



XTD-550X/750X X-Band Antenna Mount Amplifiers



- **550 Watts X-Band**
- **750 Watts X-Band**
- **No Shelter Required**
- **Short Waveguide Run**
- **Variable Gain**
- **High Efficiency Multi-Stage TWTs**
- **Complete RS-232/485 Interface**

The XTD-550X and XTD-750X are compact self-contained, antenna mountable power amplifiers designed for low cost installation and long life. The design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and the antenna feed horn. RF harmonic 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 amplifier incorporates high efficiency multi-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 XTD-550X and XTD-750X is incorporation of power factor correction 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 that is used accepts a wide range of prime power (180 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).

A complete serial monitoring and control system is built into the unit.

The XTD-550X and XTD-750X may be configured for single thread, redundant or phase-combined operation.

An optional linearizer is available to allow increased transient power while meeting spectral regrowth requirements.

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

PERFORMANCE SPECIFICATIONS

Parameter	XTD-550X, X-Band	XTD-750X, X-Band
FREQUENCY RANGE	7.9 - 8.4 GHz	7.9 - 8.4 GHz
OUTPUT POWER		
Traveling Wave Tube	550 Watts (57.4 dBm)	750 Watts (58.7 dBm)
Rated Power @ Amplifier Flange	500 Watts (57.0 dBm)	650 Watts (58.1 dBm)
Linear Power @ Amplifier Flange w/o linearizer	125 Watts (51.0 dBm)	160 Watts (52.1 dBm)
Linear Power @ Amplifier Flange w/linearizer	280 Watts (54.5 dBm)	360 Watts (55.6 dBm)
GAIN		
Large Signal, minimum	70 dB	70 dB
Small Signal, minimum	75 dB	75 dB
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	± 2.0 dB maximum over temperature range at any frequency	
INTERMODULATION with two equal signals	- 26 dBc maximum with two equal carriers at linear power, referenced to the sum of the carriers. - 26 dBc maximum with two equal carriers at rated power -8 dB, referenced to the individual carrier power.	
SPECTRAL REGROWTH @ linear power	-30 dBc	-30 dBc
HARMONIC OUTPUT, maximum	- 60 dBc	- 60 dBc
AM/PM CONVERSION, maximum	2.5 deg/dB at 6 dB below rated output power	
NOISE POWER, maximum		
Transmit Band	- 65 dBW/4 kHz	
Receive Band	- 65 dBW/4 kHz 7.25 to 7.75 GHz	
GROUP DELAY, maximum		
Bandwidth	Any 40 MHz	
Linear	± 0.01 nS/MHz	
Parabolic	± 0.005 nS/MHz ²	
Ripple	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 AC fundamental -50 dBc Sum of all spurs -47 dBc	
VSWR		
Input, maximum	1.3:1	
Output, maximum	1.3:1	

PRIME POWER OPTIONS

180-260 VAC
47 to 63 Hz, single phase
2300 (550W) VA maximum
2500 (750W) VA maximum
0.95 Minimum Prime Power Factor

Linearizer
Remote External Controller
1:1, 1:2 Redundancy
Phase Combined



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 derating/1k ft.)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

