



21AMP4-A KINESCOPE

21AMP4-A

RECTANGULAR GLASS TYPE
MAGNETIC FOCUS

ALUMINIZED SCREEN
MAGNETIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:

Voltage. 6.3 ac or dc volts
Current. $0.6 \pm 10\%$ amp

Direct Interelectrode Capacitances:

Grid No.1 to all other electrodes. 6 μf
Cathode to all other electrodes. 5 μf
External conductive coating to ultor* $\begin{cases} 750 \text{ max.} \\ 500 \text{ min.} \end{cases}$ μf

Faceplate, Spherical Filterglass

Light transmission (Approx.) 75%

Phosphor (For curves, see front of this section). P4—Sulfide Type
Aluminized

Fluorescence White

Phosphorescence. White

Persistence. Short

Focusing Method. Magnetic

Deflection Method. Magnetic

Deflection Angles (Approx.):

Diagonal 90°

Horizontal 85°

Vertical 68°

Ion-Trap Gun Requires External Single-Field Magnet

Tube Dimensions:

Overall length $20" \pm 3/8"$

Greatest width $20-1/4" \pm 1/8"$

Greatest height. $16-3/8" \pm 1/8"$

Diagonal $21-3/8" \pm 1/8"$

Screen Dimensions (Minimum):

Greatest width $19-1/8"$

Greatest height. 15"

Diagonal $20-1/4"$

Projected area 255 sq. in.

Weight (Approx.) 24 lbs

Mounting Position. Any

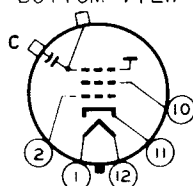
Cap. Recessed Small Cavity (JETEC No. J1-21)

Bulb J171 (90°)

Base Small-Shell Duodecal 5-Pin (JETEC No. B5-57)

Basing Designation for BOTTOM VIEW 12N

Pin 1 - Heater
Pin 2 - Grid No.1
Pin 10 - Grid No.2
Pin 11 - Cathode
Pin 12 - Heater



Cap - Ultor
(Grid No.3,
Collector)
C - External
Conductive
Coating

* The "ultor" in a cathode-ray tube is the electrode to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection. In the 21AMP4-A, the ultor function is performed by grid No.3. Since grid No.3 and collector are connected together within the 21AMP4-A, they are collectively referred to simply as "ultor" for convenience in presenting data and curves.

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GRID-DRIVE[▲] SERVICE

Unless otherwise specified, voltage values are positive with respect to cathode

Maximum Ratings, Design-Center Values:

ULTOR VOLTAGE	18000 max.	volts
GRID-No.2 VOLTAGE	500 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value	125 max.	volts
Positive bias value	0 max.	volts
Positive peak value	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode:		
During equipment warm-up period		
not exceeding 15 seconds . . .	410 max.	volts
After equipment warm-up period.	180 max.	volts
Heater positive with respect to cathode .	180 max.	volts

Equipment Design Ranges:

With any ultor voltage (E_{c2k}) between 14000 and 18000 volts and grid-No.2 voltage (E_{c2k}) between 200 and 500 volts*

Grid-No.1 Voltage for		
Visual Extinction of		
Focused Raster.	-9.3% to -24% of E_{c2k}	volts
Grid-No.1 Video Drive		
from Raster Cutoff		
(Black Level):		
White-level value		
(Peak positive)	9.3% to 24% of E_{c2k}	volts
Grid-No.2 Current	-15 to +15	μ amp
Focusing-Coil Current (DC) ^o .	$\left[\sqrt{\frac{E_{c3k}}{16000}} \times 108 \right] \pm 20\%$	ma
Ion-Trap Magnet Current		
(Average)**		
	$\sqrt{\frac{E_{c3k}}{16000}} \times 30$	ma
Minimum Field Strength of		
PM Ion-Trap Magnets§ . . .		
	$\sqrt{\frac{E_{c3k}}{16000}} \times 33$	gausses
Field Strength of Adjustable		
Centering Magnet.		
	0 to 8	gausses

Examples of Use of Design Ranges:

With ultor voltage of		16000	18000	volts
and grid-No.2 voltage of		300	400	volts
Grid-No.1 Voltage for				
Visual Extinction of				
Focused Raster.	-28 to -72	-37 to -96		volts

[▲] Grid drive is the operating condition in which the video signal varies the grid-No.1 potential with respect to cathode.

*,^o, **, §: See next page.



