NCJ Station Profile

Conducted by Mark Beckwith, N5OT

As the days get cooler, the Hardware Addict begins to question his choices about what to do at the station; instead of putting up those new Beverages, maybe we should have taken down those monster 40-meter Yagis and replaced them with something more modest. In our amateur world of seat-of-the-pants engineering, we wonder what those 40-meter Yagis will look like after a bad ice storm. Then our minds spin, playing out scenarios of taking them down when they're split in half. There are just not enough hours in a day sometimes. As if Sweepstakes was not enough, Thanksgiving wastes no time in rolling around, and we have to pause to consider what we're thankful for. We're thankful for CQ Worldwide. And I hope there isn't an ice storm during CQ Worldwide.

Wouldn't You Know

The Hardware Addict and I leave for the Caribbean in 10 hours so that we can make lots of contacts in lots of countries. Before we go, we realize the rest of the contesting world needs to hear about N9IW, the rather spectacular station of Tim Gustafson. Tim has built an off-the-shelf multi-tower station which he can access by remote control over the Internet from his wireless laptop. When I think that N5OT is 16 miles away from where the Hardware Addict and I actually reside, I wonder sometimes if those trips up the hill are really necessary—remote control over the Internet sounds good sometimes!

Tim has proven the robustness of N9IW through thousands of HF contest QSOs on phone and CW. Subsequently he has demonstrated it at local and regional contest club meetings. He piqued the interest of *NCJ* Editor Carl, K9LA (see his Editorial)—and the Hardware Addict had his work cut out for him.

A Normal Guy

We caught up with Tim and struck up a conversation. Tim is a "normal guy" and confesses that contesting is not his main focus in life. He grew up in Western Springs, Illinois, a suburb of Chicago. At age 13 he built his first ham station. As a married adult he moved into a high rise in downtown Chicago, during which time he would get on the air from his original station at his parent's house.

When mom and dad decided it was time for the antennas to go, Tim built a big station 250 miles north in Sister Bay, Wisconsin. "I would drive up north almost every weekend to enjoy the beauty of Door County where I spent my childhood summers."

