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Jann, DG8NGN, won a Yaesu FT1DR.



George, K9TRV, won an ICOM IC-80AD.



Gerald, K5SDR, won a Kenwood TH-D72A.



John, W9DDD, won a FlexRadio Systems FLEX-1500

President's Corner

DCC: Let's do it again!

By Steve Bible, N7HPR, TAPR President

The 2014 installment of the ARRL-TAPR Digital Communications Conference (DCC) in Austin was one of the most successful DCCs on record, so much so that one DCC veteran suggested, "Let's do it again!" And so we will — in September in a location east of the Mississippi River yet to be determined.

There is nothing like being there in person, but if you missed the 2014 DCC, you can experience part of it by way of the published proceedings presented at the conference, which you can order from

http://www.tapr.org/pub_dcc.html

TAPR would like to thank the following equipment makers for donating the prizes that were awarded at the DCC Banquet: Flex, ICOM, Kenwood and Yaesu. TAPR would also like to thank the hams in the Austin area who helped organized and supported the 33rd ARRL-TAPR DCC!

And if we missed you in Austin, we hope to see you in Dayton for "the real big show" also known as Hamvention!



###



TR-Plus T/R Switch kit available

By John Ackermann, N8UR

A few months ago, I posted a note to the High Performance Software Defined Radio Discussion List that I was working on a transmit/receive switch that would support the signal routing requirements for use with Pure Signal adaptive distortion. I'm happy to report that TAPR is now taking orders for the TR-Plus switch kit.

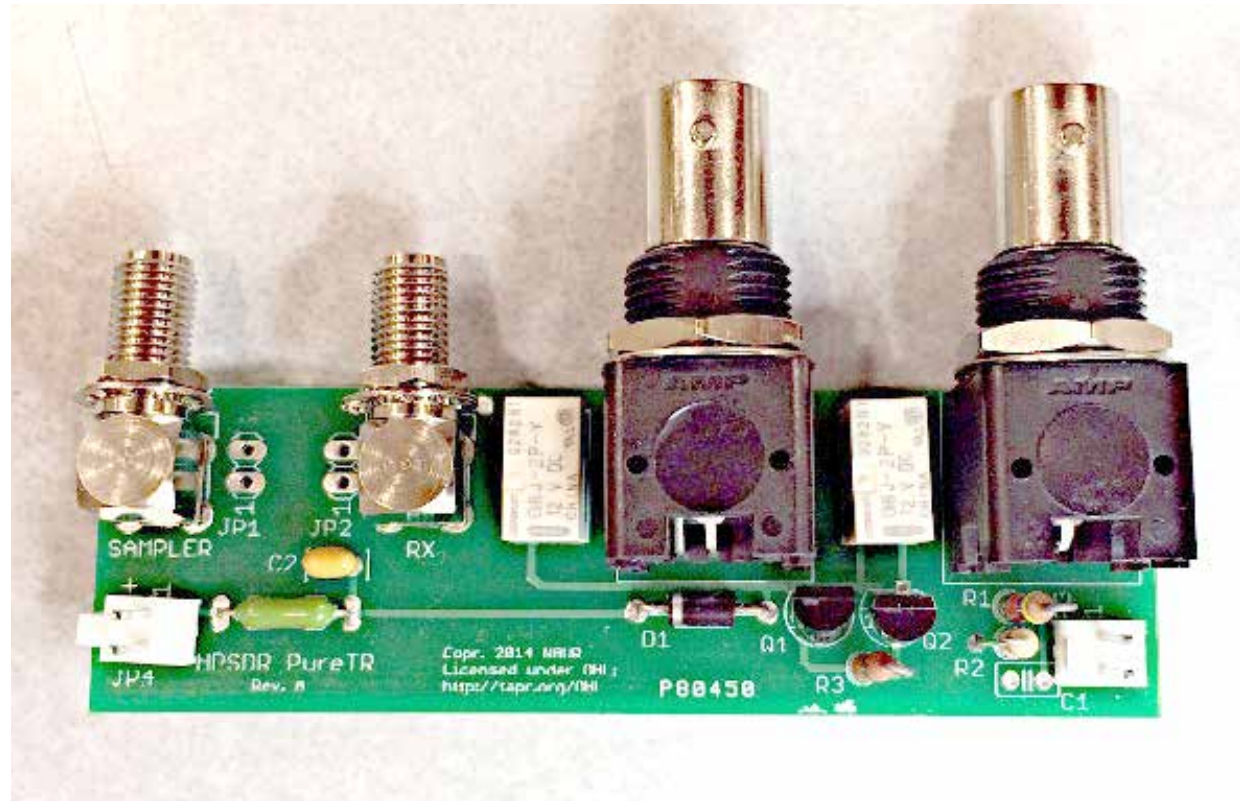
TR-Plus is an external switch with two relays and signal connections for a receiver, transmitter, antenna, and – critical for Pure Signal work – an RF sampler input. It's built on a 0.75 x 3.00 inch PCB and uses through-hole parts.

TR-Plus is not limited to use for Pure Signal – it also works as a general purpose T/R switch and requires only 12 volts and a standard ground-on-TX keying signal. It can be used, for example, to switch a Mercury/Penny pair, or with any 100W class receiver/transmitter combination.

The price is \$44 for TAPR members and \$49 for non-members. We expect to begin shipping in mid-February. You can order TR-Plus kits now from http://tapr.org/kits_trplus.html

There's further information on the TR-Plus (most of which will eventually be in the assembly guide) at <http://www.febo.com/pages/hpsdr/TR-Plus>

###



Hermes J16 Breakout Board (HBO) kit available

The HPSDR Hermes transceiver board has a 26-pin connector on the rear panel that provides access to several audio and digital signals that users may want to access when integrating the board into their complete station. These include PTT, amplifier key-out, and audio inputs and outputs, as well as digital inputs and outputs.

Since the connector is designed to interface to an IDC ribbon connector, getting to the individual signals is a bit messy. The Hermes Breakout Board (HBO) is designed to address that problem.

It is a very small (1.25 x 1.5 inch) board with a 26 pin connector on one end, and five 3.5mm (“1/8 inch”) stereo jacks on the other. These provide:

Right speaker output (Hermes already has a separate jack for the left speaker)

