



President's Corner

All Roads Lead to DCC

By Steve Bible, N7HPR



The annual ARRL-TAPR Digital Communications Conference (DCC) will occur on the weekend of September 16-18 in St. Petersburg, Florida. Specifically, the DCC will be at the Hilton St. Petersburg Bayfront Hotel.

The DCC has two days of technical forums on Friday and Saturday and concurrent introductory sessions on Saturday. Saturday night, the banquet features ARRL's Chief Technology Officer Brennan Price, N4QX, and on Sunday morning, there will be a technical seminar on digital amateur radio communications.

On-line, you can register for the DCC and make your hotel reservations at <https://www.tapr.org/dcc.html>

Updated DCC information is available on TAPR's website at <http://www.tapr.org/dcc>

I hope to see you in St. Pete!

73,

Steve Bible, N7HPR, President TAPR

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President's Corner	01
DCC Papers	02
TAPR WSPR Board Beacon	02
Directors Election	04
VOACAP Text-GUI on Linux	04
TAPR Wear Now Available	05
TAPR at Hamvention in Pictures	06
Know Your Node	09
KD6OZH Mesh Network List	13
Write Here!	13
On the Net	13
CN2016 Report	14
The Fine Print	21
Our Membership App	22



DCC Papers

The following is the list of the 2016 ARRL/TAPR DCC papers. Note that this represents the contents of the printed document and that the actual live presentation of papers at the DCC may vary from this list.

“DV4Server: A stable, economical and scalable interconnection of different digital voice networks” by Uli Altvater, AGØX and Torsten Schulze, DG1HT

“Design of an HF QSD SDR for the Arduino and Raspberry Pi Platforms” by Edward Cholakian, KB1OIE

“Introduction To The PICAXE” by Darrell Davis, KT4WX

“IPv6 in Amateur Radio” by Bryan Fields, W9CR

“PiGate Emergency E-Mail Server” by Mark Griffith, KDØQYN

“AREDN: Amateur Radio Emergency Data Network” by Andre Hansen, K6AH

“The P25 Network Exchange – Linking Amateur P25 Digital Repeaters Worldwide” by David Krauss, NX4Y

“Public service, APRS and the Internet of Things” by John Ronan, EI7IG; Pdraig Donovan, SWL, and Barry P. Mulcahy EI3HLB

“Modulation – Demodulation Software Radio: Build your own IF SDR Introduction of MDSR V3.1 and the Scanning RF-Seismograph V1.4” by Alex Schwarz, VE7DXW, and Guy Roels, ON6MU

“Using Digital Communications and Microwaves in Amateur Radio and in the Amateur Satellite Service” by Michelle Thompson W5NYV, and Dr Robert W McGwier

###

TAPR WSPR Board Beacon

By Carter Hutchinson, K9KJN

I set up a spare raspberry pi with the TAPR WSPR board, installed the latest Raspbian and the WSPR software, connected it to my homemade resonant 20-meter dipole with a 1:1 balun and it worked flawlessly, first time!

I have set up a cron job to run on the hour throughout the day so now it's a fully automated 20 meter beacon.

The longest contact so far was MW0BYS in Wales, 6130 km from my home in Indiana

This was a fun project and I just wanted to say well done on your part.

###



2016 ARRL/TAPR Digital Communications Conference

**September 16-18
Saint Petersburg,
Florida**



Make your reservations now for three days of learning and enjoyment at the Hilton Saint Petersburg Bayfront 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

Directors Election

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

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

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

To place a person in nomination, please remember that he or she must be a member of TAPR. Also, confirm that the individual is willing to have his or her name placed in nomination. Send that person's name (or your own if you wish to nominate yourself), call sign, mailing address, e-mail address, phone number(s), and a biographical sketch (100 words maximum) via <http://www.tapr.org/inforequest.php> or via snail mail postmarked by September 7, 2016, to P. O. Box 852754, Richardson, TX 75085-2754. If you submit a nomination via e-mail, we strongly encourage you to follow up by regular mail.

Nominations close after the call for nominations from the floor at the TAPR Membership Meeting at the DCC on September 17, 2016, and an online election will be held at http://www.tapr.org/tapr_elections.html from September 24, 2016 to October 7, 2016.

