The world's first dedicated remotely-controlled ham station accessible via the Internet was set up in 1999 by N2JEU and W7DXX. Here's a brief look at the station, its history, and its ongoing operation.

W7DXX Remote: 17 Years and Counting

BY KEITH LAMONICA,* W7DXX

It has been over 17 years since Bob Arnold, N2JEU (SK), and I launched W7DXX, the world's first Internet remote base station. Our goal was to provide those amateurs who are faced with antenna zoning problems, TVI, or those who just want to operate a well-equipped amateur station, the opportunity to do so without needing to invest a lot of money on equipment.

In 1999, Kachina Radio in Arizona had what was probably the first amateur radio transceiver with a serial port, a vital requirement for computer control. The company donated a 505 transceiver to get our Internet remote base project started. Alpha provided us with an 87A amplifier and Peter Juul, W6PJ, donated a Tennadyne T-11 log-periodic antenna (*Photo A*). With 1 kilowatt to an 11-element antenna, it appeared as though we were all set.

The most serious problem we had was radio frequency interference (RFI). RF was getting into almost everything in the house. Our nearest neighbors lived several hundred feet away, yet we even caused them grief. Not only did we interfere with their television and telephone, we also got into their electronic organ. When the remote base was on the air, their organ played "strange music." Further, in their bedroom they had a lamp, the kind you turned on and off by touching the base. The lamp rectified our audio, producing a very weird sounding, muffled voice. At one point the neighbor's wife was convinced their house was haunted because her lamp was talking to her.

Another problem we had to overcome was high SWR, particularly on 75 and 40 meters. MFJ came to the rescue by donating an MFJ-998 1,500-watt automatic antenna tuner. We were now able to operate 80-6 meters with very low SWR. From Boston, propagation was good to Europe and the world, even on six meters.

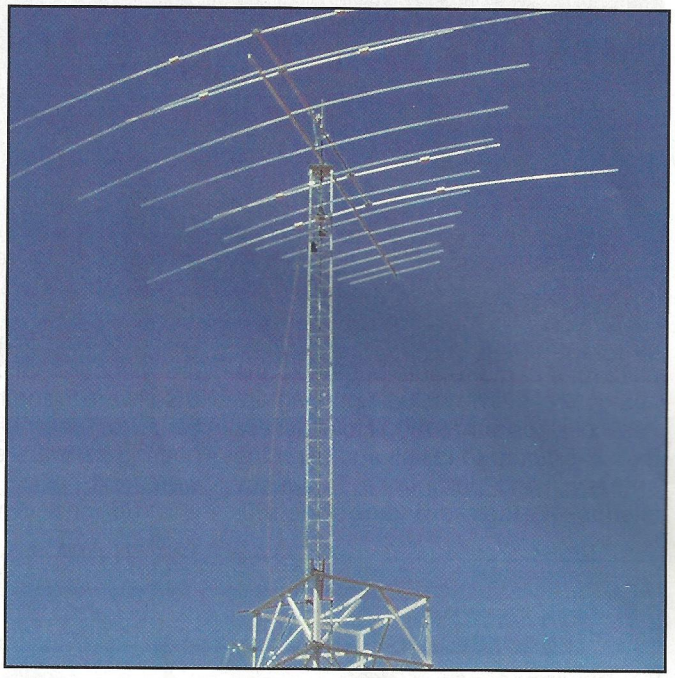


Photo A. The log-periodic antenna at W7DXX makes sure the station hears from, and is heard in, whatever parts of the world the propagation gods allow. (Photo courtesy of Don Nesbitt, N4HH)

New QTH, New Challenges

In 2005 we moved from Boston to southern New Mexico. We secured a location to build a new remote base facility away from neighbors, TVI, and QRM. Much of the remote base equipment was dated and in need of replacement. For a transceiver we picked the Elecraft K3, not only because of its outstanding performance, but because it has features making it ideal for remote base use, including built-in line audio input/output, a CW keyer, band data output, and more. (*Photo B*)

For an amplifier to replace our aging Alpha 87A, we chose the SPE 2K-FA. It, too, is ideal for remote base operation. The 2K-FA delivers 1,500 watts on all ham bands from 160 through 6 meters. It has a built-in automatic antenna tuner and a six-position antenna coax switch. The 2K-FA software is rich in protection features allowing it to be reliably operated remotely. The 2K-FA allowed us to eliminate the MFJ tuner and coax switch.

