



ELECTRONIC TUBE REFERENCE

17FP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Seventeen-inch direct-view television picture tube with electrostatic focus, magnetic deflection, high-voltage anode operation, and an external ion-trap arrangement. Manufacturer documentation warns that X-ray shielding may be required when operated above 16 kV.

GENERAL CHARACTERISTICS

BASE DESIGNATION	86-63	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

SECTION 1 Cathode Ray*No fixed ratings recorded.**CRT electron-gun/display section; published electrode ratings promoted where unambiguous.*

17FP4 — Electrostatic-Focus Cathode Ray Picture Tube

The **17FP4** is a direct-view, rectangular glass cathode ray picture tube designed primarily for television receiver applications. It features electrostatic focusing combined with magnetic deflection, utilizing a unipotential, indirectly heated cathode. The tube incorporates a grey filter glass faceplate and requires an external single-field ion trap magnet for proper operation.

A closely related variant, the **17FP4A**, shares identical electrical and mechanical characteristics with the 17FP4, differing only in the extent of its external conductive coating.

Physical and Mechanical Construction

The 17FP4 is constructed with a rectangular glass envelope and a grey filter glass faceplate. The faceplate has a light transmission of approximately 66% at its center, which improves picture contrast under ambient light conditions.

The screen utilizes Phosphor No. 4, which exhibits white fluorescence, white phosphorescence, and medium persistence. Depending on the specific design standard, the nominal raster size is either 14-1/4 x 11-1/8 inches or 14-1/4 x 10-3/4 inches.

Mechanical Dimensions

- **Overall Length:** 19-1/4 ± 3/8 inches
- **Greatest 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: 15-1/2 inches
 - Width: 14-1/4 inches
 - Height: 11-1/8 inches or 10-3/4 inches

Bulb Connections and Alignment

The tube uses a recessed small cavity cap (J1-21) for the high-voltage anode connection. The base is a small shell duodecal 6-pin configuration (designated as 86-63 or B6-63) with a 12L basing arrangement. The recessed bulb contact is aligned with pin position #6 within a tolerance of ± 30 degrees.

Coating Differences

The primary distinction between the two designations lies in their external conductive coatings:

- **17FP4:** Features a partial external conductive coating.
- **17FP4A:** Features a complete external conductive coating.

This physical difference directly affects the capacitance between the external coating and the internal anode.

Electrical Connections and Heater Ratings

The 17FP4 operates with a standard heater supply and has specific interelectrode capacitance values that vary between the coated versions.

Pin Configuration (Bottom View, Basing 12L)

The electrical connections are distributed across the 6-pin duodecal base and the high-voltage anode cap as follows:

Pin / Cap	Connection	Description
Pin 1	Heater	Filament supply
Pin 2	Grid No. 1	Control grid
Pin 6	Grid No. 4	Focusing electrode (Anode #1 / Anode #4)
Pin 10	Grid No. 2	Screen grid
Pin 11	Cathode	Unipotential cathode
Pin 12	Heater	Filament supply
Anode Cap	Grid #3, Grid #5, Collector	High-voltage anode assembly

Heater Ratings

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere
- **Heater Supply:** AC or DC

Interelectrode Capacitances

The approximate capacitances of the tube's electrodes are:

- **Cathode to all other electrodes:** 5 uuf
- **Grid #1 to all other electrodes:** 6 uuf
- **External conductive coating to anode:**
 - **17FP4:** Min. 500 uuf to Max. 750 uuf
 - **17FP4A:** Min. 750 uuf to Max. 2000 uuf

Maximum Ratings and Operating Conditions

The operating limits and typical characteristics of the 17FP4 are defined under the Design Center system.

Design Center Maximum Ratings

- **Grid #3, Grid #5, Collector Voltage:** 18,000 Volts max. (Note: X-ray radiation shielding may be necessary if the tube is operated in excess of 16,000 Volts).
- **Focusing Electrode Voltage (Anode #1 / Anode #4):** 5,000 Volts max.
- **Grid #2 Voltage:** 410 Volts max.
- **Grid #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** (with the cathode returned to one side or the mid-tap of the heater transformer winding):
 - **Heater negative with respect to cathode:**
 - During warm-up period (not to exceed 15 seconds): 410 Volts max.
 - After equipment warm-up period: 150 Volts max.
 - **Heater positive with respect to cathode:** 150 Volts max.

