

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 / 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	20000 V
Published ratings and characteristics promoted semantically from the approved source.	

19BQP4 Television Picture Tube

The **19BQP4** is a 19-inch direct-view, rectangular glass television picture tube designed for television receivers. It features electrostatic focusing, magnetic deflection, and an aluminized screen. A key design characteristic of the 19BQP4 is its bonded shield construction, which laminates a gray filter glass safety plate directly to the face of the tube. The external surface of this safety plate is treated to reduce specular reflection, improving viewing quality under varied ambient lighting conditions.

Mechanical Design and Construction

The 19BQP4 is built using a J149C glass bulb and an FP159B safety plate. It has a spherical faceplate with a gray filter glass that provides a light transmittance of approximately 44%. The screen utilizes Phosphor

P4, which produces a white fluorescence with short-to-medium persistence. To prevent electrostatic charge buildup, the tube is finished with an external conductive coating that must be connected to an electrical ground.

Physical Dimensions and Deflection Angles

The tube has a relatively compact profile for its screen size, characterized by the following physical specifications:

- **Overall Length:** 12-5/8 ± 3/16 inches
- **Neck Length:** 5-1/8 ± 3/16 inches
- **Approximate Weight:** 18-1/2 pounds
- **Deflection Angles (Approximate):**
 - Diagonal: 114 degrees
 - Horizontal: 102 degrees
 - Vertical: 86 degrees

Screen Dimensions

The minimum useful screen dimensions provide a generous viewing area:

- **Height:** 12-1/16 inches
- **Width:** 15-1/4 inches
- **Diagonal:** 17-5/8 inches
- **Total Area:** 172 square inches

Electrical Connections and Basing

The 19BQP4 uses a **B7-208** base with an **8HR** basing configuration. High-voltage anode connection is made via a recessed small cavity cap (J1-21) located on the bulb. Base pin number 4 is aligned within 30 degrees of the horizontal centerline and is positioned on the same side of the tube as the anode contact.

Pinout Configuration

The electrical connections for the 8HR base are assigned as follows:

- **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
- **Recessed Cavity Cap:** Anode

Heater and Capacitances

The tube incorporates an indirectly heated cathode with a controlled warm-up time. Its electrical characteristics include:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.60 A $\pm$ 5%
- **Heater Warm-up Time:** 11 seconds
- **Cathode to All Other Electrodes Capacitance:** Approximately 5 pF
- **Grid No. 1 to All Other Electrodes Capacitance:** Approximately 6 pF
- **External Conductive Coating to Anode Capacitance:** 1000 pF minimum to 1500 pF maximum

Cathode Drive Service and Operating Points

The 19BQP4 is rated under the Design Maximum system for cathode drive service. In this mode of operation, all electrode voltages are specified as positive with respect to the Grid No. 1 voltage, unless otherwise noted.

Maximum Ratings (Design Maximum Values)

Operating the tube beyond these limits may impair performance or cause permanent damage:

- **Anode Voltage:** 12,000 V dc (Minimum) to 20,000 V dc (Maximum)
- **Grid No. 4 Voltage (Focusing Electrode):** -550 to +1100 V dc
- **Grid No. 2 Voltage:** 70 V dc
- **Cathode Voltage:**
 - Negative Bias Value: 0 V dc
 - Negative Peak Value: 2 V
 - Positive Bias Value: 155 V dc
 - Positive Peak Value: 220 V
- **Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during the first 15 seconds of warm-up: 450 V
 - Heater negative with respect to cathode after equipment warm-up: 200 V
 - Heater positive with respect to cathode: 200 V

Typical Operating Conditions

Under typical cathode drive service, the tube is operated with the following parameters:

- **Anode Voltage:** 16,000 V dc
- **Grid No. 4 Voltage for Focus:** 0 to +400 V dc
- **Grid No. 2 Voltage:** 50 V dc
- **Cathode Voltage for Cutoff:** +32 to +50 V dc (This range is defined for the visual extinction of a focused raster. Extinction of a stationary focused spot requires the cathode voltage to be approximately 5 V more positive, resulting in a calculated range of +37 to +55 V dc).

Circuit Constraints

To ensure stable operation and prevent damage from grid current or gas ionization, the maximum allowable resistance in the Grid No. 1 circuit is **1.5 Megohms**.

Technical Summary

The **19BQP4** is a rectangular, 19-inch glass television picture tube featuring electrostatic focus and magnetic deflection. It is distinguished by its bonded safety plate with anti-reflection treatment and a high-efficiency aluminized P4 phosphor screen. Operating with a standard 6.3 V, 0.60 A heater, the tube is designed for cathode drive service with a typical anode operating potential of 16,000 V. Its physical design, including a 114-degree diagonal deflection angle and a short 12-5/8 inch overall length, allows for a compact cabinet design while maintaining a 172 square inch viewing area.



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	50 V	—
Cutoff voltage range	+32 to +50 V	—
Grid1 circuit resistance maximum	1.5 Mohm	—

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	—