



14RP4-A

14RP4-A PICTURE TUBE

SHORT RECTANGULAR GLASS TYPE
LOW-VOLTAGE ELECTROSTATIC 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 $\begin{cases} 1200 \text{ max.} \\ 800 \text{ min.} \end{cases}$ μf $\leftarrow$

Faceplate, Spherical Filterglass

Light transmission (Approx.) 78%

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 90°

Horizontal 85°

Vertical 68°

Electron Gun Ion-Trap Type Requiring
External Single-Field Magnet

Tube Dimensions:

Overall length $14\text{--}3/16" \pm 5/16"$ $\leftarrow$

Greatest width $13\text{--}1/16" \pm 1/8"$

Greatest height. $10\text{--}9/16" \pm 1/8"$

Diagonal $14" \pm 1/8"$

Neck length. $6\text{--}1/2" \pm 3/16"$ $\leftarrow$

Screen Dimensions (Minimum):

Greatest width $12\text{--}1/16"$ $\leftarrow$

Greatest height. $9\text{--}1/2"$ $\leftarrow$

Diagonal $13"$ $\leftarrow$

Projected area 104 sq. in.

Weight (Approx.) 8.5 lbs

Operating Position Any

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

Bulb J112

Base . . Small-Shell Duodecal 6-Pin (JETEC Group 4, No. B6-63)

Basing Designation for BOTTOM VIEW 12L

Pin 1—Heater

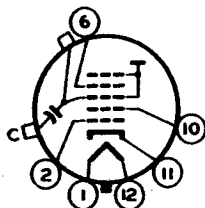
Pin 2—Grid No.1

Pin 6—Grid No.4

Pin 10—Grid No.2

Pin 11—Cathode

Pin 12—Heater



Cap—Ultor

(Grid No.3,

Grid No.5,

Collector)

C—External

Conductive

Coating

$\leftarrow$ Indicates a change.



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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.	14000 max.	volts
GRID-No.4 VOLTAGE:		
Positive value	500 max.	volts
Negative value	500 max.	volts
GRID-No.2 VOLTAGE.	400 max.	volts
GRID-No.1 VOLTAGE:		
Negative-peak value.	160 max.	volts
Negative-bias value.	110 max.	volts
Positive-bias value.	0 max.	volts
Positive-peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	180 max.	volts
Heater positive with respect to cathode.	180 max.	volts

Equipment Design Ranges:

With any ultor voltage (E_{c5k}) between 8000[#] and 14000 volts and grid-No.2 voltage (E_{c2k}) between 200 and 400 volts

Grid-No.4 Voltage required for focus:

Changes directly with E_{c5k} at the rate of approximately 30 volts for each 1000-volt change in E_{c5k} .

Changes inversely with E_{c5k} at the rate of approximately 10 volts for each 100-volt change in E_{c2k} .

Changes inversely with ultor current at the rate of approximately 25 volts for each 50- μ a change in ultor current.

For typical values, see *Examples of Use of Design Ranges*.

Grid-No.1 Voltage (E_{c1k}) for visual extinction of

focused raster See *Raster-Cutoff-Range Chart for Grid-Drive Service*

Grid-No.1 Video Drive from

Raster Cutoff

(Black Level):

White-level value

(Peak positive). Same value as determined for E_{c1k} except video drive is positive voltage

Grid-No.4 Current. -25 to +25 μ a

Grid-No.2 Current. -15 to +15 μ a

Ion-Trap Magnet Current

(Average)** $\sqrt{E_{c5k}/14000} \times 38$ ma

Minimum Field Strength of

PM Ion-Trap Magnet[§]. $\sqrt{E_{c5k}/14000} \times 43$ gauss

Field Strength of Adjust-

able Centering Magnet. 0 to 8 gauss

[▲], [#], ^{**}, [§]: See next page.



