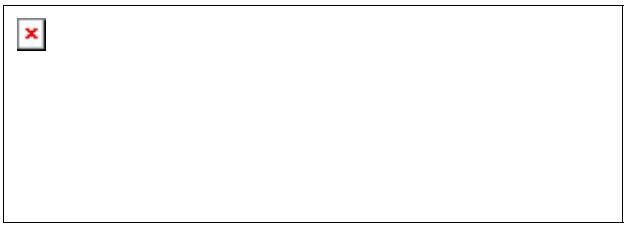


N4PQX Bob Burton President

W4WNT Bill Turner Vice President

K4MQG Gary Dixon Sec. - Treasurer

K4ZA Don Daso Editor

October 1999

CDXA Packet Cluster & other communications systems

W4DXA	Young Mountain, NC	144.93 (1200 baud) & 441.00 (9600 baud)
K4MD	Charlotte, NC	144.91 (1200 baud) & 441.075 (9600 baud)
DXWIN	Digi-peater near Wingate, NC	144.93
repeater 147.18 (+600) near Fort Mill, SC		
homepage: www.cdxa.org		Webmaster: K4MGN, Nick

The Pileup is published 10 times a year; there are no issues in June or December.

Click here to go back to the CDXA home page.

Click on the links below to go to the sections of this month's Newsletter.

PRESIDENTIAL PONDERINGS

October is upon us, the weather is cooling off and the bands are coming back to life. I hope everyone is busy preparing their stations for the fall DXing and contesting season. I hope those who needed 3C0R made it in the logs, but if not, take heart knowing equipment was left behind and the authorities have given approval for future operations. Current operations as I write are the groups now on ZK3 and at 9U5D—which sources say will count as a legitimate 9U contact. If you recently lost credit for 9U, here's a chance to get it back.

In Packet Cluster news, Joe, K4MD, continues to work on a more reliable connection for Internet spots. The plan is to create a local source using Joe's Internet service so we will not have to depend on the currently less reliable radio links to other areas. I'd like to thank Joe for his efforts in maintaining our PacketCluster system, and for constantly trying to improve it, as well as all the other Sysops and volunteers who help keep the cluster running. Also, a quick reminder that the GOLIST is active on our cluster and a GOLITE membership is only $10/year. You can get the contact information by typing SH/GO HELP. If you're not currently on the PacketCluster and want more information on this service, please contact K4MD. CDXA still has access to GE Phoenix data radios and the cost to members is only $140 each. This is a commercial radio, with 30 watts out and it will come pre-programmed with the 441.000 and 441.075 MHz CDXA PacketCluster frequencies. They are modified to run data at 9600 baud. The favorite TNC of many CDXA members is the KPC-9612, which works well with these radios. Contact K4MD if you're interested. Remember, this is YOUR PacketCluster, and we want to make it as useful and enjoyable as possible. We encourage your active interest and involvement.

Many of you may be reading this at the BVQ BBQ, and you've probably been talking about your strategy for the upcoming CDXA intra-club contests. So good luck to everyone and I hope to see all of you participating to produce some record scores for the CDXA. The awards presentations for the CQWW competition will be at our annual Christmas Party, which will be Thursday, December 2nd at 7:00 PM, at AA4SC's Branding Iron restaurant. Further details in next month's *Pileup*, (the final issue for 1999!) so mark your calendars now. The timing of the Christmas Party and the 10M contest,

(*The Last Gun Fight of the 20th-Century*) requires that award to be presented at a CDXA function, sometime early in 2000. Until next month...

73, Bob - N4PQX

CONTESTING IN THE FUTURE, REFLECTIONS ON TECHNOLOGY, an EDITORIAL

If you've been active at all within the past few years, you've encountered some of this editorial's topic-on the various Internet reflectors, in magazines, in the late-night hospitality suites at Dayton and Visalia, or on the air. It's the future, after all, and we're all affected, one way or another. Certainly most of us plan to "be there," so we've a vested interest in not only predicting some of what's going to happen, but what we'll need to meet the demands imposed by technological and other changes. Ham radio contesting is unique among competitive events since each participant is "competing" on a different playing field, to mix a few metaphors. Let's borrow an example from car racing, a popular sport here in the South. We have classes, categories, (like racing) and so on, but the playing field (the actual race track, if you will) is different (location, terrain, propagation, and so forth). It's a complicated mix. Only the WRTC competitions have attempted to level this playing field, but logistics alone limit this contest to some small chosen-few.

