The Driven Element

February 2020

The Driven Element is the newsletter of the Guelph Amateur Radio Club.

President's email	ve3sld@gmail.com
Website	www.garc.ca
Newsletter	rvwebb@rogers.com

Nets

FM Monday night net at 7:30 pm local time on 145.210 (negative offset)

70 cm. SSB sideband net, Friday at 9 pm local time on 432.210

6-meter net Tuesday 9 pm local time on 50.170

Upcoming Events and Meetings

Monday February 17 at 7:30p.m.- Meet at the Firehouse on 50 Wyndham Street South for a tour.

Monday March 16- Meet after 7:00 pm at Wellington Brewery on 950 Wellington Road West for a 7:30 tour

Monday April 20- Meet 7:00 pm, at regular spot for club elections and talk by Ted Rympa, VE3TRQ, on JS8 digital mode.

Saturday April 25- Last year of Rotary Club tree planting

Sunday May 3- MS Walk

Monday May 18, Victoria Day- Meet 7:00 pm, at regular spot for a talk by Phil, VA3QR, on our club project Mesh network. This will cover how it works as well as how we can make use of it in amateur radio.

President's Message

From the Pres:

Our group is off to a fantastic start for the new year. I would like to thank the Professor (VE3PVB) for his demonstration of the WolfWave

Advanced Audio Processor, as well as the contributions of the rest of the group. I also felt the movie regarding amateur radio in emergency situations was very relative in the shadow of accidental release of an ALERT regarding the Pickering Nuke plant, during a training exercise. We have a full schedule for the rest of our Club year. This coming February 17, 2020 meeting, we will be touring the Guelph Fire Department Headquarters at 50 Wyndham Street South. I ask everyone to meet down at the Firehouse at 7:30 pm sharp for the start of the tour. Richard (VE3HTU) and myself will firstly go to the normal meeting place to redirect any members that missed the notification, and will leave that site approximately 7:10 pm to meet our group for our tour. Our March 16, 2020, we have a returning favourite. We are going back to the Wellington Brewery, at 950 Woodlawn Road West. The tour and tasting will begin at 7:30 pm, with our members arriving any time after 7 pm. Again, I ask you to travel directly to the event, as there is no need to go to the union hall first. Ted Rympa, (VE3TRQ) is our guest speaker for the April 20, 2020 meeting, and will do a presentation on the JS8Call digital mode. May 18th, Victoria Day, Phil (Va3QR) will serve as our program. Phil will speak on our Mesh Networks Club Project. He will update the members on our progress, explain the working of the system, and explain what each member of our group would need to set up a Node at their home. Remember that April is also our Elections for the Board of our Incorporation and your Executive Team for the GARC. Mark the dates April 25, 2020 for the last Rotary Tree Day and May 3, 2020 for the M/S Walk. I would like a good turn up from our group for both these events.

Barry D. Brousseau C.E.T.

VE3SLD President of Guelph Amateur radio Club

Minutes of Last Meeting

Guelph Amateur Radio Club – Regular/Annual General Meeting – 2020-01-20

Regular Meeting Convened: 7:01PM

Roll Call:

Minutes – VA3QR displayed the minutes on the screen for the membership. VE3QB moved, VE3KCY seconded that they be accepted. Motion carried.

Treasurer's Report – VE3ML presented the report to the membership. Currently club has $9892.14 in the bank. Since the last report, we received our share of the Central Ontario Hamfest: $824.00. Insurance premiums for $312.19 paid. VE3MKY moved and VE3WBE seconded that the report be accepted. Motion carried.

Community Service – VE3SFW spoke about the last Rotary Tree Planting in April of 2020, which will coincide with the centennial for Rotary in Guelph. The signup sheet will be brought to the February meeting to ensure we have ample volunteers as we will be doing road crossing this year. The MS Walk will be on May 3, 2020 (a Sunday). VE3SFW asked for a show of hands to determine whether we respond in the positive, and enough showed to ensure the event will be properly staffed.

QSL Manager – VE3WBE has sent all VE3IFF QSLs have gone out.

Repair Committee – VE3JVC was unable to attend, but there is nothing to report

Club Nets – VE3PVB is not running the nets anymore. It has been suggested that a roster be setup to spread out the NCS responsibilities. VA3QR will speak about this more when it comes to website information.