The biggest challenge at our new location in rebuilding an Internet-controlled remote base was the lack of reliable Internet service. Our new facility was being built on a 4,000-foot bluff 13 miles from town. The only Internet service available was low speed, less than reliable, wireless service. With us running 1,500 watts output from the remote, it was nearly impossible to keep RFI out of the Internet receiver and our control computer. Jim Brown, K9YC, authored a "Cook Book" on how to address RFI problems. A thorough reading of Jim's book led us to effectively reduce RFI, including coax common mode problems.

The problem with the unreliable Internet was relatively easy to overcome, but difficult at the same time. With no wired Internet service available near the remote base site, microwave or satellite seemed to be the only options. Satellite was ruled out because of the latency, a problem that would make break-in CW next to impossible. Microwave equipment is expensive.

* w7dxx@w7dxx.com

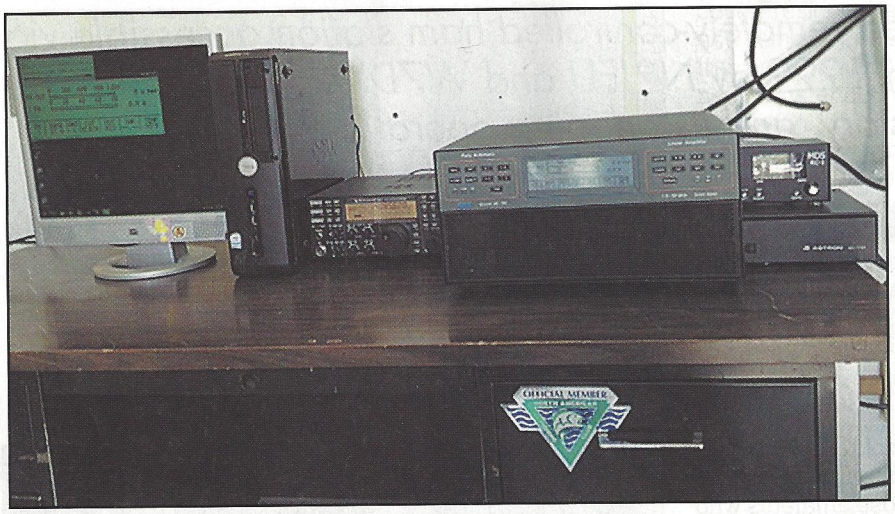


Photo B. The W7DXX remote station … nothing fancy on the walls since most of the operators never see this! From left, the internet-connected computer and monitor, the Elecraft K3, and the SPE 2K-FA amplifier. (Photo courtesy of W7DXX)

The solution to our Internet problem was soon to be solved, though. A company named Ubiquity had the answer. One of its products is a 5-GHz Internet range-extending unit. A pair of Ubiquity units (one at the remote base and one at a control point), including the antennas, cost less than $150. It took us less than two hours to install and align the antennas and program a frequency channel. We took advantage of the 100-mbs Internet service at my home and relayed Internet service to the remote. Even though the signal path is over 10 miles, the 5-GHz signal is strong and very reliable. We have not had one failure with our 5-GHz units.

Software to control an Internet remote base has been a challenge. The pioneering software efforts of Bob Arnold were text-based. A control operator would log on at <www.w7dxx.com> and enter a frequency in a text window. Only SSB mode was supported. We had no amplifier to control or beams to rotate. And then along came Stan Shretter, W4MQ, with his software that allowed us to greatly enhance the capabilities of W7DXX remote. With Stan's software, we were able to control an amplifier, operate all modes (including OSCAR satellite modes), change antennas, rotate a beam, and have password-protected access to the remote.

The most exciting development in Internet remote base software came when Brandon Hansen, KG6YPI, introduced his remote base software (*Photo C*). Brandon's software features the ability to control a number of different transceivers. It has a built-in chat window which control operators can use to talk with each other. More than one operator can be logged on at the same time. Other features include DX spotting, CW macros, and amplifier and beam rotor control. We have been using Brandon's brilliant software since it was first introduced and find it stable and very reliable. It's at <remotehams.com>.

