The LongPath

October 2024 — Volume 48 Issue 10 A North Alabama DX Club Publication

Contents:

Contributors:
AC4G
K3FRK
K8KI
N4NM
N5DF
NG3K

- .... .
.-.. --- -. --. .--. .- -
....
--- -.-. - --- -... . .-.
..--- ----- ..--- ....-
...- --- .-.. ..- -- .
....- ---..
.. ..- .
.---- -----

From the President

By Bruce Smith, AC4G

Fall season is here and cooler weather is beginning to move in as the Fall Equinox occurred on September 20. Fall equinox occurs when the sun is directly above the equator, marking the autumnal equinox in the northern Hemisphere. The Fall season welcomes some major amateur radio contests. I like to think that Fall season marks the beginning of the Low Band season. As I write this, the CQWW RTTY Contest is in full swing. The CQWW RTTY Contest is one of the largest contests in ham radio with many ham operators from around the world operating the full weekend of September 27 through September 29.

Since the temperatures are beginning to turn cooler, I trust many of us will begin to seriously work on antennas, towers, and other outdoor work. Its more enjoyable to work in cooler weather outside rather than being in 90 degree heat. This week, I installed a 700-foot bi-directional Beverage antenna pointed in the Northeast-Southwest direction. I am getting ready for the low band activity, but as we all know during this stage of the solar cycle, the higher bands are favored due to propagation being better with increasing solar flux. So, I hope we will have many low band openings with some good nights on 80m and 160m this season working DX.

As you know, the NADXC is a DX Club. Let's discuss more DX at our club meetings. I want to form a committee to help streamline and retune or recalibrate club meetings, so we can focus more on DX. How do we do this? I want this committee to study our meetings and consider changing how we do meetings. I would like to see the committee come up with ideas to make meetings more interesting rather than consuming large amounts of valuable time on the budget and other topics that consume our limited time. I also want to form a committee to take the DX funding requests we receive and figure out if we want to fund a DXpedition and the amount to fund or just merely turn down a request. I would rather use more of our limited time to listen to valuable information presented by various expert speakers that we have invited to speak.

Our NADXC "Annual Meeting" will be this month. The NADXC Constitution and By-laws calls for the "Annual Meeting" to elect new officers and directors for the following calendar year, to review the past year, and conduct other business. This month, the Nomination Committee consisting of John

From the President
(continued)

Stensby, N5DF; Rob Suggs, NN4NT; and Chuck Lewis, N4NM will present a slate of officers and directors for the NADXC membership to vote on officers for next year. We will walk through a list of accomplishments for this past year. We will remind members of the annual picnic and annual Holiday/Christmas Dinner. We will discuss the NADXC awards that will be presented and voted for at the November meeting. Finally, we will watch a program on the recent CHAD (TT8) DXpedition put on by the Italian DX Team (IDT).

I look forward to seeing everyone at the next meeting, which will be at 6:30 P.M. on October 8 at the Museum of information Explosion (MIE), 1806 University Drive, Huntsville, AL 35801. Arrive around 6:00 P.M. for some social time. For those unable to meet in person with us, we will have ZOOM details that I will send in a separate email a few days prior to our meeting.

A Simple RF Power Sensor
By John Stensby, N5DF

Absorption-type, diode-based *RF* power sensors comprise a class of wattmeters for measuring small amounts of power. A number of vendors have offerings in this product category. Particularly attractive are power sensors with a *USB* interface for computer control, computation and display purposes. In laboratories and service shops, they are used to test and calibrate signal generators, network analyzers and other equipment. Amateur radio operators and experimenters use *RF* power sensors, preceded by an attenuator and/or directional coupler, to measure the high power output of transmitters.

Due to budgetary constraints, the purchase of a new *RF* power sensor may not be advisable. Acquiring a second-hand unit may come with undesirable issues. An accurate homebrew power sensor may be difficult to build and calibrate, especially if it is implemented completely in hardware. Several of these issues are mitigated by the project described next.

An absorption-type, diode-based power sensor construction project is described in this paper. It has both hardware and software components that comprise a low-cost unit with good accuracy well into the *VHF* range.

The power sensor hardware component is called *SimpleRFpwr*. It uses a single Shockley diode, one *Op-Amp* and a few other discrete components. To keep costs low, circuit output voltages can be measured with a *DMM*. However, a computer-connected *DAQ* device can be used to speed up, and increase the accuracy of, data acquisition.

SimpleRFpwr.xslm is the software component of the power sensor [1]. It is a *Visual Basic for Applications (VBA)* program that runs as a *Microsoft Excel* macro on any *Windows 10* computer. The software is portable, does not require installation on a host computer, and can run from any computer storage device, such as an external flash drive.

Similar to many *Windows* application, *SimpleRFpwr.xslm* presents a *GUI* interface with *TextBoxes* for program *I/O*. The user writes voltage measurements into, and reads computed power output values from, *TextBoxes* on a *UserForm*.

"What's the catch?" you ask. "A *RF* power sensor with the potential for low cost, simple hard-

A Simple RF Power Sensor (continued)

ware and excellent accuracy must have disadvantages", you argue emphatically. Compared to most commercial units, using *SimpleRFpwr* and its software requires more effort to get results. Also, it requires a *PC* with *Microsoft Office* installed. For an initial power calculation, you must make three sequential *DC* voltage measurements and enter their values into *TextBoxes* on a *UserForm*. For your effort, the software computes a value for diode thermal voltage and *RF* power, both displayed in *TextBoxes*. (A stand-alone version of the software, *SimpleRFpwr.exe*, is available for those who do not have *Microsoft Office* installed on their computer [2]. It will run on any *Windows 10* PC, without any host software.)

In what follows, this homebrew power sensor is used to validate the calibration of a *Mini-Circuits PWR-4GHS* [3], a commercially-available power sensor. The two power sensors produce measurements that are in close agreement with each other. Fortunately, the time has not yet arrived to send my *PWR-4GHS* back to *Mini-Circuits* for an expensive factory calibration.

This paper provides practical "build-and-operate" information. It's sufficient to get started on a working version of my power sensor. Due to space limitations, it's terse when discussing hardware details (but the software is easy to uses). Also **not** included in this paper is a detailed math-based development of the sensor algorithm. However, serious power sensor builders should consult the extensive reference discussed next.

A fairly comprehensive discussion of the hardware, algorithm and mathematics can be found in the paper *A Diode-Model-Based RF Power Sensor* [4]. This *QEX* paper should be consulted by all serious power sensor builders.

