

# ML-7855

## UHF Planar Triode

CW, Plate or Grid Pulsed

Frequency Stable

Phormat Cathode

17 W CW at 2.5 Gc



ELECTRON TUBE SPECIALIST

### DESCRIPTION

The ML-7855 is a ruggedized, high- $\mu$  planar triode of ceramic-and-metal construction, designed for use as a grid-pulsed, plate-pulsed, or CW oscillator, frequency multiplier, or amplifier in radio transmitting service from low frequency to 3 Gc.

In addition to low interelectrode capacitance, high transconductance and high  $\mu$ , this tube incorporates design features which help to assure frequency-stable operation

even under adverse ambient temperature and varying plate dissipation conditions. The cathode is an indirectly heated disc with an oxide coating impregnated in a nickel matrix. The unique matrix construction (in combination with proper plate series impedance) reduces to a minimum failures of the cathode due to voltage surges thereby further increasing the reliability of this tube. The anode of the ML-7855 is cooled by forced air.

### GENERAL CHARACTERISTICS

#### Electrical

Heater Voltage (AC or DC) .....	6.0 V
Heater Current at 6.0 Volts .....	1.00 A
Cathode Heating Time, minimum .....	60 sec
Amplification Factor .....	80
Transconductance .....	25000 $\mu$ mhos
Interelectrode Capacitance, without Heater Voltage	
Grid-Plate .....	2.5 pf
Grid-Cathode .....	6.3 pf
Plate-Cathode, maximum .....	.06 pf

#### Mechanical

Mounting Position .....	Optional
Type of Cooling .....	Forced-air
Maximum Anode Temperature .....	250 °C
Net Weight .....	2.5 oz

## MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

**RF Power Amplifier and Oscillator  
Class C Telegraphy**

Key-down conditions per tube without amplitude modulation†

## Maximum Ratings, Absolute Values

DC Plate Voltage .....	2500	V
DC Grid Voltage .....	-150	V
Instantaneous Peak Grid-Cathode Voltage		
Grid negative to cathode .....	-400	v
Grid positive to cathode .....	30	v
DC Plate Current .....	100	mA
DC Grid Current .....	45	mA
Plate Dissipation .....	100	W
Grid Dissipation .....	2	W
Frequency .....	2.5	Gc

## Typical Operation, RF Power Amplifier

Frequency .....	500	Mc
Filament Voltage .....	6.0	V
DC Plate Voltage .....	900	V
DC Grid Voltage .....	-40	V
DC Plate Current .....	90	mA
DC Grid Current, approximate .....	30	mA
Driving Power, approximate .....	6	W
Useful Power Output .....	40	W

## Typical Operation, RF Oscillator

Frequency .....	2.5	Gc
Filament Voltage .....	6.0	V
DC Plate Voltage .....	900	V
DC Grid Voltage, approximate .....	-22	V
DC Plate Current .....	90	mA
DC Grid Current .....	10	mA
Useful Power Output .....	17	W

**Plate-Pulsed RF Oscillator and Amplifier  
Class C**

## Maximum Ratings, Absolute Values

Peak Plate Pulse Supply Voltage .....	3500	v
DC Grid Voltage .....	-150	V
Instantaneous Peak Grid-Cathode Voltage		
Grid negative to cathode .....	-750	v
Grid positive to cathode .....	250	v
Peak Plate Current from Pulse Supply .....	3	a
Average Plate Current .....	10	mA
Average Grid Current .....	5	mA
Average Plate Dissipation .....	35	W
Average Grid Dissipation .....	1.5	W
Pulse Duration .....	6	μs††

Duty Factor .....	.0033	††
Frequency .....	3	Gc

## Typical Operation, Plate-Pulsed RF Amplifier

Frequency .....	2.5	Gc
Filament Voltage .....	5.8	V
Pulse Duration .....	5	μs
Duty Factor .....	.0030	
Peak Plate Pulse Supply Voltage .....	3500	v
Peak Plate Current from Pulse Supply .....	3	a
Average Plate Current .....	9	mA
Average Grid Current .....	3	mA
Useful Peak Power Output, approximate .....	2	kw

