



5ABPI

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 μf Cathode to All Other Electrodes 5 μf DJ₁ to DJ₂ 2.5 μf DJ₃ to DJ₄ 1.3 μf DJ₁ to All Other Electrodes 9 μf DJ₂ to All Other Electrodes 9 μf DJ₃ to All Other Electrodes 5 μf DJ₄ to All Other Electrodes 6 μf

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

nection—

Do Not Use

Pin 5-Grid No.3

Pin 7-Deflecting

Electrode DJ₃

Pin 8-Deflecting

Electrode DJ₄

Pin 9-Ultor

(Grid No.2,

Grid No.4)

Pin 10-Deflecting

Electrode DJ₂

Pin 11-Deflecting

Electrode DJ₁

Pin 12-No. Conn.

Pin 14-Heater

Cap-Post-Ultor

(Grid No.5,

Collector)

DJ₁ and DJ₂ are nearer the screenDJ₃ 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

JUNE 1, 1953

TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5ABPI



5ABPI OSCILLOGRAPH TUBE

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 DJ₁ - DJ₂ trace and DJ₃ - DJ₄ 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_{c5}) between 2000* and 6000 volts
and any ultor voltage (E_{c4}) between 1500** and 2600 volts

Grid-No.3 Voltage for Focus . . 20% to 34.5% of E_{c4} . . . volts

Grid-No.1 Voltage for Visual
Extinction of Undelected
Focused Spot 2.6% to 4.3% of E_{c4} . . . volts

Grid-No.3 Current for Any
Operating Condition -15 to +10 . . . μ amp

Deflection Factors: #

$$\text{When } E_{c5} = 2 \times E_{c4}$$

DJ ₁ & DJ ₂	26.5 to 36	v dc/in./kvof E_{c4}
DJ ₃ & DJ ₄	18 to 24	v dc/in./kvof E_{c4}

$$\text{When } E_{c5} = E_{c4}$$

DJ ₁ & DJ ₂	21.5 to 29	v dc/in./kvof E_{c4}
DJ ₃ & DJ ₄	14.5 to 19.5	v dc/in./kvof E_{c4}

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.



5ABPI

5ABPI

OSCILLOGRAPH TUBE

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

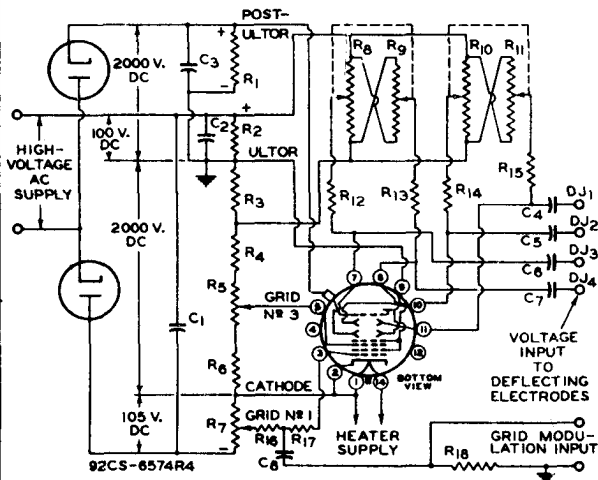
- The "post-ultor" in a cathode-ray tube is the electrode to which is applied a dc voltage higher than the ultor voltage for accelerating the electrons in the beam after its deflection. In the 5AB-types, the post-deflection acceleration function and the collector function are both performed by grid No.5 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 DJ₃ and DJ₄ 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.



5ABPI

OSCILLOGRAPH TUBE

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: 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.

