ITT 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	μμf
Grid-Filament	85	μμf
Plate-Filament	6.0	μμf

MECHANICAL:

Mounting Position				Vertical, anode down	
Type of Cooling				Water & Forced Air	
Maximum Outgoing Water Temperature				70	°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	°C
Net Weight, approx.				25	lbs.

* Formerly our D-1031A

**Using Water Jacket RT-54319.

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from JEDEC release #4504, Nov. 25, 1963

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 ☈	12	amperes
Max. Signal Plate Input ☈	175	kilowatts
Plate Dissipation ☈	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

☈ 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
TRIODE

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) ⊛

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

⊛ 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:

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

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.

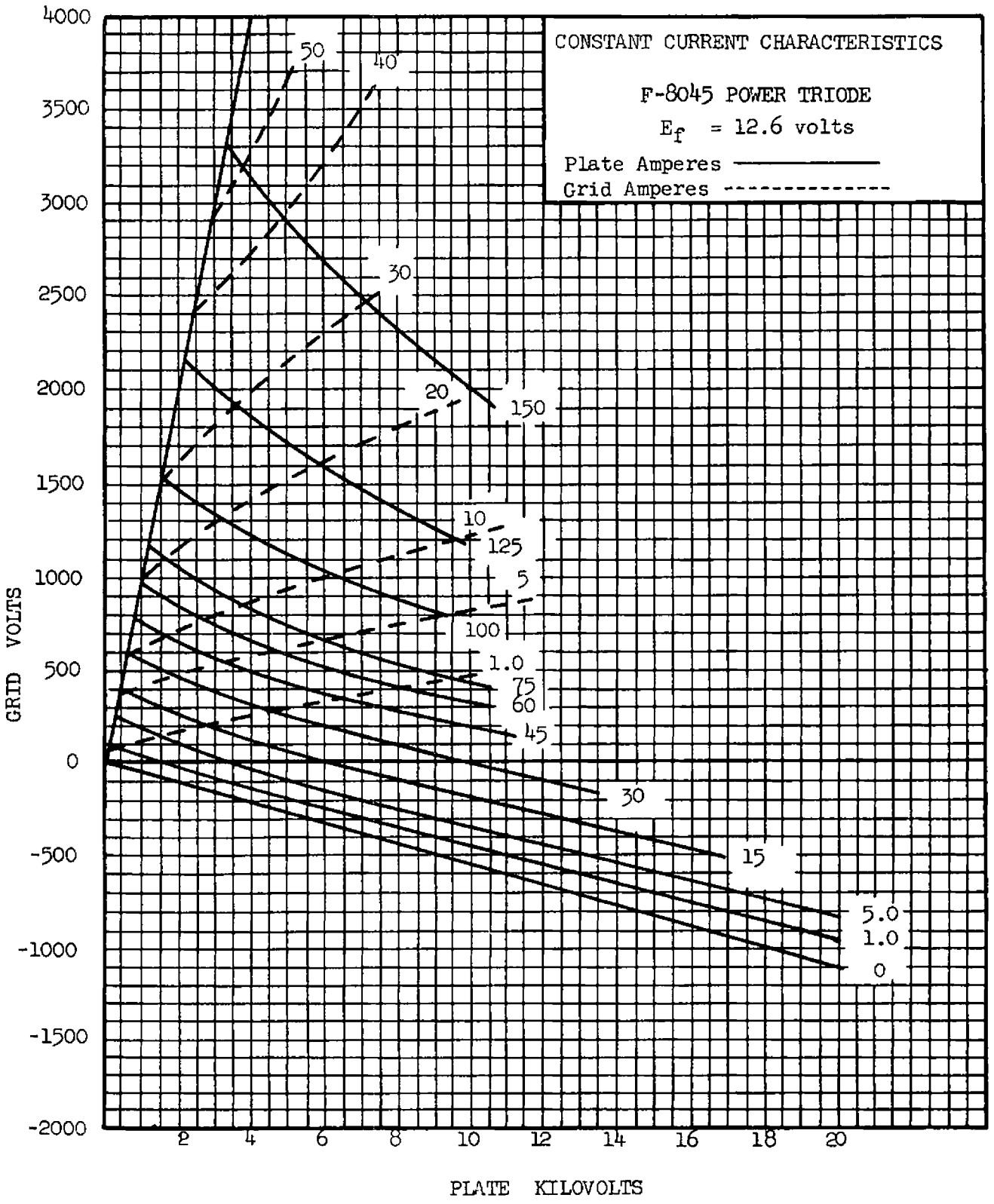
MAXIMUM FREQUENCY RATINGS

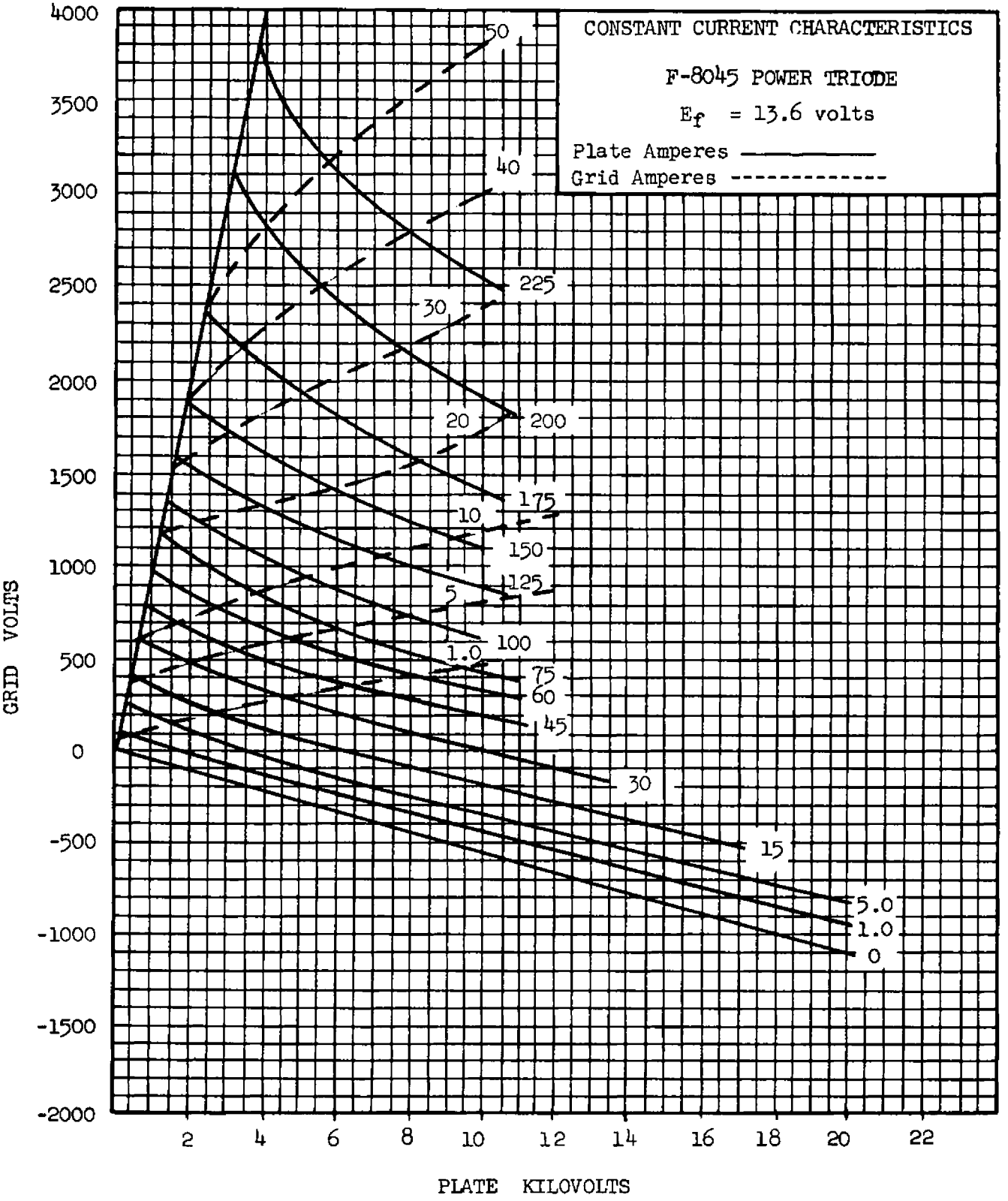
Maximum ratings apply up to 2 mc except as noted. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below.

