TAPR PS

President's Corner

Perspectives

By Steve Bible, N7HPR

Guest QEX Editorial from the President of TAPR

If you are reading *QEX*, you may be a connoisseur of all things technical. That in this hobby of Amateur Radio you enjoy the time on the bench as much as time on the air. Technical connoisseurs enjoy reading and sharing ideas. We love telling others about our journeys.

Sharing comes in many forms. Today, with this marvelous invention called the Internet, information and facts abound. But if the information and facts are not put into the context of a journey, then they are mundane. For it is not the distance from A to B that we want to read about, it's the path from A to B with all its side roads and dead ends we wish to hear. It is from the journey that we learn from others.

It has been the mission of TAPR to help experimenters on their journey. TAPR has helped many experimenters get their projects into the hands and minds of others through funding, technical support — both in development and manufacturing — and the co-production of the Digital Communications Conference with the ARRL.

We have just finished the 35th Annual DCC in St. Petersburg, Florida this past September. The DCC shares information in a printed proceeding and on YouTube thanks to Gary Pearce, KN4AQ, for his expert video production. You can view well over one hundred talks at https://goo.gl/ZMTZCG.

There are many Amateur Radio technical conferences you can attend — DCC, Microwave Update, Central States VHF Society Conference, and the AMSAT Symposium to name a few. If you have not had the chance to attend one, I highly recommend it. The one element that you can get only from attending a conference is socializing and sharing. That is the one great multiplier when you personally attend. You will come away inspired and energized. You will also be supporting the conference because this is the only way they can survive.

Many of the conferences bounce from city to city in an effort to allow local folk to attend with-

out the expense of an airplane ticket and hotel stay. When one of these conferences comes to your backyard, attend it! See for yourself what a fantastic experience it is.

The grandest way you can support a conference is to tell about your journey on one of your projects. Don't feel that you are not smart enough, or that your project is not significant to present. Nothing is further from the truth. Everyone loves to hear about your journey. Tell the audience about what you learned, the frustration you experienced, about the dirt roads and how to avoid them, and the satisfaction you felt as you completed it. Getting up in front of an audience at a technical conference is most therapeutic if not euphoric!

Share your journey. We are all in this great hobby together and we love a good technical yarn.

Steven Bible, N7HPR,

President, TAPR, www.tapr.org

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DCC Video Online

By Stana Horzepa, WA1LOU

Gary Pearce, KN4AQ, HamRadioNow's main man has posted on YouTube a slew of videos from the ARRL-TAPR Digital Communications Conference (DCC) held this past September in St. Petersburg.

At https://www.youtube.com/user/HamRadioNow/ look for HRN video numbered 271, which is the first in the series of 2016 DCC videos. They continue in ascending order to HRN 297.

###

New Kit: TNS-BUF Isolation Amplifier

The TNS-BUF Isolation Amplifier is a very low noise, high isolation, buffer amplifier for use in time and frequency measurement applications where it is important to isolate signals without adding noise. The main purpose of the TNS-BUF is to look as much as possible like a one-way piece of wire at RF frequencies.

It is designed for use at 5 or 10 MHz, but will work with some loss of gain from 1 MHz to at least 50 MHz.

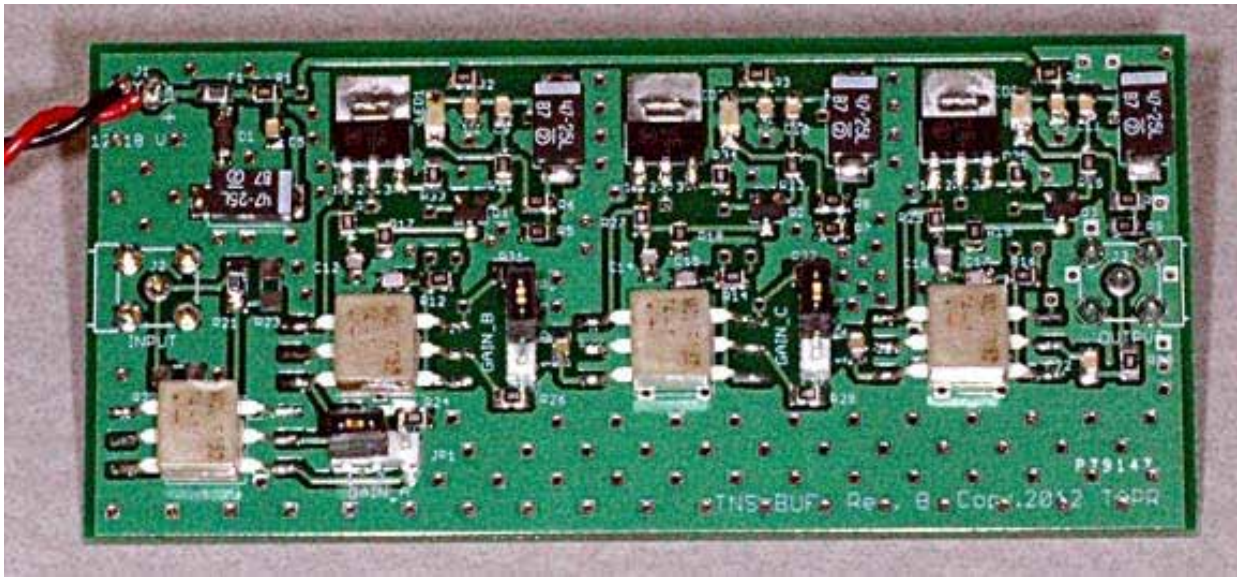
The TNS-BUF circuit was designed by Dr. Bruce Griffiths, and John Miles, KE5FX, provided valuable input on both schematic and layout.

