



The Monitor

January 2001



From the Prez:

I hope everyone had a good Holiday Season and made all those New Year Resolutions.

Is everyone is staying warm? Remember when winters were always like this?

This month's meeting will included budget voting, planning for the VHF, UHF contest and forecasted plans for the year 2001. If you have any ideas for the year come out for the meeting and put in your 2 cents.

73 de N5IEP

Upcoming Events

TSRC Meeting	Jan. 13th, 9:00am Gillam's Restaurant, WRJ, VT
UHF, VHF contest	Jan. 19-21, Strafford, VT
TSRC Meeting	Feb. 10th, 9:00am Gillam's Restaurant, WRJ, VT

January VHF Sweepstakes

The annual ARRL January VHF Sweepstakes contest will be held on Jan 20-22 this year. Start time is 1900UTC on Jan 20 and it ends at 0400 UTC Monday. A team from TSRC will be active from our home in Strafford, VT over the entire contest. So far we plan to operate 6M, 2M, 222, and 70Cm. There is an indication that KA1UAG is also working on a laser system for the 2304-and-up category!

We will be using the club trailer/tower and other temporary tower/antenna setups for the various bands. The stations will be in my (heated) workshop and sleeping/eating/other facilities are available in our lower cottage.

Setup is planned for Friday- if you are interested in joining us or just in visiting to see the operation, drop me a note for directions and information.

73, Bill Burden, WB1BRE

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December 30 VE Session Report

by K1XH - ARRL/VEC Liaison

On a cold December morning with a huge winter storm bearing down on the Northeast, 11 candidates assembled at Dartmouth College ready to present paperwork and take Amateur Radio exams. Seven VE's were also present, and the session was underway by 8:30 AM.

In total there were 10 new license classes earned, 4 Tech, 5 General, and 1 Extra. One candidate only earned credit for Element 3.

TSRC members upgraded to General were: Charles Wilber-N1AOK, Laverne Burden-N5IEP, Doug Plummer-N1KDV, and Mary Davis-WD4HCD. John Bannister, KB1CXC earned credit for Element 3.

Other candidates who either gained new licenses or upgraded were:

Jason Reeves - Tech (now KB1GDB)
Daniel Chaloux - Tech (now KB1GDE)
Chris Tausanovitch - Tech (now KB1GDC)
Alex Tausanovitch - Tech (now KB1GDD)
Richard Doody, K1MXA - General
Gary Trachier, N1MEU - Extra

All candidates gained either a new license, upgrades, or gained credit for an element. No retests were allowed (due to the impending storm), which is contrary to normal practice.

Beginning January 1, 2001 all ARRL/VEC sponsored exams will have a test fee of \$10.00. There are no free exams as there may have been in the past.

Congratulations to all on a job well done, including all the VE's who donated their time and energy to this highly successful session. VE's present were:

Mike Schmitt - N1MS
Ken Downs - KD1P
Mike Maynard - K1IH
Nancy Maynard - N1QW
Glen Harding - N1NKC
Mike McAmis - W1ECT

Again thanks to all involved!

Micky - K1XH

January Propagation Outlook

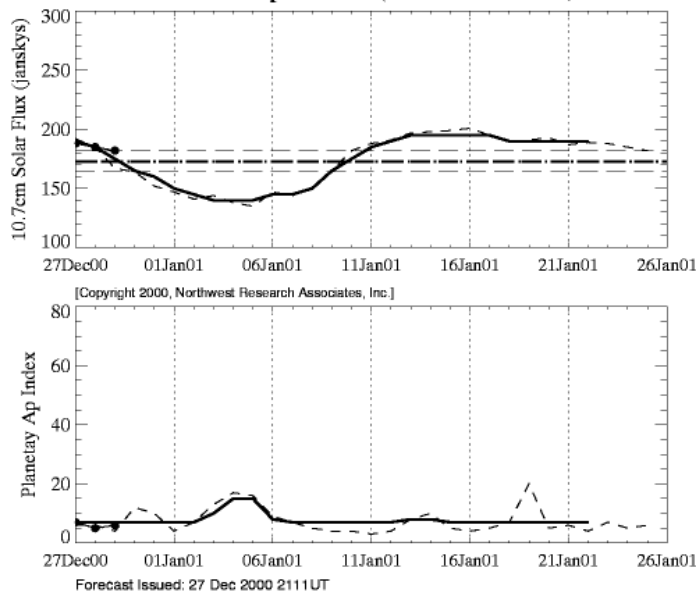
by AD5Q, edited by K1IB

It is now mid-winter. Both ten and fifteen meters are closed at night and certain night paths we take for granted on twenty meters are no longer reliable. With solar fluxes as high as they are, this situation is temporary. It is not so serious anyway as ten and fifteen meters are jumping during the day and twenty is still open to all parts of the world. Some of the DX windows are of shorter duration, and on ten meters some of them do not open at all. All this is easy to adjust to unless you specialize in ten-meter operation. Propagation patterns have shifted around some, providing opportunities on other bands that should be exploited.

LOW BANDS: DX is very workable on 40 CW now. Europeans are coming through all evening and African CW stations seem to like this band too. Pacific stations come thru late at night, and we have an evening and sunrise peak to Asia.