**Grid-Pulsed RF Oscillator and Amplifier  
Class C**

## Maximum Ratings, Absolute Values

DC Plate Voltage .....	2500	V
DC Grid Voltage .....	-150	V
Instantaneous Peak Grid-Cathode Voltage		
Grid negative to cathode .....	-750	v
Grid positive to cathode .....	250	v
Peak Plate Current from DC Supply .....	3	a
Average Plate Current .....	10	mA
Average Grid Current .....	5	mA
Average Plate Dissipation .....	20	W
Average Grid Dissipation .....	1.5	W
Pulse Duration .....	6	μs††
Duty Factor .....	.0033	††
Frequency .....	3	Gc

## Typical Operation, Grid-Pulsed RF Amplifier

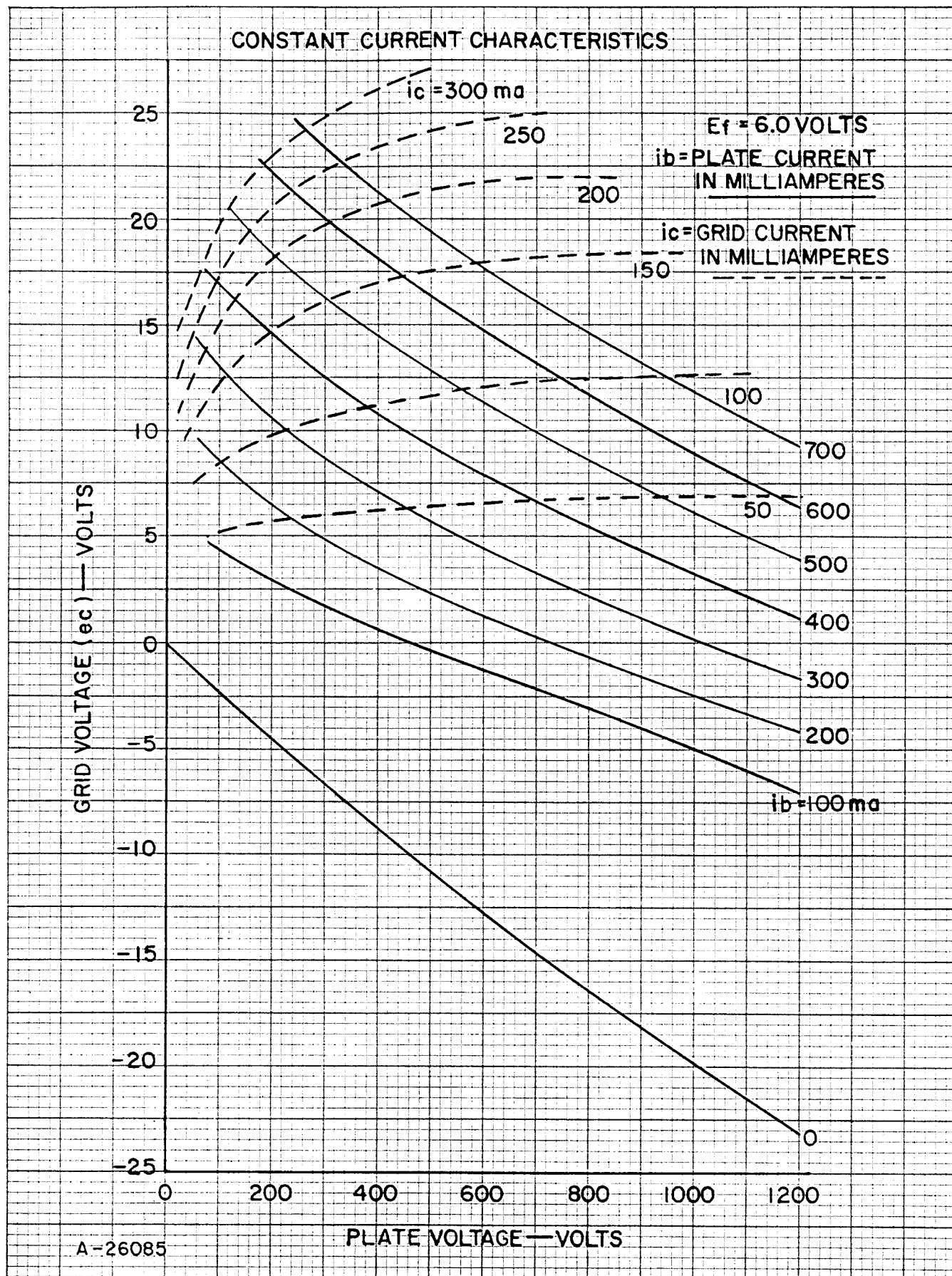
Frequency .....	1.1	Gc
Filament Voltage .....	6.0	V
Pulse Duration .....	3.5	μs
Duty Factor .....	.001	
DC Plate Voltage .....	1700	V
DC Grid Voltage .....	-45	V
Peak Plate Current from DC Supply .....	1.9	a
Peak Grid Current from Pulse Supply .....	1.1	a
Driving Power During Pulse, approximate .....	400	W
Useful Peak Power Output, approximate .....	1.5	kw

†Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115% of the carrier conditions.

††For applications requiring longer pulse duration or higher duty factors, consult the Machlett Engineering Department.

## APPLICATION NOTES

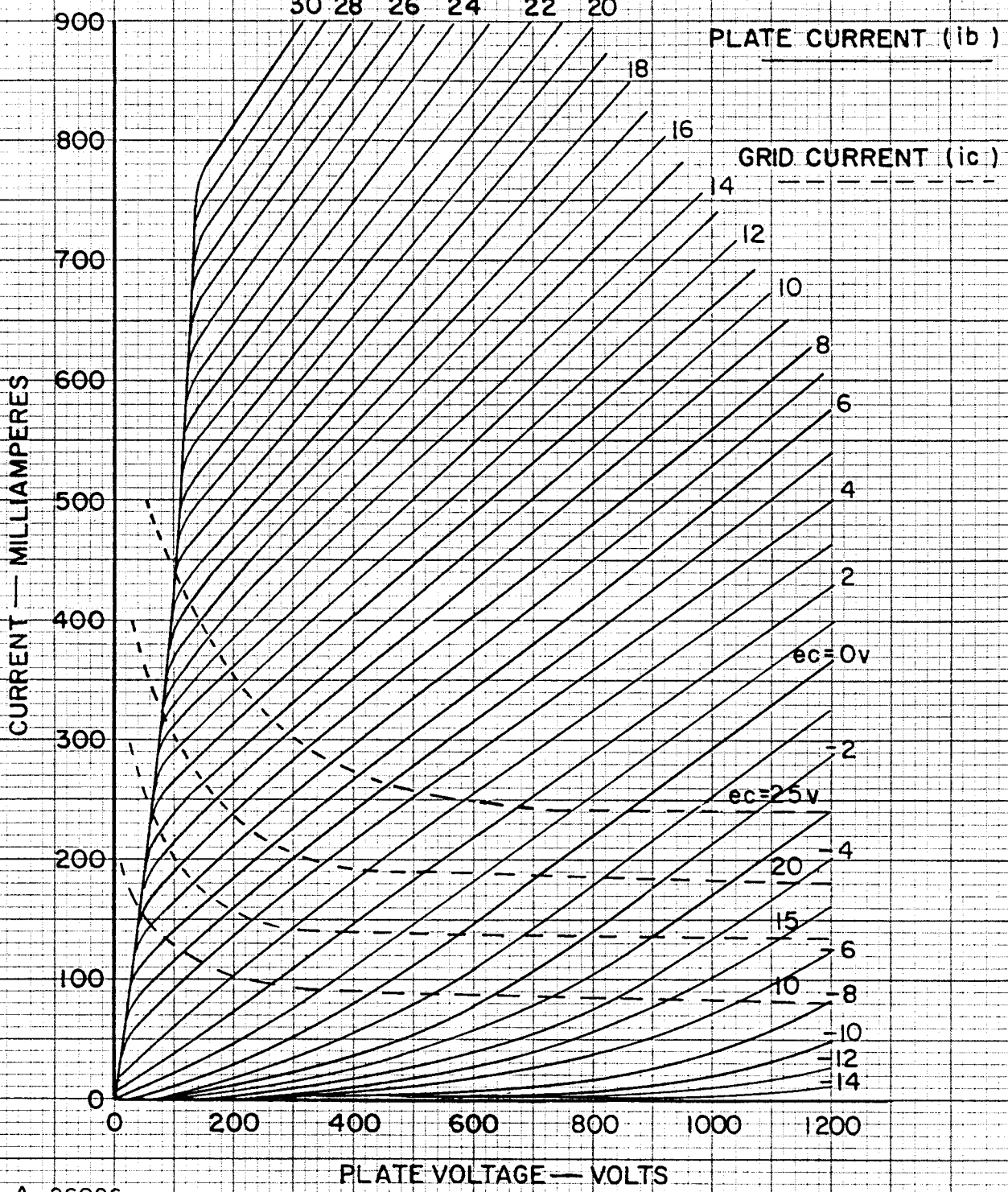
Before designing equipment for use with these tubes and before installing tubes in equipment, refer to the general information given in the Machlett publication entitled *Application Notes, UHF Tubes — General*.



