

Newcomers and Elmers Net: HF Antennas for Apartments 05/14/17

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Experimentation

Experimenting with different antennas allows you to learn about how they work, and it is part of your continuing education in amateur radio

- If working with HF antennas keep track of SWR settings, especially resonance along each band to be used
 - Track what happens when you change overall length or if working with verticals, changes with the number or position of radials
 - Track things over time as well – don't just depend on a one-time test; conditions change daily and even hourly; plan on testing an antenna for several weeks or months (assuming initial results are reasonable!)
 - Eventually you will take a year or more to test an antenna to allow time enough for various conditions to affect your tests, but that's later
- Experimenting with antennas also means exploring feedlines, supports, placement, elevation, etc.
- Coax vs. open-line/ladder line
 - Coax allows feedlines to be close to other metal objects; run along the ground; take bends/corners as long as they are not too severe
 - Open-line/ladder line inexpensive, low-loss; good for long feedlines; weak, bends/breaks easily; cannot be near conductive surfaces or go along the ground; no sharp bends or will be seen as a termination
 - Elevation experimentation – height is your friend, for the most part;
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- See what other people are doing and ask about their results
 - Understand that most people give anecdotal evidence (like "I was booming into Europe the other day") which may or may not be a real reflection on the quality of an antenna
 - Look for consistency when testing antennas—meaning there is a difference between what *can* I get vs. what will I *usually* get
 - Learn about how antennas work/why they work/when they work; this is a long-term process
 - Trial and error will teach you more than any book by itself—take what you read and study and try it in the real world
 - I would recommend even building some "bad" antennas to see why they are bad
 - Look for books on wire antennas and build a few antennas, testing each one
 - Don't be afraid to try something even if you don't think it will work – you may just end up surprised!

Making a Dipole: The Dipole Formula

The common formula for calculating the length of a dipole is:

$468 / (f \text{ MHz}) = \text{dipole length in feet}$

(e.g. $468/14.275 \text{ MHz} = 32.8$ feet total length (approx. 16.5' per side))

Cut each length a bit long, adding 6 inches or so to each side and then trim or fold back as needed. If you cut the wire too short you will have to add length or start over, so it is always better to leave a margin of error.

Some common indoor antennas:

Mobile whips

Windowsill/balcony verticals both center and end-fed

Random-length wires

Grounded wires

Dipoles strung along the ceiling or floors or in between (remember ground is not the floor you are walking on! A 2nd story apartment means you are likely up 20+ feet above the ground we walk on, and at a greater height above electrical ground which occurs often well below physical ground)

Fan dipoles – probably the most popular because it is multi-banded

Zig-Zag dipoles – can be hidden behind wall coverings, put up on ceilings with thin wire, backs of mirrors or paneling

Carpet wire antennas – run along the floor boards hidden by the carpet

Magnetic loop antennas

** Coil/trap antennas to shorten overall length but maintain electrical length

Linked dipoles

** Slinky Jr. antenna – suspended by dowel rods

** DDRR Antenna – Directional Discontinuity Ring Radiator – looks a bit like a hula-hoop but not a continuous hoop – separated by a small distance like a small section has been cut out of the hoop – search for DDRR on Google for building plans

Base-loaded vertical -

<http://comportco.com/~w5alt/antennas/index.php?pg=3>

Coaxial-trap antennas – using coax cable as the trap material for a shortened 40m dipole, for example: <http://degood.org/coaxtrap/>

- If you are allowed a patio umbrella on your deck, you might just find a way with a little creativity to use it as a stealth antenna, with the base acting as ground radials

Don't forget different transmission modes allow you to work with less power and still make DX contacts as well as stateside WAS etc.

- CW, Weak Signal Modes, PSK31, etc. are all useful at lower power levels

Commercial options

The MFJ-1622 Apartment Antenna covers 40 through 2 Meters, mounts outdoor to windows, balconies, railings, and works great indoors mounted to desks, tables, and bookshelves!

This Apartment Antenna lets you operate 40 through 10 Meters on HF and 6 and 2 Meters on VHF with a single antenna! Its universal mount/clamp lets you easily attach it to window frames, balconies, and railings. It also works great indoors mounted to a desk, table, or bookshelf. Its not a five element yagi, but you'll work your share of exciting DX!

The highly-efficient air wound bug catcher loading coil and telescoping 5 1/2 foot radiator lets you really get out! The radiator collapses to 2 1/2 feet for easy storage and carrying.

It includes coax RF choke balun, coax feed line, counterpoise wire and safety rope. The operating frequency is adjusted by moving the wander lead on the coil and adjusting the counterpoise for the best SWR. (manufacturer's description, not mine <grin>)

Alpha-Delta line of antennas

Band-hopper linked dipoles by SOTA-Beam

MFJ 1786 Super Hi-Q Loop Antennas MFJ-1786 - Antenna, Super Hi-Q Loop, Remote Tuning Type, Horizontal, Omni-directional Small Loop, 150 W, 10-30 MHz, 110 V

Bushcomm Horizon Multi-Band Loop Antennas LOOP-20 - Antenna, Loop, Magnetic, 20-10M, 125 W PEP, Each

CHAMELEON ANTENNA Deluxe Portable HF Loop Antennas F-LOOP-PLUS - Antenna, Portable, 3.5-29.7 MHz, 25W SSB, 36 in. Collapsible Aluminum Loop, Match Box, 12 ft. RG-58A Coax, Ea.

Additional Info provided during/after the net:

On the tonight net I mentioned the fact that the 3909 net can be used as an aid for evaluating receive capability for antennas (or really, for practicing weak signal listening). The key to this is the fact that they log their check-ins during the net and provide a map of them.

Here are some helpful links:

<http://www.3905ccn.com/>

<http://www.3905ccn.com/netsched.htm>

<http://hamshackonline.net/3905ccn/maps/NetSelector.php>

The maps are active during the net and for about 12 hours thereafter.

73, AC8VK | Erik

Also:

OMISS does the same with their nets.

<http://www.omiss.net/Facelift/listCheckinHistory.php>

After you select a net and display the check in list, there is a 'map it' link in the upper left that will display a map of all the check ins...

Paul, K9PLG

Thanks for the info, folks! Very helpful! Robert AK3Q