President's Corner
By Steve Bible, N7HPR

Greetings!

Hamvention is nearly here and TAPR will be present in full-force! The biggest ham radio convention of the year runs from May 17 to May 19 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 5 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:

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

- • Steve Bible, N7HPR, on "TAPR Activities Update"
- • Stana Horzepa, WA1LOU, PSR Editor, on "The Care and Feeding of a Ham Radio Newsletter"
- • Rob Robinett, AI6VN, on "KiwiSDR"
- • Bryan Hoyer, K7UDR, on "DRAWS: The Digital Radio Amateur Workstation"
- • Bruce Perens, K6BP, topic to-be-announced/

For the full description of the Forum, see "Hamvention TAPR Forum" on page 3. TAPR members attending Hamvention may also be interested in the HamSCI Forum, so you can find its schedule on page 5.

TAPR/AMSAT Dinner

The 13th annual TAPR/AMSAT dinner takes place on Friday evening, 6:30 PM at the Kohler Presidential Banquet Center, 4572 Presidential Way, Kettering, OH 45429.

Attendees will feast on a delicious dinner and then listen to Dr. P. J. Erickson, W1PJE, from the MIT Haystack Observatory, who will give 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."

Doors open to a cash bar at 6:30 PM and dinner begins at 7 PM. The banquet ticket purchase deadline is Tuesday, May 14. Banquet tickets must be purchased in advance and will not be sold at the AMSAT or TAPR booths. You may purchase tickets for $40 online at the AMSAT Store <https://tinyurl.com/y77bszyr>.

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

###

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.

###

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

Hamvention TAPR Forum
By Scotty Cowling, WA2DFI

Friday, May 19, 2019

Forum Room 1

Moderator: Scotty Cowling, WA2DFI

Bio: Scotty has been involved in the openHPSDR project for the last 12 years, is a TAPR Director and current TAPR Vice President. Scotty is also active in the production of other SDR components. 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: "TAPR Activities Update" by Steve Bible, N7HPR, TAPR President and Director

Bio: Steven (Steve) Bible has been president of TAPR since 2009 championing many technical projects that advance the amateur radio art.

9:25 – 9:30 AM: "The Care and Feeding of a Ham Radio Newsletter" by Stana Horzepa, WA1LOU

Bio: TAPR secretary and director, WA1LOU is the current editor of TAPR's newsletter, *PSR*, a former *QST* contributing editor and ARRL book author. In 2016, WA1LOU received the Hamvention Special Achievement Award for advocating cutting edge technologies that are now commonly used in ham radio.

09:30 – 09:50 AM: "KiwiSDR" by Rob Robinett, AI6VN

Abstract: The KiwiSDR is a self-contained open SW and HW SDR system which offers a very user friendly UI to this high performance RF processing system. It includes a 66 Msps 14 bit ADC RF system coupled to a FPGA which can support 4 or 8 simultaneous and completely independent receive sessions, each with over 100 dB dynamic range. The internal GPS subsystem delivers 50 ppb frequency accuracy, and the Kiwi can be easily connected to an inexpensive external GPSDO for state of the art frequency accuracy and stability. A Python library supported by the Kiwi author allows remote applications to control the Kiwi and extract and process the demodulated streams. As an example of that, I will describe the WSPR decoding program running on a Raspberry Pi at KPH which simultaneously decodes all 14 LF/MF/HF bands from 3 Kiwis during every 2 minute WSPR cycle. Live demos of the system will be available during the meeting.

Bio: Rob Robinett is CEO and Founder of Mystic Video, a Silicon Valley developer of professional TV broadcasting products. Previously I founded two other video compression equipment companies: Modulus Video, acquired by Motorola in 2007 and Skystream Networks acquired by Tandberg in 2004. After a 40 year hiatus I resumed my interest in amateur radio in 2017 with a particular interest in optimizing RF receiving systems. Last year I deployed SDR and WSPR receive systems at the historic KPH receive site at Point Reyes National Seashore <http://kphsdr.com:8073> and a second set of SDRs and WSPR receivers at a rural Maui location <http://kiwisdr.robinett.us:8073>.

09:50 – 10:10 AM: "DRAWS: The Digital Radio Amateur Workstation" by Bryan Hoyer, K7UDR

Abstract: Based on the Raspberry Pi with a Dual Radio Interface and Power Supply, DRAWS provides a complete HW and SW Solution for operating Digital Modes from HF thru VHF/UHF. DRAWS can operate

HPSDR Sale

Stand-A-Lone as well as a dedicated server or Remote Base.

Bio: Bryan Hoyer, K7UDR, is an Engineer, Entrepreneur and Inventor with over 25 years experience in Silicon Valley. Licensed in 2000, Bryan moved to the San Juan Islands WA, where he founded NW Digital Radio after becoming involved with local Hams and seeing a need to modernize Digital Radio.

10:10 – 10:30 AM: Topic To-Be-Announced by BrucePerens, K6BP

###
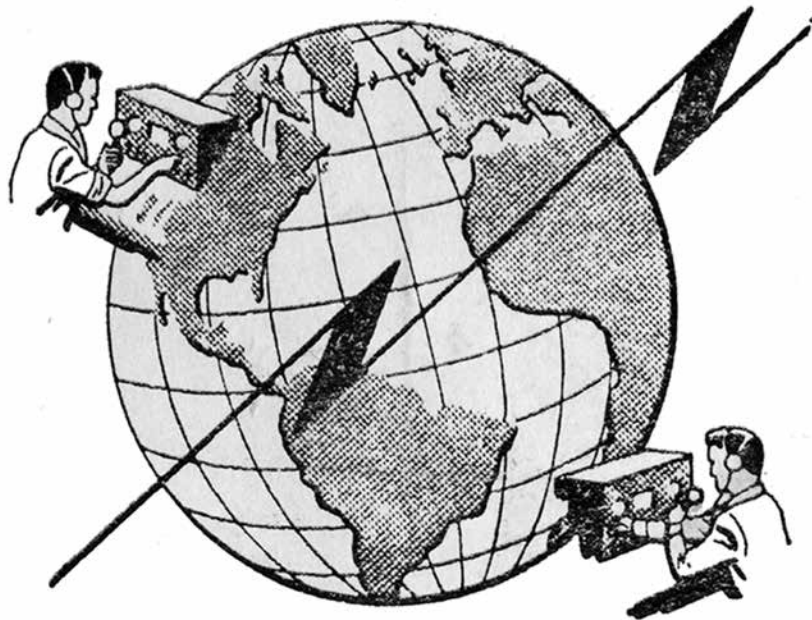
TAPR announces sale pricing on many HPSDR products. The discount for eligible items is approximately 37%. As an example, the Metis board that normally sells for $395 is available for $249.

