



ELECTRONIC INNOVATIONS
IN ACTION

TUBES

PRELIMINARY

— PRODUCT INFORMATION —
BEAM PENTODE

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M-2057

FOR RF POWER AMPLIFIER APPLICATIONS

400 MILLIAMPERES DC CATHODE CURRENT OVER 1 AMPERE PEAK CURRENT 280 VOLTS B+

40 WATTS PLATE DISSIPATION T-14 ENVELOPE

The **M-2057** is a compactron beam power pentode designed primarily for RF power output applications. Features of the **M-2057** are dual cathode and grid connections for lower lead inductance, and a 13.0 volt heater. The **M-2057** is suitable for mobile and marine applications having 12 volt battery supplies.

GENERAL

ELECTRICAL

Cathode Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC • • • • • 13.0 Volts

Heater Current • • • • • 1.30 Amperes

Direct Interelectrode Capacitances, approximate.

Grid No. 1 to Plate: (g1 to p) • • • • • 0.55 pf

Input: • • • • • 38 pf

Output: • • • • • 14 pf

MECHANICAL

Operating Position Any

Envelope T-14, Glass

Top Cap C1-1, Small

Base E12-74

Outline Drawing

Maximum Diameter • • • • • 1.813 Inches

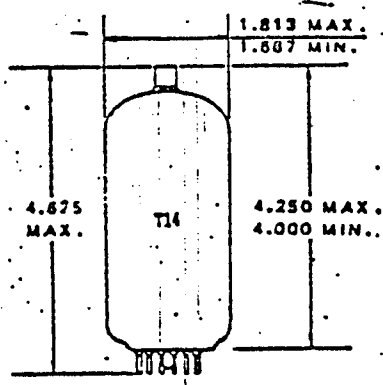
Minimum Diameter • • • • • 1.687 Inches

Maximum Overall Length • • • • • 4.625 Inches

Maximum Seated Height • • • • • 4.250 Inches

Minimum Seated Height • • • • • 4.000 Inches

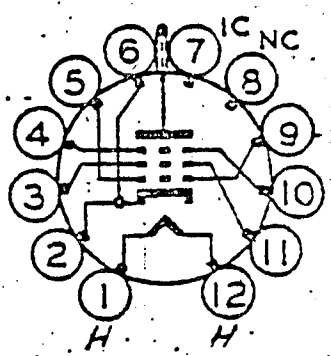
PHYSICAL DIMENSIONS



TERMINAL CONNECTIONS

- Pin 1 - Heater
- Pin 2 - Cathode
- Pin 3 - Grid 2
- Pin 4 - Grid 3 (Beam Plate)
- Pin 5 - Grid 1
- Pin 6 - Cathode
- Pin 7 - Internal Connection (Do not use)
- Pin 8 - No Connection
- Pin 9 - Grid 1
- Pin 10 - Grid 3 (Beam Plate)
- Pin 11 - Grid 2
- Pin 12 - Heater
- Cap - Plate

BASING DIAGRAM



MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES

Peak Positive Pulse Plate Voltage	7500	Volts
Screen Voltage	280	Volts
Peak Negative Grid-Number 1 Voltage	300	Volts
Plate Dissipation	40	Watts
Screen Dissipation	7.0	Watts
DC Cathode Current	400	Milliamperes
Peak Cathode Current	1400	Milliamperes
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode		
DC Component	100	Volts
Total DC and Peak	200	Volts
Heater Negative with Respect to Cathode		
Total DC and Peak	200	Volts
Grid-Number 1 Circuit Resistance		
With Fixed Bias	0.1	Megohm
With Cathode Bias	Not Recommended	
Bulb Temperature at Hottest Point †	240	°C

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions; and variations in the characteristics of all other electron devices in the equipment.

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Plate Voltage	5000	60	100	250	Volts—
Beam Plates - Connected to Cathode at Socket					
Screen Voltage	250	110	250	250	Volts
Grid-Number 1 Voltage		0	-20	-56	Volts
Plate Resistance, approximate				6700	Ohms
Transconductance				12000	Micromhos
Plate Current		650 §	920 §	125	Milliamperes
Screen Current		37 §	94 §	4.2	Milliamperes
Grid-Number 1 Voltage, approximate					
Ib = 1.0 Milliamperes	-135			-85	Volts
Triode Amplification Factor •				3.7	

MINIMUM RECOMMENDED GRID DRIVE

Peak Positive Plate Pulse Voltage	5000	6000	7000	Volts
Grid Drive for Eg2 = 150 Volts	-190	-210	-230	Volts
Grid Drive for Eg2 = 200 Volts	-210	-235	-250	Volts
Grid Drive for Eg2 = 250 Volts	□	□	□	Volts

