



7NP4

7NP4

PROJECTION KINESCOPE

METAL-BACKED FLUORESCENT SCREEN
FORCED-AIR COOLED

ELECTROSTATIC FOCUS

MAGNETIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:

Voltage. 6.6 ac or dc volts ←
Current. 0.62 amp

Direct Interelectrode Capacitances (Approx.):

Grid No.1 to All Other Electrodes. 12 μf Cathode to All Other Electrodes. 6 μf

Phosphor (For Curves, see front

of this Section) . . No.4—Silicate-Sulfide Type

Fluorescence and Phosphorescence White

Persistence of Phosphorescence Medium

Focusing Method. Electrostatic

Deflection Method. Magnetic

Deflection Angle (Approx.) 35° Overall Length $19\frac{1}{2}" \pm \frac{5}{8}"$ Greatest Diameter of Bulb (Excluding Side Cap) $7" \pm \frac{3}{16}"$ Maximum Radius of Tube (Including Side Cap). $4\text{--}11\frac{1}{32}"$

Quality Rectangle of Face Plate

(See Outline Drawing). $5" \times 3\frac{3}{4}"$

Cap. Medium

Mounting Position. Any

Base Plastic-Filled, Small-Shell Diheptal 14-Pin

Basing Designation For BOTTOM VIEW 14N

Pin 1—Heater

Pin 2—Cathode

Pin 3—Grid No.1

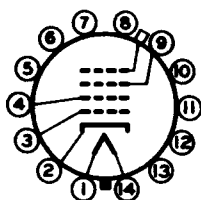
Pin 4—Grid No.2

Pin 5—No Conn.

Pin 6—No Conn.

Pin 7—No Conn.

Pin 8—No Conn.



Pin 9—Grid No.3

Pin 10—No Conn.

Pin 11—No Conn.

Pin 12—No Conn.

Pin 13—Int. Conn.—

Do Not Use

Pin 14—Heater

Cap—Anode

NOTE: Socket contacts for pins No.5, 6, 7, 8, 10, 11,
12, and 13 should be removed so that maximum
insulation is provided for pin No.9.

Air Flow to Face 40 cfm

The specified air flow should be delivered perpendicularly from a
nozzle having a diameter of about 2 inches onto the face of the tube
while it is in operation. The blower should have adequate capacity to
provide for a total system pressure drop including that of the air filter.Face Temperature 100 max. $^\circ\text{C}$

CATHODE-DRIVE* SERVICE

*Unless otherwise specified, voltage values are positive
with respect to grid No.1*

Maximum Ratings, Absolute Values:

ANODE-to-GRID-No.1 VOLTAGE^o. 80000 max. volts*,^o: See next page

← Indicates a change

JUNE 1, 1953

TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



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GRID-No.3-to-GRID-No.1 VOLTAGE	20000 max.	volts
GRID-No.2-to-GRID-No.1 VOLTAGE	850 max.	volts
GRID-No.2-to-CATHODE VOLTAGE	600 max.	volts
CATHODE-to-GRID-No.1 VOLTAGE:		
Positive bias value.	250 max.	volts
Negative bias value.	0 max.	volts
Peak negative value.	2 max.	volts
AVERAGE ANODE CURRENT.	2 max.	ma
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	150 max.	volts
Heater positive with respect to cathode.	150 max.	volts

Typical Operation:

Anode-to-Grid-No.1 Voltage#.	75000	volts
Grid-No.3-to-Grid-No.1 Voltage	16000 - 18000	volts
Grid-No.2-to-Grid-No.1 Voltage		
for Pattern Cutoff.	400 - 600	volts
Cathode-to-Grid-No.1 Voltage	125	volts
Cathode-to-Grid-No.1 Video Voltage:		
Peak positive value (Black level).	0	volts
Peak negative value (White Level).	125	volts
Max. Grid-No.3 Current	15	μamp
Max. Grid-No.2 Current Range	-15 to +15	μamp

GRID-DRIVE SERVICE**

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

Maximum Ratings, Absolute Values:

ANODE VOLTAGE ^o	80000 max.	volts
GRID-No.3 VOLTAGE.	20000 max.	volts
GRID-No.2 VOLTAGE.	600 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value.	250 max.	volts
Positive bias value.	0 max.	volts
Peak positive value.	2 max.	volts
AVERAGE ANODE CURRENT.	2 max.	ma
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	150 max.	volts
Heater positive with respect to cathode.	150 max.	volts

** Grid drive is the operating condition in which the video signal varies the grid-No.1 potential.

o The product of anode-to-grid-No.1 voltage, or anode voltage, and average anode current should be limited to 160 watts.

