EITEL-McCULLOUGH, INC.

SAN BRUNO, CALIFORNIA

4X150G

POWER TETRODE

The Eimac 4X150G is an extremely compact external-anode tetrode intended for use as a radio-frequency amplifier, frequency multiplier, or oscillator at frequencies well into the UHF region or as an amplifier in any service requiring a high-gain tube capable of delivering high power-output at low plate-voltage. The combination of a high ratio of transconductance to capacitance and a plate dissipation capability of 150 watts makes the tube an excellent wide-band amplifier for video applications.

The cathode, grid and screen electrodes are mounted on conical and cylindrical supports giving a minimum of circuit discontinuities and lead inductance. The rugged cylindrical terminals, progressively larger in size, allow the tube to be inserted in coaxial line cavities. The screen support and terminal provide maximum isolation between the grid cathode terminals and the plate circuit.

In amplifier service at 500 megacycles, output power of 140 watts per tube, with a stage power-gain of 20, can be obtained. At 1000 megacycles an output power of 50 watts per tube is obtained with a power-gain of five.

GENERAL CHARACTERISTICS

ELECTRICAL		
Cathode: Coated Unipotential		
Heater Voltage	2.5	volts
Heater Current	6.25	amperes
Minimum Heating Time	30	seconds
Screen-Grid Amplification Factor (Average)	5.0	
Direct Interelectrode Capacitances (Average)		
Grid-Plate (without shielding)	0.02	$\mu\mu f$
Input	16.1	$\mu\mu f$
Output	4.7	$\mu\mu f$
Transconductance (i_b=250 ma., e_b=500 v., E_c=250 V.)	12,000	μmhos
MECHANICAL		
Cooling	Forced Air	

At 150 watts plate dissipation, a minimum flow of 5.6 cubic feet of air per minute must be passed through the anode cooler. The pressure drop across the cooler at this flow equals 0.26 inches of water. Forced-air cooling of the base terminal assembly must be provided. In no case should the temperature of the metal-to-glass seals or the core of the anode cooler exceed 150° C.

Mounting position	Any	
Maximum Overall Dimensions		
Length	2⅝	inches
Diameter	1⅝	inches
Maximum Seated Height	1-27/32	inches
Net Weight	6	ounces
Shipping Weight (Average)	1.6	pounds

RADIO FREQUENCY POWER AMPLIFIER OR OSCILLATOR

Class-C Telegraphy or FM Telephony (Key-down conditions, per tube)

MAXIMUM RATINGS

D-C PLATE VOLTAGE	1250 MAX. VOLTS
D-C SCREEN VOLTAGE	300 MAX. VOLTS
D-C GRID VOLTAGE*	—250 MAX. VOLTS
D-C PLATE CURRENT	250 MAX. MA.
PLATE DISSIPATION	150 MAX. WATTS
ANODE-COOLER CORE TEMPERATURE	150 MAX. °C
SCREEN DISSIPATION	15 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

*Maximum permissible grid circuit resistance 25,000 ohms

TYPICAL OPERATION

Single tube, frequencies below 165-Mc.

D-C Plate Voltage	600	750	1000	1250	Volts
D-C Plate Current	200	200	200	200	Ma.
D-C Screen Voltage	250	250	250	250	Volts
D-C Screen Current	37	37	31	20	Ma.
D-C Grid Voltage	—75	—80	—80	—90	Volts
D-C Grid Current	11	11	10	11	Ma.
Peak R-F Grid Voltage (Approx.)	91	96	95	106	Volts
Driving Power (approx.)	1.0	1.1	1.0	1.2	Watts
Power Input	120	150	200	250	Watts
Power Output	85	110	150	195	Watts
Heater Voltage[1]	2.5	2.5	2.5	2.5	Volts

Single tube, 750-Mc. (Coaxial cavity)

D-C Plate Voltage	1250	Volts
D-C Plate Current	200	Ma.
D-C Screen Voltage	250	Volts
D-C Screen Current	5	Ma.
D-C Grid Voltage	—60	Volts
D-C Grid Current	5	Ma.
Peak R-F Grid Voltage (approx.)	85	Volts
Driving Power (approx.)	9	Watts
Power Input	250	Watts
Power Output	100	Watts
Heater Voltage[1]	See note	

(Effective 2-15-50) Copyright 1950 by Eitel-McCullough, Inc.