The three Director positions that are up for election are currently held by John Ackermann, N8UR, Jeremy McDermond, NH6Z, and Mark Thompson, WB9QZB.

###

VOACAP Text-GUI on Linux

By Jari Perkiomaki, OH6BG

Just wanted to inform you that, inspired by the brand-new "Bash on Ubuntu on Windows 10," I programmed a text-GUI for running the VOACAP binary (voacap1) on Linux -- or even under the new Windows Subsystem for Linux... There are two scripts : one Bash script for collecting the input and running the prediction, and one Perl script to massage the results into two fine tables (Short-Path and Long-Path). So, if you are comfortable running software from the command prompt, this is definitely for you.

Read all the details here:

<https://voacap.blogspot.fi/2016/06/introducing-text-gui-for-voacap-on-linux.html>

I have been fine-tuning the scripts. I hope you find the new tool interesting!

###



TAPR Wear Now 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 at Hamvention in Pictures



Mike Ossmann, AD0NR, presented "HackRF Update" at the TAPR Forum. (KN4AQ video).



Michelle Thompson, W5NYV, gave the after-dinner speech, "It's just software, right?" at the annual TAPR-AMSAT Dinner. (AMSAT photo)



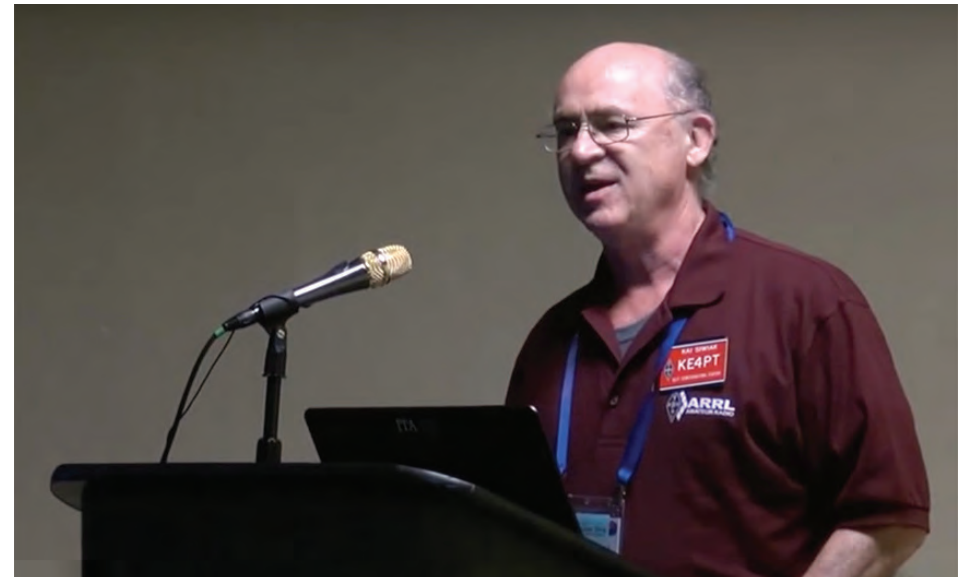
TAPR Director, Scotty Cowling, WA2DFI, moderated the TAPR Forum. (KN4AQ video)



TAPR President, Steve Bible, N7HPR, introduced the TAPR Forum (KN4AQ video).



Bryan Fields, W9CR, presented "HamWAN High Speed IP Radio Network" at the Forum. (KN4AQ video)



Kai Siwiak KE4PT, QEX Editor, urged TAPR Forum attendees to write for QST and QEX. (KN4AQ video)

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



At the TAPR Forum, Corey Shields, KB9JHU, talked about “SatNOGS,” a network of open source satellite ground stations. (KN4AQ video)



Gary Pearce, KN4AQ, recorded the TAPR Forum and it is now available for viewing at HamRadioNow on YouTube (<https://www.youtube.com/watch?v=IFcESjoWSP8>).



Rick Allnutt, WS8G, presented the 2016 Hamvention Special Achievement Award to TAPR PSR Editor, Stana Horzepa, WAILOU. (SM5LBR photo)



Chris Testa, KD2BMH, talked about the rapidly evolving tools and techniques for software defined radio (SDR) development. (KN4AQ video)



Hara Arena, the home of Hamvention since 1964, is closing, so Hamvention is moving to a new venue in Xenia, Ohio.

