

The LongPath

A North Alabama DX Club Publication

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How to Join

- * Come to a club meeting;
- * or send in an application by mail (form on www.NADXC.org)

From the President

I saw the February issue of the Long Path coming from some distance. I've been trying to pack more articles into the newsletter since the plague struck last year. With a small club like ours, 18-page issues can't continue for very long. I was afraid of running out of gas, so I scheduled a directors' meeting and sent out a survey a few weeks ago. I was trying to be aggressive, so I sent the surveys to almost 90 people. I thank those who did respond, and I'll try to do what you asked.

In last month's Long Path, I mentioned that I was looking for articles regarding your station configuration, as well as product reviews. Well, how did those topics score in your ratings? The highest rated category was antennas, and second place was a tie between ham shacks and operating. So let's start down that path right now. This month you'll see a series of articles about "why I bought my rig." And our program will be on ICOM's newest offering, the IC-705. I'll try to focus on antennas next month. I covered antennas using EZNEC last month.

I eased up the pressure on some of our authors this month, so the Long Path is shorter. But I was surprised to see how many of you actually wanted the newsletter to be longer than 18 pages! And absolutely no one wanted it to be a lot shorter. To all of you who have not been contrib-

uting articles, you should think about that one. Another question that got a compelling response was the length of the presentations. Many of you thought the presentation length on Zoom was too long. I don't know how to put a hard time length on the presentations, but understand that Zoom does have its limitations. You can't see data very well, and you can't interact with the speaker nearly as well. I'll see what I can do here. I'm also hearing that Zoom is the enabler for members that live far away, and have been asked if we could continue to use Zoom after the plague goes away. That is possible, but will take some doing.

I'm still trying to figure why our For Sale ads seem dead on arrival. I've offered radios for free and have gotten no calls. If anyone can answer that one for me, I'm all ears. We don't have a For Sale section this month.

There is a very good chance we can have a Huntsville Hamfest this year. I have called the hotel and am working on setting up the DX Banquet.

So come join us for another covid-free virtual meeting of the NADXC on Tuesday, February 9. We'll use Zoom again. I'll send you another

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Icom IC-705

February Program by Steve Molo, KI4KWR

Since the Why I Bought column is being introduced this month focusing on rigs, it is appropriate for our program to feature a rig presentation—by VP Steve Molo, KI4KWR on the Icom 705. Bob will send an email with the Zoom particulars. Be there around 6:30 pm for informal discussion, meeting at 7:00 and program around 7:30. See you there!



Relief for the Weary DXer

By John Stensby, N5DF

Are you feeling a little blue over poor band conditions? A dearth of sun spots and the lack of major DXpeditions got you down? Do you have "cabin fever" from being stuck at home due to the pandemic?

I thought so. Well, a little reminiscing about previous NADXC fun activities might relieve your doldrums. Peruse my previously-unpublished 2019 NADXC Picnic montage and dream of better days. The event was hosted by Bruce, AC4G, in Taft, TN.



Food to Fuel the Deserving



Every Picnic needs a Cake



Let the Good Times Roll!



The Maven in his Domain

Winter Field Day

By Mark Brown, N4BCD

On a cool Saturday in January, HARC members turned out to participate in Winter Field Day (WFD). Unlike the ARRL sanctioned summer Field Day, HARC members approached this event with minimal planning and expectations. We are thankful to our host, Gary W9SGM for the use of his farm which also worked very well for HARC's downsized 2020 summer FD.

Summer FD involves hitting the field at the crack of dawn on Friday to set up towers, directional antennas, trailers, stations, and generators before making completions on Saturday morning for the 1PM commencement of operations. WFD setup was accomplished in a few hours on Saturday morning with fewer people, simpler antennas, existing shelters, and smaller generators.

The minimal plan was to run a CW and a Phone station using multiband antennas in an inverted V fashion, taking advantage of Gary's numerous trees for supporting the ends of the wires.

Chris AI4U organized a Phone station using his Yaesu FT-991A, MFJ auto-tuner, and a DX-80 Off-Center Fed dipole antenna. The first attempt to use a telescoping mast was a failure when the combined weight at the feedpoint of the heavy coax, balun, and wire caused the pole to look like a flyrod with a tarpon on the hook before breaking. The HARC crank-up tower was quickly brought into position and was more than capable of supporting the center. Everyone who operated brought their own headset to maintain the COVID distancing guidelines.

The money band turned out to be 40m, with a few QSO's on 80, 20, and 10m. All afternoon, various operators enjoyed good runs, with the majority of contacts into OH, MI, IN, NY, but just about all states are shown in the log

with a sprinkling of VE's. The exchange was a little different from Summer FD. The majority of contacts were with 1H (Home) stations, with many 1I (Indoor), and a few 1O (Outdoor). Notable was the 50 we worked from SFL. Guess they had a day at the beach. We operated as 2I with the generator bonus.

The phone station shut down around 8:15 PM for the evening and started up again on Sunday morning and ran until 1 PM. The log shows 515 total QSO's.

The CW station used the "blueberry shack"; and was organized by Mark AA2MA with assistance from Tom KG4CUI who supplied the equipment. The station used the IC-756 Pro III with a Palstar tuner feeding a ladderline fed doublet. Using the crude arm-span method to check the length before it went up revealed the length to be about 42 feet per side. The ladderline



The first phone antenna support couldn't handle the weight but was quickly replaced with the HARC crank-up tower.



Chris AI4U operating inside the barn.

length actually determined the location of the 35' crank-up aluminum tower. Simple rope guys were tied to tent stakes to support the tower.

The CW station while not suffering any operational problems, did suffer from a lack of participation on that mode. One factor might have been the CQ 160 CW contest underway during the night time hours.

Two benefits of Gary's farm are its electrically quiet location and the ability to space the stations further apart. Neither station produced any hint of interference with the other station.

Many of us expressed concern for the overnight forecast of 30 MPH winds with gusts to 40 but fortunately those concerns were unfounded.

Sunday teardown started with the CW station since they were making so few contacts and everything was pretty well wrapped up by early afternoon.

One of the benefits of field opera-

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Gary W9SGM, Steve KO4ALA, Phil W4EVV and Willie KO4ALY positioned the HARC crank-up tower to support the wire antenna.

Why I Bought...

[This month we begin a column treating why NADXC members bought or otherwise acquired certain items of hardware and software for their shacks. This first edition deals with rigs—we hope to follow with antennas, amps, etc. To share your “Why I Bought...” thought processes with the club, please send whatever you have to Bob, K8KI or Tom, KG4CUI. Thanks! - ed.]

