19YP4

Picture Tube

SHORT RECTANGULAR GLASS TYPE — **ALUMINIZED SCREEN**
LOW-VOLTAGE ELECTROSTATIC FOCUS — **MAGNETIC DEFLECTION**

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Current at 6.3 volts	600 ± 30	ma
Heater Warm-Up Time (Average)	11	seconds
Focusing Method	Electrostatic	
Deflection Method	Magnetic	
Deflection Angles (Approx.):		
Diagonal	114°	
Horizontal	102°	
Vertical	85°	
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. 1000 min.	μμf μμf
Electron Gun	Type Requiring No Ion-Trap Magnet	

Optical:

Faceplate	Filterglass
Light transmission at center (Approx.)	78%
Phosphor (For Curves, see front of this Section)	P4—Sulfide Type Aluminized
Fluorescence	White
Phosphorescence	White
Persistence	Medium Short

Mechanical:

Tube Dimensions:	
Overall length	10-13/16" ± 1/4"
Greatest width	16-13/32" ± 1/8"
Greatest height	13-11/32" ± 1/8"
Diagonal	18-5/8" ± 1/8"
Neck length	3-9/16" ± 1/8"
Curvature of faceplate (External Radii):	
Center	48"
Edge	21"
Screen Dimensions (Minimum):	
Greatest width	15-1/8"
Greatest height	12"
Diagonal	17-9/16"
Projected area	172 sq. in.
Weight (Approx.)	14 lbs
Operating Position	Any
Cap	Recessed Small Cavity (JEDEC No.J1-21)
Bulb	J149A1

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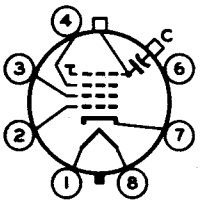
Base. . . . . Small-Button Neoeightar 7-Pin, Arrangement 1, (JEDEC No.B7-208)

Basing Designation for BOTTOM VIEW. 8JR

Pin 1 - Heater
Pin 2 - Grid No.1
Pin 3 - Grid No.2
Pin 4 - Grid No.3
Pin 6 - Internal Connection—Do Not Use
Pin 7 - Cathode



Pin 8 - Heater
Cap - Ultor (Grid No.4, Collector)
C - External Conductive Coating

GRID-DRIVE▲ SERVICE

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

Maximum and Minimum Ratings, *Design-Maximum Values:*

ULTOR VOLTAGE	20000 max. 11000 min.	volts volts
GRID-No.3 (FOCUSING) VOLTAGE:		
Positive value	700 max.	volts
Negative value	350 max.	volts
GRID-No.2 VOLTAGE	600 max. 300 min.	volts volts
GRID-No.1 VOLTAGE:		
Negative-peak value	220 max.	volts
Negative-bias value	154 max.	volts
Positive-bias value	0 max.	volts
Positive-peak value	2 max.	volts
HEATER VOLTAGE	6.9 max. 5.7 min.	volts 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	200 max.	volts

Typical Operating Conditions:

With ultor voltage (E_{c_4k}) of	*16000*	*volts*
and grid-No.2 voltage (E_{c_2k}) of	*500*	*volts*
Grid-No.3 Voltage for focus●	0 to 400	volts
Grid-No.1 Voltage for visual extinction of focused raster★	-43 to -78	volts
Field Strength of Adjustable Centering Magnet♦	0 to 10	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 and Minimum Ratings, *Design-Maximum Values:*

ULTOR-TO-GRID-No.1 VOLTAGE	20000 max. 11000 min.	volts volts
GRID-No.3-TO-GRID-No.1 (FOCUSING) VOLTAGE:		
Positive value	850 max.	volts
Negative value	200 max.	volts
GRID-No.2-TO-GRID-No.1 VOLTAGE	750 max. 450 min.	volts volts
GRID-No.2-TO-CATHODE VOLTAGE	600 max.	volts
CATHODE-TO-GRID-No.1 VOLTAGE:		
Positive-peak value	220 max.	volts
Positive-bias value	154 max.	volts
Negative-bias value	0 max.	volts
Negative-peak value	2 max.	volts
HEATER VOLTAGE	6.9 max. 5.7 min.	volts 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	200 max.	volts

