

Northwest Indiana DX CLUB

Volume 9, Issue 5

May 2021

President's Corner

Antenna weather is here! Be careful if climbing.

I just acquired a 132 feet lot next to me, so more antenna space to play with.

**Work some DX!
Please be safe and stay well.**

73
John W3ML
Good DXing!

INSIDE THIS ISSUE

- 1 President Speaks
- 2- Member News/DX News

"Working the World from the Black Hole"

NWI DX Club Website
<http://nwidxclub.weebly.com/>



Don't forget Steve is our QSL Card Checker.

DXCC Card Checking is available by appointment and may be available at meetings. E-Mail kd9hl@arrl.net for an appointment or to make other arrangements.

Reminder, the NWIDX Club has a club call W9NWI.

The call is available to members for use during contests, special events, Field Day, etc. To schedule dates for its use, contact the trustee, Steve Mollman – KD9HL. kd9hl@arrl.net

QSL cards are available.

Notice:

Articles in the Northwest Indiana DX Club Newsletter (except for those separately copyrighted) may be reprinted, provided proper credit is given.

Still Needed

Help Wanted

Webmaster

The club is in urgent need of a Webmaster to manage our website:
<http://nwidxclub.weebly.com>.

Normal workload is less than five minutes per month.

If you have the skills needed, please contact the club president, John Poindexter-W3ML at his e-mail address: w3ml.john@gmail.com



NWIDX Club

Member DXCC Challenge Scorecard

A Reminder

Get Your Latest Contacts into the ARRL by June 27

We plan on publishing the annual listing of our member's standing in the ARRL DX Challenge Award in the July Newsletter. Members are urged to submit to the ARRL's DX Desk any contacts that they may have that have not yet been accepted by the ARRL. This can be done either through the Log Book of The World process or via a formal QSL Card submission via our card checker "Contact Steve Mollman-KD9HL (email KD9HL@arrl.net)".

NOTE: Just because you have confirmations listed in your LOTW account does not mean that the DX Desk has accepted them for award credit. In the words of the ARRL, those contacts are "pending". You must make formal application for the award credit.

Members are urged to have their applications in the ARRL's hands before June 27, 2021 to ensure that there is time to process the application for the June 30, 2021 Scorecard cut-off.

The DXCC Challenge Award is earned by working and confirming at least 1,000 DXCC band-points on any Amateur bands, 160 through 6 meters (except 60 meters). A band point is earned by working and confirming a current DX entity in any mode on a single band. (You only get one point per entity per band regardless of the mode. Working a DX entity multiple times via different modes on the same band does not give you more points-you only get one. Deleted entities do not count for this award. Only stations with over 1000 DXCC band-points are listed by the ARRL.



SMALL DRILL BITS

AND

WHAT FITS IN THE HOLE

By

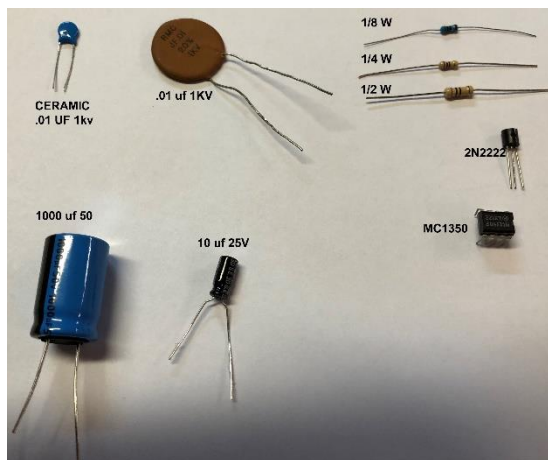
Jerry Hess,W9KTP

Recently, I was looking for small numbered drill bits to drill printed circuit boards. Initially the smallest I could find was #60 which was way too large for most standard components. Generally you need about #70 for IC's, resistors and capacitors.

