



2D21

# THYRATRON

GAS TETRODE, MINIATURE TYPE

2D21

## GENERAL DATA

### Electrical:

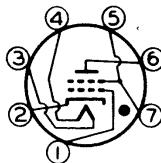
	<u>Min.</u>	<u>Average</u>	<u>Max.</u>	
Heater, for Unipotential Cathode:				
Voltage (AC or DC) . . . . .	5.7	6.3	6.9	volts
Current, with heater volts = 6.3	0.54	0.60	0.66	amp
Cathode:				
Heating Time, prior to tube conduction . . . . .	10	-	-	sec
Direct Interelectrode Capacitances (Approx.): <sup>o</sup>				
Grid No.1 to Anode . . . . .		0.026		$\mu$ f
Input . . . . .		2.4		$\mu$ f
Output . . . . .		1.6		$\mu$ f
Ionization Time (Approx.):				
For conditions: dc anode volts = 100; grid-No.1 square-pulse volts = 50; peak anode amp. during conduction = 0.5 . . . . .			0.5	$\mu$ sec
Deionization Time (Approx.):				
For conditions: dc anode volts = 125; grid-No.1 volts = -100, grid-No.1 resistor (ohms) = 1000; dc anode amp. = 0.1 . . . . .			35	$\mu$ sec
For conditions: dc anode volts = 125; grid-No.1 volts = -10; grid-No.1 resistor (ohms) = 1000; dc anode amp. = 0.1 . . . . .			75	$\mu$ sec
Maximum Critical Grid Current, with ac anode-supply volts (rms) = 460, and average anode amp. = 0.1 . . . . .			0.5	$\mu$ amp
Anode Voltage Drop (Approx.) . . . . .			8	volts
Grid-No.1 Control Ratio (Approx.) with grid-No.1 resistor (megohms) = 0; grid-No.2 volts = 0 . . . . .			250	
Grid-No.2 Control Ratio (Approx.) with grid-No.1 resistor (megohms) = 0; grid-No.2 resistor (megohms) = 0; grid-No.1 volts = 0 . . . . .			1000	

<sup>o</sup> Without external shield.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (excluding tip) . . . . .	1-1/2" $\pm$ 3/32"
Maximum Diameter . . . . .	3/4"
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW . . . . .	7BN

Pin 1-Grid No.1  
 Pin 2-Cathode  
 Pin 3-Heater  
 Pin 4-Heater



Pin 5-Grid No.2  
 Pin 6-Anode  
 Pin 7-Grid No.2

← Indicates a change.

JUNE 15, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

2D21



2D21  
**THYRATRON**

RELAY and GRID-CONTROLLED RECTIFIER SERVICE

**Maximum Ratings, Absolute Values:**

<b>PEAK ANODE VOLTAGE:</b>		
Forward. . . . .	650 max.	volts
Inverse. . . . .	1300 max.	volts
<b>GRID-No.2 (SHIELD-GRID) VOLTAGE:</b>		
Peak, before anode conduction. . . . .	-100 max.	volts
→ Average, during anode conduction <sup>■</sup> . . . . .	-10 max.	volts
<b>GRID-No.1 (CONTROL-GRID) VOLTAGE:</b>		
Peak, before anode conduction. . . . .	-100 max.	volts
→ Average, during anode conduction <sup>■</sup> . . . . .	-10 max.	volts
<b>CATHODE CURRENT:</b>		
Peak . . . . .	0.5 max.	amp
Average <sup>■</sup> . . . . .	0.1 max.	amp
→ Surge, for duration of 0.1 sec. max. . . . .	10 max.	amp
<b>GRID-No.2 CURRENT:</b>		
→ Average <sup>■</sup> . . . . .	+0.01 max.	amp
<b>GRID-No.1 CURRENT:</b>		
→ Average <sup>■</sup> . . . . .	+0.01 max.	amp
<b>PEAK HEATER-CATHODE VOLTAGE:</b>		
Heater negative with respect to cathode . . . . .	100 max.	volts
Heater positive with respect to cathode . . . . .	25 max.	volts
→ AMBIENT TEMPERATURE RANGE. . . . .	-75 to +90	°C

→ **Typical Operating Conditions for Relay Service:**

RMS Anode Voltage. . . . .	117	400	. . .	volts
Grid-No.2 Voltage. . . . .	0	0	. . .	volts
RMS Grid-No.1 Bias Voltage <sup>□</sup> . . . . .	5	-	. . .	volts
DC Grid-No.1 Bias Voltage . . . . .	-	-6	. . .	volts
Peak Grid-No.1 Signal Voltage. . . . .	5	6	. . .	volts
Grid-No.1-Circuit Resistance . . . . .	1.0	1.0	. . .	megohm
Anode-Circuit Resistance#. . . . .	1200	2000	. . .	ohms

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
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- Averaged over any interval of 30 sec. max.
- Approximately 180° out of phase with the anode voltage.
- \* Sufficient resistance, including the tube load, must be used under any conditions of operation to prevent exceeding the current ratings.
- Indicates a change.



