Broadband Digital Mode Mini-Loop

A Product of Alpha Antenna

Wholly owned by Productive Industries, LLC

α ALPHA ANTENNA®

112 East Commercial Street, Pleasant Hill, MO 64080

SPECIFICATIONS

OPERATIONAL SPECIFICATIONS

Specifications of this broadband digital mode Mini-Loop:

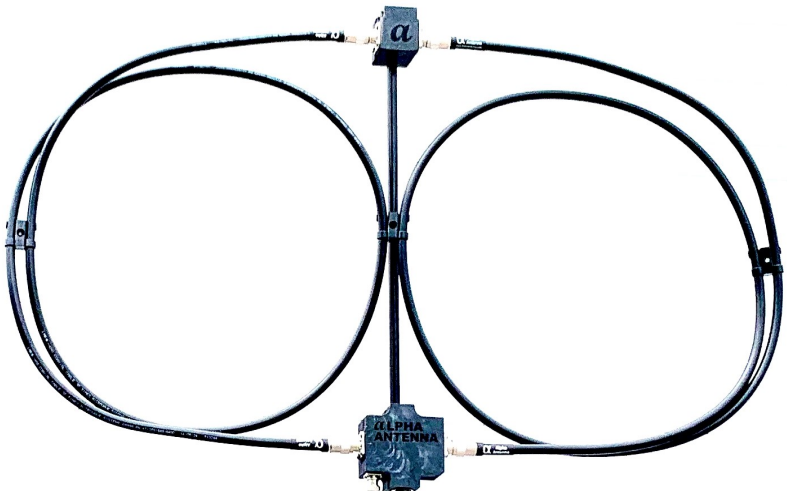
- Receive: Low noise characteristics for digital mode from 1.8MHz through 1GHz.
- Transmit: Support without a tuner for digital mode from 10MHz through 54MHz.
    - 5W minimum digital input signal required with a maximum input power rating of 25W for Digital Modes. Including but not limited to the MIL-STD-188 M110a digital communications mode that is rated at 25 watts continuous with bursts of 100 watts digital for up to 1 minute using the MIL-STD Data Modem Terminal (MS-DMT) and Automated Message Terminal (AMT) software applications.

USAGE SPECIFICATIONS

- Deployable with quantum and/or fixed/spread-spectrum digital mode equipment.
- Missions that require digital Ground-wave and/or Skywave HF communications.
- Useful when an isolated solution is required.

DEPLOYMENT SPECIFICATIONS

The Mini-Loop is deployable in two ways using the included hardware, where Deployment Option B provides the most efficiency.

Deployment Option A (20”x20”)	Deployment Option B (20”x32”)
	

USAGE SCENARIOS

Where secrecy is paramount, communication through unseen methods plays a crucial role. Some of the usage scenarios of clandestine antennas include:

1. SCADA

- ✓ Context: Protecting infrastructure is key to providing continuity, integrity, and availability.
- ✓ Scenario:
- ✓ Solution:
    - Clandestine Deployment: A small out-of-site antenna is significant to hiding communications capabilities are less likely to be thwarted.

2. Clandestine Communications in Cyber-Denied Environments:

- ✓ Context: In an era where internet-based communications are vulnerable to surveillance and attacks, intelligence operatives seek alternative methods.
- ✓ Scenario: Imagine a situation where an operative needs to communicate without exposing themselves to internet-based surveillance.
- ✓ Solution:
    - Physical Separation: Platforms physically separated from the internet can be used. These platforms are not susceptible to internet-based surveillance or attacks.
    - Radio Technology: Combine modern computer-based software with radio technology.
- ✓ Importance: Counterintelligence and law enforcement must adapt to these evolving communication methods.
- ✓ Countermeasures: Detect radio-based clandestine communications and secure evidence.

