



5CPI-A

OSCILLOGRAPH TUBE

POST-DEFLECTION ACCELERATOR

ELECTROSTATIC FOCUS

ELECTROSTATIC DEFLECTION

5CPI-A

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 μf Cathode to All Other Electrodes. 9 μf DJ₁ to DJ₂ 2 μf DJ₃ to DJ₄ 2 μf DJ₁ to All Other Electrodes. 9 μf DJ₂ to All Other Electrodes. 9 μf DJ₃ to All Other Electrodes. 7 μf DJ₄ to All Other Electrodes. 8 μf

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" $\pm$ 3/8"Greatest Diameter of Bulb 5-1/4" $\pm$ 3/32"

Minimum Useful Screen Diameter 4-1/2"

Mounting Position. Any

Cap. Recessed Small Ball (JETEC No. J1-22)

Base Medium-Shell Diheptal 12-Pin (JETEC No. B12-37)

Basing Designation for BOTTOM VIEW 14J1

Pin 1-Heater Pin 9-Anode No.2,

Pin 2-Cathode Grid No.2

Pin 3-Grid No.1 Pin 10-Deflecting

Pin 4-Internal Con. Electr. DJ₂

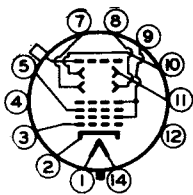
Do not use Pin 11-Deflecting

Pin 5-Anode No.1 Electr. DJ₁

Pin 7-Deflecting Pin 12-No Con-

Electrode DJ₃ section

Pin 8-Deflecting Pin 14-Heater

Electrode DJ₄ Cap -Anode No.3*DJ₁ and DJ₂ are nearer the screen**DJ₃ and DJ₄ are nearer the base*

With DJ₁ positive with respect to DJ₂, the spot is deflected toward pin 5. With DJ₃ positive with respect to DJ₄, 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 DJ₁ and DJ₂ by the following angular tolerances measured about the tube axis: Pin 5, 10°; Cap (on same side of tube as pin 5), 10°.

The angle between the trace produced by DJ₁ and DJ₂ and the trace produced by DJ₃ and DJ₄ is 90° $\pm$ 30°.



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Maximum Ratings, Design-Center Values:

ANODE-No.3 VOLTAGE	4000 max.	volts
ANODE-No.2* VOLTAGE.	2000 max.	volts
RATIO OF ANODE-No.3 VOLTAGE TO ANODE-No.2 VOLTAGE		
	2.3 : 1	
ANODE-No.1 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 ANODE No.2 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 anode-No.3 voltage (E_{b3}) between 2000** and 4000 volts
and any anode-No.2 voltage (E_{b2}) between 1500[▲] and 2000 volts

→ Anode-No.1 Voltage	18.7 to 34.5% of E_{b2} . . .	volts
→ Grid-No.1 Voltage [▲]	1.5% to 4.5% of E_{b2} . . .	volts
Anode-No.1 Current of any Operating Condition		
	-15 to +10 . . .	μ amp

Deflection Factors:

$$\text{When } E_{b3} = 2 \times E_{b2}$$

DJ1 & DJ2	39 to 53 v dc/in./kv of E_{b2}
DJ3 & DJ4	33 to 45 v dc/in./kv of E_{b2}

$$\text{When } E_{b3} = E_{b2}$$

DJ1 & DJ2	31 to 42 v dc/in./kv of E_{b2}
DJ3 & DJ4	27 to 37 v dc/in./kv of E_{b2}

Spot Position. ##

Examples of Use of Design Ranges:

For anode-No.3 voltage of				
	2000	3000	4000	volts
and anode-No.2 voltage of				
	2000	1500	2000	volts

→ Anode-No.1 Volt.	375 to 690	280 to 515	375 to 690	volts
→ Grid-No.1 Volt. [▲]	-30 to -90	-22.5 to -67.5	-30 to -90	volts

Deflection Factors:

DJ1 & DJ2	62 to 84	59 to 80	78 to 106	□
DJ3 & DJ4	54 to 74	50 to 68	66 to 90	□

Maximum Circuit Values:

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

*, •, **, ▲, ●, ##, ■, □: See next page.

→ Indicates a change.



