

About Me (Mark Buchanan, AEODJ)

<> Moved to a townhouse in 2016

<> Not really thinking about Amateur Radio

<> Tech license in August, 2018

<> Wanted to use HTs when hiking, especially with my brother (AAOLB)

<> Talked my wife (Melody) into getting a license too (KEOSYF)

<> Found the topic interesting: General & Extra in September, 2018

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"Stealth" in a Townhouse

Options:

m Indoor

m Temporary outdoor antenna for small back yard

Currently using 4 different antennas

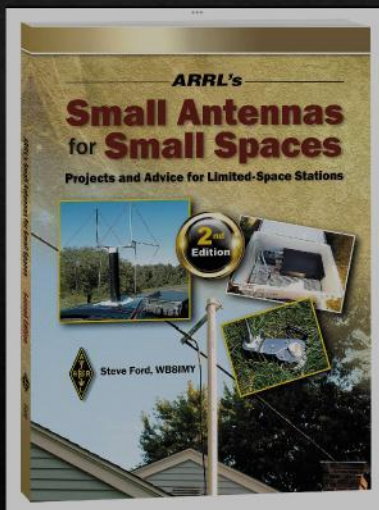
m Indoor: Mag Loop & Dipole

m Outdoor: Alpha "FMJ" Vertical and ARRL EFHW Kit (trimmed)

I do not use an external antenna tuner

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Good Book for My Situation



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Indoor Antenna Considerations

Operating location is second floor

Townhouse is staggered so no neighbors
Loop adjacent to "shack" or spare
bedroom (where loop is located)

Stucco, but not the mesh-screen type

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Magnetic Loop

Shown here in second floor bedroom adjacent to the room with the transceiver (2nd floor of townhouse)

This is the "Alpha Loop" from Alpha Antennas

Supports 40-10 meters

Can do 80 meters with an add-on second loop cable

Power limits for the antenna: 25w digital, 50w CW, 100w SSB with care to not peak ALC

With 80 meter cable, limit is 5w digital, other power levels reduced as well

Good for temporary use outdoors also if you have a good method to tune it

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Indoor Dipole

12:23 PM

ABRIL'S SMALL ANTENNAS FOR SMALL SPACES

taken to position the ends far enough from other conductors to avoid arcing, or contact with people or animals.

The dipole may end up being L-shaped, Z-shaped, U-shaped or some indescribable corkscrew shape, depending on what space is available. As an example, consider the 20-meter dipole shown in **Figure 2.1**. Using the formula, we find that each leg is about 16 feet in length, yet it can squeeze into a small 10 × 10 foot bedroom with some creative folding.

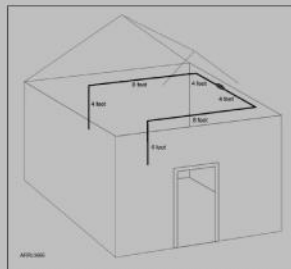
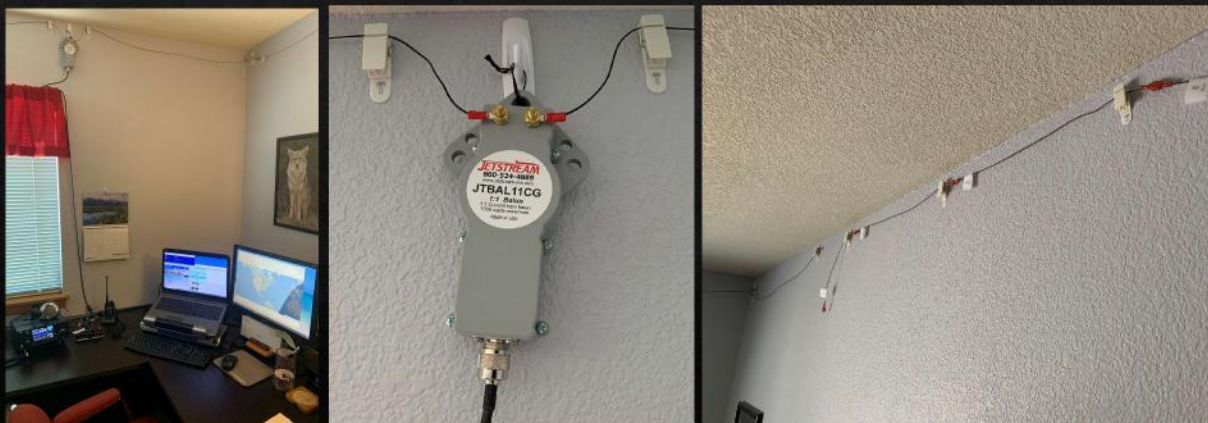


