

ELECTRONIC TUBE REFERENCE

17SP4

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 SCREEN VOLTAGE	4 V
CRT-specific electrode/focus/deflection data retained as parameter rows.	

17SP4 — Direct-View Cathode Ray Tube

The **17SP4** is a rectangular glass-envelope cathode ray tube (CRT) designed for direct-view television applications. It features electrostatic focusing and magnetic deflection, producing a rectangular raster. The tube incorporates a cylindrical faceplate, a grey filter glass to improve contrast, an external conductive coating, and requires an external single-field ion trap magnet for proper operation.

Physical and Mechanical Characteristics

The 17SP4 is constructed with a rectangular glass bulb and a cylindrical faceplate. The faceplate is made of a grey filter glass that provides approximately 70% light transmission at the center, enhancing picture contrast under ambient light conditions.

Envelope Dimensions

The physical dimensions of the tube are as follows:

- **Overall Length:** 19-3/16 ± 3/8 inches
- **Greatest Bulb Diagonal:** 16-5/8 ± 1/8 inches
- **Greatest Bulb Width:** 15-3/8 ± 1/8 inches
- **Greatest Bulb Height:** 12-1/4 ± 1/8 inches

Screen and Raster Dimensions

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

- **Minimum Useful Diagonal:** 15-13/16 inches
- **Minimum Useful Width:** 14-1/2 inches
- **Minimum Useful Height:** 10-7/8 inches
- **Standard Raster Size:** 14-1/2 inches × 10-7/8 inches

Optical Characteristics

The tube utilizes **Phosphor No. 4**, which exhibits white fluorescence and white phosphorescence with medium persistence, making it suitable for television scanning rates.

Deflection and Alignment

The 17SP4 uses magnetic deflection with an approximate horizontal deflection angle of 70 degrees. The high-voltage anode connection is made via a recessed small cavity cap (J1-21) located on the bulb cone. This contact is aligned with pin position #3 on the base within a tolerance of ±10 degrees.

Base and Pin Connections

The 17SP4 uses a **Small Shell Duodecal 5-pin base (B5-57)** with a **12N** basing arrangement. The electrical connections viewed from the bottom of the base are:

Pin / Cap	Connection
Pin 1	Heater
Pin 2	Grid No. 1 / Grid No. 4 *
Pin 10	Grid No. 2
Pin 11	Cathode
Pin 12	Heater
Cap	Anode (Grid No. 3)

*** Note:** Technical documentation contains differing designations for Pin 2, identifying it as either Grid No. 1 or Grid No. 4 depending on the source record.

Electrical Ratings and Operating Conditions

The electrical ratings of the 17SP4 are defined under the Design Center system.

Heater Specifications

The tube is equipped with an indirectly heated unipotential cathode.

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

Absolute Maximum Ratings (Design Center Values)

- **Maximum DC Anode & Grid #3 Voltage:** 14,000 V
- **Maximum DC Grid #2 Voltage:** 410 V
- **Maximum Grid #1 Voltage:**
 - **DC Negative-Bias Value:** 125 V
 - **DC Positive-Bias Value:** 0 V
 - **Positive-Peak Value:** 2 V
- **Maximum DC Peak Heater-Cathode Voltage:**
 - **Heater negative with respect to cathode (during warm-up ≤ 15 s):** 410 V
 - **Heater negative with respect to cathode (after warm-up):** 125 V
 - **Heater positive with respect to cathode:** 125 V

Note on Heater-Cathode Connection: The cathode should be returned to one side or to the midtap of the heater transformer winding.

Typical Operating Conditions

Under typical operating conditions, the tube is set up with the following parameters:

- **DC Anode & Grid #3 Voltage:** 13,000 V
- **DC Grid #2 Voltage:** 250 V
- **DC Grid #1 Voltage (for visual extinction of undeflected focused spot):** -33 V to -77 V
- **DC Ion Trap Current:** Approximately 120 mA (using Standard Coil #111)

Maximum Circuit Values

- **Maximum Grid #1 Circuit Resistance:** 1.5 Megohms

Interelectrode Capacitances

The direct interelectrode capacitances of the 17SP4 are approximately:

- **Cathode to all other electrodes:** 5 μF
- **Grid #1 to all other electrodes:** 6.5 μF
- **External conductive coating to anode:** 500 μF (minimum) to 750 μF (maximum)

The external conductive coating acts as a capacitor in combination with the internal anode coating, which can be utilized for high-voltage ripple filtering in the television receiver power supply.



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

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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
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	70 percent	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
HEATER	6.3 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
HEATER POSITIVE WITH RESPECT TO CATHODE	125 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DC ANODE S	13 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
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	25 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DC GRID #1 VOLTAGE S – value 1	1 V	Published CRT datasheet value; multiple values on a row correspond to separate source-table conditions or limits.
DC GRID #1 VOLTAGE S – value 2	33 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	4 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.