



27MP4

KINESCOPE

RECTANGULAR METAL-SHELL TYPE
MAGNETIC FOCUSMETAL-BACKED SCREEN
MAGNETIC DEFLECTION

27MP4

DATA

General:

Heater, for Unipotential Cathode:

Voltage 6.3 ac or dc volts
Current 0.6 amp

Direct Interelectrode Capacitances (Approx.):

Grid No.1 to All Other Electrodes 6 μf
Cathode to All Other Electrodes 5 μf

Faceplate, Spherical Frosted Filterglass

Light Transmission (Approx.) 66%

Phosphor (For curves, see front of this Section) . . . P4--Sulfide Type

Fluorescence White

Phosphorescence White

Persistence Short

Focusing Method Magnetic

Deflection Method Magnetic

Deflection Angles (Approx.):

Diagonal 90°

Horizontal 85°

Vertical 69°

Ion-Trap Gun Requires External, Single-Field Magnet

Tube Dimensions:

Maximum Overall Length 22-3/16"

Greatest Diagonal 26-7/8" $\pm$ 1/4"Greatest Width 25-1/4" $\pm$ 3/16"Greatest Height 19-15/16" $\pm$ 3/16"

Screen Dimensions (Minimum):

Greatest Width 23-7/16"

Greatest Height 18-1/8"

Diagonal 25-1/16"

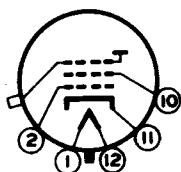
Weight (Approx.) 30 lbs

Mounting Position Any

Ultor[®] Terminal Metal-Shell Lip

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

BOTTOM VIEW

Pin 1-Heater
Pin 2-Grid No.1
Pin 10-Grid No.2
Pin 11-Cathode
Pin 12-HeaterMetal-Shell
Lip—
Ultor
(Grid No.3,
Collector)GRID-DRIVE[▲] SERVICE*Unless otherwise specified, voltage values are positive
with respect to cathode*

Maximum Ratings, Design-Center Values:

ULTOR[®] VOLTAGE 18000 max. volts

•, ▲: See next page.

AUG. 1, 1953

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TENTATIVE DATA 1

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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_{c3k}) between 16000 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	12.3% to 24.3% of E_{c2k}	volts
Grid-No.1 Video Drive		
from Raster Cutoff		
(Black Level):		
White-level value		
(Peak positive)	12.3% to 24.3% of E_{c2k}	volts
Grid-No.2 Current	-15 to +15	μ amp
Focusing-Coil Current (DC) ^{oo} .	$\left[\sqrt{\frac{E_{c3k}}{16000}} \times 110 \right] \pm 10\%$	ma
Field Strength of Single-Field	$\sqrt{\frac{E_{c3k}}{16000}} \times 50$	gausses
Ion-Trap Magnet (Approx.) .		
Field Strength of Adjustable	0 to 8	gausses
Centering Magnet		

Examples of Use of Design Ranges:

<i>With ultor voltage (E_{c3k}) of</i>	16000	16000	volts
<i>and grid-No. voltage (E_{c2k}) of</i>	300	400	volts
Grid-No.1 Voltage for			
Visual Extinction of			
Focused Raster	-37 to -73	-49 to -97	volts
Grid-No.1 Video Drive			
from Raster Cutoff			
(Black Level):			
White-level value			
(Peak positive)	37 to 73	49 to 97	volts
Focusing-Coil Current (DC) . .	110 $\pm$ 10%	110 $\pm$ 10%	ma
Ion-Trap Magnet			
(Rated Strength)	50	50	gausses

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

•, *, ^{oo}: See next page.