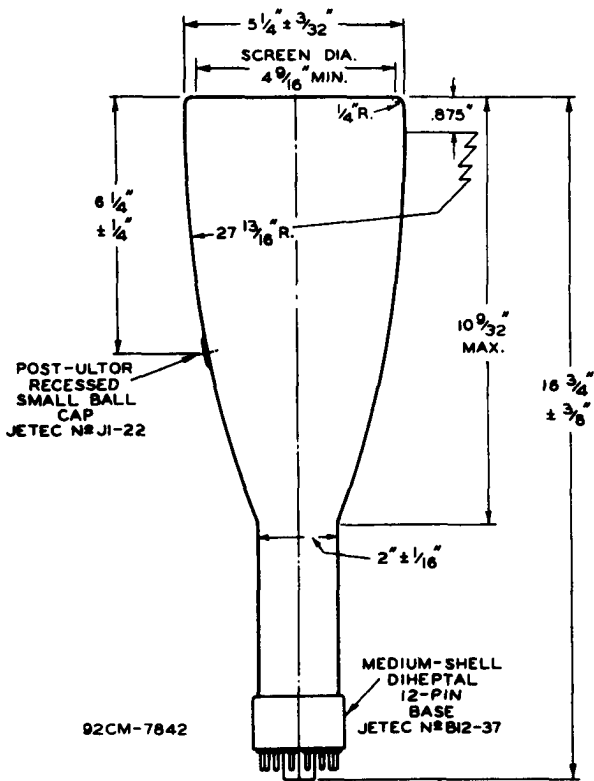
Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.



5ABPI

OSCILLOGRAPH TUBE

5ABPI



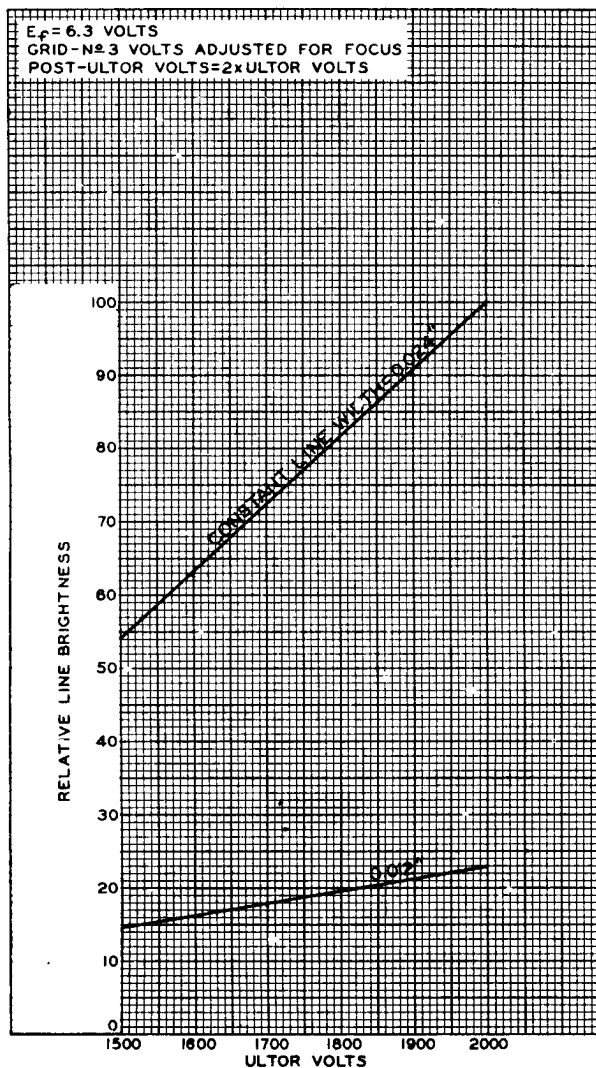
CL OF BULB WILL NOT DEVIATE MORE THAN 2°
IN ANY DIRECTION FROM PERPENDICULAR
ERECTED AT CENTER OF BOTTOM OF BASE