Figure 2.1 — Even a dipole antenna for the 20 meter band can fit into a small room with a bit of folding.

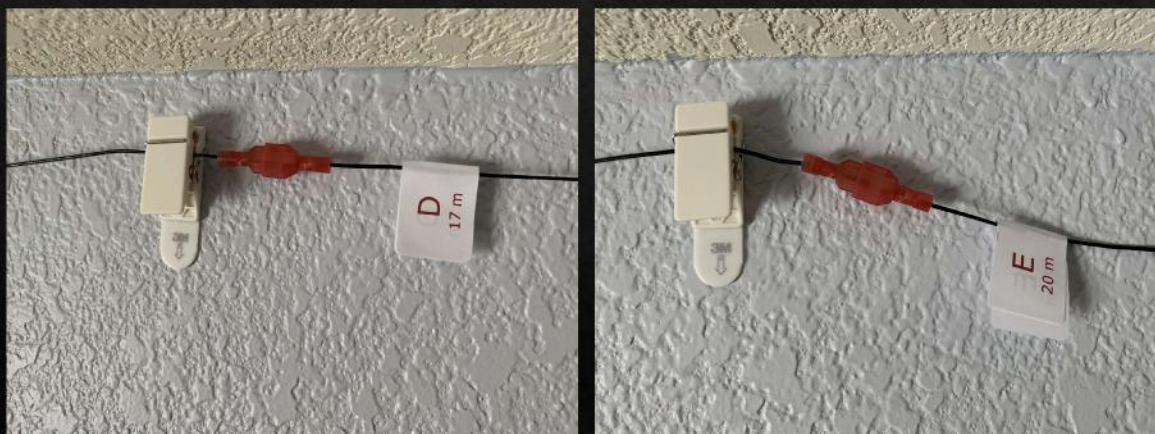
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“Multi-single-band” Indoor Dipole



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Multi-single-band dipole



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Multi-single band Dipole

<> Will work best on higher bands if pursuing DX

0 Want close to $1/2$ wavelength high if possible for low takeoff angle

0 On 10 meters, this is about 16 ft

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Indoor RF Considerations

· Calculation at right using Lake Washington Ham Club Calculator for Dipole using 20w

· Mag Loop may have very high RF density in the "near field"
Calculations need to be conservative since coupling and other factors can "challenge" the basic calculators

1 really would like to be able to measure RF exposure...

An option: remote operation over LAN to increase distance to the antenna

Parameters

• Power at Antenna: (Need help with this?) 20 (watts)

• Mode duty cycle:

For all others, or if unknown, assume worst case see nano (duty cycle=100%)

• Transmit duty cycle: (mins transmitting)
You transmit for 1 minutes then receive for 10 v. minutes (and repeat).

• Antenna Gain (dBi): 2.2

• Operating Frequency (MHz): 26

IS1 include Effects of Ground Reflections

Calculate

Results for a controlled environment:

Maximum Allowed Power Density (mW/cm²): 11485

Minimum Safe Distance (feet): 2.2986

For an uncontrolled environment:

Maximum Allowed Power Density (mW/cm²): 0.2296

Minimum Safe Distance (feet): 3.2507

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Loop tuning issues

- ◆ Mag Loops have very narrow bandwidth ("High Q")
- ◆ Issue: Avoiding unwanted transmission during tuning
 - ◆ Example: Tuned to 14.074 MHz for FT-8 with a lot of traffic
- ◆ Issue: RF exposure while manually adjusting the tuning knob
- ◆ Distance between transceiver and antenna can complicate tuning
- ◆ One solution is to switch in an antenna analyzer near the antenna for final tuning
- ◆ Another solution is to use a remote camera with a noise bridge (e.g. MFJ-212) if your transceiver has a waterfall display



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Outdoor Antenna for Limited Space: Alpha FMJ

- ◆ Multi-band
- ◆ Sets up VERY quickly (minutes)
- ◆ Small footprint if you skip the optional NVIS element



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Outdoor Antenna for Limited Space: EFHW

- ◇ ARRL Kit, \$69.95
 - ◇ If the default multi-band configuration takes too much space (66 ft wire), it can be cut for single-band operation (which is what I did)
 - ◇ Make separate wire lengths for 20m, 17m, etc.
 - ◇ I operate it mostly vertical using an MFJ 33 ft fiberglass telescoping mast
 - ◇ ½ wave height for 20 meters
 - ◇ Flimsy but works well for this purpose (avoid windy conditions)

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Deployed EFHW



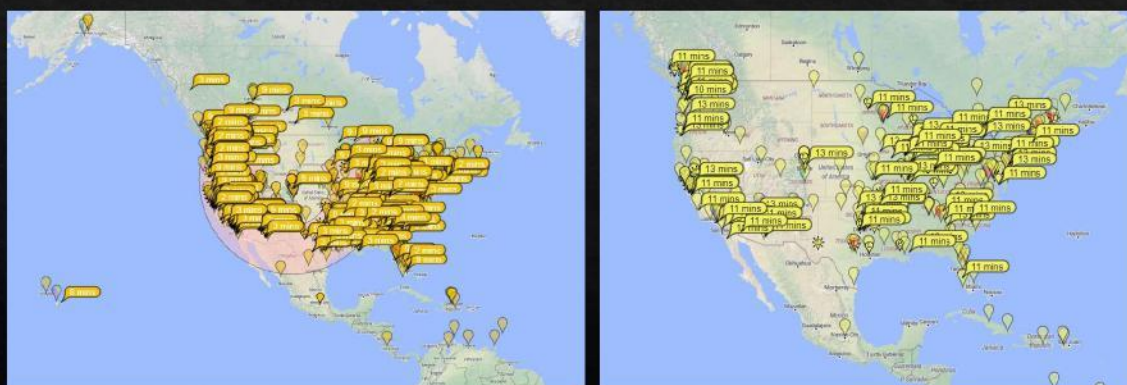
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Do these antennas work?

- ◆ YES!
- ◆ Fine print: My experience is nearly all with digital modes (PSK31, FT8, JS8, VARA-HF, etc.) The constraints are part of the challenge...
- ◆ 55 countries and all continents (except Antarctica) in my logbook (mostly FT8)
- ◆ Cycle 25 leading to improved propagation on higher bands

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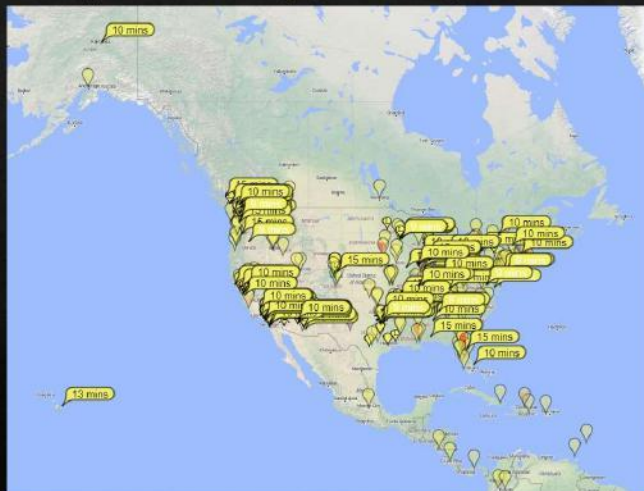
Indoor Dipole, 20 watts (20m, 17m)