###

Know Your Node

By Brian Rogers, N1URO, for the EastNet Packet Network

A while back it came to me to dig into node aliasing. It made me ask the question to the ARRL if at the AX.25 level if aliasing is an acceptable way of establishing connectivity amongst:

users ↔ nodes

nodes ↔ nodes

When you consider that our FCC Part 97 states that all transmissions, regardless of mode -must- begin and end with their proper callsign and also ID every 10 minutes in between how does this define the usage of aliases on packet? When I queried the ARRL, they even were unsure which made their Regulatory Department query the FCC for clarification. Their response was that the statute is not prejudice to -any- mode whatsoever, which includes packet operations. This had me thinking about doing some sniffs mainly on URONode and it's configurations but I took it a step further to study that of other node firmware/software. Now, of course not all firmware/software is developed within the U.S., nor is it designed to specifically follow our Part 97. That duty lays within the Node Sysop to maintain such. What I found was very fascinating to which I'll be sharing the results of my sniffs with you in this document.

Looking at the specifics of Part 97 and the FCC's recent reply to the ARRL on the issue, it's clear that since ax.25 is our proprietary protocol, then this ruling -must- remain true at this level. However, not all firmwares/software honor our FCC rulings in regards to Part 97 so SysOp beware! In my sniffs of packets I've found this to occur with almost all packet nodes available. Here's a sniff of what I'm trying to explain:

I'm using NetRom into N9LYA in Indiana who has a BPQ neighbor on his 220 interface. You'll see I made a specific request to connect to

N9UMJ-7 via 220 but I tried using his alias:

```
ax0: fm N1URO-2 to N9LYA-7 ctl I44^ pid=CF(NET/ROM) len 35
NET/ROM: N1URO-5->N9LYA-7 ttl 14
      info: ur ckt 01/A8 txseq 7 rxseq 20
0000 c ax3 lawnod-5.
      ^^^^^^^^^^^^^^^
```

... and my command ACK frame back:

```
ax0: fm N9LYA-7 to N1URO-2 ctl I54^ pid=CF(NET/ROM) len 64
NET/ROM: N9LYA-7->N1URO-5 ttl 15
      info ack: ur ckt 01/12 rxseq 8
```

You see N9LYA's URONode honoring my request:

```
ax3: fm N1URO to LAWNOD-5 ctl SABM+
```

N9LYA's URONode informs me that the link is being set up:

```
ax0: fm N9LYA-7 to N1URO-2 ctl I55^ pid=CF(NET/ROM) len 54
NET/ROM: N9LYA-7->N1URO-5 ttl 15
      info: ur ckt 01/12 txseq 20 rxseq 8
0000 IN105:N9LYA-7} link setup (ax3)...
```

My ACK back:

```
ax0: fm N1URO-2 to N9LYA-7 ctl I65^ pid=CF(NET/ROM) len 64
NET/ROM: N1URO-5->N9LYA-7 ttl 14
      info ack: ur ckt 01/A8 rxseq 21
```

A second retry:

```
ax3: fm N1URO to LAWNOD-5 ctl SABM+
```

... and finally a connect:

```
ax3: fm LAWNOD-5 to N1URO ctl UA-
```

N9LYA informing me I have link:

```
ax0: fm N9LYA-7 to N1URO-2 ctl I66^ pid=CF(NET/ROM) len 47
NET/ROM: N9LYA-7->N1URO-5 ttl 15
      info: ur ckt 01/12 txseq 21 rxseq 8
0000 .*** connected to LAWNOD-5.
```

MOTD header:

```
ax3: fm LAWNOD-5 to N1URO ctl I00+ pid=F0(Text) len 80
0000 LAWBQP:N9UMJ-7} BBS RMS CHAT CONNECT BYE INFO NODES
ROUTES PORTS
0040 USERS MHEARD ..
```

ACK of received header:

```
ax3: fm N1URO to LAWNOD-5 ctl RR1-
```

Right here, you do NOT see N9UMJ transmitting with his callsign. You can NOT look up LAWNOD in any FCC database of legitimate callsigns. This is the START of a transmission, and it also happens to violate FCC Part 97. Any FCC Official Observer monitoring the frequency would then have to foxhunt to see where this broadcast is coming from and inform the Node Op of their illegal transmissions. This is why AX.25 is a plain text protocol.- for simple FCC monitoring of our activities on packet.

