6499

RADECHON

CHARGE STORAGE TUBE
SINGLE-BEAM, BARRIER-GRID TYPE
NON-EQUILIBRIUM WRITING CAPACITANCE-DISCHARGE READING

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	9	μμf
Deflecting electrode DJ_1 to all other electrodes	13	μμf
Deflecting electrode DJ_2 to all other electrodes	13	μμf
Deflecting electrode DJ_3 to all other electrodes	11.5	μμf
Deflecting electrode DJ_4 to all other electrodes	11.5	μμf
DJ_1 to DJ_2	3	μμf
DJ_3 to DJ_4	3	μμf
Grid No.5 to backing-electrode	800	μμf
Grid No.5 and backing-electrode to collector	4	μμf
Collector to all other electrodes & external cylindrical shield	*See Curve*	
Focusing Method	Electrostatic	
Deflection Method	Electrostatic	
Overall Length	11-27/32" ± 3/8"	
Greatest Diameter of Tube	3.30" ± 0.05"	
Minimum Useful Storage-Surface Diameter	2-1/4"	
Mounting Position	Any except those positions where the diheptal base is up and the tube axis is at an angle of less than 60° from the vertical.	
Weight (Approx.)	1 lb	
Base:		
On large end of tube	Small-Button Twentyninar 8-Pin (JETEC No.E8-19)	

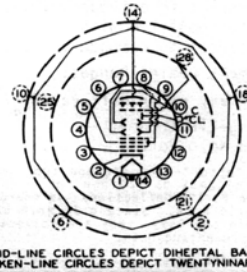
VIEW OF TWENTYNINAR-BASE END OF TUBE

Pin 2, Pin 6, Pin 10, Pin 14, Pin 18 } Multiple Connections to Backing-Electrode. Only One Need be Used

Pin 21 - No Connection

Pin 25 - No Connection

Pin 28 - Grid No.5



PINS 2,6,10,14,18: ON 1-7/8" DIA. PIN CIRCLE

PINS 21,25,28: ON 7/8" DIA. PIN CIRCLE

SOLID-LINE CIRCLES DEPICT DIHEPTAL BASE; BROKEN-LINE CIRCLES DEPICT TWENTYNINAR BASE

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On small end of tube. . . . . Small-Shell Diheptal 14-Pin (JETEC No.B14-45)

VIEW OF DIHEPTAL-BASE END OF TUBE

Pin 1 - Heater
Pin 2 - Cathode
Pin 3 - Grid No.1
Pin 4 - Internal Connection-Do Not Use
Pin 5 - Grid No.3
Pin 6 - No Connection
Pin 7 - Deflecting Electrode DJ_4
Pin 8 - Deflecting Electrode DJ_3
Pin 9 - Ultor (Grids No.2 & No.4)
Pin 10 - Deflecting Electrode DJ_2
Pin 11 - Deflecting Electrode DJ_1
Pin 12 - No Connection
Pin 13 - Same as Pin 4
Pin 14 - Heater
C,CL - External Conductive Coating, Collector, Internal Shield, Flange between Neck and Large Part of Tube

All voltages are with respect to cathode unless otherwise specified

Maximum Ratings, *Absolute Values:*

BACKING-ELECTRODE-TO-GRID-No.5 (BARRIER-GRID) VOLTAGE:		
Backing-electrode positive with respect to grid No.5	100 max.	volts
Backing-electrode negative with respect to grid No.5	100 max.	volts
COLLECTOR-TO-GRID-No.5 VOLTAGE:		
Positive value	100 max.	volts
Negative value	0 max.	volts
ULTOR• VOLTAGE	1500 max.	volts
GRID-No.3 VOLTAGE.	500 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value.	200 max.	volts
Positive bias value.	0 max.	volts
Positive peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	125 max.	volts
Heater positive with respect to cathode	10 max.	volts

Equipment Design Ranges:

*For any ultor voltage (E_{c_4}) between 1000 and 1500 volts**

Backing-Electrode-to-Grid-No.5 Voltage. . . . See Note 1

• The "ultor" in a storage 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 6499, the ultor function is performed by grid No.4. Since grid No.4 and grid No.2 are connected together within the 6499, they are collectively referred to simply as "ultor" for presenting data.