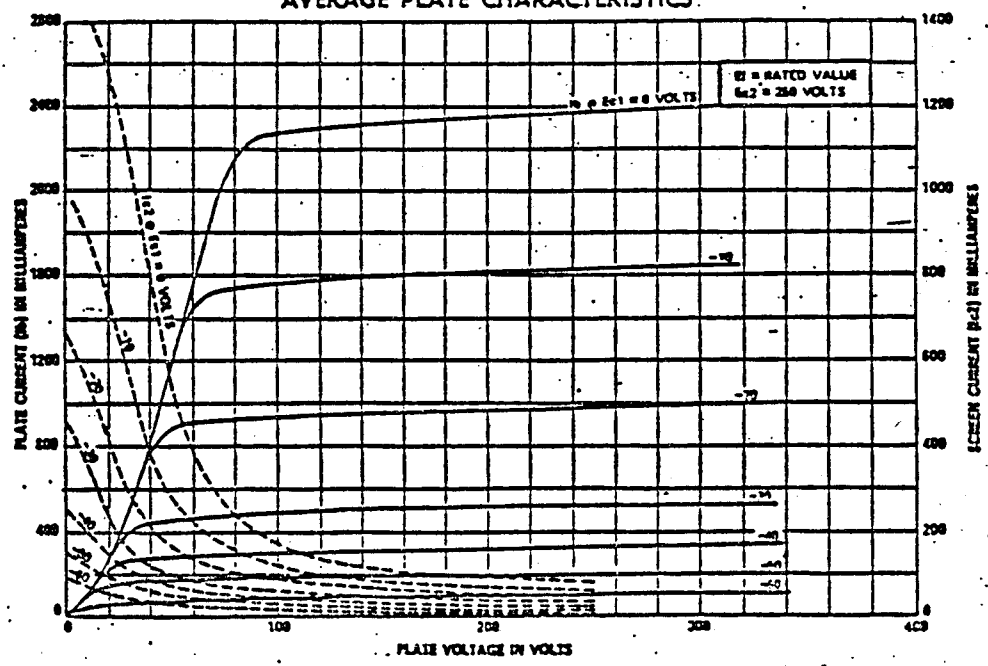
NOTES

- The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.
- Heater current of a bogey tube at E_f 13.0 volts.
- ▲ The type of input-coupling network used should not introduce too much resistance in the grid-number 1 circuit. Transformer or impedance coupling devices are recommended.
- ♦ Measured with an infrared thermometer, Iron Model 700 BC or equivalent, at an ambient temperature of 40° C.
- § Values measured by a method involving a recurrent waveform such that the plate and screen dissipation will be kept within ratings in order to prevent damage to the tube.
- Triode connection (screen tied to plate) with $E_b = E_c2 = 250$ volts, and $E_c1 = -56$ volts.
- To be determined.

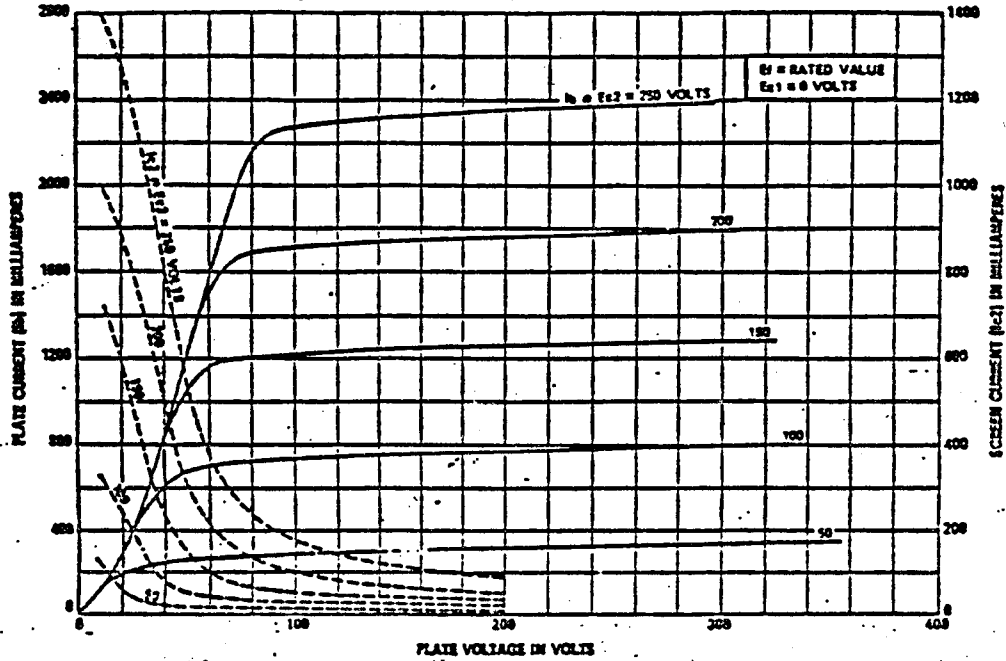
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AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



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GENERAL  ELECTRIC