

# MT7000

## TRAVELING WAVE TUBE HIGH POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS

C-BAND: 2,250W  
X-BAND: 2,250W



**THE MT7000** high power TWT amplifier is available for C-Band or X-Band applications to 2,250W. The powerful, yet compact, amplifier occupies 24.5 inches of cabinet space, making it ideal for high power applications where space is limited. The MT7000 uses standard, modular sub-assemblies, including the Control Logic Module, power supplies and cooling sub-assemblies, which are common to all models. Connector interfaces are used throughout for easy accessibility.

A switching power supply comprised of four modular subassemblies powers the TWT. These subassemblies include the prime power, switching, high voltage and cooling blower assemblies. Standard prime power interface is 47 to 63 hertz, three phase AC. Power factor correction provides near unity (greater than 0.9 PF) power transfer for the most efficient use of prime power.

Two AC blowers are used to cool the power supply and RF drawers. Both blower subassemblies are modular with electrical interface via connectors for easy removal. With proper cooling, the MT7000 is designed to operate at altitudes to 10,000 feet (derated temperature).

The advanced Control Logic Module (CLM) of the MT7000 uses three 16-bit multi-tasking microcontrollers to process and control all operational functions of the amplifier. RS232 or RS422/485 serial bus interface allows communication with the remote panel (MXR) or a remote computer. The menu-driven CLM features a 500 event log which records all operating events by date, time and summary description, and provides integral 1+1 redundant system monitoring/control capability.



### AVAILABLE SYSTEM OPTIONS:

MT7011 1 + 1 Redundant System

MT7012 1 + 2 Redundant System

MT70PC Phase Combined,  
Redundant System

### AVAILABLE OPTIONS INCLUDE:

MXR Remote Panel

Front Panel Access Door (Flip-down)  
for Linearizer and Sample Port Options

C-Band or X-Band Linearizer (Operating Controls 2)

## FEATURES:

**State-of-the-Art Performance**

**2,250W of Power**

**Internal Microcontroller**

**Low Phase Noise**

**Active Power Factor Correction**

**Modular Design**

**Switching Power Supply**

ISO 9001



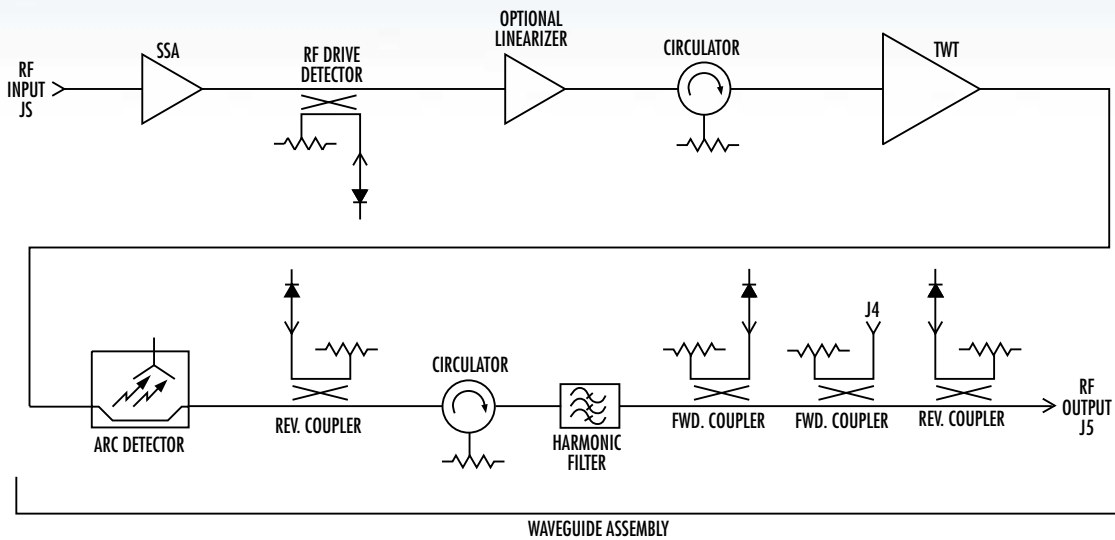
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## TRAVELING WAVE TUBE HIGH POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS	C - BAND	X - BAND
	2,250 W	
Frequency Range:	5.850 - 6.425 GHz Option: 5.850 - 6.650 GHz	7.900 - 8.400 GHz
Output Power (min.): Tube Output Flange: HPA Output Flange:	2,250 W (63.52 dBm) 2,000 W (63.0 dBm)	
Gain:		
At Rated Power (min.):	75 dB	
Small Signal Gain (SSG) (min.):	78 dB	
Attenuation Range:	32 dB (0.10 Inc.)	
Maximum SSG Variation Over:		
Narrow Band:	1.0 dB/40 MHz	
Per 500 MHz:	3.0 dB	
Slope, Max.:	±0.04 dB/MHz	
Gain Stability:	±0.25 dB/24 hr. max. (constant drive, line voltage and temp.)	
Stability, Any Freq. Over Entire Temp.:	±1 dB typ.	
Stability, Any Freq. ±10°C	±0.75 dB max.	
Input VSWR:	1.25:1 max.	
Output VSWR:	1.20:1 max.	
Load VSWR:	2.0:1 max. without damage, continuous	
AM/PM Conversion:		
At Rated Power:	4.5°/dB max.	
6 dB Below Rated Power:	2.5°/dB max.	
Residual AM Noise, Max.:		
To 4 kHz	-40 dBc	
4-500 kHz	-20 (1 + Log f kHz) dBc	
Above 500 kHz	-80 dBc	
Harmonic Output, Max.:	-60 dBc	
Noise & Spurious, Max.:		
Receive Band	-150 dBW/4 kHz, 3.7 - 4.2 GHz	-70 dBW/4 kHz, 7.25 - 7.75 GHz
Transmit Band	-65 dBW/4 kHz, 5.850 - 6.425 GHz	-65 dBW/4 kHz, 7.9 - 8.4 GHz
Phase Noise, Max.:	6 dB below IESS Phase Noise Profile	
AC Fundamental:	-36 dBc	
Sum Of All Except AC Fundamental	-42 dBc	
Intermodulation (for 2 equal carriers relative to single carrier rated output):	Total P <sub>0</sub> -4 dBc -7 dBc	IM Product -18 dBc -24 dBc
Linearizer Option:	-4 dBc	-27 dBc
Group Delay, Max.:	Any 40 MHz Bandwidth	
Linear:	0.01 ns/MHz	
Parabolic:	0.005 ns/MHz <sup>2</sup>	
Ripple:	0.5 ns p-p	
Prime Power:		
Voltage:	120/208 VAC, 3-phase, 4 wire (60 Hz), Option 220/380 VAC, 3-phase, 4 wire (50 Hz)	
Power Consumption:	8.2 KVA typ.	
Power Factor:	0.9 min.	
In-Rush:	200% max.	