W7DXX Remote Today

Most of our control operators are rabid CW DX-chasers (*Photos D & E*). With 1,500 watts to an 11-element log-periodic, their results have been impres-

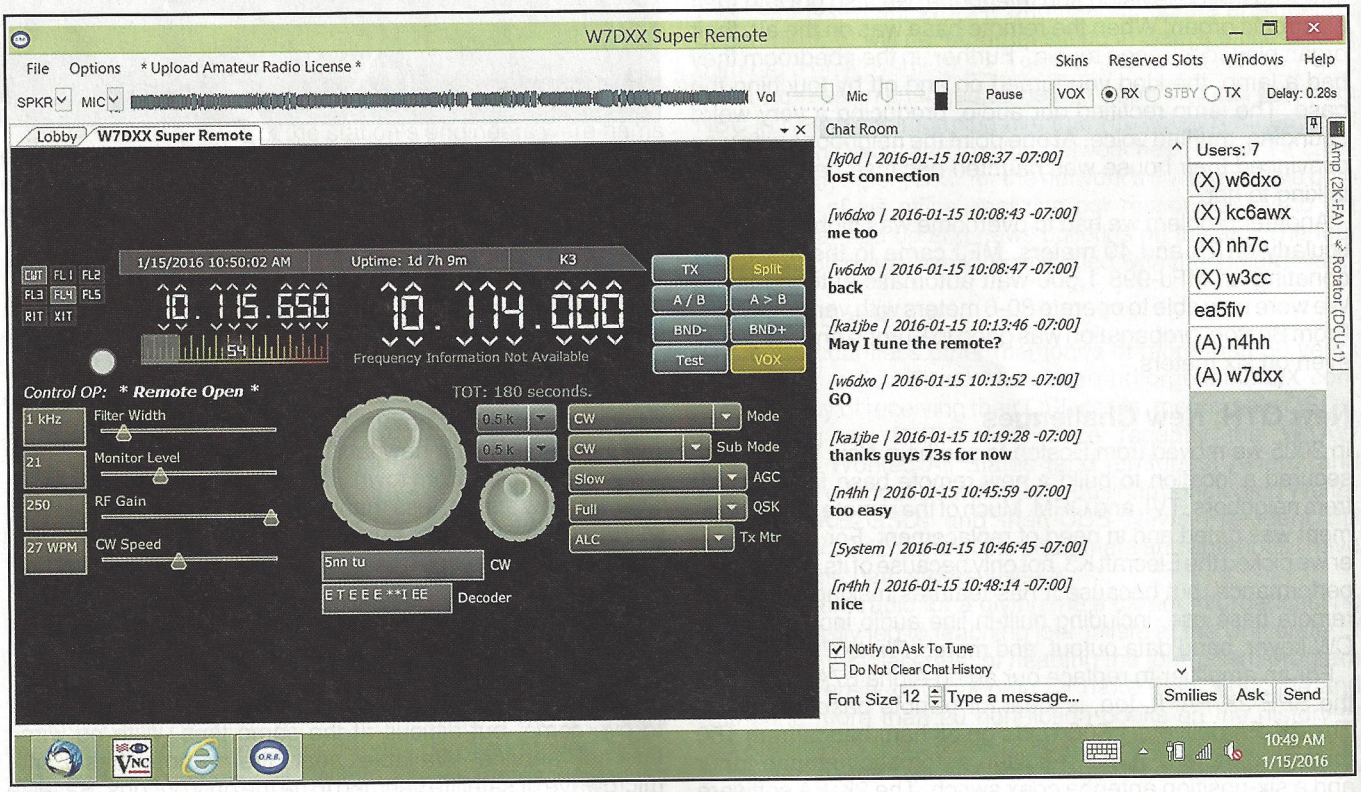


Photo C. Closeup view of the W7DXX Super Remote software as viewed on a user's computer screen. See text for details of what it can do. (Courtesy of W7DXX)