Headphone output

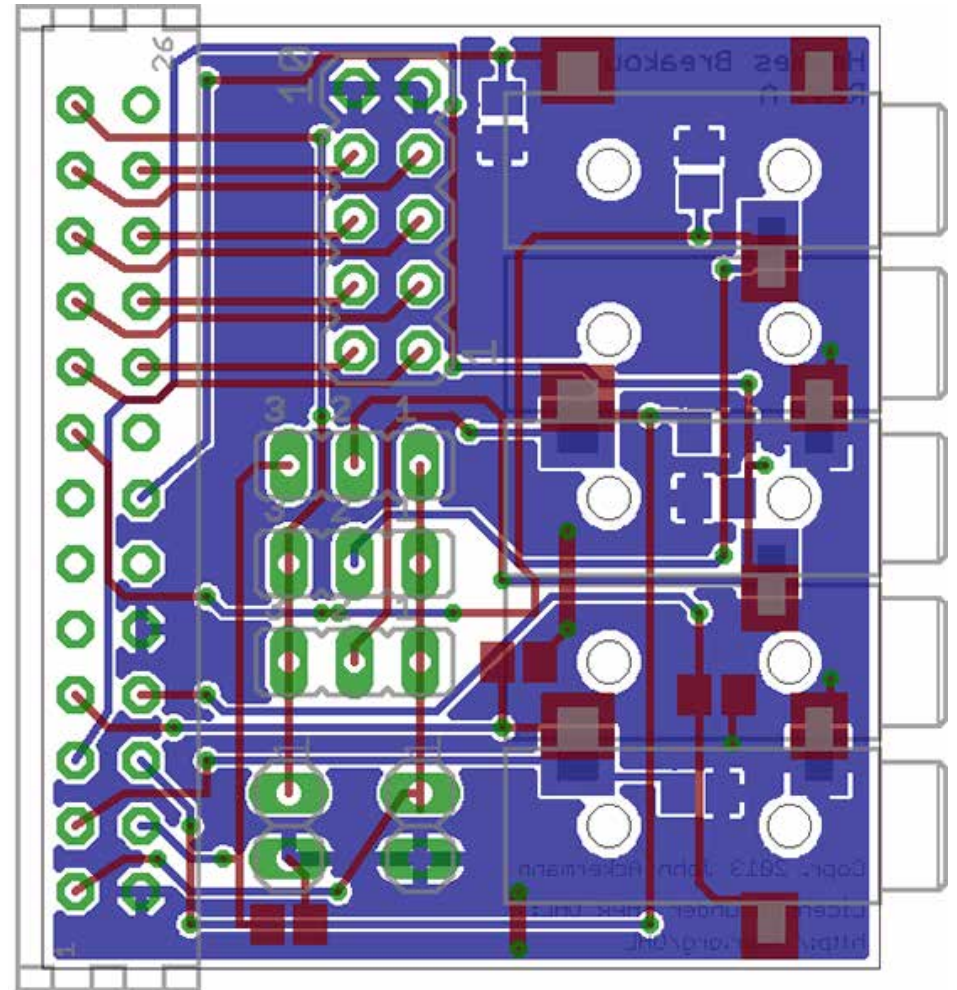
Line-level output

Line-level input

PTT In and Key Out

Headers on the board provide access to the seven open collector control outputs, which can be used to drive antenna switches or other control systems, as well as additional PTT and key-out points. Because of size limitations, the board does not provide access to the user analog or digital inputs, which are not currently supported in available software.

The price is \$25 for TAPR members and \$28 for non-members. For more information and/or to order HBO, visit http://tapr.org/kits_hermes_breakout.html



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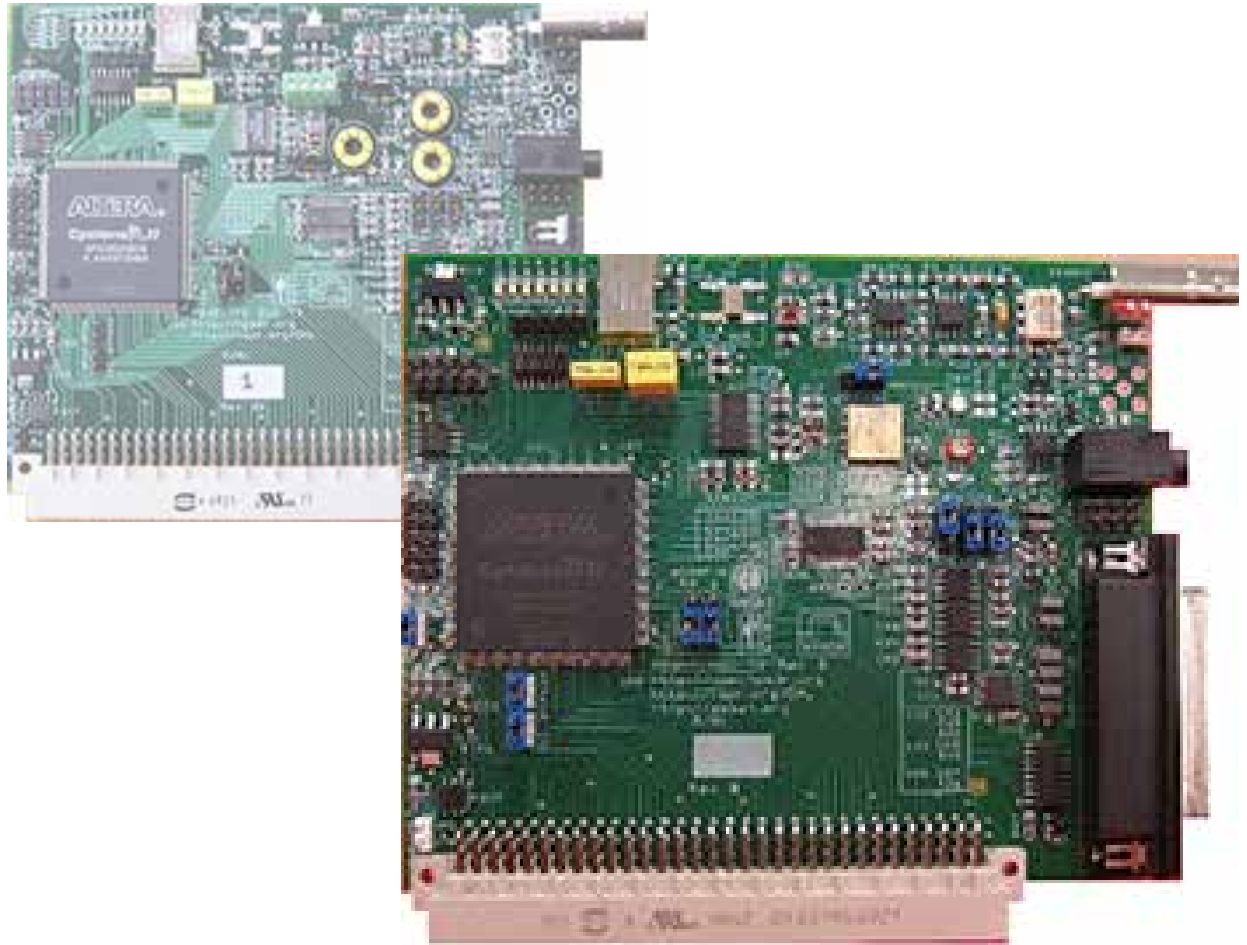
Penelope for PennyLane Trade-In Program

This is an opportunity to upgrade your Penelope board for the PennyLane board. The way this will work is that a person will place an order at the regular PennyLane price. A return authorization will be provided with the PennyLane when it is shipped to you. When the Penelope is returned in satisfactory condition to the TAPR office, a credit of \$150.00 will be issued to you.

The program is currently limited to residents of the US, sorry.

The price for the PennyLane Trade is \$399 US for members of TAPR, \$399 US for non-member plus shipping/handling if applicable. Visit http://www.tapr.org/kits_pene-trade.html for more information and to participate in this program.

###



Speaking at the DCC...



Bryan, K7UDR



David, W2LNX



Ed Gonzales



John, K7VE



John, W7FU



Chris, KD2BMH



Gary, KN4AQ



Graham, KE9H



Jann, DG8NGN



Ken, W6HHC

Speaking at the DCC...



Tom, N5EG



Stephen, N5AC



Scotty, WB2DFI, and Bruce, K6BP



Mel, K0PFX



Matt, N2MJI



Larry, WR1B



Kenneth, W6WWF



Steve, N7HPR

TAPR Board Meeting Minutes

DCC, Austin, TX, 4 September 2014

Board members attending: Steve Bible, Darryl Smith, John Koster, Tom Holmes, John Ackermann, George Byrkit

Guests: Laura Koster, David Witten, KD0EAG

Meeting started at 9:00 AM with general introductions.

The board began a discussion of the bequest of the late John Stephenson, which involves a \$25k bequest, along with hardware, software, test equipment, etc. to support an OFDM mesh network modem.

Election of officers

Stephen moved that all officers continue in their current positions. All current officers have agreed to continue to serve in their current positions: Stephen as President, Jeremy as Vice President, Stana as Secretary, Tom as Treasurer. The motion was seconded and all present voted in favor of the motion. All officers were re-elected to their current positions.

Office report of John Koster

A discussion occurred where a general consensus was reached that the stock of parts kept in Oklahoma should likely be moved to better control, and likely liquidated in part. It includes 'thru-hole' components, TNC-2 parts, and other things. Joe will be here this weekend for DCC.

Is Atlas bus dead? All Alex RX boards are sold. About 25 Alex TX boards remain. We discussed a small kit of Alex-TX board, case, and a jumper cable for the RX, to take advantage of the T/R switch built in to Alex TX.

Moved by John Ackermann: acquire the parts to offer an Alex TX board, plus enclosure, plus RX jumper cable to be sold as a complete 'Atlas system TX filter and T/R switch' kit. And that the office manager will be authorized to set the selling price without further board action. The goal is to sell at or slightly above cost. Seconded by John Koster. The vote was unanimous in favor of the motion.

