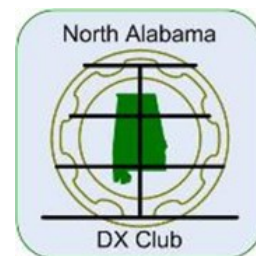


The LongPath

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Antenna Supports Special Edition: Member Tips, Reviews, and Experiences

From the President

By Bob DePierre, K8KI

How lucky we are to be engaged in a hobby that is currently celebrating one 100-year anniversary after another. It has now been 7 years since the ARRL's centennial. In the years since we have rushed past those of the regenerative and superheterodyne receiver anniversaries. In 1921 station KDKA made the first commercial radio broadcast, and spark began to disappear from the scene. Tubes were expensive, but were starting to appear, especially in the ham shacks of the day. You didn't need tubes for spark-gap, but sinewave-generated AM and CW needed both gain and selectivity. Those characteristics made the regenerative receiver immediately popular, and thus the hams of the day were introduced to the very first high-performance radios. That rush continues today, and I liken those radios to the SDRs of our current times.

It seems a right time to talk about being lucky, notwithstanding the pandemic, discontinuation of DXpeditions and bottom of the solar cycle. You still gotta have hope, but these three scourges appear to be ending. And we have a hamfest coming up – how glorious! The first big hamfest in the world in almost two years – and it's going to be right here! I'm ready. Health has hammered my body pretty hard over

the past two months, so I'm liable to need several of you to hold me on my feet.

A significant anniversary for me – it was exactly 60 years ago that I graduated from grammar school. My dad, fearful that I was really planning to become a professional athlete, took the opportunity to present me with a Knight Kit Span Master regenerative receiver kit – complete with soldering iron. That was a life-changing event for me, no matter that Dad was a far better judge of my athletic abilities than I was. I decided, here at 13 years old, that I'd rather design radios than play for the White Sox. A much better idea.

Last week's Field Day will be a prime discussion subject at our meeting. A long list of observations really got my attention – and all of them were good. I don't have enough space here, but I'll make time at the upcoming meeting.

We'll have a special presentation from Tim Duffy/K3LR at our next meeting. Tim arguably owns/operates the best antenna farm in the world, and must win a dozen major contests each year. Tim is currently the CTO at DX Engineering. Our connection with him will be via Zoom. His subject will be anten-

From the President (continued)

na theory and construction of yagis at K3LR. I'll try to run the meeting this time, so I'll need some assistance from a webmaster of sorts, who can lend help with a hotspot if needed, or from someone who can run Zoom from a home router using my sign-on.

So, let's meet for the next NADXC club meeting on Tuesday, July 13, at Newk's Eatery on University. We had no trouble with Newk's internet connection last time, so Zoom will (hopefully) be up and running early. The sign-on will be exactly the same as in the past. I'll send members the Zoom invitation on Sunday just before the meeting. We'll also go back to the old schedule: dinner sometime around 5:30; meeting starting at 6:00, and the program a little before 6:15.

VP Corner: Amateur Equipment Availabilities

By Steve Molo, KI4KWR

Thought I would do an article on how COVID-19 has affected amateur radio on this end, the Dealer. Over a year ago inventory in both the computer and amateur radio were strong with buyers for radios and accessories. Then you throw in the computer side with schools going virtual and the needs for computer and those applicable accessories we provided what we could. Thru 2020 at times items started to lead to longer backorder timeframes but manageable. The Holidays arrived and still items were available, but backorders were inevitable.

Then we begin with 2021 and my first major event is always Orlando Hamcation which is early February and has been cancelled, so no seeing faces from around the United States and South America. Though this event was cancelled I attended the same weekend the Vero Beach Hamfest in Florida and still saw new faces and same old too. The question was present then and still now...where product is. What many and I mean many do not realize was the fire overseas at a chip manufacturing plant halted production of electronic equipment and much more. The affect was not seen as bad initially, but the affects were starting to be felt and seen. Delays of manufacturing of radios were being seen not from just the main three ICOM / YAESU and KENWOOD but no video cards, motherboards, and the ever so popular Ford F-150. Yes, it is true that Kentucky Speedway inside and out is full of F-150's waiting for a chip; a chip yes no joke.

Present day the chip shortage is present with no end in sight. So that IC-7300 you are wait-

ing for; I cannot honestly give you an estimate time for arrival to me. Same goes for computer items also. My goal always is keeping you updated as much as possible, but it has not been easy on the Dealer end with product availability. Don't fear.... though you do not have yet what you desire; come to the next best thing and visit the hamfest where not only can you see the item on display but talk with the manufacturer directly here the same. Field Day weekend I was asked over 30 times at all three locations about stock availability and the so popular Kenwood product line which is now HF radios only. You heard it from me, so it is true.

We will always strive to provide the best products on the market for your ham radio and computer needs just understand we are constrained like all other stores with the same items.

- Steve KI4KWR, Gigaparts Brand Manager

Upcoming NADXC meeting:

Tuesday July 13th, 2021

5:30 PM Dinner

6:00 PM Business Meeting

6:15 PM Program

Location: Newk's and via Zoom

Lightning Does Strike Three Times in the Same Place

By Steve Werner, AG4W

On June 21, 2021 I had my third major lightning strike. I knew immediately I was in trouble due to the large thunderclap you recognize after your first direct hit. It is amazing I went 47 years in ham radio before my first lightning damage. Two of them including the most recent one I filed an insurance claim.

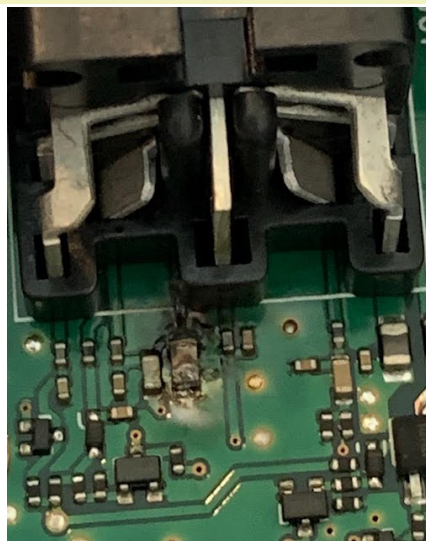
Each lightning strike I learn some lessons. After the first one in 2012 I totally changed my approach to lightning protection. I installed a lightning box outside which included lightning arrestors with gas discharge tubes for each of the antennas before they entered the home, and MOVs on control circuits such as rotors and antenna switch boxes. I also made provisions to easily disconnect the antennas inside and the AC lines from the walls. With most storms I also disconnected the rotor control box. I also was able to isolate station ground from the antenna ground outside to prevent ground bounce. I unfortunately did not disconnect the control lines for antenna switch boxes since they are hard wired.

The most recent lightning strike highlighted some other shortcomings to the current station. Although I disconnect the antenna from my DX Engineering 8 circle receive array, I did not disconnect the control cable. Since I had to repair the



Blown capacitors in AG4W's control box

active impedance matching boxes at the 8 foot antennas when I initially got them due to lightning damage, I knew it also destroyed the switch box connecting all eight of them and the control box in the shack. The picture shows the blown capacitors that got damaged this time in the control box. The FETs were blown in quite



Accessory line damage on AG4W's IC-9700

a few of the impedance matching boxes. I have even seen it destroy the transformers in those boxes. The lightning surge from the control box on the BCD control lines went straight onto the station 12VDC power pole bus. That in turn killed almost everything that ran on 12VDC including antenna switch boxes and sequencing for the EME rig which also destroyed the IC-9700 on the accessory line as shown in the picture. The IC-9700 also blew the 25-amp external fuse on the ground side and a 5-amp fuse inside the radio on the positive side. It also blew a high voltage 15VDC 15-amp protection Zener diode. The transmitter also has a major failure.

Another problem was my preamp on the 2-meter EME antenna. It could have been destroyed from the 2-meter antenna and back to the 12VDC power supply, but it showed no black marks on the antenna side. The black mark was again on the 12VDC side. I have previously put black marks on the antenna side before when the sequencing fails, and a kilowatt goes thru the preamplifier. The amplifier works almost as good as lightning destroying things.

Because the ground on the 12VDC ground is also tied to the station ground and the ground on all the AC plugs that were unplugged from the wall, the ground bounce on the AC plug ground destroyed a new HP desktop i7 computer. It was unplugged from the wall since the AC strip was unplugged. The computer destroyed the USB port on the FTDX-101MP that was plugged into the computer. It was interesting that the 8-year-old

Lightning Does Strike Three Times in the Same Place (cont.)

Lenovo desktop, new Dell laptop or old \$200 HP laptop did not die. Even the MOVs did not protect the rotor control box from getting killed. The control plug must be unplugged from the rotor control box to protect the unit.

Even with all the precautions you take isolating the inside equipment from the lightning outside you can't keep from destroying outside equipment and antennas with a direct lightning strike. Because of that you should also review your insur-

ance approach. Although State Farm has done an excellent job with my insurance claim, I have a \$1,000 deductible on my home policy. Going forward I will take advantage of the ARRL insurance with a \$50 deductible. It is \$1.40 per \$100.00.

I can also tell you each time it is a very difficult task to rebuild your station. You can also have to contend with additional damage to other things in your home. Even my fireplace didn't work after the first lightning strike. It is also very common to destroy TVs and telephones. I also now appreciate that I only have antennas that peak out at 58 feet. It is interesting that the active 8-foot ones caused the major damage this time.

ARRL Equipment Insurance

By Steve Molo, KI4KWR

Recently I have been working with the GigaParts Tech Room on one of our own members loss in equipment from a lightning strike. With everything brought it the value is over \$10,000 in damaged equipment. While in the Store I asked the question likely knowing the answer already; Do you have ARRL Equipment Insurance. The answer was no so I explained it briefly to him and will also share this on the LongPath too. Everything about the Insurance is online at <https://www.arrlinsurance.com/> ... check it out. I have a Policy and so do many of my DXer's in the US.

ARRL Insurance Program Coverage Highlights

- Property Covered: Ham radios and related equipment including computers!
- Deductible: Only a \$50.00 deductible applies!
- Competitive Rates: Minimum premium of only \$20.00!
- Computer Equipment: Computers, hard drives, printers.
- Theft from an Unattended Vehicle: Included with your premium.
- Coverage for towers & antennas up to \$15,000.00 replacement cost!
- A great rate of \$1.40 per \$100 of equipment covered!