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Examples of Use of Design Ranges:

With ultor voltage of	10000	14000	volts
and grid-No.2 voltage of	300	300	volts
Grid-No.4 Voltage for focus with ultor current of 100 μ a	-50 to +350	+70 to +470	volts
Grid-No.1 Voltage for visual extinction of focused raster	-26 to -70	-26 to -70	volts
Grid-No.1 Video Drive from Raster Cutoff (Black Level): White-level value (Peak positive).	26 to 70	26 to 70	volts
Minimum Field Strength of PM Ion-Trap Magnet	36	43	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	14000 max.	volts
GRID-No.4-TO-GRID-No.1 VOLTAGE:		
Positive value	500 max.	volts
Negative value	500 max.	volts
GRID-No.2-TO-GRID-No.1 VOLTAGE	510 max.	volts
CATHODE-TO-GRID-No.1 VOLTAGE:		
Positive-peak value.	160 max.	volts
Positive-bias value.	110 max.	volts
Negative-bias value.	0 max.	volts
Negative-peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	180 max.	volts
Heater positive with respect to cathode.	180 max.	volts

Equipment Design Ranges:

With any ultor-to-grid-No.1 voltage (E_{c5g1}) between 8000
and 14000 volts and grid-No.2-to-grid-No.1 voltage (E_{c2g1})
between 225 and 510 volts*

Grid-No.4-to-Grid-No.1 Voltage required for focus: Changes directly with E_{c5g1} at the rate of approximately 30 volts for each 1000-volt change in E_{c5g1} . Changes inversely with E_{c2g1} at the rate of approximately 10 volts for each 100-volt change in E_{c2g1} .		
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▲, #, **, §, ■: See next page.



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Changes inversely with ultor current at the rate of approximately 25 volts for each 50- μ a change in ultor current.

For typical values, see *Examples of Use of Design Ranges*.

Cathode-to-Grid-No.1

Voltage (E_{k1}) for
visual extinction of

focused raster See *Raster-Cutoff-Range Chart
for Cathode-Drive Service*

Cathode-to-Grid-No.1

Video Drive from

Raster Cutoff

(Black Level):

White-level value

(Peak negative). Same value as determined for E_{k1}

Grid-No.4 Current. -25 to +25 μ a

Grid-No.2 Current. -15 to +15 μ a

Ion-Trap Magnet Current

(Average)** $\sqrt{E_{c591}/14000} \times 38$ ma

Minimum Field Strength of

PM Ion-Trap Magnet $\S$ $\sqrt{E_{c591}/14000} \times 43$ gaussess

Field Strength of Adjust-

able Centering Magnet. 0 to 8 gaussess

Examples of Use of Design Ranges:

With ultor-to-grid-

No.1 voltage of 10000 14000 volts

and grid-No.2-to-grid-

No.1 voltage of 300 300 volts

Grid-No.4-to-Grid-No.1

Voltage for focus

with ultor current

of 100 μ a. -50 to +350 +70 to +470 volts

Cathode-to-Grid-No.1

Voltage for visual

extinction of fo-

cused raster 26 to 59 26 to 59 volts

Cathode-to-Grid-No.1

Video Drive from

Raster Cutoff

(Black Level):

White-level value

(Peak negative). 26 to 59 26 to 59 volts

Minimum Field Strength

of PM Ion-Trap Magnet. 36 43 gaussess

Maximum Circuit Values:

Grid-No.1-Circuit Resistance 1.5 max. megohms

Δ , $\#$, **, $\S$, $\blacksquare$: See next page.



