

Medium-Mu Triode

GLASS-METAL PENCIL TYPE

For Use at Frequencies Up to 4000 Mc/s in Pulse Service
and 2000 Mc/s in CW Service

ELECTRICAL

Heater, for Unipotential Cathode

Voltage (AC or DC):

Under transmitting conditions. 6.0 $\pm$ 10% V

Under standby conditions 6.3 max V

Current at 6.0 V 0.300 A

Amplification Factor 40

Transconductance 7300 μ mhos

For dc plate current of 22 mA and

dc plate voltage of 200 V

Direct Interelectrode Capacitances (Approx.)

Grid to plate. 1.8 pF

Grid to cathode. 3.2 pF

Plate to cathode. 0.07 max pF

MECHANICAL

Operating Position Any

Dimensions and Terminal Connections . . See *Dimensional Outline*

Plate Seal Temperature 175 max $^{\circ}$ C

Weight (Approx.) 0.4 oz

Sockets

Heater terminals connector. Grayhill No.22-3^a

TERMINAL CONNECTIONS (See *Dimensional Outline*)

H—Heater

K—Cathode (Cylinder
adjacent to heater
pins)

G—Grid (Flange between
glass sections)

P—Plate (Cylinder
adjacent to pinch-off)

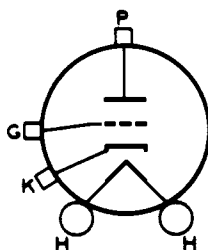


PLATE-PULSED OSCILLATOR^b—CLASS C

Maximum CCS^c Ratings, Absolute-Maximum Values

For a maximum "ON" time^d of 5 microseconds in any
500-microsecond interval.

For altitudes up to 30,000 feet

Up to 4000 Mc/s

Peak Positive-Pulse Plate-Supply Voltage^e. . . 2000 V

Peak Grid-Bias Voltage

Negative pulse 150 V

Positive pulse 25 V

Peak Plate Current 3 A

From pulse supply

Peak Rectified Grid Current. 1.5 A

DC Plate Current 0.03 A



Up to 4000 Mc/s

DC Grid Current	0.013	A
Plate Dissipation [†]	7	W
Pulse Duration	5	μs

**Typical Operation with Rectangular Wave Shape in
Cathode-Drive Circuit at 3300 Mc/s**

With duty factor^g of 0.01 and pulse duration of 1 microsecond

Peak Positive-Pulse Plate-Supply Voltage ^e	1750	V
Peak Negative-Pulse		
Grid-bias voltage.	110	V
From grid resistor of.	100	Ω
Peak Plate Current	3	A
From pulse supply		
Peak Rectified Grid Current.	1.1	A
DC Plate Current	0.03	A
DC Grid Current.	0.011	A
Useful Power Output.	800	W
At peak of pulse ^h (approx.)		

RF POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation^j

Absolute-Maximum Ratings

For altitudes up to 60,000 feet

	CCS	ICAS ^k	
DC Plate Voltage	330	400	V
DC Grid Voltage.	-100	-100	V
DC Plate Current	40	55	mA
DC Grid Current.	25	25	mA
DC Cathode Current	55	70	mA
Plate Input.	13.2	22	W
Plate Dissipation.	8	13	W
Peak Heater-Cathode Voltage:			
Heater negative with respect to cathode.	50	50	W
Heater positive with respect to cathode.	50	50	W

Typical Operation as Oscillator in Cathode-Drive

Circuit at 500 Mc/s

	CCS	ICAS	
DC Plate-to-Grid Voltage	325	380	V
DC Cathode-to-Grid Voltage ^m	25	30	V
DC Plate Current	35	35	mA
DC Grid Current (Approx.).	11	13	mA
Useful Power Output (Approx.).	5 ⁿ	6 ⁿ	W

Typical Operation as Oscillator in Cathode-Drive

Circuit at 1700 Mc/s

	CCS	
DC Plate-to-Grid Voltage ^m	263	V
DC Cathode-to-Grid Voltage	13	V
DC Plate Current	40	mA
DC Grid Current (Approx.).	13	mA
Useful Power Output (Approx.).	1 ⁿ	W



Typical Operation as RF Power Amplifier in
Cathode-Drive Circuit at 500 Mc/s

	CCS	ICAS	
DC Plate-to-Grid Voltage	342	395	V
DC Cathode-to-Grid Voltage ^m	42	45	V
DC Plate Current	35	40	mA
DC Grid Current (Approx.).	13	15	mA
Driver Power Output (Approx.).	2.4	3	W
Useful Power Output (Approx.).	7.5 ⁿ	10 ⁿ	W