Typical Operating Conditions:

With ultor-to-grid-No.1 voltage ($E_{c_4g_1}$) of	*16000*	*volts*
and grid-No.2-to-grid-No.1 voltage ($E_{c_2g_1}$) of	*500*	*volts*
Grid-No.3-to-Grid-No.1 Voltage for focus●	0 to 400	volts
Cathode-to-Grid-No.1 Voltage for visual extinction of focused raster▲	41 to 69	volts
Field Strength of Adjustable Centering Magnet▲	0 to 10	gausses

Maximum Circuit Values:

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

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

● The grid-No.3 voltage required for optimum focus of any individual tube may have a value anywhere between 0 and 400 volts and is a function of the value of the ultor voltage, ultor current, and grid-No.2 voltage. It changes directly with the ultor voltage at the rate of approximately 46 volts for each 1000-volt change in ultor voltage; inversely with grid-No.2 voltage at the rate of about 60 volts for each 100-volt change in grid No.2 voltage; and inversely with ultor current at the rate of about 60 volts for each 100-microampere change in ultor current. Because this tube has a narrow depth of focus, it is necessary to provide means such as a potentiometer or a 4-tap switch for adjusting the focusing voltage. In general, commercially acceptable focus is obtained if the focusing voltage is within 75 volts of the value

required for optimum focus and if the focusing voltage is maintained to within 75 volts of the optimum value during line-voltage fluctuations.

★ See *Raster-Cutoff-Range Chart for Grid-Drive Service.*

♦ Distance from *Reference Line* for suitable PM centering magnet should not exceed 2-1/4". The specified centering magnet compensates only for the effect which mechanical tube tolerances may have on the location of the undeflected focused spot with respect to the center of the tube face. Maximum field strength of adjustable centering magnet equals:

$$\sqrt{\frac{E_{c_4k} \text{ or } E_{c_4g_1} \text{ (volts)}}{16000 \text{ (volts)}}} \times 10 \text{ gausses}$$

The equipment manufacturer must determine and supply additional compensation for the effects of the earth's magnetic field and extraneous fields due to choice of circuitry and components. The additional compensation should preferably be applied as part of the magnetic field of the deflecting yoke.

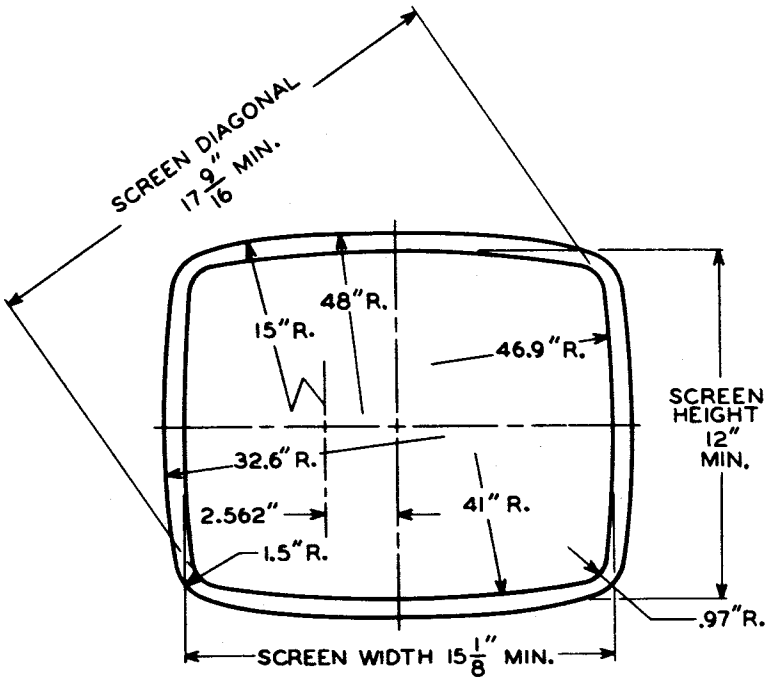
♦ Cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No.1 and the other electrodes.