Moved by John Ackermann: offer the Alex RX bare board + RX toroids. No explicit support would be offered by TAPR. Some support on the forum would likely be available. Price to be determined by the office manager. Seconded by John Koster. The vote was unanimous in favor of the motion.

John Koster reported that he got the first shipment of Hack-RF boards, pre-ordered at the Dayton Hamvention. Motion by Tom Holmes to buy 10 Hack-RF boards, to sell from stock. Second by Darryl Smith. All voted in favor.

John Koster reported that the TAPR laser printer seems to be failing. He will dispose of it if replacement of the seemingly failing part fails, and procure a replacement.

John Ackermann spoke to the point of getting rid of excess PennyLane boards by offering a Penelope trade-in program. We have not yet moved forward on the process. John moves that we offer a trade-in program where for \$150.00 you trade in your old Penelope board, with \$150, and receive a PennyLane board. This removes the tie-in with developing code for WSPR beaconing. And the plan then is to sell the Penelope boards that we receive for \$150. The president has the discretion to lower the price to promote unit sales. Limited to current stock of PennyLane boards only. Seconded by John Koster (again!) All present voted in favor.



TAPR Board meeting in Austin, (left to right) Steve Bible, N7HPR, John Koster, W9DDD, John Ackermann, N8UR, George Byrkit, K9TRV, Tom Holmes, N8ZM, and Darryl Smith, VK2TDS.

John Ackermann moved to have TAPR establish an eBay account, a PayPal account, as a seller, and begin by offering the T2-Mini unit. Seconded by Darryl Smith. Motion was approved unanimously.

The age of the group's database (Access '97 with VBA front-end) was discussed. How to move forward? How to make it more maintainable? How to keep costs down? Darryl Smith will work with John Koster to see what our needs are and propose how best to meet the expressed needs.

Mark Thompson Skyped in to discuss holding the DCC in Chicago in 2015. The concept would be likely to use the Hyatt at Schaumburg, Ill. Also the Elk Grove Holiday Inn is a possibility. Hold in conjunction with

the W9DXCC conference, just after that conference.

John Ackermann reported on the mailing list and the 'Demarc' problem. AOL and yahoo made some changes that were designed to minimize spam emails. Much work was required to upgrade server software for Febo (time nuts). The problem will be also considerable to upgrade the TAPR server. John hopes to be able to involve Jeremy to do this process on the TAPR servers. John doesn't have the energy or courage to do this upgrade.

Tom Holmes reported on the treasury. Inventory has been reduced due to sales. Current assets approx. \$154,000, down from approx. \$175,000, year previous. No great revenue due to big HPSDR projects. Comments

and concerns: still spending more than taking in. Need to look at the value propositions on various expenditures. We can survive for the foreseeable future, but need to work to reduce inventory, get members to keep renewing memberships, and produce new products.

John Ackermann began to discuss new products/projects: John proposes to build a simple T/R switch with 2 relays that would allow it to be used for PureSignal purposes. It would be usable also by Alex/Pandora users. It will be a 1" x 3" board. The proposal is to make 100 boards and buy parts for 25 kits. Consensus is that you can sell 100 of anything, so build 100 kits of parts. George moved to authorize John to build 100 boards and 100 sets of parts, call it what the market will accept. John to be reimbursed for reasonable R&D costs. John Koster seconded the motion. All voted in favor. There is a long delay on relays, so they should be ordered quickly.

Scotty Cowling arrived and made a brief presentation at the board meeting. He has been speaking with Phil Harman about the Cuda Jetson TK1. Scotty proposes making a mini-PCIe card or better a PCIe card with the RF components on it. AD 9361, 70mhz to 6ghz, in 65mhz bandwidth chunks, 2x 12 bit ADC and 2x 12 bit DAC. More information is needed before the board can proceed.

More free-format discussions about TAPR and its future and future mission ensued.

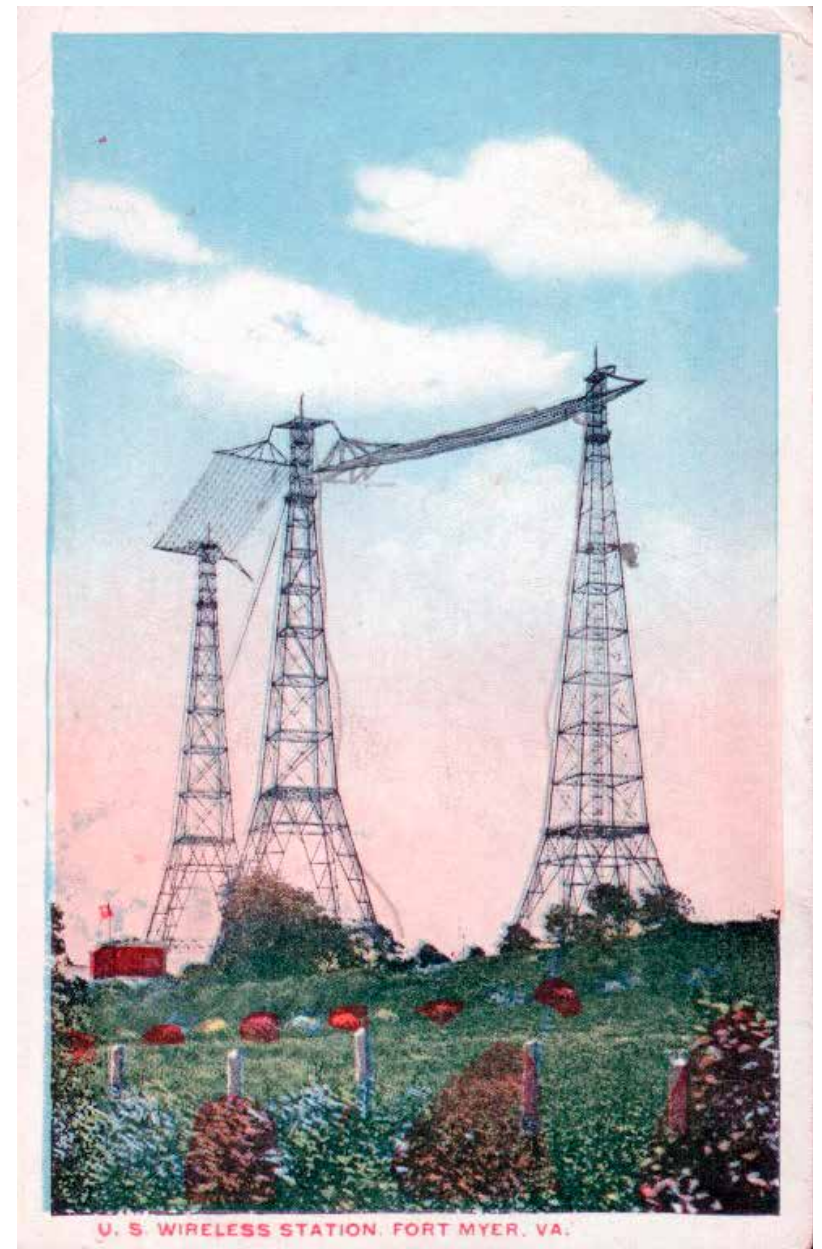
The meeting concluded at 4:30 PM.

Respectfully submitted,

George Byrkit,

Acting recorder

###



TAPR Annual General Membership Meeting Minutes

DCC, Austin, TX, 6 September 2014

Meeting scheduled for 4:00 PM, but was called to order by Steve Bible at 3:30 PM.

Board members present: Steve Bible, Darryl Smith, John Koster, Tom Holmes, John Ackermann, George Byrkit

Tom Holmes, Treasurer, presented the Treasurer's Report to the members. Despite decreasing sales, Tom is cautiously optimistic on our position. He would like to see some more new products/projects to generate more revenue.

Those board members standing for re-election to the board this year:

Stana Horzepa, WA1LOU

Steve Bible, N7HPR

Darryl Smith, VK2TDS

A motion was made to close nominations, with no other nominations besides those who are standing for re-election. Unfortunately nominations are traditionally left open until the end of DCC.