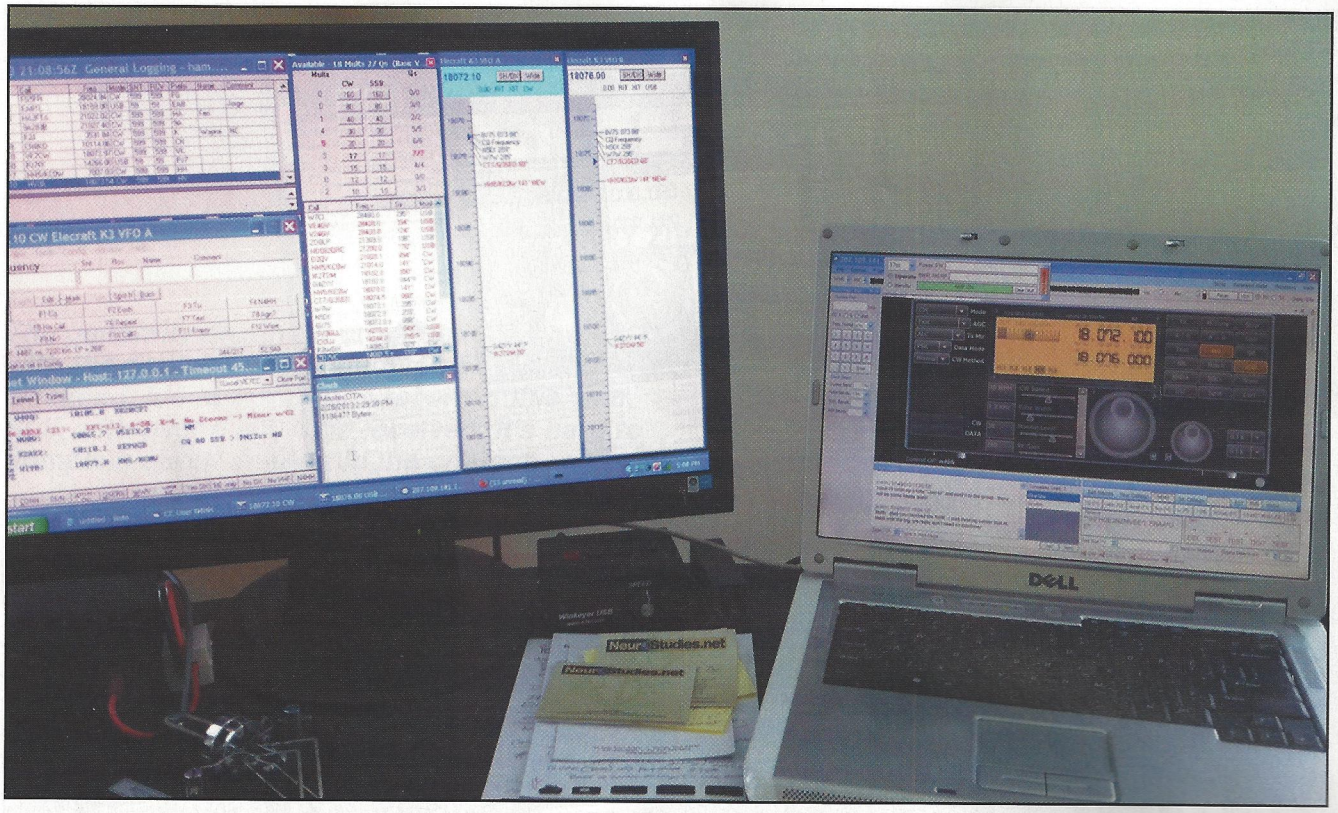


Photo D. Don Nesbitt, N4HH's remote station for operating via the W7DXX remote base. The large monitor on the left shows his N1MM logging and station control software; the laptop screen shows the settings of the W7DXX transceiver. (Photo courtesy of Don Nesbitt, N4HH)

How to Travel with 1,500 Watts in Your Back Pocket and Not Catch Your Pants on Fire

I love operating HF mobile but I have never found a transceiver small enough to fit gracefully in my small automobile, or a mobile antenna that would survive the rigors of a drive-through car wash. I also like chasing DX from my home base station. Wouldn't it be nice if I could combine the advantages of mobile operation with my 1,500-watt base station? Better yet, do it all with an HT-size transceiver? There is an easy way to do this.