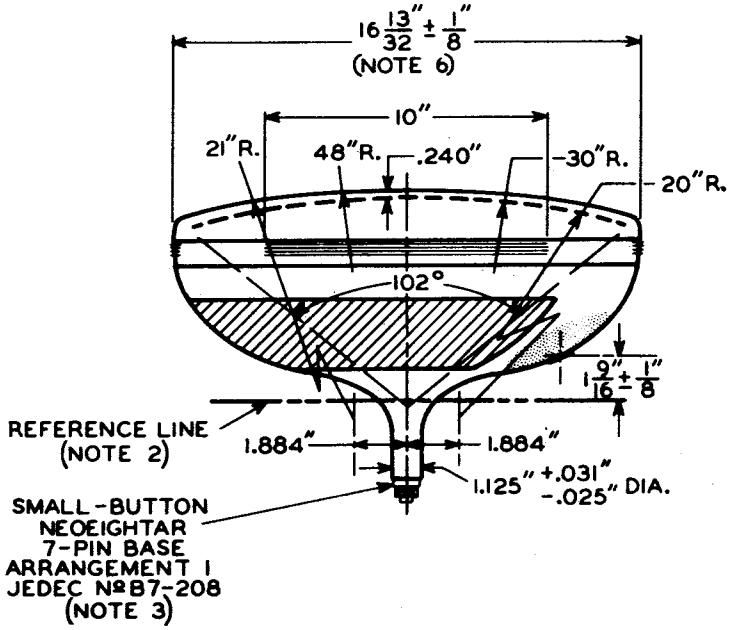
♠ See *Raster-Cutoff-Range Chart for Cathode-Drive Service.*

OPERATING CONSIDERATIONS

X-Ray Warning. When operated at ultor voltages up to 16 kilovolts, this picture tube does not produce any harmful X-ray radiation. However, because the rating of this type permits operation at voltages as high as 20 kilovolts (Design-maximum value), shielding of this picture tube for X-ray radiation may be needed to protect against possible injury from prolonged exposure at close range whenever the operating conditions involve voltages in excess of 16 kilovolts.

Shatter-Proof Cover Over the Tube Face. Following conventional picture-tube practice, it is recommended that the cabinet be provided with a shatterproof, glass cover over the face of this picture tube to protect it from being struck accidentally and to protect against possible damage resulting from tube implosion under some abnormal condition. This safety cover can also provide X-ray protection when required.


SCREEN DIAGONAL
17 9/16" MIN.
15"R.
48"R.
46.9"R.
SCREEN HEIGHT 12" MIN.
32.6"R.
2.562"
41"R.
1.5"R.
.97"R.
SCREEN WIDTH 15 1/8" MIN.


16 13/32" ± 1/8"
(NOTE 6)
10"
21"R.
48"R.
.240"
30"R.
20"R.
102°
1 9/16" ± 1/8"
REFERENCE LINE
(NOTE 2)
1.884"
1.884"
1.125" +.031" -.025" DIA.
SMALL-BUTTON
NEOEIGHTAR
7-PIN BASE
ARRANGEMENT 1
JEDEC Nº B7-208
(NOTE 3)

