



21ACP4 AND 21ACP4-A CATHODE-RAY TUBE

21ACP4
21ACP4-A
ET-T1045A
Page 1
7-56

21-INCH RECTANGULAR, GLASS	19 $\frac{1}{8}$ BY 15-INCH PICTURE SIZE
FOCUS—MAGNETIC	FACEPLATE—SPHERICAL, GRAY
DEFLECTION—MAGNETIC	EXTERNAL CONDUCTIVE COATING
90-DEGREE DEFLECTION ANGLE	ION-TRAP GUN
21ACP4-A—ALUMINIZED SCREEN	

DESCRIPTION AND RATING

The 21ACP4 is a magnetic-focus and magnetic-deflection, direct-view all-glass picture tube which provides a 19 $\frac{1}{8}$ by 15-inch picture for television applications. It has an electron gun which is used with an external single-field ion-trap magnet. The ninety-degree deflection angle allows a reduction in tube length and an increase of approximately 4.5 percent in screen area over tubes with narrower angles. Other features of this tube include a high-quality gray faceplate which increases picture contrast and detail under high ambient light conditions, and a space-saving rectangular face shape. An external conductive coating serves as a filter capacitor when grounded.

The 21ACP4-A has the additional feature of a reflective aluminized screen which increases light output.

GENERAL

ELECTRICAL

Heater Voltage	6.3	Volts
Heater Current	0.6 \pm 10%	Amperes
Focusing Method—Magnetic		
Deflecting Method—Magnetic		
Deflection Angle, approximate		
Diagonal	90	Degrees
Horizontal	85	Degrees
Vertical	68	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes	5	$\mu\mu\text{f}$
Grid-No. 1 to All Other Electrodes	6	$\mu\mu\text{f}$
External Conductive Coating to Anode		
Maximum	750	$\mu\mu\text{f}$
Minimum	500	$\mu\mu\text{f}$

OPTICAL

Phosphor Number—P4, Sulfide Type	
Fluorescent Color—White	
Phosphorescent Color—White	
Persistence—Short	
Faceplate—Gray	
Light Transmission at Center, approximate	71 Percent



Supersedes ET-T1045 and ET-T1046, dated 11-53

MECHANICAL

Over-all Length.....	.20 ± 3/8	Inches
Greatest Bulb Dimensions		
Diagonal.....	.21 3/8 ± 1/8	Inches
Width.....	.20 1/4 ± 1/8	Inches
Height.....	.16 3/8 ± 1/8	Inches
Minimum Useful Screen Dimensions		
Diagonal.....	.20 1/4	Inches
Width.....	.19 1/8	Inches
Height.....	.15	Inches
Neck Length.....	.7 1/2	Inches

Bulb Number, ASA Designation—C171 Exp. 2
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.....25 Pounds

MAXIMUM RATINGS*

DESIGN-CENTER VALUES

Anode Voltage †.....	20,000 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 Voltage π.....	-28 to -72	Volts DC
Focusing-Coil Current Δ, approximate.....	.117	Milliamperes DC
Ion-Trap Field Intensity, † approximate.....	.40	Gausses

MAXIMUM CIRCUIT VALUES

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

* 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 voltages 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.

- ‡ Cathode should be returned to one side or to the midtap of the heater transformer winding.
- § 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 the yoke-reference-line to center-of-air-gap distance equal to 3¾ inches.
- ◆ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through RETMA ion-trap magnet No. 117.

