



TENTATIVE

DESCRIPTION:

The F-6867 is a 100 milliwatt CW traveling wave amplifier tube having 30 db gain and 8000 to 9600 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 normally provided with type "N" connectors. The tube is self-aligning in the external solenoid which is required to provide a uniform magnetic field. A control electrode suitable for use as a gain control is provided. The tube is suitable for either CW or pulse service.

ELECTRICAL RATINGS, ABSOLUTE VALUES:

Heater Voltage	6.3 ($\pm 10\%$)	volts
Heater current	0.85	amperes
Maximum Anode Voltage (Note 1)	1500	volts
Maximum Shell Current (Note 2 and Note 6)	3	ma
Maximum Collector Voltage (Note 3)	1600	volts
Maximum Collector Dissipation (Note 4)	25	watts
Maximum Control Electrode Voltage (Note 5)	-250	volts

ELECTRICAL INFORMATION

Maximum Frequency	9600	mc
Minimum Frequency	8000	mc
Minimum Cold Transmission Loss	50	db
Capacitance		
Control Electrode to All Other Elements	7	μfd
All Gun Elements to Shell	4.5	μfd

MECHANICAL INFORMATION:

Type of Cathode	Oxide Coated Unipotential
Base, Small Shell Duodecal, 5 Pin	JEDEC Designation B5-57
Type of Envelope	Metal
Magnetic Field Strength	1300 Gauss
Length of Magnetic Field	5.25 inches uniform
Mounting Position	Any
Weight (not including Magnet)	1 lb. 4 ozs.
R-F Connections	50 ohm coax with Type "N" Jack UG-23B/U
Type of Cooling	Forced Air
Maximum Glass Temperature	160°C
Cooling Air Required (See Note 4)	5 cfm

TYPICAL OPERATION AS INTERMEDIATE POWER AMPLIFIER:

Anode Voltage	1400 volts
Shell Current	2 ma
Collector Voltage	1500 volts
Collector Current	8 ma
Control Electrode Voltage (Note 5)	-15 volts
Power Output	100 milliwatts
Bandwidth	8.0 to 9.6 kmc
Gain over Bandwidth (Small Signal)	30 db min.
Gain over Bandwidth (Power)	25 db min.
Duty Cycle	
R-F	Variable to 1.0
Beam	1.0

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 d-c connection is made to the shell of the solenoid.

Note 2: The shell current is the difference between the cathode current and collector current. Since this current in general should be minimized, it may be desirable to measure the current from shell to ground. It is desirable that overload protection be provided so that if shell current exceeds 3 ma, high voltage is removed.

- Note 3: It is generally desirable to operate the collector at 100 volts positive with respect to shell, and potential difference between collector and shell should be limited to 300 volts maximum.
- Note 4: Forced air cooling of collector 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 25 watts, a minimum air flow of 5 cfm through the cooling fins is required.
- Note 5: The control electrode voltage is adjusted for maximum beam transmission (collector current/cathode current). It may further be used as a gain control or for introducing modulation, but cannot be operated less negative than the value required for proper transmission.
- Note 6: In some cases, it may be necessary to rotate the tube in the solenoid to the point giving best transmission.

OPERATION PROCEDURE:

- (1) Insert tube in solenoid, secure in place with stops provided, make connections.
- (2) Turn on cooling air, solenoid voltage (adjust to approximately 1300 gauss), heater voltage, collector voltage (if used), control electrode voltage (approximately -20 volts).
- (3) Raise high voltage to desired value, adjusting solenoid voltage and control electrode voltage for maximum collector current, and observing care not to exceed 3 ma shell current. It may be necessary to rotate the tube in the solenoid to the point giving best transmission.
- (4) The above procedure is not required after initial set up; however, heater voltage should be applied two minutes before applying high voltage, and proper magnetic field and control electrode voltage must be applied before applying high voltage. Observance of the 3 ma maximum limit on shell current is essential to prevent tube damage.