The TNS-BUF is built on a 1.75 x 3.75 inch board using 0805 size surface mount components. In the picture above, the SMA connectors are mounted on the reverse side of the board.

For full technical details, visit http://www.febo.com/pages/TNS-BUF or download the manual from here: http://www.tapr.org/~n8ur/TNS-BUF_Manual.pdf.

The price for the TNS-BUF is $119 US plus shipping/handling if applicable. Note that the TNS-BUF is a one-time, limited run and there are only a few left in stock, so do not hesitate to order.

###



New Board: TICC Timestamping/Time Interval Counter

The TAPR TICC is a two-channel time-stamping counter with better than 60 picosecond resolution and less than 100 picosecond typical jitter. It has an Allan Deviation noise floor below 1x10-10 for a one second measurement.

The TICC designed to measure low-rate time intervals, such as the pulse-per-second signal from a clock or GPS, with very high resolution. The TICC hardware is a "shield" that mounts on an Arduino Mega 2560 processor board, and the TICC software runs on the Arduino. Data is sent via USB to a host computer for logging and analysis. The TICC can currently perform over 100 measurements per second; we believe that software optimization will ultimately increase the measurement speed.

The TICC can output timestamp data for each channel, or the time interval between the two channels. The channel inputs trigger with about 1.7 V and are safe to 5 V. Input impedance is 1 megohm. The TICC requires an external 10 MHz reference clock at nominally +3 dBm, though the input circuit operates over a wide amplitude range.

The TICC is powered by the Arduino to which is is attached, which in turn can be powered by the USB cable from the host computer.

More information about the TICC is available at febo.com/pages/TICC.

The TICC software is open source and available from

github.com/TAPR/TICC. The git repository also includes data sheets and other information on some of the hardware components. The software is undergoing active development.

TAPR is planning a production run of fully assembled and tested TICC systems. We have already placed an order with our contract manufacturer.

The TICC system will include the TICC shield and an Arduino 2560 Mega compatible board with TICC software loaded. The systems will be tested for functionality prior to delivery.

Delivery from our contract manufacturer to TAPR is expected in early February, 2017, and we will ship to customers as quickly as we can after receipt.

The price for the TNS-BUF is $190 US plus shipping/handling if applicable.

###

TAPR Donation to Hamlin Middle School in Oregon

October 27, 2016

Dear Tucson Amateur Packet Radio Corporation,

Thank you so much for helping us fund our science and engineering projects! Your donation of $500 will help Hamlin Middle School students do projects that would not be possible with our regular classroom budgets.

Your funds will be used specifically to help offset the cost for students to build a Morse code oscillator. Almost 600 Hamlin 6th graders have built these projects during the past three years, learned some Morse code, and also learned great lessons about electronics and radio. We've already needed to begin purchasing and organizing parts, so your donation was very timely and appreciated.

Thank you for your donation and we will let you know when this year's students complete their projects in November and May.

Sincerely,

Nelson Farrier

Nelson Farrier
Hamlin Middle School Teacher

Minutes of TAPR Board Meeting at DCC 2016

St. Petersburg, Florida

15 September 2016

Present: Scotty Cowling, George Byrkit, Darryl Smith, John Ackermann, Jeremy McDermond, John Koster, Tom Holmes, Stephen Bible, Mark Thompson

Guests: Barb Holmes, Laura Koster, Bruce Raymond, Joe Muchnij, Brennan Price N4QX, Mel Witten

Meeting called into session by Steve Bible at 9:15 AM

Election of officers: Scotty moved to re-elect the current officer corps (Steve Pres, Jeremy VP, Stana Secretary, Tom Treasurer). Darryl seconded the motion. The motion passed unanimously.

The budgeting and costing of DCC was discussed by Steve Bible, so that all board members and officers are reminded of the event structure. The nominal attendance is 100. The nominal budget is $20k. AV is about 8K.

Steve and Tina Stroh are looking to have DCC at Seattle in 2017. Same location (ex-WaMu conference center near SeaTac airport)

Proposed Ann Arbor for September 29 2018 (Michigan playing 'away' at Northwestern). This avoids the Jewish holidays (Sep 10 and 19, roughly). George K9TRV to host.

DCC in 2021 will tentatively be located in Tucson, AZ.

Mark Thompson discussed the prizes/give-aways for this year's DCC, and trends in the industry. Many think that prizes at the banquet aren't a drawing card for the DCC. Promoting incompatible digital voice standards isn't really in our best interest. But offering the vendors' radios as prizes isn't a bad thing, but we will offer them if that is what is offered. It's a low-energy operation to request their donation of prizes. If we had our choice, we would prefer cash sponsorship of the Friday socializer, Saturday banquet, etc. TAPR needs to stay aloof and not become a pawn in the 'digital voice standards' battle.

Current groups active in digital include mesh networks (Linksys, ubiquity, etc.) Other current synergies include Mike Ossman with HackRF and related projects. Northwest Digital Radio is also closely aligned with TAPR's goals.

KT7APR, our club call, is up for renewal. Scotty will continue as trustee. The renewal form needs the president's signature and the trustee's signature. This will occur.