Insurance Plan Coverages

- All Losses are settled on a replacement cost value. (Replacement cost is the full cost to repair or replace the damaged property or actual cost to reproduce property with other property of equivalent kind and quality).
- Deductible of \$50 per claim.
- This policy is designed to protect the following described property against all risks of direct physical loss or damage subject to policy exclusions.
- Property Covered: Equipment coverage for ham radios including accessories, antennas, rotators and towers; data processing systems, computers and component parts; data and media.
- Where Covered: Coverage applies to covered property Worldwide

Frequently Asked Questions

What coverage is provided in the ARRL Insurance Program?

Coverage is provided for ham radios including accessories, antennas, rotators and towers; data processing systems, computer and component parts; data and media. Towers and Antennas are eligible to be covered up to \$15,000 per policy

ARRL Equipment Insurance (continued)

period.

When does coverage begin?

Coverage is effective on the proposed effective date if premium payment is received and the proposed effective date is approved. Coverage cannot be retroactively put in place. Use today's date or later only.

Will I pay in advance or when the policy goes into effect?

You can pay either in advance or before the effective date of the policy. Payment by credit card and electronic check is accepted.

Who is the insurance administrator?

The ARRL Insurance Program is administered by Risk Strategies Company. The Risk Strategies philosophy of delivering highest-quality, customer-focused service has led to significant growth and recognition for Risk Strategies Company. Today the company has more than 400 experienced professionals and over 15 locations throughout the United States. Risk Strategies Company is in the top 30 brokers in the United States.

Must I list all of my Ham Radio Equipment?

The low rate and low deductibles are based on insuring all of your Ham Radios. You do not have to include coverage for all related equipment such as computers, but if you schedule them they will be covered at the same low policy deductible.

Does my existing Home Owners Policy cover my radio equipment?

Your Home Owners policy may cover equipment but on a limited basis and with a much higher deductible, usually at least \$500.00 or more.

How do I determine my Equipment Values?

You should use the full replacement cost as the listed value for all equipment.

How do I determine Replacement Cost?

Replacement Cost is considered the full cost to repair or replace any lost or damaged property, or

the actual cost to reproduce damaged or lost property with property of an equivalent kind and quality.

What are my payment options?

You may pay by credit card or electronic check online. We do not accept American Express.

Can I cancel my current Policy or must I wait until renewal?

You can cancel your current coverage now or wait until renewal time to purchase replacement coverage in the ARRL Plan. If you wish to replace your coverage midterm, you may be eligible for return premium on your current policy.

How do I report a claim?

Claims are reported to:
Risk Strategies Company
333 W. Wacker Drive, Suite 1200
Chicago, IL 60606

(866) 819-0209 (Toll Free)
(847) 501-2563 (Fax)
cludewig@risk-strategies.com (Email)

When filing a claim, you simply include a copy of your Proof of Loss and the replacement cost.

How do I receive payment for a claim?

The claims department at Risk Strategies will assist in making claims payments with the Insurance carrier, Hanover Insurance Group.

Who do I contact if I have questions about my coverage?

For questions about your coverage, please call the ARRL Insurance Program, at 866-819-0209 or email us at cludewig@risk-strategies.com.



Ionospherica

By “Kai” Siwiak, KE4PT

Ground Influence —

It's *not* a property of the antenna

We hear much chatter about this or that antenna having “a low take-off angle”, or superior “take-off angle performance”. There are two major flaws with such statements. First, for elevated antennas that hams use at HF, there is precious little that the antenna designer can do to influence the elevation pattern of an antenna, other than to change the directive gain. Second, the notion of *one* or a “take-off angle” is deceptive. The full set of “take-off angles” of an antenna is otherwise known as the *antenna pattern*. Furthermore, the ionosphere chooses the appropriate elevation angles to the DX, not your antenna.

Wait! What's that about that take-off angle again? There is not *one* but a *full pattern* of them. Antennas radiate at *all* angles for which there are no nulls. The antenna designer's task is to produce an antenna with a free space pattern that has no nulls in directions of interest for DXing.

Antenna “New Math”

To find the antenna pattern in the presence of a ground, take the free space pattern of your antenna, like the two element Yagi antenna in Figure 1, and multiply, angle for angle, by the interference pattern of a point source at a height H above the ground.

The influence of the ground can produce

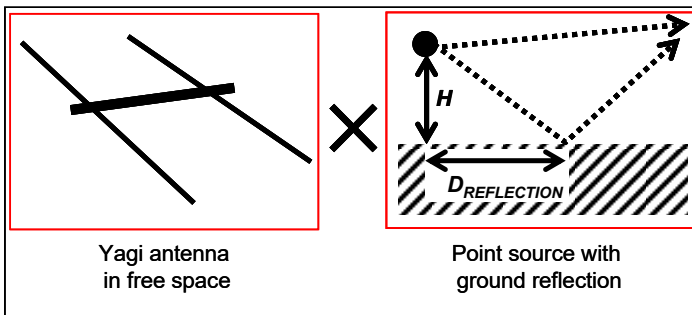


Figure 1 – The elevation antenna pattern is the result of multiplying the antenna free space pattern by the pattern of a point source above ground.

plenty of *additional nulls* – and it is *only* the height above ground that determines at what angles these additional nulls will occur. Once again with feeling, the nulls created by ground reflections have nothing to do with the antenna itself.

“New Math”? Not at all. Search for “pattern multiplication” or “pattern synthesis” with your browser or in your favorite antenna textbook. My favorite is *Antennas* by Prof. John D. Krause, W8JK.¹ The bottom line is “once a null, always a null” whether that null is created by the antenna pattern or by the ground-induced interference pattern. In the composite pattern, it remains a null.

Ah, but do we have any control over the ground-induced nulls? Yes, we do!

Antenna in “Free Space”

View the antenna pattern in free space (Figure 2) to verify coverage at angles of interest to communications. For DX, we care about elevation angles ranging from 3 to 20 degrees, or higher angles if we expect NVIS (near vertical incidence skywave) performance.

You will not recover gaps or nulls in the antenna free space pattern coverage (like along the x-axis in Figure 2) from ground reflections. This is an important concept to grasp.

Influence of the Ground

The ground effects antennas and antenna patterns in two completely independent ways. First, for low antennas, the ground may influence the feed-point impedance of the antenna. This is strictly a mutual coupling effect with the ground *directly under the antenna*. The feed-point impedance change due to mutual coupling has no effect on the antenna pattern. *None!*

Second, the reflection from the ground combines with the direct signal path from the antenna (right half of Figure 1). This reflection occurs far from the antenna for useful elevation an-

Ionospherica (continued)

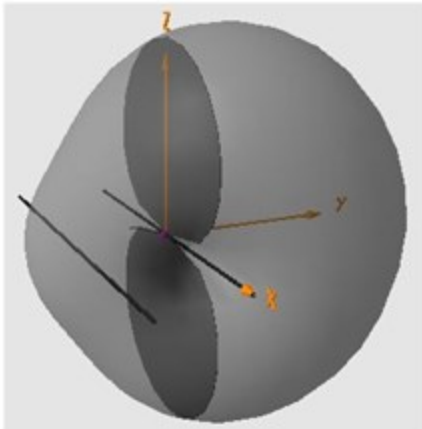


Figure 2 – 3-D pattern of the Yagi antenna in *free space*. The angular coverage around the y-axis direction of maximum gain is complete for all angles of interest.

reflection for an antenna up 70 feet occurs 1283 feet away from the antenna – this is definitely not under the antenna!

gles.

$D_{REFLECTION}$ is the distance from the antenna to the reflection region,

$$D_{REFLECTION} = \frac{55H}{\theta_{DEGREES}}$$

H is the antenna height above ground, both in the same units, and $\theta_{DEGREES}$ is the pattern elevation angle in degrees. So, at an elevation angle of 3 degrees, the

To obtain the antenna pattern over a ground (right column), multiply the free space antenna pattern (left column) by the interference pattern of the point source above ground (middle column). In an earlier Ionospherica we saw that an optimum antenna height for DXing is about one wavelength for horizontal polarization, but here I chose outlandish heights to more clearly illustrate the physical principle.²

You can generate a lobe closer to the horizon by increasing the antenna height, but it is at the cost of placing one or more nulls in the desirable 3 to 20 degree elevation range. Note that there is always a ground reflection null at the horizon for an elevated antenna.

Recap

The elevation angles to DX stations are determined by the ionosphere and the distance to the DX station. Your antenna, and its placement at a proper height will determine whether you are coupling signals at proper angles needed for ionospheric propagation.

References

1. J. D. Krause, Antennas, McGraw-Hill, 1950.
2. K. Siwiak, KE4PT, "Ionospherica, Pitching and Catching Radio Waves", QRPQ Vol 54 No. 2

Kazimierz (Kai) Siwiak, KE4PT, is an avid DXer who packs a DX Go-Bag station on his travels.

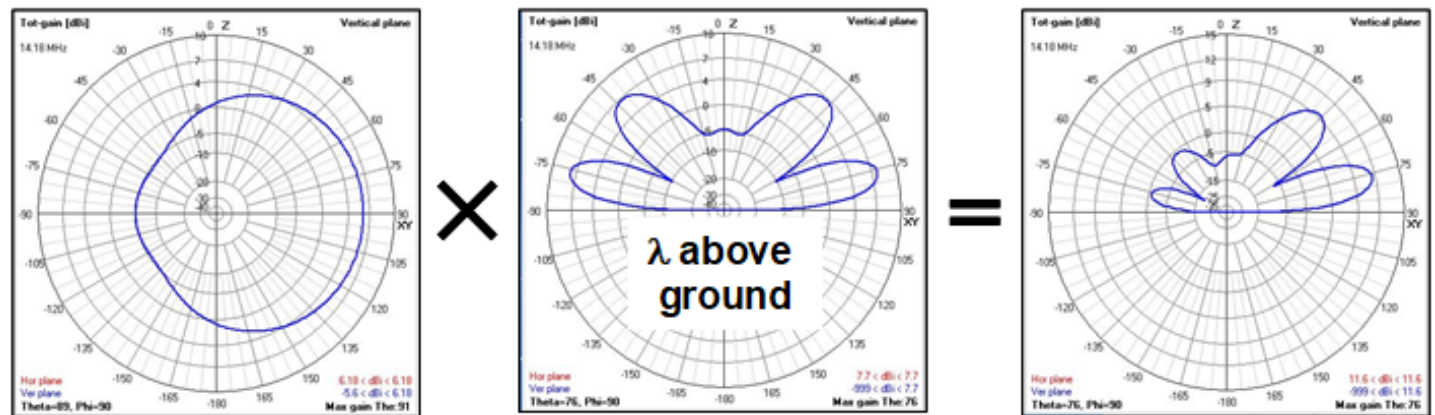


Figure 3 (continued on next page)