HIGH BANDS: There is no shortage of DX on ten meters. Fifteen is also good right now as a strictly daytime band. During spring, ten meters will deteriorate and fifteen will improve. All night twenty meter openings will return in February, but morning long path is good now. Use the afternoon and morning long-path openings for the exotic southern Asian stuff that is now difficult via the north. We also have improved daytime conditions on this band. Keep in mind that it is only winter in the northern hemisphere, and that twenty meters is open all night everywhere south of us. Long haul pipelines across the southern hemisphere are accessible from mid-afternoon. The easterly path includes Africa (during their prime TV/hamming time), the Indian Ocean (if anybody is awake) and the long path to VK (where it would be morning).

F10 and Ap Forecast (NOAA/SEC 27DO)



Solar Activity Forecast

These plots show forecasts for the 10.7cm solar radio flux (F10) and the planetary geomagnetic activity index (Ap) for the next 27 days (heavy solid lines). The light solid lines and filled circles at the start of each plot are the observed F10 and Ap for the past few days, and the light dashed lines show the observed F10 and Ap from the previous solar rotation. The three horizontal long-dash lines on the F10 plot indicate the mean (heavy line) and expected range (light lines below and above the heavy line) of F10 from the NOAA SEC long-range prediction for Solar Cycle 23. The single horizontal dotted line is the 90-day mean F10 flux for the preceding 90-day period.

160Meter Contest

by Ken Downs, KD1P

Sure, I know; you have heard the jokes. The “160-acre band”, where “antenna farm” really means you need a farm. The band where a simple dipole antenna is 260 feet long and should be mounted at least 130 feet above ground; where a reduced-size vertical antenna is sixty feet tall and needs at least sixteen 130 foot radials, although if you’re serious, you will put down the standard one hundred twenty 130 foot wires under a full 130 foot radiator. This is necessary, if you want to work beyond a couple of hundred miles.

Well, as someone once said, “It ain’t necessarily so”. The weekend of Dec 2-3 marked the annual ARRL 160Meter contest, where the object is for U.S. and Canadian stations to work as many stations as they can, anywhere in the world. Yes, real DX contacts count for more points than North American stations, but a contact is a contact, and the more the merrier. Although I have been licensed most of my life now, I have never developed either great interest in contesting or the skills necessary to do well at it. I do truly love the 160 meter band, the Top Band as it is often called, and decided on the spur of the moment to enter the contest and show my support for the band. The Top Band is unique in amateur radio; we have numerous HF, VHF/UHF, and microwave bands, but only one Medium Frequency band. One sixty behaves more like the AM broadcast band than it does 75 or 80 meters. There are no FCC mandated mode or license-class sub-bands- everyone General through Extra has the same privileges. Domestic phone and cw are separated from DX operation by means of “Gentlemen’s Agreements”, which courteous operators learn and follow, even though they are not actually set down in the regulations. For decades following World War II the band was divided into segments of 25 KHz, and different areas of the country were limited to different segments to avoid interference with the LORAN maritime navigation system, with power limits varying from one segment to another. It was a unique place, and fell from the band-switch of most commercially-built ham gear. It was truly a band reserved only for really dedicated souls who refused to let it die. That changed in the 1980’s with the demise of LORAN and the opening up of the entire band to all American hams, with full power privileges. But, due perhaps to the large size of antennas, and the peculiar propagation, the band is still not as crowded as most of the HF bands are. That is one reason for the 160 Meter contest- to try to generate activity on the band.

So, I decided to join in the fun. My station is always “under renovation”- antennas are made to be tried and then changed. Rigs are swapped out routinely, as I don’t have space to set them all up at once. Anyway, what I had to use for the contest was a minimal station by almost anyone’s standards. Due to the antenna tuner I was using, I had to limit my power to only 40 watts. The “antenna” might be better described as a “100 foot long end-fed dummy load”. It as a simple 100 foot wire about thirty feet off the ground, end-fed through an antenna tuner, worked against a single counterpoise wire approximately two hundred feet long. That may not sound like a small antenna, until you think of it in terms of wavelength. An equivalent antenna for 20 meters would be a twelve or thirteen foot wire, four feet above ground. Not the best, to say the least.

How did I do? I could have stayed up all night, both nights, and slept during the days. I was not THAT interested in the contest. I put

in a total of perhaps ten hours Friday night, early Saturday morning, and Saturday night. I did not operate Sunday morning. Due to personal operating habits, I called CQ just a couple of times; I relied instead on the "search and pounce" technique. Particularly on Saturday night, many stations seemed to have doubled their code speeds; I had to listen to several of them more than once to ensure I got their call and ARRL section copied correctly. When all was said and done, I earned what is likely to be the lowest score in New England. With 73 contacts in 26 sections, all in North America, in the "low-power" category, my score came out to a whopping 3796 points. This in a contest where the serious operators make hundreds of QSOs and earn scores well into the six-digit range. How do I feel about this? Well, forget the score. I did work two Canadian provinces and nineteen states from Georgia to Wisconsin. I heard several others, including Texas, Oklahoma, and even the Turks and Caicos Islands (VP5). I called a lot of stations which could not hear me; some of that was probably my limited skill. A lot of it was the result of my power level and antenna. Some of those guys were running thirty-five times as much power as I was! I'm actually proud of my score, considering all factors.