The discounted prices are displayed as the TAPR member price on the order page <https://www.tapr.org/products.php> for as long as the sale is in effect. You do not have to be a member to take the discount; simply indicate that you are a TAPR member when checking out. Membership status will be not be checked for the purposes of this sale. Of course, if you choose to join or renew in appreciation, that is okay.

Use this as an opportunity to expand your HPSDR system or stock up on spares.

The discounted items are as follows:

Item	Reg. Price	Sale Price
Alex TX	$279	$176
Atlas	$39	$25
Excalibur	$88	$55
Janus	$91	$57
Magister	$199	$125
Metis	$395	$249
PennyLane	$399	$251
PennyWhistle	$88	$55

###

TAPR on the Case at HamSCI Workshop

By Stana Horzepa, WA1LOU

TAPR was present at Case Western Reserve University for the 2019 HamSCI Workshop <http://www.hamsci.org/hamsci2019>, March 22-23.

TAPR makers and shakers, John Ackermann N8UR, George Byrkit K9TRV, Scotty Cowling WA2DFI and Tom McDermott N5EG, were in attendance with John, Scotty and Tom making presentations, while George recorded the proceedings and handled the sound and video for the workshop.

The TAPR presentations were as follows:

"Review of SDR Hardware for the Personal Space Weather Station" by John N8UR

"A Modular SDR for HamSCI and Other Users" by Scotty WA2DFI

"HamSCI HF Receiver Requirements" by Tom N5EG

Nathaniel Frissell W2NAF had this to say about the Workshop, "I would like to thank everyone who participated in this weekend's HamSCI workshop at Case Western Reserve University. The Case ARC host team, led by Kristina Collins, KD8OXT, Nathaniel Vishner, KB1QHX, and David Kazdan, AD8Y, did a fantastic job. Thank you to all who gave presentations and demos.

"I enjoyed hearing all of the science and engineering that is being worked on. It was great to have so many member of the ham radio community and especially TAPR come out. Also, special thanks to our invited speakers, Carl Luetzelschwab K9LA, Dr. Larisa Goncharenko, and Ward Silver, N0AX. Thanks to the members of my science/program committee, Dr. Phil Erickson W1PJE, Dr. Ethan Miller KG8U, and Mr. Bill Liles NQ6Z. And thanks to George Byrkit, K9TRV, for AV support and video recording."

###

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

Hamvention HamSCI Forum

By Nathaniel Frissell, W2NAF

Saturday, May 20, 2019

Forum Room 4

Moderator: Nathaniel Frissell, W2NAF

Bio: W2NAF is a research professor of the New Jersey Institute of Technology and the principal founder and leader of the Ham Radio Science Citizen Investigation.

9:15 – 9:35 AM: "Ionospheric Disturbances at Dawn, Dusk, and During the 2017 Eclipse" by Steve Cerwin, WA5FRF

Abstract: The author recently participated in the HamSCI propagation experiments during the August 2017 total solar eclipse and the ARRL November 2017 Frequency Measuring Test. This paper presents some interesting propagation phenomenon observed during both activities. For the eclipse experiment a well-defined propagation enhancement of both 60 kHz WWVB and 5 MHz WWV for a path between Ft. Collins, CO and San Antonio, TX was documented. Additionally, deep propagation nulls of WWVB over this path were observed to occur every morning and evening, suggesting predictable multipath interference between competing daytime and nighttime modes. During the Frequency Measuring Test, propagation-induced frequency variations of 5 MHz WWV were observed to occur at night and especially during dawn and dusk.

9:35 – 9:55 AM: "IonTV: Using WWV Timing Reference Signals to Observe Ionospheric Variation" by Bill Liles, NQ6Z

Abstract: For decades, an AM modulated time signal has been broadcast at multiple HF frequencies by the National Institute of Standards and Technology (NIST). Shortwave radio stations WWV in Colorado and WWVH in Hawaii use these frequencies for the broad dissemination of accurate coordinated universal time information. As the HF signal traverses the ionosphere, propagation effects ensue, and the high temporal precision of the original transmitted signal provides an attractive potential for wide-sense monitoring of ionospheric variations. We present the results of an ongoing set of data collections and statistical analysis of the received variation in WWV timing signals aimed at extracting ionospheric propagation effects. The work includes design of a software defined receiver (SDR) for processing the amplitude modulated dual sideband (AM-DSB) timing signal. By observing the time shift between consecutive seconds of the 10MHz WWV timing signal, reflected from the ionosphere, the change in the effective height of the ionosphere can be estimated. Simultaneous measurements taken from different observation angles allow a more accurate sensing of ionospheric electron density variability as projected into refractive effects. The project also has a goal of creating a straightforward and reliable way for hobbyists and citizen scientists to demodulate and process their own NIST timing data. We describe a sample analysis of several blocks of WWV received data. Demodulation and amplitude/phase analysis of the 100 Hz subcarrier of WWV can also provide precise delta-time information on ionospheric propagation through examination of variability in arrival of the leading edge of 1 pulse-per-second ticks. Results to date suggest that variation between consecutive second markers might be due to ionospheric factors, although systematics must be addressed

9:55 – 10:15 AM: "Sudden Ionospheric Disturbances (SIDs) and Personal Space Weather Stations" by Ethan Grace and George Lemaster, WB5OYP

Abstract: This presentation will deal with Sudden Ionospheric Disturbances (SIDs), what they are, what their effects are, how they can be observed easily at home, and observations combined with others to form a more complete view of the ionosphere. SIDs are disturbances on the Sun but can be observed through monitoring VLF transmitters and noticing the change in propagation. Since the transmitters are usually at 30 kHz and less, they are easily observed using just an antenna, amplifier and a computer sound card with appropriate software. There is a worldwide network of collection sites which feeds data to Stanford University. The equipment is easy to build but can also be procured from the Society of Amateur Radio Astronomers (SARA). Different types of equipment will be discussed and shown, including home built and the SARA kit. The antennas used are mainly simple multi-tun loop antennas. Images of different antennas will be shown and it is planned to show an actual antenna. Data collected from SID systems will be displayed and discussed. The presentation will include how people can get involved with SID monitoring and feeding the collective database at Stanford University.

