

engineering TUBE DATA

F-7831 ‡
POWER
TRIODE



Components Division

DESCRIPTION

The F-7831 is a general purpose metal and ceramic triode for use as a Class C amplifier or oscillator under CW or pulsed conditions. It is also capable of delivering 2 megawatts of power in a hard tube modulator. The anode is capable of dissipating 20 kilowatts during Continuous Commercial Service. Cooling is accomplished by circulating water on the anode and forced air on the ceramic and coaxial seals. The cathode is of mesh construction and may be operated on d-c or single phase a-c.

ELECTRICAL

Filament Voltage	7.5	volts
Filament Current	210	amperes
Filament Starting Current		
Full rated filament voltage may be safely applied to the cold filament		
Filament Heating Time, minimum	15	seconds
Amplification Factor		
$E_c = 150$ v. $I_b = 4.0$ amps	18	
Direct Inter-Electrode Capacitance		
Grid-Plate	40	μf
Grid-Filament	40	μf
Plate-Filament	3.0	μf

MECHANICAL

Mounting Position	Vertical				
Type of Cooling	Water and Forced Air				
Water Flow on Anode					
Plate Dissipation	8	12	16	20	kilowatts
Minimum Water Flow	2.6	3.3	4.6	7.2	gpm
Max. Outgoing Water Temperature				70	°C
Max. Water Pressure				80	psi
Air Flow Required					
Sufficient air must be provided to keep the ceramic stem surfaces below 250°C.					
Weight, approx.				6	lbs.

‡ Formerly our D-1008

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ELECTRON TUBE DEPARTMENT
COMPONENTS DIVISION

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

P. O. BOX 412, CLIFTON, NEW JERSEY

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Radio-Frequency Power Amplifier and Oscillator - Class C Telegraphy * (Key down conditions per tube without Amplitude Modulation) **

Maximum CCS Ratings, Absolute Values

D-C Plate Voltage	10,000	volts max.
D-C Grid Voltage	-1,500	volts max.
D-C Plate Current	8	amperes max.
D-C Grid Current ***	.6	amperes max.
Plate Input	60	kilowatts max.
Plate Dissipation	20	kilowatts max.

Typical Operation

	Cathode Drive	Grid Drive		
D-C Plate Voltage	6,500	9,500	7,500	volts
D-C Grid Voltage	-870	-1,300	-1,200	volts
Peak R-F Grid Voltage	1,350	1,850	1,700	volts
D-C Plate Current	3.8	5.5	5.2	amperes
D-C Grid Current, approx.	.53	.53	.53	amperes
Driving Power, approx.	5,320	1,000	900	watts
Grid Dissipation, approx.	236	300	275	watts
Power Output, approx.	22.3 ‡	35	28	kilowatts

* The filament voltage may be reduced to an absolute minimum at 6.8 volts under conditions of 3.5 amperes maximum plate current.

** Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

*** The power dissipated by the grid must never exceed 600 watts. Grid dissipation approximates the product of peak positive grid voltage and d-c grid current. Peak positive grid voltage may be measured by means of a suitable peak voltmeter connected between grid and filament, or determined by calculations using the constant current characteristics of the tube.

‡ Includes power transferred from driver stage.

RATINGS VERSUS FREQUENCY:

Maximum ratings apply up to 50 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the ceramics and seals at these frequencies.

Frequency	50	110	megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input	100	70	per cent

PULSE SERVICE OPERATIONS:

In pulse r-f amplifier service, it is possible to operate the tube under conditions not permissible in CW operation. Because of the wide variety of operating conditions, it is advisable that tube operation recommendations be obtained from our Engineering Department for specific conditions.

R-F POWER AMPLIFIER AND OSCILLATOR-GRID PULSED OPERATION

Maximum Ratings, Absolute Values

Peak Plate Pulse Supply Voltage	15	kilovolts
D-C Grid Voltage	-2500	volts
Peak Cathode Current	250	amperes
Plate Dissipation		
D-1008 Water-Cooled	20	kilowatts
D-1008R Air-Cooled	10	kilowatts
Grid Dissipation	600	watts
Pulse Length	50	usec.

