ELECTRONIC TUBE REFERENCE

17CP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch direct-view television picture tube using magnetic focusing and magnetic deflection. The unipotential cathode, external ion-trap arrangement, optical screen data, and high-voltage operating conditions are specified for monochrome receiver display.

General characteristics

BASE DESIGNATION	BS-57	**BASE PINS**	5
NOMINAL HEATER	– / –	**PARALLEL HEATER**	– / –
HEATING	Indirect	**SERIES OPERATION**	Not specified
CATHODE ARRANGEMENT	Separate cathodes	**SECTION CONSTRUCTION**	Similar

Section ratings

SECTION1 Cathode Ray

MAXIMUM SCREEN VOLTAGE	410 V

CRT electron-gun/display section; published electrode ratings promoted where unambiguous.

17CP4A — Rectangular Metal Picture Tube

The **17CP4A** is a direct-view cathode ray picture tube designed primarily for television receiver applications. It features a rectangular metal construction, magnetic focus, and magnetic deflection. The tube utilizes an external single-field ion trap to prevent ion burn on the screen.

The 17CP4A is identical to the **17CP4** except for the faceplate treatment: the 17CP4A is constructed with an **unfrosted faceplate**, whereas the standard 17CP4 features a frosted faceplate.

Mechanical Construction and Optical Characteristics

The 17CP4A is built with a rectangular metal shell, which provides a robust structure and a large useful screen area relative to its overall size. The faceplate is made of filter glass with a light transmission of

approximately 65% at the center, which helps improve picture contrast under ambient room lighting.

The physical dimensions of the tube are as follows:

- **Overall Length**: 19 inches
- **Greatest Diagonal Dimension**: 16 13/16 ± 3/16 inches
- **Greatest Width**: 15 15/16 ± 1/8 inches
- **Greatest Height**: 12 1/4 ± 1/8 inches
- **Minimum Useful Screen Width**: 14 5/8 inches
- **Minimum Useful Screen Height**: 11 inches

The tube's screen is coated with **No. 4 phosphor** (sulfide type), which exhibits a white fluorescent color and a white phosphorescent color. The persistence of this phosphor is classified as medium, making it well-suited for television scanning rates.

Deflection is achieved magnetically, with approximate deflection angles of:

- **Horizontal**: 66 degrees
- **Vertical**: 50 degrees
- **Diagonal**: 70 degrees

Electrical Connections and Basing

The 17CP4A utilizes a **small shell duodecal 5-pin base** (designated B5-57) with a **12D** basing arrangement. The base is aligned such that pin number 6 aligns with the horizontal picture axis within a tolerance of ±10 degrees. The anode connection is made directly to the metal shell lip.

The pin connections, viewed from the bottom of the base, are:

- **Pin 1**: Heater
- **Pin 2**: Grid No. 1
- **Pin 10**: Grid No. 2
- **Pin 11**: Cathode
- **Pin 12**: Heater
- **Metal Shell Lip**: Anode

The interelectrode capacitances of the tube are relatively low, with approximate values as follows:

- **Cathode to all other electrodes**: 5 µµf
- **Grid No. 1 to all other electrodes**: 6 µµf

Operating Conditions and Electrical Characteristics

Under typical operating conditions, the 17CP4A requires a nominal heater supply of **6.3 Volts** at **0.6 Amp**. The unipotential cathode is indirectly heated.

Typical operating parameters for the tube are established as follows:

- **DC Anode Voltage**: 12,000 Volts. While the tube can operate at lower anode voltages, both brilliance and definition decrease with decreasing voltage; therefore, the anode voltage should not be operated below 12,000 Volts.
- **DC Grid No. 2 Voltage**: 300 Volts.
- **DC Grid No. 1 Voltage**: -33 to -77 Volts. This range represents the bias required for visual extinction of the undeflected, focused spot.
- **DC Focusing Coil Current**: Approximately 96 ± 6% mA. This value is specified for a standard focus coil (such as standard focus coil #109 or its equivalent) positioned at a distance of 3.0 inches from the reference line to the center of the coil's air gap. This current is measured with the combined Grid No. 1 bias and video signal adjusted to produce a highlight brightness of 30 foot-lamberts on a 10 11/16" x 14 3/8" picture size.
- **DC Ion Trap Current**: Approximately 70 mA when using a standard single-field ion trap coil (such as standard coil #111).
- **Ion Trap Magnet Field Strength**: 45 Gausses.