3. Operational Scenarios where concealment and minimizing visibility are critical:

- ✓ Inside a Parked Car:
    - Example: Monitoring a nearby building while parked outside.
        - Setup: Transmitter, receiver, and antennas positioned out of sight from windows.
- ✓ Between Floors in an Office Building:
    - Example: Operating from the third floor to the first floor.
        - Setup: Transmitter, receiver, and antennas positioned and carried out of site under clothing.
- ✓ Out in the Open:
    - Example: Providing regional communications support while deployed in the field.
        - Setup: Transmitter, receiver, and antennas positioned out of sight inside a backpack.

Remember, clandestine antennas are designed to operate covertly, avoiding detection by adversaries. Their success lies in striking a balance between effective communication and maintaining secrecy with a right sized antenna.

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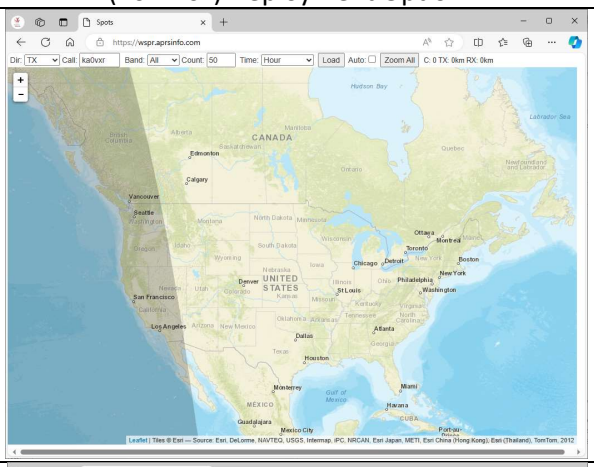
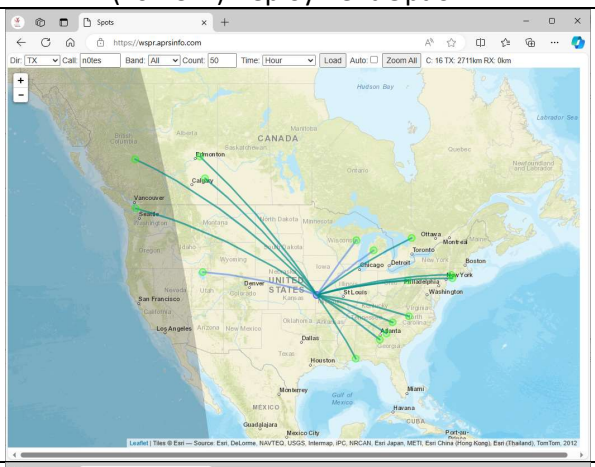
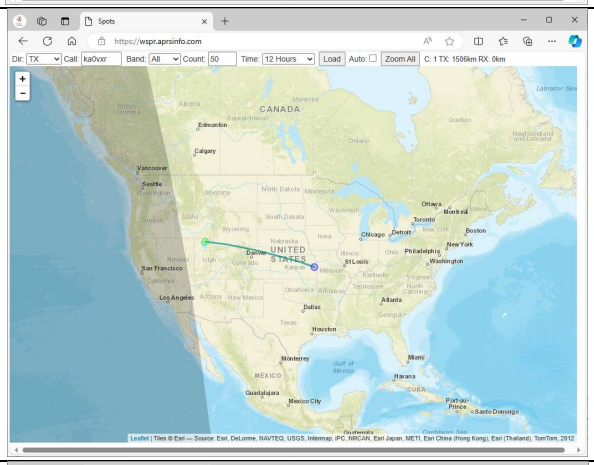
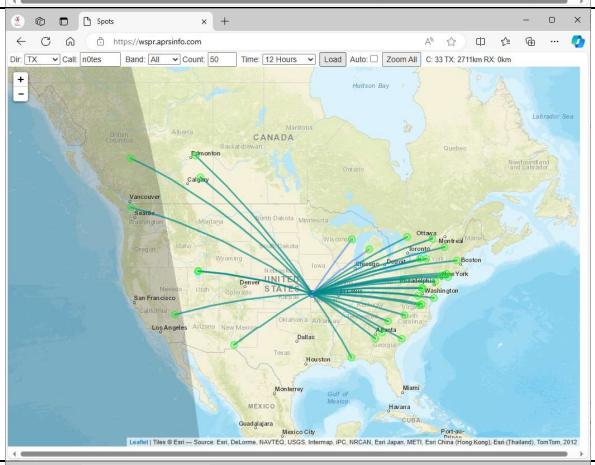
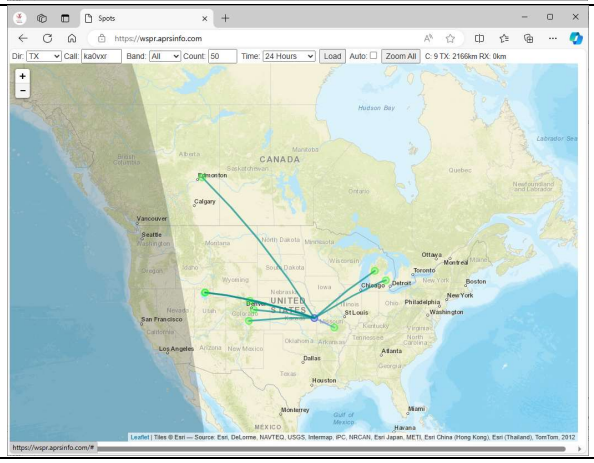
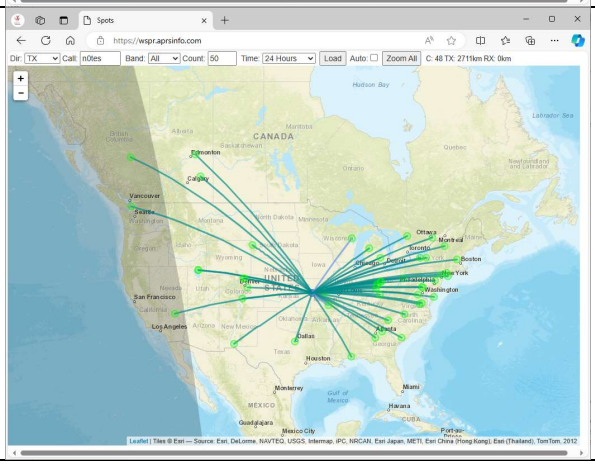
RESULTS