I just happened to be in the Chesterton Ace Hardware store and I didn't see anything smaller there either. By chance, I asked one of the salesmen and he immediately led me to another aisle with Dremel tools and other drill accessories. He handed me the pack of drill bits shown in the first picture below. The pack includes a range of bits from #61 to #80, and better yet, the case slides laterally so an individual bit can be selected as shown in the second photograph. This is a great convenience since it is difficult to determine the size of a single bit. Turns out the salesman is a model railroader and often has to use bits as small as #80. No wonder he knew where to find them. A check of the national Ace Hardware website shows that the set is available throughout their stores for \$20.



Over years, my choice of drill size has been by trial and error since I have never have found a resource that listed component required hole sizes. The ARRL Handbook lists wire sizes but that's it. Therefore, I decided to measure some common components leg diameters as shown below.



COMPONENT	DIMENSION, inches
1/8 watt resistor	0.0130"
1/4 watt resistor	0.020"
1/2 watt resistor	0.024"
2N2222 transistor	0.0175"
MC1350 IC	0.0175" x 0.01"
Older 0.01 uf 1KV disc	0.025"
Ceramic 0.01 uf 1KV "	0.015"
1000 uf 50V elect.	0.0315"
10 uf 25V elect.	0.0185"

My next step was to match the leg dimensions with a drill diameter from the table at the right. I try to keep the number drill sizes to a minimum since you really don't want to be changing bits for every component. As mentioned before, #70 is pretty universal for most of the components. The older disc and the big electrolytic capacitor will need a #68. Be careful to not drill too large a hole since it leaves too little copper to solder to. Another note, I use an awl as a center punch to get the hole in the middle of the pad.

DRILL	DECIMAL
80	.0135
79	.0145
78	.0160
77	.0180
76	.0200
75	.0210
74	.0225
73	.0240
72	.0250
71	.0260
70	.0280
69	.0292
68	.0310
67	.0320
66	.0330
65	.0350
64	.0360
63	.0370
62	.0380
61	.0390

These tiny drill bits are really handy items to have around the shack, even if you aren't making PC boards. For those of you who are going to make a board, I hope this is helpful. Best of luck.

73's,

Jerry

Tom, W8FIB sent this in. The ARRL antenna modeling course was taken offline several years ago, unfortunately. Here are some resources that may be helpful:

- <http://www.arrl.org/antenna-modeling>
- <http://www.arrl.org/antenna-modeling-for-beginners>
- <http://www.arrl.org/antenna-modeling-files>

Also, we are working on an updated antenna modeling webinar, which we hope to have available on our schedule in the next week or so:

<http://www.arrl.org/arrl-learning-network>

Kris Bickell, K1BIC

Lifelong Learning Manager

ARRL - The national association for Amateur Radio®

<http://www.arrl.org/learning-center>

ARRL DX LISTINGS **APRIL 22, 2021**

BELARUS, EW. Special event station EV76F is QRV as part of the Brest Hero-Fortress memorial station in honor of the 76th anniversary of the end of World War II. QSL via EW3W.

JAPAN, JA. Members of the A1 and Denpaken clubs are QRV with special event call sign 8N1MORSE until the end of 2022 to celebrate Samuel Morse's 230th birthday and the 120th anniversary of Marconi's first transatlantic transmission. QSL via bureau.

MONGOLIA, JT. Members of the JTDXA Team are QRV with special event call sign JU100DX to commemorate the 100 years since the Mongolian People's Revolution. QSL via JT1CH. **(SPOT: 4/26 FT8 14.074,10.136,18.100)**

SVALBARD, JW. Tom, LA6VDA will be QRV as JW6VDA from Spitsbergen Island, IOTA EU-026, from April 26 to May 9. Activity will be on the HF bands using SSB. QSL via LoTW.

GREECE, SV. Special event station SZ200P is QRV until the end of 2021 to celebrate the 200th anniversary of the Greek **Revolution** of 1821. QSL via LoTW.

