President's Corner

By Steven Bible, N7HPR, President, TAPR

The 2011 TAPR-ARRL Digital Communications Conference (DCC) in Baltimore was a very successful endeavor. A great crowd of digital ham radio enthusiasts spent the long weekend sharing hardware and software information and expanding their knowledge.

I would like to thank all the presenters and speakers, as well as Kenwood, Midnight Design Solutions, and Yaesu, who donated items for door prizes. All of your contributions helped to make the 2011 DCC a rousing success.

By the way, if you missed the DCC, you can still read all about it by purchasing the printed DCC proceedings here: www.tapr.org/pub_dcc30.html

Meanwhile, plans for the 2012 DCC in Atlanta are well underway. TAPR is currently negotiating with a hotel near the airport (ATL - Hartsfield-Jackson Atlanta International Airport) and we are shooting for the weekend of September 21-23. As soon as TAPR finalizes the plans for DCC, there will be announcements on TAPR's website, TAPR's Facebook and Twitter accounts, TAPR's announcement e-mail lists, as well as here in *PSR*.

Are you subscribed to TAPR's announcement e-mail lists? Although, our website, Facebook, and Twitter accounts may be cooler, old school text-based information is still very viable. If you are interested, you can subscribe to our general announcement list here:

www.tapr.org/mailman/listinfo/tapr-announce (if you subscribe to any other TAPR list, you are automatically subscribed to the general announcement list). Also, you can subscribe to the *PSR* announcement list (to know when new issues of *PSR* are available) or you can get *PSR* delivered automatically to your e-mail box by subscribing to the *PSR* pdf list here: www.tapr.org/mailman/listinfo

You can expect to see TAPR at the Dayton Hamvention again this year (May 18-20). We will be holding down the fort at booths 455 through 458 in HARA's Ballarena and the TAPR Forum will open the show bright and early Friday morning. Friday evening, we will be going off-site (to Kohler Presidential Banquet Center in nearby Kettering) to join AMSAT in the sixth annual TAPR-AMSAT banquet (details will be forthcoming).

Also, I invite all TAPR members to attend the TAPR Board of Directors meeting, which takes place Thursday evening of Hamvention weekend. This year, we are in a new and improved location, i.e., DoubleTree Suites in Miamisburg, just south of Dayton off I-75, so come on down to witness and partake in the wonders of a TAPR board meeting!

"Make" is a four-letter word that I am very fond of using these days. If you are not familiar with *Make* magazine <www.makezine.com> and the Maker Movement, I urge you to seek it out and familiarize yourself because the Movement and TAPR have a lot in common.

Basically, it is "a technology-based extension of DIY culture. Typical interests enjoyed by the maker subculture include engineering-oriented pursuits such as electronics, robotics, 3-D printing, and the use of CNC tools, as well as more traditional activities such as metalworking, woodworking, and traditional arts and crafts," according to Wikipedia.

So get busy making or get busy dying!

73,

Steve Bible, N7HPR, President TAPR

###

iQuadLabs-TAPR Agreement

19 January, 2012, Tempe, AZ and Richardson, TX – TAPR (www.tapr.org) and iQuadlabs (www.iquadlabs.com) jointly announced a sourcing agreement for the openHPSDR (www.openHPSDR.org) boards Magister, Mercury and Pennylane. Under the new agreement, TAPR will acquire inventory from iQuadLabs, creating a one-stop source for all openHPSDR boards. In addition, iQuadLabs will acquire inventory from TAPR to build pre-configured and tested complete openHPSDR systems. Zephyr Engineering, Inc. will continue to manufacture the assembled boards, maintaining the high quality standards already established in all previous builds.

This is good news for the openHPSDR community. TAPR will have all openHPSDR boards in stock, in one place, for those wishing to buy boards, kits and components. And, for the first time in the history of openHPSDR, those who wish to by a completely assembled and tested radio will have a source at iQuadLabs.

###

2011 DCC Video Online

That's right – all the talks from the 2011 TAPR-ARRL DCC are now available on the web. Instant viewing on a browser near you (in high-definition)! Just point to www.ARVN.TV, and you'll find them.

The programs are produced as "shareware video" by ARVN:Amateur Radio//Video News. ARVN Producer Gary Pearce KN4AQ decided to try an experiment and put all the programs up on the web (courtesy of YouTube). This is especially helpful to hams outside the US, as DVD shipping and customs clearance can take more than a month. DVDs will be available sometime soon for those who want physical media.

Free to watch, but not free to make. So yes, you can watch the video for free. But ARVN has a lot of money and time invested in producing them. They are asking for a voluntary contribution from viewers who find the programs worthwhile. Just look for "Arvin the Piggy Bank" on the ARVN web site to make a contribution. The minimum is $1.50, and the site provides some suggestions, but it really is "whatever it's worth to you." Keep in mind that if too many viewers find it's worth "nothing," that's likely to be what's produced in Atlanta this year.

