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OSCILLOGRAPH TUBE

POST-DEFLECTION ACCELERATOR

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

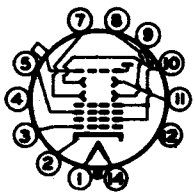
DATA

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	8	μμf
Cathode to All Other Electrodes	5	μμf
DJ_1 to DJ_2	2.5	μμf
DJ_3 to DJ_4	1.3	μμf
DJ_1 to All Other Electrodes	9	μμf
DJ_2 to All Other Electrodes	9	μμf
DJ_3 to All Other Electrodes	5	μμf
DJ_4 to All Other Electrodes	6	μμf
Faceplate, Flat		Clear Glass
Phosphor (For Curves, see front of this Section)		P1
Fluorescence and Phosphorescence		Green
Persistence of Phosphorescence		Medium
Focusing Method		Electrostatic
Deflection Method		Electrostatic
Overall Length		16-3/4" ± 3/8"
Greatest Diameter of Bulb		5-1/4" ± 3/32"
Minimum Useful Screen Diameter		4-9/16"
Bulb		J42
Weight (Approx.)		2-1/2 lbs
Mounting Position		Any
Cap	Recessed Small Ball (JETEC No.J1-22)	
Base	Medium-Shell Diheptal 12-Pin (JETEC No.B12-37)	

BOTTOM VIEW

Pin 1 - Heater
Pin 2 - Cathode
Pin 3 - Grid No.1
Pin 4 - No Connection—Do Not Use
Pin 5 - Grid No.3
Pin 7 - Deflecting Electrode DJ_3
Pin 8 - Deflecting Electrode DJ_4



Pin 9 - Ultor (Grid No.2, Grid No.4)
Pin 10 - Deflecting Electrode DJ_2
Pin 11 - Deflecting Electrode DJ_1
Pin 12 - No. Conn.
Pin 14 - Heater
Cap - Post-Ultor (Grid No.5, Collector)

DJ_1 and DJ_2 are nearer the screen
DJ_3 and DJ_4 are nearer the base

With DJ_1 positive with respect to DJ_2, the spot is deflected toward pin 5. With DJ_3 positive with respect to DJ_4, the spot is deflected toward pin 2.

The plane through the tube axis and each of the following items may vary from the trace produced by DJ_1 and DJ_2 by

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the following angular tolerances (measured about the tube axis): Pin 5, 10°; side terminal (on same side of tube as pin 5), 10°. Angle between $DJ_1 - DJ_2$ trace and $DJ_3 - DJ_4$ trace is 90° ± 1.5°.

Maximum Ratings, *Design-Center Values:*

POST-ULTOR● VOLTAGE	6000 max.	volts
ULTOR▲ VOLTAGE	2600 max.	volts
RATIO OF POST-ULTOR VOLTAGE TO ULTOR VOLTAGE	2.3:1 max.	
GRID-No.3 VOLTAGE	1000 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 VOLTAGE BETWEEN ULTOR AND ANY DEFLECTING ELECTRODE	500 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	125 max.	volts
Heater positive with respect to cathode.	125 max.	volts

Equipment Design Ranges:

For any post-ultor voltage (E_{c_5}) between 2000 and 6000 volts and any ultor voltage (E_{c_4}) between 1500** and 2600 volts*

Grid-No.3 Voltage for Focus	20% to 34.5% of E_{c_4}	volts
Grid-No.1 Voltage for Visual Extinction of Undeflected Focused Spot	2.6% to 4.3% of E_{c_4}	volts
Grid-No.3 Current for Any Operating Condition	−15 to +10	μamp
Deflection Factors:#		
When $E_{c_5} = 2 \times E_{c_4}$		
DJ_1 & DJ_2	26.5 to 36	v dc/in./kvof E_{c_4}
DJ_3 & DJ_4	18 to 24	v dc/in./kvof E_{c_4}
When $E_{c_5} = E_{c_4}$		
DJ_1 & DJ_2	21.5 to 29	v dc/in./kvof E_{c_4}
DJ_3 & DJ_4	14.5 to 19.5	v dc/in./kvof E_{c_4}
Spot Position	##	

Examples of Use of Design Ranges:

For post-ultor voltage of	*2000*	*3000*	*4000*	*volts*
and ultor voltage of	*2000*	*1500*	*2000*	*volts*
Grid-No.3 Volt. for Focus	400 to 690	300 to 515	400 to 690	volts
Grid-No.1 Volt.□	−52 to −87	−39 to −65	−52 to −87	volts

●,▲,○,*,**,#,##,□: See next page.