* Cathode drive is the operating condition in which the video signal varies the cathode potential.

#: See next page.



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PROJECTION KINESCOPE

Typical Operation:

Anode Voltage#	75000	volts
Grid-No.3 Voltage.	16000 - 18000	volts
Grid-No.2 Voltage for Pattern Cutoff .	400 - 600	volts
Grid-No.1 Voltage.	-155	volts
Grid-No.1 Video Voltage:		
Peak negative value (Black level). .	0	volts
Peak positive value (White level). .	155	volts
Max. Grid-No.3 Current	15	μ amp
Max. Grid-No.2 Current Range	-15 to +15	μ amp

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
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Brilliance and definition decrease with decreasing anode-to-grid-No.1 voltage or anode voltage. In general, the anode-to-grid-No.1 voltage or the anode voltage should not be less than 70000 volts.

OPERATING NOTES

X-ray radiation is produced at the face of the 7NP4 when it is operated at its normal anode voltage. These rays can constitute a health hazard unless the tube is adequately shielded. Make sure that the shielding provides the required protection against personal injury.

The air-cooling system required to cool the face of the 7NP4 consists of a blower and an air duct, having an outlet diameter of about 2 inches, directed perpendicularly onto the face of the tube. An air flow of 40 cubic feet per minute at the tube face is required to provide adequate cooling. In a typical system with air filter, the total system static pressure is approximately 0.25 inch of water. The cooling air must not contain water, dust, or other foreign matter. The air-cooling system should be electrically interconnected with the anode power supply to prevent operation of the tube without cooling.

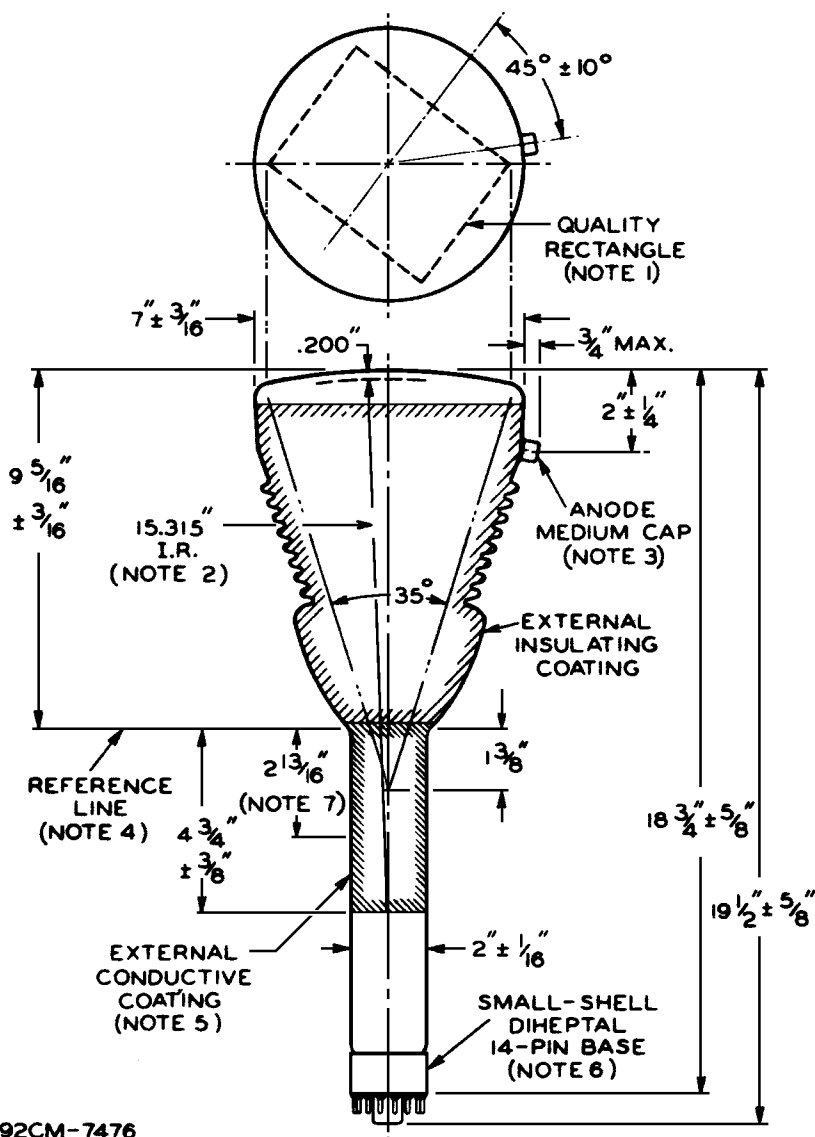
Darkening of face occurs during normal operation of the 7NP4 with resulting decrease in the light transmitted by the face. The rate of darkening increases rapidly with increase in anode voltage, is proportional to the beam current, and is inversely proportional to the scanned area. The darkening develops rapidly during initial operation; thereafter, a gradual increase in the amount of darkening will be observed during the life of the tube. The darkening, however, can be decreased periodically throughout the life of the tube by bleaching the face as prescribed in the 7NP4 bulletin.