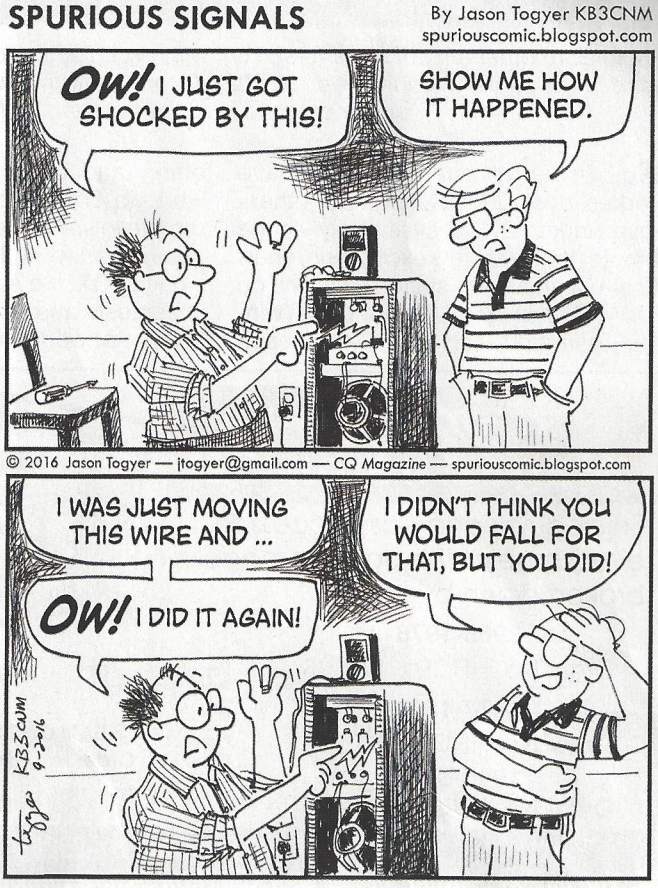
Over the past few years many communication-related "apps" have become available for smart phones. One particular application allows me total control of my K3, SPE 2K-FA, and log-periodic. I can travel almost anywhere in the world and remotely operate my own station, plus over 100 other stations worldwide. All you need is an Android smart phone and software you download from the Internet. Just follow these steps:

1. Open up the browser on your droid.
2. Navigate to: <http://www.remotehams.com/>
3. Click on RCForb Client for Android Beta

Once the program launches, a list of stations with which you can connect will load and be displayed. Scroll down and find "W7DXX Super Remote." Click on it and you will be connected. If you click on "chats," you will see the calls of others who may be logged on and be able to text-chat with them. From that same window, click on "more" to access the amplifier or antenna rotor. You can even click on "DX Summit" to keep up with DX you may be chasing.

The application is pretty self-intuitive, but if you have any questions, you can email me at <w7dxx@w7dxx.com>.

Enjoy!



