FEDERAL TELECOMMUNICATION LABORATORIES

ELECTRON TUBE

TYPE REGISTRATION

Reservation No: Reservation Date: February 3, 1950
Manufacturers Designation: X190 Data Bureau Designation: 5929

TRAVELING WAVE AMPLIFIER

General Characteristics

The X-190 is a super-high-frequency traveling wave amplifier tube employing a helical wave-propagating structure. The tube is designed for use as a continuous-wave amplifier in the frequency range 4400 to 5000 megacycles per second; it will transmit any type of modulation.

For the amplifier circuit, 1" x 2" waveguide sections are used. A magnetic field is used to hold the electron beam to constant diameter.

Electrical Data

- Heater Voltage: 6.3 volts
- Heater Current: 2.0 amperes
- Maximum Frequency: 5000 megacycles
- Minimum Frequency: 4400 megacycles
- Cold Transmission Loss: 30 decibels

Maximum Ratings, Absolute Values

- Accelerator Voltage: >500 volts
- Accelerator Current: 2 milliamperes
- Helix Voltage*: 3500 volts
- Helix Current: 1 milliamperes
- Collector Voltage: 3800 volts
- Collector Dissipation: 200 watts
- Focusing Electrode Voltage: -100 volts

* Helix voltage to ground should not exceed 1000 volts.

Mechanical Information

Type of Cathode: Coated Unipotential
Base
Physical Specifications
Base Connections (See outline drawing)
Mounting Position (See outline drawing)
Weight Any
8 Ounces

For use with waveguide RG49/U (2"x1" ). Matching sections in amplifier are fitted with choke flanges UG148/U.

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Mechanical Information (Cont.)

Type of Cooling
  Collector Dissipation - Watts
  Air Flow - Cubic Feet per Minute
  Pressure - Inches of Water

  Forced Air
  200  160
  20   17
  0.20  0.16

Typical Operation

Frequency
Heater Voltage
Heater Current
Accelerator Voltage
Accelerator Current
Helix Voltage
Helix Current
Collector Voltage
Collector Current
Focus Cup Voltage (adjusted for maximum beam transmission)

  4700 megacycles per second
  6.3 volts
  2.0 amperes
  3150 volts
  1 milliampere
  3150 volts
  1 milliampere
  3450 volts
  45 milliampere
-25 volts
10 watts

Power Output
Bandwidth to 3 db points
Gain

  greater than 600 megacycles
  20 decibels