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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_{c3g_1}) between
16000* and 18000 volts
and grid-No.2-to-grid-No.1 voltage (E_{c2g_1}) between
220 and 620 volts

Cathode-to-Grid-No.1 Voltage

for Visual Extinction

of Focused Raster 11% to 19.7% of E_{c2q1} volts

Cathode-to-Grid-No.1 Video

Drive from Raster Cutoff

(Black Level):

White-level value

(Peak negative) 11% to 19.7% of E_{c2a1} volts

Grid-No.2 Current -15 to +15 μ amp

Focusing-Coil Current (DC)^{oo} . $\left[\sqrt{\frac{E_c 3g_1}{16000}} \times 110 \right] \pm 10\%$ ma

• 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 27MP4, the ultor function is performed by grid No.3. Since grid No.3 and collector are connected together within the 27MP4, they are collectively referred to simply as "ultor" for convenience in presenting data and curves.

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 16000 volts.

∞: See next page.

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TENTATIVE DATA 2

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Field Strength of Single-Field Ion-Trap Magnet (Approx.) . . . $\sqrt{\frac{E_{c3g1}}{16000}} \times 50$ gaussess

Field Strength of Adjustable Centering Magnet 0 to 8 gaussess

Examples of Use of Design Ranges:

With ultor-to-grid-No.1
voltage (E_{c3g1}) of 16000 16000 volts
and grid-No.2-to-grid-No.1
voltage (E_{c2g1}) of 300 400 volts

Cathode-to-Grid-No.1 Voltage
for Visual Extinction
of Focused Raster 33 to 59 44 to 79 volts

Cathode-to-Grid-No.1 Video
Drive from Raster Cutoff
(Black Level):

White-level value
(Peak negative) -33 to -59 -44 to -79 volts

Focusing-Coil Current (DC) . . 110 $\pm$ 10% 110 $\pm$ 10% ma
Ion-Trap Magnet (Rated Strength) 50 50 gaussess

Maximum Circuit Values:

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

00 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 combined bias voltage and video signal voltage adjusted to produce a highlight brightness of 30 foot-lamberts on a 23-7/16" x 18-1/8" picture area sharply focused at center of screen.

