

ELECTRONIC TUBE REFERENCE

17QP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA  
1 SECTION  
CONSTRUCTION  
CATHODERAY

Seventeen-inch direct-view monochrome television picture tube with magnetic focusing, magnetic deflection, and a white P4 screen. Its approximately 90-degree deflection and high-voltage operating system are intended for conventional receiver display service.

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                                                     |
| No fixed ratings recorded.                                               |
| CRT-specific electrode/focus/deflection data retained as parameter rows. |

17QP4 — Rectangular Cathode Ray Picture Tube

The **17QP4** is a 17-inch rectangular glass cathode ray tube designed for direct-view television receiver applications. It features a cylindrical faceplate, magnetic deflection, magnetic focusing, and an electron gun designed for use with an external single-field ion-trap magnet. A closely related variant, the [17QP4A](#), is identical in construction and electrical characteristics except that it features an aluminized screen to enhance brightness and contrast.

# Mechanical Construction and Physical Dimensions

The 17QP4 is constructed with a rectangular glass bulb (ASA bulb number J133-C1) and a cylindrical gray filter faceplate. The gray faceplate is designed to reduce specular reflection and increase picture contrast. The tube incorporates an external conductive coating that, when grounded, serves as a high-voltage filter capacitor.

The physical dimensions of the tube are as follows:

- **Overall Length:** 19 3/16 plus or minus 3/8 inches or 19 7/8 plus or minus 3/8 inches, depending on the specific manufacturing design.
- **Neck Length:** 7 1/2 inches.
- **Greatest Bulb Dimensions:**
  - Diagonal: 16 5/8 inches (with a tolerance of plus or minus 1/8 or 3/16 inch)
  - Width: 15 3/8 plus or minus 1/8 inches to 15 5/8 plus or minus 1/8 inches
  - Height: 12 1/4 plus or minus 1/8 inches
- **Minimum Useful Screen Dimensions:**
  - Diagonal: 15 5/16 to 15 1/2 inches
  - Width: 14 1/4 inches
  - Height: 10 3/4 inches
- **Raster Size:** 10 3/4 inches by 14 1/4 inches.
- **Net Weight:** Approximately 18 pounds.
- **Mounting Position:** Any.

The electrical connection to the anode is made via a recessed small cavity cap (JETEC No. J1-21) located on the bulb cone. The base is a small-shell duodecal 5-pin base (JETEC No. B5-57) with a 12N basing arrangement. The anode bulb contact aligns with the vacant pin position number 6 (or Pin No. 6 position) within a tolerance of plus or minus 30 degrees.

## Electrical Characteristics and Basing

The 17QP4 utilizes a unipotential cathode with an indirectly heated filament. The heater is designed for standard television receiver power supplies.

### Heater Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere (with a tolerance of plus or minus 10% in some specifications)

### Pin Connections (Basing 12N)

The bottom view of the base provides the following pin connections:

- **Pin 1:** Heater
- **Pin 2:** Grid No. 1
- **Pin 10:** Grid No. 2

- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Anode Cap:** Grid No. 3 (Anode is connected internally to Grid No. 3)

## Direct Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 micromicrofarads (uuf)
- **Grid No. 1 to all other electrodes:** 6.0 to 6.5 micromicrofarads (uuf)
- **External conductive coating to anode:** Maximum 1,500 micromicrofarads (uuf), Minimum 750 micromicrofarads (uuf)

## Optical Characteristics and Screen Performance

The screen of the 17QP4 uses a Sulfide Type, No. 4 (P4) phosphor. This phosphor produces a white fluorescent and white phosphorescent color. Depending on the specific formulation and screen treatment (such as the aluminized screen of the [17QP4A](#)), the persistence is characterized as short to medium.

The faceplate light transmission at the center is approximately 66% to 72%. The cylindrical faceplate curvature and gray tinting work together to minimize ambient light reflections, thereby preserving the black levels and overall contrast of the displayed image.

## Deflection, Focusing, and Ion Trap Alignment

The 17QP4 requires external magnetic fields for both beam deflection and focusing.

### Deflection

The deflection system uses magnetic deflection with the following approximate deflection angles:

- **Horizontal:** 65 degrees
- **Vertical:** 50 degrees
- **Diagonal:** 70 degrees

### Focusing and Ion Trap

Focusing is accomplished magnetically using an external focusing coil. To prevent ion burn on the phosphor screen, the electron gun is designed to operate with an external single-field ion-trap magnet.

