

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

14CP4

1 SECTION
CONSTRUCTION
CATHODERAY

Specialized - Cathode Ray electronic tube

Fourteen-inch rectangular television picture tube with magnetic focusing and wide-angle deflection. Its white P4 screen and high-voltage anode operation provide a direct-view monochrome television image in a compact rectangular format.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12N	BASE PINS	5
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION0 Cathode Ray	
MAXIMUM PLATE VOLTAGE	14000 V
Design-center maximum anode voltage 14 kV; source includes X-ray shielding warning for operation above 16 kV.	

14CP4 — Rectangular Cathode-Ray Picture Tube

The **14CP4** is an all-glass, direct-view cathode-ray picture tube designed primarily for television receiver applications. It features a space-saving rectangular bulb shape, a spherical gray neutral-density faceplate to enhance picture contrast and detail under high ambient light conditions, and an electron gun designed for use with an external single-field ion-trap magnet. The tube utilizes magnetic focusing and magnetic deflection.

Mechanical Specifications and Physical Dimensions

The 14CP4 is constructed with a rectangular glass bulb and a spherical gray faceplate. The faceplate has an approximate light transmission of 74 percent at its center.

The physical dimensions and mechanical characteristics of the tube include:

- **Overall Length:** 16-3/4 ± 3/8 inches
- **Greatest Bulb Dimensions:**
 - Diagonal: 13-11/16 ± 1/8 inches
 - Width: 12-5/8 ± 1/8 inches
 - Height: 9-3/4 ± 1/8 inches
- **Minimum Useful Screen Dimensions:**
 - Diagonal: 12-1/2 inches
 - Width: 11-3/8 inches (or a picture width of 11-1/2 inches in early specifications)
 - Height: 8-1/2 inches (or a picture height of 8-5/8 inches in early specifications)
- **Neck Length:** 7-1/2 inches
- **Net Weight:** Approximately 10-1/4 pounds
- **Bulb Number (ASA Designation):** J109-1/2-C1
- **Bulb Contact:** Recessed small-cavity cap (JETEC No. J1-21)
- **Base:** Small-shell Duodecal 5-Pin (JETEC No. B5-57)
- **Basing Designation:** JETEC 12N
- **Mounting Position:** Any
- **Bulb Contact Alignment:** The anode contact aligns with the Pin No. 6 position ± 30 degrees.

Electrical and Basing Connections

The 14CP4 features a coated unipotential cathode. The heater is designed for operation on either AC or DC.

Heater Parameter	Value
Nominal Heater Voltage	6.3 V
Nominal Heater Current	0.6 A (with a ±10% tolerance)

The tube uses the **12N** basing configuration. The pin connections, viewed from the bottom of the base, are as follows:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Recessed Cap:** Anode, Grid No. 3 (internally connected)

Optical and Screen Characteristics

The screen of the 14CP4 utilizes a sulfide-type P4 phosphor. Its optical properties are characterized by:

- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Described as short to medium depending on the manufacturer's evaluation criteria.
- **Faceplate Type:** Spherical, gray neutral-density glass.

Electrostatic and Electromagnetic Characteristics

The 14CP4 employs magnetic methods for both focusing and deflection.

Deflection Angles

The approximate deflection angles of the electron beam are:

- **Diagonal:** 70 degrees
- **Horizontal:** 65 degrees
- **Vertical:** 50 degrees (with some early tentative specifications listing up to 70 degrees)

Direct Interelectrode Capacitances

- **Grid No. 1 to All Other Electrodes:** 6 μF
- **Cathode to All Other Electrodes:** 5 μF
- **External Conductive Coating to Anode:** Ranges from a minimum of 750 μF to a maximum of 2000 μF (typically around 1500 μF). When grounded, this external conductive coating serves as a filter capacitor for the high-voltage supply.

Maximum Ratings (Design-Center Values)

The maximum ratings are interpreted according to the standard design-center system, which provides a ten-percent safety factor to withstand variations in line voltage and component tolerances.

Parameter	Maximum Rating
Anode Voltage (Anode and Grid No. 3)	14,000 Max Volts DC
Grid-No. 2 Voltage	410 Max Volts DC
Grid-No. 1 Negative-Bias Value	125 Max Volts DC
Grid-No. 1 Positive-Bias Value	0 Max Volts DC
Grid-No. 1 Positive-Peak Value	2 Max Volts
Grid-No. 1 Circuit Resistance	1.5 Max Megohms

Peak Heater-Cathode Voltage

- **Heater Negative with Respect to Cathode:**
 - During equipment warm-up period (not to exceed 15 seconds): 410 Max Volts
 - After equipment warm-up period: 150 Max Volts
- **Heater Positive with Respect to Cathode:** 150 Max Volts

Typical Operating Conditions

Under typical operating conditions, the 14CP4 is operated with the following parameters:

- **Anode Voltage:** 12,000 Volts DC
- **Grid-No. 2 Voltage:** 300 Volts DC
- **Grid-No. 1 Voltage (for visual extinction of focused raster or undeflected spot):** -28 to -72 Volts DC (with some operating points extending from -33 to -77 Volts DC)
- **Focusing-Coil Current:** Approximately 105 mA DC (using a JETEC No. 109 focusing coil positioned 3-1/4 inches from the yoke-reference-line to the center of the air gap) to 115 mA DC
- **Ion-Trap Field Intensity:** Approximately 23 to 32 Gauss (using a single-field ion-trap magnet adjusted to the optimum position, equivalent to 32 mA through a JETEC No. 117 ion-trap magnet)

Operating and Safety Precautions

X-ray Radiation Shield

If the 14CP4 is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert the danger of personal injury from prolonged exposure at close range. The protective face-viewing window of the television apparatus may provide a sufficient safeguard. If the radiation measured in contact with this window does not exceed 6.25 milliroentgens per hour, the window will normally provide adequate protection.

Cathode Connection

The cathode of the tube should be returned to one side or to the electrical midtap of the heater transformer winding.

Minimum Operating Voltage

To maintain acceptable brightness and focus quality, the anode voltage should generally not be operated below 10,000 volts.

Technical Summary

The **14CP4** is a 14-inch rectangular glass cathode-ray picture tube featuring magnetic focus and magnetic deflection, a 70-degree diagonal deflection angle, and a gray neutral-density faceplate. Operating typically at an anode voltage of 12,000 V and a Grid-No. 2 voltage of 300 V, it provides a clear,

high-contrast white display using a P4 sulfide phosphor. The tube is designed for television receiver service, utilizing a standard 12N basing configuration on a small-shell duodecal 5-pin base, and requires an external single-field ion-trap magnet for proper operation.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Tung Sol

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

1961 TUNG SOL

Section 0 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	14000 V	—
Typical Anode Voltage	12000 V	—
Maximum Grid2 Voltage	410 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FocusingMethod	Magnetic	—
DeflectingMethod	Magnetic	—
DeflectionAngleApproximate	70 degree	—
PhosphorNumber	4	—
FluorescentColor	White	—



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.

1968 GENERAL ELECTRIC CO

Section 0 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection Angle	110 deg	Approximate

TUBE TINKER

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

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker