# XTRD-550X/750X X-Band High Power Rack Mount Amplifiers


- **550 Watts**
  **750 Watts**
- **Power Factor Correction**
- **Digital Display & Control Interface**
- **High Efficiency**

The XTRD-550X & XTRD-750X are highly efficient rack mountable traveling wave tube amplifiers (TWTAs) designed for fixed and mobile uplink applications.

The units include RF gain control, a solid state pre-amplifier, RF harmonic filter, cooling, and monitoring and control (M&C) systems.

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 units feature 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 four line front panel display.

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

The XTRD-550X & XTRD-750X incorporate 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 mulitiple helix fault resets (three fault cycles.)

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

Depending upon user requirements these amplifiers can be configured for either single thread or redundant system operation.

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# PERFORMANCE SPECIFICATIONS

| Parameter | XTRD-550X X-Band | XTRD-750X X-Band |
|---|---|---|
| FREQUENCY RANGE | 7.90 to 8.40 GHz | 7.90 to 8.40 GHz |
| OUTPUT POWER | | |
| Traveling Wave Tube | 550 W (57.4 dBm) | 750 W (58.7 dBm) |
| Rated Power @ Amplifier Flange | 500 W (57.0 dBm) | 650 W (58.1 dBm) |
| Linear Power @ Amplifier Flange w/o linearizer | 125 W (51.0 dBm) | 160 W (52.1 dBm) |
| Linear Power @ Amplifier Flange w/ linearizer | 280 W (54.5 dBm) | 360 W (55.6 dBm) |
| GAIN | | |
| Large Signal, minimum | 70 dB | |
| Small Signal, minimum | 75 dB | |
| Attenuator range (continuous) | 25 dB | |
| Maximum SSG Variation Over: | | |
| Any Narrow Band | 1.0 dB per 40 MHz | |
| Full Band | 2.5 dB | |
| Slope, maximum | ±0.04 dB/MHz | |
| Stability, 24 Hr maximum | ±0.25 dB | |
| Stability, Temperature | ±1.0 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**. | |
| with two equal signals | -26 dBc maximum with two equal carriers at rated power -8 dB, **referenced to the sum of the carriers**. | |
| SPECTRAL REGROWTH @ Linear Power | -30 dBc | |
| HARMONIC OUTPUT, maximum | -60 dBc | |
| AM/PM CONVERSION, maximum | 2.5°/dB 6 dB below rated power | |
| NOISE POWER, maximum | | |
| Transmit Band | -70 dBw/4 kHz | |
| Receive Band | -70 dBw/4 kHz<br>7.25 to 7.75 GHz | |
| GROUP DELAY, maximum | | |
| Bandwidth | Any 40 MHz | |
| Linear | 0.01 nsec/MHz | |
| Parabolic | 0.005 nsec/MHz$^2$ | |
| Ripple | 0.5 nsec/$P_K$-$P_K$ | |
| RESIDUAL AM NOISE, maximum | -50 dBc to 10 kHz<br>-20 (1.5 + logf) dBc to 500 kHz<br>-85 dBc above 500 kHz | |
| PHASE NOISE, maximum | 10 dB below IESS phase-noise profile<br>AC fundamental -50 dBc Sum of all spurs -47 dBc | |
| VSWR | | |
| Input, maximum | 1.3:1 | |
| Output, maximum | 1.3:1 | |

## PRIME POWER

100-260 VAC

47 to 63 Hz, single phase

0.95 Minimum Prime Power Factor

Maximum Input VA:
550W: 2300
750W: 2700

CE COMPLIANT

## OPTIONS

1:1, 1:2, 1:N Redundancy

Variable Phased Combined

Integrated Linearizers

## 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. Altitude derating 2°C/1k feet |
| SHOCK AND VIBRATION | Normal Transportation |
| COOLING | Forced Air: 250 CFM (typical) |

