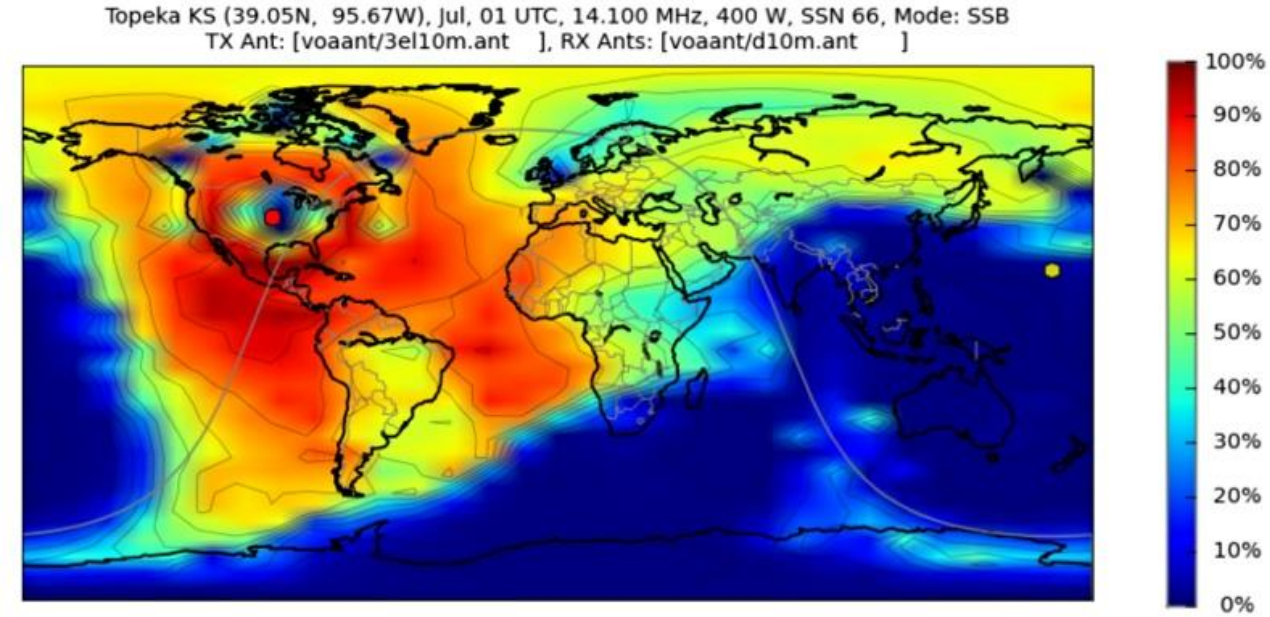
Learn Propogation

- 

Want to learn about fast easy tools to help you get propagation forecasts for your area?

For the most part this will be a basic 101 level conversation.

I am by no means an expert on this so I am merely taking notes and sharing them. There are lots of nice resources out there that you can refer to and I will provide a few links I found particularly helpful near the end of the article. I think it's worth taking a minute to talk about why one would even bother to look at propagation software.

Theoretically speaking if you know what the propagation is like between you and your destination then you can know whether it's even worth your while to try the DX and what your chances are of success providing you have a workable contact. I am going to go under a small premise that you can transmit somewhat equal to what you can receive. This will simplify the conversation as your stations dynamics can vary on whether you tend to be able to receive beyond your transmit capabilities or vice versa.

What are the variables in forecasting propagation? There are actually quite a few and it's a fairly complex science!

As a licensed ham you will have learned about the atmospheric layers and their influence on how your signal is reflected and or bounces to and from a distant point. Solar activity is also a huge influence as well and the sun spot activity is higher in various stages of the solar cycles. So e solar cycles yield enter conditions than others. This last cycle was actually very nice and we are regrettably in the down swing of that cycle.

The June 2012 issue of QST discusses this topic in great detail and it's great reading for new hams interested in working HF and DX contacts. Don't forget also that the position of the sun relative to your DX also impacts propagation with your longer skips available at sunrise and sunset (AKA Grey line). Geomagnetic storms can really shake things up as well. This is all info you will learn navigating the three levels of licensing. I believe the weather has some effect as well, it certainly can cause more static when storms are nearby. There is your station itself. The type of antenna you have and it's gain or lack of gain, your transmit power and how well your station is built and grounded.

Notice I said your station and not simply your rig. Having a cleanly installed station really helps. What do I mean by clean? Things like good coax and following the guidelines for running and grounding your connections, rig and other gear in your signal chain makes a difference. Poor installations have more signal loss than clean ones. This can result in spurious malformed signals and power loss. Of course the transceiver itself has some impact, especially with regards to receivers.

My observation in my first year is that a lot of hams don't know much or care much specifically about propagation. It's a shame in my humble opinion, however, in part I certainly understand it. When you are getting started you are usually in a hurry to get on the air and experience the thrill and satisfaction of achieving that goal. You have worked hard to get your license, setup your station, ect. Propagation probably is not sitting there in the forefront of a hams brain at that point and time.

The truth is that a ham can go quite a while and simply ignore propagation and just take what they get. At some point though some hams want more from their station and then propagation can become of great interest.

