

# 400 Watt C and Ku-Band Rack Mount High Power Amplifier



## FEATURES

- *Touch screen interface*
- *Compact 3RU chassis*
- *Built-in redundancy controller*
- *Extended frequency bands available*
- *Ethernet interface, remote diagnostics*
- *Parameter trend analysis*
- *Optional integrated linearizer*

The **XTRT-400** is a highly efficient rack mountable traveling wave tube amplifier (TWTA) designed for fixed and mobile uplink applications. The unit includes RF gain control, a solid state pre-amplifier, RF filters, cooling, and monitoring and control (M&C) systems. Rack space is conserved because the amplifier occupies only 3 rack units (5¼ inches) of a standard 19-inch rack cabinet. Nominal weight is 56 pounds.

The **XTRT-400** is a 400W amplifier with a touch screen front panel for easy customer interface. The display shows HPA status, parameter trend analysis and event logs, and remote diagnostics can be easily performed via the Ethernet interface. Also, because the display can show and control waveguide switches or a combiner, the need for separate external controllers is eliminated for common architectures.

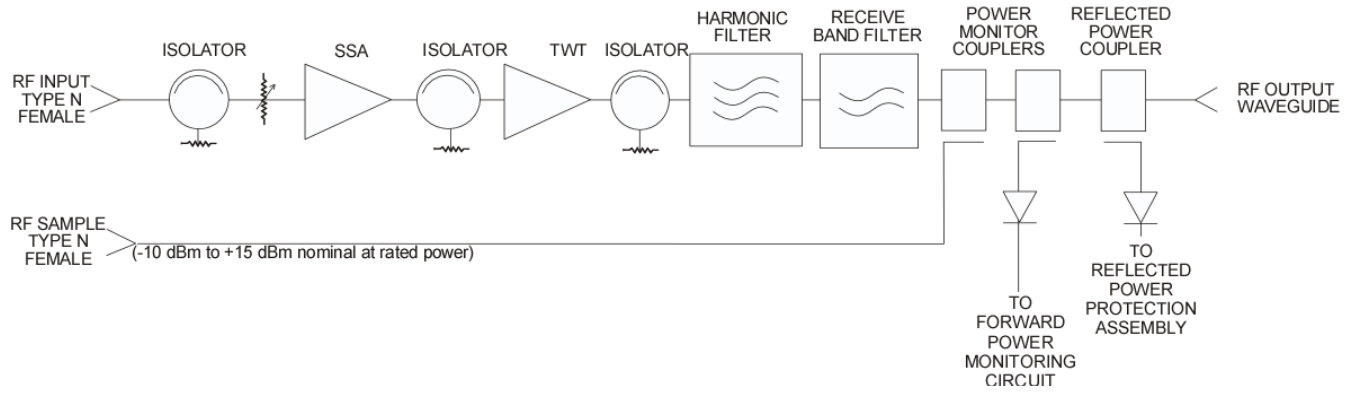
The **XTRT-400** incorporates high efficiency, dual stage collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for both the linear and saturated modes of operation. Power factor correction circuitry is also included which minimizes line current distortion and reduces the required Volt-Amps input. The automatic features of the high frequency resonant conversion power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles.) Depending upon user requirements these amplifiers can be configured for either single thread or redundant system operation.



