

The Pileup

Newsletter of the CDXA

Everybody's gone home. Now what are we going to do?

K4MD	Joe Simpkins	President
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W3ZL	Cliff Wagoner	Sec.-Treas.
K4MD	Joe Simpkins	Cluster Mgr.
AD4IE	Paul Ponak	Contest Mgr.
W3GQ	Paul Sturpe	W4 QSL Bureau Manager
WB4BXW	Wayne Setzer	Webmaster
NV4A	John Forbus	Editor

Until earlier this week, it seems there've been multiple big DXpeditions on the air for most of this year, sometimes more than one at a time. We had our very own CDXAers working K5P with over 75,000 QSOs.. Another team first visited South Sandwich, as VP8STI, and made over 54,500 contacts in spite of having to end their stay early and quickly; and then they moved to South Georgia, as VP8SGI, with almost 83,000 Q's. Seemingly almost unnoticed in the middle of the "big ones" was VK9CK on Cocos (Keeling) Is, #82 on Club Log's list. They racked up almost 24,000 contacts, although, at least for your editor, they were hard to hear. Then, to really spice things up, Heard Island came on the air as VK0EK. They managed over 75,000 Qs in spite of terrible propagation, including a few days when they got to sit around and watch the aurora australis while their receivers had S9 noise. Judging by many comments on the CDXA Reflector, lots of us had trouble hearing them, and they were dubbed "Non-Heard Island" by some CDXAers,. Working them certainly took careful studying of all the available propagation information and lots of listening. A week after VK0EK got cranked up, FT4JA

showed up from Juan de Nova. They were easier to hear, but only when the absolutely absurd level of DQRM quieted down. It wasn't just some series of dits or people tuning up or holding down the key either. The level of obscenity seemed to reach a new height. This was the first Dxpedition where I heard so much foul language and name calling on SSB, CW and RTTY. Wow! ...more on that on a following page. That pretty much summarizes the "most needed" operations, with the exception of a couple of days when Spratly Is. was on the air. If you didn't work it, and need it, Carl Smith, N4AA, reports in this week's *QRZ DX*, that "...if you missed the 9MØC activity last week, you have another chance when Michael, DF8AN is on-the-air from Layang Layang Island April 19-29. He plans to work 160-6 mostly CW. QSL to home call, direct or DL bureau. There will be NO eQSL or LoTW." By the way, you *do* subscribe to Carl's publications, don't you? Oh yeah, what about P5/3Z9DX? A very few very lucky hams worked him on his "reconnaissance" trip the end of last year. ...but will he be going back? The latest I could find was that Dom might be headed back this summer. He's only planning to work SSB and mostly 20m from what I can gather. I doubt if we are collectively holding our breath.

In addition to all the recent Dxpeditions having ended, here's a snapshot of a current prop chart as I'm writing this. ...It's been worse over the last few days.

Solar-Terrestrial Data
06 Apr 2016 1624 GMT
 SFI: 83 SN: 27
 A-Index: 5
 K-Index: 2
 X-Ray: B3.6
 304A: 120.8 @ SEM

Calculated Conditions

Band	Day	Night
80m-40m:	Fair	Good
30m-20m:	Fair	Fair
17m-15m:	Poor	Poor
12m-10m:	Poor	Poor
Signal Noise:	S1-S2	

Click to Install Solar Data On your Web Site
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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

DX KING NEWS

Paul Ponak, AD4IE

Hamfest Raffle Winner

This picture showed up too late to get in last month's *Pileup*. So, here's CDXA prez Joe Simpkins, K4MD, presenting the Hamfest raffle prize, an MFJ-259C antenna analyzer to raffle winner Bill Parris, AA4R. Congratulations Bill.



QSL Bureau Help Needed

The W4, K4, N4 QSL Bureau has two openings for "Letter Sorters". If you ever wanted to be involved with the incoming QSL Bureau, then this is your opportunity.

Almost anyone can do this job who is willing to devote a couple of hours per week (on average), has average computer skills and wants to give back to the hobby.

If you are interested and want more information, drop a note to me at sturpe@gmail.com I will be glad to answer any questions you might have.

