

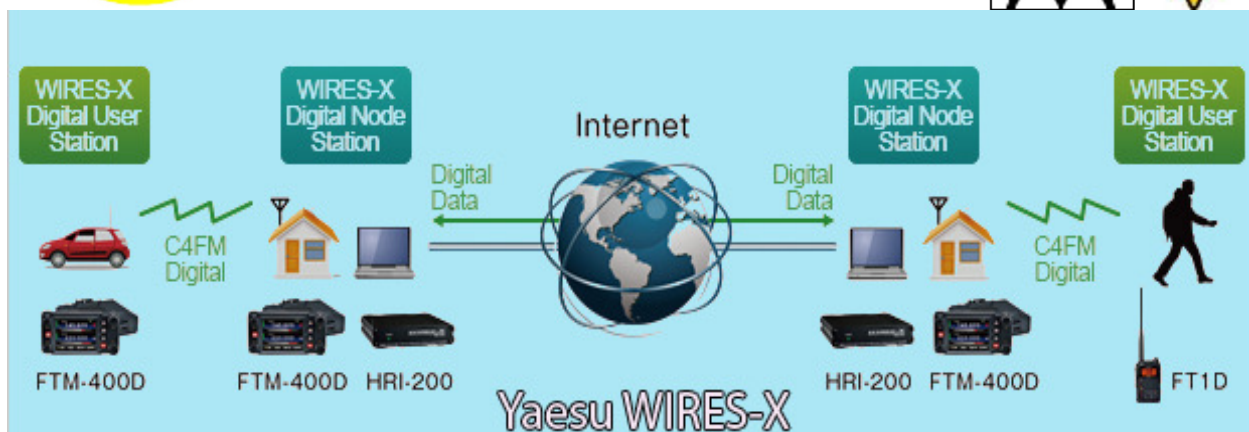
## PENN WIRELESS ASSOCIATION

# X-MITTER



***PUBLIC SERVICE  
THROUGH COMMUNICATION***

February 2015 Vol. 54 No. 2



**YAESU**  
The radio

*Introducing the C4FM/FM and Repeater System*

## Mixed-Mode DR-1 C4FM/FM Repeater System

*System Fusion*

*Leading Amateur Communications Into the Future*

A digital user to transmit in digital and the repeater will convert the digital signal to analog for non-digital users

[www.radiocronache.com](http://www.radiocronache.com)

The radio. YAESU

## PENN WIRELESS ASSOCIATION

### CLUB INFORMATION

W3SK VHF Analog Repeater Frequency: 146.790 MHz (-0.6, 131.8pl)  
W3SK UHF **Fusion** and Analog Repeater Frequency: 448.225 MHz (-5.0, 131.8pl)  
Echolink to W3SK Repeater System: Via W3SK-L (node# 502543)

PWA Webpage URL: [PennWireless.org](http://PennWireless.org)  
PWA Email: [PennWirelessARC@gmail.com](mailto:PennWirelessARC@gmail.com)  
PWA Executive Board: [PWA-EBoard@googlegroups.com](mailto:PWA-EBoard@googlegroups.com)  
Technet Email Reflector: [PWA-Technet@googlegroups.com](mailto:PWA-Technet@googlegroups.com)

**Penn Wireless Association** holds regular meetings consisting of general club business, current committee reports, group discussions, featured programs and a social period. This meeting is held at the Falls Township Building, 188 Lincoln Highway, Fairless Hills, PA on the third Monday of each month at 8:00 pm. Please contact the club vice president to add your business topic to the meeting agenda.

**ALL VISITORS ARE WELCOME!**

### PWA-Technet @ [googlegroups.com](http://googlegroups.com) Email Reflector User Account Policy

Penn Wireless Association, Inc. does not knowingly profit and/or disseminate user e-mail information to "spam" lists. The reflector provides us a means to just send e-mail to those who wish to receive notification when new X-Mitter issues and other relevant information (including, but not limited to, volunteer requests, ARES/RACES meetings, Field Day information, & Club events) are available for you to view on PWA web sites. We routinely send mass e-mail notification to all users, but we avoid issuing e-mail that is unrelated to Amateur Radio. However, we may send a mass e-mail to all users only if there is a problem with the web site, during web site maintenance, or during an emergency or scheduled public service event in order to notify those Amateur Radio operators who may wish to participate in RACES/ARES or PWA operations. If you have already registered as a user please review your account's distribution settings and if your e-mail is current so we may send you notification when new X-Mitter issues

### X-MITTER Newsletter Policy

**X-MITTER**, the official newsletter of Penn Wireless Association, is published monthly by and for Penn Wireless members and all Radio Amateurs. All material in **X-MITTER** may be reprinted, providing that a credit line is given, mentioning **X-MITTER**, Penn Wireless, Inc. and the byline contributor. The **X-MITTER** publication committee strives for accuracy, and we believe that all articles submitted are factual in their content. **X-MITTER** and PWA cannot be held responsible for inaccuracies of information and/or sources. All material submitted by PWA members shall be published, providing that such items meet generally accepted standards of quality and substance. Contributions by others shall be considered on a space-available basis. PWA membership is open to all persons with an interest in amateur radio, subject to approval of the executive board and current membership. A valid Amateur Radio license is required for full voting privileges. Mail for **X-MITTER** should be sent to: **Penn Wireless Association, P.O. Box 925, Levittown, PA 19058**. Contributions may, also, be E-mailed to [pwa-x-mitter@googlegroups.com](mailto:pwa-x-mitter@googlegroups.com). The closing date for submission of appropriate material to the pending issue (space permitting) is one week before the PWA General Meeting. We exchange **X-MITTER** with other area club newsletters. If your club is interested in exchanging with us, please e-Mail our group accordingly. Copyright © Penn Wireless Association, 2015.

