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.


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.


**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

Chase DX on LW and MW

Blow up electronic stuff

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**TAPR Membership App**

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

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

Short Bits

• FUncube Dongle support now built into GNU Radio: http://www.oz9aec.net/

• Introducing RTL­SDR: a $20 SDR: http://dangerousprototypes.com/2012/03/20/introducing­rtl­sdr­a­20­sdr

• 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/


• See photo of the Atomic Wristwatch and more: http://www.isgtw.org/feature/open­hardware­creating­more­open­world

###
TAPR at Hamvention

By Stan Horzepa, WA1LOU

Like I wrote last time, it wouldn’t be a Hamvention 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.

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 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 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

Plans for the TAPR-ARRL Digital Communications Conference <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>, which is located a half mile from Hartsfield-Jackson Atlanta International Airport (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/> 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.

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

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

###
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.

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


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

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TADD-2 Mini Top View

TADD-2 Mini Bottom View
Hermes Is On His Way

TAPR announces the opening of the interest list for the openHPSDR (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:

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.)

###
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 pigtails [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

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

Resources and References


[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


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

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/

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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 Oehlerker KN2E
January 19, 2009

Background
Output refers to a Bulletin Board System (BBS) as a place to leave 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 is typically used as a personal mail drop where users can leave messages for other users. One TNC in particular, the Grasshopper KPC-3P has been released with a PBBS feature that allows users to make a PBBS that can be easily used to support emergency communications. The two key KPC-3P features are:

- Ability to allow concurrent contacts by remote packet users to the PBBS.
- The PBBS can be accessed through a P2P connection by remote packet 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 possible digipeaters) in the event they lose their primary computer-based PBBS. 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.

What you need

KPC-3P
With firmware version 9.7 or later. Xaritronics sells an EFROM update that adds support for the PBBS feature.

Radio
2/meters is popular with Packet. Other VHF/UFH bands also have frequency allocations for packet or digipeaters. Check your local band plan for details.

PBBS
While not internally needed before the PBBS is set up, you will need a PC initially to enter the PBBS commands that set up the server’s Call Sign, message space, filename, and unit box.

Table: KPC-3P Application Note

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Cable, TNC-to-Radio</td>
<td>Usually a custom or store-bought cable. This needs to be built to work with your specific radio.</td>
</tr>
<tr>
<td>Cable, TNC-to-Computer</td>
<td>RS-232 modular cable, standard, any length. Depending on the length of your PC, you may also need a USB-to-serial port adapter to interface your PC to the TNC’s serial connector.</td>
</tr>
<tr>
<td>Power supply</td>
<td>Depending on where you will put your PBBS, the power supply you will use will vary. You will need a power source for the TNC and Radio, whether you are using 12 or 24VDC. If your TNC uses a standard 12VDC input, your power supply will suffice. If you use a TNC that requires 24VDC, you will need a TNC that can accept 24VDC. The power consumption of the TNC is minimal. For those who are planning on using this PBBS for remote sites, a battery, solar panels, and a charger would be useful.</td>
</tr>
<tr>
<td>Firmware Upgrade</td>
<td>This may not necessarily be needed depending on your KPC-3P firmware revision. You can verify this by checking the firmware version number. The latest firmware for the KPC-3P came with version 8.2. While this version 8.2 firmware includes the PBBS feature, it requires an update to the TNC’s firmware. Ensure that you are using version 9.1 or later.</td>
</tr>
<tr>
<td>Memory Upgrade</td>
<td>KX3 software version 9.2 with 16MB of memory is required. However, you can find excellent memory modules that work. Look for a memory chip that is described as follows:</td>
</tr>
</tbody>
</table>

| DIP 32          | 32 pin through hole memory chip. You may use other package types such as SOP, SSOP, or TSSOP. These are surface mount components and will not work with the KPC-3P circuit board. |
| 512 x 8          | Make sure it is 512 x 8. This means 4MB of memory is printed on the DIP8. You may have listings for 512 x 6, 4MB, this is not the same. |
| 128K x 8         | This is the maximum memory size supported by the TNC. It is similar to the 128K x 8 DIP8 that you will be replacing in the TNC. |
| 5V, Lp           | This is an optional 5 volt memory chip. Low Power consumption, and smaller in size than the current IC. |