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Deflection Factors:#				
DJ_1 & DJ_2	43 to 58	40 to 54	53 to 72	v dc/in.
DJ_3 & DJ_4	29 to 39	27 to 36	36 to 48	v dc/in.

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
Resistance in Any Deflecting-Electrode Circuit■	5.0 max.	megohms

● The "post-ultor" in a cathode-ray tube is the electrode to which is applied a dc voltage higher than the ultor voltage for accelerating the electrons in the beam after its deflection. In the 5AB-types, the post-deflection acceleration function and the collector function are both performed by grid No.5 which is conveniently referred to as "post-ultor".

▲ 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 5AB-types, the ultor function is performed by grid No.4. Since grid No.4 and grid No.2 are connected together within the 5AB-types, they are collectively referred to simply as "ultor" for convenience in presenting data and curves.

○ At or near this rating, the effective resistance of the ultor supply should be adequate to limit the ultor input power to 6 watts.

* It is recommended that the post-ultor voltage be not less than 3000 volts for high-speed scanning.

** Recommended minimum value of ultor voltage.

\# The deflecting electrodes DJ_3 and DJ_4 are designed to have extra-high deflection sensitivity and consequently produce less than full-screen deflection. With post-deflection acceleration, the length of deflection may be limited to 4 inches; without post-deflection acceleration, deflection to full screen diameter will ordinarily be obtained. These electrodes are, therefore, more suitable for the signal voltage than for the time-base voltage.

\#\# With heater voltage of 6.3 volts, post-ultor voltage of 4000 volts, ultor voltage of 2000 volts, grid-No.3 voltage adjusted to give focus, grid-No.1 voltage adjusted to give spot that is just visible, each deflecting electrode connected through a 1-megohm resistor to ultor, and tube shielded from all extraneous fields, the center of the undeflected, focused spot will fall within a circle having a 12.5-mm radius concentric with the center of the tube face.

□ For visual cutoff of undeflected focused spot.

■ It is recommended that the deflecting-electrode-circuit resistances be approximately equal.

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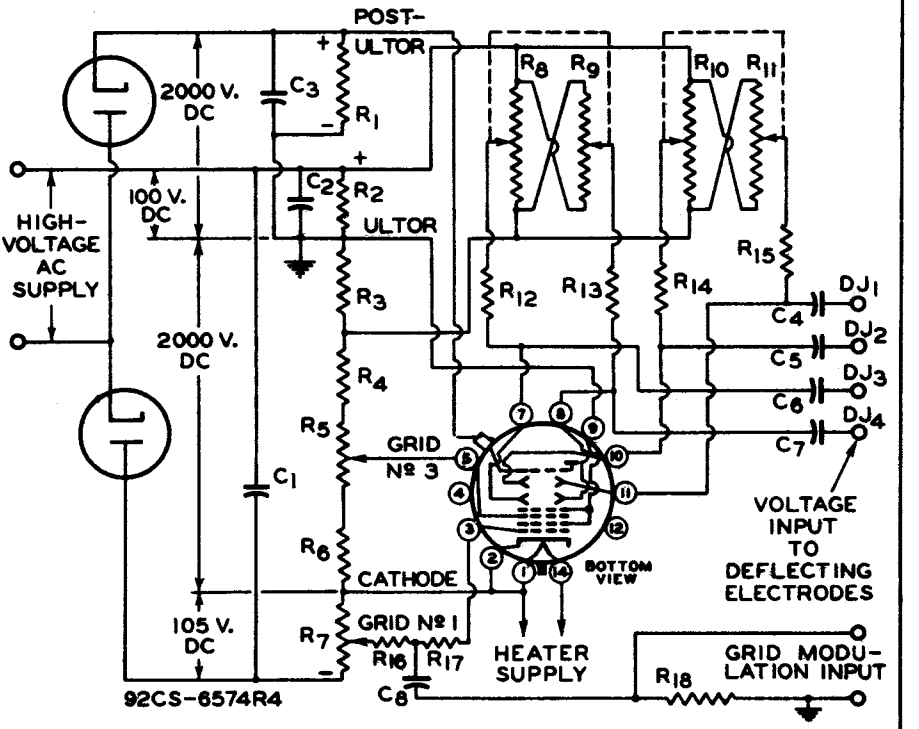
TYPICAL OSCILLOGRAPH CIRCUIT