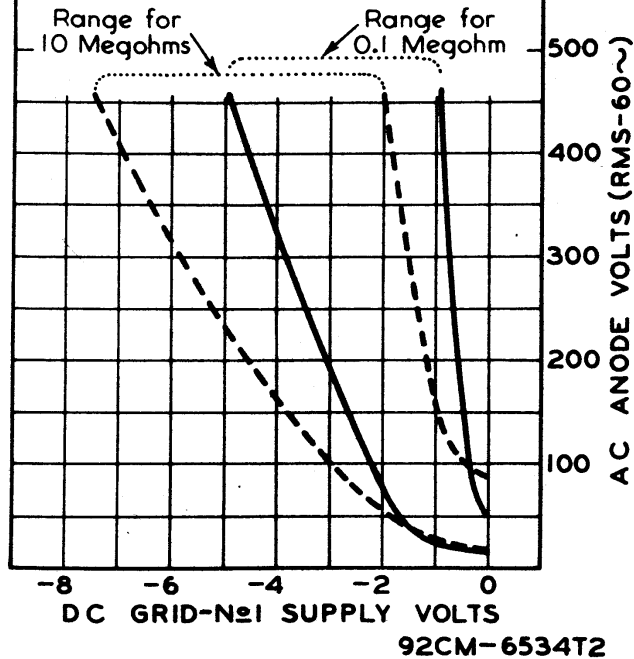
2D21

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## OPERATIONAL RANGE OF CRITICAL GRID VOLTAGE

TYPE 2D21 SHIELD-GRID VOLTS=0  
RANGES SHOWN ARE FOR TWO VALUES  
OF GRID RESISTOR - 0.1 MEG. AND 10  
MEG. -AND TAKE INTO ACCOUNT INITIAL  
DIFFERENCES BETWEEN INDIVIDUAL  
TUBES & SUBSEQUENT DIFFERENCES  
DURING TUBE LIFE, FOR A HEATER-  
VOLTAGE RANGE OF 5.7 TO 6.9 VOLTS