The death of John Stephensen was announced, and his bequest of \$25,000 to TAPR, along with the Intellectual Property relating to his OFDM mesh network modem that he has willed to TAPR.

Chris Testa, KD2BMH, made a brief presentation on the status of the Whitebox project.

John Ackermann spoke about his new project, "Pure T/R", a T/R switch.

The people were asked for a critique on this current DCC. The chief complaint was that transportation wasn't supplied by the hotel, taxis

were expensive.

The meeting adjourned at 4:58 PM.

Respectfully submitted,

George Byrkit,

Acting recorder

###

Directors Election

Three TAPR director positions were open for election in September 2014. The following three incumbant directors chose to run and since they ran unopposed, they were declared as Directors for another three-years: Steve Bible, N7HPR, Stana Horzepa, WA1LOU, and Darryl Smith, VK2TDS.

###

Third ARRL Computer Networking Conference

By Darryl Smith, VK2TDS

The complete archives of DCC papers are now online on the TAPR Web Site – www.tapr.org/dcc. At the moment this is individual papers, although we are looking at making available one PDF for each DCC as well.

By the time of the Third ARRL Computer Networking Conference held in Trenton, New Jersey in 1984, the proceedings had reached over 130 pages. Once again the conference was coordinated by Paul Rinaldo, W4RI.

As Packet Radio started to mature, a lot more effort was put into the protocol side of things. Terry Fox wrote papers on a Review of the ISO Reference Model, showing how Packet Radio fits into the now well known Seven Layer model. He also presented a series of four papers that make up a recommendation for AS.25 at ‘Layer 3A, the Network Layer’. Whilst a lot of effort went into the Specifications, I don’t think it was ever formally adopted and implemented.

Lyle Johnson, WA7GXD, produced a paper describing an ‘Enhanced Terminal Node Controller’, a subject many authors would return to over time.

“During 1981-1982, a self-contained Terminal Node Controller was developed. During the period January through June 1983, over 170 pre-assembled TNC’s were placed in more than 19 sites world wide for testing and evaluation”

“The testing revealed many things beyond the evaluation of the TNC; primary among this list is the finding that non-technically oriented Amateurs were both interested in packet radio and capable of placing a Packet station in operation”.

Think about that for a minute – 170 units pre-assembled tested in 1983,

and this was getting non-computer people into digital modes. According to the paper, this was known as ‘The Beta Board’, and used a 6809. With 6k of RAM, 24k of EPROM and 64 BYTES of NVRAM.

Even back then, people were already talking about running speeds greater than 9600 bps.

Lyle also produced a paper describing his thoughts on AX.25 Level 2. By this time there were over 700 TNC’s in the field. One of the thoughts that struck me was how AX.25 had been designed to not be susceptible to any single point of failure. Even today, parts of the cell phone network still go down due to issues with Home Location Registries.

Finally, Lyle talked about the Oscar 11 Packet Experiment. The experiment is still occasionally working, although the batteries on the satellite are rather unwell. Not bad for a 30 year old satellite.

Whilst AX.25 enjoyed significant success, Douglas Lockhart, VE7APU, proposed “A New Vancouver Protocol”. This was known as the V2 protocol. The paper proposed a number of improvements to the specification, on the basis that the existing implementation at the time was never intended to actually become a standard.

Douglas made the point that when the meeting that resulted in the adoption of AX.25 was made in the USA in 1982, he was not invited. “AX.25 addresses most of the limitations of the Vancouver protocol but is not a true link layer protocol, since it concerns itself with several link level functions as well. It is also undergoing changes at the present time and has it’s own set of problems and limitations”.

Bob Brunginga, WB4APR, the father of APRS, published his first DCC paper. Actually, looking back it seems Bob wanted to catch by publishing

three papers. Whilst future papers would talk about tracking using GPS and Packet, this first paper was talking about HF Packet Radio, and interconnections with VHF. Ever the one to innovate, Bob described not only using phone modems on air, but also using a VIC-20 as a gateway controller.

Bob's second paper looked more at network issues in the North East USA. Whilst other papers had also discussed similar issues and solutions, Bob highlighted the issues that terrain caused packet radio links.

Bob's third paper laid more of the foundations for APRS, describing an event where AMRAD provided assistance for the 100 mile Old Dominion endurance Horse Race around Virginia. Rather than tracking horses, riders or support staff with GPS, Bob used checkpoints with Packet Radio to distribute data. Looking back, it seems obvious that Bob would quickly move to GPS tracking as soon as GPS Receivers became available.

One of the more interesting and insightful papers was from Robert Richardson, W4UCH. Robert died in 2006, and was the author of The Gunplexer Cookbook, and held a patent for a 'Battery Free Remote Radio Transmitter', a prelude to today's RFID devices.

Robert proposed that CPU's replace specialized HDLC and SDLC devices, reporting that a 10 MHz Z-80 would easily work with a 9600 bps synchronous data stream. It took a number of years for this to happen.

He also presented a 'Wish List' for packet in 2000, which included:

- Fully authorized on all low bands 300/600 baud MSK. Synchronous packet totally replaces asynchronous Baudot, ASCII and AMTOR.

- VHF bands using 9600 bps and up. 19K2 bps packet the standard, much like 1200 bps today.

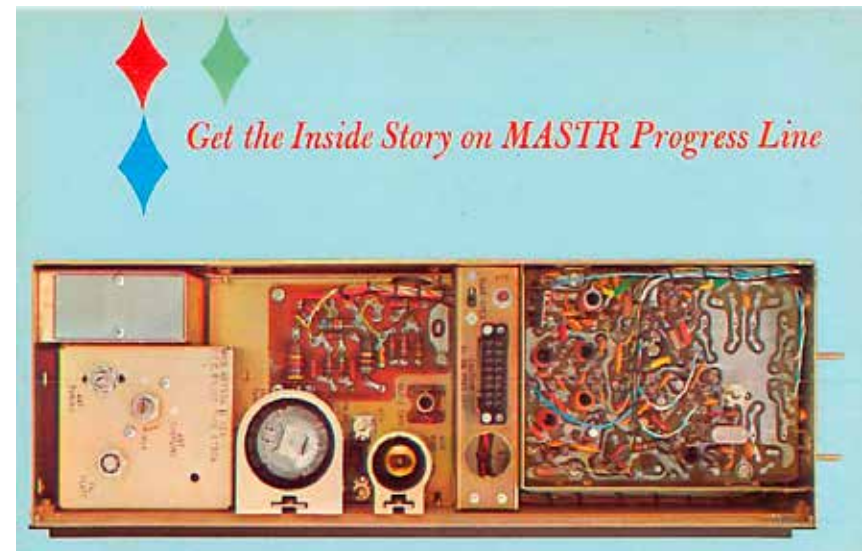
- Low altitude orbit Amateur satellites a thing of the past (like predicting the demise of buggy whips after the automobile went into production)

- The software approach

Sure, not all of them came true, but they were interesting none the less.

He then went on to talk about a 'Third Generation Software Approach' in another paper, which included 12 physical pages of assembler, and a paper on a "Mini-Sized Bulletin Board" with seven pages of assembler. Thankfully we can now distribute software in ways that do not involve printing the source code on.

###



White Space Radio

The next wave in open source packet radio

A series of articles on the technology – a call to the open source community.

By Ivan Reede, i_reede@ruralconnection.ca

President, for AmeriSys Inc., Vice President of the White Space Alliance.

Overview

A new class of radios is gradually becoming a reality. As with many new products, a few years of development is required to make such a new technology a reality. A group of companies, research centers and universities have come together to make this new technology deliver its promises under the name “WhiteSpace Alliance” (www.whitespacealliance.org).

In 2004, the IEEE set forth a new working group, 802.22, whose goal was to write the next generation radio specification. Working with regulators from various countries, the goal was to create a follow on standard for rural areas, a network, much like 802.11 with a radio range extending up to 100 km! A network that would be true non-line-of-sight in the sense that it may be able to go through vegetation better than any other high-speed digital radio. A network of radios that would use radio waves in the vacant white spaces between TV broadcast channels. Some regulators were so impressed by the technology, they coined it with the name

“SuperWiFi.” The WhiteSpace Alliance has called this the “WiFar” technology.

