



20HP4-D

KINESCOPE

20HP4-D

RECTANGULAR GLASS TYPE
LOW-VOLTAGE 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 $\begin{cases} 1500 \text{ max. } \mu\text{f} \\ 750 \text{ min. } \mu\text{f} \end{cases}$

Faceplate, Spherical Filterglass

Light transmission (Approx.) 73%

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

Fluorescence White

Phosphorescence. White

Persistence. Short

Focusing Method. Electrostatic

Deflection Method. Magnetic

Deflection Angles (Approx.):

Diagonal 70°

Horizontal 66°

Vertical 50°

Ion-Trap Gun Requires External Single-Field Magnet

Tube Dimensions:

Overall length $21\text{-}3/4" \pm 3/8"$

Greatest width $18\text{-}11/16" \pm 1/8"$

Greatest height. $14\text{-}15/16" \pm 1/8"$

Diagonal $20\text{-}3/32" \pm 1/8"$

Neck length. $7\text{-}1/2" \pm 3/16"$

Screen Dimensions (Minimum):

Greatest width 17"

Greatest height. $12\text{-}3/4"$

Diagonal $18\text{-}3/8"$

Projected area 199 sq. in.

Weight (Approx.) 30 lbs

Mounting Position. Any

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

Bulb J-161

Base Small-Shell Duodecal 6-Pin (JETEC No.B6-63)

Basing Designation for BOTTOM VIEW 12L

Pin 1 - Heater

Pin 2 - Grid No.1

Pin 6 - Grid No.4

Pin 10 - Grid No.2

Pin 11 - Cathode

Pin 12 - Heater

Cap - Ultor

(Grid No.3,

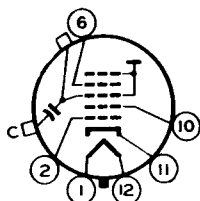
Grid No.5,

Collector)

C - External

Conductive

Coating





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Maximum Ratings, Design-Center Values:

ULTOR VOLTAGE.	16000 max.	volts
GRID-No.4 VOLTAGE:		
Positive value	1000 max.	volts
Negative value	500 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_{c5}) between 14000# and 16000 volts
and grid-No.2 voltage (E_{c2}) between 150 and 500 volts*

Grid-No.4 Voltage for		
Focus with Ultor		
Current of 100 μ amp.	-0.4% to +2.2% of E_{c5}	volts
Grid-No.1 Voltage for		
Visual Extinction of		
Focused Raster	-9.3% to -24% of E_{c2}	volts
Grid-No.1 Video Drive from		
Raster Cutoff (Black Level):		
White-level value		
(Peak positive)	9.3% to 24% of E_{c2}	volts
Grid-No.4 Current.	-25 to +25	μ amp
Grid-No.2 Current.	-15 to +15	μ amp
Ion-Trap Magnet Current		
(Average)**	$\sqrt{\frac{E_{c5}}{16000}} \times 30$	ma
Minimum Field Strength of		
PM Ion-Trap Magnet§	$\sqrt{\frac{E_{c5}}{16000}} \times 33$	gausses
Field Strength of Adjustable		
Centering Magnet	0 to 8	gausses

Brilliance and definition decrease with decreasing ultor voltage. In general, the ultor voltage should not be less than 14000 volts.

** 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 gauss. This procedure will insure use of a PM ion-trap magnet allowing adequate adjustment to permit satisfactory performance without loss of highlight brightness.



