



# President's Corner

**By Steven Bible, N7HPR, President, TAPR**



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This has been a great year for TAPR and the digital Amateur Radio community. The ARRL & TAPR Digital Communications Conference (DCC) in Atlanta was the icing on the cake with great attendance and great presentations brought to you by the makers and shakers of this important niche of the world we call “ham radio.”

To get a feeling for what you missed, I invite you to visit the website of HamRadioNow (<http://arvideonews.com/hrn/>) or the YouTube TAPR Digital Videos Channel (<http://www.youtube.com/user/TAPRDigitalVideo>) and view the videos that Gary Pearce, KN4AQ, and crew recorded at the weekend-long event. After viewing the videos, I am sure you will seriously consider attending the next DCC, which will take place west of the Mississippi in September 2013. (TAPR will announce the actual location of the 2013 DCC real soon now.)

There has been a slight shift in the makeup of TAPR officers and board members. HPSDR all-star Scotty Cowling, WA2DFI, has stepped down as TAPR vice president and director after a long and successful run. I want to personally thank Scotty for his hard work and dedication and hope he will

continue to help the cause in his new position as Director Emeritus.

Another HPSDR all-star, Jeremy McDermond, NH6Z, will take Scotty’s place as vice president and continue on as a member of the board along with two new board members, George Byrkit, K9TRV, and Tom Holmes, N8ZM, and re-elected board member, John Koster, W9DDD, who holds down the fort also known as the “TAPR office” with the his wife Laura.

New board member Tom Holmes will continue serving as our treasurer as he has done for oh-so-many years counting all those beans. Also re-elected as officers are Director and *PSR* Editor Stana Horzepa, WA1LOU, who will continue serving as our secretary and finally, there is myself, as president.

The new year looks very promising with some great new hardware and software projects in the works. And who knows what else you readers will come up with to redefine the paradigm!

Happy Holidays and 73,

Steve Bible, N7HPR, President TAPR

###

## **Election Results**

The elections of TAPR officers to one-year terms was held during the TAPR Board of Directors meeting on September 20, 2012, in Atlanta. The results were as follows::

President - Steven Bible N7HPR

Vice President – Jeremy McDermond, NH6Z

Secretary – Stana Horzepa, WA1LOU

Treasurer – Tom Holmes, N8ZM

The TAPR Board of Directors election ended at 2359 UTC Monday, October 22, 2012, and the results were as follows:

John Koster, W9DDD: 35 votes

George Byrkit, K9TRV: 30 votes

Tom Holmes, N8ZM: 31 votes

Bryan Hoyer, K7UDR: 23 votes

Mark Thompson, WB9QZB: 11 votes

Accordingly, John Koster, W9DDD; George Byrkit, K9TRV; and Tom Holmes, N8ZM, have been elected to three-year terms on the TAPR Board of Directors.

###

## **Staying Informed**

The tapr-announce e-mail list is a good way to stay informed about what is going on with the TAPR organization. It is a low-traffic list (15 e-mails in the past year) that is used by the TAPR [officers](#) and Board of Directors to only announce information of importance to the TAPR membership.

If you subscribe to any TAPR e-mail list, you are automatically subscribed to tapr-announce. However, if you are not subscribed to any TAPR e-mail list, please consider at least subscribing to psr-announce, another very low traffic list so that you will automatically be subscribed to tapr-announce.

I assure you, if you subscribe to tapr-announce, you will not be inundated with e-mails and you will not miss important and timely information regarding TAPR, for example, information about our elections, newsletter, DCC, and Hamvention. So, I urge you to subscribe to tapr-announce (via subscribing to psr-announce) by visiting this webpage:

<https://www.tapr.org/cgi-bin/mailman/listinfo/psr-announce>

###

# **Board Meeting Minutes, Sept. 20, 2012**

**Motion:** In absence of Secretary, Mr. McDermond is appointed to take minutes.

**Resolution Passes by Voice Vote**

## **Board Elections**

Mr. Cowling, Mr. Koster and Mr. Thompson's terms are expiring this year. Mr. Koster and Mr. Thompson accepted nominations for their continuing service on the board. Mr. Cowling declined to be nominated.