Granted, this is a BPQ node (and I'm not picking on BPQ's software by any means) however, there are -many- nodes which behave in this manner and like with BPQ they're not developed in the U.S. I have tried to make an effort with those who are still in development and not one of them intends to run a fix/patch for their softwares. In an ongoing discussion with Kantronics, their TNCs also are vulnerable to this bug in regards to their MYALIAS function. Kantronics fails to recognize that while in NODE mode operations ("interface user" for example) that MYALIAS -will- indeed respond at the AX.25 layer with a non-callsign if the end user put in a human-readable alias into their configuration which most do as to simulate a KA-NODE as a NetRom node. Kantronics suggests that MYALIAS is for digipeat mode only and is not meant for node connectivity regardless of the fact it still allows users to connect to the KA-Node. For their failure to recognize this as a bug I will be including them in the "bad" list.

Before I list those I've tested and the results, I wish to further explain why NetRom aliasing works under the guidelines of our Part 97. Like with the internet and it's DNS (domain name services) that takes a human-readable string and converts it to a series of IP based numerics, NetRom does the exact same thing when a user makes a request to connect. As you see here, NetRom knows well enough to convert the human-readable string into a proper callsign(-ssid) as with my connect request to INNOS:N9LYA-5:

Node connect request and link setup confirmation:

```
nluro-15@nluro.ampr.org:/uronode$ c innos
Trying INNOS:N9LYA-5... hit <Enter> to abort
```

NetRom converting INNOS to N9LYA-5 and routing it via it's NetRom neighbor:

```
ax0: fm N1URO-5 to N1URO-2 ctl I16^ pid=CF(NET/ROM) len 64
NET/ROM: N1URO-5->N9LYA-5 ttl 15
conn rqst: my ckt 01/3C wnd 1 N1URO-15@N1URO-5 timeout
120
```

Connection established and ACKed:

```
ax0: fm N1URO-2 to N1URO-5 ctl I71^ pid=CF(NET/ROM) len 22
NET/ROM: N9LYA-5->N1URO-5 ttl 7
conn ack: ur ckt 01/3C my ckt 01/02 wnd 1
```

Mailbox Header sent to me:

```
ax0: fm N1URO-2 to N1URO-5 ctl I72^ pid=CF(NET/ROM) len 44
NET/ROM: N9LYA-5->N1URO-5 ttl 7
info: ur ckt 01/3C txseq 0 rxseq 0
0000 [JNOS-2.0j.7v-BFHIM$].>.
```

My ACK of frame:

```
ax0: fm N1URO-5 to N1URO-2 ctl I37^ pid=CF(NET/ROM) len 64
NET/ROM: N1URO-5->N9LYA-5 ttl 15
info ack: ur ckt 01/02 rxseq 1
```

Node displaying to me my prompt and confirmation of connection:

```
Virtual circuit established to INNOS:N9LYA-5
[JNOS-2.0j.7v-BFHIM$]
>
```

As you see, NetRom converted my "INNOS" to N9LYA-5 for me thus keeping the frame within our Part 97... but here's also where it gets trickier – NetRom is encapsulated under AX.25! This keeps it legal because the one(s) doing the actual transmissions are N1URO-5 and N1URO-2 if you look at the "ax0" lines. Each AX.25 neighbor does hop-to-hop acknowledgment of the NetRom frames as part of it's error correction. There you see proper callsigns(-ssids) along the way at the top protocol level keeping you and the link legal.

The listing of softwares is not 100% and I may have missed some but those I have tested are pretty conclusive. Those that do/can fall 100% under Part 97 rulings are:

FlexNet*

Xnet*

URONode**

FPAC**

LinuxNode**

Those which failed the tests include:

BPQ Node (all platforms)

BPQ RMS

BPQ BBS

BPQ Chat

TheNet

X1J-4

JNOS

MFNOS

TNOS

Kantronics (if MYALIAS is configured with a non-callsign)

Other***

* Some of these may not even give you an option to configure any aliases as they don't exist in the softwares, while others use it strictly for NetRom only.

