Electronic TUBES

21WP4-A

CATHODE-RAY TUBE

21-INCH RECTANGULAR, GLASS
FOCUS—MAGNETIC
DEFLECTION—MAGNETIC
70-DEGREE DEFLECTION ANGLE
17 BY 12¾-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
ION-TRAP GUN
ALUMINIZED SCREEN
EXTERNAL CONDUCTIVE COATING

DESCRIPTION AND RATING

The 21WP4-A is a rectangular all-glass picture tube employing magnetic focusing and deflection. It provides a 17 by 12¾-inch picture for direct-view television applications. Features of this tube include a high-quality fluorescent screen which is aluminized to increase light output, a gray faceplate to increase picture contrast, an electron gun designed for use with an external single-field ion-trap magnet, and an external conductive coating which serves as a filter capacitor when grounded.

GENERAL

ELECTRICAL

Heater Voltage	6.3	Volts
Heater Current	0.6 ±10%	Amperes
Focusing Method—Magnetic		
Deflecting Method—Magnetic		
Deflection Angle, approximate		
Diagonal	70	Degrees
Horizontal	65	Degrees
Vertical	50	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes	5	μμf
Grid-No. 1 to All Other Electrodes	6	μμf
External Conductive Coating to Anode		
Maximum	750	μμf
Minimum	500	μμf

OPTICAL

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

Faceplate—Gray

Light Transmission at Center, approximate	72	Percent

MECHANICAL

Over-all Length	$22\frac{7}{16}$	$\pm\frac{3}{8}$	Inches
Greatest Bulb Dimensions			
Diagonal	$20\frac{5}{8}$	$\pm\frac{1}{8}$	Inches
Width	$18\frac{11}{16}$	$\pm\frac{1}{8}$	Inches
Height	$14\frac{15}{16}$	$\pm\frac{1}{8}$	Inches
Minimum Useful Screen Dimensions			
Diagonal	$19\frac{1}{8}$		Inches
Width	17		Inches
Height	$12\frac{3}{4}$		Inches
Neck Length	$7\frac{1}{2}$		Inches

Bulb Number, ASA Designation—J171F
Bulb Contact—Recessed Small-cavity Cap, JETEC No. J1-21
Base—Small-shell Duodecal 5-pin, JETEC No. B5-57
Basing, JETEC Designation—12N
Bulb Contact Alignment
Anode Contact Aligns with Pin No. 6 Position ±30 Degrees
Mounting Position—Any

Net Weight, approximate	23	Pounds

MAXIMUM RATINGS*

DESIGN-CENTER VALUES†

Anode Voltage‡	18,000	Max Volts DC
Grid-No. 2 Voltage	500	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	180	Max Volts
Heater Positive with Respect to Cathode	180	Max Volts

TYPICAL OPERATING CONDITIONS*

Anode Voltage§	16,000	Volts DC
Grid-No. 2 Voltage	300	Volts DC
Grid-No. 1 Voltageπ	−28 to −72	Volts DC
Focusing-Coil Current△, approximate	116	Milliamperes DC
Ion-Trap Field Intensity♦, approximate	40	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.

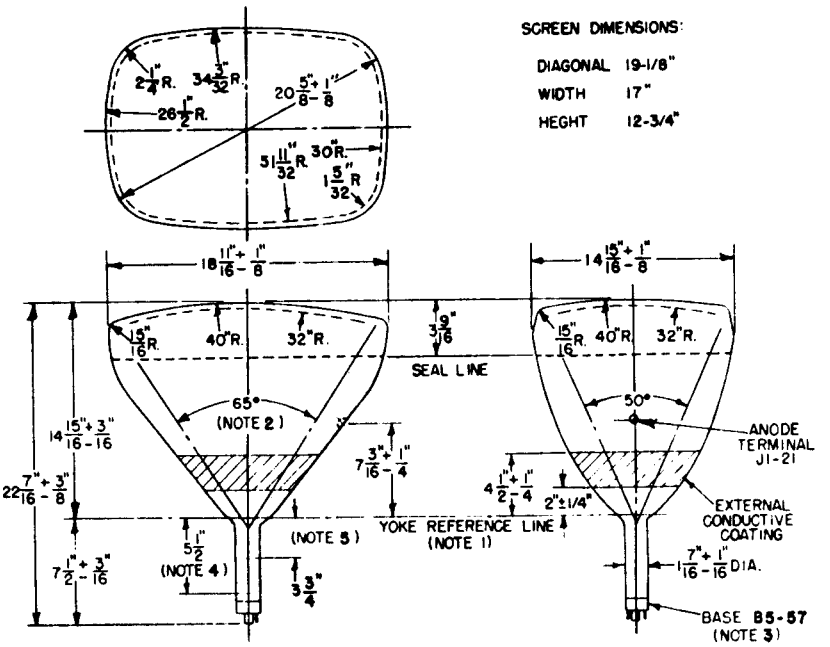
‡ Anode and grid-No. 3 which are connected together within the tube are referred to herein as anode.
If this tube is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert possible danger of personal injury from prolonged exposure at close range. The protective face-viewing window of apparatus using tubes of this type may provide such a safeguard. If the radiation measured in contact with this window does not exceed 6.25 milliroentgens per hour, the window will normally provide adequate protection.

§ Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 14,000 volts.

π For visual extinction of focused raster.

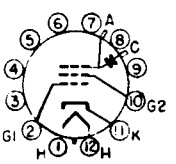
△For RETMA focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3¾-inches.

♦ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 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 110) WHEN THE GAGE IS RESTING ON THE CONE
2. DEFLECTION ANGLE ON DIAGONAL IS 70 DEGREES.
3. ANODE TERMINAL ALIGNS WITH PIN-NO. 6 POSITION ±30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET.
5. RECOMMENDED POSITION FOR CENTER OF FOCUSING FIELD



BASING DIAGRAM
12N

K-69982-13A31

6-22-55