

Seventeen-inch rectangular television picture tube with filter glass for improved viewing contrast. The available Rogers documentation identifies its direct-view television purpose; sparse surviving detail does not justify additional specialized construction tags.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 300 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray
No fixed ratings recorded.
Published ratings and characteristics promoted from the supplied Rogers/Rogers Majestic source.

17BTP4 — Rectangular Television Picture Tube

The **17BTP4** is a rectangular television picture tube designed for display applications in television receivers. It features a metal-backed screen with a white-fluorescing P4 phosphor, electrostatic focusing, and a 90° magnetic deflection system. The tube incorporates an ion trap and a filter glass faceplate to optimize picture contrast and quality.

Mechanical Specifications and Screen Characteristics

The 17BTP4 is constructed with a rectangular glass envelope designated as bulb number **J 133** (ASA), featuring a **J1-21** bulb contact (JETEC) and a **B7-51** base (JETEC).

Physical Dimensions

- **Overall Length:** 15 5/8"
- **Neck Length:** 6 1/2"
- **Bulb Dimensions:**
 - Diagonal: 16 5/8" $\pm$ 1/8"
 - Width: 15 3/8" $\pm$ 1/8"
 - Height: 12 1/4" $\pm$ 1/8"

Screen Properties

The screen utilizes a **P4** phosphor, which produces a white fluorescent color with short persistence. The faceplate is made of filter glass with a light transmission rating of **75%**. The minimum useful screen dimensions are:

- **Diagonal:** 15 3/8"
- **Width:** 14 1/4"
- **Height:** 10 3/4"

Mounting and Accessories

The tube's socket must not be rigidly mounted; instead, it requires flexible leads and free movement to prevent mechanical stress. The outer circumference of the base falls within a 2 3/16" diameter circle concentric with the perpendicular axis passing through the center of the face.

External magnetic accessories are required for proper operation:

- **Ion Trap Magnet:** A single-magnet design with a field strength of approximately 50 Gauss.
- **Picture Centering Magnet:** Provides a field intensity perpendicular to the tube axis of 0 to 10 Gauss, with a maximum distance of 70 mm from the field center to the reference line.

Heater and Electrical Connections

The 17BTP4 is equipped with an indirectly heated cathode. The heater is designed for either parallel or series string operation.

Heater Ratings

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.3 A
- **Series Operation Constraint:** When used in a series heater chain, a current-limiting device may be required. The surge heater voltage must not exceed **9.5 V RMS** when the supply is switched on.

Pinout Configuration (Base 12AJ)

The tube uses the **Base 12AJ** configuration, viewed from the bottom:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 6:** Grid No. 3 and Grid No. 5
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Bulb Contact:** Grid No. 4 and Grid No. 6, Collector

Direct Interelectrode Capacitances

- **Grid No. 1 to all other electrodes:** 7 pF
- **Cathode to all other electrodes:** 4 pF
- **External conductive coating to Grid No. 4 and Grid No. 6:** 900 pF (minimum) to 1400 pF (maximum)

Electrostatic Focusing and Magnetic Deflection

The 17BTP4 combines electrostatic focusing with magnetic deflection.

- **Focusing Method:** Electrostatic, controlled by the voltages applied to Grid No. 3 and Grid No. 5.
- **Deflection Method:** Double magnetic deflection.
- **Deflection Angles:**
 - Diagonal: 90°
 - Horizontal: 85°
 - Vertical: 65°

Design Center Ratings

The following maximum and minimum limits are established under the Design Center Rating System:

Parameter	Minimum	Maximum
Grid No. 4 and 6 Voltage (at zero current)	12,000 V	18,000 V
Grid No. 3 and 5 Voltage	-500 V	+500 V
Grid No. 2 Voltage	200 V	500 V
Grid No. 1 Voltage (negative value)	—	-150 V
Grid No. 1 Voltage (positive value)	—	0 V

Parameter	Minimum	Maximum
Grid No. 1 Voltage (positive peak value)	—	2 V
Heater-to-Cathode Voltage (heater positive)	—	125 V
Heater-to-Cathode Voltage (heater negative)	—	200 V
Heater-to-Cathode Voltage (peak during warm-up, ≤ 45 s, heater negative)	—	410 V
Heater-to-Cathode AC Component	—	20 V RMS

To avoid excessive hum, the AC component of the heater-to-cathode voltage must be kept below the 20 V RMS limit.

