THE DUMMY LOAD

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Meetings

Meetings held at 8:00pm on the second Monday of each month , Board Room Preston Arena (Bishop St at Hamilton St) No meetings in July or August. Visitors always welcome.

Club Net

on the
VE3SWR repeater 146.790 Mhz
every Wednesday
at 2100R

VE3SWA
DXCC HONOR ROLL
(332/332)
WAZ, WAC, WAS.

Next Meetings

Mon Oct 18th 2010
Mon Nov 8th 2010
Mon Dec 13th 2010
Mon Jan 10th 2011
Mon Feb 14th 2011
Mon Mar 14th 2011
usual location and time

CLUB NEWS

Fairly good turn out for our first meeting of the new season with 13 smiling faces seated around the tables after a circuitous climb through the arena seats to get to the Boardroom. I never thought I would make it and I certainly hope they have the main entrance all fixed up before our October meeting which I'm sure you all remember is the Monday in the month rather than our usual second Monday which is Thanksgiving. Getting back to the members in attendance we had VA3AVR Tony, VA3CBE Calvin, VA3MP Mike, VA3WIF Jeff, VE3BHZ Dave, VE3FC Fraser, VE3IHM Hugh, VE3MAH Tom, VE3MF Bob, VE3NXV Gerry, VE3OAV Robin, VE3OEA Ryan, and VE3USP Tony, (Congratulations Ryan). Gerry read the minutes of the June meeting which were accepted as read and Fraser then gave us a brief report on the club finances we are safely in the black and this report was also accepted as read.
The membership expressed their condolences to Scot VE3ANT on the pass of his father, a donation to the charity of their choice will be made by the club. Robin VE3OAV left the meeting with $10.00 more than he had when he arrived.. There being no further business the meeting was asjourned to the usual rag chew and a viewing of the rough footage put together by Ryan for his Amateur Radio project. Should be very nice when it has been edited and sorted out into a finished product.

ANNOUNCED DX ACTIVITIES

In addition to the usual DXpeditions being carried out there will be a great deal of activity from the Netherlands Antilles which is scheduled to be reorganized October 10th 2010. From this it is anticipated that 4 new DXCC Countries will emerge: Curacao PJ2, Bonaire PJ4, St Eustatius PJ5 & Saba PJ6, and Sint Maarten PJ7. All of those 4 will be activated between Oct 10th and Oct 20th by various groups. Curacao PJ2/K8ND by K8ND, St Eustatius/Saba by PJ5/AH6HY, St Maarten PJ7 by KQ1F and Bonaire PJ4 by a large group of Dutch hams. QSL via home calls for all except the Bonaire group, I have no QSL info for that operation yet.

Oct 10th - 14th
SVALBARD
JW/HB9LEY
JW/JQ2GYU
Low bands plus WARC
CW & SSB
QSL JQ2GYU

Oct 10th - 23rd
TOGO
5V7TT
Large op by Italian group
All bands & modes
QSL I2YSB

Oct 18th - Nov 13th
SOUTH COOK ISLANDS
E51NOU
By N7OU from Raratonga
40 to 10 CW SSB
Spare time operation
QSL N7OU