F-6867

TRAVELING
WAVE TUBE

- 4 -

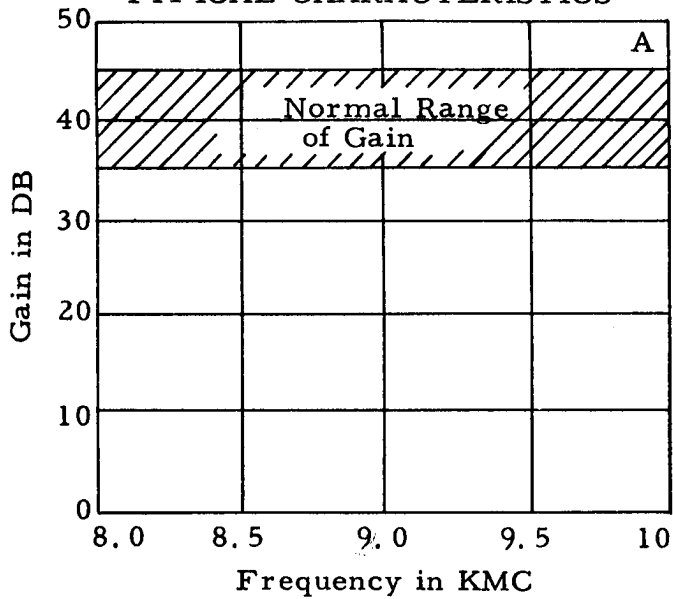
This tube has been designed primarily for operation in the 8000 to 9600 mc frequency range. Useful power and gain exist over a larger frequency range. Additional information for specific applications can be obtained from the Vacuum Tube Engineering Department.

Standard solenoids for this tube type are available and solenoids designed for specific applications can be supplied.

Additional information for specific applications can be obtained from the

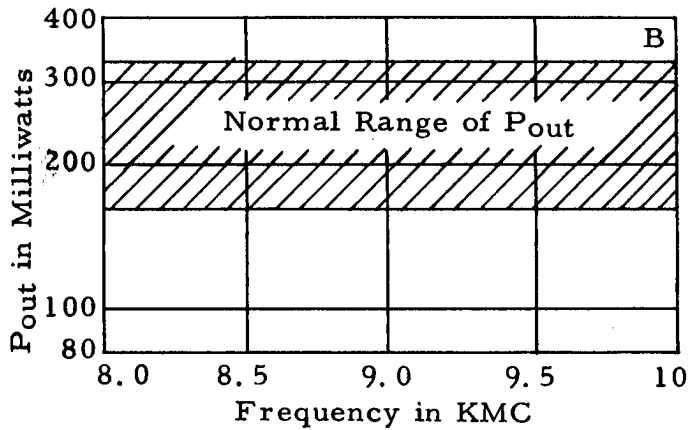
Electron Tube Applications Section
ITT Components Division
Box 7065
ROANOKE, VIRGINIA