People have been commenting on, even complaining, about the disadvantages of geography for years. Yet, if you look at CQ's Contest Hall of Fame, you'll notice a sizable number of West Coast members. They must have done something, right? They did. Once upon a time, it was possible to WIN a DX contest from the left coast-because there were fewer European participants. Once upon a time, there was a quota system, for gosh sakes, which made tuning, tuning, and more tuning, a requirement. Indeed, CQing wasn't the most-used operating method. And some of these folks traveled-a lot, and made "names" for themselves operating from exotic locations.

Regardless of changes made to various contests, one simple fact remains. If you want to have a world-class score, you must operate from someplace where that's possible. Otherwise, you'll have to be content comparing your score to others from your state or region.

Naturally, a bit of reflection leads you to the conclusion that this, in itself, is amazingly difficult. After all, the restrictions in your own community limit your ability to install the tower and antenna hardware you need to be competitive. (You simply must have the right tires on the racecar, after all!) What's a ham to do? Is the answer to be devices like the Kachina and Pegasus-transceivers based on computers? Perhaps. With their ability to be completely operated by remote control, one could have a competitive station in a location where one chose not to live, and operate from one's home shack, giving new meaning to the "virtual ham shack."

A bit more reflection leads you to the conclusion that this Dick Tracy-style fantasy is no longer so fantastical. Indeed, it becomes more real every day. Computer-control, whether it's simply sorting the countries/zones worked, or turning the beam, or the more-complex phase-locked-loop world behind the dial of your latest Japanese radio, becomes more dominate every day. The digital domain is becoming just that-more and more dominant.

Operators continue to rise to the occasion. Somewhere, somehow, someone is building a bigger station. Operators continue to push the envelope, learning to listen to two radios at once, for instance, to maximize operating time. Efficiency continues to be tantamount to contesting success. At the same time, new people "discover" contesting, and find out it's simply an amazing amount of FUN. Young or old, new ham or long-time-licensee, the idea and fact of working DXCC in a few short hours, or just working tons of Europeans, or "running" (high rates, possible sometime, in any contest), grabs people, hooks and pulls them in, making them contesters.

Most of these points are not new ideas, in the classic sense. Listening to multiple receivers was mentioned in the rules for the original CQ WW contest in the 1930s, for instance. So, what IS the future of contesting? It's amazingly rich, complex and simple, full of surprises as well as periods of ho-hum tedium. As Alice said to the Queen, "There's no use trying, one can't believe impossible things." To which she replied, "I daresay you haven't had much practice." So do a bit of that dreaming and believing yourselves-right after breakfast, as the Queen later remarks. It'll help your score in the CQ WW. Really. It will.

--K4ZA

A Few Words On Using WWV

First, let me say I'm not a propagation expert, but I have learned a good bit during 45 years of DXing. Years of searching the bands day and night have taught me a lot about propagation. A good book here and there also helped. One of the best is *The NEW Shortwave Propagation Handbook* by W3ASK, N4XX and K6GKU, published by *CQ* magazine.

Our topic this month is the propagation information put out by WWV at 18 minutes past each hour, on 2.5, 5, 10, 15 and 20 MHz, daily. I often hear people talking about this information in ways that show they don't really understand how it means or how it can be used to help their DX chase.

WWV transmits three indices each hour—the solar flux, the A index, and the K index. It's important to note the solar flux and A index are only updated once a day at 2118Z. The K index is updated every three hours. What are these indices and how do they effect the DX chase? It also helps to remember the "experts" really don't know what causes the 11 year solar cycle. If you don't really know what causes something, it's pretty hard to forecast how it's going to work. Their predictions are based on what they know of the recorded cycles over the last 250 years. Not a lot, when you consider the sun has been going through cycles for billions of years. We only have 250 years of recorded cycles to study, truly a tiny sample. Do these 250 years represent the norm, way under or way over, or none of the above ? The "experts" do a pretty good job, considering this meager data.