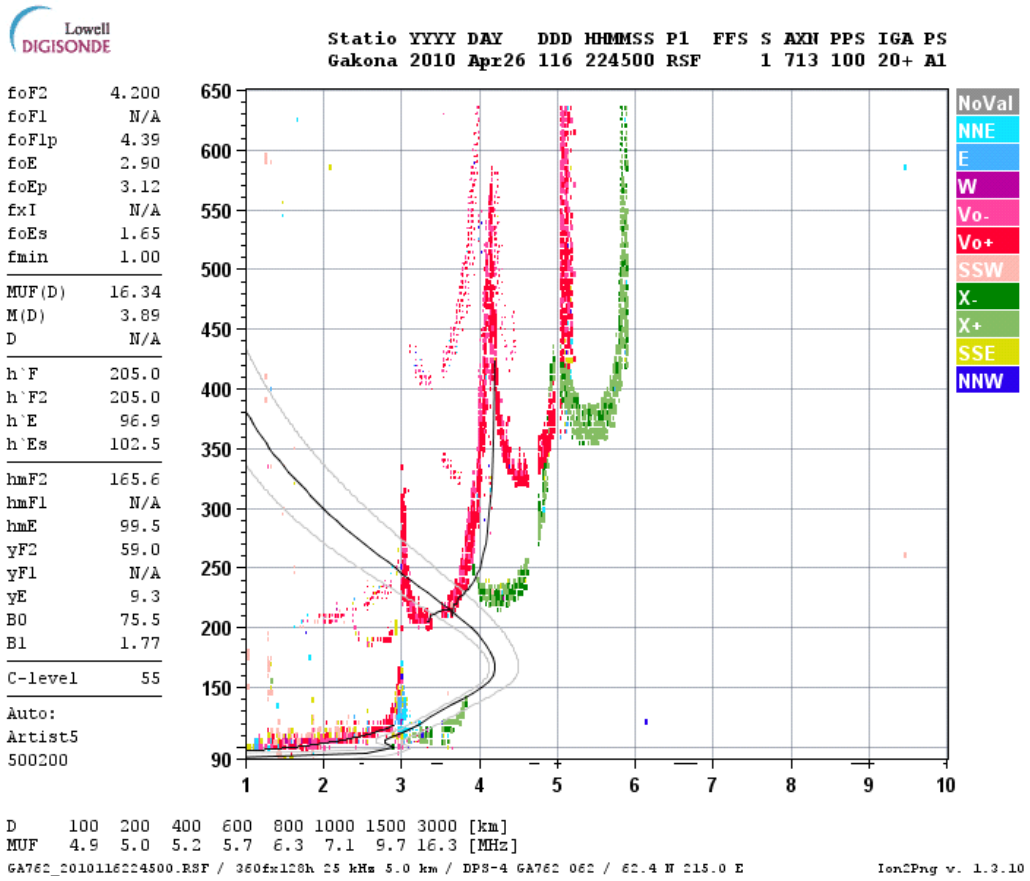
Oct21st - Nov 3rd
BOTSWANA
A25ZY (I0ZY)
A25DF (IK1MDP)
A25MB (IZ5MMB)
A25CF (K5LBU)
A25BI (K5ZOL)
A25AN (KD5TAN)
A25SL (W5SL)
All bands & modes
QSL indicated home calls

Plasma Physics for the Radio Amateur
Part IV

Are you Ordinary or Extraordinary?

We now come to my favorite part of radio physics, and a phenomenon that explains more of the "odd" behaviors of ionospheric propagation than any other factor. And you'll find scant mention of it anywhere in Amateur Radio literature.

A picture is worth a thousand words, so let's look at a picture first and go from there. Here is a very typical ionogram, taken from the HAARP Digisonde ionospheric sounder.



You can get more local ionograms in most parts of the country, and around the world.

Notice the very well defined RED and GREEN traces in this ionogram. The red trace is the ORDINARY wave, which is clockwise circularly polarized in the Northern hemisphere. The GREEN trace is the EXTRAORDINARY wave (or X wave), which is counterclockwise circular polarized in the northern hemisphere. ALL ionospherically reflected signals will result in these two separate waves. You don't have to TRANSMIT circular polarized signals to get these two rays…the ionosphere does it all by itself, with any linearly polarized "upward" signal.

This is because a MAGNETIZED plasma (which is what the ionosphere is) is what we call "birefringent." It has two different refractive indexes. There are two different velocities of propagation, two different critical frequencies, and two different heights of reflection. And of course, two different polarizations…that's the only way the ionosonde can really separate the two returning waves!

One thing you DON'T see in the ionogram is the huge divergent in AZIMUTH between the O and the X wave signals. At LOW ANGLES of radiation, these two waves can diverge well over 90 degrees in azimuth, and counter-intuitively enough, NEITHER ONE of them follows a Great Circle route, at least in magnetic polar regions. If you're near the magnetic equator, the divergence of these two rays will be a bit less.

Now, even though you ALWAYS get both rays when you transmit a signal into the ionosphere, most hams have no way of knowing which ray they are actually receiving from a distant station because there isn't one ham in 100,000 that uses circular polarization on H.F.! This is a huge mistake, as we shall clearly see.

Now, before we go too much into the practical implications of this, we need to talk a little bit about what's called the Appleton-Hartree dispersion formula.

$$n^2 = 1 - \frac{X}{1 - iZ - \frac{\frac{1}{2}Y^2\sin^2\theta}{1-X-iZ} \pm \frac{1}{1-X-iZ}\left(\frac{1}{4}Y^4\sin^4\theta + Y^2\cos^2\theta\,(1-X-iZ)^2\right)^{1/2}}$$

Actually, that's about ALL we need to say about it. What this formula does is tell you the refractive index of a magnetized plasma. There are TWO solutions to this equation, one which gives you the O mode refractive index and one that gives you the X mode refractive index. If you feel like working it out, be my guest.

