

engineering TUBE DATA

F-7837, F-7838
AND F-7839
POWER TRIODES



Components Division

DESCRIPTION:

THESE TYPES ARE THREE-ELECTRODE TUBES DESIGNED FOR USE AS RADIO FREQUENCY AMPLIFIER, OSCILLATOR, OR CLASS B MODULATOR. THEY MAY ALSO BE USED IN PULSE APPLICATIONS AS A HARD TUBE MODULATOR. THE CATHODE IS A THORIATED TUNGSTEN FILAMENT. THE F-7837 HAS A WATER COOLED, HEAVY-WALL ANODE CAPABLE OF 90 KW DISSIPATION. THE F-7838 HAS A FORCED AIR-COOLED, HEAVY-WALL ANODE CAPABLE OF 25 KW DISSIPATION. THE F-7839 HAS A FORCED AIR-COOLED ANODE, SMALLER IN SIZE AND RATING TO ACCOMMODATE PULSE APPLICATIONS OF LOW AVERAGE PLATE DISSIPATION.

ELECTRICAL:

FILAMENT VOLTAGE	12.6	VOLTS
FILAMENT CURRENT	285	AMPERES
FILAMENT STARTING CURRENT	1000	AMPERES
FULL RATED VOLTAGE MAY BE SAFELY APPLIED TO THE COLD FILAMENT		
FILAMENT COLD RESISTANCE	.006	OHMS
AMPLIFICATION FACTOR	41	
$I_B = 2$ AMPERES $E_C = -50$ VOLTS		
INTER-ELECTRODE CAPACITANCES		
GRID-PLATE	37	UUF
GRID-FILAMENT	85	UUF
PLATE-FILAMENT	2.4	UUF

MECHANICAL:

MOUNTING POSITION					VERTICAL, ANODE DOWN	
MAXIMUM GLASS & SEAL TEMPERATURE *					1800 C	
	<u>F-7837</u>				<u>F-7838</u>	<u>F-7839</u>
PLATE DISSIPATION	90	70	50	30	25	10 KILOWATTS
WATER FLOW **	30	22	16	10	-	- GPM
WATER JACKET PRESSURE DROP	15	9	4.5	2	-	- PSI
AIR FLOW	-				1800	800 CFM
STATIC AIR PRESSURE	-				2.2	2.75 INCHES OF WATER
NET WEIGHT, APPROX.	25				125	60 LBS

* AT THE UPPER FREQUENCIES, SPECIAL ATTENTION SHOULD BE GIVEN TO PROVIDE ADEQUATE COOLING TO THE DISH AND SEALS TO LIMIT THE TEMPERATURE TO 1800°C MAX.

** USING WATER JACKET RT-54319



ELECTRON TUBE DEPARTMENT
COMPONENTS DIVISION
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

6-61

P. O. BOX 412, CLIFTON, NEW JERSEY

from JEDEC release #3434, Sept. 25, 1961

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS:

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR - CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C PLATE VOLTAGE	19,500	VOLTS
MAXIMUM SIGNAL D-C PLATE CURRENT *	12	AMPERES
MAXIMUM SIGNAL PLATE INPUT *	175	KILOWATTS
PLATE DISSIPATION *		

REFER TO PLATE DISSIPATION RATINGS ON PAGE 1

TYPICAL OPERATION

(UNLESS OTHERWISE SPECIFIED, VALUES ARE FOR TWO TUBES)

D-C PLATE VOLTAGE	16,000	VOLTS
D-C GRID VOLTAGE	-270	VOLTS
PEAK A-F GRID-TO-GRID VOLTAGE	1,540	VOLTS
ZERO SIGNAL D-C PLATE CURRENT	2	AMPERES
MAXIMUM SIGNAL D-C PLATE CURRENT	22.3	AMPERES
EFFECTIVE LOAD RESISTANCE, PLATE-TO-PLATE	1,490	OHMS
MAX. SIGNAL DRIVING POWER, APPROX.	1,500	WATTS
MAX. SIGNAL POWER OUTPUT, APPROX.	225	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 MAX. MODULATION FACTOR OF 1.0)

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C PLATE VOLTAGE	17,500	VOLTS
D-C PLATE CURRENT	14	AMPERES
PLATE INPUT	150	KILOWATTS
PLATE DISSIPATION		

(REFER TO PLATE DISSIPATION RATINGS ON PAGE 1)