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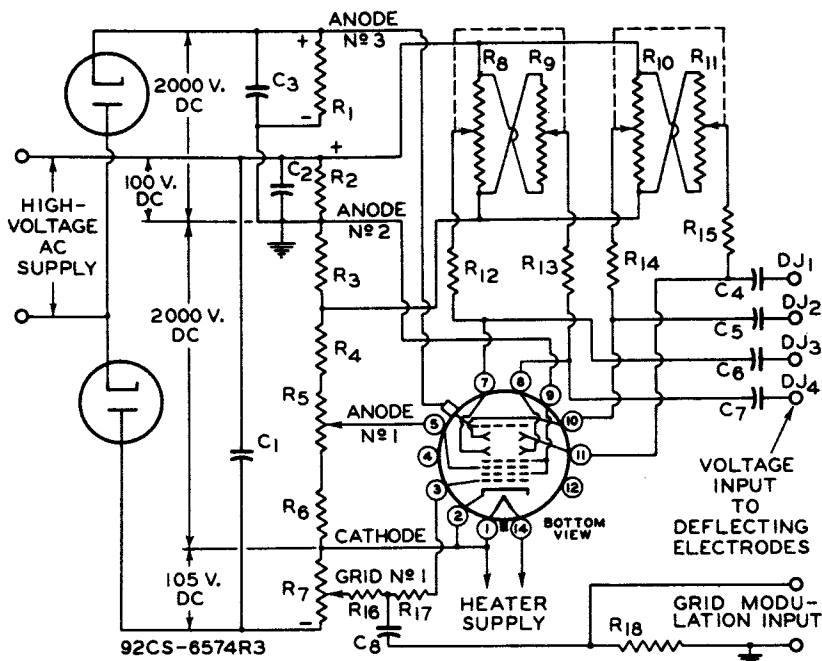
- * Anode No.2 and grid No.2, which are connected together within tube, are referred to herein as anode No.2.
- At or near this rating, the effective resistance of the anode supply should be adequate to limit the anode-No.2 input power to 6 watts.
- ** It is recommended that anode-No.3 voltage be not less than 3000 volts for high-speed scanning.
- ▲ Recommended minimum value of anode-No.2 voltage.
- ♣ For visual cutoff of undeflected focused spot.
- Volts dc/in.
- ## With heater voltage of 6.3 volts, anode-No.3 voltage of 4000 volts, anode-No.2 voltage of 2000 volts, anode-No.1 voltage adjusted to focus, grid-No.1 voltage adjusted to give spot that is just visible, each deflecting electrode connected through 1-megohm resistor to anode No.2, 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.
- It is recommended that the deflecting-electrode-circuit resistances be approximately equal.



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TYPICAL OSCILLOGRAPH CIRCUIT



- C1: 0.1 μ f, 2500 Volts
 C2: 1.0 μ f, 200 Volts
 C3: 0.1 μ f, 2500 Volts
 C4 C5 C6 C7: 0.05- μ f,
 Blocking Capacitors*
 C8: 0.0001 μ f, 2500 Volts
 R1: 50 Megohms (Five 10-Meg-
 ohm, 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: Dual 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

