



**2D21**

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**ET-T1402**  
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**THYRATRON**

**FOR RELAY AND GRID-CONTROLLED RECTIFIER APPLICATIONS**

**7-PIN MINIATURE  
 FOUR ELECTRODES**

**INERT-GAS TUBE  
 NEGATIVE CONTROL CHARACTERISTICS**

**DESCRIPTION AND RATING**

The 2D21 is a miniature, four-electrode, inert-gas-filled thyatron with negative control characteristics for use in relay and grid-controlled rectifier applications. Operating characteristics of the tube include a high-control ratio essentially independent of temperature over a wide range, low grid-anode capacitance, and very low grid current.

**GENERAL**

**ELECTRICAL**

Cathode—Coated Unipotential

Heater Voltage, AC or DC . . . . .	6.3 ± 10%	Volts
Heater Current . . . . .	0.6	Amperes
Cathode Heating Time, minimum . . . . .	10	Seconds

Direct Interelectrode Capacitances, approximate\*

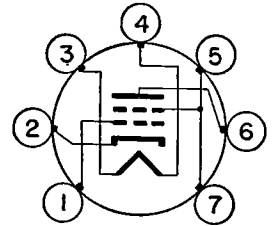
Grid-Number 1 to Anode . . . . .	0.026	μμf
Grid-Number 1 to Cathode and Grid-Number 2 . . . . .	2.4	μμf

\* Without external shield.

**MECHANICAL**

Mounting Position—Any  
 Type of Cooling—Air  
 Envelope—T-5½, Glass  
 Base—E7-1, Miniature Button 7-Pin

**BASING DIAGRAM**

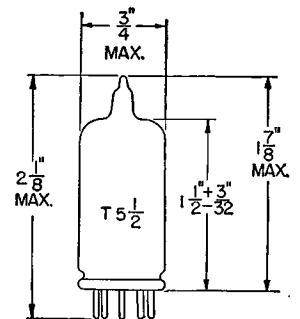


RETMA 7BN

**TERMINAL CONNECTIONS**

- Pin 1—Grid Number 1 (Control Grid)
- Pin 2—Cathode
- Pin 3—Heater
- Pin 4—Heater
- Pin 5—Grid Number 2 (Shield Grid)
- Pin 6—Anode
- Pin 7—Grid Number 2 (Shield Grid)

