



PROSPECT HILL INTERMOD

THE OFFICIAL NEWSLETTER OF THE WALTHAM AMATEUR RADIO ASSOCIATION

WWW.WALTHAMARA.ORG

Winter 2022

Next Generation Editor

Eliot Mayer, W1MJ – Publisher

No, not as in Notepad++, but quite literally the next human generation of PHI editors! I say this because Pat (K1PJW) has children about the same age as my grandchildren. I'll let Pat introduce himself.

New Editor

Patrick Whitney, K1PJW – Editor



K1PJW and son fox hunting on Prospect Hill

Hello fellow club members! I'd say I'm new to the hobby, obtaining my technician license in April of 2021.

I fondly remember keying up for the first time; It was to the 075 repeater. The ink was still wet on my ticket. I was lucky that Saturday morning and happened upon a lively crew and received a very warm welcome from the active stations using the repeater at the time. I joined the club that day!

Growing up around commercial two-way and 11-meter radios, obtaining my ham license had been a dream since I was young. Making the most of my extra time at home in 2021, I finally buckled down and got my license – It only took 3 decades or so to finally fulfill my dream. I only wish I had done it sooner!

Since then, I have had a blast! From making antennas, to fox hunting (a big shoutout to Mike (K1MJC) for putting out his fox around Waltham this past year!), to public

service, to buying my first shack radio on the Waltham Wranglers Swap Net... the fun hasn't stopped, and I know I have only just begun my journey with this vast hobby.

It's an honor to be part of this long-standing amateur radio club and I'm looking forward to carrying the editor torch. This quarter's issue is fox hunting focused, but I'd like to cover other amateur radio topics in future newsletters as well. If you have something to share or a suggestion for the PHI newsletter, please email us at news@walthamara.org.

73!

A Fox Hunting ... tail!

Mike Cormier, K1MJC

A while back, when I was fairly new to the ham radio hobby, I heard talk of something called a "Fox Hunt." Basically, what it is, is searching for a hidden transmitter for fun. And little did I know that fox hunting, or sometimes called bunny hunting or more formally called "Amateur Radio Direction Finding" (ARDF), has been around for quite some time, and has a long-storied history – which is a whole other fox hole to go down. But suffice it to say, if you were to just Google *Ham Radio Fox Hunting* or *ARDF*, you would be flooded with information. I will say only this, apparently fox hunting originated shortly after radio itself.

Here are my own personal experiences with fox hunting, and what I've been able to do in our local area over the last several months.

When I had first heard of Fox Hunting, I made mention of it on the WARA 075 repeater, and right away a few other Hams were quick to note that Eliot (W1MJ), who's normally found on the WARA 64 repeater, is a seasoned Fox Hunter, often with his faithful dog Noah aiding in the hunt.

I believe it was John (N1JAF) who pointed me immediately to the "PART of Westford" web page (<http://wb1gof.org>) and to inform me that Eliot (W1MJ) too was very active in Fox Hunting, and one time we met up for a hunt where he "Elmered" me in some of the basic and finer points of hidden transmitter hunting. While we're talking about Eliot, I'd like to extend my congratulations to him as he is now a full time Retiree (or at least he hopes to be more retired than not going forward). He's informed me that one of his first priorities is to put his years of electrical engineering experience towards the designing and building of his own "Fox" which he informed me will be a more powerful one, which can make it a bit more difficult to locate the Fox when you are closing in on it...we'll see! I'm looking forward to the hunt!

I engaged in my first fox hunt in the Littleton area only using my HT and a stubby antenna. When I got close to the fox, I removed the antenna and using the body-fade technique (and a lot of guesswork) I successfully found my first fox.

This fox was chained to a tree, and it was camouflaged somewhat with the surrounding Pine needles, leaves, and sticks. Also, accompanied with it in a plastic bag, was a logbook where you could sign in with your Call sign, the search date and time, and optional information perhaps how long it took you to locate the fox. Needless to say, I was hooked.

Since then, the Internet has been a treasure trove of information on Fox Hunting, with everything from how to build antennas, Foxes, attenuators (which are needed with any Yagi or directional antenna when you're near the fox, otherwise the signal strength will be so strong it'll appear that it is coming from everywhere), and much more.

As a part of the ham radio hobby, I've always been interested in building my own antennas. I've since built myself a tape measure Yagi (pictured below).



K1MJC's tape measure Yagi

I've also discovered other direction-finding equipment you can purchase in kit form. One such kit which I purchased and built is the *HANDI-Finder*. The HANDI-Finder incorporates the "Time Difference Of Arrival" (TDOA) method of determining direction of the signal. Basically, when the signal encounters one of the antennas before the other, there is a phase difference and because of this, the circuitry produces an audible tone through your HT's output speaker. When the signal is received equally through both antennas, the tone disappears, indicating the source is either in front of or behind you (and the line with which the antennas sit on is perpendicular to the signal). You then must determine the correct direction to travel.

