

FIELD ACTIVATION REPORT

EFHW Antenna Performance

A Technical Review of a Home-Built 64' End-Fed Half-Wave Build & Activation.

https://youtu.be/DD2BFD_yjfk?si=1XVU3h_yH5Bvb6L7

SYSTEM ARCHITECTURE



Hardware

FTX 1 Transceiver (10W)
Yaesu SDR Technology
FT8 Optimized Setup



Antenna

64' Resonant Wire Element
49:1 High-Power Unun
40' RG-58 Feedline



Support Mast

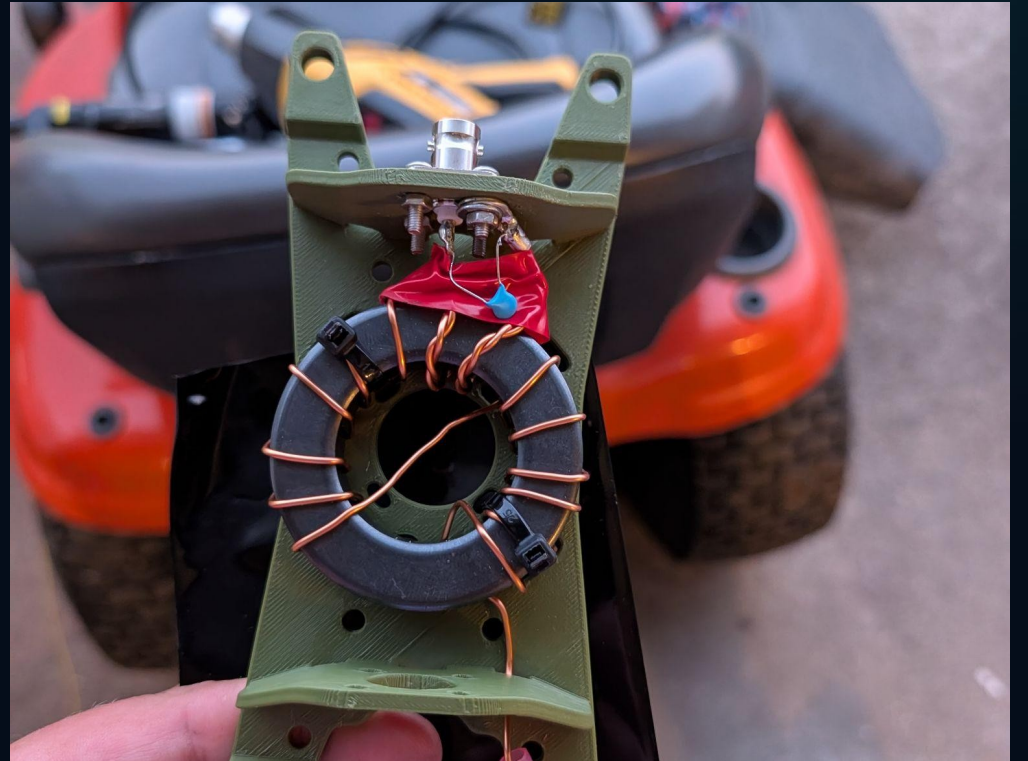
33' Carbon Fiber Mast
Lightweight Collapsible
Rapid 15-min Deployment

| THE MATCHING NETWORK

Custom 49:1 Unun

The heart of this multi-band system is a home-built impedance matching transformer designed to map the massive impedance of the end-fed half-wave wire down to 50 ohms.

Constructed inside a custom green 3D-printed enclosure with neat mechanical tie-downs. Wound using high-purity copper on a robust toroid core for ideal saturation resistance across 40m to 10m.



| THE MATCHING NETWORK

Materials

Toroid Core 240-43

48" Magnetic Wire (16 ga)

~70 ft of antenna wire

Bulkhead fitting (BNC or 239)