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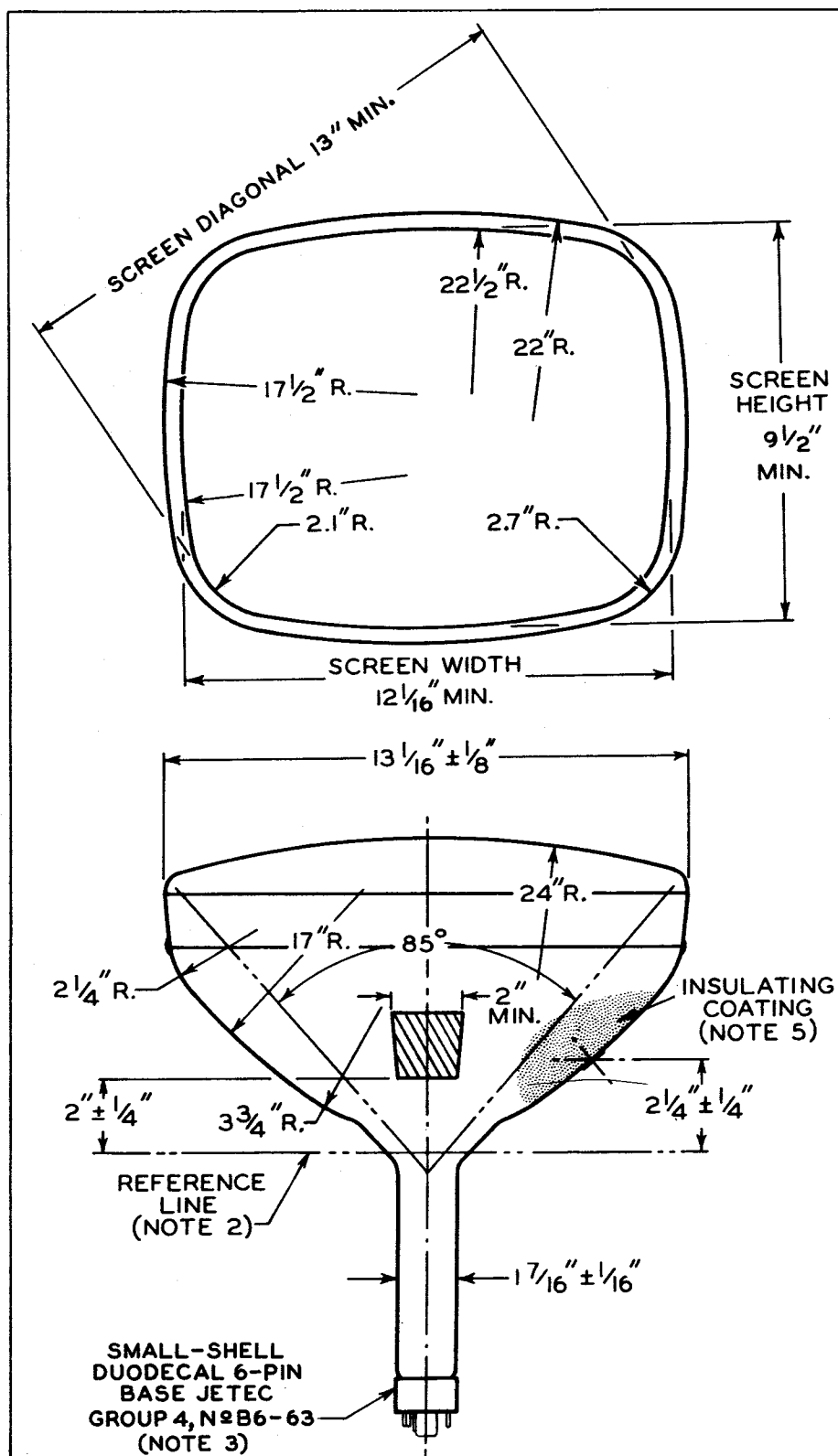
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- ▲ Grid drive is the operating condition in which the video signal varies the grid-No.1 potential with respect to cathode.
- # Brilliance and definition decrease with decreasing ultor voltage or ultor-to-grid-No.1 voltage. In general, the ultor voltage or ultor-to-grid-No.1 voltage should not be less than 8,000 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.
- 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.