You can purchase a kit, but be warned, they only accept orders submitted by mail (I used a "Money Order"). You can find the ordering instructions [here](#):

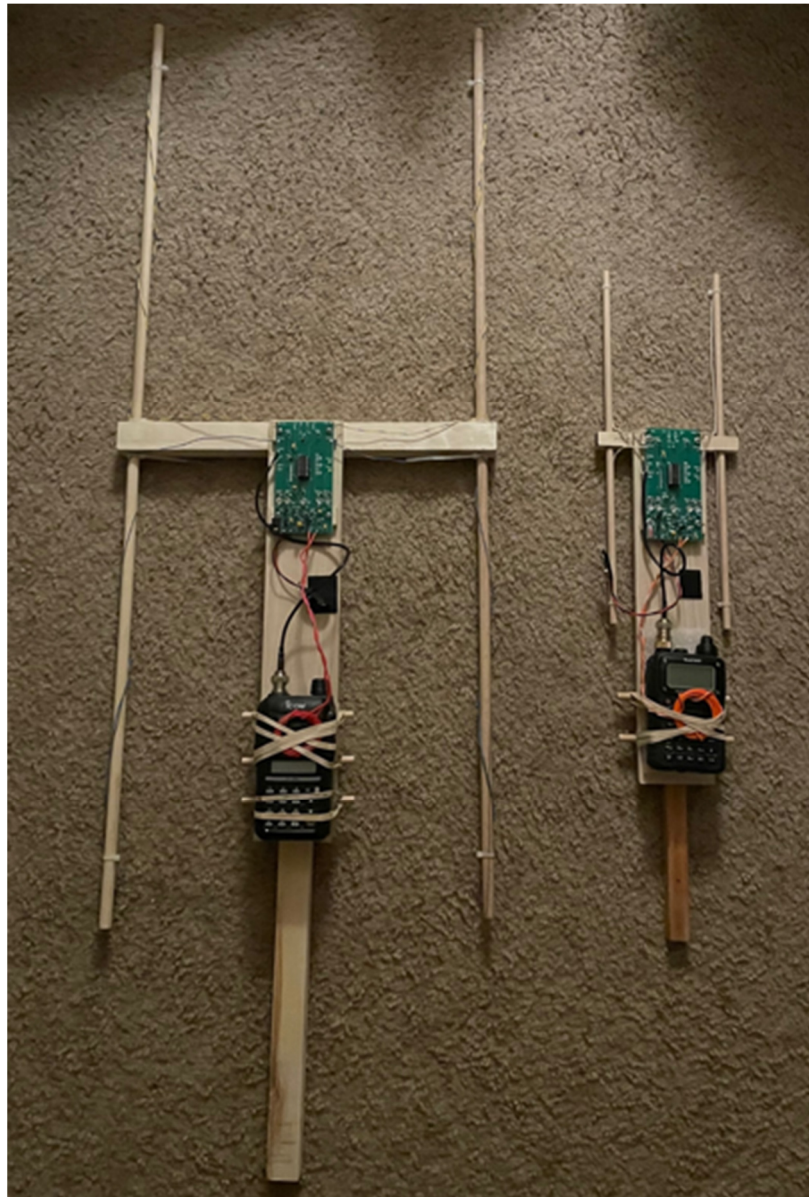
<https://www.noard.com/noardhdf.html>. You can find pictures, build hints, and instruction here: <https://www.handi-finder.com/>

Another direction finder I found was the “NZ1J Doppler.” This Doppler is very similar to the HANDI-Finder with the exception it provides you with a visual indication of direction using five LEDs: two green LEDs on either side of a red LED in the center, to help Point you in the proper direction. Of course, this direction finder has the same shortcoming of the HANDI-Finder in that the fox could be in front of or behind you.

Dave/NZ1J has a solution for this in his demonstration video (see his demonstration video on YouTube [here](#)).

I've used both the HANDI-Finder and the NZ1J Doppler, along with the body-fade technique to determine which direction the signal is coming from.

My two versions of the NZ1J Doppler are pictured below. One is for VHF, and one is for UHF. The UHF one is experimental and not working great at the time of this writing.



K1MJC's VHF (left) and UHF (right) direction finders

One great feature of these types of devices is that they do not require attenuation when you're near the transmitter because regardless of the strength of the signal coming from the Fox or Transmitter, they will always reveal the direction of the signal, as they will produce no tone at all, a "Null" as it were, right up to the transmitter itself, as opposed to a Yagi, which becomes "omni-directional" when close, unless attenuation is used. Because of this "Nulling" effect, these types of devices are very helpful when you're closing in on the Fox.