5ABPI



5ABPI

TYPICAL CHARACTERISTICS

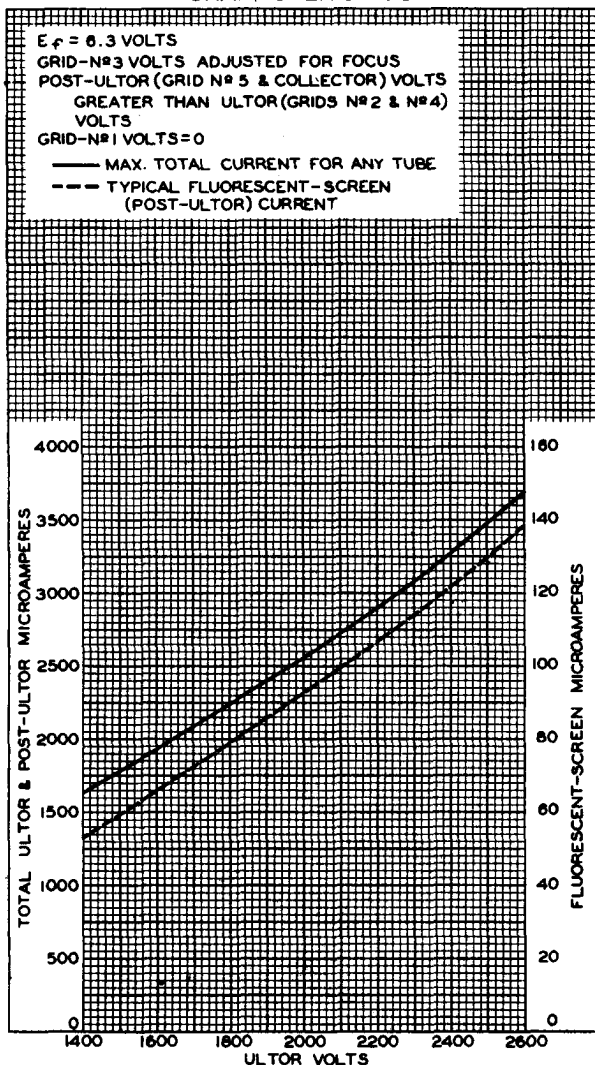


FEB. 11, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6620RI

CHARACTERISTICS



5ABPI



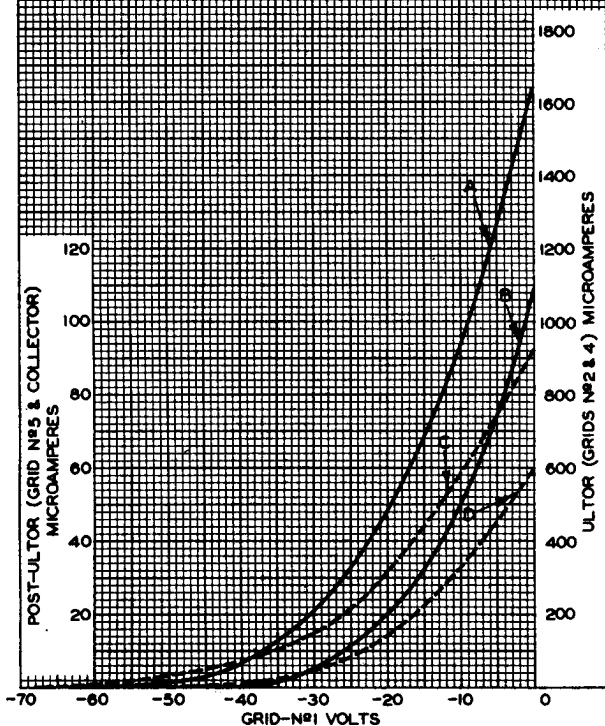
5ABPI

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



FEB. 4, 1953

TUBE DEPARTMENT

92CM-7911

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



5ABP4
TO
5ABP11

5ABP4 OSCILLOGRAPH TUBE

POST-DEFLECTION ACCELERATOR
ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 5ABP4 is the same as the 5ABP1 except for the following items:

General:

Phosphor (For curves, see front of this Section). . P4—Sulfide Type
Fluorescence. White
Phosphorescence White
Persistence Short

THE PERSISTENCE CHARACTERISTICS

of the P4-sulfide phosphor are the same as those shown for the P11 phosphor at the front of this Section

5ABP7 OSCILLOGRAPH TUBE

POST-DEFLECTION ACCELERATOR
ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 5ABP7 is the same as the 5ABP1 except for the following items:

General:

Phosphor (For Curves, see front of this Section). P7
Fluorescence. Blue
Persistence Short
Phosphorescence Greenish-Yellow
Persistence Long

5ABP11 OSCILLOGRAPH TUBE

POST-DEFLECTION ACCELERATOR
ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 5ABP11 is the same as the 5ABP1 except for the following items:

General:

Phosphor (For Curves, see front of this Section). P11
Fluorescence. Blue
Phosphorescence Blue
Persistence Short