



21ACP4 AND 21ACP4-A

CATHODE-RAY TUBE

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

21-INCH RECTANGULAR, GLASS
FOCUS—MAGNETIC
DEFLECTION—MAGNETIC
90-DEGREE DEFLECTION ANGLE

19 $\frac{1}{8}$ BY 15-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
EXTERNAL CONDUCTIVE COATING
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
---	----	---------

GENERAL  ELECTRIC

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

21ACP4
21ACP4-A
ET-T1045A

Page 2

7-56

MECHANICAL

Over-all Length.....20 $\pm$ $\frac{3}{8}$ Inches

Greatest Bulb Dimensions

Diagonal.....21 $\frac{3}{8}$ $\pm$ $\frac{1}{8}$ Inches

Width.....20 $\frac{1}{4}$ $\pm$ $\frac{1}{8}$ Inches

Height.....16 $\frac{3}{8}$ $\pm$ $\frac{1}{8}$ Inches

Minimum Useful Screen Dimensions

Diagonal.....20 $\frac{1}{4}$ Inches

Width.....19 $\frac{1}{8}$ Inches

Height......15 Inches

Neck Length......7 $\frac{1}{2}$ 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 $\pm$ 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¶.....—28 to —72 Volts DC

Focusing-Coil Current△, approximate.....117 Milliamperes DC

Ion-Trap Field Intensity,♦ approximate.....40 Gauss

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 $3\frac{3}{4}$ 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

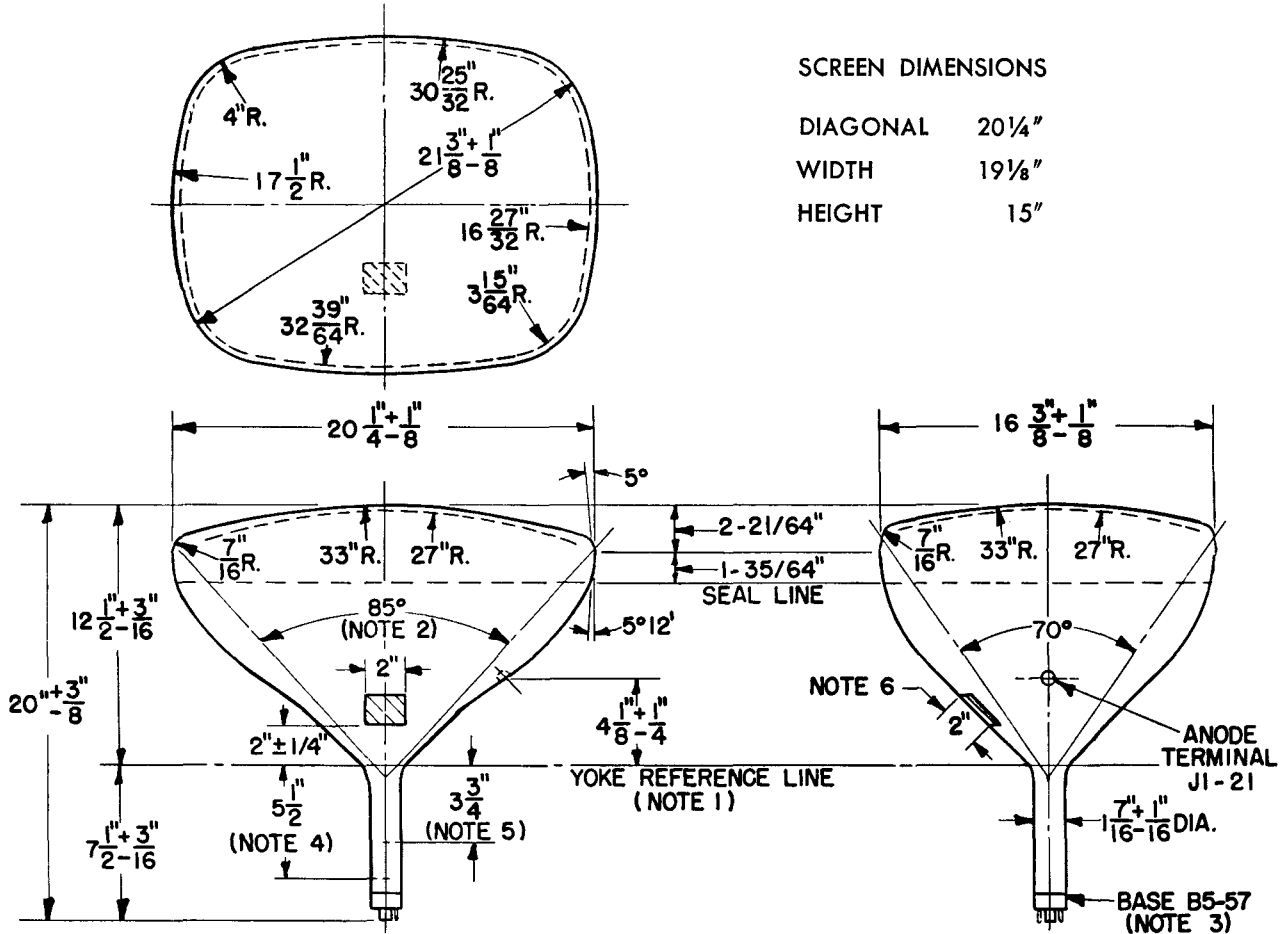
7-56

SCREEN DIMENSIONS

DIAGONAL 20 1/4"

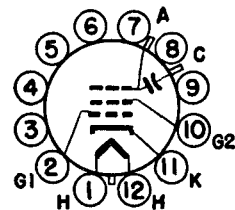
WIDTH 19 1/8"

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 ± 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

GENERAL ELECTRIC

Schenectady 5, N. Y.