TYPICAL CHARACTERISTICS

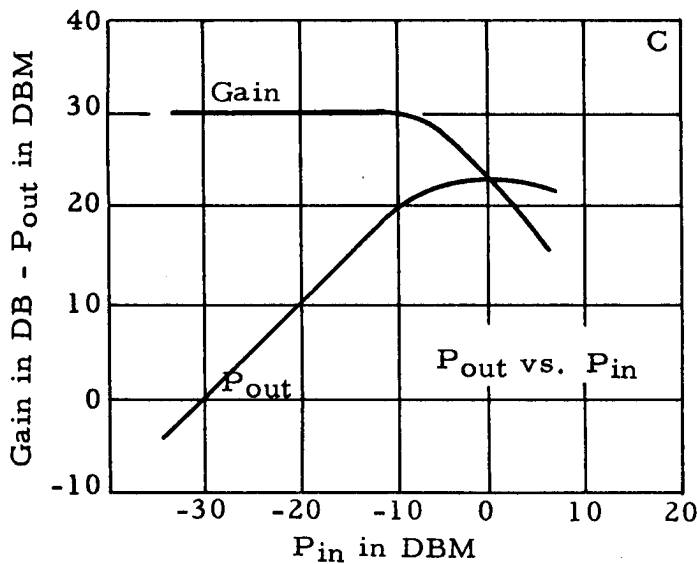


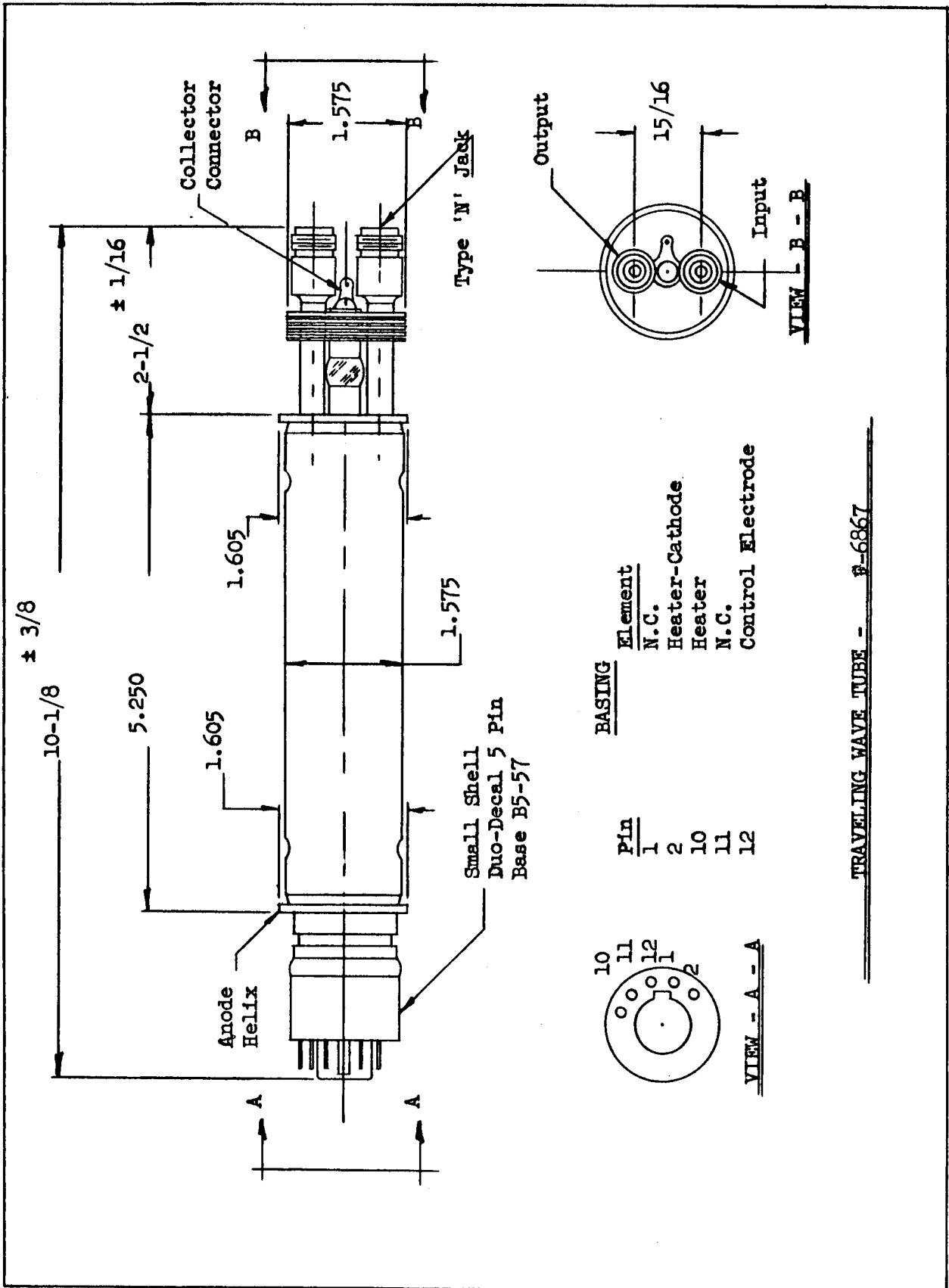
All data shown with magnetic field adjusted for best transmission in range of 900 to 1300 gauss and control electrode voltage adjusted for maximum collector current with shell current less than 3 ma.

For curve A, voltage is adjusted for maximum gain at $f = 9.0$ kmc and $P_{in} < -10$ dbm (approx. 1250 volts).



For curves B and C, voltage is adjusted for maximum P_{out} at $f = 9.0$ kmc and $P_{in} = 0.5$ mw (approx. 1400 volts).





TRAVELING WAVE TUBE - P-6867