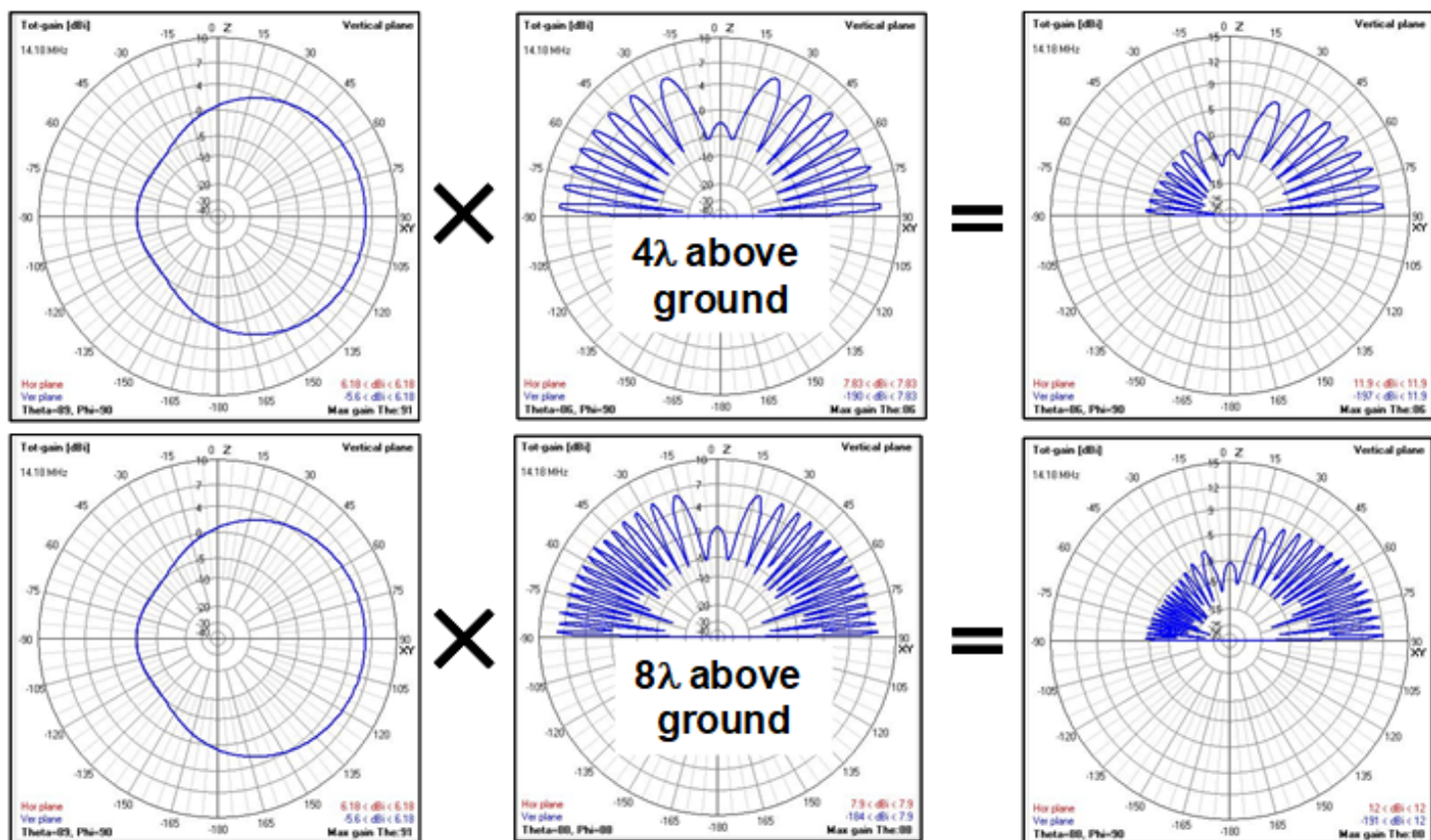


Figure 3 — Left: *free space* Yagi antenna elevation pattern. Middle column: this is how the ground influences *any* antenna at various heights (shown in wavelengths, λ). Right: product of the Yagi antenna pattern and the ground influence pattern. Patterns were produced by 4nec2 [Ari Voors, www.qsl.net/4nec2/] using medium ground parameters.

The KM3GWR FD21 Adventure

By Fred Kepner, K3FRK

A few years back, I formed a radio club with a couple of buddies. The club is the 3 Guys with Radios ARC, KM3GWR. We generally get together for Field Day, Winter Field Day, and a few random events. A couple of years ago we decided that we wanted to activate an island under the US Islands Program (<https://usislands.org/>). The plan didn't go very far because Scott, KJ4MFW, took a new job and moved to Missouri. Although Scott left, the club didn't die. We met Scott in Illinois for Field Day last year and had a ton of fun working from our campsite. This year, we decided to give our island qualification a try. An island qualification occurs when an individual or group makes 15 contacts from an island that has never been qualified before. After an island has been qualified, it

can be “activated” again but it can only be “qualified” once. The callsign of the qualifier is forever listed with the island in the US Islands database. We determined that Field Day was an opportune time to try to get the necessary contacts because many operators would be on the air.

The first step was to find a body of water approximately halfway between Scott and the rest of our crew, myself and Wil, AI4QT. We identified Lake Wappapello in Southeastern Missouri. We then checked aerial maps for islands that met the program requirements for island size and distance from shore. We found two large islands, side-by-side on the lake. The islands had primitive campsites that were managed by the Missouri State Parks system. We gathered the necessary

The KM3GWR FD21 Adventure (continued)

information and submitted it to the US Islands Qualification Manager for approval. Once the islands were approved, we picked two campsites, one on each island, that were strategically located to allow easy access by boat while maintaining line-of-site between the two campsites.

The next step was securing a boat. Although there were 3 marinas on the lake, 2 were not renting boats due to COVID concerns. We promptly reserved a large pontoon boat from the only operating marina.

Over the next few months, we developed a plan for our activation. That plan, however, changed dramatically in June 2021. In June, we learned of the creation of Boats on the Air (<https://boatsontheair.com/>). Boats on the Air involves activating...you guessed it...a boat! Since we would have a boat, we jumped at the opportunity. We registered with BOTA and started planning.

The plan we devised was for Scott (KJ4MFW) to drop Wil (AI4QT) on one island, drop me off on the other island, and then setup his HF



AI4QT on Dry Cut West Island

radio and log QSOs from the boat. The plan worked great. Wil operated his Icom IC-705 with an end fed antenna on Dry Cut West island and I setup on Dry Cut East. Scott operated his Icom 7100 from the boat on a hamstick. He quickly managed to log the required 4 QSOs plus a few more, all while constantly adjusting the boat as it drifted in the current. The anchors on our rental boat were mostly useless.

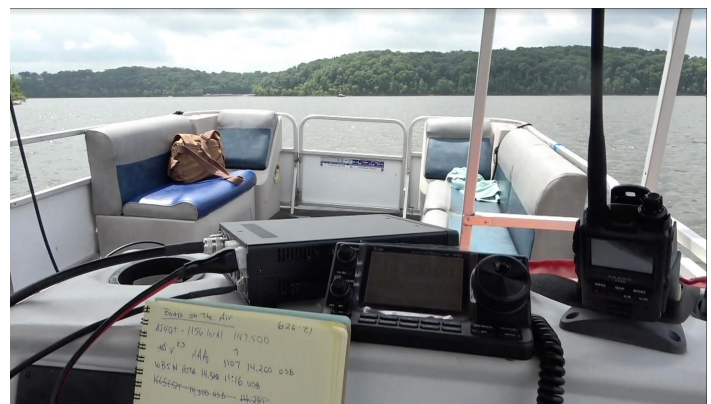
While Wil (AI4QT) and Scott (KJ4MFW) operated from batteries, I used a small inverter generator. I have a "go box" setup for my Yaesu FT-991A. I set it up on Dry Cut East and used an Alpha FMJ vertical antenna. I picked up the antenna from the eHam classifieds a few months back and quickly learned during my practice sessions that it needed some work. I added a ground and 4 long counterpoise wires, and the improvement was remarkable. I ran 100 watts SSB and 30 watts digital from my FT-991A. Although I didn't work a lot of "DX", I did work quite a few Canadian stations on FT8 and even made 4 SSB contacts with Canada on the crowded Field Day bands.



We managed to log more than enough QSOs to qualify both islands and had a blast doing it. Although we each concentrated on a separate activation (two islands and the boat), we all worked together to plan, setup, tear down, and nail out the final few QSOs for the last activation. This was a Field Day that I will always remember. I'm not sure how we will top it next year, but we've already started thinking about it.

[AI4QT's FD21 Video](#)

[KJ4MFW's BOTA Activation Video](#)



KJ4MFW's operating position for BOTA

My Views on Antenna Tuners

By Bob DePierre, K8KI

We never had boxes called “antenna tuners” until no-tune solid-state rigs came out in the late 1970’s. I went out right away and bought a Dentron 300W model to protect my Drake B-Line Twins. I thought it was great. Of course, I had an untuned dipole whose impedance was likely somewhere north of 300Ω.

Tube rigs always had π or π -L tuning networks. Those networks were supposed to take about 3kΩ at the plate and transform it to about 50Ω at the SO239 connector. They had two controls – a TUNE knob to resonate the circuit (as determined by dipping plate current), and a LOAD control to match the line impedance. That LOAD control was your antenna tuner. We had no idea what the SWR was, but we didn’t care, so long as the plate current was ok. And truly, we were ok. The actual SWR didn’t matter much since the LOAD control could keep everything happy.

