



March 2011

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Mark Pride, K1RX,
k1rx@arrl.net

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Mike Thomas, W1GEK,
w1gek@arrl.net

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Dick Cooper, W1MSN,
kb1pxe@comcast.net

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kb1qpn@hotmail.com

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aa1ca@arrl.net

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Igor Kosvin, N1YX,
n1yx@arrl.net

Roger Thompson, K1PV,
k1pv@arrl.net

George Rinalducci, N1YI
n1yi@comcast.net

Alternate Board Members:

Neil Collesidis, AA1SB,
aa1sb@arrl.net

Kriss Kliegle, KA1GJU,
kliegle@myfairpoint.net



The monthly newsletter for the Port City Amateur Radio Club

PCARC can be found on the web at <http://www.w1wqm.org> and <http://www.yahogroups.com/group/pcarc>

Presidents QSO - By Mark K1RX

Hello PCARCers!

Welcome to Spring in New England (well almost)! I am lucky enough to be writing this while on vacation in Florida with the grandkids (no, not Disney World but another nice place that is warm with NO snow). The March meeting annually opens the door to the club membership to bring in your favorite wintertime project or idea you are planning at your ham shack for the spring or summer. After battling the high winds, heavy snow and a few broken wires this season, it has given me cause to start on some projects now that will make it easier for maintaining antennas in the future. It has been a long time since I have seen over 3 ft. of snow in my backyard and this year, leading up to a few contest weekends, I needed to get out to the base of my tower (where relays are housed) to do some troubleshooting – way too much work - now thinking about better ways to make repairs and not have to wait until the snow melts. Bring your show and tell project to the meeting this Wednesday, March 2 to share with others – it is always a fun time.

We have another lovely meal planned (Mike is bringing Chipolte to the meeting!), so come early, put in your donation and enjoy your fellow members company.

73, Mark, K1RX

Sandwich Sled Dog Races 2011 - By Derek KB1LXX and Jerrie KB1OMQ

A few weeks ago "Mr. Cliff" Cliff Dickinson N1RCQ sent out an e-mail soliciting volunteers for the Public Service Event, Sandwich Sled dog race's to be held on Saturday February 19th . After talking it over with Bill KB1EOF and the wife KB1OMQ I decided to submit my name. Jerrie was unsure if she would be working that day, but as it turned out she was able to make it. In the week before the event "Mr. Cliff" sent out instructions, maps and frequencies to use. As there had been problems with intentional interference in past years we were asked not to mention the frequencies on the air, we would use Tactical references only, R1 and R2 were the two repeaters to be used with R1 used for talk in. TAC-1, 2 & 3 for the simplex channels. We would be using mainly simplex for the event so I decided to improve the range of the HT by the addition of a "Rat Tail" or counterpoise, which worked quite well even at the furthest part of the course. With all the radios programmed, extra batteries and extra clothing for the extreme cold that was forecast we were ready to go.

Saturday morning came early! We were on the road at 5:30AM for the 80 + mile trip to North Sandwich unsure of what the road conditions would be. High winds, snow fall and slippery road conditions as we got further north. We were able to listen in to the chatter on R1, and checked in when we reached the Country Store in North Sandwich at 7:30: AM, half an hour early! We were told to go inside the store, where breakfast and coffee was available, go to the back, down the stairs and into the briefing room. By the appointed hour about a dozen hams had arrived, one couple all the way from Danbury CT. We were briefed by Cliff on our duties and assignment folders were passed out with all the required info. Cliff closed the meeting with the suggestion that we should all be good dog catchers. I thought he was only joking, but as it turned out we were!

Our first assignment was to assist at site #6, the trail came up to the road where the teams had to turn left, cross a bridge and then turn right, continuing on the other side of the river. One problem with sled dogs is that the like to run straight ahead and there are no reins to steer them with, only the Musers voice commands. Our job was to make sure they made the turns by blocking the other possible routs with our bodies crouched, arms out stretched. This worked with all but one team and it was not easy to get them turned around and back on the right track. Our other duties included calling

Next Club Meeting March 2nd 2011

Sandwich Sled Dog Races 2011 continued - By Derek KB1LXX and Jerrie KB1OMQ

in the numbers of the teams as they went through to net control and keeping a check off list. We were also traffic control and shovelers of snow to repair the bare spots on the road. After several teams had gone through we had a moment of real excitement, a runaway dog team. We were able to stop the dogs and sled, call in the problem to the net and dispatch a snowmobiler to rescue the Musher. With Musher and team reunited they were able to continue. At 10:30 it was time for Jerrie and I to move on to station #10, which was at the furthest end of the 45 mile course. Frost heaves and snow covered dirt roads made the going slow, but we made it in time. This station was relatively easy, the teams went straight across the road, so traffic control and team reporting was all that was required. It was a beautiful sunny day but cold and very windy. The wind chill finally got to Jerrie and she retreated to the car to call in the information whilst I checked on traffic and chatted with the Roving Ham who stopped to have lunch with us. Fortunately this post was uneventful and when the Ham on the snowmobile who was trailing the last team gave us permission to leave.

