

Seventeen-inch direct-view monochrome television picture tube with electrostatic focus, magnetic deflection, high-voltage anode operation, and an external ion-trap arrangement. Its optical and electrode characteristics are intended for conventional receiver display service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12M	BASE PINS	6
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 SCREEN VOLTAGE	500 V
CRT electron-gun/display section; published electrode ratings promoted where unambiguous.	

17GP4 — Electrostatic-Focus Magnetic-Deflection Picture Tube

The **17GP4** is a direct-view rectangular picture tube designed for television receiver applications. It features a lightweight metal-cone envelope with a space-saving rectangular face shape, electrostatic focusing, and magnetic deflection. The tube utilizes an external single-field ion-trap magnet and a spherical, gray, frosted faceplate designed to minimize specular reflection and enhance picture contrast.

Mechanical Design and Physical Dimensions

The 17GP4 is constructed with a rectangular metal cone and a spherical glass faceplate. The faceplate is made of frosted filterglass (or gray frosted fiberglass) designed to prevent specular reflection of ambient

light, with a maximum specular reflection rating of 1.5%. The light transmission at the center of the faceplate is approximately 66%.

The physical dimensions of the tube vary slightly across different manufacturing specifications:

- **Overall Length:** Stated as 19 5/16 inches in some specifications, and 18-13/16 $\pm$ 1/2 inches in others.
- **Neck Length:** 7-1/2 inches.
- **Greatest Bulb Dimensions:**
 - **Diagonal:** 16 13/16 $\pm$ 3/16 inches or 16-3/8 $\pm$ 1/8 inches.
 - **Width:** 15 15/16 $\pm$ 1/8 inches or 15-3/8 $\pm$ 1/8 inches.
 - **Height:** 12 1/4 $\pm$ 1/8 inches.
- **Minimum Useful Screen Dimensions:**
 - **Diagonal:** 15 1/2 inches or 15-1/4 inches.
 - **Width:** 14 5/8 inches or 14-3/8 inches.
 - **Height:** 11 inches or 10-11/16 inches.
- **Approximate Net Weight:** 10 pounds.

The tube can be mounted in any position. The electrical contact to the anode is made via the metal cone lip (or metal shell lip). The tube uses a small-shell duodecal 6-pin base (JETEC No. B6-63) with a JETEC 12M basing designation.

Base alignment specifications also show minor variations:

- Some specifications state that Pin 6 aligns with the horizontal picture axis within ± 10 degrees.
- Other specifications state that the Pin 3 position aligns with the horizontal picture axis within ± 30 degrees.

Electrical Connections and Pinout

The 17GP4 uses a unipotential cathode and a shared heater. The direct interelectrode capacitances are approximately:

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

The pin connections for the 12M basing arrangement (viewed from the bottom of the base) are as follows:

Pin	Connection
Pin 1	Heater
Pin 2	Grid No. 1 (Note: Some documentation lists Pin 2 as Grid No. 4)
Pin 6	Grid No. 4 (Focusing Electrode)
Pin 10	Grid No. 2

Pin	Connection
Pin 11	Cathode
Pin 12	Heater
Metal Cone / Shell Lip	Anode (internally connects Grid No. 3, Grid No. 5, and Collector)

Note on Pin 2 discrepancy: While primary specifications designate Pin 2 as Grid No. 1 and Pin 6 as Grid No. 4, certain alternative technical records duplicate the Grid No. 4 connection to Pin 2. In standard operation, Grid No. 4 serves as the electrostatic focusing electrode, and the metal cone serves as the anode, which must be insulated to withstand high operating voltages.

Ratings and Operating Conditions

The electrical ratings for the 17GP4 are established under the Design-Center Values system, which allows the tube to withstand the combined effects of line voltage and component variations up to 10% above the ratings.

