The Pileup

Newsletter of the CDXA

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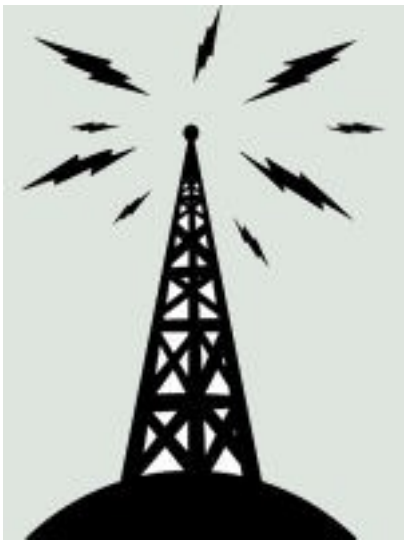


DX King News

John Forbus, NV4A

Here are the scores we have as of the end of March. The numbers are going up, as is the list of participants. If you want to be in the running for the Amazon Gift Card, don't forget to post your scores for April on the CDXA website or just click this link. (*Ed. Note: A little glitch caused last month's DX King numbers to mysteriously disappear.)*

Callsign	Category	Coun-	Zones	Total
K7BV	Unlimited	241	40	281
K5EK	Unlimited	231	40	271
W3GQ	Unlimited	200	37	237
W1AJT	Unlimited	174	37	211
W3OA	Unlimited	132	31	163
K4ESE	Unlimited	134	27	161
W3ZL	Formula	130	28	158
K4HC	Limited	107	24	131
K8YC	Unlimited	97	31	128
N4GBK	Limited	90	30	120
W4WNT	Formula	81	22	103
NV4A	Unlimited	83	17	100

CDXA PacketCluster & Other Communication Systems	
K4MD (AR Cluster via Telnet)	k4md.no-ip.com
W4DXA (AR Cluster via Telnet)	w4dxa.no-ip.com
CDXA Repeater 147.18 MHz (+600)	W4DXA, Near Fort Mill, SC
World Wide Web Homepage	www.cdxa.org
Wednesday Luncheon (11:30 AM)	Skyland Family Restaurant, 4544 South Boulevard, Charlotte, NC

Nothing increases Enjoyment of Amatuer Radio More Than Having A Good Antenna!

By John Scott, K8YC

From my licensing in 1979 until moving to Charlotte in 1995, I never had a decent antenna on the HF bands for 30m through 10m. In the first two years after being licensed I had a wonderful trapped dipole for 80m and 40m with which I quickly earned the basic WAS award, but after that nowhere that I lived would accommodate a decent antenna. I began the DX "chase" in 1996, but my home QTH was limited by CC&Rs to vertical antennas and a home brewed Moxon rectangle because the CC&Rs limited my outside antennas to be no higher than the ridgepole of my home. Yet, I was able to confirm 325 DXCC entities using that setup—occasionally having to fire up the Moxon rectangle sitting atop a temporary 26 foot tall "tower" made from telescoping PVC plumbing pipe. It was the experience with the gain attributes of my simple Moxon rectangle that made me know that I wanted more in the way of antennas. One good thing about verticals is that they have a low takeoff angle, despite hearing and radiating equally in all directions. I made up for antenna gain by putting more power into the feedline to get about 9db of "effective transmission gain", although that did not provide any gain on the receive side.

In 2013, my XYL and I decided it was time to vacate Mecklenburg County and find a homestead with a little more land, with minimal encumbrances from CC&Rs and yet, keeping reasonable proximity to "big city life". The new property we found in Iredell county has one acre of space but the "back 40" was covered with mature trees ranging from 80 to 100 feet in height. Whatever I planned to erect had to fit under the umbrella of my trees, because I just couldn't think of cutting down those nice trees. Fortunately, I met with and talked to Scott Robbins (W4PA), owner of Vibroplex keys and the U.S. distributor for Spiderbeam, at SEDCO/W4DXCC 2012. Scott mentioned that a Spiderbeam could be put up on a mast with a ground mounted rotor. I knew the Spiderbeam was considered a good performer by European DXpeditioners since I had been reading about them in recent years while doing my editing chores as newsletter editor for INDEXA. Besides an antenna that would perform well, a mast mounted antenna and its rotor could be serviced without the need to climb a tower, the guy anchors would be far simpler (and less expensive) than those needed for a full-fledged tower, and the rotor would be half the price of a tower-top rotor.