*: See next page.

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Collector-to-Grid-No.5 Voltage	0 to 50	volts
Grid-No.3 Voltage for Focus with grid-No.1 volts = 0	14% to 26% of E_{c_4}	volts
Grid-No.1 Voltage for collector-current cutoff	-2.5% to -4.7% of E_{c_4}	volts
Collector Current for grid-No.1 volts = 0	20 to 50	μamp
Max. Cathode Current for grid-No.1 volts = 0	*See Curve*	
Deflection Factors:		
DJ_1 and DJ_2	85 to 105 v dc/in./kv of E_{c_4}	
DJ_3 and DJ_4	78 to 96 v dc/in./kv of E_{c_4}	
Spot Position	See Note 2	
Signal-Uniformity Ratio	See Note 3	

Examples of Use Design Ranges:

For ultor voltage of	*1000*	*volts*
Grid-No.3 Voltage for Focus with grid-No.1 volts = 0	140 to 260	volts
Grid-No.1 Voltage for collector-current cutoff	-25 to -47	volts
Deflection Factors:		
DJ_1 and DJ_2	85 to 105	v dc/in.
DJ_3 and DJ_4	78 to 96	v dc/in.

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
Resistance in Any Deflecting-Electrode Circuit#	1.0 max.	megohm

* In general, the recommended minimum ultor voltage should not be less than 1000 volts. Signal output and resolution decrease with decreasing ultor voltage. Secondary emission characteristics of the dielectric layer limit the maximum ultor voltage to 1500 volts.

\# It is recommended that all deflecting-electrode-circuit resistances be approximately equal.

Note 1: The backing-electrode, grid No.5, and ultor are usually operated at the same dc potential. During the writing cycle, the backing-electrode may be pulsed to ±60 volts with respect to grid No.5.

Note 2: The undeflected focused spot will fall within a circle having a diameter equal to 10% of the minimum storage-surface diameter and having its center coincident with the center of the storage surface.

Spot position is calculated as follows: With heater voltage of 6.3 volts, ultor voltage of 1000 volts, grid-No.5 voltage of 1000 volts, collector voltage of 1050 volts, grid-No.3 voltage adjusted to give focus, grid-No.1 voltage adjusted for 15 microamperes peak collector current, each deflecting electrode connected through a 1-megohm resistor to ultor, and the tube shielded from all extraneous fields, the voltages

Note 3: See next page.

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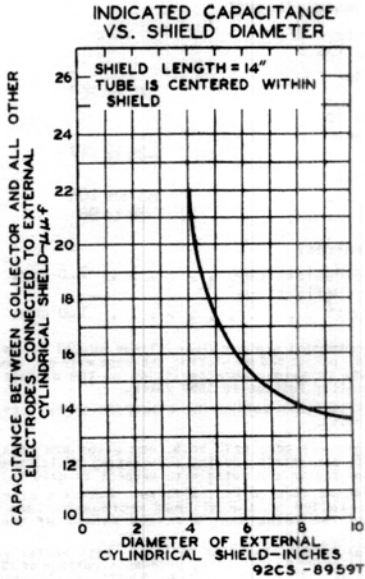
required to displace the beam from its undeflected position to the edge of the storage surface in the direction of each deflecting electrode are recorded as *a* for DJ_1, *b* for DJ_2, *c* for DJ_3, and *d* for DJ_4.

$$\text{Spot Position in \% of Storage-Surface Diameter} = 1/2\sqrt{\left(\frac{b-a}{b+a}\right)^2 + \left(\frac{d-c}{d+c}\right)^2} \times 100$$

Note 3: With voltages as specified in Note 2, and with a signal written into storage by applying a series of well-formed symmetrical square waves to grid No. 1 such that a series of 25 equally spaced stored elements are written across a single line scan, the ratio of the maximum to minimum signal amplitude observed as the single line scan is moved across the storage surface will not exceed 1.35.

