

# President's Corner

By Steven Bible, N7HPR, TAPR President



Now for something completely different: instead of describing what TAPR is up to in this installment of President's Corner, the TAPR officers and board of directors will describe what they are up to.

Steve Bible, N7HPR,  
President, Director

DCC hotel planning. The contract is signed and now promotion begins.

Dayton Hamvention planning. Gathering and scheduling Forum speakers. TAPR/AMSAT Banquet. Booth preparations.

Before Hamvention on Thursday May 17th I am invited to speak at the AIAA Dayton-Cincinnati Section Lunch n' Learn about the ARISSat-1 Program.

openHPSDR Hermes planning. Working with Scotty on the interest list and planning.

Scotty Cowling, WA2DFI,  
Vice President, Director

Getting openHPSDR Hermes and Apollo through pre-production testing and ready for manufacturing.

Working on some new SDRs for announcement at Dayton, from my company Zephyr Engineering, Inc.

Built a new QRP rig, the MTR from KD1JV Designs. This Mountain Top Radio will be perfect for upcoming SOTA (Summits On The Air) activations this summer here in Arizona. I have attached a picture of the assembled rig, less enclosure. I get 6W out on 40M and 20M, superhet RX with crystal filter, 25mA on receive.

Working on SDR presentations for FDIM <<http://fdim.qrparci.org/content/view/70/79/>> and for Sea-Pac <<http://www.seapac.org/workshop.htm>>



*WA2DFI's MTR QRPrig, front and back views*

Stan Horzepa, WA1LOU,  
Secretary, Director

Edit *PSR* (Packet Status Register), TAPR's quarterly newsletter  
Moderate APRSSIG, APRSNEWS, APRSSAT, HTAPRS, and APRSSPEC TAPR e-mail lists.

Record minutes of in-person TAPR board meetings (at Hamvention and DCC)

Staff the TAPR booth at the Hamvention

Contributing Editor of *Surfin'*, weekly column on [ARRL.org](http://ARRL.org)

Chase DX on LW and MW

Blow up electronic stuff

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### Tom Holmes, N8ZM, Treasurer

In his duties as TAPR Treasurer, Tom signs the checks and keeps an eye on the cash flow and project expenses, not to mention overseeing preparation of our tax returns. He is also the 'ship to' address and warehouse for TAPR supplies needed at Hamvention.

Non-TAPR activities include:

Actively participating in VHF Contests from a new 'shack' located on one of the higher hills in Ohio.

President of the Midwest VHF/UHF Society, a group of hams in SW OH who enjoy being involved in the technical aspects of the hobby, and food (all of our meetings seem to involve a meal, to the point of us having nicknamed ourselves 'the eating society'). Recent club projects include a 1296 beacon at 800 ft AGL, and mass (?) production of a noise source for use up to 10 GHZ, which he helped design.

Transportation chair for the 2012 Dayton Hamvention (that means he gets the calls when the buses are not running fast enough to move 1000 people from the parking lot to the arena instantly on Friday morning).

Coordinator of the balloon launch from the Hamvention Flea Market on Friday afternoon.

Co-chair of the VHF/Microwave forum at Hamvention.

Has recently become fascinated with radio astronomy as a way to use all the microwave gear he has accumulated, even though his home has no clear view of the sky in any direction, even straight up!

### John Ackermann, N8UR, Director

Trying to get T2-Mini documentation finished.

Working on Rev. B of the next project -- TNS-BUF ultra-low-noise, ultra-high-isolation buffer amplifier, and the TADD-11 that will follow from it.

Just getting started on some cool chirp radar SDR experiments (with Pieter, N4IP, as co-conspirator).

Finishing the post-move rebuild of my ham shack/lab (which will take approximately forever).

Troubleshooting a couple of pieces of test equipment that decided to wait until I was away for a few days before blowing themselves up.

Thinking, but not progressing, on an update to the OHL.

Getting ready for Hamvention (getting HPSDR and Time/Frequency demo stuff ready).

Getting ready for DCC -- in particular, working the publicity around the DCC/Gnu radio Conference synergies.

### Dan Babcock, N4XWE, Director

I am in the process of completing the Mobokit 4.3, Softrock 63ng and SDR-Widget boards that are part of my Sea-Pac presentation and demonstration. The Mobokit 4.3 is a power amplifier, transmit filter, USB interface and controller board. The Softrock 63ng is a customized surface mount version of the classic Softrock 6.3 RXTX that mates with the Mobokit to form an SDR transceiver. The SDR-Widget does the I and Q stream decoding at baseband and provides an LCD display output of the frequency settings as well as

receiver and PA information.

Although I have built numerous surface mount PCBs including one of the prototype Pennylane boards, this is my first attempt at surface mount construction using hot air reflow techniques.

### John Koster, W9DDD, Director

The usual order fulfillment tasks.

Final integration of the new T2-Mini kit.

Ordering parts for more PennyWhistle kits.

Ordering parts and building more Atlas Parts kits.

Fighting Windows networking problems because we moved a printer.

Updating web site as news items trickle in.

Bracing for server upgrade challenges.

### Jeremy McDermond, NH6Z, Director

Spoke on the openHPSDR project at the 2012 MicroHAMS Digital Conference (<http://www.microhams.com/softcontent.aspx?scId=60>) on Microsoft campus in Redmond. Managed to prevent his various Apple devices from bursting into flames during the visit.

Continuing work on Heterodyne for iPad, an SDR application for the openHPSDR project.

Participating in the beta testing for the openHPSDR Hermes board.

Preparing openHPSDR demonstrations for the Dayton Hamvention.

Assisting Scotty with preparations for TAPR participation in the SeaPac conference in Seaside, OR.

Attempting to work with the TAPR membership systems to improve member contact and tracking.

Trying to prepare to go up the tower to repair the antenna system on his D-STAR repeater system, KF7LDG.

Working on improving his test bench and equipment.

Waiting on the weather to improve enough to begin Summits on the Air operations for the year. There are still significant amounts of snow at 3000 ft. and above in the Pacific Northwest that prevent hiking without snowshoes.

Mark Thompson, WB9QZB,  
Director

As you know, I've been promoting TAPR, the DCC & the Hamvention Forum on internet groups and handling the social media aspects including Facebook & Twitter.

I also have been involved with establishing & growing the DATV group which now has over 335 members including some of the most experienced DATVers world-wide.

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## WA2DFI at Four Days in May

By Steve Fletcher, G4GXL

The QRP Amateur Radio Club International (QRP ARCI) holds a convention called Four Days in May (FDIM , for short) that runs in parallel with the Hamvention.

On the Thursday before the Hamvention, we have a day of seminars. In the past we have had Phil Harman, VK6APH, and Lyle Johnson, KK7P, give presentations on SDR and DSP. This year Scotty Cowling, WA2DFI, will present a talk called "SDR Progression: Softrock to openHPSDR Hermes and in Between."

Scotty's talk is at 9:10 AM at the venue is the Holiday Inn, Fairborn, OH. The cost of the full day is \$40. We also have evening events that are free of charge.

Details of the seminars are at <http://fdim.qrparci.org/content/view/70/79/> and the full FDIM website is at <http://www.fdim.qrparci.org>

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## Short Bits

- Funcube Dongle support now built into GNU Radio: <http://www.oz9aec.net/>
- Introducing RTL-SDR: a \$20 SDR:  
<http://dangerousprototypes.com/2012/03/20/introducing-rtl-sdr-a-20-sdr>
- It's not the license we choose, it's the communities we build:  
<http://www.adafruit.com/blog/2012/03/28/its-not-the-license-we-choose-its-the-communities-we-build/>
- OSHW Survey 2012 - First Numbers:  
<http://www.oshwa.org/2012/04/24/oshw-survey-2012-first-numbers/>
- See photo of the Atomic Wristwatch and more:  
<http://www.isgtw.org/feature/open-hardware-creating-more-open-world>

###

# TAPR at Hamvention

By Stan Horzepa, WA1LOU

Like I wrote last time, it wouldn't be a Hamvention [without TAPR](http://www.hamvention.org) 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 <https://www.tapr.org/dayton.html>.

## Board

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 piece. The Board Meeting starts at approximately 7 PM.