What is our next mission? We 'succeeded' at pushing OpenHPSDR. With items like Dave Rowe and his codecs, and Chris Testa and Whitebox, TAPR has prompted technology, but failed to find a way to capitalize on getting money back out of them to fund the next technology development. We will speak with Mel to discuss the current lay of the land with Dave Rowe's upcoming products.

Perhaps our future is more in things like the WSPR-PI board, John A's new TICC project, where add-on boards for an R-Pi, Arduino, etc. are very useful to hams.

John Ackermann now discussed the development of his new TICC board. Hardware is finished except for minor tweaks. Software is currently usable. Integrates with Jon Miles' KE5FX TimeLab program. Jeremy contributed to the software development. Propose to use Elekromont in Hungary to make the TICC board. Rough guess of parts

plus assembly is $50 each. Sell for $150. Perhaps $200 with Arduino already programmed. The board concurs that John is approved to go into production.

John A has a product that he finished several years ago. An ultra-low-noise buffer amplifier.

George reported the success of a fund raising campaign for a code-signing certificate for OpenHPSDR. We succeeded in reaching our goal ($1000) and even went over by more than $200. The extra will be earmarked and held in reserve for 3 years from now when the certificate needs to be renewed. A number of donors either joined TAPR or renewed their membership, or purchased additional items. This was a successful model. John A mentioned that going forward we could offer to sign other openHPSDR applications or similar in exchange for a donation to TAPR for the certificate fund.

WSPR-PI re-order was discussed. Scotty moved, Jeremy seconded, that we order 500 more units. Unanimously passed.

Tom Holmes discussed the treasurer's report. Both checking and savings accounts are down. Total assets including inventory is about $107,000. Dayton sales were some of the better shows in the past.

John Ackermann moved that Jeremy set us up as 'Amazon Smile'. It is a fund-raising site, so that we get money for totally amazon purchases, not just amazon purchases of TAPR products. Darryl seconded. Unanimous approval.

Office report from John Koster: John has been working thru some health issues, related to the incident on the cruise in April that caused him to miss Dayton. John spoke of having a continuity plan for succession, should he become severely ill, die, or otherwise lose interest. John has been doing this for 15 years. Jeremy mentioned that we could have an organizational 'last pass' account so that Koster could keep the passwords and such there for the sake of continuity. George is an 'understudy' for John at this time. George has run Dayton twice and will assist with registration here at DCC this year.

We need to transfer physical assets, but they are not the immediate problem. Ongoing business procedures are the immediate need for business continuity.

TAPR may sell Bill Brown (wb8elk) product that is a nano-payload that would use a mylar party balloon as a launch vehicle. These payloads are about .5 oz., which is under the 1 oz. limit that many are looking for. Discussions are in progress.

Dealing with the schedule tomorrow: we have an open slot. Scotty would like to be first. Jeremy and Darryl have offered presentations. Darryl has his presentation ready, so he gets the slot.

Technology and infrastructure: Jeremy is moving many mailings to MailChimp. And plans to better target former members, using a 'letter from the president'. Our membership software has a module (not using any, get 2 for free) that can do conferences, donations, etc. There is a storefront module, but it doesn't integrate well with Amazon. Jeremy and John A want to discuss infrastructure. We are renting a hardware server at a data center. There is a fair amount of time spent as sysadmin on this structure. They propose putting our infrastructure out in the cloud. This would replace our email with Google Email for Charities, which is free. The hardest part to replace is mailing lists. The APRS list is active, and the HF SIG list is active as part of support for the WSPR-Pi. Many other lists have not been used last in 2014. Other lists haven't been used in

longer. John A has several lists that he needs to re-host for 'FEBO'. The proposal is to find a service group that provides the services, and replace physical hardware with services. We want to not run mail servers, or have servers to manage. This does not involve virtual machines.

Darryl moves that:

1) Continue moving the mail to google

2) Continue investigating how to move the mail lists

3) Continue to investigate moving our stock to amazon and into the cloud.

4) Move from SVN to GitHub. SVN support will be decommissioned.

Seconded by Scotty. Archives are moving to Github.

Unanimously approved.

Board members up for election this year: Mark, John A, Jeremy. All three agree to run for re-election. We will attempt to see if there are any other nominees before presenting the current members standing for re-election.

It is a board consensus that Jeremy should pursue refining the concept of an annual software award for Open Software (licensed under OSI recognized free software licenses). Jeremy moved that we establish an open software prize (OSI-recognized open software licenses), to be awarded annually at the discretion of the board, with nominations by Dayton and awarded at DCC, with first prize of $1000 and optional second prize of $500. Seconded by Scotty. Approved Unanimously. Jeremy will refine the process and submit to the board.

At 3:15 PM, the board ended its current session.

Respectfully submitted,

George Byrkit, K9TRV

Recording for the TAPR secretary

###

TAPR Board of Directors meeting in St. Petersburg, September 15, 2016.

Minutes of TAPR Annual Meeting at DCC 2016

St. Petersburg, Florida

17 September 2016

Present: Scotty Cowling, George Byrkit, Darryl Smith, John Ackermann, Jeremy McDermond, John Koster, Tom Holmes, Stephen Bible, Mark Thompson

The meeting came to order at 4 PM.

Those in the audience were greeted by Steve Bible. The board members and officers were introduced.

Tom Holmes gave the treasurer's report, which will be published in the PSR.