Icom 7300 Ralph King, K1KOB



1. The IC-7300 is a 160 - 50 (74) MHz 100 watt all mode rig. It's even 100 watts on 6 meters multimode too.
2. At the time (just before Christmas) there was a \$300.00 rebate.
3. It has a real-time spectrum scope, SDR, and a large touch screen. My old Ten Tec Pegasus that I had for the last 20 years didn't have a front panel (screen), and no 6 meters, only 8 watts with a transverter.
4. It is going to have a One Touch FT8 mode preset. It already has CW and RTTY mode presets.
5. The built in antenna auto tuner is very fast and tunes my 265 ft windom just fine.

Flex 6500 Bob DePierre, K8KI



1. After seeing a panadapter screen for the first time, I was bitten hard. I wanted the largest full feature screen I could find. Fits nicely on a 24" monitor. I can trash a pileup with this puppy.
2. Integrated sound (DAX) and serial port software (CAT). I've tried integrating third party software and I've had problems, just in figuring out which side the problem was on. Now I don't need any cables at all for sound integration, and the OEM is the guy responsible for any CAT problems. I haven't had any problems at all in a while.
3. Sherwood specs. Two levels of pre-amp can hear down to -141dBm, and the IMD dynamic range is way over 100dB. And those filters have just killed interference I used to hear in contests.
4. Smooth integration of many third party programs, such as Slice Master (shows call signs adjacent to each signal on the analyzer); SDR bridge (runs my knob - the Flex control); and all the others that run every day: HRD, N1MM, WSJT, etc.
5. Excellent documentation and customer service from the OEM. Before I got my new laptop (Dell XPS13 i7 with docking station) I had lots of computer problems and needed to call for help fairly often. I don't know why, but all those problems fully disappeared with

the new laptop. I can't speak highly enough of this computer.

Kenwood TS-890 John Stensby, N5DF



1. Very good specs.
2. All of the important (to me) features.
3. A very well written Service Manual is available (I bought one). It includes a complete set of schematics, circuit board pictures with call-outs and very detailed alignment procedure(s). I really *hate* to buy stuff for which no/little technical documentation is available.
4. Kenwood is an established brand. They will be around long after I'm gone. A large number of 890s have been (and will be) sold, assuring the availability of service and spare parts for a long time to come.
5. I have an affinity for the Kenwood brand. From about 1981 to this day, I've owned and used a Kenwood TS-530s and TR-7950 (2 meter FM rig). Also, I have a Kenwood R5000 general coverage receiver. Just like there are Ford and Chevy people, I'm a Kenwood guy. (I have service manuals for the 530, the 7950 and the 5000).

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Kenwood TS-890 Art Davis, N4UC

I have owned several radios in my years as a ham radio operator. Some were memorable (Drake Twins), some were not (Heath HW-100). It all began in 1967 with my novice rig, a Knight-Kit R-100 receiver and Heathkit DX-60 transmitter. Over the next 55 years I also owned a Heathkit SB301/401, Kenwood TS-830 and TS-940, TenTec Orion, Elecraft K3, and now my current radio Kenwood TS-890. Noticeably missing from this list are Yaesu and ICOM products. Although I have been sorely tempted from time to time with offerings from those companies (FT-101ZD, FT-1000, ICOM IC-751 come to mind) it just never happened. Of course it also goes without saying that back in the 60's and early 70's a Collins S-Line was on everybody's bucket list.

When I recently decided to shop for a new radio, ICOM had just released the 7610, Elecraft was promising a K4 but wasn't sure when it would ever be available, and the new Yaesu FTDX-101 was tied up in the FCC approval cycle. After a couple of more years waiting for all the new rigs to materialize so I could do fair comparisons, I ended up buying a new Kenwood TS-890 at the 2019 Huntsville Hamfest.

Here are the reasons I chose the 890. Your mileage may vary:

1. Reliability - If you find something that works, stick with it. I still use my TS-940 daily after 33 years of ownership without a failure (unless you count light bulbs). It's built like a Sherman tank and so is the new TS890. I do however fully expect one of us to have a failure sometime before the passing of another 33 years though.
2. Aesthetics - I much prefer a traditional (i.e. boring) layout and appearance. By that I mean I like things such as big knobs with enough spacing to accommodate my fat digits. Also large size lettering especially for the frequency readout. No flashing neon lights, 3 layers of nested menus, or 3-D spectrum displays please!
3. Brand loyalty, maybe? I have owned Kenwood radios longer than any other brand. Plus, all my mobile radios are Kenwoods. Looking back on it I guess it all goes back to the fact that my first serious HiFi Stereo component system was based on my 1972 Kenwood KA_8100 stereo amplifier and KT-7500 FM receiver. Joe Walsh on vinyl still sounds great on them!
4. Physical Size - OK, I'm getting old and you would think that I would prefer a smaller, lighter weight radio, right? NO. Radios are supposed to be big and heavy and emanate waves of heat to warm the shack in the wintertime. One cherished memory of my early ham days was of my friends Hallicrafters HT-37/HT-41 and Hammarlund HQ-170 in his small shack (the younger folks will have to Google them). Warm and toasty with the smell of heated dust coming off the tubes, almost heaven! The TS-890, while not a very good space heater, does come closest to meeting the minimum size requirements. If they had just put the power supply in the cabinet like the 940, that would have done it for sure.
5. Price - After the TS_990 came out, I was afraid that Kenwood was going to offer just one radio at each end of the price spectrum. For several years their only products were the TS-590 which they kept upgrading,

and the TS-990 which was way more radio than I needed or could afford. Could it be that I would be priced out of owning another Kenwood for the rest of my life due to a marketing decision probably made by a 20-something marketing manager straight out of college? Thankfully they finally filled in the gap with the TS890 that satisfied my needs without requiring a second mortgage.

This was my thought process. Hopefully it provided you some food for thought when your wife says lovingly, "Honey, I think it's time". We all know that's the signal for you to get on the internet and start radio shopping, right?

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VP Corner By Steve Molo, KI4KWR

Hope everyone is doing well in 2021 so far. Though this coming weekend should have been Orlando HamCation both Jessica and I will be traveling to Vero Beach, FL for Treasure Coast Hamfest that Saturday.

CQ 160 CW was booming last weekend as I expected and hope for the same at the end of the month for the SSB portion. Finally, will be able to give the 160-meter vertical a chance for success. Don't fear we are still planning on our favorite hamfest of the year and hopefully a DX Dinner for us all to support and hear a presentation from our guest speaker.

See you in the pileups!!