Sunspot records started to be kept in July of 1749. And after Marconi, people began to notice that the higher the number of spots on the sun, the better the propagation and the higher radio frequency that could be used. It was later found that a measurement of energy from the sun at a frequency of 2800 MHz (10.7 cm) was a better indicator of propagation conditions. This is the "solar flux" as noted on WWV. This solar activity allows the F layer to provide world-wide propagation. Meaning you can work that VK0 on Heard Island. You want the solar flux to be as high as possible. Figure 1 shows the relationship between sunspots and solar flux. You can see there can be a good deal of difference between sunspots and solar flux. The same sunspot number can have a big variation in solar flux and it is the solar flux that's the better measure of how propagation will be. For example, note in Fig. 1 that a sunspot number of 60 has produced flux values as low as low as 102 and as high as 132. That's enough to produce a very noticeable difference in propagation. Remember, WWV only updates this information once a day. Yet the solar flux can vary from minute to minute, hour to hour, day by day. The value broadcast at 2118Z each day can be much higher or lower within a few hours. In general, it's a slow change, but it can be quite rapid. As an example of how this relates to propagation, typically, you need a flux above 100 to start getting fall, winter, or spring openings to Europe on 10 meters. A value above 220 is required for European 6 meter openings.

The sun rotates around its axis every 27 days. This means the conditions you found on the bands today may return in 27 days. Or not, since you can't be sure because the sunspots which made such good conditions may not last the 27 days it takes the sun to rotate back around to shine the same face toward earth. Those good spots may disappear before that surface of the sun rotates around again. New spots may form on the opposite side of the sun and make for a pleasant surprise as that face revolves to face the earth. Or the solar flare or corona holes that caused the really bad conditions may or may not still be there again in 27 days.

Now, the A and K indices. These are, in fact, the same information, expressed in different ways. They are each a measure of the geomagnetic activity of the ionosphere. Table 2 shows the relationship between the A and K indices. It's like saying, "I live 16 miles from downtown Charlotte," or "I live 25 km from downtown Charlotte." Either way tells you the same information, but with a different scale. In the case of A and K indices, the K is a much more gross scale since 0 to 9 in K terms equals 0 to 400 in A terms. (A better comparison would have been cm to miles, but more people can relates miles to km, so I thought that a better way to show the same thing as a different measure.)

To be truly accurate, there's a slight difference between A and K information, as sent by WWV. The A information is taken from a number of locations around the world. These are averaged together for the 2118Z A index report. There isn't a great deal of difference between the stations in this worldwide network. About 70 percent of the time, the world-wide network of stations report less than 5 units of measurement in A index differences. The K index, as sent by WWV, is the local measurement from Boulder, Colorado. With no more than 5 A units of difference around the world, Boulder's K index is sufficient for our use. It's new data every 3 hours, while the A index from 2118Z is just repeated over and over until the next 2118Z report. Remember, these indices can vary greatly during the day. I often hear hams talking about the A index as if it were the value at the time they were talking. Imagine it's 7 o'clock on a very cool morning, and you ask a ham friend, "What's the temperature?" The last time he looked at the thermometer, at 2118Z, it said 70 degrees. He says, "Not so cool, it's about 70 degrees." We'd never think of using a thermometer this way. So, obviously, once you're three hours past 2118Z, forget the A index, and go with the K index. The K index, updated every three hours, is a much better indication of the geomagnetic state of the ionosphere than the older A index. The K index is the thing to watch starting with the 0018Z WWV

report.

Remember, you want a high solar flux and a low A or K index. Next month, some practical information on what this A and K index information means in terms of propagation paths, and how to use the information to help you communicate with other parts of the world.