Back in the mid-70s, few of us had SWR meters. Then solid-state rigs started to appear, and we got deluged by the new SWR meters. Those new solid-state rigs had no output tuning controls, while the old tube rigs did. They couldn’t push much power down a mismatched line, but they could with an impedance tuner. Then, as now, transistor output stages could automatically set the output power back upon detection of too much reverse power. Overnight SWR became the

talk of the day. We were flooded by SWR meters and now “antenna tuners” with integral SWR meters. We, and I, became greatly concerned about SWR, and even used them with our tube rigs. I got one to protect my Drake TX4B. Even today I wonder why I ever did that. I was confused since I didn’t seem to get any more power out with that tuner. It was another 15 years before auto-tuners became available, and ten years after that you could find them integral with the rig itself. When that happened, I became obsessed with auto-control of my entire station. I wanted auto antenna selection as well as auto-SWR tuning. Finding components today is not hard, but it does impact the architecture of your station setup. I never found an auto-tuner that would work at high power and automatically switch to the proper antenna.

I made my decision on station architecture early. I have never liked the high-power antenna tuners, although I must admit they do work as advertised. I have always preferred resonant antennas that would always present fairly low SWR on any frequency. The auto-tuners available inside rigs or amplifiers have never had the capabilities of stand-alone tuners, but that wasn’t particularly important to me since I used only resonant antennas that didn’t have particularly bad SWR. If one of my antennas had poor SWR, my fix has always been to fix the antenna and not get a better tuner. 80m has always been my bugaboo: how do I get

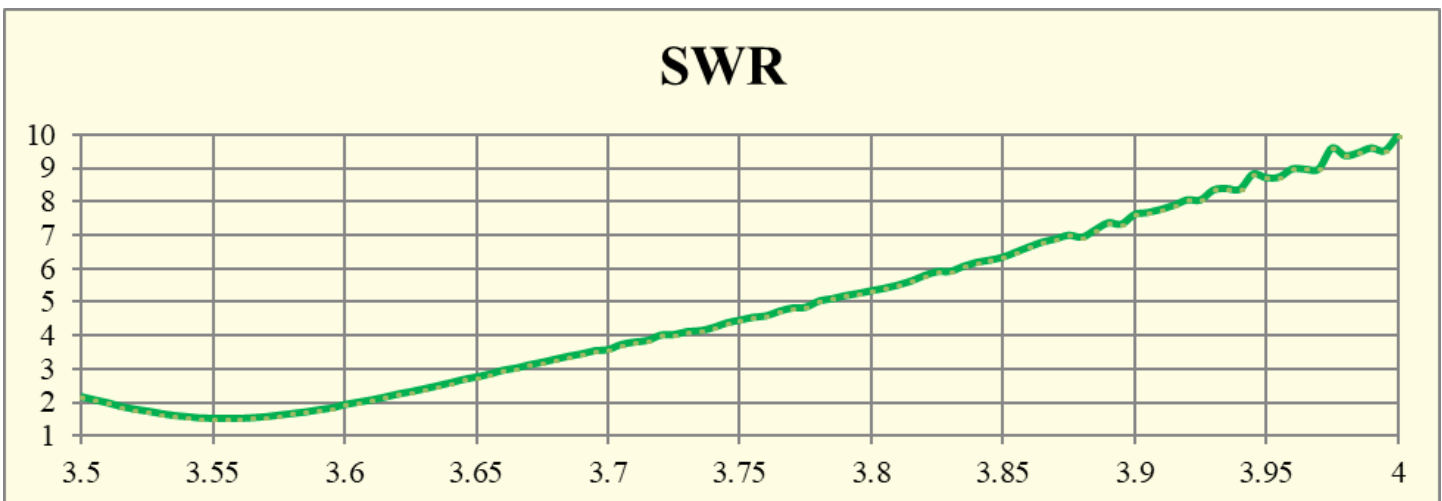


Figure 1: SWR curve of K8KI's 80m antenna

My Views on Antenna Tuners (continued)

reasonable SWR across the entire band?

For years I searched for ways to widen the SWR range of my 80m antenna. I found it a couple of years ago in the SimSmith program by AE6TY. With this program you can design an antenna tuner at the shack end of your transmission line.

Here's the SWR curve for my 80m antenna. It looks like virtually any 80m antenna, with a SWR minimum in the region where I prefer to operate. Trying to operate in the phone region is a virtual joke – the SWR is too high to even consider – with any tuner. Then SimSmith came along. The Figure 1 SWR curve was generated from my Rig Expert antenna analyzer. I fed its data to SimSmith. Its trace is in pink in the Smith chart below. I drew SWR circles for SWR of 2:1 and 3:1 as shown. You can see that the SWR is below 2:1 for the region just below 3600kHz, which matches what you see in Figure 1 (previous page).

I tried to build an antenna tuner that would give me an acceptable result. Most everyone would try to get the trace to run through the center where SWR=1.0. I didn't do that. I preferred instead to get as much of the curve as possible to

fit inside the 2:1 SWR circle, which would give me a much wider workable bandwidth. If I could do that then I could let my "less-capable" auto-tuner do the rest of the job, and my auto-tuner wouldn't have to be saddled with a 10:1 problem, but rather with a 3:1 problem at the top of the band. The blue trace in Figure 2 was my solution. The glorious part of that solution was that it only required a single capacitor right at my station

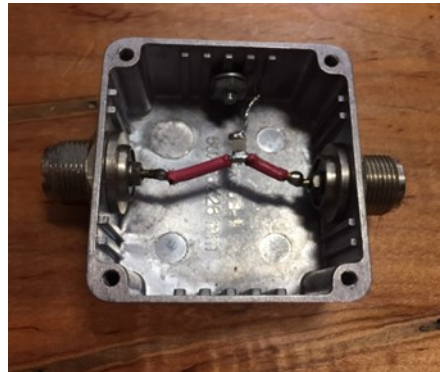


Figure 3: The single capacitor solution

(Figure 3). The cost of the entire assembly was only a few bucks. It was designed to take a full 1500 watts from my amp at any frequency in the 80m band. You can read more about this in my article from the May 2020 issue of QEX magazine.

So, this has long been my approach to managing my antenna tuner: keep ALL of my antennas within reasonable SWR so my less-capable auto-tuner can handle ANY job I give it. Now I've got an hf transceiver (100 watts) with its own auto-tuner (Flex 6500), and a couple of amps with auto-tuners. My "winter" amp is an Alpha 9500. It has my required 4-port automatic antenna switch and an auto-tuner. It has a 3CX1500 tube and an output stage structured like any other tube amp. But it's an auto-tune device. Yet with that π -L output stage, you don't tune for minimum SWR. It's just like tuning with my old Drake T4XB. You dip the plate current, then set the plate current with the Load control, except that there are no tuning controls at all, just a button. I haven't found an antenna it won't tune – on any band.

My "summer" is a SPE Expert 1.3k-FA. It has an automatic antenna tuner that actually does look for mini-

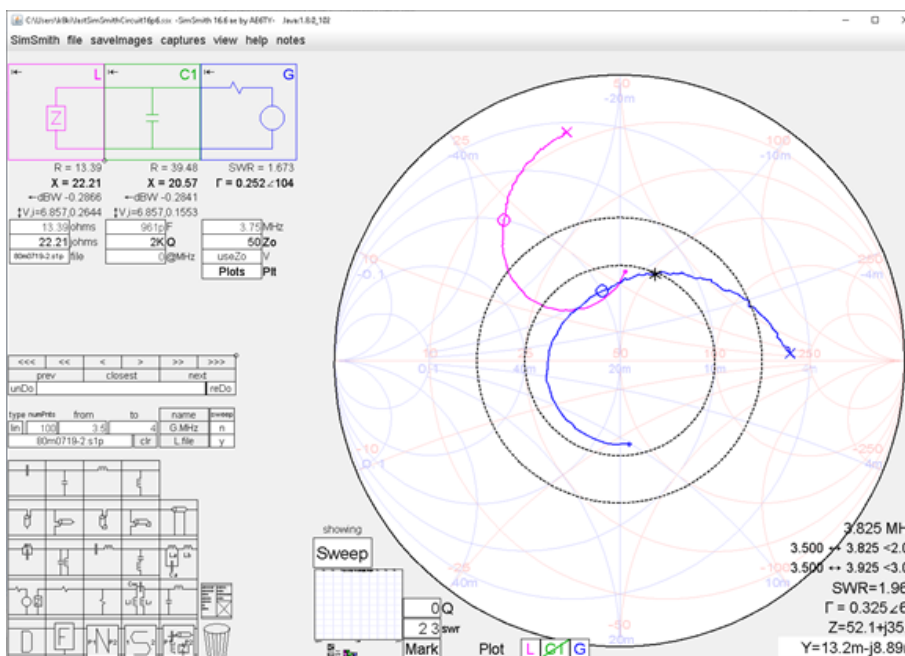


Figure 2: SWR curve of K8KI's 80m antenna after homebrew fix

My Views on Antenna Tuners (continued)

mum SWR. Otherwise, it is a broadband amplifier. When contest season arrives in late September, I pull it out and replace it with the Alpha. Both amps fit nicely with my 4 antenna cables, so they're sorta plug and play with my system.



Alpha 9500



SPE Expert 1.3K FA

Compare my system to that of AG4W, who wrote an article for last month's issue. I've discussed this philosophy with him for years. He uses a highly modified amp with a 3CX1200 tube. The 3CX1200 is a highly reliable device with a thoriated tungsten filament (instant on) and an indestructible grid. This is no summer amp – that filament gets it real hot. And it's very expensive. But it puts out big power for a long time. The 3CX1200 is at the top of the reliability ratings while my 3CX1500 is right at the bottom. Steve's many mods really bring this beast into the 21st century. It's not auto-tune by any means, and neither is his antenna tuner. His antenna tuner also has the antenna switch, which is also manual.

Hence the difference in our station philosophy. I voted to make everything automatic, while Steve voted for reliable heavy duty. Neither of us voted for compromise at any level. We habitually critique each other's decisions at every level. Each station is fairly complex and takes some understanding. But we both agree that when you finally get to the point where no more modifications are possible, then you die. We'll both be modifying for a while.

K4CNY de K4BAI By Laura Morgan, K4CNY

During the 2019 Huntsville Hamfest, I was manning the door at opening time, equipped with the K4CNY purse that Lisa W3NQL made for me. As one of the many white-haired men passed me in that immediate rush, one said, without slowing his gait, "K4CNY! That was a good friend of mine!" Wait, what? I tried to stop him, but he was gone in the rush of the crowd. I hadn't even gotten a good look at him.

