21AWP4
KINESCOPE

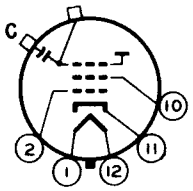
RECTANGULAR GLASS TYPE — ALUMINIZED SCREEN
MAGNETIC FOCUS — MAGNETIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.6 ± 10%	amp
Direct Interelectrode Capacitances:		
Grid No.1 to all other electrodes	6	μμf
Cathode to all other electrodes	5	μμf
External conductive coating to ultor●	1500 max. 1200 min.	μμf μμf
Faceplate, Spherical		Filterglass
Light transmission (Approx.)		71%
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		72°
Horizontal		67°
Vertical		53°
Ion-Trap Gun		Requires External Single-Field Magnet
Tube Dimensions:		
Overall length		23-1/32" ± 3/8"
Greatest width		20-1/4" ± 1/8"
Greatest height		16-3/8" ± 1/8"
Diagonal		21-3/8" ± 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 (72°)
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 21AWP4, the ultor function is performed by grid No.3. Since grid No.3 and collector are connected together within the 21AWP4, 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_{c_3k}) between 14000 and 18000 volts and grid-No.2 voltage (E_{c_2k}) between 200 and 500 volts*

Grid-No.1 Voltage for Visual Extinction of Focused Raster	-9.3% to -24% of E_{c_2k}	volts
Grid-No.1 Video Drive from Raster Cutoff (Black Level): White-level value (Peak positive)	9.3% to 24% of E_{c_2k}	volts
Grid-No.2 Current	-15 to +15	μamp
Focusing-Coil Current (DC)°	$\left[\sqrt{\frac{E_{c_3k}}{16000}} \times 108\right] \pm 20\%$	ma
Ion-Trap Magnet Current (Average)**	$\sqrt{\frac{E_{c_3k}}{16000}} \times 30$	ma
Minimum Field Strength of PM Ion-Trap Magnet§	$\sqrt{\frac{E_{c_3k}}{16000}} \times 33$	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.

*,°,**,§: 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

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 ($E_{c_3g_1}$) between 14000 and 18000 volts and grid-No.2-to-grid-No.1 voltage ($E_{c_2g_1}$) between 220 and 620 volts*

Cathode-to-Grid-No.1 Voltage for Visual Extinction of Focused Raster	8.5% to 19.4% of $E_{c_2g_1}$	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value (Peak negative)	8.5% to 19.4% of $E_{c_2g_1}$	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.

°,**,§: See next page.

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Grid-No.2 Current	−15 to +15	μamp
Focusing-Coil Current (DC)°	$\left[\sqrt{\frac{E_{c3g1}}{16000}} \times 108\right] \pm 20\%$	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:

With ultor-to-grid-No.1 voltage of	*16000*	*18000*	*volts*
and grid-No.2-to-grid-No.1 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

° 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 a 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 gausses. 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 21AWP4 is the same as that shown for Type 21AVP4/21AUP4, except that the 21AWP4 has a Small-Shell Duodecal 5-Pin Base

CURVES

for Type 21AWP4 are the same as those shown for Type 21ALP4-A

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