TYPICAL OPERATION

D-C PLATE VOLTAGE	15,000	VOLTS
D-C GRID VOLTAGE	-280	VOLTS
PEAK R-F GRID VOLTAGE	500	VOLTS
D-C PLATE CURRENT	7.7	AMPERES
PEAK R-F PLATE VOLTAGE	6,500	VOLTS
D-C GRID CURRENT	.110	AMPERES
DRIVING POWER, APPROX. **	1,640	WATTS
POWER OUTPUT, APPROX.	40	KILOWATTS

** AT CREST OF AUDIO-FREQUENCY CYCLE WITH MODULATION FACTOR OF 1.0

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	14,000	VOLTS
D-C GRID VOLTAGE	-3,000	VOLTS
D-C PLATE CURRENT	13.5	AMPERES
D-C GRID CURRENT	1.8	AMPERES
PLATE INPUT	160	KILOWATTS
PLATE DISSIPATION		
(67% OF RATED PLATE DISSIPATION REFERENCED ON PAGE 1)		

TYPICAL OPERATION

D-C PLATE VOLTAGE	14,000	VOLTS
D-C GRID VOLTAGE	-800	VOLTS
PEAK R-F GRID VOLTAGE	1,500	VOLTS
D-C PLATE CURRENT	11	AMPERES
D-C GRID CURRENT	1.5	AMPERES
DRIVING POWER, APPROXIMATE	2.2	KILOWATTS
POWER OUTPUT, APPROXIMATE	110	KILOWATTS

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR - CLASS C TELEGRAPHY
(KEY DOWN CONDITIONS PER TUBE WITHOUT AMPLITUDE MODULATION) *

MAXIMUM RATINGS, ABSOLUTE VALUES	2 MC TO 22 MC	BELOW 2 MC	
D-C PLATE VOLTAGE	17,500	19,500	VOLTS
D-C GRID VOLTAGE	-3,000	-3,000	VOLTS
D-C PLATE CURRENT	17	17	AMPERES
D-C GRID CURRENT	1.8	1.8	AMPERES
PLATE INPUT	200	270	KILOWATTS
PLATE DISSIPATION			
(REFER TO PLATE DISSIPATION RATINGS ON PAGE 1)			

* MODULATION ESSENTIALLY NEGATIVE MAY BE USED IF THE POSITIVE PEAK OF THE ENVELOPE DOES NOT EXCEED 115 PER CENT OF CARRIER CONDITIONS.

F-7837
F-7838
F-7839
POWER TRIODES

- 4 -

TYPICAL OPERATION	<u>2 MC TO 22 MC</u>	<u>BELOW 2 MC</u>	
D-C PLATE VOLTAGE	14,000	16,000	VOLTS
D-C GRID VOLTAGE	-1,000	-1,200	VOLTS
PEAK R-F GRID VOLTAGE	1,900	2,100	VOLTS
D-C PLATE CURRENT	14	15.5	AMPERES
D-C GRID CURRENT, APPROX.	1.7	1.7	AMPERES
DRIVING POWER, APPROX.	3.6	3.7	KILOWATTS
POWER OUTPUT, APPROX.	130	180	KILOWATTS

SERIES REGULATOR OPERATION

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C PLATE VOLTAGE	65	KILOVOLTS
PEAK POSITIVE PLATE VOLTAGE	70	KILOVOLTS
D-C GRID VOLTAGE	-4	KILOVOLTS
D-C PLATE CURRENT	25	AMPERES
GRID DISSIPATION	2	KILOWATTS
PLATE DISSIPATION - REFER TO PLATE DISSIPATION RATINGS ON PAGE 1		

TYPICAL OPERATION

D-C PLATE VOLTAGE	55	KILOVOLTS
D-C PLATE CURRENT REGULATED	20	AMPERES
D-C GRID VOLTAGE, APPROX.	300	VOLTS
D-C GRID CURRENT, APPROX.	5.5	AMPERES
GRID CUT-OFF VOLTAGE, APPROX.	1.5	KILOVOLTS
PLATE OUTPUT VOLTAGE	53	KILOVOLTS
PLATE OUTPUT POWER	1.06	MW

HARD TUBE MODULATOR

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C PLATE VOLTAGE	65	65**	KILOVOLTS
PEAK POSITIVE PLATE VOLTAGE	70	70**	KILOVOLTS
D-C GRID VOLTAGE	-4.0	-4.0**	KILOVOLTS
PEAK POSITIVE GRID VOLTAGE	4.0	4.0**	KILOVOLTS
PULSE CATHODE CURRENT	160	230**	AMPERES
GRID DISSIPATION	2000	2000**	WATTS
DUTY FACTOR	.06	.06**	
PULSE LENGTH	2000	2000**	U SEC.