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PROJECTION KINESCOPE



NOTE 1: WHEN VIEWED FROM THE FACE OF THE TUBE, THE MINOR AXIS OF THE $5" \times 3\frac{3}{4}"$ QUALITY RECTANGLE IS LOCATED $45^\circ \pm 10^\circ$ IN A COUNTER-CLOCKWISE DIRECTION FROM A PLANE THROUGH THE ANODE TERMINAL AND THE TUBE AXIS.

NOTE 2: INSIDE SURFACE OF FACE PLATE WITHIN THE QUALITY RECTANGLE MAY VARY $\pm 0.006"$ FROM THE SPHERICAL SURFACE HAVING A $15.315"$ RADIUS.

NOTE 3: THE PLANE THROUGH BASE PIN No.9 AND THE TUBE AXIS MAY VARY FROM THE PLANE THROUGH THE ANODE TERMINAL AND THE TUBE AXIS BY AN ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF 10° . THE ANODE TERMINAL IS ON SAME SIDE AS PIN No.9.

NOV. 1, 1950

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CE-7476A



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PROJECTION KINESCOPE

NOTE 4: REFERENCE LINE IS DETERMINED BY POSITION WHERE GAUGE 2.100" $\pm$.001" I.D. AND 3" LONG WILL REST ON BULB CONE.

NOTE 5: EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

NOTE 6: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. SOCKET CONTACTS FOR PINS 5, 6, 7, 8, 10, 11, 12, AND 13 SHOULD BE REMOVED IN ORDER TO PROVIDE MAXIMUM INSULATION FOR PIN No.9.

NOTE 7: EFFECTIVE DEFLECTING FIELD MUST BE WITHIN THIS SPACE.

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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

 $E_f = 6.6$ VOLTSANODE-TO-GRID-Nº1 VOLTS=
70000-80000GRID-Nº3-TO-GRID-Nº1 VOLTS
ADJUSTED TO GIVE FOCUSGRID-Nº2-TO-GRID-Nº1 VOLTS
ADJUSTED TO PATTERN CUTOFFCATHODE BIASED POSITIVE
WITH RESPECT TO GRID
Nº1 (VOLTS) = 125

