

EITEL-McCULLOUGH, INC.  
SAN CARLOS, CALIFORNIA

**X1131**

**TRAVELING WAVE TUBE**

**7.0 - 8.0 Gc**  
**3.0 WATTS**  
**36 db GAIN**

**TENTATIVE DATA SHEET TRAVELING WAVE TUBE X1131**

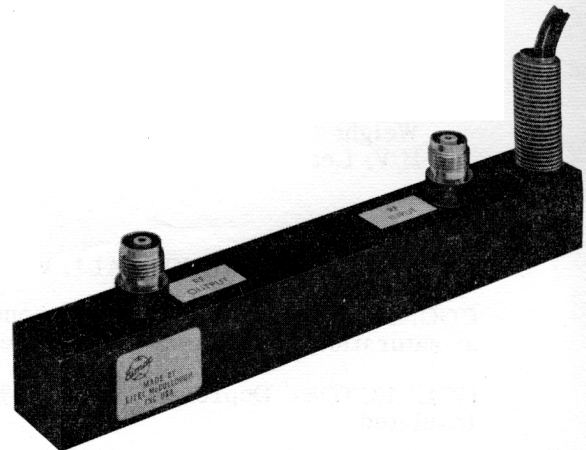
The X1131 is a highly reliable light weight miniaturized Traveling Wave Tube Amplifier designed for long life in space applications. The tube is of metal-ceramic construction utilizing periodic permanent magnets as the focusing array. From 7.0 to 8.0 Gc, 2.5 Watts of rf power at 36 db gain is provided. Electronic efficiency with collector depression is typically 33%.

**ELECTRICAL SPECIFICATIONS:**

Absolute Ratings	Maximum	Minimum
Filament Voltage	10	- volts
Filament Current	0.30	- Amperes
Helix Voltage	1600	1200 Vdc
Body and Helix Current	1.0	- mAdc
Collector Voltage	1600	550 Vdc
Collector Current	16	- mAdc
Focus Electrode Voltage	-100	- Vdc
Focus Electrode Current	1.0	- mAdc
Anode Voltage	1800	1650 Vdc
Anode Current	0.2	- mAdc
Duty Cycle	100	- %
Beam Power Input	25	- W
Input Power, rf	100	- mW
Power Reflected From Load	3.0	- W
Temperature, Body	+100	-60° C
Temperature, Collector	+200	-60° C
Ambient Temperature	+100	-50° C
Cathode Warm-Up	-	120 Seconds

**Operating and Performance Data**

Filament Voltage	6.3 Volts
Filament Current	0.20 A
Helix Voltage	1450 Vdc
Body and Helix Current	0.50 mAdc
Collector Voltage	575 Vdc
Collector Current	14.5 mAdc
Focus Electrode Voltage	0 Vdc
Focus Electrode Current	0 mAdc
Anode Voltage	1550 Vdc
Anode Current	0.2 mAdc
Duty Cycle	100 %
Frequency Range	7.0-8.0 Gc
Small Signal Gain-Minimum	40 db
- Typical	43 db
Saturated Power Out-Minimum	2.5 W
- Typical	3.0 W
Saturated Gain-Minimum	36 db
- Typical	38 db
Output VSWR (Cold)	1.5:1
Input VSWR (Cold)	1.5:1
Input and Output Impedance	50 ohms
Noise Figure, Typical	28 db



### ENVIRONMENTAL SPECIFICATIONS:

Applicable military specifications:		MIL-E- 5400
		MIL-E- 5272
Vibration	- - - - -	20 g's at 5000 cps
Shock	- - - - -	100 g's
Acceleration	- - - - -	20 g's
Temperature	- - - - -	-50° C to +100° C
Altitude	--Any, when used in conjunction with hermetically sealed capsule	

### MECHANICAL SPECIFICATIONS:

Operating Position	-	Any
Input Coupling, rf	- -	TNC
Output Coupling, rf	-	TNC
Focusing	- - - - -	PPM, magnetically shielded
Cooling	- - - - -	Heat Sink conduction
Dimensions	- - - - -	See outline drawing
Weight	- - - - -	9 ounces, encapsulated
H.V. Leads	- - - - -	Flying

### APPLICATION NOTES

**VOLTAGES REFERENCE:** ALL VOLTAGES ARE WITH RESPECT TO CATHODE.

**COOLING:** Tube is cooled by conduction through base. With depressed collector and rf output at saturation, 6.0 watts are dissipated.

**COLLECTOR:** Depressed up to 65% for full rf output. Collector is completely encapsulated and insulated.

**HELIX:** Grounded. Can be supplied floating for modulation capability.

**FOCUS ELECTRODE:** Used to gate off the tube in certain applications.

**MISSION:** This is a high reliability tube with a design "wearout" of 100,000 hours. Reliability coupled with high efficiency and light weight makes this tube ideal for long mission space applications.

**DATA SHOULD NOT BE USED FOR FINAL EQUIPMENT DESIGN**