Maximum Circuit Values

Grid-Circuit Resistance.	0.1	0.1	MΩ
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FREQUENCY MULTIPLIER

Absolute-Maximum Ratings

For altitudes up to 60,000 feet

	CCS	ICAS ^k	
DC Plate Voltage	300	350	V
DC Grid Voltage.	-125	-140	V
DC Plate Current	33	45	mA
DC Grid Current.	25	25	mA
DC Cathode Current	45	55	mA
Plate Input.	9.9	15.9	W
Plate Dissipation.	6	9.5	W

Peak Heater-Cathode Voltage:

Heater negative with respect to cathode. . .	50	50	V
Heater positive with respect to cathode. . .	50	50	V

Typical Operation as Tripler to 510 Mc/s in Cathode-

Drive Circuit

	CCS	ICAS	
DC Plate-to-Grid Voltage	410	472	V
DC Cathode-to-Grid Voltage ^m	110	122	V
DC Plate Current	26	36.5	mA
DC Grid Current (Approx.).	4.1	5.8	mA
Driver Power Output (Approx.).	2.75	4.5	W
Useful Power Output (Approx.).	2.1 ⁿ	3.4 ⁿ	W

Maximum Circuit Values

Grid-Circuit Resistance.	0.1	0.1	MΩ
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^a Grayhill Inc., 561 Hillgrove Ave., LaGrange, Ill.

^b In this class of service, the heater should be allowed to warm up for a minimum of 60 seconds before plate voltage is applied.

^c Continuous Commercial Service.

^d "ON" time is defined as the sum of the duration of all individual pulses which occur during the indicated interval. *Pulse duration* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70% of the peak power value. The *peak value* is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

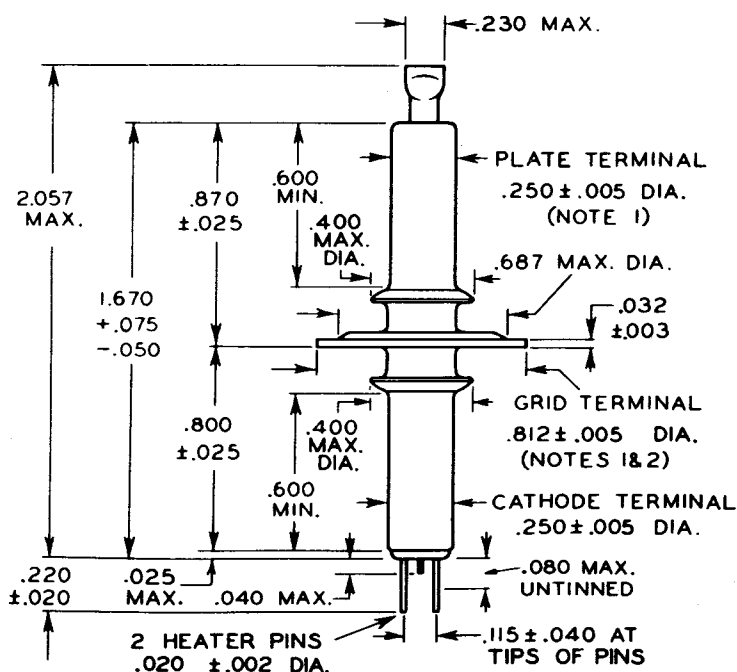
^e The magnitude of any spike on the plate voltage pulse should not exceed a value of 2000 volts with respect to cathode and its duration should not exceed 0.01 microsecond measured at the peak-pulse-value level.

^f In applications where the plate dissipation exceeds 3 watts, it is important that a large area of contact be provided between the plate cylinder and the connector in order to provide adequate heat conduction.



- ^g Duty factor is the product of pulse duration and repetition rate. For variable pulse durations and pulse repetition rates, the duty factor is defined as the ratio of time "ON" to total elapsed time in any 500-micro-second interval.
- ^h The power output at peak of pulse is obtained from the average power output using the duty factor of the peak pulse. This procedure is necessary since the power output pulse duty factor may be less than the applied voltage pulse duty factor because of a delay in the start of rf power output.
- ^j Modulation, essentially negative, may be used if the positive peak of the audio-frequency envelope does not exceed 115 percent of the carrier conditions.
- ^k Intermittent Commercial and Amateur Service.
- ^m From a grid resistor, or from a suitable combination of grid resistor and fixed supply or grid resistor and cathode resistor.
- ⁿ This value of useful power is measured at load of output circuit having an efficiency of about 75 percent.

