

# MT7000

TRAVELING WAVE TUBE HIGH POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS

C-BAND: 2250W  
X-BAND: 2250W  
2500W



## AVAILABLE SYSTEM OPTIONS:

MT7011 1 + 1 Redundant System

MT7012 1 + 2 Redundant System

MT70PC Phase Combined,  
Redundant System

Other Configurations Available Upon Request

## 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**

**Internal Microcontroller**

**Low Phase Noise**

**Active Power Factor Correction**

**Modular Design**

**Switching Power Supply**

ISO 9001



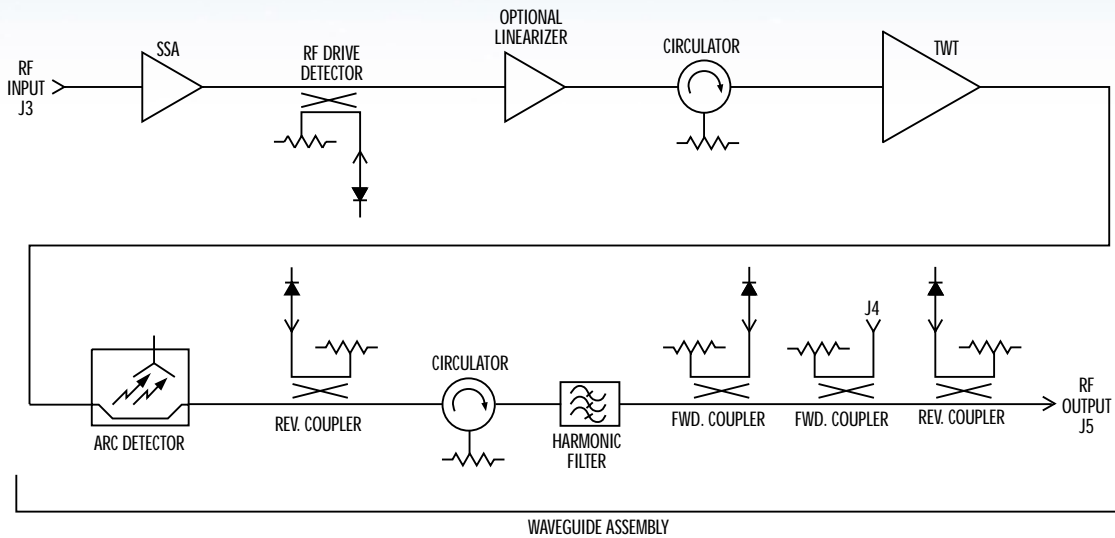
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## TRAVELING WAVE TUBE HIGH POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS	C - BAND		X - BAND			
	2250 W		2250 W	2500 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:	2250 W (63.52 dBm) 2000 W (63.0 dBm)		2250 W (63.5 dBm) 2000 W (63.0 dBm)	2500 W (64.0 dBm) 2200 W (63.4 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 <sub>f</sub> 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>	IM Product	Total P <sub>0</sub>	IM Product	Total P <sub>0</sub>	IM Product
	-4 dB	-18 dBc	-4 dB	-16.5 dBc	-4 dB	-15.5 dBc
	-7 dB	-24 dBc	-7 dB	-22.5 dBc	-7 dB	-21.5 dBc
Linearizer Option:	-4 dB	-27 dBc	-4 dB	-27 dBc	-4 dB	-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

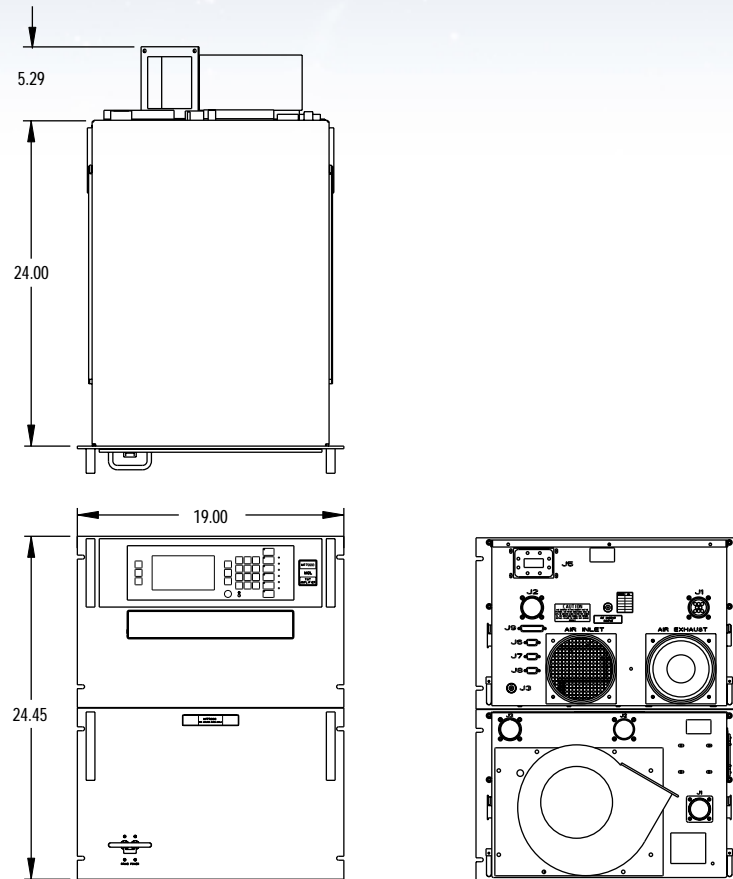


## CONTROL AND STATUS CAPABILITIES

TYPE	FUNCTION	
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
Adjustable Parameters	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