Those who don't know me may need a little backstory here. In early June 2011, Dad N4CNY and I sat at our respective computers—he in Athens and me in Tuscaloosa—as we frantically hit the F5 key on the FCC website and guessed over the phone what my callsign would be. I looked up the callsigns that had been given out that day—KK4CNC, KK4CND, KK4CNE. "What if I end up with KK4CNY?" I thought aloud to Dad. His pride

seemed to grow ever so slightly. When I finally got my call sign, KK4CNO, Dad seemed ever so slightly disappointed (he insists he wasn't). I applied for a vanity and got my callsign changed to K4CNY in time for his birthday that July.

Over time, I'd tried to find out something—anything—about the silent key who had my callsign before me. I know it's a fairly old call, but that's about as far as I've been able to get. At a hamfest, I once found a callsign directory from the early 80s and K4CNY wasn't in it, so I knew he or she died before I was born. But that was it. The only solid lead I'd ever had just walked past me and disappeared. I wandered around the rest of the Hamfest with that purse, hoping that man would see me again and have enough time to chat.

I had all but given up hope when, at the DX Banq-

K4CNY de K4BAI (continued)

uet, an old man walked up to me, introduced himself as John K4BAI and told me that he knew K4CNY. John told me that he's a federal judge in Georgia, so of course we hit it off. K4CNY, he told me, lived in Chattanooga and they frequently talked on CW. A few days later, I received a letter in the mail from John which contained a QSL card from K4CNY in 1959. What a gift!

For the last two years, I've thought this story was over. Then last month, as I was getting ready for Field Day, I decided to flip through the CW bands. I heard a CQ. He was going way too fast for me, but I wanted to see if I could catch his call sign anyway. I'm not sure which bit surprised me more: that I was able to copy it or that it was none other than K4BAI! I don't care how fast he's going, I thought to myself, I MUST give him a chance to talk to K4CNY again. He didn't respond with the expected questions about my name or my loca-

COLUMBUS, MUSCOGEE COUNTY, GEORGIA, U.S.A.

K4BAI

FOC #1121 • QCWA • ARRL • 10-x #45,389

CONFIRMING QSO WITH	DATE			UTC	MHZ	RST	MODE 2-WAY
	DAY	MONTH	YEAR				
K4CNY	22	JUN	2021	0147	7.028	579	CW SSB

SECC • SEDXC
NCDXF • HSC #1671
FISTS #2158 • SKCC #3280
SMIRK #6081 • FP #951
DXCC HR • NAQCC #644
GCG • CW OPS #76
QRP/ARCI #1208 • 4SQRP #1307

73,
John

John T. Laney, III
P.O. Box 421
Columbus, Georgia
31902-0421 U.S.A.
GRID: EM72
Email: k4bai@att.net

KB3FH QSL CARDS

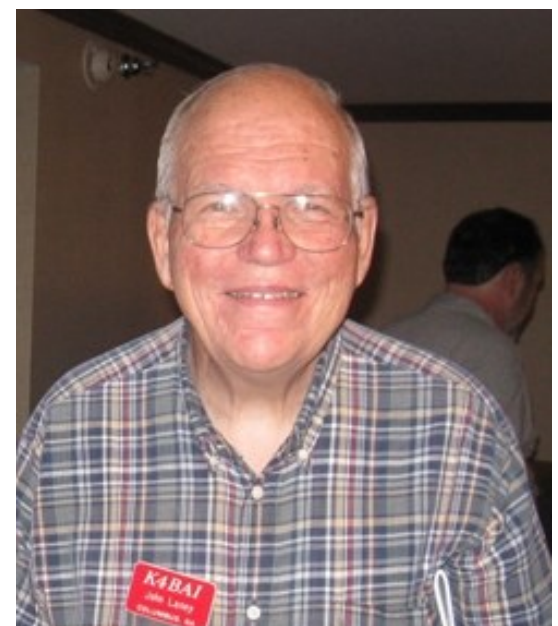
K4BAI de K4CNY

tion, instead I got a paragraph! I asked him to slow down and he sent again, this time close to my pace, but I was so busy laughing at the delightful absurdity that I still could barely copy him. My notes are incomprehensible. But I worked him. The next morning, I sent him a letter apologizing for my terrible CW but expressing how grateful I was to have had a QSO with K4CNY's old friend. I included a QSL card to replace the one he sent me and wrote on it:

"If you meet another K4CNY, please give him or her my highest regards."

Left: The original 1959 K4CNY from K4BAI's collection

Below: K4BAI





Upcoming DX Contests

By Chuck Lewis, N4NM

WAE CW DX Contest, (CW), 80-10 meters

Aug 14, 0000Z to Aug. 15, 2359Z

Exchange: RST plus serial No. See web for QTC rules.

See page 71, August QST and www.darc.de

YO DX Contest, (CW,SSB), 80-10 meters

Aug. 28, 1200Z to Aug. 29, 1200Z

Exchange: RS(T), Serial or YO district

See page 71, August QST and

[Contest Page](#)

SARL HF Digital Contest (DIG), 80-20 meters

Aug. 15, 1400Z to 1700Z

Exchange: RST, serial no.

See page 71, Aug. QST and

www.sarl.org.za

Worldwide Digi DX Contest (DIG) 160-10 Meters

Aug. 28, 1200Z to Aug. 29, 1200Z

Exchange: 4-character grid square + SNR

See: Page 71, Aug. QST and

<https://ww-digi.com/>

SARTG WW RTTY Contest, (RTTY), 80-10 meters

Aug. 21, 0000Z to Aug. 22, 1600Z

Exchange: RST plus Serial No.

See page 71, August QST and

www.sartg.com

SARL HF CW Contest (CW), 80-20 meters

Aug. 29, 1400Z to 1700Z

Exchange: RST, serial no.

See page 71, Aug. QST and

www.sarl.org.za

Keymen's Club of Japan Contest (CW), 160-6m

Aug. 21, 1200Z to Aug. 22, 1200Z

Exchange: RST and prefecture or continent

See page 71, August QST and

www.kcj-cw.com

All Asian DX contest, (SSB), 80-10 meters

Sept. 4, 0000Z to Sept. 5, 2400Z

Exchange: RS plus 2-digit age

See: [Contest page](#)

Russian District Award Contest, (CW, SSB), 160-10 meters

Aug. 21, 0800Z to Aug. 22, 0800Z

Exchange: RS(T), Serial or Russian District

See page 71, August QST and

rdaward.org/rdac1.htm

WAE DX Contest, (SSB), 80-10 meters

Sept. 11, 0000Z to Sept. 12, 2359Z

Exchange: RS, serial no.

See [Contest Page](#)

Note: Beware, dates & times often change or are misprinted in the journals.

DXpeditions in July/August 2021

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July						
2021 Jul01	2021 Jul31	Alaska	NEW KL2A [spots]	See Info	KL2A 20210702	By KL2A fm Airpark Community, Wasilla-Palmer; 160-6m; CW FT8; 100w; vertical dipole; QSL: PO Box 924, Coeur d'Alene, Idaho 83816, USA
2021 Jul04	2021 Jul17	British Virgin Is	VP2V	K3TRM	DXW.Net 20210603	By K3TRM as VP2V/K3TRM fm Tortola; 40-6m; SSB RTTY FT8 + satellite
2021 Jul06	2021 Jul13	Aruba	P44W	LoTW	TDDX 20210630	By W2GD; spare time operation; QRV for IARU Contest, probably CW only; QSL via N2MM
2021 Jul07	2021 Jul12	Alaska	KL7RRC	N7RO	TDDX 20210420	By N7QT W8HC NL8F N3QQ fm Kiska I (IOTA NA-070); 40-6m; CW SSB FT8 (f/h)
2021 Jul07	2021 Jul14	Aruba	P4	ND7J	ND7J 20190722	By ND7J as P4/ND7J and N4IQ as P4/N4IQ; QRV for IARU Contest
2021 Jul09	2021 Jul13	Alaska	KL7	LoTW	DXNews 20210614	By W1AW/KL7 Team as W1AW/KL7; HF; QRV for IARU HF Championship; QSL via W1AW, Club Log QORS
2021 Jul14	2021 Jul16	Alaska	KL7RRC	N7RO	TDDX 20210420	By N7QT W8HC NL8F N3QQ fm Adak I (IOTA NA-039); 40-6m; CW SSB FT8 (f/h)
2021 Jul14	2021 Jul21	Bahamas	C6AYW	LoTW	DXNews 20210703	By WA8Y fm IOTA NA-085 (FL15ha); HF; CW; QSL vi W8AY direct
2021 Jul23	2021 Aug03	St Vincent	J88PI	GW4DVB Direct	DXW.Net 20200727	By GW4DVB fm Palm I (IOTA NA-025, FK92ho); 40-6m; SSB FT8
2021 Jul21	2021 Jul26	Svalbard	JW0W	LoTW	DXW.Net 20210422	By LB1QI LB2HG LA7GIA LA7QIA LA8OM fm Prins Karls Forland I (IOTA EU-063); focus on 40 30 20m; focus on NA and Asia; 1kw; VDAs and verticals nr salt water; QSL via M0OXO; QRV for RSGB IOTA
RSGB IOTA Contest (Jul 24-25, 2021) Check here for pericontest activity too.						
2021 Jul25	2021 Sep04	Azores	CT8	LoTW	TDDX 20210519	By W6PQL as CT8/W6PQL; FT8 on all bands; 20m SSB
2021 Jul30	2021 Sep17	Peru	OA7	DD5ZZ	DD5ZZ 20210622	By DD5ZZ as OA7/DD5ZZ fm Cuzco region; HF; SSB FT8 FT4, perhaps CW; high power; wires; will try to be QRV for WAE and WW DIGI
August						
2021 Aug01	2021 Aug30	Dominican Republic	HI9	eQSL	TDDX 20200206	By HB9TUZ as HI9/HB9TUZ fm Las Terransa; 40-10m; SSB
2021 Aug11	2021 Aug16	Bermuda	VP9EE	OZ2I	OZ2I 20200616	By OZ2I; CW; QRV for WAE CW Contest

BRITISH VIRGIN ISLANDS



Saint Vincent



Svalbard Islands



Antenna Supports Special Edition: Member Tips, Reviews, and Experiences

Introduction

By Fred Kepner, K3FRK

No matter whether you are a big gun operating from a superstation or a portable operator conducting a remote activation, your radio will have an antenna and you will need to secure that antenna in some way. This month's focus is antenna supports. We have articles about towers, masts, and tree installations, as well as how to get your antennas where you want to install them. Thank you to all of the contributors for sharing your experiences and tips with our readers.