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

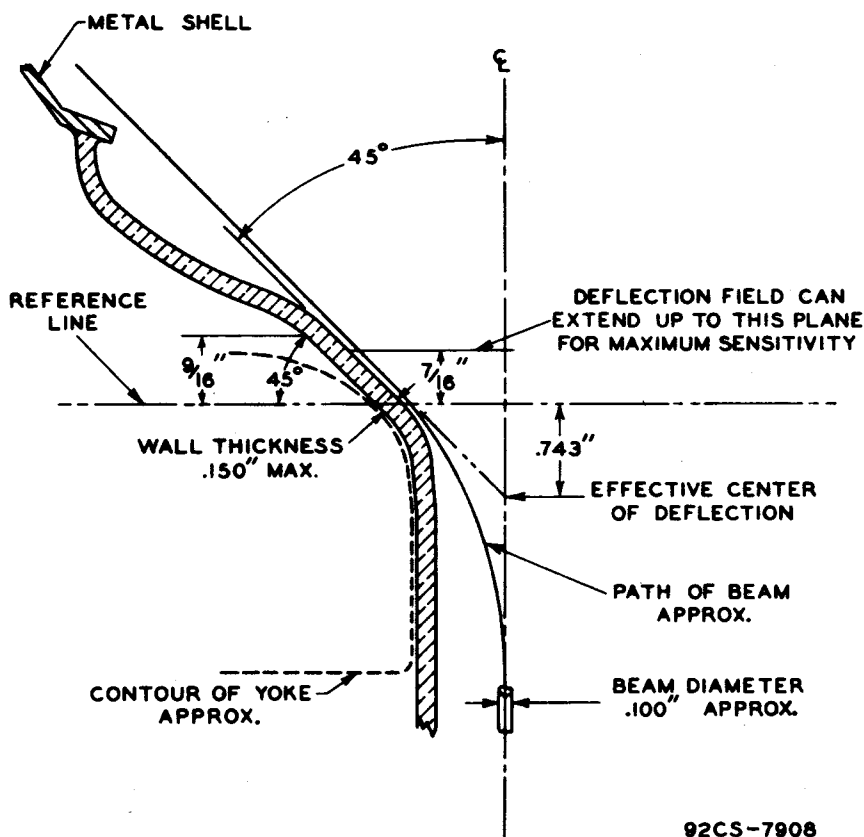


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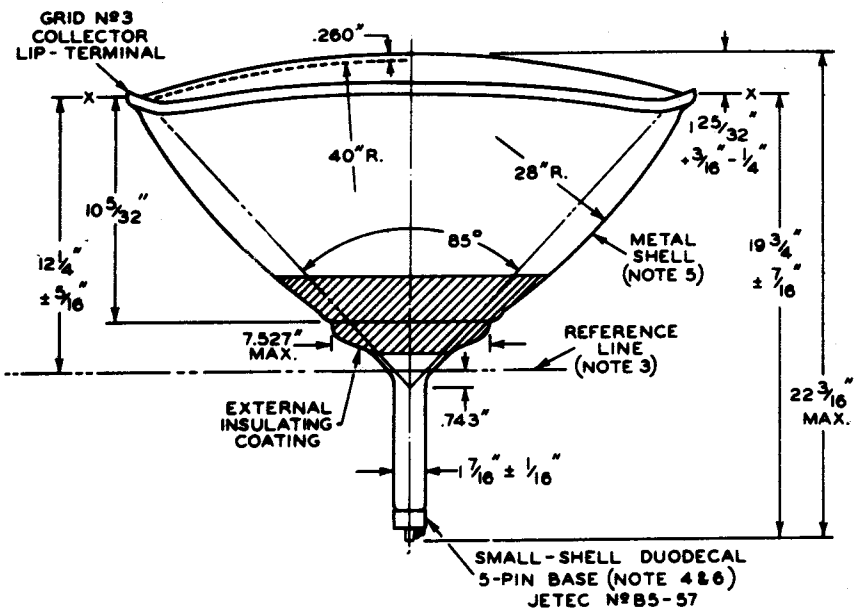
