750 Watt C, X and Ku-Band Antenna Mount Amplifiers With Block Upconverter

FEATURES

- *Rugged 75 lb. antenna mount package*
- *Extended frequency band available*
- *Complete RS-232/422/485 M&C interface*
- *L-band input*

The **XTD-750-B1** is a series compact, self-contained, antenna mountable power amplifiers designed for low cost installation and long life. The **XTD-750-B1** design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and antenna feed horn. RF filters, cooling, and monitoring & control (M&C) systems are all self-contained within the High Power Amplifier (HPA). These features provide high reliability, low maintenance costs, and low replacement costs.

The **XTD-750-B1** uses high efficiency, dual-stage collector Traveling Wave Tubes (TWT). Some benefits of this type of tube 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.

The **XTD-750-B1** incorporates power factor correction circuitry, which 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 (180 to 260 VAC). The automatic features of the power supply include quick recovery from prime power outages and multiple helix arc fault resets (three fault cycles). A complete serial M&C system is built into the unit.

The **XTD-750-B1** 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 location. Mounting brackets can be supplied to mount the HPA to most popular antennas.

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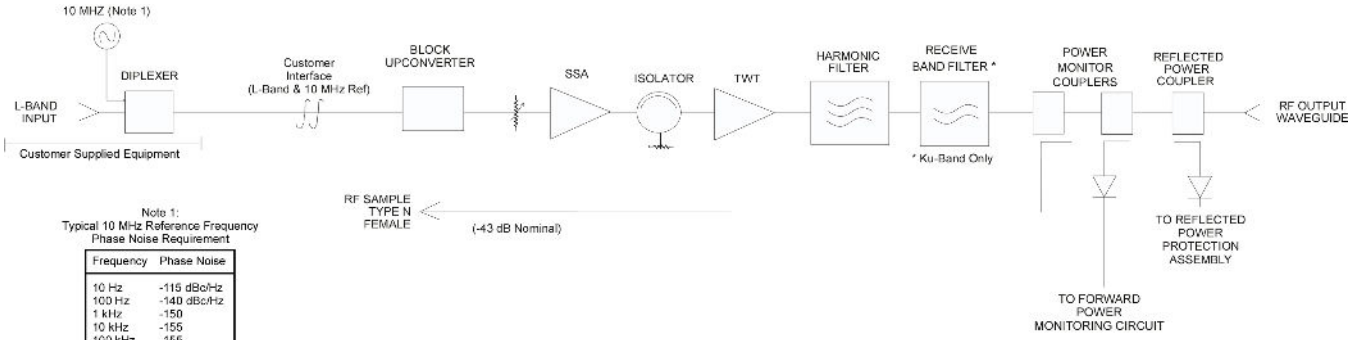
PERFORMANCE SPECIFICATION

Parameters	XTD-750C-B1 C-Band	XTD-750X-B1 X-Band	XTD-750K-B1 Ku-Band
FREQUENCY RANGE (extended frequency coverage available)			
Output	5.850 to 6.425 GHz	7.9 to 8.4 GHz	13.75 to 14.5 GHz
Input	950 to 1525 MHz	950 to 1400 MHz	950 to 1700 MHz
LO Frequency	4900 MHz	6950 MHz	12800 MHz
Input Level, w/o damage (maximum)		10 dBm	
Reference Signal Frequency		external 10 MHz	
10 MHz Power Level		2 dBm ± 5 dB	
Referenced Input Impedance		50 Ohms	
OUTPUT POWER			
Traveling Wave Tube		750 Watts	
Rated Power @ Amplifier Flange (minimum)		650 Watts	
GAIN			
Large Signal (minimum)		67 dB	
Small Signal (minimum)		72 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	1.0 dB per 80 MHz
Full Band		± 2 dB	
Slope (maximum)		± 0.04 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 output power	
NOISE POWER (maximum)			
Transmit Band		70 dBW/4 kHz	
Receive Band	-150 dBw/4 kHz 3.7 to 4.2 GHz	-150 dBw/4 kHz 10.95 to 12.75 GHz	-150 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY (maximum)			
Bandwidth	Any 40 MHz	Any 80 MHz	Any 80 MHz
Linear		0.01 nS/MHz	
Parabolic		0.005 nS/MHz^2	
Ripple		0.5 nS/Pk-Pk	
RESIDUAL AM NOISE (maximum)		-60 dB > 100 kHz from carrier AC fundamental -50 dBc Sum of all spurs -47 dBc	
PHASE NOISE (maximum		Per IESS phase noise profile AC fundamental -50 dBc Sum of all spurs -47 dBc	
VSWR			
Input (maximum)		1.8:1	
Output (maximum)		1.3:1	