**PHYSICAL DIMENSIONS**



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## MAXIMUM RATINGS

### ABSOLUTE MAXIMUM VALUES

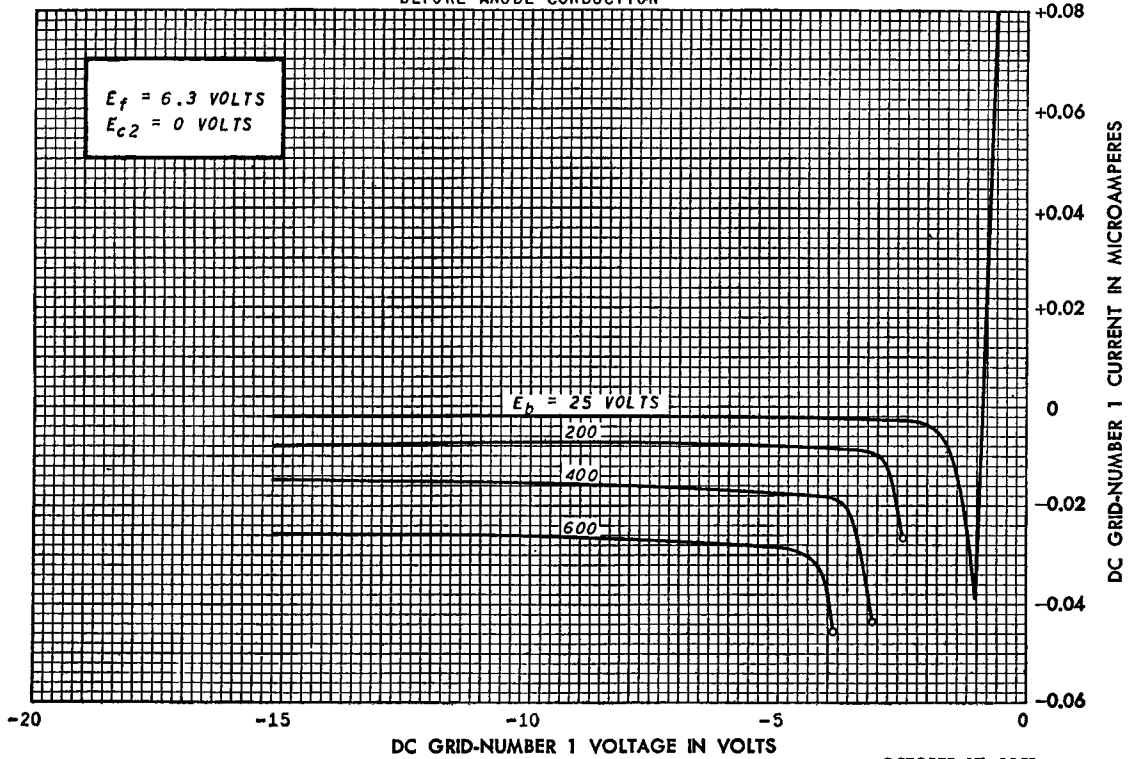
<b>Peak Anode Voltage</b>		
Inverse . . . . .	1300	Volts
Forward . . . . .	650	Volts
<b>Cathode Current</b>		
Peak . . . . .	0.5	Amperes
Average . . . . .	0.1	Amperes
Maximum Averaging Time . . . . .	30	Seconds
Fault . . . . .	10	Amperes
Maximum Duration . . . . .	0.1	Seconds
<b>Negative Control-Grid Voltage</b>		
Before Conduction . . . . .	100	Volts
During Conduction . . . . .	10	Volts
<b>Positive Control-Grid Current</b>		
Anode Positive . . . . .	10	Milliamperes
Anode Negative . . . . .	10	Milliamperes
<b>Negative Shield-Grid Voltage</b>		
Before Conduction . . . . .	100	Volts
During Conduction . . . . .	10	Volts
<b>Positive Shield-Grid Current</b>		
Anode Positive . . . . .	10	Milliamperes
Anode Negative . . . . .	10	Milliamperes
<b>Heater-Cathode Voltage</b>		
Heater Positive with Respect to Cathode . . . . .	25	Volts
Heater Negative with Respect to Cathode . . . . .	100	Volts
Control-Grid Circuit Resistance . . . . .	10	Megohms
Ambient Temperature Limits . . . . .	-75 to +90	C