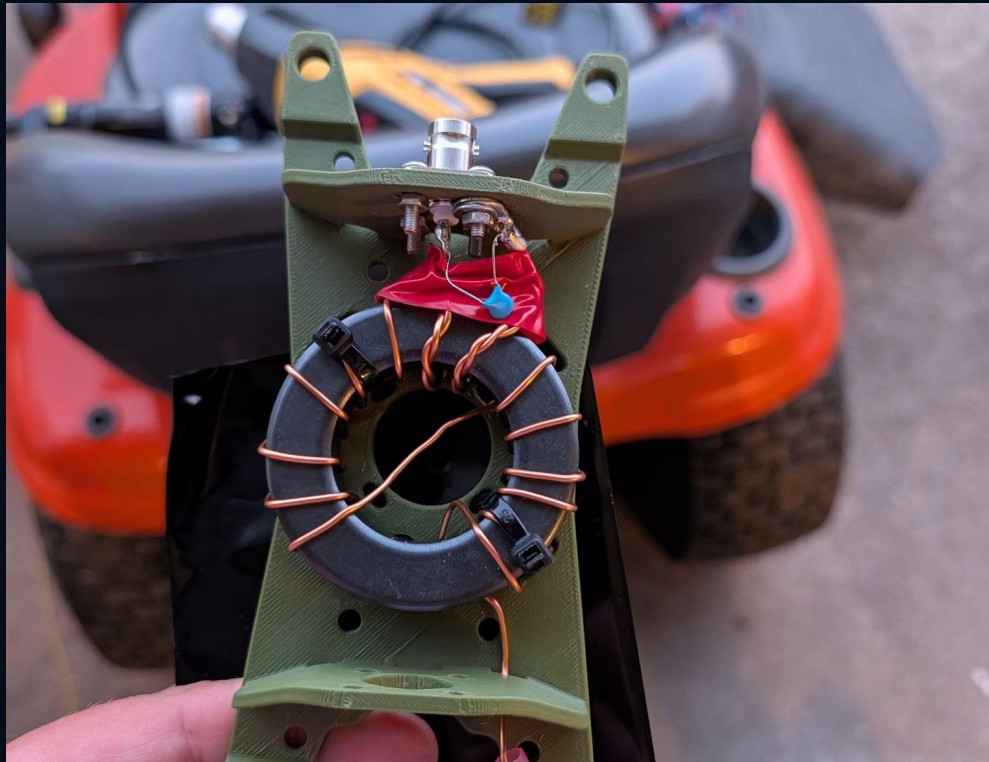
2 red ring wire connectors,

1 yellow ring wire connector

1 kV 100 pf Ceramic Capacitor

Heat Shrink

Wire Winder



Tools

Pliers

Wire Strippers

Side Cutters

Soldering Iron

Solder

Heat Gun

Small Screwdriver or Stick

Antenna Analyzer

FIELD OPERATING POSITION

Integrated Station

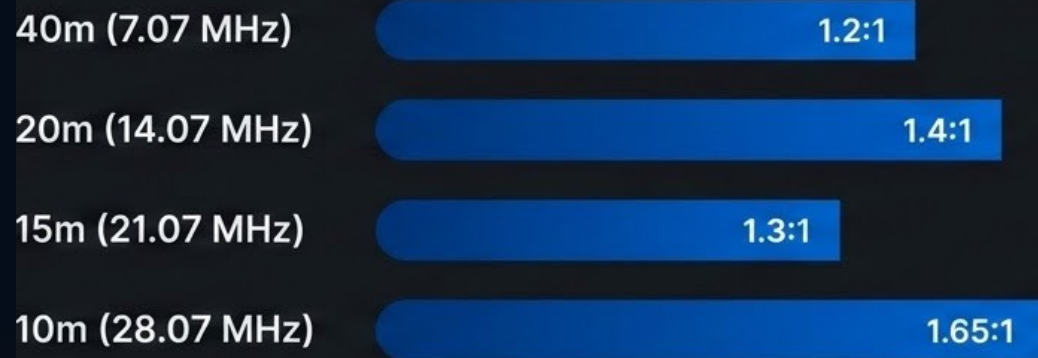
Deploying under the canopy in a classic picnic-table operating spot.

The primary field transceiver (Yaesu FTX 1) is coupled to a laptop running WSJT-X. A precision power meter monitors real-time battery voltage and current draw during transmit intervals.

This layout offers optimal line-of-sight to the carbon fiber support mast while maintaining a small tactical footprint.