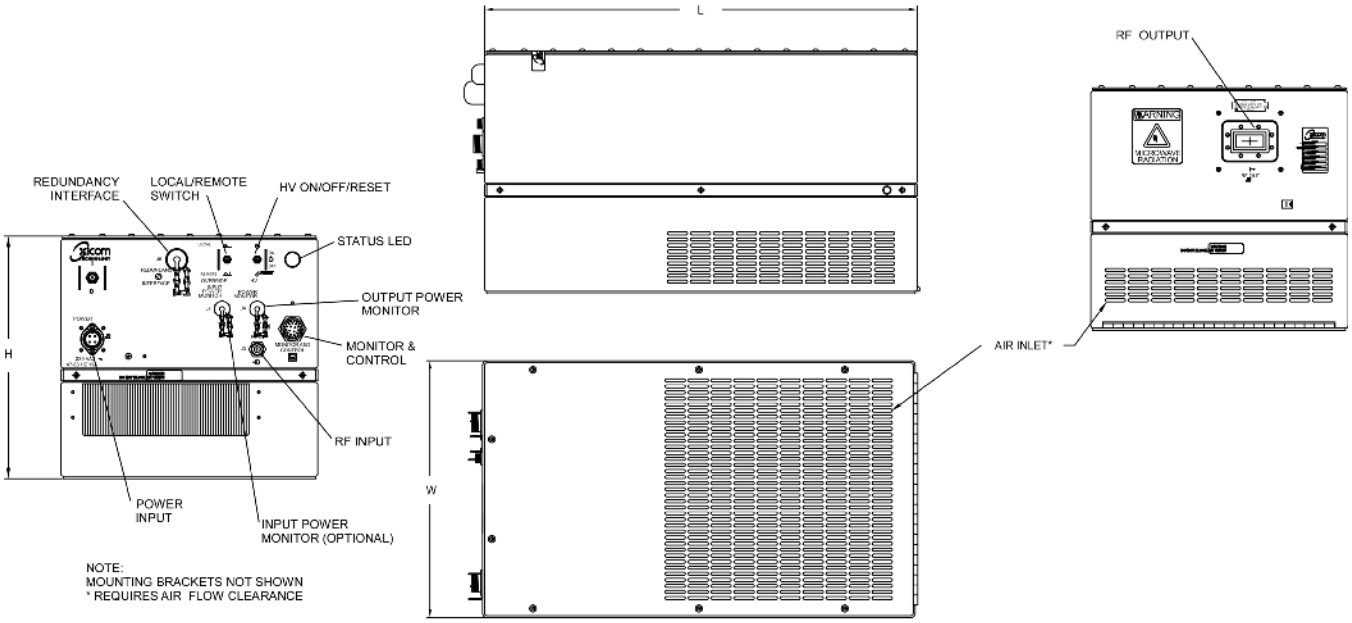
BLOCK DIAGRAM



Note 1:
Typical 10 MHz Reference Frequency Phase Noise Requirement

Frequency	Phase Noise
10 Hz	-115 dBc/Hz
100 Hz	-140 dBc/Hz
1 kHz	-150
10 kHz	-155
100 kHz	-155
1 MHz	-155

OUTLINE DRAWING



NOTE:
MOUNTING BRACKETS NOT SHOWN
* REQUIRES AIR FLOW CLEARANCE

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

Nominal Weight = 75 lbs (34.02 kg)

RF OUTPUT	
FREQUENCY BAND	WAVEGUIDE FLANGE
KU	WR-75
C	CPR-137

PRIME POWER

180 to 260 VAC
47 to 63 Hz, Single Phase
2450 VA (maximum)
0.95 Minimum Prime Power Factor

CE

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +60°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 Feet MSL (maximum)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

INTERFACE

Type	Function	
LOCAL CONTROL	Prime Power ON/OFF	Local/Remote
	Power Supply ON/OFF	HV ON/OFF
LOCAL STATUS	Tri-Color LED:	
	Fault: Red	Standby: Continuous Amber
	HV ON: Green	FTD: Flashing Amber
REMOTE CONTROL	HV ON/OFF	Constant Power
	Min/Max Power Alarm/Fault	RF Inibit (HV OFF)
	RF Attenuation (w/preamp)	Fault Reset
	Heater Standby ON/OFF	
REMOTE STATUS	RF Output Power	Reflected Power
	Helix Current	Helix Voltage
	Heater/Beam Hours	Filament Time Delay
	Attenuator Setting	HV ON
	TWT Temperature	Fault Identification
FORM C DRY CONTACT CLOSURE	Summary Fault	
RF MONITOR PORT	-43 dB Coupling Value (approx.)	

OPTIONS

- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Integrated Linearizer
- Input Diplexer (combining IF & 10 MHz reference)
- Reverse RF Inhibit
- Extended Frequency Coverage

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