



ELECTRONIC TUBE REFERENCE

16HP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

P4 cathode-ray picture tube documented by Tung-Sol for direct-view television service; available extracted source detail is limited.

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

SECTION 1 Cathode Ray	
MAXIMUM SCREEN VOLTAGE	4 V
<i>CRT-specific anode/focus/deflection ratings retained as parameters rather than mapped to ordinary plate/screen fields.</i>	

16HP4A — Direct-View Cathode Ray Picture Tube

The **16HP4A** is a direct-view, round glass cathode ray picture tube designed primarily for television receiver applications. It features magnetic focus and magnetic deflection with a nominal deflection angle of approximately 60 degrees. The tube incorporates a unipotential cathode, an external conductive coating, and requires an external double field ion trap magnet.

The 16HP4A is identical to the [16HP4](#) except for its faceplate construction: the 16HP4A utilizes a grey filter faceplate to improve picture contrast under ambient light conditions, providing a faceplate light transmission of approximately 70 percent at the center. The tube provides a standard 10 1/4" by 14 1/2" raster size with a minimum useful screen diameter of 14 1/2 inches.

Mechanical Specifications and Basing

The 16HP4A is constructed with a round glass bulb and a small shell duodecal 5-pin base (designation B5-57), utilizing the 12N basing arrangement.

Physical Dimensions

- **Overall Length:** $21 \frac{1}{4} \pm \frac{3}{8}$ inches
- **Greatest Diameter of Bulb:** $15 \frac{7}{8} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diameter:** $14 \frac{1}{2}$ inches
- **Neck Diameter:** $1 \frac{7}{16} \pm \frac{1}{16}$ inches
- **Deflection Angle (Approximate):** 60 degrees

Connections and Alignment

The electrical connections are made through the 5-pin duodecal base and a recessed small cavity cap (J1-21) which serves as the anode terminal. The J1-21 anode contact is aligned with pin position #3 within a tolerance of ± 10 degrees.

The pinout configuration (viewed from the bottom of the base) is as follows:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 10:** Grid No. 2
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Anode Cap:** Recessed small cavity cap (J1-21)

A dedicated space of $4 \frac{5}{8} \pm \frac{1}{16}$ inches along the neck, measured from the reference line toward the base, must be kept clear to accommodate the external double field ion trap magnet.

Electrical and Optical Characteristics

Optical Data

The tube utilizes a No. 4 phosphor screen, which produces a white fluorescent color and a white phosphorescent color with medium persistence. The grey filter faceplate of the 16HP4A provides approximately 70 percent light transmission at the center of the screen.

Direct Interelectrode Capacitances

The external conductive coating forms a capacitor with the internal anode structure, which can be utilized for high-voltage ripple filtering:

- **Maximum External Conductive Coating to Anode:** 3,500 μpF (pF)
- **Minimum External Conductive Coating to Anode:** 1,500 μpF (pF)

Heater Ratings

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.6 A

Maximum Ratings (Design Center Values)

The following maximum ratings are established under the Design Center system:

Parameter	Value	Unit
Maximum DC Anode Voltage	14,000	Volts
Maximum DC Grid No. 2 Voltage	410	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 $\leq$ 15 s)	410	Volts
— Heater negative with respect to cathode (after warm-up)	125	Volts
— Heater positive with respect to cathode	125	Volts

Typical Operating Conditions

Under typical operating conditions, the 16HP4A is operated with an anode potential of 12,000 Volts. Focusing and ion-trap alignment are achieved using external magnetic components.

Parameter	Typical Value	Unit
DC Anode Voltage	12,000	Volts
DC Grid No. 2 Voltage	300	Volts

Parameter	Typical Value	Unit
DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot)	-33 to -77	Volts
DC Focusing Coil Current (Approximate)	110	mA
DC Ion Trap Current (Standard Coil #108, Approximate)	120	mA

Operating Notes and Circuit Values

- **Focusing Coil Setup:** The typical focusing coil current of 110 mA is specified for a standard focus coil #109 (or equivalent). This value is obtained with the combined Grid No. 1 bias voltage and video signal voltage adjusted to produce a highlight brightness of 20 foot-lamberts on a 10 1/4" by 14 1/2" picture size. The distance from the reference line to the center of the air gap on the focus coil must be maintained at 3.25 inches.
- **Grid No. 1 Circuit Resistance:** The maximum allowable resistance in the Grid No. 1 circuit is 1.5 Megohms.

Technical Summary

The **16HP4A** is a 16-inch class, round glass, direct-view television picture tube utilizing magnetic focus and magnetic deflection. It features a unipotential cathode, a 6.3 V / 0.6 A heater, a No. 4 white phosphor screen with medium persistence, and a grey filter faceplate that provides 70 percent light transmission at the center. Operating typically at an anode voltage of 12,000 V, the tube requires an external double field ion trap magnet and a standard focusing coil to produce a 10 1/4" by 14 1/2" raster.



SOURCE OPERATING CONDITIONS

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	14000 V	—
Typical Anode Voltage	12000 V	—
Maximum Grid2 Voltage	410 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngleApproximate	60 degree	—
FocusingMethod	Magnetic	—
DeflectingMethod	Magnetic	—
PhosphorNumber	4	—
FluorescentColor	White	—
Persistence	Medium	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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
NAGMETIC FOCUS 6 DEFLECTION	6	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
EXTERNAL DOUBLE FIELD ION TRAP – value 1	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
EXTERNAL DOUBLE FIELD ION TRAP – value 2	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
EXTERNAL DOUBLE FIELD ION TRAP – value 3	2	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DEFLECTION ANGLE (APPROX.)	60 degrees	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC GRID #2 VOLTAGE – value 1	2 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC GRID #2 VOLTAGE – value 2	3 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC GRID #1 VOLTAGE A – value 1	1 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC GRID #1 VOLTAGE A – value 2	33 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC GRID #1 VOLTAGE A – value 3	-77 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC ION TRAP CURRENT STANDARD COIL #108 (APPROX.)	108 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJUSTED TO PRODUCE A XI GXLIGT BRIGHTNESS OF 20 FOOT LAMBERTS ON a 10 1/4" BY – value 1	10 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
SIGNAL VOLTAGE ADJUSTED TO PRODUCE A XI GXLIGHT BRIGHTNESS OF 20 FOOT LAMBERTS ON a 10 1/4" BY – value 2	1 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJUSTED TO PRODUCE A XI GXLIGHT BRIGHTNESS OF 20 FOOT LAMBERTS ON a 10 1/4" BY – value 3	4 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
14 1/2" PICTURE SIZE. GIST ANGLE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SHALL BE – value 1	14	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
14 1/2" PICTURE SIZE. GIST ANGLE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SHALL BE – value 2	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
14 1/2" PICTURE SIZE. GIST ANGLE FROM REFERENCE LINE TO CENTER OF AIR GAP ON FOCUS COIL SHALL BE – value 3	2	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM OC GRID #2 VOLTAGE – value 1	2 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM OC GRID #2 VOLTAGE – value 2	4 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM GRID #1 CIRCUIT RESISTANCE	1 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.

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