pskreporter.info, July 2, 2022, SFI 98, Geomagnetic Field Unsettled/Quiet

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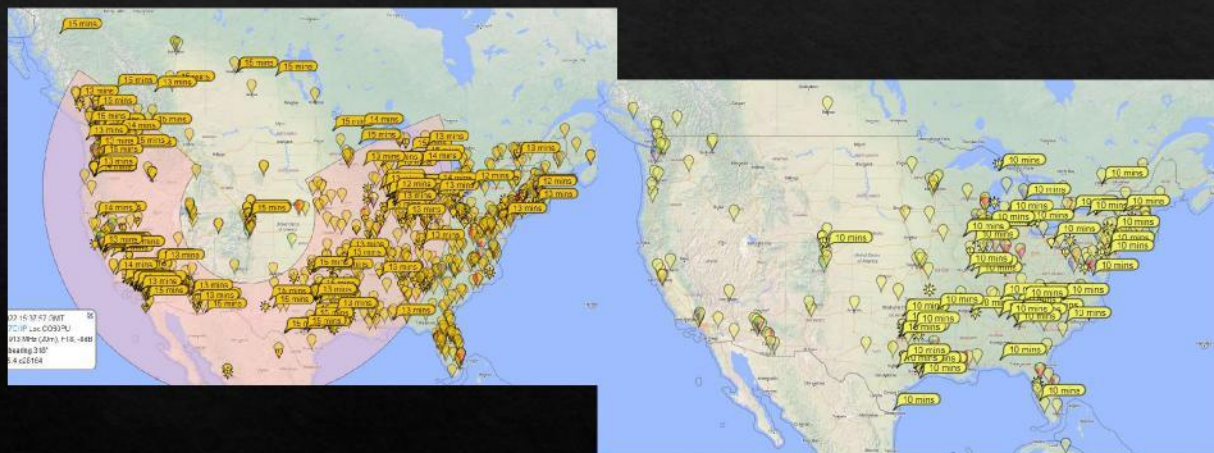
Alpha Loop, 17m, 25 watts



pskreporter.info, July 2, 2022, SFI 98, Geomagnetic Field Unsettled/Quiet

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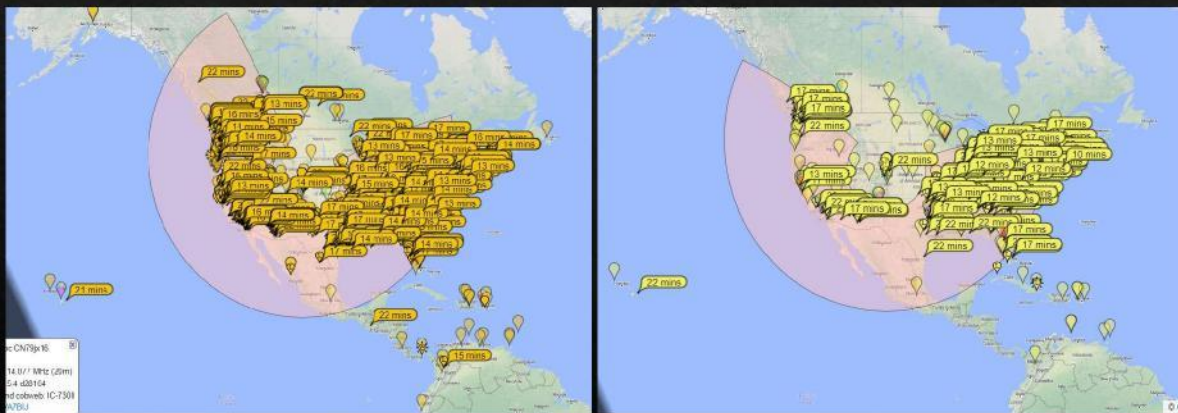
Alpha FMJ Vertical, 25 watts (20m, 17m)



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EFHW 25 watts (20m, 17m)



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AA0LB deck-mounted approach



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AA0LB deck-mounted approach



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