SOMALIA, T5. Ali, EP3CQ will be QRV as 6O1OO from Mogadishu for two months beginning on April 25. Activity will be in his spare time on the HF bands using mostly FT8. QSL direct.

KALININGRAD, UA2. Special call signs RK75AK, RK75FF, and RK75FU are QRV until July 31 to commemorate the 75th anniversary of Kaliningrad. QSL via UA2FAK, UF2F, and RA2FU, respectively.

MEXICO, XE. Members of the Asociacion de Radio Aficionados de la Republica Mexicana are QRV with special event calls 6D1A, 6D2A, and 6D3A until May 16 to celebrate the club's 61st anniversary. QSL via LoTW. **(SPOT: FT8 4/24-26 7.74, 18.082, 28.074)** Please see April QST, page 75, and the ARRL and WA7BNM contest web sites for details.

NOTES: Expired listings deleted: Spots noted from "Dxwatch.com"

NCDXF/IARU DX Beacons

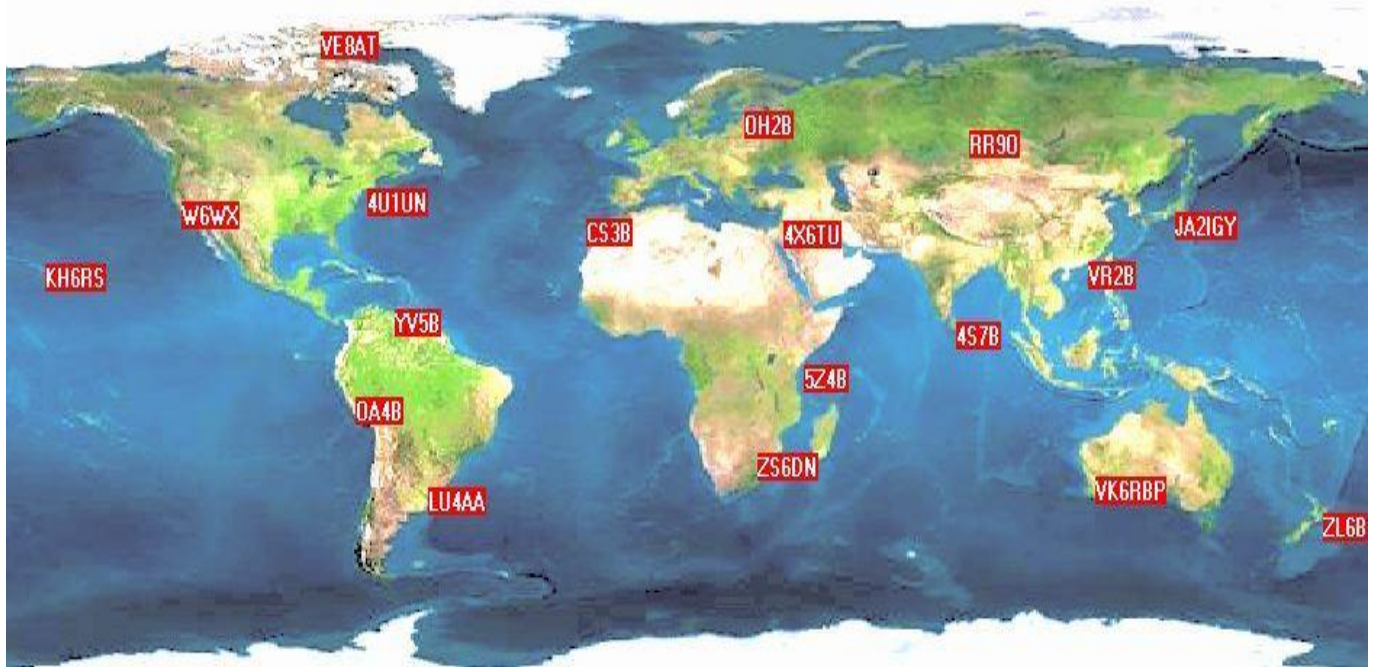
By

Ned Stearns-AA7A, and Kevin Rowett-K6TD

Our goal for this article is to cover the Version 2 (V2) update program to the DX beacons, additions to the beacon program, and the development of a new antenna, well suited for the DX beacons, both transmitting and receiving, and for, ahem, FT8.