What's the moral of the story? Since before the first World War, radio amateurs have been proudly doing things the experts say are impossible. Don't let the Laws of Physics keep you from having fun. On 160, or any band, use what you have and do what you can. You might not achieve a World-Class score, but you sure can have fun! My score is dismal; I did, however, work several new states (for me) on the band, improve my skills and confidence, and have a thoroughly good time. Does it get any better than that?

PROGRESS REPORT NO. 3 ON THE RADIOTELESCOPE PROJECT

Well, it's been almost a year since I last provided an update on the progress on my radiotelescope system. This doesn't mean that I have been working diligently on the project for the past 10 months. Wear and tear on my Amateur towers and antennas have taken their toll and I had to take all three rotors down from my towers, rebuild them and remount and recable each one. This took most of the spring and summer- I'm not as good on tower work as I was 20 years ago! The Dartsat and Hypersat projects have taken some time as well, so my forward motion on the radiotelescope has inched along. Hey, it's not like we expect a contact tomorrow!!

The 1420 Mhz lower noise preamp design I tried early in the year was a failure- I really needed a clean PC board design to make it work. I scrapped that approach, figuring that someone who really knows how to design and build these preamps would come out with one. I did find an interesting engineering prototype preamp package available from MAXIM that allows tuning to about 1400 Mhz with a couple of simple parts changes. This design will provide about a 1 dB noise figure with about 16 DB of gain. (Remember- my first preamp has a 2 DB Nf) In the meantime, I did locate a unit on a website from an outfit called Radio Astronomy Supplies (<http://www.setileague.org/hardware/preamp.htm>) that has 16 DB of gain and a Nf of .35- .37 DB! Now, this is a significant improvement and will get the self noise down to a level that should make some naturally occurring Hydrogen line signals readable. Also, I was able to locate a good beginning spectrum analysis software package called

FFTDSP for analyzing the data. Located on the SETI website at: <http://www.setileague.org/software/software.htm>

This package is produced by Mike Cook AF9Y and provides a 2 Hz resolution from 300 Hz to 1500 Hz. The display is continuous with many nice features for identifying particular signals. While not as fine a resolution as some other packages, it is a good starting point for checking out the radiotelescope system. As a result, I now have the compete systems up and running with the original 1420 Mhz preamp and the downconverter mounted on the feedhorn at the dish. In this way I am feeding a 2M signal over the coax run to the shop location, instead of the 1420 Mhz input, and experiencing very little signal loss. In the shop, I have a 2M/10M downconverter driving an HR 2510 10 Meter rig with the audio output fed to an 8 ohm resistor. The 2510 audio bandwidth is sufficient for the range of the spectrum analyzer software. My computer is a 486 with Windows 3.1 and a Sound Blaster board (required by the FFTDSP software). The output of the 2510 across the 8 ohm resistor is wired to the input port on the Sound Blaster card. In addition, I have an astronomy software package "The Sky" installed for monitoring object locations. I have had the system running for a couple of weeks, learning how to use it. One big problem is trying to do the "end to end" test by providing a 1420 Mhz signal at the dish. My old HP generator is not very stable at 1420 Mhz, so I have had to check the system in pieces. I am still trying to get a precise frequency calibration so that I will know the actual received frequency within 100 Hz. The crystal on the local oscillator on the 1420/2M downconverter at the dish is subject to some variation with temperature, so I am also considering adding a small light bulb to keep the crystal at a reasonably constant temperature. I'll continue to check out the system until the new really-low noise preamp from Radio Astronomy Supplies comes in within the next two months. This has been a very wide-ranging learning experience, including building with SM devices, building a 1400 Mhz feedhorn for the dish, and even designing and building the control and elevation indicating circuitry for the dish. As mentioned in a previous article the elevation is controlled by an old TVRO actuator- I have already had one freeze up on me and blow a power supply, so Murphy is waiting everywhere! As you might expect at this point, I haven't seen any "signals" from out in space yet, but I've recorded a lot of noise!

In the bigger picture, the Seti League now has 101 privately owned radiotelescopes in various stages of operation. We are all doing independent testing and data gathering at this point. Ultimately, the plan is to develop software and a systems to gather in continuous streams of data from a large number of radiotelescopes to be processed and analyzed to see if any interesting signals show up. Each radiotelescope will, in the future, be assigned an elevation to search so that each of us will be constantly looking at a little sliver of the visible universe. The goal of the Seti League is to eventually have 5000 such dishes distributed around the earth. By using cross-correlation and other mathematical schemes in the analysis process, we can synthesize a very large array of radiotelescopes viewing segments of the sky with an apparent diameter approaching 8000 miles. Even this may not be enough to really dig out distant signals and it may take years to even get to this point, but if we don't try, we will never know if there are other intelligent beings out there!!

73, Bill

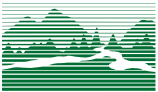
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