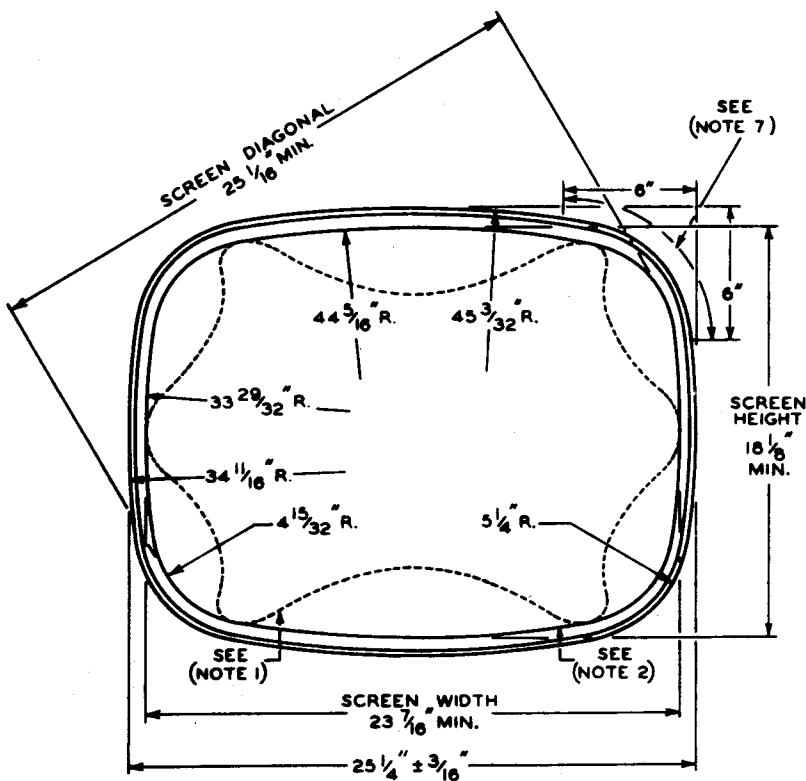
Shape of Neck-Funnel Section with Indication of Recommended Approximate Inside Contour of Yoke Based on Dimensions of Reference-Line Gauge (JETEC No.116) Shown at Front of this Section.



