



# President's Corner

By Steve Bible, N7HPR



Greetings!

Here is the latest news regarding the upcoming DCC.

## The Facts

ARRL-TAPR Digital Communications Conference (DCC)

Sept. 20-22, 2019 at the Detroit (MI) Metro Airport Marriott Hotel

## Early Bird Special

Reserve your hotel room by September 9 to get the special conference room rate of \$106 per night, which is good for three days before and after the DCC. Go to <https://tinyurl.com/y4e87t9u> to save!

## Students

Thanks to a generous grant from Amateur Radio Digital Communications, TAPR is able to fund attendance at the DCC for a number of students.

## Papers

The following is a list of the papers submitted for the DCC.

“PSAT2 DTMF Experiment APRStt – Touchtone® Digital Communications Using Any Radio for Data Exchange” by Bob Bruninga, WB4APR

“Extending D-STAR with Codec 2” by Antony Chazapis, SV9OAN

“IPV6 for Amateur Radio” by Daniel Estévez, EA4GPZ / MØHXM

“Synchronization in FT8” by Mike Hasselbeck, WB2FKO

“WSPR in an Educational Project” by Anthony Le Cren, F4GOH

“Portable Audio Frequency-Shift Keying Sensors Using a Hamshield Mini” by Nolan Pearce, KE8JCT, Stephen S. Hamilton, KJ5HY, and Kate J Duncan, KB2ZOO

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“An FPGA Learning Experience: SPI Interface to Max10 FPGA” by Gregory Raven, KF5N

“Modulation – Demodulation Software Radio” by Alex Schwarz, VE7DXW

“How to Kill Packet-Radio & APRS? Come to Serbia! (Part 2)” by Miroslav “Misko” Skoric, YT7MPB

“GPS Watch Technology” by Darryl Smith, VK2TDS

### **Banquet Speaker**

“Digital Modes on Amateur Radio High Altitude Balloons” by Bill Brown, WB8ELK, the father of Amateur Radio ballooning, is the title of the DCC Saturday evening banquet presentation.

Bill has been flying APRS and other digital modes on high altitude balloons since 1987. He flew the first high altitude packet digipeater on a balloon in 1988 that allowed hams in 12 midwestern states to communicate with each other. Since that time he has flown over 600 balloon missions some of which have circumnavigated the world multiple times. He has developed a 12 gram APRS tracker called the Skytracker designed to fly on foil party balloons that can stay aloft for weeks.

Bill currently works at the NASA Marshall Space Flight Center in Huntsville, Alabama, as a Systems Engineer working with the avionics and flight software systems for the Space Launch System rocket.

### **Sunday Seminar**

“Learn to build and operate your own SatNOGS ground station” is this year’s Sunday Seminar to be presented by Dan White, AD0CQ and

Corey Shields, KB9JHU.

The topic will be: Learn to build and operate your own SatNOGS ground station.

This seminar will be a hands-on, progressive tutorial, starting with the basics of SatNOGS and ending with the development of telemetry decoders. Familiarity with Linux and the Raspberry Pi platform is beneficial but not required. We will also interact with the SatNOGS web services themselves, and discuss other technologies in use such as: Python, GNURadio, InfluxDB, Kaitai Structs, and Grafana. Participants should leave with an understanding of how SatNOGS applications work, how to use them, and a basic familiarity with the technologies behind the scenes should they wish to contribute to the development of the project. Participants should bring a laptop and sign up (free) for an account at <https://network.satnogs.org>

### **Demo Room**

Everyone is invited to bring demos, experiments, show-and-tell, etc. and set them up in the demonstration room. Tables and power strips will be provided.

### **Call for Speakers**

There are still a few slots open to speak at the DCC, so if you have something to say, contact Steve Bible, N7HPR at [n7hpr@tapr.org](mailto:n7hpr@tapr.org)

See you in Detroit!

