



ELECTRON TUBE DIVISION

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

BOX 100 EASTON, PA. 18043

F-1087
HYDROGEN
THYRATRON

TENTATIVE

DESCRIPTION

The F-1087 is the first in a family of new generation hydrogen thyratrons, operating at levels of 100,000 volts or more. The F-1087 is a multigap metal-ceramic hydrogen thyatron capable of switching over 15 megawatts peak power at greater than 25 kilowatts average power at a peak forward voltage of 100,000 volts. It is a zero bias unit consisting of six elements designed for operation in oil. The novel iterative gradient grid structure of the tube produces favorable anode take-over time and relatively low minimum anode take-over voltage characteristics. Other features of the tube include a planar type oxide coated cathode and a titanium hydride reservoir which combine to produce long life with exceptional range stability.

GENERAL CHARACTERISTICS

Electrical Data

	Nom.	Min.	Max.	
Cathode Heater Voltage	6.3	5.8	6.8	Volts AC
Cathode Heater Current (at 6.3 volts)	6.0	5.5	6.5	Amperes AC
Reservoir Voltage	5.0	2.5	6.8	Volts AC
Reservoir Current (at 4.5v)		4.0	6.0	Amperes AC
Cathode and Reservoir Heaters (See Note 1)				
Minimum Heating Time		5		Minutes

Mechanical Data

Mounting Position	Any
Base (Per Outline)	Flange
Cooling/Insulation Medium	See Note 2
Net Weight	1 - 1/4 Pounds
Dimensions (Per Outline)	Seated Height 6.25 Inches

MAXIMUM RATINGS

(See Note 3)

Max. Peak Anode voltage, Forward	100.0	Kilovolts
Min. Anode Supply Voltage (Note 5)	5.0	Kilovolts DC
Max. Peak Anode Current	350	Amperes
Max. Average Anode Current	500	Milliamperes
Max. RMS Anode Current (Note 6)	7.0	Amperes AC
Max. epy x ib x prr	20×10^9	
Max. Anode Current Rate of Rise	2500	A/Microseconds
Peak Trigger Voltage		See Note 7
Max. Anode Delay Time (Note 8)	1.0	Microsecond
Max. Anode Delay Time Drift	0.10	Microsecond
Max. Time Jitter (Note 9)	0.005	Microsecond

WARNING: Operation of this tube may produce x-rays, which constitute a health hazard. Adequate rayproof shielding must therefore be provided in the equipment.

MAXIMUM RATINGS (Cont'd)

Note 1: See Outline Drawing, Figure 1.

Note 2: For operation above 25KV peak forward voltage the tube should be immersed in regular transformer insulating oil (Esso 35 or equivalent), Freon or sulfahexaflorine.

Provision should be made to cool the insulating medium so that the temperature is less than 50°C.

Note 3: Absolute values should not normally be allowed to occur simultaneously. For specific applications, consult the ITT Electron Tube Division, Applications Section.

Note 4: During the first 25 usec after conduction, the peak inverse voltage shall not exceed 20KV.

Note 5: A resistance divider of 40 megohms shall be connected between anode and cathode. The divider shall be tapped in four equal sections and connected to the tube per Figure 2. It is recommended that this arrangement be employed whether low voltage operation is required or not. This divider is a necessity for keyed grid operation.

Note 6: The root mean square anode current shall be computed as the square root of the product of peak current and the average current.