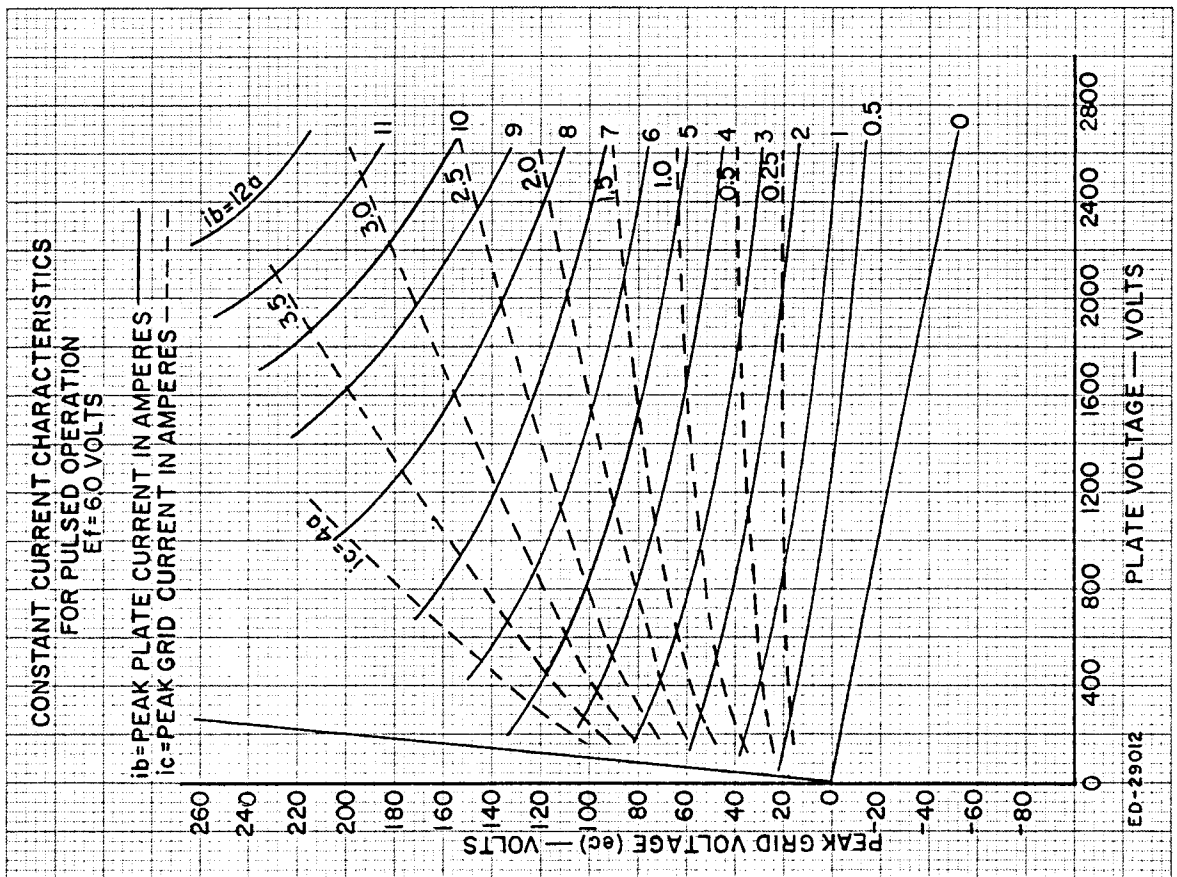