## Booths

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. We plan to have so many items on exhibit this year that space will be tight --- so visit our booth early and often. The booth and other inside exhibits will be accessible at 9 AM on Friday and at 8 AM on Saturday and Sunday; closing time is 6 PM Friday, 5 PM Saturday, and 1 PM Sunday.

## Speaks

The TAPR Forum gets underway in Room 1 of the HARA Arena at 9:15 AM on Friday and runs until 11:15 AM. Here is the schedule of TAPR Forum speakers:

**9:15 AM** - "Introduction" and "TAPR Update" by Steve Bible, N7HPR

**9:25 AM** - "Beyond openHPSDR: Hermes and the Future" by Scotty Cowling, WA2DFI. Hermes is the latest addition to the openHPSDR stable of boards. Here is an in-depth look at openHPSDR Hermes and a glimpse of future openHPSDR projects.

**9:50 AM** - "Embedded DSP for PC-less SDR" by Lyle Johnson, KK7P. Self-contained radios have been standard since the mid-1920s. Why should SDRs be different? For many applications -- especially portable operation -- not having to lug a PC around, or try and read its screen in bright ambient light, or depend on a laptop's battery charge level can be decided benefits. Advances in DSP technology allow self-contained, highly-portable SDRs that provide many hours of operation on small, internal battery packs.

**10:15 AM** - "Time and Frequency Update" by John Ackermann, N8UR. After some down time, the TAPR T&F project list is moving forward. This presentation will discuss the new TADD-2 Mini frequency divider that is now shipping, and will give a glimpse of new products in the pipeline.

**10:40 AM** - "CODEC 2" by David Rowe, VK5DGR. Codec2 is an open source low bit rate speech codec designed for communications quality speech at 2400 bit/s and below. Applications include low bandwidth HF/VHF digital radio and VOIP trunking. Codec 2

operating at 2000 bit/s can send 32 phone calls using the bandwidth required for one 64 kbit/s uncompressed phone call. It fills a gap in open source, free-as-in-speech voice codecs beneath 5000 bit/s and is released under the GNU Lesser General Public License (LGPL).

## Eats

Plantation chicken breast

Sliced strip loin (beef) with bordelaise sauce

Baked Italian lasagna

Rosemary mashed potatoes

Normandy blend green beans

Seven layer salad

Fresh fruit bowl

Roll and butter

Coffee, iced tea

Assorted pies

Friday night, TAPR will break bread with AMSAT <http://www.amsat.org> at the annual TAPR-AMSAT (or AMSAT-TAPR) Banquet at Kohler Presidential Banquet Center, 4572 Presidential Way, Kettering, OH 45429. Attendees will digest a delicious buffet dinner while listening to the words of a noted after dinner speaker Howard Long, G6LVB, who will be talking about his 64-1700 MHz SDR FUNcube Dongle.

Doors open to a cash bar at 6:30 PM and dinner begins

# DCC Update

By Stan Horzepa, WA1LOU

at 7:15 PM. Reservations are required and must be made by Monday, 14 May 2012; you can purchase tickets for \$30 online at the [AMSAT store](#). Reserved tickets can be picked up at the AMSAT booth on Friday or at the door to the banquet. Visit the [AMSAT banquet webpage](#) for more information.

## Guys and Gals

Most of the guys and gals behind the scenes at TAPR will be in attendance at the Hamvention, so if you see TAPRkind at any of the TAPR venues, say "Hello." Until then, "Goodbye."

Plans for the TAPR-ARRL Digital Communications Conference  [<http://www.tapr.org/dcc.html>](http://www.tapr.org/dcc.html) are coming together.

September 21-23, 2012, are the DCC dates and Atlanta is the DCC site, specifically, the Sheraton Gateway Hotel Atlanta Airport  [<http://www.sheraton.com/atlantaairport>](http://www.sheraton.com/atlantaairport), which is located a half mile from Hartsfield-Jackson Atlanta International Airpor (ATL). The hotel room rate is \$95 per night plus \$5 per day for vehicle parking.

The conference runs all day on Friday and Saturday with technical presentations, a Friday evening social, a Saturday evening banquet, and closes with a Sunday Seminar featuring Tom Rondeau, KB3UKZ, who will present a seminar about GNU Radio (Tom is the GNU Radio project manager; the GNU Radio Conference  [<http://gnuradio.squarespace.com/gnu-radio-conference-2012/>](http://gnuradio.squarespace.com/gnu-radio-conference-2012/) immediately follows the DCC in the same hotel, September 24-27, 2012).

There are still a few loose ends and TBDs regarding the DCC, so visit the DCC webpage to get the latest information.

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## Call for Papers

Technical papers are solicited for presentation at the DCC and publication in the Conference Proceedings. Annual conference proceedings are published by the ARRL. Presentation at the conference is not required for publication. Submission of papers are due by July 31, 2012 and should be submitted to

Maty Weinberg, ARRL  
225 Main Street  
Newington, CT 06111  
e-mail [maty at arrl.org](mailto:maty@arrl.org)

More information and submission guidelines are here: <https://www.tapr.org/dcc.html#dcccalleforpapers>

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# TADD-2 Mini Is Now Available

By John Ackermann, N8UR

We are happy to announce that TAPR is now accepting orders for the TADD-2 Mini (or T2-Mini) pulse-per-second ("PPS") frequency divider: [http://www.tapr.org/kits\\_t2-mini.html](http://www.tapr.org/kits_t2-mini.html).

The T2-Mini is a tiny (0.75 x 2.0 inch) board that accepts a 1, 2.5, 5, or 10 MHz input and uses a PIC chip running open source firmware to divide it to a PPS signal. Changing the firmware can allow applications such as 32.768 kHz output to drive clock chips.

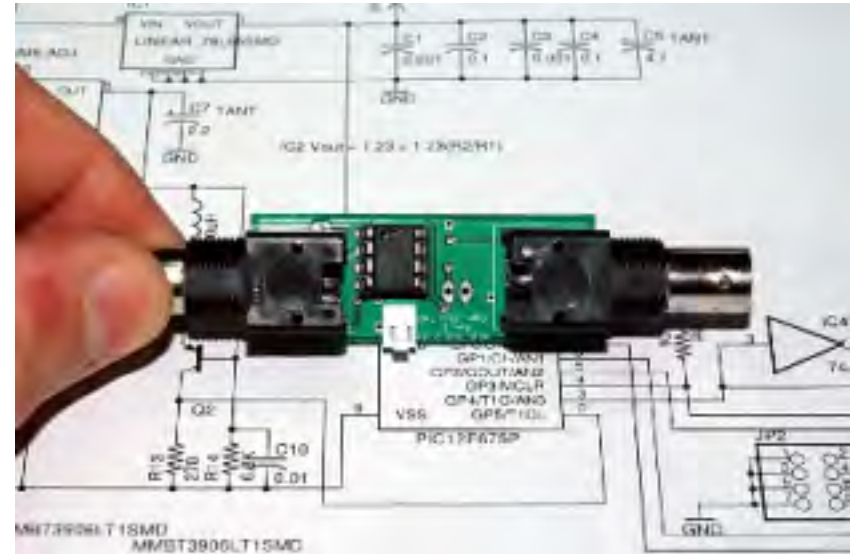
Why do you need a PPS divider? If you want to measure the characteristics of an oscillator, PPS comparisons can be much more precise than a typical frequency counter and can be done with simple equipment. Dividing your oscillator to a PPS signal allows easy direct comparison against GPS. Every time-nut needs one (or several...)