Absolute Maximum Ratings

Parameter	Design-Center Value
Anode Voltage (Grid No. 3, Grid No. 5, Collector)	16,000 V DC max
Focusing-Electrode Voltage (Grid No. 4)	5,000 V DC max
Grid No. 2 Voltage	500 V DC max
Grid No. 1 Negative-Bias Value	125 V DC max
Grid No. 1 Positive-Bias Value	0 V DC max
Grid No. 1 Positive-Peak Value	2 V max
Peak Heater-Cathode Voltage (Heater negative, warm-up ≤ 15 s)	410 V max
Peak Heater-Cathode Voltage (Heater negative, after warm-up)	180 V max
Peak Heater-Cathode Voltage (Heater positive)	180 V max

Heater Specifications

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.6 A (with a tolerance of $\pm 10\%$ specified in some sources)

Typical Operating Conditions

Under typical operating conditions, the tube is operated with an anode voltage of 14,000 V DC. The typical parameters are:

- **Anode Voltage:** 14,000 V DC (A minimum recommended anode voltage of 12,000 V is specified; brightness and focus quality decrease below this value).
- **Grid No. 2 Voltage:** 300 V DC.
- **Grid No. 4 (Focusing-Electrode) Voltage:** 2,670 to 3,620 V DC. This focusing-voltage range represents approximately 19.1% to 25.9% of the applied anode voltage.
- **Grid No. 1 Voltage (for visual extinction of focused spot/raster):** -33 to -77 V DC (or -28 to -72 V DC in alternative specifications).
- **Grid No. 4 Current:** -15 to +25 μ A DC.
- **Grid No. 2 Current:** -15 to +15 μ A DC.
- **Ion-Trap Magnet Field Intensity:** 37 to 40 Gauss. A field strength of 37 Gauss is equivalent to 37 milliamperes through a RETMA ion-trap magnet No. 117 adjusted to the optimum position.
- **Adjustable Centering Magnet Field Strength:** 0 to 8 Gauss.

Circuit Operating Limits

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms.
- **Metal Cone Insulation:** Because the metal cone operates at high voltage (up to 16,000 V), it must be adequately insulated from the chassis and surrounding components.

Optical and Deflection Characteristics

The 17GP4 utilizes a Sulfide Type No. 4 (P4) phosphor screen, which produces a white fluorescent color and a white phosphorescent color with short persistence.

The deflection system is magnetic, with the following approximate deflection angles:

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

The nominal raster size is 14 5/8 inches by 11 inches, with a picture size of 14-3/4 by 10-11/16 inches.

Technical Summary

The **17GP4** is a rectangular, electrostatic-focus, magnetically deflected television picture tube featuring a lightweight metal-cone envelope and a 17-inch diagonal screen. Operating with a standard 6.3 V, 0.6 A heater, the tube is rated for a maximum anode voltage of 16,000 V DC, with a typical operating point of 14,000 V DC. It incorporates a P4 sulfide-type white phosphor screen with short persistence, a frosted faceplate to reduce ambient reflections, and requires an external single-field ion-trap magnet. With its electrostatic focusing electrode (Grid No. 4) operating typically between 2,670 and 3,620 V DC, the 17GP4 provides a reliable, high-contrast display for vintage television designs.



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
Heater voltage	6.3 V	Nominal
Heater current	600 mA	Nominal
Grid 2 voltage	500 V	Published CRT operating condition



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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Grid No. 2 voltage	500 V	Published maximum Grid No. 2 voltage
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	66 %	FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.) 66 PERCENT
HEATER VOLTAGE	6.3 V	HEATER VOLTAGE 6.3 VOLTS
HEATER CURRENT	600 mA	HEATER CURRENT 0.6 AMP.
MAXIMUM DC GRID #3, GRID #S, COLLECTOR VOLTAGE	16000 V	MAXIMUM DC GRID #3, GRID #S, COLLECTOR VOLTAGE 16 000 VOLTS
MAXIMUM OC GRID #4 VOLTAGE	5000 V	MAXIMUM OC GRID #4 VOLTAGE 5 000 VOLTS
MAXIMUM DC GRID #2 VOLTAGE	500 V	MAXIMUM DC GRID #2 VOLTAGE 500 VOLTS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HEATER POSITIVE WITH RESPECT TO CATHODE IR	0 V	HEATER POSITIVE WITH RESPECT TO CATHODE IRO VOLTS
DC GRID #3, GRID #5, COLLECTOR VOLTAGE	14000 V	DC GRID #3, GRID #5, COLLECTOR VOLTAGE 14 000 VOLTS
DC GRID #2 VOLTAGE j	0 V	DC GRID #2 VOLTAGE j00 VOLTS

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
GRID #1 TO ALL OTHER ELECTRODES	6 MMF	GRID #1 TO ALL OTHER ELECTRODES 6 µpf


SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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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 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
AnodeVoltageMaximum	16000 V	—
AnodeVoltageTypical	14000 V	—
Grid2VoltageMaximum	500 V	—