So now what? Well, the great news is that you can dig into the subject a little at a time and benefit. In fact, if you have never paid attention to all this the great news is that you can get a lot with very little work. In fact, it’s my

opinion that the best fruit hangs low on the learning curve tree. For example, we can keep things as simple as looking at the forecast meter available on QRZ and it will give you a very simple forecast based on the current space weather status. Right there at that level you can know if the day is better or worse than others for propagation. Get yourself a small apple crate to get one step up and you can go to VOAProp Online and punch in your location coordinates, antenna type, transmit power, communication mode (SSB, CW, ect) and the band you want and after hitting the button and waiting 5-10 seconds you will get a gorgeous world map view of the propagation in a heat-map view that shows you where your signal will be able to reach for that given time of the day. This is last forecast is based on the month, year and loose solar cycle information so if you are willing to go get the step latter to reach just a little higher up in the tree you can get a theoretically more accurate forecast.

Top Right Corner of my desktop you can see IonoProbe, HamCap and DX Atlas with World Clocks at the bottom.

VOACAP is software the government commissioned to be created to help the military and other agency better predict propagation for radio communications. You can get some better history by pulling it up in Wikipedia, so I will spare you that here. It's free for public use and so anyone can use it and get the source code if they want and leverage it. And the reason I mention this is that is exactly what several hams and developers have done. So there are now several packages that have attempted to improve upon VOACAP. Some have focused on improved accuracy while others have focused on proving the ease of use and interface. VOAPROP is a nice little package for windows that you can run locally on your computer. If you have an antenna model, part 13 file, (can be written out of EZNEC +) you can use that model in your forecast to improve upon your accuracy. The download version provides a little more flexibility than the online version.

The DX labs suite of software has a multi-pronged group of software that provides you a DX Atlas, a solar weather monitor named IonoProbe and a small package called HamCap. These can all work together and show you on DXAtlas a nice shaded view of the propagation based on the band you have chosen in HamCap and the latest solar information. This is really slick and easy to install and use. I am using this now, you can see this on my desktop picture here. I have not added my part 13 file yet to VOACAP which is also required for this setup.

I did look at some other packages, ACE HF is another pay software package that touts forecasting, however, it really doesn't claim to do more than a forecast by month. You can change the data and enter in your Antenna as well from a part 13 file. I have produced a part 13 file and added it, it seems to work as far as I can tell. I wish I had not spent money on either of these packages though. Had I read an article like this one I could have avoided it and saved myself some money. I may use the modeler though in the future as I want to build my own mobile yagi for field use. Here is a nice link that has a dated but brief review of lots of what I have talked about so far as well as a few others.

There is obviously more to this. I can say so far that the forecasts seem fairly accurate. I have reached beyond a few times, both to Japan. I might be able to say the opposite, however, you can't really know sometimes if it's simply a matter of there not being anyone to reach. Obviously propagation doesn’t matter if there are no DX’s listening and paying attention.

A few months have passed since I started this article, it's been a while in the making and I had to figure out where I would land with all this. It would seem that I have focused on the DX Labs tools as their map view just makes it easier for me to see where my signal can reach and allows me to use the latest sun spot info from Ionprop. It's nice and compact on the desktop as well. I also run VOAPROP online as well to double check it. They do differ on occasion a bit and I can't really tell you why. Of course DX Atlas has other features I am exploring as well. I purchased the bundle and also received Band Master for free and will be exploring that as well.

Suffice to say that if you want to improve your probability of DXing then I would suggest the following for the sake of ease and convenience. Get VOAPROP Online working for you. It's free, it works and it's pretty nice as well. Understand when DX's with various countries take place and be ready ahead of that time so you can actually be their first contact when they call CQ.

It's nice that the grey line will usually improve their propagation and so if you catch their morning window then even with lower power your odds increase verses getting caught in pileups. You can actually develop a DX plan for those countries you are seeking that looks at the best time of day for propagation (ACE HF actually makes this pretty easy as it will show you a summary for a band verses time of day when the propagation is best for a month) and try to line that up with their early morning. It can easily be laid out in a spreadsheet and kept handy at your station. Don't be afraid to call CQ, I am getting a good chunk of my DX's this way.

It’s important as well in my opinion to understand world time. Again, if your DX pool is not awake and on the air, great propagation won’t help you much.

LINKS
http://www.astrosurf.com/luxorion/qsl-review-propagation-software.htm
http://www.voacap.com/

One other key point I caught when updating this article for use on SDRZone is the concept of using beacons to help determine propogation. I hope to convince a wise Ham I know to contribute an Article and video on this topic. The super short version if you are curious is to find known beacons in the area and band you wish to DX on and see how well if at all you can recieve them.

I think that pretty much sums it up for now. If you have wondered why I write all these articles, it's both out of the spirit of sharing and also helping me remember what I research and get the very most from my limited time at the radio. These last few article were written on airplanes and research for parts was done at airports on layovers. May are written during lunch hours as well. I happen to enjoy writing as well, so these are an outlet for that as well. Please checkout my book if you have time at AM4L.com.

Thanks for checking in!
NI0Z