C1: 0.1 μf, 2500 Volts
C2: 1.0 μf, 200 Volts
C3: 0.1 μf, 2500 Volts
C4 C5 C6 C7: 0.05-μf, Blocking Capacitors*
C8: 0.0001 μf, 2500 Volts
R1: 50 Megohms (Five 10-Megohm, 1-Watt Resistors in Series)
R2 R3: 2 Megohms, 0.5 Watt
R4: 5.5 Megohms, 2 Watts
R5: 2-Megohm Potentiometer
R6: 1.5 Megohms, 0.5 Watt
R7: 0.5-Megohm Potentiometer
R8 R9: 5-Megohm Potentiometer
R10 R11: Dual 5-Megohm Potentiometer
R12 R13 R14 R15: 2 Megohms, 0.5 Watt
R16: 0.5 Megohm, 0.5 Watt
R17: Not less than 2000 ohms per volt of positive signal
R18: 5 Megohms, 0.5 Watt

* When cathode is grounded, capacitors should have high voltage rating (2500 volts); when ultor is grounded, they may have low voltage rating (200 volts). For dc amplifier service, deflecting electrodes should be connected direct to amplifier output. In this service, it is preferable usually to remove deflecting-electrode resistors to minimize loading effect on amplifier. In order to minimize spot defocusing, it is essential that ultor be returned to a point in the amplifier system which will give the lowest possible potential difference between ultor and the deflecting electrodes.

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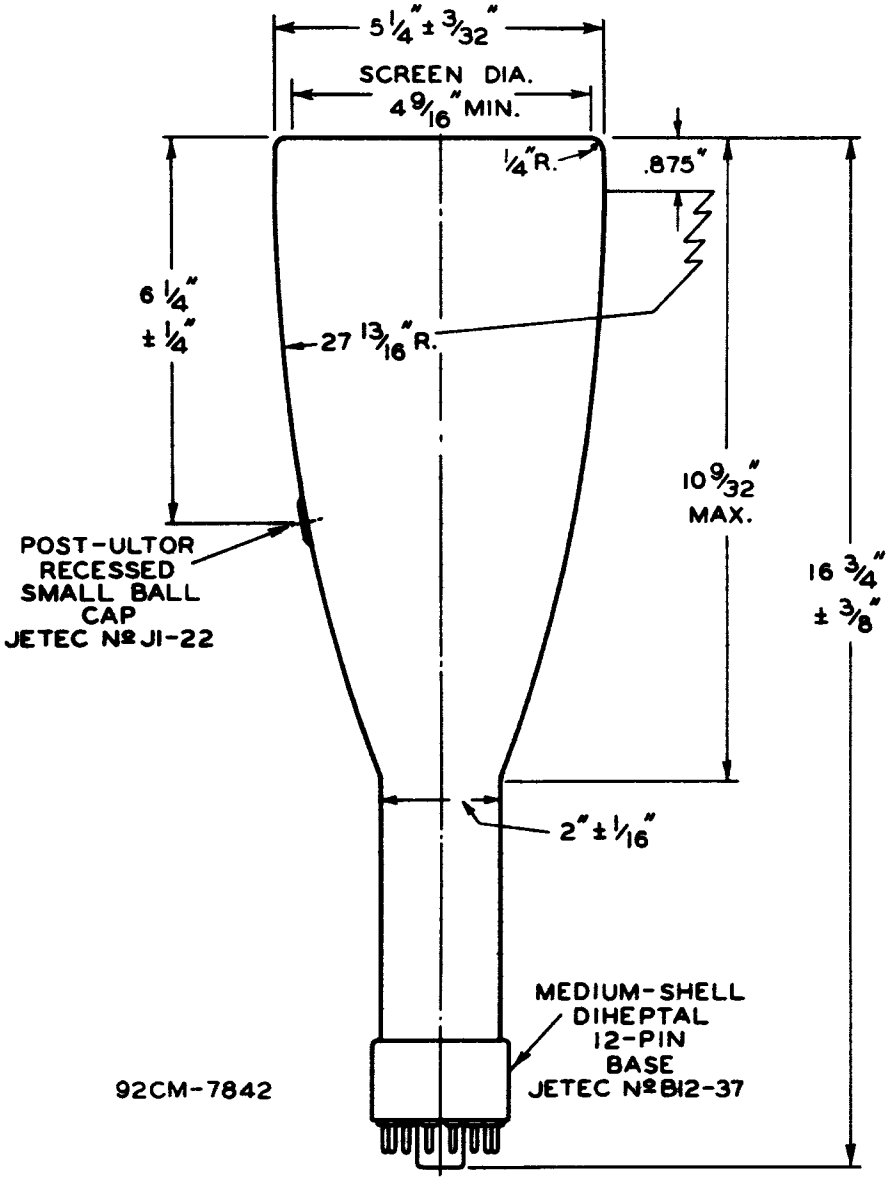