Technical – VE3PVB spoke about SDR Console working with one of the RSP-1A or RSP-Duo, and that there is a "learning" noise removal algorithm that can be used to remove noise from any received signal. SDR Console is freeware, and is updated every 2 months.

Repeaters – VE3SLD reports that the repeaters are running relatively well, but it appears that the Fusion repeaters wouldn't go into digital modes after a few months and that they require a reboot.

RAC Update – VA3QR spoke about the current status of the regulations (366/09).

Examiner – VA3QR gave an exam on January 17th, and he passed with honours.

Elections – VA3QR spoke about how all of the club executive and corporate board of directors will come up for election at the April 2020 meeting, and that volunteers who would be willing to stand for office should get a hold of VA3QR over the next couple of months.

Website – VA3QR spoke about how the website will be created in a Wordpress platform format, and the domain and site will be hosted by VA3QR (and will not cost anything, as it will go on his existing corporate services).

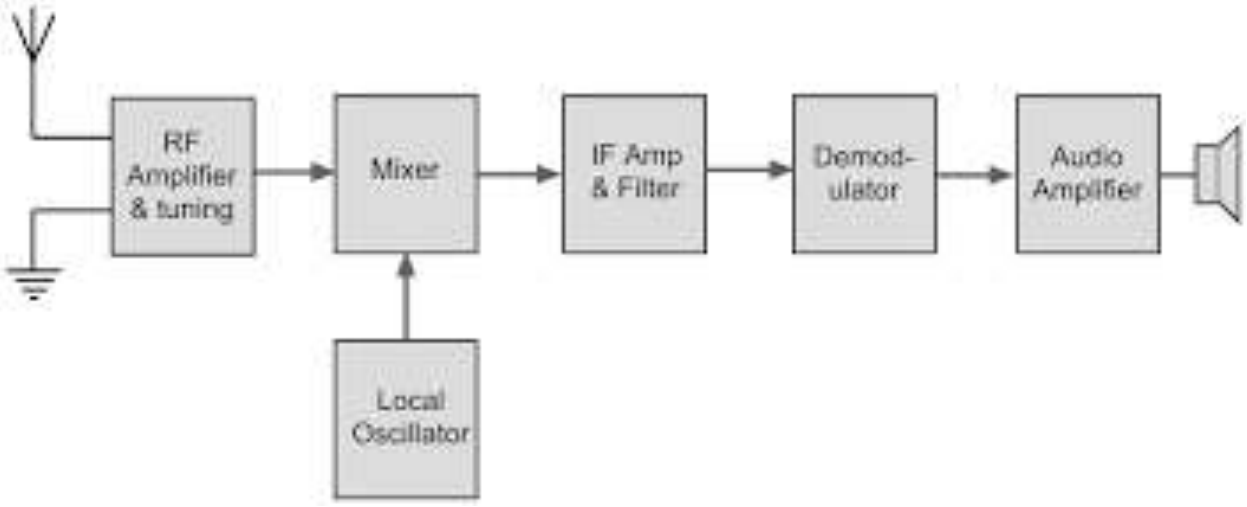
Adjournment – VA3QR moved and VE3MKY seconded that the meeting be adjourned at 7:28PM. Motion carried.

The club went around the table where members spoke of/showed off their current projects, and VA3QR showed an NBC piece on Amateur Radio pertaining to the Hawaiian accidental missile alert.