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Examples of Use of Design Ranges:

With ultor voltage of	14000	16000	volts
and grid-No.2 voltage of	300	300	volts
Grid-No.4 Voltage for Focus with Ultor			
Current of 100 μ amp. . .	-55 to +300	-65 to +350	volts
Grid-No.1 Voltage for Visual Extinction of Focused Raster	-28 to -72	-28 to -72	volts
Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value (Peak positive)	28 to 72	28 to 72	volts
Minimum Field Strength of PM Ion-Trap Magnet . . .	31	33	gausses

Maximum Circuit Values:

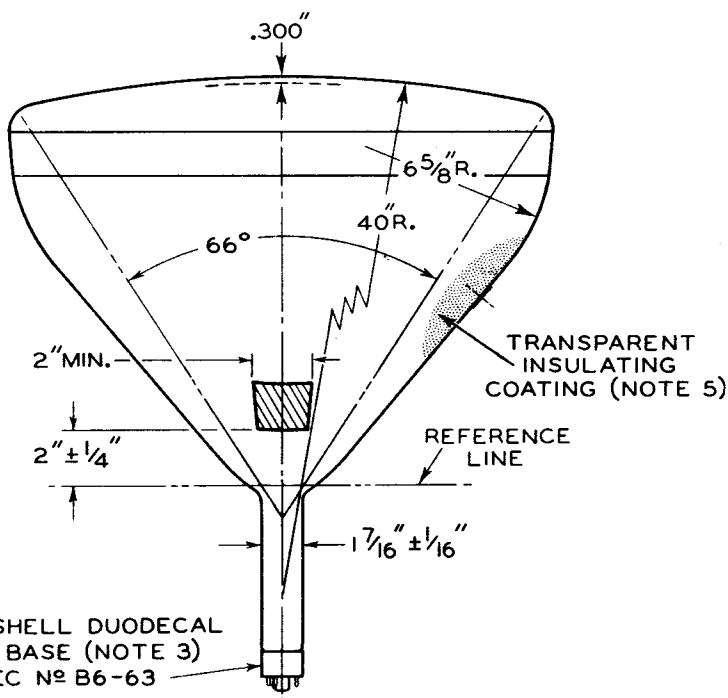
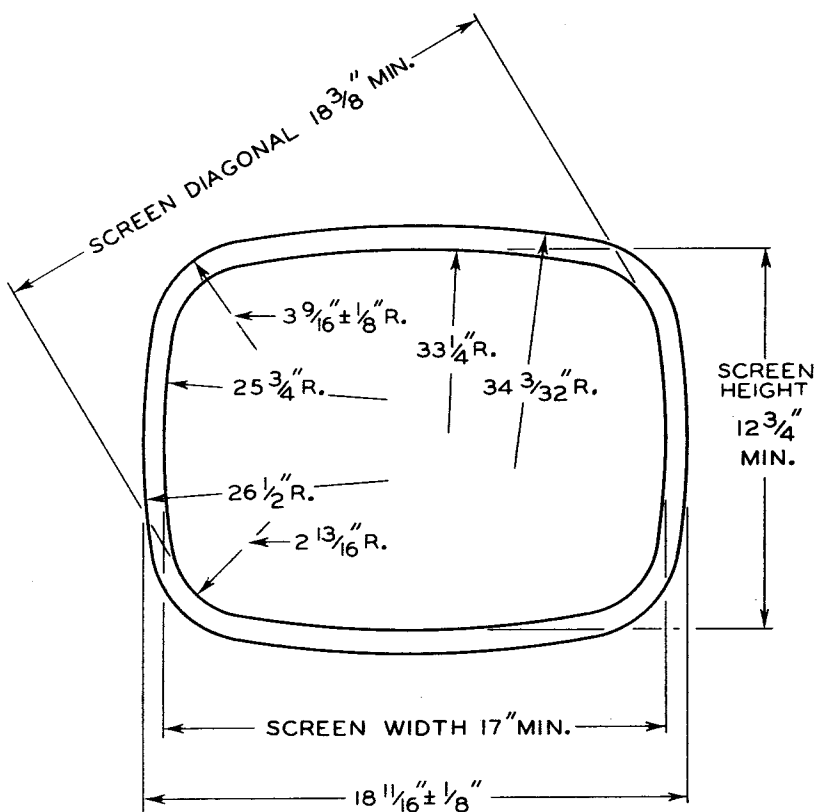
Grid-No.1-Circuit Resistance.	1.5 max.	megohms
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*For X-ray shielding considerations, see sheet
X-RAY PRECAUTIONS FOR CATHODE-RAY TUBES
at front of this Section*

