

Orange County Radio Amateurs (OCRA) Newsletter June 2007

From the Editor

I have not been licensed for too many years; however, when I realize that June has arrived and think about amateur radio activities, there is only one event that immediately comes to mind. It is Field Day. By the time the July newsletter is published, Field Day 2007 will be history. You will read about Field Day in this newsletter, and you will hear about Field Day at the June OCRA meeting. But, trust me, reading and hearing about this event will not suffice. You need to participate as well. I look forward to seeing you at OCRA Field Day 2007.

May has been a very active month for OCRA members. Several attended the Durham Hamfest. Others participated in an Adopt-a-Highway clean-up effort. Many were involved in a mock emergency drill in which multiple county agencies participated. Others assisted in a tower raising party at our QTH. Be sure to attend the June OCRA meeting to learn more about these events and how you can become active in future activities. In addition to these topics, final planning for Field Day will be the main focus of the meeting.

As in past months, the OCRA newsletter is full of diverse and interesting articles. Please follow the monthly mantra by getting comfortable and taking time to read through your club's newsletter. And, remember -- Get radio active!

Best regards,
Laurie - N1YXU
lbmeier@bellsouth.net

Summary of the May 14th Meeting

- In addition to the usual introductions of callsign, name, and amateur radio activities for the past month, at May's meeting, everyone was asked to share a non-radio related interest. We learned quite a bit about different hobbies and talents of fellow members.
- Final information about the May 26 Durham Hamfest was shared. We will have an update on the hamfest activities at the June meeting.
- The Adopt-a-Highway road clean-up project was also coordinated for May 19. The group who assisted in the clean-up efforts will provide an update at the June meeting.
- Two scheduled VE sessions were discussed - One at the Durham hamfest and another at the Hillsborough Public Library on June 9. If you are a VE and interested in helping with the session, please talk with Dee (KU4GC) who will coordinate the session on June 9.
- There was quite a bit of discussion regarding Field Day planning. In addition to confirming the captains and co-captains for the stations, a recommendation was made to have a safety officer for the event. Final Field Day planning and discussions will take place at the June meeting. For those who are captains and co-captains, please be prepared to discuss the status of your stations. For all others who have specific responsibilities, please also be prepared to discuss the status of your work.
- Skip (N6LUZ) announced a mock emergency drill to take place on June 2. Several OCRA members volunteered to take part. A debrief of the drill will be given at the June meeting.
- Congratulations to Steve (KZ1X) for winning the monthly OCRA paper contest! The theme was matching famous hams to their respective callsigns.
- Via a show and tell, Steve (KZ1X) shared his "other" kind of vertical antenna at the May meeting. This is the antenna discussed in Steve's article in the May newsletter. You will find the second part of his discussion of the "other" kind of vertical antenna in this month's newsletter.

- The original OCRA cup was retired and a new mug introduced to carry on the monthly tradition of recognizing the OCRA amateur of the month. The new mug, crafted by the Signman of Baton Rouge, was donated to the club by Woody (K3VSA). The first recipient of the new mug is Dan (KR4UB) for his continued excellent project management to replace the club's repeater. Sincere congratulations, Dan!

The June OCRA meeting will be held on Monday, June 11, at the Sunrise Church beginning at 7:30 pm. Come join in the final Field Day 2007 planning and, who knows, you might even go home with a prize from the paper contest.

The weekly Orange County ARES net meets on Saturdays at 9:30 am local on the W4UNC repeater [442.150MHz with a PL tone of 131.8Hz]. All licensed amateur radio operators are invited and encouraged to check in.

