# Member Newsletter

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The latest news from your digital radio society

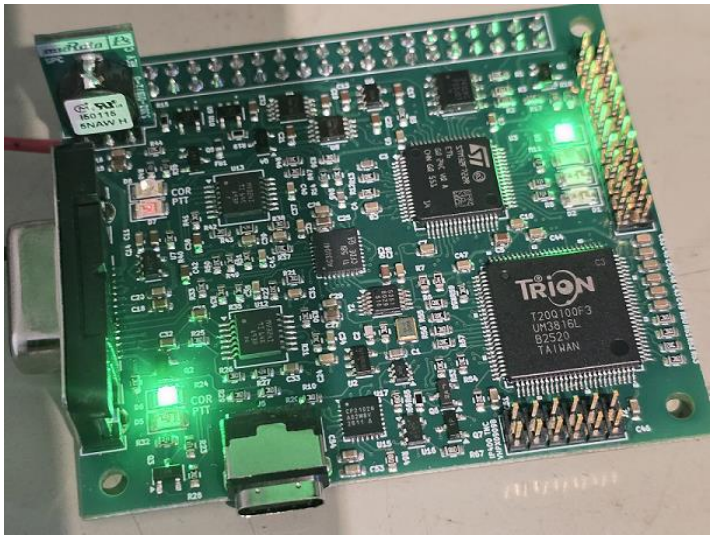
**INSIDE**



**UPCOMING EVENTS**

**ZRDC Conference, San Ramon, CA**

**October 2026**




*IP400 Advanced Mesh Network Controller (courtesy Mike VA3TEC)*

# President's Message

**- Garvin Cole, VE6GFC**

We have made significant progress on our IP400 project since our last newsletter. I continue to be delighted with our team's progress as each time I view the status I am greeted with more and more tasks marked complete. The dedication to our project and our hobby from our team is truly amazing. When we started the IP400 project we made some bold statements and I understood that there were some who doubted. We knew, that although the tasks were not easy, we had a fundamental grounding in the concepts and the underlying technology that would make the project successful. IP400 mesh networking does breathe new life into older repeater systems; and IP400 does provide increased data speeds no matter which radio or band is used.

We are engaging a partner who has both manufacturing and distribution capabilities, a volume build is being scheduled around part availability, and we expect that will be announcing it at the Zero Retries Digital conference in October.

# From the Board of Directors

Martin Alcock, VE6VH, Secretary and CTO

The Board met in May of this year and reviewed the governance in place for the IP400 project, which was funded by ARDC. The control mechanisms for expenditure authorizations are working correctly, and the financial statements balanced both to the bank account and the authorized expenditures.

The board awarded Mike Kennedy, VA3TEC of Orleans, Ontario, and Nino Carrillo, KK4HEJ, honourary memberships for their outstanding work on the IP400 OFDM-AB project. Contracts with our design service providers have been renewed for another year.

It was decided that publicity for the IP400 project would commence in August, and we will be making an appearance at the ZRDC conference this year, and Hamvention in 2027.

# What's going on

The AREDN upgrade has been completed and the network is now up with the new firmware. It has been stable for the last 4 months. Sadly, not all stations came back, so if you were previously on the network and have not upgraded, please do so and rejoin.

The mesh map on the PNW information site has been taken down, as the crawler that gathered the information did not support the new protocol. Instead, it now links to a map at the AREDN site that has the same information.

Two builds have been successfully carried out at our manufacturing partner. The quality of their work was excellent so we will be engaging with them for all builds in future.

Unexpectedly, the PI Zero 2 that we needed for the power node is not currently available, so that project has been postponed indefinitely.

We are getting closer to the first release of the new hardware platform. Final firmware integration and lab testing is ongoing, and we are working on the best way forward to engage our manufacturer.

# Membership Update

Membership is open to any licenced amateur anywhere in the world, however board positions, due to local legislation can only be taken by Alberta residents. Applicants for board positions must have been paid up members for at least 2 years, or have participated in at least one of our projects, such as the AREDN network or IP400 project.