###

TAPR Directors Election

Three Directors were elected to the TAPR board of directors: Steve Bible, N7HPR, Stan Horzepa,WA1LOU, and Darryl Smith, VK2TDS. Their terms of office end in the fall of 2014.

###

VK5DGR on Codec 2 at linus.conf.au 2012

David Rowe, VK5DGR, presented a paper on Codec 2 at linus.conf.au 2012. It was voted the best paper of the conference and David was asked to present it again at the end of the conference. In the paper, he put some effort into relating ham radio and open source, which went down well.

The video is on YouTube here at www.youtube.com/watch?v=KsywWf8dQgU and a slide presentation in Open Office format is here at www.rowetel.com/downloads/lca_2012_codec2.odp

###

Doodle Labs DL-435

By Steve Lampereur, KB9MWR

For those of you who heard David Rowe, VK5DGR's speech on the Mesh Potato at the TAPR-ARRL Digital Communications Conference, there is an interesting new product from a company called Doodle Labs: an OFDM (Orthogonal Frequency Division Multiplexing) radio capable of about 6 Mbps of data throughput utilizing a 5-MHz wide channel in the 420-450 MHz, 70-cm band. More information can be found on their website www.doodlelabs.com.

The DL-435 was first made available in November 2011, so tests have been somewhat limited. However here are some initial conclusions.

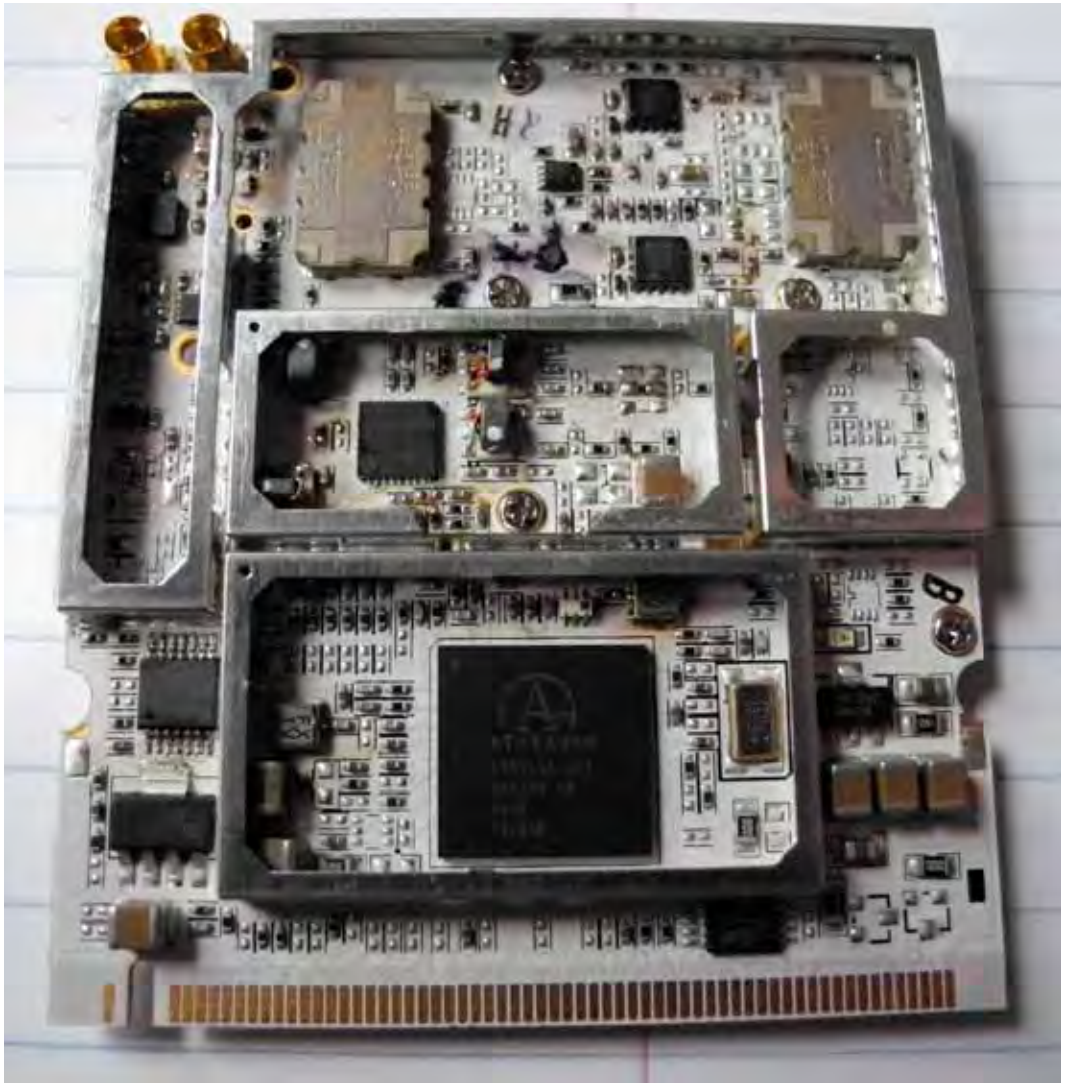
At 20-30 feet using a 6 dBi gain omnidirectional antenna, a couple of different ham groups have seen 1/2 mile to 3/4 of a mile usable non-line of site mobile coverage using a 1/4 wave mag mount antenna. Both reports were in moderate to heavily mature treed neighborhoods.