There's actually a pretty good Wikipedia article on it here:

http://en.wikipedia.org/wiki/Appleton-Hartree_equation

Now, I'm not a mathematical sadist, so instead I'll really tell you what it means in real life. What it means is that you will see a HUGE difference by using circular polarization on H.F.! The only case you might not care is if you're using NVIS, in which case, you will receive both the X and the O modes in the same location…but with a slight time delay. But if you're more than a few hundred miles or so from the transmitting station, the X and O waves will have diverged by a large margin. You will be receiving ONLY and X mode or O mode signal at your particular location. This is easy to see with a very simple CPOL antenna, such as a turnstile (two dipoles at right angles fed with a 90 degree phase shift.) You will typically see at least a 3 S-unit difference between being the correct polarization and the "wrong" sense polarization. It's theoretically possible to get INFINITE rejection of the opposite sense wave, but only if the signal is arriving precisely normal to the antenna, and this isn't going to happe often.

In any case, the only way to really know if you're receiving the X wave or the O wave is to USE circular polarization.

Now, for a news flash. Don't let ANYONE tell you that the polarization of H.F. signals is "random." It is NOT. It is absolutely predictable. Appleton-Hartree will tell you. It is Right Hand circular, or it is Left Hand circular. One or the other. Always. The only thing that may be random is your knowledge of which of the two rays is arriving at your particular QTH! Is it any wonder that so many hams think that H.F. is randomly polarized when they haven't even been told that it's CIRCULAR in the first place?!

Of all the phenomena observable in plasma physics, this whole X and O mode business is one of the EASIEST to demonstrate in your own shack. The results are clear and predictable. Build a CPOL antenna for yourself and see!

Now here's another neat little trick that CPOL will allow you to do. Remember how we said how difficult it can sometimes be to determine the direction of arrival of distant signals? Well, one way you can determine if a turnstile antenna is looking "down the barrel" of an incoming CPOL wave, is to check for the circularity! (This can be done with a two channel oscilloscope in the X-Y mode, each channel looking at one dipole of the turnstile) A wave arriving "dead on" will have the ROUNDEST display possible. In fact, this is the

method the Digisonde uses to determine direction of arrival, when it's used in the oblique sounding mode (something not all Digisondes are set up to do). It uses some fancy footwork to "steer" the antenna array electrically, rather than physically scanning the sky. But the principle is the same.

Stay tuned!

NO MORE NETHERLANDS ANTILLES

Yesterday (Sep 9th) during the Final Round Table Conference government officials from the Dutch Antilles and The Netherlands signed an agreement to reform the status of the former Dutch Caribbean island colonies of Curacao, St. Maarten, Bonaire, Saba and St. Eustatius. Starting October 10th the Netherland Antilles "cease to exist as a country".
"Curacao and St. Maarten will become separate countries within the Kingdom of the Netherlands, while Bonaire, Saba and St Eustatius will become special Dutch municipalities" reports Radio Netherlands Worldwide (RNW). This process has taken five years to come to fulfillment and will begin the new status at 0400Z on October 10th of this year.

DID NOAH FISH?

A Sunday school teacher asked, 'Johnny, do you think Noah did a lot of fishing when he was on the Ark?' 'No', replied Johnny. 'How could he, with just two worms'?

MOSES AND THE RED SEA

Nine-year-old Joey was asked by his mother what he had learned in Sunday School. 'Well, Mom, our teacher told us how God sent Moses behind enemy lines on a rescue mission to lead the Israelites out of Egypt. When he got to the Red Sea, he had his army build a pontoon bridge and all the people walked across safely. Then he radioed headquarters for reinforcements. They sent bombers to blow up the bridge and all the Israelites were saved.'
'Now, Joey, is that really what your teacher taught you?' his Mother asked.
'Well, no, Mom. But, if I told it the way the teacher did, you'd never believe it!'

SAY A PRAYER

Little Johnny and his family were having Sunday dinner at his Grandmother's house. Everyone was seated around the table as the food was being served. When Little Johnny received his plate, he started eating right away.
'Johnny! Please wait until we say our prayer.' said his mother.
'I don't need to,' the boy replied.
'Of course, you do.' his mother insisted. 'We always say a prayer before eating at our house.'
'That's at our house.' Johnny explained. 'But this is Grandma's house and she knows how to cook!'

LOT'S WIFE

The Sunday School teacher was describing how Lot's wife looked back and turned into a pillar of salt, when little Jason interrupted, 'My Mommy looked back once while she was driving,' he announced triumphantly, 'and she turned into a telephone pole!'

What's the difference between roast beef and pea soup ?

Anyone can roast beef ....