Shockley Diode Equation Model

Diode current and junction voltage are denoted as i_d and v_d, respectively. By definition, current i_d is positive when entering the anode, and v_d is sensed positive at the anode. In the *SimpleRFpwr* analysis presented here, both i_d and v_d are modeled as periodic-in-time quantities.

The *Shockley Diode Equation Model* [5, 6] is used here to relate i_d and v_d. This model is valid for small-signal diodes operating at sufficiently low values of current, voltage and frequency, the case assumed here. The model depends on a number of parameters, including I_S = Reverse Saturation Current, η = Emission Coefficient and V_T = Thermal Voltage. For the *1N5711* diode used here, I_S is on the order of 2.2×10^{-9} amperes, $\eta \approx 1.08$, and $V_T \approx 25.7 \times 10^{-3}$ volts at *78°F* [7]. These values are approximate. From one diode sample to the next, they can vary significantly. Also, I_S and V_T are strongly temperature dependent. To keep things simple in what follows, the product ηV_T is called Thermal Voltage.

SimpleRFpwr Hardware

The *SimpleRFpwr* sensor hardware consists of an implementation of the **Figure 1** (next page) detector circuit and two switch-selectable current sources (for I_{d1} and I_{d2}), each shown by **Figure 2** (next page). Input *RF* power is supplied via the *N*-connector, and output *DC* measurements are made at the *Voltage Port* and *Current Port* shown on **Figure 1**. The hardware should be mounted in a shielded aluminum enclosure. If implemented and operated with good *RF* design practices, and used with the software described below, this temperature-compensated *RF* power sensor can produce accurate results over a wide *RF* input power range, well into the *VHF* region.

Figure 3, on page 5, depicts a *brassboard* constructed for *SimpleRFpwr* development. *RF* power is input via a chassis-mounted *N*-connector.

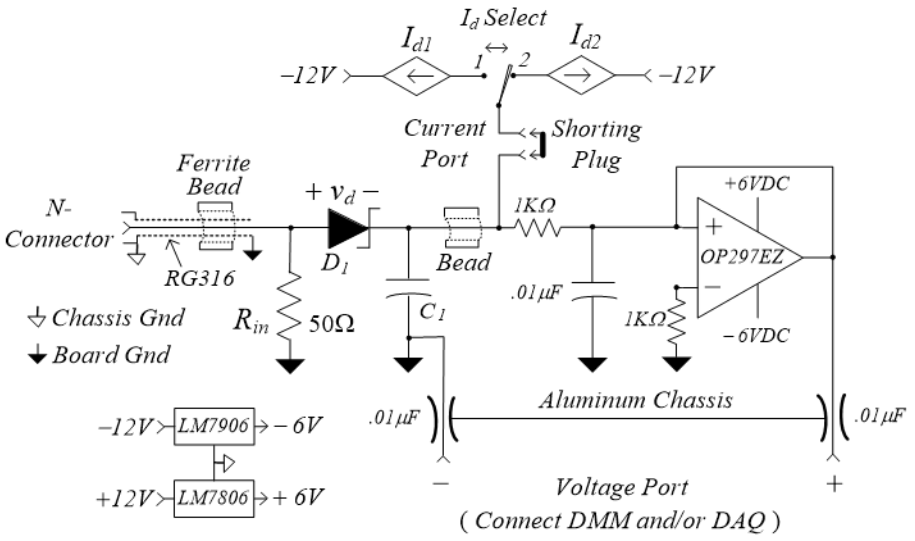


Figure 1 – *SimpleRFpwr* circuit diagram. The R_{in} = 50Ω resistor [8] and C_1 = 2000*pf* capacitor [9] are surface-mounted components. I_{d1} and I_{d2} are temperature-compensated current sources. D_1 is a 1*N5711* diode.

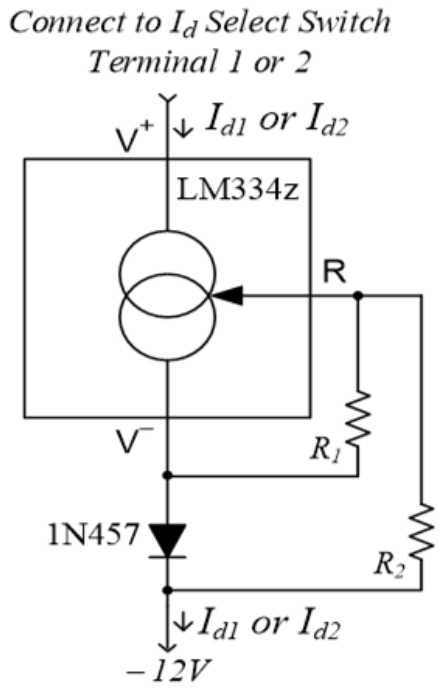


Figure 2: An LM334z current source [9] (two required). A pair (R_1, R_2) must be chosen for each current value.

Current Port and *Voltage Port* measurements are made by plugging *DMM* pin-tip probes into pin jacks mounted on the left-side of the lower chassis. The chassis-mounted I_d-*Select* toggle switch is used to choose either I_{d1} or I_{d2}.

An optional *DATAQ DI-245 DAQ* [10] module is under the *brassboard's* perforated aluminum top-cover. It is used to validate and/or supplement the *DMM*-based measurements. Via a *USB* interface, a *PC*-based *Visual Basic* program communicates with the *DI-245* module to make and process voltage measurements.

Determination of Resistance Rs

Let resistance R_s denote the parallel combination of R_{in} = 50Ω (see **Figure 1**) and the *DC* resistance looking back into the output of your *RF* source. Many *RF* signal generators/sources have a capacitor-coupled output so that R_s = R_{in} = 50Ω, the default used in power sensor software. As described in what follows, by using the software's graphical user interface (*GUI*), R_s can be changed easily.

Alternatively, you can use a commercially-available *DC-Block Adapter* on the input *N*-connector and keep the default R_s = R_{in} = 50Ω. In this case, the Input Return Loss of the *DC-Block Adapter* must be factored into your power measurement to prevent a loss of accuracy. Note that a *DC-Block Adapter* **must** be used if your *RF* source output contains a *DC* component.