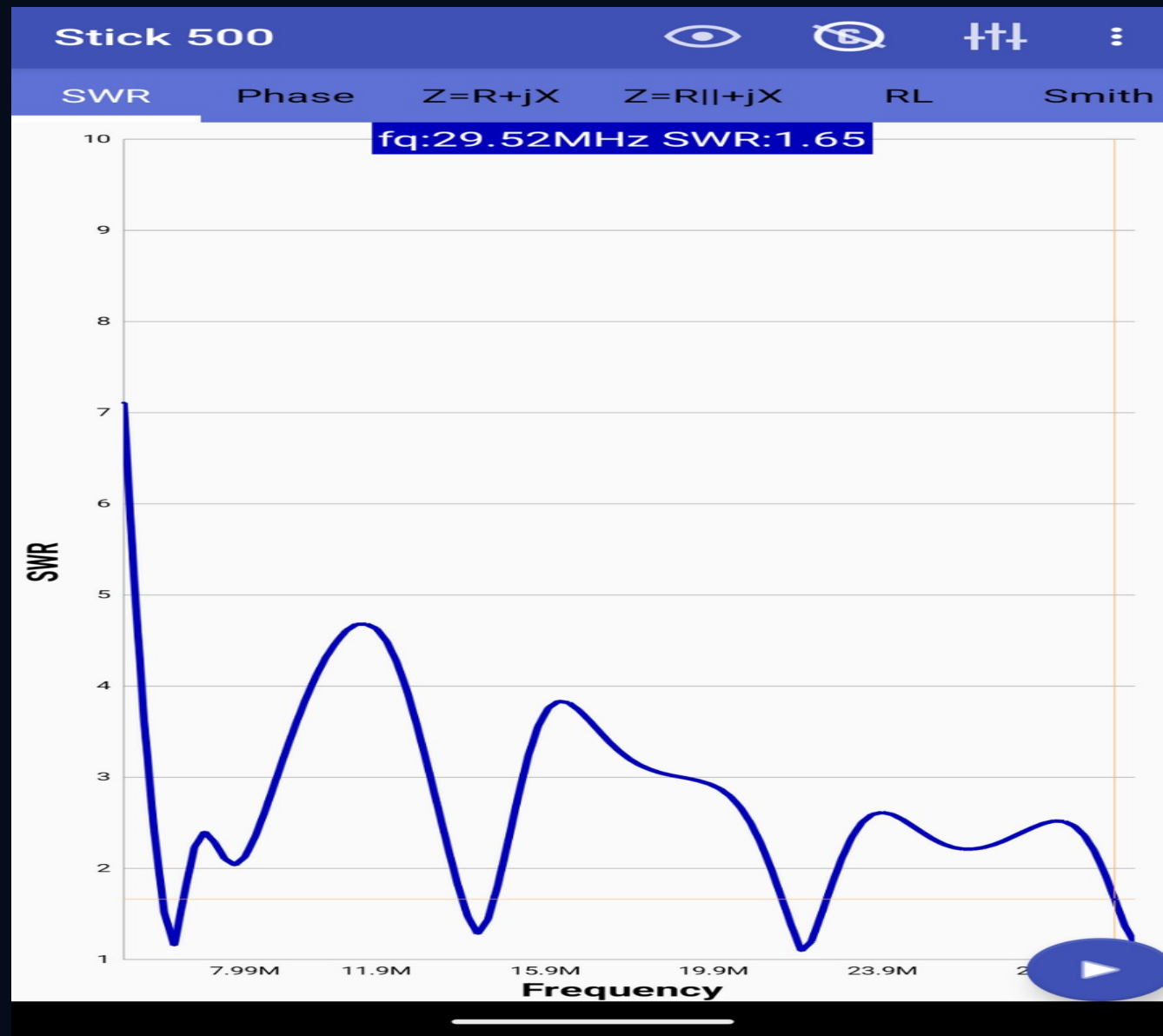


RESONANCE PROFILE



SWR sweep data matched directly from RigExpert analyzer. High-efficiency, multi-band coverage without external tuners.

PERFORMANCE ANALYTICS



Activation Phase

Analyzing real-world field metrics gathered during first activations.