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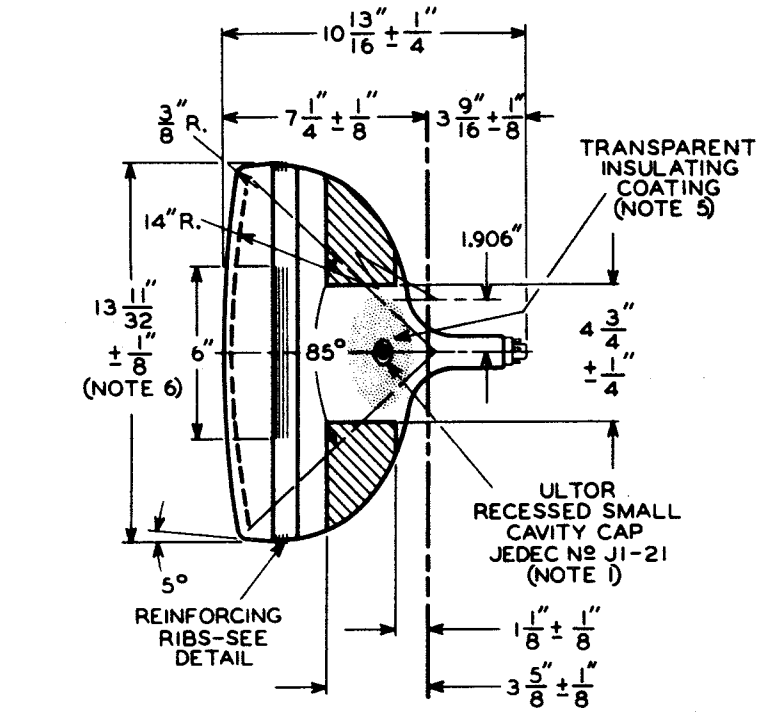

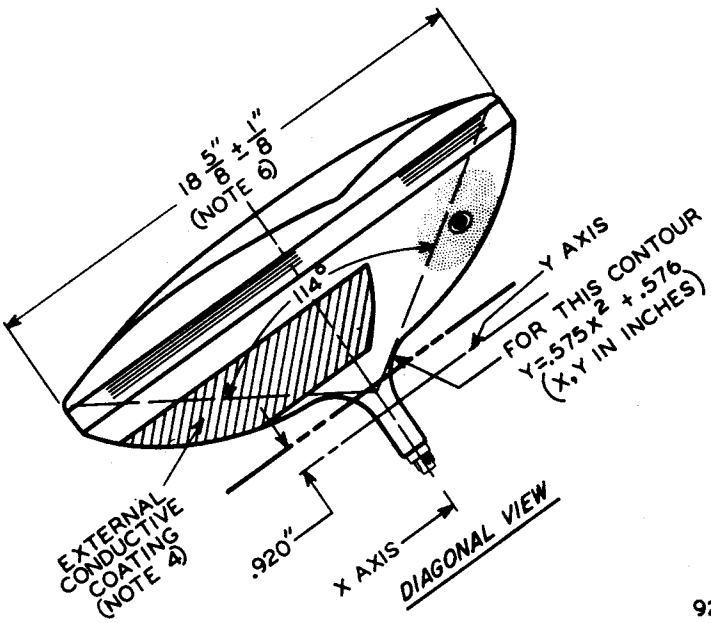

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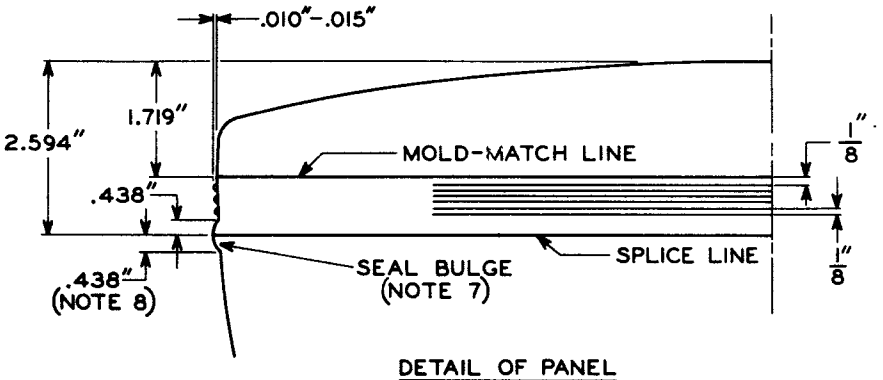

DETAIL OF PANEL

NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN 4 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ULTOR TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF ± 30°. ULTOR TERMINAL IS ON SAME SIDE AS PIN 4.

NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JEDEC No.G-126 (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. THE DESIGN OF THE SOCKET SHOULD BE SUCH THAT THE CIRCUIT WIRING CANNOT IMPRESS LATERAL STRAINS THROUGH THE SOCKET CONTACTS ON THE BASE PINS. BOTTOM CIRCUMFERENCE OF BASE WAFER WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 1-3/4".

