ELECTRON TUBE DIVISION
P.O. Box 100
Easton, Pennsylvania 18042
Telephone 215 252-7331

F-6696A
F-6697A

POWER TRIODES

F-6696A

F-6697A

DESCRIPTION

The F-6696A and F-6697A are general purpose metal and ceramic triodes designed for use as radio frequency amplifiers, oscillators, or Class B modulators. The rugged coaxial stem structure provides high dissipation, low inductance r-f electrode terminals. The cathode is a thoriated tungsten filament.

The F-6696A has a water cooled, heavy wall anode capable of 60 kw dissipation. The F-6697A has a forced-air cooled copper anode-radiator assembly of brazed construction capable of 35 kw dissipation.

Electrical

Filament Voltage	13.0 ± 5% Volts
Filament Current	205 Amps
Filament Starting Current	800 Amps
Filament Cold Resistance	.0073 Ohms
Amplification Factor	20
Inter-Electrode Capacitances:	
Grid-Plate	55 uuf
Grid-Filament	76 uuf
Plate-Filament	2.7 uuf

Mechanical

Mounting Position ..... Vertical, Anode down

Max. Ceramic & Seal Temperature* ..... 200°C

	F-6696A			F-6697A			
Plate Dissipation	60	45	30	35	25	15	KW
Water Flow	18	13	8	—	—	—	gpm
Water Jacket Pressure Drop	7	4	2	—	—	—	psi
Air Flow**	—	—	—	1700	1000	440	cfm
Static Air Pressure	—	—	—	7.8	2.8	.6	in. of water
Net Weight, Approx.		19			38		lbs.

*At the upper frequencies, special attention should be given to provide adequate cooling to the seals to limit temperature to 200°C max.; up to 150 cfm air flow may be required. A temperature sensitive lacquer is convenient for this measurement.

**Maximum incoming air temperature of 50°C at sea level.

F-6696A
F-6697A

Audio-Frequency Power Amplifier and Modulator—Class B

Maximum Ratings, Absolute Values

D-C Plate Voltage	16,000	Volts
Max. Signal D-C Plate Current[2]	11	Amperes
Plate Dissipation[2]		
F-6696A	60	Kilowatts
F-6697A	35	Kilowatts

[2]Averaged over any audio frequency cycle of sine-wave form.

Typical Operation

(Unless otherwise specified, values are for two tubes)

	F-6696A		
D-C Plate Voltage	10,000	12,000	Volts
D-C Grid Voltage	—450	—600	Volts
Peak A-F Grid-to-Grid Voltage	1,750	2,120	Volts
Peak A-F Plate-to-Plate Voltage	16,000	19,200	Volts
Zero Signal D-C Plate Current	3.0	2.0	Amperes
Max. Signal D-C Plate Current	17.4	20.0	Amperes
Effective Load Resistance, Plate-to-Plate	1,170	1,230	Ohms
Max. Signal Driving Power, Approx.	550	600	Watts
Max. Signal Power Output, Approx.	110	152	Kilowatts

Radio-Frequency Power Amplifier—Class B

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

Maximum Ratings, Absolute Values

D-C Plate Voltage	16,000	Volts
D-C Plate Current	9.0	Amperes
Plate Dissipation		
F-6696A	60	Kilowatts
F-6697A	35	Kilowatts

Typical Operation

D-C Plate Voltage	12,000	12,000	Volts
D-C Grid Voltage	—550	—550	Volts
Peak R-F Grid Voltage	510	640	Volts
D-C Plate Current	4.3	6.8	Amperes
Peak R-F Plate Voltage	5,300	5,300	Volts
D-C Grid Current	0	0	Milliamps
R-F Load Resistance	780	500	Ohms
Driving Power, Approx.†	450	1,500	Watts
Power Output, Approx.	18	28	Kilowatts

†At crest of audio-frequency cycle with modulation factor of 1.0.