73, Steve Molo KI4KWR

Yaesu FTDX3000
Fred Kepner, KF3FRK



Why I bought it and why I still use it:

1. I got a sweet, sweet deal on it as part of a package from a ham who needed to raise cash ASAP
2. The built-in USB port and soundcard simplifies digital modes
3. The CW decoder (although I've never really gotten it working well, need some help!)

More traditional controls and knobs than my previous radio, an FT-991.

What I wish it had:

An ethernet port and an easy way to implement remote operation.

Icom 7610
Susan Seaford, AI4VV



In 2018 after attending Contest University at Dayton, I placed an order for the Icom 7610 at the Dayton Hamfest. Why did I do that?

Let me go back in time. When I was first licensed in 2004 my 1st purchase was an Icom handheld followed by an Icom 706MKIIG. The latter worked well except not very many things were controlled on the face of the radio. Then it was time for a real radio: the Icom 756ProIII. It always worked well though I did not avail myself of its many fea-

tures. Then the SDR era began and the 7300 came into my shack. Time passed. I was running two weekly nets for the Coast Guard Auxiliary, one voice and one digital. I wanted some ham radio activity for myself.

In 2018 I signed up to attend the Dayton Hamfest and wanting to add an extra day also signed up for Contest University of which Icom is a sponsor. I had been thinking that I wanted to expand the activities I did in ham radio and wanted to use the radio better. I had read about all the features on this radio some of which I understood and some I did not. (Actually many I did not.) There was a coupon that year offered by Icom to those that attended Contest University and there was a second coupon offered as well. So that brought the price down to just below my established limit.

With my history of buying Icom products I have gotten used to reading Icom manuals, so that made it easier to use and learn new features. I joined that .io group that Adam Farson and Rob Sherwood contribute to. Andrew Barrons also started writing books on these Icom models. So I had other materials to learn from.

I have liked the new radio for many reasons. Using it on the same nets and with the same antenna I noticed that I could hear better. With the history of using Icom products the user interface was familiar to me. The screen is large and can be used with a monitor. Filter adjustments are great. The notch filter is amazing. Noise reduction is good. It integrates well with my new desktop computer. I had selected an Elecraft amp and preamp to use with the 7300 and when the 7610 came I just took the cables out of the 7300 and into the 7610. Digital modes are easy to set up (and reset up after Windows updates).

I am still very happy with this radio and continue to learn with it.

Yaesu FTDX-101MP vs FTDX-5000D
Steve Werner, AG4W



FTDX-101MP Advantages over FT DX - 5000D

1. Number 1 on Sherwood's receiver list. 110 dB narrow-band dynamic range.
2. Hybrid Architecture - best properties of SDR and down-converting radios
3. VC tuning on main and sub receiver -70 dB of interference reduction-great for 160 meters
4. 2D and 3D spectrum scope
5. Digital noise reduction and CW peaking filter- industry leader before. Even better now.

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Kevin Hibbs, KG4TEI, The Casual DXer

The Gap Resonated HF Loop

The small gap resonated HF loop is popular for portable QRP operations. In the previous *Ionospherica* we explored the bent dipole near the ground, and how its fields couple to the ground and to the ionosphere. This time we'll take on the small loop near the ground. The loop is often thought to be a purely magnetic antenna, but it can have a very strong electric near field as well as a strong magnetic field. We confine our discussion to small loops, those less than one-tenth of a wavelength in di-

ameter, and resonated by a capacitor in the loop gap.

We will look at the near fields of the loop, how it couples to the ground compared to a dipole, and how it couples to the ionosphere.

Figure 1 shows a portable ham radio operator using a small loop. HF loops, are typically about 1 m in diameter, incorporate a tuning-resonating capacitor and some sort of feeding mechanism, which can take the form of a secondary feeding loop or a shunt feeding arrangement. The loop and capacitor

form a high-Q resonant circuit where the "beneficial" loss is radiation resistance. Measuring the Q and performance of a small HF loop are discussed in [1].

Loop near field analysis is very complex. Necessarily, this will involve some equations, but we'll keep them to a minimum and as uncomplicated as possible! We'll look at some specific results, including close electric near field expressions that are not readily available elsewhere.

The Close Near Fields of Small Loops

According to derivations in [2], the loop current $I(f)$ around the circumference f of the electrically small loop is not constant, but has a f dependency,

$$I(\phi) = I_0 (1 - 2(kb)^2 \cos(\phi)) \quad (1)$$

where I_0 is the loop feed current, b is the loop radius, and $k = 2\pi/\lambda$. Everywhere on the loop of wire radius a the surface tangential magnetic field is,

$$H_{\text{surface}} = \frac{I(\phi)}{2\pi a} \quad (2)$$

The current correction term in Eq (1) that depends on f is the first term of a Fourier series expansion of the exact loop current, and is usually ignored. This term, however, results in a charge accumulation on the loop, and that in turn gives rise to an impressive close-near electric field.

The electric fields near the loop are very complex and very difficult to calculate analytically, however at the center $(x,y) = (0,0)$ of a small loop in the $x-y$ plane (see Figure 2) the result is remarkably simple,



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Cont'd on p. 8

$$E_{0,0} = -j \frac{\eta_0 k I_0}{2} \quad (3)$$

where $\eta_0=376.7 \text{ } \Omega$. Note that the electric field at the loop center does not depend on any loop dimensions (for an electrically small loop). This electric field is *y*-directed, or *horizontally polarized* inside the loop for a vertical loop oriented with the resonating capacitor at the top as shown in Figure 1. More on this later.

The magnetic field at the loop center, using classic solenoid analysis, is simply

$$H_{0,0} = \frac{I_0}{2b} \quad (4)$$

Unlike the electric field in the center, the magnetic field depends on the loop diameter $2b$. The wave impedance Z_w at the origin is the ratio of $E_{0,0}$ to $H_{0,0}$,

$$Z_w = -j \eta_0 k b \quad (5)$$

Since Z_w in the loop center is not zero, the small gap-resonated loop is clearly not a purely magnetic antenna, and in this orientation its close near-field polarization is at right angles to the far field polarization!

In addition to providing insight into the behavior of small loops, equations (1)–(5) are useful for validating the results of numerical electromagnetic code (NEC) such as MiniNEC.

We can easily find the exact electric field at three specific places inside the small loop: $E_{0,0}$ (Eq 3) at the loop center, E_{gap} across the gap-capacitor, and opposite the gap, where $E=0$. The electric field at the gap-capacitor is easy to find from the rms capacitor voltage,



Figure 1—The small gap resonated loop fed by a secondary loop makes a compact portable HF antenna for QRP expeditions. Source: ©2014 Chris Dean, KD7CNU, used with permission.