PLATE MODULATED RADIO FREQUENCY AMPLIFIER

Class-C Telephony

MAXIMUM RATINGS (Carrier Conditions)

D-C PLATE VOLTAGE	1000 MAX. VOLTS
D-C SCREEN VOLTAGE	300 MAX. VOLTS
D-C GRID VOLTAGE*	—250 MAX. VOLTS
D-C PLATE CURRENT	200 MAX. MA.
PLATE DISSIPATION	100 MAX. WATTS
ANODE-COOLER CORE TEMPERATURE	150 MAX. °C.
SCREEN DISSIPATION	15 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

*Maximum permissible grid circuit resistance 25,000 ohms

PLATE PULSED RADIO FREQUENCY AMPLIFIER OR OSCILLATOR

MAXIMUM RATINGS

PULSED PLATE VOLTAGE	7000 MAX. VOLTS
PULSED SCREEN VOLTAGE	1500 MAX. VOLTS
D-C GRID VOLTAGE	—500 MAX. VOLTS
MAXIMUM PULSE DURATION	5 MICROSECONDS
PULSED CATHODE CURRENT	7 MAX. AMPS
AVERAGE POWER INPUT	250 MAX. WATTS
PLATE DISSIPATION	150 MAX. WATTS
ANODE-COOLER CORE TEMPERATURE	150 MAX. °C
SCREEN DISSIPATION	15 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