Nominees for (re)election to the board

- Expiring terms:
  - John Ackermann N8UR
  - Mark Thompson WB9QXB
  - Jeremy McDermond NH6Z
- From the floor:
  - Bruce Raymond ND8I

Nominations were closed. Since there are more nominees than positions, an election will be held. Most likely will be an email ballot, sent from the member's portal.

Steve Bible presented a series of slides about what TAPR does:

- Hamvention
- DCC
- Projects
- Fulfilment by AMAZON
- N8UR TICC
- N8UR TNS-Buf
- HA7DCD WSPRpi Board
  - Over 500 sold
  - Ordering 500 more
- GIT update
  - Github organizational account
- TICC project
- John Stephenson archives
  - Will put other projects there
- Move the FTP server contents to github
- Move the SVN server used largely by openHPSDR to github
- Fund raising for an 'EV code signing certificate'
- Supporting TAPR
- How TAPR makes money
  - Membership dues
  - Donations (TAPR is a 501(c)3
  - Amazon Smile

Thanks to our local hosts, Darrell Davis, KT4WX, Bryan Fields, W9CR. 104 registrants this year.

- DCC future locations

Steve and Tina Stroh, Seattle WA likely for 2017. Looking at different sites in SeaTac area, due to price increases of previous site (Cedarbrook lodge)

Looking at Ann Arbor, MI for 2018 (tentatively September 29, 2018 weekend.)

The TAPR software prize. Jeremy talked about the TAPR open software prize. Nominations by Hamvention. Board will decide and award at DCC. Will have to be an open source project. $1000 for first prize. Optional $500 second prize. Awarded at the discretion of the board.

The meeting ended at 5 PM

Minutes taken by George Byrkit, K9TRV

###

TAPR Election Results

TAPR elections during the DCC resulted with Steve Bible, N7HPR, in the President's office, Jeremy McDermond, NH6Z, in the Vice President's seat, Tom Holmes, N8ZM, counting beans in the Treasurer's slot, and Stana Horzepa, WA1LOU, taking notes in the Secretary's role.

The post-DCC Board of Directors election resulted with John Ackermann, N8UR, Jeremy McDermond, NH6Z, and Mark Thompson, WB9QZB, being reelected to the Board.

###

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.

###

KD6OZH Mesh Network List

A mail list to discuss and further the mesh network technology work of John Stephensen, KD6OZH, is now up and running on the TAPR server. The list is open to all who are interested in John's work and subscriptions to the KD6OZH Mesh list may be had at:
https://www.tapr.org/mailman/listinfo/kd6ozh_mesh

###

Write Here!

Your *PSR* editor is patiently waiting 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.

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 March 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!

###

2017 DCC Photos

By George Byrkit, K9TRV

Andre Hansen, K6AH

Bob McGwier, N4HY

Brennan Price, N4RX

Bryan Fields, K7UDR

Bryan Hoyer, K7UDR

Darrel Davis, KT4WX

Darryl Smith, VK2TDS

David Krauss, NX4Y

Gary Pearce, KN4AQ

John Ackermann, N8UR

John Hays, K7VE

John Ronan, EI7IG

Kai Siwiak, KE4PT

Lu Romero, W4LT

Mark Griffith, KD0QYN

Mel Whitten, K0PFX

Michelle Thompson, W5NYV

Scotty Cowling, WA2DFI

Steve Bible, N7HPR

Ted Okada, K4HNL

Uli Altvater, AG0X

DCC Banquet Prizes

By Mark Thompson, WB9QZB

QEX Membership: Marian Beckett, KW4GH
QEX Membership: Chris Gass, N4CAG
ARRL $25 Gift Certificate: Tom Holmes, N8ZM
ARRL $25 Gift Certificate: Henry Black, KK6JR
TAPR $25 Gift Certificate: Darryl Smith, VK2TDS
TAPR $50 Gift Certificate: Paul Cecil, KA5FTP
ARRL $50 Gift Certificate: David Bern, W2LNX
TAPR $75 Gift Certificate: David Rush, KY7DR
DX Engineering $100 Gift Certificate: Kai Siwiak, KE4PT
TAPR $100 Gift Certificate: Brent Parker, W8XG
Northwest Digital Radio URDX: Paul Krashmer, KA4IOX
Wireless Holdings DV4Mini: Sharon McGwier, N1SMM
Icom ID-51 HT: Rich Smith, W1EZ
Kenwood, TH-D74 HT: Vic, K4GXV
Austrialian Movie DVD: Bob McGwier, N4HY

###

Open Hardware Presentation

By John Ackermann, N8UR

I finally got around to uploading a recording of the Open Hardware presentation I gave to the Open Hardware workshop at the 2013 International Conference on Accelerator & Large Experimental Physics Control Systems (ICALEPCS):

https://youtu.be/EARyXhrz-CY

###

Case for Mars

By Dave Duca, KA9JSV

Interest in space has changed radically since Apollo ended and the Shuttle Fleet retired. Advances in Science through NASA have continued since then, but mostly from Low Earth Orbit, leaving only interplanetary probes and landers to perform the state-of-the-art observations at the great distances to the planets.

Space communications are enjoyed by all radio operators with the rewards of exacting views of Mars, all the way to Pluto and well beyond.