President's QRM

by Dave Snyder, W4SAR

This will be my last article preparatory to Field Day for this year. I'll address you a little bit on operations and strategy, a few more points of logistics, and safety. As I mentioned previously, Field Day is a mix of emergency exercise and contest. One of the important guidelines in communications for both venues is brevity - get the required information across concisely and burn up less amperage in the process. The exchange we use in Field Day is very simple and concise. The only info needed is your callsign, operating class, and ARRL section. As it stands now, we will probably have an 8A battery operation, but do check with us the morning of Field Day just in case we change the number of transmitters again. Unlike other contests where a signal report is given, none is given here. If they can hear you well enough to get the correct information, that is fine. You'll never hear "You're 5 by 9, what is your call again?".

An example Field Day exchange on phone would be as follows:

You tune on the band and hear: "CQ Field Day, CQ Field Day Whiskey One Sierra Tango"

You call back: "Whiskey Four Echo Zulu"

They hear you: "Whiskey Four Echo Zulu, this is Whiskey One Sierra Tango, Six Alpha Romeo India"

(They have given their callsign, their exchange is a 6A operation in Rhode Island)

Your Reply: "Whiskey One Sierra Tango, this is Whiskey Four Echo Zulu. We copy your Six Alpha Romeo India. We are Eight Alpha November Charlie"

(You have acknowledged both their callsign and exchange and given yours)

They end the exchange: "Whiskey Four Echo Zulu from Whiskey one Sierra Tango, we copy your Eight Alpha November Charlie. Thanks and Seven-Three."

You'll note that in each case, the stations "read back" the callsign and exchange to each to each other. This proves you've copied the right information and gives an opportunity to make corrections if you did not. Do note that in most cases, a thank you will be inserted. On a very slow band, the operator might even ask how you are doing, what the weather is like, and so forth. Other times, if the band is busy, if it is a very competition-oriented station, they will blow past you with a minimum exchange and move on to the next station without a courtesy. Don't take it personally. Just like any sporting event, you'll have seriously focused competitors and others with a more casual approach. Just follow their lead.

On CW and digital stations, the exchanges will operate in a similar fashion but tend to be more terse and use abbreviations.

Each band captain is responsible for maintaining a log of his station's contacts during Field Day. The log must have the callsign, exchange, and time in UTR of each contact to be valid. It is also wise to run a "Dupe Sheet" for each station. A dupe sheet is used to list the callsigns of stations you have already logged in an easily referable manner. This helps to avoid wasting time trying to contact stations you have already worked. This can be done two ways, either a paper dupe sheet using a grid or by using software.

Over the past few years, we have used a freeware Field Day Logging program from WR9R that does both the logging and dupe sheet functions. I highly recommend using it as it also does a nice breakdown of data for the final submission of the total results to the ARRL. It is a DOS based program which works within a DOS window on a Windows machine nicely. I have several laptops which will have this program loaded available for use on Field Day. I will give a tutorial on use of the program at the next OCRA meeting. Most of these laptops will also have harnesses so they may be used on batteries. You will find electronic logging and duping indispensable on a busy band. However, I strongly recommend also running a paper log as back-up in case the computer dies. All logs of Field Day contacts should be submitted to me no later than the July OCRA meeting. I will compile all the results and submit them to the ARRL.

Strategy - In most cases, follow the lead of your band captain. Since we are operating on QRP (5 watts or less of transmitted RF), we may have trouble being heard. In general, it is more productive for us to rove the bands and "hunt and pounce" on stations we hear. If they do not respond to you after you have called them three times or so, just move on to the next one you hear. Conditions to that station may improve when you work your way back to them. On quieter bands and especially later in the contest when most of the "big guns" you hear have been worked, it is then worthwhile to park on an open frequency and call CQ. Propagation will dictate operating hours for the most part. Bands like 10 meters and 15 meters will primarily work better during daylight hours. Lower bands like 40 and 80 meters may have some closer ground wave contacts during the day and then will open up to the west coast as night falls across the continent.

