6130/3C45
HYDROGEN THYRATRON

POSITIVE-CONTROL TRIODE TYPE

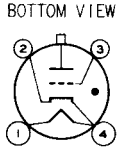
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 $\begin{cases}+5\% \\ -10\%\end{cases}$	ac or dc volts
Current at 6.3 volts:		
Minimum	2	amp
Average	2.3	amp
Maximum	2.5	amp
Minimum heating time	2	minutes
Direct Interelectrode Capacitances (Approx.):		
Grid to anode	3.9	μμf
Grid to cathode	8.6	μμf
Ionization Time (Approx.)□	0.6	μsec
Deionization Time (Approx.)	25	μsec
Anode-Cathode Voltage Drop (Approx.) at middle of pulse duration	150	volts
Maximum Variation in Firing Time (Jitter)	0.06	μsec

Mechanical:

Operating Position	Any
Maximum Overall Length	5-3/16"
Seated Length	4-3/8" ± 3/16"
Maximum Diameter	1-9/16"
Weight (Approx.)	3 oz
Cooling	Natural
Bulb	T12
Cap	Small (JEDEC No.C1-1)
Base . . . Medium-Shell Small 4-Pin, Micanol (JEDEC No.A4-9)	
Basing Designation for BOTTOM VIEW	4BL



Pin 1 – Heater
Pin 2 – Cathode, Circuit Returns
Pin 3 – Grid
Pin 4 – Heater, Cathode
Cap – Anode

PULSE-MODULATOR SERVICE

Maximum and Minimum CCS● Ratings, *Absolute Values:*

	*For pressures down to 70 mm of Hg**	
DC ANODE-SUPPLY VOLTAGE	800 min.	volts
PEAK ANODE VOLTAGE:		
Forward (E_{bmf})*	3000 max.	volts
Inverse	5% of E_{bmf} min.	volts
After anode-current pulse:▲		
During first 25 μsec	1500 max.	volts
After first 25 μsec	3000 max.	volts

□, ●, #, *, ▲: See next page.

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	For pressures down to 70 mm of Hg#	
GRID VOLTAGE:		
Negative (DC or Peak), before conduction	200 max.	volts
Peak positive-pulse	175 min.	volts
ANODE CURRENT:		
Peak	35 max.	amp
Average°	0.045 max.	amp
Rate of rise	750 max.	amp/μsec
OPERATION FACTOR†	3×10^8 max.	
PULSE DURATION□	6 max.	μsec
AMBIENT-TEMPERATURE RANGE	−50 to +90	°C

Typical Operation:♦

	At 2000 pps in accompanying circuit with pulse duration of 0.5 μsec	
DC Anode-Supply Voltage	1250	volts
Peak Anode Voltage:		
Forward	3000	volts
Inverse: Immediately after anode-current pulse	530	volts
GRID VOLTAGE:		
Negative, before conduction	0	volts
Peak positive-pulse (Unloaded)	175	volts
Effective Grid-Circuit Resistance	1000	ohms
ANODE CURRENT:		
Peak	35	amp
Average°	0.035	amp
Operation Factor†	2.1×10^8	
Peak Power Output to Pulse Transformer (T)	43000	watts

Maximum Circuit Values:

Effective Grid-Circuit Resistance	1500 max.	ohms

□ Defined as the time interval between the point on the rising portion of the grid pulse which is 26 per cent of the peak unloaded-pulse amplitude and the point on the anode-current pulse which is 26 per cent of its peak amplitude. The anode-current pulse has a maximum time rise of 0.05 μsec. The grid pulse has a minimum peak amplitude of 130 volts, a maximum rise time of 0.5 μsec, and is supplied by a driver having a maximum internal impedance of 1500 ohms.

● Continuous Commercial Service.

\# Corresponds to altitude of about 50,000 feet.

* In applications where the anode voltage is applied instantaneously, the power-supply filter should be designed so that the peak forward anode voltage is applied at a rate not to exceed 75,000 volts per second.

▲ Exclusive of spike not having more than 0.05 μsec duration.

° Averaged over any cycle.

† Defined as *Peak Forward Anode Volts* × *Pulse-Repetition Rate (pps)* × *Peak Anode Amperes* (excluding spike).

♦, ♦: See next page.

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* Pulse duration is defined as the time interval between points on the pulse envelope at which instantaneous amplitudes are equal to 70.7 per cent of the maximum amplitude excluding spike.

♦ Operation with a bulb temperature within the approximate range of 60° to 90° C measured on the bulb directly opposite the anode is recommended for longest life. To attain this temperature under operating conditions involving low ambient temperature, the use of a heat-conserving enclosure for the tube may be necessary.

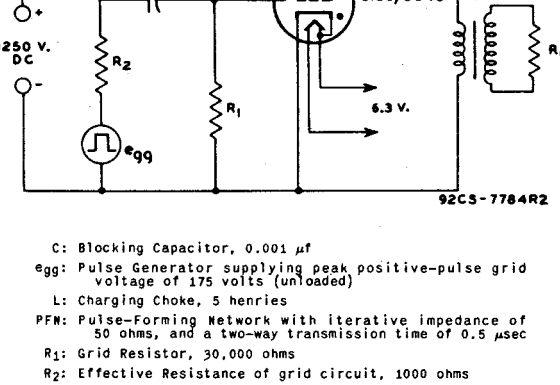
OPERATING CONSIDERATIONS

The *anode* is brought out of the tube to a Small cap. The connector for this cap should be of the heat-radiating type and the connector lead should have ample current-carrying capability for the operating requirements.

Shielding of the 6130/3C45 should be provided if it is operated in the presence of strong electric fields which will ionize the gas within the tube. Any such ionization will cause erratic performance.

Cooling of the 6130/3C45 is accomplished by natural circulation of air around it. Under no circumstances should a stream of cooling air be applied to the glass envelope.

TYPICAL PULSE-MODULATOR CIRCUIT



C: Blocking Capacitor, 0.001 μf

e_{gg}: Pulse Generator supplying peak positive-pulse grid voltage of 175 volts (unloaded)

L: Charging Choke, 5 henries

PFN: Pulse-Forming Network with iterative impedance of 50 ohms, and a two-way transmission time of 0.5 μsec

R_1: Grid Resistor, 30,000 ohms

R_2: Effective Resistance of grid circuit, 1000 ohms

R_L: Load Resistance. Value reflected into primary of transformer (T) is 35 ohms.

T: Matching Pulse Transformer

ELECTRON TUBE DIVISION
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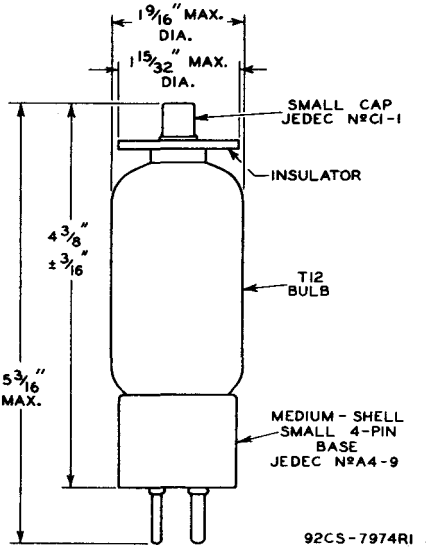

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