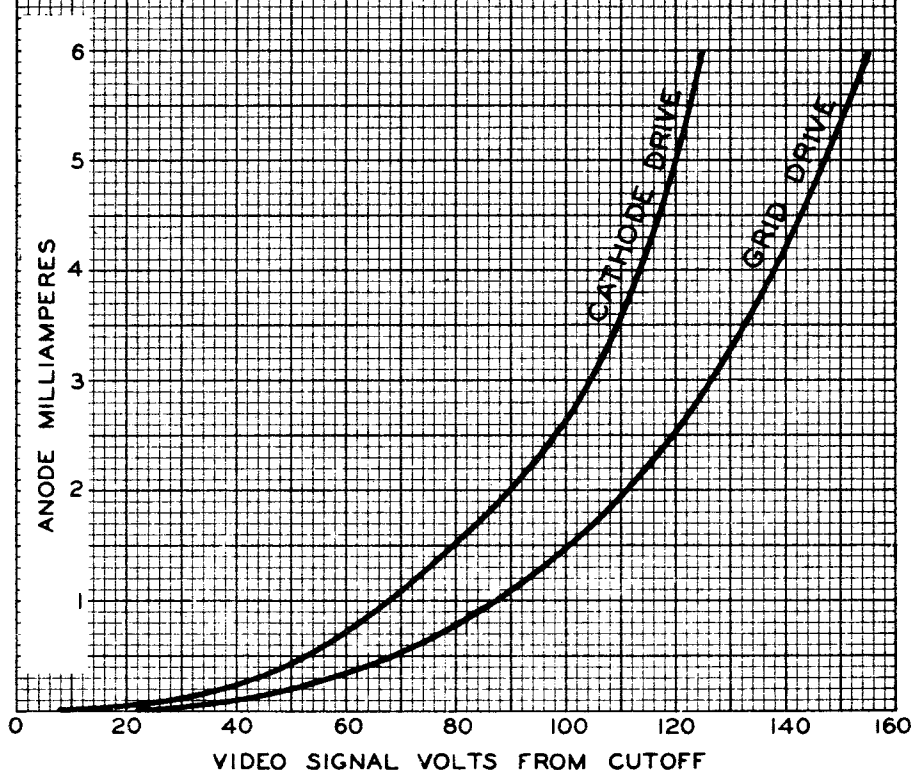
GRID-DRIVE SERVICE

 $E_f = 6.6$ VOLTS

ANODE VOLTS = 70000-80000

GRID Nº3 VOLTS ADJUSTED
TO GIVE FOCUSGRID Nº2 VOLTS ADJUSTED
TO PATTERN CUTOFF

GRID-Nº1 BIAS VOLTS = -155



JULY 26, 1950

TUBE DEPARTMENT

92CM-7514

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



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AVERAGE DRIVE CHARACTERISTICS

CATHODE - DRIVE SERVICE

$E_f = 6.6$ VOLTS

ANODE-TO-GRID-N $\#$ 1 VOLTS = 75000

GRID-N $\#$ 3-TO-GRID-N $\#$ 1 VOLTS ADJUSTED TO GIVE FOCUS

GRID-N $\#$ 2-TO-GRID-N $\#$ 1 VOLTS ADJUSTED TO PATTERN CUTOFF

CATHODE BIASED POSITIVE WITH RESPECT TO GRID N $\#$ 1 (VOLTS) = 125

RASTER SIZE: 5" x 3 $\frac{3}{4}$ "

