

Next Monthly Meeting: Friday October 27 6:30 PM at the MCL Cafeteria in Kettering .
Meeting is always the 4th Friday of the month except for when impacted by holidays

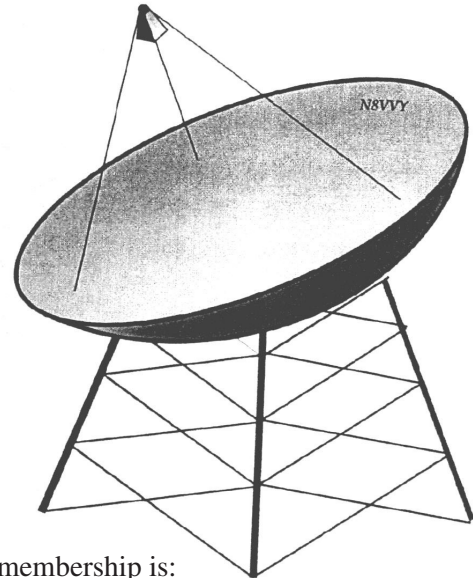
ANOMALOUS PROPAGATION

September 2023

Newsletter of the **Midwest VHF/UHF Society**

Editor: Jim Bacher, WB8VSU

For a Word document template for articles, send a request to Jim (j.bacher@ieee.org) or click on this link to get the Word format Template. Thank you!



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Beacons: 1296.079 W8KSE EM79ur Dayton, OH---- 2W to Big Wheel at 800' AGL.
MVUS Skimmer -. <http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=w8kse&t=de>

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De N8ZM

I do not know about the rest of you, but it just hit me that the Autumnal Equinox is this week! Where did the summer go? Yet it has been almost a month since our MVUS picnic, so it must be true. The picnic, by the way, was well attended by a happy group of folks. Both Bob, K8TQK with XYL Carolyn, as well as Red, W8ULC, made the effort to attend. It has been a long time since either has been able to attend, so it was terrific to get to have both here at the same time. We did some of the usual measurements kind of things, as well as an attempt at some 10 GHz QSO's. Mike, W8RKO, brought his 'white box; 10 GHz rig, and though we tried for reception of several different stations, as well as the KA8ABR beacon, no joy. Mike thinks he has a receiver preamp issue, but has not had a chance to sort it out as of my last conversation with him. But it was still interesting and attracted a lot of attention from the folks in attendance, which was the whole point anyway. Thanks, Mike!

The 2023 ARRL September VHF contest was just two weeks ago, and while we at N8GA have no idea how we did compared to other stations, it felt like a good showing even though the bands did not really open much. There was not as much SSB activity this time, which is the indicator I use for whether there were any serious band openings. We had a decent score, helped along by the efforts of Joe, WA8OGS, and Richard, KC8RK, to produce 5 EME contacts on 432 with their very nice portable setup. Those Q's added about 9000 points to our score! Thanks, guys!

Coming up are the various Fall Sprints on the VHF bands, and then the holidays, followed by the January VHF contest. BRRR!

I seem to have become somewhat the 'go-to' guy for some of the estates of recently SK hams in the area. I do not mind doing it, but I have accumulated quite a bit of equipment and antennas, both HF and VHF, and with the limited hamfests available for me over the summer (I made Columbus, but had conflicts with Cincy and Findlay), the next opportunity is going to Ft. Wayne in early November. I do plan to attend that one on Saturday. However, in the meantime, I would like to find new, loving homes for as much of the gear as possible. I will get a list of the main items together soon, and have our Anom Prop editor, WB8VSU, mail it to the MUS list. If you are looking for something, let me know, as it cannot hurt to ask if I have it. There are a couple of VHF/UHF SSB rigs in the mix, by the way. You can email me at n8zmtwh@mymetronet.net.

Our next meeting is 9/22/23 at the MCL. Hope to see you there.

de N8ZM

Building a Prototype Rover from Scratch

Author: Ethan Miller, K8GU

This article will probably be a little unsatisfying since it's not a complete roving adventure. But, I thought it would be good to walk through my recent first-time dry run as a novice rover builder. At my previous location in FM19, I had a pretty good horizon in all directions with scattered trees and sparse houses. Combined with the high population density up and down the East Coast, it was a good VHF location. I had 5 elements and 500 W on 6, 9 over 9 and 100 W on 2, and 15 elements and 100 W on 432. I never entered any contests seriously, but I had fun. My present location between Centerville and Kettering, OH, in EM79, has good topography to the West, adequate to the South and East, and Mount Kettering to the North; but, it also has lots of dense mature trees. I have always been intrigued by VHF roving and have followed the handiwork of Brian, ND3F/N3IQ, who lived near me in FM19, as well as the Grid Pirates, especially Terry, W8ZN, and Andy, K1RA. This article describes a rover set up that should balance performance, economy, and convenience. It is not directly duplicable without suffering on the latter two metrics and the former would suffer from not using the latest hardware. Take it as inspiration and hints for your own projects.