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### PWA ANNUAL MARCH AUCTION

3/16/15  
7:30PM

FALLS TOWNSHIP  
MUNICIPAL BLDG  
188 US RT1  
FAIRLESS HILLS,  
PA 19030

Remember we "try" to get the business portion of this meeting started earlier than usual, then start the auction by 8 or 8:30.

Monday evening March 16th 2015 Penn Wireless Association will again hold their annual club auction.

VE testing is typically at 6:30; a brief business meeting at 7:30; and the auction will get underway

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## PENN WIRELESS ASSOCIATION



### WE ARE GROWING

This issue is 24 pages, thanks to our contributors and ex-

panding in size and popularity.

We are developing our newsletter in a recent version of Microsoft Publisher, an MS Office application and including whenever possible, color photographs that display far better on monitors than when printed on copy paper.

Thanks to my employer, J Lorber Co. [www.jlorber.com](http://www.jlorber.com), we have a Dell laser printer to make a limited run of X-MITTERs. However, making paper prints is expensive and time-consuming. Printing to paper is not environmentally friendly, but if you must have one, please contact me personally and I'll reserve a copy for you and delivered at one of our monthly meetings.

We will print just six copies for distribution to new or upgrading license candidates at our monthly VE sessions. We hope to inform potential members about Penn Wireless Association that will interest them to attend our monthly meetings and join our club.

### FROM THE EDITOR

#### PRINT AND VIEW VERSIONS

Both the Print and View copies are written to a \*.PDF portable document file using Foxit PDF Reader software, a free program that runs equally well on Windows XP or Windows 7.

The Print version is paginated to permit printing two X-MITTER pages on one side of legal-size paper, and folded in booklet fashion. The number of pages must be evenly divisible by four. After folding, the booklet is open, turned inside fold down on a piece of Styrofoam and a single staple is driven in the center of the fold. The booklet is carefully lifted off and turned outside fold down so that the staple can be closed.

The Print copy is available for anyone to print should they so desire, however a better way to read X-MITTER is by downloading and opening the View copy. Unlike the Print copy, the View copy is paginated for on-screen viewing.

Commercially published documents will use specialize software to create a digital magazine that appears on the screen like a paper copy, complete with page turning,

visual, and sound effects. PWA unfortunately does not own this software and unlikely to license it. We'll wait until it becomes available in public domain

We have used the Issuu service to post our view versions; members and the general public could view the issue on Issuu. It has become a paid-subscription site (imagine!), although there may be a way to access it freely, but beware of the advertisements.

Due to bandwidth limitations of some network servers, we are publishing our documents after formatting the picture for image compression. Thus, our images will not hold up well for wall-size prints, although actual-size, screen viewing should be quite acceptable for most readers.

#### BE AN X-MITTER SUPPORTER

We are not professional journalists, technical writers or publishers. These issues are working documents even after days of preparation and finishing. We will routinely modify a published issue to enhance or correct material printed. If you see an error, please report it to

*(Continued on page 19)*

## PENN WIRELESS ASSOCIATION

### ON THE COVER

Now that we have a repeater able to dialog with C4FM digital radios we have the option to add a wide area enhancement to the system. The enhancing technology is offered by Yaesu and is called WIRES. The acronym spells Wide-coverage Internet Repeater Enhancement System.

Two flavors of the Yaesu Radio network are available, WIRES-II and WIRES-X. With the latter enhancement using a device called HR200, a station that utilizes C4FM communication and the Yaesu System Fusion protocol becomes an access point to the YSF network which extends by way of the Internet to other users anywhere with similar communication technology.

Amateur radio operators equipped with the Yaesu YSF radios notice the full benefit of digital voice over IP communication.

The characteristic narrow bandwidth speech mixed with RF noise that we all expect of amateur radio audio is totally eliminated – like talking effortlessly on a land-line phone or watching the nightly news on a FIOS or Xfinity digitally-connected television.

Digital communications can be very complicated if effective realization of the various linking and protocol translating hardware are considered, however much of the worry over making things work have been solved by Yaesu so the result is a “simple, easy and user friendly” communications mode. Newer amateur radio operators without benefit of homebrew radio experience, but with interest in computers and advanced digital communication, will embrace the new technology and the chance to meet hams all across the Yaesu radio universe.

With YSF, a lot of new services like digital pictures, movies, GPS and deterministic address selection, much like a cellular phone, are offered to further enhance the user's amateur radio experience.

Yaesu recognized the pitfalls in making these connections “play” and have done their due-diligence in making their implementation plug-and-play. I am hopeful that they will share their experience with other companies interested in becoming YSF-compatible.

According to Yaesu, connection Ids and DTMF connection codes are no longer

needed.

New for YSF is the concept of nodes and rooms, and these higher layer protocols are embedded automatically and exchanged in their C4FM digital signaling. These “nodes” are ..... Using their node addresses, amateur radio operators can select communication areas to direct their communications by specifying “rooms.” Yaesu and their affiliates provide address lists for rooms established throughout the YSF universe.

Continued communication with a logical connection is guaranteed by the digitally encoded addresses between stations. New connections are possible between nodes by polling an ID, somewhat reminiscent of a station calling another FCC-issued call sign by phone inquiry, but more like sending a text message to another operator to schedule an RF call at a predetermined time and frequency.

There is a whole lot more going on under the hood. I will explore further features, tips and techniques in future articles. In the meantime do a bit of web-surfing; try any of the popular search engines using the words Yaesu Fusion Radio, and have fun learning.