73, Steve Bible, N7HPR, President TAPR

###



## Schedule at a Glance

### Thursday, 19 Sep

9:00 AM TAPR Board Meeting  
5:00 PM (everyone is welcome to attend)

### Friday, 20 Sep

8:00 AM Conference Registration and Demonstration Room Open  
8:45 AM Welcome  
9:00 AM Technical Presentations  
Noon Lunch  
1:00 PM Technical Presentations  
5:30 PM Friday Night Social  
10:00 PM Demonstration Room Closed

### Saturday, 21 Sep

8:00 AM Conference Registration and Demonstration Room Open  
8:45 AM Welcome  
9:00 AM Technical Presentations  
Noon Lunch  
1:00 PM Technical Presentations  
4:45 PM TAPR Membership Meeting  
6:00 PM No Host Cash Bar  
7:00 PM Dinner Banquet  
10:00 PM Demonstration Room Closed

### Sunday, 22 Sep

8:00 AM Sunday Seminar  
Noon

## Rooms at a Glance

Registration – Foyer  
Demonstration Room – Dearborn

### Thursday

TAPR Board Meeting – Romulus

### Friday

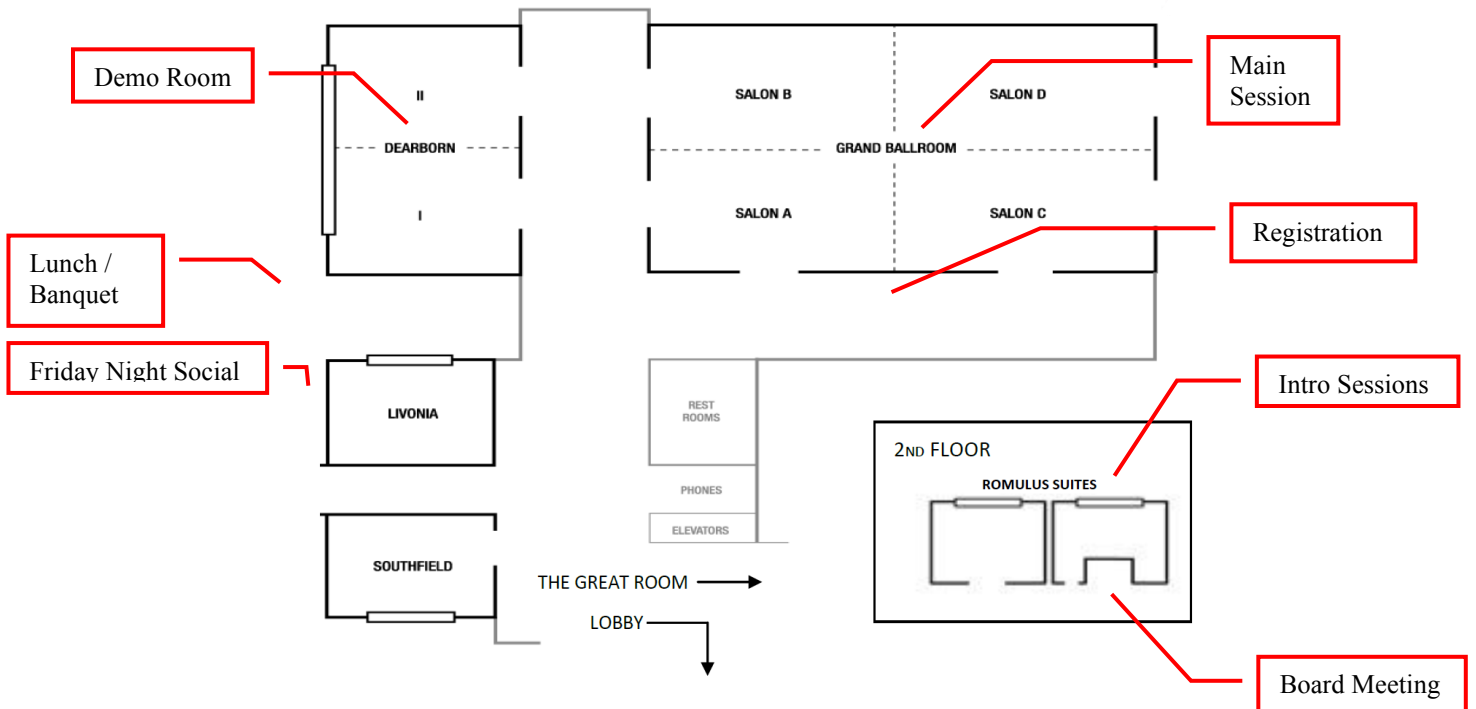
Main Session Technical Presentations – Ballroom  
Lunch – North Private  
DCC Social – North Private

