



7WP4

7WP4

PROJECTION KINESCOPE

METAL-BACKED FLUORESCENT SCREEN

FORCED-AIR COOLED

ELECTROSTATIC FOCUS

MAGNETIC DEFLECTION

DATA**General:**

Heater, for Unipotential Cathode:

Voltage $6.6 \pm 5\%$ 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) . . . P4—Silicate-Sulfide Type

Fluorescence and Phosphorescence White

Persistence of Phosphorescence Medium

Focusing Method Electrostatic

Deflection Method Magnetic

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

Quality Rectangle of Faceplate

(See Outline Drawing) $5" \times 3-3/4"$

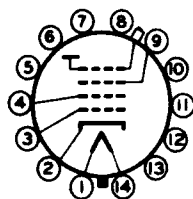
Refractive Index for Faceplate Glass 1.469

Cap Medium (JETEC No.C1-5)

Mounting Position Any

Base Plastic-Filled, Small-Shell Diheptal 14-Pin
(JETEC No.B14-45)**BOTTOM VIEW**

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—Ultor
 (Grid No.4,
 Collector)

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. $^\circ\text{C}$

JULY 1, 1952

TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



PROJECTION KINESCOPE

CATHODE-DRIVE* SERVICE

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

Maximum Ratings, Absolute Values:

ULTOR [•] -to-GRID-No.1 VOLTAGE ^o	80000 max.	volts
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 ULTOR 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:

Ultor-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:

ULTOR [•] VOLTAGE ^o	80000 max.	volts
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- In the 7WP4, grid No.4 which has the ultor function and collector are connected together within the tube and are conveniently referred to collectively as "ultor". The "ultor" in a cathode-ray tube is the electrode, or the electrode in combination with one or more additional electrodes connected within the tube to it, to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection.

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

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

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

See next page.



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PROJECTION KINESCOPE

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 ULTOR 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:

Ultror 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 ultor-to-grid-No.1 voltage or ultor voltage. In general, the ultor-to-grid-No.1 voltage or the ultor voltage should not be less than 70000 volts.

OPERATING NOTES

X-ray radiation is produced at the face of the 7WP4 when it is operated at its normal ultor voltage. For x-ray shielding considerations, see sheet X-RAY PRECAUTIONS FOR CATHODE-RAY TUBES at front of this Section.

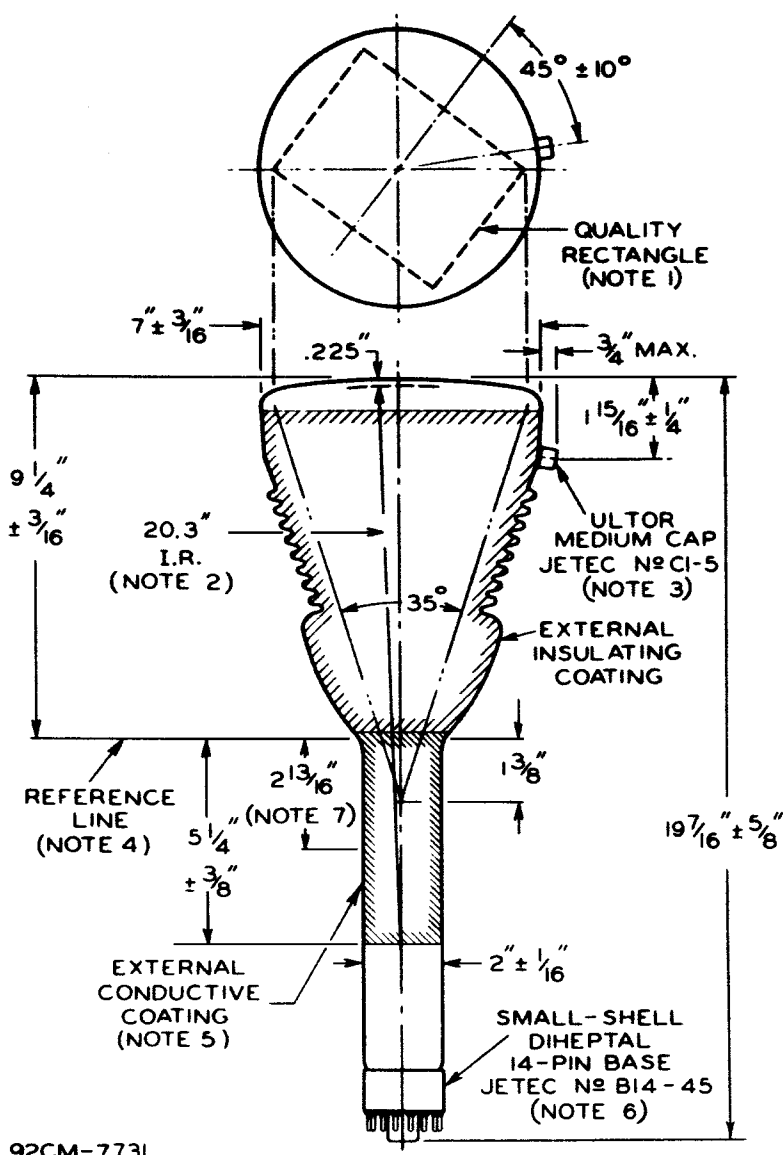
The air-cooling system required to cool the face of the 7WP4 consists of a blower and an air duct, having an outlet diameter of about 2 inches, directed perpendicularly onto the face of the tube. An air flow of 40 cubic feet per minute at the tube face is required to provide adequate cooling. In a typical 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 ultor power supply to prevent operation of the tube without cooling.