20M Time-lapse WSPR Results at 250mw for Mini-Loop Deployment Options A & B

Time Tested	(20”x20”) Deployment Option A	(20”x32”) Deployment Option A
1 Hour		
12 Hours		
24 Hours		

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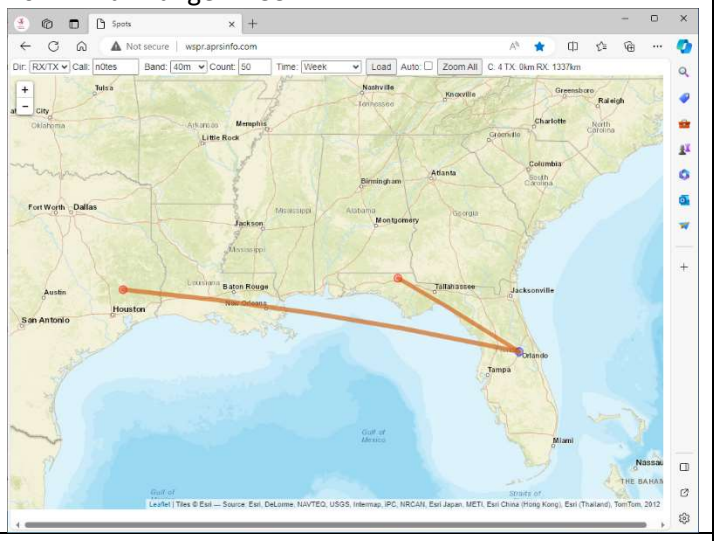
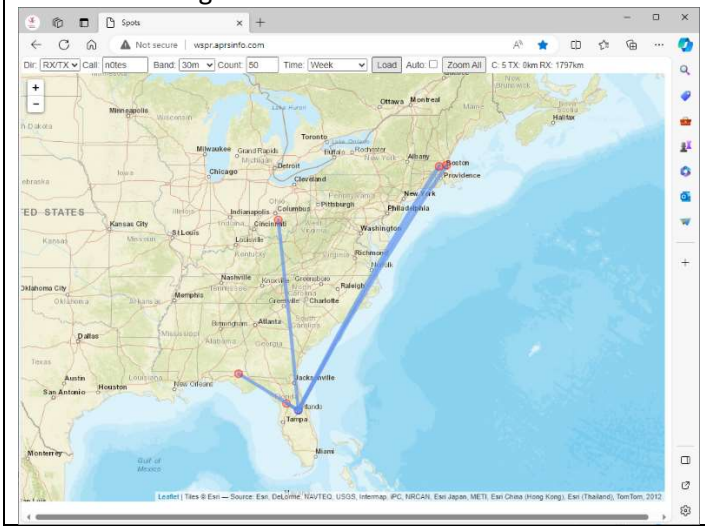
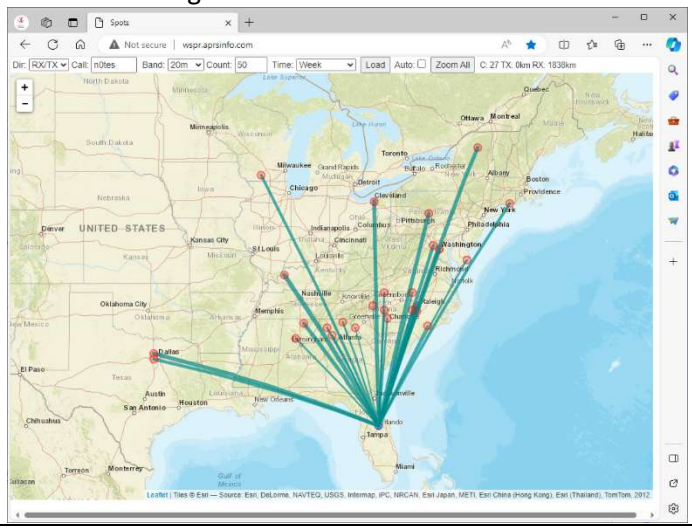
MINIMUM EXPECTED TX/RX PERFORMANCE RESULTS

WSPR RX Results

To generate the minimum RX results, the Mini-Loop was deployed using Option A,

which was placed indoors and between floors of a multi-story building.

80M, 40M, 30M, & 20M RESULTS for the Mini Loop +	
Deployment A 	40M - Max Range = 1337km 
30M - Max Range = 1797km 	20M - Max Range = 1838km 

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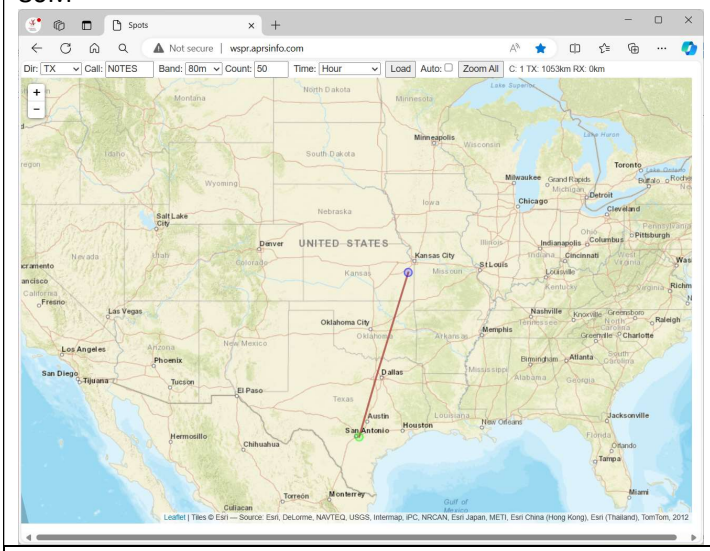
pWSPR TX Results at 250mw

To generate the minimum TX results, the Mini-Loop was deployed using Option A, which was placed between two metal buildings.