The T2-Mini uses surface mount parts tightly jammed on a very small board. TAPR offers three versions, each with all SMT parts installed:

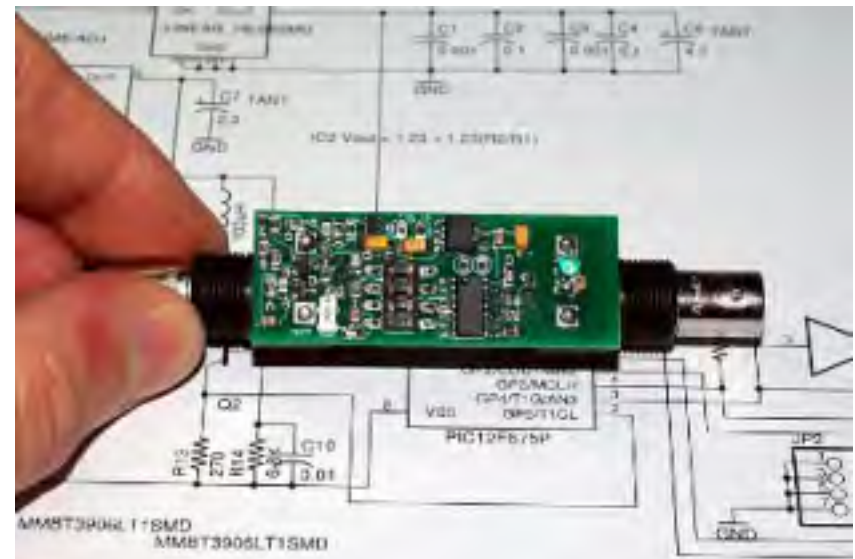
- Board alone for \$44 (\$39 for TAPR members)
- Board with programmed PIC chip, connectors, and other required parts for \$55 (\$49 for TAPR members)
- Assembled and power-tested version for a price still to be finalized, but probably about \$79. If you're interested, please contact TAPR via <https://tapr.org/inforequest.php>

For more information, or to order, go to [http://www.tapr.org/kits\\_t2-mini.html](http://www.tapr.org/kits_t2-mini.html). A preliminary version of the product manual is at [http://www.tapr.org/~n8ur/T2\\_Mini\\_Manual.pdf](http://www.tapr.org/~n8ur/T2_Mini_Manual.pdf)

See the TADD-2 Mini at TAPR's booths at the Dayton Hamvention!



*TADD-2 Mini Top View*



*TADD-2 Mini Bottom View*

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# Hermes Is On His Way

TAPR announces the opening of the interest list for the openHPSDR ([openhpsdr.org](http://openhpsdr.org)) Hermes single-board SDR. The Hermes interest list is used by TAPR to determine the number of Hermes boards to manufacture in the pending initial production run this spring.

Hermes is a long-awaited addition to the openHPSDR project lineup, advancing through four prototypes while evolving from a USB-based to an Ethernet-based transceiver in about two years. Hermes is a Digital-Down-Conversion receiver, a Digital-Up-Conversion 500mW transmitter and a gigabit Ethernet interface all on one board. Also on board is an RF-quiet switch-mode power supply, allowing Hermes to run from a single 13.8V DC supply.

More information can be found on the Hermes Wiki:  
<http://openhpsdr.org/wiki/index.php?title=HERMES>

To show your interest, you can sign up here:  
<http://www.hamsdr.com/login.aspx> (Note: Look under the Projects tab TAPR-HPSDR link after you log in.)

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# Getting Started: Doodle Labs DL435-30 420-MHz Broadband Data Radio

By David Bern, W2LNX

In the previous TAPR *PSR*, Steve, KB9MWR, introduced the Doodle Labs DL435-30 420-MHz broadband data radio miniPCI cards [KB9MWR 1]. This article relates my experience getting started with these miniPCI cards.

## Introduction

My interest in ham radio is primarily in digital modes and earlier this year, Chris, KB3CS, a fellow member of the Montgomery Amateur Radio Club (MARC), Rockville, Maryland, suggested I take a look the Doodle Labs website about their 420-MHz broadband data radios for Amateur Radio [Doodle]. This prompted me to do a Google search on “Doodle Labs” where I found Steve’s blog entry about these data cards [KB9MWR 2]. There he references a short video by Kyle, N0KEW, where he demonstrates a speed test using these radio cards. Then I found a detailed description by Joseph, N9ZIA, on how to use a DL435-30 in a Ubiquiti RouterStation with its DD-WRT firmware [N9ZIA]. This motivated me to order four DL435-30 cards from Singapore.

## Getting Started

I ordered two Ubiquiti RouterStation Pro router boards [RS Pro], and four MMCX male-to-N female connector pigtailed [pigtail] for the DL435-30 cards, several Wistron CM9 Wi-Fi miniPCI card from mini-box.com [Wistron] and from eBay. The RouterStation Pro boards were reflashed with their DD-WRT firmware using TFTP [reflash]. While waiting for the DL435-30 cards to arrive, I played with Wistron Wi-Fi cards to learn and understand DD-WRT. In theory, the DL435-30 cards are a drop-in replacement for Wistron Wi-Fi cards. My first exercise was configure one of the RouterStation Pro boards as a Wi-Fi client in Client Wireless Mode [client] to access our household Wi-Fi access point. Likewise, I configured the second RouterStation Pro as a Wi-Fi access point in AP Wireless Mode [AP] to be accessed by my laptop. And finally I connected the two RouterStation Pro boards.

When the Doodle Lab DL435-30 cards arrived, I replaced the Wistron cards with the

Doodle Lab cards in both router boards (see photo 1), configured DD-WRT to use a 5-MHz bandwidth and, to my disappointment, it did not work. I had made two mistakes: first, a dummy load is a very poor antenna at 500 mW, the RF power output, spread over a 5-MHz bandwidth. Second, I had set the speed to 1 Mbps. I replaced the dummy load antennas with two home brew ¼-wave antennas cut at 422.5 MHz; a large tuna fish can is used as the ground plane (see photo 2). The SWR of the antennas were trimmed with my MFJ-269 antenna analyzer to be less than 1.5:1. Then when I set the minimum and maximum transmissions rates to Auto, it worked! In Client mode, the DD-WRT has a Site Survey button on the Wireless Status page; the client router board had found the access point router board. Both router boards needed to be set to the same wireless network name (SSID). Clicking on Join on the Site Survey page sets them both to the same SSID. The SSID I use is BOARnet, Broadband Over Amateur Radio network.

## Testing

My test application is the Yawcam webcam software [Yawcam] that I learned about in a recent *QST* article [scope]. It has a built-in web server that streams video from a webcam. At the highest quality of 30 frames per second, it uses about 1.2 Mbps. Together with a file download, it goes at about 3.3 Mbps (see photo 3). For this photo, the two antennas were about six feet apart. At the lowest quality of one frame per second, it uses about 50 Kbps. I needed a video application since, after all, I am in the 420-MHz ATV sub-band.

## Continuing work

I am impressed and encouraged with this technology, but this is just the beginning of our experimentation. A partial list of more work that needs to be done is:

- Do range testing with 420-MHz omni-directional and directional antennas.
- Set up a test link to the house of another MARC member about a mile away.