℄ OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE

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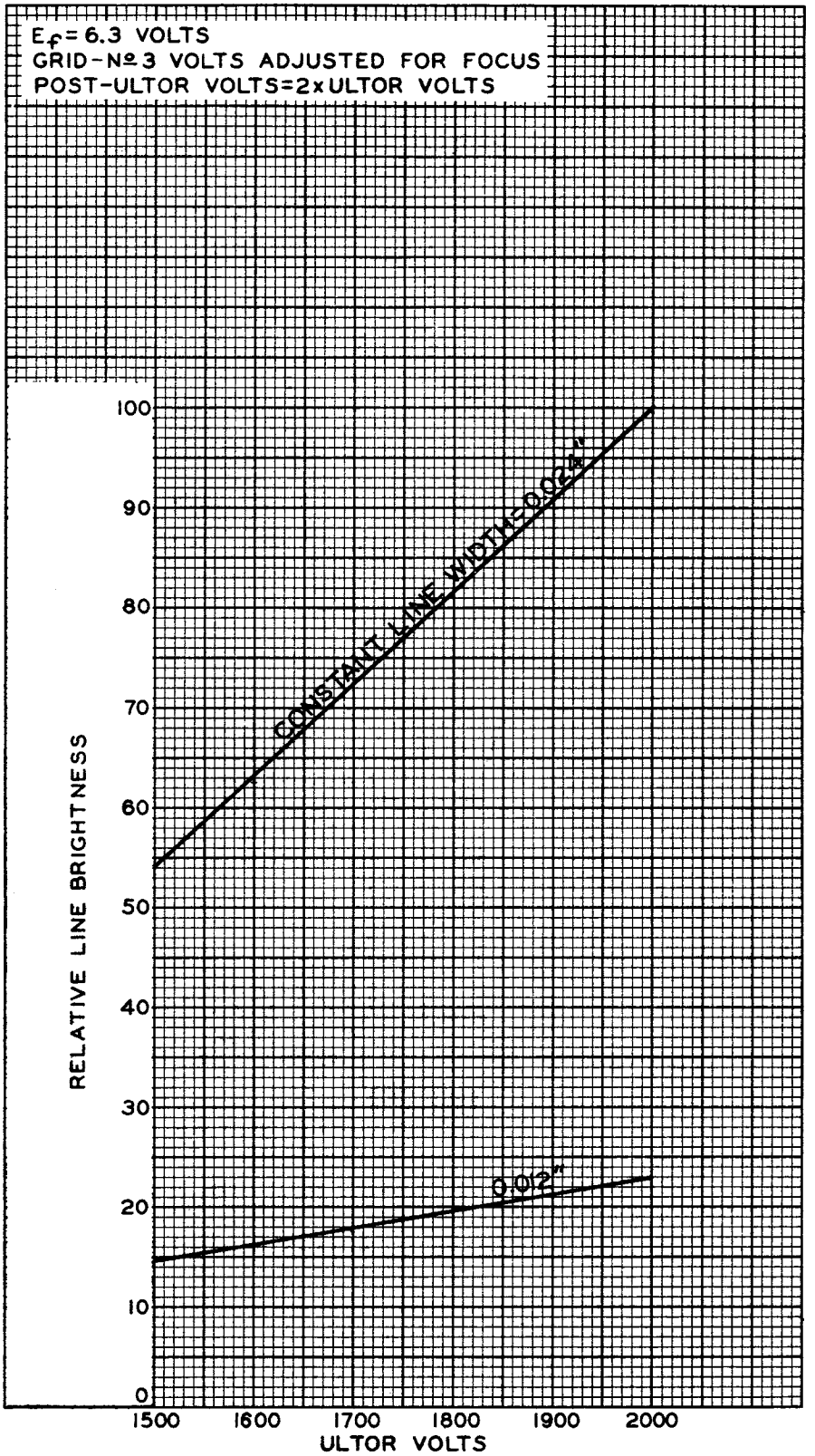
TYPICAL CHARACTERISTICS