The first problem, of course, was to identify a suitable vehicle. My father-in-law lives about 20 minutes away and has a 1996-vintage Chevy Astro minivan which my wife would prefer he sell to anyone but me. Buying a dedicated vehicle was out of the question in any event. So, I was constrained to use my daily driver 2012 Ford Fiesta hatchback. I've been operating HF from the Fiesta (and a 1999 Escort before that; these are reliable vehicles with manual transmissions and low total cost of ownership) for a few years now and know many of its idiosyncrasies. I also have a trailer hitch (and associated utility trailer) on the Fiesta for those couple of times every year that I wished I owned a pickup truck. That seemed like a good place to attach the antenna mast.

I initially homebrewed a heavy-duty 16-foot telescoping aluminum mast; but, I did not finish the design for the mast mount to attach to the car. While it is certainly heavy duty, it is also heavy and does not always telescope easily, and I worried about it seizing in the field, leaving me, "in a bind" as the saying goes. My brother, ex-KB8YUO, has a neighbor who is both a surveyor and a master thrifter. Several years ago, the neighbor produced two telescoping surveying poles which no longer met tolerance, each about 12 feet tall. These poles already telescope much more easily and have sliding bearings. Although they are smaller and not as robust, this struck me as a good interim solution and I sprung them out of storage at my parents' farm.

A previous HF mobile adventure resulted in a homebrew copy of the Breedlove Machine [1] trailer hitch mounts: a 1 ¼" square aluminum bar with mitered corners to fit in my trailer hitch and accept a pin (stainless hex head screw). I bored two holes in the bar and attached a hefty bracket which Stauff clamps to hold the mast.

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Figure: Rover mast installed with four bands (6-432) at full height.

Among the other difficulties with the telescoping masts is handling a Christmas tree of VHF/UHF Yagi's. The haste of rover setup in adverse conditions invites over-tightened saddle clamps and U-bolts that mar sliding surfaces. I elected to use Stauff hydraulic



Figure: Hitch receiver mount for mast made from telescoping surveying pole.

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routing clamps-popularized by G0KSC and others-instead for the boom-to-mast interface. I rummaged around in my junk “box” and was able to produce a few Stauff clamps of the requisite sizes (1 ¼” to mount the bottom section of the mast to the hitch) and ordered the balance from McMaster-Carr (Note that The Wilson Company [2] is the cheapest and most flexible vendor if you need a bunch of Stauff clamps; I needed other stuff from McMaster and there was negative savings for small number of clamps from Wilson when shipping figured.)

I retrofitted the Directive Systems K1FO 15-element 432 MHz “rover Yagi” I used previously as a fixed-station antenna first. Shortly thereafter, I did an old Cushcraft 11-element 220-MHz Yagi, which seemed to have acceptable SWR at 222 MHz. I have a 6-element WA5VJB “Cheap Yagi” for 2 meters that I built hastily and pushed up along side my



Figure: Boom-to-mast bracket with Stauff mast clamps.

chimney with a TV rotator when we lived in Silver Spring, MD. It works well, but it was made from ⅛-inch rod and is definitely not road-worthy. L. B. Cebik, W4RNL (SK), has an article on a 6-element OWA for 2 meters that I thought would be a good rover antenna [3]. OWA designs are flexible for either FM or weak-signal and are fairly robust to detuning from weather and nearby antennas. Turning to my stash of aluminum, I found the FM elements from one antenna from my M2 2M9SSB stack. Cebik used a PVC boom, which in my experience is both a pain and looks like Hell, although it is cheap. So, I investigated conductive boom compensation and it seemed that once you get about one element diameter above the boom, the element correction tends toward zero. I found some miniature single-hole Stauff insulators (in the junk box again, [4]) that seemed to fill the bill, although they were for ¼-inch diameter tubing and 3/16-inch rod elements. I ended up shimming them with electrical tape. Menard's [5] still has a relatively attractive price on 1-inch square aluminum boom material for small VHF and UHF Yagi's. At this point, I only needed a reflector...ordering 3/16-inch 6061 or 6063 rod is possible, although shipping costs make small quantities prohibitive. Tom, N8ZM, hooked me up with a couple of 6-foot pieces...enough to build a stack of these antennas if I can find some more M2 elements to cannibalize. This left 6 meters...

Despite the fact that Force12 founder N6BT is fond of pointing out [6] that going from

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a dipole to a 2-element Yagi is the single biggest antenna gain you can achieve in ham radio, I elected to repurpose the driven element from a small, but heavy and hastily constructed homebrew 6-meter 2-element Yagi as my 6-meter antenna. All four antennas were fed with RG-213. I like RG-213 because it's flexible and doesn't use dissimilar metals like LMR400. The 6-meter antenna will be one of the first to receive an upgrade.

