

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.	

19BNP4 — Rectangular Glass Television Picture Tube

The **19BNP4** is a 19-inch direct-viewed, rectangular glass television picture tube designed for use in television receivers. It features a spherical faceplate with a bonded shield, consisting of a gray filter glass safety plate laminated directly to the face of the tube. The tube utilizes electrostatic focusing and magnetic deflection, with an aluminized P4 phosphor screen that produces white fluorescence with short-to-medium persistence. Designed primarily for cathode-drive service, the 19BNP4 operates with a nominal 6.3 V heater and has a wide deflection angle.

Construction and Mechanical Characteristics

The 19BNP4 is constructed with a rectangular glass bulb (designated J149C) and a spherical faceplate. The faceplate incorporates a bonded shield (FP159A safety plate) made of gray filter glass, which provides a light transmittance of approximately 44%.

The screen uses an aluminized P4 phosphor, which exhibits white fluorescence and short-to-medium persistence. To prevent electrostatic charge buildup, the tube is equipped with an external conductive coating that must be grounded.

Physical Dimensions and Weight

- **Minimum Useful Screen Dimensions:**
 - Height: 12-1/16 inches
 - Width: 15-1/4 inches
 - Diagonal: 17-5/8 inches
 - Area: 172 square inches
- **Neck Length:** 5-1/8 ± 3/16 inches
- **Overall Length:** 12-5/8 inches (with a documented tolerance of ±3/16 or ±5/16 inches)
- **Bulb Designation:** J149C
- **Bulb Contact:** Recessed Small Cavity Cap (J1-21)
- **Base:** B7-208
- **Weight:** Approximately 18-1/2 pounds

Deflection Angles

The tube uses magnetic deflection with the following approximate angles:

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

Heater and Electrical Ratings

The 19BNP4 features an indirectly heated cathode with a controlled warm-up time.

Heater Characteristics

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.60 A ± 5%
- **Heater Warm-up Time:** 11 seconds

Direct Interelectrode Capacitances

- **Cathode to All Other Electrodes:** Approximately 5 µpf

- **Grid No. 1 to All Other Electrodes:** Approximately 6 μf
- **External Conductive Coating to Anode:** 1000 μf (minimum) to 1500 μf (maximum)

Maximum Ratings (Design Maximum Values)

All maximum ratings are specified for **Cathode Drive Service**, where voltages are positive with respect to Grid No. 1 unless otherwise indicated:

- **Maximum Anode Voltage:** 20,000 V dc
- **Minimum Anode Voltage:** 12,000 V dc
- **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 warm-up (≤ 15 seconds): 450 V
 - Heater negative with respect to cathode after warm-up: 200 V
 - Heater positive with respect to cathode: 200 V

Typical Operating Conditions (Cathode Drive Service)

Under typical operating conditions, voltages are referenced positive with respect to Grid No. 1:

- **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 Required for Cutoff:** +32 to +50 V dc (for visual extinction of a focused raster).
Note: Extinction of a stationary focused spot requires approximately 5 V more positive values.

Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 Megohms maximum

Basing and Pin Connections

The 19BNP4 uses a B7-208 base with an **8HR** basing configuration. The anode connection is made via a Recessed Small Cavity Cap (J1-21), which connects to the anode (Grid No. 3 and Grid No. 5). Base Pin No. 4 aligns with the horizontal centerline within 30° and is located on the same side as the anode contact.

There are minor discrepancies in the documented pinout configurations for the 8HR base in technical literature:

Pin	Configuration A	Configuration B
Pin 1	Heater	Heater
Pin 2	Grid No. 1	Grid No. 4 (Focusing Electrode)
Pin 3	Grid No. 2	Grid No. 2
Pin 4	Grid No. 4	Grid No. 1
Pin 6	Grid No. 1	Cathode
Pin 7	Cathode	Grid No. 1
Pin 8	Heater	Heater
Cap	Anode (Grid No. 3, Grid No. 5)	Anode

Technical Summary

The **19BNP4** is a 19-inch rectangular glass television picture tube designed for cathode-drive service. It features a 114° diagonal magnetic deflection angle, electrostatic focusing, and an aluminized P4 phosphor screen with a bonded gray filter glass safety plate (FP159A) providing 44% light transmittance. Operating with a 6.3 V, 0.60 A heater, the tube requires an anode voltage between 12,000 V and 20,000 V (typically 16,000 V) and utilizes an 8HR basing arrangement with a B7-208 base and a J1-21 recessed small cavity cap for the high-voltage anode connection.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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	—

TUBE TINKER

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