President's Corner
By Steve Bible, N7HPR

Hamvention is nearly here and TAPR will be present in full-force! The biggest ham radio convention of the year runs from May 18 to May 20 at the Greene County Fairgounds in Xenia, Ohio and TAPR has plans to fill your Hamvention weekend.

TAPR Booths

TAPR's booths will be in Building 5 (booths 5009 through 5011) where we will show what we have been up to lately. You can visit our booths 9 AM to 6 PM on Friday, 9 AM to 5 PM on Saturday and 9 AM to 1 PM on Sunday.

TAPR Forum

Friday at 9:15 AM, Scotty Cowling, WA2DFI, will moderate the TAPR Forum in Greene County Fairgounds Forum Room 1. This years' speakers include:

- My "Introduction"
- Stana Horzepa, WA1LOU, *PSR* Editor, on "The World According to *PSR*"
- Steve Ford, WB8IMY, *QST* Editor, on "Write for *QST*/*QEX*"
- Adam Farson, VA7OJ/AB4OJ, on "SDR vs Legacy Radio"
- John Ackerman, N8UR, on "Collecting Solar Eclipse Data Using SDR, plus a Low Noise VHF/UHF Synthesizer"
- Nathaniel Frissell, W2NAF, on "What is HamSCI"

For the full description of the Forum, see "Hamvention TAPR Forum in Detail" on page 3.

TAPR/AMSAT Dinner

The 12th annual TAPR/AMSAT dinner takes place on Friday evening at the Kohler Presidential Banquet Center, 4572 Presidential Way, Kettering, OH 45429.

TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.

Attendees will feast on a delicious dinner (menu below) and then listen to Jeri Ellsworth, AI6TK, present her innovative ideas and adventures in Amateur Radio.

AI6TK <https://www.jeriellsworth.com> is an American entrepreneur, self-taught engineer and autodidact computer chip designer and inventor, who gained notoriety in 2004 for creating a complete Commodore 64 system on a chip housed within a joystick, called C64 Direct-to-TV. That "computer in a joystick" could run 30 video games from the early 1980's, and sold over 70,000 units in a single day via the QVC shopping channel.

Doors open to a cash bar at 6:30 PM and dinner begins at 7 PM. The banquet ticket purchase deadline is Tuesday, May 15. Banquet tickets must be purchased in advance and will not be sold at the AMSAT or TAPR booths. There will no printed tickets for the dinner. Rather there will be a list of ticket purchasers at the banquet to check-off as people arrive. You may purchase tickets for $37 online at the AMSAT Store <https://tinyurl.com/ycyytsza>.

Here is the Menu:

- Entrees:

  Roast Beef Carved on site

  Chevre Apricot Chicken

  Deep Fried Tempura Shrimp

- Salad:

  Caesar

- Vegetables:

  Cauliflower

  Fresh Asparagus

- Starch:

  Risotto Cake

- Rolls. butter, Coffee, Iced Tea Water

The Gang

The folks behind the scenes at TAPR will be at Hamvention, so you will have an opportunity to say "Hello" and have an eyeball QSO with the TAPR gang.

I hope to see you at Hamvention!

73,

Steve Bible, N7HPR, President TAPR

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Hamvention TAPR Forum in Detail

By Scotty Cowling, WA2DFI

Friday, May 18, 2018

Moderator: Scotty Cowling, WA2DFI

Bio: Scotty was first licensed in 1967 and has been continuously active since that time. He is active while mobile on HF CW and on APRS. Scotty is an advisor for Explorer Post 599, a BSA affiliated ham club for teens in the Phoenix area. He has been involved in the openHPSDR project for the last 11 years, is a TAPR Director and current TAPR Vice President. Scotty is also active in the production of openHPSDR components and other SDR projects. He is a co-founder of iQuadLabs, LLC, a supplier of openHPSDR systems and other Software Defined Radio components. He currently works at Zephyr Engineering, Inc, a computer consulting company that specializes in FPGA design and SDR hardware.

9:15 – 9:25 AM: "Introduction" by Steve Bible, N7HPR, TAPR President

9:25 – 9:30 AM: "The World According to *PSR*" by Stana Horzepa, WA1LOU, *PSR* Editor

9:30 – 9:35 AM: "Write for *QST*/*QEX*" by Steve Ford, WB8IMY *QST* Editor

9:35 – 10:00 AM: "SDR vs Legacy Radio" by Adam Farson, VA7OJ/AB4OJ

Abstract: SDR technology is rapidly displacing legacy radio architecture in the mil/gov, commercial and Amateur Radio sectors.

Several new OEM's, as well as a strong open-source group, are building SDR transceivers and receivers rivaling and even surpassing legacy radio equipment. Established OEM's are transitioning from legacy to SDR. We will explore the relative merits of SDR and legacy radios and the issues peculiar to each type, from the Ham's perspective. Two architectures will be discussed: the legacy superhet with a DSP IF chain and the direct-sampling/digital up-converting SDR. It is assumed that the serious Ham will choose one or the other of these, or both.

Bio: Adam graduated from University of Cape Town, South Africa with a BSEE in 1963 and an MSEE 1971. He is a holder of US Extra Class and GROL, Canadian Advanced licenses. Adam retired in 1999 after a 35-year professional career in RF design for radio communications and at CERN followed by satellite and wireline telecom. He is now keeping busy with evaluation and testing of amateur transceivers and receivers, and with technical writing and presentations on related topics.

10:00 – 10:25 AM: "Collecting Solar Eclipse Data using SDR, plus a Low Noise VHF/UHF Synthesizer" by John Ackerman, N8UR

Abstract: (1) Using an SDR to collect data during the "Great American Eclipse" on August 21, 2017, and (2) a Versatile Low-Noise VHF/UHF Synthesizer.

Bio: John Ackermann, N8UR, has been a board member, officer, and project contributor to TAPR for over 25 years. His long-term interest is precise time and frequency measurement, and for the last several years he has also been involved in SDR development and application. John and wife Jody, KC8KDC, recently moved back home to Dayton after a seven-year relocation to Atlanta.

10:25 – 10:30 AM: "What is HamSCI?" by Nathaniel Frissell, W2NAF

Abstract: The Ham Radio Science Citizen Investigation (HamSCI) is an organization that allows professional researchers to collaborate with the Amateur Radio community in scientific investigations. HamSCI aims to advance scientific research and understanding through Amateur Radio activities, encourage the development of new technologies to support this research, and provide educational opportunities for the amateur community and the general public. This presentation will explains HamSCI's goals, organization, and an overview of current projects, including the Solar Eclipse QSO Party, the Personal Space Weather Station, and Field Day Experiments.