In the spirit of keeping costs down (or focusing on adding capability), I wanted to use radios I had on-hand. There were really two (three) viable configurations centered around my three primary HF transceivers: My present HF mobile setup employs a Kenwood TS-50S; so, no VHF/UHF built-in. My primary HF station is an Elecraft K3 (+internal 2m transverter) and K2. I also have a decrepit Icom IC-290A 2-meter all-mode and transverters for 6 (Homebrew), 222 (Downeast Microwave), and 432 (Microwave Modules), all configured ("the right way") for low-drive, split-IF...this rules out the TS-50S. I built both the K3 and K2 from kits and "future-proofed" them for VHF work by installing the low-level transverter interfaces. I like having 100W on 6 instead of 10-15W (I sold my companion Mirage 6m amp when I bought the K3) from my homebrew transverter and a Labor Day trip (during the good tropo conditions we had then) to EN91 with the IC-290A proved it too unreliable for this. So, I chose the K3, which involved completely dismantling my HF setup...this is a future to-do list item, probably involving buying another K3 or two.

The next task was to integrate everything. I had recovered a nice pallet with an OSB top when a server rack was delivered at work a while back. I sawed the OSB into 1-foot squares to create shelves for each of the 2-meter and 432 Mirage bricks and the 222 and 432 transverters, as well as the switch box. Then, I measured the hatch in the Fiesta and figured at 32 inches, I was good to go. So, I cut four posts from 2x3 lumber and slotted them on the table saw to accept the OSB shelves. I assembled everything in my hamshack and took it out to the car...due to the dome of the roof, it only fit in the center of the hatch with the wider of the two back seat sections folded forward. Ooops. But, by this time it was Saturday morning of the September VHF contest and I was determined to get on the air. So, I squeezed into the back seat and propped up the K3...clearly, I was not going to be doing any actual roving.

A word about power: I have a 20-Ah LiFePO4 battery in a Harbor Freight ammo can that I use for mobiling and portable/back up power. This is my initial power unit for the rover. The intent of the shelf in the car's hatch is to provide space to eventually build a set of "battery pens" on the floor with 2-4 deep-cycle AGM (or even lithium, but probably the cheaper chemistry, for my purposes) batteries to keep everything up and running.

I initially set up without a computer, just a hand mic and portable key (resulting in more QSD than normal) on Saturday afternoon. This was an exercise in frustration as I only heard a few syllables on 2 meters and nothing on 6 meters. There were occasional signals on 50.313 and 144.174; so, I pressed an old ThinkPad into service on WSJT-X on Sunday and managed to make a few QSOs. After I hibernated the ThinkPad once, it completely lost its audio settings...and I reverted to the fruitless CQs on the analog



Figure: Equipment “rack” shelves.

modes. Having been now 5ish years since I operated a VHF contest on a band other than 6 meters, the world has clearly changed for the digital. Future iterations of the configuration will emphasize a (more) bulletproof digital setup.

Speaking of future iterations, the next step is to trim the equipment rack so it fits to the narrow back seat (passenger) side. This will keep the rack out of the rearview mirror, enable it to be tied down to the car body to improve stability while in motion, and provide the operator a little more space in the back seat. Then, an operator’s desk will be fashioned to hold the K3, W2 wattmeter head, paddles, and computer, and protect them from sliding around while the car is in motion. Longer term, a new 6-meter antenna (either a Moxon or Omni-Angle loop) and possibly a second 6-element OWA for 2 meters are in the works, as well as additional bands. I have an Analog Devices ADALM Pluto and the filters, amps, and antennas to add 903 and 1296 already. It’s “merely an integration activity” at this point, meaning months or years of effort.

As far as activity, I hope to get out to a hilltop for one of the Fall sprints or maybe a 222 Tuesday night to keep wringing out the station before January I’d love to get some suggested rover stops around the EM79/EN70/EM89/EN80 grid corner, which is only about 45 minutes from my home. The EN80/EN81/EN90/EN91 corner is close to my brother and parents; so, those eight grids are good candidates for early rover runs.

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2. Wilson Company (Stauff clamp vendor):
<https://www.wilson-company.com/departments?Filter=department.clamps/product-type.stauff-standard-clamps/>
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See also: QEX article
4. Miniature single-hole “Stauff” clamps used on the 2-meter Yagi:
<https://www.mcmaster.com/products/routing-clamps/chemical-resistant-plastic-routing-clamps-8/>
5. Boom material for W4RNL OWA Yagi:
<https://www.menards.com/main/hardware/sheet-metal-rods/hillman-reg-aluminum-square-tube-16-gauge/11391/p-1444432420777-c-9215.htm>
6. Schiller, Tom. *Array of Light*, 3rd ed. Self-published. 2012.
<https://n6bt.com/on-line-check-out-cart>

MVUS Picnic And Annual Meeting

Tom Holmes called the meeting to order at 3:00 PM Saturday August 16, 2023.

First Item was given away some items, including books and other items.

Elections were held, current officers were relected

Discussion of Fair Radio

Discussion of the upcoming ARRL September VHF contest

Meeting was closed aboutr 3:30 PM