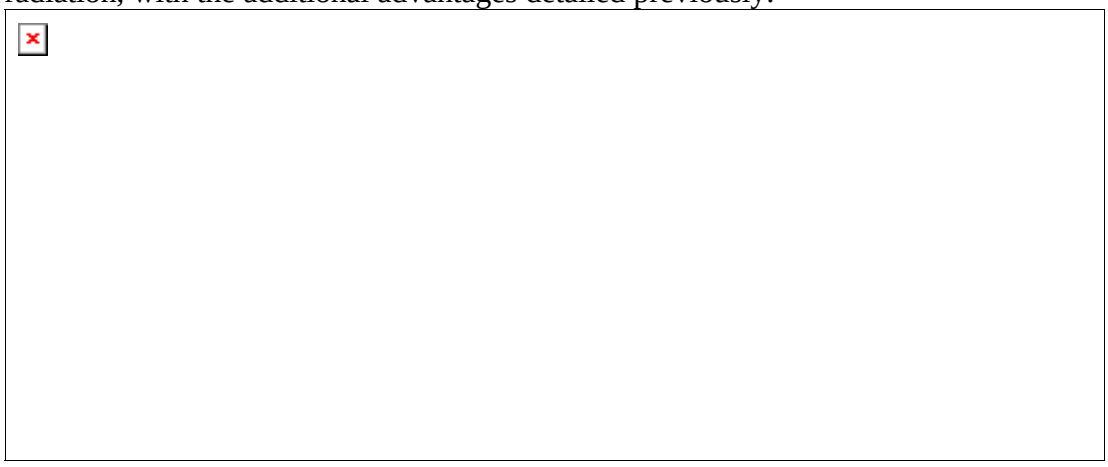
--N4ZC

LOOKING AT LOOPS FOR LOW BAND USE

Who among us can put up really tall towers, or afford beams for 40, 80, or, dare I say it, 160M? Wire antennas are the compromise of choice. But the choices suddenly seem endless: verticals, dipoles, slopers, inverted-Vees and Ls, and, of course, loops.

The loop represents a fair compromise. The article will present a loop design that has provided good performance on all the HF bands, while requiring little more space than an inverted-Vee. For good performance on 80M, it does require some means of support at least 70-feet high, but in this part of the country, that perennial ham antenna support—the mighty pine tree—can serve well. Even a relatively short tower can be used. Some advantages of the design: various feedlines can be used (coax or open-wire); only a single support is required; and it's capable of a vertical angle of radiation, which aids DXing.

The triangle-shaped loop has been described in the literature for years. It's usually a single band design, a variation on the full-wave loop. Some common examples are shown in figure 1. If the classic delta loop is "inverted," a low angle, vertically polarized lobe is generated. But this design requires two high supports. A more up-to-date, or proven-by-modeling-design, has the delta loop configuration fed at ¼-wavelength from the apex. This design concentrates the vertical angle of radiation, with the additional advantages detailed previously.



Construction is surprisingly simple. Approximately 275-287 feet of insulated wire (the velocity factor of your wire choice and height will determine exact length) is erected with the apex at least 70-feet high. The corners are pulled out to suitable points using insulators and nylon cord. The base will probably be about 10-feet above ground. An rf bridge will confirm resonance (probably around 3.5 MHz—adjust accordingly); radiation resistance will probably also be around 60-70 ohms. On the

second harmonic (7 MHz), the resistance will be about 200 ohms, moving higher, of course, as you move higher in frequency. Open wire feedline will help eliminate losses from SWR. An antenna coupler or transmatch is recommended, of course, for use on "all bands." (A transmatch remains one of the easiest, and cheapest, things the average ham can still put together in the home workshop, too.)

Figure 3 shows the current distribution, which tells us we can consider the delta loop to be two ¼-wave sloping verticals, each with one radial. And as with all vertically polarized antennas, the ground underneath the antenna will contribute greatly to its efficiency. (Near the antenna, we need a good ground to establish the antenna's return current—without losses. This determines the radiation efficiency. Farther away from the antenna, earth reflects the wave and creates a low angle of radiation, but absorbs some of that signal. This determines the reflection efficiency of the antenna. This is usually 1-2 wavelengths away from the antenna, or more, depending upon the type of vertical. For quarter wave verticals, on up to a full wave loops, we should concern ourselves with the real ground around the antenna.)