Keep in mind, at this low of a frequency, the height of the antenna will play a role to clear the large Fresnel zone and improve the performance.

The fact that you are not competing with your next door neighbors WiFi, makes these boards great for HSMM (High-Speed MultiMedia radio). If you can find a few hams in your area interested in it, there are bunch of possibility's for an OLSR (Optimized Link State Routing protocol) network built on these things eliminating Internet costs at repeater sites, repeater linking etc.

I have seen little on the subject of bi-directional amplifier designs for either 400, or 900 MHz. So I'd like encourage that project for anyone up to the task as I feel that can augment this quite nicely.

###



Going to Ohio

It wouldn't be a Hamvention <www.hamvention.org> without TAPR and you can be sure that the organization will have a presence at this year's installment of the Real Big Ham Radio Show during the weekend of May 18-20.

Hamvention weekend starts off with the TAPR Board of Directors meeting Thursday evening at TAPR's new digs, DoubleTree Suites by Hilton Hotel Dayton in Miamisburg. All TAPR members are invited to attend the meeting and speak their peace.

Friday morning, TAPR unveils its booths, numbered 0455 through 0458 in the Ballarena of the HARA Arena, where our digital doodads and moms will be available throughout Hamvention weekend. Meanwhile, the TAPR Forum gets underway to inform and entertain the Hamvention attendees in Meeting Room number yet TBD starting around 1300Z.

Friday night, TAPR will break bread with AMSAT <www.amsat.org> at the annual TAPR-AMSAT Banquet at Kohler Presidential Banquet Center, 4572 Presidential Way, Kettering, OH 45429. Attendees will digest while listening to the words of a noted after dinner speaker yet TBD.

All the "yet TBDs" will be worked out and detailed in the next issue of *PSR* as well as on the TAPR website.

###

When Digital Was Mechanical

By Stan Horzepa, WA1LOU

Jim Cain, K1TN, wrote: "Every active ham I knew in the 1960s and 1970s had a 24-hour Numechron Tymeter 'digital' clock, the one in a brown plastic case with rotating drums. I was watching *The Black Cat* (1934, Bela Lugosi and Boris Karloff, www.imdb.com/title/tt0024894) and in one scene, I saw one of those clocks. It was in a white case and the numbers were sort of Gothic (no surprise there), but the camera filmed the minutes turning over and it surely was the real deal."

Jim pointed me to the Reverse Time Page website <www.uv201.com/Clock_Pages/pennwood.htm>, which spills the beans on this early digital clock.

Also, I found a slew of related videos on YouTube that include how to service and replace the motor <\www.youtube.com/watch?v=fkMyKxRIy0M> in a Numechron, as well as various Numechron collections <www.youtube.com/results?search_query=numechrom+collection>. I also found photos of vintage Numechrons on flickr. <www.flickr.com/search/?q=numechron> And if you are interested in adding a Numechron to your shack, be sure to check out eBay.

The first clock in my radio shack was a mechanical digital alarm clock handed down from my old folks at home, circa 1967. I have no idea who manufactured it, but I am fairly certain that it was not a Numechron because it looked different than any Numechrons I've seen so far.)

This article originally appeared in the January 27 installment of Surfin' *on the ARRL website* <www.arrl.org/news/surfin-when-digital-was-mechanical>

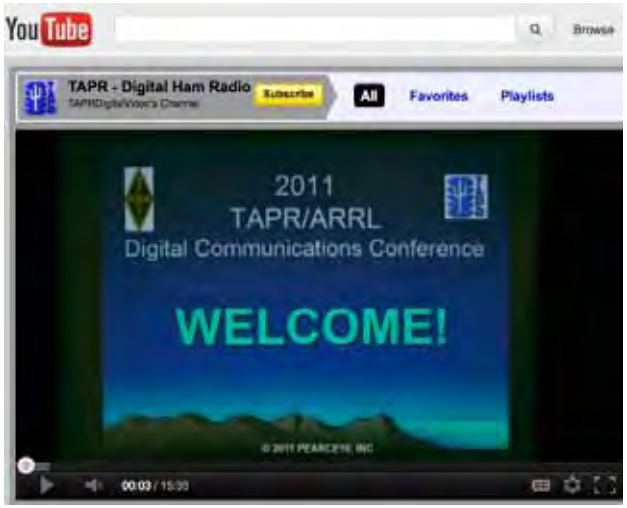
###

Now 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 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!

