

TUNG-SOL / CHATHAM

CROWBAR THYRATRON

DESCRIPTION: The 7568 is a zero bias hydrogen thyatron designed to pass high currents in "crowbar" protective circuits. As described in the application notes, destructive arc currents are short circuited by the crowbar tube before damage occurs to other tubes or circuit elements.

The instantaneous response, and ability to repeatedly carry extremely large currents, makes the hydrogen thyatron particularly attractive for this application. One type 7568 can handle a peak current of 800 Amperes at 25 Kilovolts. This tube contains a fast warmup hydrogen reservoir which promotes long life and permits optimum gas pressure adjustment for various conditions of operation.

This tube type was designed into some circuits under development type designation CH1095.

ELECTRICAL DATA

	Min	Bogey	Max	
Cathode Heater Voltage.....	6.0	6.3	6.6	Volts
Cathode Heater Current..... (at $E_f = 6.3$ volts)	15	16	22	Amperes
Cathode Heating Time.....	3			Minutes
Reservoir Voltage.....	2.5	Marked on base	5.5	Volts
Reservoir Current.....			6.5	Amperes
Reservoir Heating Time.....	3			Minutes

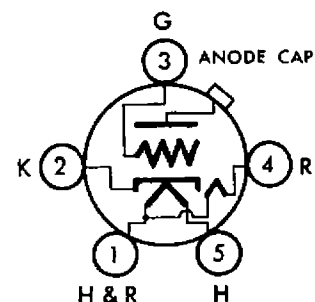
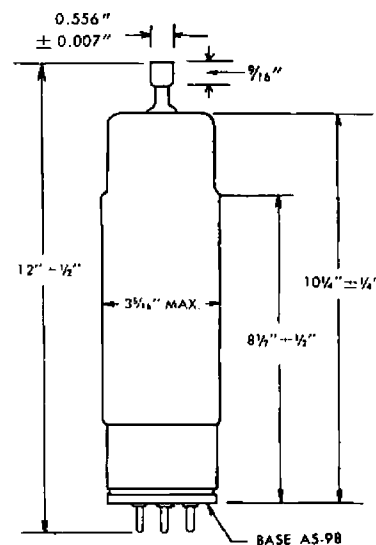
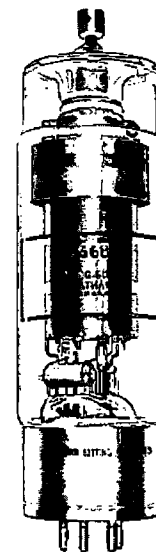
MECHANICAL DATA

Type of Cooling.....	Convection
Maximum Net Weight.....	2 1/4 lbs
Mounting Position.....	Any
Dimensions.....	See Outline Drawing

MAXIMUM RATINGS — ABSOLUTE VALUES

	Min	Max	
D-C Anode Voltage			
Forward.....	5	25	Kilovolts
Inverse.....		15	Kilovolts
Cathode Current			
Peak			
Filter discharge period			
0 to 1.5 Microseconds.....		800	Amperes
		or 0.8	Coulomb
Rectifier short circuit period			
1.5 to 100 Microseconds.....		40	Amperes
1.5 to 50 Microseconds.....		80	Amperes
1.5 to 30 Microseconds.....		125	Amperes
Average.....		0.5	Ampere
Conduction Time per Fault.....		0.1	Second
Averaging Time.....		10	Seconds
Recovery Time.....		50	Microseconds
Grid Signal Voltage.....	1000	2500	Volts
Grid Impedance.....	50	200	Ohms
Grid Voltage Rate of Rise.....	1800		Volts per Microsecond
Anode Delay Time.....		0.6	Microsecond
Anode Voltage Drop.....	50	300	Volts
Ambient Temperature Range.....	-55	+75	Degrees Centigrade

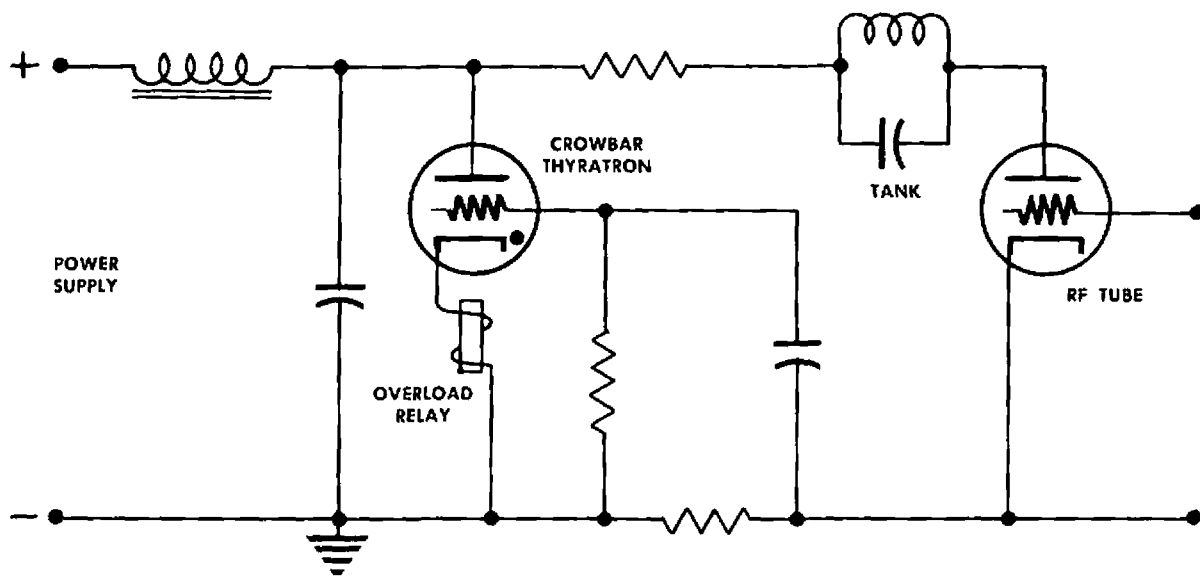
TYPE 7568



BOTTOM VIEW

Application Notes

In a typical application, a crowbar thyatron is connected in series with a suitable impedance across the filter of the high voltage power supply for a high frequency triode oscillator. Whenever an arc occurs in the oscillator tube, the rising current is used to deliver a suitable signal to the grid of the thyatron. The thyatron immediately conducts to short circuit the power supply until the protective circuit breaker opens 0.1 second later. In this latter case, the oscillator tube is protected with a minimum interruption in operating time.



References:

SMITH, BOB:

The Fault Diverter — A Protective Device for High-Power Electron Tubes. Report UCRL-3701 Rev. University of California, Radiation Laboratories, Berkeley, Calif.

PARKER, W. N.

and

HOOVER, M. V.:

Gas Tubes Protect High-Power Transmitters. Electronics, Jan. 1956.

DOOLITTLE, H. D.:

High Powered Hydrogen Thyatrons. Cathode Press, VI, P6, 1954.