Human space travel beyond the Van Allen Belt stopped in 1973. Excursions to lunar soil...no more. Since its conception, NASA has drafted scores and volumes of plans for every conceivable mission possible from this planet. But only one plan stands out as most feasible in view of the pioneering spirit of an off-world adventure… going to Mars!

Dr. Robert Zubrin of Pioneer Astronautics, Lakewood, CO, has a vision that extends to colonizing the planet Mars. His radical approach surpasses NASA's studies in "micro-gravity" and in his words "..the purpose of spaceships is to actually travel across space and go to new worlds, not to hang out in space and observe the effects of doing so...." (circa 2003, US Senate Committee of Space Exploration). His book, *Case for Mars*, lays out the most suitable approach of a Mars direct (or, semi-direct) plan of going there.

The Mars Society has established a number of Mars simulation stations on Earth called "Analog Stations." Two of these, MDRS and FMARS, are affordable platforms offering a "near-to experience" for future Martian dwellers, in the traditions Dr. Robert Zubrin's Mars Direct Program.

Since the first "Crew 1" of 2001, the Crews have displayed techniques for:

Growing sustainable crops to survive,

Health and medical care

Habitability and water reclamation.

Geodesics and photogrammetry.

UAVs and Rovers

All this, with devices brought with them for the duration of their stay.

What they lack is a realistic communications system to simulate the kinds of remote communicaitons they would actually use on the planet. This article is a call to hams to solicit help for the Mars Society in establishing some meaningful amateur radio between and around the camps. This help can either be radio work-groups or donations towards current state-of-the-art equipment and devices.

Amateur radio has a lot to offer the Mars Society activities. If they adopt ham radio, then licensing requirements would be mandatory for crew members and mission control.

HF could be used for making reports to mission control in Colorado,

New Mexico or for relaying reports between the other Analog Stations.

Getting their licenses reminds the operators of the importance of their radio studies. It is a medium to use at all times, no matter which world they are on.

The objective is to have both Analogs and Mission Control "permanently equipped" with communications, PCs, sensors and hardware.

1) Mission Control Radio Communication (HF medium/high power) for "checking in" and reporting status of accomodations.

2) Point-to-Point Communication (VHF low power) – Mars has no ionosphere, therefore line-of-sight radio is handled by GMRS or 2-meter simplex modes. Longer distance coverage is handled by a remote, solar-powered, repeater station(s).

3) Telemetry (VHF/UHF low power using APRS) for weather, seismic sensor, tracking, EVA suit and health, power charge monitoring.

4) Position reporting (VVHF/UHF low power using APRS) – RDF, APRS and EPLRS methods can be used because by the time men and women arrive on Mars, there will be a network of GPS-Mars satellites to support exploration. In addition, RDF can be useful for search and rescue.

5) Ground Penetrating Radar (GPR) (UHF, 1 to 4 watts for depth data, VHF for data transfer) – Device mounted on a rover for high-definition tomography.

6) Satellite Communications [OSCAR satellites (any or all available), VHF, 20 to 35 Watts] – Remote satellite dish controller and program for orbital predictions. Exercising the practice of tracking and piloting a supply ship to and from the surface.

7) Power Management Monitoring (VHF/UHF low power) – Solar/thermal/RTG power plants and storage arrays.

8) Enhanced UAV (VHF/UHF low power) for ground-penetrating radar, geodesics (LIDAR and photogrammetry), seismic sensor positioning.

9) Packet Digipeating (VHF simulating MARS networks) for wireless Internet, multi-node, global coverage.

Telemetry, Telemetry, Telemetry.... it's about telemetry. The variety of existing APRS formats can be used to provide the neural life-blood of information that lives are depending on. The objective is to use communications in a real-world environment to gain experiemce in day-to-day operations or emergencies 250 million miles away.

Mars simulated inhabitants would gain experience in the face of failures and power outages and make immediate and command decisions as needed to conserve power in low power modes, use alternate frequencies, troubleshoot, make on-the-fly repairs. Similarly, Mars Ground Control would learn to activate alternate tracking and communications stations as needed to address very conceiveable combination of situations – no exceptions – as lives are on the line.

Communicating at such a remote and distant location or in the protective cover of a habitat or EVA suit is as important as the air they breathe. The Mars Society's Analog Stations in Hanksville, Utah, and Devon Island, Northern Canadian Reaches have been established over 15 years at locations almost identical to the Martian terrain, but with air. Well over 1,000 crew members have dedicated their studies of alternate foods, longevity, geology, mapping, power generation, tomography, astronomy, terraforming, fuel production... anything and everything

humanly devised to be put to the task here and out there.

Seen from their crew reports, there's been limited use of telemetry, tracking and telecoms to date. University teams who introduced various hardware, have returned home with them and not left working systems behind to add to the stations. As such, the stations are relatively incomplete owing to the full spectrum of devices that are needed to make off-world procedures successful.

In the future, with ham radio participation and assistance in setting up communications, telemetry and networks, it is possible to see these habitats fully equipped with more state-of-the-art devices permanently on hand at all the Analogs and Mission Control centers with real-time techniques and real-world equipment.

These Analogs and Simulations are not just practicing life on Mars for the sake of isolation. They are trying to replicate the full spectrum of conditions that would be involved in communicating with distant world humans and reporting their findings over actual radio links. Using Wi-Fi, the Internet and our latest technology is not an accurate simulation. With amateur radio communications and links we would be practicing to be becoming proficient in the techniques involved in actually settling there.

