

The ATRAD transceiver is a scalable receiving system for use as a building block for MF, HF, VHF and UHF radar systems. The system is expandable in groups of three receivers, with up to 12 in a single 4U rack, and 24 receivers in a single 8U rack. The transceiver is based on ATRAD's scalable modular approach to system design. It offers operation in the MF/HF/VHF/UHF bands, and being GPS time and frequency locked, it enables monostatic, bistatic and multi-static radar operation.

APPLICATIONS

- VHF (45 – 65 MHz) SA and DBS wind profiling radars
- UHF (400 – 500 MHz) SA and DBS wind profiling radars
- MST radar
- MF and HF SA and DBS partial reflection radars
- HF and VHF ionospheric radars
- HF and VHF meteor radars
- Monostatic radar
- Bi-static radar
- Multi-static radar



(Above) Six channel receiver.



(Below) 12-channel receiver

The transceiver uses FPGAs and a Trimble GPS module as building blocks. Frequency and time are disciplined using the GPS. The system is scalable, in groups of three receivers, up to 12 in single 4U rack (shown above), and 24 in a 8U rack (shown below). The system includes an exciter for driving ATRAD (or other) transmitters.



(Above) 24-channel receiver system



(Above) An ATRAD Remote Receiving system based on the transceiver. This figure shows a 6-channel transceiver, with Linux-PC, bandpass filter and UPS; the keyboard and screen are deployed. This is stand-alone system designed for use with remote transmitters or radars. (Below top) BLP radar using a three-receiver transceiver, (centre) an ionospheric radar using a six-channel transceiver, and (below bottom), a meteor radar with five-receivers



KEY FEATURES

Channels

3 – 24

Type

Digital

IF LO

82 MHz

Frequency Stability

< 1 ppm

GPS

Trimble Mini-T, 120 MHz clock, 1 PPS

External Data Interface

1 Gb ethernet (IEEE 802.3)

Gain

Relative gain adjustable from 0 to 80 dB

Receiver bandwidth

Programmable digital filter (range sampling rate dependant)

Transmitter Drive output

4.7 V_{p-p} (50R) typical (17.4 dBm)

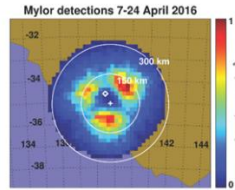
Transceiver

(12-channel ATRAD Digital receiver)



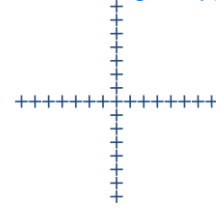
Transmitters

Use co-located transmitters, or remote radars or transmitters



Antenna Arrays

Selected according to application



General Description

16-Bit Digital Transceiver incorporating receiver, exciter, GPSDO option

User selected

User selected

Specifications

Receiver: 3-24 Channel, 16-bit

Exciter: Single Channel, 16-bit

Typical Sounding Range: User selectable

Range Resolution: 100 – 4,000 m (software selectable)

Range Gates: Up to 6,000

Operating Modes: User determined operating modes. Multiple modes possible by switching antenna sets

Remote access: Remote monitoring and control via Satellite, 3G/4G, ethernet or dialup.

Frequency: 2-65 MHz, 400-500 MHz (up to 3 bands, with filter sets fixed at factory)

Transmitter: User / application determined

AC Mains Power: 220-240V AC or 110-120V AC, single-Phase

Antenna Array Configurations:

User / application determined

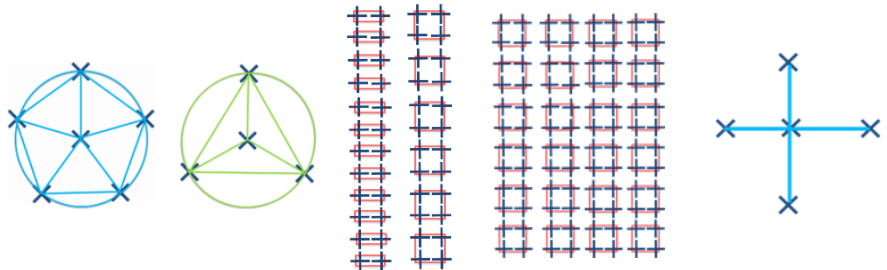
Antenna Array Footprints: User / application determined

Options

ATRAD DAA: software modules selected for the particular applications

Antenna Arrays

Example layouts for 6-receiver meteor interferometer or spaced antenna applications (pentagon), 4-channel Spaced Antenna (triangle), 6- and 12-receiver Ionospheric Arrays, 24-receiver general purpose array, 5-receiver meteor interferometer (cross). User defined arrangements are of course possible.



Antenna Guying

Recommended for high-wind locations (> 20m/s)

Transmitters

Examples of (from left to right) ATRAD MF, VHF and UHF transmitters

ATRAD MF, HF VHF transmitters available

