

## **XTD-2500CL/KL Antenna Mount Power Amplifier**



- **High Rated Power:  
1000 Watts C-Band  
1000 Watts Ku-Band**
- **Full Instantaneous Bandwidth**
- **Linearizer Included**
- **Optional Block Upconverter**
- **No Shelter Required**
- **Variable Gain Control**

The XTD-2500 amplifier is a series of compact antenna mounted high power amplifiers designed for applications requiring high transmit power levels.

The unit includes integrated cooling and monitoring and control systems. All high-voltage cabling is contained within the amplifier chassis.

The amplifier uses two peak-power TWTs operating in parallel and power combined in a hybrid circuit. The total peak power of the TWTs is 2,500 Watts. This technique enables power levels rivaling klystron-based amplifier solutions. Because these amplifiers are used outdoors, losses from waveguide runs, multiplexers and rotary joints are eliminated delivering more power to the antenna feed. Both C-Band and the Ku-Band amplifiers will deliver 800 watts of

linear power. TWTs have very high instantaneous bandwidth compared to Klystron amplifiers allowing the simultaneous transmission of multiple carriers without the need to multiplex signals at the transmit frequency.

The XTD-2500 amplifiers include linearizers and several methods of fault protection including arc detectors and fast power supply shutdown circuits. The unit features power factor correction circuitry that minimizes line current distortion and reduces the required Volt-Amps input.

The amplifier includes full remote control capability supporting either RS-232, or RS-485; and a controller is available to operate the amplifier from a remote location.

# PERFORMANCE SPECIFICATIONS

Parameter	XTD-2500CL C-Band	XTD-2500KL Ku-Band
FREQUENCY RANGE	5.85 - 6.425 GHz	13.75 - 14.5 GHz
OUTPUT POWER		
TWT PEAK POWER, Typical	64.0 dBm (2,500 W)	64.0 dBm (2,500 W)
HPA FLANGE PEAK POWER, Typical	63.5 dBm (2,250 W)	63.5 dBm (2,250 W)
LINEAR RATED POWER, HPA FLANGE	59.0 dBm (800 W)	59.0 dBm (800 W)
SINGLE CARRIER POWER, HPA FLANGE, Typical	60.0 dBm (1,000 W)	60.0 dBm (1,000 W)
GAIN		
Rated Power, minimum	70 dB	70 dB
Small Signal, minimum	75 dB	75 dB
Attenuator Range	25 dB	25 dB
Slope, maximum	0.04 dB/MHz max	0.04 dB/MHz max
Maximum SSG Variation Over:		
ANY Narrow Band	1.0 dB peak to peak per 40 MHz	1.0 dB peak to peak per 80 MHz
Full Band	2.5 dB peak to peak per 500 MHz	2.5 dB peak to peak per 500 MHz
Stability, 24 Hr maximum	±0.25 dB	±0.25 dB
Stability, Over Temperature	± 1.0 dB	± 1.0 dB
INTERMODULATION		
with two equal signals at 800 W (Total Power)	- 27 dBc	- 27 dBc
HARMONIC OUTPUT, maximum	- 60 dBc	- 60 dBc
AM/PM CONVERSION, maximum	1.5 deg/dB ≤800 W	1.5 deg/dB ≤800 W
NOISE and SPURIOUS, maximum		
Transmit	-70 dBW/4 kHz	-70 dBW/4 kHz
Receive	-150 dBW/4 kHz 3.7 - 4.2 GHz	-150 dBW/4 kHz 10.95 - 12.75 GHz
GROUP DELAY, maximum		
Bandwidth	Any 40 MHz	Any 80 MHz
Linear	± 0.01 nS/MHz	± 0.01 nS/MHz
Parabolic	± 0.005 nS/MHz <sup>2</sup>	± 0.005 nS/MHz <sup>2</sup>
Ripple	0.5 nS/Pk-Pk	0.5 nS/Pk-Pk
RESIDUAL AM NOISE, maximum		
- 50 dBc to 10 kHz	- 50 dBc to 10 kHz	- 50 dBc to 10 kHz
- 20 (1.5 + logf) dBc 10 to 500 kHz	- 20 (1.5 + logf) dBc 10 to 500 kHz	- 20 (1.5 + logf) dBc 10 to 500 kHz
- 85 dBc above 500 kHz	- 85 dBc above 500 kHz	- 85 dBc above 500 kHz
PHASE NOISE, maximum		
10 dB below IESS phase noise profile	10 dB below IESS phase noise profile	10 dB below IESS phase noise profile
AC fundamental -50 dBc	AC fundamental -50 dBc	AC fundamental -50 dBc
Sum of all spurs -47 dBc	Sum of all spurs -47 dBc	Sum of all spurs -47 dBc
VSWR		
Input, maximum	1.3:1	1.3:1
Output, maximum	1.3:1	1.3:1