## PENN WIRELESS ASSOCIATION

### JANUARY MEETINGS



#### **PWA Business Meeting Minutes**

**Date :**  
**01/12/15**  
**Call to Order:**  
**7:35 P.M.**

#### **In Attendance:**

Tom Stafford (KE3QC) - Vice President  
Howard Rubin (N3FEL) - Treasurer  
Jim Petrosky (KE3LA) - Recording Secretary  
Guests: Cully (N3HTZ) Repeater Chairman, Scott (KD2EQP) PWA Webmaster

#### **Old Business:**

**Treasurer's Report:**  
Brief discussion on anticipated Field Day expenses.

Howard (N3FEL) reported on a revenue generating proposal (Market America) as suggested by Paul (N3TMX).

New PO Box active. Accounts and activities address have been changed.

#### **Repeater:**

Cully (N3HTZ) reported new Fusion system is working well. Will resume site activities/improvements after weather improves.

Cully (N3HTZ) and Mark (WA3QVU) to do Fusion presentation at the General Membership meeting.

#### **Membership:**

Jim (KE3LA) presented examples of new member welcome packet.

Jim (KE3LA) to begin direct mail campaign in January.

V.E. session is scheduled for January General Membership meeting.

#### **Activities:**

Board approved official list of club-sponsored activities.

- ◆ Field Day 6/27 - 06/28/15
- ◆ Picnic/NAQP 8/15 - 08/16/15
- ◆ PAQSO Party 10/10 - 10/11/15
- ◆ Holiday Party 12/21/15

January General Membership Program - Fusion Presentation.

#### **New Business:**

##### **Website**

Scott (KD2EQP) reported on his progress with upgrading the PWA website.

Scott (KD2EQP) requested various items be forwarded to him for publication on the website. Preferred submission format is .pdf (scott@pycik.com).

Scott (KD2EQP) hopes to have the new website published (active) in two weeks.

Meeting Adjourned at: 9:46 P.M.

#### **Submitted by:**

**Jim Petrosky, KE3LA**  
**Recording Secretary**

#### **PWA General Membership Meeting Minutes**

**Date: 01/19/15**  
**Call to Order: 8:15 P.M**

Opening ceremonies: Pledge of Allegiance, Round of Introductions

#### **In Attendance:**

N3TMX, KE3QC, N3FEL, KE3LA, K3JQH, WA3QVU, K3TX, KA3ZKJ, NY3J, K3FKW, K3JCP, N3OJB, N3HTZ

#### **Old Business:**

**Treasurer's Report:** By N3FEL  
**Board Actions Report:** By N3TMX. New PO box office established for PWA. Penn Wireless Association, PO Box 925 Levittown, PA 19058-0925

#### **Website: Scott (KD2EQP)**

Prepping new website for startup. He expects it to be ready (published) in two weeks. Various board members have forwarded Scott items for inclusion on the web page. Members wishing to contribute suggestions, comments or other items should contact Scott via scott@pycik.com. Preferred format for submissions will be .pdf.

Board approved four club-sponsored activities ..

- ◆ Field Day 06/27/15 - 06/28/15 at Tyler Park
- ◆ Club Picnic/NAQP 08/15/15 - 08/16/15 - Venue Open,
- ◆ PAQSO Party 10/10-



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- 10/11/15, Venue Open  
♦ Holiday Party 12/21/15,  
Venue Open

**V.E. Report:** By K3JQH  
Three exams given on  
01/19/15. One candidate  
passed Tech exam.

**Repeater:** By N3HTZ  
New Fusion system working  
well. Several members on air  
with FT1DR HT's.

**Membership:** By KE3LA  
New member welcome packets  
prepared. Direct mail campaign  
to begin this month.

**Activities/Public Service:**  
No report

**New Business:**  
Field Day: Mark, WA3QVU  
Donation can available to help  
defray costs

**Presentation:** By Mark  
(WA3QVU) and Cully (N3HTZ)  
Video on new Yaseu Fusion sys-  
tem (video). Comparison of  
digital communication proto-  
cols D-Star, Fusion, DMR (video)

**Break:** 9:30 P.M.— 9:45 P.M.  
Presentation - Part 2 -WiresX  
video, Arduino repeater inter-  
face - Cully

**Additional:** 50/50 drawing -  
Winner - Howard N3FEL  
Meeting Adjourned at: 10:15 PM

**Submitted by:**  
**Jim Petrosky, KE3LA**  
**Recording Secretary**

## MEMBERSHIP CHAIRMAN

### It's Our Club

Dear Members,

Penn Wireless Association is at a crossroad. In a time where life places increasing demands on our time and resources, our club finds itself in the unenviable position of declining membership, interest and activism. A club the size of Penn Wireless is entirely dependent on its members to insure continuing survival. I know that many of us would never have discovered the joy of amateur radio without the efforts of a healthy and vibrant radio club.

As a result, your E Board has decided to make membership one of its primary goals this year. We are currently engaged in a direct mail campaign to solicit the return of inactive members and well as reaching out to the large number of amateurs in our immediate geographic area. Additionally, we are exploring other options involving the new web site, soon to come online, as well as venturing into the social media field. Many of you are friends with former members. Why not take a moment and send them a text, email or Facebook mes-

sage and invite them to return to our club.

I write to you today to inform you of our efforts and also to ask for your help. This club belongs to each of us and as such, each of us bears a responsibility to keep it healthy. There are a number of committee chairperson vacancies that we'd like to fill. Too few people are carrying most of the load for the club. I know we all have time constraints but any time you can offer would be greatly appreciated. Open Committee Chairperson positions are as follows:

- ♦ Elmer
- ♦ Hospitality
- ♦ QSL Manager
- ♦ Fundraising
- ♦ Interference
- ♦ Website Alt - Archives
- ♦ Website Advisor

Each of us can add facets to the club that are needed to make us more diverse and successful. Your knowledge, skills and enthusiasm are critical for our continued success.