COMPARATIVE METRICS

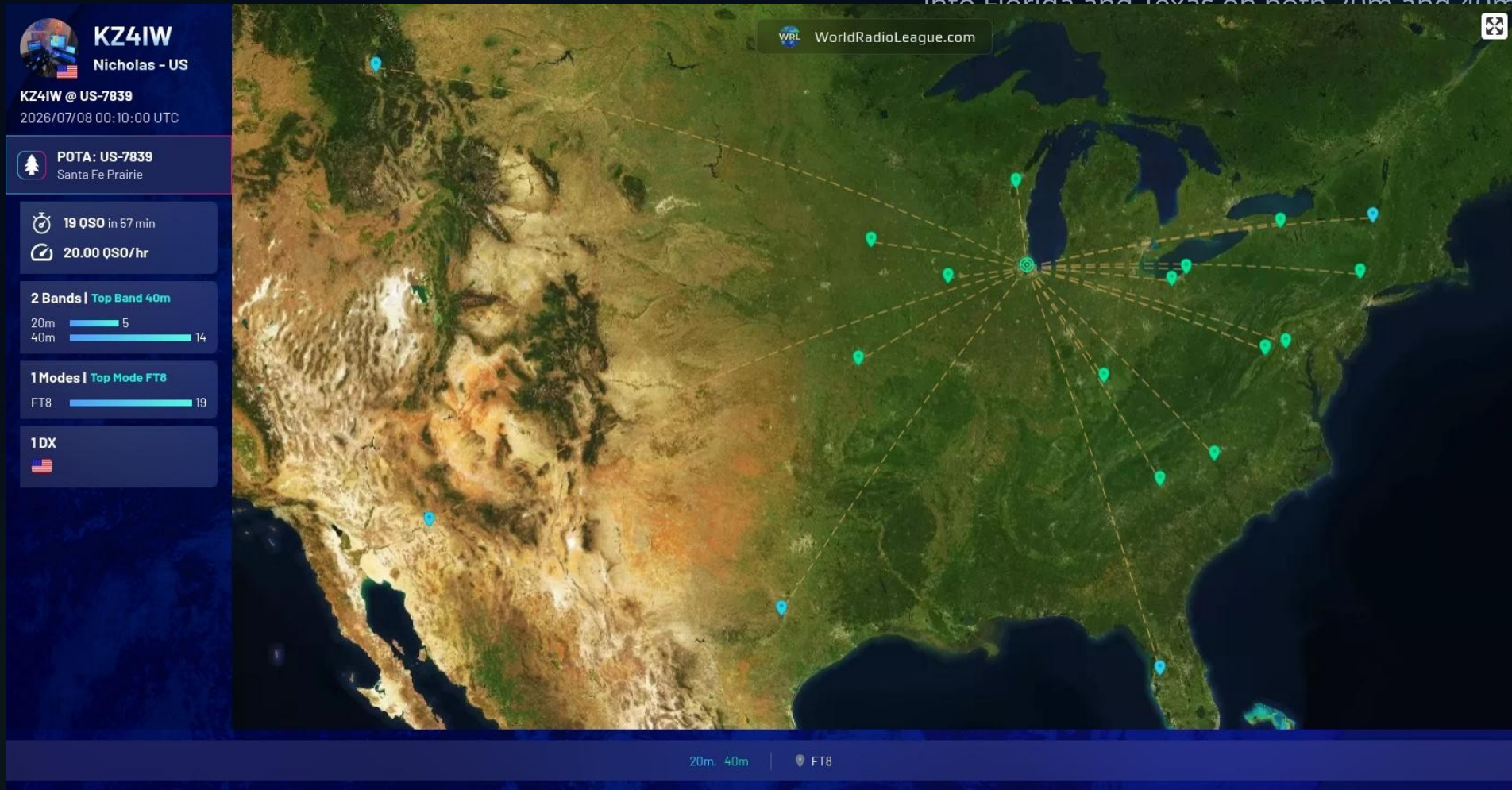
Performance Metric	Indiana Dunes (US-0765)	Santa Fe Prairie (US-7839)
Total Contacts (QSOs)	13 Contacts	19 Contacts
Operating Time	27 Minutes	57 Minutes
QSO Rate	28.9 / Hour	20.0 / Hour
Active Band Focus	40m (FT8)	20m & 40m (FT8)

SANTA FE PRAIRIE REACH

Santa Fe QSO Map

Operating from US-7839, the 64' wire supported by the 33' carbon fiber mast demonstrated an exceptional propagation footprint.

The geographic plot shown in the map showcases strong regional coverage throughout the Midwest, reaching deep into Florida and Texas on both 20m and 40m bands.



| EXTREME REACH

2,069

Longest Distance (Miles)

KJ7EP Contact Details

During the Santa Fe Prairie activation, the EFHW easily spanned the continent, hitting Washington State at a distance of 2,069 miles with only 10W of RF power.

