



Electron Tube Division

BOX 104 CLIFTON, NEW JERSEY
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

F-8045
POWER
TRIODE

DESCRIPTION:

The F-8045 is a three-electrode tube designed for use as a radio-frequency amplifier or oscillator. It may also be used in pulse applications in r-f circuits or as a hard tube modulator. The anode is cooled by circulating water and is capable of dissipating 90 kw. The cathode is a thoriated tungsten filament.

ELECTRICAL:

Filament Voltage	12.6	volts
Filament Current	285	amperes
Filament Starting Current		
Full rated voltage may be safely applied to the cold filament		
Filament Cold Resistance	.006	ohms
Amplification Factor		
$E_c = -50$ volts; $I_b = 2.0$ amperes	20	
Inter-Electrode Capacitance		
Grid-Plate	85	μmf
Grid-Filament	85	μmf
Plate-Filament	6.0	μmf

MECHANICAL:

Mounting Position	Vertical, anode down			
Type of Cooling	Water & Forced Air			
Maximum Outgoing Water Temperature			70	$^{\circ}\text{C}$
Plate Dissipation	90	75	50	30 kilowatts
Water Flow **	30	22	13	7 gpm
Water Jacket Pressure Drop	15	9	3	1.5 psi
Maximum Glass & Seal Temperature			180	$^{\circ}\text{C}$
Net Weight, approx.			25	lbs.

* Formerly our D-1031A

**Using Water Jacket RT-54319.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Audio-Frequency Power Amplifier and Modulator - Class B

Maximum Ratings, Absolute Values

D-C Plate Voltage	18,000	volts
Max. Signal D-C Plate Current λ	12	amperes
Max. Signal Plate Input λ	175	kilowatts
Plate Dissipation λ	90	kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

D-C Plate Voltage	14,000	volts
D-C Grid Voltage	-650	volts
Peak A-F Grid-to-Grid Voltage	2,400	volts
Zero Signal D-C Plate Current	2.0	amperes
Max. Signal D-C Plate Current	22.3	amperes
Effective Load Resistance, Plate-to-Plate	1,370	ohms
Max. Signal Driving Power, approx.	1,200	watts
Max. Signal Power Output, approx.	210	kilowatts

λ Averaged over any audio frequency cycle of sine-wave form.

Radio-Frequency Power Amplifier - Class B

(Carrier conditions per tube for use with a maximum modulator factor of 1.0)

Maximum Ratings, Absolute Values

D-C Plate Voltage	16,000	volts
D-C Plate Current	14	amperes
Plate Input	150	kilowatts
Plate Dissipation	90	kilowatts

Typical Operation

D-C Plate Voltage	14,000	volts
D-C Grid Voltage	-650	volts
Peak R-F Grid Voltage	650	volts
D-C Plate Current	7.2	amperes
Peak R-F Plate Voltage	5,500	volts
D-C Grid Current	0	amperes
Driving Power, approx. ++	1,725	watts
R-F Load Resistance	460	ohms
Power Output, approx.	33	kilowatts

++ At crest of audio-frequency cycle with modulation factor of 1.0

F-8045
POWER
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Plate-Modulated Radio-Frequency Power Amplifier - Class C Telephony
(Carrier conditions per tube for use with a max. modulation factor of 1.0)

Maximum Ratings, Absolute Values

D-C Plate Voltage	12,500	volts
D-C Grid Voltage	-3,000	volts
D-C Plate Current	13.5	amperes
D-C Grid Current	2.0	amperes
Plate Input	160	kilowatts
Plate Dissipation	60	kilowatts

Typical Operation

D-C Plate Voltage	12,000	volts
D-C Grid Voltage	-1,400	volts
Peak R-F Plate Voltage	10,000	volts
Peak R-F Grid Voltage	2,100	volts
D-C Plate Current	10	amperes
D-C Grid Current	1.35	amperes
Driving Power, approx.	2.7	kilowatts
R-F Load Resistance	555	ohms
Power Output, approx.	90	kilowatts

Radio-Frequency Power Amplifier and Oscillator - Class C Telegraphy
(Key down conditions per tube without amplitude modulation) ⑧

Maximum Ratings, Absolute Values

D-C Plate Voltage	18,000	volts
D-C Grid Voltage	-3,000	volts
D-C Plate Current	17	amperes
D-C Grid Current	2.0	amperes
Plate Input	270	kilowatts
Plate Dissipation	90	kilowatts

⑧ Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.