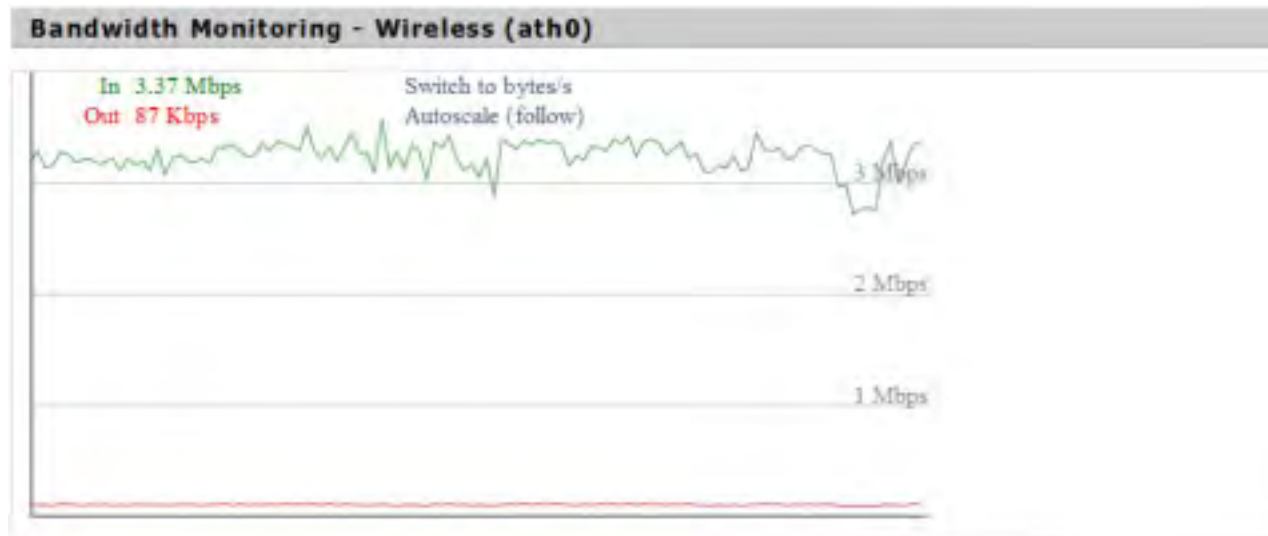




*Doodle Labs DL435-30 miniPCI card in Ubiquiti RouterStation Pro*



*Homebrew quarter-wave 70-cm antenna on a large tuna fish can*



*Bandwidth of highest quality video with a file download*

- Shop for high-gain highly directional antennas in the 420-432 MHz range.
- Shop for high quality bi-directional linear broadband amplifiers for the 420-432 MHz range.
- Set up four routers with the DL-435-30 cards and configure DD-WRT in a mesh or ad-hoc configuration instead of an access point/client configuration.
- Test the x86 version of DD-WRT on an Intel Atom PC motherboard using a PCI to miniPCI adapter. Can an inexpensive low electrical power consumption PC motherboard running DD-WRT or a more generic Linux distribution be an effective broadband router?
- Evaluate the Xagyl XC420M miniPCI cards [Xagyl] when I receive them. I am interested in comparing the Xagyl cards with the Doodle Lab cards.
- Internetwork with separate 2.4 GHz Wi-Fi mesh networks running HSMM-MESH™ on Wi-Fi routers [HSMM-MESH]. Can we establish a super mesh network?

## Goals

Our immediate goal is to set up a test network between four MARC member's houses to gain experience with these Doodle Lab broadband data radios. A long term goal is to set a local broadband metropolitan area network (MAN) for hams to use in the local Rockville, Maryland area. More importantly, our public service long term goal is to ensure that this broadband data network can be used as a self-contained backup for local hospitals and other public safety agencies.

Ideas, suggestions, questions and comments are welcome; please email them at [W2LNX at arrl.net](mailto:W2LNX@arrl.net). Thank you.

## Resources and References

[AP] Wireless Access Point,

[http://www.dd-wrt.com/wiki/index.php/Wireless\\_access\\_point](http://www.dd-wrt.com/wiki/index.php/Wireless_access_point)

[client] Client Mode, [http://www.dd-wrt.com/wiki/index.php/Client\\_Mode](http://www.dd-wrt.com/wiki/index.php/Client_Mode)

[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>

[Doodle] 420 – 450 MHz Embedded COFDM Transceiver (DL435-30), Doodle Labs (SG) Pte. Ltd., Singapore, <http://doodlelabs.com/products/amateur-radio/420-450-mhz-band-dl435.html>

[reflash] TFTP flash, [http://www.dd-wrt.com/wiki/index.php/TFTP\\_flash](http://www.dd-wrt.com/wiki/index.php/TFTP_flash)

[HSMM-MESH] David Rivenburg, AD500, robert Morgan, WB5AOH, Richard Kirchoff, NG5V and Glenn Currie KD5MFW, HSMM-MESH™, <http://www.hsmm-mesh.org/>

[KB9MWR 1] Steve Lampereur, KB9MWR, Doodle Labs DL-435, TAPR PSR #117 Winter 2012, <http://www.tapr.org/psr/psr117.pdf>

[KB9MWR 2] Steve Lampereur, KB9MWR, Doodle Labs DL435-30 Reports, Advancing Ham Radio.. different ideas, January 29, 2012, <http://kb9mwr.blogspot.com/2012/01/doodle-labs-dl435-30-reports.html>

[scope] Wayne Smith, WA4WZP, Webcam Microscope for the Radio Amateur, *QST*, March 2012, page 38

[N0KEW] Kyle Whitney, N0KEW, quick test of the Doodle labs DL435-30, N0KEW, February 5, 2012, <http://n0kew.blogspot.com/>

[N9ZIA] Joseph Loritz, N9ZIA, Doodle Labs DL435-30 420-450 MHz OFDM Transceiver Experiments, <http://www.qsl.net/n9zia/dl435/index.html>

[pigtail] CA100 Pigtail Cable N Jack or Female Bulkhead to MMCX Male Right Angle (RA), 8 Inches (20.3 cm), <http://www.air802.com/product.php?productid=18505>

[RS Pro] Ubiquiti RouterStation Pro, Ubiquiti Networks, Inc., <http://www.ubnt.com/rspro>

[Wistron] Wistron CM9 Atheros 802.11a/b/g miniPCI, <http://www.mini-box.com/s.nl/it.A/id.387/.f>

[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/>

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# UDPSDR-HF2 SDRstick™

by Scotty Cowling, WA2DFI

Zephyr Engineering, Inc. announced a new series of Software Defined Radio hardware dubbed the SDRstick™.

The first SDR in the SDRstick series, the UDPSDR-HF2 features a 16-bit ADC sampling at 122.88MSPS. HF2 is designed to be a front-end companion to the Altera BeMicro SDK from Arrow Electronics. Together, the HF2 and BeMicro SDK form a complete high-performance 100kHz–54MHz Digital-Down-Conversion receiver.

HF2 Features:

- LTC2208 16-bit, 122.88MSPS ADC

- On-board 20dB LNA and LPF

- Step attenuator, 0-31dB in 1dB steps

- Extremely low phase-noise oscillator, -152dBc/Hz (@10kHz spacing)

- External LVDS clock input/output for custom sampling rates or synchronization

- External sine-wave clock input for multi-receiver synchronization

- Audio CODEC directly drives headphones for receive audio output

- Power requirements: 5VDC@800mA (including BeMicroSDK)

- Hardware emulation of openHPSDR Mercury and Hermes (receive section only)

- Compatible with PowerSDR™, Kiss Konsole, GHPSDR3 software

- GNU Radio drivers and sample IP available soon

- Customization available to suit specific applications

BeMicro SDK added features:

- Altera Cyclone IV EP4CE22 FPGA for I/Q pre-processing

- 10M/100M Ethernet interface for streaming I/Q data via UDP

- 64Mbyte Mobile DDR SDRAM



*UDPSDR-HF2 SDRstick*



*A complete SDR receiver: UDPSDR-HF2 SDRstick paired with BeMicro SDK*

- Embedded USB Byte Blaster for programming configuration flash

- Micro-SD card socket

Web links for more information:

UDPSDR-HF2 SDRstick: <http://zephyrengineering.com/sdrstick/>

BeMicro SDK: <http://www.arrow.com/solutions/bemicro-sdk/>

GNU Radio: <http://gnuradio.org/redmine/projects/gnuradio/wiki>

###

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

## Deploying the KPC-3P as a "BBS-in-a-Box"

Jim Oberhofer KN6PE  
January 19, 2009

### Background

Outpost relies on a Bulletin Board System (BBS) as a place to leave packet messages for other users to retrieve at a later time. These BBS packages are computer-based with almost all of the BBS software freely available for download.

Many TNCs also include a Personal Bulletin Board System (PBBS) that typically is used as a personal mail drop where others can leave packet messages. One TNC in particular, the Kantronics KPC-3Plus (hereafter referred to as KPC-3P), offers a couple of compelling features that makes it an attractive small-scale BBS alternative that could be quickly used to support an emergency response. The two key KPC-3Plus features are:

- Ability to allow concurrent connects by remote packet users to its PBBS. This feature lets the KPC-3P begin to approach the level of accessibility experienced by full BBS users.
- Supports a 512Kb memory upgrade that can deliver 480Kb of PBBS message storage. While this is not as much as PC-based disk storage, if managed correctly, this amount of memory is sufficient to keep message traffic flowing between several users.

With these capabilities in mind, some emergency communications teams are now looking at deploying the KPC-3P as a "BBS in a Box" for emergency backup packet communications (or portable digipeaters) in the event they lose their primary computer-based BBS. Additionally, teams with limited resources are investigating the KPC-3P as their primary packet PBBS for all their packet communications.

This application note describes how to deploy the KPC-3P as a multi-user PBBS.