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Antenna Hanging

By David Shealy, K4KSV

My current station includes IC-7610 with MFJ-939 tuner connected directly to radio, Dell Win10 with WSJT-X, WriteLog and N1MM Logger and several wire antennas to support all of my ham radio activities with about 65% FT8/FT4 and 35% SSB contacts. All of my QSOs since 1956 are currently located on an iMac computer using MacLoggerDX.

After retiring from UAB in 2015, I became more active in ham radio activities based on WSJT

-X which I began using in 2019, but now represents 65% of my QSOs and is well matched with wire antennas which are well suited for my current QTH. However, installing wire antennas does require skill of using a sling-shot to put wire antennas high among suitable trees.

During the past five years, I have developed skills to install wire antennas up 70 feet among very tall oak trees at my QTH. First, one needs to become proficient using a EZ HANG Square Shot Kit, which is available from multiple ham radio stores. Next, I replaced the reel in EZ HANG Square Shot tool with a better-quality reel, which I bought from a local outdoor store for about \$50 and loaded about 400 feet of good quality non-plastic fishing line.

Next, I planned where to install three wire antennas up seventy feet to provide wire antennas with following directions:

- North to South running antenna between to oak trees over 90 feet tall oak tree and base diameter of 3 feet;
- East to West running antenna, where east connection is within same 90 feet tall oak tree as South end of N-S antenna;
- South-east to North-west antenna also shares the same 90 feet tall oak tree as South end of the N-S antenna, which is currently being repaired.

Next, I developed skills to put a weight from the EZ HANG Square Shot tool over the limbs desired. Then, I connect some good quality string to the EZ HANG weight and pull a good quality string over the desired limb, which is used to bring the antenna rope over the desired limb with one end of the wire antenna connected. Then, repeat the process with a second tree to be used for raising wire antennas, which have been 150 or more feet apart.

After the antenna is in place and operational with adequate coax, ground rod used with lightning arrestors, then run coax to switch system

used before going to radio. Currently, I use a MFJ coax switch, which sends a DC voltage over coax from the radio. Also, I installed a 50-pound weight to one of the ropes near the ground to give the antenna some flexibility during our common tropical storms.

Since FT8/FT4 during May 2021 as reported in bit.ly/FT80P represents over 65% of all ClubLog QSOs, it is timely to carefully evaluate features of digital modes of ham radio for with modest wire antennas, a good radio and computer system using WSJT-X modes and multiple advanced features for special events, such as, Field Day, multiple contest which use grid square for exchange and Fox & Hound feature is very helpful working DXpeditions, such as Russian activities with C92RU and A25RU during April 2021, which were worked by K4KSV.

Repairing wire antenna is another topic which seems to be beyond the scope of this summary but is very important during our age of intense tropical storms regularly arriving at our QTH.

150# Crossbow

By Bob DePierre, K8KI

The first time I asked Mark Brown/N4BCD to help me put an antenna in the trees, he brought his crossbow and a couple of arrows. The first arrow went over the tallest tree right on the mark. I thought it was going into orbit, but it came down right where it was supposed to. I learned my lesson and bought my own crossbow a week later. I also found that arrows called de-cocking bolts don't have a pointed end and are very heavy. The heavy bolts come down out of the trees far easier.

My crossbow is a fairly heavy one rated at 150# pull-strength. Actually, I'm not that strong, so I use a simple cocking mechanism which essentially divides the pull strength by four. I can lift 40# ok. Seeing how strong this crossbow was, I decided to get a couple of smaller ones for occasions where I didn't need to throw a line up so high. My best shot so far cleared an 85 ft. oak

tree. Beat that!

I have been using 50# fishing line, but it gets tangled very easily. I am looking for ways to fix this problem. Ideas?

Antenna Supports on a Small Lot

By Rob Suggs, NN4NT

I have a small lot and a lot of trees which are a blessing and a curse. They are great to string dipoles in; I have a dipole each for 30m, 40m and 80m strung up using my homebrew slingshot antenna deployment device. The curse is that they limit the height of my hexbeam and I have to keep the branches trimmed back to prevent snags during rotation. The first photo shows my recent activity with a rope saw (a bit of bi-directional chainsaw blade with long ropes on each end) to remove a branch which just started impeding the rotation of the hexbeam as the leaves appeared this spring. It helps to have 2 people working the rope saw to keep it from snag-



Rope saw doing its thing on an offending branch

ging and to keep out from under the branch as it succumbs to the forces of gravity.

The hexbeam is on a push up mast at about 25 feet. The photo shows it with 3 sets of 2 guys. I use 3 guys on the lower section when the mast is telescoped down for

servicing since I can reach the rotator and antenna from a stepladder. Those lower guys are very annoying when we are playing with the grandkids in the backyard. I use a rope winch attached to a gin-pole made from fiberglass military surplus mast pieces to raise the antenna.

Antenna Supports on a Small Lot (continued)



**Push up mast and MFJ
hexbeam on Hy-Gain
rotator**

As an aside, the orange disk on the mast is a frisbee I cut and mounted to keep the squirrels from climbing the mast and going down the guy to the bird feeder on the right. Yes, I have caught them doing that. It is working so far but it is only a matter of time before they figure out they could easily climb up the guy from the anchor point. This is my game of “is a rocket scientist smarter than a squirrel” and I suspect they will win. The game isn’t over yet and I’m sure I’ll have to put a similar obstacle on the guys.

By the way, the bird and hummingbird feeders make the whole setup slightly more appealing to my very understanding XYL.

Speaking of the guy anchors, below is an image of one of the 3. They are those screw-type anchors with the adjustable turnbuckles for final tightening of the guys.



**Guy anchor and
turnbuckles**

I’ve found that I strongly prefer the “aircraft rope” type of cable to the steel cable I bought with the mast. That cheaper steel stuff is just too stiff and hard to work with. So far, the mast and guy system has withstood some serious winds and even a dead limb falling on the hexbeam (another curse of the trees). The hexbeam had minor damage to some of the wires and clips but the 2-foot piece of fiber-

glass mast between the rotator and beam sacrificed itself to save the rest of the system. It was a bit scary getting the mast down and the hexbeam off as it was dangling from the feedline. Fortunately, the beam is relatively light.

So, between the trees and the push-up mast, I’ve managed to keep some radiators in the air which work fairly well.

Amateur Radio Antenna Supports

By Bruce Smith, AC4G

Having been a ham radio operator for many years, I have had the pleasure to experiment with many types of antenna supports. I have also had the pleasure to visit many hams, field day events, Hamfests, and even research the web for antenna support ideas, but it all boils down that there are only a few supports that best hold-up ham antennas being erected above the ground.

The following supports are the supports I have used at my station(s) in the past: trees, PVC pipe/conduit, bamboo (grown on my farm in Tennessee), and finally aluminum & steel towers most being used today. We will briefly address each of these that I have listed.

When we all erected our first antenna after receiving our coveted radio amateur license, we first begin to look at the structures around our home to hang a wire dipole antenna designed in many configurations (simple half-wave dipole, G5RV, Delta loop, Bazooka, Double Bazooka, Inverted “L”, NVIS, and the list goes on). Most often the best structure is one of those trees we have in our back yard. I have been fortunate to have tall trees to support my wire antennas. We all know that the higher the antenna, the better the low angle of radiation to work that DX located around the globe. As DX’ers, we want our transmissions to be heard in distant lands.

However, some ham operators merely want to check into statewide and local nets for emergency communications training, which lends itself to having a low hanging dipole or antenna of the sort to be able to be heard by the net control station.

Amateur Radio Antenna Supports (continued)

It does not matter your antenna preference; the antenna still has to be raised and supported. For years, I climbed every tree to support my antennas until one day my wife decided it was too dangerous for me to do so. Then I graduated from tree climbing to using a home-made slingshot contraption. I found that the slingshot did a fair job of lofting the end of the string in the tree, but never over the top. I continued to look for better methods. I read about sling shots and potato air launcher but was too tight with my money to ever buy one of these. One day I decided to use my hunting bow to launch my string over the top of the tree. Wow, did it work.

It not only launched it over the tree, but about two hundred yards down wind. Then I decelerated to begin using my son's "kid bow" which had less force. I still was not happy with the approach. Since my shoulders were blown out due to years of hunting whitetail deer with a bow, I purchased a hunting crossbow. I drill a hole with my drill and small bit in the end of the arrow (called "bolt" in crossbow terminology), so I could thread fishing line in the end. The only issue I had was I had to launch in low winds, and not make much of an arch with my aim, or the arrow would go out of sight and run my fishing line out with an abrupt stop not making its target.

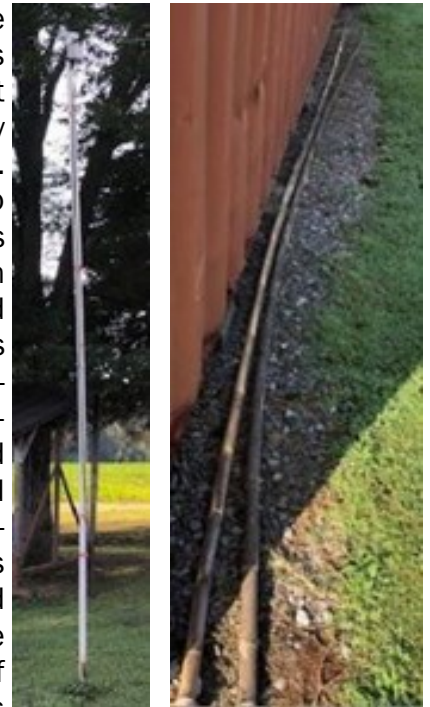
Today I am fortunate to own a bucket truck that helps me to raise and position any wire antenna that I might have. As you can see, I accelerated and progressed from climbing trees, shooting sling shots, bows & crossbows to a truck lift for doing menial task discussed.

We go from trees to PVC pipe/conduit (Reference Picture 1). I like PVC pipe as a short support for short antenna support because it is insulated. I currently use PVC pipe to support my 12-foot-high NVIS antenna that I use to check into the Tennessee Phone and CW training nets, training sessions held seven days a week to allow practice in case of emergencies. I found that other antennas do not provide the best communications to these local and regional net control station

when propagation stretches long distance. The high angle radiation pattern is best suit for close-in communications for these types of situations. The drawback to PVC pipe is that it is flexible. The NVIS wire elements actually hold up the PVC pipe in a vertical position not causing any issue for this type of antenna. I must say that PVC pipe does need to be "guyed" in order to hold it in position, thus NOT making it a good, suitable support for many ham radio antenna applications.

