

ELECTRONIC TUBE REFERENCE

15DP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
CATHODERAY

Direct-view P4 television picture tube using magnetic focusing and deflection, with white medium-persistence fluorescence, approximately 57-degree deflection, ion-trap operation, and typical 13 kV anode supply.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	12
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	15000 V
MAXIMUM SCREEN VOLTAGE	410 V
CRT section; Magnetic focus and Magnetic deflection.	

15DP4A — Direct-View Cathode Ray Picture Tube

The **15DP4A** is a direct-view cathode ray picture tube designed primarily for television receiver applications. It features a unipotential cathode, magnetic focus, and magnetic deflection. The tube provides a nominal raster size of 12 3/4 inches by 9 1/2 inches and requires an external, single-field ion trap magnet for proper operation.

The 15DP4A is electrically and mechanically identical to the [15DP4](#), with the sole distinction being the faceplate treatment: the [15DP4](#) utilizes a gray filter faceplate, whereas the 15DP4A does not incorporate this specific gray filter.

Optical and Screen Characteristics

The 15DP4A utilizes a sulfide-type phosphor designated as P-4. This phosphor is characterized by the following optical properties:

- **Fluorescent Color:** White
- **Phosphorescent Color:** White
- **Persistence:** Medium

The tube provides a minimum useful screen diameter of 14 inches, supporting a standard television raster size of 12 3/4 inches by 9 1/2 inches.

Mechanical Specifications and Basing

The physical structure of the 15DP4A is designed for standard television chassis mounting. Its primary mechanical dimensions and features include:

- **Overall Length:** 20 1/2 ± 3/8 inches
- **Greatest Diameter of Bulb:** 15 1/2 ± 1/4 inches
- **Bulb Contact:** Recessed Small Ball Cap (J1-22)
- **Base:** Small Shell Duodecal 5-Pin (B7-51)
- **Basing Configuration:** [12D](#)
- **Bulb Contact Alignment:** The J1-22 anode contact aligns with pin position #3 within a tolerance of ±10 degrees.

Pin Connections

The [12D](#) basing arrangement provides the following electrical connections, viewed from the bottom of the tube base:

Pin Number	Connection
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

Electrical Ratings and Operating Conditions

The electrical design of the 15DP4A requires careful adherence to maximum ratings to ensure reliable operation and longevity.

Heater Specifications

The heater is designed for indirect heating of the unipotential cathode:

- **Heater Voltage:** 6.3 Volts
- **Heater Current:** 0.6 Ampere $\pm$ 10%

Maximum Ratings (Design Center Values)

- **Maximum DC Anode Voltage:** 15,000 Volts
- **Maximum DC Grid No. 2 Voltage:** 410 Volts
- **Maximum Grid No. 1 Voltage:**
 - *DC Negative-Bias Value:* 125 Volts
 - *DC Positive-Bias Value:* 0 Volts
 - *Positive Peak Value:* 2 Volts
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 Megohms
- **Maximum DC Peak Heater-Cathode Voltage:**
 - *Heater negative with respect to cathode (during warm-up period not to exceed 15 seconds):* 410 Volts
 - *Heater negative with respect to cathode (after equipment warm-up):* 140 Volts
 - *Heater positive with respect to cathode:* 140 Volts

To minimize potential stress, the cathode should be turned to one side or to the mid-tap of the heater transformer winding.

Typical Operating Characteristics

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

- **DC Anode Voltage:** 13,000 Volts
- **DC Grid No. 2 Voltage:** 250 Volts
- **DC Grid No. 1 Voltage (for visual extinction of undeflected focused spot):** -27 to -63 Volts
- **DC Focusing Coil Current (Approximate):** 146 mA
- **DC Ion Trap Magnet Standard Coil #108 (Approximate):** 105 mA

The typical focusing coil current of 146 mA is specified for a standard focus coil #106 (or equivalent) positioned such that the distance from the reference line to the center of the air gap on the focus coil is exactly 3.0 inches. This operating point is established with the combined Grid No. 1 bias voltage and video-signal voltage adjusted to produce a highlight brightness of 38 foot-lamberts on the 9 1/2 inch by 12 3/4 inch picture area.

Deflection and Capacitance

- **Deflection Method:** Magnetic
- **Focusing Method:** Magnetic
- **Deflection Angle (Approximate):** 57 degrees

- **Direct Interelectrode Capacitances (Approximate):**

- *Cathode to all other electrodes:* 5 pF (μμf)
- *Grid No. 1 to all other electrodes:* 7 pF (μμf)

Technical Summary

The **15DP4A** is a 15-inch class, magnetically focused and deflected cathode ray picture tube designed for direct-view television applications. Operating with a nominal anode voltage of 13,000 Volts (up to a maximum of 15,000 Volts), it utilizes a P-4 white sulfide phosphor screen to display a 12 3/4" x 9 1/2" raster. The tube features a 57-degree deflection angle, a unipotential cathode with a 6.3 V, 0.6 A heater, and requires an external single-field ion trap magnet. It is housed in a bulb with a greatest diameter of 15 1/2 inches, utilizing a Small Shell Duodecal 5-pin base and a recessed small ball cap for the high-voltage anode connection. The 15DP4A is distinguished from the companion [15DP4](#) by its clear (non-gray) faceplate.

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

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Magnetic	—
Deflecting method	Magnetic	—
Phosphor	P4	White;MediumPersistence

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Deflection angle	57 deg	Approximate

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode to all other electrodes capacitance	5 pF	Approximate
Grid #1 to all other electrodes capacitance	7 pF	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	—
Heater current	600 mA	—
Maximum DC anode voltage	15000 V	—
Maximum DC grid #2 voltage	410 V	—
Maximum grid #1 negative-bias magnitude	125 V	—
Maximum grid #1 positive DC bias	0 V	—
Maximum grid #1 positive peak	2 V	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Typical DC anode voltage	13000 V	TelevisionPictureTube
Typical DC grid #2 voltage	250 V	TelevisionPictureTube
Typical grid #1 voltage minimum	-63 V	VisualExtinctionRange
Typical grid #1 voltage maximum	-27 V	VisualExtinctionRange
Focusing coil current	146 mA	Approximate
Ion trap current	105 mA	Approximate
Maximum heater-cathode voltage during warm-up	410 V	HeaterNegative;Warmup<=15s

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Direct-view television picture tube	—

TUBE TINKER

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