10:15 – 10:30 AM: "Update on Personal Space Weather Station & SDR Hardware" by Scotty Cowling, WA2DFI

Abstract: The Personal Space Weather Station is a HamSCI project to create a distributed network of ground-based ionospheric and space science instrumentation. This presentation will discuss the current mission objectives and project requirements, as well as the status of current hardware development.

###

2018 DCC Videos Online

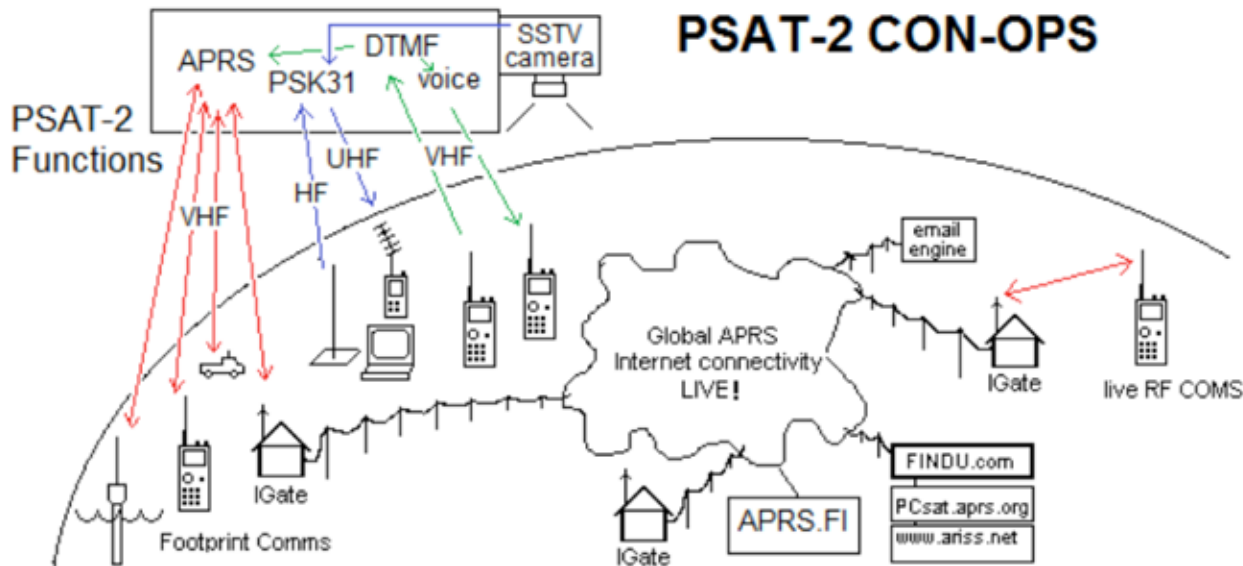Videos of presentations given at the 2018 ARRL/TAPR Digital Communications Conference (DCC) are now online at: https://tinyurl.com/y373h3wx

###

PSAT2 User Operations Manual

By Bob Bruninga, WB4APR <http://aprs.org/psat2.html>

PSAT2 Capabilities Summary: PSAT2 contains multiple transponder functions that will be used in the following descending priorities as power permits. The concept of operations is to give PSK31, a guest payload from Brno University, priority. But DTMF and Voice are also an exciting new APRS capability too. Conventional APRS digipeating is of low priority and will usually be off to minimize channel congestion.

1st PSK31: 29 MHz uplink to UHF 435.350 MHz FM downlink like PSAT,

2nd SSTV: SSTV images transmitted in same PSK31 downlink when power avail

3rd DTMF Grids: DTMF grid squares are converted to Voice and APRS packet

4th DTMF Messages: DTMF user messages to Voice and APRS packet downlink

5th APRS-to-Voice: packet uplink to Voice downlink

6th DIGI: APRS digipeater identical to PCSAT-1, PSAT-1, ISS

Channel Capacity: Expect only a few user successes per pass due to channel congestion. APRS and the DTMF are ALOHA protocols and users share the uplink channel blind with all other users. The theoretical maximum throughput of an Aloha channel before the channel degrades due to collisions is 18%. With packets lasting 1 second and DTMF lasting 4 seconds each, and with the channel being half-duplex (cannot receive 60% of the time while transmitting) then the optimum throughput is about 10%, or about ten packets per minute. This equates to no more than a dozen or so users in the 6 million square mile footprint (entire USA). So users must share equitably and not hog the uplink. Please transmit rarely.

Unattended beaconing on the APRS satellite channel of 145.825 is not authorized.

PSAT2 TELEMETRY: PSAT2's health/status Telemetry is transmitted once a minute in the standard 5-channel APRS telemetry format but the Kenwood APRS radios do not decode this special format. When a Telemetry packet is received, the radio will simply display the callsign and ??. Only channels 1 and 2 are human readable. The other three are temperatures that need decoding programs.

The format is:

**PSAT2,ARISS:T#mmm,ch1,ch2,ch3,ch4,ch5,01000000**

mmm is the telemetry serial number in minutes.

Ch1 is the Bus voltage in tenths of a volt

Ch2 is bus current in Ma both charging and discharging and needs a decoder.   But any current below 500 is charging, and above is discharging to the load

Ch3,ch4,ch5 are temperatures that get larger as the temperature goes down.

PSAT2-MODE Indicators: The status of the operating modes of the spacecraft is included in the ending string of 8 bits as shown here:
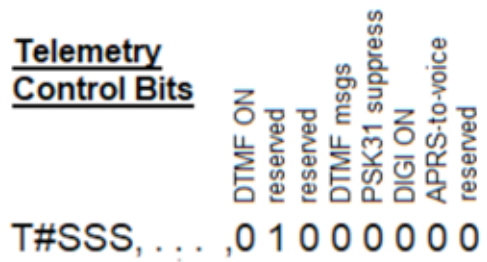
Digipeater/Channel Status: The 6th bit indicates if the DIGI is on or off and what uplink frequency is being used. When the digi is ON, then uplink is on the normal 145.825 MHz. When it is off, then the DTMF uplink is on 145.980. The path is via ARISS in case there is a lucky opportunity to digipeat the satellite's packets via the ISS or other nearby APRS satellite.