GRID-DRIVE SERVICE

$E_f = 6.6$ VOLTS

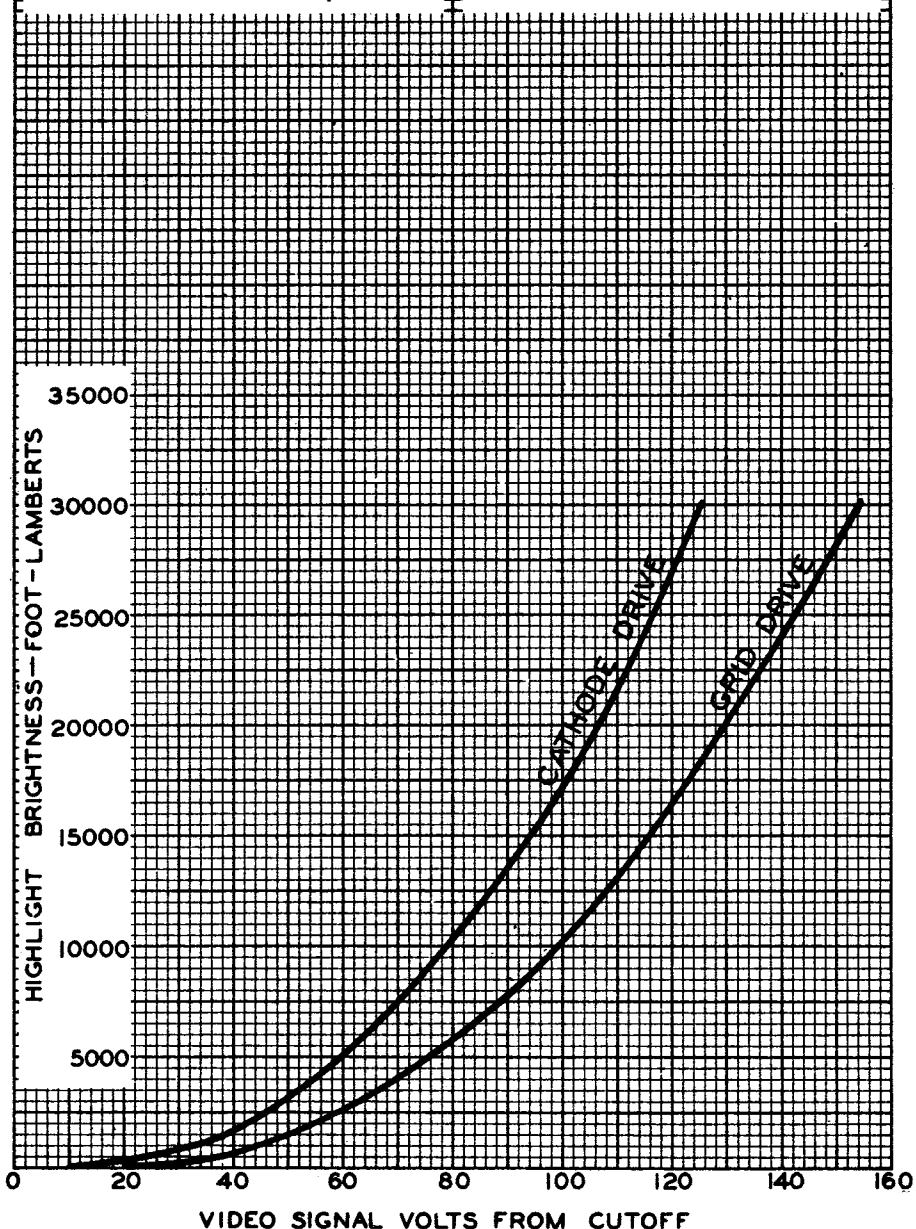
ANODE VOLTS = 75000

GRID-N $\#$ 3 VOLTS ADJUSTED TO GIVE FOCUS

GRID-N $\#$ 2 VOLTS ADJUSTED TO PATTERN CUTOFF

GRID-N $\#$ 1 BIAS VOLTS = -155

RASTER SIZE: 5" x 3 $\frac{3}{4}$ "



JULY 26, 1950

TUBE DEPARTMENT

92CM-7515

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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