** THESE RATINGS APPLY ONLY UNDER ELEVATED FILAMENT TEMPERATURES AS SPECIFIED AS FOLLOWS:

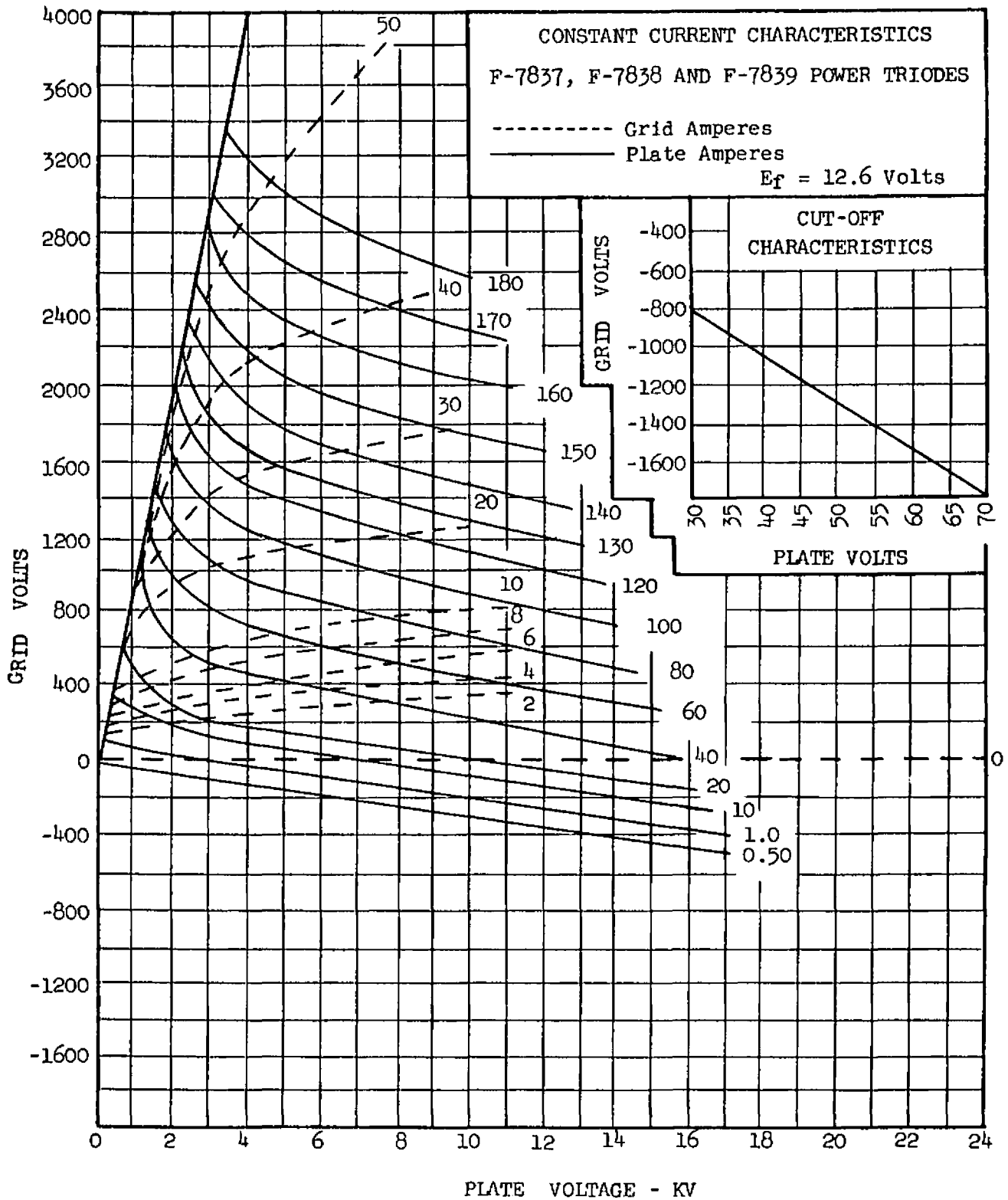
- 5 -

F-7837
F-7838
F-7839
POWER TRIODES

	<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	200			AMPERES
$E_P = E_G = 3$ KV -30				