PROJECTION KINESCOPE

OPERATING NOTES (Cont'd)

Darkening of face occurs during normal operation of the 7WP4 with resulting decrease in the light transmitted by the face. The rate of darkening increases rapidly with increase in ultor 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 bulletin.



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PROJECTION KINESCOPE

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

NOTE 2: INSIDE SURFACE OF FACEPLATE WITHIN THE QUALITY RECTANGLE MAY VARY ± 0.006 " FROM THE SPHERICAL SURFACE HAVING A 20.3" RADIUS.

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

NOTE 4: REFERENCE LINE IS DETERMINED BY POSITION WHERE GAUGE 2.100" ± 0.001 " 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 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

 $E_f = 6.6$ VOLTSULTOR - 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

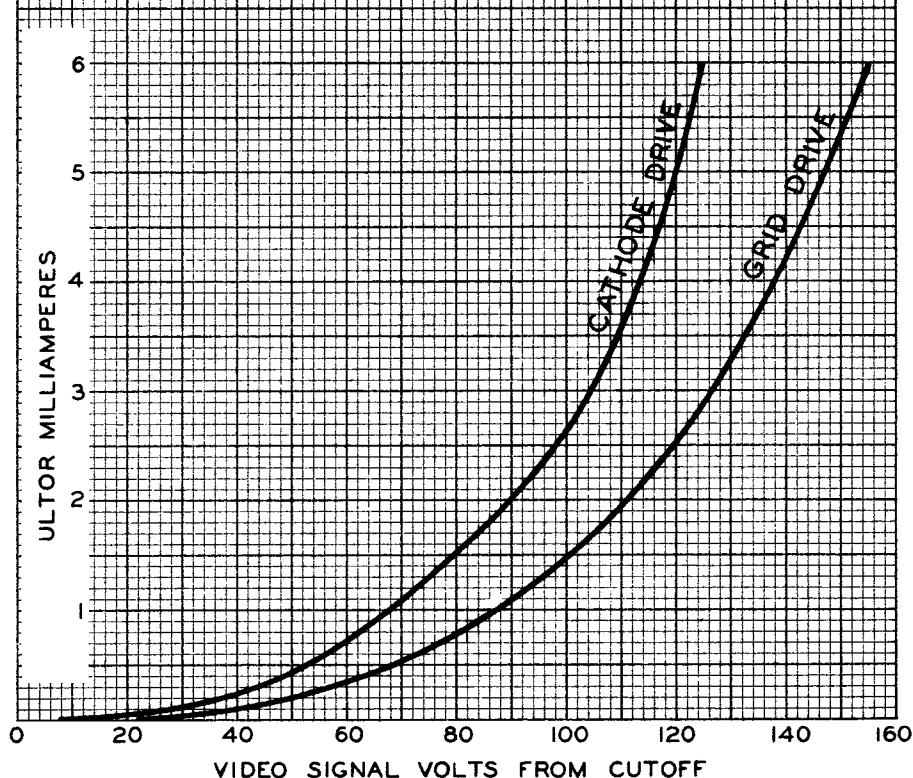
GRID-DRIVE SERVICE

 $E_f = 6.6$ VOLTS

ULTOR VOLTS = 70000-80000

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

GRID-Nº1 BIAS VOLTS = -155



JULY 26, 1950

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AVERAGE DRIVE CHARACTERISTICS