Radio-Frequency Power Amplifier and Oscillator - Class C Telegraphy (cont'd)

Typical Operation

D-C Plate Voltage	10,000	12,000	16,000	volts
D-C Grid Voltage	-1,200	-1,400	-1,800	volts
Peak R-F Plate Voltage	9,000	10,000	13,000	volts
Peak R-F Grid Voltage	1,825	2,100	2,600	volts
D-C Plate Current	7.6	10.0	13.2	amperes
D-C Grid Current, approx.	1.35	1.35	1.25	amperes
Driving Power, approx.	2.5	2.7	3.25	kilowatts
R-F Load Resistance	675	555	565	ohms
Power Output, approx.	60	90	150	kilowatts

Series Regulator Operation

Maximum Ratings, Absolute Values

D-C Plate Voltage	40,000	volts
Peak Positive Plate Voltage	45,000	volts
D-C Grid Voltage	-5,000	volts
D-C Plate Current	25	amperes
Grid Dissipation	3.0	kilowatts
Plate Dissipation	90	kilowatts

Hard Tube Modulator

Maximum Ratings, Absolute Values

D-C Plate Voltage	40,000	40,000#	volts
Peak Positive Plate Voltage	45,000	45,000#	volts
D-C Grid Voltage	-5,000	-5,000#	volts
Peak Positive Grid Voltage	4,000	4,000#	volts
Pulse Cathode Current	200	270#	amperes
Grid Dissipation	3.0	3.0#	kilowatts
Duty Factor	.06	.06#	
Pulse Length	2000	2000#	μseconds
Plate Dissipation	90	90#	kilowatts

These ratings apply only under elevated filament temperatures as specified below:

	<u>Min.</u>	<u>Bogey</u>	<u>Max.</u>	
Filament Voltage	13.2	13.6	14.0	volts
Filament Emission $E_f = 13.2$ v.	250			amperes
$E_p = E_g = 3$ kv				

Radio-Frequency Power Amplifier and Oscillator - Pulse Operation

Maximum Ratings, Absolute Values

D-C Plate Voltage		22,000	volts
D-C Grid Voltage		-5,000	volts
Peak Cathode Current	270 ***	200	amperes
Duty Cycle		.06	
Grid Dissipation		3	kilowatts
Pulse Length		2,000	μseconds

Typical Operation

D-C Plate Voltage	21,000	volts
D-C Grid Voltage	-1,100	volts
D-C Plate Current	2	amperes
Duty Cycle	.03	
Output Crest Value	2,000	kilovolt amps

