



XT-400C/X/Ku-Band Antenna Mount Amplifiers



- **400 Watts C-Band**
400 Watts X-Band
400 Watts Ku-Band
- **No Shelter Required**
- **Short Waveguide Run**
- **Power Factor Corrected**
- **High Efficiency Dual-Stage TWTs**

The XT-400 is a compact, self contained, antenna mountable power amplifier designed for low cost installation and long life. The XT-400 design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and the antenna feed horn; for example, an antenna mounted 400 Watt Ku-Band amplifier with its shorter waveguide run will often deliver EIRP comparable to a 650 Watt rack mounted HPA. RF filters, cooling, and monitoring & control systems are all self contained within the HPA. These features provide high reliability, low maintenance costs, and low replacement costs.'

The XT-400 incorporates high efficiency, dual-stage collector TWTs. Some of the benefits of this type of TWT are: reduced prime power consumption, lower internal operating temperatures, and reliability enhancement. These benefits are obtained for both the linear and saturated modes of operation.

One of the features of the XT-400 is incorporation of power factor correction circuitry that minimizes line current distortion and reduces the required volt-amps. The combination of power factor correction and high efficiency TWTs reduces input Volt-Amps by 45% when compared to equivalent amplifiers. A high frequency resonant conversion power supply is used that accepts a wide range of prime power (100 to 260 VAC). The automatic features of the power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles).

The XT-400 may be configured for single thread, redundant, phase combined, or linearized operation.

A remote external controller is available to operate the HPA from a user selected locations. Mounting brackets can be supplied to mount the HPA to most popular antennas.

PERFORMANCE SPECIFICATIONS

Parameter	XT-400C, C-Band	XT-400X, X-Band	XT-400K, Ku-Band
FREQUENCY RANGE	5.850 to 6.425 GHz	7.90 to 8.40 GHz	13.75 to 14.5GHz
Extended Frequency Coverage	(5.85 to 6.725 GHz)		(112.75 to 14.50 GHz)
OUTPUT POWER			
Traveling Wave Tube	400 Watts	400 Watts	400 Watts
Rated Power @ Amplifier Flange	350 Watts	350 Watts	350 Watts
GAIN			
Large Signal, minimum	47 dB	47 dB	47 dB
Small Signal, minimum	52 dB	52 dB	52 dB
Maximum SSG Variation Over:			
Any Narrow Band	1.0 dB per 40 MHz	1.0 dB per 40 MHz	1.0 dB per 80 MHz
Full Band	2.5 dB	3.0 dB	2.5 dB/500 MHz
Slope, maximum	± 0.04 dB/MHz	± 0.04 dB/MHz	± 0.04 dB/MHz
Stability, 24 Hr maximum	± 0.25 dB	± 0.25 dB	± 0.25 dB
Stability, Temperature	± 1.0 dB maximum over temperature range at any frequency		
GAIN CONTROL		20 dB	
INTERMODULATION with two equal signals		- 18 dBc maximum with two equal carriers at 4 dB total power backoff from rated output	
HARMONIC OUTPUT, maximum	- 60 dBc	- 60 dBc	- 60 dBc
AM/PM CONVERSION, maximum	2.5 deg/dB at 3 dB below rated output power		
NOISE POWER, maximum			
Transmit Band	- 70 dBW/4 kHz	- 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	- 150 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY, maximum			
Bandwidth	Any 40 MHz	Any 40 MHz	Any 80 MHz
Linear	± 0.01 nS/MHz	± 0.01 nS/MHz	± 0.01 nS/MHz
Parabolic	± 0.005 nS/MHz ²	± 0.005 nS/MHz ²	± 0.005 nS/MHz ²
Ripple	0.5 nS/Pk-Pk	0.5 nS/Pk-Pk	0.5 nS/Pk-Pk
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	
VSWR			
Input, maximum	1.3:1	1.3:1	1.3:1
Output, maximum	1.3:1	1.3:1	1.3:1

PRIME POWER

100-260 VAC
47 to 63 Hz, single phase
XXX VA Typical
0.95 Minimum Prime Power Factor



OPTIONS

Detected RF
Remote External Controller
Preamplifiers
Gain Control
Serial or Discrete Interface
Extended Frequency Coverage
1:1, 1:2, 1:N Redundancy
Variable Phase Combined
Integrated Linearizers

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
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

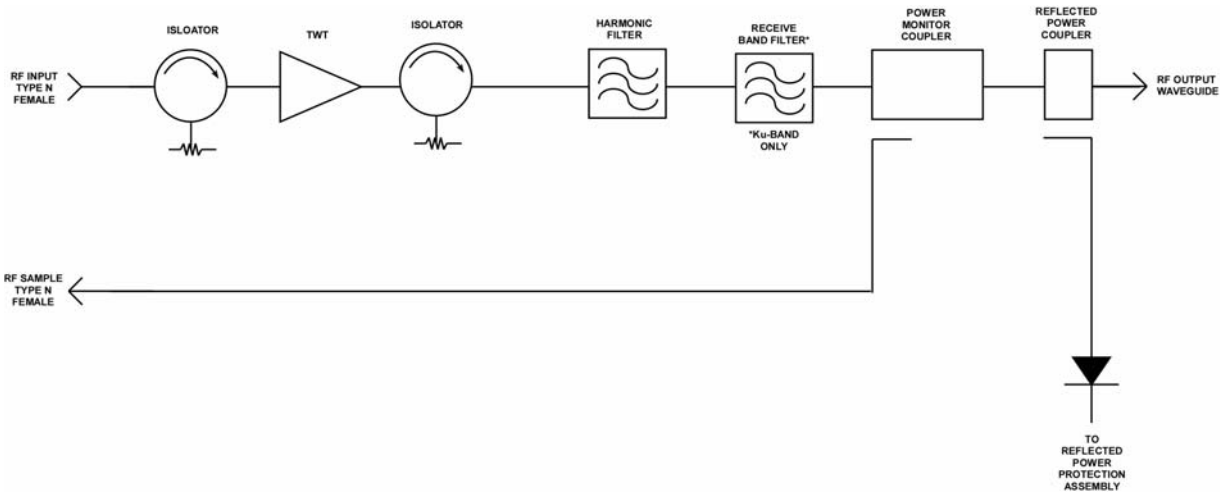
INTERFACE

TYPE	FUNCTION		
CONTROLS	Power ON	HV ON	Fault Reset
	Heater Standby		
<i>Note: heater Standby reduces the TWT heater voltage for situations where the high voltage is off for extended periods.</i>			
MONITORS — DIGITAL	Helix Current Latched Fault	High Voltage ON	Heater Standby (FTD)
	Helix Current/Arc Fault	Summary Fault	Standby
	High Voltage Fault	Fan Fault	
MONITORS — ANALOG	Cathode Voltage (1000:1 V/V)	Helix Current (2 mAV)	TWT Temperature
	RF output Power (Optional)	+15 VDC (100 MA max)	+24 VDC (100 MA max)

XT-400C/X/Ku High Power Amplifiers



Block Diagram



Outline Drawing