…and get on the air, I'm sure.
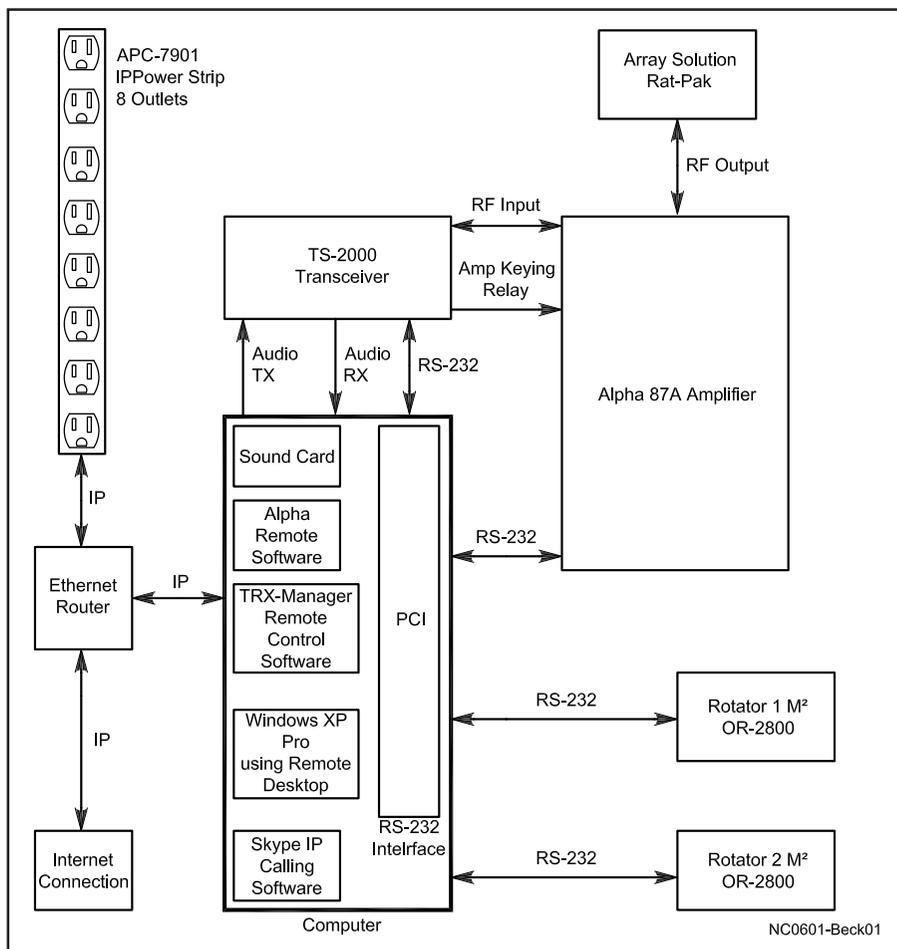
Block diagram of the N9IW remote contest station.
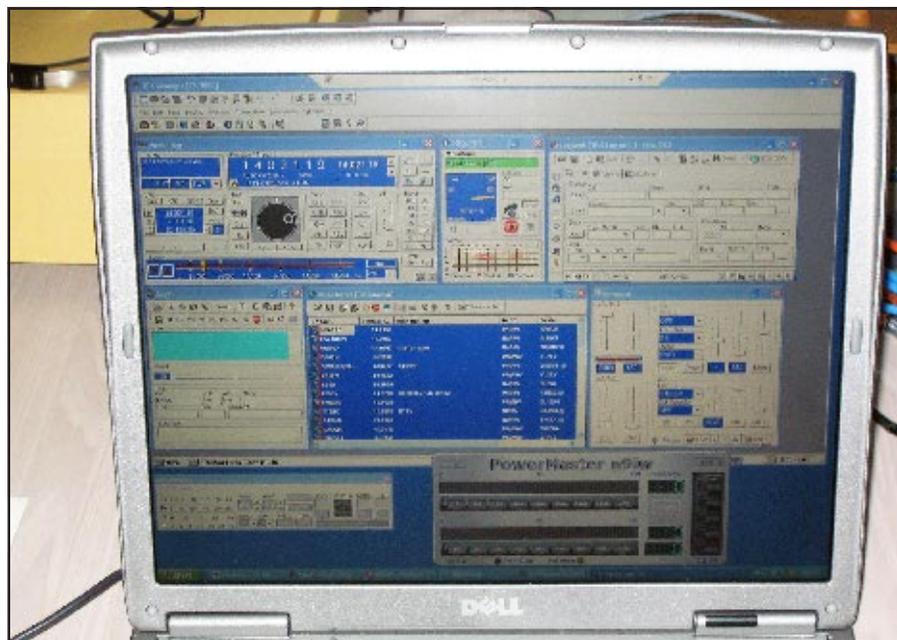
Screen shot of N9IW's laptop when running the remote station.

Another One Bites the Dust

"A few years ago I read an article about remote controlling an HF station," Tim relates. "The article piqued my curiosity. I was currently living in a condo in downtown Chicago, and my station was located 250 miles to the north.

"I was in the process of upgrading the antennas and wanted the opportunity to play radio other than just on the weekends I went north. A remote station fit the bill." Here again, the Hardware Addict and I can only imagine what that would be like. Surely this is not an undertaking for the faint-hearted, or to quote John Battin, K9DX, "If you're controlling your radio directly, and you have a [modem] drop out, you're in deep trouble."

Tim continued, "My first goal was to make sure every piece of equipment I used had the ability to be computer controlled." He e-mailed us a block diagram of the station so I could get an idea of all the various components that had to be drawn together into the system. Our first reaction was how much common sense it made. I asked Tim if one of the design criteria was that it could be duplicated with off-the-shelf components. Tim responded with an emphatic *yes*.

Makes sense, doesn't it?