I. PSK31 Texting Operations:

The BRNO transponder downlink can use any PSK31 program listening to a UHF receiver on 435.350 MHz FM. It will display the usual audio waterfall. The PSAT2 PSK telemetry is found around 300 Hz. And typical PSK31 users will show a negative shifting Doppler due to the satellite motion. But especially for satellite operations, K0SM wrote a special Doppler PSK software for uplink. It pre-compensates for the satellite Doppler on the uplink to maintain a constant tone in the FM downlink.

The uplink will require from 25 to 100 Watts using a SSB transmitter on 29.401 MHz and a computer running another copy of PSK31 software or K0SM's DopplerPSK. Users can transmit the entire pass because the transponder is full duplex with the downlink on UHF. This will allow continuous simultaneous conversations with everyone on the channel in real time.

II. Slow Scan TV (SSTV) Downlink:

Every 2 minutes or so the SSTV camera will take a picture. If it is not saturated (looking at sun), or black (looking at space) it will downlink it in the middle of the PSK31 waterfall downlink between 1200 to 2300 Hz. Since this is in the middle of the PSK31 audio spectrum, PSK users should stay well above and below those tones to avoid interference.

III. DTMF (Touchtone) Grid Square and Voice Response:

After PSK, the next highest priority is DTMF to Voice grid square reporting. DTMF grids are spoken and are converted to an APRS packet on the downlink. APRS digipeating is lower priority and will not normally be on. The DTMF grid square mode allows users of simpler DTMF keypad radios such as the one shown here to communicate and

enter data into the APRS network without having an APRS radio. But DTMF takes several seconds and must be error free. So, most operations require the DTMF string to be preloaded into the radio's many DTMF memories.
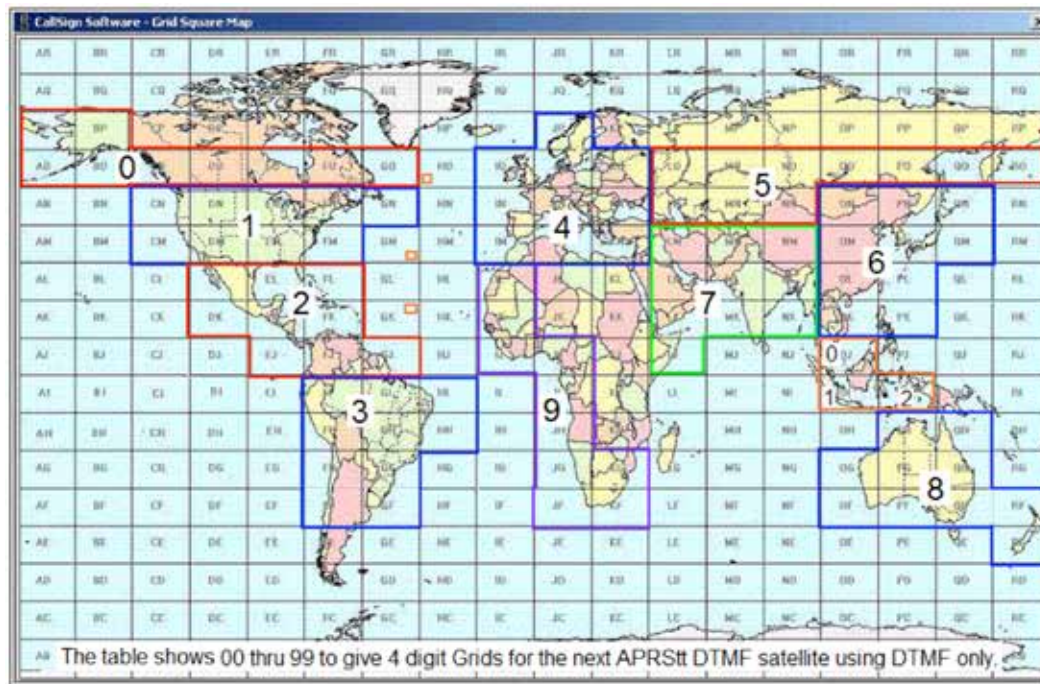
The Grid DTMF uplink consists of a beginning *, then the 4 digit grid and then the 10 key callsign field ending with the # key as shown here.

Grid DTMF Format: *ddddCCCCCCxxxx#

DTMF CCCCCCxxxx Callsign Encoding:

The callsign digits are simply single presses of each callsign letter key followed by a 4 digit special code that tells PSAT2 how to read those letters (shorter calls, pad with 0). The final 4 x's represent a "keycode" that encodes the positions of each of these letters on each key of the user's callsign. Note, the Q and Z are located on key 1. Rather than belabor how the xxxx key code is derived, you can use the on-line keycode calculator at http://aprs.org/aprs_translator.htm You only need to do this once for your callsign. For example, the key code for the academy club call W3ADO is 1116.

The table shows 00 thru 99 to give 4 digit Grids for the next APRStt DTMF satellite using DTMF only.

0x Canada
00: AP, BP, AO, BO, CO
05: DO, EO, FO, GO, OJ
1x USA
10: CN, DN, EN, FN, GN
15: CM, DM, EM, FM, OI
2x C America
20: DL, EL, FL, DK, EK
25: FK, EJ, FJ, GJ, PI
3x S. America
30: FI, GI, HI, FH, GH
35: HH, FG, GG, FF, GF
4x Europe
40: JP, IO, JO, KO, IN
45: JN, KN, IM, JM, KM
5x Russia
50: LO, MO, NO, OO, PO
55: QO, RO, LN, MN, NN
6x Japan, China
60: ON, PN, QN, OM, PM
65: QM, OL, PL, OK, PK
7x India
70: LM, MM, NM, LL, ML
75: NL, LK, MK, NK, LI
8x Aus/NZ
80: PH, QH, OG, PG, QG
85: OF, PF, QF, RF, RE
9x Africa
90: IL, IK, IJ, JJ, JI,
95: JH, JG, KG, JF, KF

GRID SQUARE Format: *GGgg…

There is no room to include alpha characters for the first two grid letters, so we took the top 99 populated grids and assigned them a pair of digits according to the map above.

The first two digits correspond to the 99 populated grids illustrated in the outlined areas, the first digit representing the greater continent, the second defining the order of its appearance as read from left to right, top to bottom in said area, and listed on the right. For example, central Alaska Grid BP in the "0x" group (Canada and Alaska) will be identified by 01, the 01th Grid listed on the right. The Grid FN around Maine will be identified in the USA group "1x" as 13, the 3rd grid in the 1x list.