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Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value (Peak positive)	28 to 72	37 to 96	volts
Focusing-Coil Current (DC) . .	108 ± 20%	115 ± 20%	ma
Minimum Field Strength of PM Ion-Trap Magnet	33	35	gausses

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
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CATHODE-DRIVE[■] SERVICE

*Unless otherwise specified, voltage values are positive
with respect to grid No.1*

Maximum Ratings, Design-Center Values:

ULTOR-TO-GRID-No.1 VOLTAGE	18000 max.	volts
GRID-No.2-TO-GRID-No.1 VOLTAGE	625 max.	volts
GRID-No.2-TO-CATHODE VOLTAGE	500 max.	volts
CATHODE-TO-GRID-No.1 VOLTAGE:		
Positive bias value	125 max.	volts
Negative bias value	0 max.	volts
Negative peak value	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode:		
During equipment warm-up period not exceeding 15 seconds	410 max.	volts
After equipment warm-up period	180 max.	volts
Heater positive with respect to cathode .	180 max.	volts

Equipment Design Ranges:

*With any ultor-to-grid-No.1 voltage (E_{c2g1}) between
14000* and 18000 volts
and grid-No.2-to-grid-No.1 voltage (E_{c2g1}) between
220 and 620 volts*

Cathode-to-Grid-No.1 Voltage for Visual Extinction of Focused Raster	8.5% to 19.4% of E_{c2g1}	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value (Peak negative)	8.5% to 19.4% of E_{c2g1}	volts

■ cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No.1 and the other electrodes.

* Brilliance and definition decrease with decreasing ultor voltage or ultor-to-grid-No.1 voltage. In general, the ultor voltage or the ultor-to-grid-No.1 voltage should not be less than 14000 volts.

O, **, §: See next page.

NOV. 1, 1955

TUBE DIVISION

TENTATIVE DATA 2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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Grid-No.2 Current	-15 to +15	μamp
Focusing-Coil Current (DC) ^o .	$\left[\sqrt{\frac{E_{c3g1}}{16000}} \times 108 \right] \pm 20\%$	ma
Ion-Trap Magnet Current (Average)**	$\sqrt{\frac{E_{c3g1}}{16000}} \times 30$	ma
Minimum Field Strength of PM Ion-Trap Magnet§	$\sqrt{\frac{E_{c3g1}}{16000}} \times 33$	gausses
Field Strength of Adjustable Centering Magnet.	0 to 8	gausses

Examples of Use of Design Ranges:

<i>With ultor-to-grid-No.1</i>			
voltage of	16000	18000	volts
<i>and grid-No.2-to-grid-No.1</i>			
voltage of	300	400	volts
Cathode-to-Grid-No.1 Voltage for Visual Extinction of Focused Raster	25 to 58	34 to 78	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value (Peak negative)	25 to 58	34 to 78	volts
Focusing-Coil Current (DC)	108 ± 20%	115 ± 20%	ma
Minimum Field Strength of PM Ion-Trap Magnet.	33	35	gausses

Maximum Circuit Values:

Grid-No.1-Circuit Resistance.	1.5 max.	megohms
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- ^o For specimen focusing coil similar to JETEC Focusing Coil No.109 positioned with air gap toward kinescope screen and center line of air gap 3 inches from Reference Line (*See Dimensional Outline*). The indicated current is for condition with sharp focus at center of picture area and combined grid-No.1 voltage and video-signal voltage adjusted to produce a highlight brightness of 30 foot-lamberts measured on an Indian Head Test Pattern set for a 19-1/8" x 15" picture size.
- ** For JETEC Ion-Trap Magnet No.117, or equivalent, located with the trailing edge of the pole pieces located over the gap between grid No.1 and grid No.2 and rotated to give maximum brightness.
- § For specimen PM ion-trap magnet, such as Heppner Model No.E437, or equivalent, located in optimum position and rotated to give maximum brightness. For given equipment application, the tolerance range for the strength of the PM ion-trap magnet should be added to the minimum value. The maximum strength of this magnet should not exceed the specified minimum value by more than 6 gauss. This procedure will insure use of a PM ion-trap magnet allowing adequate adjustment to permit satisfactory performance without loss of highlight brightness.

*For X-ray shielding considerations, see sheet
X-RAY PRECAUTIONS FOR CATHODE-RAY TUBES
at front of this Section*



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DIMENSIONAL OUTLINE

for Type 21AMP4-A is the same as that shown for Type 21ALP4-A, except that the 21AMP4-A has a Small-Shell Duodecal 5-Pin Base

CURVES

for Type 21AMP4-A are the same as those shown for Type 21ALP4-A