In addition to our YouTube presence, TAPR is on Facebook <www.facebook.com/TAPRDigitalHam> and Twitter <www.twitter.com/taprdigital>, not to mention the Internet <www.tapr.org>!

###



TAPR-ARRL DCC 2011

By John Blowsky, KB2SCS

The 2011 DCC in Baltimore was my 10th DCC. I started attending the DCC back in 1997. That year's DCC was also in Baltimore. Back then, the digital communications modes were all new to me. Hell, back then, amateur radio was all new to me.

I was first licensed in 1994. After the 1997 DCC, I decided that I wanted more. More DCCs. More knowledge. The talks at the DCC are all very well done and very informative. This years' DCC talks were no exception. Take a look at the 2011 DCC schedule found at www.tapr.org or buy the proceedings and you will quickly agree with me.

The draw of the DCC is also the "talks" that go on in the hallways of the conference hotel. These "talks" go on at lunch time and at night after the DCC program talks are finished. These "talks" are the informal networking between attendees. I have learned so much by just being able to talk to the presenters and attendees alike. It is like having Google come to life.

There is a demonstration room where attendees set up their projects. Here is where you get to have a hands-on experience with the new hardware and software that is being developed by some very smart people. Anyone can setup their projects in the demonstration room.

This year in the demonstration room included the following:

Jason Rausch from RPC Electronics demonstrating the new YagTracker. It was great being able to hold the unit and go through its memories.

George Heron and Dave Collins demonstrating the NUE-PSK CW mode. George also demonstrated the SDR Cube transceiver, a self-contained and portable SDR transceiver using a Softrock front end and embedded Digital Signal Processing No PC required

Bob McGwier demonstrated the new features in the Flex Radio line of SDRs.

You need to go to the 2012 DCC in Atlanta, Georgia. Finish the project you are working on and set it up in the demonstration room. Do not miss out on all the fun and knowledge.

###

HPSDR Projects

TAPR produces hardware for various HPSDR projects. Whether a HPSDR project is produced by TAPR is determined by the project team. Production by TAPR has been a one-time production run with the quantity determined by the interest shown by the HPSDR community. Other entities are producing additional boards where the TAPR production run has sold out. If that is the case, it will be indicated on the page for that individual project.

Below is a list of the boards TAPR has produced so far.

Alex Bandpass Filters - ALEXIARES (or ALEX for short) is a combination RF Preselector for use with Mercury or any other SDR, as well as a transmitter low pass filter bank for a transmitter such as Penelope, and optionally, with an associated RF power amplifier up to 100 watts peak. Read more here: www.tapr.org/kits_alex.html

Atlas Backplane - The Atlas is a passive backplane that all other modules plug into. Read more here: www.tapr.org/kits_atlas.html

Excalibur Reference Oscillator - Excalibur is a small accessory card for the Atlas bus that provides improved frequency stability for the HPSDR system. This card is sold as a kit, but uses the larger 1206 surface mount parts for easier manual assembly. Read more here: www.tapr.org/kits_excalibur.html

Janus Audio Converter - The Janus module is a very high performance, dual, full duplex, A/D and D/A converter board. The Janus board is a component of a system. In conjunction with Ozy (or Magister), Atlas and a suitable power supply it becomes a part of a Software Defined Radio (SDR) system which performs A/D and D/A conversions as well as control functions. Read more here: www.tapr.org/kits_janus.html

LPU Power Supply - LPU is the project-name for a simple HPSDR power supply. Although power supplies are widely available, the LPU will provide a convenient low-noise solution until the more complex Demeter power supply is completed. The LPU (as well as Demeter) are specifically designed for the HPSDR project. Read more here: www.tapr.org/kits_lpu.html

Magister USB Interface - Magister is Latin for master. Magister is the master for HPSDR cards residing on the Atlas bus. Magister performs most of the same functions as the discontinued Ozy. Functions missing are those used to interface to the SDR1000. Read more here: www.tapr.org/kits_magister.html

Mercury RX Module - Mercury, an HF direct sampling receiver board is a companion to the Penelope 1/2-watt transmitter/exciter board. The Atlas (bus) compatible Mercury receiver uses direct RF sampling and produces the I and Q data for processing by the PC directly without the need for a sound card. Read more here: www.tapr.org/kits_merc.html

Metis Ethernet Interface - Metis is a high speed PC interface. While the original Ozy board has served us well to date, in order to implement some of the future HPSDR projects we are going to need a faster interface between the various boards on the Atlas bus and the PC. Metis is a kick off point for this project. Since this board will not need to support the SDR1000 there will be room for testing other high performance interfaces. Metis an Atlas size board that contains a large, leaded, Altera Cyclone III FPGA connected to a Gigabit Ethernet PHY. Read more here: www.tapr.org/kits_metis.html