This is a good opportunity for ham radio Elmers can participate and consider what could be used on Mars and then help in setting it up (as well as getting new experimenters and scientists into the hobby).

Imagine how radio-quiet those first humans will find Mars to be. It will be like listening to the ether when Marconi first heard it on Earth a century ago, but without all the static and noise of lightning and thunderstorms. Maybe there are new noise sources on Mars or propogation possibilities as yet unknown on Mars.

The radio communiations needs are not just those on the surface of Mars, but also every component that could be used enroute to, orbiting above and onto or under the surface of Mars.

With the help of hams, these Mars simulated stations on Earth can be much more than simple exercises in human isolation. The real-world experience with simple communications established from the ground up by the participants can be invaluable to learning about the experience of inhabiting a new world.

Think about this opportunity to involve ham radio in not only the future of planetary exploration, but also involving these active and enthusiastic experimenters in a life-long pursuit: the joy of radio communications.

Consider what you or your club can do to participate or provide equipment donations that can be the instruments of success in this endeavour.

The Mars Society (www.marssociety.org) is a non-profit and welcomes donations pertinent to their mission goals.

###

Iron Butt Ride Trip Report

By Scotty Cowling, WA2DFI

Well, I have finally rested up enough to write a trip report for my Iron Butt "Bun Burner Gold 1500" motorcycle ride.

To recap, it was a 1500+ mile ride from Tempe, AZ to Chesterfield, MO that had to be completed in under 24 hours to qualify for the BBG1500 award from the Iron Butt Association <ironbutt.com>.

Here is a link to the actual route that I took:

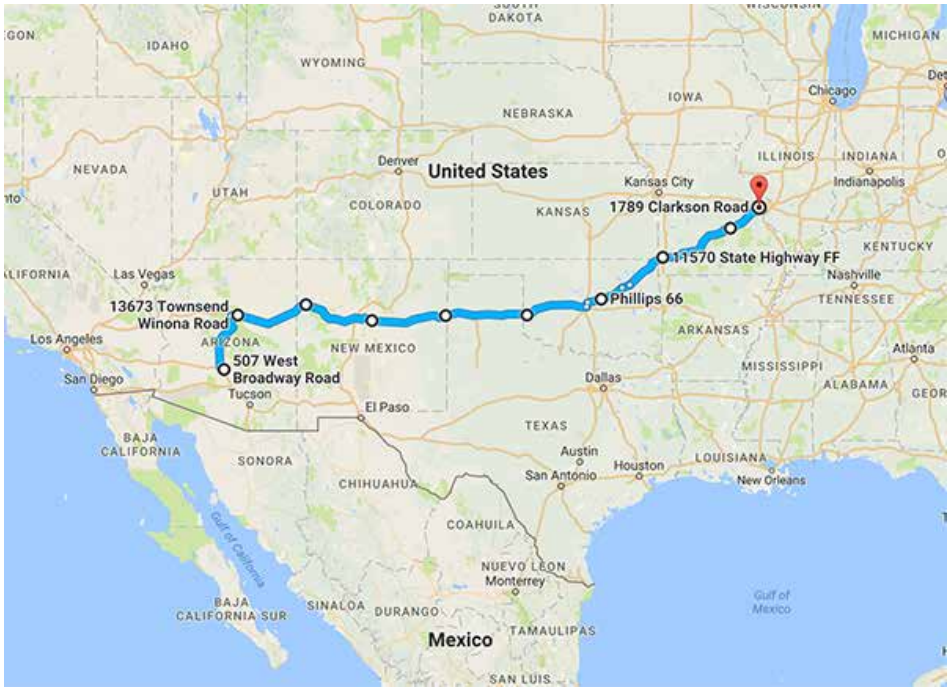
https://goo.gl/maps/oSpNomgTB5E2

It was 1519 Google miles between the starting and ending gas station receipts. It was 1573 miles on my odometer, which reads about 3.5% high. Why this is important, I will now explain.

To qualify for the award, you must have **two** witnesses at the start to certify that you did, in fact start at the time and place that you claim. Notice that I started at 5AM Sunday morning (Oct 16, 2016). Thank you Nona and Dana, K1BOT, for being willing accomplices in my insanity and being awake to sign my witness forms.

At the finish, you must also have **two** witnesses to certify that you arrived at a time that is less than 24 hours from when you started. Fortunately, there is a two hour time difference between Arizona and Missouri, so my absolute latest finish time was 7 AM on Monday morning (Oct 17, 2016). As it was, I arrived at 6:10 AM and my brother and his wife are early risers.

In between the four witness signatures, you must get a date and time stamped receipt for every gas stop that you make. Gas stops may be no more than 300 miles apart, which is no problem since my maximum range on one tankful is about 210 miles. I scheduled my gas stops at 170 to 190 miles apart and made sure that there was a gas station open



at each stop at the time I rolled through. Google said that I needed to average 67 MPH while in the saddle to make it with nine 10-minute gas stops. Ha ha!

Have you ever tried to make a 10-minute gas stop when you have to:

1. Take your gloves off.
2. Take your glasses off.
3. Take your helmet off.
4. Put glasses on.
5. Find your credit card and start the pump.
6. Fill the tank.
7. Slop gas all over.