Paul Sturpe, W3GQ, QSL Bureau Manager
W4, K4, N4 Prefixes

The Pileup

Official Newsletter of the Carolina DX Association
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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](http://www.cdxa.com), to the Secretary/Treasurer:

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

The heated battle for first place in the Unlimited category continued through the month of March between Ed, K5EK, and Dennis, K7BV, with Wayne, W4HG, closely behind. The big difference in the total scores seems to be in the number of countries worked as their zone counts are practically identical. Meanwhile Chris, K4HC, has a comfortable lead in the Limited category and Cliff, W3ZL, leads the formula category. Thanks to all for posting your scores via the link on the club website within a day or two at most of the last day of the month.

It's not too late to join in the competition, as anyone with over 100 points at the end of the year will be entered into a drawing for a \$100 gift card from Amazon.com. See the January 2016, *Pileup* for details. Here are the standings as of March 31,

Callsign	Category	Countries	Zones	Total
K5EK	Unlimited	242	40	282
K7BV	Unlimited	229	40	269
W3GQ	Unlimited	209	39	248
W4HG	Unlimited	203	40	243
K8YC	Unlimited	160	34	194
W7DO	Unlimited	149	34	183
K2SX	Unlimited	140	34	174
K4HC	Limited	138	34	172
W3OA	Unlimited	137	33	170
NV4A	Unlimited	132	30	162
W3ZL	Formula	129	28	157
K4FS	Unlimited	120	29	149
KZ2I	Unlimited	117	32	149
K3IRV	Formula	104	27	131
N4GBK	Limited	96	27	123
K1MIJ	Unlimited	91	23	114
K4IRV	Formula	72	25	97
W4WNT	Formula	55	16	71
K4MLD	Formula	38	16	54
N2TU	Unlimited	14	12	26

Wullenwhat???

Your Editor

The picture of N4ZCs antenna farm in the February Pileup, and the article with details in last month's edition, got me thinking about big antenna farms. That got me thinking about the craziest looking antenna I've ever seen, and undoubtedly one of the most practical (at least for receiving): the Wullenweber. Check out the picture below to see what these big beasts looked like. All you need is several (...hundred) acres and a VERY understanding XYL ...and no HOA! You put your house/station in the center of the antenna array. Nothing to it. So what is a Wullenweber? I know that some of our members are military vets who were in communications or served at "listening posts." So, we probably have some members who do actually know what a Wullenweber is, how it works, and what it looks like. For the rest of you, here's what Wikipedia has to say, edited for at least a bit of briefness:



The Elmendorf AFB Wullenweber ...note the snow!

"The Wullenweber ...is a type of Circularly Disposed Antenna Array (CDAA) sometimes referred to as a Circularly Disposed Dipole Array (CDDA). It is a large circular antenna array used (*mainly*) for radio direction finding. It was used by the military to triangulate radio signals for radio navigation, intelligence gathering and search and rescue. Because its huge circular reflecting screen looks like a circular fence, the antenna has been colloquially referred to as the elephant cage. The term Wullenweber (*changed to Wullenweber at some point*) was the World War II German cover term used to identify their secret CDAA research and development program; its name is unrelated to any person involved in the program.Wullenweber technology was developed by the German navy communication research command, (*known as NVK*) and Telefunken during the early

years of World War II.The first Wullenweber was built during the war (in) Denmark. It used forty vertical radiator elements, placed on the arc of a circle with a diameter of 120 meters (390 ft). Forty reflecting elements were installed behind the radiator elements, suspended on a circular wooden support structure with a diameter of 112.5 meters. To more easily obtain true geographic bearings, the north and south elements were placed exactly on the North-South meridian." Note that much of the following also uses the information from Wikipedia.

Needless to say, after the war, the British, the US and USSR were very interested in the Wullenweber, as it really did offer a lot of "bang for the buck" and actually took up less space than more traditional antennas. For instance, at least 30 "Krug" (Russian for circle) arrays were installed all over the Soviet Union and allied countries in the 1950s. Several Krugs were installed in pairs within 10 kilometers of each other, apparently for "radio navigation" purposes. At least four Krugs were installed near Moscow; just to the north, east and south of the city. The Krugs were used to track the early Sputnik satellites, using their 10 and 20 MHz beacons, and were instrumental in locating re-entry vehicles. The Soviet Krug arrays also used the 40 radiator "Wullenweber" configuration which the Germans had used.