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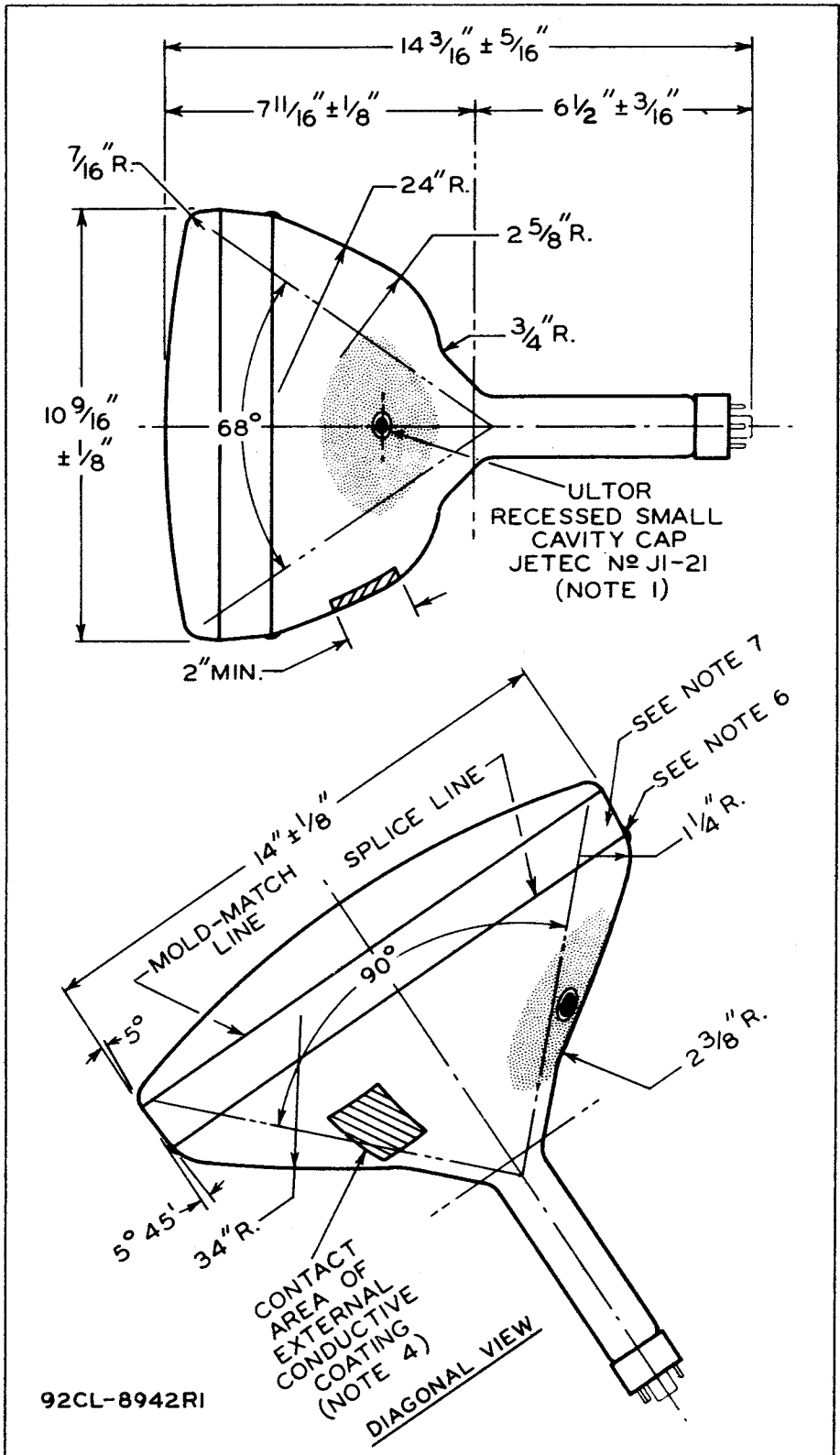
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NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN 6 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ULTOR TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF $\pm 30^\circ$. ULTOR TERMINAL IS ON SAME SIDE AS PIN 6.

NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JETEC No.G-116 (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 2-3/4".

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 LINT-LESS CLOTH.

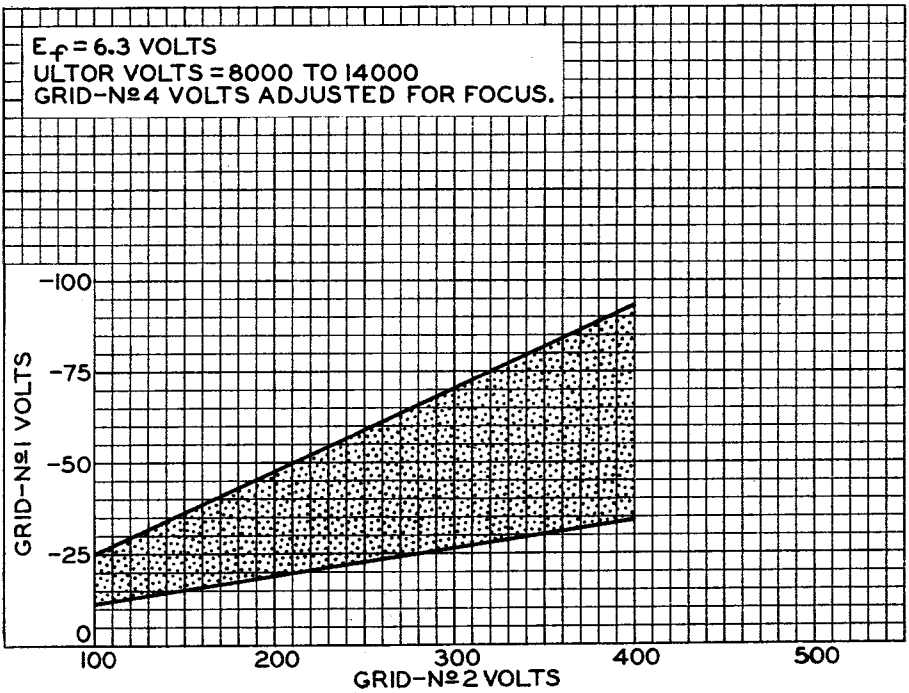
NOTE 6: BULGE AT SPLICE-LINE SEAL WILL NOT PROTRUDE BEYOND THE MAXIMUM INDICATED VALUE FOR ENVELOPE WIDTH, DIAGONAL OR HEIGHT.

