, spherical filterglass faceplate. This faceplate provides a typical light transmission of approximately 74% at the center.

The physical dimensions and screen area of the tube are as follows:

- **Projected Area of Screen:** 149 square inches
- **Raster Size:** Approximately 14-1/8" x 10-3/8" to 14-1/4" x 10-3/4"
- **Minimum Useful Screen Dimensions:**
 - Diagonal: 15-9/16 inches
 - Width: 14-5/16 inches
 - Height: 11-1/8 inches

Mechanical Specifications

The mechanical design of the 17BJP4 incorporates specific physical dimensions and alignment tolerances to facilitate mounting and connection within television chassis:

- **Overall Length:** 14-5/8 inches (with a tolerance of $\pm 3/16$ to $\pm 3/8$ inches)
- **Neck Length:** 5-1/2 $\pm 3/16$ inches
- **Greatest Bulb Dimensions:**
 - Diagonal: 16-5/8 $\pm 1/8$ inches
 - Width: 15-3/8 $\pm 1/8$ inches
 - Height: 12-9/32 $\pm 1/8$ inches
- **Weight:** Approximately 15 lbs.
- **Bulb Contact:** Recessed Small Cavity Cap (JEDEC No. J1-21)
- **Base Options:** Small-Shell Duodecal 6-Pin (JEDEC Group 4, No. B6-63) or Short Small-Shell Duodecal 6-Pin (JEDEC No. B6-203)
- **Bulb Contact Alignment:** The J1-21 anode contact aligns with pin position #6 within a tolerance of ± 30 degrees.

Electrical Connections and Basing

The 17BJP4 uses the **12L** basing configuration (viewed from the bottom). The pin assignments and electrode connections are detailed below:

Pin / Cap	Connection
Pin 1	Heater

Pin / Cap	Connection
Pin 2	Grid No. 1 (Control Grid)
Pin 6	Grid No. 4 (Focusing Electrode)
Pin 10	Grid No. 2 (Screen Grid)
Pin 11	Cathode
Pin 12	Heater
Anode Cap	Grid No. 3, Grid No. 5, Screen, Collector
Coating (C)	External Conductive Coating

Heater Ratings and Interelectrode Capacitances

The unipotential cathode is indirectly heated. The heater and interelectrode capacitance values are specified as follows:

- **Heater Voltage (Typical):** 6.3 V
- **Heater Voltage Limits (Design-Maximum):** 5.7 V minimum to 6.9 V maximum
- **Heater Current:** 0.6 A nominal (600 $\pm$ 30 mA at 6.3 V)
- **Cathode to all other electrodes capacitance:** 5 pF
- **Grid No. 1 to all other electrodes capacitance:** 6 pF
- **External conductive coating to anode capacitance:** 1500 pF maximum, with a minimum limit of 1000 to 1200 pF

Deflection and Focus

The tube utilizes magnetic deflection and electrostatic focusing. The approximate deflection angles are:

- **Horizontal:** 85 degrees
- **Vertical:** 68 degrees
- **Diagonal:** 90 degrees

The electrostatic focusing system is controlled via Grid No. 4, which operates at low voltages relative to the high-voltage anode.

Maximum Ratings

The operating limits of the 17BJP4 are defined under both the Design Center System and the Design-Maximum System. These limits must be observed to prevent degradation of performance or premature tube failure.

Design Center System Ratings

- **Maximum DC Anode Voltage:** 16,000 V (Anode voltage should not be operated below 12,000 V to prevent a decrease in brilliance and definition)
- **Maximum DC Grid No. 4 Voltage:** -500 to +1000 V
- **Maximum DC Grid No. 2 Voltage:** 500 V
- **Maximum Grid No. 1 Voltage:**
 - DC Negative-Bias Value: 140 V
 - DC Positive-Bias Value: 0 V
 - Positive-Peak Value: 0 V
- **Maximum DC Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up (not to exceed 15 seconds): 410 V
 - Heater negative with respect to cathode after warm-up: 180 V
 - Heater positive with respect to cathode: 180 V

