

ELECTRONIC TUBE REFERENCE

17BP4B

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 17BP4B.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12D	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
Direct-view television CRT with magnetic focus and magnetic deflection. P-4 white screen data and CRT electrode ratings are preserved in parameters; CRT maximum anode voltage is promoted to MaxPlateVoltage.	

17BP4B — Direct-View Cathode Ray Picture Tube

The **17BP4B** is a direct-view, rectangular glass cathode ray picture tube designed primarily for television receiver applications. It features a reflective metal-backed (aluminized) screen, magnetic focus, and magnetic deflection. The tube incorporates an electron gun designed for use with an external single-field ion-trap magnet, and its external conductive coating serves as a high-voltage filter capacitor when connected to ground.

Construction and Physical Characteristics

The 17BP4B is constructed with a rectangular glass envelope and a neutral-density grey filter faceplate that provides approximately 66% light transmission at the center, improving picture contrast under ambient light. The screen utilizes Phosphor No. 4 (Sulfide Type), which exhibits white fluorescence and white phosphorescence with medium persistence.

Mechanical Dimensions

The physical dimensions of the tube are as follows:

- **Overall Length:** $19 \frac{1}{4} \pm \frac{3}{8}$ inches
- **Greatest Bulb Diagonal:** $16 \frac{5}{8} \pm \frac{1}{8}$ inches
- **Greatest Bulb Width:** $15 \frac{3}{8} \pm \frac{1}{8}$ inches
- **Greatest Bulb Height:** $12 \frac{1}{4} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diagonal:** 15 $\frac{3}{8}$ to 15 $\frac{1}{2}$ inches
- **Minimum Useful Screen Width:** 14 $\frac{1}{4}$ inches
- **Minimum Useful Screen Height:** 10 $\frac{3}{4}$ to 11 $\frac{1}{16}$ inches
- **Standard Raster Size (3x4 Aspect Ratio):** 14 $\frac{1}{4}$ inches x 10 $\frac{3}{4}$ inches

Deflection and Focus

The tube utilizes magnetic deflection and magnetic focus. The approximate deflection angles are:

- **Horizontal:** 65°
- **Vertical:** 50°
- **Diagonal:** 70°

An external single-field ion-trap magnet is required to prevent ion burn on the phosphor screen.

Electrical Specifications and Pin Connections

The 17BP4B uses a small-shell duodecal 5-pin base (designation B5-57) and is compatible with both 12N and 12D basing configurations. High voltage is applied via a recessed small cavity cap (designation J1-21) located on the bulb side. The anode contact aligns with vacant pin position No. 6 within a tolerance of ± 30 degrees.

Pinout Configuration (Basing 12N / 12D)

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Anode Cap:** Grid No. 3 / Anode (connected internally)

Heater Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere (with a tolerance of $\pm 10\%$)

Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 μF
- **Grid No. 1 to all other electrodes:** 6 to 6.5 μF
- **External conductive coating to anode:** Minimum 750 μF , maximum 1500 to 2000 μF

Maximum Ratings (Design Center Values)

The following maximum ratings must be observed to ensure reliable operation and prevent damage to the tube:

Parameter	Maximum Rating
DC Anode (Grid No. 3) Voltage	16,000 Volts
DC Grid No. 2 Voltage	410 Volts
DC Grid No. 1 Negative-Bias Value	125 Volts
DC Grid No. 1 Positive-Bias Value	0 Volts
Grid No. 1 Positive-Peak Value	2 Volts
Peak Heater-Cathode Voltage (Heater negative, during warm-up $\leq 15\text{s}$)	410 Volts
Peak Heater-Cathode Voltage (Heater negative, after warm-up)	150 Volts
Peak Heater-Cathode Voltage (Heater positive with respect to cathode)	150 Volts
Maximum Grid No. 1 Circuit Resistance	1.5 Megohms

Operating Conditions and Characteristics

The 17BP4B can be operated under standard comparative conditions or optimized recommended conditions. Brilliance and definition decrease if the anode voltage is reduced; therefore, the anode voltage should not be operated below 12,000 Volts.

JETEC Comparative Operating Conditions

- **DC Anode (Grid No. 3) Voltage:** 12,000 Volts

- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** -33 to -77 Volts
- **DC Focusing Coil Current:** 92 mA (with a tolerance of $\pm 10\%$ to $\pm 20\%$ depending on the specific focus coil setup, assuming a standard focus coil No. 109 or equivalent, with the air gap center positioned 3.0 inches from the reference line, and the combined Grid No. 1 bias and video signal adjusted for 30 to 35 foot-lamberts highlight brightness)
- **DC Ion-Trap Current:** 70 to 75 mA (using standard single-field ion-trap magnet coil No. 111 or equivalent, positioned 5 1/2 inches from the yoke reference line; or $75 \pm 50\%$ mA)

Recommended Operating Conditions

- **DC Anode (Grid No. 3) Voltage (at average brightness of 20 foot-lamberts):** 14,000 Volts
- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** -33 to -77 Volts
- **DC Focusing Coil Current:** Approximately 115 mA (using standard coil No. 109 positioned at 3 3/4 inches)
- **Ion-Trap Field Intensity:** Approximately 35 gauss (using a single-field magnet adjusted to optimum)

Performance and Drive Characteristics

Under typical operating conditions with a heater voltage of 6.3V, Grid No. 2 voltage of 250V, anode voltage of 14,000V, and a focused 525-line raster (10 3/4" x 14 1/4"):

- **Highlight Brightness:** Rises from approximately 0 foot-lamberts at 10V drive to approximately 62 foot-lamberts at 28V drive.
- **Anode Current:** Rises from approximately 0 μ A at 10V drive to approximately 820 μ A at 45V drive.

Related Designations

The 17BP4B belongs to a family of closely related cathode ray tubes, which includes the [17BP4](#), [17BP4A](#), and [17BP4C](#). The primary distinguishing feature of the 17BP4B is its aluminized (reflective metal-backed) screen, which enhances light output and picture brightness compared to non-aluminized variants. It shares the external conductive coating feature with the [17BP4A](#) and [17BP4C](#) models.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1966 Tung Sol Electronic Tubes 4 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum DC grid 2 voltage	410 V	—
Maximum grid 1 negative-bias voltage	125 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	150 V	HeaterNegativeAfterWarmup
Peak heater-cathode voltage	150 V	HeaterPositive
DC anode voltage	12000 V	TypicalOperation
DC grid 2 voltage	300 V	TypicalOperation
DC grid 1 voltage	-33--77 V	TypicalOperation
Focusing coil current	92 mA	Approximate
Ion trap current	70 mA	Approximate

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal deflection angle	65 degrees	Approximate
Vertical deflection angle	50 degrees	Approximate
Diagonal deflection angle	70 degrees	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid 1 to all other electrodes capacitance	6.5 pF	Approximate
External conductive coating to anode capacitance	1500 pF	Maximum
External conductive coating to anode capacitance	750 pF	Minimum



SOURCE DATA APPENDIX

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	16000 V	—

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