I_{d1} and I_{d2} Current Port Measurements

Chosen by the I_d-*Select* switch depicted on **Figure 1**, the detector diode *DC* bias current is either I_{d1} or I_{d2}. Both currents should be measured with an accurate *DMM* plugged into chassis-mounted *Current Port* pin jacks. As described be-

A Simple RF Power Sensor (continued)

Figure 3: *SimpleRFpwr* brassboard.

low, the measured values can be input to the software by its graphical user interface (*GUI*). When not measuring currents, insert a shorting plug into the *Current Port* pin jacks.

Both I_{d1} and I_{d2} are supplied by a dedicated current source, with a schematic depicted by **Figure 2**. Each source incorporates a (R_1, R_2) pair that yields the desired current value. For computing ηV_T, the software uses an iterative algorithm that converges reliably and quickly for $I_{d1} \approx 1\ \mu A$ and $1.5 < I_{d2}/I_{d1} < 3$, the suggested range for current values. Values for these currents are not extremely critical. However, they must be measured accurately and supplied to the software, as described below.

The *LM334z* data sheet **[9]** provides a design procedure for computing "ball-park" values for R_1 and R_2 given a desired constant current value. With $I_{d1} \approx 1\ \mu A$, use $R_1 \approx .134/\ I_{d1}$. Then set $R_2 \approx$ 10R1 for good thermal stability, according to the data sheet. Repeat this procedure for the I_{d2} current source (use $I_{d2} > I_{d1}$). This approach yields approximate resistor values. From one *LM334z* sample to the next, results vary slightly, so experimenting with a range of resistor values (or a trim pot) may be required. See my *QEX* paper **[4]** for additional information on selecting values for I_{d1} and I_{d2}.

SimpleRFpwr.xlsm

SimpleRFpwr.xlsm is the software component of the power sensor project. It is a *Microsoft Excel*, *Visual Basic for Applications (VBA)*, program that implements the power sensor algorithm. The software is portable; it can be run from a flash drive, for example. It does not require installation. In *File Explorer*, simply double click on the *SimpleRFpwr.xlsm* file to bring up the **Figure 4** *GUI*. Alternatively, on your *Windows* desktop, assign any convenient icon to the *SimpleRFpwr.xlsm* file, located anywhere on your disk drive. Double click on your icon and you will be presented by the *GUI*. In *Excel*, be sure to enable both *editing* and *macros* before entering *TextBox* data in the *GUI*.

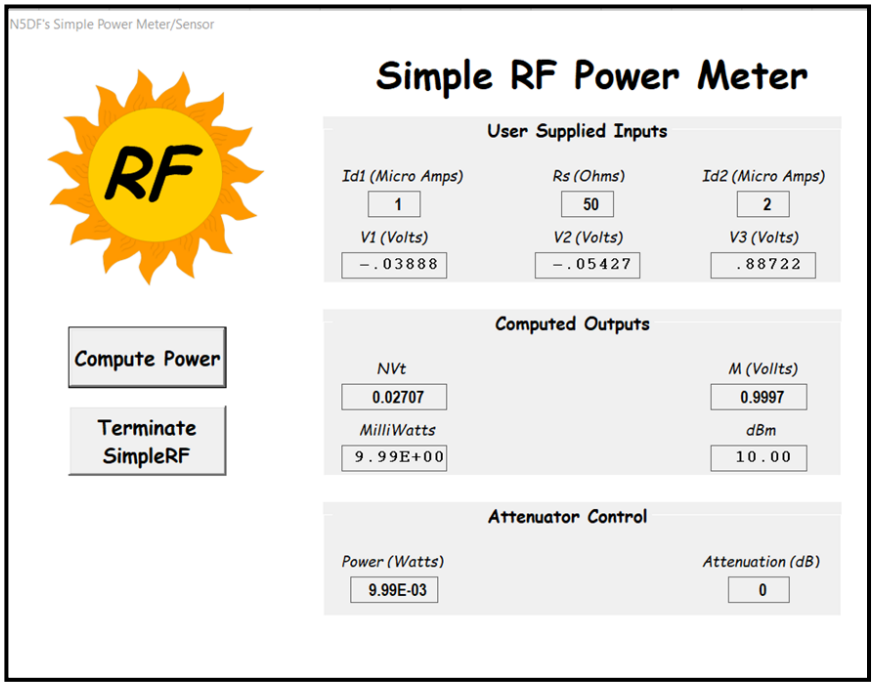


Figure 4: The GUI interface to *SimpleRFpwr.xlsm*.

A Simple RF Power Sensor (continued)

Using your mouse and keyboard, in the text boxes labeled I_{d1} and I_{d2}, you must enter your measured currents, in microamperes. The accuracy of your power sensor depends directly on entering accurate current values. Next, in the designated R_s *Textbox*, you must check the resistance value and update it if necessary. The default value is $R_s = R_{in} = 50\Omega$, described previously.

These current and resistance values should not drift/change appreciably. You can reduce work by including your fixed R_s, I_{d1}, and I_{d2} values directly in the *SimpleRFpwr.xlsm* file. (The source file is commented well; hand-coding the above-mentioned fixed values is easy.) Then, every time you execute *SimpleRFpwr.xlsm*, your current and resistance values will automatically appear in their *TextBoxes*, saving you time and effort. Of course, with your mouse and keyboard, you can change resistance and/or current values "on the fly", while running the software.

At the *Voltage Port* shown on **Figure 1**, three *DC* voltage measurements must be made and recorded *sequentially*. First, with the *RF* input source disconnected, (*i.e.*, **no** *RF* input) *DC* measurements *V1* and *V2* are made for I_{d1} and I_{d2}, respectively (just flip the I_d-*Select* toggle switch and record the voltages). Then, with the *RF* input source connected (*i.e.*, **with** *RF* input), and the I_d-*Select* switch set to the I_{d1} position, measure and record *DC* voltage *V3*.

In *TextBoxes* on the *GUI* shown on **Figure 4**, enter your recorded *V1*, *V2* and *V3* voltages. Next, check and update (if necessary) the value R_s that appears on the *GUI*. Finally, press the *Compute Power* Command button and observe computed values for thermal voltage (approximately .027 volts, depending on diode temperature) and input *RF* power (supplied by your source and absorbed by resistance $R_{in} = 50\Omega$ depicted on **Figure 1**). Note that *RF* power is displayed in *watts* and *dBm*.

Before thermal voltage changes significantly (as would happen due to a change in diode temperature), you can change your input *RF* power and make a new *V3* measurement. Enter your new *V3* value, but do not change your previously entered values of *V1* and *V2*. Press *Compute Power* to compute the new value of input *RF* power. After completing your measurements, click the **Terminate SimpleRF** button to stop the program and return to the *Windows Desktop*.