8. Clean up sloppy tank fill.

9. Fill out IBA log.

10. Fill out gas log.

11. Drink a bottle of water.

12. Eat either (a) half a PB&J sandwich or (b) Slim Jim or (c) 4-pack of cookies or (d) all of the above.

13. Dispose of used water (must go inside to do this).

14. If printer on pump is broken (happened twice), go inside and wait in line to get duplicate receipt from cashier.

15. Zip up all bags and make sure wallet isn't left on top of gas pump.

16. Take your glasses off.

17. Put your helmet on.

18. Put your glasses on.

19. Put your gloves on.

20. Ride off into the night.

This reminds me of the Three Stooges short *Disorder in the Court*, but I digress...

Anyway, gas stops were more like 15-20 minutes, sometimes even 25 minutes. Like in Glen Rio, NM (at the TX/NM border) where the wind was blowing so badly that neither my gloves or my glasses would stay on the bike without "mechanical assistance."

It turns out that with judicious attention to my speed, I could average a bit more than 67 MPH and so buy myself some extra gas stop time. I managed to average about 65.5 MPH **including** stops to arrive in 23 hours and 10 minutes.

I have to send my route, witness forms and gas receipts to the committee and the IBA and they decide if I qualify or not. For example, if they decide my maps and odometer are inaccurate and I only rode 1499 miles, too bad, no award for you! This is why I rode about 20 extra miles and know **exactly** how far off my odometer really is!

The trip was pretty uneventful, but here are a few "observations."

Minimum temperature (yes, I have a thermometer on my bike; added it just for this trip) was 38 degrees just south of Flagstaff, AZ, at about 6:30 AM. Maximum temperature was 105 degrees in eastern NM in the afternoon, around 3 PM.

My first gas stop was at Winona, AZ. (Where's that?!?!) It was **supposed** to be an out-of-the-way place to make a quick gas stop since I would still be fresh and not need much "stretching" time. I pull in and seven of the eight pumps are busy att 7 AM on a Sunday! What the... So I manuever around to the back to the only free pump and fill up. When I am done, the pump says "receipt inside." Oh nooooo, now I have to waste time inside.

The worst was yet to come. Inside I find a whole bevy of guys in camo outfits making their weekly grocery run and they are all ahead of me. After the world's slowest cashier rings up the bread, eggs, beer, chips, etc., and then bagging the bread, eggs, beer, chips, etc., another 10 minutes has gone by. I hoped that this was not a portent of things to come.

My second gas stop was in Gallup, NM, and the same thing happened at the pump! Only this time there was only one elderly couple in front of me paying for their gas. That was only about a 2-minute penalty.

Fortunately all seven remaining gas stops had working printers!

Nothing much of import. No rain. No wandering animals. No mechanical failures. No need to use the one spare gallon of gas that I carried along "just in case."

The return trip will begin either Saturday or Sunday (Oct 22 or 23). I will likely be returning via Kansas City, Witchita, Dalhart, TX, Albuquerque and Flagstaff. Due to the much colder nighttime temperatures that preclude my riding at night, I will take at least two days to get back. What a wuss!

I will be running the same tracker setup, WA2DFI-5 on the aprs.fi web site.

Thanks to those who rode along with me and sent me comments. It has helped make this ride a special one. Next time I will have either photos or video clips from the "bike cam." Watch for it!

###

TUCSON AMATEUR PACKET RADIO CORPORATION

COMPILED FINANCIAL STATEMENTS

For the months and seven months
ended July 31, 2016 and 2015

C O N T E N T S

SJM

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William H. Frazer, CPA

Accountants' Compilation Report

Board of Directors
Tucson Amateur Packet Radio Corporation
P.O. Box 852754
Richardson, TX 75085-2754

Management is responsible for the accompanying financial statements of Tucson Amateur Packet Radio Corporation (a nonprofit organization), which comprise the statements of assets, liabilities, and net assets – income tax basis as of July, 2016 and 2015, and the related statements of revenues, expenses and other changes in net assets – income tax basis for the months and seven months then ended, and for determining that the income tax basis of accounting is an acceptable financial reporting framework. We have performed a compilation engagement in accordance with Statements on Standards for Accounting and Review Services promulgated by the Accounting and Review Services Committee of the AICPA. We did not audit or review the financial statements nor were we required to perform any procedures to verify the accuracy or completeness of the information provided by management. Accordingly, we do not express an opinion, a conclusion, nor provide any form of assurance on these financial statements.

The financial statements are prepared in accordance with the income tax basis of accounting, which is a basis of accounting other than accounting principles generally accepted in the United States of America.

Management has elected to omit substantially all the disclosures ordinarily included in financial statements prepared in accordance with the income tax basis of accounting. If the omitted disclosures were included in the financial statements, they might influence the user's conclusions about the Company's assets, liabilities, net assets, revenues, and expenses. Accordingly, the financial statements are not designed for those who are not informed about such matters.

August 24, 2016

SJ Meyer + Associates, Inc.