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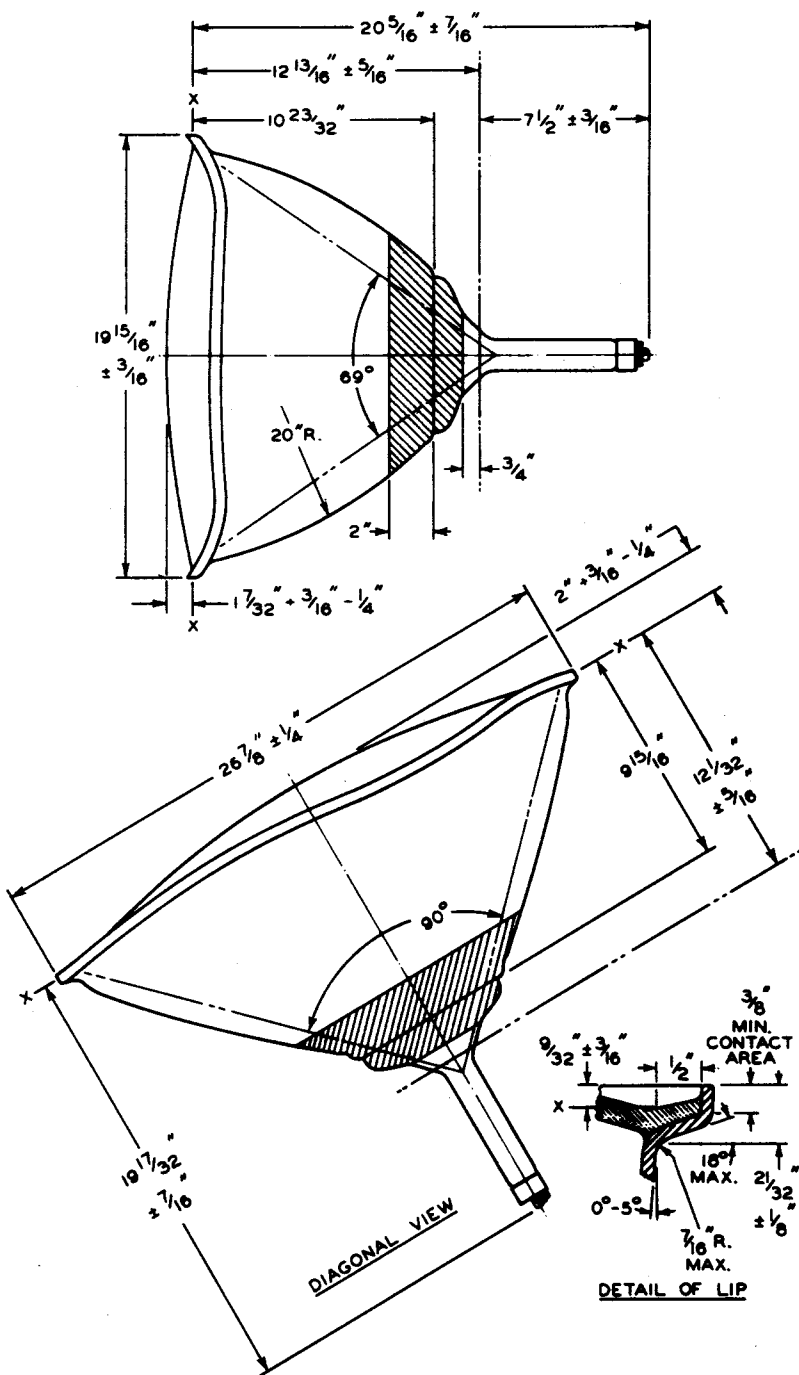
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CE-7924A



27MP4 KINESCOPE

27MP4



92CL - 7924R1

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CE-7924B

27MP4



27MP4

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NOTE 1: APPROXIMATE BOUNDARY OF SPHERICAL SURFACE HAVING 40" RADIUS. OUTSIDE THIS BOUNDARY, THE CURVATURE OF THE SURFACE IS BLENDED INTO THE RIM. (SEE NOTE 2).