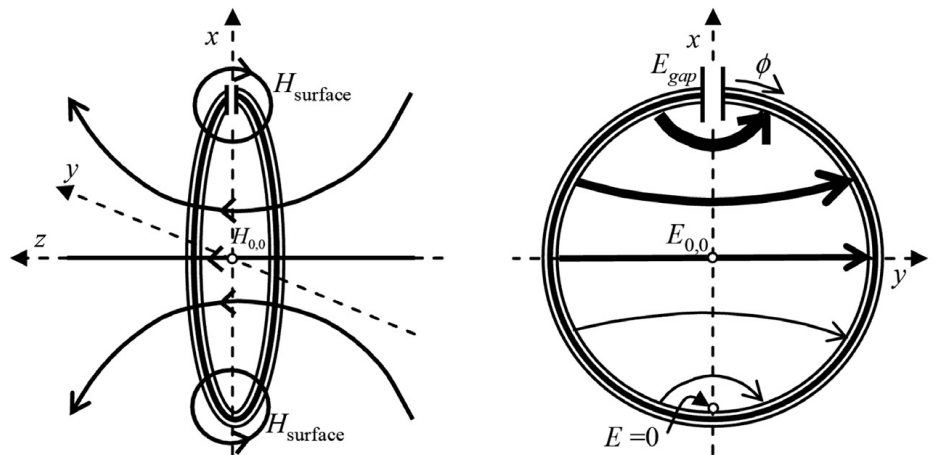


Figure 2—The (left) solenoidal magnetic fields on the loop surface ($H_{surface}$) and in the center ($H_{0,0}$) are easily determined. The (right) electric fields at the center ($E_{0,0}$), the gap (E_{gap}) and opposite the gap ($E = 0$) are also easy to determine.

$$V_{cap} = \sqrt{X_C Q_L P} \quad (6)$$

where X_C is the capacitor reactance at resonance, Q_L is the loaded Q of the system [1], and P is the power radiated by the loop so,

$$E_{gap} = \frac{V_{gap}}{g} \quad (6)$$

where g is the gap dimension. V_{gap} can be almost 1 kV *peak* at QRP power levels.

An important take-away here is that there can be an enormous electric field near the small loop whose origin is the

slight departure from a constant loop current seen in Eq (1). That field is of great interest when we assess RF exposure from a small HF loop.

Loop Far Fields

In the orientation of Figure 1, with the plane of the loop perpendicular to the ground, the far magnetic field pattern (see Figure 3) is toroidal. A slice through the y - z plane (parallel to the ground) has a figure-eight pattern, with nulls directed along the z -axis, the same as that of a horizontal dipole oriented along the z -axis. The loop electric far field wraps around the z -axis and is vertically polarized near the horizon.

Cont'd on p. 9

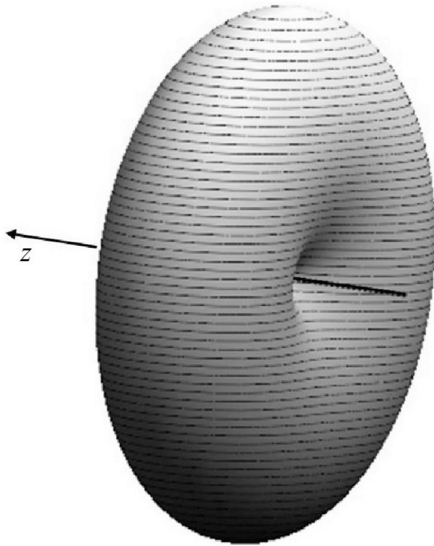


Figure 3—The magnetic far field of a vertical loop is solenoidal. Its electric far field wraps around the z-axis and is vertically polarized near the horizon.

Coupling to the Ionosphere and Earth

The loop radiation pattern null on the z-axis becomes less prominent and the pattern more omni-directional as the radiation angle relative to the ground increases. This means that loop radiation will couple in all directions into the ionosphere at the 5 to 20 degree elevation angles that are important to DX communications.

Although the electric field inside the loop is *horizontally polarized*, far from the loop (more than a few wavelengths) the electric field has only a E_r component, so the polarization is *vertical* at angles near the horizon!

Small loops couple weakly to the ground, as seen in Figure 4. The mutual inductive coupling to ground for the 1 m diameter loop is 7% when resting just above a perfect ground, and only 0.34% when the center is 1 m above ground. This is far less than the coupling to ground of a horizontal dipole at the same height. I based my calculations on Neumann's integral formula

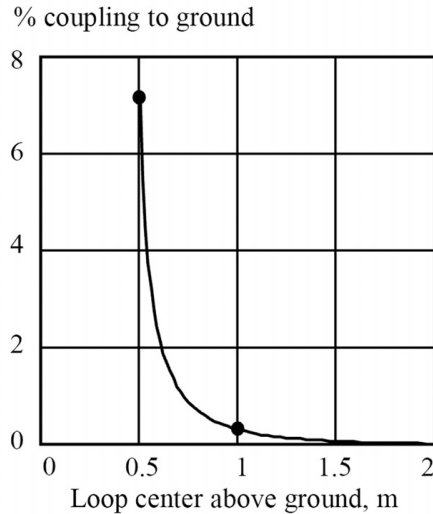


Figure 4—Loop field coupling to the ground vs. height of the loop center in meters.

for coupling between a loop and its image in a perfect ground. For the QRP operator this means that the loop tuning will not be perturbed very much by changes to the height above ground.

Loop RF Safety

With just 10 W RF power the voltage on the loop at the tuning capacitor peaks out at nearly 1 kV peak, (multiply Eq (6) by 1.41), and is a safety concern. At 10 W the FCC compliance distance for RF exposure, see [3], is between 1.3 and 1.5 m (<5 ft) from the loop center across 7–29 MHz. Figure 5 shows that the electric field near the loop may be of more concern than the magnetic field, especially on the capacitor side (top) of the antenna.

Enjoy QRP operation with your loop – safely!

References

1. A. Findling, K9CHP, and K. Siwiak, KE4PT, How Efficient is Your QRP Small Loop Antenna?, *QRP Quarterly*, Summer 2012.

