Skywave Over-the-Horizon Radar

Skywave Over-The-Horizon Radar use ionospheric reflections of HF signals to detect targets thousands of miles away. To combat the congested HF spectrum, these radars require receivers and transmitters with the highest possible performances and use processing techniques that can detect low probability of intercept signals that exhibits both low and high doppler shifts.

D-TA Delivered World's Largest OTHR

1024-Ch. Receive & 256-Ch. Transmit

1024 receive channels are distributed across 4 identical racks with 256 channels in each rack. All 1024 channels operate synchronously with less than 1 ns timing skew PA is integrated with AWG (256 channels) for smart transmit. The AWG system is based on I/Q data streaming from deep memories (hard drives) for dynamic transmit.

OTHR Stimulator

The AWG system is based on the concept of streaming baseband I/Q time-series data from computer hard drives to an HF signal generation circuit. The I/Q data is either mathematically computed based on a signal scenario or collected from an actual mission and stored in the hard drives. Upon playback, the digital I/Q samples are sent to an FPGA for digital up conversion (DUC), followed by a DAC and LPF to generate HF environment.

The I/Q data is prestored in the RAID server for playback during a test mission. Propagation Model & Target Characteristics can be incorporated in the I/Q data files. The software offers unprecedented degrees of freedom in designing and evaluating the radar waveforms and allows the user to numerically simulate the Range-Doppler response for arbitrary Tx-Rx array geometry and target clutter models. The software models the radar scenario by simulating all the associated channel.

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OTHR

Over-the-Horizon Radar (OTHR) for Long Range Surveillance

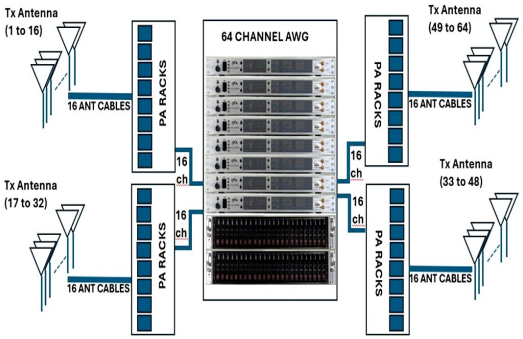
D-TA SYSTEMS

The Future Of EMSO

Dynamic OTHR Transmit

AWG (Arbitrary Waveform Generator) with integrated HPAs (High Power Amplifiers) can offer a dynamic Transmit configuration where the transmit waveform characteristics can be changed every transmit cycle (CIT) based on a pre-defined schedule or receiver data analysis in real-time.

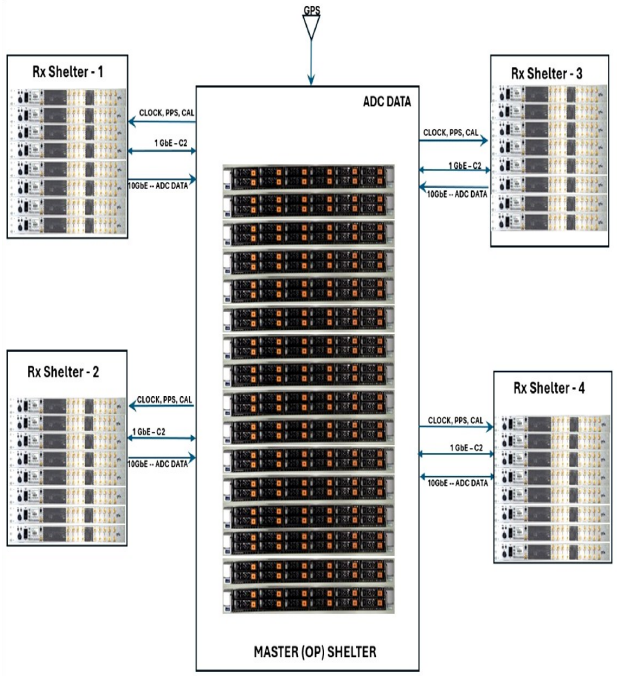
Adaptive transmit is key to detecting agile and high-velocity target.



Next Generation OTHR

D-TA's next generation OTHR receiver system includes a Wide-Open Front End (WOFE) with IP2, IP3 and NF compensated analog front end, ADC, FPGA based digital equalization and 10 GbE optical interface to transfer ADC data to Master Shelter for software-based narrowband channelization using floating-point arithmetic for unmatched performances.

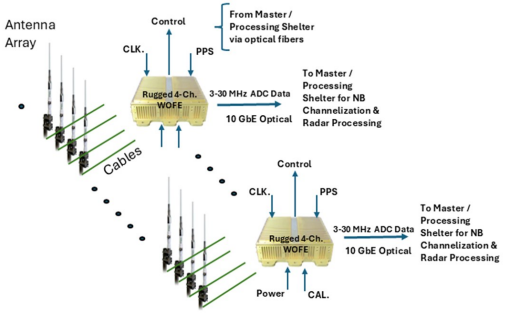
Typical OTHR Distributed Receiver Configuration. ADC data (3-30 MHz) is transferred via fibers (from WOFE) to Master Shelter for NB Channelization (up to 10 /ADC) & Radar Processing.



Shelter-Free Outdoor Receivers for Rapid Deployment

Limited channel count WOFE part of the receiver system is placed inside a protective shelter to shield it from temperature extremes, moisture, dust and other physical impacts can be readily installed without requiring expensive site preparation.

The narrowband (NB) channelization and other processing is off-loaded from the WOFE thereby drastically reducing power requirement. Clean energy sources may be used for the receiver shelters.



Shelter-free receiver architecture that requires little or no site preparation. By off-loading all signal processing to Master shelter, the power requirement is significantly reduced.