

ELECTRONIC TUBE REFERENCE

16RP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Direct-view cathode-ray picture tube documented by manufacturer data for type 16RP4A; available extracted technical detail is limited, so the description remains conservative.

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

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	16000 V
MAXIMUM SCREEN VOLTAGE	41 V
CRT-specific anode/focus/deflection ratings retained as parameters rather than mapped to ordinary plate/screen fields.	

16RP4A — Cathode Ray Picture Tube

The **16RP4A** is a rectangular glass, direct-view cathode ray picture tube designed for television applications. It is identical to the **16RP4** except that the 16RP4A features an aluminized screen. Both tubes share a suite of common design features, including a grey filter faceplate, a unipotential cathode, magnetic focus and deflection, an external single field ion trap, and an external conductive coating. The standard raster size for these tubes is 10 1/8 inches by 13 1/2 inches.

Mechanical Specifications and Physical Dimensions

The 16RP4A is constructed using rectangular glass. Its physical dimensions and mechanical characteristics are precisely defined:

- **Overall Length:** $18 \frac{3}{4} \pm \frac{3}{8}$ inches
- **Greatest Bulb Diagonal:** $16 \frac{1}{8} \pm \frac{1}{8}$ inches
- **Greatest Bulb Width:** $14 \frac{3}{4} \pm \frac{1}{8}$ inches
- **Greatest Bulb Height:** $11 \frac{1}{2} \pm \frac{1}{8}$ inches
- **Minimum Useful Screen Diagonal:** $14 \frac{7}{8}$ inches
- **Minimum Useful Screen Width:** $13 \frac{1}{2}$ inches
- **Minimum Useful Screen Height:** $10 \frac{1}{8}$ inches
- **Bulb Contact:** Recessed small cavity cap (designated J1-21)
- **Base:** Small shell duodecal 5-pin (designated B5-57)
- **Basing Designation:** 12N
- **Bulb Contact Alignment:** The J1-21 contact aligns with pin position number 6 $\pm$ 30 degrees.

Pin Connections

The tube utilizes a 5-pin base configuration. The pin connections, viewed from the bottom of the tube, are assigned as follows:

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

Electrical Ratings and Capacitances

The electrical ratings of the 16RP4A are interpreted according to the Design Center System. Operating the tube within these limits is necessary for reliable performance.

Maximum Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere
- **Maximum DC Anode Voltage:** 16,000 Volts

- **Maximum DC Grid No. 2 Voltage:** 410 Volts
- **Maximum Grid No. 1 Voltage (DC Negative-Bias Value):** 125 Volts
- **Maximum Grid No. 1 Voltage (DC Positive-Bias Value):** 0 Volts
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms

Peak Heater-Cathode Voltage Limits

- **Heater Negative with Respect to Cathode (During Warm-up Period $\leq$ 15 seconds):** 410 Volts maximum
- **Heater Negative with Respect to Cathode (After Equipment Warm-up Period):** 150 Volts maximum
- **Heater Positive with Respect to Cathode:** 150 Volts maximum

Direct Interelectrode Capacitances

The approximate direct interelectrode capacitances of the tube are:

- **Cathode to All Other Electrodes:** 5 μf
- **Grid No. 1 to All Other Electrodes:** 6 μf
- **External Conductive Coating to Anode (Maximum):** 1,500 μf
- **External Conductive Coating to Anode (Minimum):** 750 μf

Optical Characteristics and Operating Conditions

The optical performance and typical operating parameters of the 16RP4A are optimized for television display systems.