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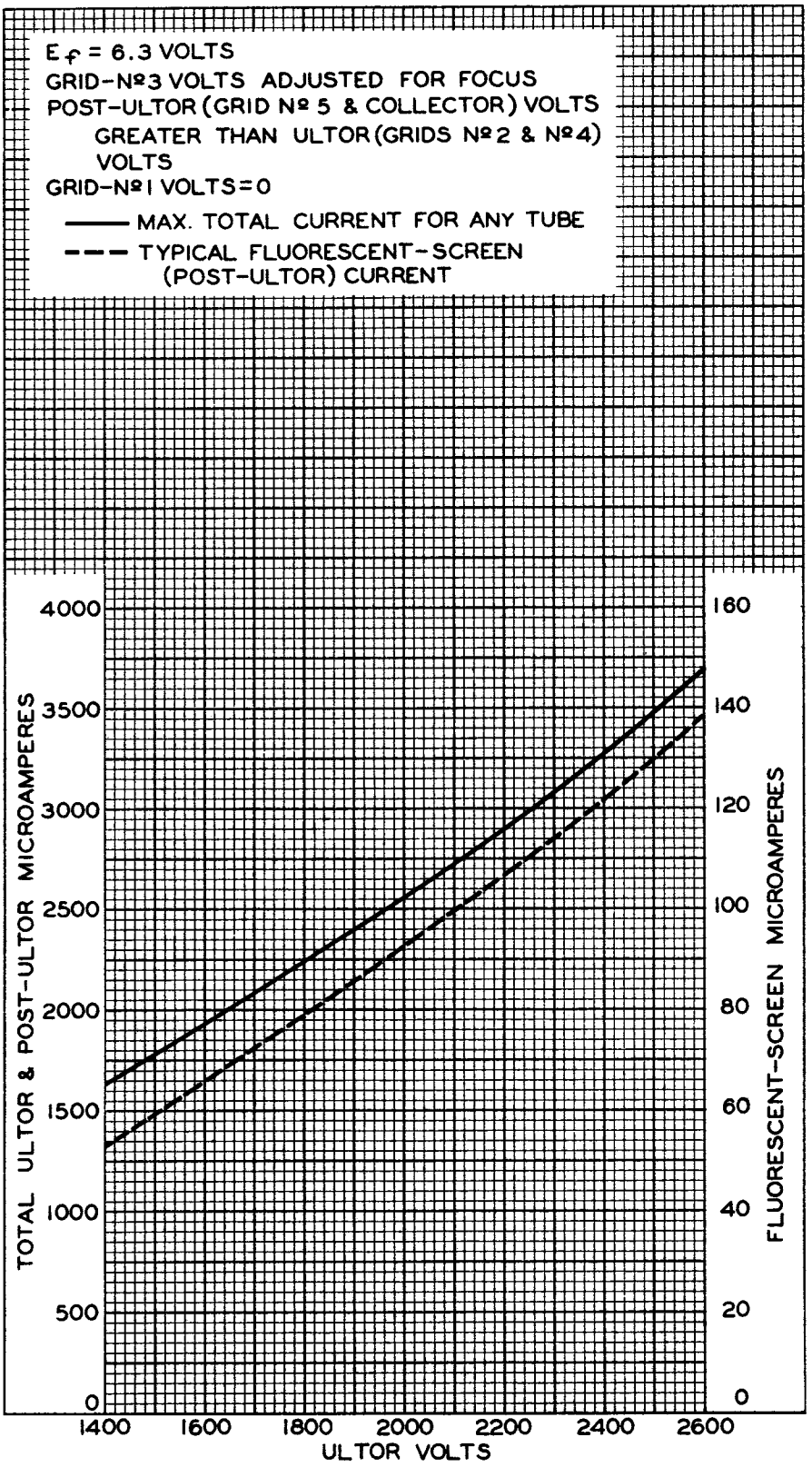
CHARACTERISTICS



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AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
GRID-Nº3 VOLTS ADJUSTED FOR FOCUS

CURVE	ELECTRODE CURRENT	ULTOR VOLTS	POST-ULTOR VOLTS
A	ULTOR	2000	4000
B	ULTOR	1500	3000
C	POST-ULTOR	2000	4000
D	POST-ULTOR	1500	3000