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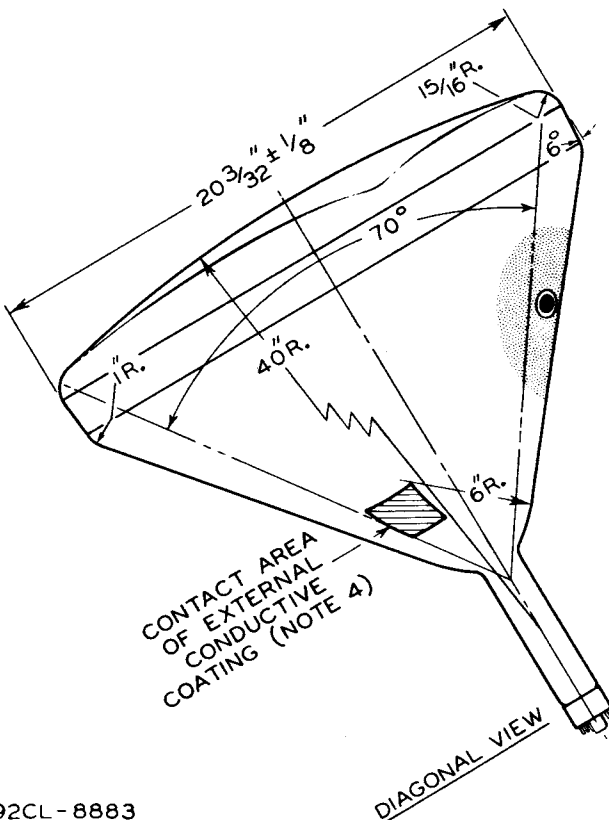
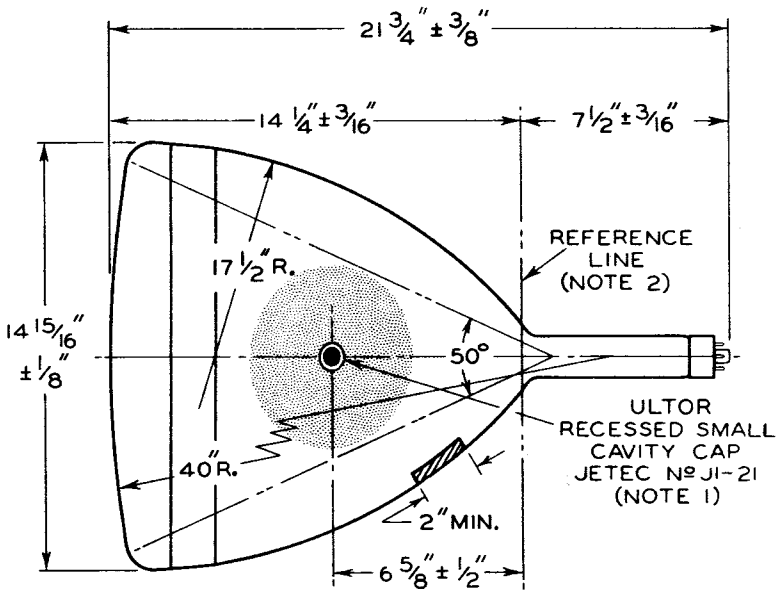
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DIAGONAL VIEW



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NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN No.6 MAY VARY FROM THE PLANE THROUGH THE AXIS AND ULTOR TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF $\pm 30^\circ$. ULTOR TERMINAL IS ON SAME SIDE AS PIN No.6.

NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JETEC No.110 (SHOWN AT FRONT OF THIS SECTION) AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

NOTE 3: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. BOTTOM CIRCUMFERENCE OF BASE SHELL WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 3".