George Byrkit (K9TRV), Bryan Hoyer (K7UDR) and Tom Holmes (N8ZM) are current nominees for the three open positions in addition to the two incumbent board members. Nominations will remain open until the membership meeting.

Mr. Cowling expounded on the personal reasons for leaving the board mentioning the allegations apparent conflicts of interest leveled by some members.

**Motion:** Mr. Cowling is appointed as Director Emeritus as an honorary position.

**Resolution Passes by Voice Vote**

## **Officer Elections**

**Motion:** Mr. Koster nominates Mr. McDermond for Vice President.

**Second:** Mr. Cowling

**Resolution Passes by Voice Vote**

**Motion:** Mr. Ackerman nominates Mr. Holmes for Treasurer.

**Second:** Mr. Cowling.

**Resolution Passes by Voice Vote**

**Motion:** Mr. Koster nominates Ms. Horzepa for Secretary.

**Second:** Mr. Cowling

**Resolution Passes by Voice Vote**

**Motion:** Mr. Babcock nominates Mr. Bible for President.

**Second:** Mr. Cowling

**Resolution Passes by Voice Vote**

## **Office Report**

Mr. Koster reports 200 Hermes orders processed. European Credit Card orders are

having some difficulties with the prepay system. 40 bare board orders were processed.

Also, there were 10 orders for PennyWhistle, but the office is having some issues with heat sink manufacturing. Other items are slowly dribbling out the door.

Mr. Babcock requests that the office generate a running monthly inventory report for the board. Mr. Holmes is requested to forward sales reports from the accounting firm to the board mailing list monthly.

Mr. Koster reports that the office printer is having some issues. He will work around these issues by retiring it in favor of the newer HP printer.

## **Web Server**

Mr. Ackerman reports that the [tapr.org](http://tapr.org) server hardware at Server Beach needs to be upgraded. He will research the possibilities and report back to the board on the mailing list.

## **Treasurer's Report**

Mr. Holmes reports that Hermes sales will be booked as they are shipped, not as billed. This means that the Hermes orders will not show up in August's financials. DCC expenses and income will show up in the September financials. There were about \$7800 in sales not counting Hermes. There were 25 new members in July and 35 renewals.

## **General Discussion**

**Motion:** All future TAPR funding requests must be accompanied by a written agreement stating TAPR's expectations regarding the product.

**Second:** Mr. McDermond

**Resolution Passes by Voice Vote**

**Motion:** TAPR deprecates the NDL and will remove it from the [tapr.org](http://tapr.org) website.

**Second:** Mr. Cowling

**Motion Passes**

**Motion:** TAPR will bring the TNS Buff into production for subsequent sale.

**Second:** Mr. Koster

**Resolution Passes by Voice Vote**

###

# Empirical Outlook

By Larry Wolfgang, WR1B

(Originally published in *QEX* November-December 2012)

On the weekend of September 21-23 I attended the ARRL/TAPR Digital Communications Conference in Atlanta. This conference rates a one of, if not the top technical conference in Amateur Radio every year. The presentations this year were once again outstanding. The attendees have such a wealth of knowledge and experience to share, whether they are giving a presentation or continuing the discussion in the hallways and demo room long after the talk is over.

One of the first presentations on Friday morning was Steve Bible, N7HPR. Steve gave a report on ARISat-1 and the results of an on-line survey. ARISat-1 provided a fantastic opportunity to share the excitement of Amateur Radio and the space program with a wide audience of students from elementary age through college engineering programs. Although it is hard to tell how the word about the survey spread outside of the AMSAT/Amateur Radio community, it was quite disappointing to see that less than 5% of respondents were educators on any level, with only about 2% being students.