Bio: Nathaniel Frissell, W2NAF, is a research professor with the New Jersey Institute of Technology Center for Solar-Terrestrial Research. Nathaniel's interest in ionospheric science began in middle school when he was introduced to Amateur Radio through scouting. He earned his B.S. in Physics and Music Education from Montclair State University and his M.S. and Ph.D. in Electrical Engineering from the Virginia Tech SuperDARN Laboratory. His Ph.D. dissertation is entitled "Ionospheric Disturbances: Midlatitude Pi2 Magnetospheric ULF Pulsations and Medium Scale Traveling Ionospheric Disturbances." Nathaniel is an Eagle Scout and remains and active scouter. He holds an Extra class Amateur Radio license and founded the Ham Radio Science Citizen Investigation (HamSCI) project. Nathaniel is a co-advisor to the NJIT Amateur Radio Club, K2MFF.

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2018 ARRL / TAPR

Digital Communications Conference

September 14-16
Albuquerque, New Mexico

Make your reservations now for three days of learning and enjoyment at the Sheraton Albuquerque Airport Hotel. The Digital Communications Conference schedule includes technical and introductory forums, demonstrations, a Saturday evening banquet and an in-depth Sunday seminar. This conference is for everyone with an interest in digital communications from beginner to expert.

Call Tucson Amateur Packet Radio at: 972-671-8277, or go online to www.tapr.org/dcc

Sheraton Albuquerque Airport Hotel

DCC Call for Papers

Technical papers are solicited for presentation at the ARRL and TAPR Digital Communications Conference (DCC) and publication in the Conference Proceedings. Annual conference proceedings are published by the ARRL. Presentation at the conference is not required for publication. Submission of papers are due by July 31st, 2018 and should be submitted to

Maty Weinberg, ARRL

225 Main Street

Newington, CT 06111

or via the Internet to maty@arrl.org

The ARRL and TAPR DCC is an international forum for radio amateurs to meet, publish their work, and present new ideas and techniques. This year, the DCC is in Albuquerque, New Mexico, September 14-16. Presenters and attendees will have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications. Topics include, but are not limited to:

• Software Defined Radio (SDR)
• Digital voice (D-Star, P25, WinDRM, FDMDV, DRMDV, G4GUO)
• Digital satellite communications
• Global position system
• Precise Timing
• Automatic Packet Reporting System (APRS)
• Short messaging (a mode of APRS)
• Digital Signal Processing (DSP)
• HF digital modes
• Internet interoperability with Amateur Radio networks
• Spread spectrum
• IEEE 802.11 and other Part 15 license-exempt systems adaptable for A mateur Radio
• Using TCP/IP networking over Amateur Radio
• Mesh and peer to peer wireless networking
• Emergency and Homeland Defense backup digital communications in Amateur Radio
• Updates on AX.25 and other wireless networking protocols
• Topics that advanced the Amateur Radio art

Go to https://tinyurl.com/y7wgm6vh to view the guidelines for paper submissions.

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TAPR at HamSCI Workshop
By John Ackermann, N8UR, & Steve Bible, N7HPR

TAPR President Steve Bible, N7HPR, and TAPR Director John Ackermann, N8UR, attended the HamSCI Workshop at the New Jersey Institute of Technology. Here is their report.

The first HamSci Workshop, held in Newark, NJ on February 23 and 24, brought together ham radio operators and space scientists for discussions about how space weather affects radio propagation. Along with introductory (and not-so-introductory) presentations about space science theory and tools, the conference focused on analysis of the 2017 total solar eclipse and the development of a "personal space weather station" that will allow hams and other amateur experimenters to gather and analyze data impacting propagation.

Steve, N7HPR, gave a presentation to the group about TAPR's capabilities and in particular how we can help with the design and implementation of the Personal Space Weather Station. According to Steve, "HamSCI is a new and interesting dynamic for Amateur Radio." Of all the many facets one can explore, HamSCI gives you the ability to perform and contribute to real science.

John, N8UR, talked about his recording and analysis of the solar eclipse using HPSDR equipment and also about new TAPR projects that could be of interest to the HamSCi group.

This workshop was the first event sponsored by HamSCI, which is currently formalizing its organizational structure. The HamSCI folks will be at the upcoming Hamvention; TAPR will be well represented in the HamSci events, and *vice versa*. There's a lot of good the two organizations can do together.

(You can read HamSCI's summary of the workshop here: http://hamsci.org/article/njit-hosts-2018-hamsci-workshop.)

###

TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.

WSPR Without Tears: TAPR's 30m WSPR Transmitter

By Bruce Raymond, ND8I

TAPR has created a low-power WSPR transmitter (WSPR Without Tears) for the 30m ham band that avoids most of the problems associated with building a fairly complicated digital mode kit. Check out the TAPR website (www.tapr.org/kits_30M-wspr-pi.html) for more information.

WSPR stands for Weak Signal Propagation Reporter Network. It's a digital mode used by hams. The process is similar to a beacon. WSPR is a wonderful communication mode created by Joe Taylor, K1JT.

WSPR Without Tears is TAPR's attempt to simplify the process of getting an actual transmitter up and running so you can enjoy working with WSPR and avoid dealing with the headaches associated with building a working system. What makes it really interesting is that WSPR is optimized for operating at very low power. Our kit puts out a whopping 200 mW which is capable of reaching impressive distances even with a bad antenna (see Figure 1 for typical response using an end-fed dipole in an attic).