As shown on **Figure 4**, the **Attenuator Input Power** panel provides additional useful functionality. In situations where you need to measure high power levels (above *20 dBm*, for example), it is necessary to use an attenuator, or directional coupler, between the *RF* source and the *SimpleRFpwr*

DSG815 Output (Milliwatts)	*PWR-4GHS (Milliwatts)*	*SimpleRFpwr (Milliwatts)*
.01	.0101	.0101
.1	.102	.103
1	1.01	1.01
10	10.0	9.98

Table 1 – Power measurement comparison results. Measurements are rounded to three significant figures. Entries are in milliwatts. Freq. = 10 MHz. Room Temp. = 69°F

A Simple RF Power Sensor (continued)

sensor input. In this case, in the *dB Attenuation* TextBox, an attenuation value should be entered before pressing the **Compute Power** button. The source power into the attenuator will be computed and appear in the **Power (Watts)** TextBox.

SimpleRFpwr vs PWR-4GHS

Years past the "Cal Due" date posted on its calibration sticker, my *Mini-Circuits PWR-4GHS* power sensor needed its calibration checked. With my *SimpleRFpwr* sensor, I've accomplished this and decided that my *PWR-4GHS* need not be sent back to the factory for recalibration, yielding me a significant saving.

Table 1 lists some comparison results. A frequency of *10 MHz* was used for all tests, and all table entries are in milliwatts. The first column contains values that were programmed into my *Rigol DSG815* signal generator, the *RF* source used for this test. When rounded to three significant figures, the second (alternatively, third) column contains power values (in milliwatts) reported by my *PWR-4GHS* (alternatively, *SimpleRFpwr*) sensor. The second and third column entries are important here, and they differ by about *1%* or less. My *PWR-4GHS* is sufficiently accurate for home lab work. It need not be sent in for an expensive factory calibration.

Download and Run *SimpleRFpwr.xlsm* Now!

From Google Drive, *SimpleRFpwr.xlsm* can be downloaded. Into your browser address box, copy and paste the URL https://drive.google.com/file/d/16j1mYYQApxPO7-19YFdXryLPeNYlXHhi/view?usp=sharing and press enter. This will open a Google Drive spreadsheet. Located on the spreadsheet's *Ribbon*, press the Download icon, just to the right of the *Print* Icon. *SimpleRFpwr.xlsm* should appear in your *Download Directory*. (This method works on my three *Windows 10* computers. Hopefully, it will work on your computer.)

Alternatively, email me (stensbj@uah.edu). Use *SimpleRFpwr* as the subject, and I will reply with the *Excel* program as an attachment. Both methods give you the software's source code for you to inspect and convince yourself that the program contains no malicious content. (As a bonus, you will also receive a *SimpleRFpwr.exe*, a standalone, *GUI*-based *Windows 10* app that implements the power sensor algorithm.)

Startup *Excel*, and enable program editing and macros. Load *SimpleRFpwr.xlsm*. You should see the *GUI* depicted by **Figure 4**. Follow the instructions outlined in this paper, and click on *Compute Power*. You do not need any hardware to run the software, so do it now.

Finally, I've compiled a *Microsoft Visual Basic* version of the software, called *SimpleRFpwr.exe*. The executable runs as a "standard" *Windows 10* application, without *Office* or any other host program. However, my executable file is not *Signed*. Hence, I cannot distribute my *.exe* file by using *Google Drive*, *Drop Box*, *etc*. Email me, and I will send you the .exe file as an attachment.

Conclusions

Diode-based, absorption-type *RF* power sensors are used extensively in the *RF* Engineering profession and the amateur radio avocation. Often, they are referred to as wattmeters. In most cases, they are limited to measuring only small amounts of *RF* power. However, when used with an attenuator or directional coupler, a power sensor can measure high power levels, such as a radio transmitter output.

SimpleRFpwr is the power sensor described in this paper. It uses a unique switching

A Simple RF Power Sensor (continued)

approach implemented sequentially in time to obtain three *DC* voltage measurements that are necessary to determine diode reverse-saturation current, thermal voltage and input *RF* power. Basically, *SimpleRFpwr* reduces hardware complexity and cost, but it increases required operator time and effort, a trade-off many users are willing to make.

For *SimpleRFpwr* operation, all required measurements can be made with an accurate *DMM*. Alternatively, they can be made with a *USB* -based *DAQ* module built into the power sensor enclosure. *SimpleRFpwr.xlsm* is a portable *Excel VBA* application that accepts user-supplied *DC* voltage measurements and computes input *RF* power and diode thermal voltage for display in *TextBoxes* on a *GUI*.

A Diode-Model-Based RF Power Sensor **[4]** contains a complete mathematical development of the *SimpleRFpwr* sensor algorithm, none of which is given in this paper. Also, my *QEX* paper contains additional hands-on information that is helpful during power sensor construction and operation.

Hopefully, my *SimpleRFpwr* sensor encourages the formation of an active community of users and developers. I challenge readers to make this happen.

References

[1] J. Stensby, *SimpleRFpwr.xslm*, On Google Drive – go to: https://drive.google.com/file/d/16j1mYYQApxPO7-19YFdXryLPeNYlXHhi/view?usp=sharing Also via email – send a request to stensbj@uah.edu.

[2] J. Stensby, *SimpleRFpwr.exe*, via email – send request to stensbj@uah.edu.

[3] Mini-Circuits, *PWR-4GHS*, 13 Neptune Ave, Brooklyn, NY 11235, www.minicircuits.com/pdfs/PWR-4GHS.pdf.

[4] J. Stensby, *A Diode-Model-Based RF Power Sensor*, September-October QEX, www.arrl.org/QEX. (The QEX version has several typos that were introduced by ARRL's Copy Editor(s). By email to stensbj@uah.edu, request a "cleaner" version, without the typos).

[5] G. Massobrio, P. Antognetti, *Semiconductor Device Modeling with SPICE*, Second Edition, McGraw-Hill, 1993.

[6] W. Cardone, N8QM, *Precision Generic Diode Characterization for Simulation*, *QEX*, May/June, 2023, Issue No. 338, pp. 3-7, www.arrl.org/QEX.

[7] Hewlett Packard, *Shockley Barrier Diodes for General Purpose Applications*, Technical Data Docu ment 5966-0930E.