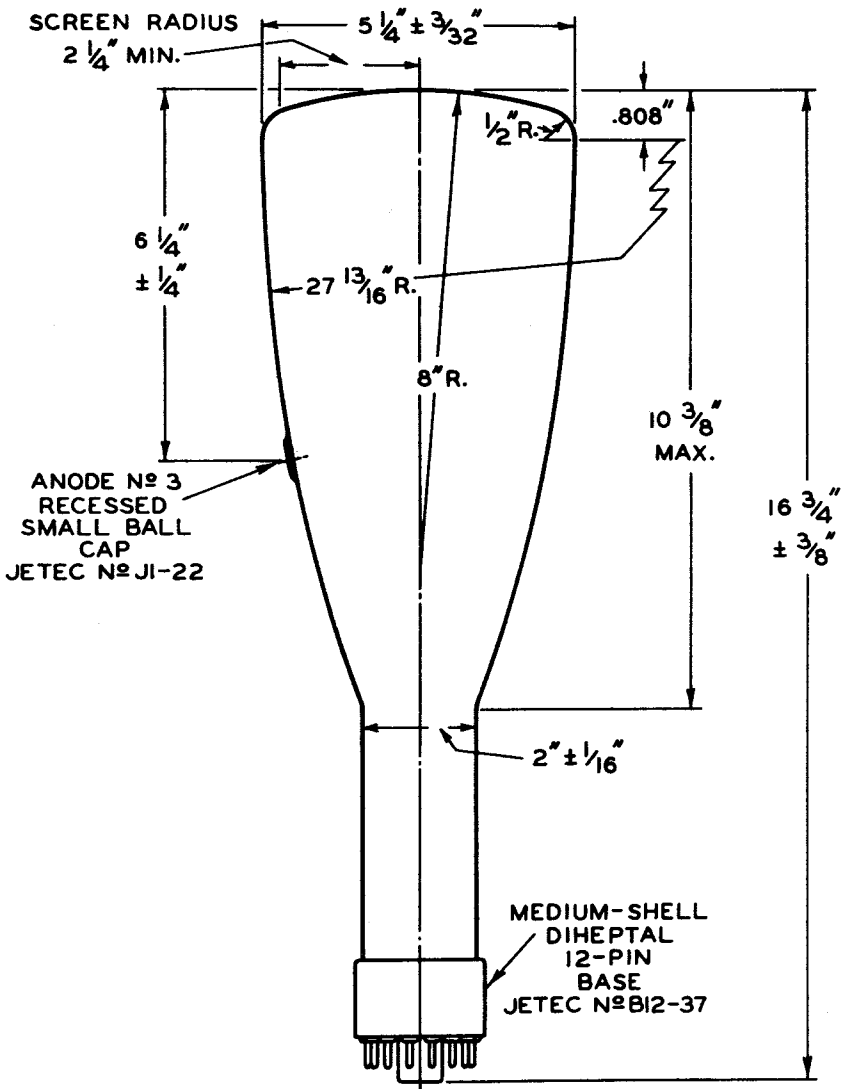
* When cathode is grounded, capacitors should have high voltage rating (2500 volts); when anode No.2 is grounded, they may have low voltage rating (200 volts). For dc amplifier service, deflecting electrodes should be connected direct to amplifier output. In this service, it is preferable usually to remove deflecting-electrode resistors to minimize loading effect on amplifier. In order to minimize spot defocusing, it is essential that anode No.2 be returned to a point in the amplifier system which will give the lowest possible potential difference between anode No.2 and the deflecting electrodes.

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.



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

92CM-6408R4

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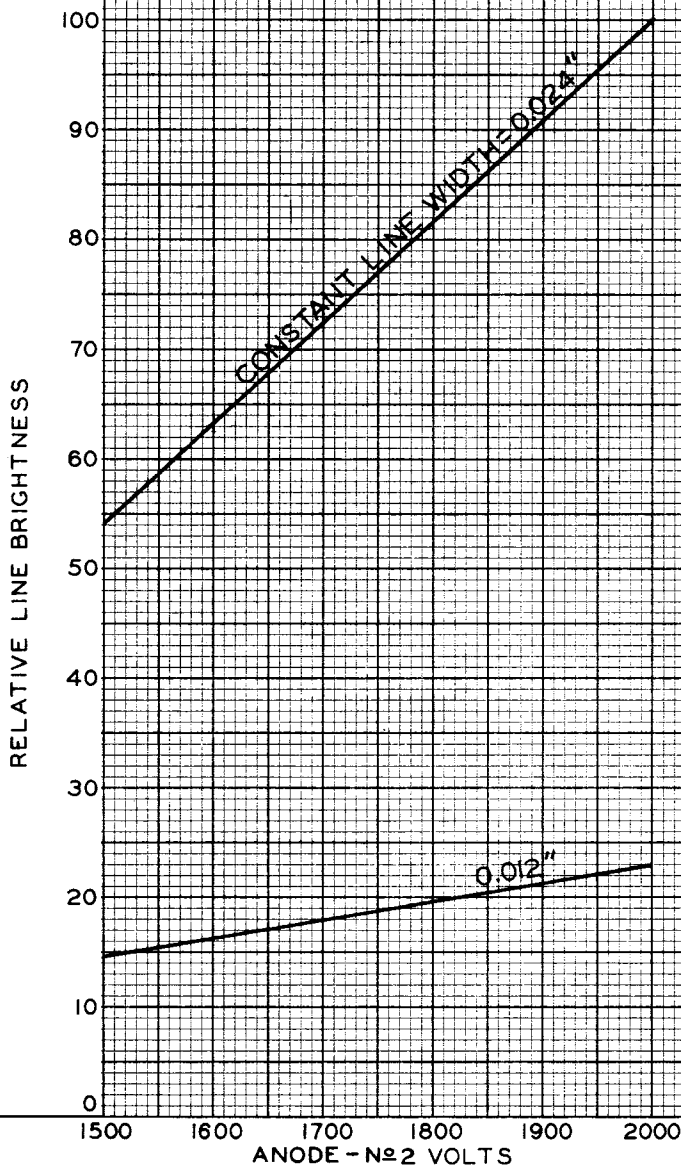
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CHARACTERISTICS