Next, I have used bamboo as an antenna support since it is readily available to me. Bamboo needs to be dried out and is very hard when dried. Hardwood floor manufactures actually use bamboo to make bamboo hardwood floors. If one used bamboo as a support when it is green and not dried out it can cause issues to ground if the wire elements come in contact with the bamboo. I actually grew bamboo to make some supports for a loop and quad antenna that I designed but

have not yet used bamboo in this design yet. I recently gave some bamboo to another local ham to support his Bazooka antenna to hold up the ends. Needless to say, I gave that ham a fresh cut of green bamboo about 30 feet in length. When the antenna was installed, the antenna ends were high in the air, but over time, the bamboo began to droop. Now the antenna support dried in an "L" shape position and the ends are not as high as that ham would like, only about 18 feet high. So much for bamboo and using organic supports for ham radio antennas. Bamboo can be used but



Above left: PVC Antenna Support

Above right: Bamboo Support

Amateur Radio Antenna Supports (continued)

must be completely dried before use.

Finally, we will discuss steel and aluminum towers currently being used at my QTH. Towers are strong and I utilize them to primarily hold my rotatable Yagi antennas. I have one crank-up tower with a tilt base that makes antenna installation an easy chore. I have a couple of Rohn 25 steel, galvanized towers that requires one to climb the towers to install rotors, antennas, or do work in case of issues, the drawback of a non-cranking, non-tilting tower. Since I have a bucket truck that extends sixty feet, my antenna work is made much easier than most hams. I have one aluminum tower about forty feet high that holds a tribander. With the tornadic winds that we get quite often in my area in southern Tennessee, I chose to guy all of my towers with either galvanized wire cable guys or phillystran-type guywires. One of the issues I have found with both galvanized steel and aluminum towers is tower legs splitting without sufficient drainage. Yes, I have tower legs that accumulated water in the legs due to snow, ice, and rainwater. Knowing that I needed a way of water to drain in the tower legs, but not realizing that water did not have sufficient weep holes to drain, the tower legs froze and split both steel galvanized and aluminum tower legs even though I allowed several inches of gravel in the tower base hole prior to pouring concrete. Reference the below pictures.



Steel tower leg frozen and busted



Aluminum tower leg froze and split

As one can see, it is critical to ensure that tower bases in concrete have plenty of drainage capability prior to pouring concrete; otherwise, your tower leg can result as shown in Picture 3 and Picture 4. Many tower specifications suggest 6" to 12" of gravel in the bottom of the hole to allow for drainage. This was a hard lesson to learn, that my water drainage was insufficient, but is critical for those with towers and those thinking of installing a tower and a tower base pad.

I trust my antenna support experience has been useful and hope that you can learn from my experience and be aware of some considerations I have outlined in this article. Not all antenna work is doom & gloom but can be accomplished by sharing articles like this with fellow hams. Perhaps your antennas are supported from trees or towers and are support structures that allow you to get on the air. Don't be shy if you need help with antennas. There are plenty of hams in the local area dying to help, so they can learn and apply new techniques and knowledge to their own ham radio station. If you have any questions about antenna supports or antennas in general, or have alternate antenna structure not listed in this article, please drop me a note, I would love to hear about it.

Universal Towers 15-40 Tower

By Bob DePierre, K8KI

I have a Universal Towers 15 Dash 40 antenna tower that I installed in 2013. It is 40 feet tall and has two taper sections. It weighs 111 pounds.

Universal Towers 15-40 Tower (continued)

nds and doesn't need any guys. It assembled easily. It took three of us to rotate it up to vertical. This tower currently costs around \$1,500 at DX Engineering, and required another \$1,300 of backhoe and concrete work to finally set it up. I have had no maintenance issues with it over the past 8 years. This will be my best, and final, tower. It has a 5-band, 3-element quad on top.

I thought the light aluminum would be a lot weaker than a steel tower, but this one doesn't seem to be.

Before I moved up to the Universal, I had a 35' Alumicraft crank-up. That tower was very light, almost too light. I mounted it by lag-bolting it to a rock with six 1.75" lag bolts. I thought that was silly, but I never had a problem with it. Somehow Warren pried it away from me.

A Few Words on Towers By Byron Allen, N4AX

Since the late 70's I have been climbing towers and installing omni and directional antennas first for Citizen Band, then in the mid-eighties as an Amateur. I have owned over the years 11 towers as I can recall at this time, lattice and welded type constructions, even a tubular crank-up /fold-over. Many of these were acquired from amateurs that were re-locating, or just never got to put the tower in the air. As these years have passed and the experiences I've personally had with towers ("Antenna Supports") is SAFETY is the first concern. As my late friend Jerry (N4NO-SK) would say "it's time to do Spring maintenance on the tower", specifically which means inspections, condition of the structure and safe practices is what keeps you safe. I will be straight to the point, keep your feet on the ground! Don't climb. But if you must, a stacked/guyed tower is my preference, no moving parts.

Let me explain. I have had two close calls thru the years. Both of these were on crank-up towers. The first event was on an EZ-Way 50 ft crank-up /fold-over that I had erected without the

fold-over mechanism which was installed on the West side my home. It was a 3- section manual winch driven crank-up steel tower, very heavy! I did not install the concrete base for the fold-over kit because in those days I traded towers and antennas a lot. I just simply added one set of guys on the lower section. One day after getting home from work and a strong storm was approaching, I noticed the quad on top was freewheeling in the winds, so not to have coax or spreader damage I quickly ran up the tower as the raindrops were starting. I found the large bolt had loosened and the u-clamp nuts were not tightly holding the mast in the rotator. I had grabbed a few hand tools to take to do the job, just as I completed the tightened and stepped down, 2-rungs in the top section nested and trapped my feet. I had on steel toe boots still from work, to make this story abbreviated and spare the fine details, I finally using hand tools and wiggling my feet out until the tower top section nested on the second section welded stops, I quickly got free and to the ground, when the blood started circulating the pain was excruciating. Mistake number one: my wife didn't know I was up there. Always have a ground person nearby, first safety tip. My feet were bruised for a week. That tower left my property soon after, I never looked to see exactly what happened, but it had to go!

Second close call, I had installed a 80 ft US-TOWER, 5 section manual, winch-driven crank-up steel tower in my back yard on the north-side of my home, again guyed at the lower section only. I would never leave home with this one cranked above 40 ft using the single guy point. The winch was designed differently on this tower compared to the EZ-Way that I had previously had the close-call. One weekend I wanted to swap antennas on this 80 footer only cranked up 40 feet, so with my tool pouch and hand tools I went up the tower strapped on un-bolted the antennas lowered it to the guy wires and slid the antenna down the guy wire until it rested at the ground level, I tied the rope to hold it from moving then I came down the tower tied on the other directional beam antenna and back up the tower to hoist it up again sliding up the guy wire then bolting the antenna to the mast, I come down the tower put my feet on the ground walk back towards the house 15 feet and

A Few Words on Towers (continued)

the tower nests to the stops as I am walking away, this tower also left the property without hesitation, both times I told the new owners what had happened and to find the cause before installing, make needed repairs, and be careful, these guys got "A DEAL." The other crank-up I owned was a Wison 50 ft Tubular crank-up/fold-over. I never got to use or install this one. It was a most brilliant design and the ham that bought it still uses it today, so if you want to keep your feet on the ground this is my preference, the rotator mounted onto the fold-over base were you could replace or repair it from the ground, brilliant!

The other towers I have owned, installed, climbed, removed are ROHN 20, 25G, 45G, HBX54 , HDBX54, HBX40. All of these are great but I prefer, based on my experience, the 25G guyed tower as the standard, sections not too heavy, strong and secured, guyed every 30 feet per ROHN specifications. Also currently a great option used at the site that I contest from a 70-foot Glen Martin lattice section, bolted joint assembly that has a HAZER installed. This tower, being aluminum, is very light compared to steel riveted and welded lattice towers. It has a hinged base for laying over to ground level. The HAZER is also a nice feature for bringing the rotator and antennas to the ground working level. In my installation here this tower is guyed at the half-way point because of the extended height to 70 feet. This tower was originally sold and packaged as a 50-footer that the HAZER would carry the top set of guys up with the antenna and rotator until taught. In my installation it still carries the top set, but can't be lowered below the 35-foot level for antenna placement, removal, etc. I did recently have all the guys off the tower, rebuilt the T2X rotator and the A4S tri-bander that was having issues. I have climbed this tower many times and at 70 feet, one drawback is the lattice or cross-bars some call there tubular aluminum, and although I have never weighed over 165 lbs. those cross members are slightly bowed on the side that I climbed most, I try to go up on different sides to lessen this . So with aluminum there is some side twist occurring

while on the tower, more-so than the ROHN HBX, HDBX steel towers, but aluminum never rusts. It looks like it did when installed in the late eighties.

So in summary, most people like what they own. In my case I do not own what I prefer, which is a tubular crank-up/ fold-over. I am not as interested in climbing as I once was. I operate HF CW Mobile almost daily now, because we live in an apartment but are looking for property to build or buy a home as a steppingstone to then build. So, one day I will look for the tubular crank-up or build one since I still have the copy of the assembly manual for the WILSON 50-footer that I owned.

This is the brief experiences of Byron - N4AX and my personal preferences. This is not saying that one tower is better than the other. That primarily depends on how SAFE you believe it to be and what ease of service it provides. That's my "Dimes Worth."



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Aluma Towers 32-footer

By Mick Bell, N8AU

When I reconstructed my station, I went with a modest self-standing crank-up aluminum tower of 32 ft. My back yard isn't large enough to accommodate guy wires and I liked that the aluminum would not rust and is relatively light (125 lbs.). It's made by Aluma Towers out of Vero Beach, Florida. The tower was a bit pricey (\$3753.) but I've been pleased with it and because it is so light, the hole I needed to dig for concrete was only 4X4X4.

Erecting the tower was not at all difficult. It is also a tilt-over so it can simply be "walked up" once it's secured to the bracket which is bolted to concrete. Their rep (Hank Halbert - KD4VJP) was

very helpful and was available via cell to answer any questions or deal with any issues. Lead time on delivery was about four months. To anyone contemplating the purchase of a tower I'd just have this to say: Brace yourself for freight costs!