NOTE 7: UNDISTURBED AREA BETWEEN MOLD-MATCH LINE AND SPLICE LINE IS 3/4" MINIMUM. THIS SHOULD BE THE MAXIMUM WIDTH OF TUBE SUPPORT BAND.



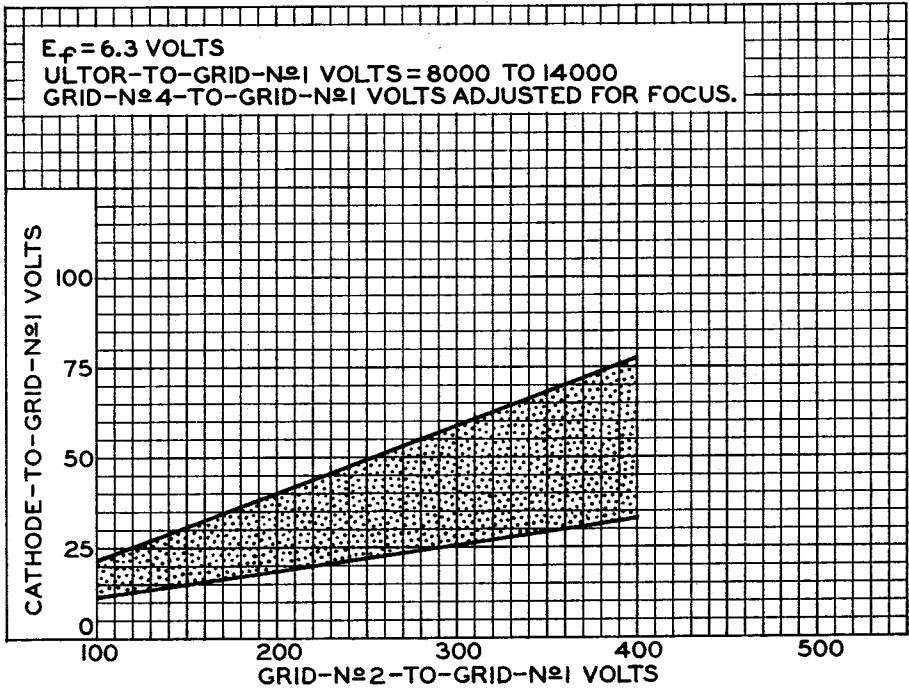
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14RP4-A RASTER-CUTOFF-RANGE CHARTS GRID-DRIVE SERVICE