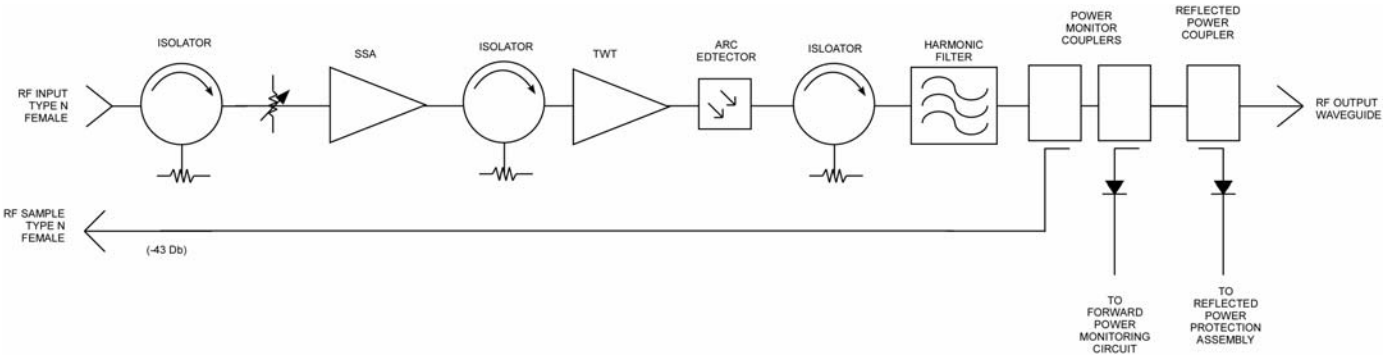
## INTERFACE

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

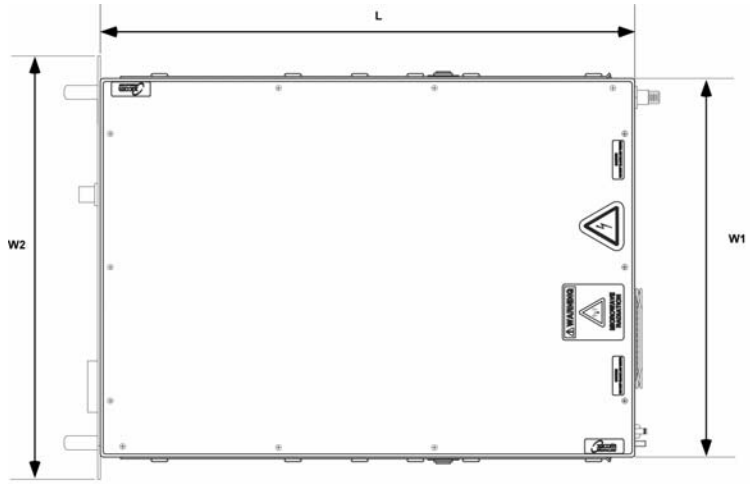
# XTRD-550X/750X High Power Rack Mount Amplifiers

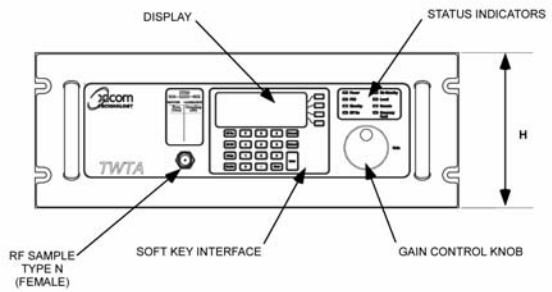
xicom TECHNOLOGY

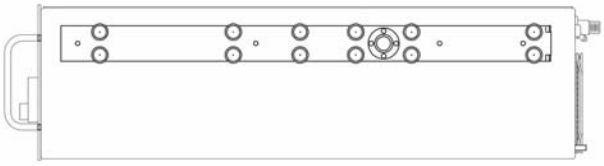
# Block Diagram

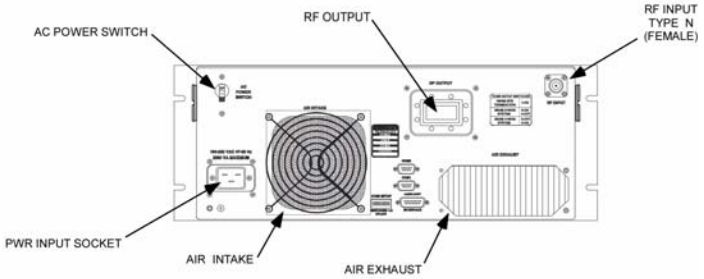



# Outline Drawing






| | |
|---|---|
| **RF OUTPUT**: | CPRG-112<br>or<br>CPRG-137 |
| **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 |

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