[8] Vishay, *FC0603E50R0BST1*, www.vishay.com. (R_{in} = 50Ω must be an RF-rated chip resistor.)

[9] CDE Cornell Dubilier, *CDE MC22FA102J-F*, www.cde.com. (A stack of two parallel capacitors is used to obtain 2000*pf*.)

[10] DATAQ, *DI-245 Thermocouple and Voltage Data Acquisition System*, www.dataq.com. (This DAQ module has 12 software-programmable voltage ranges. It is usable with voltage in puts that range from millivolts to tens of volts.)

[11] Texas Instruments, *LM134/LM234/LM334 3-Terminal Adjustable Current Sources*, Revised May 2013, www.ti.com. See the section titled *Application as a Zero Temperature Coefficient Cur rent Source*.

A PSK Reporter Anomaly

By Fred Kepner, K3FRK

The PSK Reporter website is a tool that I use daily to hunt DX. If you aren't familiar, you really need to go to https://pskreporter.info/ and check it out. After entering a callsign, the site will produce a map that refreshes every few minutes. The map will be covered with flags of many colors. The flags represent stations that are reporting digital signal decodes, and sometimes CW signals. The color of the flag communicates the band that station is on. The tool is very helpful in showing you exactly who can hear your signal. If you click on a flag that has reported hearing your signal, it will show you their callsign, location, frequency, and the signal strength of the decoded signal. Sometimes it even tells you what antenna they are using. While I do monitor who is hearing my signal, I also use the site in a couple of other ways. I often search DX callsigns to see who is hearing them or if they are on the air at all. This is very handy for tracking what bands or non-standard frequencies a DXpedition is operating on or even to help you find a station you are trying to put in your log. For example, I've been trying to work V85NPV so I keep his map up, and when he's transmitting, I can see it and move to his band/frequency. I also watch the greyline on the map to see what countries have sunrise or sunset and may have improved propagation.

When I pulled up PSKreporter on October 2nd, I spotted an anomaly on the map. As you can see in my photo below, there is a dark spot over the south Pacific Ocean. What would cause such a thing? I suspected, and quickly confirmed, that there was a solar eclipse occurring. Solar eclipses are only visible from a small area of the Earth at any given time and are pretty rare. The small area under the darkest portion of the spot on my map was experiencing a near total eclipse at that moment. This type of eclipse is called an annular eclipse and is often referred to as a "ring of fire" because only the outer edge of the Sun is visible. Locations in the lighter shaded areas surrounding the dark spot would have seen partial eclipses with varying portions of the sun and its light blocked.

If you are interested in reading more about the October 2nd eclipse, I recommend the article and accompanying videos at this link - https://www.space.com/annular-solar-eclipse-wows-skywatchers-photos-video.

Upcoming DX Contests

By Chuck Lewis, N4NM

OceaniaDXcontest

Oceania DX Contest, (SSB) 160-10 meters
Oct. 5, 0600Z to Oct. 6, 0600Z
Exchange: RS & serial No.
See page 77, Oct. QST and
www.oceaniadxcontest.com

Russian WW Digital Contest, (DIG), 160-10 meters
Oct. 5, 1200Z to Oct. 6, 1159Z
Exchange: RST(Q) plus Serisl No. (or Oblast)
See page, 77, Oct. QST and www.rdrclub.ru

UBA ON Contest, (SSB), 80 Meters
Oct. 6, 0600Z to 0900Z
Exchange: RST, serial No., ON section (if any)
See page 77, Oct. QST and www.uba.ba/en

DARC RTTY Sprint, (RTTY), 80 & 40 meters
Oct. 8, 1800Z to 1929Z
Exchange: RST, Serial No. or DOK code
See page 77, Oct. QST and www.darc.de

Makrothen RTTY Contest, 80-10 meters
Oct. 12, 0000Z to Oct. 13, 0600Z
Exchange: 4-char. grid
See page 77, Oct. QST and
www.pl259.org

OceaniaDXcontest

Oceania DX Contest, (CW) 160-10 meters
Oct. 12, 0600Z to Oct. 13, 0600Z
Exchange: RS & serial No.
See page 77, Oct. QST and
www.oceaniadxcontest.com

Scandinavian Activity Contest, (SSB) 80-10 meters
Oct. 12, 1200Z to Oct. 13, 1200Z
Exchange: RS & Serial No.
See page 77, Oct. QST and http://www.sactest.net

UBA ON Contest, CW, (CW), 80 Meters
Oct. 13, 0600Z to 0900Z
Exchange: RST, serial No., ON section (if any)
See page 77, Oct. QST and www.uba.ba/en

JARTS WW RTTY Contest, (DIG), 80-10 meters
Oct. 19, 0000Z to Oct. 20, 24359Z
Exchange: RS(T) & Op's age
See page 77, Oct. QST and
http://www.jarts.jp/rules/2024_rule_en.htm

Worked All Germany Contest, (SSB & CW), 80-10 meters
Oct 19 1500Z to Oct 20, 1459Z
Exchange: RS(T) plus serial number or DOK code
See page 77 Oct. QST and www.darc.de

Stew Perry Topband Challenge, (CW), 160 meters
Oct. 19, 1500Z to Oct. 20, 1500Z
Exchange: 4-character grid square
See page 77, Oct. QST and
www.kkn.net/stew

YB8DXPI FT8 Contest, (FT8), 160-10 meters
Oct. 19, 0000z to Oct. 20, 2359Z
Exchange: 4-Char. grid square
See page 77, Oct. QST and
www.contest.ybdxpi.net/rules

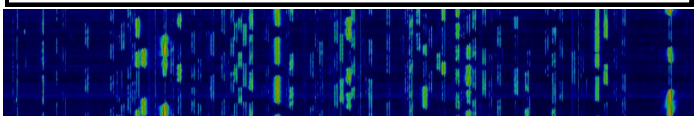
Upcoming DX Contests
(continued)

ARRL EME Contest, (CW. SSB. DIG), 50-1296 MHz
Oct. 19, 0000z to Oct. 20, 2359Z
Exchange: Signal report
See page 77, Oct. QST and www.arrl.org/eme-contest

Asia-Pacific Fall Sprint, (CW), 15 & 20 meters
Oct. 20, 0000Z-0200Z,
Exchange: RST plus serial number
See page 77, Oct QST and www.jsfc.org/apsprint

CQ WW SSB, (SSB), 160-10 meters
Oct. 26, 0000Z to Oct 27, 2359Z
Exchange: RS & CQ zone
See page 77 Oct. QST and
www.cqww.com/rules.htm

Dates & times often change or are misprinted in the journals; beware. See also: http://www.contestcalendar.com/contestcal.html



Mark your calendars!