** Sysop has the duty to NOT configure aliasing in their ax25d.conf file

*** There may be others that were not tested due to lack of resources

So, know your node! You worked too hard for your license to have it violated! If you're using any of the node programs mentioned above you may wish to consider taking proper action so that you may insure you won't be making any illegal transmissions when a user or bbs script attempts to connect to you.

###

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

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 wallou@tapr.org, she can handle it!

The deadline for the next issue of *PSR* is November 1, 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.

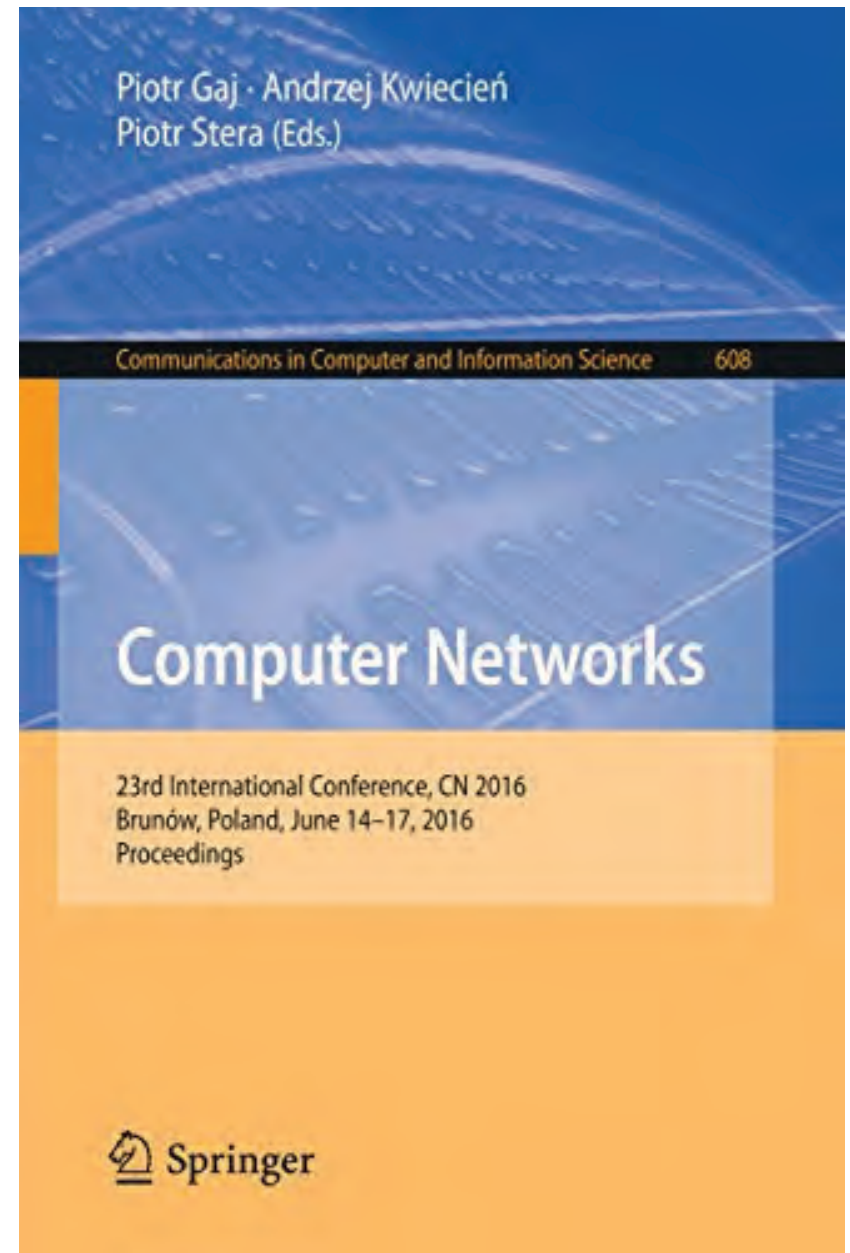
At this time, there are a slew of videos on our channel including many from the TAPR-ARRL Digital Communications Conference (DCC) that you may view at no cost, so have at it!