No Antenna Slouch

"The antennas consist of a 3 stack of home brew log periodics for 14-30 MHz. Each log is 14 elements on a 40-foot boom, and they were designed using techniques to maximize performance compared to standard designs."

"The design of the logs is a whole 'nother story," Tim said. I bet it is. We hope

you tell us sometime, Tim.

"The Logs are on a 125-foot Rohn 55 rotating tower using KØXG's hardware and an M² OR2800 RS232-controllable rotor controller. On a second 100 foot tower is a homebrew full-sized 2 element 40 meter beam with 2 elements for 30 meters interlaced using one 50-Ω feed point for both bands."

Like I said, Tim is no antenna slouch. Anyone who scratch-builds full sized 40-meter Yagis gets our respect.

"I'm also using an M² OR2800 rotor to turn the 30/40 antenna. For 80 I'm using a 2 element K8UR wire array and on 160

meters I'm shunt feeding the 100 foot tower. The station is pretty competitive except for being located in 'The Black Hole.'"

Tim has casually operated his beautiful station in contests by remote control for several years now, and made several thousand contacts.

RS232 Central

Inside the well-appointed shack, as you can see in the cover photograph, Tim made good on his parameter to seek only hardware that was computer controllable. To interconnect all the serial devices (i.e.

The 40/30-meter antenna at N9IW's remote contest station.

The 6-meter amp at N9IW's remote contest station

N9IW Equipment Summary

Radios
Kenwood TS-2000
FT-1000D

Amps
Alpha 87A
King Conversions 6M Kilowatt

Antennas
160	Shunt-fed 100 foot tower
80	2-element K8UR wire array
30	2-element home-brew Yagi (full-sized)
40	2-element home-brew Yagi (full-sized)
20–10	3 x 14-element home-brew log periodics
6	3 x M² 6M7s

Antenna Switching
Array Solutions StackMatchs and RatPaks
APC7901 (to turn on 12V wall warts to activate the selected antenna on the RatPaks)

radios, amps, rotator controls) he relies on a Byterunner PCI to RS232 8-port serial expansion card. Like K9DX, Tim chose to have a PC on-site that does the actual controlling, and uses a wireless laptop to link to the shack computer via the Internet.

"To control the TS-2000, I use *TRX-Manager* software by F6DEX." Tim comments, "Laurent [F6BEX] has been very helpful with his software." Laurent's program is only needed on the actual shack computer. To access the shack computer Tim uses the remote desktop connection feature inside *Windows XP*. "Get the professional version!" he adds quickly.

Tim uses a Dell D610 laptop. "Make sure you get a machine which will do SXGA+ for graphics. This allows the remote computer window to fit on my laptop screen without having to scroll all over the place." I had to agree that the bigger displays are helpful. The Hardware Addict and I don't have a single 15-inch or smaller screen in the place, and there's nothing left that's heavy or uses cathode rays. Flat screens are the best thing to happen to the operating console since SO2R.

Pesky Details

Naturally, there are little things here and there that make Tim's installation complete and play like a charm. I asked him about some of the smaller details.

"To remotely control power and relays to switch antennas I use an APC7901 IP-addressable power strip. For audio I use *SKYPE*— you will also need an isolation transformer between the computer sound card line output and the microphone input on the rig to eliminate the ground loop. I also use a backup UPS to keep the computer on at the station if I ever lose power."

Tim heaped praise on *SKYPE* for passing all his audio over the Internet. *SKYPE* results in an approximate 50 millisecond delay in audio in both directions." Tim feels that this is about as good as it gets and is very happy with this figure. "If you set up your own link outside of the Internet you could get the delay down to nothing."

Just About Ready

After talking with Tim, the Hardware Addict and I sat and thought about the upcoming cold winter months. "Gotta get those 40s down," he said without a trace of enthusiasm.

"Yep," I curtly replied.

But then we thought about how cool it would be if we could get our station to where we didn't have to bash through the snow and ice to get on the air. "This off-the-shelf remote thing has some promise," I said to him, breaking the silence.

"Yep." he replied curtly. The Hardware Addict is a man of few words. **NCJ**