

ELECTRONIC TUBE REFERENCE

# 17BRP4

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 17BRP4.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | &R                | BASE PINS            | —             |
| 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       |
| No fixed ratings recorded. |

### 17BRP4 — Electrostatic-Focus Magnetic-Deflection Picture Tube

The **17BRP4** is a 17-inch rectangular glass, direct-view cathode-ray picture tube designed for television receiver applications. It features electrostatic focusing, magnetic deflection, a short overall length, and a small neck diameter. The design incorporates an aluminized fluorescent screen, an ion-trap gun requiring an external magnet, and an external conductive coating that serves as a high-voltage filter capacitor when grounded.

### Mechanical and Optical Specifications

The 17BRP4 is constructed with a rectangular glass envelope and a spherical gray faceplate. The faceplate glass provides approximately 76% light transmission at the center, improving picture contrast under ambient light.

## Physical Dimensions and Weight

- **Overall Length:** 12 9/16 ± 5/16 inches
- **Neck Length:** 5 7/16 + 3/16 - 1/8 inches
- **Bulb Dimensions:**
  - Diagonal: 16 9/16 ± 0.100 inches
  - Width: 15 5/8 ± 0.100 inches
  - Height: 12 3/4 ± 0.100 inches
- **Minimum Useful Screen Dimensions:**
  - Diagonal: 15 3/4 inches
  - Width: 14 3/4 inches
  - Height: 11 11/16 inches
  - Total Area: 155 square inches
- **Net Weight:** Approximately 10 1/3 lbs
- **Mounting Position:** Any

## Optical Characteristics

The tube utilizes a **P4** sulfide-type phosphor screen, which produces white fluorescence and phosphorescence with short persistence. The aluminized backing on the screen increases light output and prevents ion burn in conjunction with the ion-trap gun.

## Deflection Angles

The tube is designed for wide-angle magnetic deflection with the following approximate angles:

- **Diagonal:** 110°
- **Horizontal:** 105°
- **Vertical:** 87°

## Electrical Connections and Pinout

The 17BRP4 uses a **Small-button Eightar 7-pin** base (JETEC No. B7-183) with an **8HR** basing designation. High voltage is applied to the anode via a recessed small-cavity cap (JETEC No. J1-21) located on the bulb. The anode contact is aligned with Pin No. 4 within a tolerance of ±30 degrees.

## Pin Assignment (8HR Diagram)

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 3:** Grid No. 2
- **Pin 4:** Focusing Electrode (Grid No. 4)
- **Pin 6:** Grid No. 1
- **Pin 7:** Cathode

- **Pin 8:** Heater
- **Recessed Cap:** Anode (Grid No. 3 and Grid No. 5 are connected internally to the anode)

## Heater Ratings

The heater is designed for series or parallel operation with the following nominal ratings:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.6 A  $\pm$  10%
- **Heater Warm-up Time:** 11 seconds (measured in a standard test circuit with an applied voltage of 25 V and a series resistance of 31.5 ohms)

## Interelectrode Capacitances

- **Cathode to all other electrodes:** 5  $\mu$ F (approximate)
- **Grid No. 1 to all other electrodes:** 6  $\mu$ F (approximate)
- **External conductive coating to anode:** 800  $\mu$ F (minimum) to 1400  $\mu$ F (maximum)

## Operating Ratings and Typical Conditions

The ratings of the 17BRP4 are established under the **Design-Center System**. Operating the tube within these limits ensures reliable performance and longevity.

### Absolute Maximum Ratings

- **Anode Voltage:** 15,000 Max V DC
- **Focusing-Electrode Voltage:** -500 to +1000 Max V DC
- **Grid-No. 2 Voltage:** 500 Max V DC
- **Grid-No. 1 Voltage:**
  - Negative-Bias Value: 140 Max V DC
  - Positive-Bias Value: 0 Max V DC
  - Positive-Peak Value: 2 Max V
  - Negative-Peak Value: 200 Max V
- **Peak Heater-Cathode Voltage:**
  - Heater negative with respect to cathode (during warm-up  $\leq$  15 seconds): 410 Max V
  - Heater negative with respect to cathode (after warm-up): 180 Max V
  - Heater positive with respect to cathode: 180 Max V

### Typical Operating Conditions

For standard operation, the following parameters represent typical performance points:

- **Anode Voltage:** 14,000 V DC (minimum recommended operating voltage is 12,000 V)
- **Focusing-Electrode Voltage for Focus:** 0 to 500 V DC
- **Focusing-Electrode Current:** -15 to +25  $\mu$ A DC

- **Grid-No. 2 Voltage:** 300 V DC
- **Grid-No. 1 Voltage (for visual extinction of focused raster):** -28 to -72 V DC
- **Ion-Trap Field Intensity:** 37 Gauss minimum (using a Heppner PM ion-trap magnet or equivalent adjusted to the optimum position)

## Maximum Circuit Values

To protect the tube from damage due to internal arcing or excessive current, specific circuit resistance limits must be observed:

- **Grid-No. 1 Circuit Resistance:** 1.5 Max Megohms
- **Grid-No. 2 Circuit Resistance:** 0.1 Min Megohms
- **Focusing-Electrode Circuit Resistance:** 0.1 Min Megohms

*Note: It is highly recommended to include protective resistance in both the Grid-No. 2 and the focusing-electrode circuits to safeguard the gun structure.*

## Technical Summary

The **17BRP4** is a compact, wide-angle (110° diagonal) television picture tube featuring electrostatic focus and magnetic deflection. Utilizing a 17-inch rectangular glass envelope with a short overall length of 12 9/16 inches, it is optimized for space-saving chassis designs. The tube operates typically at an anode voltage of 14,000 V DC, requiring an external ion-trap magnet of at least 37 Gauss and a 6.3 V, 0.6 A heater supply. Its integrated external conductive coating provides essential high-voltage filtering when properly integrated into the receiver circuitry.

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

## Section 1 · Cathode Ray

| OTHER               |                 |                  |
|---------------------|-----------------|------------------|
| PARAMETER           | PUBLISHED VALUE | CONDITION / NOTE |
| AnodeVoltageMaximum | 15000 V         | —                |
| AnodeVoltageTypical | 14000 V         | —                |