Note: Performance information is subject to change without notification. Contact MCL for the latest specifications.

## RF BLOCK DIAGRAM

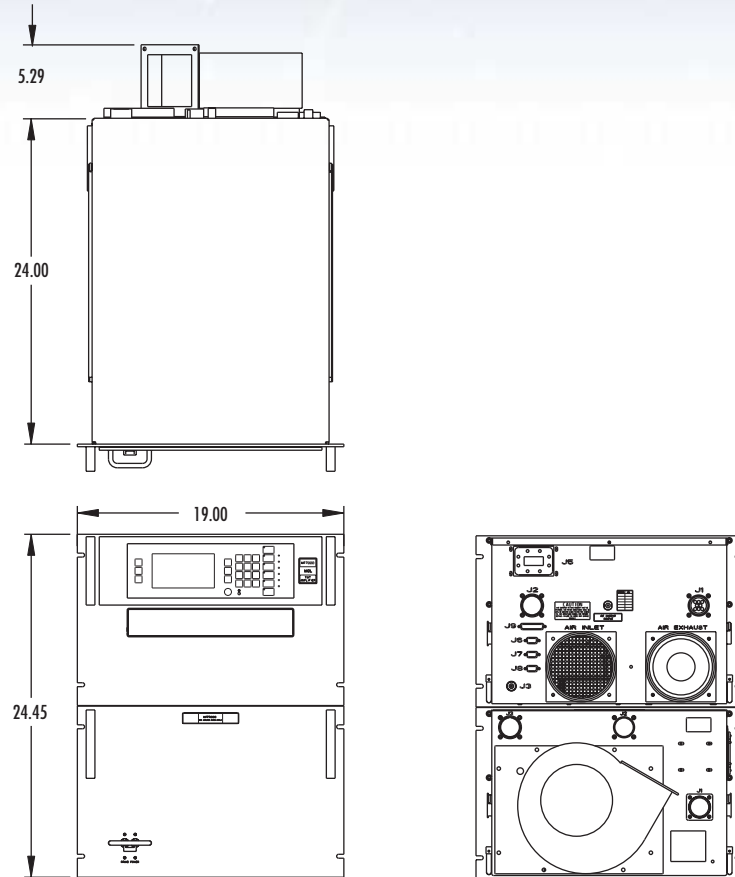


## CONTROL AND STATUS CAPABILITIES

TYPE	FUNCTION	
Local Controls	Power On RF ON/OFF Local/Remote/Computer Attenuation Time & Date Auto Fault Reset	Transmit/Standby Reset Auto Power Clear Event Log Switchover
Meters	Tube Drive Power RF Forward Power Helix Voltage Filament Delay	Forward Power Sample Port RF Reflected Power Helix Current
Limits	Helix Run Trip Tube Overdrive Fault RF Reflected Power Fault Auto Power Window %	Helix Surge Trip RF High Alarm RF Low Alarm
Alarms	RF High RF Reflected Power	RF Low Summary
Faults	Summary RF Reflected Power Tube Temperature Helix Surge Current HV Under Voltage Waveguide Arc	Tube Overdrive Chassis Interlock User Interlock Helix Run Current HV Over Voltage

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## OUTLINE DRAWING



### ENVIRONMENTAL SPECIFICATIONS

**Operating Temperature:**

0°C to +50°C (derated 1.9°C per 1,000 ft. above sea level)

**Relative Humidity:**

95%, non-condensing

**Operating Altitude:**

10,000 ft. above sea level (3,048 m)

**Vibration:**

Basic Transport Method 514-4 of MIL-STD-810E Category I, Figures 514.4-1, 514.4-2, 514.4-3

**Shock:**

10g for 11ms

**Maximum Backpressure:**

0.25 inches of water

### MECHANICAL SPECIFICATIONS

**RF Connectors:**

Input: Type N female  
Output: (Waveguide Flange)

C-Band: CPR137  
X-Band: CPR112

**Installed Weight:**

HVPS Drawer: 155 lbs.  
TWTA Drawer: 100 lbs.  
HPA Total Weight: 260 lbs (including cables)

**Cooling:**

Forced air with integral blower

**Acoustic Noise:**

72 dBA max.

### PHYSICAL SPECIFICATIONS

**Dimensions:**

24.50" H (14RU)  
19.00" W  
29.48" L (nom.)

**Air Flow:**

HPA TWTA: 230 CFM  
HPA HVPS: 150 CFM

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