We can hope that many more teachers took the opportunity to share lessons about science, math, radio, communications space and engineering with their students, but there is little solid evidence that the program had the wide impact it was designed to create. Getting the word out about some of the neat things we do in Amateur Radio, which can be used for educational programs to spark interest in students, continues to be a challenge. There must be more we can do to reach out to students and help them become excited about science, technology, math and engineering topics and careers! Do you have any ideas?

Along those same lines, Bdale Garbee, KB0G, gave a presentation about AMSAT Fox. AMSAT's latest idea for obtaining launch opportunities for Amateur Radio satellites is to partner with various universities, where students are building cubists, AMSAT can help by providing expertise with the RF engineering aspects. The partnerships will provide a convenient platform to include some Amateur Radio equipment on board. Fox-1 is a partnership with Penn State, where they are building a MEMS Gyro experiment. This satellite has been accepted by NASA for a free launch, with a target launch date of the second half of 2013.

I'm sure there was a lot more information and discussion about the program at the AMSAT Symposium in Orlando, FL at the end of October, but I did not attend that conference. This may be one example of a way for Amateur Radio organizations to form stronger partnerships with educational institutions. Most of us would probably agree that we, as the Amateur Radio Service, need to reach out more effectively to younger students, so that there would be more college engineering students interested in studying RF.

Bdale was also the Saturday evening banquet speaker. The theme of this talk was "Sharing the Joy of Making." Those who are acquainted with Bdale will know that he is an excellent story teller, and he kept us spellbound throughout his presentation. It's a theme that many hams can relate to. We enjoy building things, and perhaps taking something designed for one application and adapting it to something else entirely. Bdale has taken this to the extreme, and he certainly exudes the joy he feels when he builds something useful. He serves as an excellent example of how any of us should

reach out to others and share the excitement we find in Amateur Radio.

Chris Testa, KD2BMH, became interested in Amateur Radio through a *Make* Magazine article. He has been licensed for a little more than 6 months, and was showing the circuit board he has produced, which will be an all-mode handheld SDR 2 m and 70 cm transceiver. Chris's radio had receive capability in the 1100 MHz to 1 GHz range. He has the hardware working, and is looking for some others to help write software to enhance the radio. He is moving ahead with the manufacture of a limited number of "kits." Chris expressed interest in writing about his project for *QEX*, so I hope you will be hearing more about this in the near future.

I also had the great honor of presenting the 2011 Doug DeMaw, W1FB, ARRL Technical Excellence Award to James Ahlstrom, N2ADR, for his January-February 2011 *QEX* article, "An All-Digital Transceiver for HF." Jim is a regular at the DCC, and we have another of his excellent articles in the works for next year.

Gary Pearce, KN4AQ, has been videotaping all of the DCC presentations for a number of years, and he provided this service again at the 2012 Conference. Rather than producing and selling a set of DVDs with the entire Conference, Gary is now making these videos available on his website, [www.HAMRADIONOW.tv](http://www.HAMRADIONOW.tv). By the time you read this, Gary may have some, if not all of the recordings from this year's DCC posted. The videos don't take the place of actually being there to meet and talk with so many active experimenters, but there is a lot to learn just by watching the presentations. Enjoy!

###

# DCC Prize Winners

**By Steve Bible, N7HPR**

The 31st annual ARRL & TAPR Digital Communications Conference (DCC) is a wrap. Attendance was excellent; you would wish you were there! Three lucky winners won prizes at the DCC banquet thanks to Icom, Kenwood, and Yaesu.

###



*Brian Kopp, KC5LPA, wins Kenwood TM-D710A Multi Communicator 144/400 MHz FM/APRS Dual Band Mobile Transceiver as N7HPR lets go of the box.*



*Bill Watt, K4BLL, wins Yaesu VX-8DR APRS®/GPS/Bluetooth® Handheld Transceiver as N7HPR smiles at the camera.*



*Tom Rondeau, KB3UKZ, wins Icom ID-31A UHF D-STAR Digital Transceiver as N7HPR looks on.*

# Online Board Meeting

The TAPR Board of Directors meets in person at the Dayton Hamvention in May and the Digital Communications Conference (DCC) in the September. During the rest of the time, the Board of Directors meets online on a continuous basis.