$E_f = 6.3$ VOLTS

ANODE - N^o1 VOLTS ADJUSTED FOR FOCUS

ANODE - N^o3 VOLTS = 2 x ANODE - N^o2 VOLTS



DEC. 23, 1946

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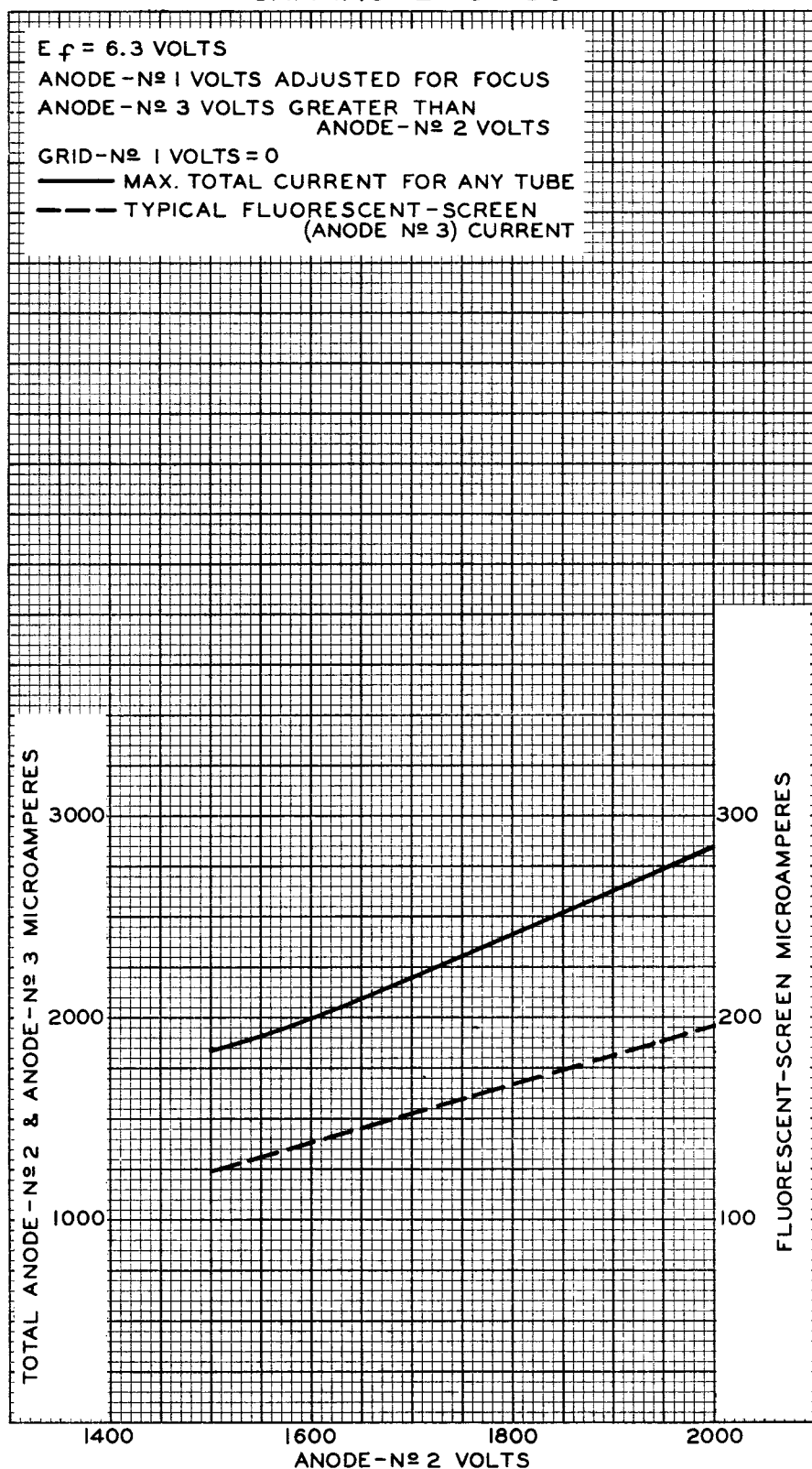
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CHARACTERISTICS