Obviously, this tells us we should be concerned with the quality of the soil under our antennas. There are plenty of DXers who swear by horizontal antennas, living in the mountains or in desert conditions. There are plenty of DXers who swear by their verticals and vertical arrays, living near a coastline. Typically, antenna-modeling programs use "sea," "excellent ground," "average ground," and "extremely poor ground" as their standards. The Carolina clay soils we usually encounter would probably best be classified as average to poor. Obviously, this means you should be installing some type of ground system, in order to achieve the needed efficiency. *You didn't think there was any sort of "free lunch" when it came to antennas, did you?*

--K4ZA

WEB WANDERINGS & HAM-RELATED

NEWS

A web site for the upcoming March 2000 DXpedition to Clipperton Island has been set up at: http://www.qsl.net/clipperton2000. The site is pretty extensive and contains:

Clipperton Island Pictures and History

QSLs & Stories from Previous DXpeditions

Operator Profiles

Pictures of the boat

Operating Frequencies & Propagation aids & more

This DXpedition is still seeking sponsors. Please contact John Kennon, N7CQQ at n7cqq@laughlin.net if you can help out.

K4MGN suggests the following for ham software

http://www.geocities.com/CapeCanaveral/Hall/8701/hamlynx/hammisc2.htm

Here's a swell idea, promoted on the eHam.net website. Are you trying to upgrade your license class? You might like to join the reflector devoted to the topic of upgrading. When you join, you can ask questions and discuss topics with others regarding the upgrade process. To join, send an email to upgrade-request@eHam.net and in the body of the message type only 'subscribe'. You will be added to the list and any time someone posts a message to the list, you will receive a copy.

http://www.eHam.net

If you missed him at Dayton, or locally at the Shelby Hamfest, here's another chance to hear Riley Hollingsworth of the FCC, who will be speaking in Fort Mill, SC on December 3, 1999 at 7:00 PM. He will be at the Fort Mill Municipal Center, 113 Academy Street (next to the police department). Lots of folks feel Mr. Hollingsworth has done much to restore ham radio, especially in terms of enforcement.

The ARRL's September 29th news release announcement promises to "standardize" electronic file formats, for ARRL-sponsored contests. The file format, known as Cabrillo, has been adopted by the League, starting with the November 1999 Sweepstakes. Contesters may continue to use any file format which has previously been accepted for

ARRL contests,

through November of next year. This file format is a joint effort between the contest sponsor and software developers, lead by Trey Garlough, N5KO. The format standardizes what information for each contact appears in each column of data. For specifics on the format, visit: http://www.kkn.net/~trey/cabrillo

---

September 12 & 13, Paul, AA4ZZ, Scott, K2SD, Ken, K4DXA, & Ted ,W4VHF entered the ARRL VHF contest from a mountaintop outside of Boone NC. The operation was Field Day-style, with one difference—we used commercial power. Murphy always stalks such events & this year's twist for us was the equipment worked great, but Roger, W4MW hurt his back and Gary, K4MQG had to work, so we lost one third of our team before the contest. In any case, we had three stations: 6M, 2M & a combined 222/432 MHz station, all set up in a small shed, a true radio shack. For SSB and CW, each station had an HF rig driving transverters, (FT-1000, TS-930 & IC-751A) each with tube type KW amps. Our 6M amp was Roger's classic Johnson 6N2 Thunderbolt, the other bands had 3CX-800 amps, & bricks for FM. SSB & CW are used to work DX for multipliers (grid squares), while FM helps add to the QSO total. We appreciate all those CDXA members who got on to give us contacts. Special thanks to those who drove across grid square lines to give us additional points. Our small team got a little tired late Sunday afternoon & we wondered how we would make it till 11PM when the contest ended. Then the bands all opened together. Ken was working Florida, Texas & Louisiana on 6M. A duct made us loud in New England on the other bands, including up to K1WHS in Maine. W2SZ/1 in Massachusetts said we were 40 over 9 off the side of his beam on 222 MHz. All thoughts of being tired vanished as the DX rolled in. We had 710 QSOs & 186 multipliers for 172,050 points, which we expect to be one of the top Limited (4 band) Multiop Scores in the country.

--AA4ZZ

Finally, a delighted 'thanks!' to those of you who wrote or sent wedding remarks. No, Marti is not really a dare-devil sort of lady (although she's certain I'm probably fool-hardy & bruised enough from tower work to qualify). The hot-air balloon ride was quite gentle & romantic, in its own Las Vegas way. We had a swell time, & life's more-or-less normal once again. We're looking forward to the annual get-together at
K4BVQ's.

--K4ZA