(Picture from [www.kantronics.com/products/kpc3.html](http://www.kantronics.com/products/kpc3.html))

### What you need

KPC-3P	With firmware version 9.1 or later. Kantronics sells an EPROM update that you will need for concurrent access. Firmware version 9.0 or later gives you the critical <b>PBUSERS</b> command that enables concurrent user connects.
Radio	2 meters is popular with Packet, but other VHF/UHF bands also have frequency allocations for packet or digital messaging. Check your local band planning group for details.
Computer	While not normally needed after the TNC is set up, you will need a PC initially to enter the TNC's commands that set up the station's Call Sign, message space, beaconing, and mail box.

Cable, TNC-to-Radio	Usually a custom or store-bought cable. This needs to be built to work with your specific radio.								
Cable, TNC-to-Computer	RS-232 modem cable, standard, any length. Depending on the age of your PC, you may also need a USB-to-Comm Port adaptor to interface your PC to the TNC's serial connector.								
Power supply	Depending on where you will put your BBS will determine what kind of power supply you will need. You will need to power both the TNC and Radio wherever you install it. For in-house use, pick a standard 13.8vdc power supply with sufficient power to drive your radio at whatever power level you intend to use. The power consumption of the TNC is minimal. For those who are thinking of placing the TNC/Radio combination at some remote site, a battery, solar panels, and a charger could be used.								
Firmware Upgrade	This may not necessarily be needed depending on the KPC-3P firmware revision you currently have installed. The initial release of the KPC-3P came with version 8.2. While this works fine for single connections, it does not support the <b>PBUSERS</b> command – the critical command that gets you concurrent user connects. If you do not need concurrent user access, you can skip this part. If you want it, you need version 9.0 or greater.  As of this writing, Kantronics has released version 9.1. To order this firmware upgrade, Contact Kantronics directly and place a phone order for the latest firmware ( <a href="http://www.kantronics.com/support.html">http://www.kantronics.com/support.html</a> ). Because my KPC-3P has version 8.2 installed, I performed this upgrade, described here.								
Memory Upgrade	Kantronics no longer offers the 512Kb memory upgrade. However, you can find equivalent memory modules that will work. Look for a memory chip that is described as follows: <table border="1" data-bbox="1365 868 1885 1123"> <tr> <td>DIP-32</td> <td>32 pin through-hole memory chip. You may see other package types such as SOIC or TSSOP. These are surface-mount components and will not work with the KPC-3P circuit board.</td> </tr> <tr> <td>512k x 8 SRAM 4Mbit</td> <td>Make sure it is "512k x 8". This means 4Mbits of memory arranged in 512K bytes. You may see listings for 256k x 16, 4Mbit; this is not the same.</td> </tr> <tr> <td>70ns</td> <td>This is the maximum memory access time. This is similar to the 128Kb SRAM that you will be replacing in the TNC.</td> </tr> <tr> <td>5V, LP</td> <td>This is a typical 5 volt memory chip, Low Power consumption, and is similar to the current IC.</td> </tr> </table> <p>There are several mail order houses that carry memory such as Jameco or Digkey. I purchased the following from <a href="http://www.jameco.com">http://www.jameco.com</a>: Jameco Catalog No: 157358 Mfg Part Number: 628512LP-70 Description: IC, SRAM, BS62LV4006PC-70</p>	DIP-32	32 pin through-hole memory chip. You may see other package types such as SOIC or TSSOP. These are surface-mount components and will not work with the KPC-3P circuit board.	512k x 8 SRAM 4Mbit	Make sure it is "512k x 8". This means 4Mbits of memory arranged in 512K bytes. You may see listings for 256k x 16, 4Mbit; this is not the same.	70ns	This is the maximum memory access time. This is similar to the 128Kb SRAM that you will be replacing in the TNC.	5V, LP	This is a typical 5 volt memory chip, Low Power consumption, and is similar to the current IC.
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70ns	This is the maximum memory access time. This is similar to the 128Kb SRAM that you will be replacing in the TNC.								
5V, LP	This is a typical 5 volt memory chip, Low Power consumption, and is similar to the current IC.								
Enclosure	How you mount or enclose your BBS really depends on where you intend to deploy it. If it is at home or in a repeater shack on some hill, having all the components in close proximity may work for you. If you plan to make it field-deployable, you may need some type of enclosure that can hold all the parts. Surviving in all types of weather should also be considered.								

Getting the KPC-3P set up is a big piece of this process. The set up process will include the following steps:

1. Buy or build all the components you need for your BBS-in-a-Box project.
2. Install the firmware upgrade
3. Install the memory module
4. Configure your TNC
5. Initial test
6. Final packaging

**NOTE: Read through Steps 1, 2, 3, and 4 before beginning.**



**Step #1 Buy or build all the components**


I won't walk you through acquiring all of the parts for your project. However, as part of the parts checkout process, there are a couple of things that you should do before beginning:

Steps	Notes, Comments, Description
<p><b>1.1 Initial TNC Check-out</b></p> <p>It may not be obvious that you have the right TNC or firmware level. Before beginning, do the following:</p> <ol style="list-style-type: none"> <li>1. Connect the TNC to your power supply, cable it to the PC, and boot up your PC.</li> <li>2. Run your favorite terminal emulator program (Hyperterm, ipserial, etc).</li> <li>3. Power up the TNC and confirm that you see...                             <ul style="list-style-type: none"> <li>• the TNC welcome message</li> <li>• <b>KPC3P</b> in the message. If this does not say KPC3P, <b>STOP</b>... do not upgrade the memory. It will not work.</li> <li>• the version is <b>9.0</b> or <b>9.1</b>. In my case, I have version 8.2; this TNC requires the firmware upgrade. This version does work, but does not support the PBUSERS command (more on that later).</li> </ul> </li> <li>4. At the TNC command prompt, enter PBBS command. A "100" returned means that there is a 128Kb memory module installed now. This TNC is a candidate for a memory upgrade.</li> </ol>	<pre> KANTRONICS KPC3P VERSION 8.2 (C) COPYRIGHT 1997 BY KANTRONICS INC. ALL RIGHTS RESERVED. DUPLICATION PROHIBITED WITHOUT PERMISSION OF KANTRONICS. cmd: cmd:pbbs pbbs 100 cmd:                     </pre>


**Step #2 Installing the Firmware Upgrade**

If the results of the above checkout show KPC-3P Version 9.0 or greater, **STOP!** You already have the firmware needed to run a multi-user PBBS. If this is the case, skip this section and go to **Step #3**. Otherwise, proceed as follows:

Steps	Notes, Comments, Description
<p><b>Before beginning:</b> I recommend you be familiar with the following:</p> <ol style="list-style-type: none"> <li>1. ESD (Electrostatic Discharge) Procedures. The Integrated Circuits (ICs) for the Firmware and Memory module upgrades can be sensitive to static. Make sure you read up on ESD procedures before beginning. The ARRL Handbook is a good source of information.</li> <li>2. Methods for removing and replacing chips from a circuit board.</li> </ol> <p><b>2.1 Install the Firmware Upgrade</b></p> <p>The sequence of replacing the Firmware IC is as follows:</p> <ol style="list-style-type: none"> <li>1. Power off the TNC and disconnect it from the computer, radio, and power supply.</li> <li>2. Remove the cover from the TNC.</li> <li>3. Disable the TNC internal backup battery.</li> </ol> <p>You can do this by either removing the battery completely, or putting a piece of paper or card between the top contact and the battery. One of my QST cards worked great.</p> <ol style="list-style-type: none"> <li>4. Remove the existing Firmware IC.</li> </ol> <p><b>NOTE</b> the orientation of the semi-circle indent on the top at one end of the chip (semicircle indentation next to the "EPROM" silk-screening on the PC board). The replacement chip must be oriented the same way.</p> <p>If you do not have an IC puller (not many people do), with a small flat head screw driver, gently work the blade of the screw driver between the IC and the socket at one end. Begin prying the IC out of the socket. As it begins to lift, push the screwdriver blade in further and lift from the center. The goal is NOT to</p>	<p><b>WARNING:</b> Integrated Circuits are sensitive to static discharge. Use a ground strip between you and the TNC chassis when performing these steps.</p>  <p style="text-align: center;"><b>Old version 8.2 Firmware to be replaced</b></p>  <p style="text-align: center;"><b>Gently pry one end of the IC out of the socket</b></p>