Additionally, because membership has fallen, your dues are critical to the day to day operation of Penn Wireless.

*(Continued on page 18)*

## PENN WIRELESS ASSOCIATION

### WITH JUST A WSPR



**By Dan  
Romanchik,  
KB6NU**

It's really a m a z i n g what you can do with computers in amateur radio, and there's been an explosion in the number of digital modes. One interesting mode that I've recently been introduced to is WSPR, which is short for Weak Signal Propagation Reporting. The protocol and the original WSPR program was written by Joe Taylor, K1JT, and is designed for sending and receiving low-power transmissions on the HF bands to test propagation paths.

I won't try to cover all the technical details here. There are several sites that cover them pretty well:

\* Wikipedia: WSPR  
[http://en.wikipedia.org/wiki/WSPR\\_%28amateur\\_radio\\_software%29](http://en.wikipedia.org/wiki/WSPR_%28amateur_radio_software%29)

\* G4ILO's Shack:  
WSPT - Distant Whispers  
<http://www.g4ilo.com/wspr.html>

I was introduced to WSPR by my friend, Joe, AC8ES. He posted a message to our club mailing list asking if anyone had a toroid core that he could buy to make a QRP balun for 10 MHz. When I asked what he was going to

use it for, he said that he was making a WSPR transmitter with a Raspberry Pi, and the balun was for the dipole he built for it. He said that he'd gotten roped into doing this because he'd attended a local Raspberry Pi users' group, and when he mentioned he was an amateur radio operator, they encouraged him to try this project.

How could I refuse a request like that? I have a whole kit of ferrite cores, and after some back and forth, we found a small core that he could use.

The software he chose is

WsprryPi  
<https://github.com/JamesP6000/WsprryPi>

It's described a "Raspberry Pi transmitter using NTP-based frequency calibration." It uses a GPIO port to generate WSPR signals anywhere from 0 to 250 MHz. Joe said that there are several Raspberry Pi programs that run WSPR, but that he chose this one because it seemed to have more features than the others.

The Figure above shows Joe's setup. Since the output generates a square wave, a low-pass filter is needed to filter out the high-frequency components. As you can see,



the GPIO output is fed through a 0.1uF decoupling capacitor into a Mini-Circuits 10.7MHz low-pass filter, then to a 1:1 balun, which is connected directly to the dipole elements.

Joe says, "The antenna is just a dipole taped up to the walls of my living room and hallway." As you can see he made the balun and dipole from 24 ga speaker wire.

The performance of this setup has been kind of amazing. In one e-mail, Joe reported, "Your toroid seems to be working well. Got the balun and antenna finished and executed seven WSPR transmissions from the Raspberry Pi. The WSPR reporting website

WSPRnet  
<http://wsprnet.org>

came back with a couple dozen reception reports; typical distance is ~300+ miles, max was 593 miles." In a second e-mail, Joe writes, "Did a few more beacon transmissions and checked the WSPR signal re-



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ports again. Someone picked up my 5 mW signal from 1010 miles away in Canada."

Joe's turned into quite a WSPR fan. He's even written an Android app -

WSPRnet Viewer

<https://play.google.com/store/apps/details?id=com.glandorf1.joe.wsprnetviewer.app>

to retrieve and displays report from [www.wsprnet.org](http://www.wsprnet.org). Tapping on a specific report displays more details about it, along with a world map that shows transmitter and receiver locations.

Unfortunately, I don't have a Raspberry Pi, or I'd try this as well. I do have a Beagle-Bone Black, but there doesn't seem to be software that I can download and install as easily as the Raspberry Pi software. That being the case, this might be a good excuse to purchase one of those new, cheaper RPis.

---

*When he's not digging through his junk box or teaching amateur radio classes, KB6NU writes about amateur radio at KB6NU.Com.*



*He has just released The CW Geek's Guide to Having Fun*

*with Morse Code. The CW Geek's Guide to Having Fun with Morse Code is now available in [PDF](#), Kindle and [Nook](#) e-book formats. Written in my "no nonsense" style, this book is designed to not only help you get started in CW, but to have fun doing it. The book is available on [Amazon.Com](#) or on [KB6NU.Com](#).*

*(Continued from page 10)*

per. Once the final procedures go into effect designating electronic access as the default, licensees can change the ULS License Manager setting so that the Bureau will print and mail a license document. Licensees also may contact FCC Support via the web at

[http://esupport.fcc.gov/index.htm?job=contact\\_fcc\\_support](http://esupport.fcc.gov/index.htm?job=contact_fcc_support)

or via telephone or mail to request paper licenses. The FCC rejected as "outside the scope of this proceeding" an ARRL argument that Section 97.23 of the Amateur Service rules be amended to replace "licensee mailing address" with other alternatives, including e-mail, for use in Commission correspondence. The rule, which requires that any licensee mailing address be in an area where the licensee has US Postal Service access, has precluded FCC issuance of location-specific call signs in such areas as Navassa Island (KP1) and some Pacific islands.  
NNNN

**Forwarded by  
Ron Wenig, NY3J**

*I guess this means that the next time I'm at the repeater site and the police come I won't have a Ham Radio license to show them :-)*

### HAMFESTS & CONVENTIONS

#### **2/21/2015 | Gloucester City**

ARC Location: Gloucester City, NJ,  
ARRL Hamfest: Gloucester City Amateur Radio Club  
Website: [nj2gc.org](http://nj2gc.org)

#### **5/03/2015 | WARC Hamfest**

Location: Newtown, PA  
ARRL Hamfest: Warminster Amateur Radio Club  
Website: [k3dn.org/hamfest.htm](http://k3dn.org/hamfest.htm)