Our approach uses a Raspberry Pi computer ($35) to generate WSPR transmissions. Our board plugs into a Raspberry Pi and amplifies and filters the output (the Raspberry Pi output is a very low-power square wave that would be illegal to transmit due to its harmonic content). The Raspberry Pi generates the WSPR signal in software and utilizes timing data from the Internet to calibrate its
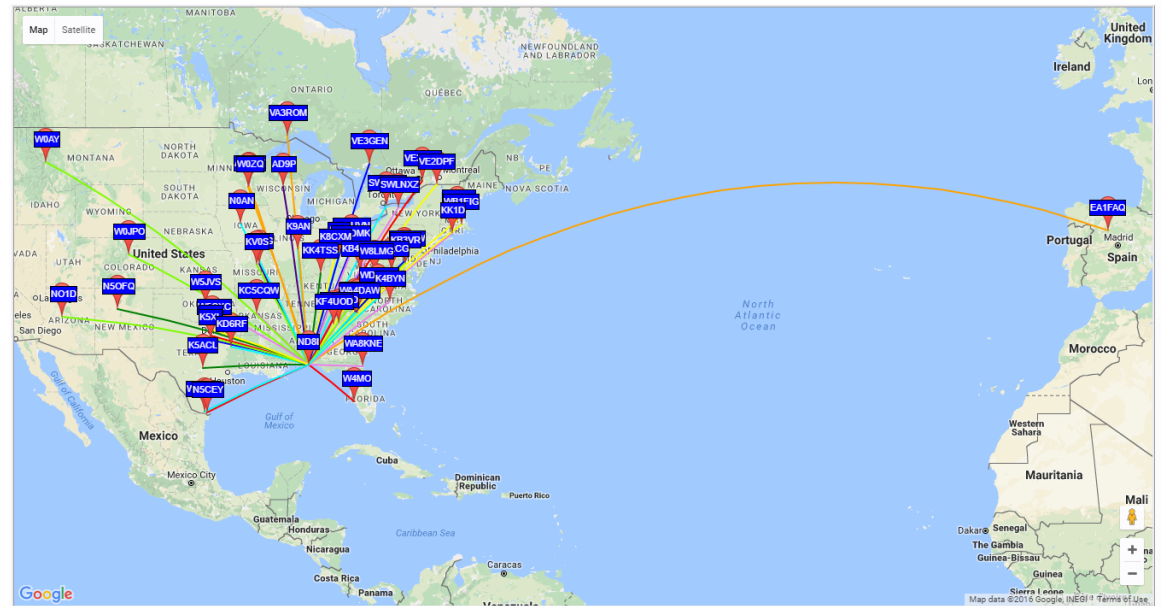

Figure 1. WSPR Coverage

Figure 2. WSPR Without Tears

TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.

TAPR Wear Available

internal clock and transmit frequency, so you don't have to do it.

Our WSPR transmitter is fully assembled (see Figures 2 and 3). Instructions for downloading the software and copying it to an SD card are on the website.

You set WSPR parameters (your callsign and grid square) from a webpage in your favorite web browser. You get WSPR Without Tears up and running without doing any programming or soldering.

Enjoy!

###

Figure 3. WSPR Without Tears Assembly

Personalized Land's End clothing with the TAPR logo and your name and call sign are now available from the TAPR Store at http://business.landsend.com/store/tapr/

Select from the Men's or Women's catalog. (To make shopping easier, there are "TAPR Recommended Shirts" in the Men's catalog including two styles of polo shirts, each available with or without pockets.)

The logo is available in three colors -- red, blue, and white. The name/call sign monogram thread will match the logo color. (We recommend that you use the white logo with dark colored shirts.)

Prices are very reasonable, for example, after adding the logo and monogram, a mesh pocket shirt is $36.95. Processing time is 5-7 days, plus shipping.

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TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.

In the Works

By John Ackermann, N8UR

At the HamSCI conference, I mentioned that I was working on a "universal" synthesizer board providing a GPSDO-referenced clock to a Red Pitaya, or the LO to a bunch of VHF/UHF transverters, or work as a beacon transmitter, or ???

After I got home, I finished my VHF phase noise test setup -- basically, mix the device under test with the 160 MHz second harmonic of an ultra-low-noise 80 MHz oscillator. Add in several low noise amp blocks, and a couple of big bandpass filters. Then feed the resulting difference signal at around 16 MHz into one of my phase noise sets, each of which only works with 1 - 30 MHz range signals. The whole thing makes a nice mad scientist breadboard. (See attached; the actual phase noise test set is in another room.)

Working with Mike, W8RKO, we've tested multiple configurations of three candidate chips -- the Analog Devices ADF4351, the Silicon Labs Si5340 (my original target, and the Silicon Labs Si5342. Attached is one plot showing the best performance we've rung out of each chip, and showing the relative price and capabilities. The second plot adds a "best" and a "worst" reference point -- an HP8662A signal generator, and a 20 year old TenTec 526 6M/2M transceiver -- to give some idea how these chips stack up.
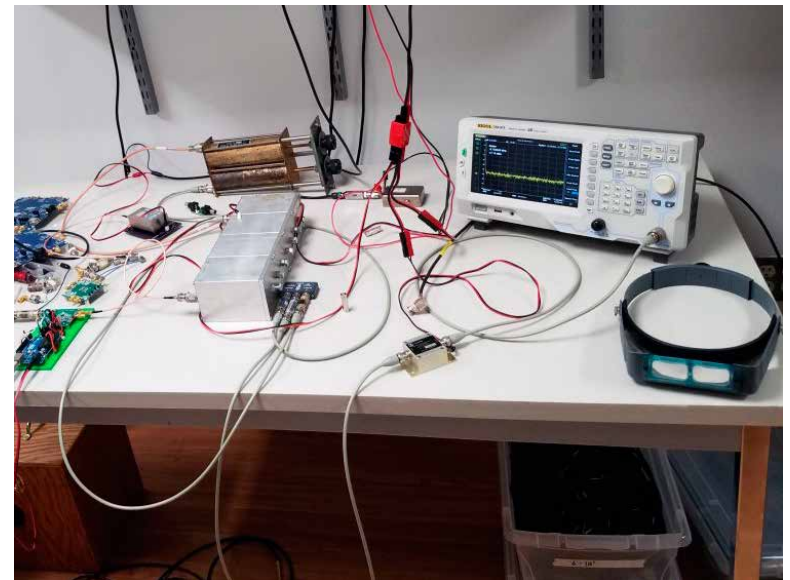
Two notes:

(a) These plots only go out to 100 kHz offset, the limit of the Miles Lab Timepod I used for most of the measurements. I also did sample measurements using a Symmetricom TSC-5120A that goes to a 1 MHz offset. That shows that the ADF4351 and Si5340 chips have a steep drop in noise just beyond 100 kHz, while the Si5342 doesn't drop much

