



ELECTRONIC TUBE REFERENCE

16ATP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

CATHODERAY

Sixteen-inch P4 cathode-ray picture tube documented by General Electric. The surviving source supports a direct-view television display role, while insufficient detailed evidence prevents assigning additional specialized construction or performance tags.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	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

SECTION 1 Cathode Ray*No fixed ratings recorded.*

16ATP4 — Cathode Ray Tube

An electrostatic-focus, magnetic-deflection glass picture tube featuring an integral plastic implosion barrier, designed for cathode-drive television receiver applications.

Overview

The **16ATP4** is a 16-inch rectangular glass cathode ray tube (CRT) designed for television display service. It features electrostatic focusing and magnetic deflection with a nominal diagonal deflection angle of 114 degrees. The tube is specifically engineered as a low Grid No. 2 voltage type optimized for cathode-drive operation.

Key design features of the 16ATP4 include lightweight glass construction, a short overall length, a small neck diameter, and a non-ion-trap gun. The fluorescent screen uses a P4 aluminized phosphor to maximize

light output and minimize screen charging. Additionally, an external conductive coating is provided which, when grounded, acts as a filter capacitor in conjunction with the internal anode coating.

Mechanical Design and Physical Dimensions

The 16ATP4 is constructed with a rectangular glass bulb (JEDEC designation J125A1) and a spherical gray faceplate. It features an integrated plastic implosion barrier for safety.

The physical dimensions of the tube are highly compact, characterized by a short neck and overall length:

- **Overall Length:** $10 \frac{1}{8} \pm \frac{1}{4}$ inches
- **Neck Length:** $4 \pm \frac{1}{8}$ inches
- **Neck Diameter:** $1 \frac{1}{8} \pm \frac{1}{8}$ inches
- **Greatest Bulb Dimensions:**
 - **Diagonal:** $15 \frac{11}{16} + \frac{5}{32}$, $- \frac{1}{8}$ inches
 - **Width:** $13 \frac{3}{4} \pm \frac{1}{8}$ inches
 - **Height:** $11 \frac{5}{32} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Dimensions (Projected):**
 - **Diagonal:** $14 \frac{7}{8}$ inches
 - **Horizontal Axis:** $12 \frac{15}{16}$ inches
 - **Vertical Axis:** $10 \frac{1}{4}$ inches
 - **Minimum Useful Area:** 125 square inches

The tube utilizes a JEDEC No. J1-21 bulb contact for the high-voltage anode connection. The anode contact is aligned with base pin No. 4 within a tolerance of ± 30 degrees. The base is a JEDEC No. B7-237 or B7-208, which requires a non-rigidly mounted socket with flexible leads to prevent mechanical stress on the glass. The bottom circumference of the base wafer falls within a $1 \frac{3}{4}$ -inch diameter circle concentric with the bulb axis.

Electrical and Optical Characteristics

The 16ATP4 is designed with a low Grid No. 2 voltage configuration, making it highly suitable for cathode-drive circuitry.

Heater and Warm-Up

The tube is equipped with an indirectly heated cathode. The heater has the following specifications:

- **Heater Voltage (Nominal):** 6.3 V
- **Heater Current:** 450 ± 23 mA
- **Heater Warm-Up Time:** 11 seconds

Electrostatic and Deflection Parameters

- **Focusing Method:** Electrostatic (Grid No. 4)

- **Deflection Method:** Magnetic
- **Approximate Deflection Angles:**
 - **Diagonal:** 114 degrees
 - **Horizontal:** 102 degrees
 - **Vertical:** 84 degrees

Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 μF
- **Grid No. 1 to all other electrodes:** Approximately 6 μF
- **External conductive coating to anode:** 1000 μF minimum to 1500 μF maximum

Optical Specifications

- **Phosphor:** P4 (Aluminized)
- **Light Transmittance at Center:** Approximately 48%

Basing and Pin Connections

The 16ATP4 uses the **8HR** basing diagram. The pin connections, viewed from the bottom of the base, are as follows:

Pin Number	Connection
1	Heater (H)
2	Grid No. 1 (G1)
3	Grid No. 2 (<u>G2</u>)
4	Focusing Electrode / Grid No. 4 (F)
6	Grid No. 1 (G1)
7	Cathode (K)
8	Heater (H)
Recessed Cap	Anode (A)

Note that Grid No. 1 is internally connected to both Pin 2 and Pin 6. Pin 5 is omitted from the base configuration.

Ratings and Operating Conditions

The ratings of the 16ATP4 are defined under the **Design Maximum System**. Unless otherwise specified, all voltage values are positive and measured with respect to Grid No. 1.

Design Maximum Ratings

- **Anode Voltage:** 11,000 V minimum to 18,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1000 V
- **Grid No. 2 Voltage:** 40 V minimum to 100 V maximum
- **Cathode Voltage:**
 - **Maximum Positive DC Value:** 140 V
 - **Maximum Positive Peak Value:** 200 V
 - **Maximum Negative DC Value:** 0 V
 - **Maximum Negative Peak Value:** 2 V
- **Heater Voltage:** 5.7 V minimum to 6.9 V maximum
- **Maximum Heater-Cathode Voltage:**
 - *Heater negative with respect to cathode:*
 - During warm-up period (not to exceed 15 seconds): 410 V
 - After equipment warm-up period: 180 V
 - *Heater positive with respect to cathode:* 180 V

Typical Operating Conditions (Cathode-Drive Service)

Under typical cathode-drive operating conditions, the electrode potentials are set as follows:

- **Anode Voltage:** 15,000 V DC
- **Grid No. 4 Voltage:** 250 V DC (Individual tubes will achieve satisfactory focus at some value between 0 V and 500 V DC)
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode-to-Grid No. 1 Voltage for Cut-off:** 31 V to 49 V DC (defined as visual extinction of the focused raster)

Note on Focus Voltage: The typical focusing electrode voltage is specified at 150 μ A anode current on a 12 15/16-inch x 10 1/4-inch pattern (using an RCA [2F21](#) monoscope or equivalent) with the combined Grid No. 1 bias and video-signal voltage adjusted accordingly.

Maximum Circuit Values

To prevent damage to the tube, the external circuit resistances must be kept within the following limits:

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 megohms
- **Minimum Grid No. 2 Circuit Resistance:** 0.1 megohms
- **Minimum Focusing Electrode Circuit Resistance:** 0.1 megohms

To prevent damage, it is advisable to incorporate protective resistance in both the Grid No. 2 and focusing electrical circuits. If applicable, a single common resistor may be shared between both of these circuits.

Technical Summary

The **16ATP4** is a specialized 16-inch rectangular glass cathode ray tube featuring electrostatic focusing, magnetic deflection, and a 114-degree diagonal deflection angle. Designed for cathode-drive television receiver service, it operates with a low Grid No. 2 voltage (typically 50 V DC) and features a short overall length of 10 1/8 inches. The tube incorporates an integral plastic implosion barrier, an aluminized P4 screen with 48% light transmittance, and an external conductive coating that functions as a filter capacitor. With its compact physical dimensions, small neck diameter, and standardized 8HR basing, the 16ATP4 provides a robust and efficient display solution for its class.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

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Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltageNominal	6.3 V	—
HeaterOrFilamentCurrentNominal	450 mA	—

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