Typical focusing and ion-trap operating parameters include:

- **Focusing Coil Current:**
  - Approximately 95 mA DC when using standard focus coil No. 109 (or equivalent) with the air gap center positioned 3.0 inches from the reference line. This condition is specified with the combined Grid No. 1 bias and video signal adjusted to produce a highlight brightness of 30 foot-lamberts on a 14 1/4 by 10 3/4 inch picture size.
  - Approximately 110 mA DC when using JETEC focusing coil No. 109 with the distance from the yoke reference line to the center of the air gap set at 3 3/4 inches.

- **Ion Trap Field Intensity:**
  - Approximately 30 Gauss using standard coil No. 111.
  - Approximately 37 Gauss using a single-field ion-trap magnet adjusted to the optimum position (equivalent to 37 mA through JETEC ion-trap No. 117).

## Operating Points and Maximum Ratings

The operating limits of the 17QP4 are defined under the Design-Center Rating system. Operating the tube beyond these limits can impair performance or cause permanent damage.

### Design-Center Maximum Ratings

- **Anode and Grid No. 3 Voltage:** 16,000 to 18,000 Volts DC
- **Grid No. 2 Voltage:** 410 to 500 Volts DC
- **Grid No. 1 Voltage:**
  - DC Negative-bias value: 125 Volts Max
  - DC Positive-bias value: 0 Volts Max
  - Positive-peak value: 2 Volts Max
- **Peak Heater-Cathode Voltage:**
  - Heater negative with respect to cathode during warm-up (less than or equal to 15 seconds): 410 Volts Max
  - Heater negative with respect to cathode after warm-up: 150 Volts Max
  - Heater positive with respect to cathode: 150 Volts Max
- **Grid No. 1 Circuit Resistance:** 1.5 Megohms Max

### Typical Operating Conditions

- **DC Anode and Grid No. 3 Voltage:** 14,000 Volts DC (Brightness and focus quality decrease with decreasing anode voltage; operation should not be less than 12,000 Volts)
- **DC Grid No. 2 Voltage:** 300 Volts DC
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot or raster):** -28 to -72 Volts DC

These typical operating conditions demonstrate that the tube is optimized for high-voltage operation around 14,000 Volts, where it provides adequate brightness and sharp focus. The Grid No. 1 bias voltage range of -28 to -72 Volts allows for effective beam cutoff (visual extinction) across typical production variations of the electron gun.



## 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 OPERATING CONDITIONS

[SOURCE PDF](#)

# 1966 Tung Sol Electronic Tubes 4 of 4

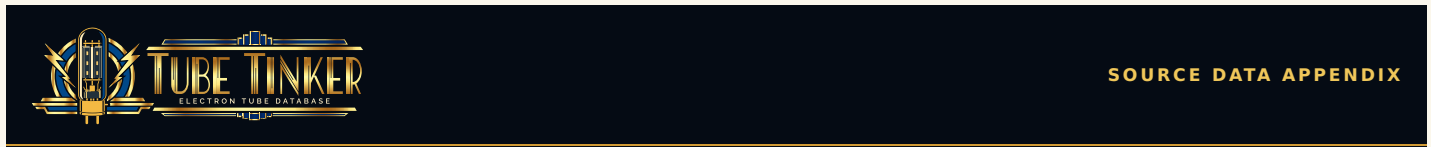
Published test conditions and operating points. Values on this page are preserved as reported by this source.

1966 TUNG SOL ELECTRONIC TUBES 4 OF 4

## Section 1 · Cathode Ray

| CHARACTERISTIC                               |                 |                                                            |
|----------------------------------------------|-----------------|------------------------------------------------------------|
| PARAMETER                                    | PUBLISHED VALUE | CONDITION / NOTE                                           |
| CATHODE TO ALL OTHER ELECTRODES              | 5 MMF           | CATHODE TO ALL OTHER ELECTRODES 5 $\mu$ f                  |
| MAXIMUM EkTERNAL CONDUCTIVE COATING TO ANODE | 1500 MMF        | MAXIMUM EkTERNAL CONDUCTIVE COATING TO ANODE 1 500 $\mu$ f |

| OTHER                                      |                 |                                                   |
|--------------------------------------------|-----------------|---------------------------------------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE                                  |
| HEATER VOLTAGE                             | 6.3 V           | HEATER VOLTAGE 6.3 VOLTS                          |
| HEATER CURRENT                             | 600 mA          | HEATER CURRENT 0.6 AMP.                           |
| HEATER POSITIVE WITH RESPECT TO CATHODE IS | 0 V             | HEATER POSITIVE WITH RESPECT TO CATHODE ISO VOLTS |
| DC GRID #2 VOLTAGE                         | 300 V           | DC GRID #2 VOLTAGE 300 VOLTS                      |



### SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 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 | 410 V           | —                |

## TUBE TINKER

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