The DX beacons are familiar to most DXers. They are a group of 18 stations, transmitting a CW call sign and tones on all the high bands 20 Meters on up. Through a lot of international work, the frequency in each band has been licensed to operate automatic, unattended beacons. These frequencies generally remain clear of other signals. The DX beacons all share the frequency on each band using a timing scheme such that only one DX beacon is transmitting on the frequency at a time, worldwide.

The DX beacons were created on the idea to help a DXer get an idea when a band is open in a specific direction. Turn your radio on, pick a beacon frequency (i.e., 14.100 MHz), point your Yagi where you want to work, and copy the CW signals for the beacons heard. You will hear the CW call sign of the beacon at 22 WPM, then a series of four dashes, one second in duration, at power levels of 100 watts, 10 watts, 1 watt and 1/10th of a watt. Your observed S-meter reading will give you an idea of DX signals you might hear in that direction.



Version 2 program: The DX beacon stations are operated by volunteers — which could be an individual operator or a club — and the equipment at each site consists of an antenna, transmit radio, custom

controller, power supply and a GPS receiver. These units were first distributed and installed in 1995, and 20 years later, the equipment reached the end of its life. In 2013, we began the V2 program.

A new custom controller was designed, based on an Arduino Leonardo MCU board. The custom shield contained circuits to interface to ICOM CI-V, power, display, and a 12-channel GPS receiver.

The remainder of the equipment consists of an Astron PSU, an ICOM IC-7200, a MA5V antenna, a GPS timing standard antenna plus various cables and coaxes. The units were tested, burned in, and shipping commenced to each of the 18 locations.

As of this writing, the V2 units have been installed at 15 of the 18 locations, with shipments completed to 17. The last location, RR9O, will complete shortly.

When the V2 program was started, we looked at alternatives, such as WSPR (FT8 hadn't been invented), but all the alternatives required specialized software to hear, decode and track the signals. CW is the "universal" mode, easy to decode with just a radio, yet software can decode and track. Hence, the V2 program was designed to replace failing hardware, yet keep the same program and concept.

The development of V2 involved a team of operators: Leigh Klotz, WA5ZNU; Lance Ginner, K6GSJ; Tom Berson, ND2T; Peter Jennings, VE3SUN; Charlie Mason, W4NJK; Walt Wilson, N6XG, and Don Greenbaum, N1DG, along with the authors, Ned Stearns, AA7A and Kevin Rowett, K6TD.

One particular note is the support from ICOM and Ray Novak, N9JV. Ray was able to locate plenty of used IC-7200 radios, have them refurbished and supplied to the program at no cost. This was especially important and helpful, as we'd designed the V2 program around the IC-7200, and then ICOM discontinued the product in favor of the IC-7300. This program couldn't have gone forward without Ray's support and efforts. Thanks Ray!

N6XG took on the task of final testing finished units, and the logistics of V2 packages to existing ops. This involved considerable coordination with the ops, learning their issues and shipping communications equipment into some countries. Walt excelled at getting each site running.

DX beacons sites and ops: Each operator has taken great care of their beacons, doing a significant amount of repair and upkeep as the beacons aged, or were affected by environmental issues, such as antenna corrosion and lightning strikes. We also had some problems with the V2 controller, but local operators often jumped in and helped us diagnose or even repair the issue. Ruwan Abeykoon, 4S6RUA, was able to repair a V2 controller failure; Marcelo Duca, LU1AET, completely rebuilt the software, converting it to work with a different model of ICOM radio after the original 7200 failed and couldn't be repaired and there was no way to ship in a new radio. Frank Schneider, ZS6GE, repaired the LCD for the ZS6DN beacon, and Thomas Worthington, NH6Y and Alan Maenchen, AD6E, adopted KH6RS when the prior operator retired and moved off Oahu

If it weren't for the volunteer operators the beacons would not be on the air, nor would they stay on the air. The 4U1UN beacon has been off the air since January 2020, due to an antenna failure, and COVID-19 has made it impossible to gain access to that site. A new V2 package was shipped to the 5Z4B in 2019, but the DX beacons team has lost all contact with the operator for this beacon. If you can help, please contact www.ncdxf.org/beacons.

