

ELECTRONIC TUBE REFERENCE

17ATP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Wide-angle P4 cathode-ray display tube using low-voltage electrostatic focusing and magnetic deflection, typically operated around 14 kV; manufacturer documentation warns that X-ray shielding may be required above 16 kV.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12L	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 PLATE VOLTAGE	17600 V
MAXIMUM SCREEN VOLTAGE	550 V
CRT-specific anode, focus, deflection and optical data retained as parameters rather than forced into ordinary plate/screen fields.	

17ATP4 — Electrostatic-Focus Television Picture Tube

The **17ATP4** is a 17-inch, direct-view, rectangular glass cathode ray tube designed primarily for television receiver applications. It features low-voltage electrostatic focusing and magnetic deflection. The tube is closely related to several variants: the **17ATP4A** is identical except for its metal-backed (aluminized) screen, while the **17AVP4** and **17AVP4A** represent corresponding non-aluminized and aluminized models sharing similar electrical and physical profiles.

Construction and Optical Characteristics

The 17ATP4 is constructed with a rectangular glass envelope and a spherical faceplate. The faceplate is made of grey filter glass to improve picture contrast, providing a light transmission of approximately 66% to 71% at the center.

The screen utilizes a P-4 sulfide-type phosphor that produces a white fluorescence and phosphorescence with a short to short-to-medium persistence. While the base 17ATP4 and [17AVP4](#) models feature a non-metal-backed screen, the "A" suffix variants ([17ATP4A](#) and [17AVP4A](#)) incorporate a metal-backed (aluminized) screen to enhance brightness and performance.

To prevent ion-burn damage to the screen, the tube requires an external, single-field ion trap magnet. Additionally, the outer surface of the bulb is treated with an external conductive coating that must be grounded during operation.

Mechanical Specifications and Basing

The tube has a nominal weight of approximately 13.5 lbs. Its physical dimensions and installation requirements are highly specific:

- **Overall Length:** 16 +1/4 -3/8 inches
- **Greatest Bulb Dimensions:** Diagonal of 16-5/8" $\pm$ 1/8", width of 15-3/8" $\pm$ 1/8", and height of 12-1/4" $\pm$ 1/8"
- **Minimum Useful Screen Dimensions:** Diagonal of 15-1/4", width of 14-1/4" to 14-5/16", height of 11-1/16" to 11-1/8", yielding a minimum useful screen area of approximately 149 square inches
- **Raster Size:** Approximately 10-3/8" x 13-7/8" to 10-3/4" x 14-1/4"
- **Deflection Angles:** Horizontal deflection of 80° to 85°, vertical deflection of 65°, and diagonal deflection of 90°

Electrical connections are made through a small shell duodecal 6-pin base (designation B6-63), conforming to the 12L basing diagram. The high-voltage anode connection is made via a recessed small cavity cap (J1-21) located on the bulb cone, which aligns with pin position #6 within a tolerance of ± 30 degrees. Because of the physical tolerances of the glass envelope, the socket must not be rigidly mounted; it must have flexible leads to permit free movement.

Pin Connection Configuration

The bottom view of the 12L base provides the following pinout:

Pin Number	Connection
Pin 1	Heater
Pin 2	Grid No. 1 (Control Grid)
Pin 6	Grid No. 4 (Focusing Electrode)
Pin 10	Grid No. 2

Pin Number	Connection
Pin 11	Cathode
Pin 12	Heater
Anode Cap	Grid No. 3, Grid No. 5, Collector

Electrical Ratings and Operating Conditions

The 17ATP4 operates with a unipotential cathode heated by a nominal 6.3-volt filament. The heater draws 0.6 Ampere (with a $\pm 5\%$ tolerance). Under standard JETEC test conditions (using a 25 V source and a 31.5-ohm series resistor), the heater warm-up time to reach 5.0 Volts is approximately 11 seconds.