***See note on elevated filament temperatures on sheet 4.

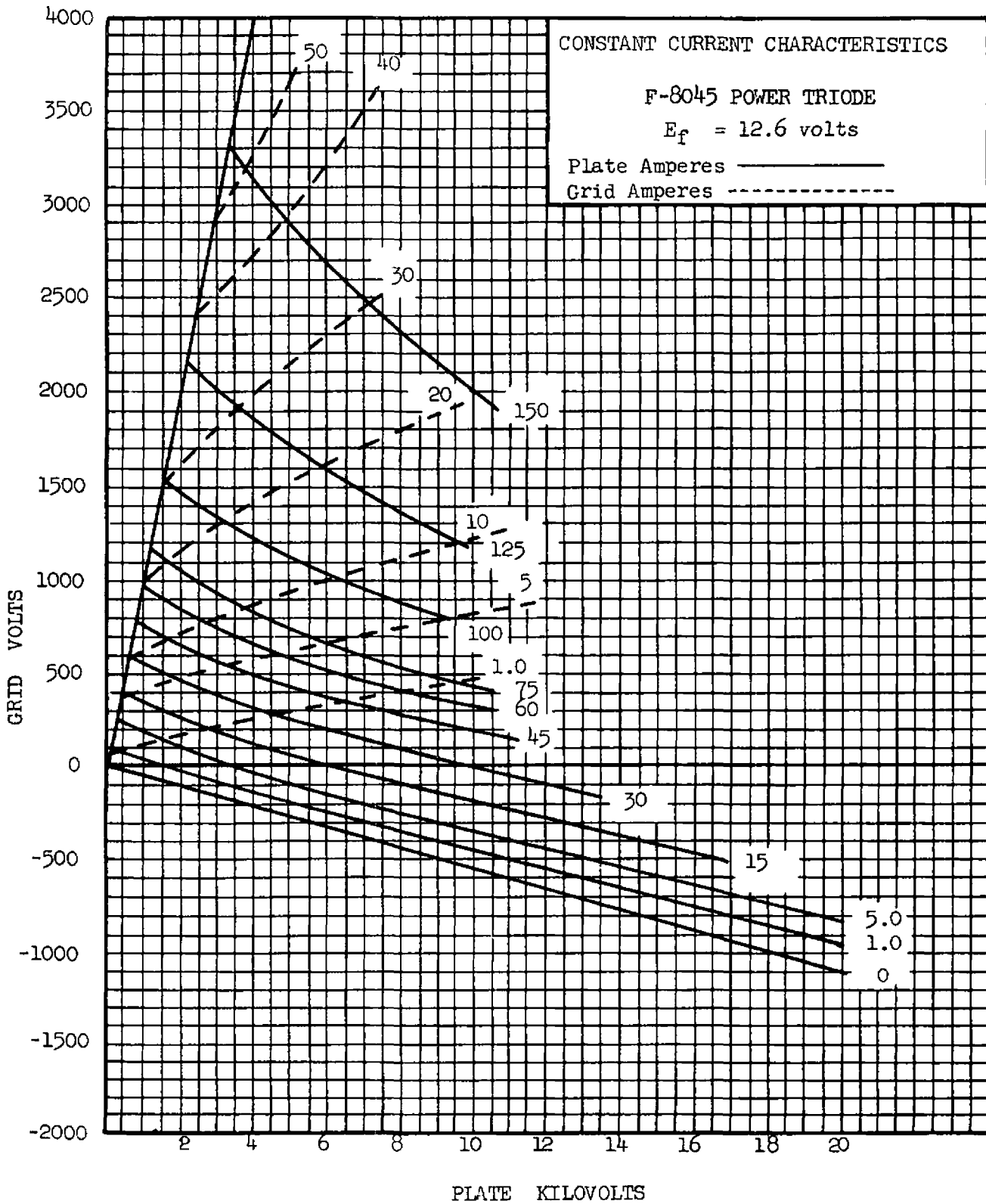
MAXIMUM FREQUENCY RATINGS

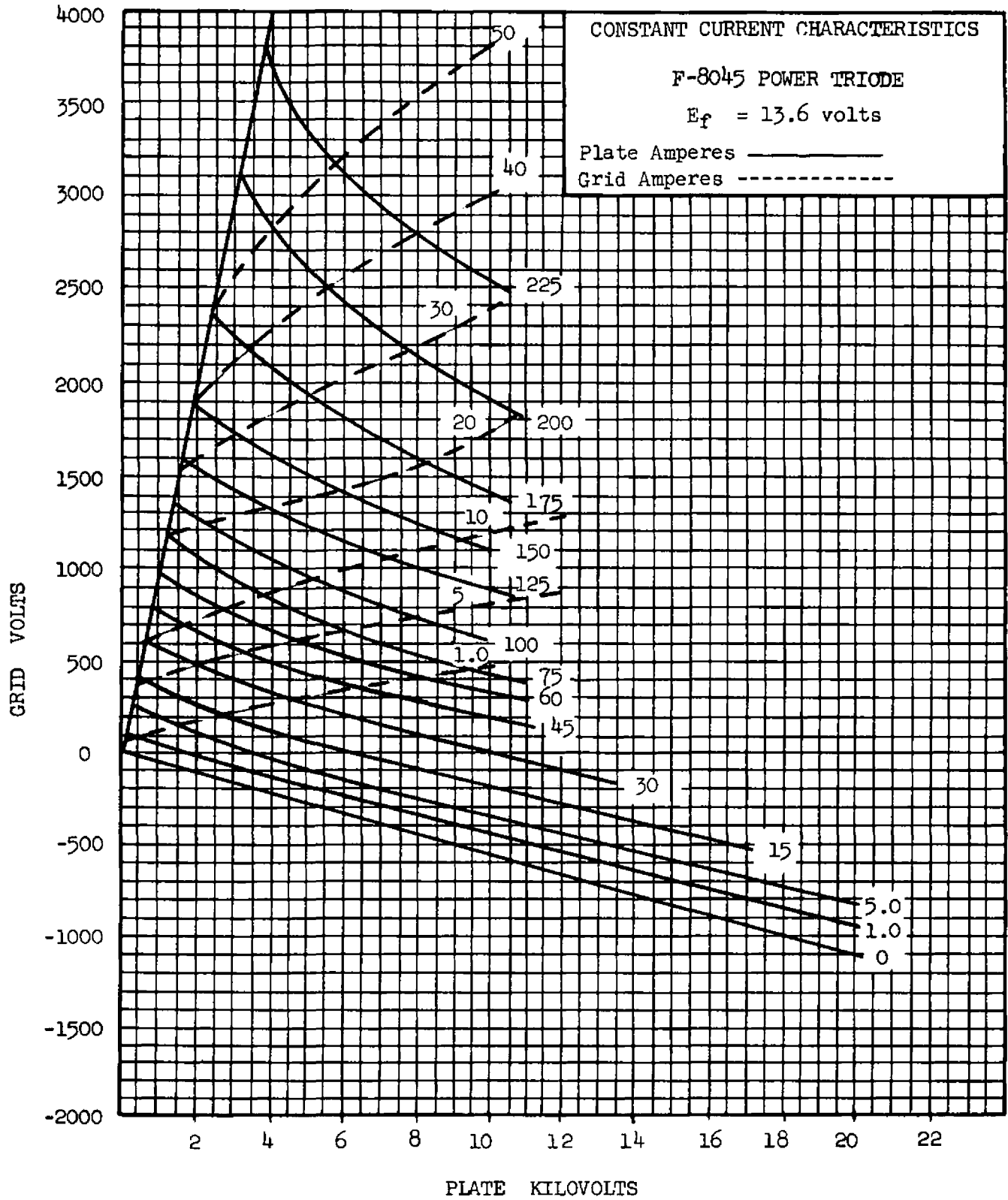
Maximum ratings apply up to 2 mc except as noted. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below.

Frequency	2	10	15	megacycles
Max. Rated Plate Voltage & Plate Input:				
Class B	100	100	90	per cent
Class C	100	90	70	per cent

Additional information for specific applications can be obtained from the:

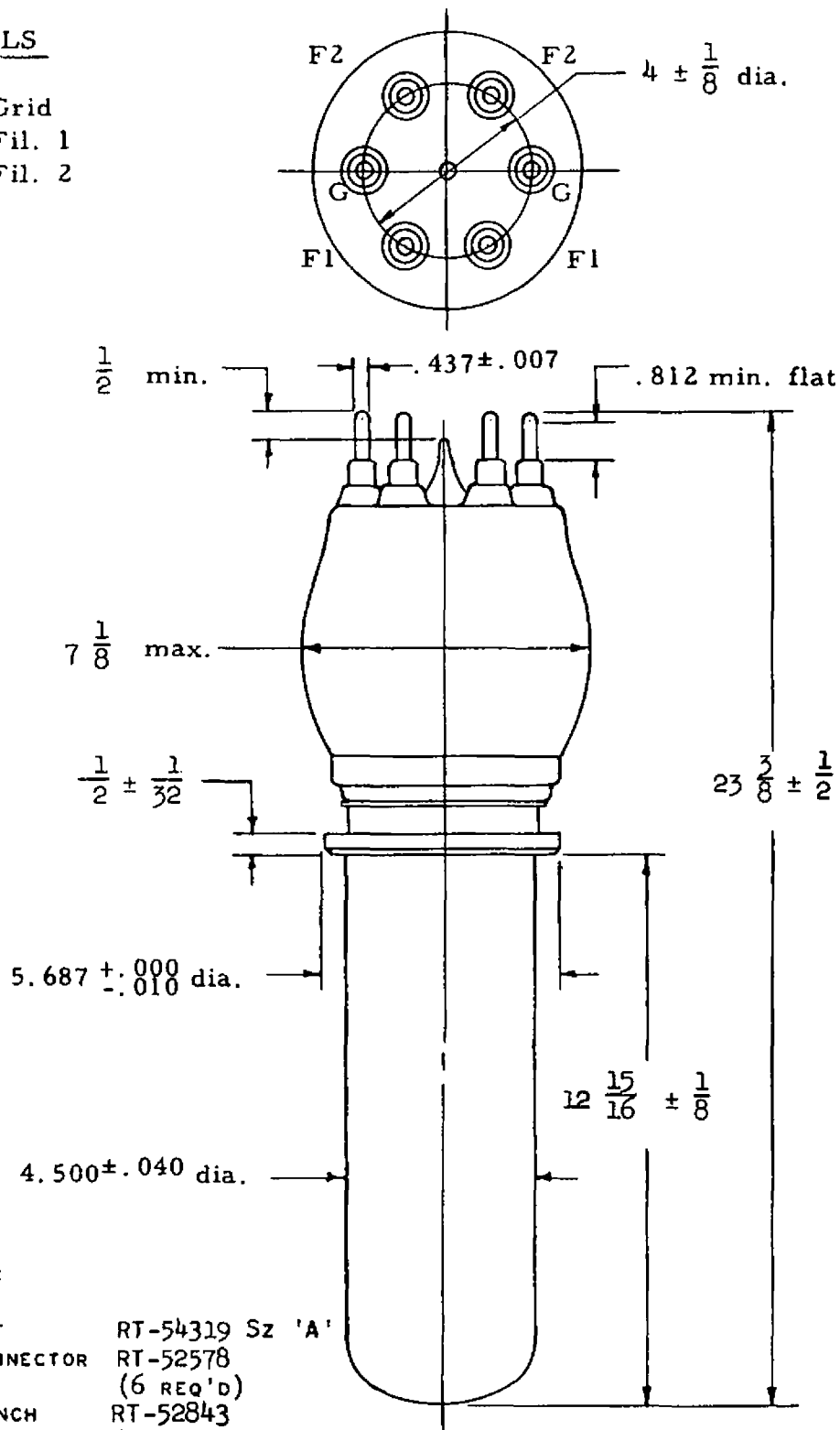
Electron Tube Applications Section
ITT ELECTRON TUBE DIVISION
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TERMINALS

Black - Grid
 Yellow - Fil. 1
 Red - Fil. 2



ACCESSORIES:

WATER JACKET	RT-54319 Sz 'A'
TERMINAL CONNECTOR	RT-52578
	(6 REQ'D)
SPANNER WRENCH	RT-52843
	(2 REQ'D)
O-RING	RT-53836

OUTLINE

F-8045 POWER TRIODE