



## 2000 Watt C and X-Band Dual Band Rack-Mount High Power Amplifier



- **Compact Size**
- **High Efficiency**
- **Digital Display and Control Interface**
- **Power Factor Correction**
- **Linearizer Option**

XTRD-2000CX digital rack-mount amplifiers are designed for fixed (ground and shipboard) as well as mobile uplink applications and occupy only 11 rack units while providing RF output of 2000 Watts.

These high efficiency traveling wave tube amplifiers include RF gain control, a solid-state pre-amplifier, RF filters, cooling, and monitor & control (M&C) systems.

The dual-drawer amplifier conserves rack space and occupies only 19.25 inches (11 rack units) of a standard 19 inch rack cabinet. A complete 1:1 or 1:2 redundant TWTA system, including a redundant controller, can be mounted in a single rack.

The unit features a menu-driven front panel display and RS-232 & RS-422/RS-485 serial port interfaces for complete remote control.

Gain control is set by the front panel manual control or by computer commands sent via the remote interface(s).

The units incorporate high efficiency, multi-stage depressed collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for the linear and saturated modes of operation.

The high frequency resonant conversion power supply is highly efficient and allows for quick recovery from prime power outages.

Depending upon user requirements, the high power amplifiers can be configured for single-thread, or redundant operation.

# PERFORMANCE SPECIFICATIONS

## XTRD-2000CX

Parameter	C-Band	X-Band
FREQUENCY RANGE standard extended frequency coverage available	5.85 - 6.65 GHz	7.90 - 8.40 GHz
OUTPUT POWER		
Traveling Wave Tube	2000W	2000W
Amplifier Flange	1750W	1750W
Rated Linear	500W	500W
		1000W (With Optional X-Band Linearizer)
GAIN		
Large Signal, minimum	70 dB	70 dB
Small Signal, minimum	75 dB	75 dB
		(70 dB with Linearizer)
Attenuator Range (continuous)	25 dB	25 dB
Maximum SSG Variation Over:		
Any Narrow Band	1.0 dB per 40 MHz	1.0 dB per 40 MHz
Full Band	2.5 dB	2.5 dB
Slope, maximum	±0.04 dB/MHz	±0.04 dB/MHz
Stability, 24 Hr maximum	±0.25 dB	±0.25 dB
Stability, Temperature	±1.0 dB maximum over temperature range at any frequency	
HARMONIC OUTPUT, maximum	-10 dBc	-60 dBc
SPECTRAL OCCUPANCY	-26 dBc @ 1 symbol rate offset from carrier @ rated linear power, QPSK	-30 dBc @ 1 symbol rate offset from carrier @ rated linear power, OQPSK
INTERMODULATION with two equal signals	-16 dBc maximum with two equal carriers (-26 dBc in X-Band with Linearizer) at 4 dB total output backoff	
AM/PM CONVERSION, maximum	2.5°/dB at 6 dB below rated power	
NOISE POWER, maximum		
Transmit Band	-70 dBw/4 kHz	-70 dBw/4 kHz
Receive Band	-150 dBw/4 kHz 3.7 to 4.2 GHz	-70 dBw/4 kHz 7.25 to 7.75 GHz
GROUP DELAY, maximum		
Bandwidth	Any 40 MHz	
Linear	0.01 nsec/MHz	
Parabolic	0.005 nsec/MHz <sup>2</sup>	
Ripple	0.5 nsec Peak to Peak	
RESIDUAL AM NOISE maximum	-50 dBc to 10 kHz -20 (1.5 - logf) dBc 10 to 500 kHz -85 dBc above 500 kHz	
PHASE NOISE, maximum	10 dB below IESS phase noise profile AC fundamental -50 dBc Sum of all spurs -47 dBc	
VSWR	1.3:1	
Input, maximum	1.3:1	
Output, maximum		

## PRIME POWER

208 VAC  $\pm$  10% Three Phase, 4 Wire, 47-63 Hz  
 220/380 VAC  $\pm$  10% Three Phase, 5 Wire, 47 to 63 Hz  
 240/415 VAC  $\pm$  10% Three Phase, 5 Wire, 47 to 63 Hz  
 8500 VA Maximum  
 0.95 Minimum Power Factor

## OPTIONS

Extended Frequency Coverage  
 1:1, 1:2, 1:N Redundancy  
 Integrated Linearizers



## ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50° C to +70° C
OPERATING TEMPERATURE RANGE	-10° C to +50° C
HUMIDITY	Up to 95% Non-Condensing
ALTITUDE	10,000 feet MSL maximum
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air 275 CFM (typical)

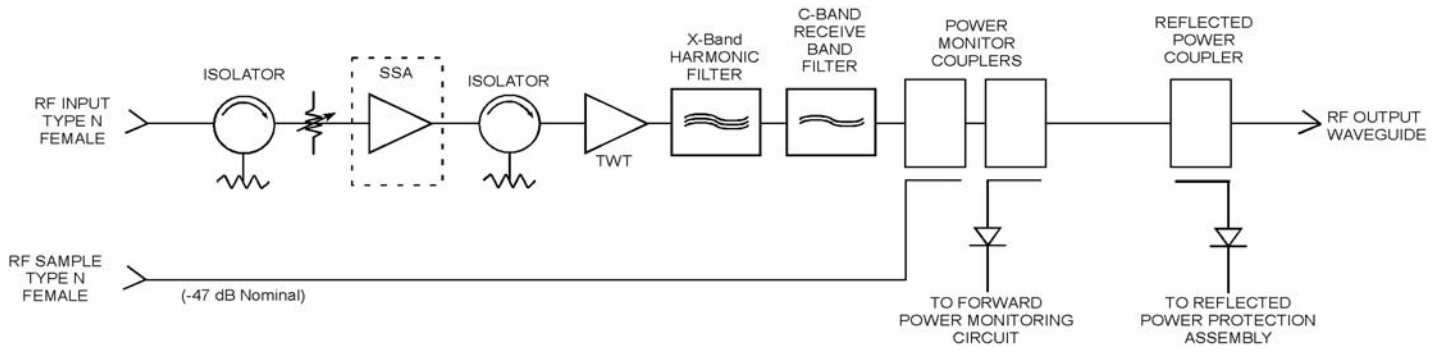
## INTERFACE

TYPE		FUNCTION			
CONTROLS	Local	Local/remote	AC Power ON/OFF		
	Local and Remote	Gain	Reflected Power Alarm/Fault	Units (Watts, dBm, dBw)	
		Heater Standby ON/OFF	Frequency Select	Fault Reset	
		Minimum Power Alarm/Fault	High Voltage ON/OFF	Lamp Test	
		Maximum Power Alarm/Fault	Audio Alarm ON/OFF		
STATUS	Front Panel LEDs	Power	Heater Standby	Heater Time Out (FTD)	
		Local Mode	Remote Mode	Standby	
		High Voltage	Summary Fault		
	Front Panel Digital Display	Power Out	Reflected Power	Fault:	
		TWT Temperature	Helix Current	High VSWR	
		Helix Voltage	Heater Hours	High voltage	
		Beam Hours	Attenuator Setting	Helix Current	
	Units Selection		TWT Temperature		
Dry Form-C Relay Contacts (Two)	Summary Fault				
COMPUTER	Hardware Interface	2 ports: RS-232 & RS-422/RS-485			
SERIAL PORT	Xicom Command Set	ASCII Commands			
RF SAMPLE PORT COUPLING		-47 dB Nominal			

# XTRD-2000CX Dual Band High Power Amplifiers



# Block Diagram



# Outline Drawing