The second pair of two digits of the grid square is used as-is from the Maidenhead grid system to indicate which 10 x 10 grid within the lettered block. The lower left subgrid is 00 and the upper right subgrid is 99. For example, the furthest bottom left region of Box FN will be 1300, while the furthest top right portion will be 1399.

IV. DTMF to Voice Text Messaging: CNNxxCCCCCxxxx#

The first key (the C key) indicates this is a message format and the NN indicates the pre-arranged satellite message Number from a list of ARRL Radiograms and other numbered messages. The pair of xx modifier digits can be used for additional numeric modifiers in some messages, but otherwise are ignored. After these 5 keys, then the normal CCCCCCxxxx# callsign follows. These messages take longer speech on the downlink and so take more power, so this message mode might be turned off to conserve power. A list of all the spacecraft pre-loaded messages is on the http://aprs.org/psat2.html web page.

Pre-Storing DTMF Memories: Consult your radio user manual to see how to load these grids and messages into your radios DTMF memory.

Sending DTMF Memory: In most radios, to send a DTMF memory, first press and hold the PTT button and then press the radios MENU key to find the message to be sent. Select the message and the DTMF string will be transmitted. As soon as the string begins, it is a good idea to release the PTT so that the microphone noises are not also added to the transmitted tones. When the tones are done, the radio will drop the PTT.

PSAT2 Receiver Wake-up: The first user per continent will have to wake up the satellite receiver that goes to sleep after 10 seconds of no channel activity. This applies to both DTMF and packet. While sleeping, the receiver only listens for 0.1 second every second or so, and that is too short to capture a packet. So the first person per continent should hold the PTT down for 1 second prior to that first continental packet. Do NOT do it subsequently because it is just wasted channel congestion.

Two-Way Contact QSL Exchange: For a contest exchange, each user must acknowledge (QSL) another user's contact number. To do this,

there are three special formatted QSL messages (#40, 41, 42) that begin with the letter B followed immediately by the needed contact number **xx** and then the message number and callsign to complete the uplink.

```
Bxx40CCCCCCxxxx# "Q S L, your number --, My number is *.
Bxx41CCCCCCxxxx# "Q S L, your C Q number --.
Bxx42CCCCCCxxxx# "Q S L, your C Q number -- and thanks for
the contact.
```

* In #40, the * auto increments the CQ number to complete this contact.

In this "B" format, the order of the message number (40, 41 or 42) and "xx" modifier digits are reversed from the standard Cmmxx… message format. This is so that the sender can manually enter the "Bxx" consisting of the CQ number quickly and then quickly send one of these three special DTMF QSL memory suffixes that contain the remainder of this special QSL format. … for example "42CCCCxxxx#" Be sure to preload these special QSL messages.

V. APRS-to-VOICE Function:

When enabled, you can send a packet message to be spoken using this format. Send the APRS message to PSAT2-SAY, but there must not be any digipeater path in the packet. If the packet has a digipeat path, it will not be spoken but will be digipeated. After entering the TOCALL above, then enter your normal alphanumeric callsign followed by "sez" followed by the text message to be spoken:

"CCCCCC sez speak this message…, etc"

The spacecraft will speak "CCCCCC says speak this message etc" or whatever follows the "sez".

VI. APRS DIGIPEATER OPERATIONS: Up/Down on

145.825 MHz packet

This mode is identical to other APRS digipeating satellites in space and will not be used unless the other exciting special DTMF and PSK modes in this satellite do not work.

APRS Packet Position/Status: During an APRS digipeater pass, typical user operations consist of watching the screen and seeing packets come in to the station LIST and be displayed (10 second hold time). Then toggling your BCON button no more often than every 30 seconds or so while manned. Once every 5 minutes if unmanned temporary experiment. OFF if unattended more than a day. If the satellite hears and digipeats your packet, your radio will display "my position" on your screen. You can use the LIST key to explore other user's positions and status. The downlink should be visible on http://PCSAT.FINU.COM.

APRS Packet Messaging: *Not generally authorized for PSAT2 due to the multiplication of channel QRM for all the acks and retries.* You can manually enter a message to another callsign, or you can press the MSG key while on the LIST or while the packet is still displayed temporarily and enter a quick text message to him. Or you can call up a previous message you have sent and edit its callsign and transmit it. Another lazy method is to simply send your message to ALL.

ACKS Not Needed! Remember, ACKS are just wasted QRM on the channel. If you see that your message packet was successfully digipeated ("My Message") then immediately cancel the message to prevent duplicative QRM. To cancel the message on a Kenwood, select the message in the list, and then press the CLR button. The message TX countdown digit will change to a period to indicate it is no longer to be transmitted.

Launch is scheduled for 31 May 2019.

APPENDIX A: DTMF User Messages

Preloaded PSAT2 General Purpose ARRL Radiograms (40 to 69) and some the students came up with (70-90). Format is CMMxx… followed by the normal DTMF encoded callsign. Spellings are sometimes corrupted to get the best speech sound for that word.

