

ELECTRONIC TUBE REFERENCE

17CKP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch aluminized television picture tube with 110-degree magnetic deflection, low-voltage electrostatic focusing, and a straight electron gun. Its wide-angle direct-view geometry supports reduced-depth monochrome television receivers.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	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
No fixed ratings recorded.
Published ratings/characteristics promoted where applicable; additional operating data retained in TUBE_SECTION_PARAMETER.

17CKP4 Television Picture Tube

The **17CKP4** is a 17-inch rectangular glass, direct-view television picture tube. It features low-voltage electrostatic focusing and 110-degree magnetic deflection. The tube is designed with a straight electron gun that does not require an ion trap, an aluminized screen to maximize light output and minimize screen charging, and an external conductive coating that serves as a supplementary filter capacitor when grounded.

Mechanical and Optical Design

The 17CKP4 is constructed with a rectangular glass envelope and a spherical, neutral gray glass faceplate. The faceplate provides an approximate light transmission of 76% to 78% at its center. The minimum useful screen dimensions are:

- **Diagonal:** 15-3/4 inches
- **Width:** 14-3/4 inches
- **Height:** 11-11/16 inches
- **Total Useful Area:** 155 square inches

The physical dimensions of the bulb (designation J132-1/2 A1 or equivalent) are:

- **Greatest Diagonal:** $16\frac{9}{16} \pm \frac{1}{8}$ inches (or ± 0.100 inches)
- **Greatest Width:** $15\frac{5}{8} \pm \frac{1}{8}$ inches (or ± 0.100 inches)
- **Greatest Height:** $12\frac{3}{4} \pm \frac{1}{8}$ inches (or ± 0.100 inches)
- **Overall Length:** $12\frac{9}{16} \pm \frac{1}{4}$ inches (up to $\pm \frac{5}{16}$ inches)
- **Neck Length:** $5\frac{7}{16}$ inches (with a tolerance of $+\frac{3}{16}$ to $-\frac{1}{8}$ inches)
- **Neck Diameter:** 1.168 inches maximum at the splice

The net weight of the tube is approximately 10 to 10-1/3 pounds. The tube is designed to be mounted in any position.

Heater and Basing Configuration

The 17CKP4 is equipped with an indirectly heated cathode. The heater has the following ratings:

- **Heater Voltage (AC or DC):** 6.3 V
- **Heater Current:** 0.6 A (with a tolerance of $\pm 10\%$)
- **Heater Warm-up Time:** 11 seconds

The 11-second warm-up time is defined by two standard test methods:

1. The time required to reach 80% of the rated heater voltage when four times the rated voltage is applied in series with an external resistance equal to three times the rated voltage divided by the rated current.
2. The time required to reach 5.0 V in a test circuit with an applied voltage of 25 V and a series resistance of 31.5 ohms.

The tube uses the **8HR** basing designation. The base is a Small-Button Eightar 7-pin base (JETEC No. B7-183), and the anode terminal is a recessed small-cavity cap (JETEC No. J1-21). The anode terminal is located on the same side of the tube as pin 4. The plane passing through the tube axis and base pin 4 may vary from the plane passing through the axis and the anode terminal by ± 30 degrees.

The pin connections are:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1

- **Pin 3:** Grid No. 2
- **Pin 4:** Focusing Electrode (Grid No. 4)
- **Pin 6:** Grid No. 1
- **Pin 7:** Cathode
- **Pin 8:** Heater
- **Cap:** Anode (Anode, Grid No. 3, and Grid No. 5 are connected together internally)

Electrical and Deflection Characteristics

The 17CKP4 utilizes magnetic deflection with approximate deflection angles of:

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

The screen uses an aluminized P4 sulfide phosphor, which exhibits white fluorescence and white phosphorescence with short persistence. The external conductive coating on the glass envelope forms a supplementary filter capacitor when grounded.

The interelectrode capacitances are:

- **Grid No. 1 to all other electrodes:** 6 μF
- **Cathode to all other electrodes:** 5 μF
- **External conductive coating to anode:** 800 μF minimum to 1500 μF maximum (specifically, a range of 800 to 1400 μF or 1000 to 1500 μF depending on the manufacturer specification)

Operating Conditions and Drive Configurations

The 17CKP4 can be operated using either grid-drive or cathode-drive configurations. Operation below an anode voltage of 12,000 V is not recommended because brightness, focus, and definition decrease.

Grid Drive Operation (Video Signal to Grid No. 1)

Under grid-drive conditions, the typical operating parameters are:

- **Anode Voltage:** 14,000 V to 16,000 V DC
- **Grid No. 2 Voltage:** 300 V to 400 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 0 to 400 V DC (or up to 500 V DC)
- **Grid No. 1 Raster Cutoff Voltage:** -28 to -72 V DC (at 14,000 V anode / 300 V G2) or -36 to -94 V DC (at 16,000 V anode / 400 V G2)
- **Focusing Electrode Current:** -15 to +25 μA DC

Cathode Drive Operation (Video Signal to Cathode)

Under cathode-drive conditions, the typical operating parameters are:

- **Anode to Grid No. 1 Voltage:** 14,000 V to 16,000 V DC
- **Grid No. 2 to Grid No. 1 Voltage:** 300 V to 400 V DC
- **Grid No. 4 to Grid No. 1 Voltage:** 0 to 400 V DC
- **Cathode to Grid No. 1 Raster Cutoff Voltage:** 28 to 60 V DC (at 14,000 V anode / 300 V G2) or 36 to 78 V DC (at 16,000 V anode / 400 V G2)

Maximum Ratings and Circuit Limits

The maximum ratings are established as design-center values:

- **Anode Voltage:** 15,000 V to 16,000 V DC maximum
- **Focusing Electrode (Grid No. 4) Voltage:** -500 V to +1000 V DC maximum
- **Grid No. 2 Voltage:** 500 V DC maximum
- **Grid No. 1 Voltage:**
 - *Negative-Bias Value:* 140 V DC maximum
 - *Negative-Peak Value:* 200 V maximum
 - *Positive-Bias Value:* 0 V DC maximum
 - *Positive-Peak Value:* 2 V maximum
- **Peak Heater-Cathode Voltage:**
 - *Heater Negative with respect to Cathode:* 180 V DC maximum (during warm-up for the first 15 seconds, this limit is 410 V maximum)
 - *Heater Positive with respect to Cathode:* 180 V DC maximum

Limiting Circuit Values

- **Grid No. 1 Circuit Resistance:** 1.5 MΩ maximum
- **Grid No. 2 Circuit Resistance:** 10,000 Ω to 0.1 MΩ minimum (protective resistance is advised)
- **Focusing Electrode Circuit Resistance:** 10,000 Ω to 0.1 MΩ minimum (protective resistance is advised)

Safety and X-Ray Considerations

The 17CKP4 is capable of operating at voltages up to an absolute maximum value of 17.6 kV. If the operating anode voltage exceeds 16 kV, appropriate shielding may be required to protect personnel against X-ray radiation.



SOURCE OPERATING CONDITIONS

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	1 code	LowVoltageElectrostatic
Deflection method	1 code	Magnetic
Deflection angle	110 deg	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	16000 V	—
Anode voltage	14000 V	—
Grid No. 2 voltage maximum	500 V	—
Grid No. 4 focusing voltage minimum	0 V	—
Grid No. 4 focusing voltage maximum	400 V	—

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

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