This validates the low-loss performance of the home-wound Unun and the efficient current distribution of the end-fed half-wave element under field conditions.

EXTREME REACH

19 QSOs

Total Contacts

57 min

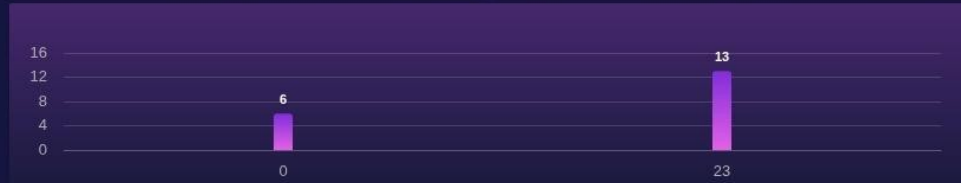
Operating Time

20 QSO/hr

Overall QSO Rate

20 QSO/hr

Fastest QSO Rate



KJ7EP 2,069.1 mi

Longest Contact

722.2 mi

Avg. Distance

US-7839

Park Number:

POTA

0

Number of P2P:

2 Bands | Top Band: 40m



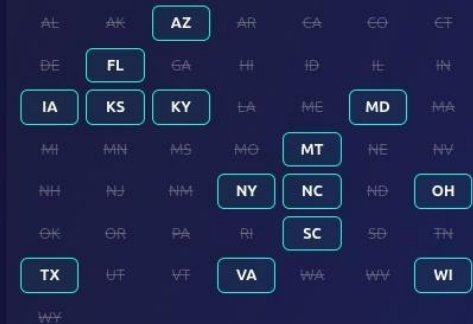
1 Modes | Top Mode: FT8



Number of DX: 1

United States (19),

US States: 14 / 50 (28%)