NOTE 2: FACEPLATE SHAPE AT PERIMETER OF SCREEN CONFORMS TO SURFACE OF SPHERE HAVING 50" RADIUS.

NOTE 3: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JETEC No.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 4: 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 METAL-SHELL AXIS AND HAVING A DIAMETER OF 3-1/4".

NOTE 5: METAL SHELL AND GLASS FACE OPERATE AT HIGH VOLTAGE. ANY MATERIAL IN CONTACT WITH THE SHELL OR THE FACE MUST BE INSULATED TO WITHSTAND THE MAXIMUM APPLIED ULTOR VOLTAGE.

NOTE 6: THE PLANE THROUGH THE TUBE AXIS AND VACANT PIN POSITION No.6 MAY VARY FROM THE HORIZONTAL AXIS OF THE GLASS FACE BY AN ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF $\pm 10^\circ$.

NOTE 7: SUPPORT TUBE IN LIP REGION ONLY AT CORNERS WITHIN THIS SPACE.

AUG. 1, 1953

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CE-7924C



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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

$E_f = 6.3$ VOLTS

ULTOR-TO-GRID- $N_{\phi 1}$ VOLTS =
16000 TO 18000

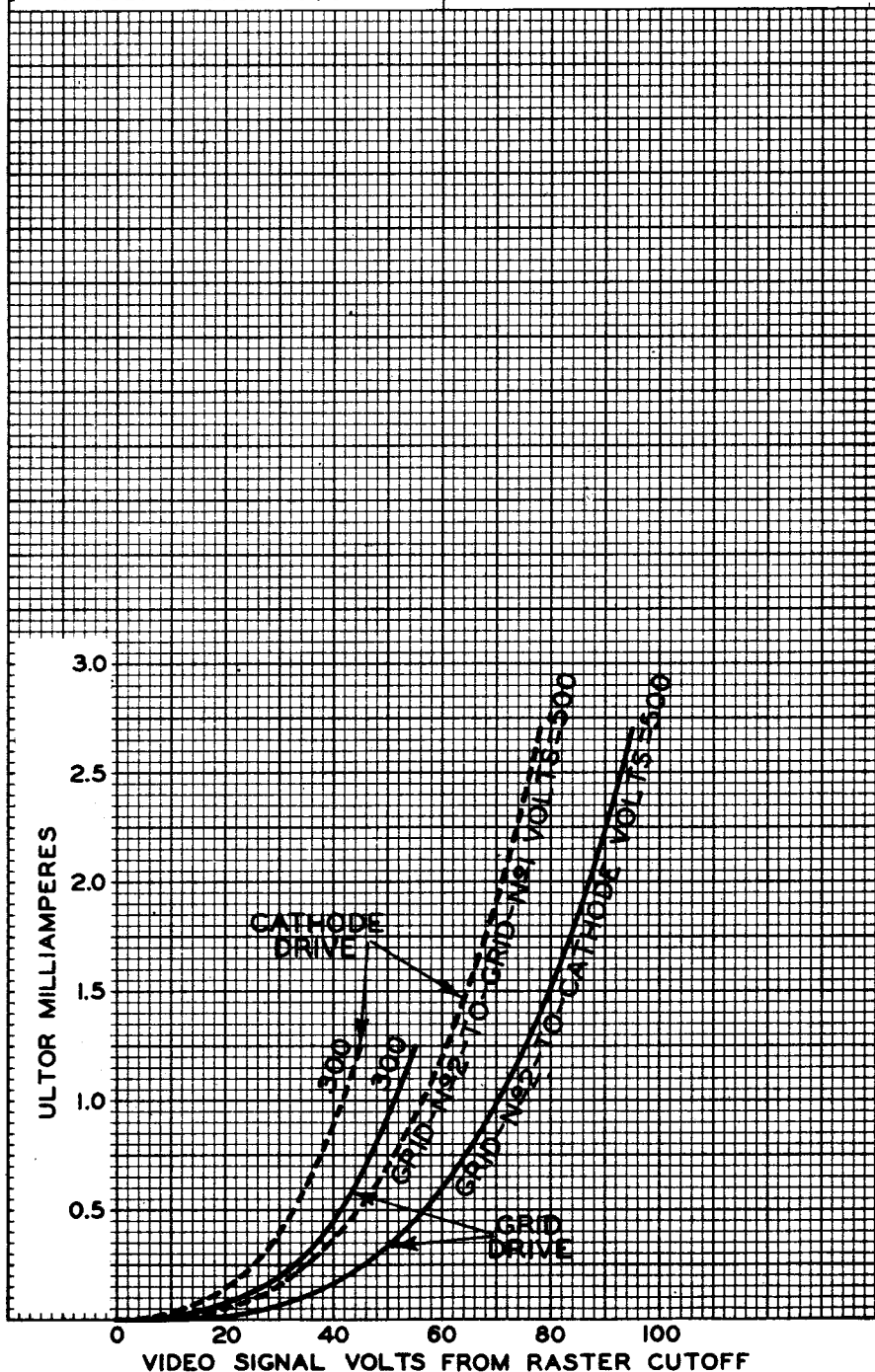
CATHODE BIASED POSITIVE WITH
RESPECT TO GRID $N_{\phi 1}$ TO GIVE
FOCUSED RASTER CUTOFF