Pandora Enclosure - Read more here: www.tapr.org/kits_pandora.html

PennyLane TX Module - PennyLane (DUCk), a 1/2-watt transmitter/exciter board, is a companion to the Mercury HF direct sampling receiver board. The Atlas (bus) compatible PennyLane transmitter uses Digital Up Conversion (DUC) techniques and processes the I and Q signals from the PC (or Sasquatch DSP board) directly without the need for a sound card. PennyLane is an updated version of Penelope. Read more here: www.tapr.org/kits_PL.html

PennyWhistle PA - PennyWhistle is a compact RF power amplifier stage that can be used with Penelope and Alex to make a complete 16 to 20 Watt transmitter. This amplifier can quickly and inexpensively be used to get an HPSDR on the air, either barefoot, or as a driver for a larger linear. It covers the

same 160 Meter through 6 Meter bands as the rest of HPSDR. Read more here: www.tapr.org/kits_pw.html

Pinocchio Extender Board - Pinocchio is an extender card to allow measurements and troubleshooting of an active card in an ATLAS backplane. Test points are provided to allow access to every backplane signal, and the test points are located well above the standard module height. The test points are clearly labeled. Read more here: www.tapr.org/kits_pinocchio.html

###

Frequency & Time Related Kits

N8UR has designed a series of kits useful with time and frequency standards that are available from TAPR:

TADD-2 Pulse-Per-Second (PPS) Divider - The TADD-2 divides a 5 or 10 MHz input signal down to PPS (and other jumper-selectable rates). The outputs can be synchronized to an external clock. The TADD-2 uses a programmed PIC as an extremely low jitter divider. The code is open source. Read more here: www.tapr.org/kits_tadd-2.html

TADD-3 PPS Distribution Amplifier - The TADD-3 is a distribution amplifier for digital pulses. Its primary use is to distribute 1 pulse-per-second ("PPS") signals such as those obtained from GPS timing receivers. Read more here: www.tapr.org/kits_tadd-3.html

TADD-ENC Metal Enclosure - The TADD Enclosure is an attractive metal case designed to hold any of the TAPR TADD series projects. The six BNC outputs are on the front panel, while the rear panel provides for one or two BNC inputs, up to two DB-9 connectors, and a 3/8 inch hole for DC power input. The case is in two pieces for easy assembly. Read more here: www.tapr.org/kits_tadd-enc.html

Clock-Block - The Clock-Block is a flexible frequency synthesizer that can be used for many timing and clocking purposes. It accepts an external reference signal from 2 MHz to 50 MHz, and can be programmed via DIP switches to generate output frequencies in the range of about 500 kHz to 250 MHz. The output is a square wave at either 3.3 or 5 volts peak-to-peak. An on-board divider circuit allows the output frequency to be reduced by factors of 16 to 16384 for specialized applications. Read more here: www.tapr.org/kits_clock-block.html

FatPPS - PPS Conditioner - The FatPPS is a signal conditioner for pulse-per-second ("PPS") signals. Its primary purpose is to interface a PPS signal from a clock source so that it can drive a PC serial port and be used as a clock source for software such as NTP. Read more here: www.tapr.org/kits_fatpps.html

TADD-1 RF Distribution Amplifier - The TADD-1 is no longer available due to parts availability issues. A replacement (and higher performance) product is in development.

###

The Great Create

By Stan Horzepa, WA1LOU

RadioShack is back in the parts business providing bits and pieces for hobbyists and do-it-yourselfers.

Their website has a tab <www.radioshack.com/category/index.jsp?categoryId=2032058> dedicated to this effort, and their Great Create webpage <www.radioshackdiy.com> promotes it all by publicizing projects that customers created using RadioShack parts. According to The Great Create webpage, "We want to know what great creations you've come up with using RadioShack parts. Our goal is to gather the coolest projects from our most creative customers and share them here. So, show us what you've got and submit your project now. Let the making begin."

A caveat: This may not be "news" as in an up-to-the-minute, breaking news sense. I stopped visiting RadioShack stores and websites after they marginalized their parts department, so I am not sure when they reversed course. But I assume there are others like me who abandoned the Shack and that is why I am passing along this information to enlighten anyone as clueless as I was.

This article originally appeared in the October 7, 2011 installment of Surfin' *on the ARRL website* <www.arrl.org/news/surfin-got-parts-maps-and-macs>.

###

My Steve Jobs Story

By Stan Horzepa, WA1LOU

Anyone who has been reading my stuff for awhile knows that I am a dyed-in-the-wool Mac fan. I bought the first Mac in 1984 and have continued buying Macs ever since.

A few years ago, my Mac allegiance was tested. I had a six-month-old Macbook Pro that had a display issue. Researching the problem, I found that it was common to a batch of Macbook Pros manufactured over a two-week period in Singapore.

The display was defective, but Apple had no plans to recall the Macbook Pros and fix the problem. Any fixes were the customer's responsibility, but getting a fix was a little daunting because the replacement part itself cost about $1000.