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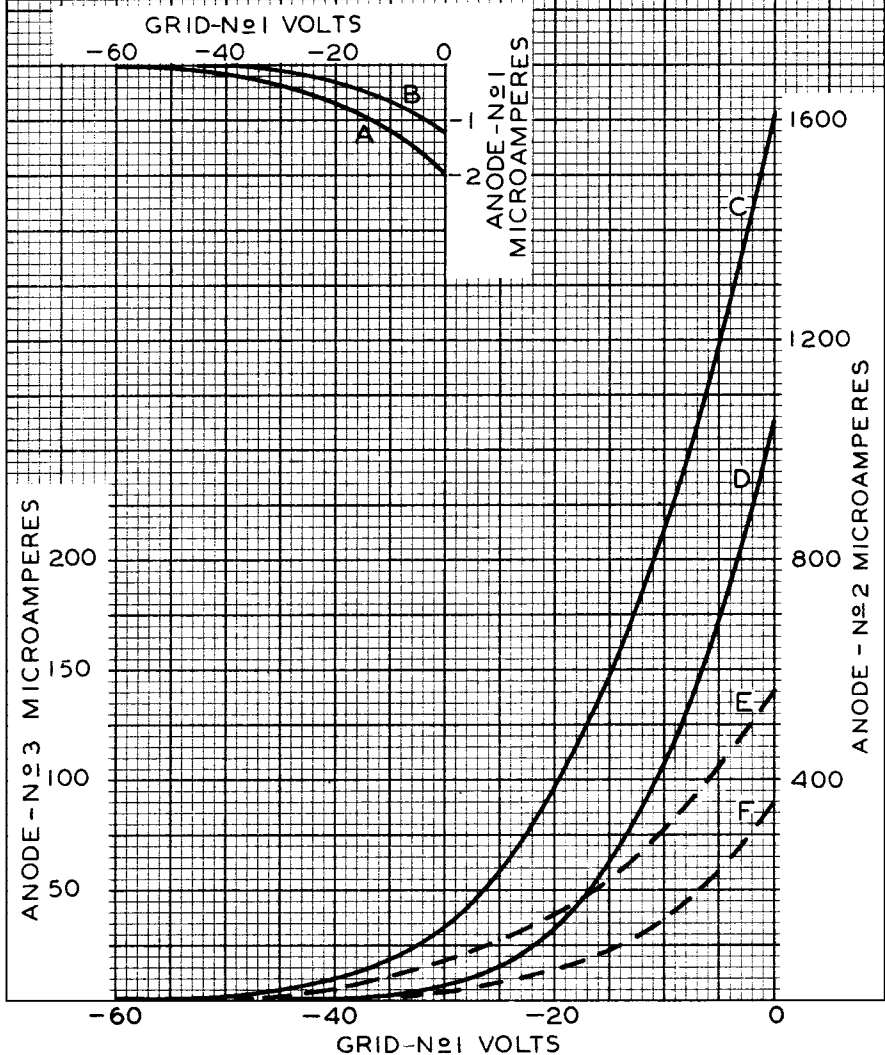
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AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS

ANODE-Nº1 VOLTS ADJUSTED TO GIVE FOCUS

CURVE	ELECTRODE CURRENT	ANODE-Nº2 VOLTS	ANODE-Nº3 VOLTS
A	ANODE Nº1	2000	2000-4000
B	ANODE Nº1	1500	1500-3000
C	ANODE Nº2	2000	4000
D	ANODE Nº2	1500	3000
E	ANODE Nº3	2000	4000
F	ANODE Nº3	1500	3000



DEC. 26, 1946

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92CM-6414R2