Wherever a blank "--" appears, then the number "xx" will be inserted

Wherever a * appears, the auto CQ number will be incremented by 1 and inserted

40 Q S L, your number --, My number is **.   '2-way QSO

41 Q S L, your C Q number --.   'QSO msg

42 Q S L, your C Q number -- and thanks for the contact.   'QSO msg

43 Go Navy, beat Army.

44 Navy Beats Army by --.

45 I am -- years old.

46 Greetings on your birthday.

47 Got your message number --.

48 I am in school grade --.

49 Celebrating -- months in space.

50 Greetings by Amateur Radio.

51 Am having a wonderful time.

52 Really enjoyed visiting with you.

53 Received your package, Thank you.

54 Many thanks for your good wishes.

55 Very delighted to hear your good news.

56 Congratulations on your worthy achievement.

57 Wish we could be together.

58 Have a wonderful time, Let us know when you return.

59 Congratulations on the new arrival, Hope all are well.

60 Wishing you the best.

61 Wishing you happy holidays and New Year.

62 Greetings and best wishes for the holiday season.

63 Our best wishes are with you, Hope you win.

64 Arrived safely at -- hours.

65 Please meet me on arrival at -- hours.

66 D X Q S Ls are on hand at the Q S L Bureau.

67 Your message -- is undeliverable.

68 Best wishes for a speedy recovery.

69 Welcome, We hope you will enjoy the fun and fellowship.

--- New messages -----------

70 Call me ON my cell at -- Oh clock.

71 No cell phone service here.

72 My Cell phone battery is dead.

73 Greetings from AMSAT, Keeping ham radio in space for -- years.

74 My Cell phone charging opportunities are limited.

75 Call my cell phone on the hour.

76 My Radio power charging capabilities are limited.

77 My next contact time will be in -- minutes.

78 My next contact time is tomorrow.

79 Please send item number --.

80 I am on schedule."

81 I may be delayed by -- hours.

82 I may be delayed by -- days.

83 I may be earlier by -- hours.

84 I May be earlier by -- days.

85 I may quit earlier by -- stops.

86 I may go further by -- stops.

87 We are camping and enjoying it greatly.

88 Sending love and kisses.

89 Contact me on the -- meter band.

90 There are -- of us here.

91 Celebrating -- weeks in space.

ARRL Emergency Radiogram Messages: The messages numbered 1 through 38 are the classical Amateur Radio numbered emergency messages. They should not generally be used because the channel is so unreliable, that it is impossible to tell a real emergency from a test. But to allow for testing, if xx is 90 or more, then the pro-word TEST is included. If xx is 99, then the pro-word EMERGENCY is included

01 Everyone is safe. Do not worry.

02 I am Coming home as soon as possible.

03 In hospital, Receiving care and recovering.

04 Only slight property damage here, Do not worry.

05 I am moving to a new location, Will make contact then.”

06 Will contact you as soon as possible.

07 Please reply by Amateur Radio.

08 Need additional radio equipment for emergency use.

09 Additional -- radio operators needed.

10 Please standby for further information.”

11 Establish Amateur Radio contact on -- meters

12 Anxious to hear from you.

13 Medical emergency situation exists here.

14 Situation here is worsening and becoming critical.

15 Please advise your condition and what help is needed.

16 Property damage is very significant.

17 RE ACT communications are on channel --.

18 Please contact me as soon as possible.

19 Request health and welfare report.

20 Temporarily stranded, Will need some assistance.

21 Search and Rescue assistance is needed.

22 Need accurate information on conditions at your location.

23 Report accessibility and best way to reach your location.

24 Evacuation of residents from here is urgently needed.

25 Please advise weather conditions at your location.

26 Need help and care for evacuation of sick and injured.

27 Hi, This was Dove in space, -- anniversary.

28 There are -- of us here.

29 Midshipmen really rock.

30 Maritime Emergency Code number --.

31 We are operating on emergency power.

32 We are operating on solar power.

33 This is a voice test.

34 Wow! This is really fantastic!

35 Midshipmen really rock!

36 Listening.

37 Using APRS TT and DTMF really works.

38 For more info, go to APRS dot Org.

###

DCC Call for Papers

Technical papers are solicited for presentation at the ARRL/TAPR Digital Communications Conference (DCC) to be held September 20-22 at the Marriott Detroit Metro Airport Hotel. Papers will also be published in the Conference Proceedings. Authors do not need to attend the conference to have their papers included in the Proceedings.

The submission deadline is August 5, 2019. Submit papers to via e-mail to maty@arrl.org, or via post to Maty Weinberg, KB1EIB, ARRL, 225 Main St, Newington, CT 06111. Papers will be published exactly as submitted and authors will retain all rights.

###

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

###

2019 ARRL / TAPR
Digital Communications Conference

September 20-22
Detroit, Michigan

Make your reservations now for three days of learning and enjoyment at the Marriott Detroit Metro 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—beginner to expert.

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

Marriott Detroit Metro Airport Hotel

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

DCC Prize Winners

The following lists the prizes (and their winners) donated for the 2018 ARRL/TAPR Digital Communications Conference.

• ABR Industries: RG8X - PL259 - 50 feet: Brandon WA5DSS

• ARRL: Gift Certificate: George K9TRV, Red KC4LE, Marion WA5DSS

• ARRL: Handbook Certificate: Adam N4ABK

• ARRL: *QEX* Subscription Certificate: Larry W9INE, Dan KB5VBY

• DRAGINO: SM1000 FreeDV Adaptor: Justice Engstrom

• DX Engineering: Gift Certificate: Anthony KG5PYK

• HRO: Gift Certificate: Laura Koster, Phil W1PJE

• ICOM: ID51A Plus 2: Bob WB2FHR

• MFJ: MFJ-107B LCD Clock: George WB0IIS, Eric K0JEG

• MFJ: MFJ-1204D8 USB to Rig Interface: Will N0XGA, Paul KA5FPT

• MFJ: MFJ-4432 Digital Voltmeter: George AB0SF

• RSGB: *SDR Software Defined Radio*: Jerry VE3OBX

• TAPR: 20m WSPR Transmitter: Rick AE5JI, Phil KA9Q

• TAPR: 30m WSPR Transmitter: David W2LNX, John N8UR, Dave WB0SEM

• TAPR: Gift Certificate: John WA0VPJ

• TAPR: Gift Certificate: Mark WB9QZB

• TAPR: Gift Certificate: Jerry VE3OBX

• TAPR: Gift Certificate: Phyllis Whitten

• West Mountain Radio: Gift Certificate: Bob N4HY

• Yaesu: FT-70DR: Bill KD5TFD

• Yaesu: FTM-7250: Marian C6ACH

###
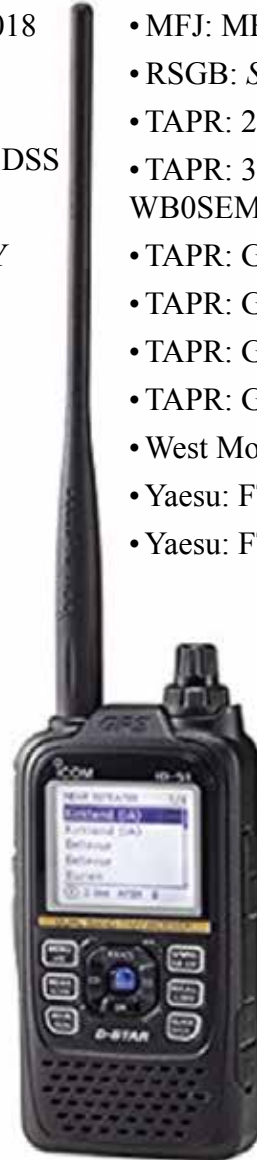
Call for All: GNU Radio Conference (GRCon19)

By Michelle Thompson, W5NYV

Dear friends and fans of GNU Radio,

GNU Radio Conference celebrates and showcases the substantial and remarkable progress of the world's best open source digital signal processing framework for software-defined radios. In addition to presenting GNU Radio's vibrant theoretical and practical presence in academia, industry, the military, and among amateurs and hobbyists, GNU Radio Conference 2019 will have a very special focus.

