



**ELECTRON TUBE DEPARTMENT ■ COMPONENTS DIVISION**  
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, CLIFTON, NEW JERSEY

F-7847  
TRAVELING  
WAVE TUBE

FORMERLY X-319

## T E N T A T I V E

### DESCRIPTION:

THE F-7847 IS A 10 WATT CW TRAVELING WAVE AMPLIFIER TUBE HAVING 27 DB GAIN AND 5.0 TO 6.0 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 FEMALE TNC 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 COATED CATHODE ARE USED. THE TUBE IS SUITABLE FOR EITHER CW OR PULSE SERVICE.

### ELECTRICAL INFORMATION:

|                                   |                        |         |
|-----------------------------------|------------------------|---------|
| HEATER VOLTAGE                    | 6.3 ( <sup>+5%</sup> ) | VOLTS   |
| HEATER CURRENT                    | 2.2                    | AMPERES |
| MAXIMUM FREQUENCY                 | 6.0                    |         |
| MINIMUM FREQUENCY                 | 5.0                    |         |
| MINIMUM COLD TRANSMISSION LOSS    | 55                     | DB      |
| CAPACITANCE                       |                        |         |
| CONTROL ELECTRODE TO ALL ELEMENTS | 15                     | UUF     |

### ELECTRICAL RATINGS, ABSOLUTE VALUES:

|                                                        |      |       |
|--------------------------------------------------------|------|-------|
| MAXIMUM ANODE VOLTAGE (NOTE 1)                         | 3000 | VOLTS |
| MAXIMUM HELIX CURRENT (NOTE 2)                         | 2    | MA    |
| MAXIMUM COLLECTOR DISSIPATION (BEAM POWER)<br>(NOTE 3) | 196  | WATTS |
| MAXIMUM CONTROL ELECTRODE VOLTAGE                      | 0    | VOLTS |

### MECHANICAL:

|                          |                           |
|--------------------------|---------------------------|
| TYPE OF CATHODE          | OXIDE COATED UNIPOTENTIAL |
| GUN CONNECTIONS          | FLYING LEADS              |
| R-F CONNECTIONS          | FEMALE TNC                |
| MAGNETIC FIELD STRENGTH  | 1200 GAUSS                |
| MOUNTING POSITION        | ANY                       |
| WEIGHT (TUBE ONLY)       | 14 OZ.                    |
| TYPE OF COOLING (NOTE 4) | WATER OR AIR              |

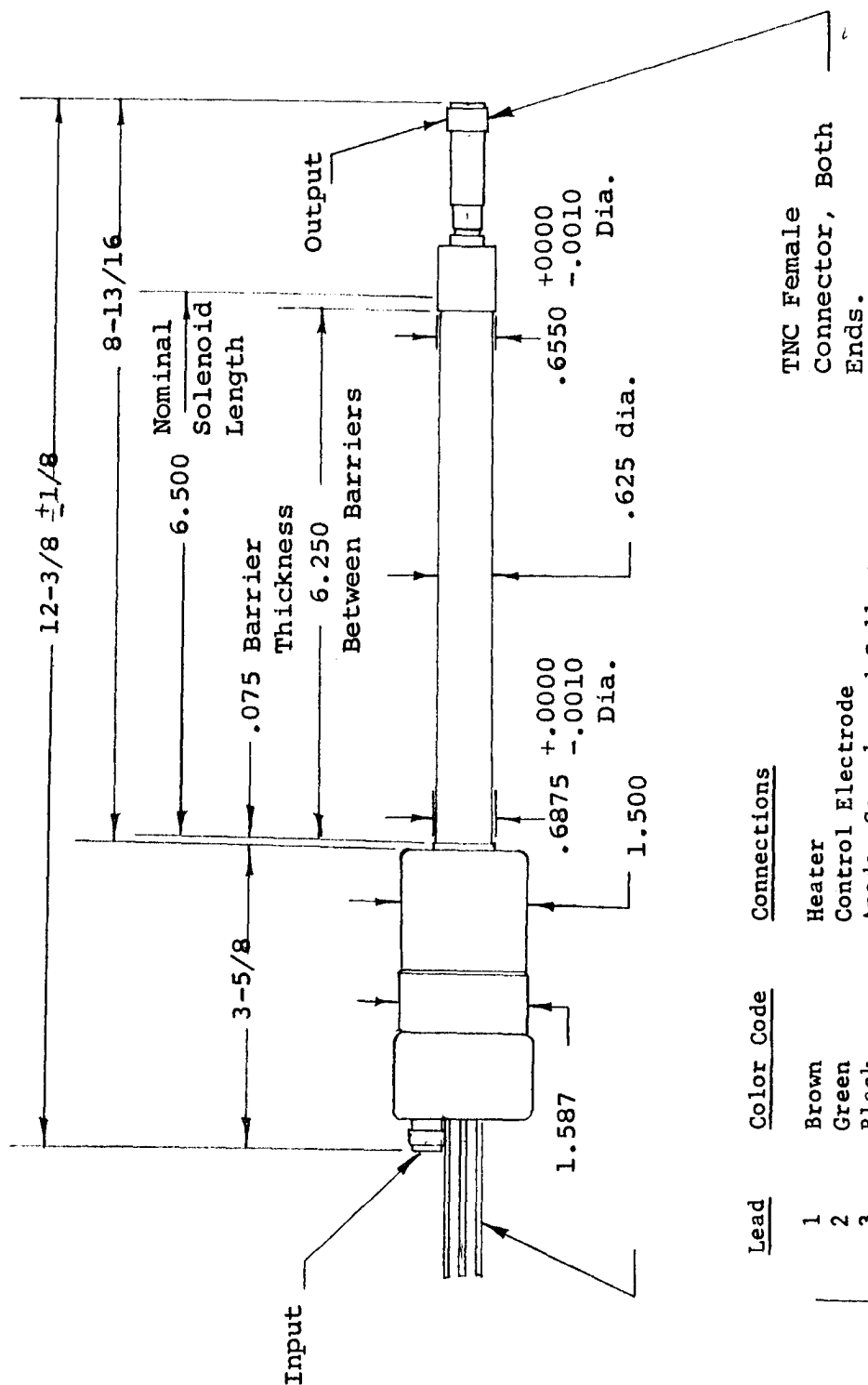
TYPICAL OPERATION:

|                           |                 |       |
|---------------------------|-----------------|-------|
| ANODE VOLTAGE             | 2800            | VOLTS |
| ANODE CURRENT             | 67              | MA    |
| HELIX CURRENT             | 1.0             | MA    |
| CONTROL ELECTRODE VOLTAGE | 0               | VOLTS |
| POWER OUTPUT              | 10              | WATTS |
| GAIN                      | 27              | DB    |
| DUTY CYCLE (NOTE 5)       |                 |       |
| R-F                       | VARIABLE TO 1.0 |       |
| BEAM                      | 1.0             |       |

- NOTE 1: ALL VOLTAGES SHOWN ARE WITH RESPECT TO CATHODE. ANODE, COLLECTOR AND OUTER COAX CONDUCTOR OF THE R-F TERMINALS ARE CONNECTED INTERNALLY TO THE SHELL AND ARE OPERATED AT GROUND POTENTIAL. THE HELIX IS CONNECTED TO THE CENTER CONDUCTOR OF THE COAX LINE AND A D.C. CONNECTION TO THE HELIX MUST BE PROVIDED EXTERNALLY IN THE R-F CIRCUITRY.
- NOTE 2: THE HELIX CURRENT SHOULD BE MINIMIZED AND MUST BE LESS THAN THE MAXIMUM RATING. IT IS DESIRABLE TO MONITOR THIS CURRENT DURING OPERATION AND TO PROVIDE OVERLOAD PROTECTION. IN PULSED BEAM OPERATION, THE PEAK HELIX CURRENT MAY EXCEED 2 MA, BUT CARE SHOULD BE TAKEN TO OPERATE AT REASONABLY LOW VALUES AND AVERAGE CURRENT MUST NOT EXCEED 2 MA.
- NOTE 3: THE BEAM VOLTAGE SHOULD BE APPLIED TO THE TUBE ONLY AFTER THE MAGNETIC FIELD IS TURNED ON AND WATER OR AIR IS FLOWING THROUGH THE COLLECTOR COOLING JACKET.
- NOTE 4: COOLING METHOD DEPENDS ON TYPE OF COLLECTOR COOLING JACKET USED.
- NOTE 5: GATED BEAM OPERATION CAN BE UTILIZED BY PULSING ANODE VOLTAGE IN THIS TYPE OF OPERATION, THE VALUES OF POWER OUTPUT, ANODE CURRENT AND HELIX CURRENT BECOME PEAK VALUES.

ADDITIONAL INFORMATION FOR SPECIFIC APPLICATIONS CAN BE OBTAINED FROM THE:

ELECTRON TUBE APPLICATIONS SECTION  
ITT COMPONENTS DIVISION  
POST OFFICE BOX 7065  
ROANOKE, VIRGINIA



Connections

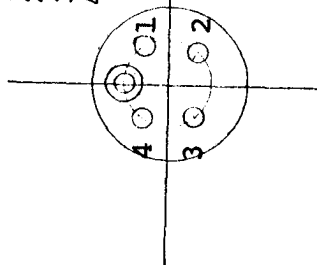
Color Code

Lead

|   |        |                              |
|---|--------|------------------------------|
| 1 | Brown  | Heater                       |
| 2 | Green  | Control Electrode            |
| 3 | Black  | Anode, Capsule and Collector |
| 4 | Yellow | Heater-Cathode               |

Flexible Leads 12" Min. Length

TNC Female  
Connector, Both  
Ends.



OUTLINE - F-7847