Logistics - We may commence setting up as of 2:00pm Friday June 22. I cannot emphasize enough that the earlier you get your set-ups done and tested, the happier the contest experience will be for you. I recommend as many as possible come in and set up on Friday afternoon and evening. Sunrise on that Saturday is not too early. Please don't show up 15 minutes prior to the contest start on Saturday at 2:00pm and ask for help getting an antenna raised. Yes, that's actually happened! We definitely will need lots of hands to help raise some antennas. Likewise, we will also need help tearing down after the contest ends on Sunday at 2:00pm. Many hands not only make light work, it helps keep things safe. If the ground is not too soft, you may drive your vehicles onto the field to offload, but you must park alongside the gravel drive.

Safety - All stations must have fuses on the power harnesses. A short circuit on a CD battery line can create enough heat to ignite metal in a heartbeat. When raising masts or wires, helmets and gloves are required for anyone within the fall zone. I will have a dry fire extinguisher and a first-aid kit at my station. All band captains are strongly urged to do the same. All guy lines and cables running on the ground should be flagged with day-glo tape. If any guy lines are in a traffic area, they should also be marked at night with glow sticks. Ground rods should be used with each station, both for lightning protection and to cut down on noise on your received signal. In the event of inclement weather, feed lines should be disconnected, and the best refuge would be inside your vehicle. As Blackwood Farm is a planned County Park, their regulations are to be followed. No alcohol, no fireworks, no firearms. Do take care to police up any trash in your area. We should leave it cleaner than we found it. A special concern is that we remove any metal. Especially, be sure to remove all ground rods or stakes. That field is mowed for hay, and we do not want to damage any farm equipment.

Personal Behavior - Do remember that this exercise also puts a public face on amateur radio. Be courteous and act professionally especially since many of our emergency services contacts and the press will be around. Children are welcome and encouraged to participate so long as they are willing to learn and are willing to follow directions. All children must remain under the supervision of a responsible adult. Please do not presume that band captains will automatically take children under their wing. They are taking part in an exercise and are not babysitters. Unruly or disruptive children (and adults for that matter) will be asked to leave. Field Day is also an opportunity for people first showing an interest in amateur radio to participate. So, do encourage them to sit down and squeeze a mike under supervision. Quite a few of our members had their first contact with us on Field Day.

In closing, Field Day is a lot of work, but it is also one of the most rewarding experiences we do together as a club. Enjoy yourself out there. Be safe, and revel in the good work we'll be doing together. I look forward to seeing you all out there.

Monthly Technical Article - The "Other" Kind of Vertical Antenna by Steve Jackson, KZ1X

Part 2 of a 2 part article

Remember last month, I told you how I was able to contact Damien, F5RRS, near Geneva, in the French Alps, with 5 watts and a scrap of wire - on 30 meters in the middle of the day. I was using an end-fed, half wave vertical antenna to do the job, the same sort of antenna used by clear-channel 50 kW AM stations such as WSM, WLW, WLS, and WABC.

This month I can tell you all about how you can make great DX the same way that I did, and the same way that the big commercial broadcast stations radiate their mega-powerful signals. It's not a secret how this is done, but it isn't all that commonly used a design, by hams anyway.

The best way to tell folks about an antenna is to present them with plans for one they can REALLY build themselves. And, if you want the schematic for this antenna and matching network, why, just look at the ARRL diamond. It's printed (well, mostly) right there. An antenna wire, connected to a coil, connected to ground. Doesn't get any simpler than this! For our use, we'll resonate the matching network with a variable capacitor placed across the coil, and find a good 50 ohm match by connecting our coax to the coil at a 'tap' point near its grounded end.

First off, like I said last month, this is a one-band antenna. Yes, it could be made to work on other bands, but, to make it simple and cheap and effective, let's pick just one band. Many people pick 20 meters (it offers great DX opportunities almost all the time) so I will do so for this article as well. Also, for 20 meters, the antenna only needs a single support about 35 feet up, and NO ground radials.

One more thing: this antenna design makes it VERY useful for portable operation, and because of that I will be bringing one to Field Day later this month. Just because it's great for portable use doesn't mean you can't install one permanently, which is very easy to do.