NOTE 4: EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

NOTE 5: TO CLEAN THIS AREA, WIPE ONLY WITH SOFT DRY LINT-LESS CLOTH.

NOTE 6: MEASURED AT THE MOLD-MATCH LINE.

NOTE 7: BULGE AT SPLICE-LINE SEAL MAY INCREASE THE INDICATED MAXIMUM VALUE FOR ENVELOPE WIDTH, DIAGONAL, AND HEIGHT BY NOT MORE THAN 1/8", BUT AT ANY POINT AROUND THE SEAL, THE BULGE WILL NOT PROTRUDE MORE THAN 1/16" BEYOND THE ENVELOPE SURFACE AT THE MOLD-MATCH LINE.

NOTE 8: UNDISTURBED AREA BETWEEN MOLD-MATCH LINE AND SPLICE LINE IS 3/8" MINIMUM. THIS SHOULD BE THE MAXIMUM WIDTH OF THE TUBE SUPPORT BAND. TUBE MOUNTING AND YOKE SUPPORT CLAMPS MUST BE SPACED FROM THE TUBE BY USE OF CUSHIONING PADS MADE OF MATERIAL SUCH AS ASPHALT-IMPREG-NATED FELT, OR EQUIVALENT.

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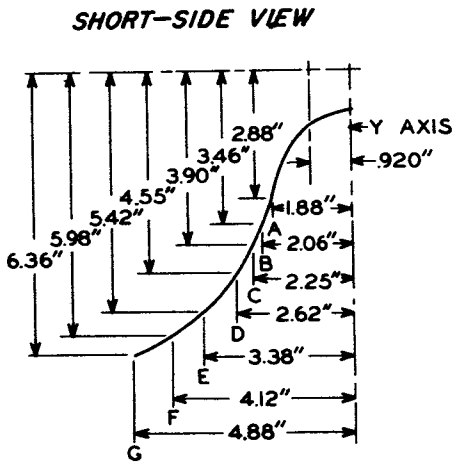
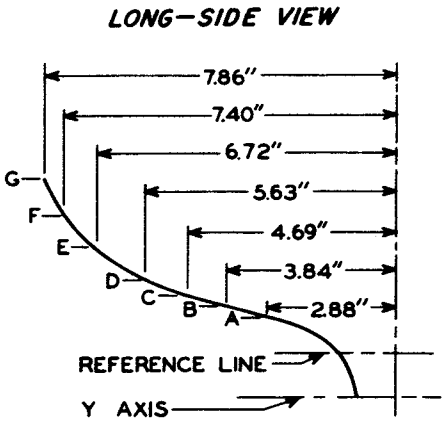
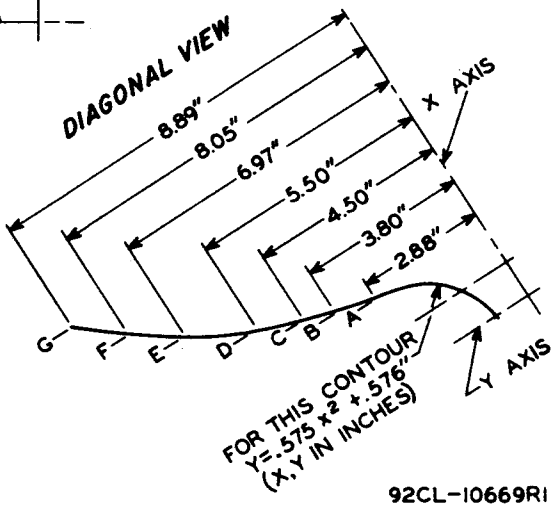
BULB-CONTOUR DIMENSIONS