###

CN2016 Report

By Misko Skoric, YT7MPB

The following six pages is YT7MPB's report from CN2016, 23th International Science Conference on Computer Networks in Brunów, Poland, in June 2016.



The conference CN2016 took place in Pałac Brunów, a small village in southwestern Poland. The nearest town is Lwówek Śląski. That part of the country is a rural area, without much industrial activity, and there were no local radio amateurs whom to establish direct communication with. However, Pałac Brunów location was good enough to activate a VHF FM repeater located at mountain Góra Szrenica, in small town called Szklarska Poręba (Fig. 1 & 2).

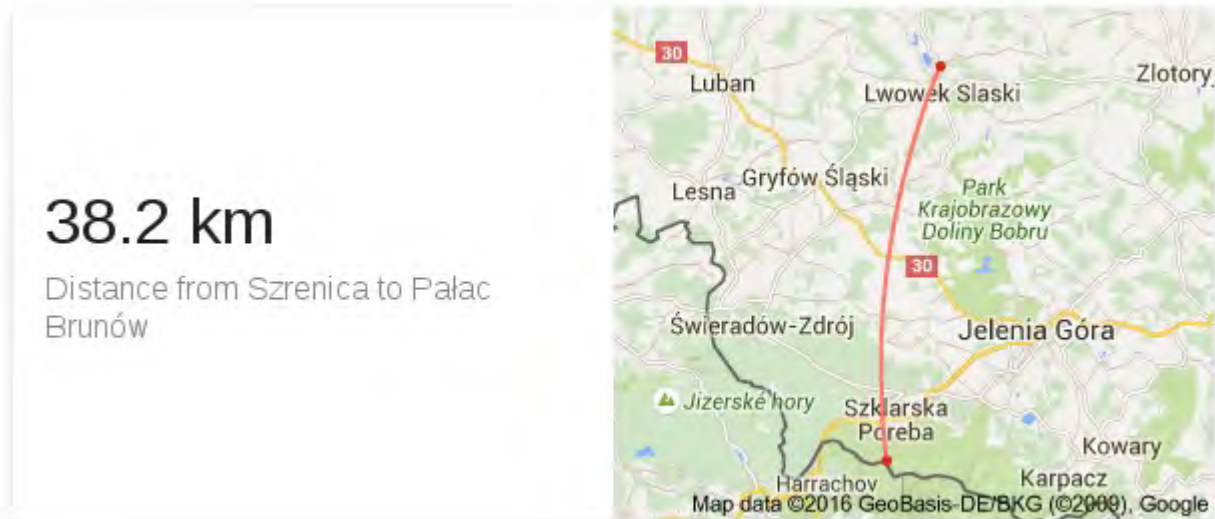


Fig. 1



Fig.2

The amateur radio communications seminar (where I distributed copies of PSR) was announced in a slide show of the conference committee member (Fig. 3).



Fig. 3

A short description of previous and the actual CN event was presented in Fig. 4



Fig. 4

Before the first amateur radio session in the morning, the organizing committee ensured that copies of

PSR are available to the conference participants, both in the presentation room and in the corridors (Fig. 5 & 6).



Fig. 5



Fig. 6

After CN2016 was finished on June 17, I returned back to Wroclaw city to spend a few days there. Later in the evening from the hotel room, I called local radio amateurs on VHF. The first correspondent was Mike SQ6WEM who did some assistance by searching the websites for some additional info on local radio clubs. So the next day I visited SP6PWS radio club location (Fig. 10 &11). The visit was organized and conducted by Marcin SQ6POL (not photographed) whom I also contacted the previous evening. I left some copies of PSR to the club members.



Fig. 10



Fig. 11

There were few more hams in the club who came to welcome and greet me, so we exchanged information about our ham equipment. I had a RIGblaster Plug & Play with me so I could perform a short data mode presentation for the club members – similarly as I did at the conference (Fig. 12).



Fig. 12

The next day I contacted with Robert 3Z6AET who has been active in *dasr.pl* (an emergency radio communication group in that part of Poland). Another friendly meeting was made with Michal SQ6IYV (Fig. 13), following by an 'ice cream session' in a local bar with myself SP6/YT7MPB (Fig. 14 black shirt).