NADX Club Picnic

Sunday, October 20 at 1pm

Monte Sano State Park - John Scoble Memorial Pavilion

Free park admission for attendees.

RSVP by email to Bruce, AC4G

North Alabama DX Club

Help Wanted: LongPath Publishers

LongPath Publisher Fred, K3FRK is looking for several people to assist with creating the monthly LongPath newsletters.

Volunteers will be trained to turn submitted articles into the final LongPath document.

After training, the LongPath publishing team will take turns publishing the monthly newsletter.

Anyone interested should contact Fred, K3FRK.

Upcoming NADXC Meeting

Tuesday, October 8, 2024
5:45 PM Doors Open / 6:30 PM Meeting

Program: Chad (TT8RR) 2024 Dxpedition video

Location: Signals Museum of Information Explosion, 1806 University Drive NW, Huntsville, AL 35801 and via Zoom

DXpeditions in October 2024

Reprinted with permission of Bill Feidt, NG3K

Start Date	End Date	DXCC	Call	QSL	Info
2024 Sep28	2024 Oct07	Reunion	TO2DX	OM2DX	By OM2DX; HF; CW + digital; EFHWs; QRV for CQWW DX RTTY Contest
2024 Sep29	2024 Oct01	Guam	KH2	JH3DJX Buro	By JH3DJX as KH2/JH3DJX fm Tamuning; 40-10m; CW FT8; 100w
2024 Sep29	2024 Oct14	Botswana	A25AO	HA5AO OQRS	By HA5AO fm Chobe National Park (KH22ox); 80-6m; CW SSB FT8
2024 Sep30	2024 Oct11	Namibia	V55LA	M0OXO	By LA7THA + team; HF; CW SSB
2024 Oct01	2024 Oct12	St Kitts & Nevis	V4	LoTW	By W4AUV as V4/W4AUV and K4RLC as V4/K4RLC fm St Kitts I (IOTA 104); 40m 20m; mainly CW; fm 3 POTA locations
2024 Oct03	2024 Oct10	Samoa	5W0TE	LoTW	By ZL4TE fm Apolina Uta; 40 20 10m; CW, some SSB FT8 10w; EFHW; QSL via ZL4TE w/ SAE + 4$US
2024 Oct03	2024 Oct10	Samoa	5W0TE	TBA	By ZL4TE fm Apia; HF; CW FT8
2024 Oct09	2024 Oct14	Svalbard	JW5X	LA5X	By LA6VM LA7XK LA9DL; QRV for SAC SSB (Oct 12-13); outside contest using JW6VM JW7XK JW9DL
2024 Oct09	2024 Oct27	Reunion	FR	LoTW	By F5UOW as FR/F5UOW; 40-10m; CW + digital; QSL via F5UOW
2024 Oct10	2024 Oct29	Nauru	C21MM	Club Log OQRS	By DG2RON DJ5IW DJ7TO DJ9KH DK3CG DK5WL DL1KWK DL2RNS DL4SVA DL6KAC DL6KVA DL7JOM DL7VEE DL8LASeam; 160-6m; CW SSB FT8 RTTY; 5 stations
2024 Oct10	2024 Nov11	Tanzania	5H3MB	LoTW	By IK2GZU; 80-10m; SSB CW + digital; spare time operation; QSL via Club Log OQRS or IK2GZI (B/d)
2024 Oct11	2024 Oct14	Bermuda	VP9	W9HT Direct	By W9HT as W9HT/VP9; HF + 6m; SSB CW FT8
2024 Oct12	2024 Nov24	Guyana	8R1TM	LoTW	By PY1SAD; HF; CW SSB + digital and satellite; QSL via PY1SAD direct
2024 Oct15	2024 Oct31	Chatham Is	ZL7IO	LoTW	By ZL3IO; HF; QSL via Club Log OQRS or DK7AO
2024 Oct16	2024 Oct30	Vanuatu	YJ0VV	LoTW	By N4VGE K4QQG K1NZ K2SAV; 160-6m; SSB CW + digital; QSL via K4NHW; QRV for CQWW DX Phone
2024 Oct17	2024 Oct23	Svalbard	JW	DK1VK	By DK1VK as JW/DK1VK fm Barentsburg (JQ78cb); 160-10m; SSB; end-fed longwire
2024 Oct17	2024 Oct24	Mozambique	C91BV	EB7DX	By CX2AM CX3AN CX8FB; 40-6m; CW SSB FT8; 100w; 2 stations; holiday style operation
2024 Oct20	2024 Oct25	Cayman Is	ZF2XX	LoTW	By AE6Z fm Grand Cayman I; CW, perhaps FT8; QRP
2024 Oct23	2024 Nov06	Jamaica	6Y	eQSL	By G0RNU as 6Y/G0RNU fm Oracabessa, St Mary; 40-6m; SSB + digital

DXpeditions in October 2024 (continued)

Reprinted with permission of Bill Feidt, NG3K

2024 Oct23	2024 Nov06	Madagascar	5R8	Club Log OQRS	By SP9FIH as 5R8WE and SP6CIK as 5R8CI fm Nosy Be I (IOTA AF-057); 40-10m; CW SSB FT8; verticals, quad, yagi
2024 Oct24	2024 Nov02	Malawi	7Q1	EA7FTR	By 7Q7CT CT1BOL EC7R 7Q6M EA7FTR fm Lilongwe; all bands; all modes; QRV for CQWW DX SSB Contest
2024 Oct25	2024 Nov09	eSwatini	3DA0DL	LoTW	By DL7DF DK1BT DL4WK DL6SAK DL7BO DI7UFR; 80-10m; CW SSB + digital; QSL via DL7UFR (B/d), LoTW after 6 months
2024 Oct31	2024 Nov11	Burkina Faso	XT2MD	TBA	By 14 ops fm Ouagadougou; HF w/ focus on low bands and WARC
2024 Nov01	2024 Nov15	Cocos Keeling	VK9CV	OK6DJ	By OM5ZW OM4AYL OK6DJ OK2ZA OM3PC OM4MM OM4MW VK5GR OM5RW; 160-10m; SSB FT9 RTTY QO-100
2024 Nov02	2024 Nov09	Maldives	8Q7TR	OE1TRI	By OE1TRI fm Kagi I; HF; SSB FT8; holiday style operation
2024 Nov05	2024 Nov12	Cayman Is	ZF2KM	LoTW	By W9KM fm Grand Cayman I; HF; CW + digital
2024 Nov07	2024 Nov24	South Cook Is	E51SGC	LoTW	By LZ1GC LZ5QZ fm Rarotonga I (IOTA OC-013); 160-6m, focus on 160 80 60m; CW SSB FT4 FT8 RTTY; 3 stations; QSL via E51SGC OQRS or LZ1GC (B/d)
2024 Nov08	2024 Dec12	Fiji	3D2TP	PA3CBH	By PA3CBH fm Suva; HF; SSB CW; spare time operation

September 2024 Meeting Minutes
by Bob DePierre, K8KI

The meeting was called to order by Bruce, AC4G.