## CHARACTERISTICS AND TYPICAL OPERATION

### AVERAGE CHARACTERISTICS

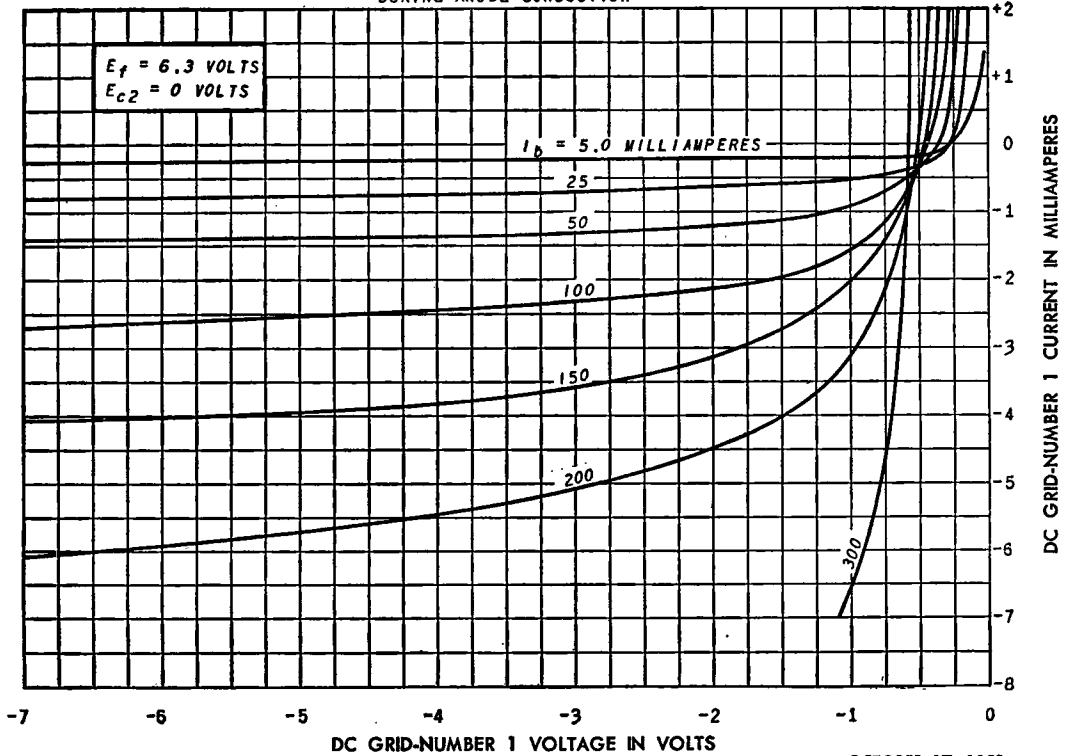
Ionization Time, approximate . . . . .	0.5	Microseconds
<b>Deionization Time, approximate</b>		
Ebb = 125 volts d-c, Ib = 0.1 ampere d-c, Rg = 1000 ohms		
Ecc1 = -100 Volts DC . . . . .	35	Microseconds
Ecc1 = -11 Volts DC . . . . .	75	Microseconds
Anode Voltage Drop . . . . .	8	Volts
<b>Critical Grid Current, maximum</b>		
Ebb = 460 Volts RMS . . . . .	0.5	Microamperes