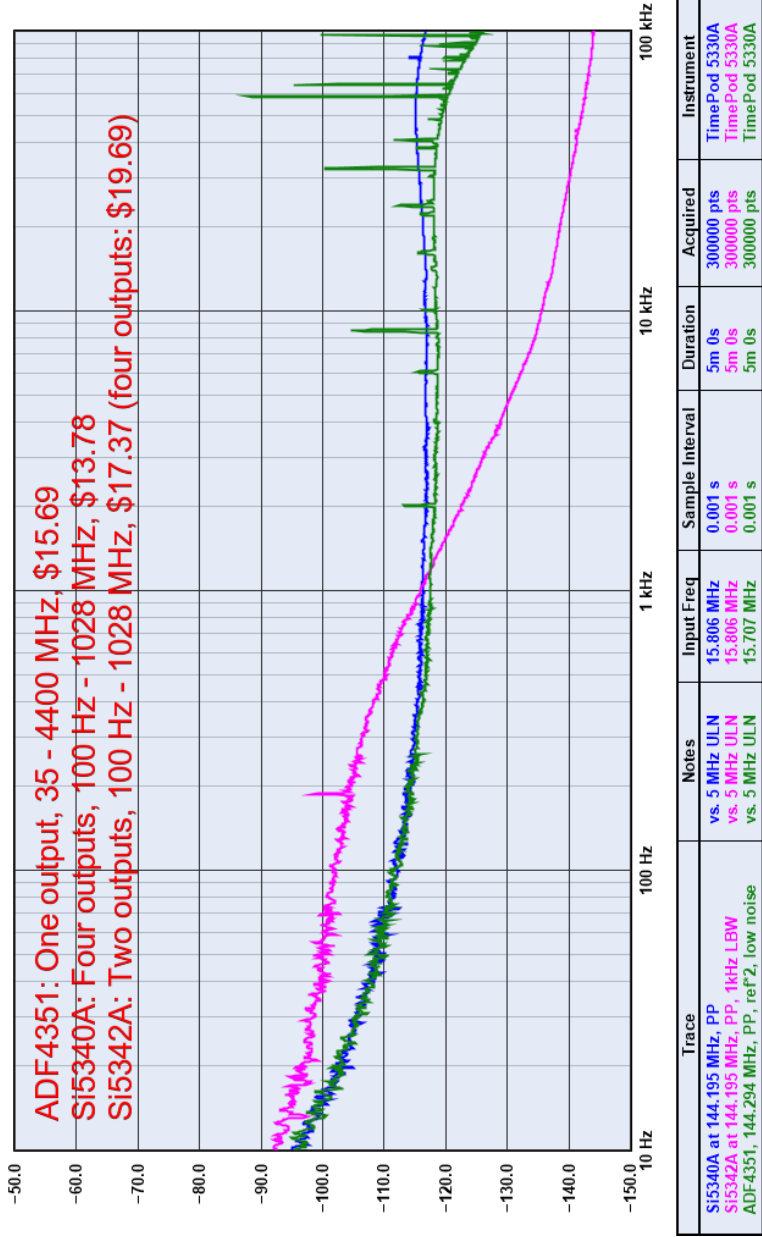further. The net result is that all three chips end up at just about -150 dBc/Hz at 1 MHz offset.

(b) The biggest problem with the ADF4351 chip is that there it has lots of spurs, including one at about 58 kHz offset that's only about 60 dB down. It's easy to hear that one a receiver if the main signal is S9+20. Mike is researching and thinks that the cheap Chinese clone board he's using may have layout issues that contribute to the spurs.

Not sure how interested any of you are in all this detail, but the take away is that we're continuing work and hope to have a design finalized Real Soon Now for what will probably end up as a TAPR product.
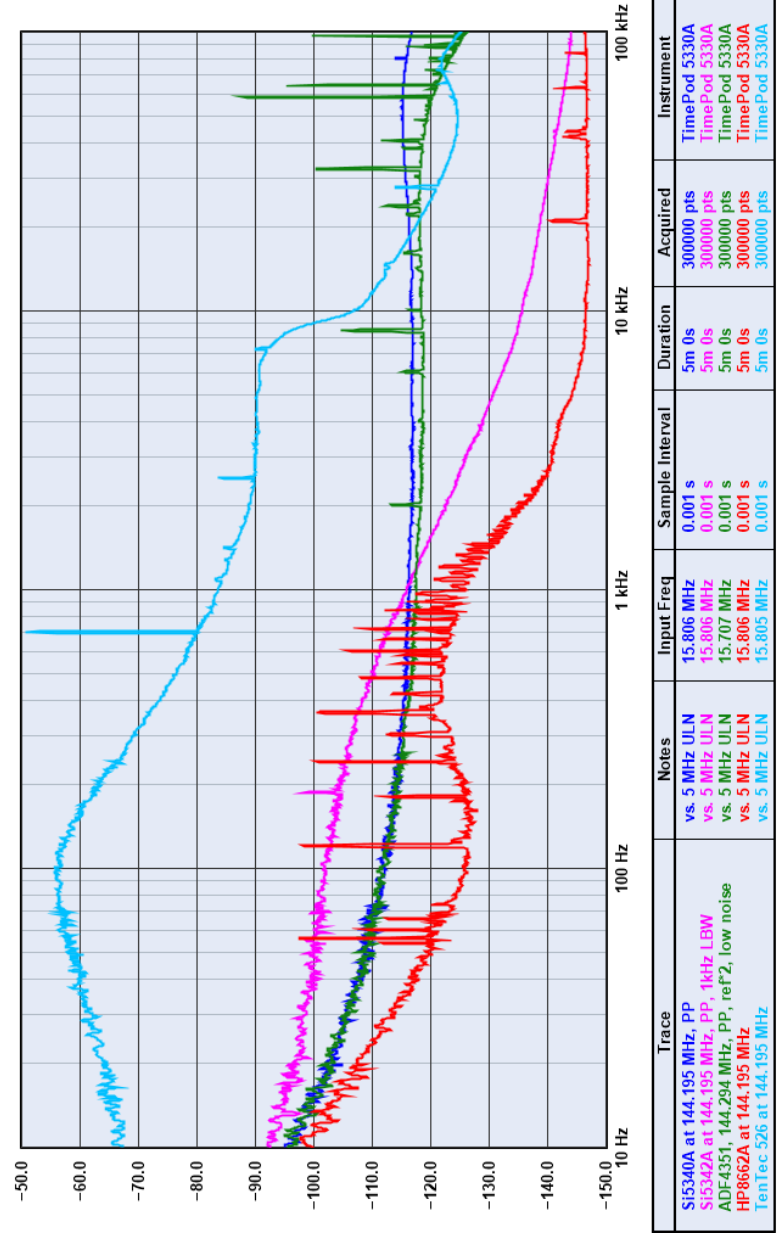
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Phase Noise $\mathcal{L}(f)$ in dBc/Hz

ADF4351: One output, 35 - 4400 MHz, $15.69
Si5340A: Four outputs, 100 Hz - 1028 MHz, $13.78
Si5342A: Two outputs, 100 Hz - 1028 MHz, $17.37 (four outputs: $19.69)