In the U.S., a group at the University of Illinois Radio Direction Finding Research Group reassembled a German Wullenweber which had been disassembled by the British after the war, studied the design and performance of HF/DF arrays and researched the physics of HF/DF under contract to the U.S. Navy from 1947 through 1960.

In 1959, the U.S. Navy contracted with ITT Federal Systems to deploy a worldwide network of "AN/FRD-10" HF/DF arrays based on lessons learned from the experimental array constructed by the University of Illinois team. The FRD-10 at NSGA Hanza, Okinawa was the first installed, in 1962, followed by eleven additional arrays, with the last completed in 1964 at NRRF Imperial Beach, CA. which was demolished in 2014. A pair of FRD-10s not equipped for HF/DF were installed in 1969 at NAVRADSTA(R) Sugar Grove, WV for naval HF communications, replacing the NSS receiver site at the Naval Communications Station in Cheltenham, MD. The last two FRD-10 HF/DF arrays were installed in 1971 for the Canadian Forces in Gander, Newfoundland and Masset, British Columbia. After the Hanza array

was decommissioned in 2006, the Canadians now operate the last two FRD-10 arrays in existence.

Also in 1959, a contract to build a larger Wullenweber array, the AN/FLR-9 antenna receiving system, was awarded by the U.S. Air Force to GT&E Syl-



The entrance to the Sobe, Japan Wullenweber

vania Electronics Systems (now General Dynamics Advanced Information Systems). The first FLR-9 was installed at RAF Chicksands in the U.K. in 1962. The second FLR-9 was installed at San Vito dei Normanni Air Station, Italy also in 1962. The Chicksands array was dismantled following base closure in 1996 and the San Vito array was dismantled following base closure in 1993.

The Air Force awarded a second contract to Sylvania to install AN/FLR-9 systems at Misawa AB, Japan; Clark AB, Philippines; Pakistan (never built); Elmendorf AFB, Alaska; and Karamursel AS, Turkey. The last two were completed in 1966. The Karamursel AS was closed and the array was dismantled in 1977 in retribution for the suspension of U.S. military aid to Turkey. The Clark AB array was decommissioned after the Mt. Pinatubo volcano eruption in 1991. It was later converted into an outdoor amphitheater! Demolition of the Misawa FLR-9 began in October 2014. As of 2014, only the Elmendorf array remained in service, but, according to Wikipedia, it was likely to be decommissioned due to its age and unavailability of repair parts. So, in short, as the Government(s) began to rely less and less on HF, the Wullenwebers began to fade away.

On a personal note, the first Wullenweber I ever saw was in Greece, in the '70s. It was one of the Navy AN/FRD-10s which had been decommissioned by the Navy. I don't know what they used it for, but probably "listening." When I visited the station, which was, of course, in the middle of the Wullenweber, with a gate to drive into the compound,(...see the picture of the Sobe complex, which is attributed to Bmeg) it was being used

as the receive side of a diplomatic communications relay station, connecting the State Dept. U.S. communications base with embassies in the mid-east.

So, how do Wullenwebers work? ...pretty dern well, actually. Oh, you want technical details? Basically, there are two rings of monopoles. The outer ring is for higher frequencies, and the inner ring is for lower freqs. There's a ground plane under the whole thing. The individual elements connect via very carefully calculated lengths of low-loss coax, for accurate phase matching to the operation building (shack?) in the center of the antenna. Once the coax gets to the ops building, the fun begins. It's easier to quote Ian Cummings, KB1SG, than to try to ramble on by myself. Besides, he seems to know a lot more about the details of operation than I do anyway. See his full description, with pictures here:

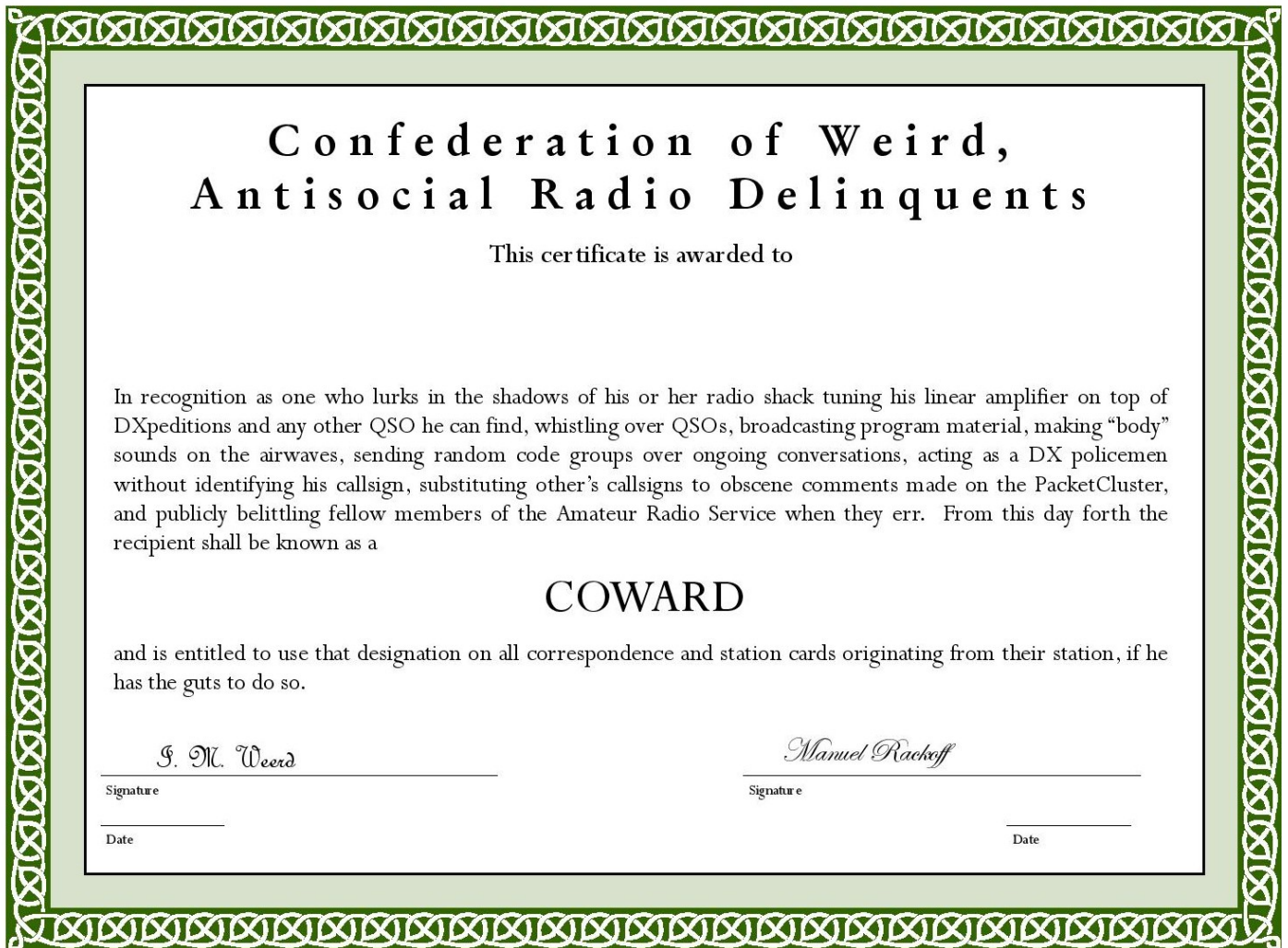
<http://www.mapability.com/ei8ic/rhombic/wullen.php>.

KB1SG says that once the coax gets to the ops building: "The cables then enter a series of primary multicouplers that function to distribute the RF energy from each element. One tap of the low band multicouplers goes to a goniometer (*Ed. Note: ...an instrument that either measures an angle or allows an object to be rotated to a precise angular position*) which switches the elements electronically and provides a "chopped" version of the RF which is then used in either sum or difference modes to give azimuth information. There is a separate goniometer for the high band array. The other outputs of the multicoupler will go to secondary multicouplers and actually enter the receivers. The really unique use of the CDAA antenna is that certain elements can be selectively chosen and electronically added or subtracted in phase effectively synthesizing an array that behaves as if the elements were a linear end-fire array with substantial gain. This permits the construction of electronic "sector" beams that are 30 degrees wide or "monitor" beams that are 15 degrees wide. The array can also be set up to give a truly omnidirectional pattern." See, told you it was simple.