Broadcasters were also interested. Representatives from large broadcaster incumbents became active members of 802.22. Even the National Broadcasting Association pitched in. The result: first, a new

802.22 standard with up to 100km range. In a second time, a new

802.11AF standard! Their critics and help on this upcoming technology allowed the group of 100 engineers to craft an unprecedented radio milestone.

Regulators all over the world are gearing up by changing regulations to make space for this technology. The FCC, after adopting regulations to allow this technology, is still active in improving the regulatory context to allow people to use the TV band whilst protecting the incumbent broadcast industry.

Finally, in 2012, eight years after this effort began, the IEEE published the IEEE 802.22

standard, a first in a series of standards for White Space network radios.

So, why should this interest you, members of the amateur radio community... well, for one, this open hundreds of megahertz of bandwidth you may use... in a band. It supports unicast and broadcast. It promises speeds of up to 22.5 Megabits per second in a single 6 MHz TV channel, 45 Megabits in a couple TV channels. Lastly, a large part of it will be software-defined. One company, AmeriSys, has publicly stated it is building it's first cognitive radio version on an open Linux platform. Although regulators require that some parts of the software not be altered by the end user (which results in closed source hardware level drivers) to protect incumbent broadcasters, most of the software platform above this required protection layer will be open to the community. In fact, AmeriSys (www.AmeriSys.com) is seeking assistance of the open software community and the radio amateur community.

OK, so how is this at all possible.? The main

ingredient in this new radio, to get access to this band is a cognitive radio technology. With this technology, this will be the first commercial radio that becomes “aware” of the radio environment. It senses the radio spectrum environment, it talks to databases, it runs interesting algorithms, all this to make sure it can use the spectrum safely without causing interference to the broadcasters.

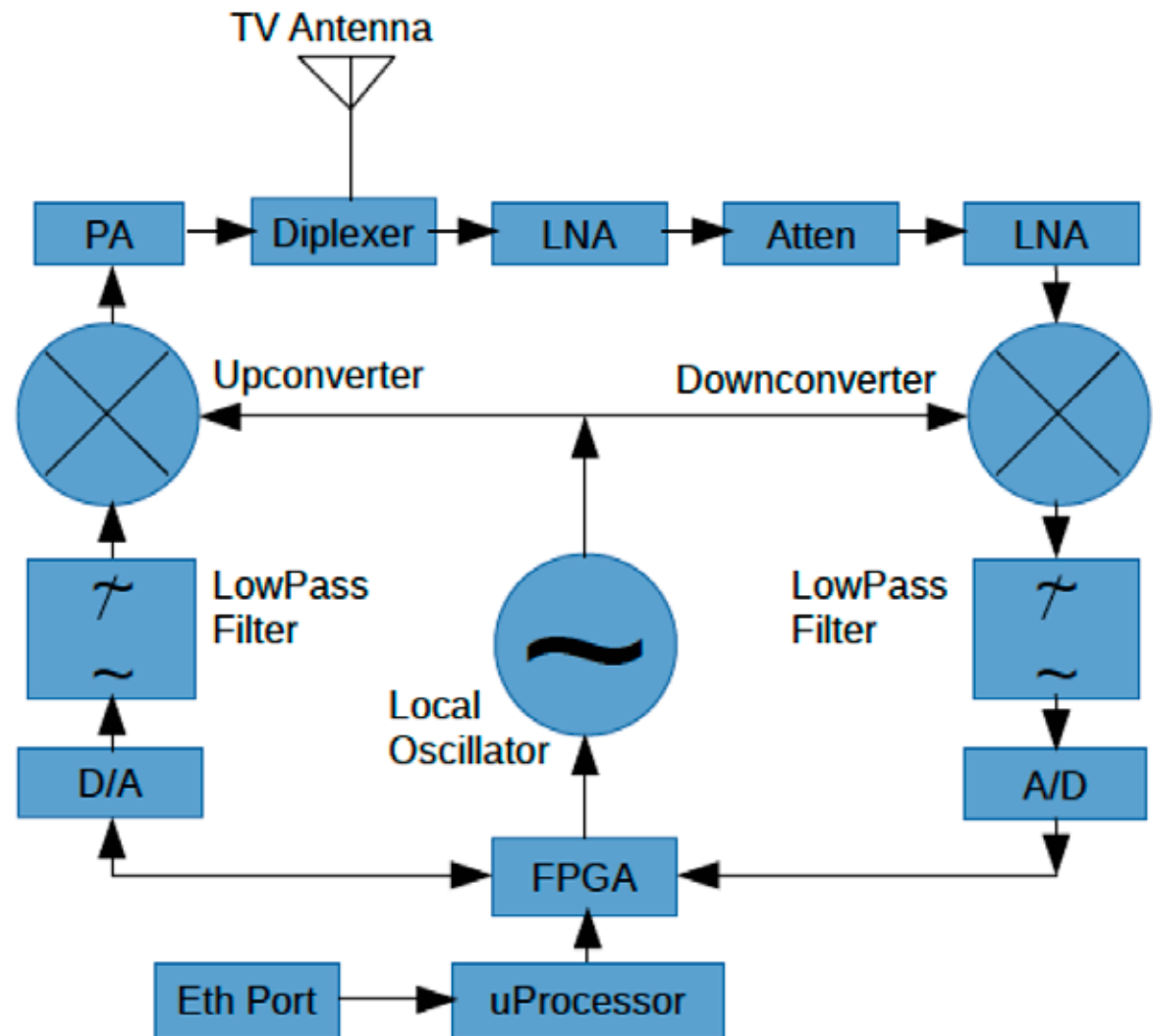
Technology Overview

Well, what’s in this radio? That will be for the follow on articles. For the moment, as an introduction, here’s a couple block diagrams of the OFDMA radio.

First, here’s a peek preview of the hardware (*figure right*):

And now, for the FPGA (*figure on next page*):

So what does this radio technology do that other radio technologies don’t. Well for starters, it has a huge FFT engine. The engine works on a 2048 point fft, that means that the radio actually emulates thousands of modems working in parallel, each transmitting data slowly while the collective yields and impressive throughput. What this also means is each modem, transmitting slowly, can deal with delay spread of the radio wave as it bounces between tree leaves. The FFT was chosen to be as big as practically possible



without have extreme latency. In fact, one can expect a latency of about 3 milliseconds in the transmitter and a similar number in the receiver. That makes for a great user experience with a total latency of about 6 milliseconds.