We headed back to the start/finish line where we hoped they would have a Porta-Jon. At the finish we were able to talk to several Musher about their day and dogs. Teams were from all over the North East, and surprisingly the majority of the Musher were female. We both agreed that it had been a great day out, with some stunning scenery and new friends.



Figure 1: Runaway Team



Figure 2: Dog Catchers!



Figure 3: Skijor

Additional images at:
<http://www.rickzach.com/sandwich2011>

Electronics Today Part 2 - By Igor Kosvin N1YX

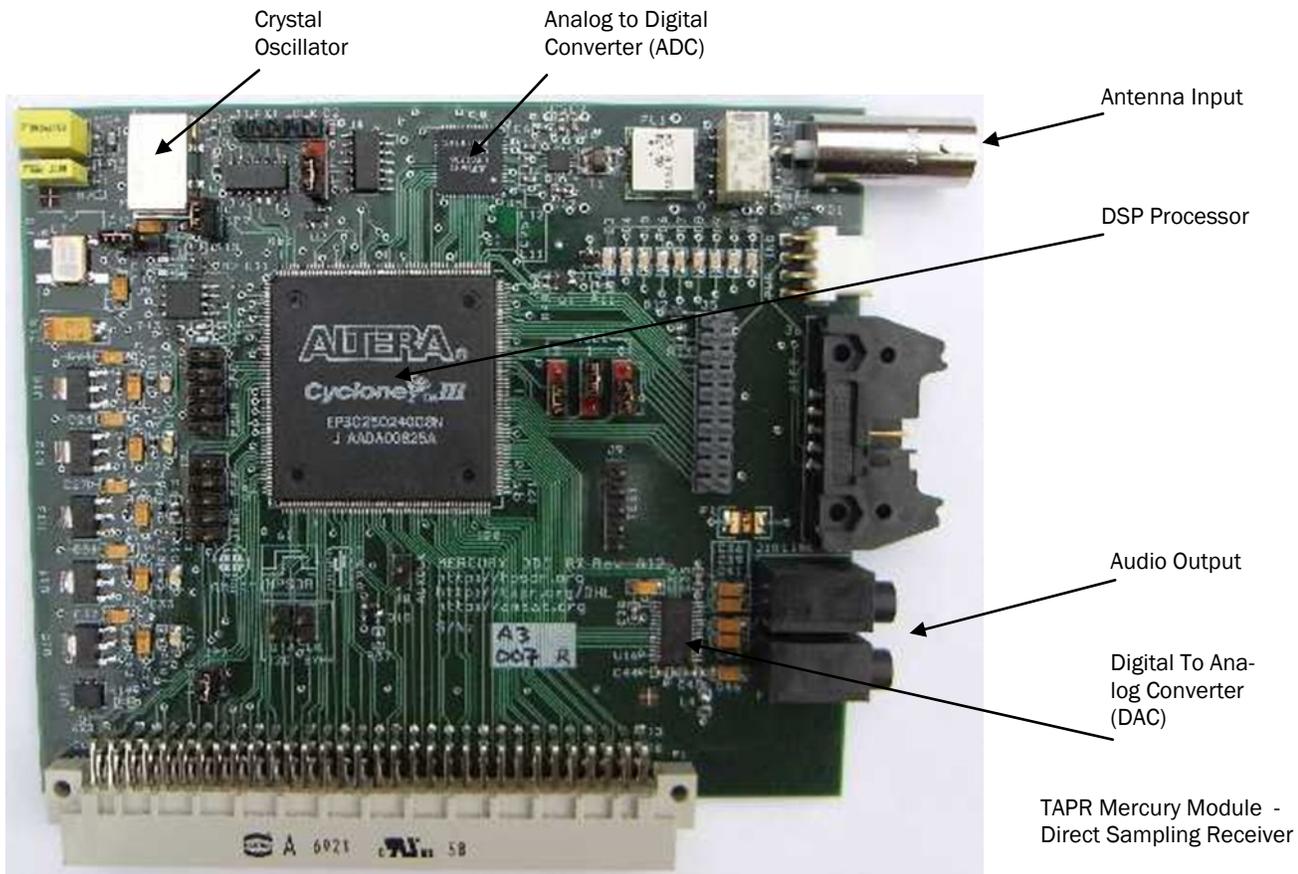
Many of the readers found my drivel interesting. So, here is another one for your reading pleasure.

DSP or not DSP?