So now you know what a Wullenweber is, and even what a goniometer is. Now that you know, do you want to build a new receive array?

P.S. I know it's April, but all this is for real.

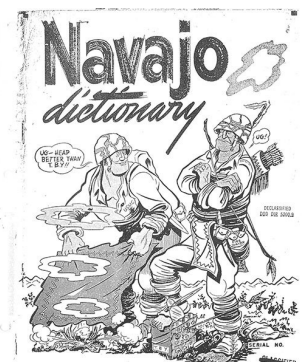
John, NV4A



The Certificate above comes from the fertile mind of John Scott, K8YC. He and I were exchanging a series of emails about the incredibly rude behavior (mentioned on Page 1) during almost every DXpedition, or even if there’s semi-rare DX on the air. I simply said that they were rude, antisocial, mean, and possibly were sociopaths. John decided that they were actually cowards, hiding behind their mics, keys and keyboards to upset the rest of us. So, in typical John Scott fashion, he came up with this very appropriate certificate, suitable for framing. Thanks John!

A different kind of code

Our Contest Manager, Paul, AD4IE, came across this [link](#) to a 1945 “Navajo Code Talkers’ Dictionary” from the Navy Department Library. The cover certainly wouldn’t be considered Politically Correct these days, nor would some of the translations, but the contents show some real ingenuity in using Navajo words and phrases for war-time communications purposes. A “simplex signal” would have been “ALAH-IH-NE-TIH NA-EH-EH-GISH” which, strangely, translates into “Inner Wire By Signs.” Some are a bit more straight forward. “Sniper” becomes “OH-BEHI “ meaning “Pick ’em Off.”



The Wayback Machine

After all the discussion of Roger Burt's antenna farm, John Scott did us the favor of digging back through some old Pileups, from his days as Editor (thanks again, John), and found these pictures of the inside of the N4ZC Contest Station in the August 2008 Pileup. If you recognize yourself (or anyone else) in any of the pictures let me know at jtfnv4a@aol.com. ...not you, Roger. Even though you've dyed your hair grey, we know that's you.



The Back Page

- Although propagation has been pretty bad, and there have been some solar storms, the year has gotten off to a great start with some of the entities very near the top of the “Most Wanted” lists on the air.
- As I was reading the *Pileup* one last time, in my usually futile attempt to eliminate typos. I noticed that I had left off a DXpedition: There is a team in Iran operating as EP2A. They just started operation, and plan to be there until the 25th of April. Iran is #56 on the most recent Clublog list, but that doesn’t mean there aren’t some CDXAers who need it ...or at least need more band/mode entities.
- The latest DX King numbers are on Page 2, with the usual suspects taking an early lead. Don’t forget, that if you want to get in on the fun, and have a chance to win a nice prize, it certainly isn’t too late.
- Ever heard of a Wullenweber antenna? If you aren’t familiar with it, the article on Page 3 explains what it is.
- There is a certificate, suitable for framing, on Page 5, for those hams who insist on trying to spoil every DXpedition for the rest of us with Deliberate (and oftentimes obscene) QRM. It’s brought to us from the fertile mind of John Scott, K8YC.
- Have you ever wondered what “Navajo Code Talkers” in WWII were actually saying? Our Contest Manager, Paul, AD4IE, came across a site that has a Navajo Dictionary used by the Code Talkers. See Page 5.
- The Wayback Machine has pictures from the inside of N4ZC’s Contest Station from the days he had the huge antenna field pictured in the February *Pileup*.
- Next month we’re going to take a look at the success in VHF contests over the last year by some of our fellow CDXAers, and also we’ll have some pictures and a summary of the recent VHF SuperConference, held near Washington, D.C. and attended by several CDXAers.
- Since CDXA has decided not to sponsor a Field Day event this year, we’re going to be invited to join the W4BFB Field Day effort. Be on the lookout for detailed information.
- One last note, for the two or three of you who noticed, the 35th Anniversary logo has been replaced with our regular CDXA logo. It’s been decided that, since the Club actually was formed in July 35 years ago, we’ll start the big celebration then, and the 35th Anniversary logo will reappear. More to follow.

Until then ...73, John, NV4A