There are several mail order houses that carry memory chips. Purple Pig, Tenna, and I purchased the following from http://www.janecel.com

Barna一号, 577 358
Mila Park Mailing: 620 1234, 70
Distribution: Y, B, B, 120 4070, 70

Endnotes
How you intend to use your PBBS will dictate whether you should use a multifunctional purpose PBBS, or one that is designed for a specific purpose. For example, you may need some type of emergency plan that involves all the sites. Service in all types of weather should also be considered.

TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.
Getting the KIC3-VP setup is a big step of this process. The set up process will include the following steps:

1. Buy or build all the components you need for your 335-in-One project.
2. Install the firmware upgrade
3. Install the antenna module
4. Configure your TN3
5. Install net
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:

<table>
<thead>
<tr>
<th>Steps</th>
<th>Notes</th>
<th>Comments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Initial TNC Check-out</td>
<td></td>
<td></td>
<td>It may not be obvious that you have the right TNC or firmware loaded before beginning, so do the following:</td>
</tr>
<tr>
<td>1. Connect the TNC to your power supply, cable it to the PC, and boot up your PC.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Rate your favorite external database program (KIC3-VP in a text file, etc.)</td>
<td></td>
<td></td>
<td>Power up the TNC and confirm that you see:</td>
</tr>
<tr>
<td>• the TNC welcome message</td>
<td></td>
<td></td>
<td>PARTNORIES KIC3-VP VERSION 1.2</td>
</tr>
<tr>
<td>• the KIC3-VP in the message.</td>
<td></td>
<td></td>
<td>COPYRIGHT 1999 BY PARTNORIES INC. ALL RIGHTS RESERVED.</td>
</tr>
<tr>
<td>• the version is 50 or 91. If the version is 52 or 92, then the TNC requires the firmware upgrade. This version does work, but does not support the BT/SEIS command mode on the TNC.</td>
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</tr>
<tr>
<td>3. At the TNC command prompt, enter PBRS command. A “+100” receives means that there is a 1200 baud memory module installed now. This TNC is a candidate for a memory upgrade.</td>
<td></td>
<td></td>
<td>PARTNORIES KIC3-VP VERSION 1.2</td>
</tr>
</tbody>
</table>

Step #2 Installing the Firmware Upgrade

If the results of the above checkout show KIC3-VP Version 3.0 or greater, STOP! You already have the firmware loaded to use a multi-user PBRS. If this is the case, skip this section and go to Step #3.

Otherwise, proceed as follows:

**WARNING:** Integrated circuits are sensitive to static discharge. Use a ground strap between you and the TNC chassis when performing these steps.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Notes</th>
<th>Comments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Install the Firmware Upgrade</td>
<td></td>
<td></td>
<td>The sequence of replacing the firmware IC is as follows:</td>
</tr>
<tr>
<td>1. Power off the TNC and disconnect it from the battery, radio, and power supply.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Remove the cover from the TNC.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Unplug the TNC internal backup battery.</td>
<td></td>
<td></td>
<td>You can do this by either removing the battery completely, or pulling a piece of paper or card between the top contact and the battery. One of my CSTs even worked great</td>
</tr>
<tr>
<td>4. Remove the existing Firmware IC.</td>
<td></td>
<td></td>
<td><strong>NOTE:</strong> The orientation of the circular contacts on the top of one end of the chip coincide with the “PROM” all-staining on the IC board. The replacement chip must be oriented the same way.</td>
</tr>
<tr>
<td>If you do not have an IC puller you may proceed by using a small flat-head screwdriver gently insert the blade of the screwdriver between the IC and the socket at one end. Begin forcing the IC out of the socket. As it begins to lift, push the screwdriver blade further up, then lift and pull out the IC. Do not use excessive force. It is just a chip.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

   **Step 3** Installing the Memory Upgrade

   If the result of the PWR command entered in **Step 1** returned 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.