OPERATING CONSIDERATIONS

Shielding. The use of a magnetic shield of high-permeability material surrounding the tube is recommended. This shield prevents the effect of stray fields in causing unwanted deflection of the electron beam.



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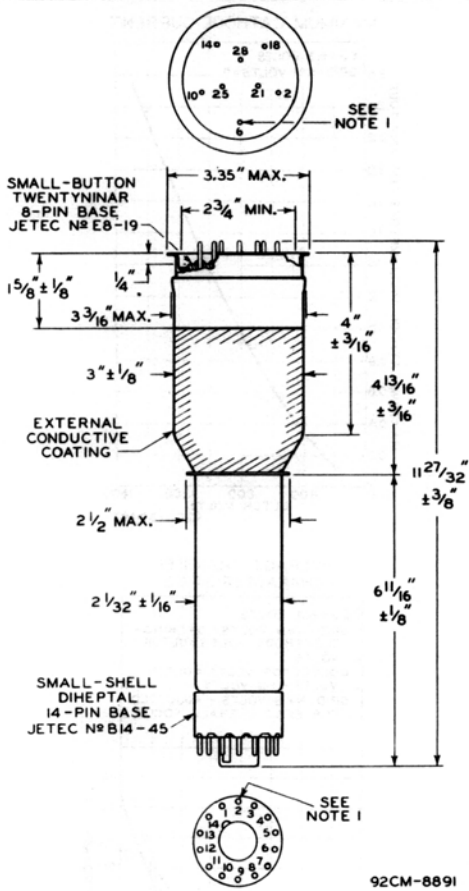

NOTE 1: THE ANGLE BETWEEN PLANE THROUGH PIN 6 OF TWENTY-NINAR BASE AND TUBE AXIS, AND PLANE THROUGH PIN 2 OF DIHEPTAL BASE AND TUBE AXIS WILL NOT EXCEED 10°. THE INDICATED PINS ARE BOTH ON THE SAME SIDE OF THE TUBE.

NOTE 2: DEFLECTING ELECTRODES DJ_1 & DJ_2 ARE NEARER THE TARGET. DEFLECTING ELECTRODES DJ_3 & DJ_4 ARE NEARER THE DIHEPTAL BASE.

NOTE 3: ANGLE BETWEEN DJ_1 & DJ_2 DEFLECTION PATH AND DJ_3 & DJ_4 DEFLECTION PATH IS 90° ± 3°.

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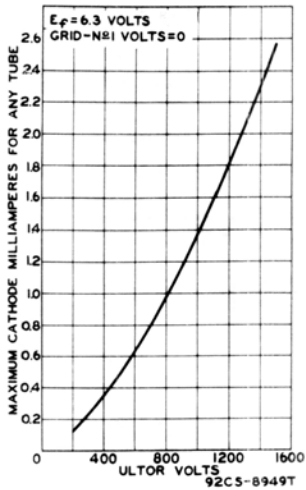
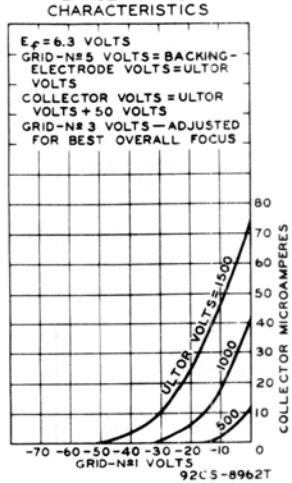
MAXIMUM CATHODE CURRENT