Trace	Notes	Input Freq	Sample Interval	Duration	Acquired	Instrument
Si5340A at 144.195 MHz, PP	vs. 5 MHz ULN	15.806 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
Si5342A at 144.195 MHz, PP, 1kHz LBW	vs. 5 MHz ULN	15.806 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
ADF4351, 144.294 MHz, PP, ref^2, low noise	vs. 5 MHz ULN	15.707 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A

Phase Noise $\mathcal{L}(f)$ in dBc/Hz

Trace	Notes	Input Freq	Sample Interval	Duration	Acquired	Instrument
Si5340A at 144.195 MHz, PP	vs. 5 MHz ULN	15.806 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
Si5342A at 144.195 MHz, PP, 1kHz LBW	vs. 5 MHz ULN	15.806 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
ADF4351, 144.294 MHz, PP, ref^2, low noise	vs. 5 MHz ULN	15.707 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
HP8662A at 144.195 MHz	vs. 5 MHz ULN	15.806 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A
TenTec 526 at 144.195 MHz	vs. 5 MHz ULN	15.805 MHz	0.001 s	5m 0s	300000 pts	TimePod 5330A

AxMail-FAX
By Brian Rogers, N1URO

Introduction:

Since the early goings of packet radio, hams were exchanging electronic messages through the PBBS system. One could send a bulletin that could be read by a group defined by which group that bulletin was sent to using the SB command or they could send a message directly to another ham using the SP command. During the development of such systems, a group of coders drafted specific standards which this system was to operate under. These guidelines were then adopted by TAPR, the same entity that developed the type 2 TNC that most hams use to this day or a replica of such.

As the Internet came on the scene to the general public for usage, it's services were a "pay for" based service and had such information based tools such as Gopher, finger, and the web as 3 for example. File sharing was made via the FTP (file transfer) protocol and private messaging through electronic mail services using the SMTP (simple mail transfer) protocol. These and a bunch more services became attractive to the more computer savvy user and before you know it software was designed to be a lot easier to use as to attract more clients for the local ISP. Unfortunately the costs to use such a service back then was so expensive most hams didn't want to bother as their money was more invested in RF gear than wired services.

Fortunately for hams, an entity calling itself the "AMateur Packet Radio" organization prior to stricter rules and costs on blocks of IP addresses were able to secure a full class A (/8) IPv4 subnet of addresses beginning with 44. and thus the ampr.org or better known as the amprnet was born. Around this same time frame Phil Karn, KA9Q, was able to figure out that IP could be encapsulated underneath our existing ax25 protocol after answering a challenge from a co-worker on how to get simple DOS computers to speak IP with their VAX system, and thus NOS was born for the amateur community to use. SMTP based electronic mail was being passed via ham radio frequencies without the need for wired services however certain people were able to tie NOS into an ISP account which served as global gateways for the various NOS services.

With NOS sites sprouting like Dandelion flowers in the spring, hams found that by using the amprnet on a NOS station they could send and receive SMTP mail with other hams and friends around the globe at no fees to them. There couldn't be any fees assessed because hams were using their 1200-baud TNCs to connect into their desired NOS system. By the mid 1990s, if you were a ham on packet, most likely you had an @*.ampr.org email address which the globe recognized as a valid SMTP based email mailbox. Doing email on ham radio isn't anything new since NOS systems have been doing it for a few decades, yet there's a stigma formed from a site in Newington, Connecticut, that makes it seem as if it's something new from a different software-based system. Remember this lack of integrity when it comes renewal time.

Since NOS, there have been a few different SMTP and mail systems to hit the airwaves. The most powerful yet least recognized system is axMail-FAX. It's the most feature packed SMTP based mail system out there for Amateur Radio, never asks/begs for money/donations, and is not recognized by a certain Newington, Connecticut based organization because it does not donate 6 figure or higher dollar amounts to said organization as was told to my face at a meeting in October, 2017 by

certain key "political" figures.

How It Came To Be

After coming out with my Linux-based URONode front-end, one sysop who decided to try it out pressed me to compliment it with some sort of an SMTP based mail system as LinFBB (which I supply code for on occasion) was a perfect plugin for PBBS type mail, SMTP mail was lacking. Being hesitant, I tried to nicely push back thinking "somewhere somehow someone must have such

a project already completed, no need for me to re-invent the wheel". Finally after days of searching I came across an incomplete project simply called axMail that had already went through 2 primary coders. The first of which was Heikki Hannikainen (OH7LZB) in 1996. He had a basic mailbox system that could allow existing users on a Linux server the ability to read and send SMTP based mail. It lacked many needed features such as allowing new users via RF to create their own mail-only accounts, and other mailbox handling instructions. Next came Marius Petrescu (YO2LOJ) who's the current author of many other ham projects today such as ampr-ripd, and an amprnet injector for Microtik routers to name a couple. He tightened up some of the internal mailbox routines in 1998 but still couldn't figure out a few needed features. It had appeared to be orphaned so I took a look at the code. By 2005 I was able to get a very basic NOS type SMTP system working which included user account creations. Users, existing and new, were able to send/receive SMTP based mail just like they did with NOS. I put out word about its initial release and to my surprise I received a very complimentary email from YO2LOJ on the user accounting that I added. Satisfied with the approval from Marius, I considered axMail reborn.

Later on I was able to figure out how to take input from an end user and turn it into a fax- transmission system complete with automatic cover page creation with an SF (send fax) command that quite easily walks the sender through very layman's prompts on how to send a fax. This also includes receipt of fax job accepted into the outbound fax queue and afterword a confirmation of the completion or failure of the fax, and thus axMail-FAX became the project's new name.

Feature-packed

The difference with axMail-FAX and other SMTP mail systems out there for packet is that it's mega feature packed vs. the rest. They really begin to shine the deeper into the various command trees you maneuver. For starters, your email address is displayed within the prompt so you can never forget your email address.. If you accidentally delete/kill a message you can easily recover it before you log out – no other system allows for this over RF. You can send carbon copies and also blind carbon copies (cc: and bcc: mail) in which no other email system for packet has. You can set a custom one- line signature for all your messages so you wouldn't have to type "-73 de C4LL" at the end of each message, and a LOT more.

The basic Commands:

? - brings up the command listing.

Autofwd – sets or unsets a mailbox you wish your incoming mail to get forwarded to and not saved on your axMail host.

Bye, Exit, Quit – Save your mailbox as you have it and exit the program. Cancel – Quit the program but discard any mailbox changes.

