

Member Newsletter

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The latest news from your digital radio society

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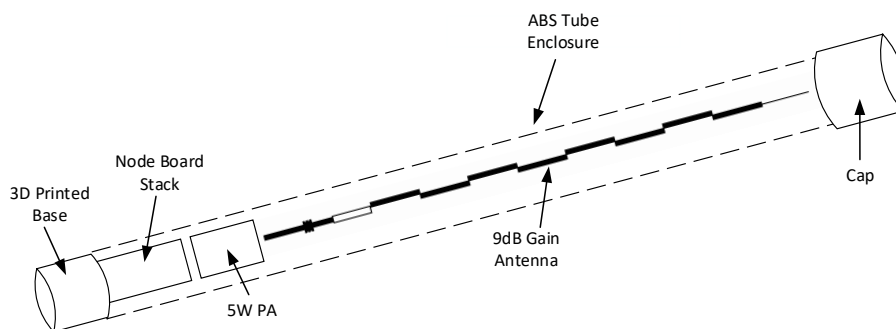
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Annual General Meeting

Nov 28th, 2025, via Zoom



The next evolution of the IP400 node

President's Message

- Garvin Cole, VE6GFC

Over the last three months we have come a long way forward. Our flagship project, IP400, has been funded by Amateur Radio Digital Communications (ARDC), a California-based foundation with roots in amateur radio and the technology of internet communication. We are pleased with their support and feel that their confidence in us as an organization is a strong validation of our mandate.

I am pleased that our IP400 project has also captured the interest of several highly skilled Amateurs with backgrounds in RF architecture and signal processing, PA development and OFDM. Once again, this is a strong validation of our IP400 project and the mandate of our Society.

The picture above shows the new 'power node' or outdoor version of IP400 mini node, that includes an amplifier and integrated antenna. This was one of the announcements we made during our participation in the Zero Retries conference in September. I was pleased to present at this conference and receive such positive feedback.

As always, we have some exciting times ahead and I continue to be proud of our progress.



What's going on

The grant from ARDC has been completed, and the funds are now in the bank. The next phase of the IP400 project, to develop the high speed modem for repeater use, is now under way.

The grant conditions required that we make a bylaw amendment, which was successfully passed by the membership.

ADRCs presented at the Zero Retries Digital conference via zoom. A statement was made by the granting organization that our IP400 project was 'exactly the type of project that they want to fund'. This indicates that we are on the correct path to map out our future work and will be able to apply for more grants as time goes on.

Two new development were announced during the conference, the successor to our first node, and the outdoor 'Power Node' version.

The course material for the digital fundamentals course has been drawn up, and a venue has been found. Courses will begin in the New Year, attendance can be local or remote, using Microsoft Teams. A signup page will be posted on the website.

From the Board of Directors

Martin Alcock, VE6VH, Secretary

The special meeting of the membership to amend the bylaws was held on August 21st. There were two proposed amendments, one was requested by the grant procedure for the disposition of assets to a charitable organization on the dissolution of the society, the second to amend the term and appointment procedures for the board of directors. Each now has a 3-year term, be an Alberta resident and must hold an advanced licence, due to IC licensing requirements for club callsigns. The amendments were passed by the membership present unanimously and take effect immediately.

A director may voluntarily resign during the term, but as the bylaws state there must be a minimum of five and an odd number, so the board may appoint a candidate on a temporary basis until the next election. We regret the resignation of Tim Hubbard, VA6TH, from the board and thank him for his service. Jerry Spring, VE6TL, has been appointed to round out the required numbers.



Membership Update

Our annual general meeting is set for November 28th of this year. An agenda and zoom link will be posted to all members one week prior to the meeting. It is amazing how quickly the time flies, as the 3-year term for the current board terminates at this meeting.

The candidates for election to the new board will be circulated with the meeting agenda. Also, a reminder that memberships expire at the end of December of each year, to renew click the 'join' button on the website. Annual dues are \$25 CAD.



IP400 Project Update

Martin Alcock, VE6VH

The development of the next generation of the mini node is under way, to enable outdoor deployments with higher power. A 3-board stack has been developed, with the addition of an ethernet controller which supports power over ethernet (POE) and is compatible with the previous power injector. A 5W power amplifier is being developed, which is the same that is being investigated by the M17 project, and a 9dB gain coaxial collinear antenna is included that was developed by Mike Martell, N1HFX. The node is encased in PVC tubing which can be purchased from any hardware store, and the antenna is built from RG58 coax. The board stack is pre-built, but the enclosure and antenna are not.

With the ARDC grant in place, the development of the next generation digital controller is under way. We have decided to do this in two phases, the first phase will create a single board audio digital signal processor that can provide full repeater control or operate as a companion to an existing controller, which also adds a new enhanced digital mode based on the MMDVM-TNC project. The processor will take the form of a raspberry Pi HAT which augments the functionality of Allstar for linking and additional processing.

The second phase will be the development of the high speed OFDM modem, which connects to a raspberry Pi with a USB connection, which is required to achieve target data rates. The modem will accommodate the audio signal processor and provide the same functionality as in the standalone HAT mode, including the enhanced data mode and high speed modem. A fallback version that will work in the 900MHz band is also being planned.

The MMDVM-TNC (multi-mode digital voice modem terminal node controller) was developed by Jonathan Naylor, G4KLX, as a next generation mobile digital mode. It is based on an adaptation of the DMR (Digital Mobile Radio) protocol, including more robust data transmission schemes that include forward error correction, and an improved layer 2 protocol called IL2P, developed by the Terrestrial Amateur radio packet network (TARPN). The native mode delivers 9600bps and can be adapted for repeater use. A prototype has been developed using hardware from Zum radio, and a code base has is now in place. A companion TNC for mobile use will be announced in the future, which will build on the original work that was done but will provide a WiFi hot spot for a phone or tablet, as well as a KISS-compatible serial port.

Repeater News



Our planned deployment of the next 900MHz repeater has been delayed due to unavailability of some components, and oncoming inclement weather. We will revisit this in the spring, by which time we should be able to deploy the first audio signal processor and introduce the new enhanced data mode.

Our other two 900MHz repeaters will also be upgraded, we have purchased two more 100W power amplifiers, and TKR901 repeaters to replace the original TK941s that were used. This repeater from Kenwood requires a new module to tune the synthesizers to the amateur bands, originally pioneered on a raspberry pi Zero by Neal Reasoner, KB5ERY (SK). The pi zero has effort been replicated on a dedicated STM32F103 microcontroller, which will be used instead. The result of the upgrades will be ubiquitous coverage on 900 MHz in the local area.

In addition, a remotely operable power controller has been prototyped that implements four DC switched ports using a microcontroller and latching relays. The controller connects to a control computer using USB to implement a serial port, and responds to a simple command set to view status and turn ports on or off. This will be offered on our website at a future date.

Other Projects

The IP400 developers are busy with several projects that will enhance the network. One project in progress implements an interface for GStreamer to the mini node, which presents a set of exciting new capabilities for audio and video. More information about the capabilities of GStreamer can be found on its website.

Another project has created a ping capability for the node, which is assisting in tuning the turn-around time to get the best performance of the node.

We thank these members for their contributions and value their input to the project.

Building on the new mini-node development, a new version of the Pi Weather receiver, called Mini-Wx, is under development. This is also a 3-board stack, which uses an SA818S VHF receiver module and adopts the new POE ethernet controller. We expect to deploy them next month.

Feedback

We are always interested in hearing feedback from our membership, please use the contact form on the website to submit your ideas, they are always welcomed.