JUNE 15, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

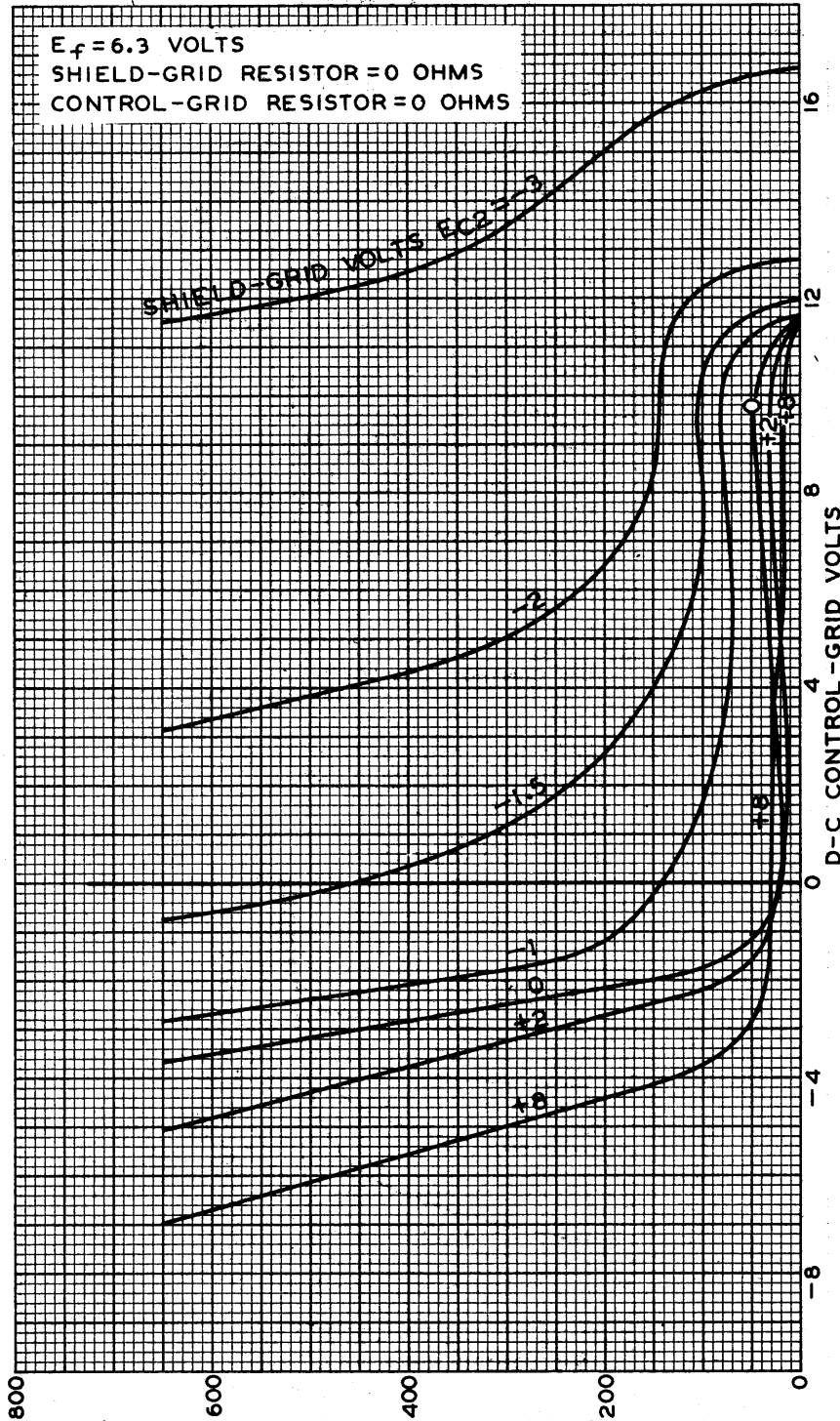
CE-6534T2



2D21

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### AVERAGE CONTROL CHARACTERISTICS



MAY 2, 1944

D-C ANODE VOLTS  
RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6531R1

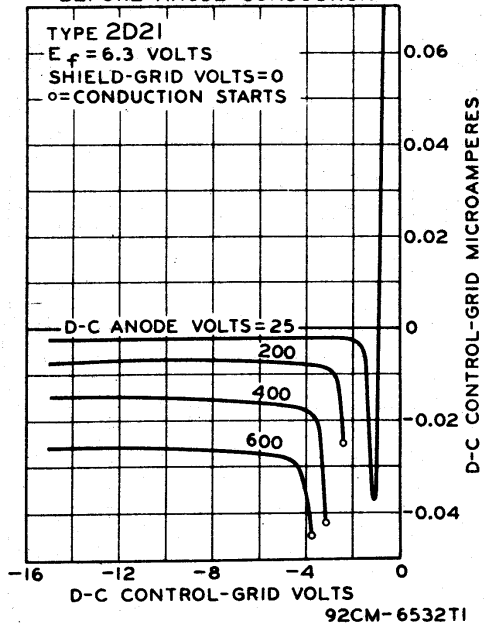
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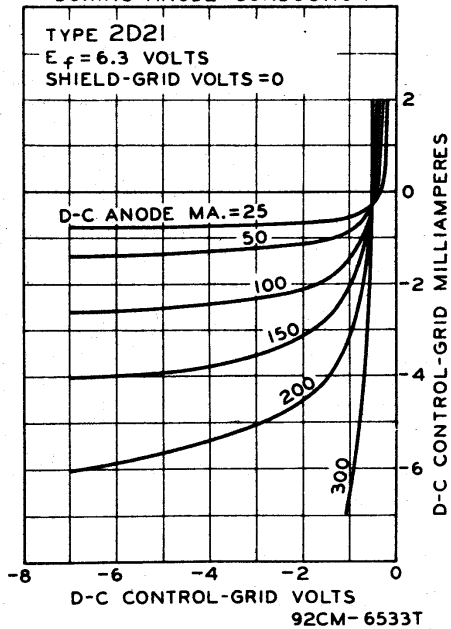
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# THYRATRON

AVERAGE GRID CHARACTERISTICS  
BEFORE ANODE CONDUCTION



AVERAGE GRID CHARACTERISTICS  
DURING ANODE CONDUCTION



APRIL 1, 1944

RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6532T1  
92CM-6533T