#### **10/02/2015 | Mid-Atlantic States VHF Conference**

Location: Bensalem, PA  
ARRL Convention pending Executive Committee approval  
Mt. Airy VHF Radio Club  
Packrats  
Website: [www.packratvhf.com](http://www.packratvhf.com)

## PENN WIRELESS ASSOCIATION

### FCC ACTIONS

#### **BREAKING NEWS: FCC INAUGURATES PAPERLESS HAM RADIO LICENSING EFFECTIVE FEB 17 (Courtesy ARRL)**

Starting February 17, the FCC no longer will routinely issue paper license documents to Amateur Radio applicants and licensees. The Commission has maintained for some time now that the official Amateur Radio license authorization is the electronic record that exists in its Universal Licensing System (ULS), although the FCC has continued to print and mail hard copy licenses. In mid-December the FCC adopted final procedures to provide access to official electronic authorizations, as it had proposed in WT Docket 14-161 as part of its "process reform" initiatives. Under the new procedures, licensees will access their current official authorization ("Active" status only) via the ULS License Manager. The FCC will continue to provide paper license documents to all licensees who notify the Commission that they prefer to receive one. Licensees also will be able to print out an official authorization - as well as an unofficial "reference copy" - from the ULS License Manager. "We find this electronic process will improve efficiency by simplifying access to official authorizations in ULS, shortening the time

period between grant of an application and access to the official authorization, and reducing regulatory costs," the FCC Wireless Telecommu-

nications Bureau (WTB) said. According to the WTB, the new procedures will save at least \$304,000 a year, including the cost of staff re-

sources. In comments filed November 5, the ARRL had strongly recommended that the FCC "give serious consideration to continuing a default provision for sending an initial paper license document to new licensees in the Amateur Radio Service, along with detailed, simple instructions for how to make the elections set forth in the notice relative to future modified or renewed licenses." The FCC said that applicants or licensees who include a valid e-mail address under "Applicant Information" in the ULS will receive an official electronic authorization via e-mail. New license applicants who do not provide a FCC Registration Number at the

examination point will receive a printed license as well as an FRN and a temporary password to access the Commission Registration System (CORES). The ARRL and other Amateur Radio commenters also worried that unless a

license document is printed on distinctive paper stock, its authenticity could be questioned in such situations as obtaining vanity call sign licenses

plates. To address this, the FCC said the watermark "Official Copy" will be printed on each page of an official authorization that a licensee prints out from the ULS. The WTB recently stopped using distinctive paper stock to produce hard copy licenses and has been printing these on "standard, white recycled paper." The Bureau noted that the distinctive paper stock it had used was six times more expensive than the plain recycled paper it now uses. The ULS License Manager now includes settings that allow licensees to notify the WTB that they prefer to receive official authorizations on pa-

*(Continued on page 9)*

UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION AMATEUR RADIO LICENSE XX3XXX			
JOHNATHAN WIDE [uselessly redacted --GL] PALO ALTO, CA 94306			
FCC Registration Number (FRN):		98765432100	
Special Conditions / Endorsements			
NONE			
Grant Date	Effective Date	Print Date	Expiration Date
01-10-2013	01-10-2013		01-10-2023
File Number	Operator Privileges		Station Privileges
000123456789	Technician		PRIMARY
THIS LICENSE IS NOT TRANSFERABLE			
_____ (Licensee's Signature)			
FCC 680 - May 2007			

## PENN WIRELESS ASSOCIATION

### W3SK REPEATER

#### To Link or Not to Link...

By Mark Hinkel, WA3QVU

Our amateur radio play has the main character on stage. With Shakespearean gestures, Ham(let) says, "To link or not to link, and to where ... that is the question."

D-Star, DMR, Allstar, the list goes on, all linking thru the internet. Now that PWA has the new Fusion repeater, when will we link to the internet? Hmmm, I don't have an answer for that. What is clear to me is -- the Fusion radio is much more accommodating than D-Star in allowing hams with different radio modes to communicate with one another.

Tom, KE3QC and Howard, N3FEL advise to work with the board and make a proposal for repeater upgrades at one of their monthly board meetings. Well folks, we are nowhere near there yet. Ron, NR3J advises to take things one step at a time. After a phone call to Doug, N3OJB one Friday evening, I'd like to propose a step-by-step plan that will put a Wires-X node together without dipping into the club treasury. That'll make our Treasurer happy.

**In the meantime, we can instantiate a simplex node repeater to link to Yaesu's System Fusion, YSF via their Wires-X interface box, HRI-200 to sample their new world of digital voice radio -- and here's how it can be done.**

**Step 1:** Doug or I will purchase the Wires-X box and run the software on a computer at Doug's house in Levittown.

**Step 1a:** Register the Wires-X box with Yaesu so we can get it running on the system in Analog mode.

**Step 2:** Connect a radio to the box, either VHF or UHF -- frequency to be determined later. Since every time the internet talks the radio will be in transmit mode, it's best not to run things on a ham-quality radio -- we would rather setup a commercial-quality VHF/ UHF radio.

**Step 2a:** I have a Kenwood TK-860G -- the "H" model with 40w transmit. Or maybe (if we're lucky) Cully, N3HTZ will come up with a 110w Motorola radio and tune it back to 70 or 80 watts so the finals don't cook themselves. In either case, we apparently need the line output that bypasses the

squench and gives us COR (Carrier Operated Relay.) Commercial-quality radios usually do that as well as ham-quality radios with the 6 pin DIN connector on the back.

**Step 3:** After making sure the radio and Wires-X box connect to the internet, announce the simplex frequency to PWA members.

**Step 4:** Determine if we wish to join a Yaesu "Room" or create our own Room.

**Step 4a:** Determine the difference between the Analog FM side and the Digital side of the Wires system. As far as I know, the Yaesu Wires system is currently running both, but only running voice. Eventually we'll be able to send text and pictures on the Digital side.

