TENTATIVE

DESCRIPTION:

The F-6825 is a 1 kilowatt pulse traveling wave amplifier tube having 30 db gain and 2000 to 4000 mc frequency range. It is constructed in a rugged metal envelope with a helix-type slow wave structure. The integral matching circuit is in 50 ohm coaxial line and is provided with type "N" connectors. The tube is self aligning in the external solenoid which is required to provide a uniform magnetic field. A convergent beam gun and oxide impregnated cathode are used. Duty cycles up to .005 and pulse widths up to 15 microseconds can be used.

ELECTRICAL RATINGS, ABSOLUTE VALUES:

Heater Voltage	6.3 (±10%)	volts
Heater Current	5.0	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)	150	watts average
Maximum R-F Input Power	10	watts average
Maximum R-F Output Power	20	watts average
Maximum Duty Cycle	.005	
Maximum Pulse Width (Beam)	15	microseconds
Maximum Cathode Current	2.5	amperes peak

ELECTRICAL INFORMATION:

Maximum Frequency (Note 5)	4000	mc
Minimum Frequency (Note 5)	2000	mc
Minimum Cold Transmission Loss	60	db
Capacitance		
All Gun Elements to Shell	4.2	μμfd

MECHANICAL INFORMATION:

Type of Cathode	Oxide Impregnated Unipotential
Base, Small Shell Duodecal, 5 Pin	JEDEC Designation B5-57
Type of Envelope	Metal
Magnetic Field Strength	1200 gauss
Length of Magnetic Field	9.625 inches uniform
Mounting Position	Any
Weight (not including Magnet)	1 pound, 14 ounces
R-F Connections	50 ohm coax with Type N Jack UG-23B/U
Type of Cooling	Forced Air
Air Flow on Collector Radiator (Note 4)	30 cfm
Glass Temperature	160° C max.

TYPICAL OPERATION AS POWER AMPLIFIER:

Center Frequency	3000 mc
Anode Voltage (Note 1)	8000 volts peak
Cathode Current	1.8 amperes peak
Collector Voltage (tied to Shell)	8000 volts peak
Collector Current	1.5 amperes peak
Power Output (at center frequency)	2 kw peak
Bandwidth to 3 db power points	2.0-4.0 kmc
Gain (Note 6)	30 db
Duty	.001
Pulse Width	2 μ seconds

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 150 watts, a minimum air flow of 20 cfm through the cooling fins is required.

Note 5: Useful gain and power output exists below 2000 mc and above 4000 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 usually be lower than rated values.

Note 6: This gain is obtained over the 2.0 to 4.0 kmc bandwidth at the power level indicated. Since this is in the power saturation region, small signal gain will be approximately 10 db higher.

OPERATING INSTRUCTIONS:

(1) Heater warm up of 2 minutes before applying high voltage is recommended.

(2) Initial adjustments should be done at low duty cycle (less than .001) to prevent tube damage due to high shell (interception) current.

Standard solenoids to operate this tube are available, and solenoids designed for particular application can be supplied.

Additional information for specific applications can be obtained from the

Electron Tube Applications Section
ITT Components Division
Box 7065
ROANOKE, VIRGINIA

TYPICAL P_{out} VS. FREQUENCY CHARACTERISTICS