Summer 2019 marks the 50th anniversary of NASA's Apollo 11 mission, which landed the first humans on the Moon. GNU Radio Conference selected Huntsville, AL, USA as the site for GNU Radio Conference 2019 in order to highlight and celebrate space exploration, astronomical research, and communication.

Space communications are challenging and mission critical. Research and development from space exploration has had and continues to have far-reaching effect on our communications gear and protocols.

Please join us September 16-20, 2019 at the Huntsville Marriott at the Space & Rocket Center hotel for the best technical conference of the year.

Registration and an online and mobile-friendly schedule will be posted at the conference web site: https://www.gnuradio.org/grcon/grcon19/

Call for All!

We invite developers and users from the GNU Radio Community to present your projects, presentations, papers, posters, and problems at GNU Radio Conference 2019. Submit your talks, demos, and code! Please share this Call for All with anyone you think needs to read it.

To submit your content for the conference, visit our dedicated conference submission site at: https://openconf.org/GRCon19/openconf.php

First round closes 1 July 2019. If accepted, your content will be immediately scheduled.

Final round closes 1 September 2019. Space permitting. Pun intended.

If you have questions or need assistance with OpenConf, or have content that doesn't quite fit and you want to talk it over, please write grcon@gnuradio.org

Topics may include but are not limited to:

Space (including ground stations)*

Amateur radio	Digital Signal Processing
Radio astronomy	Education
Atmospheric research	Radio Interface
Theoretical work	Machine Learning
Practical applications	Cognitive Radio
Aviation	Transportation
Biomedical	Wireless security
Citizen Science	

###

*Special focus awards given to all accepted work with Space as a topic.

Microwave Update 2019

By Al Ward, W5LUA and Bob Stricklin, N5BRG

The North Texas Microwave Society would like to invite you to the annual Microwave Update Conference to be held October 3rd through the 5th 2019 at the Hilton Garden Inn and Conference Center in Lewisville (Dallas) Texas. Microwave Update is the premier microwave conference of the year and was initially started by Don Hilliard W0PW (sk) back in 1985. This is the ideal conference to meet fellow microwave enthusiasts and share ideas and techniques that will help you conquer your next microwave band.

We have a full slate of speakers already set up including Rex VK7MO, Tony Emanuele K8ZR, Rick Fogle WA5TNY, Paul Wade W1GHZ, Joe Jurecka N5PYK, Doug Miller K6JEY, Greg McIntire AA5C, Steve Kostro N2CEI, Kent Britain WA5VJB, Bob Stricklin N5BRG, Barry Malowanchuk VE4MA, Tom Williams WA1MBA, Tom Apel K5TRA, Tom McDermott N5EG and Al Ward W5LUA. If you are interested in speaking, please let us know. Topics will include small dish EME, microwave propagation, parabolic dish feedhorn design and construction, SSPAs, circuit design, latest microwave devices, software defined radios, digital modes just to name a few.

Friday morning will be dedicated to antenna gain measuring led by WA5VJB, noise figure testing led by W5LUA and phase noise analysis led by AF8Z and KC4YOE.

We still have several surplus electronics and mechanical places in the DFW area that may still be worth a visit on Thursday. Those would include Tanner Electronics in Carrollton, Altex Electronics in Carrollton, and CDC Surplus in Richardson. Other places that would also handle walk-in business and be worth a visit include Texas Towers, Ham Radio Outlet, Fry's Electronics. A complete list is available on www.ntms.org.

On Thursday afternoon, we plan to have a workshop lead by Tom McDermott N5EG on GNU Radio. GNU Radio is a development and simulation environment used to create and test software design radio applications. This is a powerful learning tool and GNU Radio can be used to implement working radio applications.

Topics to be covered during the workshop will include:

• Installation of the GNU Radio package in Windows.

• Review of GNU Radio capabilities and core concepts.

• Review of important GNU Radio modules, building a project, implementing and running projects involving hardware.

• Use of Gnuradio Companion (GRC) graphical environment.

• Demonstration of Gnuradio Companion (GRC) application with Ettus radio.

The attendee is encouraged to bring their 64-bit laptop with Windows 10. The focus will be on Windows but GNU radio works well in Linux also. Tom, N5EG has a good deal of experience working with GNU radio and communication systems. He has made presentations on the topic at the ARRL TAPR Digital Communication Conference. Tom will also have other speakers assisting him with the workshop.

We have tentatively scheduled the workshop on Thursday afternoon from 3 PM until 6 PM.

We plan to have an informal program for the spouses which will include local shopping and sightseeing in the Lewisville, Grapevine and greater DFW area on both Friday and Saturday.

Our Saturday night banquet speaker will feature Rex VK7MO who has activated over 100 grid squares on 10 GHz EME in both Australia and New Zealand. Rex will show us some of the beautiful places he has visited and talk about his adventures to some of the more remote places down under. This

should be a real treat for hams and spouses.