GRID-DRIVE SERVICE

$E_f = 6.3$ VOLTS

ULTOR VOLTS = 16000 TO 18000

GRID $N_{\phi 1}$ BIASED NEGATIVE WITH
RESPECT TO CATHODE TO GIVE
FOCUSED RASTER CUTOFF



MAR.25,1953

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AVERAGE DRIVE CHARACTERISTICS

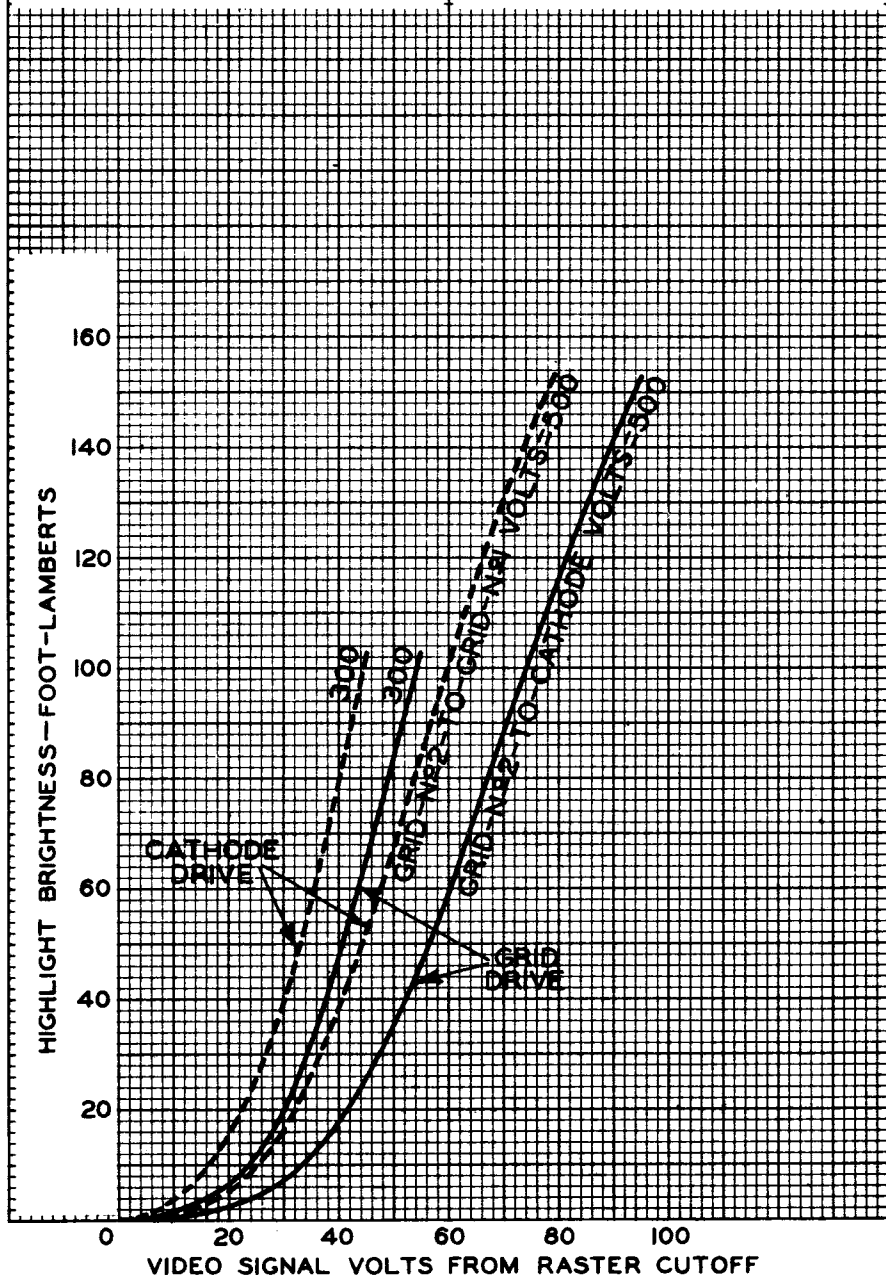
CATHODE-DRIVE SERVICE

 $E_f = 6.3$ VOLTSULTOR-TO-GRID-N₁ VOLTS = 16000CATHODE BIASED POSITIVE WITH
RESPECT TO GRID N₁ TO GIVE
FOCUSED RASTER CUTOFF
RASTER FOCUSED AT AVERAGE
BRIGHTNESSRASTER SIZE = $23 \frac{7}{16}$ " x $18 \frac{1}{8}$ "

GRID-DRIVE SERVICE

 $E_f = 6.3$ VOLTS

ULTOR VOLTS = 16000

GRID N₁ BIASED NEGATIVE WITH
RESPECT TO CATHODE TO GIVE
FOCUSED RASTER CUTOFF
RASTER FOCUSED AT AVERAGE
BRIGHTNESSRASTER SIZE = $23 \frac{7}{16}$ " x $18 \frac{1}{8}$ "

MAR. 26, 1953

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92CM-7900

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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-№1 VOLTS=16000	ULTOR VOLTS=16000
GRID-№2-TO-GRID-№1 VOLTS=300	GRID-№2-TO-CATHODE VOLTS=300
CATHODE BIASED POSITIVE WITH RESPECT TO GRID №1 TO GIVE FOCUSED RASTER CUTOFF	GRID №1 BIASED NEGATIVE WITH RESPECT TO CATHODE TO GIVE FOCUSED RASTER CUTOFF
RASTER FOCUSED AT AVERAGE BRIGHTNESS	RASTER FOCUSED AT AVERAGE BRIGHTNESS
RASTER SIZE: $23 \frac{7}{16}'' \times 18 \frac{1}{8}''$	RASTER SIZE: $23 \frac{7}{16}'' \times 18 \frac{1}{8}''$

