

Seventeen-inch monochrome picture tube with electrostatic focus, magnetic deflection, an automatic-focus gun, and P4 screen. Designed for high-voltage direct-view television service, its documentation warns that X-ray shielding may be required above 16 kV.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12AT	BASE PINS	12
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	17600 V
MAXIMUM SCREEN VOLTAGE	550 V
MAXIMUM HEATER-CATHODE VOLTAGE	180 V
CRT anode and grid-2 maximum ratings are promoted from the printed ratings block; other CRT-specific focus/drive/deflection values are preserved in parameters.	

17EAP4 — Electrostatic Focus Picture Tube

The **17EAP4** is a rectangular glass cathode-ray picture tube designed for television receiver applications. It features automatic electrostatic focusing, magnetic deflection, and an aluminized screen. The tube is designed to eliminate ion spot blemishes through the use of a single external magnetic field ion trap.

Physical and Mechanical Construction

The 17EAP4 is constructed with a rectangular glass envelope (Bulb No. J133B1/D1) and an aluminized screen utilizing No. 4 phosphor. The screen provides a minimum useful projected area of 150 square inches, with a center light transmittance of approximately 74%.

Mechanical Dimensions

The physical dimensions of the tube are characterized by the following measurements:

- **Overall Length:** $19 \frac{1}{4} \pm \frac{3}{8}$ inches
- **Neck Length:** $7 \frac{1}{2} \pm \frac{3}{16}$ inches
- **Greatest Diagonal Dimension:** $16 \frac{5}{8} \pm \frac{1}{8}$ inches
- **Greatest Width:** $15 \frac{3}{8} \pm \frac{1}{8}$ inches
- **Greatest Height:** $12 \frac{1}{4} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diagonal (Projected):** $15 \frac{9}{16}$ inches
- **Minimum Useful Screen Horizontal Axis (Projected):** $14 \frac{5}{16}$ inches
- **Minimum Useful Screen Vertical Axis (Projected):** $11 \frac{1}{8}$ inches

Deflection and Focusing

The tube operates with magnetic deflection, offering the following approximate deflection angles:

- **Horizontal:** 65 degrees
- **Vertical:** 50 degrees
- **Diagonal:** 70 degrees

Focusing is achieved automatically via an electrostatic focus design. The Grid No. 4 (G_4) focus electrode is internally connected to the filament lead on Pin 1, which eliminates the requirement for an external focus voltage connection.

Heater, Base, and Pinout

The 17EAP4 utilizes an indirectly heated filament and a standard base configuration. The external conductive coating of the bulb must be grounded during operation.

Heater Ratings

- **Nominal Heater Voltage:** 6.3 V
- **Nominal Heater Current:** 0.6 A (subject to a $\pm 10\%$ tolerance)

Base and Basing Configuration

The tube features a **B5-57** Small Shell Duodecal 5-Pin Base and utilizes the **12AT** basing arrangement. The high-voltage anode connection is made via a **J1-21** anode cavity cap located on the bulb envelope.

Pin Number	Connection
Pin 1	Heater, Focus Electrode (G_4)
Pin 2	Grid No. 1
Pin 10	Grid No. 2
Pin 11	Cathode
Pin 12	Heater
Bulb Contact	Ultor (Anode)

Electrical Characteristics and Capacitances

The electrical interface of the 17EAP4 includes capacitance between the external conductive coating and the internal anode structure:

- **External Conductive Coating to Anode Capacitance (Maximum):** 1500 μF (pF)
- **External Conductive Coating to Anode Capacitance (Minimum):** 1000 μF (pF)

Operating Conditions and Ratings

The operating limits of the 17EAP4 are defined under the Design Maximum System. All voltages are positive and measured with respect to the cathode unless otherwise specified.

Design-Maximum Ratings

- **Anode Voltage:** 17,600 V max.
- **Grid No. 2 Voltage:** 550 V max.
- **Grid No. 1 Voltage:**
 - Maximum Negative DC Value: 155 V
 - Maximum Negative Peak Value: 220 V
 - Maximum Positive DC Value: 0 V
 - Maximum Positive Peak Value: 2 V
- **Heater Voltage Range:** 5.6 V to 7.0 V
- **Maximum Heater-Cathode Voltage:**
 - Heater negative with respect to cathode during warm-up (≤ 15 seconds): 410 V
 - Heater negative with respect to cathode after warm-up: 180 V
 - Heater positive with respect to cathode: 180 V

Typical Operating Conditions (Grid Drive Service)

Under typical grid drive operating conditions, the tube is configured with the following parameters:

- **Anode Voltage:** 12,000 V DC
- **Grid No. 2 Voltage:** 300 V DC
- **Grid No. 1 Voltage (for visual extinction of focused raster):** -28 V to -72 V DC
- **Ion Trap Current:** $40 \pm 50\%$ mA DC (using JEDEC Coil #RMA111)

To achieve proper ion trap alignment and maximum screen brightness, the external ion trap magnet must be positioned with the trailing edge of its pole pieces directly over the gap between Grid No. 1 and Grid No. 2.

Operating and Safety Notes

Socket Mounting

The socket for the 17EAP4 must not be rigidly mounted. To prevent mechanical strain on the glass neck and base pins, the socket must be connected via flexible leads and allowed to move freely.

X-ray Radiation Warning

When the 17EAP4 is operated at anode voltages exceeding 16,000 Volts, it can produce X-rays. Personal safety may require the installation of appropriate radiation shielding around the tube.

Technical Summary

The **17EAP4** is a 17-inch class rectangular television picture tube featuring automatic electrostatic focusing (G_4 tied internally to Pin 1) and magnetic deflection (70-degree diagonal). It operates with a 6.3 V, 0.6 A heater and is housed in a J133B1/D1 glass envelope with a B5-57 Small Shell Duodecal 5-pin base. Under typical grid drive service, it operates at an anode voltage of 12,000 V DC (with a design-maximum limit of 17,600 V) and requires an external single-field ion trap magnet for proper raster alignment and blemish prevention.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1956 National Video

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

1956 NATIONAL VIDEO

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Anode Voltage	12000 V	—
Phosphor	P4	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage Nominal	6.3 V	—
Heater Current Nominal	600 mA	—