

JANUARY 1963

TUNG-SOL

PRODUCT BULLETIN

CROWBAR THYRATRON

DESCRIPTION The 7590 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 7590 can handle a peak current of 1000 Amperes at 30 Kilo-volts. This tube contains a fast warmup hydrogen reservoir which promotes long life and permits optimum gas pressure adjustment for various conditions of operation.

ELECTRICAL DATA

	Minimum	Bogey	Maximum	
Cathode Heater Voltage.....	6.0	6.3	6.6	Volts
Cathode Heater Current — Ef = 6.3 volts.....	12	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

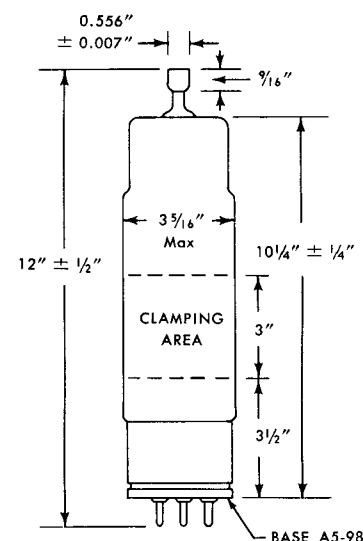
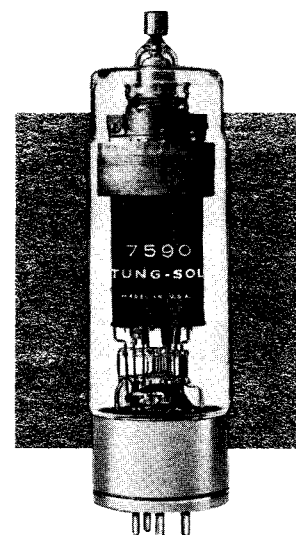
MECHANICAL DATA

Type of Cooling.....	Convection
Maximum Net Weight.....	2¼ lbs
Mounting Position.....	Any
Dimensions.....	See Outline Drawing

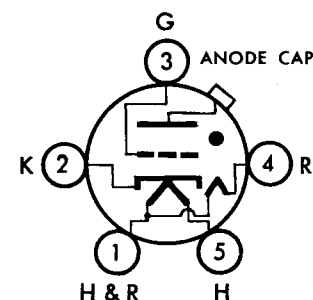
MAXIMUM RATINGS — ABSOLUTE VALUES

	Minimum	Maximum	
D-C Anode Voltage			
Forward — See Note Below.....	10	25	Kilovolts
Inverse.....	—	15	Kilovolts
Cathode Current			
Peak			
Filter discharge period			
0 to 1.5 Milliseconds.....	—	1000 or 0.8	Amperes Coulomb
Rectifier short circuit period			
1.5 to 100 Milliseconds.....	—	25	Amperes
1.5 to 50 Milliseconds.....	—	50	Amperes
1.5 to 30 Milliseconds.....	—	85	Amperes
Average.....	—	0.5	Ampere
Conduction Time per Fault.....	—	0.1	Second
Averaging Time.....	—	10	Seconds
Recovery Time.....	—	50	Microseconds
Grid Signal Voltage.....	550	2500	Volts
Grid Impedance.....	50	200	Ohms
Grid Voltage Rate of Rise.....	1800	—	Volts per Microsecond
Duration of Grid Signal.....	2	—	Microseconds
Anode Delay Time.....	—	0.6	Microsecond
Anode Voltage Drop.....	50	200	Volts
Ambient Temperature Range.....	—55	+75	Degrees Centigrade

Note: A maximum forward voltage of 30 kilovolts will apply to a transient voltage condition wherein the duration of the transient does not exceed 2 seconds.



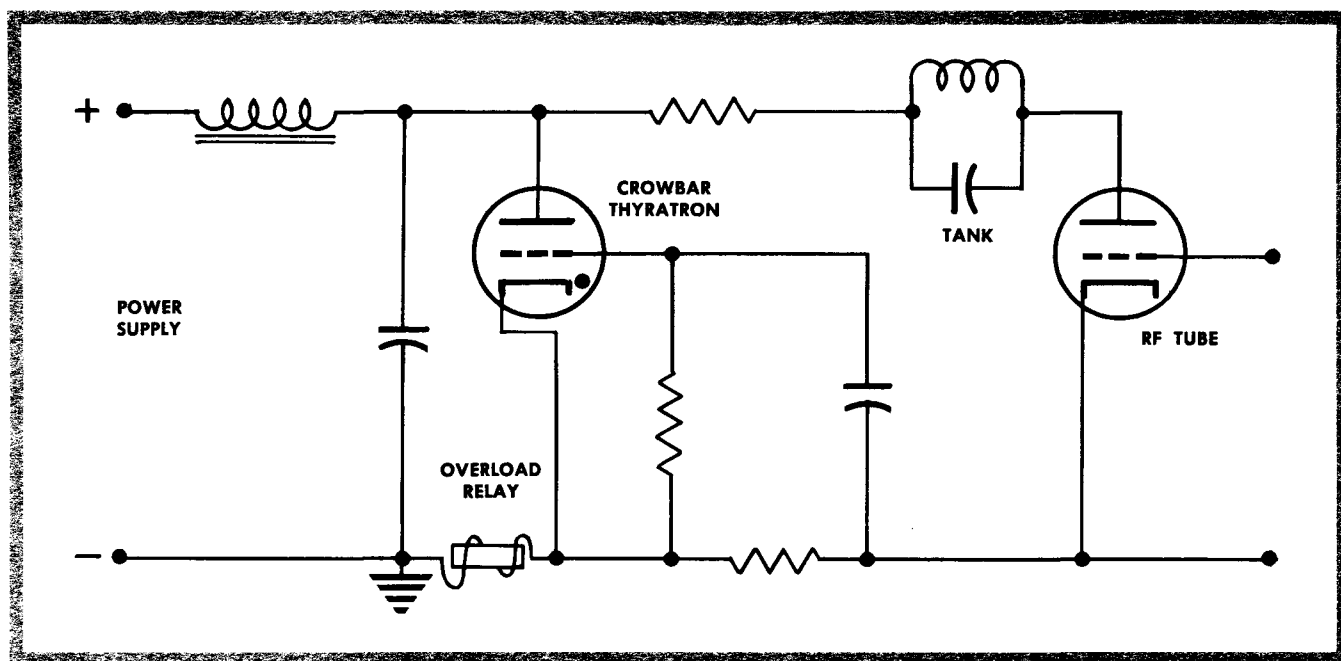
OUTLINE DRAWING



BASING DIAGRAM
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:

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