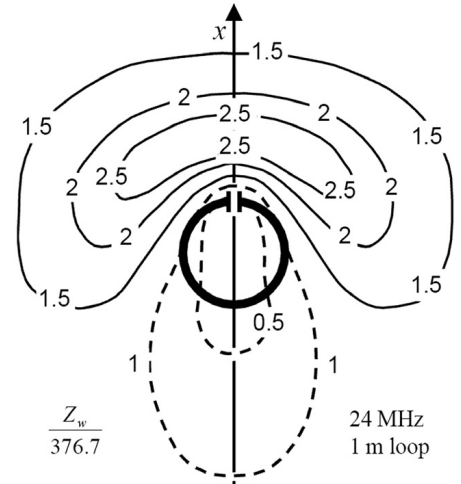


Figure 5—The electric field energy exceeds the magnetic field energy when the field impedance $Z_w/376.7$ exceeds 1 (solid contours).

2. K. Siwiak and Y. Bahreini, **Radio-wave Propagation and Antennas for Personal Communications, Third Edition**, Artech House, Norwood MA: 2007, Chapter 11.
3. E. Hare, W1RFI, **RF Exposure and You**, ARRL, Newington, CT, Table 17, p. 8.77, www.arrl.org/shop/.

Kazimierz (Kai) Siwiak, KE4PT, is an avid DXer who packs a DX-go-bag station on his travels. His technical writings appear in many publications. You can reach Kai at k.siwak@ieee.org.

This article reprinted from the Fall 2014 edition of *QRP Quarterly* with permission of the author.

From the President
(cont'd from p. 1)

invitation, but the sign-on will be exactly the same. I'll open Zoom for informal discussion at 6:30, and start the meeting at 7pm. Steve Molo, KI4KWR, will present the new IC-705 radio.

Winter Field Day (cont'd from p. 3)



Blueberry shack housing the CW station.

tions is forcing one to think about all the little things that make up a station. From generator gas can to antenna rope, leaving something at home could invite failure. None of that happened here. In fact, the word of the day seemed to be redundancy.

HARC's Winter Field Day was a great success. The exercise proved that if



Mark AA2MA running stations on 40m CW.

needed, our Club could put multiple stations on the air for emergency communications on very short notice.

73,

Mark N4BCD

Winter Field Day Participants:

Mark	AA2MA
Chris	AI4U
Laura	K4CNY
Tom	KG4CUY
John	KK5KKT
Tim	KM4ESU
John	KM4VSY
Steve	KO4ALA
Willie	KO4ALY
Douglas	KO4DGJ
Mark	N4BCD
Jim	N4KH
Art	N4UC
Phil	W4EVV
Jordan	W4HBO
Gary	W9SGM



CW station's Alumina tower (formerly K8KI's and loaned to us by Warren, K4MMW) and ladder-line-fed doublet.



Host Gary W9SGM shown here clearing some branches for the ladder-line is not pruning the feedline.

Using Natural Resources for Ham Radio Projects

By Bruce Smith, AC4G

I do not know about you, but I am always thinking how I can improve my antennas and equipment in order to work those rare DX and make more QSO's in ham radio contests. At the moment, my station is receiving a lot of hash and trash noise on the order of 5 to 20 dB most of the time. My suspicion is that it is due to the local power company increasing the voltage on the lines from 7200 VAC to 14,400 VAC to supply 3-phase power to some new,

small manufacturing companies in my area. I have always had a small bit of noise, but now it is killing my ability to receive those tough ones on 160m. Since the low bands are the bands I monitor most, I have had some time to think about what I can do to eliminate this noise or reduce it tremendously, so that I can hear those distant DX stations on the low bands. I came up with

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DX Contests for February

By Chuck Lewis, N4NM

CQWW RTTY WPX Contest, (DIG), 80-10 meters

Feb 13, 0000Z to Feb 14, 2359Z

Exchange: RST & Serial No.

See page 73, Feb. QST and
www.cqwprrtty.com/rules.htm

Asia-Pacific Sprint, (CW), 40 & 20 meters

Feb 13, 1100Z to Feb 13, 1300Z

Exchange: RST & serial #

See page 73, Feb. QST and
www.jsfc.org/apsprint/aprule.txt

ARRL Intl. DX Contest, (CW), 160-10 meters

Feb 20, 0000Z to Feb 21, 2359Z

Exchange: RST plus State/Province;
DX send RST plus pwr.

See page 73, Feb. QST and
www.arrl.org/arrl-dx

CQ 160 Meter Contest (PH), 160 meters

Feb 26, 2200Z to Feb 28, 2200Z

Exchange: RS plus State/Province;
DX: RS plus CQ zone

See page 73, Feb. QST and
www.CQ160.com/rules.htm

REF French Contest (PH), 80-10 meters

Feb 27 0600Z to Feb 28, 1800Z

Exchange: RS plus Serial No.; F stns.
send Dept.

See page 73, Feb. QST and
www.concourse.r-e-f.org/contest/

UBA (Belgium) Contest (CW), 80-10 meters

Feb 27, 1300Z to Feb. 28, 1300Z

Exchange: RST plus Serial No.; ON
stns. send province

See page 73, Feb. QST and
www.uba.be/en

ARRL Intl. DX Contest, (PHONE), 160-10 meters

Mar 2, 0000Z to Mar 3, 2400Z

Exchange: RS plus State/Province;
DX send RS plus pwr

See www.arrl.org/arrl-dx

Stew Perry Topband Challenge, (CW), 160 meters

Mar 13, 1500Z to Mar 14, 1500Z

Exchange: 4 Character Grid Square

See www.kkn.net/stew

Other contests:

EurAsia HF championship, CW/SSB,

0300Z - 1200Z, Feb 6

KCJ Topband Contest, CW,

1200Z, Feb 6 - 1200Z, Feb 7

Mexico RTTY International Contest, DIG,

Feb 6, 1200Z - Feb. 7, 2359Z



SARL FD Contest, CW/SSB/DIG,

Feb 13, 1000Z - Feb 13, 1000Z

Balkan HF contest, CW/SSB,

1300Z, Feb 14 - 1700Z, Feb 10

Russian PSK WW contest, DIG,

1200Z, Feb 20 - 1159Z, Feb 21

UBA Spring Contest, CW,

0700Z -1100Z, Mar 7

Dates & times often change or are mis-
printed in the journals; beware.

Chuck, N4NM

Flex 6400M

Jack Hemby, W5WQQ



After watching the Flex Radio transceiver demonstration at a hamfest, I built and operating several Softrock 40 receiver kits. These single band SDR receiver kits sold for \$10 delivered. They used a modified version of Flex Radio's PowerSDR. So my display looked like I was running a Flex.

Flex Radio was happy for hams to use a modification of their software.

