



XTRD-500DBS DBS-Band Rack Mount Amplifier



- **Compact 7 inch Package**
- **Digital Display & Control Interface**

The XTRD-500DBS is a highly efficient rack mountable traveling wave tube amplifier (TWTA) designed for test and measurement applications.

The unit includes RF gain control, a solid state pre-amplifier, cooling, and monitoring and control (M&C) system.

Rack space is conserved because the amplifier occupies only 4 rack units (7 inches) of a standard 19 inch rack cabinet. Nominal weight is 75 pounds.

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

RF, traveling wave tube, and default parameters are easily monitored on the 4-line front panel display.

- **High Efficiency**

Gain control is provided via the front panel or through the serial interface.

The XTRD-500DBS incorporates high efficiency, multi-stage collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for both the linear and saturated modes of operation.

Power factor correction circuitry is also included which minimizes line current distortion and reduces the required Volt-Amps input.

The automatic features of the high frequency resonant conversion power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles.)

Depending upon user requirements, the amplifier can be configured for either single thread or redundant system operation.

PERFORMANCE SPECIFICATIONS

| Parameter | XTRD-500DBS, DBS-Band |
|--|--|
| FREQUENCY RANGE | 17.3 - 18.4 GHz |
| OUTPUT POWER | |
| Traveling Wave Tube | 500 Watts (17.3-18.1) 450 Watts (18.1-18.4) |
| Rated Power @ Amplifier Flange | 415 Watts (17.3-18.1) 380 Watts (18.1-18.4) |
| GAIN | |
| Large Signal, minimum | 65 dB |
| Small Signal, minimum | 70 dB |
| Attenuator Range (continuous) | 25 dB |
| Maximum SSG Variation Over: | |
| Any Narrow Band | 1.0 dB per 80 MHz |
| Full Band | 4.0 dB |
| Slope, maximum | ± 0.04 dB/MHz |
| Stability, 24 Hour maximum | ± 0.25 dB |
| Stability, Temperature | ± 1.0 dB maximum over temperature range at any frequency |
| INTERMODULATION (4 dB total output backoff) | -17 dBc from 17.3 to 18.1 GHz -16 dBc from 18.1 to 18.4 GHz |
| HARMONIC OUTPUT, maximum | -60 dBc |
| AM/PM CONVERSION, maximum | 3.0°/dB at 6 dB below rated power |
| NOISE POWER, maximum | |
| Transmit Band | -70 dBw/4 kHz |
| Receive Band | -150 dBW/4 kHz 10.95 to 12.75 GHz |
| GROUP DELAY, maximum | |
| Bandwidth | Any 80 MHz |
| Linear | 0.01 nS/MHz |
| Parabolic | 0.005 nS/MHz ² |
| Ripple | 0.5 nS/P _k -P _k |
| 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 | 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

180-260 VAC
47 to 63 Hz, single phase
Maximum VA: 2450
0.95 Minimum Prime Power Factor

OPTIONS

Extended Frequency Coverage
1:1, 1:2, 1:N Redundancy
Variable Phase Combined
Integrated Linearizers
Three-Phase Power



ENVIRONMENT

| | |
|--------------------------------|-------------------------------|
| NONOPERATING TEMPERATURE RANGE | -50° C to +70° C |
| OPERATING TEMPERATURE RANGE | -10° C to +50° C |
| HUMIDITY | Up to 95% Noncondensing |
| ALTITUDE | 10,000 feet MSL maximum |
| SHOCK AND VIBRATION | Normal Transportation |
| COOLING | Forced Air: 200 CFM (typical) |