**Step 5:** Enjoy Internet connected radio to stations worldwide.

**Step 6:** Get more "local users" on the node with Fusion -- either the HT or Mobile radios.

**Step 6a:** This is when we'll need a FTM-400DR running full time at Doug's house.

**Step 7:** Think about linking the internet node to the repeater in Digital mode via RF -- a bit more difficult but

*(Continued on page 19)*

# PENN WIRELESS ASSOCIATION

## February 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Technet 8PM						
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
Technet 8PM	PWA E-Board Meeting 7:30PM					
<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
Technet 8PM	PWA General Meeting 8 PM			Arduino uP SIG Mtg 7:30p Falls Rm 205		
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
Technet 8PM						

# PENN WIRELESS ASSOCIATION

## March 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Technet 8PM						
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
Technet 8PM	PWA E-Board Meeting 7:30PM					
<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
Technet 8PM	PWA General Meeting 8 PM			Arduino uP SIG Mtg 7:30p Falls Rm 205		
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
Technet 8PM						
<b>29</b>	<b>30</b>	<b>31</b>				
Technet 8PM						



## PENN WIRELESS ASSOCIATION

### EMBEDDED SYSTEMS GROUP

By Ed Wells, N3IAS

#### Introduction

While on the ham radio in Spring/Summer of 2012, there were several discussions involving an increase in digital electronic devices showing up in radio designs. Digital electronics was showing up in newer radios and many other radio-related devices (antenna tuners, radio keyers, Morse encoders/decoders, etc.) Digital electronics was also showing up in many other areas of our lives: Kitchen appliances, automotive application, lighting systems, heating and air conditioning systems, security systems, smart phones, and more.

#### Interest Areas

Initially, these devices used many discrete digital IC chips providing only hard coded functionality. Today's electronic devices are now using microcontrollers having the ability to think and make decisions. Microcontrollers on a single chip include a CPU, timers, counters, volatile and non-volatile memory, complex DSP's (Digital Signal Processing), input/output signals for monitoring and controlling the outside world, configuration registers to meet a wide

variety of application areas, and more. Microcontrollers are not only single-chip solutions but they also are much less expensive. They operate cooler, are energy efficient, and most of all provide programmability.

#### Programming Environments

Programmability allows the designer to program microcontrollers applicable to thousands of problem-solving areas. If a process needs to be changed, or a new process added, it's as simple as going back to the original programming (called source code), modifying it, compiling it, and downloading it from a development environment back to the microcontroller chip. Most of the programming environment tools are very inexpensive -- if not completely free. These development tools use command-line programs, as well as graphic IDE's. (Integrated Development Environments.)

#### Our Initial Meeting

It was suggested that there should be a place where we could get together to discuss technical issues of common interest for such devices. That's when I decided to put a first meeting together

on September 2012. We met at the Falls Township Building, in Fairless Hills, PA with 7 members attending. Members were from Bucks County, as well as Philadelphia, Montgomery County, New Jersey, and other areas. Our group is open to anyone (radio operators or not.) Their interests vary widely, from a few with professional system development and programming backgrounds, to the hobbyist at many skill levels, and those who attend to learn all about it. Our meetings are kept informal so that we keep the creativity juices flowing.

We have had demonstrations for 3D printers, LED cubes containing 512 individually-addressable lights, on-air station controllers, demonstrations with many devices, and theory classes about many topics. The central focus of our group involves interest with any controller device. One of our meetings was held at a Bucks County electronics manufacturing facility to see how circuit boards are built using hi-tech surface-mount manufacturing. Other meetings have had discussions on PIC chips Atmel chips (used in the Arduino microcontroller kits, Beaglebone Black boards, Raspberry PI computers (using versions of

*(Continued on page 18)*

## PENN WIRELESS ASSOCIATION

### CLASSIFIED ADS

#### VIVITAR CAMERA TRIPOD

Very light weight and complete with carrying case. \$10 each. (includes \$2 donation to PWA.) Five available.

Email n3fel@arrl.net or call Howard at 267-304-6949.



[www.vivitar.com/products/13/tripods/125/vpt-2457](http://www.vivitar.com/products/13/tripods/125/vpt-2457)

[www.amazon.com/Vivitar-VPT2457-57-Inch-Tripod-Black/dp/B002FBDD6K](http://www.amazon.com/Vivitar-VPT2457-57-Inch-Tripod-Black/dp/B002FBDD6K)

***Have something of general interest to the amateur radio community?***

***Send your classified ad by email to PWA-X-MITTER (see below.) Include a cell-phone picture as an attachment.***

***This listing service is available exclusively to current members of PWA.***



#### BEGALI CW KEY

The **Sculpture Mono** was designed to represent the ultimate key of its type, combining materials and state-of-the art techniques that set it apart from anything else on the market.

This fine work of art was graciously donated by Bob Hecht, KA3ZKJ to benefit Penn Wireless Association.

The CW Key, SN#871 is brand new, with documentation and original packaging. It is available now in exchange for a cash donation of \$500. to Penn Wireless Association. *Note: Consult your tax advisor. A donation of cash and items of material value to a 501C3 Non-Profit Organization may qualify as a substantial tax-deductable event.*

Email n3fel@arrl.net or call Howard at 267-304-6949.