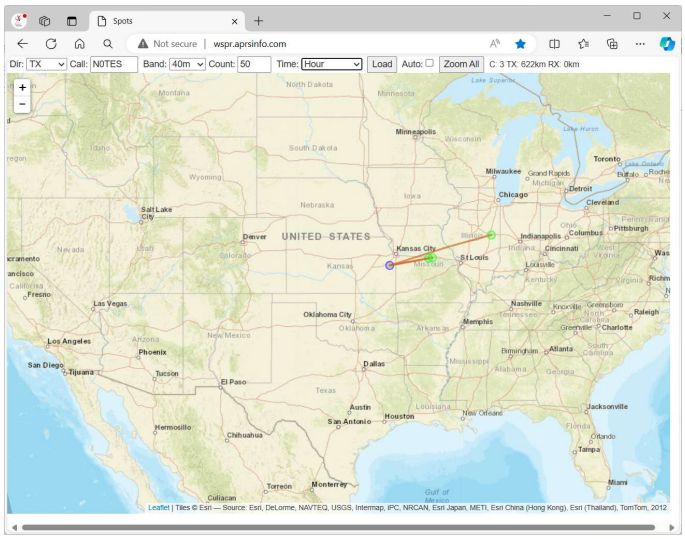
NOTE – TX efficiencies increase as power increases.

80M, 40M, 30M, & 20M RESULTS for the Mini Loop +

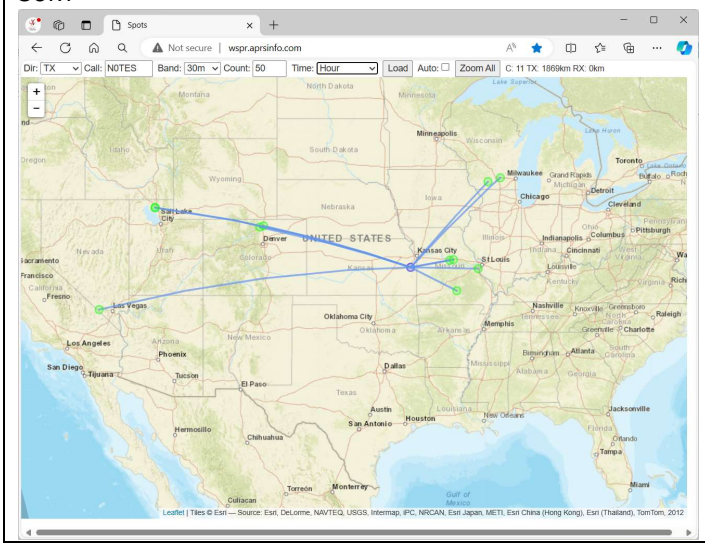
80M



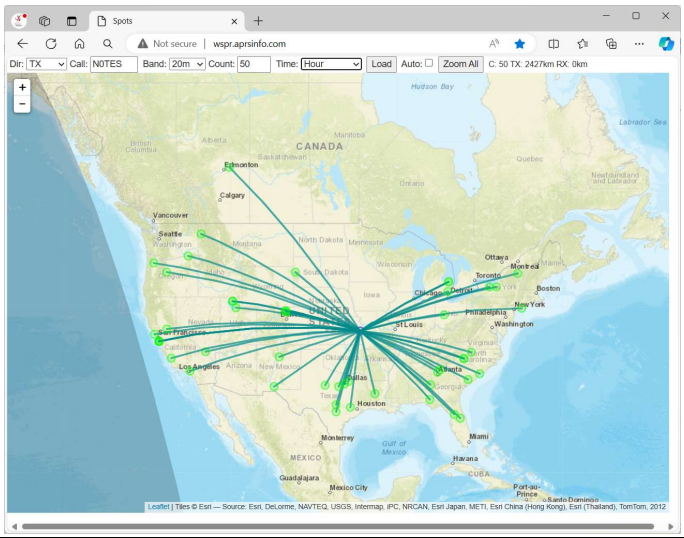
40M



30M



20M



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