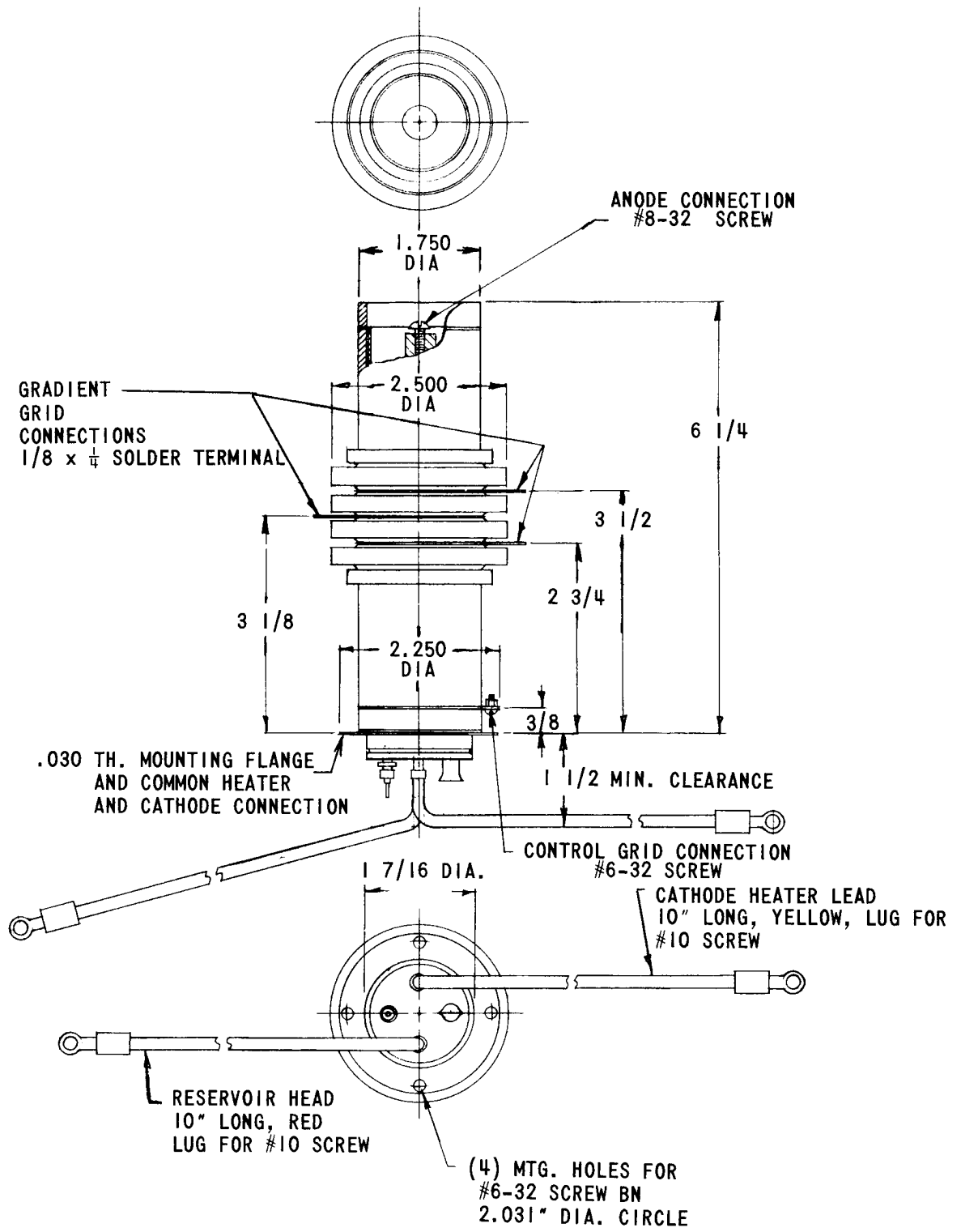
Note 7: The pulse produced by the driver circuit shall have the following characteristics when viewed at the F-1087 mounting plate with the tube grid disconnected:

A. Amplitude	200-500 volts
B. Duration	2 usec (at 70% Points)
C. Rate of Rise	0.35 usec (Max.)
D. Impedance	50-500 ohms

The limits of anode delay time, delay time drift, and time jitter are based on the minimum trigger. Using the highest permissible trigger voltage and the lowest trigger source impedance materially reduces those values below the limits specified.

