

ELECTRONIC TUBE REFERENCE

19BCP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch direct-view monochrome television picture tube with electrostatic focusing, magnetic deflection, and an aluminized P4 screen. Manufacturer documentation places it in the high-voltage picture-tube family used for bright, high-contrast receiver display.

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	
MAXIMUM PLATE VOLTAGE	20000 V
Published ratings and characteristics promoted semantically from the approved source.	

19BCP4 — Rectangular Glass Television Picture Tube

The **19BCP4** is a 19-inch direct-viewed, rectangular glass television picture tube designed for television receiver applications. It features a spherical faceplate, a bonded shield, gray filter glass, and an aluminized screen. The tube incorporates electrostatic focusing and a 114-degree magnetic deflection system. It operates without an ion trap and includes an external conductive coating. The external surface of its safety plate is treated to reduce specular reflection, and the faceplate assembly provides a light transmittance of approximately 44%.

Mechanical Specifications and Physical Dimensions

The 19BCP4 is constructed using a J1-21 bulb and an FP159B safety plate. It has a recessed small cavity cap (J1-21) for the anode bulb contact and a B7-208 base. The physical dimensions and weight of the tube are as follows:

- **Overall Length:** 11 5/8 ± 3/16 inches
- **Neck Length:** 4 1/8 ± 1/8 inches
- **Weight:** Approximately 18.5 pounds
- **Minimum Useful Screen Dimensions:**
 - **Height:** 12 1/16 inches
 - **Width:** 15 1/4 inches
 - **Diagonal:** 17 1/4 inches
 - **Area:** 174 square inches

Electrical Characteristics and Heater Ratings

The 19BCP4 features an indirectly heated cathode with a controlled warm-up time.

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.30 Ampere ± 5%
- **Heater Warm-up Time:** 11 seconds

Direct Interelectrode Capacitances

The interelectrode capacitances of the tube are approximately:

- **Cathode to all other electrodes:** 5 pF
- **Grid No. 1 to all other electrodes:** 6 pF
- **External conductive coating to anode:** 1500 pF maximum, 1000 pF minimum

Deflection, Focusing, and Phosphor Characteristics

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

- **Diagonal:** 114 degrees
- **Horizontal:** 102 degrees
- **Vertical:** 86 degrees

The screen uses an **Aluminized P4** phosphor, which provides a white fluorescence with short-to-medium persistence.

Basing and Pinout Connection

The 19BCP4 uses the **8HR** basing configuration (B7-208 base). The pin connections, viewed from the bottom of the base, are:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 3:** Grid No. 2
- **Pin 4:** Grid No. 4 (Focusing Electrode)
- **Pin 6:** Grid No. 1
- **Pin 7:** Cathode
- **Pin 8:** Heater
- **Anode Contact:** Recessed Small Cavity Cap (J1-21)

Base Pin No. 4 aligns with the horizontal centerline (A-A') within 30% and is located on the same side of the neck as the anode contact.

Operating Conditions and Drive Services

The 19BCP4 can be operated in either Grid Drive Service or Cathode Drive Service. The typical operating conditions and maximum ratings (Design Maximum Values) differ between these two modes.

Grid Drive Service

In Grid Drive Service, the control signal is applied to Grid No. 1.

- **Typical Operating Conditions:**
 - **Anode Voltage:** 16,000 Volts DC
 - **Grid No. 4 Voltage (Focus):** 0 to 400 Volts DC
 - **Grid No. 2 Voltage:** 400 Volts DC
 - **Grid No. 1 Voltage for Cutoff:** -46 to -94 Volts DC
- **Design Maximum Ratings:**
 - **Anode Voltage:** 20,000 Volts DC
 - **Grid No. 4 Voltage:** -550 to +1100 Volts DC
 - **Grid No. 2 Voltage:** 550 Volts DC
 - **Grid No. 1 Negative Bias:** 155 Volts DC
 - **Grid No. 1 Negative Peak:** 220 Volts
 - **Grid No. 1 Positive Bias:** 0 Volts DC
 - **Grid No. 1 Positive Peak:** 2 Volts

Cathode Drive Service

In Cathode Drive Service, the control signal is applied to the cathode.

- **Typical Operating Conditions:**
 - **Anode Voltage:** 16,000 Volts DC
 - **Grid No. 4 Voltage (Focus):** 0 to 400 Volts DC
 - **Grid No. 2 Voltage:** 400 Volts DC
 - **Cathode Voltage for Cutoff:** 42 to 78 Volts DC

- **Design Maximum Ratings:**
 - **Anode Voltage:** 20,000 Volts DC
 - **Grid No. 4 Voltage:** -400 to +1250 Volts DC
 - **Grid No. 2 Voltage:** 700 Volts DC
 - **Cathode Positive Bias:** 155 Volts DC
 - **Cathode Positive Peak:** 220 Volts
 - **Cathode Negative Bias:** 0 Volts DC
 - **Cathode Negative Peak:** 2 Volts

Heater-Cathode Voltage Ratings

The heater-cathode voltage limits are identical for both Grid Drive and Cathode Drive services:

- **Heater negative with respect to cathode (during warm-up $\leq 15\text{s}$):** 450 Volts peak maximum
- **Heater negative with respect to cathode (after warm-up):** 200 Volts peak maximum
- **Heater positive with respect to cathode:** 200 Volts peak maximum

Circuit Values and Operating Considerations

- **Grid No. 1 Circuit Resistance:** The maximum allowable resistance in the Grid No. 1 circuit is **1.5 Megohms**.
- **External Conductive Coating:** The external conductive coating must be grounded to provide proper shielding and capacitance.
- **Cutoff Voltage Definition:** The specified cutoff voltage values are for the visual extinction of a focused raster. For the cutoff of an undeflected focused spot, the absolute value of the bias voltage between the cathode and Grid No. 1 increases by approximately 5 Volts.
- **X-ray Warning:** If the tube is operated at voltages higher than 16,000 Volts or the maximum rated anode voltage (whichever is less), shielding may be necessary to protect against prolonged exposure to X-radiation at close range.



SOURCE OPERATING CONDITIONS

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	20000 V	—
Anode Voltage	16000 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	Aluminized



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Electrostatic	—
Deflection method	Magnetic	—
Horizontal deflection angle	102 deg	—
Diagonal deflection angle	114 deg	—
Vertical deflection angle	86 deg	—
Fluorescence	White	—
Persistence	Short to medium	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	Aluminized P4	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum anode voltage	20000 V	—
Typical anode voltage	16000 V	—
Typical focus-electrode voltage maximum	400 V	—
Typical grid2 voltage	400 V	—
Cutoff voltage range	-46 to -94 V	—
Grid1 circuit resistance maximum	1.5 Mohm	—
Focus-electrode voltage minimum	-550 V	—
Focus-electrode voltage maximum	1100 V	—
Grid2 voltage maximum	550 V	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid1-to-all capacitance	6 pF	—
External conductive coating to anode capacitance maximum	1500 pF	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Monochrome television picture display	—