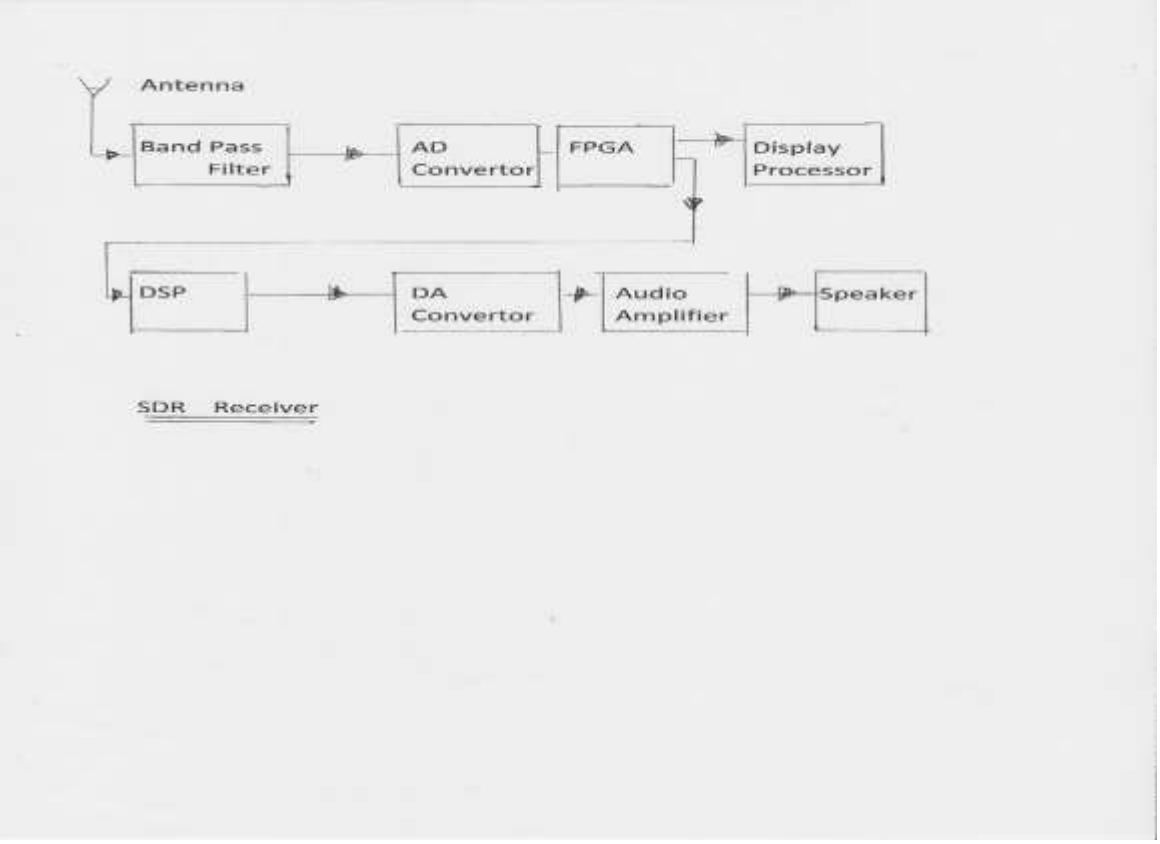
Radio Wanderings

Software defined radio

We are all comfortable and familiar with the standard block diagram for an analog receiver.



The SDR, however, is laid out differently as signal processing is done in the software.



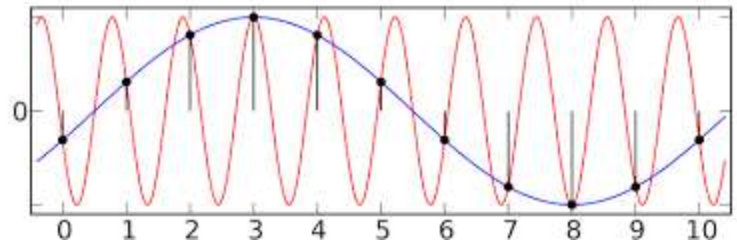
In SDR, software defined radios, software is used to perform some, often all, the functions of the radio. Most often operating on a generic hardware platform the software modules perform modulation, demodulation, band width changes, filtering, DSP and frequency selection. This allows a high level of performance that can be be altered by changing the software. Different software with the same hardware gives us a different radio.

SDR are rated in sampling frequencies and bits as this establishes the dynamic range of the radio. In an analog radio we are dealing with a signal that is a continuous function of time while in digital radio we have samples, a sequence of values in time. Sampling is the process of converting a continuous signal into a sequence of values.

As the AD chip became faster the SDR radios no longer needed a mixer and now do direct sampling of RF. This direct sampling needs fewer parts and modules, is cheaper, more reliable, simpler and gives higher fidelity.

The Nyquist theorem states that if the highest frequency of a signal is B Hz the sampling rate must be higher than 2B Hz in order to accurately capture the signal. If the AD (analog digital) convertor of an SDR allows signals above half the sample rate in or creates them in the digital system we get false signals or aliasing. This aliasing gives distortion that cannot be corrected. This is most often caused by overloading the system. These false signals are dealt with by an anti-aliasing, low-pass, filter placed before the AD convertor.