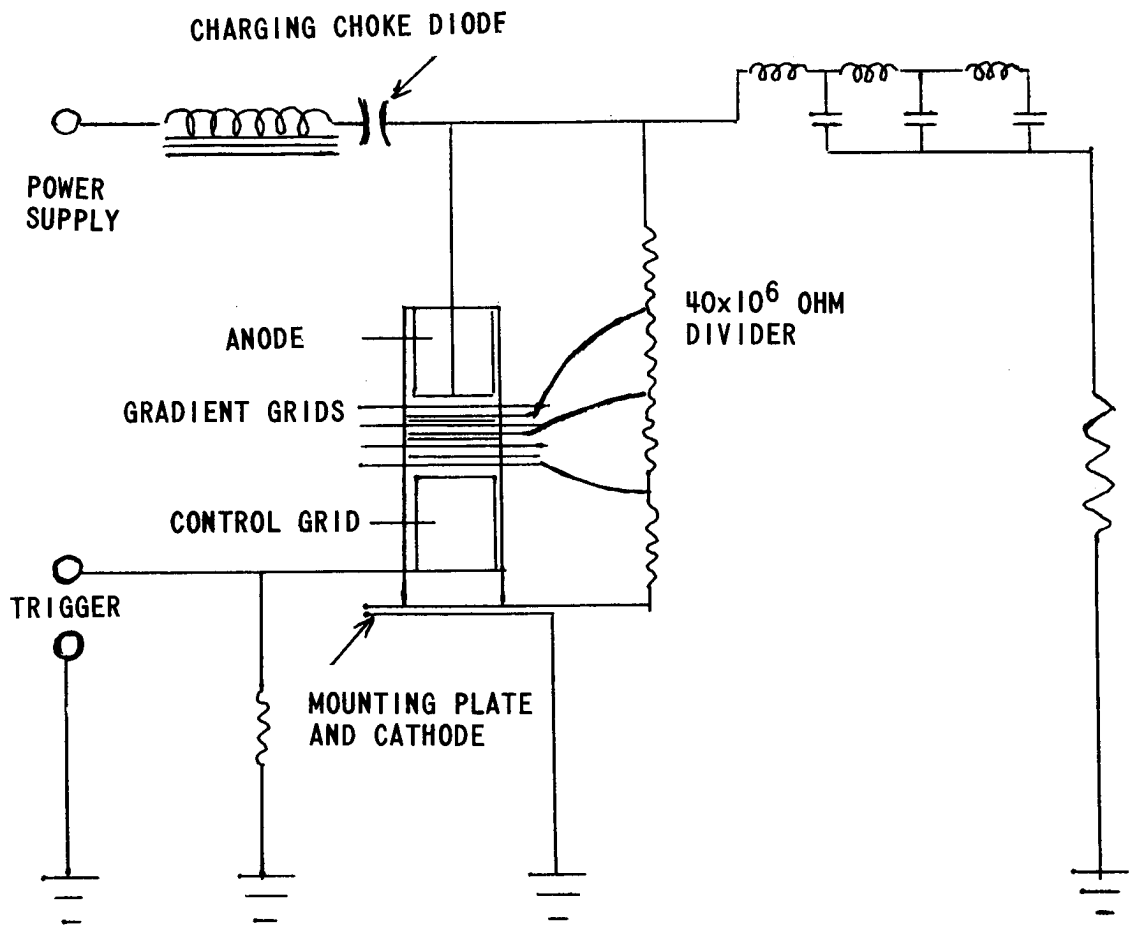
Note 8: The time of anode delay is measured between the 26 percent point on the rising portion of the unloaded grid voltage pulse and the point at which anode conduction begins.

Note 9: Time jitter is measured at the 50% point on the leading edge of the current pulse.



F-1087 OUTLINE
FIGURE 1

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F-1087 OUTLINE
FIGURE 2