Fig. 13



Fig. 14

A couple of days after, the visit to Krakow was used for a couple of short radio communications with Eryk SQ9KCN (not photographed), and for extensive testing the capabilities of my ADI AF-16 at a

famous Wawel Castle in Krakow. It was a very hot day, so it was interesting to compare the size of AF-16 and a half-full glass of cold Polish beer (Fig. 15 & 16).



Fig. 15

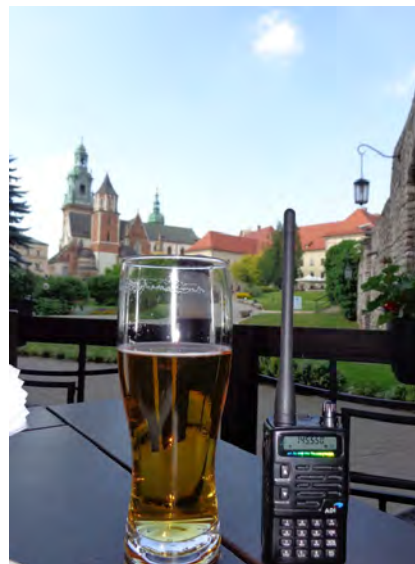


Fig. 16

As seen in the photos, the local calling frequency in Krakow was a simplex channel of 145.550 MHz. The second day in Krakow, I made additional tests in a similar guest-house environment (Fig. 17-19):

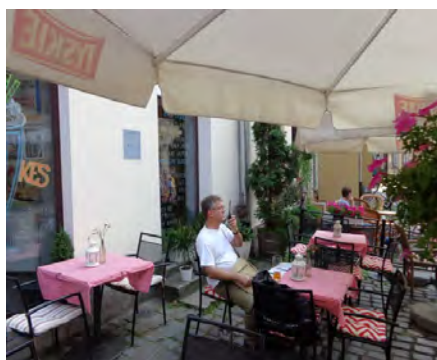


Fig. 17



Fig. 18



Fig. 19

Remarks:

- Participants of CN2016 enjoyed their copies of PSR. I take this opportunity to appreciate WA1LOU's willingness to provide copies of the newsletter for disseminating at this non-ham event.
- Having in mind that the conference was devoted primarily to the computer networks (hence the name CN), my intention was to provide many examples of what can be done with ham data software in a computer lab equipped with 2-3 computers in a LAN. The point was to persuade the audience that it is always possible to explore [free and open source] amateur radio software before investing real money in real radio equipment.
- While staying in Krakow, I was capable to hear very strong packet-radio signals within the city

area (at 144.800 MHz). Unfortunately, I was not able to decode those signals because while preparing for the conference I was told that packet-radio was pretty “dead” in that part of Poland. So I did not bring with me all proper cabling for connecting my RIGblaster Plug & Play to a portable VHF radio. Having in mind that I am a frequent conference traveler, my preferable option is to carry a VHF and/or a UHF portable handy radio(s) during my trips. Secondly, the packet-radio is my preferable data mode at home. Therefore the proper cabling will be a necessity for me the next time.

- The next year's CN2017 is supposed to happen in some other part of southern Poland, but probably very close to the national borders of Poland to Czech Republic, Slovakia, and/or Germany – probably with an intention to attract more participants from those countries as well. There is a proposal from the conference committee to consider organizing an amateur radio workshop, and new products display & demo. I invite US hams – especially packeteers to consider some active participation in the next year's conference, either with their ham and non-ham related papers & discussions.
- My next conference travel might happen in September 2016 for a similar technical conference in Kolkata, India.

Miroslav Skoric

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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) so that your work can be shared with the Amateur Radio community. If you feel uncomfortable or otherwise unable to write an article yourself, please contact the editor for assistance. Preferred format for articles is plain ASCII text (OpenOffice or *Microsoft Word* is acceptable). Preferred graphic formats are PS/EPS/TIFF (diagrams, black and white photographs), or TIFF/JPEG/GIF (color photographs). Please submit graphics at a minimum of 300 DPI.

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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.