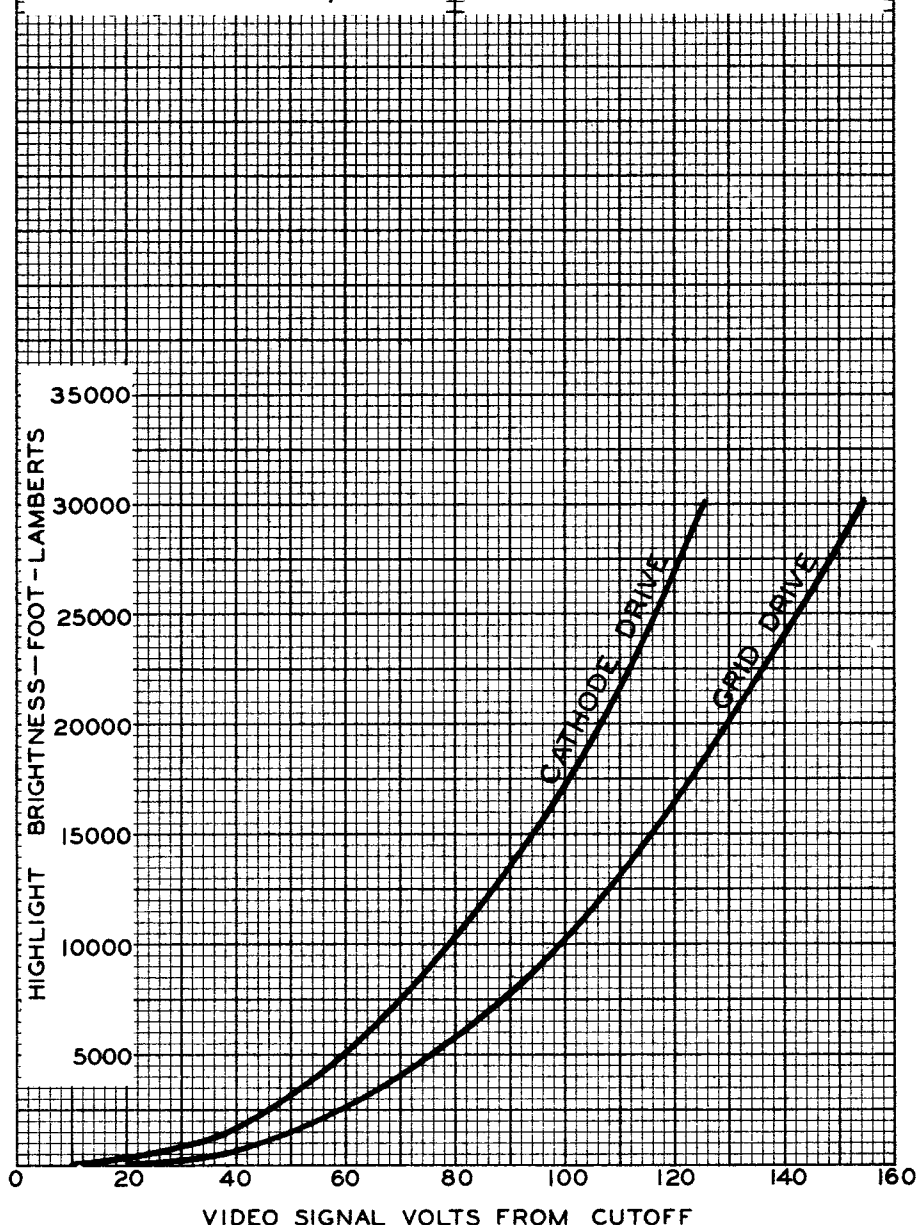
CATHODE - DRIVE SERVICE

 $E_f = 6.6$ VOLTSULTOR - TO - GRID - N^o1 VOLTS = 75000GRID - N^o3 - TO - GRID - N^o1 VOLTS
ADJUSTED TO GIVE FOCUSGRID - N^o2 - TO - GRID - N^o1 VOLTS
ADJUSTED TO PATTERN CUTOFFCATHODE BIASED POSITIVE
WITH RESPECT TO GRID
N^o1 (VOLTS) = 125RASTER SIZE: 5" x 3 $\frac{3}{4}$ "

GRID-DRIVE SERVICE

 $E_f = 6.6$ VOLTS

ULTOR VOLTS = 75000

GRID - N^o3 VOLTS ADJUSTED
TO GIVE FOCUSGRID - N^o2 VOLTS ADJUSTED
TO PATTERN CUTOFFGRID - N^o1 BIAS VOLTS = -155RASTER SIZE: 5" x 3 $\frac{3}{4}$ "

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TUBE DEPARTMENT

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AVERAGE DRIVE CHARACTERISTICS

CATHODE-DRIVE SERVICE

$E_f = 6.6$ VOLTS
 ULTOR-TO-GRID-N $\approx$ 1 VOLTS = 75000
 GRID-N $\approx$ 3-TO-GRID-N $\approx$ 1 VOLTS
 ADJUSTED TO GIVE FOCUS
 GRID-N $\approx$ 2-TO-GRID-N $\approx$ 1 VOLTS
 ADJUSTED TO PATTERN
 CUTOFF
 CATHODE BIASED POSITIVE
 WITH RESPECT TO GRID
 N $\approx$ 1 (VOLTS) = 125
 RASTER SIZE: 5" x 3 $\frac{3}{4}$ "

GRID-DRIVE SERVICE

$E_f = 6.6$ VOLTS
 ULTOR VOLTS = 75000
 GRID-N $\approx$ 3 VOLTS ADJUSTED
 TO GIVE FOCUS
 GRID-N $\approx$ 2 VOLTS ADJUSTED
 TO PATTERN CUTOFF
 GRID-N $\approx$ 1 BIAS VOLTS = -155
 RASTER SIZE: 5" x 3 $\frac{3}{4}$ "