[http://www.i2rtf.com/html/sculpture\\_mono.html](http://www.i2rtf.com/html/sculpture_mono.html)

## PENN WIRELESS ASSOCIATION

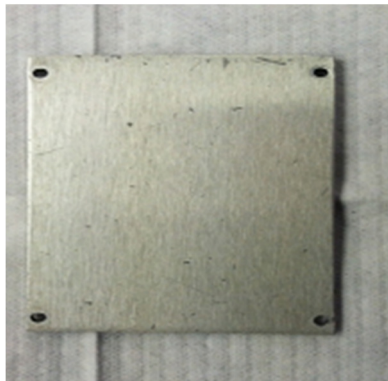
### HOMEBREW

#### Project Graphics

I like to do my own graphics on homebrew projects. While various labeling equipment (P Touch etc.) will do an adequate job, I like something that looks a little more professional. To this end, I use an overlay painting technique. Here is my technique.

Once all fabrication on the project is complete (drilling, tapping etc.) and before you begin assembly, thoroughly clean the surfaces to which you will apply lettering and graphics. A chemical cleaning agent is a good choice. Running the pieces through the dishwasher will remove any remaining contaminants. Your finished work will only be as good as your initial preparation.

Primer the entire project.



**Figure 1** Work piece sanded and cleaned

Two coats make a nice base. A heat gun on medium heat can be used to speed drying time between coats.



**Figure 1-A** Chemical Cleaner/Degreaser

Once the primer coat has thoroughly dried (let the project set over night), apply the base coat. This will be the coloring of your letters and graphics. White lettering on a black ground provides



**Figure 2** Primered work piece

nice contrast.

After the base coat has dried (again an overnight drying time is recommended), apply your masking letters/graphics. I use vinyl stick-on letters/numbers available from the local craft shops. Apply the vinyl lettering to the appropriate locations. Once you are satisfied, gently press each vinyl symbol down to insure proper adhesion. The vinyl lettering/



**Figure 2-A** Primer/Sealer used

graphics will form a mask to block the application of the finish coat/color.

Paint the entire project with the finish color, painting over the entire surface including the vinyl lettering/graphics. Allow adequate drying time between coats. To ease the removal of the masking vinyl, I recommend a maximum of two coats of the finish color. Many times

## PENN WIRELESS ASSOCIATION

a single coat will suffice. The heat gun, on medium heat, can speed up this process and smooth the finished surface on multiple coats. Avoid applying too much heat to the areas with vinyl lettering



**Figure 3 White Base Coat applied**

as they tend to wrinkle and peel if overheated. Allow your project to set overnight.

The last step will be to remove the vinyl lettering/graphics. When removed, the base coat will show through the top coat providing a professional look to your project. To remove the masking vinyl, start on an end-corner of the letter. Use a straight pin or needle to begin to lift it off the project. Once the corner has been lifted, use a small pair of tweezers to completely remove the vinyl mask. Go slowly! Avoid damaging the top coat of paint.

Give the painted parts a day or two before beginning assem-

bly. This will allow the top coat to harden, lessening the chances of damage during assembly.



**Figure 4 Vinyl Masking Letters applied**



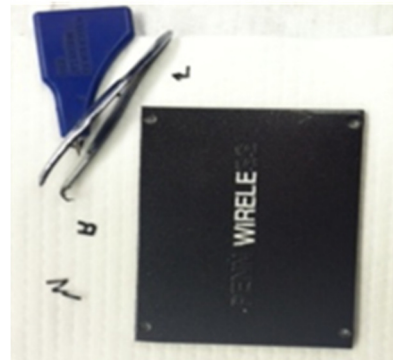
**Figure 5 Work Piece Over-painted**

Hope this helps. I'd love to see your finished work. Have fun. Build, build ... build!

**Jim, KE3LA**



**Figure 5-A Overpaint Used**



**Figure 6 Use Straight Pin and Tweezers to remove**



**Figure 7 Finished Graphics**

## PENN WIRELESS ASSOCIATION

*(Continued from page 7)*

Please remember to keep them current. Until we can develop additional revenue generating mechanisms (currently being investigated by the Board), dues will remain the life blood of the club.

Please try your best to make the General Membership meetings. Mark has generated a very interesting program schedule for this calendar year. It should prove to be both entertaining and enlightening. We would love to hear your suggestions for future program content. Consider offering the membership the benefit of your knowledge by doing a presentation on any subject you feel comfortable with. The Board will assist you with any resources required to develop your presentation. Remember, you are among friends and we are all interested in what you have to say.

Feel free to voice your opinions and suggestions at the E-board meetings are open to any member in good standing and held on the 2<sup>nd</sup> Monday of each month in Rm. 205 of the Falls Township building. You are welcome to join us.

**Thank you,  
Jim KE3LA  
Membership Chairman**

*(Continued from page 3)*

shortly after 8pm.

I have extra copies of the PWA Auction Rules.doc -- or e-mail me and I'll send you an attachment to fill out in advance.

PWA meeting place is the rear entrance of the Falls Township Building, Bucks County, Pa -- located just North of Oxford Valley Rd (Oxford Valley Mall) at 188 Lincoln Highway (Business Rt 1) Fairless Hills, PA 19030.

First we will auction off the donated items, then the non-donated equipment.

If you have an item for sale and wish to place it on the auction block, a donation cost of \$2 per item (or box lot) will be collected.

If the item doesn't sell you're only out the two bucks. (This fee is waved for club members.)

If the item does sell, you pay a 10 percent donation to the club -- the \$2 fee will be deducted from the total.

This is again limited to a \$35 maximum (10 percent of a \$350 sale).

Again this year you do NOT need to disclose the minimum bid -- hold that figure "close vested" -- the bidding will start low and work up.

You the seller will approve

final sale or no sale.

Donated items not sold at auction or immediately after will go to the Warminster Club Hamfest held on Sunday May 2nd, 2015 (Middletown Grange Fairgrounds.)

PWA will have one or two indoor tables at the Hamfest -- look for us there.