Radio-Frequency Linear Amplifier

Class AB Single Sideband Suppressed Carrier

Maximum Ratings, Absolute Values

D-C Plate Voltage	16,000	Volts
D-C Plate Current	11.0	Amperes
Plate Dissipation		
F-6696A	60	Kilowatts
F-6697A	35	Kilowatts

Typical Operation

(Peak-envelope or modulation crest conditions in cathode drive circuit)

	F-6696A		
D-C Plate Voltage	12,000	12,000	Volts
D-C Cathode Voltage	600	600	Volts
Peak R-F Driving Voltage	830	1,020	Volts
D-C Plate Current	5.2	9.8	Amperes
D-C Grid Current	60	200	Milliamps
Resonant Load Resistance	880	700	Ohms
Driving Power, Approx.	3,500	8,200	Watts
Plate Power Output, Approx.	43	83	Kilowatts

RATINGS VERSUS FREQUENCY

Maximum ratings apply up to 40 MHz 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	40	60	80 MHz
Max. Rated Plate Voltage and Plate Input: Class B	100	80	55 per cent
Class C	100	75	50 per cent

Plate-Modulated Radio-Frequency Power Amplifier—Class C Telephony

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

Maximum Ratings, Absolute Values

D-C Plate Voltage	10,000	Volts
D-C Grid	—3,200	Volts
D-C Plate Current	8.5	Amperes
D-C Grid Current	2.0	Amperes
Plate Dissipation		
F-6696A	40	Kilowatts
F-6697A	23	Kilowatts

Typical Operation

D-C Plate Voltage	9,500	Volts
D-C Grid Voltage	—1,800	Volts
Peak R-F Grid Voltage	2,300	Volts
Peak R-F Plate Voltage	7,800	Volts
D-C Plate Current	8.4	Amperes
D-C Grid Current	0.90	Amperes
R-F Load Resistance	510	Ohms
Driving Power, Approx.	2.0	Kilowatts
Power Output, Approx.	60	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	16,000	Volts
D-C Grid Voltage	—3,200	Volts
D-C Plate Current	11	Amperes
D-C Grid Current	2.0	Amperes
Plate Dissipation		
F-6696A	60	Kilowatts
F-6697A	35	Kilowatts

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

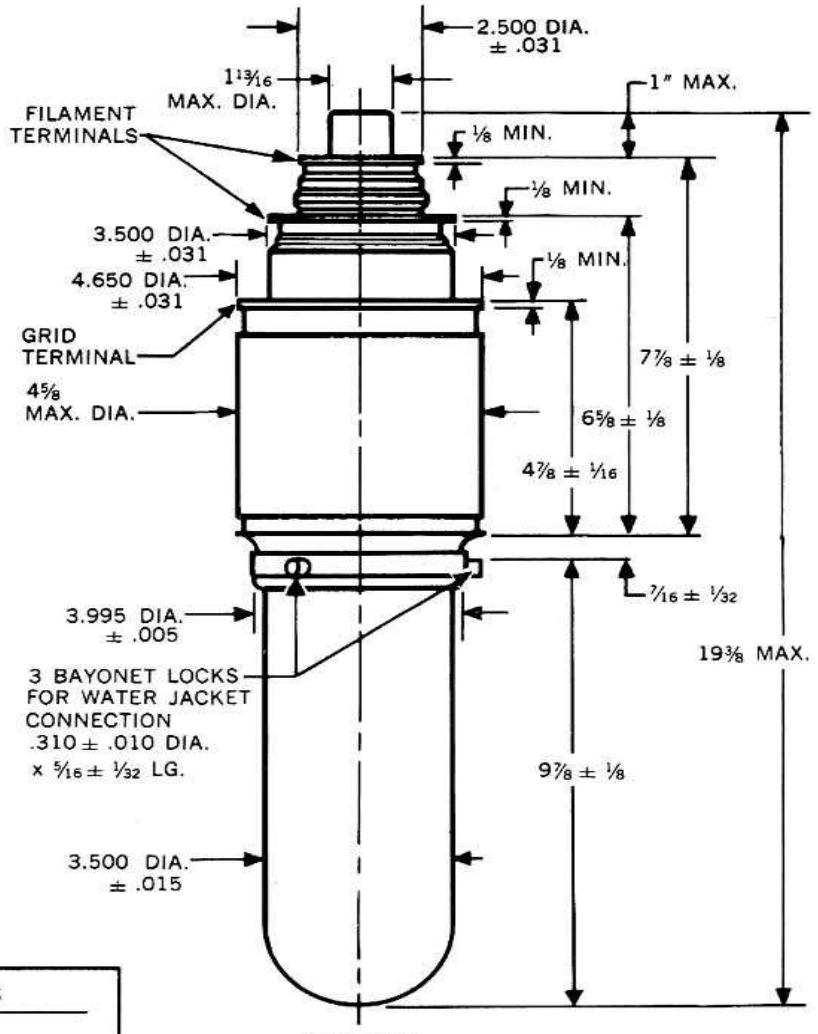
Typical Operation

D-C Plate Voltage	10,000	15,000	Volts
D-C Grid Voltage	—1,200	—1,600	Volts
Peak R-F Grid Voltage	1,900	2,120	Volts
Peak R-F Plate Voltage	8,000	12,500	Volts
D-C Plate Current	10	7.0	Amperes
D-C Grid Current, Approx.	0.81	0.30	Amperes
R-F Load Resistance	440	970	Ohms
Driving Power, Approx.	1.5	0.60	Kilowatts
Power Output, Approx.	72	80	Kilowatts