Delete, Kill – Followed by a number or series of numbers to kill/delete

mail(s).

Help – Followed with a full command name gives detailed help on a specific command. Info – Information about axMail-FAX.

List – Verbosely lists your mail messages.

Name – Sets your name that is appended to your email address when sending mail. Read – Followed with a number reads a specific mail message.

Send – Sends an email message. This walks the end user through the whole process asking them if they wish to send cc/bcc mail, flag it priority mail, request a read receipt, and then the subject line. Entering the body is next followed first by a confirmation prompt. If the user accidentally flags the body as complete but wishes to continue, C for continue message will allow them to continue adding to the email message. Another feature ALL OTHERS LACK. This confirmation prompt will continue to loop until the user selects Yes upon which they will be asked if they desire a server delivery receipt. This receipt will email you a confirmation that your message was in fact delivered to the recipient's mailbox. Remember, read receipts are generated at the option of the reader and can easily be ignored thus leaving the sender in a state of unknown as to whether or not the mail was received and/or read. This receipt comes from the remote server itself so if the receiver fails to acknowledge reading your mail, they cannot say it was never received. Here's a key example of how this may come into play:

User A uses ARES selected email system to mail FEMA in a disaster requesting 3 days worth of food and bedding for 50 affected citizens, and requests a read receipt.

User B uses axMail-FAX and emails FEMA requesting 5 days worth of food and bedding for 25 affected citizens and requests a server receipt along with a read receipt.

Outcome: FEMA fails to respond, communications personnel claim no mails were received from EITHER A or B tries to fault both for failing to relay emergency communications. User A is stuck! He has no proof communications were sent, while User B has the server receipt from FEMA's mail server as proof the FEMA personnel failed to do their job and User B is saved from any punishments that may have come his way that User A will receive. This one is HUGE.

SFax – Send a facsimile communication. Very much like with Send SF alone will walk the end user in sending a fax and will automatically create a cover page.

Sig – Set or delete your signature. If not set, you'll be reminded of such when you send a mail.

Spers – This command is more geared for HF users. It shortens the prompting of the standard "Send" command and auto flags the mail priority since it's coming via Amateur Radio.

Sreply – Send a reply to the current message number listed in your prompt. STatus – Brief status of your mailbox.

Unkill – Followed by a number, restores a previously killed message proper to your logging off. Verbose – Like with the Read command, this command shows you the message in full, meaning all the message headers, etc. that are contained within the mail message.

When you first login you'll be asked a series of basic questions. The

version number will be displayed prior to asking you anything. Please insure that the version is 2.9 or above. If it isn't ask your sysop to upgrade as soon as possible. You'll be asked your name and instructed to contact your sysop with a desired password. I've taken every step possible so that not even a portion of your password is exchanged via plain text anywhere when you login!.. unlike other software that do.

Once on the system your prompt may look like this:

axMail-Fax v2.9

You have 7 messages (1 new).

n1uro@n1uro.ampr.org

Current message 0 of 7

=>

It has the program/version

Your mail count (and any that are new)

Your email address in full

Current message you read and the command arrow =>

When I type L at the arrow I will get a list of my mail:

l

St Num From   Subject   Date   Size

U   1 postmaster@portal.ampr.or [AMPRNet] Encap file   Mon, 16 Apr 2018 49295

U   2 uro-jokes-owner@n1uro.amp Uro-jokes post from lu9d Sun, 15 Apr 2018 6705

U   3 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   4 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   5 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   6 root@n1uro.ampr.org (Cron Cron <root@n1uro> /usr/l Mon, 16 Apr 2018 7166

N   7 postmaster@portal.ampr.or [AMPRNet] Encap file   Mon, 16 Apr 2018 49280 n1uro@n1uro.ampr.org

Current message 0 of 7

=>

Status, message number, From, Subject, Date, and message size are listed.

U in status is for Unread, while N is a new message that has not been listed or read yet.

I chose to read message #3:

=> r 3

Message 3: (Unread)

From: root@asterisk.n1uro.ampr.org (Cron Daemon)

To: root@asterisk.n1uro.ampr.org

Subject: Cron <root@asterisk>

Date: Mon, 16 Apr 2018 00:00:02 -0400 (EDT)

--- end of message #3 ---

n1uro@n1uro.ampr.org Current message 3 of 7

Now I wish to kill it and then list my mailbox to see it's killed:

=> k 3

Message 3 killed.

n1uro@n1uro.ampr.org

Current message 3 of 7

=> l

St Num From   Subject   Date   Size

U   1 postmaster@portal.ampr.or [AMPRNet] Encap file   Mon, 16 Apr 2018 49295

U   2 uro-jokes-owner@n1uro.amp Uro-jokes post from lu9d Sun, 15 Apr 2018 6705

>K 3 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   4 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   5 root@asterisk.n1uro.ampr. Cron <root@asterisk> /va Mon, 16 Apr 2018 1144

U   6 root@n1uro.ampr.org (Cron Cron <root@n1uro> /usr/l Mon, 16 Apr 2018 7166

N   7 postmaster@portal.ampr.or [AMPRNet] Encap file   Mon, 16 Apr 2018 49280 n1uro@n1uro.ampr.org

Current message 3 of 7

But I changed my mind as it may be a server report I want to save:

=> u 3

Message 3 unkilled.

n1uro@n1uro.ampr.org

Current message 3 of 7

Here I sent myself a mail and requested both receipts to be generated. Creating a read receipt on axMail-FAX is as simple as reading the mail:

N   8 Brian <n1uro@n1uro.ampr.o test   Mon, 16 Apr 2018   609

N   9 MAILER-DAEMON@n1uro.ampr. Successful Mail Delivery Mon, 16 Apr 2018 2318

n1uro@n1uro.ampr.org

Current message 0 of 9

=> r 8

Message 8: (New)

From: Brian <n1uro@n1uro.ampr.org>

To: n1uro@n1uro.ampr.org

Subject: test

Date: Mon, 16 Apr 2018 00:33:54 -0400 (EDT)

test.

---

73 de Brian, N1URO - supporting packet radio since 1995.

sent via axMail-FAX by N1URO.

--- end of message #8 ---

A receipt was asked for, do we send one? (y/N):

Commands in Uppercase are hotkeys and/or defaults. If I chose to NOT send one all I would have to do is hit enter. N or n is not required, but here I want to be nice and send one:

y

Receipt going to: Brian <n1uro@n1uro.ampr.org> Read receipt sent.

n1uro@n1uro.ampr.org

Current message 8 of 9

=>

Can't get any easier than that!