   **3.1 Install the memory module**

   Before beginning, I recommend you have the KPC-3P user’s guide available. Look for the section titled “Extending the RAM in the KPC-3P” in short, the steps are as follows:

   1. Power off the TNC and disconnect it from the computer and power supply.

   2. Remove the cover from the TNC.

   3. Disable the TNC internal backup battery. You can do this by either removing the battery completely, or putting a piece of paper or cloth between the two contacts and the battery. One of my TNCs worked great.

   4. Remove the existing 32Kb RAM from socket U-14 and allow the KPC-3P firmware, see picture.

   **3.2 TNC checkout after firmware installation**

   Verify the firmware is installed correctly by doing the following:

   1. Connect the TNC to your power source and the PC.

   2. With the serial emulator running, power up the TNC.

   3. The TNC’s Atheros7020 bootstraps normally.

   4. When you see the “boot” prompt, press the “^” key to reset the board, then enter your call sign in the prompt.

   5. Verify the KPC-3P welcome message includes Version 9.1.

   Congratulations, your firmware is now updated.

---

**TAPR** is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.
3.2 TNC checkout after memory installation

Verify that memory has been installed correctly by doing the following:

6. Connect the TNC to your power source and the PC.
7. With the serial emulator running, power up the TNC.
8. The TNC’s Auditor should turn on.
9. When you see an intelligible text, press the ** key to set the baud rate, then enter your call sign in the prompt.

10. At the TNC command prompt, enter PAINS command. You should see **48** returned meaning that the TNC recognized the 32K memory module that you just installed.

---

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

4.3 Setting up the P12B

1. First, reconfig that we are using all BBS memory for messages.

2. Next, set up the number of simultaneous connections that can be made. A couple of commands need to be entered.

3. users: Specify the number of channels that can be made available for incoming users.

4. phones: Controls the maximum number of connections to the P12B. Unchanging the value, the TNC will initiate a soft reset and drop all existing connections.

NOTES: For owners, I will set this number to the 32 value. Setting a higher value results in more TNCs collecting an empty resource for access to the BBS. Setting a lower value results in more empty resources. You need to check your TNC's manual to determine what the right number is for you.

NOTES: The above 3 commands should always be entered in the same manner.

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

Phoneset: Set the message size. The TNC defaults to a value of 16 (8 byte limit) for phone. I am changing it to Outpost message 16,000 characters.

You can make it smaller if you want. However, you will have to manually enforce this as a policy since Outpost will not default to a message size as it receives.

pseudodns: Turn this off. When On, Routing headers are added to the end of the message.

4. Lastly, set up some messages and controls for a P12B context:

pseudodns: This sets the message to be sent back to the user immediately on a connection to the P12B. It can be up to 128 characters.

msg: Make sure that someone attempting to connect to your network is using msg.

context: Because keyboard or keyboard request will be passed to the TNC by the CMSG command, let the user know that they are being handled correctly.

datename: Set the name of the TNC so that messages are time-stamped correctly.

4.4 Set up for remote sysop

My BBS in a box may be away from where I am, therefore, I want to have a remote access. The following commands set up how to remotely perform SYSCP commands:

myremote: Set the connect address to access this BBS. The myremote command capability comes pre-enabled. You are entering a call sign and SSHD to what you will be connected to end your problems. I suggest using a format: W6CMA.

The command will perform a soft reset when entered.

mycontext: Set the password string that the TNC will use to challenge any user attempting to gain SYSCP access either when connecting by a Telnet or when performing SYSCP programs to the P12B remotely. I set the default string of "W6CMA." See Step 5.3 Sysop Connect Test.
4.5 Optional TNC Settings

There are a series of commands that you may use with the TNC to further customize your TNC/PBS. Here are the ones listed:

1. **Beacon**: This is the beacon that is sent every 20 minutes. It is disabled by default.

2. **Encrypt**: The TNC will encrypt the traffic sent through the Serial Port. It will encrypt the text to be transmitted periodically at stations.