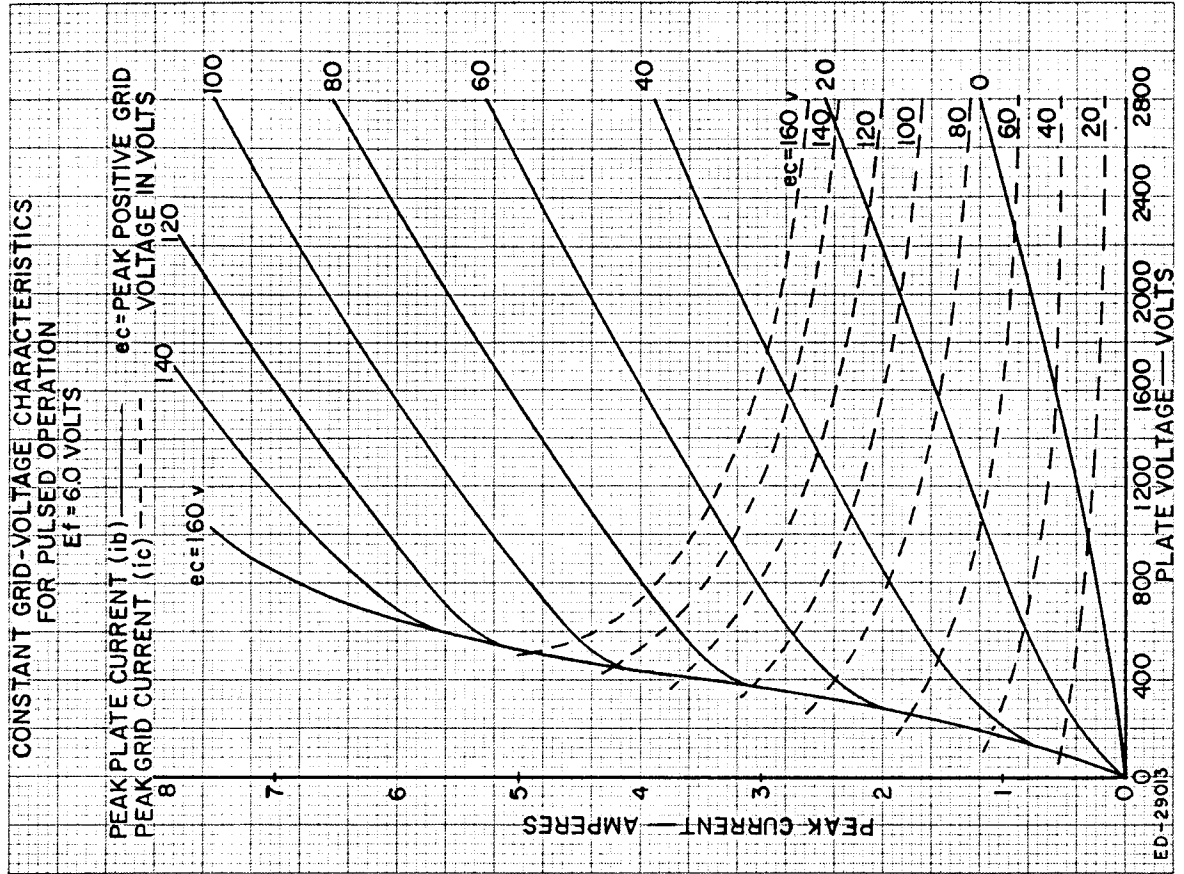
CONSTANT GRID-VOLTAGE CHARACTERISTICS