Now, off to build one. Only common hand tools are needed for this project, such as wire strippers, a soldering iron, a drill with suitable bits, hacksaw, screwdrivers, and the like. Moreover, all but one part can be obtained at nominal cost, from local retail stores.

The end-fed half wave vertical's radiating element really IS just a piece of wire. It would be difficult (even for me) to make cutting a piece of wire into a complex project, so, we can start with this part of the project first. Simply cut a piece of wire that is 33 feet long. It doesn't matter if the wire is insulated or not. You can use any wire that you have handy, and if you don't have any, you can get some at Radio Shack or at the hardware store.

That step was easy. While you're at the store, get some string or thin rope to hang the antenna with. Usually an overhead tree branch is used, but this will depend on where you are trying to install the antenna. For best results, the antenna radiating element should be vertical. If it can't be perfectly vertical, you can have it sloping slightly, no less than, say, 75 degrees. Back to the string: I use surveyor's line, because it is cheap, readily available, easy to see, strong, and light weight. It's not the best choice for a permanent installation, but it's plenty good for most other uses.

Do you know your knots? To put the top end of the antenna wire into the air, bend one end of the wire into a J shape, about 2" long, and tie the string to it using a sheet bend. Look at this URL if you need a refresher on this knot:

http://en.wikipedia.org/wiki/Sheet_bend

At the other end of the wire, you will need a weight. Try a plastic milk jug filled with sand or small gravel. (Water will do, and is more convenient, but isn't as heavy as sand, and water will freeze in the winter, cracking the jug.) Connect the remaining end of the wire antenna to the handle of the milk jug. One good way to do this is to poke a very small hole on the top and bottom of the jug's handle, and feed the wire end through. Then tie a knot so the wire can't pull back through.

This weighted end will become the bottom of the antenna, and with this method it is also properly insulated, and just about the right height above the ground. The price is right, too.

Find a suitable support (such as a tree branch), and toss the string over the support. A softball works great for launching the string. You can use masking tape to help keep the string on the ball. Use the string to hoist up the antenna wire until it is vertical and has the slack pulled out of it. Voila! The radiating element is installed. It may well have taken you longer to read this and get the parts, than it did to install the antenna itself.

Next step is to make the matching network to connect to your coax. You have two choices here:

1. You can build one.
2. You can buy one.

Of course, we'll take the first choice! A matching network for this antenna is a circuit that takes the coax impedance of 50 ohms and transforms it to the feed point impedance of the antenna. According to W7EL's EZNEC antenna modeling program, that impedance is around 2600 ohms.

This is a 52:1 matching ratio, which seems like a lot, except when you recall that you can get to this ratio with a transformer that has the square root of that number ... or, about 7.2 to 1. I like even numbers, so, we need to wind a coil that has 15 turns on it, and the 'tap' for 50 ohms will therefore be about 2 turns from one end.

A 6" piece of 1 1/2" size PVC pipe can act as a good coil form, because the diameter of the resulting coil will be almost exactly 2" - a good size. The coil can be made from #14 solid Cu wire. Lowe's, Home Depot, etc. sell this wire by the foot, and the white-insulated wire is easiest to work with. (Buy a little extra, it's cheap, and you can use it for wiring the inside of your matching network box, and maybe even for connecting the ground.) Fifteen turns of wire, at this diameter, with the turns spread evenly over 4 1/2" of length, equals about 5 microHenrys of inductance. Each turn is roughly 6.2 inches long. So, 15 turns should take a little less than 8 feet of wire.

Once the coil is made, mark a spot on the wire two turns from the end of the coil, and unwind the coil to this point. Strip off the insulation about 1" 'before' and 'after' the spot, by gently scoring the jacket all the way around the wire at those points. A n Exacto knife is handy for this. Then, you 'slice' the section of insulation away by scoring the jacket along the wire and removing the sleeve. Tin the newly-bare wire with solder, and re-wrap the coil on to the form. Another alternative is to simply strip ALL the insulation off the wire on this coil. Doing so can allow more experimentation with locating the best 'tap' point for the most precise 50 ohm match.