Design-Maximum System Ratings

- **Anode Voltage:** 17,500 V maximum, 11,000 V minimum
- **Grid No. 4 (Focusing) Voltage:** Positive 1100 V maximum, Negative 550 V maximum
- **Grid No. 2 Voltage:** 550 V maximum
- **Grid No. 1 Voltage:**
 - Negative peak: 220 V maximum
 - Negative bias: 155 V maximum
 - Positive bias: 0 V maximum
 - Positive peak: 2 V maximum
- **Peak Heater-Cathode Voltage:**
 - Heater negative to cathode (during warm-up $\leq$ 15 seconds): 450 V maximum
 - Heater negative to cathode (after warm-up): 200 V maximum
 - Heater positive to cathode: 200 V maximum (combined AC & DC), 100 V maximum (DC component)
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 M Ω

Typical Operating Conditions (Grid-Drive Service)

In typical grid-drive television applications, the 17BJP4 operates under the following conditions (with voltages specified positive with respect to the cathode):

- **DC Anode Voltage:** 14,000 V
- **DC Grid No. 4 Voltage:** -55 to +300 V
- **DC Grid No. 2 Voltage:** 300 V
- **DC Grid No. 1 Voltage (for visual extinction of focused raster):** -28 to -72 V

These operating parameters ensure proper focus and raster brightness control, with Grid No. 4 adjusted within its specified range to achieve optimum electrostatic focus across the screen.



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 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	16000 V	—
Typical Anode Voltage	14000 V	—
Maximum Grid2 Voltage	400 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FocusingMethod	Electrostatic	—
DeflectingMethod	Magnetic	—
DiagonalDeflectionAngleApproximate	90 degree	—
PhosphorNumber	4	—
FluorescentColor	White	—
Persistence	Medium	—



SOURCE OPERATING CONDITIONS

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1966 Tung Sol Electronic Tubes 4 of 4

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1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum DC grid 2 voltage	500 V	—
Maximum DC grid 4 voltage	-500–1000 V	—
Maximum grid 1 negative-bias voltage	140 V	NegativeBias
Maximum grid 1 positive-bias voltage	0 V	PositiveBias
Maximum grid 1 positive-peak voltage	2 V	PositivePeak
Peak heater-cathode voltage	410 V	HeaterNegativeWarmup
Peak heater-cathode voltage	180 V	HeaterNegativeAfterWarmup
Peak heater-cathode voltage	180 V	HeaterPositive
DC anode voltage	14000 V	TypicalOperation
DC grid 4 voltage	-55–300 V	TypicalOperation
DC grid 2 voltage	300 V	TypicalOperation
DC grid 1 voltage	-28--72 V	TypicalOperation
Faceplate transmission at center	74 %	Approximate

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal deflection angle	85 degrees	Approximate
Vertical deflection angle	68 degrees	Approximate
Diagonal deflection angle	90 degrees	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate
Grid 1 to all other electrodes capacitance	6 pF	Approximate
External conductive coating to anode capacitance	1500 pF	Maximum
External conductive coating to anode capacitance	1200 pF	Minimum

SOURCE OPERATING CONDITIONS

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1971 RCA HB3 Binder 1 of 7

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

1971 RCA HB3 BINDER 1 OF 7

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
LOW-VOLTAGE ELECTROSTATIC FOCUS	90 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid No.1 to all other electrodes	6 pF	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 1	6.3 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 2	600 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Current at 6.3 volts – published value 3	30 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Light transmission (Approx.)	74	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Projected Area of Screen	149	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Pi n	1	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ANODE VOLTAGE	111000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
HEATER VOLTAGE	15.7 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode Voltage	14000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage – published value 1	-55 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltage – published value 2	300 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage	300 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 1	-28 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
focused raster – published value 2	-72 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
External conductive coating to anode	1500 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
GRID-No.2 VOLTAGE	550 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Combined AC and DC voltage	200 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.1-Circuit Resistance	1.5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.