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:

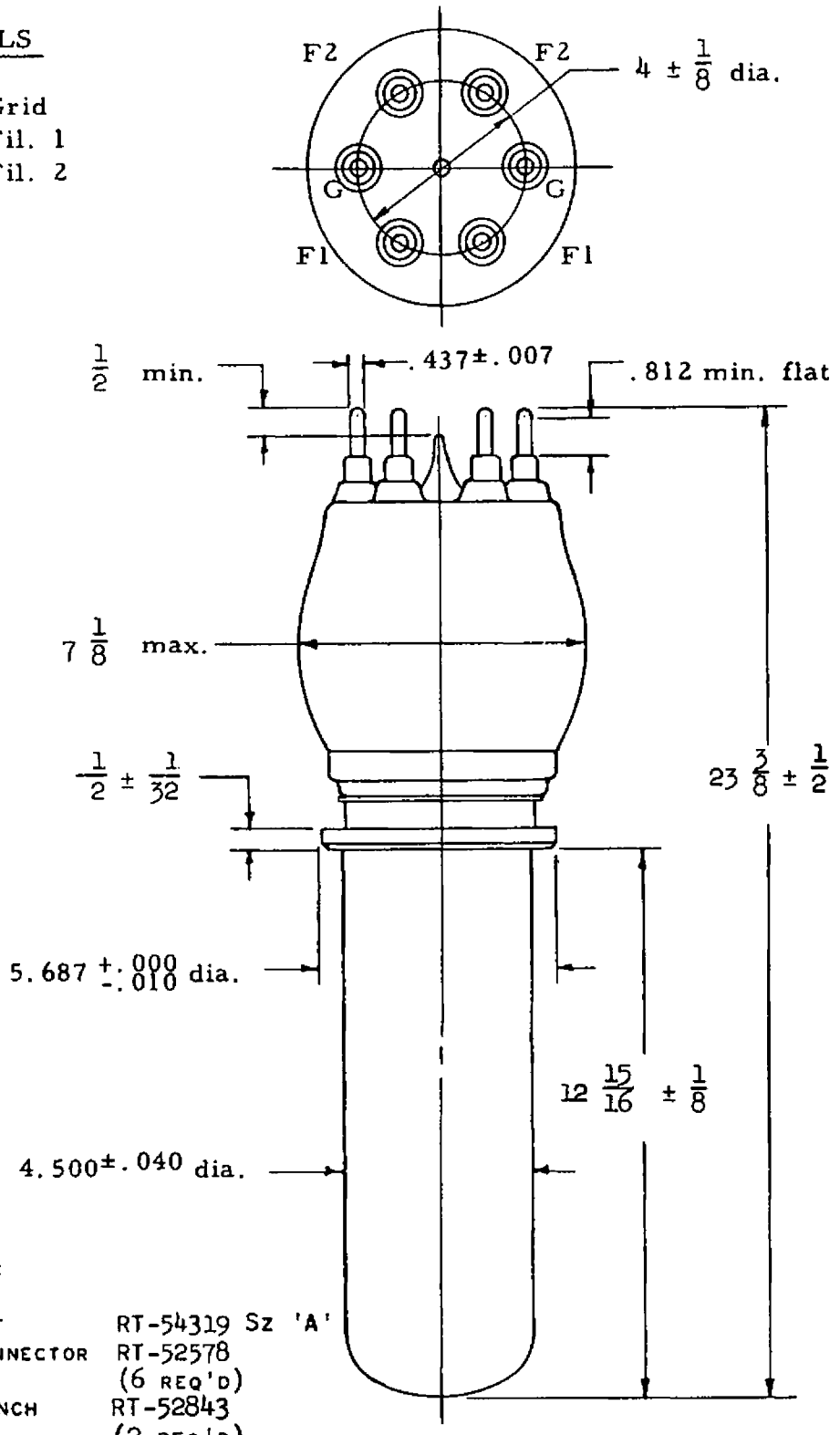
Electron Tube Applications Section
ITT ELECTRON TUBE DIVISION
P.O. Box 104
Clifton, New Jersey


CONSTANT CURRENT CHARACTERISTICS
F-8045 POWER TRIODE
E_f = 12.6 volts
Plate Amperes
Grid Amperes
4000
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
GRID VOLTS
2
4
6
8
10
12
14
16
18
20
PLATE KILOVOLTS
50
40
30
20
150
10
125
5
100
1.0
75
60
45
30
15
5.0
1.0
0


CONSTANT CURRENT CHARACTERISTICS
F-8045 POWER TRIODE
E_f = 13.6 volts
Plate Amperes ————
Grid Amperes ----------
GRID VOLTS
4000
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
2
4
6
8
10
12
14
16
18
20
22
PLATE KILOVOLTS
50
40
225
30
200
20
175
10
150
125
5
100
1.0
75
60
45
30
15
5.0
1.0
0

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