### Saturday

Main Session Technical Presentations – Ballroom  
Introductory Sessions Presentations – Romulus (2<sup>nd</sup> Floor)  
Lunch – North Private  
Dinner Banquet – North Private

### Sunday

Sunday Seminar – Ballroom



# 2019 DCC Conference Schedule

	<b>Friday – Main Session</b>	<b>Saturday – Main Session</b>		<b>Sunday</b>
8:00 AM		Conference Registration Demonstration Room Open		<b>Sunday Seminar</b> <b>8:00 AM – 12:00 AM</b>  <b>Learn to build and operate your own SatNOGS ground station</b> Dan White, ADØCQ Corey Shields, KB9JHU
8:45 AM	Conference Registration Demonstration Room Open	<b>Personal Space Weather Station Update</b> Nathaniel Fressell, W2NAF	<b>Introductory Session</b>	
9:00 AM		<b>TangerineSDR -- A Modular SDR for HamSCI, Satellite, Experimenters and Academics</b> Scotty Cowling, WA2DFI		
9:30 AM	<b>Welcome and Introductions</b>			
9:45 AM	<b>GPS -- Beyond the Basics</b> John Ackermann, N8UR	<b>Using TangerineSDR to Build a Personal Space Weather Station</b> Tom McDermott, N5EG		
10:30 AM	<b>The Threat of High Voltage Switching, Solar and EV's to Amateur Communications</b> Bob Bruninga, WB4APR	<b>Large Scale Traveling Ionospheric Disturbances as Observed by RBN and WSPRNet</b> Nathaniel Frissell, W2NAF <b>Challenges in WWV Doppler Measurements</b> Phil Erickson, W1PJE	<b>Introduction to Hi-Def Digital Amateur Television</b> Mel Whitten, KØPFX	
11:15 AM	<b>2-meter and 70-centimeter digital radio modulation basics</b> Mark Miller, N5RFX	<b>Estimating LF–HF Band Noise while Acquiring WSPR Spots</b> Gwyn Griffiths G3ZIL, Rob Robinnett AI6VN, and Glenn Elmore N6GN <b>Field Day 2019 Observations from the Swarm-E Spacecraft</b> Gareth Perry, KD2SAK		
<b>Noon</b>	<b>Lunch</b>	<b>Lunch</b>		
1:00 PM	<b>Lightning Talks</b> (Impromptu 5-minute talks)	<b>Lightning Talks</b> (Impromptu 5-minute talks)		
1:45 PM	<b>The Homogeneous AMPRnet Data Network</b> Jay Nugent, WB8TKL	<b>Ground-Based VLF Observations of Whistler Waves</b> Jonathan Rizzo, KC3EEY	<b>System Fusion Overview</b> Mark Thompson, WB9QZB	
2:30 PM	<b>From ad hoc to automated data collection in Linux</b> Dan White, ADØCQ	<b>An FPGA Learning Experience: SPI Interface to Max10 FPGA</b> Gregory Raven, KF5N;		
3:15 PM	<b>Portable Audio Frequency-Shift Keying Sensors using a Hamshield mini</b> Nolan Pearce, KE8JCT	<b>PSAT2 DTMF Experiment APRStt – Touchtone® Digital Communications: Using any Radio for Data Exchange</b> Bob Bruninga, WB4APR		
4:00 PM	<b>The Lion in the Path</b> Kristina Collins, KD8OXT	<b>Synchronization in FT8</b> Mike Hasselbeck, WB2FKO		
4:45 PM	<b>Play Time</b> in the Demonstration Room	<b>TAPR Annual Meeting</b>		
5:30 PM	<b>Friday Night Social</b> <b>No-Host Cash Bar</b>	<b>Play Time</b> in the Demonstration Room		
6:00 PM		<b>Dinner</b> <b>No-Host Cash Bar (6:00 PM)</b> <b>Dinner (7:00 PM)</b> Bill Brown, WB8ELK Digital Modes on Amateur Radio High Altitude Balloons <b>Awards Presentation</b> <b>Prize Drawings</b>		
10:00 PM	<b>Demonstration Room Closed</b>			

