



HYDROGEN THYRATRON

**PULSING SERVICE
INTEGRAL GAS RESERVOIR**

**POSITIVE CONTROL
TRIODE TYPE**

The GL-5948 is a hydrogen thyatron for pulsing applications which require a tube that will give dependable operation under the stringent operating conditions encountered in radar modulator and other pulsing service.

The ability of this tube to carry high peak currents and to withstand voltages as high as 25,000 volts combine with the short deionization time to assure satisfactory tube performance in the class of service for which this thyatron is designed. The tube is also suitable for operation without negative bias; a feature which adapts it for use in

service requiring zero-bias operation with positive triggering pulses. Another advantage which ensures freedom from failure due to gas cleanup is the use of a hydrogen reservoir within the tube to supply gas to compensate for what is consumed during operation. This reservoir also enables the user to adjust the pressure within the tube to the most suitable value for the service desired.

The tube ratings make it especially suitable for pulsing magnetron and other oscillators with power inputs up to 12.5 megawatts.

GENERAL  ELECTRIC

*Supersedes pages 1 and 2 dated 6-54

TECHNICAL INFORMATION

GENERAL

Electrical

Cathode—Indirectly Heated

The Cathode is tied to the Heater Midpoint

	Minimum	Bogey	Maximum
Heater Voltage.....	6	6.3	6.6 Volts
Heater Current, $E_f = 6.3$ Volts.....	27	30	33 Amperes
Cathode and Reservoir Heating Time.....	15	...	Minutes
Reservoir Heater Voltage*.....	2.5	4.5	5.5 Volts
Reservoir Heater Current, $E_f = 4.5$ Volts.....	3	4.5	6 Amperes
Direct Interelectrode Capacitance			
Grid to Anode.....	..	45	... uuf
Grid to Cathode.....	..	50	... uuf
Anode Current Time Jitter.....	..	0.01	0.02 Microseconds
Deionization Time, approximate.....	..	50	... Microseconds
Ionization Time, approximate†.....	..	...	1 Microsecond
Anode Voltage Drop.....	..	400	... Volts
Grid Drive‡			
Pulse Duration.....			10 Microseconds

Mechanical

Type of Cooling—Convection

Cooling of Anode Lead by Forced Convection Permissible,
but there shall be no Air Blast Directly on Bulb.

Mounting Position—Vertical, Base Down

Net Weight, approximate..... $4\frac{3}{4}$ Pounds

MAXIMUM RATINGS, Absolute Values

Maximum Peak Anode Voltage

Inverse §..... 25,000 Volts

Forward ¶, minimum supply voltage = 5,000 volts d-c..... 25,000 Volts

Maximum Cathode Current

Peak..... 1,000 Amperes

Average..... 1.0 Amperes

Maximum Averaging Time..... 1 Cycles

Operation Factor △..... 9.0×10^9

Maximum Negative Control-Grid Voltage

Before Conduction..... 650 Volts

Maximum Rate of Rise of Anode Current..... 5,000 Amperes per
Microsecond

Ambient Temperature Limits..... -50 to +75 C

* The optimum reservoir voltage for operation at maximum tube voltage, maximum peak and average tube currents, and at a repetition corresponding to the rated operation factor is inscribed on the base of the tube and must be held within ± 5 percent. Applications involving operation at other conditions will necessitate the redetermination of the optimum reservoir voltage.

† The time interval between the point on the rising portion of the grid pulse which is 26 percent of the peak unloaded pulse amplitude, and the start of the anode current pulse.

‡ Driver pulse measured at tube socket with thyatron grid disconnected: amplitude = 700 volts minimum, 2,000 volts maximum, above 0; time of rise = 0.35 microseconds maximum, measured from 26 percent to 70 percent of peak value; grid pulse duration = 2 microseconds minimum, measured between 70 percent of peak on rising side to 70 percent of peak on falling side; impedance of drive circuit = 50 to 200 ohms.

§ The minimum inverse anode voltage permissible is 5 percent of the peak forward voltage, and the maximum is 5,000 volts during the first 25 microseconds following the anode pulse exclusive of a spike of 0.05 microseconds duration.

¶ Instantaneous starting is not recommended. However, in cases where it is necessary to apply anode voltage instantaneously the maximum permissible forward starting voltage is 18,000 volts peak. The power-supply filter should be designed to limit the rate of application of this voltage to 450,000 volts per second.

△ The peak forward anode voltage x pulse repetition rate x peak anode current.

□ Denotes an addition.

□ X-RAY WARNING NOTICE

If the GL-5948 is operated at anode voltages in excess of 16 kilovolts, x-ray radiation shielding may be necessary to protect the user against possible danger of personal injury from prolonged exposure at close range. For further information consult the following references or other standard texts on the subject:

(a) *X-Ray Protection Design*, Handbook No. 50. National Bureau of Standards, Washington, D. C.

(b) *X-Ray Protection*, Handbook No. 60. National Bureau of Standards, Washington, D. C.

The above references are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



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