There were 13 club members present.

- The minutes for the August meeting were approved.
- Bruce/AC4G announced that much if the K4ADK equipment was sold at the hamfest. The total sales are now $5,500. Mark Brown/N4BCD additionally donated $500 in thanks from the Hamfest Committee.
- Bob/K8KI commented on the financial report, noting that we'll finish up the year well in advance of that expected, especially in view of the additional costs we've seen.
- The Banquet was a huge success. Several comments were made to help next year go better:

  1. Start 15 minutes earlier since guests are arriving so early, no more name tags for the banquet.

  2. When reserving the room for the banquet speaker make sure to reserve it in his name.

- The number of paid dues did not match the number of people who supposedly paid. Fix it. (Both the number of members paid and the amount accounted were in error, and were fixed for the October report).
- AC4G directed K8KI to plan the club picnic in October. There will be an October meeting. The picnic will be held at the Scoble Pavilion in Monte Sano Park on the afternoon of Sunday, Oct 20. The cost to reserve the location was $228. Entry for members is free, if you tell the gate guard.
- Barry/W4WB reserved the Full Moon BBQ Restaurant for the Christmas Party for the second Tuesday in December at 6:30 (normal meeting time).
- The members voted to fund DXpeditions to Burkina Faso ($150) and Marshall Islands ($150). Then they voted to raise the DXpedition budget for this year to $1500. The amount funded as of now is $1150.
- Bruce/AC4G noted that Mike Rozar is experiencing serious health problems, and might not make meetings for a while.

After the business meeting, Bob, K8KI presented part 1 of "Who Invented the Sinewave?".

About the NADXC

2024 NADXC Officers and Directors

President	Bruce Smith, AC4G
Vice President	Fred Kepner, K3FRK
Sec./Treasurer	Bob De Pierre, K8KI
Director	Mick Bell, N8AU

How to Join

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

Monthly Meetings

Meetings are held at the Museum of Information Explosion at 6:30pm on the 2nd Tuesday of each month. Participants can also join the meeting virtually via Zoom.

This edition of The LongPath published by: Fred Kepner, K3FRK

NADXC Picnic Info
by Bob DePierre, K8KI

We talked about scheduling our annual picnic at the last meeting. Now we're going to do it. And we need you to participate.

Time, Date, Place: Sunday, Oct 20, 1pm, Monte Sano State Park, John Scoble Memorial Pavilion.

How to get there: End of Nolen Ave to park entrance. Go 0.55 miles to sign on the left saying: Cabins 1-5. Turn there, go 30 yards, bear to the right. There it is. **Be sure to tell the gate guard you are going to the scheduled DX Club picnic at the Scoble Pavilion so that you'll be admitted free.** We haven't used this pavilion in the past, but you can ask the gate guard for a map. That might be wise. I'll bring a map to the next meeting to show you where it's at.

We need members to start signing up now, especially if you won't be present at the next meeting. The location is sized for 75 people, so it's certainly big enough for all of us. But I'm worried about actually getting a lot of us to attend. We'll plan activities, and a meal, which brings me to...

We'll pass around a sign-up list at the Oct meeting, including a place for you to add your covered dish. The club will provide some food as well - we'll let you know about that at the meeting. See you there!

Financial Report
by Bob DePierre, K8KI

2024, now nearly almost over, didn't wind up anywhere near where I thought it would go. But fate takes its course.

We lost longtime member, Mike Maples/ K4ADK, last January. Mike was way up on the DXCC list, having worked them all. His last thoughts were of our club - he decided to will all of his station equipment to the club. You'll see that on the accompanying spreadsheet - we sold it for $2,551.

I had set up the budget to drop our resources down by $515 (column A) this year, but instead we're now $1911 in the black. We even made a profit $308 on the DX Banquet. Over the past 15 years, I think I've seen a profit for only 2 of those years. The difference this year was likely the Banquet raffle spearheaded again by Steve/AG4W, who gathered the prizes. Of course, it didn't hurt to get a wonderful venue at a low price, a guest speaker, and a management team on stage to distribute the prizes.

Another unexpected loss was two of our longtime XYL supporters, Sandi Bell and Melanie Winter. We got bricks in Newington to commemorate their service to us and ham radio.

So, the year is now almost over. There won't be much to show over the next few months. Hopefully we can get a better treasurer for next year...but we're not done yet:

Please don't forget our club picnic next week. We'd really like to see you there to celebrate a great year for DX!

2024 NADXC Financial Status — 09/30/24 — End September

Budget Category	Targets	Year Totals	Month Totals
Year Start	**9236**	9,235.83	8,317.78
Dues In	**1150**	1,039.23	20.00
Huntsville Hamfest Donation		500.00	500.00
Recurring Exp	**-1175**		
recurring expenses		-57.00	
repeater elect	-160		
web hosting/domain service	-20	-16.88	
repeater maintenance			
to HARC for Zoom	-50	-100.00	
use of museum	-400	-400.00	
Miscellaneous	-475		
DX Plaque	-70	-70.00	
Bank checks			
Other Transactions	**-320**		
Donations/equipment to sell	500	2551.00	2551.00
Dxpeditions	-700	-1,150.00	-300.00
Picnic	-120	-228.23	-228.25
ARRL Bricks		-551.95	275.00
DX Banquet	**-170**		
venue	-700	*-700.00*	
food	*-2350*	*-2,377.86*	
speaker+room+travel	*-450*	*-369.40*	
ticket sales	*3650*	*413.00*	
raffle	*400*	*4,147.83*	
grand prize	*-400*	*-381.50*	
beer/wine/soft drinks/glasses	*-200*	*-237.30*	
insurance	*-120*	*-106.00*	
name tags		*-5.24*	
EOY Bank Delta	**-515**		
Year End Bank Balance	**8,721**	11,135.53	11,135.53

Nominations for the 2025 Board of Directors

In accordance with the NADXC Constitution and Bylaws, President Bruce Smith, AC4G appointed a Nomination Committee to recommend a slate of Officers and Directors to serve the club in 2025. The below slate was submitted and will be voted on at the October 8th meeting.