## TAPR Directors Election

Three Director positions on the TAPR Board of Directors are now open for nomination and nominations may be submitted now.

TAPR Board members serve three-year terms and their responsibilities include:

- 1) Attendance at both in-person board meetings each year. [One is held at the Dayton Hamvention in May, the other at the Digital Communications Conference (DCC) in September.]
- 2) Regular participation in the continuous board session, which is conducted over the Internet.
- 3) Active engagement in TAPR's management.

To place a person in nomination, please remember that he or she must be a member of TAPR. Also, confirm that the individual is willing to have his or her name placed in nomination. Send that person's name (or your own if you wish to nominate yourself), call sign, mailing address, e-mail address, phone number(s), and a biographical sketch (100 words maximum) via <http://www.tapr.org/inforequest.php> or via snail mail postmarked by September 6, 2017, to P. O. Box 852754, Richardson, TX 75085-2754. If you submit a nomination via e-mail, we strongly encourage you to follow up by regular mail.

Nominations close after the call for nominations from the floor at the TAPR Membership Meeting at the DCC on September 21, 2019, and an online election will be held at [http://www.tapr.org/tapr\\_elections.html](http://www.tapr.org/tapr_elections.html) from September 28, 2019 to October 12, 2019.

The three Director positions that are up for election are currently held by John Ackermann, N8UR, Bruce Raymond, ND8I, and Mark Thompson, WB9QZB. All three decided to run for reelection

###

## WSPR on 20, 30 & 40 Meters

TAPR now offers its popular Raspberry Pi QRP TX Shield for WSPR in three versions: 20, 30 and 40 meters!

Nowadays, one of the most impressive QRP modes is Joe Taylor, K1JT's WSPR (pronounced "whisper") mode. WSPR stands for "Weak Signal Propagation Reporter." Programs written for WSPR mode are designed for sending and receiving low-power transmissions to test propagation paths on the MF, HF and recently, UHF bands. Users with Internet access can watch results in real time at [wsprnet.org](http://wsprnet.org).

TAPR's QRPI board (or "shield" as referred by the community today) is an inexpensive way of turning a Raspberry Pi single-board computer into a QRP transmitter. The QRPI comes to you assembled and tested.

For more information and to place an order visit [https://www.tapr.org/kits\\_20M-wspr-pi.html](https://www.tapr.org/kits_20M-wspr-pi.html) for the 20 meter version, [https://www.tapr.org/kits\\_30M-wwot.html](https://www.tapr.org/kits_30M-wwot.html) for the 30 meter version and [https://www.tapr.org/kits\\_40M-wwot.html](https://www.tapr.org/kits_40M-wwot.html) for the 40 meter version.

###



## \$10,000 Grant from ARDC

TAPR received a \$10,000 grant from Amateur Radio Digital Communications (ARDC) for the purpose of providing all-expense-paid trips to the DCC for students and some seminar presenters. The intent is to enable those who might not otherwise be able to attend the opportunity to participate in the Conference.

The grant allows us to provide financial support (travel, lodging, conference attendance, meals) for a few students, whether or not presently licensed, who would benefit from attendance and who would help represent a broader demographic than the current ham radio community (e.g., young people, people of color, women, etc.).