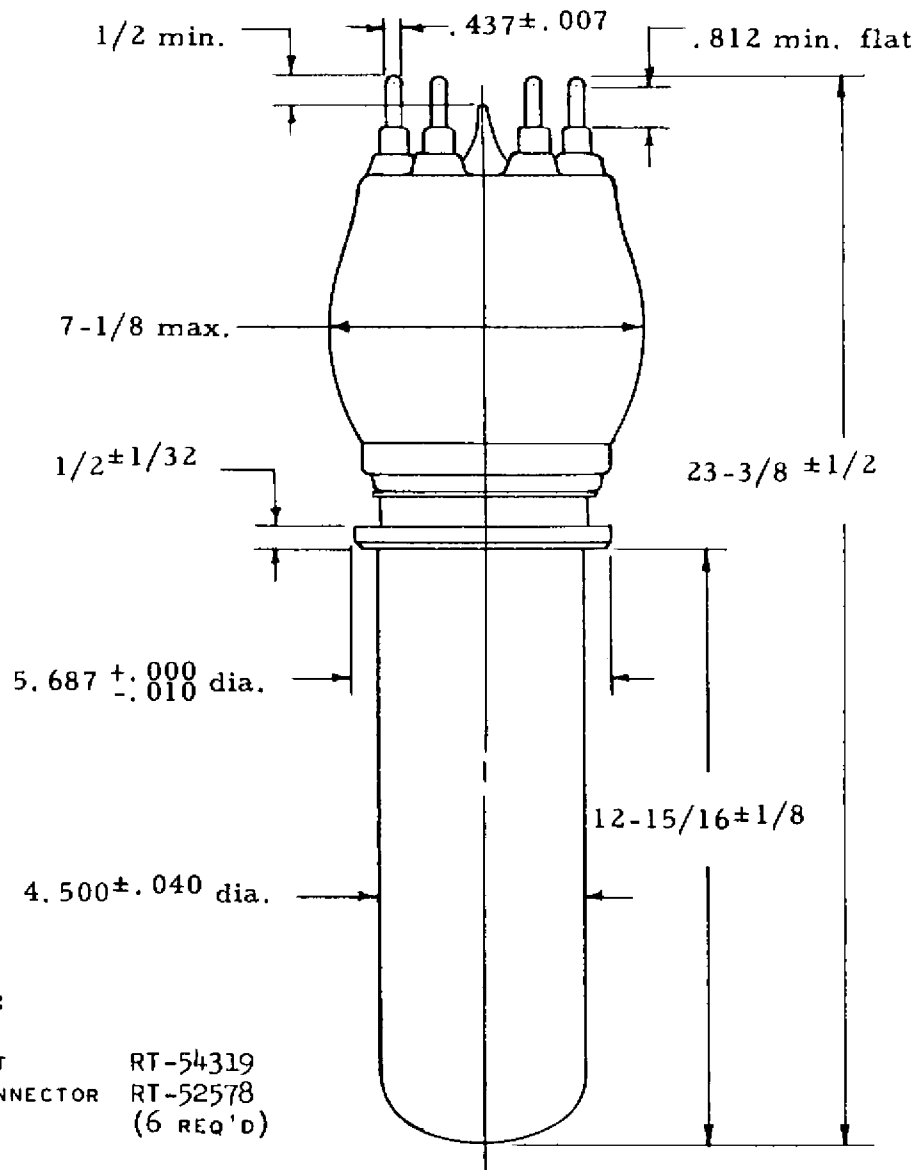
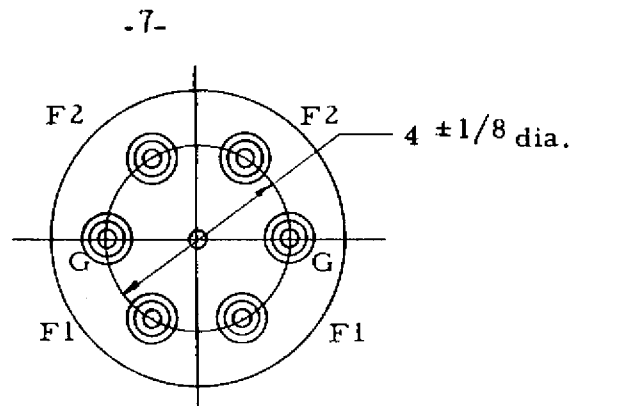
ADDITIONAL INFORMATION FOR SPECIFIC APPLICATIONS CAN BE OBTAINED FROM THE