### AVERAGE CHARACTERISTICS BEFORE ANODE CONDUCTION



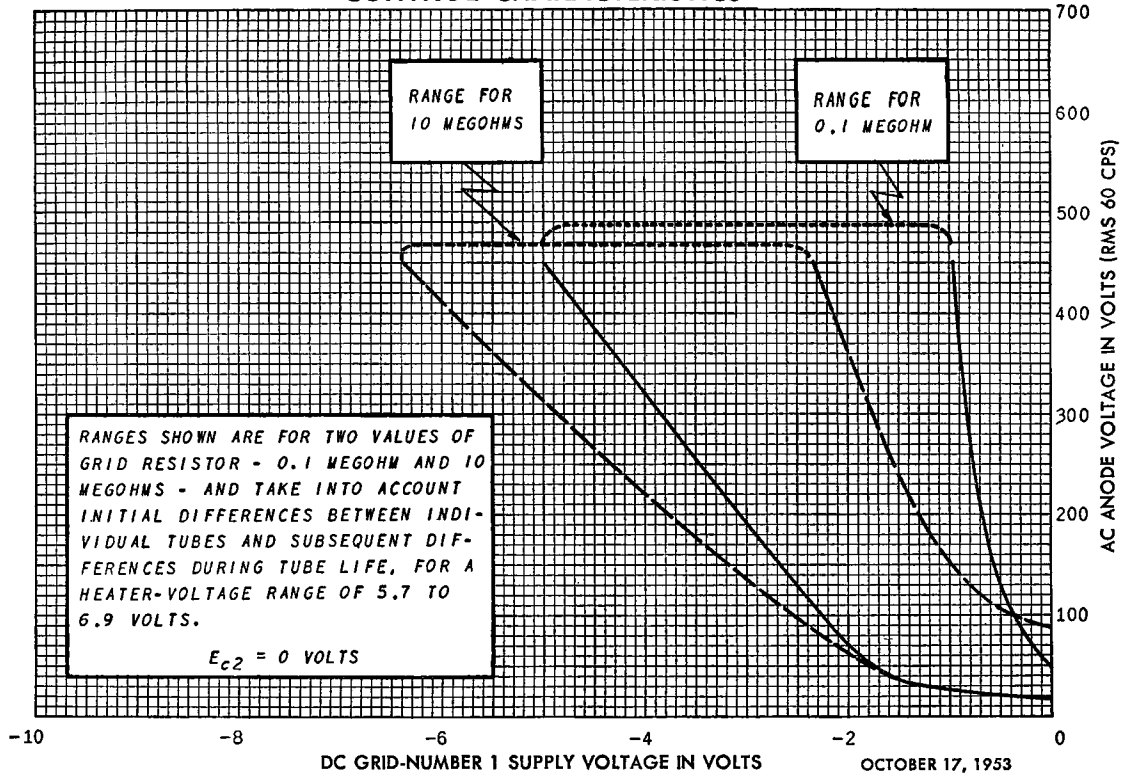
OCTOBER 17, 1953

### AVERAGE CHARACTERISTICS DURING ANODE CONDUCTION

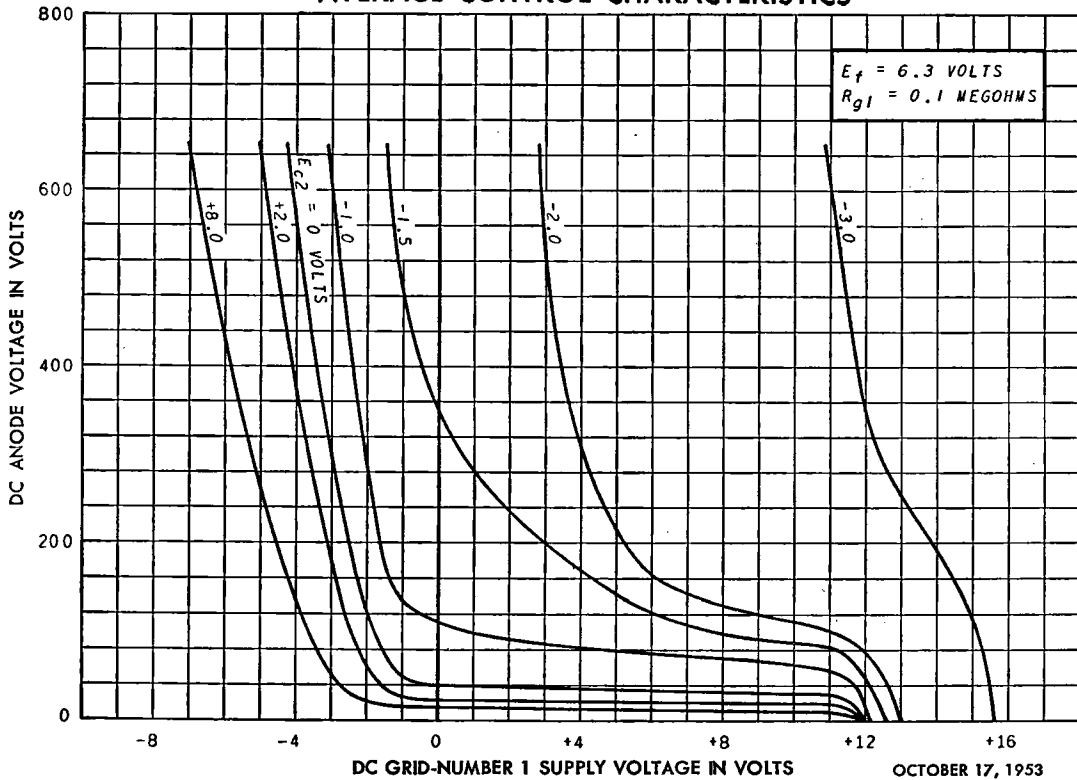


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### CONTROL CHARACTERISTICS



### AVERAGE CONTROL CHARACTERISTICS



ELECTRONIC COMPONENTS DIVISION



Schenectady 5, N. Y.