I was upset about spending $1000, plus labor on a $2500 computer that was less than a year old and I considered going over to the Dark Side. But I read somewhere that if you wrote directly to Steve Jobs with a problem, he would consider its merits and fix the problem if he thought the merits called for a fix. He would not inform you that he got it fixed, but it would get fixed.

What did I have to lose?

I wrote a letter to Mr Jobs stating my case and soon I exchanged my sick Macbook Pro for a brand new one at no cost. And as luck would have it, Apple had just introduced a new line of Macbook Pros, so not only did I get a free replacement, but I also got a new model.

Thank you, Steve Jobs; may you rest in peace.

###

LW and MW DX

By Stan Horzepa, WA1LOU

(My latest radio passion is very old school. The only thing digital about it is the frequency readout of my transceiver. So you have been forewarned and may skip to the next article in PSR *and return to our normal scheduled programming.)*

As I wrote in a recent installment of *Surfin'* <www.arrl.org/news/surfin-listening-anew>, "During the holidays, I began chasing long and medium wave DX using my Kenwood TS-440S transceiver and an inverted V antenna cut for 40 meters."

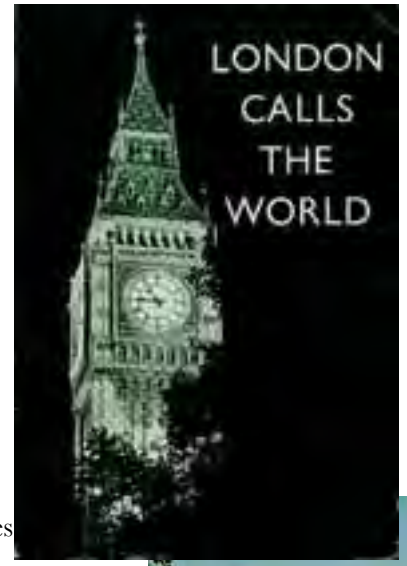
The December 23 installment of *Surfin'* <www.arrl.org/news/surfin-going-long> about ultra-light radios sparked my interest to explore the long and medium waves. I began monitoring the bands while cleaning and reorganizing the shack.

I started by listening on the long wave band and logged 33 aeronautical navigation stations sending their IDs in CW. The best DX was DDP, 1647 miles away in San Juan, Puerto Rico on 391 kHz.

After hearing all I could hear long wave wise, I began working my way from one end to the other of the AM broadcast band. After a few days, I logged 72 stations. The best DX was WWL, 1266 miles away in New Orleans on 870 kHz.

I am building an indoor loop antenna <www.mds975.co.uk/Content/aerials1.html>, which I hope will result in new log entries.

I am indebted to William Hepburn's LW Radio Beacon <www.dxinfocentre.com/ndb.htm> and The am-dx.com Western Hemisphere List <www.am-dx.com/fcclist.htm> for their lists of LW and MW stations, respectfully, that helped me identify what I heard.



My Best DX (So Far)

I powered the TS-440S at 2300 UTC 17 January and tuned to 198 kHz.

I could tell that there was a station there, but it was way down in the mud. The voices sounded like they were mumbling; there was no discernible intelligence.

The signal started coming up at around 2325. An occasional word was intelligible.

At 2330, a female clearly identified the station, "BBC Radio 4," which is 3375 miles away.

The signal gradually returned to the mud. Meanwhile, radio navigation station DIW in Dixon, NC, showed up on 198 kHz and got stronger as BBC 4 disappeared.

DIW held the frequency for about 15 minutes, then conditions reversed. BBC 4 got stronger and DIW dropped into the mud.

At 0000 UTC, BBC 4 played the Westminster Chimes of Big Ben.

Very cool!

###

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 wa1lou at tapr.org.

The deadline for the next issue of *PSR* is April 15, so write early and write often.

###

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

###

Join TAPR on Twitter & Facebook

By Mark Thompson, WB9QZB

We encourage everyone to follow TAPR on Facebook and Twitter to learn about:

- What's new at TAPR.
- Upcoming events at the Dayton Hamvention and the Digital Communications Conference.
- Other updates like *PSR*, projects, etc.

Access the TAPR Twitter account at www.twitter.com/taprdigital

Access the TAPR Facebook account at www.facebook.com/TAPRDigitalHam

###

Still Fixing a Little TAPR History

By Stan Horzepa, WA1LOU

In *PSR* #115, I presented the results of my researching the past officers, board of director members, *PSR* editors, and TAPR office managers. In *PSR* #116, I corrected a mistake. In this issue of *PSR*, I updating the history to reflect the recent board of directors election and correcting an omission: Bob Nielsen, W6SWE, pointed out that he was vice president in 1990-1991.

To reiterate, each column in the following table represents one elected office term. For example, the first column, "1982 07 to 1983 01," indicates that the officers in that column began serving in July 1982 and that their term of office ended in January 1983.