Now I want to read my server receipt:

r 9

Message 9: (New)

Date: Mon, 16 Apr 2018 00:33:54 -0400 (EDT)

From: MAILER-DAEMON@n1uro.ampr.org (Mail Delivery System

Subject: Successful Mail Delivery Report

To: n1uro@n1uro.ampr.org

This is a MIME-encapsulated message.

--69E882111F.1523853234/n1uro.ampr.org

Content-Description: Notification

Content-Type: text/plain; charset=us-ascii

This is the mail system at host n1uro.ampr.org.

Your message was successfully delivered to the destination(s) listed below. If the message was delivered to mailbox you will receive no further notifications. Otherwise you may still receive notifications of mail delivery errors from other systems.

The mail system

<n1uro@n1uro.ampr.org> (expanded from <n1uro>): delivery via local: delivered

to command: /usr/bin/procmail -a "$EXTENSION" -p /etc/procmailrc

--69E882111F.1523853234/n1uro.ampr.org

Content-Description: Delivery report

Content-Type: message/delivery-status

Reporting-MTA: dns; n1uro.ampr.org

X-Postfix-Queue-ID: 69E882111F

X-Postfix-Sender: rfc822; n1uro@n1uro.ampr.org

Arrival-Date: Mon, 16 Apr 2018 00:33:54 -0400 (EDT)

Final-Recipient: rfc822; n1uro@n1uro.ampr.org

Original-Recipient: rfc822; n1uro

Action: delivered

Status: 2.0.0

Diagnostic-Code: X-Postfix; delivery via local: delivered to command:

/usr/bin/procmail -a "$EXTENSION" -p /etc/procmailrc

--69E882111F.1523853234/n1uro.ampr.org

Content-Description: Message Headers

Content-Type: text/rfc822-headers

Return-Path: <n1uro@n1uro.ampr.org>

Received: by n1uro.ampr.org (Postfix, from userid 1000)

id 69E882111F; Mon, 16 Apr 2018 00:33:54 -0400 (EDT)

From: Brian <n1uro@n1uro.ampr.org>

To: n1uro@n1uro.ampr.org

X-Priority: 3 (Normal)

Disposition-Notification-To: Brian <n1uro@n1uro.ampr.org>

Subject: test

Message-Id: <20180416043354.69E882111F@n1uro.ampr.org>

Date: Mon, 16 Apr 2018 00:33:54 -0400 (EDT)

--69E882111F.1523853234/n1uro.ampr.org--

--- end of message #9 ---

n1uro@n1uro.ampr.org

Current message 9 of 9

=>

Now I can't say I didn't get the mail as there's physical proof otherwise to argue such a statement. For grins I want to read my read receipt:

r 10

Message 10: (New)

From: Brian <n1uro@n1uro.ampr.org>

To: Brian <n1uro@n1uro.ampr.org>

Subject: axMail-FAX read receipt for "test"

Date: Mon, 16 Apr 2018 00:35:21 -0400 (EDT)

Your mail to Brian <n1uro@n1uro.ampr.org> about "test"

written on Mon, 16 Apr 2018 00:33:54 -0400 (EDT) has been read.

--- end of message #10 ---

n1uro@n1uro.ampr.org

Current message 10 of 10

=>

Very VERY simple to use and without any special needs just a dumb terminal and you're off and running.

Other "fax"

One big question I get is "Can it handle file attachments?" The answer is quite simple: Yes.

File attachments, as much as they appear to the eye as a separate entity, are often an encode of a file which is placed within the body of a mail message. The client then determines where and how it's located and then extracted upon receipt. This can be accomplished by using an external encode/decode utility such as UUCP or MIME. Say I have a file with some sort of wire labeling

I want to send. I'd run uuencode to parse it and then copy/paste the file in email:

n1uro@n1uro:~$ cat foo

1-red

2-brown

3-white

4-black

5-green

or...

1-white

2-brown

3-red

4-green

5-black

n1uro@n1uro:~$ uuencode foo foo.txt

begin 644 foo.txt

M,2UR960*,BUB<F]W;@HS+7=H:71E"0M8FQA8VL*-2UG<F5E;@H*,2UG<F5E;@HR+7=H:71E"0M8FQA8VL*

G"C$M=VAI=&4*,BUB<F]W;@HS+7)E9`H

E9`HT+7=H:71E+6=R965N"C4M8FQA8VL*

`

end

.

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

uuencode this buddy

begin 644 foo.txt

M,2UR960*,BUB<F]W;@HS+7=H:71E"0M8FQA8VL*-2UG<F5E;@H*,2UG<F5E;@HR+7=H:71E"0M8FQA8VL*

G"C$M=VAI=&4*,BUB<F]W;@HS+7)E9`H

E9`HT+7=H:71E+6=R965N"C4M8FQA8VL*

`

end

.

Deliver (Y/n/c/?):

Request a delivery receipt? (y/N):

Message sent.

Now I received it and I paste it into a file called foo.uu:

n1uro@n1uro:~$ nano foo.txt

Now I decode it:

n1uro@n1uro:~$ uudecode -o foo.uu foo.txt

and I read it as it was originally:

n1uro@n1uro:~$ cat foo.uu

1-red

2-brown

3-white

4-black

5-green

or...

1-white

2-brown

3-red

4-green

5-black

Typically your email client software will do this for you when you 'attach a file'. This however separates you from an appliance operator. It's always best to know how something works vs. being held captive to the unknown.

Another question I get asked often is "what software if I chose to use a GUI client does this take?.. is there an axMail-express or similar?" There's what I consider 2 levels of axMail-FAX:

1 – Basic

2 – Suite

The basic is more designed for the simple 1200-baud or lower node and while it may support IP to the end-user, it's not the ideal scenario so just basic ax25 connections are mainly used.

The suite typically contains a pop-before-smtp utility that grants temporary SMTP access for dynamic Ips and can be used strictly on amprnet OR any other Internet device. Also a modified pop3 daemon is used which can be had from my FTP server. Because of this, NO SPECIAL SOFTWARE is required. You can use Outlook, Thunderbird, whatever email client software you desire to use. On my mobile devices I like to use Aqua-mail and for a client I use Evolution that is a Linux client by Novell that acts and feels like Outlook. ANY client not designed for a specific mail system is fine.