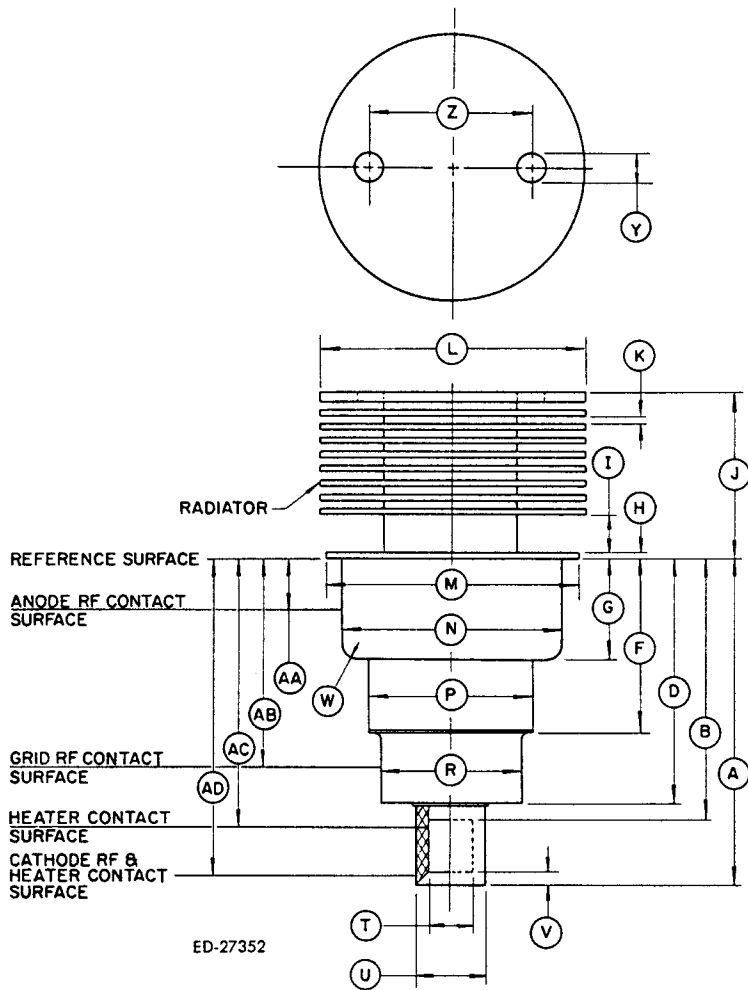
$e_c$  = GRID VOLTAGE IN VOLTS

$E_f$  = 6.0 VOLTS



A-26086





DIMENSIONS FOR  
OUTLINE (INCHES)

Ref.	Minimum	Maximum
A	1.500	1.560
B	—	1.214
D	1.125	1.165
F	0.800	0.840
G	0.462	0.477
H	—	0.040
I	0.125	0.185
J	0.766	0.826
K	0.025	0.046
L	1.234	1.264
M	1.180	1.195
N	1.025	1.035
P	0.752	0.792
R	0.655	0.665
T	0.213	0.223
U	0.315	0.325
V	—	0.086
W	—	0.100
Y	0.105	0.145
Z	0.650	0.850

NOTES

1. The total indicated runout of the anode and grid contact surfaces with respect to the cathode contact surface will not exceed 0.020 inch.
2. The total indicated runout of the cathode contact surface with respect to the heater contact surface will not exceed 0.012 inch.

DIMENSIONS FOR  
ELECTRODE CONTACT SURFACES  
(INCHES)

Ref.	Dimension	Contact
AA	0.198 ± 0.163	Anode
AB	1.061 ± 0.040	Grid
AC	1.316 ± 0.097	Heater
AD	1.330 ± 0.170	Cathode

THE MACHLETT LABORATORIES, INC.

An Affiliate of Raytheon Company

SPRINGDALE  CONNECTICUT