Typical Operation

	Cathode Drive		Grid Drive		
	8	12	8	12	
Peak Plate Pulse Supply Voltage					kilovolts
D-C Grid Voltage	-1400	-1800	-1400	-1800	volts
D-C Plate Current (during Pulse)	22	17.75	22	17.75	amperes
D-C Grid Current (during Pulse)	5.4	3.75	5.4	3.75	amperes
Peak R-F Plate Voltage	6.0	10	6.0	10	kilovolts
Peak R-F Grid Voltage	3.0	3.2	3.0	3.2	kilovolts
Driving Power (during Pulse) approx.	74	63	16.4	12	kilowatts
Power Output (during Pulse) approx.	173	210	115	158	kilowatts
R-F Load Resistance	234	418	157	317	ohms

MODULATOR TUBE - PULSED OPERATION:

Maximum Ratings, Absolute Values

D-C Plate Voltage	18	kilovolts
Peak Plate Voltage (instantaneous)	20	kilovolts
D-C Grid Voltage	-2500	volts
Peak Positive Grid Voltage	4000	volts

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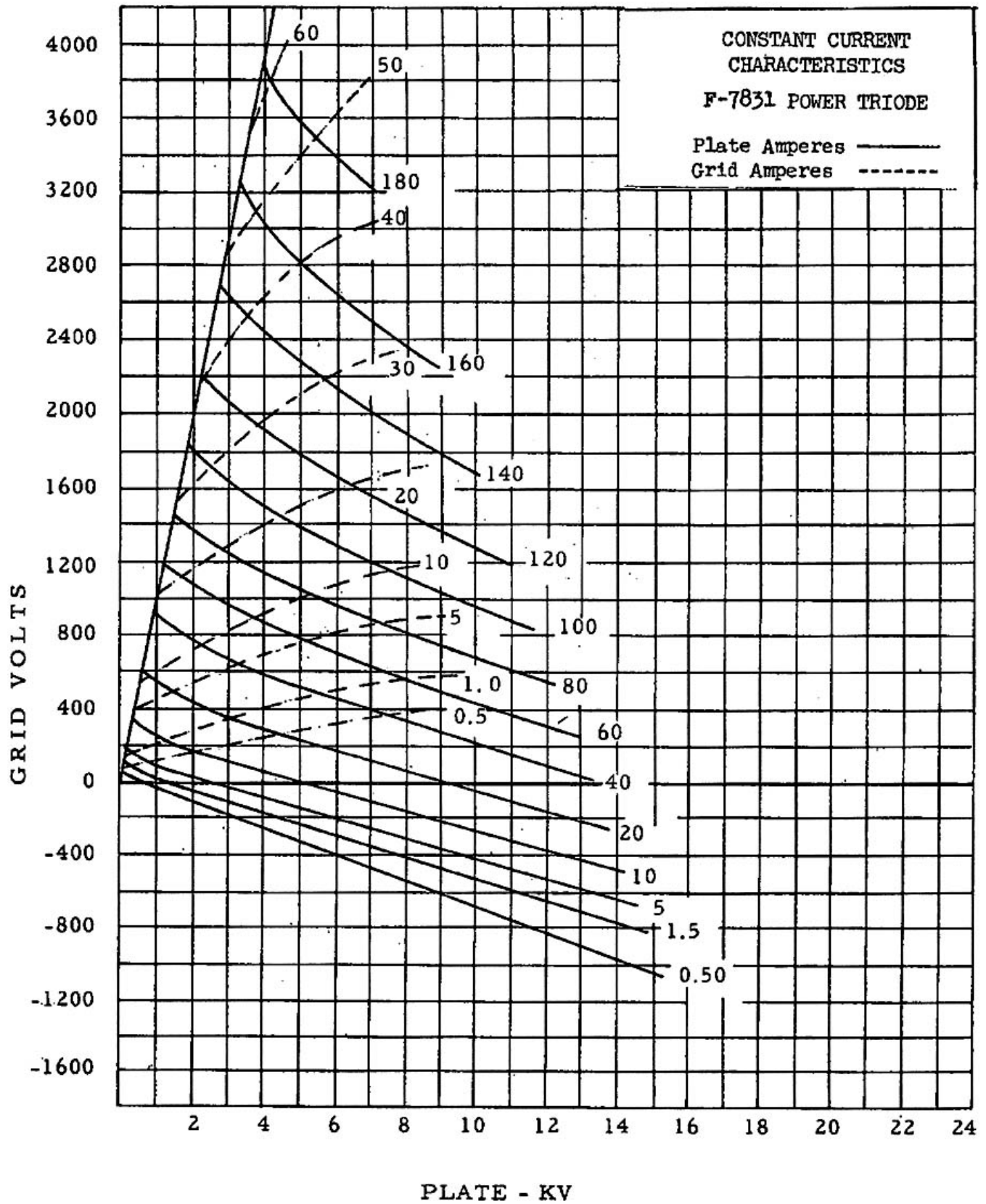
Pulse Cathode Current	220	amperes
Grid Dissipation	600	watts
Pulse Length	2000	μ sec.

