

ELECTRONIC TUBE REFERENCE

17YP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

High-voltage P4 cathode-ray picture-display tube using magnetic deflection, with manufacturer data supporting wide-angle scanning and typical anode operation in the 12-14 kV range.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	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

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	18000 V
MAXIMUM SCREEN VOLTAGE	5 V
CRT-specific electrode/focus/deflection data retained as parameter rows.	

17YP4 — Rectangular Television Picture Tube

Overview

The **17YP4** is a direct-view rectangular glass cathode ray tube designed primarily for television receiver applications. It features a 17-inch screen with a cylindrical faceplate, a grey filter glass to improve contrast, and an external conductive coating. The tube utilizes magnetic deflection and magnetic focusing, requiring an external single-field ion trap magnet for proper operation. Its design incorporates a unipotential cathode and a standard phosphor screen to deliver high-definition monochrome images.

Mechanical and Construction Details

The 17YP4 is constructed with a rectangular glass envelope and a cylindrical faceplate. The faceplate is made of grey filter glass, which has a light transmission at the center of approximately 66% to 72%.

Physical Dimensions

The physical envelope of the 17YP4 has the following dimensions:

- **Overall Length:** $19 \frac{3}{16} \pm \frac{3}{8}$ 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

Screen and Raster Specifications

The screen provides a minimum useful area with the following dimensions:

- **Minimum Useful Diagonal:** $15 \frac{3}{4}$ inches
- **Minimum Useful Width:** $14 \frac{1}{4}$ inches
- **Minimum Useful Height:** $10 \frac{3}{4}$ inches
- **Raster Size:** Typically ranges from $10 \frac{3}{8}$ " x $13 \frac{3}{4}$ " to $10 \frac{3}{4}$ " x $14 \frac{1}{4}$ "

Base, Basing, and Alignment

The tube uses a **Small Shell Duodecal 5-Pin (B5-57)** base with a **12N** basing configuration. The high-voltage anode connection is made via a **recessed small cavity cap (J1-21)** located on the bulb. The alignment of this J1-21 contact is designed to align with pin position No. 6 within a tolerance of ± 30 degrees.

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

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 6:** Vacant Position
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Anode Cap (Recessed Cap):** Collector / Anode

Electrical and Optical Characteristics

Heater Ratings

The 17YP4 is designed to operate with a standard heater supply:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** Approximately 0.6 Ampere

Direct Interelectrode Capacitances

The approximate capacitances between the internal electrodes and external coatings are:

- **Cathode to all other electrodes:** 5 μF
- **Grid No. 1 to all other electrodes:** 6 μF
- **External conductive coating to collector (anode):** 500 μF (minimum) to 750 μF (maximum)

The external conductive coating acts as a capacitor in conjunction with the internal anode, which helps in filtering the high-voltage anode power supply.

Optical and Phosphor Data

The tube utilizes **Phosphor No. 4 (P4)**, which exhibits white fluorescence and white phosphorescence with medium persistence. This phosphor is optimized for standard television scanning rates to prevent flicker while avoiding trailing artifacts.

Deflection and Focusing

The 17YP4 employs magnetic deflection and magnetic focusing. The approximate deflection angles are:

- **Horizontal Deflection Angle:** 55° to 65°
- **Diagonal Deflection Angle:** 70°

Focusing is achieved via an external focusing coil, such as a JETEC No. 109 or equivalent, positioned approximately 3 inches from the reference line.

Operating Conditions and Maximum Ratings

The operating limits of the 17YP4 are specified under the Design Center system. Operating the tube outside these limits can degrade performance or shorten its service life.

Maximum Ratings (Design Center Values)

- **Maximum DC Anode (Collector) Voltage:** 18,000 Volts
- **Maximum DC Grid No. 2 Voltage:** 500 Volts
- **Maximum Grid No. 1 Voltage:**
 - **DC Negative-bias value:** 125 Volts
 - **DC Positive-bias value:** 0 Volts
 - **Positive peak value:** 2 Volts
- **Maximum DC Peak Heater-Cathode Voltage:**
 - **Heater negative with respect to cathode during warm-up (≤ 15 seconds):** 410 Volts
 - **Heater negative with respect to cathode after warm-up:** 150 Volts

- **Heater positive with respect to cathode:** 150 Volts

Typical Operating Conditions

For standard television applications, the recommended typical operating points are:

- **DC Anode (Collector) Voltage:** 16,000 Volts (operation below this value is not recommended, as it leads to a decrease in picture brilliance and definition)
- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage (for visual extinction of focused raster or undeflected spot):** -33 to -77 Volts
- **DC Focusing Coil Current:** Approximately 100 mA (with bias adjusted to 20 foot-lamberts on a 10-3/4 x 14-1/4 inch area focused at the center)
- **Ion Trap Magnet Field Intensity:** Approximately 45 Gauss (using a single-field ion trap magnet)

Circuit Constraints and Safety

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms
- **X-ray Protection:** When operating the 17YP4 at anode voltages exceeding 16,000 Volts, or at the maximum rated anode voltage of 18,000 Volts, appropriate X-ray radiation shielding may be necessary to protect users from exposure.

Technical Summary

The **17YP4** is a 17-inch rectangular glass cathode ray tube designed for monochrome television receivers. It features a cylindrical grey-filter faceplate, magnetic deflection (70° diagonal), and magnetic focusing. Operating at a typical anode potential of 16,000 Volts and a heater rating of 6.3 V / 0.6 A, the tube utilizes a P4 white phosphor screen and an external single-field ion trap magnet. With its standard duodecal 5-pin base and robust design-center ratings, the 17YP4 provides a reliable display solution for vintage television designs, provided that appropriate safety precautions regarding high voltage and potential X-ray emission are observed.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	18000 V	—
Anode Voltage	16000 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor	P4	Aluminized



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 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	18000 V	—
Typical Anode Voltage	14000 V	—
Maximum Grid2 Voltage	500 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FocusingMethod	Magnetic	—
DeflectingMethod	Magnetic	—
DeflectionAngleApproximate	90 degree	—
PhosphorNumber	4	—
FluorescentColor	White	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1966 Tung Sol Electronic Tubes 4 of 4

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

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAGNETIC FOCUS AND DEFLECTION – value 1	10 mA	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
MAGNETIC FOCUS AND DEFLECTION – value 2	3 mA	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
MAGNETIC FOCUS AND DEFLECTION – value 3	1 mA	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DIRECT INTERELECTRODE CAPACITANCES (APPROX.)	1	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	66 percent	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
HEATER POSITIVE WITH RESPECT TO CATHODE	15 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DC COLLECTOR	1 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC GRID #2 VOLTAGE – value 1	2 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DC GRID #2 VOLTAGE – value 2	3 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM DC GRID #2 VOLTAGE – value 1	2 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
MAXIMUM DC GRID #2 VOLTAGE – value 2	5 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
MAXIMUM GRID #1 VOLTAGE	1 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
MAXIMUM GRID #1 CIRCUIT RESISTANCE	1 mA	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.

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