AVERAGE TRANSFER CHARACTERISTICS



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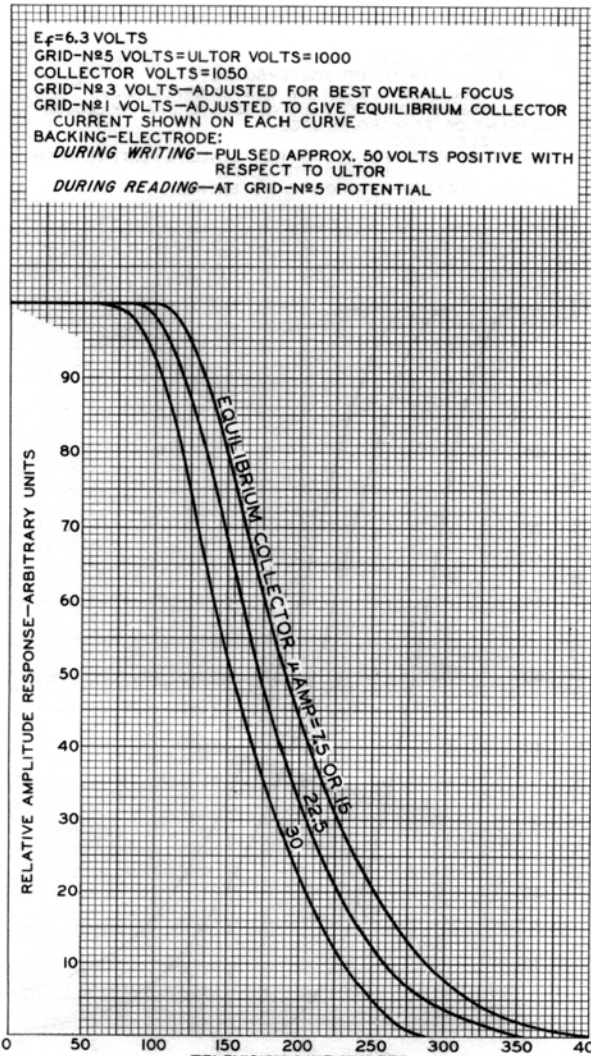
RESOLUTION CHARACTERISTICS



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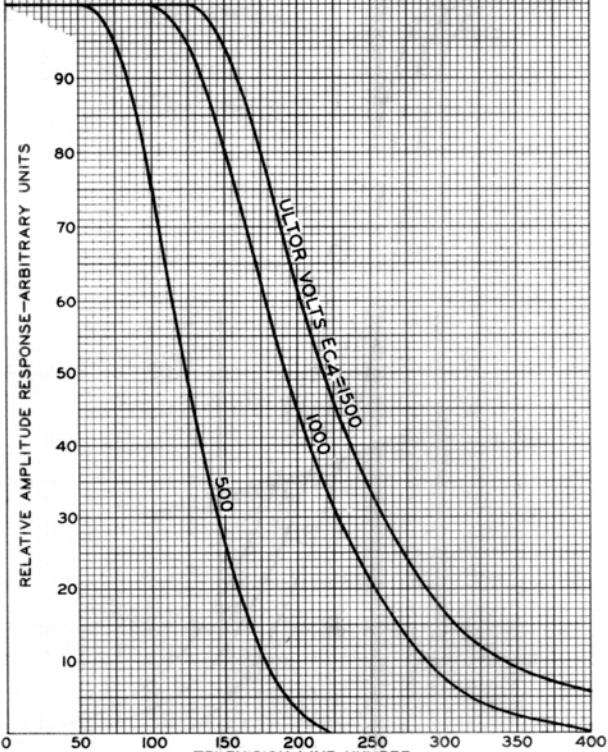
RESOLUTION CHARACTERISTICS

E_f=6.3 VOLTS
GRID-№5 VOLTS=ULTOR VOLTS
COLLECTOR VOLTS=ULTOR VOLTS+50 VOLTS
GRID-№3 VOLTS—ADJUSTED FOR BEST OVERALL FOCUS
GRID-№1 VOLTS—ADJUSTED TO GIVE EQUILIBRIUM COLLECTOR CURRENT OF 7.5 MICROAMPERES
BACKING-ELECTRODE:
DURING WRITING—PULSED APPROX. 50 VOLTS POSITIVE WITH RESPECT TO ULTOR
DURING READING—AT GRID-№5 POTENTIAL