 $E_f = 6.6$ VOLTS

ULTOR-TO-GRID-№1 VOLTS = 75000

GRID-№3-TO-GRID-№1 VOLTS ADJUSTED TO GIVE FOCUS

GRID-№2-TO-GRID-№1 VOLTS ADJUSTED TO PATTERN CUTOFF

CATHODE BIASED POSITIVE WITH RESPECT TO GRID №1 (VOLTS) = 125

RASTER SIZE: $5'' \times 3 \frac{3}{4}''$

GRID-DRIVE SERVICE

 $E_f = 6.6$ VOLTS

ULTOR VOLTS = 75000

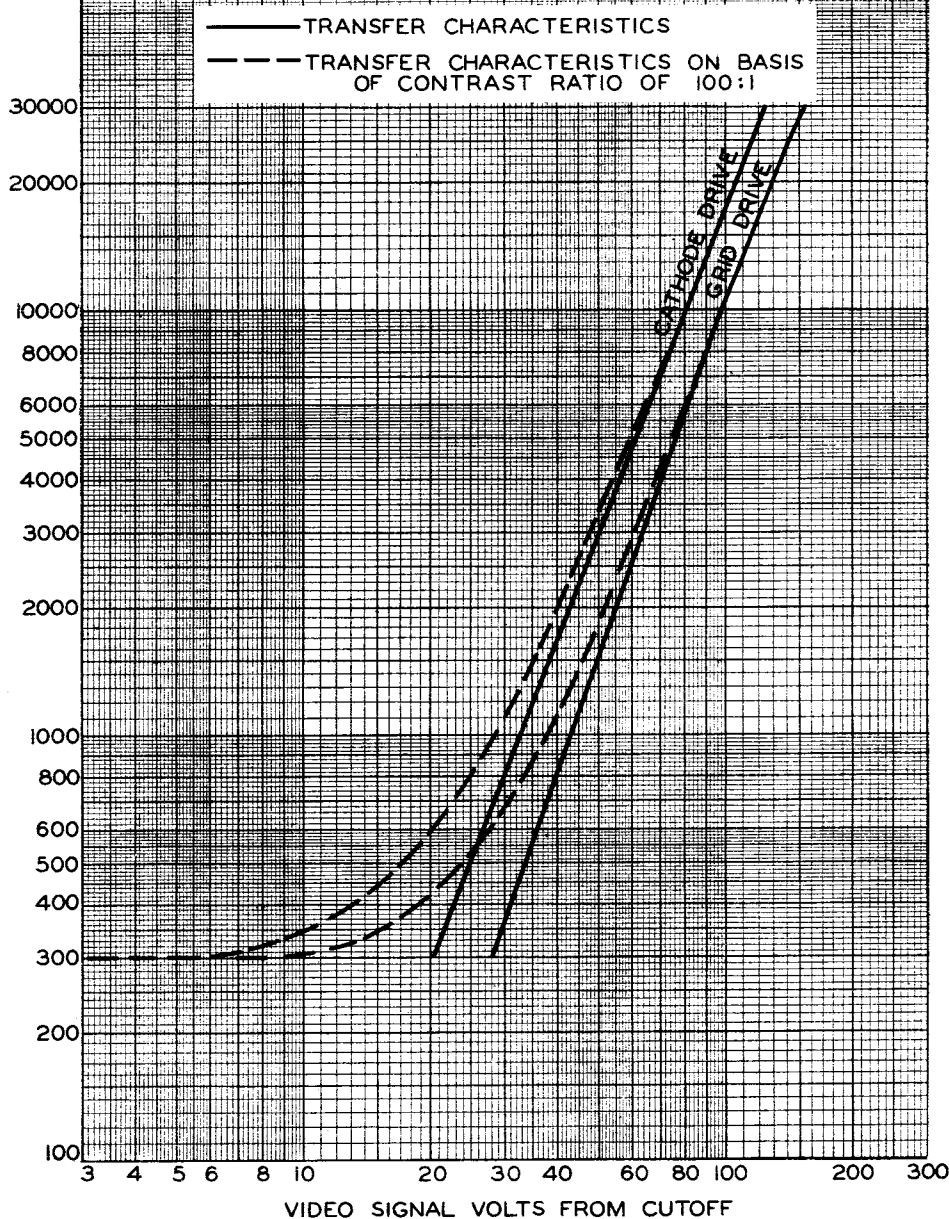
GRID-№3 VOLTS ADJUSTED TO GIVE FOCUS

GRID-№2 VOLTS ADJUSTED TO PATTERN CUTOFF

GRID-№1 BIAS VOLTS = -155

RASTER SIZE: $5'' \times 3 \frac{3}{4}''$

HIGHLIGHT BRIGHTNESS—FOOT-LAMBERTS



JULY 28, 1950

TUBE DEPARTMENT
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CL-7519