Typical Operation

D-C Plate Voltage	16	kilovolts
Pulse Plate Current	120	amperes
D-C Grid Voltage	-1500	volts
Pulse Grid Current	40	amperes
Pulse Positive Grid Voltage	2200	volts
Duty Factor	.003	
Pulse Length	10	μ sec.
Plate Output Voltage	13.5	kilovolts
Pulse Output Power	1.6	mw

Additional information for specific applications can be obtained from the:

Electron Tube Applications Section
ITT Components Division
P.O. Box 412
Clifton, New Jersey

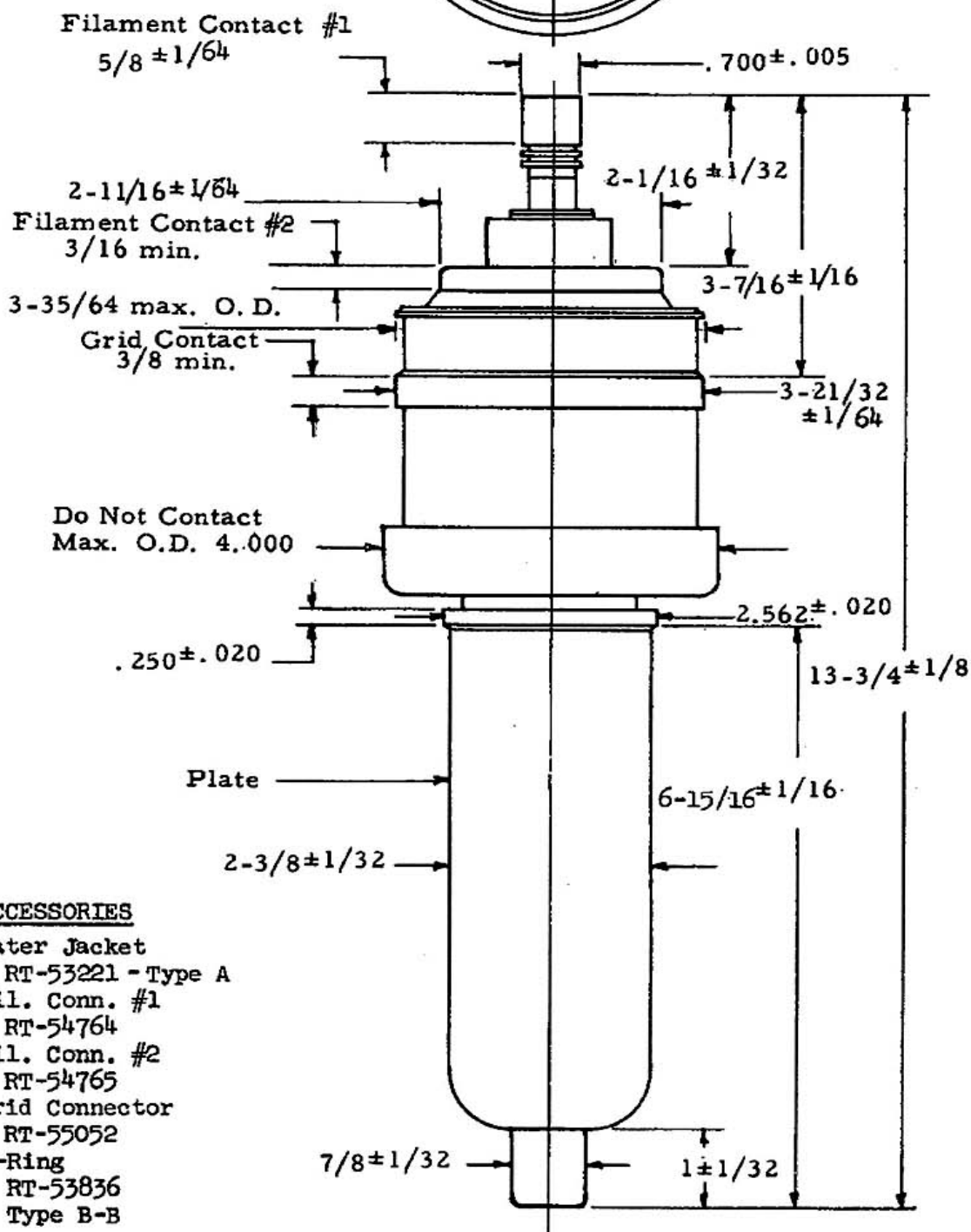


Note:

Contact areas are to
be concentric within
.025"

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OUTLINE



ACCESSORIES

Water Jacket

RT-53221 - Type A

Fil. Conn. #1

RT-54764

Fil. Conn. #2

RT-54765

Grid Connector

RT-55052

O-Ring

RT-53836

Type B-B