Maximum Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 M Ω (maximum)
- **Grid No. 1 Circuit Impedance (at 50 Hz):** 0.5 M Ω (maximum)
- **Cathode-to-Heater Circuit Resistance:**
 - With a separate transformer supply: 1 M Ω (maximum)
 - In a series chain or earthed configuration: The maximum circuit impedance at 50 Hz is 0.1 M Ω .

Circuit Design Values

- **Grid No. 3 and 5 Current (positive or negative):** 10 μ A (maximum)

Typical Operating Conditions

The tube can be operated under different accelerating voltages. The typical operating points are outlined below:

Parameter	Condition A	Condition B
Grid No. 4 and 6 Voltage (Anode)	14,000 V	16,000 V
Grid No. 3 and 5 Voltage (at 100 μ A final accelerating current)*	-103 to +203 V	-75 to +235 V
Grid No. 2 Voltage	300 V	300 V

Parameter	Condition A	Condition B
Grid No. 1 Voltage (for visual extinction of undeflected focused spot)	-40 to -80 V	-40 to -80 V

**Note: These focusing voltage ranges provide optimum focus at the center of the screen. To obtain uniform overall screen focus, the focusing voltage should be raised by 100 to 200 V.*

Analysis of Characteristic Curves

The performance of the 17BTP4 is characterized by several key relationships between electrode voltages and currents:

- **Final Accelerating Electrodes Current vs. Grid No. 1 Voltage:** The current drawn by the final accelerating electrodes (Grid No. 4 and Grid No. 6) increases exponentially up to 3000 μ A as the Grid No. 1 voltage approaches 0 V. Higher Grid No. 2 voltages (ranging from 200 V to 500 V) shift these curves to the left, indicating that a more negative Grid No. 1 voltage is required to control the current at higher screen-grid potentials.
- **Focusing Voltage Limits vs. Grid No. 2 Voltage:** The limits of the focusing voltage (Grid No. 3 and Grid No. 5) exhibit a linear downward slope as the Grid No. 2 voltage is increased from 200 V to 500 V.
- **Focusing Voltage Limits vs. Final Accelerating Electrodes Current:** As the final accelerating electrodes current increases from 0 to 400 μ A, the range of the focusing voltage slopes downward.
- **Focusing Voltage Limits vs. Grid No. 4 and 6 Voltage:** The focusing voltage limits show a linear upward slope as the final accelerating voltage (Grid No. 4 and Grid No. 6) increases from 12,000 V to 18,000 V.
- **Grid No. 1 Voltage Limits vs. Grid No. 2 Voltage:** The voltage range required for the visual extinction of the undeflected focused spot widens and becomes more negative as the Grid No. 2 voltage is increased from 200 V to 500 V.

Technical Summary

The **17BTP4** is a 90° magnetic deflection, electrostatic-focus television picture tube featuring a rectangular 16 5/8-inch diagonal bulb and a P4 phosphor screen. It operates with a 6.3 V, 0.3 A heater and is designed to handle final accelerating voltages between 12,000 V and 18,000 V. Its electrostatic focusing system utilizes Grids No. 3 and 5, with typical focusing voltages ranging from -103 V to +235 V depending on the anode voltage. Proper operation requires external magnetic components, including a 50-Gauss single ion trap magnet and a 0-10 Gauss centering magnet, alongside a non-rigid socket mounting to prevent mechanical strain.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1959 Rogers

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

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Section 1 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater0rFilamentVoltage	6.3 V	—
Heater0rFilamentCurrent	300 mA	—