DIMENSIONAL OUTLINE



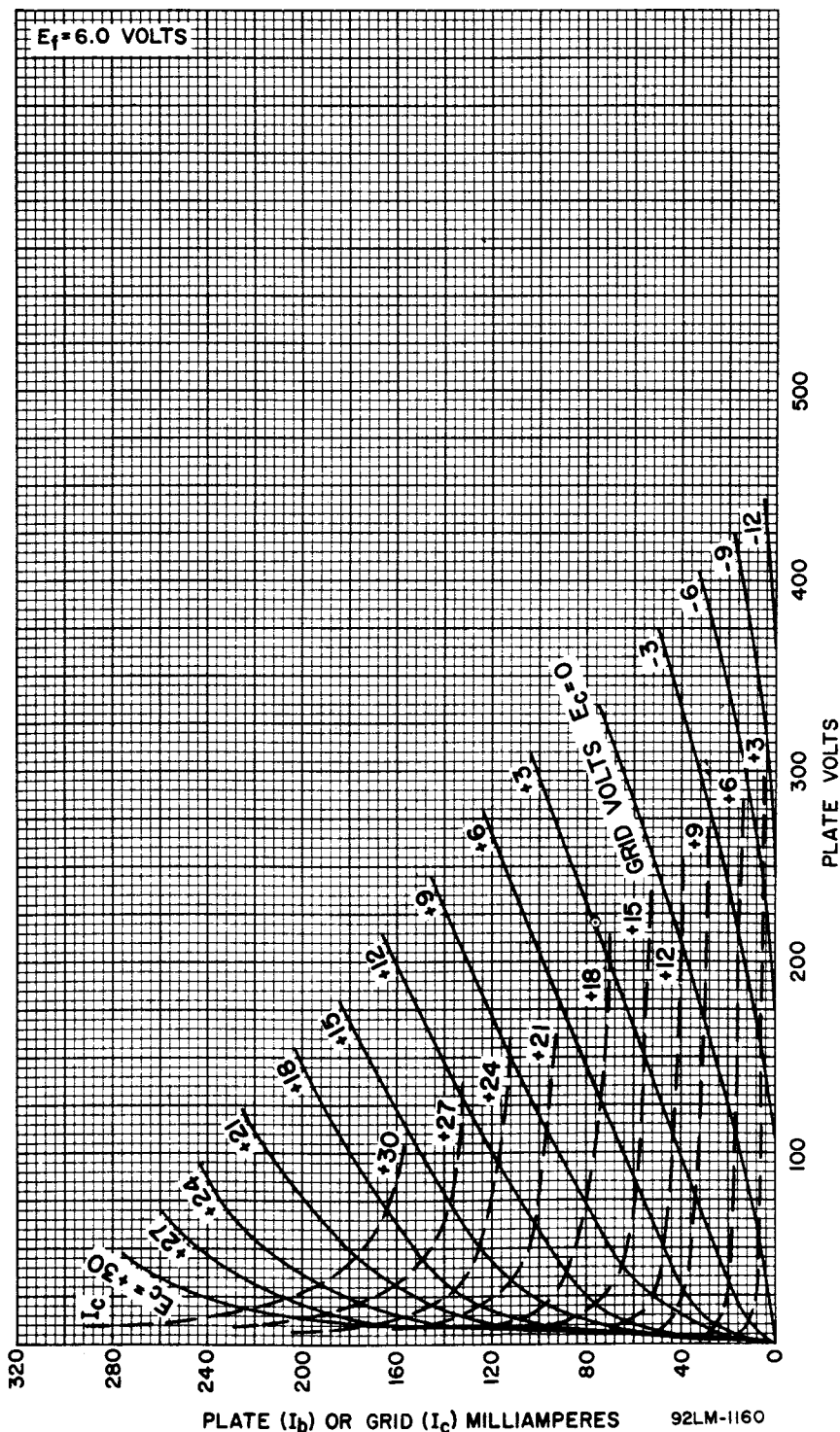
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DIMENSIONS IN INCHES

Note 1: Max. eccentricity of center line (Axis) of plate terminal or grid-terminal flange with respect to the center line (Axis) of the cathode terminal is 0.010 inch.

Note 2: Tilt of grid-terminal flange with respect to rotational axis of cathode terminal is determined by chucking the cathode terminal, rotating the tube, and gauging the total travel distance of the grid-terminal flange parallel to the axis of a point approximately 0.020 inch inward from its edge for one complete rotation. The total travel distance will not exceed 0.020 inch.

Average Plate Characteristics



Average Constant-Current Characteristics