Typical Operating Conditions

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

- **Grid #3, Grid #5, Collector Voltage:** 12,000 Volts
- **Focusing Electrode (Anode #1 / Anode #4) Voltage:** 2,300 to 3,550 Volts
 - *Note on measurement:* This range is determined with the combined Grid #1 bias and video-signal voltage adjusted to produce an anode current of 100 uA on a 10-3/4 x 14-1/4 inch picture size, resulting in the visual extinction of the undeflected focusing spot.
- **Grid #2 Voltage:** 300 Volts
- **Grid #1 Voltage:** -33 to -77 Volts (for visual extinction of the undeflected focusing spot)
- **Maximum Grid #1 Circuit Resistance:** 1.5 Megohms

Deflection and Ion Trap Requirements

The tube utilizes magnetic deflection with a horizontal deflection angle of 65 degrees and a diagonal deflection angle of 70 degrees.

To prevent ion burn on the phosphor screen, an external single-field ion trap magnet must be installed. When using a standard Coil #111, the typical operating requirements are:

- **Ion Trap Current:** 75 ± 50% mA (approximate)
- **Ion Trap Field Intensity:** 35 Gauss (approximate)

Technical Summary

The **17FP4** and its fully coated variant, the **17FP4A**, are electrostatic-focus, magnetic-deflection cathode ray picture tubes designed for television applications. Operating with a standard **6.3 V, 0.6 A** heater, they provide a rectangular viewing area with a grey filter faceplate for enhanced contrast. The design features a unipotential cathode, a 12L duodecal base, and requires an external single-field ion trap magnet.

Depending on the specific variant, the external conductive coating provides either a partial (17FP4, 500–750 uuf) or complete (**17FP4A**, 750–2000 uuf) capacitance to the anode. The tube is rated for a maximum collector voltage of **18,000 V** (with X-ray shielding recommended above 16,000 V) and typically operates with a collector voltage of **12,000 V** and a focusing electrode voltage between **2,300 V and 3,550 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

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OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	Nominal
Heater current	600 mA	Nominal
Grid 2 voltage	410 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

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CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
CATHODE TO ALL OTHER ELECTRODES	5 MMF	CATHODE TO ALL OTHER ELECTRODES 5 μ f
GRID #1 TO ALL OTHER ELECTRODES	6 MMF	GRID #1 TO ALL OTHER ELECTRODES 6 μ f

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	66 %	FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.) 66 PERCENT
MAXIMUM DC GRID #3, GRID #5, COLLECTOR VOLTAGEA 1B	0 V	MAXIMUM DC GRID #3, GRID #5, COLLECTOR VOLTAGEA 1B 000 VOLTS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
MAXIMUM DC ANODE #1 VOLTAGE	5000 V	MAXIMUM DC ANODE #1 VOLTAGE 5 000 VOLTS
MAXIMUM OC GRID #2 VOLTAGE	410 V	MAXIMUM OC GRID #2 VOLTAGE 410 VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE	150 V	HEATER POSITIVE WITH RESPECT TO CATHODE 150 VOLTS
F TNIS TUBE IS OPERATED AT VOLTAGE IN E%LESS OF	16000 V	F TNIS TUBE IS OPERATED AT VOLTAGE IN E%LESS OF 16,000 VOLTS. %-RAY RADIATION SHIELDING MAY
DC GRID #3, GRID #5, COLLECTOR VOLTAGE	12000 V	DC GRID #3, GRID #5, COLLECTOR VOLTAGE 12 000 VOLTS
DC ANODE #1 VOLTAGE (FOCUSING ELECTRODE)C 2300 TO j	550 V	DC ANODE #1 VOLTAGE (FOCUSING ELECTRODE)C 2300 TO j550 VOLTS
DC GRID #2 VOLTAGE j	0 V	DC GRID #2 VOLTAGE j00 VOLTS

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