Softrock receivers used a quadrature sampling detector developed by Dan Tayloe, N7VE, to get simple inphase (I) and 90 degree shifted quadrature (Q) samples of the input signal. These signals can be used with sampling theory to reconstruct the original signal.

I ordered the \$10 receiver kit to help determine if I could successfully work with surface mount components. I found I could handle the surface mount components by using 0.015 size solder and by using a small tip soldering iron. Surface mount components are now my preferred components for assembling kits. As with many projects, miscellaneous small tools are handy such as: magnifying glasses, some means of holding the component in position for soldering, and soldering wick.

Flex Radios are Software Defined Radios which are designed around sampling theory. Prior radios used the conventional superheterodyne design. They could be controlled by a computer. All features exist in the hardware within the radio. If you needed different bandwidth filters, a fixed module for each bandwidth you want is required. In a SDR, software code makes the filter. New modes, as developed, will also exist in software.

It didn't take long to realize the features of Power SDR software couldn't be matched in conventional software controlled radios. Digital signal processor chips now have enough bandwidth to sample and display the whole band.

Here are just a few other things that could be done with Power SDR and SDR radios.

- A real-time dynamic spectrum analyzer to show signal density. Have you ever wondered where the other side of a DX contact is transmitting or that is there a small clear space within the pile-up to try making your transmission? The display can be expanded to show spacing between closely spaced signals. Transmitting in the free space might give you an advantage.
- Monitoring two signals within the tuning range.
- Help determine the mode and signal bandwidth that you are receiving.
- New modes may not require any new hardware, and can be designed in software updates.
- Filters are programmed, not hardware for each bandwidth desired. Do you remember the ringing when you use a narrow bandwidth cw filter? The little \$10 receivers can go to 25Hz bandwidth without ringing!

Power SDR as modified for Softrock receivers used the digital signal processor in your computer's sound card. However it took a little while to get comfortable not having knobs on the radio.

After playing with a radio that looks like a Flex on the monitor, I decided my old superheterodyne design receiver could not approach the "must have features" for my probably "last new rig." I had just become a late 70 year old. The FlexRadio 6400M which has a front panel with knobs for operation seemed to meet my radio desires. Software by Flex Radio allows access and control of their radios.

References:

DanTayloe, N7VE, developed quadrature sampling detector.

KB9YIG, Tony Parks, produced and sold the Softrock40 kits. www.fivedash.com currently sells Softrock40 kits. www.WB5RVZ.org has schematics and description of Softrock40 products.

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NADXC Officers and Directors

President	Bob De Pierre, K8KI
Vice President	Steve Molo, KI4KWR
Secretary/	Chris Reed, AI4U
Treasurer	
At-large	Kevin Hibbs, KG4TEI
Directors	Tom Duncan, KG4CUY
(Ex-Officio)	Steve Werner, AG4W

this idea that I believe to be economically feasible for me to try. My idea is to use one of the natural resources on my farm that is free and readily available for use. My idea is to build another low band receive antenna. There appear to be many articles on the internet for this particular receive antenna. This will be my project for this summer 2021.

Below in Picture 1 and Picture 2 is the necessary natural resource to help me build my receive antenna – bamboo. I have read articles from many hams worldwide who use bamboo or palm trees as an antenna support. My idea is to use the bamboo grown on my farm as spreaders for a receive antenna. Specifically, my idea is to build a Flag Antenna.

First, bamboo is a grass in the Bambusoideae family. It can range in size from a few inches in height to over 100 feet and can grow a foot a day. Bamboo grown in your garden spot can become uncontrollable. The bamboo at my QTH began growing about five (5) years ago. It has come to the point where I need to cut it because it ap-



Picture 1: Bamboo brake at AC4G QTH

pears to be getting out of control. Some of the bamboo is approximately 30 feet long. Bamboo is a non-native plant to Tennessee and its growth is becoming too erratic for me. I have decided to cut it and use some for my antenna spreaders for my flag receiving antenna. Since it has been cold being the middle of winter (January 2021), I have been harvesting my bamboo to avoid snakes, ticks, and other four-legged critters living on my farm in middle Tennessee.

So, why did I decide on a flag antenna? What is a flag antenna? How will I design my flag antenna? Let's discuss in the remaining part of this article. This article will not discuss any specific construction details, but will only focus on my design plan idea rolling around in my head.

I decided to go with a flag antenna because after doing some research trying to figure out why I cannot hear distant stations on top band (160m) the other side of the world, but there are those in the U.S.A. who can. They often hear stations via longpath such



Picture 2: Bamboo harvested at AC4G farm

as 9M2, 9V, VU, etc. I have never heard any longpath 160m signals ever. I found that most of the North America hams that hear those distant stations are using high, flag antennas. Also, after hearing and studying the different receive antennas that exist, the flag has some of the best performance characteristics for receive antennas.

What is a flag antenna? The flag antenna is typically shaped like a flag or rectangle (see Figure 1), fed with a 10:1 balun and having a 300-500 ohm terminating resistor. The flag antenna is highly directional toward the feed point. It must be supported and a pre-amp is needed. It can be horizontally polarized and is good for city lots due to the little space it takes to perform. Its size is approximately 35 ft x 16 ft and is rotated on a tower. The antenna element can be made from low-visibility #12 gauge wire. The front-to-back gain is 33.2dB (Figure 2).

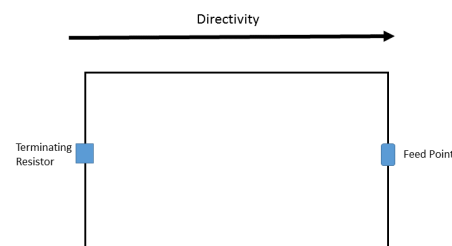


Figure 1: Flag antenna shape

Figure 3 shows the schematic of a typical flag antenna. Direction of reception is toward the feed point which is shown on the left of the picture. The schematic shown is of a pennant antenna, but the flag and pennant are very similar except for the shape. My antenna will be shaped like a rectangle since it will be easier to construct and fabricate.

How does the bamboo fit into this project? The bamboo will be used as

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Using Natural Resources for Ham Radio Projects

(cont'd from p. 13)

spreaders attached to an aluminum boom to hold the wire element. Dried bamboo will not be a conductor, but an insulator as it holds the wire into the shape of a rectangle or flag-shaped antenna. I am giving my cut bamboo plenty of time to dry out. Figure 4 below shows the plan to construct the flag antenna. The spreaders are bamboo, the boom is aluminum, the spreader-to-mast plate is of aluminum, and the antenna will be attached to an aluminum mast plate connected to a steel mast on an antenna rotator in the top of some tower section.