NOTE 4: THE DRAWING SHOWS THE MINIMUM SIZE AND LOCATION OF THE CONTACT AREA OF THE EXTERNAL CONDUCTIVE COATING. THE ACTUAL AREA OF THIS COATING WILL BE GREATER THAN THE CONTACT AREA SO AS TO PROVIDE THE REQUIRED CAPACITANCE. EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

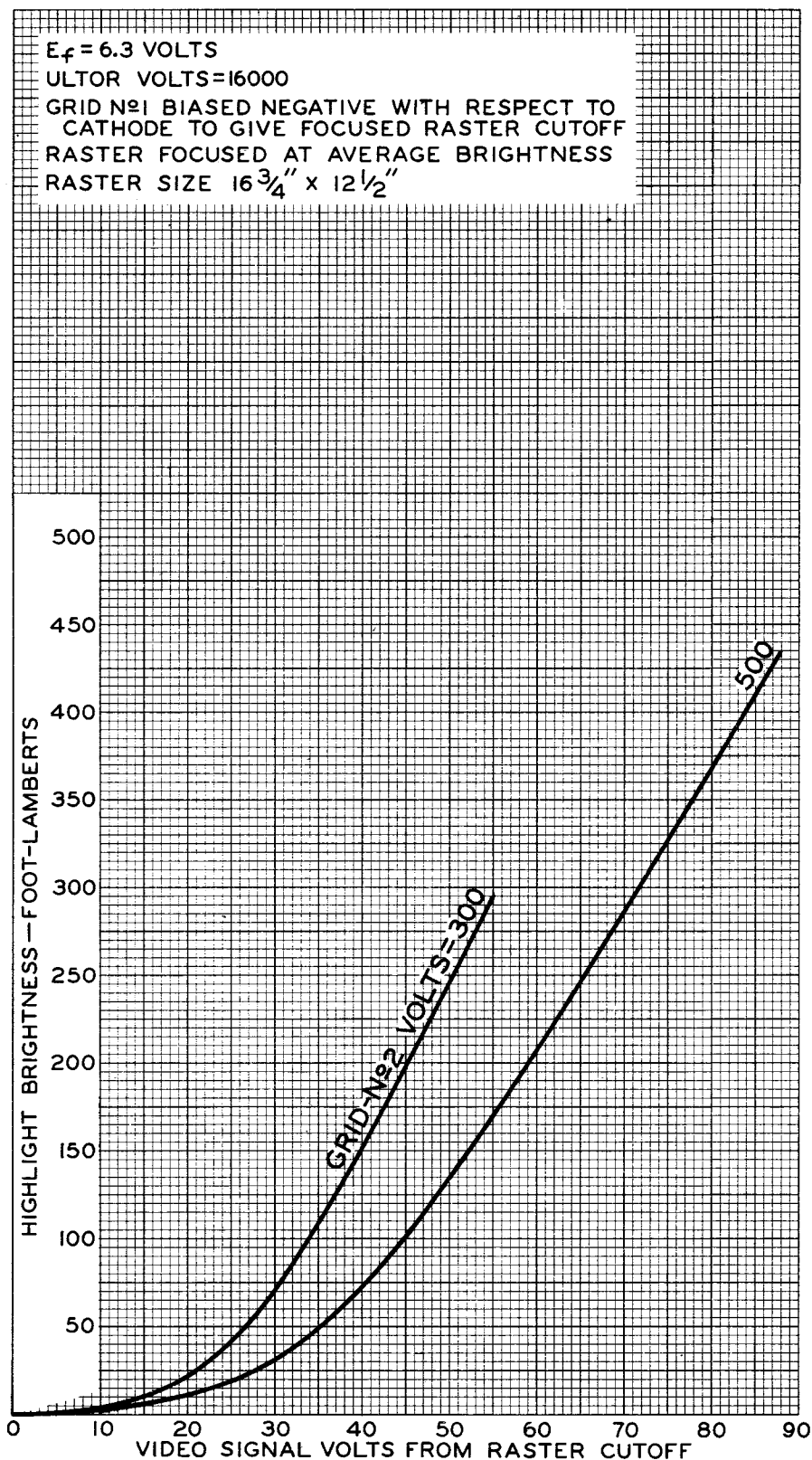
NOTE 5: TO CLEAN THIS AREA, WIPE ONLY WITH SOFT DRY LINTLESS CLOTH.



