

ELECTRONIC TUBE REFERENCE

17ATP4A

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.	

17ATP4A — Electrostatic-Focus Cathode Ray Picture Tube

The **17ATP4A** is a direct-view, rectangular glass cathode ray picture tube designed for television applications. It features a nominal diagonal screen size of 17 inches, low-voltage electrostatic focusing, and magnetic deflection. The tube is identical to the [17ATP4](#) except for the addition of a metal-backed screen.

The 17ATP4A incorporates a spherical, grey-tinted filter faceplate with approximately 66% light transmission at the center, which improves picture contrast under ambient light. The screen utilizes a

metal-backed, Sulfide-type P-4 phosphor that produces a white fluorescence and phosphorescence with short persistence. Additional features include an external conductive coating (which must be grounded to form a filter capacitor with the anode) and an external single-field ion trap.

Physical Specifications and Base Configuration

The 17ATP4A is constructed with a rectangular glass envelope. The physical dimensions and mounting requirements are as follows:

- **Overall Length:** 16 +1/4, -3/8 inches
- **Bulb Dimensions:** Diagonal 16 5/8 ± 1/8 inches, Width 15 3/8 ± 1/8 inches, Height 12 1/4 ± 1/8 inches
- **Minimum Useful Screen Dimensions:** Diagonal 15 1/4 inches, Width 14 1/4 inches, Height 11 1/16 inches
- **Raster Size:** 10 3/4 inches x 14 1/4 inches

Base and Socket Mounting

The tube uses a small shell duodecal 6-pin base (designation **B6-63**) with a **12L** basing arrangement. The bulb contact is a recessed small cavity cap (**J1-21**), which aligns with pin position #6 within a tolerance of ±30 degrees.

To prevent mechanical stress on the glass envelope, the socket should not be rigidly mounted. Instead, flexible leads must be used to allow free movement of the socket.

Pinout (Basing 12L, Bottom View)

The electrical connections are distributed across the 6-pin base and the recessed anode cap:

Pin / Cap	Connection
Pin 1	Heater
Pin 2	Grid #1 (Control Grid)
Pin 6	Grid #4 (Focusing Electrode)
Pin 10	Grid #2 (Screen Grid)
Pin 11	Cathode
Pin 12	Heater
Anode Cap	Grid #3, Grid #5, Collector

Heater and Interelectrode Capacitances

The 17ATP4A utilizes a unipotential cathode with an indirectly heated filament.

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

Interelectrode Capacitances

The approximate capacitances between the electrodes are:

Measurement	Value
Cathode to all other electrodes	5 μF
Grid #1 to all other electrodes	6 μF
External conductive coating to anode	750 μF (Min) to 1500 μF (Max)

The capacitance between the external conductive coating and the internal anode serves as a high-voltage filter capacitor when the external coating is properly grounded.

Deflection and Electrostatic Focusing

The tube utilizes magnetic deflection with the following nominal deflection angles:

- **Horizontal:** 80°
- **Vertical:** 65°
- **Diagonal:** 90°

Focusing is achieved electrostatically via Grid #4, which operates at a relatively low voltage. This electrostatic focus design allows the focusing voltage to be adjusted to compensate for variations in anode voltage and beam current.

Operating Ratings and Conditions

The ratings of the 17ATP4A are established under the Design-Maximum system (design center values). Operating the tube within these limits ensures reliable performance and longevity.

Design-Maximum Ratings

- **DC Anode, Grid #3, Grid #5 Voltage:** Maximum 16,000 V. (Operation up to 17.6 kV absolute is permitted, but shielding for X-ray radiation may be required above 16 kV. The anode voltage should not be operated below 12,000 V to maintain adequate picture brilliance and definition).
- **DC Grid #4 (Focusing) Voltage:** Positive Maximum 1,000 V, Negative Maximum -500 V (applicable when AC voltage is provided for dynamic focusing).
- **DC Grid #2 Voltage:** Maximum 500 V.
- **Grid #1 Voltage:**
 - DC Negative-bias Maximum: 125 V
 - DC Positive-bias Maximum: 0 V

- Positive-peak Maximum: 2 V
- **DC Peak Heater-Cathode Voltage:**
 - Heater negative with respect to cathode: Maximum 410 V during warm-up (first 15 seconds or less); Maximum 180 V after warm-up.
 - Heater positive with respect to cathode: Maximum 180 V.
- **Grid #1 Circuit Resistance:** Maximum 1.5 MΩ.

Typical Operating Conditions

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

Parameter	Typical Value
DC Anode, Grid #3, Grid #5 Voltage	14,000 V
DC Grid #4 Voltage	-55 to +300 V (at an anode current of 100 αAmp)
DC Grid #2 Voltage	300 V
DC Grid #1 Voltage	-33 to -77 V (for visual extinction of the undeflected focused spot)
DC Ion Trap Magnet	37 Gauss

An external single-field ion trap magnet adjusted to approximately 37 Gauss is required to prevent ion burn on the phosphor screen.

Technical Summary

The **17ATP4A** is an 80-degree horizontal deflection, rectangular glass television picture tube featuring a **17-inch** diagonal envelope, low-voltage electrostatic focusing, and a metal-backed Sulfide-type P-4 phosphor screen. It operates with a standard **6.3 V, 0.6 A** heater and requires an external single-field ion trap magnet of **37 Gauss** for proper operation. With a typical anode operating voltage of **14,000 V** and a design-maximum limit of **16,000 V**, the tube provides a bright, high-contrast display utilizing its grey filter faceplate. The external conductive coating provides a capacitance of **750 to 1500 μF** to the anode, serving as an integral part of the high-voltage filtering system when grounded.



SOURCE OPERATING CONDITIONS

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

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

TUBE TINKER

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