   Kent Britain WA5VJB will coordinate the publishing of the proceedings by the ARRL. We are always looking for additional papers for the proceedings. You don't have to be a presenter to have your paper published in the proceedings. If you have an article on your latest microwave related project that you would like published, please send your article to Kent WA5VJB at wa5vjb@flash.net
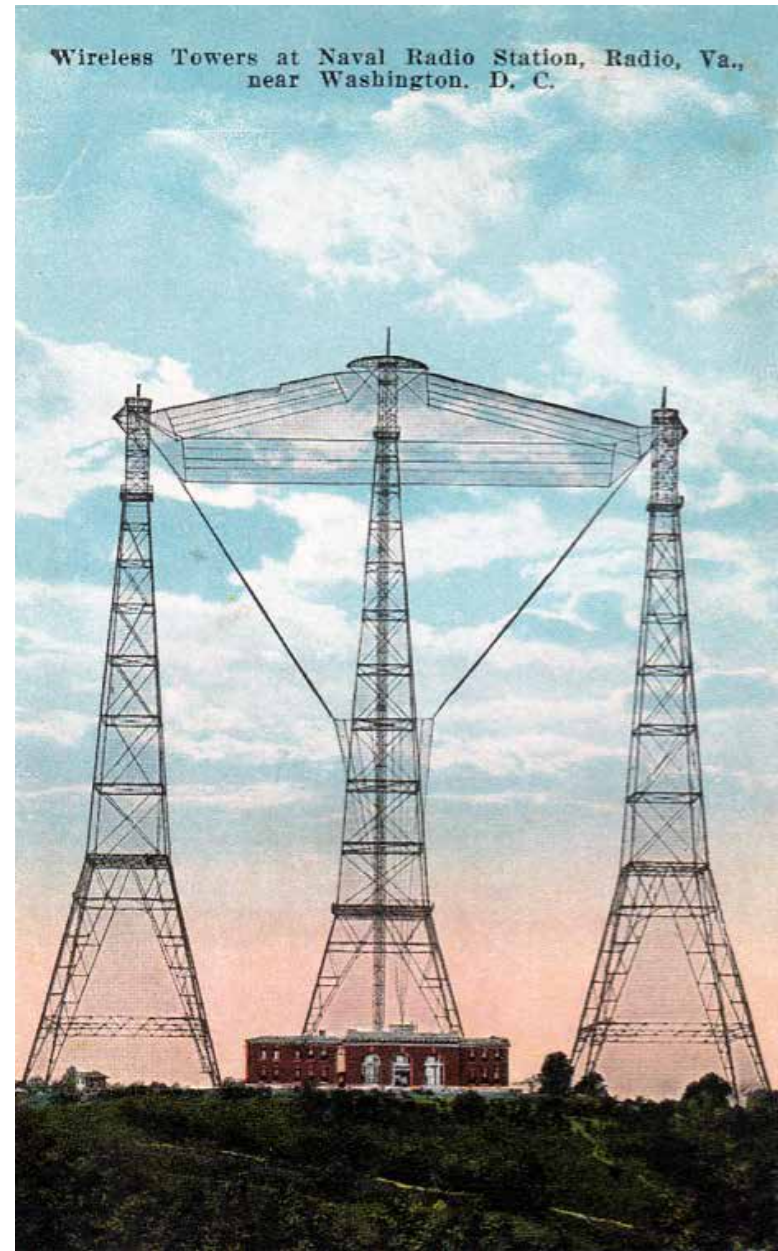
   Hotel registration has been setup at http://tinyurl.com/yys5fbun

   I suggest copying and pasting the link into your internet browser for best results. Microsoft Edge gets fussy but Chrome and Mozilla Firefox work well. The conference rate for Thursday, Friday, and Saturday night is $104 per night for a King which includes breakfast. The rate on the same days for a Double Queen is $114 per night including breakfast. The rate for Wednesday night is $129 per night for a King including breakfast and $132 for a Double Queen. The hotel charges a higher rate on Wednesday as they have a lot of business travelers. We encourage everyone to register for the hotel as early as possible. If your plans change and you can't attend, you have until September 30th to cancel without any cancellation fee. Special room rate will be available until September 13. If you book without using the link above please mention North Texas Microwave Society so we can get credit for the room nights as this is required for us to keep conference registration rates as low as possible. The Group Code is "MICRO". If you have any problems with booking the hotel rate please contact w5lua@sbcglobal.net.

   The Microwave Update web page will be updated shortly and it will include conference registration as well as other helpful information.

   Hope to see you in the Dallas area once again.

                                                                  ###

Wireless Towers at Naval Radio Station, Radio, Va., near Washington, D. C.

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 wa1lou@tapr.org --- she can handle it!

The deadline for the next issue of *PSR* is July 30, 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!

###

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

PSR

#141 Spring 2019, ISSN: 1052–3626

Published by

TAPR

Phone 972–671–TAPR (8277)

E-mail taproffice@tapr.org

URL www.tapr.org

Facebook www.facebook.com/TAPRDigitalHam

Twitter www.twitter.com/taprdigital

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 (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.

Production / Distribution

PSR is exported as Adobe Acrobat and distributed electronically at www.tapr.org

PSR Editor:

Stana Horzepa, WA1LOU

E-mail wa1lou@tapr.org

TAPR Officers

President: Steve Bible, N7HPR, n7hpr@tapr.org
Vice President: Scotty Cowling, WA2DFI, 2018, wa2dfi@tapr.or
Secretary: Stana Horzepa, WA1LOU, wa1lou@tapr.org
Treasurer: Tom Holmes, N8ZM, n8zm@tapr.org

TAPR Board of Directors

Board Member, Call Sign, Term Expires, e-mail address
John Ackermann, N8UR, 2019, n8ur@tapr.org
Steve Bible, N7HPR, 2020, n7hpr@tapr.org
George Byrkit, K9TRV, 2021, k9trv@tapr.org
Scotty Cowling, WA2DFI, 2021, wa2dfi@tapr.org
Stana Horzepa, WA1LOU, 2020, wa1lou@tapr.org
John Koster, W9DDD, 2021, w9ddd@tapr.org
Bruce Raymond, ND8I, 2019, bruce@raymondtech.net
Darryl Smith, VK2TDS, 2020, vk2tds@tapr.org
Mark Thompson, WB9QZB, 2019, wb9qzb@tapr.org

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.

PSR Advertising Rates

Full Page Ad for 1 issue: $100, 4 issues: $350
Half Page Ad for 1 issue: $75, 4 issues: $250
Quarter Page Ad for 1 issue: $50, 4 issues: $175

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

Membership Application

TAPR

P. O. Box 852754, Richardson, TX 75085–2754

Phone 972–671–TAPR (8277), Monday–Friday, 9AM–5PM Central Time

E-mail taproffice@tapr.org   URL http://www.tapr.org

Join or renew online at https://secure.tapr.org/np/clients/tapr/login.jsp

Benefits of a TAPR Membership:
- *Subscription to the quarterly PSR*
- *10% off most TAPR kits and publications*
- *Access to the TAPR digital library*
- *Latest information on TAPR R&D projects*
- *Co-sponsor of the annual TAPR-ARRL Digital Communications Conference (DCC)*

Name_____Call Sign_____

Address_____

City_____State/Province_____Postal Code_____

Country_____ Daytime Phone No._____

E-mail Address_____

New ☐   Renewal ☐ $25 X _____ number of years = $_____ total

Payment Method: Check ☐   Money Order ☐   Credit Card ☐

STOP! Provide the following information only if paying **by mail** with a credit card:

VISA ☐   Mastercard ☐   Discover ☐

Credit Card No. _____ Expiration Date_____Security Code_____

Card Holder's Name_____

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