If you would like to submit the name of a deserving student along with brief information about why you feel he/she would be a good selection, we would be happy to consider him/her. We would like to receive nominations by September 1 if possible, though we will be as flexible as possible in the timing. Please send nominations to [taproffice@tapr.org](mailto:taproffice@tapr.org).

###



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

## TAPR Short Bits

### N7HPR interview

TAPR President Steve Bible, N7HPR, was interviewed by Eric Guth, 4Z1UG, for his QSO Today podcast. (John Ackermann, N8UR, was interviewed back in 2017.)

The topics we talked about were my getting into ham radio and TAPR. It was a fun interview and I believe it turned out pretty good.

You can hear it here: <https://www.qsotoday.com/podcasts/N7HPR>

### Hamvention Videos

Videos of the TAPR, HamSCI and SDR Forums from this year's Dayton Hamvention are now online and accessible at <https://tangerinesdr.com/video>.

### All PSR issues are now searchable

PSR issues 1 to 80 were image files and the text contained in those issues was not searchable. (Issues 81 and beyond were searchable.)

Robert Greenfield, VE5DSC, kindly volunteered to perform optical character recognition (OCR) on issues 1 to 80 and create pdf files containing searchable text. As a result, all of the PSR files at [www.tapr.org](http://www.tapr.org) are now searchable.

###

## 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](http://www.tapr.org/tapr_donate.html)



## Team Up with YT7MPB

By Miroslav "Misko" Skoric, YT7MPB

My LinkedIn profile <https://www.linkedin.com/in/miroslavskoric/> includes (up to now) some 40 short video-photo clips describing my previous Amateur Radio efforts in promoting packet-radio and other data modes, as well as related computer networking, among students and teachers of several universities and high schools and conference participants in various technical events held in Europe, Asia, and Africa.

Now after going retired, I plan to expand those activities to other continents. Prospective collaborators are welcomed. I invite TAPR *PSR* readers to visit my profile page and make connection.

I am going to participate as a tutorial speaker on amateur radio communications with "IEEE RADIO 2019" in Reunion Island (France). More details about the conference is here: <http://www.radiosociety.org/radio2019>

###

Besides my usual talks about packet-radio, APRS and related computer networking, there will be some local demo in those modes as well. Applications for using special Amateur Radio prefix (TO\*) are processed by French authorities, and that will be used to celebrate the conference itself and support amateur radio in Reunion Island. I planned to have with me some portable radios capable for VHF/UHF demo with FM and DMR voice and data operations.

Possible HF activity will depend on local FR\* hams and their equipment.

###

# Minutes of TAPR Board of Directors Meeting

May 16, 2019, Dayton, Ohio

Attendees: Officers and Board Members: John Ackermann - N8UR, Steve Bible - N7HPR, George Byrkit - K9TRV, Scotty Cowling - WA2DFI, Tom Holmes – N8ZM, Stana Horzepa - WA1LOU, John Koster - W9DDD, Bruce Raymond - ND8I and Mark Thompson - WB9QZB. Guest: Tim Shepherd – KD1KY.

Hamvention Booth is all set.

Hamvention Forums are all set. To be videotaped by K9TRV, WA2DFI and Dave Larsen – KV0S.

Discussion about Xenia Hamvention site.

Discussion about Hamvention forum listings foul-ups in printed and online programs.

Office Report (W9DDD): All excess parts are to be handed off to complete fire sale. HPSDR remainders are still for sale.

Hamvention booth displays all set with lots of stuff to sell.

Treasury Report (N8ZM): New accountant did not complete taxes, so he filed an extension.

ND8I showed 40-meter WSPR board. Needs to be added to TAPR website.

WA2DFI discussed HamSCI project.

WA2DFI discussed Tangerine SDR WIP. [www.tangerine.com](http://www.tangerine.com) and teamspeak are up and running.

N8UR discussed new and old time projects. “TADDs live forever!”

40th anniversary book discussion. It was decided to go forward with project under WA1LOU.