During the past quarter, the Board made the following decision online:

**Motion:** Mr. McDermond, NH6Z, moved that the board approve transitioning membership management software to the Neon platform by Z2 Systems with costs to be \$99/month in addition to any credit card processing fees. TAPR executive is authorized to take all appropriate actions to carry out this transition.

**Second:** Mr. Ackermann

**Resolution passed by an online vote on November 5, 2012**

###

**Update: Over 50-Mile Range Test Successful!**

# Experimenting with High-Speed Wireless Networking in the 420-MHz Band

**By David Bern, W2LNX, Montgomery Amateur Radio Club, Maryland, W2LNX @ arrl.net**

This article is an update to the paper that I submitted at the end of July 2012 to the 2012 ARRL and TAPR Digital Communications Conference held in Atlanta, Georgia [W2LNX]. The whole conference including my presentation can be seen on the HamRadioNow Web site [KN4AQ].

We are pleased to report that we successfully completed an over fifty mile range test across Shenandoah Valley, Virginia between the Hogback Mountain overlook at 3383 feet (1031 m) to Reddish Knob at 4396 feet (1339.9 m). Eugene, KB3TZH and William, W3QX were on Hogback Mountain – see photo 1 while David, W2LNX and Chris, KB3CS were on Reddish Knob – see photo 2. The distance between these two mountain tops is about 56.5 miles (90.9 km). The radio modules used were the Xagyl Communications XC420M miniPCI radio modules [Xagyl] and the antennas were a pair of M2 420-50-11 Yagi antennas [M2 Yagi] stacked array at each station.

The test applications were the hfs file download Web server [hfs] and the Yawcam Webcam program [Yawcam] which has a built-in Web server that can stream video from a Webcam video camera. The video camera internal in the netbook computers were used for this test – see screen shot 3.

The signal quality was 28% with a data rate of 300 to 500 kilobit/s – see screen shot 4. Note that the time scale of the graph is two minutes of data. The file download rate was about 50 kilobyte/s. The hfs and Yawcam Web servers use TCP/IP which means that every data packet is acknowledged. This introduces a round trip delay of nearly a millisecond which explains the relatively low data rate at this distance. So, we needed to increase the Sensitivity Range (ACK Timing) parameter in DD-WRT [DD-WRT] to a value greater than the default setting of 2 km. In comparison, our previous 12.8 mile (20.6 km) range test between the Skyland Lodge patio and Massanutten Mountain at a comparable signal quality of 32% had data rate of 2.5 megabit/s [W2LNX]. One can appreciate how slow the speed of light is!

Stay tuned for future updates on this ongoing project. Ideas, suggestions, questions and comments are welcome; please e-mail them at W2LNX @ arrl.net.

Thank you., (October 23, 2012)



*Eugene, KB3TZH, on Hogback Mountain overlook (W3QX photo)*



*David, W2LNX, on Reddish Knob (KB3CS photo)*

## References

[DD-WRT] DD-WRT is a Linux based alternative OpenSource firmware suitable for a great variety of WLAN routers and embedded systems, NewMedia-NET GmbH, <http://www.dd-wrt.com/site/index>

[KN4AQ] Pearce, Gary KN4AQ, HamRadioNow, <http://HamRadioNow.tv/>

[M2 Yagi] 420-50-11 70 cm Yagi, M2 Antenna Systems, Inc., <http://www.m2inc.com/index.php?ax=amateur&pg=103>