**NOTE**: Alternatively, the CW L and CW TEXT commands can be used to send the CW identifier.

**NOTE**: If the MONITOR is left ON, the TNC will continue to send the traffic through the Serial Port. It is unclear whether this will significantly increase its size because the Serial I/O buffer is 128 bytes.

---

**Step 5 Initial Test**

To get the system up and running, you need to get it off the assembled code and onto the air. My intention is to deploy a very simple amateur radio system that includes:

1. **KPC-1P**
2. **Radio Shack HTX 200V**
3. **Two powered off of a 12V 7Ah gel cell battery**
4. **and all the interconnecting cables**

My basic check list is to do the following things:

1. **Assemble the system using garage**
2. **Find the pieces with the TNC, test connections to the KPC-1P in a test world, have one pick up a message**
3. **Connect to a repeater, and check that I have access to all TNC commands**

Proceed as follows:

<table>
<thead>
<tr>
<th>Step</th>
<th>Notes, Comments, Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Assemble the system</td>
<td>This is really all up to you, as to what you have or equipment. Connect all the parts and power it all on. This is where my comments start.</td>
</tr>
</tbody>
</table>

5.2 User connect test

For this test do the following:

1. **Connect using the PANS using the DTMF-1 call sign**
   - Once connected, note that there is 48,000 bytes of memory available.
   - Also, confirm that your PBS welcome message is as you wanted it to read.

2. **Send yourself a short message**
3. **Link messages**
   - Retrieve the message, and then kill the connection.
4. **Log off when done**

---

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Step #6 Final Packaging

A quick start is really a matter of personal preference. Depending on where you intend to put and power your PBBS, you will determine how it goes together. In my case, I wanted a portable unit that could be deployed anywhere throughout the city. In the event we needed to establish a backup or temporary PBBS, or unusually demanding, here are the pictures of my system:

### Steps

<table>
<thead>
<tr>
<th>Steps</th>
<th>Notes, Comments, Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Connect to the PBBS using the WGTDM call sign.</td>
<td>The PBBS replies with 3 sets of numbers. I pressed the 1st set in this case. To make it easier, I always try to get the password (remember setting the text above) with the numbers associated with each channel. So, “CC” is 1, “F” is 6. “N” is 22, and 3130.</td>
</tr>
<tr>
<td>2. Navigating the 1st row of numbers against the reset code, you get: 3-5, 2-10, 12-4, 4-2, 20-6, 13-5</td>
<td></td>
</tr>
<tr>
<td>“password” is entered after the 5 codes. Once the PBBS confirms the correct entry, you see the password prompt.</td>
<td>NOTE: What you enter is case-sensitive.</td>
</tr>
<tr>
<td>3. At this point, you have access to the command line and can typically see from the TNC’s command prompt. However, you don’t have access to the usual PBBS user commands when it runs on auto mode.</td>
<td></td>
</tr>
<tr>
<td>4. To exit, enter an EXIT-C to get back to the TNC’s prompt, then type “1” to disconnect.</td>
<td></td>
</tr>
</tbody>
</table>

### Summary

This is it! If you come up with an interesting implementation or packaging scheme, please send it 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
Access the TAPR Facebook account at www.facebook.com/TAPRDigitalHam

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 wal1ou at tapr.org. The deadline for the next issue of PSR is August 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

TAPR is a community that provides leadership and resources to radio amateurs for the purpose of advancing the radio art.
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/> in the ARRL Propagation Bulletin for April 13 <www.arrl.org/w1aw-bulletins-archive/ARLP015/2012> and I mentioned it here <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 <www.home.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!


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

###
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 rack.
• 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
Posters: Poster Chair, Paulo Blikstein, at summit-posters at oshwa.org
Demo: Demo Chair, Charles Pax, at summit-demos at 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, 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

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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 (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

PSR Editor:
Stan Horzepa, WA1LOU
One Glen Avenue
Wolcott, CT 06716–1442 USA
Phone 203–879–1348
E-mail wa1lou at tapr.org
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)

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