My plan is that construction of this receive antenna will commence in warm weather late-Spring or early-Summer 2021. Mast plates and spreader plates will be cut and drilled

in the workshop any time from now until spring. During the rest of the current winter months, I will be finalizing the feed point balun and preamplifier. If all goes well, I should be able to have a fantastic receive antenna to receive very difficult signals on the other side of the globe on the low bands made from materials grown in southern Tennessee and constructed in southern Tennessee. I probably need to do some RF sniffing to find my noise source, but I am hoping that this antenna will be the "cure-all" to "kill two birds with one stone" and solve my noise issue and allow me to work the tough ones on top band (160m). I am hoping to provide an update later in 2021.

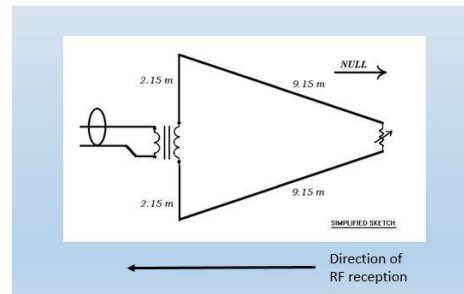


Figure 3: Schematic of my Flag Antenna

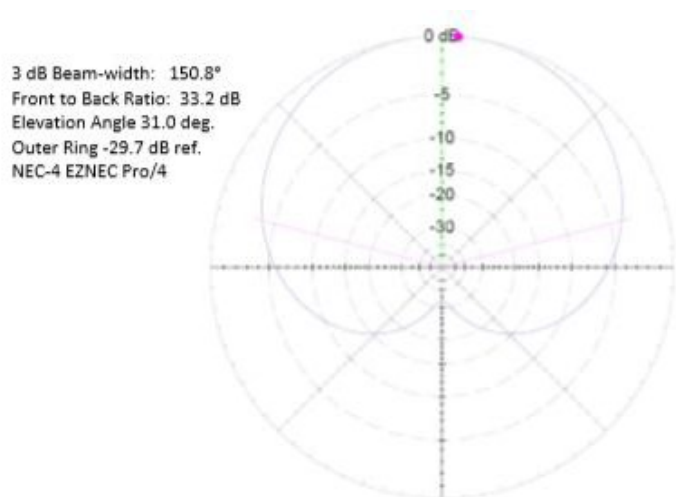


Figure 2: Antenna Pattern of Flag Antenna

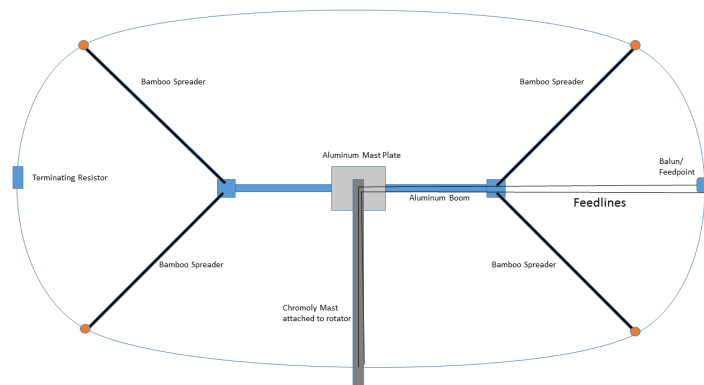


Figure 4: Construction-Fabrication Plan (Antenna shown vertical for details to be seen – final antenna will be twisted horizontal)

Why I Bought...

(cont'd from p. 14)

Yaesu FTDX-101D
Jim Spikes, N4KH



1. To upgrade to a rig with dual receivers
2. Excellent receiver and audio
3. Built in bandscope
4. Filtering and VC Tune
5. To try a Yaesu (never owned one) while watching how the introduction of the Elecraft K4 goes.

Product Review—Chameleon Antenna MPAS 2.0

By Steve Molo, KI4KWR

This month's product review is the Chameleon Antenna MPAS (Modular Portable Antenna System 2.0). This product has been on the market for over a year now and has become my camping and Field Day antenna for 2020 and the future. The advantage I see with this not only being a portable antenna covering 160 to 6 meters but the options for setting it up. Some of the possible deployment configurations: Vertical / Horizontal / Sloper / Inverted "V" / Inverted "L" / NVIS / Balcony / Vehicle (Stationary) and Man-Pack. The military style backpack holds everything, and setup takes no more than five minutes for Jessica and me. Now you may ask about setup which is a spike in the ground which you screw

the balun (Hybrid-Micro) on and then the folding poles which extend full at 113 inches. Typically, we set it up with the 25' wire as the ground. The 50' of coax with a RFI choke works great when used on my Go-Kit IC-706MKIIG. Using the LDG IT-100 tuner normally is a 3-5 second "zip-zip" and tuned. The SWR before tuning we have seen 2.5:1 across all the bands.

Specifications:

Frequency: 160M – 6 meters

Power: 100 SSB or 50W CW.

Mounting Configuration: 3/8-24 Thread



The Casual DXer

By Kevin Hibbs, KG4TEI

I'm always looking for the easiest way to be the most productive when I sit behind a radio. Often not having hours to devote to chasing DX the most bang for my buck is usually during DX contests. I rarely enter these contests in a search for the highest scores. No, I have ulterior motives. I want all time new countries and new band countries. To make my time more productive I often turn to contesting aids like DX clusters. My preferred logging software, N1MM, has a built-in dx cluster telnet software. A quick selection of a near-by cluster, enter my call sign as the user name, and I'm off to the races as N1MM parses the incoming data to display. With the click of the mouse my radio tunes to the desired DX frequency and I complete the contact. What could be a lot of dial turning takes just a few minutes. I'm sure many, if not most, those reading this article have done the same thing.

So what's happening behind the scenes when I select that address? The logging program is utilizing

one of the oldest programs on the Internet called telnet. It was created back in 1969. I know many hams love old gear, but most don't actively use a radio built 52 years ago during a contest. I think we are just living by the motto of if it ain't broke don't fix it. Telnet provides a basic communication scheme that passes data between a client, the computer, and a host, the remote server known as the DX cluster. When the computer connects to the cluster a connection is requested and the user is presented with a request to login. The user enters a callsign and the DX cluster uses that information to set up a bi-directional connection where data is sent back and forth in the form of spots. It is a simple, low bandwidth connection method, and provides an easy way to share basic data between computers.