40th anniversary DCC discussion. Start marketing after Charlotte DCC

Regarding the Charlotte DCC, WA1LOU brought up NC LGBT issue.

N8UR proposed a Code of Conduct. He will look at similar organizations’ Codes of Conduct as a model for ours.

WA2DFI discussed expense of Tangerine production. Maybe use crowd-funding to raise money.

Discussion about NSF grant for HamSCI, which we can help support.

Meeting adjourned.

(Thanks to the Ackermanns, Jody, KC8KDC, and John, N8UR, for hosting the meeting in their lovely home.)

###



*Keith Sproul, WU2Z, and Guy Story, KC5GOI, at the 1999 DCC in Phoenix. (from PSR #76)*



# Appalachian Golden Packet Expansion

By Bob Bruninga, WB4APR

We finished the Appalachian Golden Packet (ATGP) event with 15 hops to Maine and 14 hops back to Georgia.

We think we can increase throughput 20x or more for 2020 by totally changing our beacon plan, messaging plan and getting the 2X benefit of 9600 baud.

This means we would like to see extension of the network perpendicular to the chain such as these mountains: Huntsville, AL, Lookout Mountain, TN, Stone Mountain, GA, Ridge South of Morganton, NC, etc. And so forth up to Maine.

Desired locations are high places on the order of a hundred miles away from the ATGP backbone stations that can see one of the ATGP stations. This allows for a much bigger network during the event, but still keeping paths linear and avoiding the NxN explosion of packets.

We need to begin to find people to locate and man these additional sites. Please do not waste time on a mountain idea unless it can really be very far and perpendicular from the ATGP chain and always best if it is across valleys. Do path-tracing homework first before just throwing out ideas.

You can see the ATGP chain on this page:

<http://aprs.org/at-golden-packet.html>

###

# TAPR Wear Available



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.

###

# Hamvention Photo Gallery

As usual, TAPR had a significant presence at Hamvention with its TAPR Forum opening the festivities on Friday morning and the annual TAPR-AMSAT Dinner ending the day Friday evening, while staffing a suite of booths throughout Hamvention weekend.

Videos of the TAPR Forum, as well as the HamSCI and SDR Forums are online and accessible at <https://tangerinesdr.com/video>, while the photographs of TAPR at Hamvention appear on the following pages.

###



*Scotty Cowling, WA2DFI, George Byrkit, K9TRV, and Steve Bible, N7HPR, warm up the crowd before the TAPR Forum commences.*



*TAPR President, Steve Bible, N7HPR, welcomes all to the annual Hamvention TAPR Forum.*



*TAPR Vice President, Scotty Cowling, WA2DFI, was the moderator and organizer of the TAPR Forum.*



*Nathaniel Frissell, W2NAF, HamSCI Lead Organizer, introduced HamSCI to the TAPR Forum attendees.*



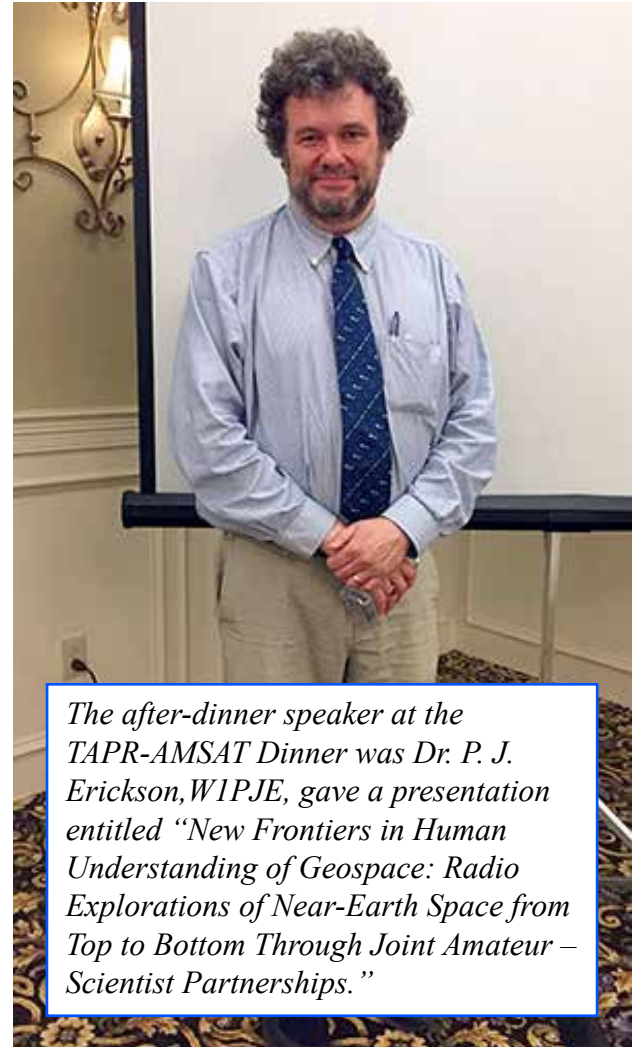
*Bryan Hoyer, K7UDR, CEO of NW Digital Radio presented "Digital Radio Amateur Workstation (DRAWS)" at the TAPR Forum.*