92CS-8972R1

CATHODE-DRIVE SERVICE



92CS-8973R1

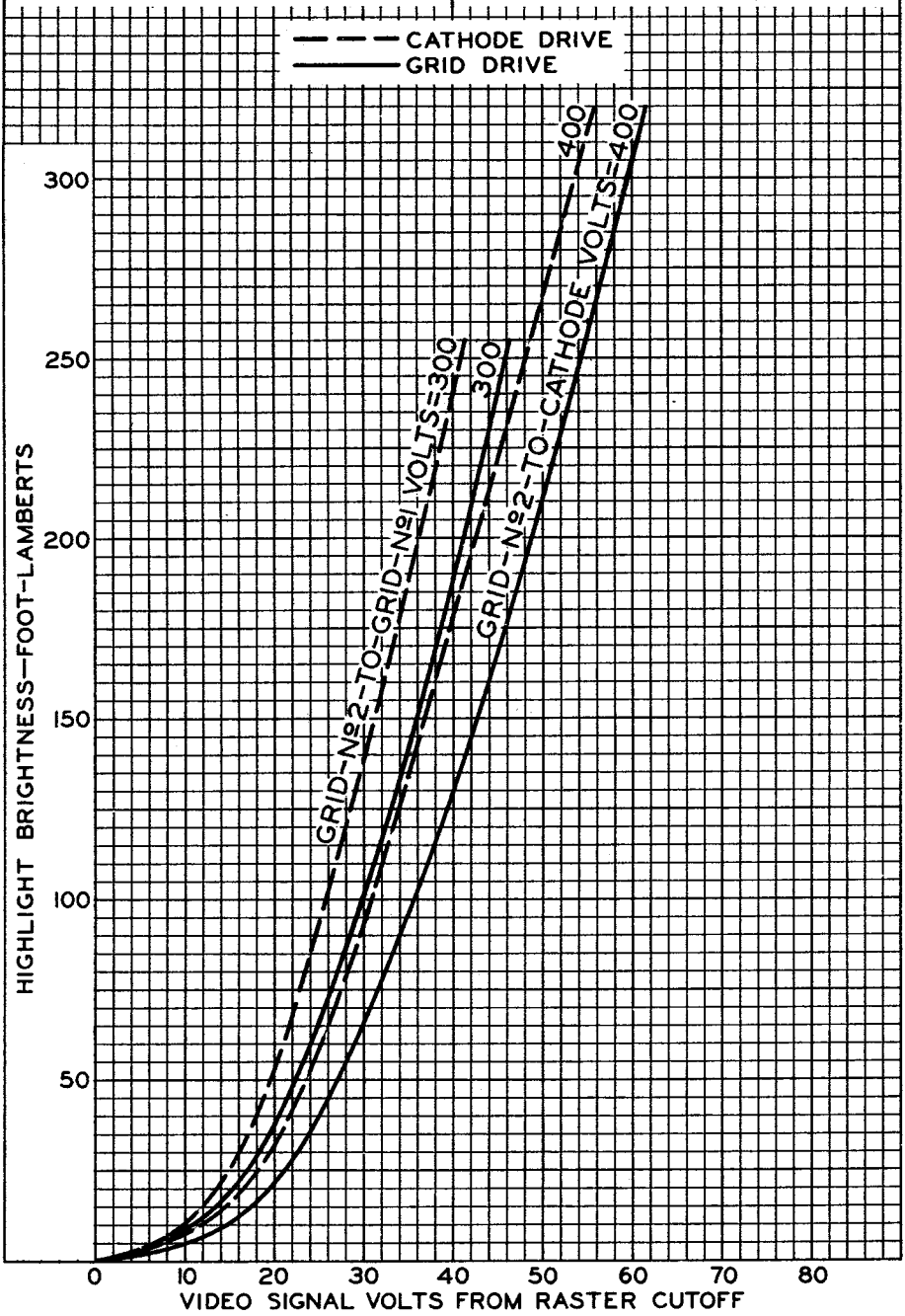
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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE	GRID-DRIVE SERVICE
$E_f = 6.3$ VOLTS	$E_f = 6.3$ VOLTS
ULTOR-TO-GRID- $N\#1$ VOLTS = 10000	ULTOR VOLTS = 10000
CATHODE BIASED POSITIVE WITH RESPECT TO GRID $N\#1$ TO GIVE FOCUSED RASTER CUTOFF.	GRID $N\#1$ BIASED NEGATIVE WITH RESPECT TO CATHODE TO GIVE FOCUSED RASTER CUTOFF.
RASTER FOCUSED AT AVERAGE BRIGHTNESS.	RASTER FOCUSED AT AVERAGE BRIGHTNESS.
RASTER SIZE = 11" x 8 1/4"	RASTER SIZE = 11" x 8 1/4"





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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

$E_f = 6.3$ VOLTS

ULTOR-TO-GRID-No.1
VOLTS = 8000 TO 14000

CATHODE BIASED POSITIVE
WITH RESPECT TO GRID No.1
TO GIVE FOCUSED RASTER
CUTOFF.

GRID-DRIVE SERVICE

$E_f = 6.3$ VOLTS

ULTOR VOLTS =
8000 TO 14000

GRID No.1 BIASED NEGATIVE
WITH RESPECT TO CATHODE
TO GIVE FOCUSED RASTER
CUTOFF.