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

Characteristics	Conditions		Limits			
			Min.	Bogey	Max.	
Grid Voltage	eb = 1500 Volts; ib = 48 Amps	ec	—	—	1000	Volts
Grid Current	eb = 1500 Volts; ib = 48 Amps	ic	—	—	15	Amps
Plate Voltage	Ec = 0 V d-c; Ib = 3.0 A d-c	Eb	1.9	2.4	2.9	Kv d-c
Plate Voltage	Ec = —200 V d-c; Ib = 3.0 A d-c	Eb	5.6	6.4	7.2	Kv d-c
Grid Voltage	Eb = 15.0 Kv d-c; Ib = 0.020 A d-c	Ec	—700	—820	—940	V d-c
Plate Power Output	Eb = 15.0 Kv d-c; Ib = 7.0 A d-c Ec = —1600 V d-c; Ic = 0.30 A d-c	Po	68	—	—	Kw

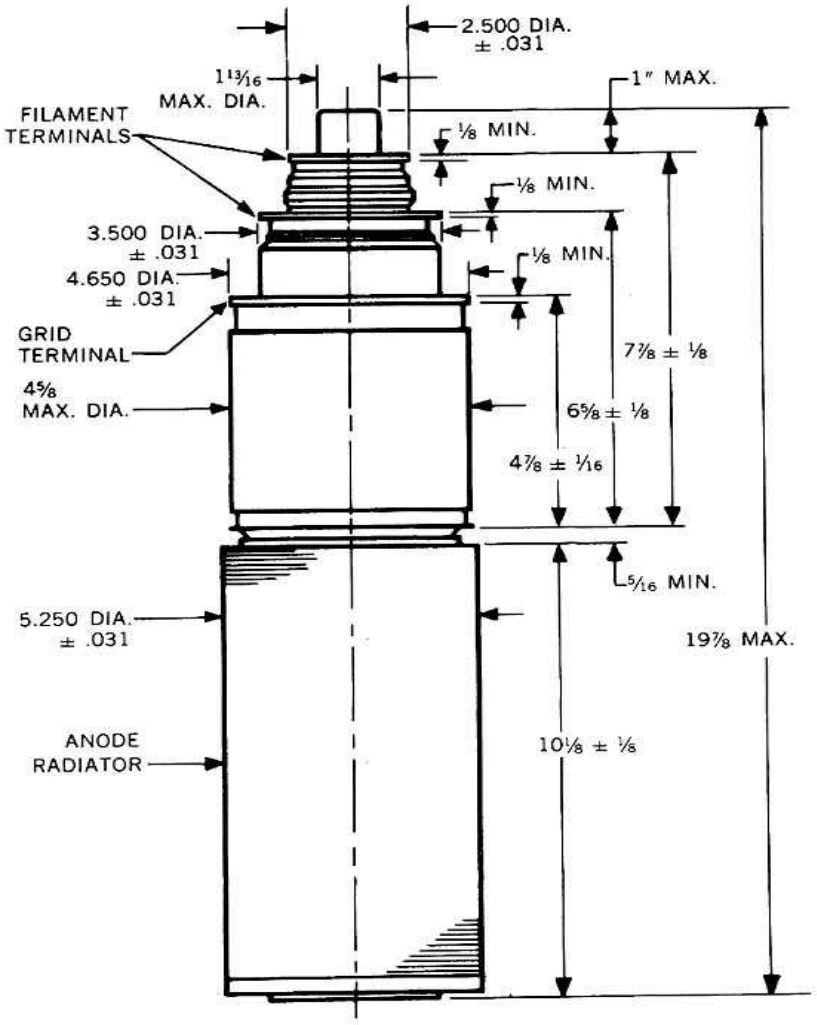
Additional information for specific applications can be obtained from:
ITT ELECTRON TUBE DIVISION
P.O. BOX 100
EASTON, PENNSYLVANIA 18042



OUTLINE
F-6696A POWER TRIODE

ACCESSORIES

WATER JACKET
-RT-55359
MOUNTING CLAMP
-RT-55309
GRID CONNECTOR ASSEM.
-RT-55246
FILAMENT CONNECTOR
-RT-55247
FILAMENT CONNECTOR
-RT-55248