Monitoring tools and resources: Here is a list of monitoring tools available for the beacons. Intended for spotting DX stations is www.reversebeacon.net. It is also used extensively to spot CW and RTTY stations during contests, and has a menu dedicated to spotting for the DX beacons. Using the Spot Analysis tool, you can learn info about band openings. VE3SUN has written several tools for the DX beacons (visit ve3sun.com).

KiwiSDR is a wide band HF monitoring receiver with over 500 sites deployed. Peter wrote an extension for the KiwiSDR webpage, providing direct timing and monitoring of DX beacons, at a specific receiver. Peter has gone on to organize a webpage that is very helpful in tracking where the DX beacons are heard (ve3sun.com/KiwiSDR).

All of these programs provide real time audio reception of DX beacons at the location of the receiver. Much can be learned about propagation at your location, by setting up a FAROS-based monitoring station. Peter also has a webpage providing step-by-step instructions to create a monitoring station and post the info to a webpage.

FAROS software was created by Alex Shovkoplyas, VE3NEA, and it is still available; however, Alex has not updated the software to work on WIN10. The application seems to work on WIN10 but may not survive some future update to the operating system.

Antenna development: An extensive search for alternatives to the beacon network's standard MA5V antenna took place in 2017. Slow, steady degradation of electrical and mechanical features in deployed antennas have been observed in many of the installations. Replacement antennas and parts are no longer available, so the NCDXF beacon team was tasked to find, or create, replacement antennas, with the challenge being to provide a reliable, maintainable antenna that can be shipped commercially, and will also provide acceptable technical performance that supports the beacon network's mission.

Following the exploration of alternatives, AA7A created a unique antenna concept called the Dual Band Discone (DBD) that appears to meet all of the requirements for the beacon network. The footprint of the antenna is slightly larger than the MA5V, but the electrical bandwidth is extremely wide, and the radiation pattern is superior to that of a trapped vertical. The challenge of making a single antenna that has both good SWR and low angle radiation pattern over a 2:1 frequency range (e.g., 14 to 28 MHz) is extremely high. A single discone antenna will present a good SWR over an octave frequency range but the radiation pattern at the high end is very poor.

The novelty of the DBD approach is that there are essentially two discone antennas in the same location fed by a single feedline. One of the two discones essentially covers the 20 Meter band, while the second covers the 17M through 10M bands. This approach provides good SWR on all the beacon network bands while also producing very good, low-angle radiation patterns.

A prototype DBD was built in the AA7A antenna lab and tested on a small antenna range. Side-by-side comparisons of the DBD prototype and the last MA5V antenna in the inventory were performed using WSPR transmissions conducted over a time span of several weeks. The results of received signals on all the HF bands using data collected on WSPRNet indicated that the DBD's performance was consistently better than the MA5V and the favorable performance difference of the DBD got better on the higher HF bands. The initial DBD prototype was delivered to the W6WX beacon site in November 2018 and, for a period of time, was operated with the prototype. The signal strength comparisons between the previous MA5V vertical were compared to those using the DBD and after only a short time it was quite clear that the DBD was a superior antenna. Soon after the installation of the DBD at W6WX, a strong winter storm with 100 mph winds blew through the site and demolished the MA6V; the DBD was unaffected. As a result, the decision was made in February 2019 to operate this beacon site with the DBD and move forward with the development of a production antenna drawing package.