Telnet has also been used for years for connecting to network switches and other computers to perform configuration tasks. However, it has fallen out of favor due to large security holes. This is mostly due to the fact that the data is

passed in clear text across the Internet. For most of these tasks network administrators now prefer to use Secure Shell (SSH), which offers encryption and as the name implies, a secure connection to the host computer. For hams, this isn't much of a concern because we aren't sharing passwords, or other important data through telnet, just DX spots.

As a last bit of information, if you want to see what is actually entering and leaving your computer during a DX cluster telnet session take a look at a program called WireShark. It captures network packets and presents them in human readable format. WireShark is a very useful program to network administrators and security professions as it has the ability to filter, sort, and follow network packets interacting with a computer. For more data on telnet wikipedia has a good article on the subject: en.wikipedia.org/wiki/Telnet.

That's all for this month. I hope to see you all on the zoom meeting Tuesday.

January Meeting Minutes

By Chris Reed, AI4U

The January 12th meeting of the North Alabama DX Club was called to order at 7:03 pm by President Bob Dipperre, K8KI via Zoom. We all agreed that we miss meeting in person, but it was the best alternative to keep the group meeting on a regular basis. Bob made a few brief announcements then turned it to Chris for the Membership and Financial reports. After a few minutes of discussion Bob, K8KI adjourned the meeting at 7:18 pm.

Bob, K8KI presented the program on the basics of EZNEC. The next scheduled meeting will be February 9th, 2021 at 7pm with the Zoom session opening around 6:30 pm for informal social activity.

Respectfully submitted,

Chris Reed, AI4U

Winter FD Thanks

By Chris Reed, AI4U

Mark, N4BCD outlined our Winter Field Day activities in his article. I just wanted to extend a big thank you for several DX club members that helped make our small effort possible including: Tom Duncan, KG4CUY, Mark Morgida, AA2MA, Mark Brown, N4BCD, Art Davis, N4UC, and Jim Spikes, N4KH and a big thank you to Gary Suckow, W9GSM. Gary was a gracious and hard working host at his farm. Whether it was coffee, helping to raise antennas, lending coax, making a great pot of coffee and a renting a port a potty to allow for the return of recycled coffee, Gary was there. Great effort by all involved.

Thank you for a fun weekend!

Chris Reed, AI4U

Dues Reminder

By Chris Reed, AI4U

Thank you to all the members who have paid your dues for 2021. A quick reminder that if you haven't paid your 2021 dues, please do so. The preferred method is using the paypal payment button on the website at www.nadxc.org. It's ok if you don't have paypal, you can pay with a debit or credit card. This is a secure purchase. Your dues are greatly appreciated and go toward our efforts to promote DX and support when we can.

73,

Chris,

AI4U

Winter Field Day Reflections

By Tom Duncan, KG4CUY

I was skeptical of the value of Winter Field Day when the idea of mounting an effort started circulating at HARC meetings several months ago. Would it be worth the work a few of us would have to put out — because surely we would have lackluster turnout in the depth of winter? Would there be anyone else on the air? I had never paid any attention to WFD before, so probably nobody else had either. The contest, or event, or whatever you want to call it doesn't have official ARRL status — even Straight Key Night has that! And the CQ 160m CW contest is the same weekend, so all the CW ops who would turn out for the real Summer Field Day would be catching up on their sleep during the day. But I said I'd help, so Saturday morning I left civilization and headed for the great wilderness of Toney or Harvest or whatever it is up there.

The strangest thing happened. Two very minimal stations were set up in short order, one for phone and one for CW. There were plenty of people to do

Financial Report

By Chris Reed, AI4U

January beginning balance \$8,333.40

DXer of the year plaque \$54.49

February beginning balance \$8,278.91

Paypal balance: \$577.63
from membership dues

Three membership dues awaiting deposit at the bank.

(see Mark's article for a list). Inside Gary's barn and his blueberry shack things were quite comfortable despite sleet early on and windy conditions outside. There were indeed other WFD stations on the air, although indeed more of them running phone than CW. Conditions were good enough to work WWA, ME, SFL, and ORG sections and all the stuff in between. Hard as I tried to explain all this away, it seemed everyone was having a good time. We had demonstrated to ourselves at least that a viable field day setup could be thrown together by — in Summer Field Day terms — a small group of people and with less-than-herculean effort.

When we tore down Sunday afternoon there was a general feeling of accomplishment and "I'm glad I came."

I learned once again, that nothing ventured, nothing gained.

Proposed NADXC Budget for 2021

By the NADXC Board of Directors

Proposed Budget for 2021											
Item	Description	Budgeted Income	Budgeted Expense	Projected Bank Balance	ACTUAL in 2020						
	Current Bank Account Balance 1/1/21	8,333.40		8,333.40	8638.51						
1	Projected Dues receipts (est. 55 members @ \$15)	825.00		9,158.40	700.75						balance on 1/1/2020
2	Repeater Power Bill (Janet Richardson)		(80.00)	9,078.40	-160.00						reduced to 50 members
3	Repeater maintenance		(100.00)	8,978.40	-200.00						Paid for 2019 and 2020.
4	Annual Web Hosting & Domain Service		(72.72)	8,905.68	-93.16						Donation to NARA
5	DX Expedition Sponsorship		(400.00)	8,505.68	-416.00						Website hosting/Domain
6	Young Ham of the Year Plaque		(55.00)	8,450.68	0.00						Tokelau, Zambia
7	DX Club Banquet Receipts	3,990.00		12,440.68	0.00						
8	DX Club Banquet Expenses - venue & meal		(3,500.00)	8,940.68	0.00						
9	DX Banquet Speaker Expenses (reduce to 400)		0.00	8,940.68	0.00						
10			0.00	8,940.68	-235.00						NM4T Brick
11	Annual Club Picnic (picnic supplies)		(100.00)	8,840.68	0.00						
12	Plaque, Dxer of the year		(55.00)	8,785.68	-54.49						Plaque for AG4W, Steve
13	Speaker Fund		(55.00)	8,730.68	0.00						
14	Incorporation*		0.00	8,730.68	0.00						tabled
15	Name Reservation with AL Sec'y of State		0.00	8,730.68	0.00						tabled
16			0.00	8,730.68	-32.70						DX banner
17			(20.00)	8,710.68	0.00						Stephen KK4TJP tracking
			0.00		0.00						
	Summary	13,148.40	(4,437.72)	8,710.68							
	Net Difference in Bank Balance			(377.28)							
NOTES											
*Donation of \$200 to the club earmarked for incorporation expenses (2/9/2016)											
Money in Paypal Account											372.21
Proposed Net Expenses for Year											(5.07)