[W2LNX] Experimenting with High-Speed Wireless Networking in the 420 MHz Band, The 31th Annual ARRL and TAPR Digital Communications Conference, September 2012, Atlanta, GA, <http://www.tapr.org/pdf/DCC2012-Experimenting-...-Wireless-Networking-in-420-MHz-Band-W2LNX.pdf>

[Xagyl] XAGYL XC420M 420-450MHz 1000mW miniPCI, Xagyl Communications, LLC, [http://www.xagyl.com/store\\_us/product.php?productid=31](http://www.xagyl.com/store_us/product.php?productid=31)

[Yawcam] Magnus Lundvall, Yet Another WebCAM software, <http://www.yawcam.com/>

###



Eugene, KB3TZH, on Yawcam



Access point bandwidth page in Reddish Knob (120 s)



## Reading the Mail

Steve, N7HPR,

Thanks for the hospitality at the TAPR conference. Having run a conference myself, I know that they look deceptively simple and that there is a lot of work on the backend to get everything smooth. I've been in a digital community all my ham life: from the early days of packet and running PACTOR III in the field during Katrina for the Salvation Army. But I've not been to a DCC before that I can recall. This conference has been added to my "must attend" list.

Thanks,

Steve Hicks, N5AC, AAR6AM

VP Engineering

FlexRadio Systems™

Hello Steve,

Thank you for the kind words and it was our pleasure having you. And thank you very much for your presentation!

We're starting to plan next years DCC. Let us know how we can improve, what we can try new, and what we can do to support you and Flex Radio.

Take care and 73,

Steve Bible, N7HPR

TAPR President

###

## DCC Video Online

By Gary Pearce, KN4AQ



HamRadioNow recorded all of the 2012 Atlanta ARRL & TAPR Digital Communications Conference (DCC) except the introductory talks and we are beginning to put them on-line. Get the details at our website, <http://arvideonews.com/hm/>!

Episode 33 is a talk I had with TAPR President Steve Bible, N7HPR, about what TAPR is today (and what it's been), and what the DCC is all about.

Episode 34 is Steve again with his lead-off talk on the ARISSat project's user survey.

Episode 35 has Scotty Cowling, WA2DFI, and Jeremy McDermond, NH6Z, reviewing this year's hardware and software updates to HPSDR – High Performance Software Defined Radio.

Episode 36 is more than a primer on SDR and FlexRadio's new 6000 series by FlexRadio's Stephen Hicks, N5AC.

Episode 37 has NW Digital Radio's Bryan Hoyer, K7UDR, and John Hays, K7VE, updating a pair of old ideas: a packet-hailing channel (you never guess which he recommends, and who thinks it's a good idea) and AMPRNet44.

Episode 38 features Hessu Hannikainen OH7LZB, developer of the website [APRS.FI](http://APRS.FI), describing development of an open-source server for the APRS-IS network that distributes APRS data worldwide.

(Editor's Note: KN4AQ's DCC videos will also be viewable on the YouTube TAPR Digital Videos Channel (<http://www.youtube.com/user/TAPRDigitalVideo>))

###

# Gnuradio Module for Hermes/Metis

By Tom McDermott, N5EG

An alpha-version of a Gnuradio module for Hermes/Metis is available in the SVN repository: [http://svn.tapr.org/repos\\_sdr\\_hpsdr/trunk/N5EG](http://svn.tapr.org/repos_sdr_hpsdr/trunk/N5EG)

You will need to build the gnuradio Hermes module from the source (easy).

The build instructions are very similar to building gnuradio, and instructions are in the top trunk/N5EG directory.

The gr-hpsdr directory contains the source, SVN->Checkout gr-hpsdr directory and contents to your *Linux* system.

This has been tested with *Gnuradio 3.6.2* and *Ubuntu 12.04*.

The initial code provides receive-only operation, one receiver only, can set receive sample rate, receive frequency, and turn the receive preamp on and off. I'm assuming that Metis works the same as Hermes, but can only test Hermes. The host Ethernet interface is hard-coded to "eth0" in this version.

