Electronic TUBES

# 12UP4-B

# CATHODE-RAY TUBE

**12-INCH ROUND, METAL**
**FOCUS—MAGNETIC**
**DEFLECTION—MAGNETIC**

**11⅜ BY 8½-INCH PICTURE SIZE**
**FACEPLATE—SPHERICAL, GRAY, FROSTED**
**ION-TRAP GUN**

**54-DEGREE DEFLECTION ANGLE**

## DESCRIPTION AND RATING

The 12UP4-B is a magnetic-focus and -deflection, direct-view picture tube which provides an 11⅜ by 8½-inch picture with rounded sides for television applications. Features of this tube include a lightweight metal cone envelope, a high-quality frosted gray faceplate to prevent specular reflection and increase picture contrast, and an electron gun which was designed for use with an external single-field ion-trap magnet.

## GENERAL

### ELECTRICAL

| | | |
|---|---|---|
| Heater Voltage | 6.3 | Volts |
| Heater Current | 0.6 ± 10% | Amperes |
| Focusing Method—Magnetic | | |
| Deflecting Method—Magnetic | | |
| Deflection Angle, approximate | 54 | Degrees |
| Direct Interelectrode Capacitances, approximate | | |
| Cathode to All Other Electrodes | 5 | μμf |
| Grid-No. 1 to All Other Electrodes | 6 | μμf |

### OPTICAL

Phosphor Number—P4, Sulfide Type
Fluorescent Color—White
Phosphorescent Color—White
Persistence—Short

| | | |
|---|---|---|
| Faceplate—Gray | | |
| Light Transmission at Center, approximate | 66 | Percent |
| Specular Reflection of Ambient Light, maximum | 1.5 | Percent |

## MECHANICAL

| | | |
|---|---|---|
| Over-all Length | $18\frac{3}{4} \pm \frac{3}{8}$ | Inches |
| Greatest Bulb Diameter | $12\frac{7}{16} \pm \frac{1}{16}$ | Inches |
| Minimum Useful Screen Diameter | $11\frac{3}{8}$ | Inches |
| Neck Length | 8 | Inches |

Bulb Contact—Metal Cone Lip
Base—Small-shell Duodecal 5-pin, JETEC No. B5-57
Basing, JETEC Designation—12D

Mounting Position—Any

| | | |
|---|---|---|
| Net Weight, approximate | 8 | Pounds |

## MAXIMUM RATINGS♦

### DESIGN-CENTER VALUES*

| | | |
|---|---|---|
| Anode Voltage† | 12,000 | Max Volts DC |
| Grid-No. 2 Voltage | 410 | Max Volts DC |
| Grid-No. 1 Voltage | | |
| Negative-Bias Value | 125 | Max Volts DC |
| Positive-Bias Value | 0 | Max Volts DC |
| Positive-Peak Value | 2 | Max Volts |
| Peak Heater-Cathode Voltage | | |
| Heater Negative with Respect to Cathode | | |
| During Warm-up Period not to Exceed 15 Seconds | 410 | Max Volts |
| After Equipment Warm-up Period | 140 | Max Volts |
| Heater Positive with Respect to Cathode | 140 | Max Volts |

## TYPICAL OPERATING CONDITIONS♦

| | | |
|---|---|---|
| Anode Voltage‡ | 11,000 | Volts DC |
| Grid-No. 2 Voltage | 300 | Volts DC |
| Grid-No. 1 Voltage§ | −28 to −72 | Volts DC |
| Focusing-Coil Current$\pi$, approximate | 98 | Milliamperes DC |
| Ion-Trap Field Intensity△, approximate | 33 | Gausses |

## CIRCUIT VALUES

| | | |
|---|---|---|
| Grid-No. 1 Circuit Resistance | 1.5 | Max Megohms |

♦ All voltages are measured with respect to cathode.

* The maximum ratings provide a ten-percent safety factor in accordance with the standard design-center system of rating cathode-ray tubes. The tube will withstand the combined effects of variations in line voltage and components provided the maximum design-center values are not exceeded by more than ten percent.