21ACP4
21ACP4-A

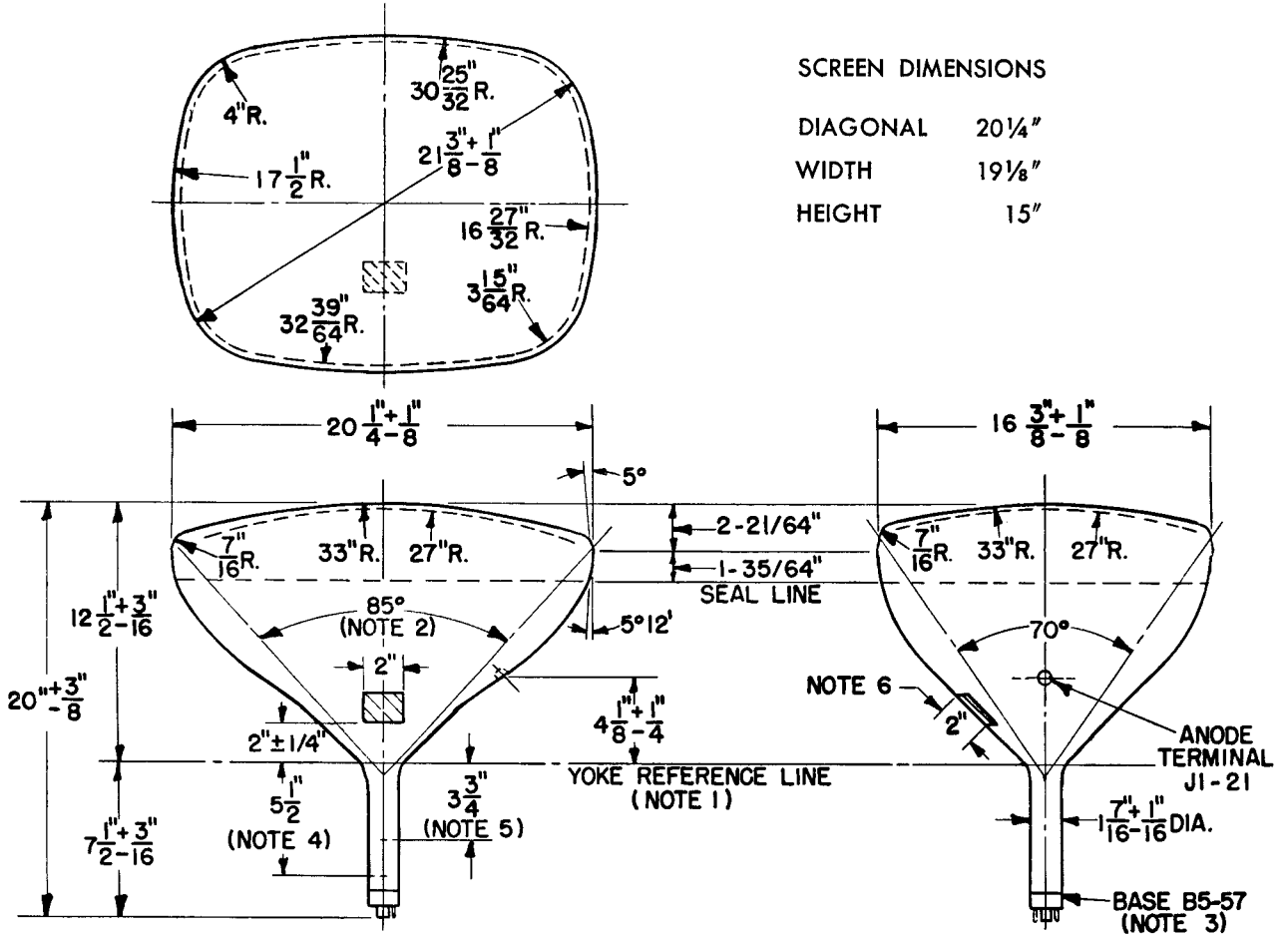
ET-T1045A

Page 4

7-56

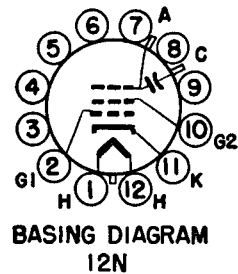
SCREEN DIMENSIONS

DIAGONAL	20 1/4"
WIDTH	19 1/8"
HEIGHT	15"



NOTES:

1. REFERENCE LINE IS DETERMINED BY THE PLANE OF THE UPPER EDGE OF THE SHOULDER OF THE REFERENCE-LINE GAGE (RETMA NO. 116) WHEN THE GAGE IS RESTING ON THE CONE.
2. DEFLECTION ANGLE ON DIAGONAL IS 90 DEGREES.
3. ANODE TERMINAL ALIGNS WITH PIN-NO. 6 POSITION \pm 30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET.
5. RECOMMENDED POSITION FOR CENTER OF FOCUSING FIELD.
6. EXTERNAL CONDUCTIVE COATING CONTACT AREA.



BASING DIAGRAM
 12N

TUBE DEPARTMENT



Schenectady 5, N. Y.