Steps	Notes, Comments, Description
<p>bend any pins in the event this IC needs to go back in.</p> <p>5. Install the new Firmware IC. ICs that have never been inserted before tend to have their legs flared outward. The technique I use to insert an IC is to:</p> <ul style="list-style-type: none"> <li>• Orient the new IC correctly so that the semi-circle indentation is next to the EPROM mark on the PC board.</li> <li>• Position the pins on one side of the IC into their respective sockets first (DO NOT fully seat them).</li> <li>• Gently align the IC so that the other set of pins are positioned over the rest of the socket.</li> <li>• Then, slowly press the IC completely into the socket until it is completely seated.</li> </ul> <p>6. Remove the card that you previously installed to disable the TNC backup battery.</p> <p>7. If you are not performing a memory upgrade, replace the TNC's cover.</p>	 <p style="text-align: center;"><b>Aligning one side of the IC before inserting it into the socket</b></p> <p><b>WARNING:</b> DIP-32 chips have 16 pins on each side. Be very careful when inserting the new DIP package into the socket. . . the pins will not be completely aligned on both sides the first time you insert the chip.</p> <p>Note the orientation of the chip relative to the EPROM marking on the PC Board. The way the old chip came out is the way the new chip must go in.</p> <p>Make sure all pins are aligned over all sockets before applying any force to fully seat the chip.</p>
<p><b>2.2 TNC checkout after firmware installation</b></p> <p>Verify the firmware is installed correctly by doing the following:</p> <ol style="list-style-type: none"> <li>1. Connect the TNC to your power source and the PC.</li> <li>2. With the terminal emulator running, power up the TNC.</li> <li>3. The TNC's Autobaud routine will run first.</li> <li>4. When you see intelligible text, press the "*" to set the baud rate, then enter your call sign at the prompt.</li> <li>5. Verify the KPC-3P welcome message indicates Version 9.1.</li> </ol> <p>Congratulations . . . your firmware is now updated!</p>	<pre>cmd: ***** XX E"  +++++#p"***E" eEE"  TE ffp PRESS (*) TO SET BAUD RATE ENTER YOUR CALLSIGN=&gt; W6TDM KANTRONICS KPC3P VERSION 9.1 (C) COPYRIGHT 2002-2005 BY KANTRONICS INC. ALL RIGHTS RESERVED. DUPLICATION PROHIBITED WITHOUT PERMISSION OF KANTRONICS. cmd:</pre>

**Step #3 Installing the Memory Upgrade**  
 If the results of the PBBS command entered in Step 1.1 returned a 480, **STOP!** You already have a 512Kb memory module installed. If this is the case, skip this section and go to **Step #4.** Otherwise, proceed as follows:

Steps	Notes, Comments, Description
<p><b>3.1 Install the memory module</b></p> <p>Before beginning, I recommend you have the KPC-3P users guide available. Look for the section titled "Expanding the RAM in the KPC-3Plus". In short, the steps are as follows</p> <ol style="list-style-type: none"> <li>1. Power off the TNC and disconnect it from the computer and power supply.</li> <li>2. Remove the cover from the TNC</li> <li>3. Disable the TNC internal backup battery. You can do this by either removing the battery completely, or putting a piece of paper or card between the top contact and the battery. One of my QST cards worked great.</li> <li>4. Remove the existing 32/128K RAM from socket U14 (located below the KPC-3P Firmware, see picture).</li> </ol>	<p><b>WARNING:</b> SRAM are sensitive to static discharge. Use a ground strip between you and the TNC chassis when performing these steps.</p> <p>Note the orientation of the semi-circle indent on the top at one end of the chip. The replacement chip must be oriented the same way.</p>
	<p>The process is essentially the same as used for the Firmware Upgrade. I have used a small flat-blade screw driver wedged between the chip and the socket, then gently rocking it back in forth to pry the chip out slowly.</p>  <p style="text-align: center;"><b>New firmware and memory ICs installed. The arrow points to J14 jumper.</b></p>



#### 4.3 Setting up the PBBS

1. First, reconfirm that we are using all BBS memory for messages.
2. Next, set up the number of simultaneous connects that can be made. A couple of commands need to be entered.

**maxusers:** TNC allocates memory required for the maximum number of simultaneous connects to the TNC that you wish to allow. On changing the value, the TNC will initiate a soft-reset and drop all existing connections. The Default is 10. I recommend 5 for starters.

**users:** Specifies the number of channels that can be made available for incoming connects

**pbusers:** Controls the maximum number of connects to the PBBS. On changing the value, the TNC will initiate a soft-reset and drop all existing connections.

**NOTE:** For starters, I am setting this number in the "5" range. Setting it higher may result in more packet collisions as users compete for access to the BBS. Setting it lower results in more connect rejects. You need to look at your local situation to determine what the right number is for you.

**NOTE:** The above 3 commands should always be entered with the same parameter.

3. Set up a couple of commands that control message size.

**pbsize:** Set the message size. The TNC defaults to a value of "0" (no size limit). For today, I am limiting the size to Outpost's size, 10,000 characters.

You can make it smaller if you want. However, you will have to manually enforce this as a policy since Outpost will not detect a "message too large" message.

```
cmd:pbba
PBBS 480
cmd:
```

```
cmd:maxusers
MAXUSERS 10
cmd:maxusers 5
cmd:
```

```
KANTRONICS KPC3P VERSION 9.1
(C) COPYRIGHT 2002-2005 BY KANTRONICS INC. ALL RIGHTS
RESERVED.
DUPLICATION PROHIBITED WITHOUT PERMISSION OF KANTRONICS.
cmd:maxusers
MAXUSERS 5
cmd:
```

```
cmd:users 5
USERS was 1
cmd:users 5
cmd:
```

```
cmd:pbusers 5
PBUSERS was 1
cmd:
```

```
KANTRONICS KPC3P VERSION 9.1
(C) COPYRIGHT 2002-2005 BY KANTRONICS INC. ALL RIGHTS
RESERVED.
DUPLICATION PROHIBITED WITHOUT PERMISSION OF KANTRONICS.
cmd:pbusers
PBUSERS 5
cmd:
```

```
cmd:pbsize 10000
PBSIZE was 0
cmd:pbsize
PBSIZE 10000
cmd:
```

**pbheaders:** Turn this off. When On, Routing Headers received from a full service BBS will be stored. When off, headers are not stored allowing for more message storage.

4. Lastly, set up some messages and controls for a PBBS connect.

**ptext:** This sets the message to be sent back to the user immediately on a connecting to the PBBS. It can be up to 128 characters

**msg:** Make sure that someone attempting to connect only to W6TDM for keyboard-to-keyboard gets redirected to the PBBS.

**ctext:** Because a keyboard-to-keyboard request will be pointed to the PBBS by the CMSG command, let the user know that they are being redirected.

**daytime:** Set the time of the TNC so that messages are time-stamped correctly.

```
cmd:pbh off
PBHHEADER was ON
cmd:pbh
PBHHEADER OFF
cmd:
```

```
cmd:ptext Welcome to the Cupertino ANES/RACES PBBS
PTEXT was
cmd:ptext
PTEXT Welcome to the Cupertino ANES/RACES PBBS
cmd:
```

```
cmd:cmsg pbba
CMSG was OFF
cmd:cmsg
CMSG PBBS
cmd:
```

```
cmd:ctext Redirecting you to the PBBS...
CTEXT was
cmd:ctext
CTEXT Redirecting you to the PBBS...
cmd:
```

```
cmd:daytime
DAYTIME 01/01/97 01:03:57
cmd:daytime 0810261E10
cmd:daytime
DAYTIME 10/26/08 16:10:04
cmd:
```

#### 4.4 Set up for remote sysop

My BBS-in-a-Box may be away from where I am, therefore, I want to have remote access to it. The following commands set up how to remotely perform SYSOP controls.

**myremote:** Set up the connect address to access this BBS. The myremote command capability comes disabled. You are entering a callsign and SSID to which you will use to connect to enter sysop commands. I set it up as W6TDM-8. This command will perform a soft reset when entered.

**rtext:** Set the password string that the TNC will use to challenge any user attempting to gain SYSOP access either when connecting by myremote or when performing SYSOP functions to the PBBS remotely. I set up my password string as shown.