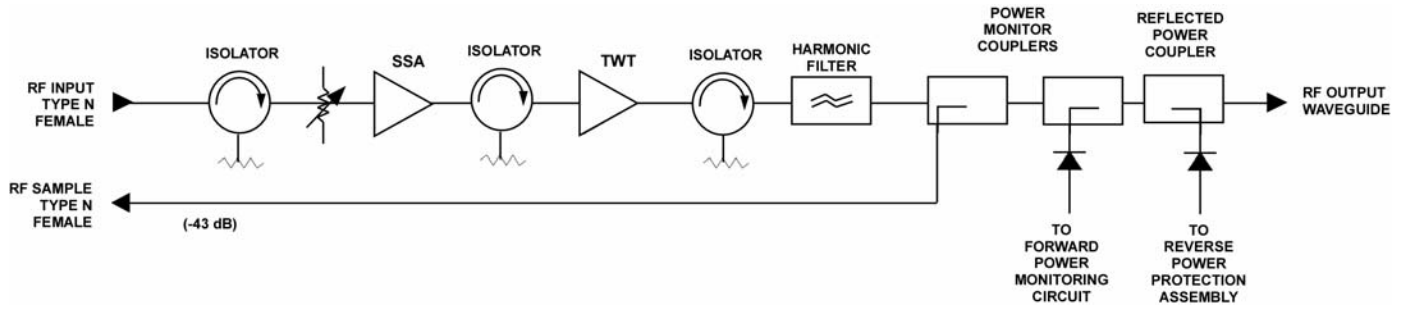
INTERFACE

TYPE	FUNCTION		
LOCAL CONTROL	Prime Power ON/OFF	Local/Remote	HV ON/OFF
LOCAL STATUS	Tri-Color LED:		
	Fault: Red	Standby: Continuous Amber	
	HV ON: Green	FTD: Flashing Amber	
REMOTE CONTROL	HV ON/OFF	RF Inhibit (HV OFF)	Heater Standby
	Gain	Units (Watts, dBm, dBw)	Reflected Power Alarm/Fault
	Minimum Power Alarm/Fault	Maximum Power Alarm/Fault	
	RF Attenuation (w/preamp)	Fault Reset	
REMOTE STATUS	HV ON	Heater/Beam Hours	Filament Time Delay
	RF Output Power	Helix Current	Fault Identification
		Helix Voltage	High VSWR
	Reflected Power	TWT Temperature	High Voltage
			Helix Current
			TWT Temperature
			RF Arc
Form C Dry Contact Closure	Summary Fault		
RF MONITOR PORT	-43 dB Coupling Value (Approx)		

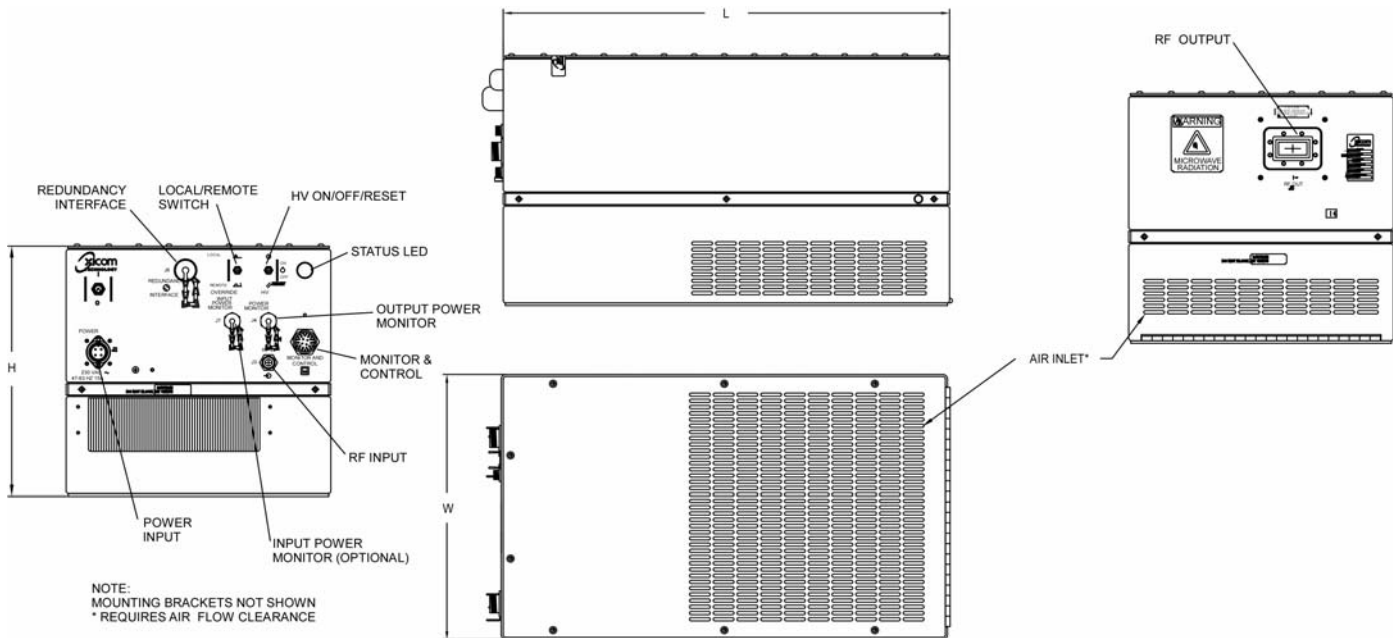
XTD-550X/750X High Power Amplifiers



Block Diagram



Outline Drawing



DIMENSIONS		
	INCHES	CENTIMETERS
L	21.50	54.61
H	12.13	30.81
W	12.75	32.39

RF OUTPUT = CPRG-137

Nominal Weight = 75 lbs (34.02 kg)