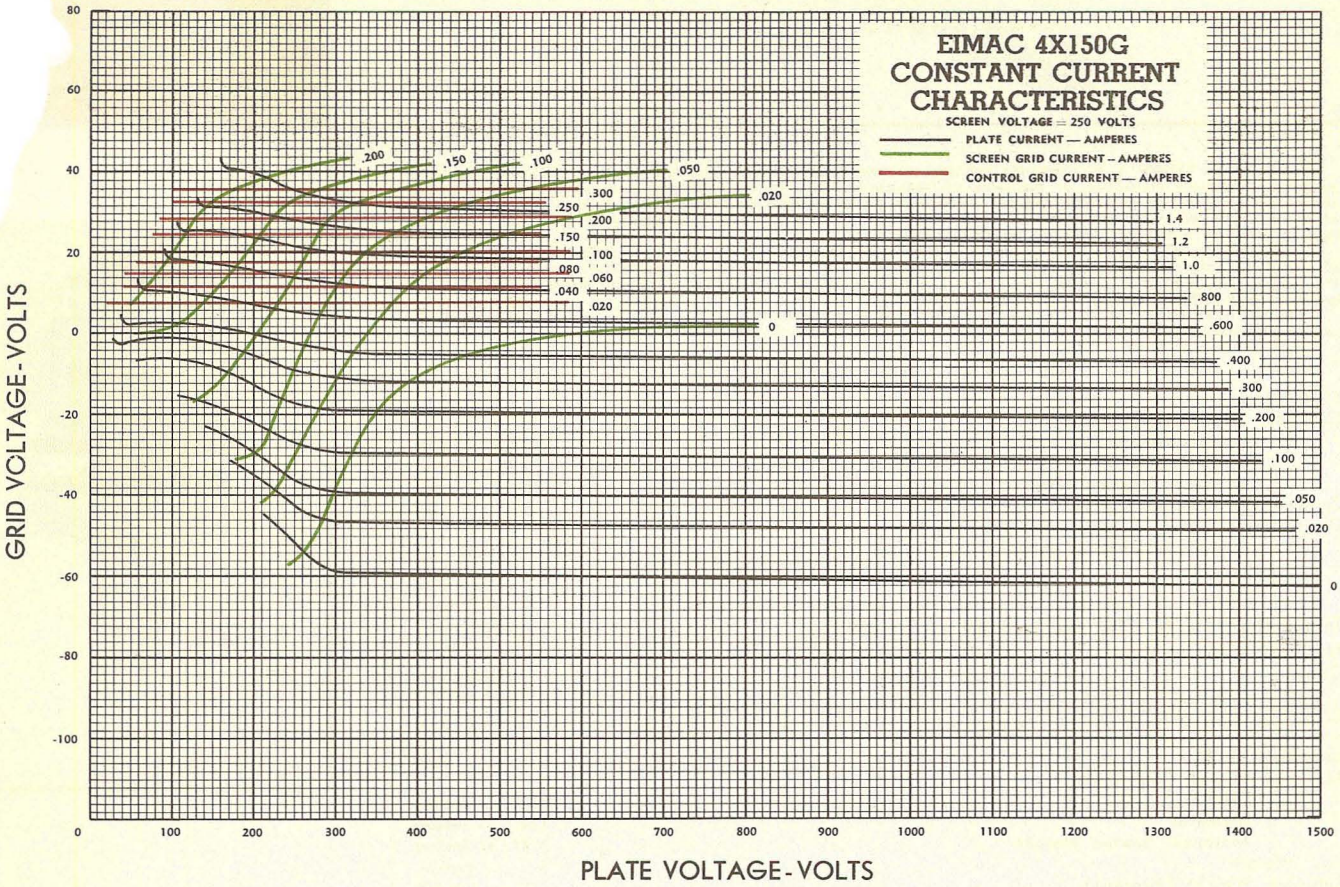
TYPICAL PULSE OPERATION

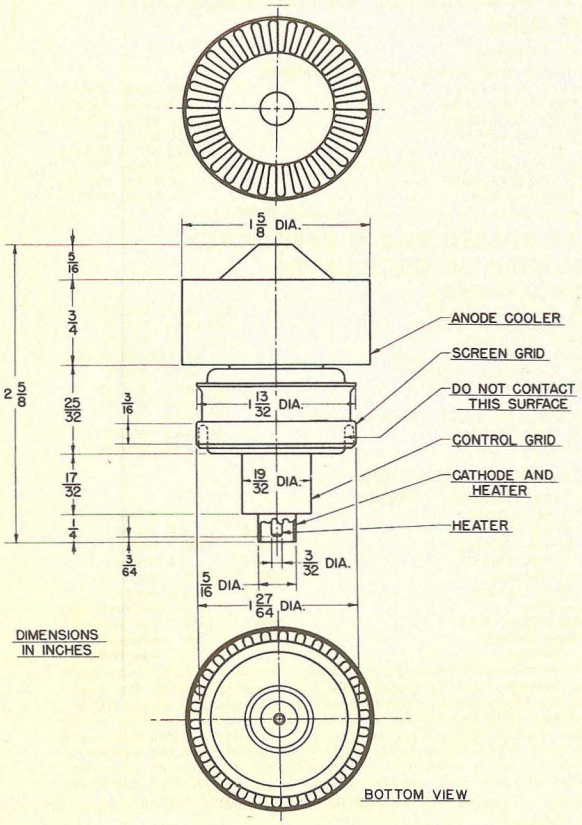
Single tube oscillator, 1200-Mc.

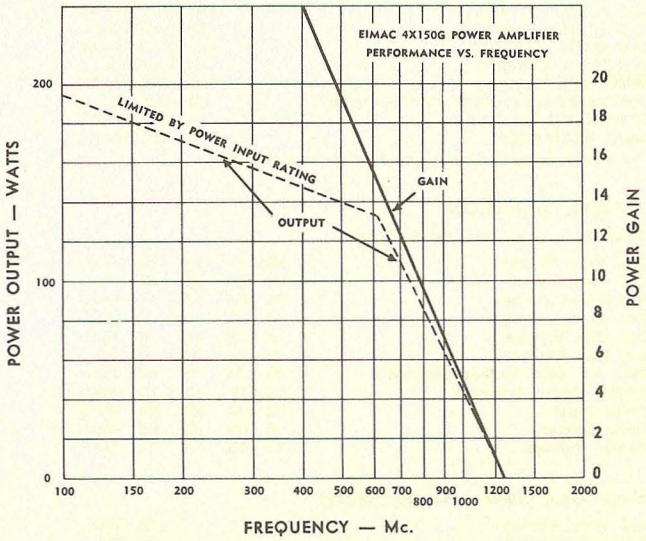
Pulsed Plate Voltage	5	7	Kilovolts
Pulsed Plate Current	4.0	6.0	Amps.
Pulsed Screen Voltage	800	1000	Volts
Pulsed Screen Current	0.3	0.4	Amps.
D-C Grid Voltage	—200	—250	Volts
Pulsed Grid Current	0.5	0.6	Amps.
Pulse Duration	4	4	Microseconds
Pulse Repetition Rate	2500	1250	Per second
Peak Power Output	10	20	Kilowatts
Heater Voltage[1]			See Note[1]

[1]Heater Voltage—Due to transit time back heating effects, the heater voltage should be reduced when operating at frequencies above 400 Mc. This voltage reduction should be made after dynamic operation of the tube has started. Since back heating is a function of frequency, grid current, grid bias, circuit design and circuit adjustment, the amount of back heating varies considerably with different methods of operation. The following table is an approximate guide for normal tube operation:

Frequency	up to 400 Mc.	400 to 1000 Mc.	1000 to 1500 Mc.	above 1500 Mc.
Heater Voltage	2.5 v	2.2 v	2.0 v	1.8 v







Printed in U.S.A. 1-AO-37276