See Step 5.3 Sysop Connect Test

```
cmd:myremote
MYREMOTE disabled
cmd:myremote w6tdm-8
```

```
KANTRONICS KPC3P VERSION 9.1
(C) COPYRIGHT 2002-2005 BY KANTRONICS INC. ALL RIGHTS
RESERVED.
DUPLICATION PROHIBITED WITHOUT PERMISSION OF KANTRONICS.
cmd:myr
MYREMOTE W6TDM-8
cmd:
```

```
cmd:rtext
RTEXT
cmd:rtext CupertinoANES/RACES 081026
RTEXT was
cmd:rtext
RTEXT CupertinoANES/RACES 081026
cmd:
```



to see how this works.	
<p><b>4.5 Optional TNC Settings</b></p> <p>There are a series of commands that you may also want to enter to further customize your TNC/PBBS. Here are the ones I used.</p> <ol style="list-style-type: none"> <li>Beaconing is when the TNC transmits some type of identifier in between connects  <b>btext:</b> Enter the text to be transmitted periodically as a station beacon.</li> </ol> <p><b>beacon:</b> This is the partner command for the BTEXT and sets the interval that the beacon will be sent. I set my beacon for 30 minutes (a "0" value turns beaconing off).</p> <p><b>NOTE:</b> Alternatively, the CWID and CWIDTEXT commands can be used to send the CW identifier.</p> <ol style="list-style-type: none"> <li>If you intend to operate stand-alone without a PC attached, before deploying your PBBS-in-a-Box, turn <b>monitor</b> off.</li> </ol> <p><b>NOTE:</b> If MONITOR is left ON, the TNC will continue to send the traffic to the Serial Port. It is unclear whether this will inevitably cause a hang because the Serial I/O buffer fills up.</p>	<pre>cmd:btext Cupertino ARRS/PACES PBBS BTEXT was cmd:btext BTEXT Cupertino ARRS/PACES PBBS cmd:  cmd:beacon BEACON EVERY 0 (disabled) cmd:beacon 30 BEACON was EVERY 0 (disabled) cmd:beacon BEACON EVERY 30 min cmd:  cmd:monitor off MONITOR was ON</pre>

**Step #5 Initial Test**


To get the system checked out, you need to get it sufficiently assembled to do a real RF test. My intention is to deploy a very compact stand-alone system that includes:

1. KPC-3P
2. Radio Shack HTX 202
3. both powered off of a 12v 7Ah gel cell battery
4. and all the interconnecting cables

My basic checkout is to do the following things:

1. Assemble the system in my garage
2. From another packet station (PC, TNC, radio), connect to the KPC-3P as a user would, leave and pick up a message
3. Connect as a Sysop, and check that I have access to all TNC commands

Proceed as follows:

Steps	Notes, Comments, Description
<p><b>5.1 Assemble the system</b></p> <p>This is really left up to you as to what you have for equipment. Connect all the parts and power it all on.</p> <p>This is what my components look like.</p>	
<p><b>5.2 User connect test</b></p> <p>For this test do the following:</p> <ol style="list-style-type: none"> <li>1. Connect using the PBBS using the W6TDM-1 call sign.                      Once connected, note that there are 480,000 bytes of memory available. Also, confirm that your PBBS welcome message is as you want it to read.</li> <li>2. Send yourself a short message</li> <li>3. List messages</li> <li>4. Retrieve the message, and</li> <li>5. Kill the message</li> <li>6. Log off when done.</li> </ol>	<pre>cmd:p w6tdm-1 cmd:*** CONNECTED to W6TDM-1 [KPC3P-9.1-ns0] 480000 BYTES AVAILABLE THERE ARE NO MESSAGES Welcome to the Cupertino ARRS/PACES PBBS ENTER COMMAND: B,J,K,L,N,S, or Help &gt; Lm ENTER COMMAND: B,J,K,L,N,S, or Help &gt; lh ENTER COMMAND: B,J,K,L,N,S, or Help &gt; h *** DISCONNECTED cmd:W6TDM&gt;W6TDM-1: &lt;&lt;UA&gt;&gt;</pre>

Steps	Notes, Comments, Description
<p><b>5.3 Sysop connect test</b></p> <p>For this test do the following:</p> <ol style="list-style-type: none"> <li>Connect to the PBBS using the W6TDM-8 call sign.  The BBS replies with 3 sets of numbers. I picked the 1<sup>st</sup> set in this case. To make it easier, I always lay out the password (remember setting rtext above?) with the numbers associated with each character. So, "C" = 1, "t" = 6, "8" = 22, and so on.  00000000011111111112222222 12345678901234567890123456 CupertinoARKS/RACKS 081026  Mapping the 1<sup>st</sup> row of numbers against the rtext code, you get:  3=p, 2=u, 12=E, 4=e, 26=6, 13=S.  "puEe6s" is entered after the 3 codes. Once the PBBS confirms the correct entry, you see the prompt: prompt  <b>NOTE:</b> What you enter is case sensitive.</li> <li>At this point, you have access to the commands that you typically see from the TNC's cmd: prompt.  However, you do not have access to the usual PBBS user commands when in sysop mode.</li> <li>To exit, enter a ctrl-C to get back to the TNC cmd: prompt, then a "D" to disconnect.</li> </ol>	<pre>cmd: w6tdm-8 cmd: *** CONNECTED to W6TDM-8 3 2 12 4 26 13 5 14 5 14 18 22 9 18 20 10 18 22 puEe6s prompt:</pre> <pre>prompt:ptext PTEXT Welcome to the Cupertino ARKS/RACKS PBBS prompt:etext ETEXT Cupertino ARKS/RACKS PBBS prompt:etext Cupertino ARKS/RACKS Emergency PBBS ETEXT was Cupertino ARKS/RACKS PBBS prompt:b 10 BEACON was EVERY 0 (disabled)</pre>
<p><b>5.4 Redirect connect test</b></p> <p>We set up the PBBS to ensure that anyone attempting to connect to "W6TDM" looking for keyboard-to-keyboard chat will get redirected to the PBBS.</p> <ol style="list-style-type: none"> <li>Try connecting to the TNC using the W6TDM call sign.  Confirm that you are redirected to the PBBS.</li> </ol>	<pre>cmd: w6tdm cmd: *** CONNECTED to W6TDM Redirecting you to the PBBS... [KPC3P-9.1-HM8] 480000 BYTES AVAILABLE THERE ARE NO MESSAGES Welcome to the Cupertino ARKS/RACKS PBBS ENTER COMMAND: B,S,K,L,R,S, or Help &gt; b *** DISCONNECTED cmd:</pre>

**Step #6 Final Packaging**

As stated earlier, packaging is really a matter of personal preference. Depending where you intend to put and power your PBBS will determine how it goes together. In my case, I wanted a portable system that could be deployed anywhere throughout the city in the event we needed to establish a back-up or temporary PBBS, or extra county digipeater. Here are some of the pictures of my system.

Steps	Notes, Comments, Description
	 <p>I used an ammo box as the enclosure. A BNC connector on the top provides for the antenna connector.</p> <p>I also drilled a vent, installed a fan, and grate for a fan, but did not connect it to the battery (future enhancement; possibly put some type of temperature sensor and relay in there to turn on the fan if it gets too warm inside).</p>
	 <p>Inside the ammo box, the radio belt clip slips into a tie wrap that loops through 2 holes in the back of the box.</p> <p>Because I had the space, I actually installed 2 12v Gel Cells in parallel. Anderson PowerPoles provide all the power interconnects between the battery, TNC, and Radio.</p> <p>A stiff piece of card-board sits on top of the batteries (covers the battery terminal posts), with the TNC then on top if it.</p>

**Summary**

That's it! If you come up with an interesting implementation or packaging scheme, please send in your pictures and I will be happy to share them with others.

## 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](http://www.twitter.com/taprdigital)

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###

## 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 [wallou at tapr.org](mailto:wallou@tapr.org). The deadline for the next issue of PSR is August 15, so write early and write often.