To resonate this coil in the 20 meter band, we will need a capacitor with range between 20 to 30 pF ... and because we want this to work at power levels up to 100W or more, we need the capacitor to have a relatively high voltage rating. For that, we'll need to go shopping, since there are some parts we just can't easily build at home. A variable capacitor of this sort is pretty tough to construct, especially when you can buy a surplus unit for \$20. Max-Gain Systems in Atlanta sells a Cardwell model # 154-12-6 (Max-Gain part #AC-7) which will do the job perfectly. See it at this URL (last item on this web page):

<http://www.mgs4u.com/RF-Microwave/air-variable-capacitor.htm>

[This same firm also sells ready-made coils that could be used for this matching, for a dollar or two. It is a faster way to get to a finished antenna, but, many people want to learn how to make their own parts when possible, so I have included the instructions to do so.]

You will want to install the matching network pieces in some kind of non-metallic waterproof enclosure. The enclosure will obviously keep the weather away from the electronics, and is also a place to mount the parts ... and the connectors. I have been using gray plastic outdoor electrical boxes made by Carlon and sold at Lowe's and Home Depot. These are relatively inexpensive, high quality, and are easy to work with.

For connectors, you will need three: one for a ground, one for the antenna, and some kind of coaxial jack. For the latter, most people use an SO-239 style panel mount jack, such as the Radio Shack #278-201. The 'Shack also sells an inexpensive set of 5-way binding posts, handy for the other two connections you need. See their #274-662.

Without pictures, an assembly detail would be difficult to describe, but the circuit is so simple it really doesn't matter. Each person building this will opt for a different way of doing it, and there are no wrong ways, as long as the wires in the box are kept to just a few inches in length. The center pin of the SO-239 connects directly to the 'tap' point on the coil. The coil and capacitor connect in parallel; the end of the coil nearest the 'tap' connects to ground, and the other end connects to the antenna element. Remember to connect the SO-239 'shell' to the ground point. That's it!

Last thing is the earth 'ground' connection itself. While radials are not necessary for this antenna to work well, some sort of connection to earth IS in order, for best operation. Not much of a ground is needed compared to most antennas you may be familiar with. If you have a 2' or 3' scrap of 1/2" copper pipe, that will do nicely. Pound it into the ground near the matching network cabinet, making the connection with a pipe clamp, and as short a ground wire as possible.

To operate the antenna, connect the matching network output to the antenna element, as close to the end as practical. Right at the knot of the milk jug is a good spot, and make this connection as SHORT as possible. Remember, this wire is part of the antenna, and too long a piece can quickly de-tune the system.

Tuning is easy, especially if you have an antenna analyzer of some kind. Just dial up a frequency near the middle of the band (say, 14.200) and adjust the capacitor for minimum SWR. If the SWR does not come down to a point less than 1.5:1, you may wish to try other 'tap' points on the coil to see where your antenna presents a better match to your radio. A slight readjustment of the capacitor might be handy afterwards.

The antenna should present a near-perfect match across the entire 20 meter band. It is a great DX performer, putting the bulk of your signal right at the horizon. Hope you enjoy using yours as much I enjoy mine.

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Our Rich Ham Radio Heritage (Number 2 of a series)

By Woody Woodward, K3VSA

After all the hoopla we had late last year concerning the hundredth anniversary of voice over wireless, I was surprised that the hundredth anniversary of another one of the radio-electronics industry's most significant creations went essentially unheralded. I'm referring to the invention of the amplifying vacuum tube, the patent for which was awarded on January 15th of 1907. It's an interesting story that illustrates some of the personalities and chicaneries that make the story of radio-electronics so fascinating.