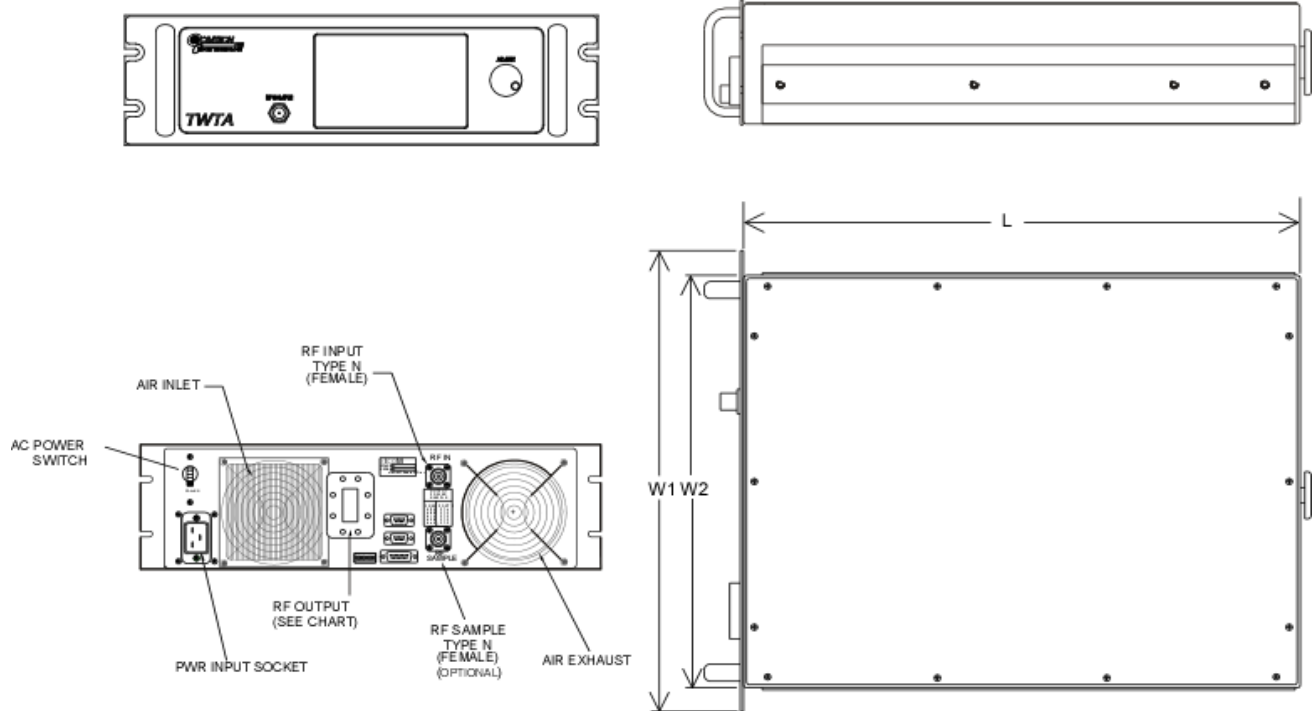
# PERFORMANCE SPECIFICATION

Parameters	XTRT-400C C-Band	XTRT-400K Ku-Band
FREQUENCY RANGE (extended frequency coverage available)	5.850 to 6.425 GHz (various)	13.75 to 14.5 GHz (12.75 to 14.5 GHz)
OUTPUT POWER		
Traveling Wave Tube		400 W
Rated Power @ Amplifier Flange (minimum)		350 W
GAIN		
Large Signal (minimum)		70 dB
Small Signal (minimum)		75 dB
Attenuator Range (continuous)		25 dB
Maximum SSG Variation Over:		
Any Narrow Band	1.0 dB per 40 MHz	1.0 dB per 80 MHz
Full Band	2.5 dB/575 MHz	2.5 dB/750 MHz
Slope (maximum)		± 0.02 dB/MHz
Stability, 24 hr. (maximum)		± 0.25 dB
Stability, Temperature (maximum)		± 1.0 dB over temperature range at any frequency
INTERMODULATION (maximum) with two equal carriers		-18 dBc @ 4 dB total output power backoff from rated power
HARMONIC OUTPUT (maximum)		-60 dBc
AM/PM CONVERSION (maximum)		2.5 deg/dB at 6 dB below rated power
NOISE POWER (maximum)		
Transmit Band		-70 dBW/4kHz
Receive Band	-150 dBW/4 kHz 3.7 to 4.2 GHz	-150 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY (maximum)		
Bandwidth	Any 40 MHz	Any 80 MHz
Linear		0.01 nS/MHz
Parabolic		0.001 nS/MHz <sup>2</sup>
Ripple		0.5 nS/Pk-Pk
RESIDUAL AM NOISE (maximum)		-50 dBc to 10 kHz -20 (1.5 + logf) dBc to 500 kHz -85 dBc above 500 kHz
PHASE NOISE (maximum)		12 dB below IESS phase noise profile AC fundamental -50 dBc Sum of all spurs -47 dBc
VSWR		
Input (maximum)		1.3:1
Output (maximum)		1.3:1

# BLOCK DIAGRAM



# OUTLINE DRAWING



<b>RF OUTPUT (WAVEGUIDE FLANGE)</b>
C-Band: CPR-137G Ku-Band: WR-75

DIMENSIONS		
	Inches	Centimeters
W1	17.00	43.18
W2	19.00	48.26
L	23.00	58.42
H	5.22	13.26
Nominal Weight = 56 lbs (25.4 kg)		

## PRIME POWER

100 to 260 VAC  
 47 to 63 Hz, Single Phase  
 C-Band: 1500 VA Max, 1400 VA typical  
 Ku-Band: 1400 VA Max, 1300 VA typical  
 0.95 Minimum Prime Power Factor



## ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-10°C to +50°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 95% Noncondensing
ALTITUDE	10,000 Feet MSL (maximum)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

## INTERFACE

	Type	Function	
CONTROLS	LOCAL	Local/Remote	AC Power On/OFF
	LOCAL AND REMOTE	Gain	High Voltage ON/OFF
		Min/Max Power Alarm/Fault	Audio Alarm ON/OFF
		Reflected Power Alarm/Fault	Units (Watts, dBm, dBW)
		Fault Reset	Lamp Test
		Heater Standby ON/OFF	System
STATUS	FRONT PANEL LCD	Standby	Power
		Local	Remote
		Summary Fault	High Voltage ON/OFF
		Heater Time Out (FTD)	Heater Standby
		Power Out	Beam Hours
		Reflected Power	Helix Current
		TWT Temperature	Helix Voltage
		Heater Hours	Faults:
		Uplink Power (option)	High VSWR
		Event Log	High Voltage
		Trend Log	Helix Current
		System Status	TWT Temperature
		DRY FORM-C RELAY CONTACTS (2)	Summary Fault
COMPUTER SERIAL PORT	HARDWARE INTERFACE	Two Ports: RS-232 & RS-422/RS-485 Ethernet T10/100	
	XICOM COMMAND SET	ASCII Commands	
	RF SAMPLE PORT COUPLING	-37 dB Nominal	

## OPTIONS

- Extended Frequency Coverage
- 1:1, 1:2, 1:N Redundancy
- Uplink Power Control
- Variable Phase Combined
- Integrated Linearizer
- Integrated Block Upconverter

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