Five production DBD antennas have been built and are ready to ship. Clearly, this antenna requires some installation techniques that are different than those for a small trapped vertical, but the performance and

reliability of the antenna will likely make the investment in time to install this antenna at remote beacon sites worth the effort.



Dual Band Discone Antenna

The future: The value of the DX beacons is in using the beacon signal to learn about current propagation and how it is changing (are signals building or fading?) compared to the recent past. This is especially useful at the operator's location.

Now that the V2 program is well on its way to completion and improvements to the antennas are in progress, the DX beacons team is moving on to providing direct aids for the use of an operator at each location.

The most helpful is a real time graph showing signal strength, per band, over a period of time. FAROS, with a local DX beacon receiver is the premier tool for that information. These days, most Ops would prefer to get relevant information via a webpage.

Our team is looking at regional, or local receiver options, methods and software for data collection, and access to the information via a webserver. One of the areas of investigation is the work done by HamSci — especially the personal space WX station — as a local receiver. The team will also join the upcoming HamSci Workshop on 19-20 March.

Cycle 25 is upon us. One NCAR solar scientist is predicting a cycle like Cycle 19 in 1959. HF propagation models, including VOACAP and ITU tell us what might happen. Knowing today, and last week, locally can also provide some insight to when and how to work those rare DXpeditions that should start to peak about the time Cycle 25 peaks.

Over the next year, look for the DX beacons to provide info about what has actually happened on the bands.

Ed Stearns-AA7A, is an avid Dxr and a retired electrical engineer.. He has operated as AA7A/VP2A, 9G5NS, 3B9R op, T32R op, AA7A/KH5, AA7A/KH5K, K5K (KH5K) op, ZF2ES, TZ6NS, TZ5A op, 3X5A op, 9L7NS, 9L5A op, 9L5VT op, EL2A op, EL2ES, KH2/AA7A, 5B/AA7A, P3F op, 9K2HN op, C6ANS, C6ATA op, VP8STI (South Sandwich) op, VP8SGI (South Georgia) op, 6Y5AZ, PZ5Z (op), KH1/KH7Z (op). He resides in Scottsdale, AZ.

Kevin Rowett-K6TD, is a design engineer for Elecraft and an avid Dxr. He has operated as K4M - Midway 2009, C82DX - Mozambique 2013, TX3X 2015 –Chesterfield Island and KH1/KH7Z - Baker Island. He resides in Cupertino, CA.

This article is published with the permission of the Northern California DX Foundation (NCDXF). The NCDXF relies upon the generosity of contributors to fund various projects including Dxpeditons and the Beacon Network.

They ask you to consider making an annual contribution of US\$50 or its equivalent in foreign currency. If \$50 is not within your budget, then please give what other amount you can. Naturally, they welcome contributions in excess of \$50! NCDXF is an organization described in Section 501(c)(3) of the Internal Revenue Code and all contributions are tax-deductible to the extent permitted by law for U.S. taxpayers. Send your contribution to: NCDXF, PO Box 2012, Cupertino, CA 95015-2012, USA. You may also contribute and order supplies online via their secure server, visit www.ncdxf.org/donate.



New FCC RF Exposure Rules

The FCC has adopted new guidelines and procedures for evaluating environmental effects of RF emissions. The new guidelines incorporate two tiers of exposure limits based on whether exposure occurs in an occupational or “controlled” situation or whether the general population is exposed or exposure is in an “uncontrolled” situation. In addition to guidelines for evaluating fixed transmitters, the FCC adopted limits for evaluating exposure from mobile and portable devices, such as cellular telephones and personal communications devices.

The Lake Washington Ham Club of Kirkland, WA has posted on their web site an easy to use the RF Exposure Calculator.

<http://www.lakewashingtonhamclub.org/resources/rf-exposure-calculator/>

To use the RF Exposure Calculator, fill-in the form with your operating power, antenna gain, and the operating frequency. Depending on how far above ground the RF source is located, you might want to consider ground reflections — and then click “Calculate”.