Board members serve three-year terms, which are represented by the three column color coding. By the way, early on, there were 15 board members, but in the early 1990s, there was a transition from 15 to the present 9 board members.

History is always a work-in-progress and this project is no different. If you discover any errors, omissions, etc., please let me know so I can make corrections and this project as accurate as possible.

###

	1982 07 to 1983 01	1983 02 to 1984 01	1984 02 to 1985 01	1985 02 to 1986 01	1986 02 to 1987 01	1987 02 to 1988 01	1988 02 to 1989 01	1989 02 to 1990 01	1990 02 to 1991 01	1991 02 to 1992 02	1992 03 to 1993 02
President	KD2S	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	N0CCZ	N0CCZ	WA7GXD	W6SWE	W6SWE
Vice President	KV7D								W6SWE		VE3GYQ
Exec Vice President	WA7GXD	KD2S	WB9FLW*	WB9FLW	WB9FLW	W3IWI	W3IWI	N3EUA	NK6K	NK6K	
Secretary	Mbaker	N7DZU	N7DZU	WA0TTW	N7DZU	AL7FG	W3VS	VE3GYQ	WD5IVD	WD5IVD	WB6RTH
Treasurer		N0ADI	N0ADI	KV7B	N6HBB	N6HBB	W3VS	WB9FLW	WD5IVD	WD5IVD	WB6RTH
President Emeritus											
BOD		W1HDX	WA0TTW	WA0TTW	WA0TTW	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ
BOD		W3IWI	W3IWI	W3IWI	W3IWI	W3IWI	W3IWI	W3IWI	W3IWI	W3IWI	W3IWI
BOD		WB9FLW	WB9FLW	WB9FLW	WB9FLW	AL7FG	WB9FLW	WB9FLW	WB9FLW	WB9FLW	WB9FLW
BOD		NK6K	NK6K	NK6K	NK6K	NK6K	NK6K	NK6K	NK6K	NK6K	NK6K
BOD		KV7D	KV7D	KV7D	KV7D	KB6QH	KB6QH	KB6QH	N4PCR	N4PCR	
BOD		WB6HHV	WB6HHV	WB6HHV	WB6HHV	WB6HHV	WB6HHV	WB6HHV	WB6HHV		
BOD		KD4NL	KD4NL	WB6YMH	WB6YMH	WB6YMH	WB6YMH	WB6YMH	WB6YMH	WD5IVD	WD5IVD
BOD		WD0ETZ	WD0ETZ	WD0ETZ	WD0ETZ	WD0ETZ	KA9Q	KA9Q	KA9Q	K7UPJ	K7UPJ
BOD		KV7B	KV7B	KV7B	KV7B	KV7B	KV7B	KV7B	KV7B	KV7B	KV7B
BOD		KT7D	KT7D	N0CCZ	N0CCZ	N0CCZ	N0CCZ	N0CCZ	N0CCZ	N0CCZ	WA4EJR
BOD	MarkBaker	MarkBaker	MarkBaker	MarkBaker	W1BEL	N4HY	N4HY	N3EUA	N3EUA	N3EUA	W6SWE
BOD	WA7PXW	WA7PXW	WA7PXW	WA7PXW	K9NG	K9NG	K9NG	K9NG	K9NG	K9NG	
BOD	KD2S	KD2S	KD2S	KD2S	W3VS	W3VS	W3VS	N6NKF	N6NKF	N6NKF	
BOD	N0ADI	N0ADI	N0ADI	N0ADI	N7CL	N7CL	N7CL	N7CL	N7CL	N7CL	
BOD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	WA7GXD	
PSR Editor	group	KV7D	KV7D	WA0TTW	W1BEL	W3VS	W3VS	WD5IVD	W6SWE	N2GDE	N2GDE
PSR Co_Editor		KD2S		N0CRN					N2GDE		
PSR Issues		2	3 to 5	6 to 15	16 to 27	28 to 35		36	37 to 41	42 to 80	
Office Mgr		N7DZU	N7DZU	N7DZU	N7DZU	AL7FG	N7DZU	N7DZU	N7DZU	N7DZU	N7DZU
Co-Office Mgr											