WHY WORKING DX IS EASIER THAN EVER

N4KC Don Keith
eHam.net

Before I even get started, allow me to make clear the purpose of this article. It is NOT to minimize at all the efforts of those who successfully work large numbers of DX stations. Those who are most proficient at this aspect of the hobby of amateur radio have certain traits that I will discuss later in this piece. Allow me to also add that this article is not for everyone. I am aware that working DX—either for awards in what some decry as "5/9, 73 QSOs" or for the experience of meeting people from all corners of the world—is not everyone's cup of tea. Fine. Hit the "Back" button up at the top and go read something else.
Many of us enjoy working DX, though, whether we are serious or casual about it. It's a major part of our hobby, and ties in nicely with other pursuits, such as antenna experimentation, digital mode operation, honing operating skills, QRP, radiosport competition, and even stamp collecting.

There are many amateurs, though, who are reluctant to dive in and get their feet wet. Maybe they are convinced they need light-dimming power and a ton of aluminum in the air to ever hope to enjoy such a thing. Or they see no reason to upgrade to a higher license class, assuming they would never be able to contact someone on the other side of the globe with any little peanut-whistle station they could afford to assemble.

My goal here is to entice newcomers as well as those who have been around for a while to come on in, the water's fine! And in an attempt to do so, I am going to give five reasons why having a satisfying DX experience in our hobby is easier than ever. I do this from the perspective of my own recent experience.

I became active once again in amateur radio in 2005 after a 15-year hiatus from HF. You know the story: work, kids, work, kids' sports, and work. But I got the itch, acquired a 100-watt rig, and strung up a G5RV in the backyard in August of 2005. Though those were the waning days of the previous sunspot cycle, and though I still had work, work and work issues which left me with little time to operate, and even though I did not consciously try to lasso a ton of DX or consciously make that the focus of my operating, I had soon picked up 75 or 80 countries.

That is when I gave myself a challenge: work 200 countries, using only 100 watts and simple antennas (along with the G5RV, I soon added a horizontal loop, a ladder-line-fed dipole, and a Hustler 4-BTV vertical to my little aerial farm). In a couple of years, and with sunspots becoming as rare as knees on a chicken, I had done it. I promise I did not work hard at it. I spent a good portion of my on-air time doing things other than chase elusive stations in faraway lands. And that is my point.

If I can do it, anybody can do it. With a modest station. With simple antennas. Even if El Sol does not lend us a hand in the pursuit of our hobby.

Here are the reasons why I think it is easier than ever for you to have a satisfying DX-chasing experience, regardless of how seriously you want to indulge:

1) Today's radios and other gear are better equipped for it. I love the boat-anchors as much as anyone, but when even an entry-level transceiver has some DSP and filtering, easily operates split frequencies, comes equipped with an effective noise-limiting system, does not drift even a tiny little bit, allows for some voice-processing, and includes a built-in CW keyer, then anyone can be equipped to work DX. Also, when you decide to up your power, relatively inexpensive desktop amplifiers that give you 9 or 10db gain and operate just fine on regular household 110-volt power are available—including many used ones. This includes newer solid-state amps, too. And there are all sorts of inexpensive digital-mode

and operating gizmos that tie to your computer, giving you myriad choices for improving your capability with minimal investment.

2) There are more hams in more countries than ever before for you to work. I remember when it was rare to hear a Russian station. No more. There was a long period when no one could get on the air from China. Not now. Sometimes it seems there are millions of stations in Italy, Brazil, Germany and other countries. And many of those DX stations are much better equipped than in the past. They are more capable of pulling out weak signals and they produce lots of RF for you to snag. Also, with the portability of gear and marginally less government restriction on such shenanigans, there are more and more DX-peditions operating, including many travelers who operate "holiday style" while on vacation or in exotic areas for work.

3) There are more amateur radio bands on which to operate than ever. Before I drifted away from the hobby for all that work/kids/kids' sports stuff, we did not have 60, 30, 17 or 12 meters. Few thought of 160 or 80/75 as DX bands. But with all that new HF spectrum, and with advances in antennas and other equipment on the lower frequencies (see ON4UN's wonderful book on low-band DXing if you want to see what I am talking about), we almost always have bands open to various parts of the world, regardless of when you can slip away to the shack for a few minutes of operating.

4) Digital modes now offer wonderful opportunities to communicate with DX with very modest power and antennas. Those little squeaks and squawks get decoded sometimes even when you can't hear the other guy with your ears.