Let's begin with a bit of context. Really, the first commercially viable "tube" was Thomas Edison's light bulb, and it had only one element: the "filament". The filament glowed, fulfilling the tube's mission of providing light. And Edison saw the light and pronounced it good and profitable. But Edison noticed that over time, a discoloration developed on the inside of the glass envelope. So, he added another element to the tube, a metal plate, and connected this additional element to a voltage source in an attempt to draw off the discoloration. Edison noticed that a current flowed through the wire that was connected to this additional element, but he had no time to do anything further with this phenomenon except to name it the "Edison Effect". Edison, you see, rarely spent time investigating anything that didn't have a strong potential for making money.

The Englishman, Sir John Ambrose Fleming, discovered late in 1904 that the Edison Effect had an interesting property of only allowing current to flow in one direction, from the filament to the plate. The tube acted as a sort of one-way valve, and to this very day, in deference to Sir John, all proper Englishmen refer to vacuum tubes as "valves". This one-way

action was useful because you could change AC into DC, either in the form of a power supply or as a detector of wireless waves. I don't recall if Fleming became rich from his discovery or not, but I think he might have been more the researcher in pure science than entrepreneur. Fleming's valve came to be called a "diode", because it had two elements in it. (As an interesting footnote, Fleming was the one who, on the far side of the Atlantic, transmitted that Morse Code letter "s" that Marconi famously received here on our side of it.)

Two years later, the American, Lee de Forest placed an order with his instrument supplier for a Fleming valve with an added coil of wire to be placed between the filament and plate. He called this additional element the "grid". What he thought it would do will probably never be known for certain. The truth is probably that he hoped this new three element tube would do something, anything, that would allow him to patent it and become a wealthy man, because de Forest was as devoted to riches for riches' sake as Fleming was devoted to science for its own sake. Indeed, de Forest was not above reinterpreting history to serve his own interests. He had a talent for creating companies and driving them into bankruptcy, and also to marrying and divorcing. (The marriage to his first wife was never consummated, causing one wry ham to observe that de Forest was the first in a long line of guys who obtained their tickets but never fired up their rigs.)

Returning to the subject at hand, the new "triode" tube did do something noteworthy. It amplified. First, it was used to amplify audio frequencies, so de Forest called it the "Audion" tube. The initial versions were not much good at radio frequencies, and since de Forest had utterly no clue as to how the tube actually worked, he couldn't do much to perfect it. But soon afterward, another American, Edwin Howard Armstrong, set out to understand how it operated and created an oscillator and a regenerative receiver using it. His inventions would be the driving forces that changed wireless into radio. To this very day, almost every radio receiver uses circuit concepts that Armstrong created. Years later, during the decades-long court battles over the patent rights to regeneration, de Forest would claim that he'd known all along that his tube would oscillate, even though he couldn't offer any convincing evidence that he'd made it do so. Nevertheless, the courts eventually sided with de Forest over Armstrong in what the entire electronics engineering community thought was a calamitous judicial error. This bad legal decision would start a chain of depressing events that would result in Armstrong's suicide years later, robbing humanity of the fruits of an authentic genius.

Most knowledgeable people think that Sony's Betamax was better than JVC's VHS and that the Apple was better than the PC. It's a regrettable fact that the "good guy" doesn't always win. You should know that this isn't a recent phenomenon. Not surprisingly, that Bible verse about the love of money being the root of all evil continues to be proven true!

What is DX?

By Mark Lunday, WD4ELG

DX, quite simply, means distance. But there's more to it – DXing (the pursuit of distant stations) is a big piece of our hobby. Some details can be found at wikipedia:

<http://en.wikipedia.org/wiki/DXing>

There is an award for working and confirming (via QSL card) 100 or more entities, called DXCC (administered by the ARRL).

http://en.wikipedia.org/wiki/DX_Century_Club

From the wikipedia entry above, we learn that:

“Entities are usually, but not always, [countries](#). Each entity contains some definable political or geographical distinctiveness specified in the DXCC Award rules. For example, although [Hawaii](#) is not a separate country from the [United States](#), it is a separate entity due to its distance from the rest of the US.”

