

FEDERAL TELEPHONE AND RADIO COMPANY
A Division of International Telephone and Telegraph Corporation

TRAVELING WAVE TUBE REGISTRATION

Reservation No. 6826 Manufacturer's Designation: D-78
Reservation Date: October 13, 1955 Data Bureau Designation: 6826

General Characteristics

The 6826 metal envelope traveling wave tube employing a helical type wave propagating structure is for power amplifier operation in the 2400 to 3600 mc frequency range. The power output is approximately 1 kilowatt peak and the tube is forced air cooled. It is designed for pulsed service with a maximum duty cycle of .005. A control grid suitable for grid pulsing is provided. The matching circuit in 50 ohm coaxial line is integral with the tube. A uniform magnetic field is used to control the electron beam. This is not integral with the tube.

Electrical Ratings, Absolute Values

Heater Voltage	6.3 ($\pm 10\%$) volts
Heater Current	4.0 amperes
Maximum Anode Voltage (Note 1)	8500 volts peak
Maximum Shell Current (Note 2)	0.5 ampere peak
Maximum Collector Voltage (Note 3)	9000 volts peak
Maximum Collector Dissipation (Note 4)	100 watts average
Maximum R-F Input Power	2 watts average
Maximum R-F Output Power	10 watts average
Maximum Duty Cycle	.005
Maximum Pulse Width (beam)	5 microseconds
Maximum Cathode Current	2.5 amperes peak
Maximum Grid Voltage	
Negative	-300 volts
Positive (Note 7)	+ 5% of anode voltage

Electrical Information

Maximum Frequency (Note 5)	2400 mc
Minimum Frequency (Note 5)	3600 mc
Minimum Cold Transmission Loss	60 db

Mechanical Information

Type of Cathode	Oxide Coated Unipotential
Base, Small Shell Duodecal, 6 Pin, JETEC Designation	B6-63
Type of Envelope	Metal
Magnetic Field Strength	1200 gauss
Length of Magnetic Field	9.625 inches uniform
Mounting Position	Any

Mechanical Information (continued)

Weight (not including magnet)	1 pound, 14 ounces
R-F Connections	Type N Jack UG-23B/U
Type of Cooling	Forced Air
Air Flow on Collector Radiator (Note 4)	10 CFM
Glass Temperature	160°C max.

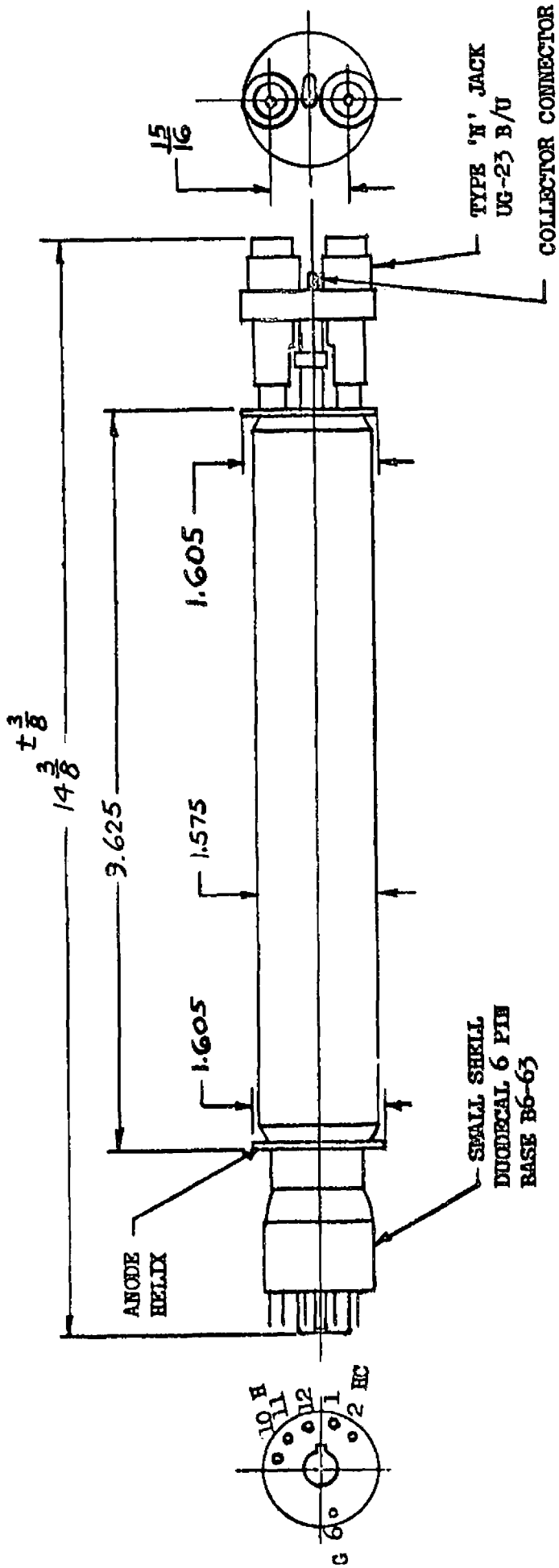
Typical Operation as Power Amplifier

Center Frequency	3000 mc
Anode Voltage (Note 1)	7500 volts peak
Cathode Current	1.95 amperes peak
Collector Voltage (tied to shell)	7500 volts peak
Collector Current	1.6 amperes peak
Power Output (at center frequency)	1.5 kw peak
Bandwidth to 3 db power points	2.4 to 3.6 kmc
Gain (Note 6)	27 db
Duty	.001
Pulse Width	2 microseconds

- Note 1: All voltages shown are with respect to cathode. Anode and helix are connected internally to the shell. The shell is normally operated at ground potential and the anode connection is made to the shell of the solenoid.
- Note 2: The shell current is the difference between cathode current and collector current. Since this current in general should be minimized, it may be desirable to measure current from shell to ground. In making this measurement, care should be taken that both the tube and solenoid are completely insulated from ground. Once operating characteristics (voltage, current, and magnetic field) have been established, shell should be grounded.
- Note 3: The tube may be operated with the collector tied to the shell (anode and helix) or may be operated at several hundred volts positive with respect to shell with slight improvement in beam transmission. The potential difference between collector and shell must be limited to 500 volts maximum.
- Note 4: Forced air cooling is required for average collector power in excess of 10 watts. As the collector power is increased, the air flow required increases. At the maximum collector power of 100 watts, a minimum air flow of 10 CFM through the cooling fins is required.
- Note 5: Useful gain and power output exists below 2400 mc and above 3600 mc and can be utilized by adjusting anode voltage to optimize the frequency range desired. However, bandwidth cannot be extended both upward and downward simultaneously and maximum gain and power output outside the normal bandwidth will be lower than rated values.

Note 6: This gain is obtained over the 2.4 to 3.6 kmc bandwidth at the power level indicated. Since this is in the power saturation region, small signal gain will be approximately 10 db higher.

Note 7: Positive voltage must not be applied to the grid in the absence of anode voltage.



BASING

PIN	ELEMENT
1	NO CONN.
2	HEATER CATHODE
6	CONTROL GRID
10	HEATER
11	NO CONN.
12	NO CONN.

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