Optical Data

- **Phosphor Number:** No. 4
- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Medium
- **Faceplate Light Transmission at Center:** Approximately 66%

Deflection and Focusing

The tube employs magnetic focusing and magnetic deflection. The approximate deflection angles are:

- **Horizontal Deflection Angle:** 65 degrees
- **Diagonal Deflection Angle:** 70 degrees

Typical Operating Conditions

Under typical operating conditions, the tube is configured with the following electrical parameters:

- **DC Anode Voltage:** 12,000 Volts
- **DC Grid No. 2 Voltage:** 300 Volts
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** -33 to -77 Volts
- **DC Focusing Coil Current (Approximate):** $100 \pm 20\%$ mA
- **DC Ion Trap Current (Approximate, using Standard Coil No. 111):** $75 \pm 50\%$ mA

The typical focusing coil current of $100 \pm 20\%$ mA is specified for a standard focus coil No. 109 (or equivalent), with the combined Grid No. 1 bias voltage and video signal voltage adjusted to produce a highlight brightness of 30 foot-lamberts on a 10 1/8 inch by 13 1/2 inch picture size. The distance from the reference line to the center of the air gap on the focus coil is specified as 3.50 inches.

Technical Summary

The **16RP4A** is a rectangular glass, direct-view television picture tube featuring an aluminized screen, magnetic focus, and magnetic deflection. It operates with a 6.3 V, 0.6 A heater and is housed in a bulb with a small shell duodecal 5-pin base (B5-57) and a recessed small cavity cap (J1-21) for the anode connection. The tube utilizes a No. 4 white phosphor with medium persistence, providing a light transmission of approximately 66% at the center of its grey filter faceplate. Designed for television applications, it supports a maximum DC anode voltage of 16,000 V and requires an external single field ion trap for proper operation.



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	16000 V	—
Typical Anode Voltage	12000 V	—
Maximum Grid2 Voltage	410 V	—
Typical Grid2 Voltage	300 V	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DeflectionAngleApproximate	70 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
MAGNETIC FOCUS b DEFLECTION – value 1	13 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAGNETIC FOCUS b DEFLECTION – value 2	1 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAGNETIC FOCUS b DEFLECTION – value 3	2 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
HEATER	6.3 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
OC ANODE VOLTAGE	12000 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
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.
OC 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 #i VOLTAGE A	77 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
OC FOCUSING COIL CURRENT S (APPROX.)	2 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC ION TRAP CURRENT STANDARD COIL #111 (APPROX.) – value 1	111 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC ION TRAP CURRENT STANDARD COIL #111 (APPROX.) – value 2	75 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DC ION TRAP CURRENT STANDARD COIL #111 (APPROX.) – value 3	5 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
DFOR STANDARD FOCUS COIL N109 r OR EDUIVALEXT r WITH THE COMBINED GRID #1 BIAS VOLTAGE AND VI DEC	1 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 NiGXL IGH T BRIGMTNEGG OF j0 F00T LAMBERTS OX A 10 1/8" – value 1	10 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
SIGNAL VOLTAGE ADJUSTED TO PRODUCE A NiGXL IGH T BRIGMTNEGG OF j0 F00T LAMBERTS OX A 10 1/8" – 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 NiGXL IGH T BRIGMTNEGG OF j0 F00T LAMBERTS OX A 10 1/8" – value 3	8 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
1j 1/2" PICTURE SIZE. DISTANCE FROM REFERENCE LINE TO CENTER OF AIR GAP OX FOCUS COIL GN ALL BE – value 1	1	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
1j 1/2" PICTURE SIZE. DISTANCE FROM REFERENCE LINE TO CENTER OF AIR GAP OX FOCUS COIL GN ALL BE – value 2	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 DC ANODE	16000 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM 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.
MAXIMUM DC GRID #2 VOLTAGE – value 2	41 V	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM GRID #1 CIRCUIT RESISTANCE – value 1	1 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.
MAXIMUM GRID #1 CIRCUIT RESISTANCE – value 2	1.5 mA	Published CRT datasheet value; multiple values on a row represent the source table's separate conditions/limits.



SOURCE OPERATING CONDITIONS

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

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OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltageNominal	6.3 V	—
HeaterOrFilamentCurrentNominal	600 mA	—

TUBE TINKER

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