The version I settled on was the heavy duty 5 band version of the Spiderbeam and a 47.5 foot tall heavy duty aluminum mast, also made by Spiderbeam. This would give me the five bands from 20 meters to 10 meters I had become accustomed to having on my multi-band vertical, and I could get the 40m and 80m bands from a Butternut HF2V that I moved from the old homestead. Some people confuse the Spiderbeam with a hex beam, but each uses distinctively different technologies. The hex beam is mounted on a hexagonal shaped structure formed by three spars separated by 60 degrees. The hex beam has two elements on each of its 5 bands—a driven element and a reflector—with the elements shaped in the form of a two opposed "W" letters along the arms of the hexagon and the supporting trussing lines. Accordingly the turning radius of the hexbeam is quite compact, being as small as 11 feet. On the other hand, the Spiderbeam is mounted on four 5 meter long fiberglass poles 90 degrees apart, creating a turning radius of 16.4 feet. Yet that added turning radius allows for three elements on 15m and 20m; four elements on 10m; and two elements (driven element and reflector) on 17m and 12m—14 wire elements in all. This arrangement provides gain characteristics, F/B and F/S ratios more typical of a conventional Yagi-Uda antenna. Below is an image of how the wire elements are shaped on the tri-band version:

The Pileup

Official Newsletter of the Carolina DX Association

Published monthly 10 times per year, excluding the months of June and December.

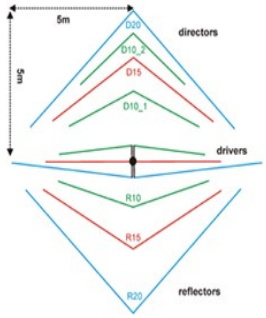
The purpose of the association is to secure for the members the pleasures and benefits of the association of persons having a common interest in Amateur Radio.

Members of the CDXA shall adhere to "The Amateur's Code" as published from time to time in *The ARRL Handbook for Radio Amateurs*, and shall consist of those valid licensed amateur operators having an interest in promoting amateur radio. Long distance communications (DX) is of special interest to members of the association, but said interest is not a requirement of membership.

Yearly dues are $25.00. A second licensed Amateur family member living in the same household can join for $5.00 for a total family price of $30.00 per year. The total price for 3 or more licensed family members living in the same household is only $35.00 per year. All family members enjoy full member status. Dues are payable annually in December by check or through the CDXA website, to the Secretary/Treasurer:

Cliff Wagoner, W3ZL
P. O. Box 577
Davidson, NC 28036

Address, telephone, and email address changes should be directed to the Secretary/Treasurer at the above address or via email at: jcw53@cornell.edu.



against the “big gums”, I am yet to feel that I am at a disadvantage in the pileups.

Oh, and did I tell you, **NOTHING INCREASES ENJOYMENT OF AMATEUR RADIO MORE THAN HAVING A GOOD ANTENNA**

The rotor I used is a Yaesu G450-A which costs about $280. It is mounted on a weldment created by a local welder (for about $70) pictured here before and after being mounted in the ground.

Once the concrete is set, the rotor is attached to the mounting plate. Guy stakes are set at 120 degree angles around the base, the mast is attached to the rotor and the dacron guys are attached to the mast. After the feedline is affixed to the antenna mounted on the mast, with the help of a few friends, up it goes. In my case, the antenna is up about 40 feet to fit under the umbrella formed by my trees. The whole raising job, including the time to solve a few glitches, took about 2-1/2 hours to accomplish.

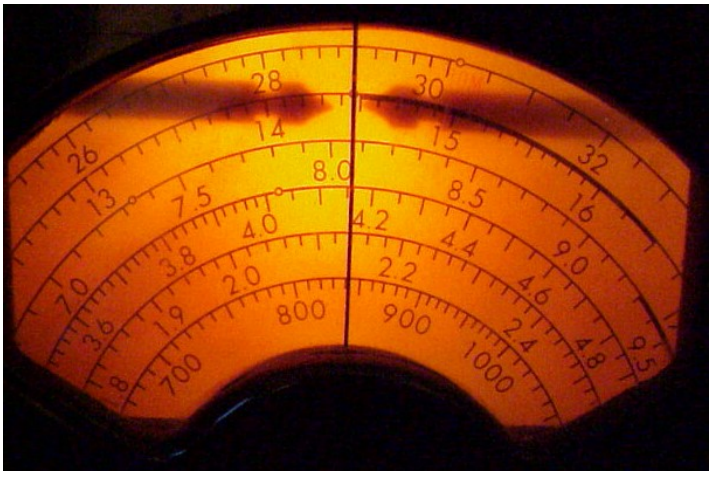
Since arriving at the new QTH, using the new antenna, I have put 9 of the more difficult DXCC entities in my log and moved myself onto the DXCC Honor Roll. I put near legal limit power into this antenna with the linear amplifier I possess, and while I may not be the strongest signal at some far away place when competing against