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AVERAGE GRID-DRIVE CHARACTERISTICS



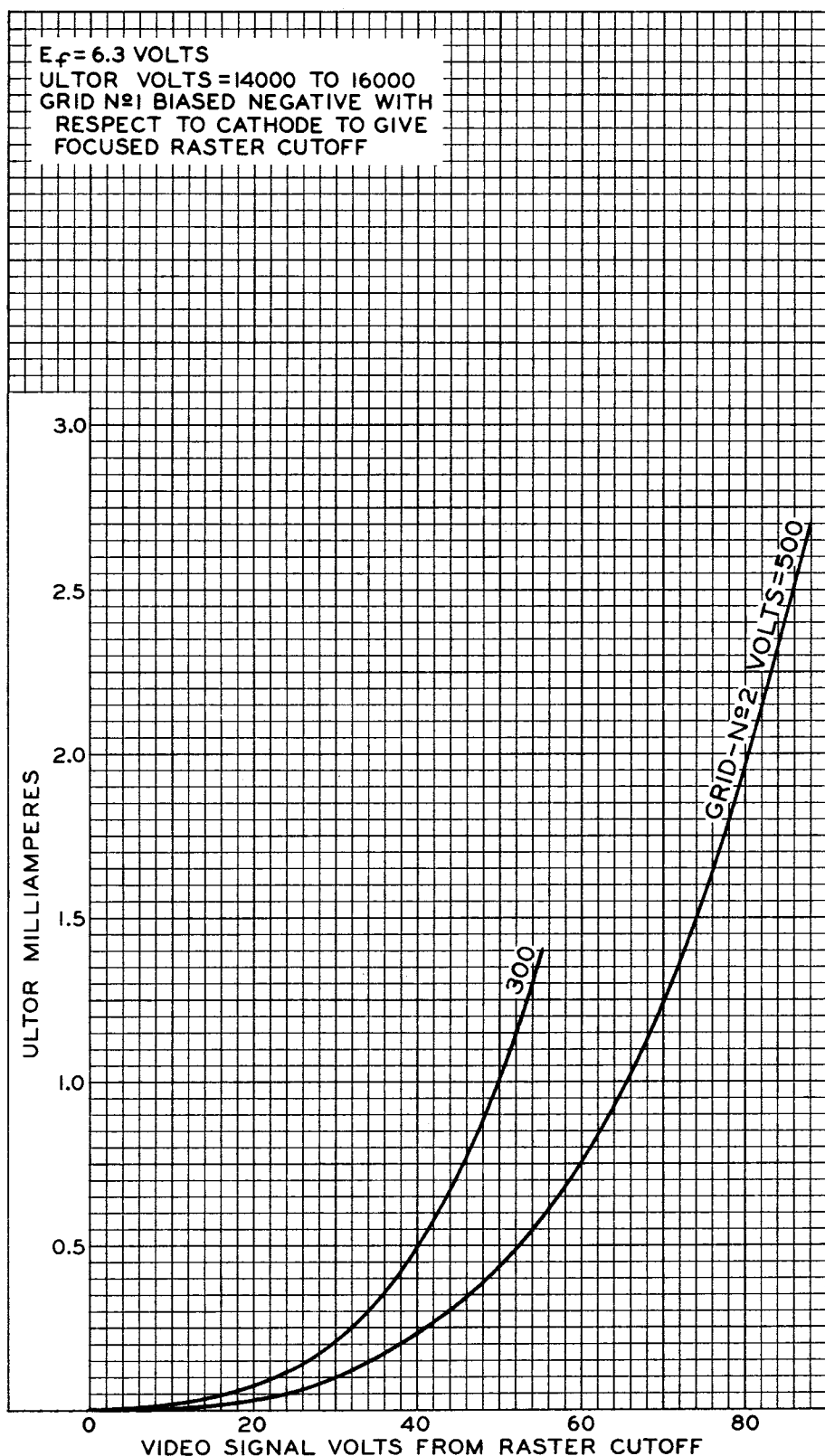
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AVERAGE GRID-DRIVE CHARACTERISTICS