###

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###

## Get On-the-Air with SDR

By Stan Horzepa, WA1LOU

On the Software-Defined Radio (SDR) front, Tad Cook, K7RA, mentioned PA3FWM's WebSDR <[www.websdr.org/](http://www.websdr.org/)> in the ARRL Propagation Bulletin for April 13 <[www.arrl.org/wlaw-bulletins-archive/ARLP015/2012](http://www.arrl.org/wlaw-bulletins-archive/ARLP015/2012)> and I mentioned it here <[www.arrl.org/news/surfin-lou-on-sdr-and-gps](http://www.arrl.org/news/surfin-lou-on-sdr-and-gps)> back in June 2008. It is worth repeating because it is a very valuable online resource and it has expanded greatly since my mention four years ago.

WebSDR is an online SDR receiver that allows many users to listen and tune it simultaneously. SDR technology makes it possible for each user to tune independently, and thus listen to different signals; this is in contrast to the many classical receivers that are already online.

Pieter-Tjerk de Boer <[wwwhome.cs.utwente.nl/~ptdeboer/](http://wwwhome.cs.utwente.nl/~ptdeboer/)>, PA3FWM, first conceived WebSDR as a means to make the 25-meter radio telescope at Dwingeloo, The Netherlands, available to many radio amateurs for EME reception. In order to test a preliminary version of the software without using the 25-meter dish, a shortwave WebSDR was set up on Christmas Eve 2007 at the radio club of the University of Twente.

After further development, its existence was publicly announced in April 2008. Interest for the project has been great since then, and many amateurs worldwide have set up their own WebSDR server. The WebSDR website lists 34 WebSDR servers located all over the world.

As Woody Woodward, K3VSA, remarked to me, "For those of us who are curious about SDR, here's a way to get an introduction to it without having to invest anything more than your time." Yes, indeed!

*This article originally appeared in the April 27 installment of Surfin' on the ARRL website <<http://www.arrl.org/news/surfin-get-on-the-air-with-sdr>>.*

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## W7SLB SK

By Bob Larkin, W7PUA

Beb Larkin, W7SLB, the DSP-10 e-mail reflector administrator, passed away on February 19. Beb had been struggling with multiple illnesses for some time. It is sad, and we will miss both Beb and hearing W7SLB on the air. Beb had been very active in a number of elements of ham radio with HF DX being his strongest interest.

He had also distributed boards for the DSP-10 project and collected pictures and information on DSP-10 builders and their radios. He had been a major contributor to the project. When I shut down W7SLB, his good-looking DSP-10 was on and running fine!

More info on Beb is available at [http://www.proaxis.com/~boblark/FAL\\_Obit\\_win.txt](http://www.proaxis.com/~boblark/FAL_Obit_win.txt)

###

# Open Hardware Summit 2012 – Call for Submissions

The Open Hardware Summit (OHS) invites submissions for the third annual summit, to be held on September 27, 2012 at Eyebeam Art + Technology Center in New York City. The Open Hardware Summit is a venue to present, discuss, and learn about open hardware of all kinds. The summit examines open hardware and its relation to other issues, such as software, design, business, law, and education. We are seeking submissions for talks, posters, and demos from individuals and groups working with open hardware and related areas. Submissions are due by May 31, 2012 BY 11:59pm (EST). Notification of accepted proposals will happen by July 8th, 2012.

## Submission topics

Topics of interest for the summit include, but are not limited to:

- Digital fabrication
- DIY bio
- Soft circuits
- Wearables and fashion tech
- Quantified-self hardware
- Means of supporting collaboration and community interaction
- On demand and low volume manufacturing
- Distributed development and its relationship to physical goods
- Software design tools (CAD / CAM)

- DIY technology
- Ways to share information about hardware that's not captured in source files
- Business models
- Competition and collaboration
- Sustainability of open hardware products (e.g. how to unmake things)
- Industrial design
- Open hardware in the enterprise
- Specific product domains: e.g. science, agriculture, communications, medicine
- Legal and intellectual property implications of open-source hardware
- Open hardware in education
- Addressing the gender imbalance in the open hardware community
- And any other topic you think relates to openness and hardware. We want to hear all about it!

## Types of submissions

To increase the chances that we can include your work in the Summit, feel free to submit a proposal in one or more of the following formats. Keep in mind if you submit for only one category and are not accepted, there will be no resubmissions to different categories because the acceptance notification is after the submission deadline passes.

## Talk

- Expected duration for talks is between 5 and 20 minutes, depending on the number and quality of submissions.
- All talks to be plenary (i.e. presented to the entire summit audience).
- Talk submissions primarily containing marketing for a product, non-profit, or company, will not be accepted. However, talks that share knowledge and insight derived from work on commercial products or organizations are welcome.

## Poster

- This is a casual show and tell session that will take place at the end of the day together with the demo session.
- Poster submissions could be about an organization, an initiative, a project, a platform, a process, a research project, a work-in-progress. For example, if your project is now beyond the “demo” phase and has scaled up, a good way to share your results is the poster session. Also, if your product is too big or complicated to be physically brought to NYC, you should submit it as a poster and not a demo (see one example here)
- A poster session is also a great way to receive focused feedback from the community, as opposed to a talk.
- You are encouraged to include pictures and links to videos as part of your poster submissions.

- Each poster will be given a vertical mounting surface. It will be your responsibility to print/carry/set up/unmount your poster. We cannot provide any support for the receiving or storing of posters before the event.
- If you have a physical product to show, use the demo track.
- Postersubmissions primarily containing marketing for a product, non-profit, or company, will not be accepted. However, posters that share knowledge and insight derived from work on commercial products or organizations are welcome.

## Project Demo

- This is a casual show and tell session that will take place during the end of the day.
- You are encouraged to include pictures and links to videos as part of your demo submissions.
- Each demo will be given table space and one outlet. Please bring your own power strip if you need to plug in more than one device.
- Keep in mind this is an informal project demo, and complex requirements/constraints (light/sound conditions, etc.) will be difficult to accommodate.
- All demos will be required to also produce written documentation for reference and archival purposes and to communicate the intention of the demo to Summit attendees.
- It will be your responsibility to carry/assemble/set

up/disassemble your demo. We are unable to receive shipments or provide storage for demos.

- There will be time the day before the event for you to set up, or from 8-8:45am the day of the event.
- Note: If submitting a project demo, your project MUST be working by the time of the summit.

## Submission Format

Submissions should be formatted as plain text of no more than 1,000 words in length and include ALL of the following:

- The type of submission (talk, poster, or demo)
- Name/title for submission
- The name, bio, and email address of the author(s). If more than one author, designate one as the contact person.
- What you intend to talk about, the topic for your poster, or a description of your demo
- An explanation of the importance of your submission to the open-hardware community
- A maximum of TWO photos that help explain your topic of submission (optional)

Keep in mind that we'll be deciding what to accept based primarily on the submissions themselves. Be sure to give us enough information to make a good decision. Don't assume we know you or your project. Documentation of accepted submissions WILL BE PUBLISHED on the OHS website.

Submissions should be emailed to the respective chair with the subject line "Open Hardware Summit submission" followed by the type of submission in parentheses (e.g. "Open Hardware Summit submission (poster)"). Please place the submission text in the body of the email, not a separate attachment.

Talks: Review Chair, David Mellis, at [summit-talks at oshwa.org](mailto:summit-talks@oshwa.org)

Posters: Poster Chair, Paulo Blikstein, at [summit-posters at oshwa.org](mailto:summit-posters@oshwa.org)

Demo: Demo Chair, Charles Pax, at [summit-demos at oshwa.org](mailto:summit-demos@oshwa.org)

## Funding

Unfortunately we can't guarantee travel or accommodation funding for speakers, poster presenters, or demo presenters. Accepted speakers will be exempt from the event registration fee. Poster and demo presenters will still be required to pay the event registration fee.

For more details about the Open Hardware Summit, see the website at [summit.oshwa.org](http://summit.oshwa.org), especially the FAQs section. Please direct questions about submissions to the respective chair. Please direct other questions about the summit to General Chairs Catarina Mota and Dustyn Roberts at [summit at oshwa.org](mailto:summit@oshwa.org)

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## 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 at 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.

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# Membership Application

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## Benefits of a TAPR Membership:

- Subscription to the quarterly PSR
- 10% off most TAPR kits and publications
- Access to the TAPR digital library
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- Co-sponsor of the annual TAPR-ARRL Digital Communications Conference (DCC)

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