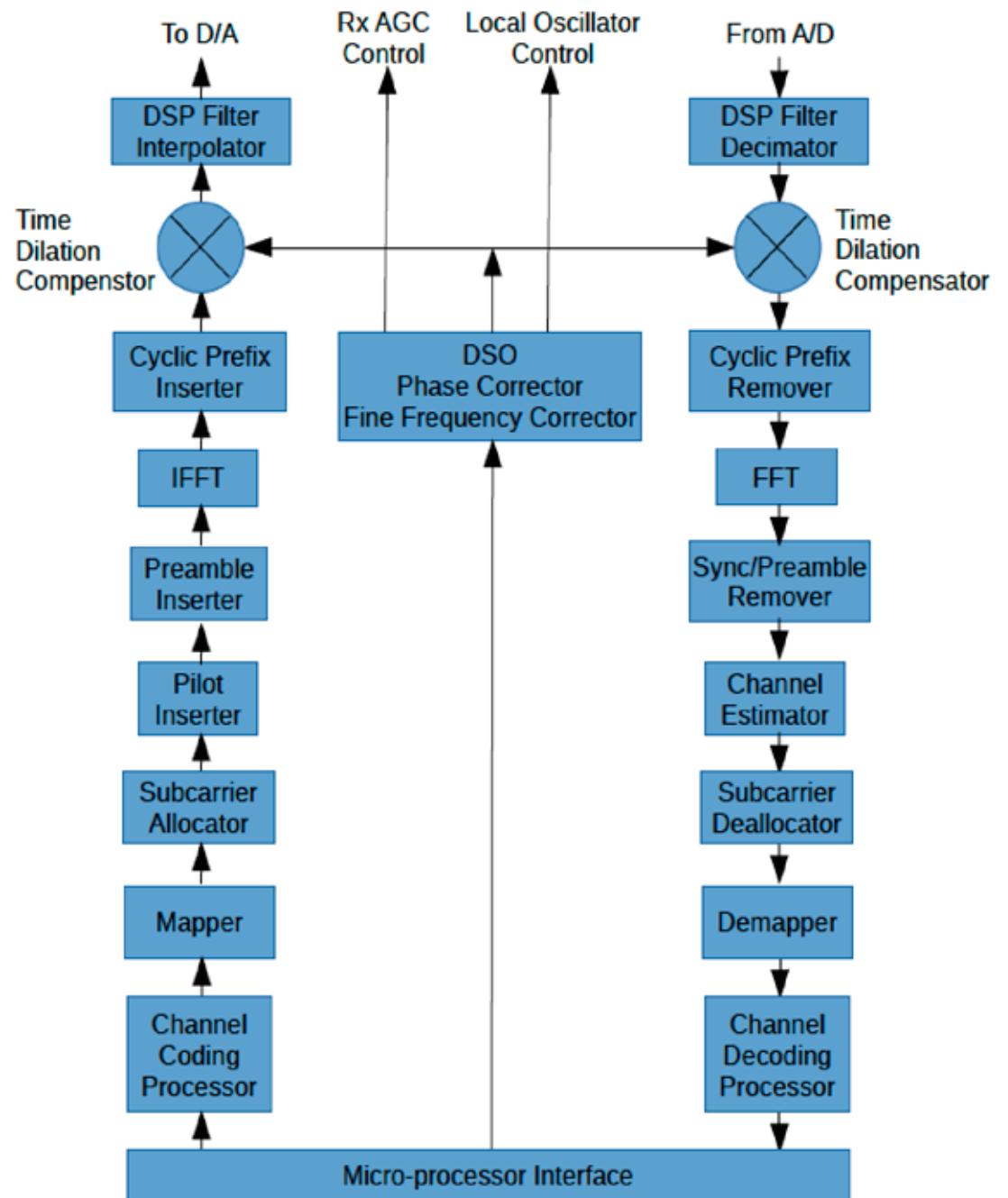
It's a TDMA system like this, all transmissions are scheduled and predictable, therefore streaming services like Voice over IP should work very well. Moreover, it's the first standard that has a built-in broadcast mechanism, therefore this technology could be used for IP-based broadcasting, one of it's major attractions. One could see a system of interactive TV working on this networking technology, or many other types of broadcasting use cases, such as mass software upgrades, sent all at once, to many clients.

The open source community will have a lot of space to contribute here, open source routing, open source broadcasting, scheduling... you name it. The ham radio community will be able to use this technology just like any ham radio, sending out broadcast signals and hoping someone out there hears them and responds. Since the technology is allowed by regulators to operate down to 54 MHz, there will be plenty of DX opportunity. There will also be a lot of work to be done on the antenna crafting side, an antenna with a good VSWR over a wide frequency range would greatly enhance the technology.

Stay tuned... ask questions... that will spur the content of the follow-on articles here.

© Ivan Reede, 2014

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AxMail-Fax – A powerful front-end client for URONode

By Brian Rogers, N1URO /n1uro@n1uro.ampr.org/n1uro@n1uro.#cct.ct.usa.noam

There's been a little buzz around about axMail-Fax and what it can do, what it is, and why does it exist. I was asked if it was possible to incorporate an SMTP based front-end to my URONode package (featured in the summer 2014 PSR) since there's already fine PBBS softwares available such as LinFBB, the only thing a node lacked was a plugin for handling SMTP based mail. Before re-inventing the wheel I guessed that such a project already existed and I was correct. The original axMail was created by Hessu [Heikki Hannikainen (OH7LZB)], picked up by Marius Petrescu (YO2LOJ) but wasn't complete on the backend and left as it was. Rather than scrapping that work I decided to complete the package. Needless to say, the work was successful, and axMail was a working package.

After getting familiar with the Asterisk VoIP system and Hylafax FoIP fax server, I was able to figure out a way to incorporate auto-faxing through axMail and renamed it axMail-Fax. This ability is extremely handy for sending an EOC or Red Cross center a hardcopy communication in the event of an emergency using just a dumb terminal on any packet outlet whether it's 300 baud HF or the high speed 802.11ham networks. This gives your node a larger advantage over current services such as packet PBBS systems, xNOS systems, and even RMS based systems. Automatic cover sheets stamped with the fact the communication is amateur radio based is available if the sysop desires to progress to a fax-based configuration.

As mentioned in the first paragraph, axMail-Fax is a user front-end to URONode (and possibly other linux-based nodes which is untested as of this writing). It is not a mail server but does allow a user on packet to send/receive mail, send/receive attachments, and send/receive faxes. It provides a simple prompt-based system for the end user on a dumb

terminal to manage their SMTP mail using standard PBBS mailbox commands. The user's email address is always listed above the flexnet-type prompt so they never have a need to ask what their address is. Online help for commands is also available to the end user.

By issuing a "?" for basic help, the full command-set is available:

Commands:

?, Help, Info, List, Kill, Delete, dele, Unkill, Read, Verbose
Send, SFax, SReply, Name, SStatus, Exit, Quit, Bye, CANCEL

Shortcuts for commands are in CAPS, so a ST would give you your mailbox status and not begin a new outbout mail message (Send).

Help gives the user help on how to use the online help system. The output is standard to URONode's help system. Help <command> shows detailed information about a specific command.

Info shows basic information about axMail-Fax, and the history of authors involved in the package.

List or SStatus will present onscreen the user's mail messages, and their status of new/read/etc., along with a numeric assigned to that specific message. This is handy for when the user wants to read a specific mail message.

Kill and Delete do exactly what they say – they flag a message to be killed or deleted upon exit. For protection of the user, a mail message is not permanently destroyed until they exit the app. In the event a user flags a message to be killed, they may undo the kill using the Unkill command. You may also kill/delete mail in a series of numbers. For example, if a user has 5 mails and wishes to kill the first 2 and one after the third, they may enter: K 1 2 4 and messages 3 and 5 will remain in

their mailbox. If before the user exits axMail-Fax wishes to save mail 2, they may issue U 2 to unflag that mail from being purged. The current message you're working in will be listed in your prompt so you'll know where you are. If you wish to send a reply to that mail message that you're listed in working in, you may use the SR command to Send a Reply.

If you wish to create a new mail message, just hit S and axMail-Fax will walk you through the rest of it. Ex: n1uro@n1uro.ampr.org

Current message 0 of 0

=> s

To:

At the To: enter in the address. It will ask you if this is priority mail such as an emergency message an EOC may need to act urgently on:

spam@n1uro.ampr.org

Is this message emergency or urgent? (y/N/?):

Being in CAPS, hitting enter will default to No.

You will next be brought to a subject header for the message. Ex:

Subject:

Enter your topic/subject and hit enter:

PSR Document

Enter message text (end with "/ex" or "." on a line by itself):

As standard, the typical "/ex" will save the mail OR you may enter a period "." on a blank

line to complete the body of the mail:

Send in your axMail-Fax for the PSR.

/ex

Deliver (Y/n/c/?):

Here you are asked whether or not you wish to send the mail. You may infact did /ex prematurely and wish to continue writing! This is something xNOS and others do NOT offer. For extended help on what these mean a "?" will show you:

Deliver (Y/n/c/?): ?

Answering "N" here will cancel the message. Answering "C" will let you continue writing the message. Answering anything else will proceed with delivering the message to the recipient.

Deliver (Y/n/c/?):

If you hit C, you may continue and the original instructions on saving your mail is repeated as a reminder:

Continue entering message text

(end with "/ex" or "." on a line by itself):

As you see, the Deliver message defaults to Y so hitting enter will complete the send and confirmation is delivered to the screen:

Message sent.

n1uro@n1uro.ampr.org

Current message 0 of 0

=>

Exit/Quit do just that. Your "flagged for kill" mail will then be purged and if you had any NEW mail, you'll be alerted to it's arrival:

Exiting, saving changes in mailbox.