5) And my final reason DX is easier to work than ever before: the DX cluster and other aids. Back in the dark ages, when we worked dinosaur mobile, it was no great stroke to tune 20, 15 and 10—our "DX bands"—to see what was coming in. Heck, 10 was dead most of the time anyway—or so we assumed, since nobody transmitted—so a quick run up and down 20 or 15 would tell us if there was anybody worth pursuing. Now, with spots popping up in the window at the bottom of my logging software—another real boon for us weekend DX fanatics—all I have to do is scroll up and down the list. It tells me instantly if anyone has spotted a country that would be a new one for me, or one I still haven't confirmed. So off I go to see if I can hear him well enough to try to work him…if he is on one of the 12 bands for which I have capability and FCC authority to transmit. There are also free propagation software downloads, propagation reports all over the Internet, online forums for discussion of DX status, DX-peditions, and QSL info,and so much more that we did not have at our disposal back in the day.

Now, let me quickly say that your success in working DX goes up greatly if you add some other things to your arsenal or have at your disposal. These include:

Power. 100 watts can get the job done. 600 watts is better. Legal limit works best. But heck, people do it all the time with 5 watts or less. I got my 200 with 100 watts before I went over to the "dark side" with my 500-watt tube-type amp.

Antennas. Simple dipoles and verticals work fine. (See my article on "get on the air quickly" antennas http://www.eham.net/articles/21270) Hexbeams, moxons, or other wire beams are better. Multi-band trapped Yagis are better still. Multi-element, long-boomed monoband monsters are best. But remember, I got 200 with a dipole, a loop and a vertical I picked up used for $50.

CW. If you ever plan on getting serious about making DXCC honor roll, or if you just like to carry on interesting QSOs with guys in other countries, you need to be proficient at Mr. Morse's code. Bands open sooner and close later for CW. DX-peditions who ignore you completely on SSB will happily log you on CW. I got about 65% of my first 200 countries on CW. (Read my article on the ten reasons why you should learn Morse code http://www.eham.net/articles/19366.)

Competition-grade rig. Again, there are marvelous entry-level HF radios available at well under a grand. Guys trade up, too, so you often find them for sale used. And you can work the world with them. But you can do even better with rigs that offer separate receivers, spectrum scopes, state-of-the-art filtering, and more. There is a wide spectrum of radios available, and you can grow with them, depending on your interests and available disposable income. (I got my 200 on a Kenwood TS-2000…a station-in-a-box radio, with no special DX-chasing features.)

Time. That's the hard-to-come-by commodity for most of us. Fortunately, I spend a lot of time at my computer in my second job (writing books), so if I hear a DX station that is marginal, or if I see someone spotted that I need but I don't hear him, I just set the radio on his frequency, aim the homebrew hexbeam his way (see my article about that baby http://www.eham.net/articles/20575), and go back to work. Sometimes he comes up. Sometimes I never hear him.

Patience. If you get fed up after calling a couple of times in a chaotic pile-up, then you probably don't have the patience for it. Go do something else. Patience is a virtue. Some have it, some don't. Best you take up some other facet of ham radio or go find another hobby altogether rather than throw carriers on the DX station's frequency or utter words on the air more suitable for the locker room.

Operating smarts. Those come from watching, listening, and reading. They come easily for some but can be acquired by most. There are books and articles on the subject. Emulate what the good ops do. Do not mimic what the dolts do, and you'll hear plenty of them. Being rude or boorish sometimes works, but I suspect many of those who call out of turn, walk on other stations the DX is working, or crank their voice processors up to 11 strangely fail to make it into the DX station's log. I even hear the good DX ops chastise them sometimes right there in front of the whole pileup. I avoid throwing out a cheer!

So there you go. Working DX is easier than ever. Having the thrill of communicating around the world is at your fingertips. The fingertips that twirl the knob on the front of that basic HF radio that is hooked to a decent hunk of wire strung around the backyard.

Frankly, the first 100 countries are easy. You can almost get that many in our hemisphere. I've done it with casual operation in only a few hours during a DX contest. That is enough to get you the DXCC certificate. The next 100 are much more difficult. And I have a true admiration for those guys on the DXCC Honor Roll.

But you know, I bet I get just as much satisfaction adding Azberjain or Togo, as I recently did, as they do in getting a new endorsement. And I know I truly enjoy the interesting ragchews I have had recently with fellow hams in Ireland, Australia, and Austria. That is even more true considering my modest 500-watt station and homebrew antennas.

So, if you have hesitated diving into the pileups or answering the CQ from some exotic callsign, or if you have procrastinated upgrading from Technician because you are afraid your little signal will not reach out there to all that exciting DX, get off the dime!

There's a 9K2 in Kuwait on 17 PSK right now, Sweden's working CW in the General portion of 20 with a good signal, and I was just listening to several guys from Australia with 5/8 signals on 20 SSB.

I bet they would all love to have a QSO with YOU!