President	Bruce Smith, AC4G
Vice President	Fred Kepner, K3FRK
Sec./Treasurer	Bob De Pierre, K8KI
Director	Mick Bell, N8AU
Director	Chuck Lewis N4NM

Duties

President - Preside over all meetings of the club and Board of Directors, enforce due observance of this Constitution and the By-Laws, decide all questions of order, sign all official documents that are adopted by the club, and serve as ex-officio member of all committees.

Vice President - Serve as consultant to the President, focusing on public relations and membership issues, coordination of monthly programs, and membership communications. Assume the duties of the President in the President's absence.

Treasurer/Secretary - Record and keep the minutes of club and Board of Directors' meetings; maintain the membership list; maintain custody of all funds of the club; maintain a full and accurate account of all receipts and expenditures; make disbursements as authorized by the President, Board of Directors, or membership; and prepare and maintain records of all official correspondence pertaining to the club. The Secretary/Treasurer shall preside in the absence of both the President and Vice President.

Directors - Participate in Board of Directors' meetings and perform duties as assigned from time to time, such as participation on club committees.

2024 Club Awards

In June, President Bruce Smith, AC4G announced a revamp of the club's annual recognition awards. In recent years, the club has voted only on the DXer of the Year award, which has been given to the club member who the membership felt best served the club or the DX community during that year. For 2024, the club membership will award four different awards. The DXer of the Year, Best LongPath Article, and Best Club Program awards will be selected by secret ballot. The President's Award recipient will be selected by the President. The awardees will be selected at the November meeting and announced at the December Holiday Dinner, so start thinking about who you will nominate. Below is a list of this year's programs. Past issues of the LongPath can be found on the club website.

Meeting	Presenter	Topic
January 9, 2024	Steve Werner, AG4W	TJ9MD Cameroon Dxpedition
February 13, 2024	Zach Rozar, K4ZSR	Becoming the (mini) DX: Operating QRP Portable in Europe
March 12, 2024	Mark Wohlschlegel, WC3W	CQ DX Marathon Overview
April 9, 2024	Krish Kanakasapapathi, W4VKU	VU4A and VU7N DXpeditions
May 14, 2024	Bruce Smith, AC4G	Six Meters -You Must Be Present to Win
June 11, 2024	Rob Suggs, NN5NT	NN4SA Club and Activities Overview
July 9, 2024	Adrian Ciuperca, KO8SCA	W8S Swains Island DXpedition
August 13, 2024	Mike Crownover, AD5A	CB0ZA Juan Fernandez Is Dxpedition
August 17, 2024 (NADXC Banquet)	Gene Spinelli, K5GS	TX5S Clipperton Island DXpedition
September 10, 2024	Bob DePierre, K8KI	Who Invented the Sine Wave?
October 8, 2024	Video presentation	TT8RR Dxpedition video
November 12, 2024	Barry Johnson, W4WB	Elecraft KH1 Features and Operation
December 10, 2024		Holiday Dinner, no December meeting

North Alabama DX Club (NADXC)

"Club Fact Sheet"

Who We Are: NADXC is a group of active radio amateurs with a deep compassion for working DX, contesting, and other aspects of Amateur Radio. We welcome everyone who is interested in joining our club. NADXC members are active in all facets of DX and contesting. The NADXC also donates funding for various DXpeditions all over the world. The NADXC sponsors a DX Banquet in mid-August of every year in conjunction with the Huntsville Hamfest in Huntsville, Alabama. NADXC members moderate various programs at club meetings and during the Huntsville Hamfest, covering amateur radio technical and operating topics for all to learn and enjoy. The NADXC sponsors a prestigious award at the end of year for the most deserving DXer of the Year from the NADXC club.

DX Funding Policy: The policy supports major DXpeditions that meet our requirements for financial sponsorship. Details are available on the NADXC website and in the "Longpath" newsletter.

Club History: The NADXC was organized in December 1966 by a group of 12 charter members. The original constitution was adopted and signed on December 19, 1966. The first chairman was Dan Whitsett, W4BRE (SK). In the early-1970's, the NADXC was custodian of the W4, K4 QSL Bureau which became such a huge undertaking that it eventually was passed to other larger clubs. In January of 1977, the club bought a VHF repeater for sharing DX spots and hosting a weekly net on Wednesday nights. The repeater was located on Redstone Arsenal, Weeden Mountain using the frequencies of 147.91/147.31 MHz on two meters. Today, the repeater has been relocated and utilizes the frequencies of 147.90/147.30 MHz, with a callsign of W4QB. The weekly net has been discontinued. In 1980, the club started the monthly newsletter known as the "Longpath" which currently continues to be produced every month.

While organized as a DX club, NADXC members are active in all aspects of the hobby. We trust that this information will be of interest to all and hope all hams have a long and pleasant association with the NADXC.

Requirements for Membership: The NADXC welcomes all hams radio operators who have an interest in DXing. It does not matter whether you are a new ham, a seasoned ham operator, an old-timer to DXing, or a ham who has just been hit with the DX bug; everyone is welcome! See the club website: www.nadxc.org. Dues are paid in January of every year.

Meetings: The NADX club meets the second Tuesday night of every month, with the current location at the Signals Museum of Information Explosion (MIE) located at 1806 University Drive, Huntsville, Alabama and virtually via Zoom. Some members gather early to eat their dinner, socialize, discuss DX worked, and then we have a short business meeting starting at 6:30 P.M. CT. followed by an exciting, interesting program to help, entertain, and teach members about DX and amateur radio in general.

Club Officers: There are four elected officers (President, Vice-President, Secretary, and Treasurer) and three elected directors on the NADXC Board of Directors. The current roster of club officers and directors can be seen of the NADXC web site or in the "Longpath" newsletter, which is uploaded each month to the club website.

Website: The NADXC club maintains a website at www.nadxc.org. This site provides club information and activities throughout the year about a variety of subjects related to the club, DX, and amateur radio.