New mail has arrived.

Bye n1uro! from axMail@n1uro.ampr.org.

Faxing is parallel to sending email. It will show you examples on the prompts as to what it requires for you to send a fax through. The main difference between sending a standard message and a fax is that you don't want to send an attachment via fax. This will appear as binary and not humanly readable to the recipient.

One of the most confusing things about doing mail on packet is attachments. This is actually very simple to do. On linux you'll need the uucp and sharutils packages. Since attachments are uucp encoded these will do what you need to do. Next, encode your file as an attachment. I made a linux script I call uumail:

```
-- begin uumail --
#!/bin/sh
echo -n "What file do you wish to encode? "; read file1
echo -n "Name of output file remote sees: "; read file2
cat $file1 | uuencode $file1 > $file2
cat $file2
exit 0
--- EOF ---
```

The file I converted was called uronode.txt, and the file it made is called uronode.uucp:

```
more uronode.uucp
begin 644 uronode.txt
[bunch of binary]
```

end

After you initiate writing your mail, before you end it with /ex, ascii upload your attachment as an ascii upload, or copy and paste it in. The remote may have uucp built into their email client OR they'll need to uuencode your attachment. Either way your attachment will go through. For DOS/Windows systems, you can search for uucp encode/decode tools. The file can be a text file, spreadsheet/document, or even a binary file.

If you receive a uucp encoded attachment, you'll need to decode it. Copy and paste the attachment into a plain text file. MS-WORD/WORKS and Write are NOT text editors. Notepad is, and any text editor on linux such as vim/nano/joe are. Include the first line that has the filename in it and the last line which has the word "end". Save it as uuencode.me (anyname will do). Then run:

uuencode uuencode.me and your file will be decoded and saved in its original form and name.

When you first log into axMail-Fax, it may ask you for your username, and prompt for a password. This password would be used if the sysop allows for remote pop/smtp and/or webmail access. Remember your password! You may be able to change it later by asking your sysop if you can do it or if they need to. This is determined in the axmail.conf file and documented in the man pages.

AxMail-Fax has been known to work with Sendmail, Postfix, and Qmail. Issues have been reported about smail and exim. Postfix is the preferred MTA for many reasons. With my modified pop3 system, you can do your axMail email via your cellphone! NO special software is required and it'll automatically fetch your mail unlike all other packet

mail systems which require you to at least manually log in. *** This is key over ALL other methods especially in the event of a true emergency and you're at a remote location. This document was sent to TAPR via axMail-Fax!

To obtain the software, visit:

<ftp://n1uro.ampr.org/packet/>

Any questions feel free to ask, and happy mailing!.. 73 de Brian NIURO

(Editor's Note: axMail and URONode are a part of Fedora's RPMs beginning with version 20, and may be installed by using Yum.)

###

TAPR Calendar

2015

Apr. 15 – PSR #128 issue deadline

May 1 – PSR #128 issue publication date

May 14 – Board of Director In-Person Meeting, Dayton, OH

May 15-17 – Dayton Hamvention

May 15 – TAPR-AMSAT Annual Dinner, Dayton, OH

July 15 – PSR #129 issue deadline

Aug. 1 – PSR #129 issue publication date

Sept. – ARRL-TAPR Digital Communications Conference,
date and location TBD

Oct. 15 – PSR #130 issue deadline

Nov. 1 – PSR #130 issue publication date

###

Burning Man Trackers and Display Software

By Allan Sadowski, AH6LS

OK... I'm finally digging out from the nearly 3000 mile drive to come back from the Burning Man Event.... catching up on email....

I can respond to some of the outstanding work that Scott Miller did for my Burning Man "Practical" Art Project..... if somebody wants to see pictures of equipment or the display... or installation... I guess we can figure out how / where to place the pictures for general viewing....

First... OUTSTANDING gear Scott.... I bought 10 trackers from Scott to trial ambulance tracking for this event....

low power... SUPURB power management

9600 bps... time slotting...

robust... works in HEAT... works in DUST... works in vibration environment... just plain WORKS...

I'm thinking a few more - (improved from lessons learned) trackers for the future if Scott can put up with me for another round....

As Scott related... we tracked almost 20 vehicles and they were running around the clock.... UHF.... I figure less than half a watt at the antenna... and yet we had great tracks to 10 miles as the crow flies (town of Empire).... from a 24 ft magnesium mast with a Hustler G6-440 antenna. 30 ft of VERY LOW LOSS Wilson LMR 400 coax from antenna to lightning arrestor.... arrestor bolted to copper ground rod... and then another 30 Ft of LMR 400 to my old Kenwood D700 receiver. That in turn (via serial to USB converter) to a refurb Dell laptop... running the Depiction software. Oh by the way... lightning hit within a few hundred yards during the event... when power was restored it continued to operate for 7 more days till we demob'd. Oh... winds were near Hurricane strength a couple of times.... did I mention the salty talcum powder like

dust :)

Why Depiction....

I asked a few authors about how to take a pdf file of the city map... (10k by 10k when converted to TIFF format and the map pdf not available till a few weeks before event)... oh by the way, that pdf was NOT north up... and make a decent quality map for display (zoom) - usable WITHOUT the internet.... and it appeared that there wasn't an easy way for this dummy (me) to get a decent map georegistered and working with most software out there...

I'm sure some folks here on the SIG could have done it with some other software.... just I'm not that capable/good with most APRS software... I did it my way.... and I'd love to learn a better way - especially if it is anywhere near as easy as it ended up being with Depiction.

FYI.... the event map changes every year, the location shifts a little bit every year... the city is about five square miles and probably over 60 miles of streets.... coordinates and pdf map come out less than 10 weeks prior to event. I am not a GIS specialist... but with the 30 day trial Depiction allows... and the videos Depiction has on line... and Depiction has a module upgrade that does live APRS data - I could do what I need to get a georegistered map at the last minute (without internet)...

Depiction worked... and if we can find a way to post some images... you can see just how well the tracks followed the city streets.... outstanding results from Depiction and I can say enough good about Scott (Argent Data)....

Andrew... I was the one who approached you... and in NO WAY do I want any poor reflection to be upon you... it was the last minute when I reached out to you... and I dearly wished I could have used your

software.... and some of the other authors software too... and I'd love to compare and see what we can do in the future - lets work together and shame on me for not working with you sooner. Depictions ability to rotate, translate, and scale an image file derived from a converted pdf... to georegister it with a few surveyed coordinates (only available at the last minute)... made Depiction a pivotal part of the success of tracking medical vehicles.

This is not a benign environment.... but the system worked for DAYS....with updates at 6 second temporal resolution... WITHOUT being tied to vehicle power.... all in a size smaller than a paperback book.... mag mount to vehicle roofs where we had to place a metal plate.... I cannot say enough.... simply outstanding results from Scott and the Depiction product.

Problems I'd like to address for future use - and I hope Scott will decide not to ignore me in the future for all my failings.....

1. I don't need to display a breadcrumb trail that lasts forever... it'd be better to have three choices...
 - forever... like now
 - never (just current positions)...
 - user selected time (5, 20, 60 minutes)
2. Ability to select (and display) just one selected vehicle and its track
 - Similarly to highlight one track so it is different from all the other tracks
3. Log of all vehicle tracks and playback of the same - post event. - even better to pick the time range and vehicle out from the logs....
4. Ability to change unit ID on screen. When a vehicle role changes

during the event I'd like to be able to change it there... not have to go reprogram it in the tracker

Example - the Airway team moves from Ambulance 5 to Ambulance 7..... I'd like to hook the new unit and modify its attributes immediately...

without changing callsign or having to reprogram tracker.

5. Want to be able to dynamically change beacon rate.... universally (all devices at a minimum)

Individually even better... from the base station.... even if I can only do so when the vehicles are within 100 ft of the base station

6. Need the tracker to adjust it's position rate due to power available... as well as report it's current power status.

7. Though Scotts devices exceeded my design specs...I learned (my fault) we need trackers that work 3x as long a period (two weeks at the incredible rate of 20 of 24 hours a day and NOT tied to vehicle power) OK Scott... I know the device will be twice the size... I'm ok with that....