Tucson Amateur Packet Radio Corporation
Statements of Assets, Liabilities and Net Assets - Income Tax Basis
July 31, 2016 and 2015

ASSETS

		2016	2015
Current assets			
Cash in bank-checking	$	5,344.06	9,142.61
Cash in bank - savings		37,908.50	61,452.40
Inventory - TAPR		63,923.50	68,491.41
Total current assets		107,176.06	139,086.42
Property and equipment at cost			
Equipment - Dayton		1,678.95	1,678.95
Equipment - Richardson		3,391.29	3,391.29
Equipment - Oklahoma		0.00	1,976.63
		5,070.24	7,046.87
Less: accumulated depreciation		(5,070.24)	(7,046.87)
		0.00	0.00
	$	107,176.06	139,086.42

Tucson Amateur Packet Radio Corporation
Statements of Assets, Liabilities and Net Assets - Income Tax Basis
July 31, 2016 and 2015

LIABILITIES AND NET ASSETS

		2016	2015
Current liabilities			
Texas sales tax payable	$	53.91	38.00
Total current liabilities		53.91	38.00
Net assets			
Net assets		115,080.44	128,252.88
Net increase (decrease) in net assets		(7,958.29)	10,795.54
Total net assets		107,122.15	139,048.42
	$	107,176.06	139,086.42

Tucson Amateur Packet Radio Corporation
Statements of Revenues, Expenses and Other Changes in Net Assets - Income Tax Basis
For the Month and Seven Months Ended July 31, 2016 and 2015

	Current Month	% of Sales	Prior Year Month	% of Sales	Current Year to Date	% of Sales	Prior Year to Date	% of Sales
Revenues								
Sales - inventory	$ 3,098.00	77.86	$ 1,628.00	52.03	$ 38,205.69	88.43	$ 43,492.99	97.25
Shipping and handling	604.00	15.18	220.00	7.03	4,692.00	10.86	3,655.00	8.17
Sales discounts	(553.00)	(13.90)	(79.00)	(2.52)	(1,664.05)	(3.85)	(5,585.00)	(12.49)
DCC convention income	830.00	20.86	1,360.00	43.46	1,970.00	4.56	3,160.00	7.07
Total revenues	3,979.00	100.00	3,129.00	100.00	43,203.64	100.00	44,722.99	100.00
Cost of sales								
Cost of sales	1,397.00	35.11	886.00	28.32	19,665.00	45.52	26,248.50	58.69
Bank and credit card fees	285.18	7.17	351.30	11.23	3,413.17	7.90	2,296.41	5.13
Postage	284.45	7.15	364.62	11.65	2,575.11	5.96	3,165.48	7.08
Rent - storage	55.00	1.38	55.00	1.76	385.00	0.89	385.00	0.86
Rent	1,600.00	40.21	1,600.00	51.13	11,200.00	25.92	11,200.00	25.04
Shipping - general	133.53	3.36	126.90	4.06	1,365.43	3.16	377.58	0.84
Shipping - kits	150.00	3.77	85.00	2.72	1,341.50	3.11	1,012.50	2.26
Total cost of sales	3,905.16	98.14	3,468.82	110.86	39,945.21	92.46	44,685.47	99.92
Gross profit (loss)	73.84	1.86	(339.82)	(10.86)	3,258.43	7.54	37.52	0.08
Expenses								
Accounting fees	0.00	0.00	680.00	21.73	3,005.00	6.96	3,795.00	8.49
Amazon fees	49.35	1.24	0.00	0.00	305.84	0.71	0.00	0.00
Convention	0.00	0.00	283.40	9.06	3,855.70	8.92	3,633.82	8.13
Convention - DCC	0.00	0.00	0.00	0.00	466.25	1.08	404.15	0.90
Insurance	0.00	0.00	0.00	0.00	1,415.00	3.28	1,405.00	3.14
Internet	46.90	1.18	46.97	1.50	536.78	1.24	429.51	0.96
Legal fees	0.00	0.00	0.00	0.00	75.00	0.17	75.00	0.17
Miscellaneous expense	25.00	0.63	0.00	0.00	169.72	0.39	0.00	0.00
Office supplies	0.00	0.00	15.67	0.50	314.59	0.73	694.27	1.55
Kit assembly	30.00	0.75	150.00	4.79	270.00	0.62	645.00	1.44
PSR newsletter	0.00	0.00	0.00	0.00	1,000.00	2.31	1,000.00	2.24
Repairs and maintenance	0.00	0.00	0.00	0.00	0.00	0.00	76.62	0.17
Research and development	0.00	0.00	0.00	0.00	588.76	1.36	758.62	1.70
Server hosting	256.51	6.45	256.51	8.20	1,795.57	4.16	2,183.12	4.88
Taxes	0.00	0.00	0.00	0.00	1,164.72	2.70	807.86	1.81
Telephone	69.43	1.74	69.36	2.22	489.27	1.13	537.75	1.20
Travel	0.00	0.00	0.00	0.00	1,100.00	2.55	2,580.12	5.77
Travel/hotel (board)	1,200.00	30.16	0.00	0.00	2,804.31	6.49	2,736.88	6.12
Total expenses	1,677.19	42.15	1,501.91	48.00	19,356.51	44.80	21,762.72	48.66
Other (income)/expenses								
Other income	0.00	0.00	0.00	0.00	(1,024.00)	(2.37)	(25,000.00)	(55.90)
Interest income	(6.41)	(0.16)	(11.09)	(0.35)	(40.79)	(0.09)	(70.74)	(0.16)
Dues	(750.00)	(18.85)	(825.00)	(26.37)	(7,075.00)	(16.38)	(7,450.00)	(16.66)
Total other (income)/expenses	(756.41)	(19.01)	(836.09)	(26.72)	(8,139.79)	(18.84)	(32,520.74)	(72.72)
Net increase(decrease)in net assets	$ (846.94)	(21.29)	$ (1,005.64)	(32.14)	$ (7,958.29)	(18.42)	$ 10,795.54	24.14

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