$E_f = 6.3$ VOLTS
ULTOR VOLTS = 14000 TO 16000
GRID N^o1 BIASED NEGATIVE WITH
RESPECT TO CATHODE TO GIVE
FOCUSED RASTER CUTOFF



TUBE DIVISION

92CM-8871

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Picture Tube

RECTANGULAR GLASS TYPE
LOW-VOLTAGE ELECTROSTATIC FOCUS

ALUMINIZED SCREEN
70° MAGNETIC DEFLECTION

GENERAL DATA

Electrical:

Heater Current at 6.3 volts	600 ± 30	ma
Direct Interelectrode Capacitances:		
Grid No.1 to all other electrodes . . .	6	pf
Cathode to all other electrodes	5	pf
External conductive coating to anode. .	{ 1500 max. 500 min.	pf pf
Electron Gun.	Ion-Trap Type Requiring External Single-Field Magnet	

Optical:

Phosphor (For curves, see front of this Section). P4—Sulfide Type, Aluminized	
Faceplate, Spherical.	Filterglass
Light transmission (Approx.).	75%

Mechanical:

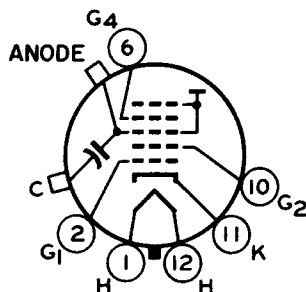
Weight (Approx.).	30 lbs
Overall Length.	21-3/4" ± 3/8"
Neck Length	7-1/2" ± 3/16"
Projected Area of Screen.	215 sq.in.
External Conductive Coating:	

Type.	Regular-Band
Contact area for grounding.	Near Reference Line
For Additional Information on Coatings and Dimensions:	

See *Picture-Tube Dimensional-Outlines and Bulb J161 C/D* sheets at front of this section

Cap	Recessed Small Cavity (JEDEC No.J1-21)
Base.	Small-Shell Duodecal 6-Pin (JEDEC Group 4, No.B6-63)
Basing Designation for BOTTOM VIEW.	12L

- Pin 1—Heater
- Pin 2—Grid No.1
- Pin 6—Grid No.4
- Pin 10—Grid No.2
- Pin 11—Cathode
- Pin 12—Heater



- Cap—Anode
(Grid No.3,
Grid No.5,
Screen,
Collector)
- C—External
Conductive
Coating

Maximum and Minimum Ratings, Design-Maximum Values:

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

ANODE VOLTAGE	17500 max.	volts
GRID-No.4 (FOCUSING) VOLTAGE:		
Positive value.	1100 max.	volts
Negative value.	550 max.	volts



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GRID-No.2 VOLTAGE	550 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value	140 max.	volts
Positive bias value	0 max.	volts
Positive peak value	2 max.	volts
HEATER VOLTAGE.	{ 6.9 max.	volts
	{ 5.7 min.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode:		
During equipment warm-up period		
not exceeding 15 seconds.	450 max.	volts
After equipment warm-up period. . .	200 max.	volts
Heater positive with respect to cathode:		
Combined AC and DC voltage.	200 max.	volts
DC component.	100 max.	volts

Typical Operating Conditions for Grid-Drive Service:

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

Anode Voltage	14000	volts
Grid-No.4 Voltage	-56 to +310	volts
Grid-No.2 Voltage	300	volts
Grid-No.1 Voltage for visual extinction of focused raster.	-28 to -72	volts

Maximum Circuit Value:

Grid-No.1-Circuit Resistance.	1.5 max.	megohms
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For X-radiation shielding considerations, see sheet
X-RADIATION PRECAUTIONS FOR CATHODE-RAY TUBES
 at front of this Section