For further information and FAQ’s on the new rules, check out the ARRL’s “RF Exposure” web site.

<http://central.arrl.org/docs/RFX%20FAQ%20V1.3.pdf>



A friend of Tom, W8FIB sent this to him and he shared it with us.

This interesting. I don't do any backpacking, roving, or the like, but if you do, this might be just what you needed. It is a kit or can be ordered fully assembled. It's not cheap (\$250) but it sure isn't that expensive. Comes from Seattle.

<https://griduino.com/>

72nd International DX Convention

For those that enjoy DXing, or want to learn about DXing, registration (free) is now open for the 72nd International DX Convention. This is what was previously known as the Visalia DX Convention. This year's event will be conducted via Zoom (surprise!). Sessions run from 1400 - 2300 UTC (10:00 am to 7:00 pm EDT) on both

[May 15](http://dxconvention.com/index.html) and 16. Registration for this free event is open now. Go to <http://dxconvention.com/index.html> to register and see the program line up. There will also be some impressive door prizes awarded at two drawings each day.

"Let me get this straight:
You have thousands of
dollars of ham gear,
but you still can't
hear me calling you
from the kitchen?"



Submitted KD9HL

I received an email forwarded from the website from a non-ham. You may judge whether you want to contact him to discuss his request.

The request is non-ham related, except for the tower space is looking to use.

Submitted Information:

Name

Robert Reel

Call (NOCALL if you have none)

NOCALL

Email

hobozbz@gmail.com

Comment

Support,

I'm looking into starting a new business and was thinking that some of your members might be interested in renting space on their towers. I'm looking for tower space in densely populated areas to install 900mhz antennas that connect to a box that has internet access. This setup is used to track items in a global gps type system that is internet based.

I believe This setup could easily pay the internet bill of the hosting tower and possibly up to \$250/month for a good location.

I have no idea if this type of antenna would interfere with your current operations. Any information you can provide on this would be helpful.

I'm on a low startup budget and the equipment is 60 days out so no hurry at this time. I'm interested in 5-10 locations in NWI. All I need is the physical address of your tower to look at the current coverage in your area.

Thanks for your help and consideration,

Robert Reel

Address

10518 Chevette Drive
Wheatfield, IN US 46392

From Dave – K9FN

I have decided to sell my remote antenna tuner. This is NOT an automatic tuner. It currently sits at the base of my vertical controlled by a box sitting on my desk.

The tuner is a Model AT-615U, made by Hamware.de in Germany. I bought mine from Array Solutions in 2016. My total investment is about \$2800, including 125 feet of control cable.

Here is a link to the manual:

<http://www.hamware.de/hardware/tuner615U/short%20form%20manual%20615U-E.pdf>

As an unbalanced tuner, this can be used to feed a long wire, a vertical, inverted L etc. It could be used to feed an open wire fed loop or dipole with a balun at the output of the tuner. The tuner has both a coax output, and a single wire output.

I confirmed more than 85 countries on 160 meters, with just a 30' vertical after putting this tuner into service.

I would prefer to not ship the unit but can do so at additional cost. My guess is that packing and shipping will total \$50 to \$75.

I will gladly answer any questions I can and would be very happy to demonstrate the unit here at my home in West Lafayette.

I am asking \$1200 and, being a ham, will certainly entertain SERIOUS offers.

Thanks, de Dave – K9FN
765-714-7618

You may call, but if I don't recognize your number, I may not answer. If interested email first and we can arrange to talk on the phone if appropriate.

Please email me directly: dpbunte@gmail.com

I have received more stuff from K9QA SK's shack. There is a listing on the <http://www.w9joz.org/forsale.htm>

If you have ham items for sale, email me a list along with prices and contact information. I will put it in the next newsletter.

I want to thank those that have been sending in articles for the newsletter. All items are appreciated.



Until Next Time,

73

John

W3ML

<http://nwidxcub.weebly.com/>



DX