Maximum Ratings and Circuit Limits

The maximum ratings for the 17CP4A are defined under the Design Center system. Operating the tube beyond these limits can impair performance or cause permanent damage.

- **Anode Voltage**: The maximum DC anode voltage is **16,000 Volts**. Additionally, the product of the anode voltage and the average anode current must be strictly limited to **6 Watts** to prevent excessive thermal stress on the metal shell and screen.
- **Grid No. 2 Voltage**: The maximum DC Grid No. 2 voltage is **410 Volts**.
- **Grid No. 1 Voltage**:
  - Maximum DC Negative-Bias Value: 125 Volts
  - Maximum DC Positive-Bias Value: 0 Volts
  - Maximum Positive-Peak Value: 2 Volts
- **Peak Heater-Cathode Voltage**:
  - During the equipment warm-up period (not to exceed 15 seconds), the heater may be negative with respect to the cathode up to a maximum of **410 Volts**.
  - After the equipment has warmed up, the maximum voltage with the heater negative with respect to the cathode is **180 Volts**.
  - With the heater positive with respect to the cathode, the maximum voltage is **180 Volts**.
- **Grid No. 1 Circuit Resistance**: The maximum resistance in the Grid No. 1 circuit must not exceed **1.5 Megohms** to maintain bias stability.

Technical Summary

The **17CP4A** is a 19-inch rectangular metal-shell picture tube designed for television display systems. It features magnetic focus and deflection, an external single-field ion trap, and an unfrosted filter-glass faceplate with 65% light transmission. Operating with a 6.3 V, 0.6 A heater, the tube is rated for a maximum DC anode voltage of 16,000 Volts (with a 6-Watt power limit) and typically operates at 12,000

Volts. Its duodecal 5-pin base provides standard connections for the unipotential cathode, control grid, and screen grid, while the metal shell lip serves as the anode terminal.

SOURCE OPERATING CONDITIONS

1966 Tung Sol Electronic Tubes 4 of 4

SOURCE PDF

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

1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

Section 1 · Cathode Ray

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Maximum Grid No. 2 voltage	**410 V**	Published maximum Grid No. 2 voltage
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	**65 %**	FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.) 65 PERCENT
HEATER VOLTAGE	**6.3 V**	HEATER VOLTAGE 6.3 VOLTS
R EATER CURRENT	**600 mA**	R EATER CURRENT O.6 AMP.
MAXIMUM OC ANODE VOLTgGE A 16 OQ	**0 V**	MAXIMUM OC ANODE VOLTgGE A 16 OQO VOLTS
MAXIMUM DC GRID #2 VOLTAGE	**410 V**	MAXIMUM DC GRID #2 VOLTAGE 41O VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE	**180 V**	HEATER POSITIVE WITH RESPECT TO CATHODE 18O VOLTS
DC ANODE VOLTA 6E B	**12000 V**	DC ANODE VOLTA 6E B 12 OOO VOLTS
DC GRID #2 VOLTAGE	**300 V**	DC GRID #2 VOLTAGE 300 voLTs
DC ION TRAP CURRENT STANDARD COIL #111 (APPROX.)	**70 mA**	DC ION TRAP CURRENT STANDARD COIL #111 (APPROX.) 7O MA.
MAXIMUM GRID #1 CIRCUIT RESISTANCE	**1.5 Mohm**	MAXIMUM GRID #1 CIRCUIT RESISTANCE 1.5 MEGOHMS

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
CATHODE TO ALl OTHER ELECTRODES	**5 MMF**	CATHODE TO ALl OTHER ELECTRODES 5 µµf

TUBE TINKER

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

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