Interelectrode Capacitances

- **Cathode to all other electrodes:** Approximately 5 μf
- **Grid No. 1 to all other electrodes:** Approximately 6 μf
- **External conductive coating to anode:** 750 μf minimum to 1,500 μf maximum (some specifications list a minimum of 1,200 μf)

Operating Voltages and Limits

The tube's performance is highly dependent on maintaining adequate anode potential; brilliance and definition decrease significantly below 12,000 Volts. The operating limits are defined under both Design Center and Absolute Maximum rating systems:

Parameter	Design Center Rating	Absolute Maximum Rating	Typical Operation
Anode (Grid 3, Grid 5) Voltage	16,000 V	17,600 V	14,000 V
Grid No. 4 (Focusing) Voltage	-500 V to +1,000 V	-550 V to +1,100 V	-56 V to +310 V
Grid No. 2 Voltage	500 V	550 V	300 V
Grid No. 1 Negative Bias	125 V	140 V	—
Grid No. 1 Negative Peak	—	220 V	—
Grid No. 1 Positive Bias	0 V	0 V	—

Parameter	Design Center Rating	Absolute Maximum Rating	Typical Operation
Grid No. 1 Positive Peak	2 V	2 V	—
Grid No. 1 Cutoff Voltage	—	—	-28 V to -77 V

Note on Grid No. 4: The negative limit on Grid No. 4 applies specifically when an AC voltage is provided for dynamic focusing. The typical operating range of -55 to +300 Volts (or -56 to +310 Volts) is specified at an anode current of 100 μ A. *Note on Grid No. 1 Cutoff:* Visual extinction of an undeflected focused spot requires a bias of -33 to -77 Volts, while visual extinction of a focused raster requires -28 to -72 Volts. Extinction of a stationary focused spot requires approximately 5 Volts more negative bias than raster extinction.

Heater-Cathode Voltage Limits

- **Heater negative with respect to cathode (during warm-up $\leq$ 15s):** Max 410 V (Design Center) / 450 V (Absolute)
- **Heater negative with respect to cathode (after warm-up):** Max 180 V (Design Center) / 200 V (Absolute)
- **Heater positive with respect to cathode:** Max 180 V (Design Center) / 200 V (Absolute)

Circuit Parameters and Ion Trap

- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms
- **Ion Trap Magnet:** Requires a magnetic field strength of 31 Gauss minimum (for a typical PM magnet with a ± 3 Gauss tolerance) or a nominal 37 Gauss. Alternatively, when using a JETEC No. 117 electromagnet with pole pieces centered over Grid No. 2 and rotated for maximum brightness, the average current is 28 mA DC.

Safety and X-Ray Shielding

When operating the 17ATP4, safety precautions regarding X-ray radiation must be observed. The tube is rated to permit operation at absolute anode voltages up to 17.6 Kilovolts. However, if the operating voltage exceeds 16,000 Volts or the manufacturer's maximum rated anode voltage (whichever is less), appropriate shielding may be necessary to protect personnel against potential X-ray exposure during prolonged close-range contact.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Cathode Ray

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	600 mA	—
Cathode To All Other Electrodes Capacitance	5 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	17600 V	—
Maximum Grid2 Voltage	550 V	—
Typical Anode Voltage	14000 V	—



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	16000 V	—
Typical Anode Voltage	14000 V	—
Maximum Grid2 Voltage	500 V	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical Grid2 Voltage	300 V	—
XRayShieldingNote	Shielding may be needed above 16 kV	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FocusingMethod	LowVoltageElectrostatic	—
DeflectingMethod	Magnetic	—
DiagonalDeflectionAngleApproximate	90 degree	—
PhosphorNumber	4	—
FluorescentColor	White	—
Persistence	Medium	—


SOURCE DATA APPENDIX

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 DC grid 2 voltage	500 V	—
Maximum DC grid 4 voltage	1000 V	Positive
Maximum DC grid 4 voltage	-3500 V	Negative
Maximum grid 1 negative-bias voltage	125 V	NegativeBias
Maximum grid 1 positive-bias voltage	0 V	PositiveBias
Maximum grid 1 positive-peak voltage	2 V	PositivePeak
Peak heater-cathode voltage	410 V	HeaterNegativeWarmup
Peak heater-cathode voltage	180 V	HeaterNegativeAfterWarmup
Peak heater-cathode voltage	180 V	HeaterPositive

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC anode voltage	14000 V	TypicalOperation
DC grid 4 voltage	-55–300 V	TypicalOperation
DC grid 2 voltage	300 V	TypicalOperation
DC grid 1 voltage	-33–-77 V	TypicalOperation
Faceplate transmission at center	66 %	Approximate

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal deflection angle	80 degrees	Approximate
Vertical deflection angle	65 degrees	Approximate
Diagonal deflection angle	90 degrees	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	3 pF	Approximate
Grid 1 to all other electrodes capacitance	6 pF	Approximate
External conductive coating to anode capacitance	1500 pF	Maximum
External conductive coating to anode capacitance	750 pF	Minimum