Aliasing can also occur if the sampling rate is too low and allows a high frequency signal to look like, be an alias of, a low frequency signal.



Aliasing

Signal processing occurs in the FPGA and there are new techniques such as dithering, oversampling and decimation for improving performance. Dithering is adding noise to an incoming signal which will mix with spurious signals to make them random noise. Decimation is decreasing how often the signal is sampled which reduces the complexity of calculation. Oversampling increases how often we sample and gives performance gain and increased dynamic range.

Processing requires time which adds to latency and current consumption which adds heat. For prototyping or small volume runs FPGA – field programmable gate array – devices are used. These are integrated circuits made up of programmable logic and programmable interconnections. The FPGA does the modulation, demodulation, filtering, bandwidth selection and frequency

selection. For high volume production ASIC, application specific integrated circuits, are used but their high setup costs keep them out of reach for small production volumes.

There is then splitting of the signal to display processing and also to the DSP, Digital Analog conversion, amplification and audio output path.

This technology is maturing and well worth a look. A reasonably priced introduction is the RSP1A for around $149 from radioworld or ebay.

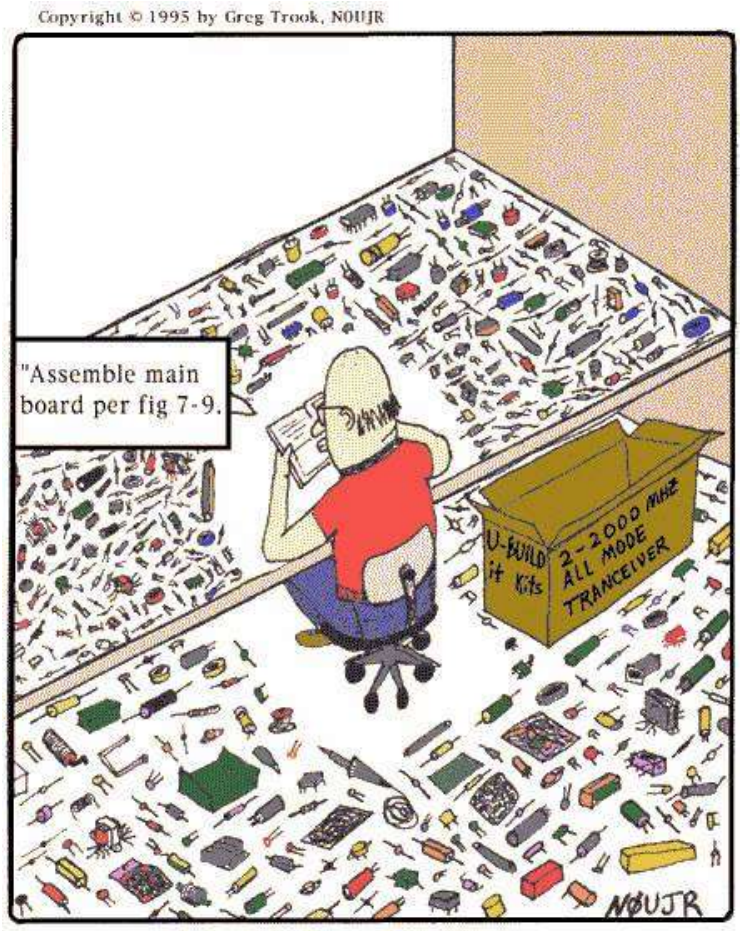
For more information

1. SDRplay website
2. Youtube on SDR by SDRplay, Robert Nagy, Dave Casler,741

Ron Webb VE3WBE

For Sale/Wanted- Please let me know what classic items you have for sale, what you want for it and any contact information

Spurious Emissions



Kit fun.

73

Thanks to the executive for arranging our meetings and events as well as keeping the club moving forward. With the upcoming elections there is a chance to have a larger role in the direction of the club in the future so please consider this and speak to Phil McBride if you are interested.

Please also consider taking a turn at running the Monday FM net. It is good experience for special events or ARES situations.

Ron Webb VE3WBE