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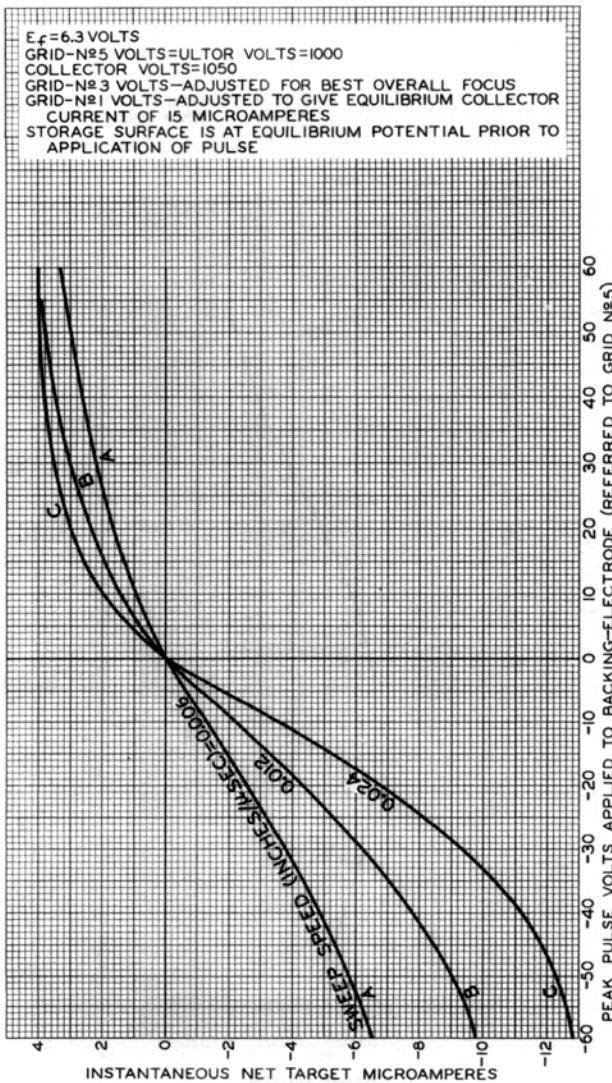
TYPICAL TARGET CHARACTERISTICS



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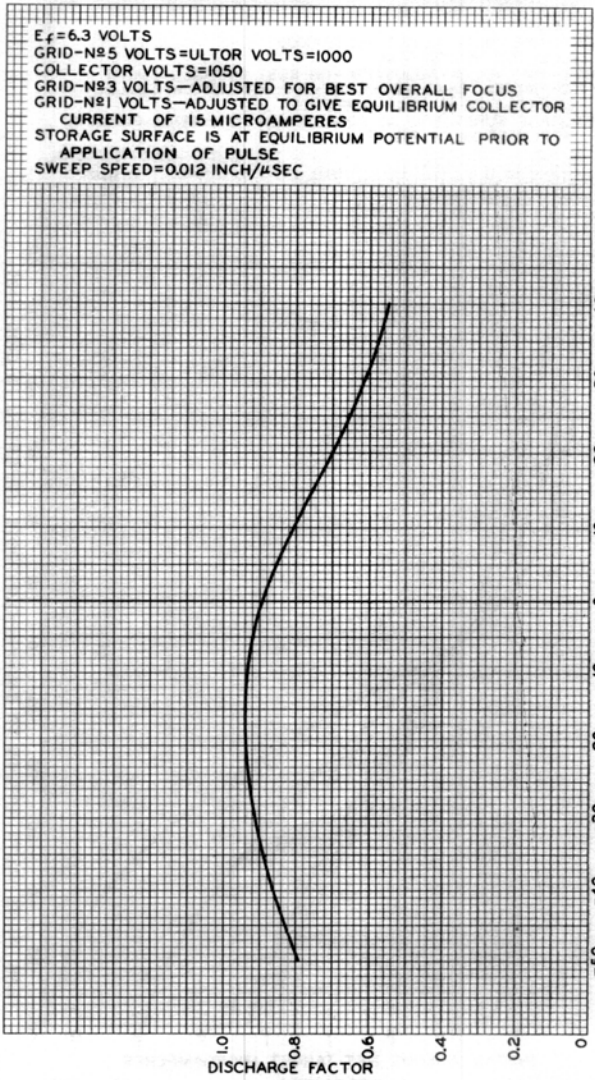
APPROXIMATE DISCHARGE-FACTOR CHARACTERISTIC



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