## PRIME POWER

## OPTIONS

208 VAC  $\pm$ 10%  
47 to 63 Hz, 3-phase 4-wire  
6000 VA Maximum  
0.95 Minimum Power Factor

Block Upconverter  
Remote External Controller  
Extended Frequencies



## ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50° C to + 70° C
OPERATING TEMPERATURE RANGE	-40° C to +50° C
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 feet MSL maximum (2° C/1000 ft derating)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

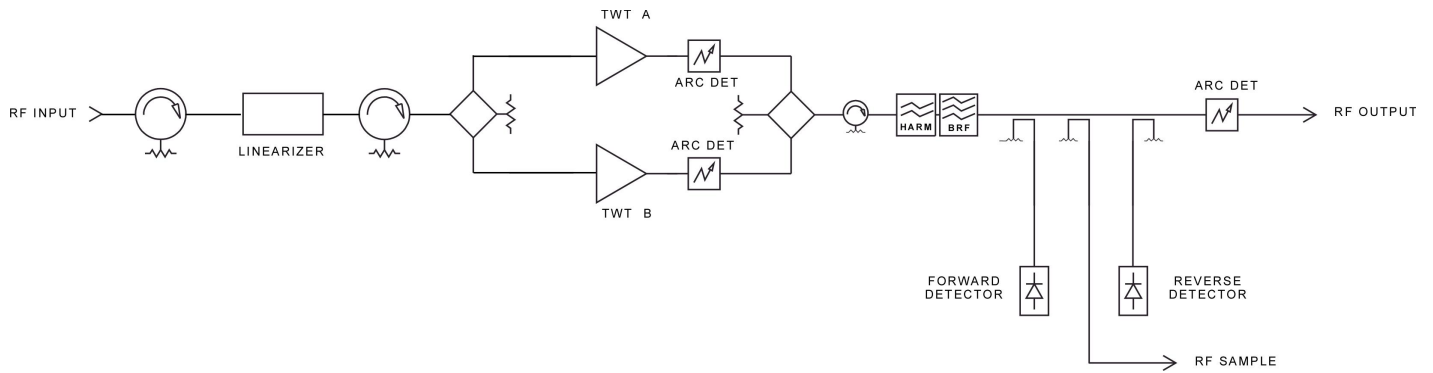
## INTERFACE

TYPE	FUNCTION		
LOCAL CONTROL	AC Power ON/OFF	Local/Remote	HV ON/OFF
LOCAL STATUS — Tri-Color LED	Fault: Red	Standby: Amber	
	HV ON: Green	FTD: Flashing Amber	
REMOTE CONTROL	HV ON/OFF	Gain	Heater Standby ON/OFF
	Constant Power	Fault Reset	Min/Max Power Alarm/Fault
	Reflected Power Alarm/Fault		
REMOTE STATUS	Attenuator Setting	Heater/Beam Hours	Faults:
	Power Out	Units Selection	High VSWR
	Reflected Power	TWT Temperature	High Voltage
	Helix Current	Helix Voltage	Helix Current
			TWT Temperature
			Arc Detection
Computer Serial Port	2 Ports: RS-232 and RS-485		
Command Set	XTC-100D Compatible		
RF MONITOR PORT	-40 dB Nominal		

# XTD-2500CL/KL High Power Amplifiers



# Block Diagram



# Outline Drawing