ELECTRON TUBE APPLICATIONS SECTION
ITT COMPONENTS DIVISION
P.O. Box 412
CLIFTON, NEW JERSEY



TERMINALS

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



ACCESSORIES:

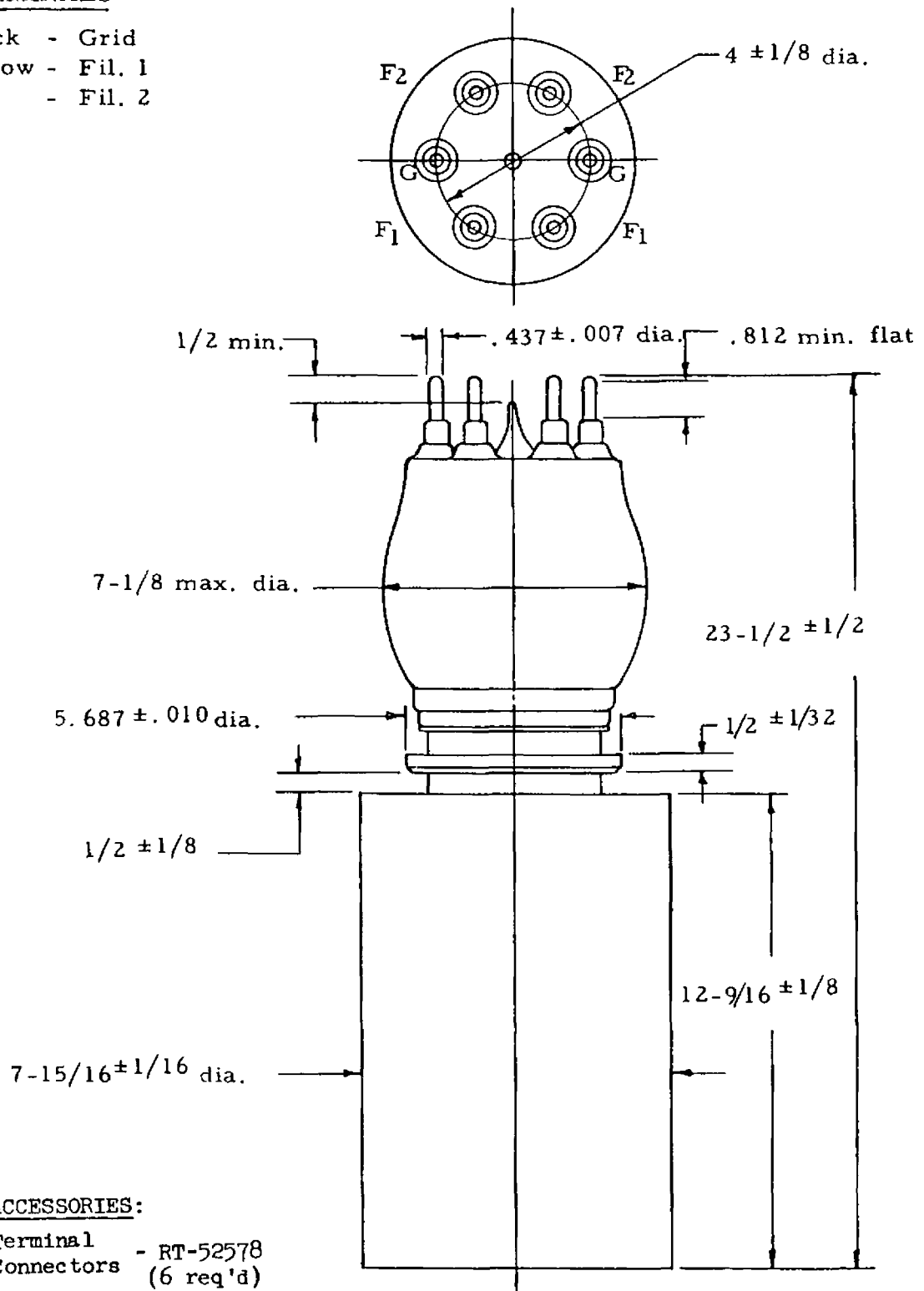
WATER JACKET	RT-54319
TERMIANL CONNECTOR	RT-52578
	(6 REQ'D)

OUTLINE

F-7837 POWER TRIODE

TERMINALS

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



ACCESSORIES:

Terminal
 Connectors - RT-52578
 (6 req'd)

OUTLINE
 F-7839 POWER TRIODE