* resigned May 1984

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

	1993 03 to 1994 02	1994 03 to 1995 02	1995 03 to 1996 02	1996 03 to 1997 02	1997 03 to 1998 02	1998 03 to 1999 02	1999 03 to 2000 02	2000 02 to 2001 08	2001 09 to 2002 08	2002 09 to 2003 08
President	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	N8UR	N8UR	N8UR
Vice President	W6SWE	KF7TP	AG9V	AG9V	N8UR	N8UR	N8UR	N7HPR	N7HPR	N7HPR
Exec Vice President										
Secretary	N4CHV	N4CHV	N4CHV	N8GNJ	N8GNJ	N8GNJ	N2GDE	KC5GOI	KC5GOI	KC5GOI
Treasurer	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS	WA5LHS
President Emeritus										
BOD	AG7H	AG7H	AG9V	AG9V	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR
BOD	WA4EJR	WA4EJR	VE3JF	VE3JF	VE3JF	VE3JF	VE3JF	N6BG	N6BG	N6BG
BOD	WA5LHS	WA5LHS	KC3RL	KC3RL	KC3RL	KC3RL	KC3RL	KC3RL	KC3RL	KC3RL
BOD	KF7TP	KF7TP	KF7TP	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR
BOD	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	WA1LOU
BOD	N4CHV	N4CHV	N4CHV	N4CHV	N4CHV	N4CHV	K4HG	K4HG	K4HG	VK2TDS
BOD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	WD5IVD	N8GNJ	N8GNJ	N8GNJ
BOD	K7UPJ	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD
BOD	KV7B	K0PFX	K0PFX	K0PFX	K0PFX	K0PFX	K0PFX	K0PFX	K0PFX	K0PFX
BOD	WA4EJR									
BOD	W6SWE									
BOD										
BOD										
BOD										
BOD										
PSR Editor	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N2GDE	N8GNJ	WA1LOU	WA1LOU
PSR Co_Editor										
PSR Issues								81 & 82	83 to present	
Office Mgr	KA5DWR	KA5DWR	KA5DWR	KA5DWR	KA5DWR	KA5DWR	KA5DWR	L Koster	L Koster	L Koster

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

	2003 09 to 2004 08	2004 09 to 2005 08	2005 09 to 2006 08	2006 09 to 2007 08	2007 09 to 2008 08	2008 09 to 2008 08	2009 09 to 2010 08	2010 09 to 2011 08	2011 09 to 2012 08	2012 09 to 2013 08	
President	N8UR	N8UR	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	N7HPR	N7HPR	N7HPR		
Vice President	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	WA2DFI	WA2DFI	WA2DFI		
Exec Vice President											
Secretary	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU		
Treasurer	N8ZM	N8ZM	N8ZM	N8ZM	N8ZM	N8ZM	N8ZM	N8ZM	N8ZM		
President Emeritus							VE3GYQ	VE3GYQ	VE3GYQ		
BOD	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR	N8UR	
BOD	N6BG	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	VE3GYQ	N4XWE	N4XWE	N4XWE	
BOD	KC3RL	WA7NWP	WA7NWP	WA7NWP	WA7NWP	WA7NWP	WA7NWP	NH6Z	NH6Z	NH6Z	
BOD	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR	N7HPR
BOD	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU
BOD	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS	VK2TDS
BOD	N8GNJ	N8GNJ	N8GNJ	WA2DFI	WA2DFI	WA2DFI	WA2DFI	WA2DFI	WA2DFI		
BOD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD		
BOD	WA8WDQ	WA8WDQ	WA8WDQ	AA4SW	AA4SW	AA4SW	WB9QZB	WB9QZB	WB9QZB		
BOD											
BOD											
BOD											
BOD											
BOD											
BOD											
PSR Editor	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU	WA1LOU		
PSR Co_Editor											
PSR Issues											
Office Mgr	L Koster	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD	W9DDD		

PSR

#117 Winter 2012, ISSN: 1052–3626

Published by

TAPR

Phone 972–671–TAPR (8277)

E-mail taproffice at 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 at 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

Packet Status Register is exported as Adobe Acrobat and distributed electronically at www.tapr.org

PSR Editor:

Stan Horzepa, WA1LOU

One Glen Avenue, Wolcott, CT 06716–1442 USA

Phone 203–879–1348

E-mail wa1lou at tapr.org

TAPR Officers

President: Steve Bible, N7HPR, n7hpr at tapr.org

Vice President: Scotty Cowling, WA2DFI, wa2dfi at tapr.org

Secretary: Stan Horzepa, WA1LOU, wa1lou at tapr.org

Treasurer: Tom Holmes, N8ZM, n8zm at tapr.org

TAPR Board of Directors

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

John Ackermann, N8UR, 2013, n8ur at tapr.org

Steve Bible, N7HPR, 2014, n7hpr at tapr.org

Dan Babcock, N4XWE, 2013, n4xwe at tapr.org

Scotty Cowling, WA2DFI, 2012, wa2dfi at tapr.org

Stan Horzepa, WA1LOU, 2014, wa1lou at tapr.org

John Koster, W9DDD, 2012, w9ddd at tapr.org

Jeremy McDermond, NH6Z, 2013, mcdermj at xenotropic.com

Darryl Smith, VK2TDS, 2014, vk2tds at tapr.org

Mark Thompson, WB9QZB, 2012, wb9qzb at aol.com

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.

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

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 - $25 ☐ Renewal - $25 ☐

Payment Method: Check ☐ Money Order ☐ Credit Card ☐

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

VISA ☐ Mastercard ☐ Discover ☐ JCB ☐

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.