8. Need to be able to take tracker feeds coming in on multiple frequencies simultaneously.... Ambulances on one freq, logistics vehicles on another freq, fire on another freq, security vehicles on yet a fourth freq. At four vehicles reporting every second (TDMA) and six second update interval.... that's 24 vehicles per freq.... no digipeater involved. To get all the other vehicles displayed.... need to accept that multiple freqs are in use. Using multiple freqs is NOT AN ISSUE IN REMOTE AREAS FOLKS.... plenty of freqs... I have no desire to feed this to the internet... it's not for internet consumption.... in any case, this is LOW

POWER.... If you have different needs... then do it the way you want to in your sandbox.... this event has 70,000 people in 5 square miles.... no town within 12 miles and the next town is about 15 miles... their combined population is 750 people... and no city within 100+ miles....

9. Need to have trackers shut themselves off when they go outside geofence.... (patients being transported 120 miles away to regular hospital)

10. Need to have the map display at 10 to 20 others locations all on a LAN... but do not need ten to twenty base stations (antennas, receivers, power supplies, etc).... screen capture at six second rate and display at multiple displays elsewhere (I'm thinking screen captures and dumps to web server application every six seconds... then use Raspberry Pi at the other 10 locations ... using Pi browser.... gotta check license issue).... yeah... other 10 locations do not get to manipulate screen or data like at the master station.... but most of them don't need to.... but it's clear that everybody needs to see this location info... and make decisions with common picture of locations. A picture is worth 10,000 words.... an advanced life support supervisor turned to me during one point in the event and said - why is that vehicle over there... that Nurse didn't realize how that one comment was priceless to me.... I had no clue why... .but that individual was making decisions about patient

care with the additional info we were providing... that was priceless and made my anxiety/funding/contribution worth it to me... exactly why I took on the project... and to be fair... Scott had more skin in this game than me.... THANK YOU SCOTT.....

11... quick attach and detach to UTV's... where no metal to mag mount on roof....

12. I have been requested for man portable device... .needs to be real small.... also a distance and direction like Yaesu does.... events in cities where walking (running) responders can get to the scene where huge crowds are at and no addresses are known

13... OK Scott... 10 second updates would probably have worked :)

I gave Scott lots of freedom (not that I had a choice:) for this "Practical" Art Project.... I did not worry about backwards compatibility.... I had a set of Specs and gave the Engineer (Scott) his reigns to make a go of it.... I did not nag him (well... no more than once every three weeks)... nor have scope creep. I trusted him and did not question his pricing ... yeah... I was getting anxious at some project schedule issues.... but I tried to stay low key... blew some operational test, integration, and training schedule dates... but Man oh man... did Scott come through with outstanding results.

Folks, 9600 is here today at a reasonable price point with the UHF device Scott did for me... .and we received the data on my D700 in 9600 mode.... and if I could do OpenTrac instead of APRS as the protocol I would have... just on principal....

We did NOT need all the backwards compatibility baggage of APRS... BTW 18 plus years of baggage.... we didn't need to be everything to everybody. Oh.... there were APRS packets on at least three freqs at event..... we were only one on UHF that I found... .

As to other issues.... yeah.... digipeating is needed in the future to accommodate terrain masking... but as far as my needs go... .it too can be to a separate freq... just set up yet another receiver at the command node... .

I guess I could work with display folks to take multiple concurrent

feeds on separate serial ports... but it seems it'd be more flexible to have a SoC or SBC that merges multiple serial feeds onto one feed... I'd love to take ACARS and AIS and have the option of converting to same format... interleave them into the serial stream and have that too.... we had one of the busiest airports in Nevada for a week.... some other place might be a lake or harbor so tracking those with existing aviation and vessel tracking would be useful.

Some additional (thinking as I type thoughts).... I worked on an system 18 years ago that had two speed (1200 and 9600) digis to accommodate trackers and digi relay on one freq... when you go back, I believe this was the first time - time slot APRS happened... using PACCOMM TNCs... those of you who've been around for 18 plus years on APRS (like me) possibly recall the effort I'm talking about...you can have the pain of two speeds on same freq.... same system tried to do ROSE network to control movement of data back to command center... no way I'll go that route any time soon.... the world has changed in 18 years. But we continue to saddle APRS with backwards compatibility... I don't need the baggage.... messaging... don't need it.... auto QSY... don't need it... bulletins... don't need.... this is about TRACKERS.... for tracking acute care patient transport and maybe other critical asset tracking... where no cellular exists.... or where crowd density precludes cellular being reliab

le. Ambulance drivers don't need to message some of the odd vanity ego stuff that I see with some APRS users.... I did AVL that predates APRS - APRS wasn't the first GPS tracking approach over RF by a long shot....but I give Bob credit...his baby has moved some of the common use forward at a low cost.... I just don't need everything and the kitchen sink.....

Oh... it's my hope the other 50 weeks a year... some of that time it'll be used to track racing dinghy's at local regattas :)

Armor on ... shields up.... back into the hole.... and obviously --- you do what you want to do for your event....

I'll tell you something.... anything Scott or Bill V. and a couple of others that contribute here say to me... I'll take that to the bank by golly....

Parting thoughts.... Thinking about having some weather instruments out there.... like what the wind speed and direction are at the primary, alternate, contingency, and emergency LZ's.... Hey... a vehicle counter would be REAL useful.... counting vehicles at ingress and egress points.... oh.... some emergency call boxes - strategically placed.... could be very useful.... ever tried to call for help when no cell service is available? Hmm... seems like this might be just another other kind of telemetry....

###

From the TAPR Mailbag

Hi All

Thank you for yet another wonderful TAPR DCC. A great time was had by all.

I cannot wait for next year to once again join "The Flying Circus."

73,

John, KB2SCS

★ ★ ★

Curious what is the TAPR digital library and how do I get access?

Thanks,

Steve, KB9MWR

It's pretty much an archive at this point in time. At one time it contained the most current copies of APRS and other packet software. As those folks found it possible to have their own web sites, they stopped supplying TAPR with updates. The library also contains 'manuals' for some of the kits such as TNC-1 and TNC-2. Also there are archives of mailing lists dated before the newer list server maintained it's own archives.

Here is the URL: http://www.tapr.org/software_library.php

— John, W9DDD

###

Bits of TAPR

All the DCC photos in this issue of *PSR* are courtesy of George Byrkit, K9TRV.

★ ★ ★

Please keep TAPR in mind, when you are making bequests or contributions. TAPR is a 501(c)(3) not-for-profit scientific research and development corporation and all bequests and contributions to TAPR are tax-deductible to the extent allowed by US tax laws.

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Write Here!

Your *PSR* editor is looking for a few good writers, particularly ham radio operators working on the digital side of our hobby, who would like to write about their activities and have them published here in *PSR*.

You don't have to be Hiram Percy Maxim to contribute to *PSR* and you don't have to use *Microsoft Word* to compose your thoughts.

The *PSR* editorial staff can handle just about any text and graphic format, so don't be afraid to submit whatever you have to wallou@tapr.org. The deadline for the next issue of *PSR* is April 15, so write early and write often.

If *PSR* publishes your contribution, you will receive an extension to your TAPR membership or if you are not a member, you will receive a TAPR membership.

###



On the Net

By Mark Thompson, WB9QZB

Facebook

As you may know, TAPR has a Facebook page, www.facebook.com/TAPRDigitalHam.

However, I also created a TAPR Facebook Group, www.facebook.com/groups/TAPRDigital/.

If you have a Facebook account, "Like" the TAPR Facebook page and join the TAPR Facebook Group.

If you join the group click on the Events link and indicate you're Going to the events.



On Twitter, Too

Access the TAPR Twitter account at www.twitter.com/taprdigital.



Also on YouTube

TAPR now has its own channel on YouTube: the TAPR Digital Videos Channel: www.youtube.com/user/TAPRDigitalVideo.

At this time, there are a slew of videos on our channel including many from the TAPR-ARRL Digital Communications Conference (DCC) that you may view at no cost, so have at it!

###



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