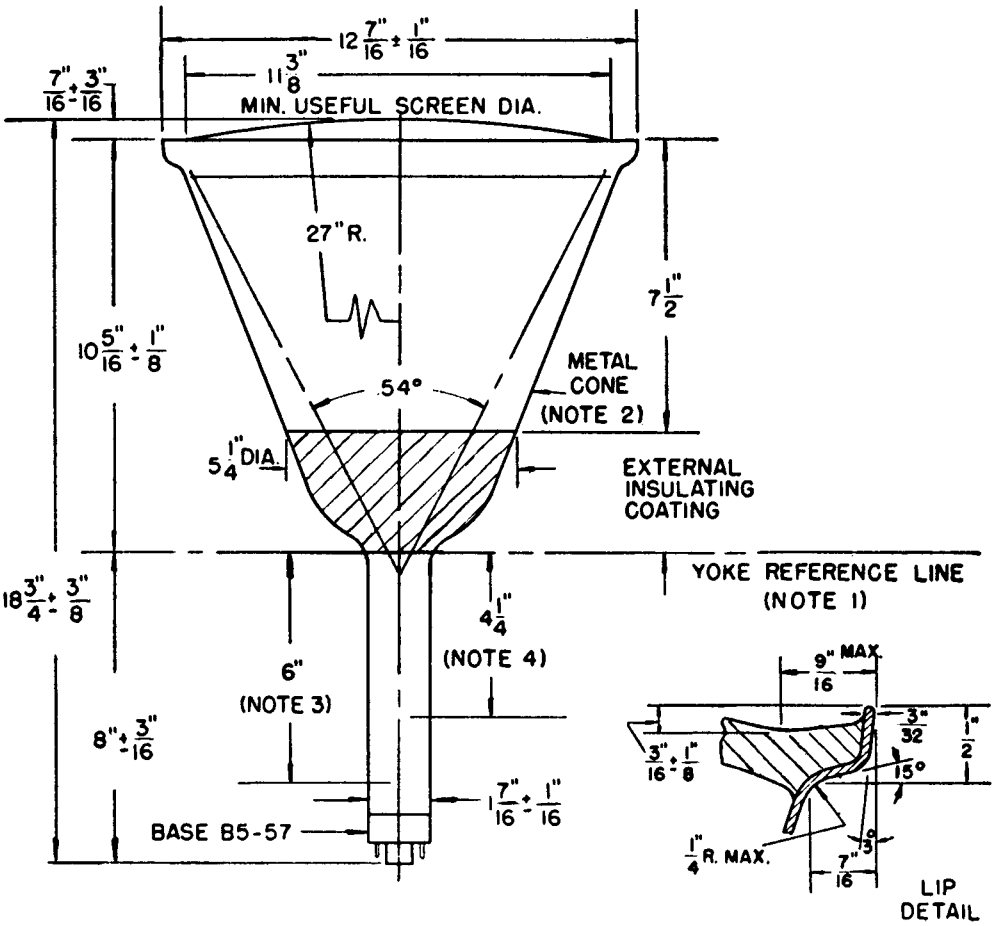
† Anode and grid-No. 3 which are connected together within the tube are referred to herein as anode.

‡ Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 9000 volts.

§ For visual extinction of focused raster.

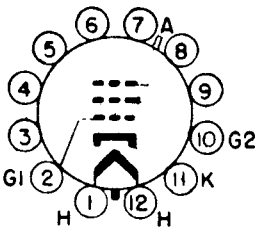
$\pi$ For RETMA focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 4¼ inches.

△Single-field ion-trap magnet adjusted to optimum position, equivalent to 33 milliamperes through RETMA ion-trap magnet No. 117.




NOTES

1. REFERENCE LINE IS DETERMINED BY THE PLANE OF THE UPPER EDGE OF THE REFERENCE-LINE GAGE (RETMA NO 112) WHEN THE GAGE IS RESTING ON THE CONE.
2. METAL CONE OPERATES AT HIGH VOLTAGE AND MUST BE INSULATED TO WITHSTAND THE MAXIMUM APPLIED ANODE VOLTAGE.
3. APPROXIMATE POSITION OF ION-TRAP MAGNET.
4. RECOMMENDED POSITION FOR CENTER OF FOCUSING FIELD.




BASING DIAGRAM
12D