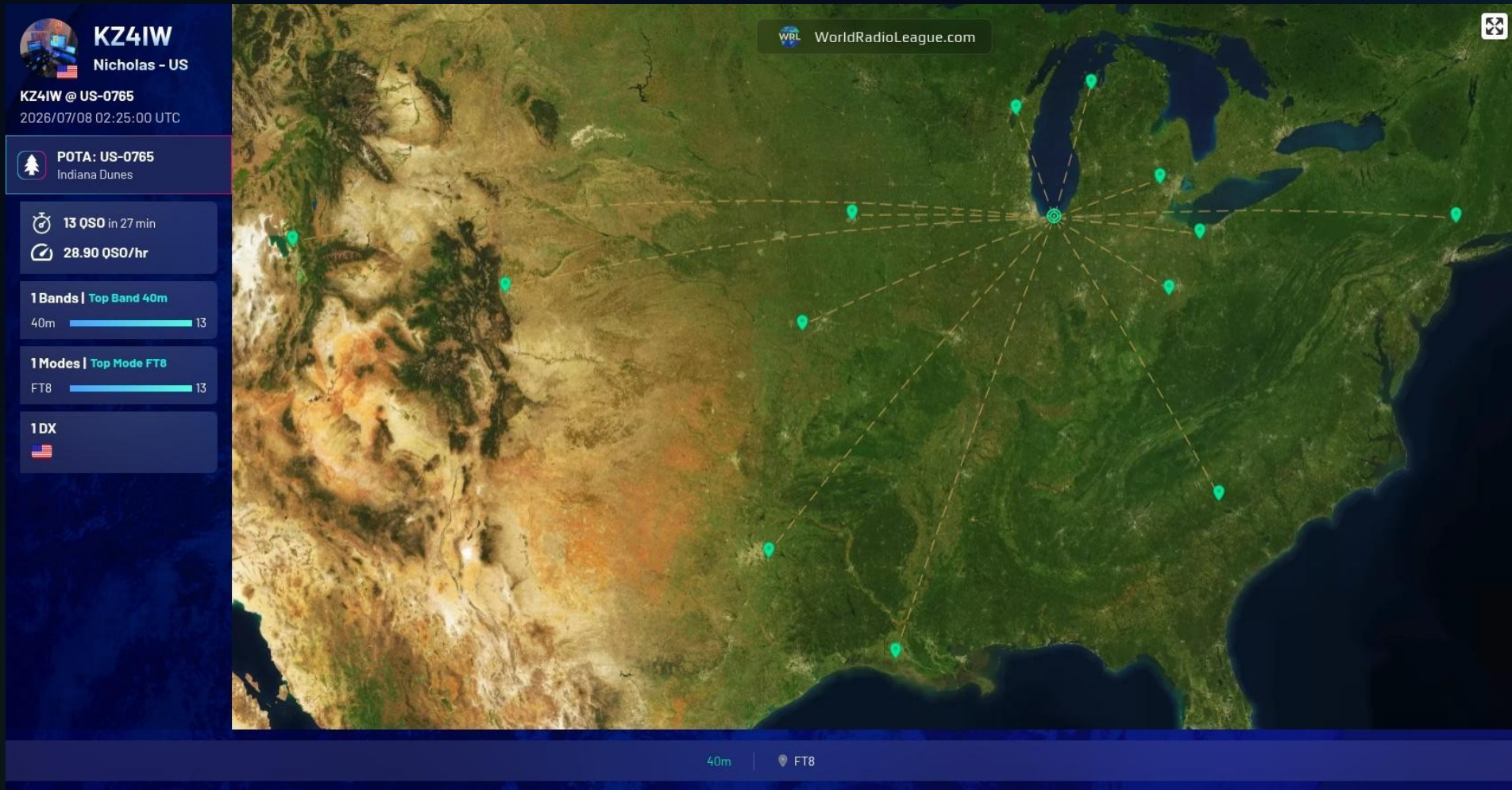


World Radio League

INDIANA DUNES NATIONAL

Indiana Dunes QSO Map

Operating from US-0765, the 64' wire supported by the 33' carbon fiber mast demonstrated an exceptional propagation footprint.



EXTREME REACH

13 QSOs

Total Contacts

27 min

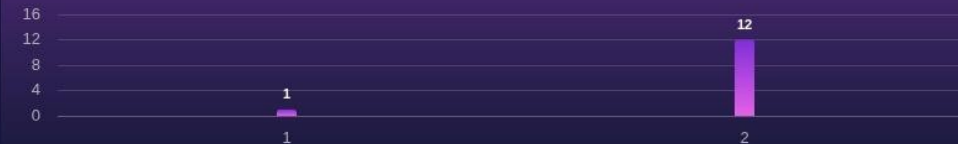
Operating Time

28.9 QSO/hr

Overall QSO Rate

28.9 QSO/hr

Fastest QSO Rate



 **K7EBO** 1,935.7 mi

Longest Contact

885.2 mi

Avg. Distance

US-0765

Park Number:

POTA

0

Number of P2P:

1 Bands | Top Band: 40m

40  13 QSOs

1 Modes | Top Mode: FT8

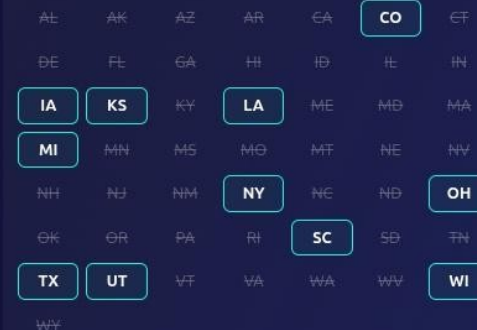
FT8  13 QSOs

Number of DX: 1

 United States (13),



US States: 11 / 50 (22%)



World Radio League

| LESSONS & OBSERVATIONS

- ✔ **SWR Consistency:** The homebuilt 49:1 transformer achieved sub 1.7:1 SWR on standard digital segments, negating any tuner reliance.
- ⚡ **QRP Capability:** The FTX 1's 10-watt limits proved completely capable of high-rate operations under moderate band conditions.
- ⚠ **Mast Support:** The 33' carbon fiber mast from Gigaparts handled field winds safely and offered ideal vertical radiator clearance.
- 🕒 **Rapid Setup:** Single-line hoisting and 40' coax length allowed full, lone station setup in under 15 minutes.

Questions?

Thank you for reviewing the EFHW build and field test.

https://youtu.be/DD2BFD_yjfk?si=1XVU3h_yH5Bvb6L7

<https://3chamshack.com/products/efhw-antenna-kit>

73 de Nicholas (KZ4IW)