

ELECTRONIC TUBE REFERENCE

17BYP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch direct-view picture and monitor CRT with electrostatic focusing and magnetic deflection. Sylvania specifies high-voltage anode operation, interelectrode capacitances, and an X-ray radiation warning for the display.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7FA	BASE PINS	–
NOMINAL HEATER	6.3 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	17600 V
MAXIMUM SCREEN VOLTAGE	550 V
Maximum anode/grid ratings and capacitance presence promoted from supplied Sylvania CRT data. X-ray warning is explicitly published.	

17BYP4 — Television Picture Tube

The **17BYP4** is a 17-inch direct-viewed, rectangular glass television picture tube. Designed with a lightweight envelope, it features a spherical gray filter glass faceplate, an aluminized P4 phosphor screen, and electrostatic focusing combined with magnetic deflection. The tube does not require an ion trap and incorporates an external conductive coating that must be grounded.

Physical and Mechanical Design

The 17BYP4 is constructed using a J132 1/2A1 bulb (or equivalent) with a neck diameter of 1 1/8 inches. The complete assembly weighs approximately 10 pounds.

Screen and Faceplate Characteristics

The faceplate is made of spherical gray filter glass with a nominal light transmittance of $77\% \pm 3\%$. The screen utilizes an aluminized P4 phosphor, which exhibits white fluorescence with short to medium persistence.

The physical dimensions of the screen provide the following minimum useful limits:

- **Minimum Useful Screen Width:** 14 3/4 inches
- **Minimum Useful Screen Height:** 11 11/16 inches
- **Minimum Useful Screen Area:** 155 square inches

Deflection and Alignment

Deflection is achieved magnetically, supporting wide-angle scanning. The approximate deflection angles are:

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

The high-voltage anode connection is made via a recessed small cavity cap (J1-21) located on the bulb. The tube uses a B6-185 base with a 7FA basing configuration. The physical alignment of the anode is designed such that base pin number 7 aligns with the anode contact within an angular tolerance of 30° .

Heater and Electrical Characteristics

The 17BYP4 is equipped with an indirectly heated cathode. The heater has the following nominal ratings:

- **Heater Voltage:** 6.3 V
- **Heater Current:** $0.450 \text{ A} \pm 5\%$
- **Heater Warm-up Time:** 11 seconds

The heater warm-up time is defined as the time required for the heater voltage to reach 80% of its rated value when four times the rated voltage is applied in series with a resistance equal to three times the rated voltage divided by the rated current.

Direct Interelectrode Capacitances

The approximate direct interelectrode capacitances of the tube are:

- **Cathode to all other electrodes:** 5 pF (μpf)
- **Grid No. 1 to all other electrodes:** 6 pF (μpf)

- **External conductive coating to anode:** 1000 pF (μpf) minimum, 1500 pF (μpf) maximum

The external conductive coating must be grounded in operation, forming a high-voltage filter capacitor in combination with the internal conductive coating of the anode.

Pinout and Basing

The 17BYP4 utilizes the **7FA** basing arrangement. The pin connections, viewed from the bottom of the B6-185 base, are detailed below:

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

Typical Operating Conditions

Under typical operating conditions, the 17BYP4 is configured with the following electrical parameters:

- **Anode Voltage:** 14,000 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 0 to 400 V DC
- **Grid No. 2 Voltage:** 300 V DC
- **Grid No. 1 Voltage for Cutoff:** -35 to -72 V DC

The Grid No. 1 voltage range of -35 to -72 V DC is required to achieve visual extinction of a focused raster. For the complete extinction of a stationary focused spot, the required voltage is approximately 5 Volts more negative (i.e., -40 to -77 V DC).

The maximum design limit for the Grid No. 1 circuit resistance is **1.5 Megohms**.

Absolute Maximum Ratings

To prevent damage and ensure safe operation, the following absolute maximum limits must not be exceeded:

- **Anode Voltage:** 17,600 V DC
- **Grid No. 4 Voltage (Focusing Electrode):** -550 to +1100 V DC
- **Grid No. 2 Voltage:** 550 V DC

- **Grid No. 1 Voltage:**
 - **Negative Bias Value:** 154 V DC
 - **Negative Peak Value:** 220 V
 - **Positive Bias Value:** 0 V DC
 - **Positive Peak Value:** 2 V
- **Peak Heater-Cathode Voltage:**
 - **Heater negative with respect to cathode (during warm-up $\leq$ 15s):** 450 V
 - **Heater negative with respect to cathode (after warm-up):** 200 V
 - **Heater positive with respect to cathode:** 200 V

Safety and X-ray Radiation

When operating the 17BYP4, appropriate safety precautions must be observed regarding X-ray radiation. Shielding may be necessary if the tube is operated at voltages higher than the manufacturer's maximum rated anode voltage (17,600 V DC) or 16,000 V, whichever is less.

Technical Summary

The **17BYP4** is a 17-inch rectangular glass television picture tube featuring electrostatic focusing, magnetic deflection (110° diagonal), and an aluminized P4 white phosphor screen. Operating at a typical anode voltage of 14,000 V DC, it provides a minimum useful screen area of 155 square inches. The tube's lightweight design, lack of an ion trap, and 6.3 V, 0.450 A heater with a controlled 11-second warm-up time make it a highly standardized component for television receivers of its era.

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

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	450 mA	—
Cathode To All Other Electrodes Capacitance	5 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	17600 V	—
Maximum Grid2 Voltage	550 V	—
Typical Anode Voltage	14000 V	—

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