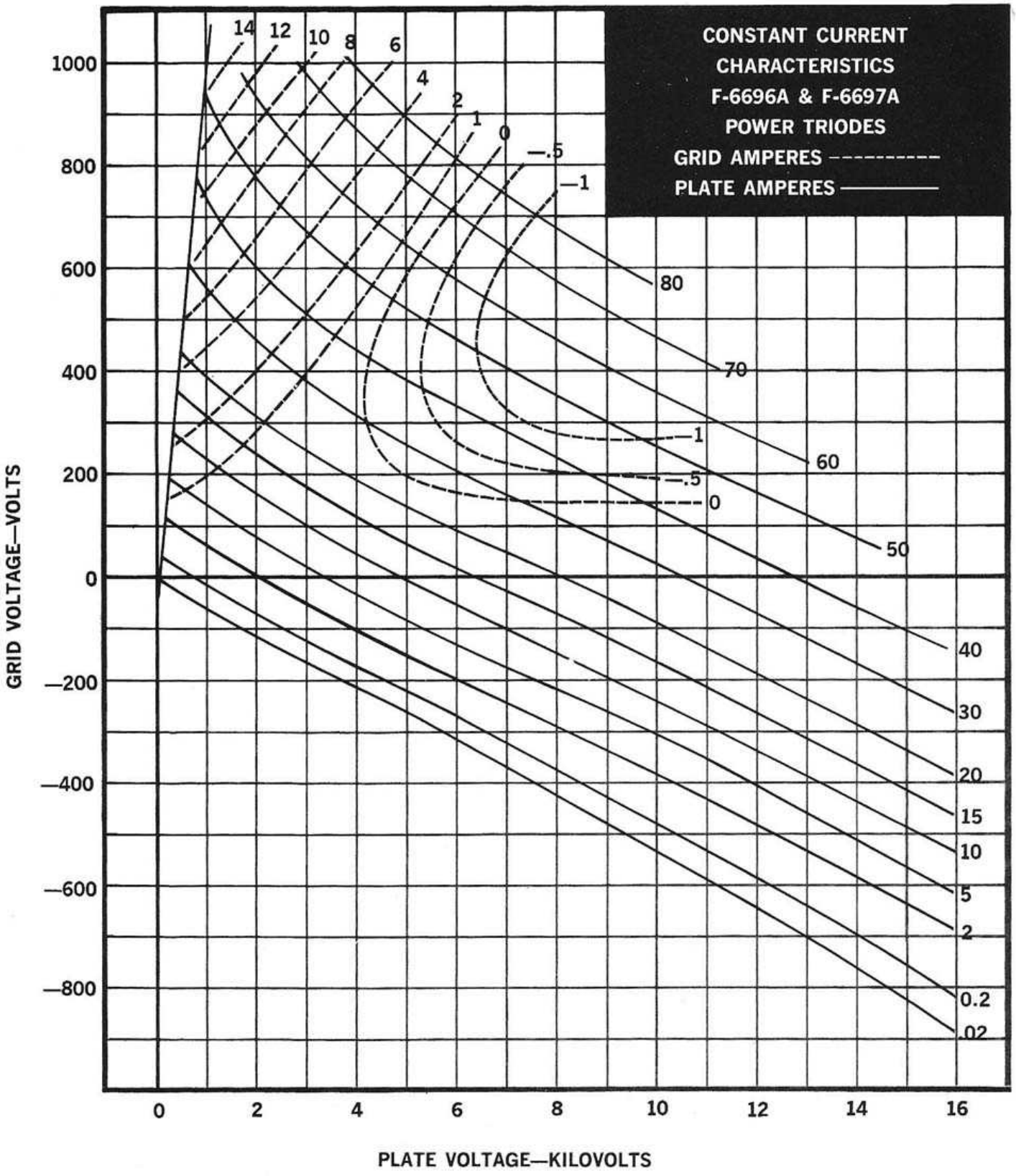


OUTLINE
F-6697A POWER TRIODE

ACCESSORIES

AIR DISTRIBUTOR
-RT-55301
TUBE SUPPORT
-RT-55302
SPRING CLIPS (3) REQUIRED
-RT-55303
GRID CONNECTOR ASSEM.
-RT-55246
FILAMENT CONNECTOR
-RT-55247
FILAMENT CONNECTOR
-RT-55248

F-6696A
F-6697A



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