*Bruce Perens, K6BP, CEO of Open Research Institute, introduced the Open Research Institute at the TAPR Forum.*



*TAPR's suite of booths were buzzing with activity throughout Hamvention weekend.*



*The after-dinner speaker at the TAPR-AMSAT Dinner was Dr. P. J. Erickson, WIPJE, gave a presentation entitled "New Frontiers in Human Understanding of Geospace: Radio Explorations of Near-Earth Space from Top to Bottom Through Joint Amateur – Scientist Partnerships."*



*PSR Editor, Stana Horzapa, W1LOU, invites attendees at the HamSCI Forum to contribute to PSR.*

*32,472 attended the 2019 Hamvention, which is the highest attendance recorded since the move to the Greene County Fairgrounds and Exposition Center in Xenia, Ohio.*



*Laura Koster with yet another customer at the TAPR suite of Hamvention booths.*

# TAPR's packetRadio

By Stana Horzepa, WA1LOU

After returning home from Hamvention 30 years ago, I wrote the following for ARRL's packet radio newsletter *Gateway*:

## TAPR UNVEILS packetRADIO AT DAYTON

The Tucson Amateur Packet Radio (TAPR) booth at the Dayton Hamvention was buzzing with the unveiling of a number of new packet-radio products including prototypes of the TAPR "packetRADIO," a low-cost (approximately \$250) two-stage VHF transceiver designed exclusively for packet-radio applications. TAPR's packetRADIO features 9600 baud FSK and 1200 baud AFSK 2-meter operation with 25 watts output, five crystal-controlled channels and a transmit-receive turnaround time of less than one millisecond (ms).

The working prototypes displayed at the Hamvention were the result of a six-week crash project by TAPR. Beta-testing will begin soon with the radios expected to be available to the general public in approximately six months.

TAPR's packetRADIO generated a lot of excitement at Hamvention in 1989, but the project was never completed and was eventually cancelled to the disappointment of many packeteers including myself.

Fast-forward 30 years...

While cleaning out the TAPR warehouse, John Koster, W9DDD, found the packetRADIO prototype and brought it to the TAPR board meeting for show and tell. I ended up with it and brought it home to add to my collection of vintage packet radio TNCs.

###



TAPR's packetRadio

## Write Here!

Your *PSR* editor is working 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 [wallou@tapr.org](mailto:wallou@tapr.org) --- she can handle it!

The deadline for the next issue of *PSR* is October 31, 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](http://www.facebook.com/TAPRDigitalHam).

However, I also created a TAPR Facebook Group, [www.facebook.com/groups/TAPRDigital/](http://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](http://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](http://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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TAPR Office Hours: Monday to Friday, 9 AM to 5 PM Central Time

**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 ([wallou@tapr.org](mailto:wallou@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.

**Production / Distribution**

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