In the grc\_applications directory, two demo apps show how to interact with the Hermes module.

The SSB receiver app provides the ability to select upper/lower sideband, turn the preamp on/off, set the receive frequency and the receive sample rate (48000, 96000, or 192000). The AGC works poorly - it's hard to make a good audio-only AGC! The receiver works fine.

The GUI app shows how to connect the QT GUI (spectrum analyzer, time-domain, and constellation-domain) viewers to the app.

###

# FreeDV Ham Radio Digital Voice Software

*FreeDV* is an application for *Windows* and *Linux* that allows any HF SSB radio to be used for digital voice mode with a bandwidth of just 1.1 kHz. Speech is compressed down to 1400 bit/s then modulated onto a 1100 Hz wide QPSK signal which is sent to the Mic input of a SSB radio. On receive, the signal is received by the SSB radio, then demodulated and decoded by *FreeDV*.

Features:

- Codec 2 voice coder and FDMDV modem

- 50 baud 14 QPSK voice data

- 1 Center BPSK carrier with 2x power for fast and robust synchronization.

- 1.125 kHz spectrum bandwidth (half SSB) with 75 Hz carrier spacing

- 1400 bit/s data rate with 1375 bit/s open source Codec 2 voice coding and 25 bit/text for call sign ID

- No interleaving in time or FEC philosophy resulting in low latency, fast synchronization and quick recovery from fades.

- 44.1 or 48 kHz sample rate sound card compatible

*FreeDV*, the new HF digital audio program for Radio Amateurs: [http://www.youtube.com/watch?v=Pfyn0NEcNHs&feature=player\\_embedded](http://www.youtube.com/watch?v=Pfyn0NEcNHs&feature=player_embedded)

Watch when it's switched to analog SSB. The SSB bandwidth is about 3 times that of the digital audio. Also note the diagonal black streaks across the waterfall display. That's fading, probably from two reflections arriving out of phase. The ID on the bottom is coming in during the silent periods between words.

This software is Open Source, and uses Codec2. This Codec was presented by Bruce Robertson, VE9QRP at the 2012 AMSAT Space Symposium in Orlando, Florida.

See <http://freedv.org/>

[ANS thanks Southgate and FreeDV for the above information]

(Source: ANS-344 AMSAT News Service Weekly Bulletins)

###

## Write Here!



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

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

The *PSR* editorial staff can handle just about any text and graphic format, so don't be afraid to submit whatever you have to [wally@tapr.org](mailto:wally@tapr.org). The deadline for the next issue of *PSR* is January 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](http://www.facebook.com/TAPRDigitalHam).

However, recently I also created a TAPR Facebook Group, [www.facebook.com/groups/TAPRDigital/](http://www.facebook.com/groups/TAPRDigital/).

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

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



### On Twitter, Too

Access the TAPR Twitter account at [www.twitter.com/taprdigital](http://www.twitter.com/taprdigital).



### Also on YouTube

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

At this time, there are over 30 videos on our channel including many from the TAPR-ARRL Digital Communications Conference (DCC) that you may view at no cost, so have at it!



###

## **PSR**

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TAPR Office Hours: Monday to Friday, 9 AM to 5 PM Central Time

## **Submission Guidelines**

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

## **Production / Distribution**

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## **TAPR Officers**

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Secretary: Stana Horzepa, WA1LOU, [wallou@tapr.org](mailto:wallou@tapr.org)

Treasurer: Tom Holmes, N8ZM, [n8zm@tapr.org](mailto:n8zm@tapr.org)

## **TAPR Board of Directors**

Board Member, Call Sign, Term Expires, e-mail address

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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](mailto:taproffice@tapr.org) URL <http://www.tapr.org>

Join online at <http://www.tapr.org/organization.html#membership>

## *Benefits of a TAPR Membership:*

- *Subscription to the quarterly PSR*
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- *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 \_\_\_\_\_

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New - \$25  Renewal - \$25

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