"What about webmail services?" This is one of the key reasons for stricter password security. It's been known that other systems that require the end-user to share their password IN PLAIN TEXT is so dangerous. Even those who challenge passwords are easily cracked and can be tested via webmail – and to the wrong user (listening is allowed by EVERYONE not just hams) they can collect usernames and passwords from RF and sell them to spam outlets. Since axMail-FAX 2.9, there is never a password to be sent via RF. If the user is pirating a call sign, that's an FCC matter as it is anyway not ours and sending mail would then lead a trail to the pirate who'd be looking for replies. Sometimes we over-process things to the point where security by obscurity makes the best sense. Using Lets Encrypt, apache2, Squirrel-mail, and Dovecot in ssl-imap mode, full SSL/TLS webmail is very doable and also can be done via a mobile device. Obviously not to be run at a 1200-baud node site but for those on HamWan/802.11 or even 9600 baud systems (the typical speed of a router's console) this is quite feasible and is actually in

use on EastNet at various locations.

"Why you over them?" It's not a matter of who/what/where/when/ how it's a matter of what's proven to last. During Hurricane Irma, it was reported to me that the center part of Florida and out to the coasts were without Internet . The excessive winds also ate HF antennas like it was having a midnight snack – basically rendering EOC/ARES mail in some parts totally useless. Little does everyone know, the amprnet and axMail-FAX exchanges between Melbourne and Vero Beach was 100% functional 100% of the time. This unfortunately is the result of when politics takes president over functionality – innocent lives get harmed.

The FCC asked ALL communication providers amateur and commercial to provide them with a listing of infrastructures during all major hurricane events in 2017 and the biggest failures were HF amateur communications and wired Internet services. High winds were way too much even for the best of HF antenna structures, along with the dangling wires of telcom/cable providers. Those that had the lesser amounts of damage were the cellular networks and short-hop RF services which VHF/UHF/802.11 provide. The proof positive of this is the fact W4OT<>W4MLB continued to be able to exchange mail the entire time. The real question here is why is it buried under the rug? Two things you can't accept in times of emergency: failed communications transport and suffering a blue screen of death.

"How do we get a demo or training?" Simple: ask! The U.S. Air Force and U.S. Army MARS programs are migrating away from everything else to axMail-FAX, don't you think the EOCs and ARES folks should as well? Go to https://eastnetpacket.org and write to the webmaster. I'm sure arrangements can be made somehow.

"We're out of IPv4 now, what about IPv6 can you handle that?" Absolutely! https://uronode.n1uro.com has a listing of URONode sites that are already IPv6, to which axMail also is IPv6. You'll find these sites to be dual stacked.

"This guy says he can support 100 users at once, can you?" First, I want him to get 100 radios with

100 TNCs and make 100 concurrent connects to the same single node at 1200 baud. If he told you also that he can spit $10.00 GOLD coins out of his ears would you believe that too? Both make equal sense to each other. In reality yes we can support more than 100 concurrent users to axMail- FAX... and the more sites that set up with it, the more users and improved IP routing we'll have on Amateur Radio.

Closing

I thank you for reading this and for your interest in the axMail-FAX system. Most importantly for making use of our packet resources and keeping it alive and well. Use axMail-FAX and tell your ham friends about the ease of use, the volume of features (especially those that help you C.Y.A.) Both axMail-FAX and URONode are available from SourceForge, and from ftp://n1uro.ampr.org and are both given support by TAPR.

###

Power Down, DX Up

By Stana Horzepa, WA1LOU

We lost power mid-afternoon one Friday. After I iPhoned in the outage, I got on the radio to take advantage of the lack of noise in the neighborhood.

Conveniently for power outages, the ELAD FDM-S2 SDR receiver gets its power from my laptop. So I don't need to be on the grid for some serious monitoring. The only problem yesterday was that I had been using my laptop for hours and the battery was down to about 40% capacity.

During the day under normal noisy conditions, I may hear one local navigational beacon (JWE, Waterbury-Oxford Airport, Connecticut), but yesterday, I could hear many more and I logged six new ones. Five were located nearby in Massachusetts and Eastern New York, but one was 925 miles away in Fort Mitchell, Alabama (AWS on 335 kHz, photo below right).

When the laptop battery finally ran out, I switched to the C.Crane CCRadio 2E Enhanced receiver, which was loaded with fresh batteries and connected it to the outdoor antenna switch.

When I turned on the radio, it was tuned to 1710 kHz and I was very surprised to hear an old friend that I normally only hear at dusk, the unidentified mystery station thatplays Spanish music. Occasionally, the mystery station had competition from the Hudson County (NJ) TIS (WQFG689), which normally I only hear at night.

After monitoring 1710 for about 10 minutes hoping to hear a voice ID from the Spanish station, power was restored and the stations on 1710 disappeared into the noise.

Donate to TAPR

TAPR is now participating in the AmazonSmile program!

When you shop using the AmazonSmile program, Amazon makes a donation to TAPR equal to 0.5% of the price of your eligible AmazonSmile purchases.

AmazonSmile is the same Amazon you know. Same products, same prices, same service.

Bookmark the TAPR AmazonSmile Program link:

https://smile.amazon.com/ch/86-0455870

That link takes you to a special login portal where you enter your normal Amazon credentials and get redirected at the same Amazon home page except there will now be a notice that you are supporting TAPR.

Other ways to donate to TAPR:

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

AWS, 335 kHz,Fort Mitchell, Alabama

Write Here!

Your *PSR* editor is focusing on the next issue of PSR and hopes to find 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.

Your *PSR* editor can handle just about any text and graphic format, so don't be afraid to submit whatever you have to wa1lou@tapr.org, she can handle it!

The deadline for the next issue of *PSR* is July31, 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!

###

PSR

Submission Guidelines

TAPR is always interested in receiving information and articles for publication. If you have an idea for an article you would like to see, or you or someone you know is doing something that would interest TAPR, please contact the editor (wa1lou@tapr.org) so that your work can be shared with the Amateur Radio community. If you feel uncomfortable or otherwise unable to write an article yourself, please contact the editor for assistance. Preferred format for articles is plain ASCII text (OpenOffice or *Microsoft Word* is acceptable). Preferred graphic formats are PS/EPS/TIFF (diagrams, black and white photographs), or TIFF/JPEG/GIF (color photographs). Please submit graphics at a minimum of 300 DPI.

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TAPR is a not–for–profit scientific research and development corporation [Section 501(c)(3) of the US tax code]. Contributions are deductible to the extent allowed by US tax laws. TAPR is chartered in the State of Arizona for the purpose of designing and developing new systems for digital radio communication in the Amateur Radio Service, and for disseminating information required, during, and obtained from such research.

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TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.

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TAPR

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