That is the question! Many of us heard this magic abbreviation. We even know that DSP means "Digital Signal Processing". We also know that some of the best radios on the market use this technology. But what it really does? We all know about microprocessors that are widely used for automation and control. Also we all know about computer processors and even know to compare them by frequency, bus speed, number of cores etc. So, what puts DSP processors in special category? Can't, for example, computer

processors do Digital Signal Processing? The answer is not simple. To answer this question one need to learn more about Digital Signal Processing.

When we talk about quality of receiver, what comes to mind as the most critical component? The answer is: mixing and filtering. Why? Mixing is necessary to convert the received signal to defined intermediate frequency (IF), so the signal can be filtered (to leave only wanted signal) and de-modulated (carrier removed) so we can hear the original signal that operator of transmitting station wanted us to hear. When we talk about analog mixing and filtering, the main manipulation of the signal is multiplication. I could bore you with formulas proving this, but I better ask you to take my word for it. Every stage of analog mixing and filtering adds noise. Plus, due to limitations of electronic components, the characteristics of mixing and filtering are limited as well. For example, if you need to attenuate QRM on 10 MHz that is 50Hz away for 40dB, the conventional filter will require minimum 9 inductors and 9 capacitors with values that are absolutely not practical to build. Even if you build this filter, it will be very unstable - temperature, electromagnetic fields, smallest vibrations and time will change it characteristic and it will be size of at least 4" by 3" by 2". Digital Signal Processing solves this problem. The voltage of electric signal is converted to stream of numbers by using special component called Analog to Digital Converter (ADC). Then, the stream of numbers is manipulated with special algorithm in DSP processor, and finally another special component - Digital to Analog Converter (DAC) converts it back to analog signal to be forwarded further. So, instead of bulky and imperfect discrete components, all we need is to multiply, add and divide some numbers. If tomorrow (or next minute) the filter needs to be changed to different bandwidth or different spectral shape, all that need to be done is to change few coefficients in the software and new filter is ready. Easy, right? Well, while DSP technology is a huge breakthrough, it has some limitations as well. The main limitation is related to the process of conversion from analog domain to digital and back. The quality of processing is tremendously dependant on how fast the input analog signal voltage can be measured, or sampled, and converted to numbers. Obviously, higher the frequency of the input signal requires faster sampling. In fact, the absolute slowest sampling rate requires being at least twice the frequency of input signal. So, sampling speed is very important. Once you have the number, it is time to do all these operations (mixing, filtering) to calculate the output. Fast conversion will not help if the processor power is not adequate. So, the processors used for DSP have to be extremely powerful. Building components (ADCs, DACs DSP processors) capable to work at very high speeds is very challenging and these components are expensive. But, the benefits of this technology are tremendous. Actually, the Tucson Amateur Packet Radio group (TAPR) developed amateur receiver that sampling directly the whole range from 100 kHz to 55 MHz with single ADC and very powerful DSP processor. The ADC/processor used in this design works with sampling range of 122.88MHz! See http://www.tapr.org/kits_merc.html for more information.



TAPR Mercury Module - Direct Sampling Receiver

Continued...

Port City Amateur Radio Club

Port City Amateur Radio Club
P.O. Box 159
Greenland, NH 03840-0159

2m Repeater: 145.150 PL: 123.7
440 Repeater: 444.40 PL: 100
Web site: <http://www.w1wqm.org>

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Amateur radio is an exciting hobby that can provide a lifetime of enjoyment. Radio amateurs or "hams" communicate around the neighborhood and around the world using state of the art equipment and antennas.

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Electronics Today Part 2 continued - By Igor Kosvin N1YX

So, can your PC processor do DSP processing? It can, but the capabilities of PC based DSP processing is very limited. Why? First, your average PC does not have good ADC and DAC. The only PC peripheral that has ADC and DAC is sound card, with sampling rate of 44 kHz. How about processor in PC? With all the 2.5 or more Giga Hertz of speed it should be fast enough, isn't it? Well, the PC processor is designed to perform long array of various tasks: interface with memories, control big number of peripherals, etc. It is not specifically designed to do complex arithmetic operations with big numbers. Yes, the clock speed can be very high, but to multiply two 32 bit numbers, PC processor needs high number of clock cycles so the number of multiplications per second is not that high. Introduction of Dual Core processors improved the performance of PC processors, but it is still not good enough for serious processing at high sampling rates. In comparison, one of the leading DSP processors from Texas Instruments (used in modern amateur radios like Elecraft K3) multiply two 32 bit numbers in one cycle at over 100 MHz sampling rate. It uses 8 arithmetic cores! On other hand, though, the peripheral and memory control capabilities of this processor are very limited in comparison to PC processors.

Next License Exam Session - By Deuce N1YI

Date: 04/30/2011

Sponsor: Port City ARC

Time: 2:30 PM (Walk-ins allowed)

Contact: George F. Rinalducci (603) 231-1392

Email: N1YI@COMCAST.NET

VEC: ARRL/VEC

Location: Piscataqua Fish & Game Club
198 Tuttle Lane
Greenland NH 03840-9999