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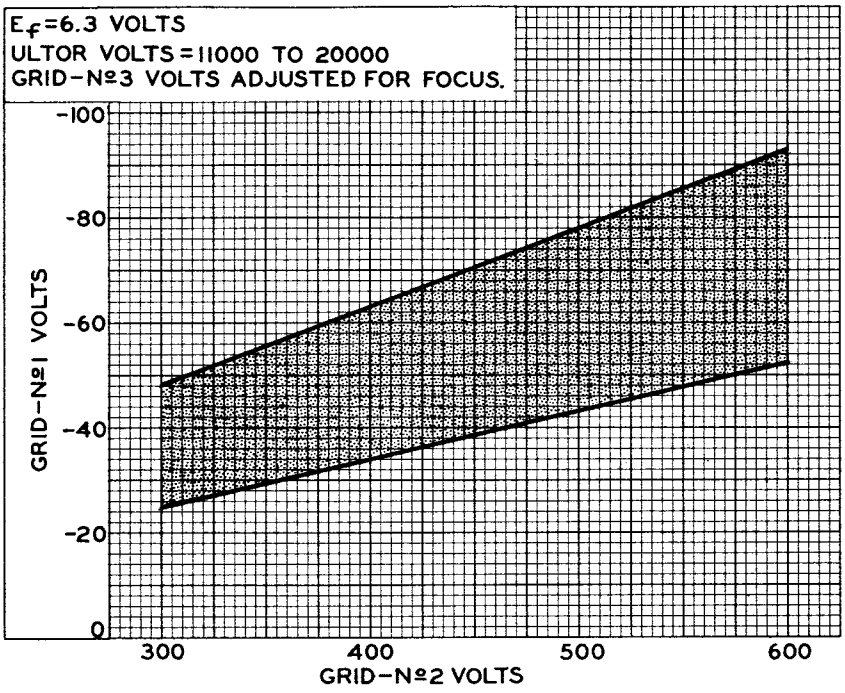
NOTE: PLANES A THROUGH G ARE NORMAL TO THE TUBE AXIS AND AT FIXED LOCATIONS FROM THE Y AXIS. THESE COORDINATES DESCRIBE THE BOGIE-BULB EXTERNAL CONTOUR IN PLANES THROUGH THE TUBE AXIS AND THE RESPECTIVE FACEPLATE AXES.

RASTER-CUTOFF-RANGE CHARTS
Grid-Drive Service



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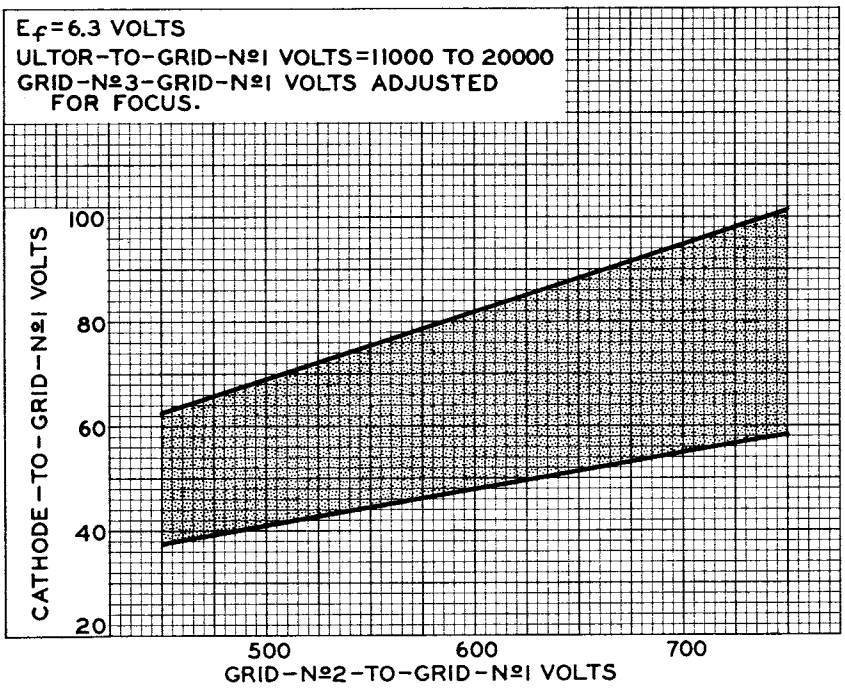
Cathode-Drive Service



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