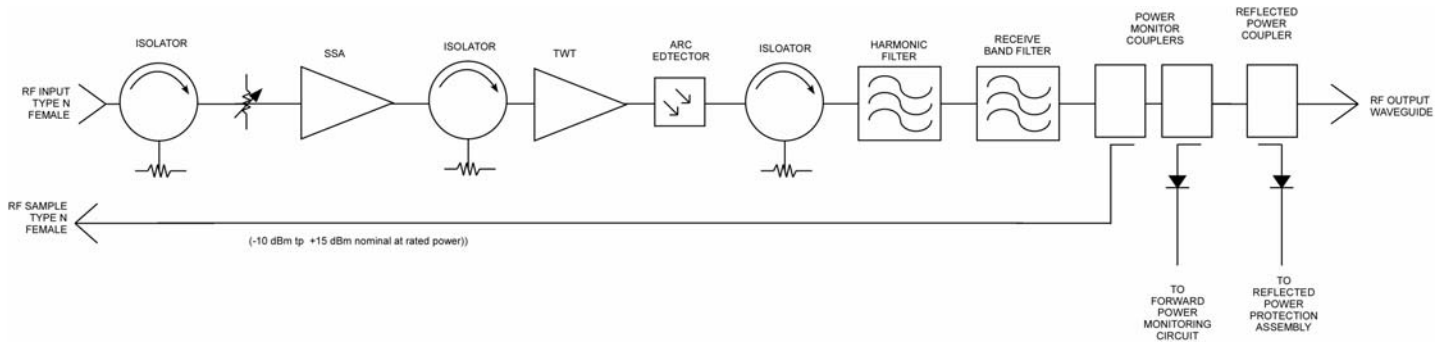
INTERFACE

| TYPE | FUNCTION | | | | |
|---------------------------------|-----------------------------|-----------------------------|-------------------------|---------------------|-----------------|
| CONTROLS | Local | Local/remote | AC Power ON/OFF | | |
| | Local and Remote | Gain | Heater Standby ON/OFF | Fault Reset | |
| | | Min/Max Power Alarm/Fault | Audio Alarm ON/OFF | Lamp Test | |
| | | Reflected Power Alarm/Fault | Units (Watts, dBm, dBW) | High Voltage ON/OFF | |
| STATUS | Front Panel LEDs | Power | Heater Time Out (FTD) | Standby | |
| | | High Voltage | Heater Standby | Local Mode | |
| | | Remote Mode | Summary Fault | | |
| | Front Panel Digital Display | Power Out | Attenuator Setting | Faults: | |
| | | Reflected Power | Units Selection | High VSWR | |
| | | TWT Temperature | Heater Hours | High Voltage | |
| | | Helix Current | Helix Voltage | Helix Current | |
| | | Beam Hours | | | TWT Temperature |
| Dry Form-C Relay Contacts (Two) | | Summary Fault | | | |
| COMPUTER | Hardware Interface | 2 ports: RS-232 | RS-232/RS-422/RS-485 | | |
| SERIAL PORT | Xicom Command Set | ASCII Commands | | | |
| RF SAMPLE PORT COUPLING | -43 dB Nominal | | | | |

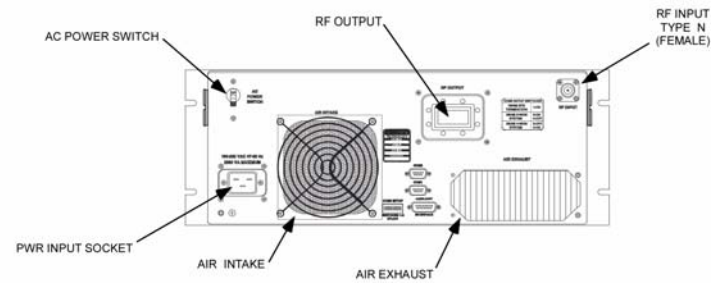
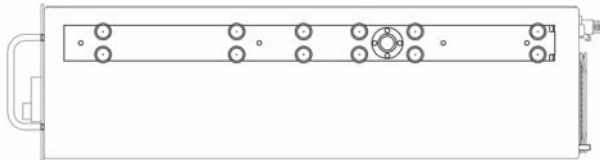
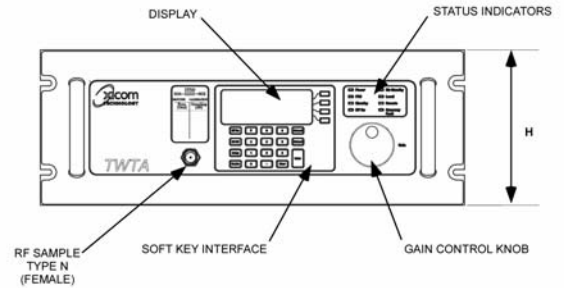
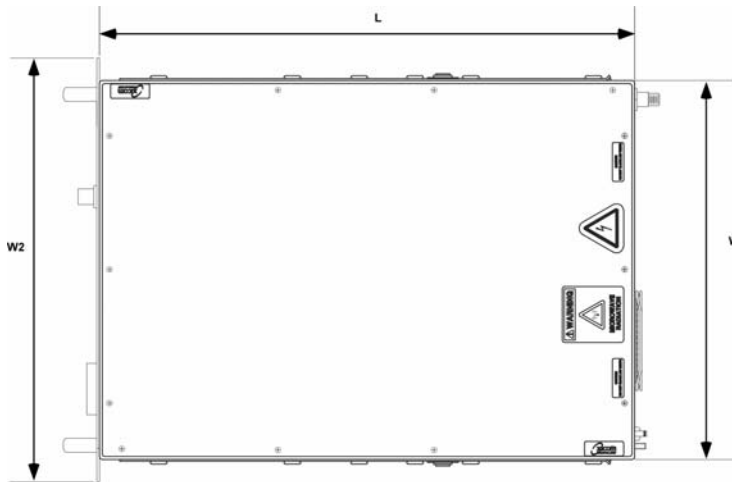
XTRD-500DBS High Power Amplifiers



Block Diagram



Outline Drawing



| | |
|-----------------------------------|-------|
| RF OUTPUT: | WR-62 |
| Nominal Weight: 75 lbs (34.02 kg) | |

| | DIMENSIONS | |
|----|------------|-------------|
| | INCHES | CENTIMETERS |
| W1 | 17.00 | 43.18 |
| W2 | 19.00 | 48.26 |
| L | 24.00 | 60.96 |
| H | 6.97 | 17.70 |