Addendum – Low Power DXing & Contesting

by: Cliff Wagoner, W3ZL

In the original article there were several references to the “low vertical angles” necessary for deep DX. The indoor antennas, due to their relatively low elevations (25-30 ft.), lack very low angle lobes. Therefore I employ my mobile when I cannot hear the DX station. For example, I had to do this to work the recent VP8 DXpeditions. I did this to hear the S2 also, but was unable to break the pileups. The mobile is a Kenwood TS-50 using hamstick band specific antennas. It has the low angle lobe characteristic of ground plane verticals.

There have been requests for information on my actual results. They are: DXCC 330 total, 321 current; DXCC Challenge 1080 current; CQ Marathon countries - for 2017 (to date) 130, 2016 165, 2015 193, 2014 221, 2013 215, 2012 211 (follows conditions); CQWW CW + SSB DX contest 2014 1,013,577.



Strong Angel III

By Art Tolda, W1AJT

Disaster Preparation
Strong Angel III
W6W

In August 2006, a small communications focused team of two Canadians and one American participated in Strong Angel III. Strong Angel III was a low-key demonstration of globally relevant methods for improving resilience within any community under pressure. Strong Angel III had no dedicated staff, no official funding source and no policy or tasking legitimacy, and that has generally been true of each of the previous Strong Angel demonstrations as well. Historically, however, the Strong Angel series has a modestly successful record of providing effective civilian-military interaction and interesting solution sets to vexing problems. Strong Angel III involved roughly 800 participants in nine nations, including more than 70 national and international corporations and several academic institutions. From that very large, week-long effort in an isolated and challenging environment (a cold, dark, hazardous building abandoned for fifteen years), came a set of lessons and pragmatic tools that have altered disaster preparedness discussions at the highest levels of several governments and are perhaps worth a few minutes review.

The scenario for Strong Angel III

Although Strong Angel is not played as an exercise, there are scenario determinants that serve to enforce initial conditions and ongoing constraints. The initial conditions were the following:

- In August of 2006 many countries in the world find themselves in the grip of a lethal pandemic Despite an historical recognition of limited quarantine effectiveness, many areas in the US, like most urban

centers across the globe, are under quarantine, enforced by the National Guard, and movement is highly restricted. As the virus spreads, regional hospitals and clinics are rapidly overwhelmed and alternate care sites appear anywhere they can, perhaps in nursing homes, schools, and stadiums. As the weeks drag on and workers manning public utilities fall ill, critical infrastructure begins to falter.

- As the scenario unfolds, public health officials soon express urgent concern that a loss of their own regional communications system would have a significant impact since they would be unable to effectively coordinate disease containment and resource allocation. The city seeks help from the national capitol, but the central government is occupied with both the national crisis and with local outbreaks that have placed the central government itself in isolation. The city is told that they must ride out the initial phase alone.
- None of this escapes the notice of disruptive organizations. Such groups have long understood that it is possible to do a great deal of harm by watching for (or triggering) an initial event, and then using a secondary attack against responders in order to amplify the morbidity of the original event. Well-versed in techniques of information warfare, they launch a series of cyber-attacks spread out over the course of several hours, targeting critical infrastructure at vulnerable nodes. Grid power is lost for the entire region and, with it, most Internet access. Restoration of services is hampered by illness, quarantine, and confusion. The local community, along with those military personnel deployed to enforce the quarantine, is faced with mounting their own response to these very difficult circumstances.