SAVE THE DATE

NADXC Banquet

Saturday, August 21st, 2021

Keynote Speaker:

Adrian Ciuperca, KO8SCA

Tickets are on sale on the NADXC website

<https://www.nadxc.org/nadxc-dinner-banquet-details/>

Huntsville Hamfest Info



August 21 & 22, 2021

Von Braun Center South Hall

700 Monroe St. SW
Huntsville, AL 35801

<https://hamfest.org/>

- **Hamfest Hours:** We will be open to the public **Sat, 9:00–4:30 PM** and **Sun, 9:00–3:00 PM**.
- Move-in hours for dealers and flea market are **Fri, 10:00 AM–8:00 PM** and **Sat, 7:00–8:30 AM**.
- **Grand Prize drawing – Saturday @ 4:00 PM** (need not be present to win)
- **Main Prize drawing – Sunday @ 2:00 PM** (must be present to win).
- **Admission:** is \$10, ages 12 and under free.
- **Talk-in:** Will be on the 146.94 repeater, 100Hz tone, and the backup in case of failure will be on the 145.33-, 100Hz tone, repeater
- **Huntsville's Wide Coverage D-STAR System is W4WBC:** 145.36-, 443.425+, 1285+ and 1251 DD
- **Yaesu Digital Fusion Users:** Use 147.14+, 100 Hz PL
- **DMR Users:** DMR Networked System 442.275+. For Talk Group info, go to www.N4HSV.net for more info and code plugs.



Crank-up, Tilt-over Tower Experience

By Kim Hensley, WG8S

I knew in my ham radio infancy that I could never have a tower. I'm not a climber and getting above 10-ft. isn't my thing. I eye-balled this type of tower (crank-up) forever!

For me it was finding a good, used tower (U.S. Towers 572-family, meaning a 72-ft. tower). I also knew from 10+-years of working with a contest group's portable towers I wanted a motorized tower (hand cranking is not fun!).

I searched every available resource, including online ham resources and their tower forums. If you are in the market, be diligent and patient. I eventually found a used tower that met my criteria on Craig's List. Exceptional towers like this aren't cheap. Mine was in the \$5-10K range.

Using motorized winches for marine (boat) lifts, I put together a motorized winch to take care of tilting the tower over, and back up. That's been a great addition!

Another must are the stand-off brackets for your cables.

I knew a firm that did foundations for structures, and I was able to hire them to dig and pour the foundation I needed. The foundation crew only required 2 folks with equipment. A forklift unloaded it, and another track-hoe-like device put it on the foundation. Once there, it was all me. I didn't need any other help.

The one thing we forgot to do was add the base T-plate to help line up the anchor bolts while the foundation



WG8S's US Towers 572 tower

was setting. It worked out despite that.

It's nice to lower the tower, tilt it over, and work on the antennas! Questions or comments, I'll be glad to handle.

Rapidly Deployable 10-meter Mast System

By Barry Johnson, W4WB

To complete my rapidly deployable portable HF station, I needed (really wanted) a great portable mast that could be easily carried and erected by one person if necessary. It also needed to be able to interface with antennas I want to



Figure 1. 40-30m Hex-Beam atop the 15m BlueSky Mast.



Figure 2. Motorized dipole with 40-30m Hex-Beam in background

use in the field such as the Buddipole, the mono-band Hex-Beam antennas in the Hex-Pac, and a 2m/70cm Yagi beam antenna. For some years, I have had a 15m BlueSky Mast and several 10m BlueSky Lite Masts. These are great masts and can be seen in Figures 1 and 2 when we used them for the 40m phone station of K4BFT at Field Day 2007. This Hex-Beam is about 40 feet in diameter and weights almost 40 pounds. The rotor was a Yaesu G1000 plus the coax and rotor cables. It was an amazing feat that we got it erected and taken down with no damage. Ralph N5DOI and I did the pushing up of the antenna system while eight other hams handled the three tiers of guy lines. The motorized dipole was much

Rapidly Deployable 10-meter Mast System (continued)

easier to erect by just the two of us. Both mast systems really need at least two people to carry and handle the cases. These I felt are not suitable for my concept of a rapidly deployable portable HF station.

Recently, Buddipole, Inc. introduced a new mast system under the name Mastwerks™. I have known Budd and Chris Drummond for about 20 years. Budd developed the widely-used Buddipole and other products with his son Chris. Several years ago, Chris and a couple of colleagues developed a new mast system that is intended to be



Figure 3. Buddipole atop of the Mastwerks 10m system.



Figure 4. Mastwerks tripod.

strong, light-weight, and easily carried. If you have interest in understanding more about the details of workings of this mast system, I suggest you read their U. S. patent number 10,550,993 that was issued in February last year. You can obtain a Mastwerks masts in heights of 4m, 7m, and 10m. A few weeks ago, I received my 10m version and was impressed by the design and construction. Weight of the system in its shoulder bag is 13 pounds. The mast is held by a tripod that has some nice features. Figure 3 shows the mast system with the Buddipole dipole at about 10m. A closeup of the tripod is presented in Figure 4. Unlike other mast systems I have and knew about, the Mastwerks provides a means to rotate the mast in the tripod as illustrated in Figure 5. The handle simply attaches by a quarter-turn of the connector and then you manually crank the



Figure 5. Crank for rotating the mast.



Figure 6. Bubble level.



Figure 7. Cross-sectional view of the mast.



Figure 8. Fixture to mount the Buddipole to the mast.

mast to the direction desired. In a few months, they will offer an electric rotor attachment that replaces the crank handle. This rotor is battery powered and can be remotely controlled by using an iPhone. The tripod also contains a bubble level, shown in Figure 6, to aid in setting the mast vertical. I'm on the list to get one of these remote-control rotors. Also, I was impressed by how smooth the rotation was when I tried it out rotating the Buddipole.

So, what makes the Mastwerks so different from other mast systems? Rather than the mast having the typical cross-section, it has something like an ogive shape as shown in Figure 7. This provides a clever way to index fixtures to the mast in various ways when the need is to be able to rotate the antenna. The Mastwerks comes with the fixture shown in Figure 8. It is used to attach the Buddipole to the mast. This fixture has the internal shape of the mast and a hole that allows the spring-loaded ball-headed pin to capture the fixture and hold it in place. This pin seems to be quite strong and durable.

My primary interest in acquiring the Mastwerks was to use it with

Rapidly Deployable 10-meter Mast System (continued)

my Hex-Pac. The Traffie Technology Hex-Pac allows one to quickly assemble a monoband Hex-Beam from 6m to 20m, and mine has additional elements for both CW and SSB portions of 10m and 20m. The center column for the Hex-Beam has a 1" inside diameter and is cylindrical. The topmost section of the mast is a bit smaller than this. So, a customized adapter had to be made that would provide a stable and indexed mounting of the center column to the mast. Chris sent me a small section of the mast to consider how to make a simple adapter. My idea was to make an ogive



Figure 9. Adapter for 1" ID pipe with dowel pin partially inserted.



Figure 10. Adapter for 1" ID pipe with dowel pin fully inserted.

to cylindrical adapter and use two of them spaced 6" apart. Chris agreed and fabricated them for me using his 3D printer. An adapter is shown in Figures 9 and 10, and has a length of 3/4". After sliding the adapter onto the mast about 1/2" below the spring-loaded ball-headed pin, I carefully drilled a 13/64" hole through the adapter and the mast. Next, a 3/16" by 1" steel dowel pin was inserted into the hole as shown in Figure 9 and is flush on both sides when fully inserted (see Figure 10). The second adapter was located 6" (center-to-center) below the upper adapter as can be observed in Figure 11. The final step was to secure and index the Hex-Beam center column to the mast. Of course, the spring-loaded ball-headed pin on the mast could be used for this purpose, but likely it would become damaged in time. A better way I thought was to use a 1/4" cotterless hitch pin as illustrated in Figure 12. The center column comes with a 7/16" hole on one side. On the other side, I drilled a 1/4" hole that just allows the hitch



Figure 11. Adapters have been installed on the mast.



Figure 12. Hex-Beam center column is solidly attached to the mast.

pin to pass through (it is actually slightly smaller than 1/4" diameter). Another hole (17/64") was drilled through the mast for passage of the hitch pin. The retaining spring-loaded ball on the hitch pin works fine in keeping the hitch pin from falling out. The hitch pin and the two dowel pins cost a total of about \$5 at Lewter Hardware. The center column slid nicely over the adapters and is held solidly in place by the cotterless hitch pin.

A feature I really appreciate about the Mastwerks mast is its locking mechanism (lock). These are the grey parts seen in Figures 11 and 12 with the

locks in the closed position (yellow arrow in Figure 12). These are easy to use, parts don't get misplaced, and the locking is solid. Figure 13 is a photograph of the base part of the BuddiHEX that fits the top of the mast. The lock is shown in the open position. The BuddiHEX (6-20m, 6 bands) is another new product of Buddipole and they use

Rapidly Deployable 10-meter Mast System (continued)



Figure 13. Mast adapter for the Buddibeam with the latch shown open.



Figure 14. Field Day in Eastern Oregon featuring the BuddiHEX and Mastwerks mast.

the basic element design developed by Steve G3TXQ (SK). Figure 14 is a picture taken by Chris during Field Day in Eastern Oregon last month with the BuddiHEX mounted on a Mastwerks 10-meter mast. Nice looking installation and scenery can also be appreciated! I note that my Hex-Pac Hex-Beams are known as the Traffie Hex-Beams or as the Classic Hex-Beam. The G3TXQ version is known as the Broadband Hexbeam. What's the difference between them and which works better? That's a topic for another article.

An important aspect to consider when using a tripod-based mast is how to keep the tripod feet from not moving. The BlueSky masts have special feet that allow stakes to be driven into the ground, and this is my favorite approach. For those that don't have this feature, I typically used a pair of tent stakes for each tripod leg and located them inside of the "tent" formed by the tripod. Each leg was then secured by rope to its respective tent stakes. Presently, this is what I will do when I deploy the Mastwerks mast; however, Chris has given me permission to show the prototype optional feet for the Mastwerks mast system that will provide the same type of tripod leg securing as the BlueSky masts. Figure 15 shows the foot in a deployed manner while Figure 16 illustrates the op-

tional foot in the stowed position. Chris expects these optional feet to be available later this year.

There are a variety of alternative tripod mast systems sold by our favorite ham stores, but the Mastwerks is the closest in quality to the BlueSky masts (the gold standard in my opinion). Now I wait for the remote-controlled rotor and the feet to be offered!



Figure 15. The optional foot shown in deployed position.



Figure 16. The optional foot shown in the stowed position.

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