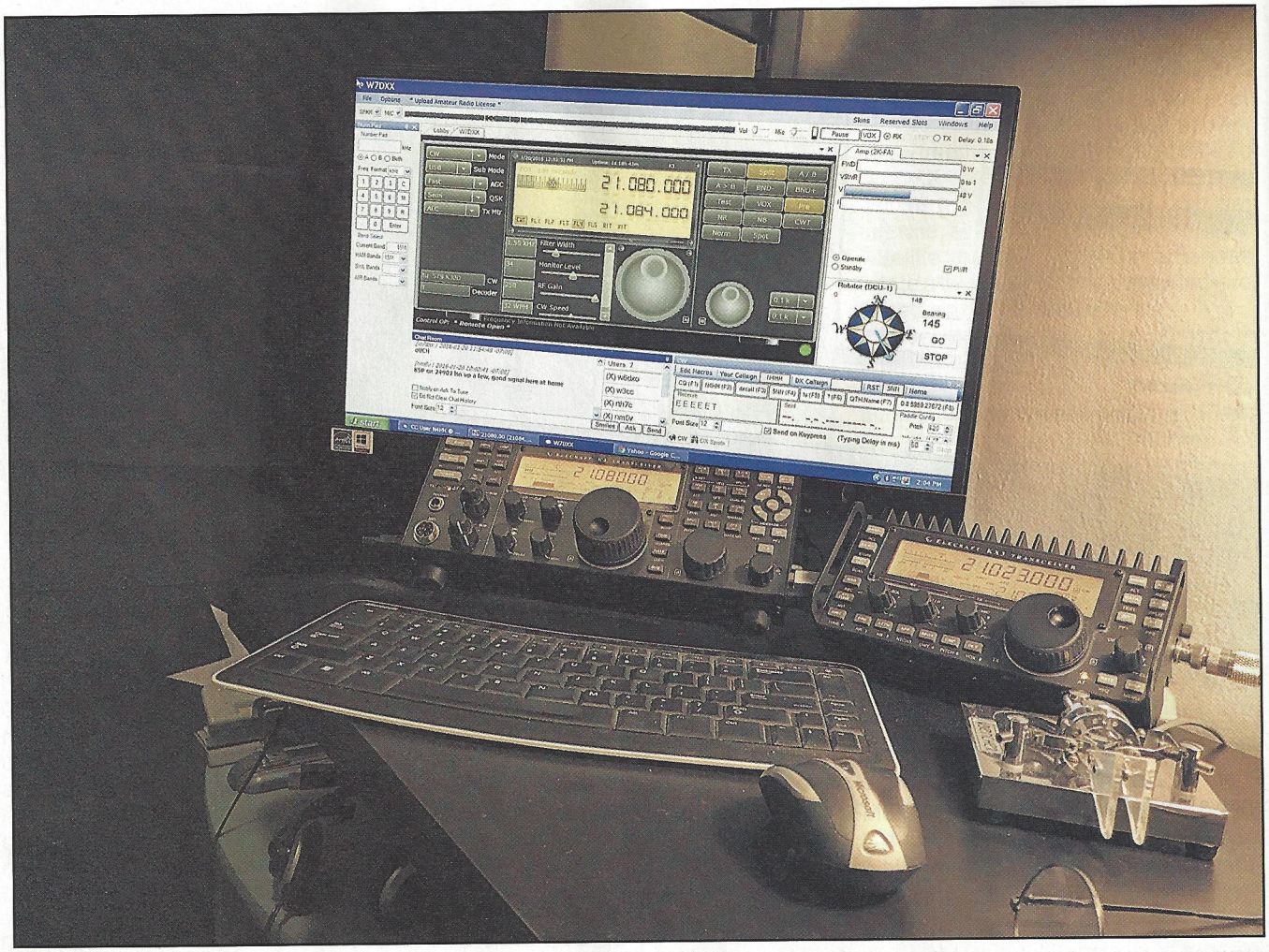


Photo E. Another shot of N4HH's station, with everything happening on one computer screen. The Elecraft K3/Mini control head in the center is connected to W7DXX via the Internet, while the KX3 on the right is used for local operation (note the coax plugged in at the far right). (Photo courtesy of Don Nesbitt, N4HH)

sive. Some of our operators have worked over 300 DX entities, others have worked DXCC exclusively via the remote (With very few exceptions, operators use their own station callsigns on the W7DXX system). With the chat window, operators can spot DX for each other, and often after one operator works a DX station he can pass the remote to someone else on chat so that person can work the DX. In addition to working DX, we sometimes participate in contests and have earned first place in a major worldwide DX contest.

Here's how one user, Greg Morrow, NI5W, summarizes his experience as a W7DXX control op: "After 20 years off the air, I got bitten by the ham bug again. By then, I was living in a HOA (homeowner association) neighborhood with lots of restrictions. Remote was the only way for me to get back on the air. Now I'm up to 301 countries, 432 islands, and still have had time to enjoy a few ragchews. One of the things I enjoy the most about the remote is when a group of us get on at the same time and tag team working a new one together."

If your enjoyment of our hobby suffers because of antenna zoning restrictions, TVI, lack of equipment, or you just want to operate a world-class amateur radio station via your computer from anywhere in the world, consider joining us. Membership is $200/year, all of which goes to help cover the costs of operating and maintaining the station. Go to <www.w7dxx.com> for details on how to become a control operator of W7DXX internet remote.