The demonstration started 10:00 AM San Diego time August 21st from shipping crates with no power, lighting, chairs or tables set up in an abandoned building near San Diego airport used for fire and tactical police training. The first task was to be up and running with communications in 4 hours. There were in excess of fifty spontaneous tasks during the week each emulating real-world problems. The tasks focused equally on the technical, operational and social aspects of humanitarian relief. Those tasks included the elimination, at odd intervals, of power, light, radio waves, transportation, wireless clouds, staff,

hierarchical structures, and expectations forcing collaboration and team building.

The primary Canadian participants were all from Bell Canada; Doug Hanchard Executive Committee Member and lead for Wifi, WiMax, and Satellite communications, Dragan Mihajlovic – VE3FF commercial and amateur radio communications specialist, and Art Tolda – W1AJT/VE3UTT emergency communications and amateur radio specialist. (Figure 1 – Dragan – standing, Art – sitting in the Geophysics Lab at SDSU))

Due to antenna height restrictions near airports, the radio team, Dragan and I, needed to deploy at a second location, San Diego State University (SDSU), along with the US Marine Corps Emergency Communications Truck from Camp Pendleton, California assigned to work with us. The truck has it own 60 foot telescoping mast, RF smart-zone capability for 250 talk-groups, internal PBX, and 300 handheld radios. The radio team demonstrated the value and speed of implementation inherent in RF communications. The team started without a defined location and was communicating within the required 4 hour window with two stations (no handhelds or repeaters were used).

As mentioned before, we started with nothing in place and as it turned out, a major part of our equipment was in shipping limbo until the day before SA3 ended. Of course, this gave Dragan and I opportunity to homebrew what we needed mostly from bits and pieces we thought we might need and brought along. Luckily, we traveled with our transceivers and computers so we had a great start.

I think everyone reading this is well aware of the poor radio conditions, at the near minimum of the 11 -year sunspot cycle, we had to cope with. One very bright spot was playing with a BiggIR Vertical that FluidMotion let us borrow. On purpose, we did not use CW which we would have both chosen. We used RTTY, PSK31, and SSB so that observers could participate. We used dipoles, hamsticks and the BiggIR all on a one-story roof, surrounded by taller structures except to the North, from 80m to 2m with a maximum of 100w. (Figure 3 – BiggIR just left of center, and right attached to ladder 2m dipole and hamsticks)

Coincidently, a major effort to expose amateur radio to the public while supporting our team in California

was organized by the Ontario Science Center Amateur Radio Club (OSCARC) VE3OSC. They, with OSC management, set up large screens in a main exhibit area at the Center for visitors to see and hear what was going on at Strong Angel during one of the busiest times of the year. Tremendous effort was made by the club to help pass emergency messages mostly through terrible conditions and long hours. I cannot possibly do justice to all of the members participating but the effort was organized by Richard – VA3YT.

What Worked

Overall the results were very positive. The team demonstrated why Amateur Radio has been passing emergency messages since the beginning of the 20th century. We successfully demonstrated multiple progressive communications strategies that can be deployed from "Day One" to "Day N" with ever increasing capabilities. Parallels can be drawn between the scenario and what we experienced in Canada during SARS and what we could potentially experience with high profile events such as the 2010 Winter Olympics. Although the results that follow don't indicate it, the Bell team worked a minimum of 12 hours a day for 7 days. The team demonstrated:

- Message relay from San Diego to Toronto to two different locations in the Ukraine and back to San Diego starting at 4:00AM Ukraine time in 3 hours and 35 minutes with 100% accuracy. Thanks to Yuri-VE3DZ, Nick-UT2UZ, and Dimitry-UT5UGR
- Direct unscheduled message passing complying with the 100% character accuracy standards for emergency message handling to:
  - Georgia Tech
  - Georgia Office of Emergency Services
  - Albuquerque, NM Health and Safety
  - Missouri Office of Emergency Services
  - Sacramento, CA Radio Amateur Civil Emergency Services
  - Washington State Radio Amateur Civil Emergency Services
  - Toronto Radio Group
  - US Navel Academy in Annapolis, Maryland
  - Headquarters of the American Red Cross in Washington, DC, and
  - The Ontario Science Center
- Establishment of 215 direct contacts in 38 states and 10 foreign countries including French Polynesia and Palmyra & Jarvis Islands (every QSO was confirmed by QSL)
- With Bell Canada's partner Codespear we demonstrated totally transparent bi-directional connectivity between: text (SMS), Amateur Radio, Civil Government Radio, Family Radio Service, VHF Military Radio, Cellular Phones, and Internet email. Through this unique capability we enabled true, integrated, any-to-any communications. The lack of interconnectivity is always listed as the major impediment in providing aid during times of crisis.
- The total remote control and operation of an Amateur Radio station in Kitchener, Ontario with the help of Paul-VE3SY from a wireless laptop in San Diego. This demonstrated the viability of installing a remote system in a non-human friendly environment.
- Complex technologies such as:
  - Two 5 x 5 MB VSAT Satellite links with Intelsat
  - 300 MB Microwave 5.4 GHz Bridged Link – full duplex / 60 MB Microwave link 5.4 GHz – full duplex / 14 mile bridged link (no direct line of sight) with Orthogon/Motorola
  - 2 Broadband Global Area Network (BGAN) Satellite low bandwidth receivers and bandwidth consisting of 492 KB for each device to enable remote internet access with Telenor Satellite Services
  - 2 additional BGAN units plus a prototype of a mobile-on-the-fly unit with Hughes Network Systems (a Hummer at highway speed using satellite communications)
  - Wi-Fi 802.11 four unit meshed wireless network with Nortel Communications
  - Wi-Max 100 MB Microwave 5.4 GHz full duplex Bridged Link / 12 mile bridged link (no direct line of sight) with Redline Communications

On the social engineering end, critically important in times of crisis, the team scored high. The radio team, primarily Dragan, mentored and provided much technical assistance to the Marines enabling communications from their truck. The team also gave tours of the radio operations area for SDSU faculty giving first amateur radio exposure to many in San Diego and with VE3OSC in Toronto. Doug was part of the executive leadership team at the primary location.

There were many lessons learned by all the participants. There was formal recognition of the value of Amateur Radio for the first responder which is not our typical historic position. Our team's ability to backpack in with effective tech-

nology and set up a meaningful long reach communications facility that can be operated by people with little or no training provided great value. Military and civil participants were enthusiastic enough to investigate cross-training their personnel. The tuneable BiggIR really got the attention of the military commanders who traditionally need to deploy many antennas to effectively cover the range of frequencies we demonstrated. The effect of transmitting SSB on 20m through our amateur transceivers and being simultaneously heard by the Marines with their VHF military radios, the San Diego Fire Department on their secure channel radio system, FRS handhelds, cell phones receiving the message via SMS and even to Microsoft SPOT technology watches challenged conventional thinking.

Great efforts to help were spontaneously made by many amateurs both in Canada and the US, as well as numerous ARES groups. We did not pre-arrange any participation or publish schedules in order to closely emulate what would actually happen in a disaster. We used RACES frequency ranges for the most part and relied on individuals to spot us. Overall, this worked quite well and was very realistic.

What Fell Short

Logistics were a challenge and we were in North America imagine in other parts of the world. For the most part, today's training regime does not prepare our military and civilian communication specialists with needed plans of action when "things don't work". They are getting a lot of training but not the real tactical information they need to provide immediate communications solutions. I am very sorry to say, it was impossible to mobilize the ARRL either at headquarters or in the local San Diego area to participate in the world's largest disaster exercise with almost three months notice, many emails to every ARRL HQ and Field executive and a totally blank sheet of paper for them to define what they would like to do.. The only person that came to help while we were breaking down on the last evening was the San Diego Section Manager, Pat – WA6MHZ.

Epilogue

The team's efforts were well recognized. The Assistant Secretary of the Department of Defence specifically sought out Doug to thank the team for all of its contributions. We are having emergency response discussions with the Marine Corps and Microsoft Corporation. The Canadian Department of National Defence through its contacts with the US Department of Defence wants to discuss what we were able to achieve and are interested in hosting a "Strong Angel –type" exercise in Canada.

Amateur radio despite all of the new, amazing, high-bandwidth communications technologies still provided communications fast and effectively while satellite dishes were being aimed, WiFi networks tuned, routers configured and millions of dollars in commercial radio equipment re-programmed. We all know that this is nothing new. Amateur radio has been documented as relaying emergency messages since March, 1913 when conventional means are not available.

For those interested, discussions of Social Interoperability Networking, non-standard pursuit of communications, lift, and power, and the results of the 50 or so demonstration tasks pursued in Strong Angel III, can all be found at www.strongangel3.org.

Hope to see you all from the next Strong Angel.