Of course, there are other technologies available such as full Doppler direction finders that incorporate four antennas in an electronically switched 360° fashion which will lock onto a signal almost immediately and give you an estimate for which direction to go; these come in handy in a real world "Fox Hunt" where Jammers make short hit-and-run transmissions. Hams have long been known to hunt down malicious jammers that interfere with Repeater communications and the like.

“PART of Westford” as they call themselves is an “ARRL special service club.” Although they do have a focus on foxhunting, they are mainly geared towards, and I paraphrase from their homepage: a “...public service support and community outreach...with many interests, ... including radio contesting equipment construction... radio fox hunting, and more...”.

You can glean a lot of good Fox Hunting related information from the “PART of Westford” web page: <http://wb1gof.org/activities/Foxing/>. There you can find links to things like building a tape measure Yagi, build or buy your own Fox, links to area conservation land maps, and much more. You can also find information on how to join their “Groups.io” page where notifications are sent out to an email group when foxes are placed in the field. PART members primarily place their Foxes in and around Westford, Littleton, and Chelmsford, in conservation areas and places open to the public.

There’s not much else to say here and perhaps much of what I have said is pretty much known by many reading this article, but with that I’ll leave you with just the few words above and the pictures of some of the equipment that I’ve built, and a picture of my fox that I purchased (The Byonics MicroFox 15) from Byonics.com. In the first picture below, the fox shown in both its “un-clothed” configuration and with its modified camouflaged fox box for use with a larger power source for extended field time and more fox hunting fun!



Byonics MicroFox 15 (left) and its custom armor (right).



The K1MJC Fox in its natural habitat.

With that, I'll bid you all "73" and Happy Fox hunting from:

Mike C. K1MJC

Remote HF Operation

Eliot Mayer, W1MJ

The past two years have shown our ability to adapt. Firsts for me include online church, online radio club meetings and conventions, online jam sessions, and remote operation of HF (high frequency) ham radio stations. Remote HF started before the pandemic but has now grown in popularity and will likely remain popular. If you are an apartment or condo dweller with no possibility of a home HF station, you can operate portable or mobile, and now remote operation from home is a practical option.

My recent remote operations have been through two stations geared for competitive [contesting](#), but I have also used these stations for casual contacts.

Dave Robbins, K1TTT has a contest superstation in the Western Massachusetts town of Peru. I recently operated this station remotely using [Anydesk](#), a remote desktop application, with [Mumble](#) used for low-latency audio. For further information, see Dave's presentation, [K1TTT Superstation Remote Operation](#).

My other remote operations have been hosted by Tony Brock Fisher, K1KP, in Andover, MA. Tony has a FlexRadio [FLEX-6400](#) transceiver, which has no front-panel controls. Even local operation is done using the [SmartSDR](#) computer app. Rather than using a remote desktop app, Tony has his guest operators install SmartSDR on their own computers to control his radio directly.

I am lucky to have an HF station despite living in a condo, and I even manage to work DX with my low wire dipole antenna on the side of the building. Still, it has been nice to occasionally operate these remote stations with their Big Gun signals.

Most remote operation is done through networking (in the social sense); I know Dave and Tony through the contesting community. There are also commercial options, such as [Remote Ham Radio](#).

If you'd like to learn more about remote HF operating, give me a call on the '64 repeater or email me (eliotmayer@yahoo.com).

A Mobile Fox Hunt as They Used To...

Patrick Whitney, K1PJW

It is without a doubt that automated foxes are a great addition to the hobby but let's not forget the fun and social aspects of having a foxhunt as they used to!

I am organizing a mobile fox hunt for February 19th, from 10am to 12pm. I will select a volunteer to be the fox, and they will "hide" somewhere within the city limits of Waltham. The starting point and frequency will be announced the morning of the hunt.

If you're interested, please let me know. I monitor the 64 and the 075 repeaters during the day and you can email me at pjwhitney@gmail.com.

BREAKING NEWS – A New Fox is on the Loose!

Eliot Mayer, W1MJ

Just in time to make this newsletter, I have completed a recent project... A homebrew 5 Watt fox! I am planning on describing it in more detail in the next newsletter. Keep your foxhunting equipment ready, as I plan to hide it soon somewhere in Waltham!

Waltham A.R.A Repeater

Input	Output	Tone In	Tone Out	Notes
146.040	146.640	136.5	136.5	NAC 293 for P25 use EchoLink W1MHL-R Node: 490278
223.34	224.94	None	None	
444.075	449.075	88.5	None	
902.1375	927.1375	131.8	100	Linked to NEAR 900 Network via IRLP



Club Officers

President – Ron Senykoff (KG1T)

Vice President – Glenn Shiffer (N1GAS) ***pending***

Secretary – Ned Bannon (W1NED)

Treasurer – Rich Comer (K1RBC)

Assistant Treasurer – Eliot Mayer (W1MJ)