There are more than 335 different "entities" as identified by the ARRL DXCC committee. What makes an entity? Well, a unique country counts, but so do islands and land masses separated by a distance from the administering authority. Lots of uninhabited islands are entities. At the last club meeting, I joked with Steve/KZ1X and Bruce/N1LN about a DX trip (a.k.a. DXpedition) to Swain's Island, a small atoll out in the Pacific. I was so thrilled to work them; it was a new DX entity for me. I have a marginal station setup at my house for DX work. Steve and Bruce have been doing serious DXing a lot longer than I have, and they have superbly designed and equipped stations. They both expected to work Swain's Island early in the effort and numerous bands, even considering that thousands and thousands of other well-equipped stations from around the world would be doing the same during a 10 day period, and that no operations were likely for a long time to come.

And therein lies a key element of DXing - one is competing against oneself, trying to improve one's own performance and history of achievements, using the worked/confirmed "DX entity list" (DXCC entity listing) as a benchmark. Sure, there is a list of the top performers (the Honor Roll), but with so many variables and folks involved from around the world, each person is trying to improve his/her own total count. And THAT is the addictive part of this aspect of the hobby. It's not that different than golf in terms of the fundamental theory - one is always trying to improve one's OWN performance against the standard.

For those new to the HF bands, the lure of DX is like a prospector searching for gold in a back creek...sifting through rocks and nuggets while looking for a single shiny piece that signifies PAY DIRT. Every serious DX chaser knows his/her count of worked and confirmed (via QSL card), the top 10 most wanted entities in the world, upcoming DXpeditions, etc. (I have mine posted at <http://wd4elg.net/>!)

How addictive is DX? Take a look at what a bunch of our fellow hams did to make Scarborough Reef available earlier this month. Scarborough is one of the "most wanted" entities. And it's just four rocks on a reef in the South China Sea! Administered and maintained by China, the rules (set by ARRL) say that for DX credit the operators cannot just anchor a boat at Scarborough...they must be ON THE ROCK (or rocks). One joke is that the place is now nicknamed "Scaffold Reef" instead of "Scarborough Reef." The hams were there for 7 days, exposed to the elements (90+F, high humidity, sun, winds, coral, storms and rain, and of course salt).

Keep in mind ours is a hobby. These folks did this for FUN! They are pretty serious about the hobby to go to this extreme. I've done some crazy things for DX in my 30 years of operating (climbing on roofs and trees to put up better antennas to work the DX), but never anything like this!

<http://www.scarboroughreef.com/4rocks.html>

So be careful, if you get bitten by the DX bug there is NO CURE. Symptoms include:

- Many late nights with minimal sleep
- Lots of time spent surfing the web: looking at propagation predictions and DX cluster spots and discussion boards about upcoming DXpeditions
- Lots of \$\$ spent on postage for QSL cards, instead of for retirement
- Obsession with numbers (worked and confirmed entities)
- Planning of vacations around major DX contests and events, on a not-to-interfere basis
- Inability to remember anniversary or wife's birthday, but uncanny memory for prefixes of entities
- Frequent talking to oneself, saying incoherent nonsense like "Why does the @#%* Fish and Wildlife Service NOT allow us to visit Navassa Island, but Haitian fishermen are permitted to stay there overnight?" AND "Where is the mailman today?" AND "What the heck is the split for that operation?"
- Incessant tinkering with one's own antennas, radios, and other equipment in an effort to get a better transmitted and received signal

There are therapy/support groups for the DX malady, and if you get the bug, you can always find a sympathetic ear from those seasoned DX chasers who were bitten long ago, like Steve and Bruce!

73, (and as those of us who have the DX bug say, GOOD DX!)

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