# IP400 Project Update

**Martin Alcock, VE6VH, Chief Technology Officer**

Phase 3 of the IP400 project is almost complete, which introduces both new hardware and firmware. The hardware, called the Advanced Mesh Network Controller (AMNC), connects to any radio and utilizes a new communication mode called 'OFDM-AB', which raises the bar with data speeds previously never realized, while preserving all the mesh networking capabilities of its predecessors.

OFDM (Orthogonal Frequency Division Multiplexing), is a technique that uses several carriers to send data at the same time, instead of a single carrier. OFDM-AB is a creation of society members that uses the audio range of a transceiver, which is independent of the band or on-air transmission mode. It can operate on any amateur band from 10m to 1296MHz, utilizing FM on air. Connection to the radio, for lower data rates, is through the microphone and speaker connections, or for higher speeds, a dedicated data port.

Four different audio bandwidths have been designed into the firmware, from a narrow band mode that works with the old clunker that you purchased at the flea market for $5, up to higher end radios that have wider and flatter passbands. Data rates are dependent on two factors: the audio bandwidth and subcarrier modulation. In the narrowest bandwidth they vary from 2.6K to 19K bits/sec, in the widest from 7.7K to 57K bits/sec. The subcarrier modulation scheme utilized is dependent on the signal to noise ratio at each end.

The OFDM-AB modem has been integrated into a new release of the firmware that was previously deployed on the mini node, now re-released as the Unified Firmware Platform, which has now can support interchangeable modems and will be the basis for future platforms. The firmware is open source and can be downloaded from the GitHub repository.

The Advanced Mesh Network Controller is a single circuit board that can work in a standalone mode or be mounted on a raspberry Pi as a HAT (Hardware attached on Top). In the standalone mode it uses a USB connection to a PC, which can be PC or Linux based, to implement a serial port that can connect to popular data packages that utilize the AX.25 KISS protocol. Software packages such as BBS systems and Winlink can be employed in this mode.

In the HAT mode it not only has the KISS interface using the Pi UAR/T, but also a Serial Peripheral Interface for higher speeds. Also, in this mode it provides an audio path from a second SPI that interfaces with the popular Allstar software, using a custom driver. Any existing repeater system can now be upgraded to now have a data mode as well as audio, and the two modes can co-exist as the repeater will not key on received data messages, and transmitted messages will not open the squelch on a remote radio if a PL tone is utilized. There are two radio ports on the TNC, which could be used independently for repeater and data radios.

All the features that were designed into the previous firmware have been preserved, including sending beacon messages, maintaining a mesh table with routing information, a chat mode as well as 'ping', or echo mode to test the quality of a link. An optional GPS receiver can be added in the mobile environment for position reporting, and with the AX.25 interface it is now possible to do SMS messaging or Winlink e-mail using existing radios, concurrently breathing new life into ageing repeater systems and making mobile data practical

A compatible version of the power node will be released at a later date, pending some redesign effort.

# Repeater News

VE6CQM in High River has a new antenna system that has improved is coverage area dramatically. It has a pending upgrade to install of a 100W power amplifier.

VE6IPR is going to be rolled out with the OFDM data mode, and an interconnection to the AREDN network. It will be the first of its kind to extend the network to a mobile station using high speed data and the wideband OFDM mode.

A data link over the AREDN network connects VE6CQM and VE6IPR together with a digital voice link, and a server on the network provides a gateway for position reporting, SMS messaging and remote e-mail. Eventually both repeaters will have data capabilities using the new OFDM data mode.

# Other Projects

The Pi Weather receiver has been relegated to the archives, as the serving system is no longer operating in this country. New systems can be deployed still in other countries, but the functionality is now frozen, and no further development will be done. Existing systems will be supported to end of life.

The Mini-Wx project has been put on hold indefinitely, due to lack of resources and availability of the Pi Zero that it required.

# Publishing Dates

Our year begins in November, so the newsletter will be published in February, May, August and November. The November issue will contain information about the Annual General Meeting.

# 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.