**Mark WA3QVU (originally  
3/14, updated 2/8/15)**

*(Continued from page 14)*

Linux, and other operating systems), Industrial PLCs (programmable logic controllers), and others. We've discussed many programming languages such as Assembly language, C language, C++ language, Python, Unix/Linux shell language, Linux programming tools, and more.

### Join Us

We meet at 7:30 PM on the 3rd Thursday of each month in Room 205 at the Falls Township Building. If you would like to join our group, please feel free to stop in. You can also call me at 215-943-6061 for additional information.

**Ed Wells, N3IAS  
Embedded Systems  
Interest Group**



## PENN WIRELESS ASSOCIATION

### COMPUTER USERS



#### Life After Windows XP ...

If you are interested in a replacement operating system following the demise of Windows XP, try Linux Mint. Any LTS (long term support) version should do fine. You can load one onto your computer as follows. You'll find that many desirable, generic SW programs and applications are available on Linux, and they are generally downloadable FREE of charge.

Try it first on a machine that is no longer a primary tool, i.e., one that you can experiment on without consequence of file loss or corruption. If you are careful, you can create a dual boot startup that lets you choose which OS to use ... XP/7/8 or Linux.

How to start? Find and download the LINUX MINT ISO file. Decide whether your preference is for 32bit (older PC with limited

memory) or 64bit (newer PC with lots of memory.) It'll take some time to download the .4GB file. Go do something else, and return to continue.

<http://www.linuxmint.com/>

Find and install FREEDVDISO-BURNER to burn the DVD from your ISO file. This tool runs in the windows environment. This one is a lot smaller, only 1.6MB.

[http://download.cnet.com/Free-DVD-ISO-Burner/3000-2242\\_4-10902630.html](http://download.cnet.com/Free-DVD-ISO-Burner/3000-2242_4-10902630.html)

Use caution when downloading this or any utility from a "free s/w" website. The provider often includes along for the ride unwanted programs that can usually be avoided. Examples are virus checkers, file cleaners, speed enhancers, alien web browsers, etc.

**Howard, N3FEL**

*(Continued from page 11)*

things should work.

**Step 7a:** Make a formal proposal in about a year to the PWA EBoard: YSF-WIRES-X at our repeater at Southampton.

**Further reading:**

<https://www.yaesu.com/jp/en/wires-x/index.phpDigital/Analog>

#### Mutual Communication

"WIRES-X of course also supports traditional analog FM users. Not only can analog FM stations have a QSO with each other, WIRES-X also permits C4FM Digital stations to communicate with analog FM stations. WIRES-X is an FM friendly digital solution, because Amateur Radio should always allow operators to communicate freely all over the globe."

**Mark Hinkel, WA3QVU**

*(Continued from page 4)*

us by email so we can fix it.

Please contribute an article and/or picture for our club's newsletter. Send us an unformatted text version to

[pwa-x-mitter@googlegroups.com](mailto:pwa-x-mitter@googlegroups.com)

If sending us a picture, include a bit of interesting text that we can use to introduce the picture.

Please enjoy this and all other issues of X-MITTER. Soon you will find the current and past issues of X-MITTER on our website at ....

[www.pennwireless.org](http://www.pennwireless.org)

And of course, contact us if you would like to join our staff as an alternate editor.

**Enjoy the issue,  
Howard Rubin, N3FEL**

## PENN WIRELESS ASSOCIATION

### Volunteer Examiners

#### Take the FCC Amateur Exam...

Our ARRL/VEC VE Team is ready and willing to administer any license grade/upgrade or code element test. Confirm your intention to test with Ben Johns, VE Contact at 215-657-5994 not later than the Friday evening before the 3rd Monday of the month. Please advise us in advance of any special needs you may have in successfully completing the intended test. Our testing session begins promptly at 6:30 pm and remains active until all license grades desired are administered. We do not recommend, nor is it our practice, to administer repeat examinations of similar license grades to any candidate. However, progressive license grades may be attempted by any applicant at no additional charge. Please come prepared with the following items.

- ◆ Confirmation of appointment letter, email, note, etc. Walk-ins are not guaranteed a test session.
- ◆ Test fee of \$15 in cash or personal check payable to ARRL/VEC.
- ◆ Either of the following ID methods:
  - One legal photo ID (driver or non-driver license, passport, radiotelegraph license, or other legal photo ID)

OR

- Any two of the following IDs: Non Photo ID/Driver License, Social Security Card, Birth certificate, Minor's work permit, Utility bill, bank statement, business correspondence specifically naming the person, postmarked envelope ad-

ressed to the person at their mailing address as it appears on the FCC Form 605

- ◆ Any of the following ID numbers: Taxpayer ID (Social Security Number), IRS issued EIN (Employer Information Number), Alternate taxpayer ID Number (ATIN), FCC Issued Registration Number (FRN), FCC Issued Licensee ID Number
- ◆ The **\*\*original\*\*** plus one copy of your FCC license or CSCE (Certificate of Successful Completion of Examination). The original will be returned immediately to you.
- ◆ If applicable, a Physician's Statement if necessary to validate your claim of difficulty at reading, writing or speaking when requesting special assistance.
- ◆ A calculator is recommended and allowed if ALL internal memories are cleared and can be demonstrated free of information. A simple four-function calculator is suggested.
- ◆ One or more black-lead pencils and eraser, and a ball point pen.



*Penn Wireless Association  
P.O. Box 925  
Levittown, PA 19058*



## APPLICATION FOR MEMBERSHIP

*Personal Information (please print):*

Name: \_\_\_\_\_ Date : \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Home Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

Birth Date: \_\_\_\_\_ Occupation: \_\_\_\_\_ ☐ active ☐ retired

*License Information:*

Call Sign: \_\_\_\_\_ Class: ☐ Novice ☐ Tech ☐ General ☐ Advanced ☐ Extra

Date First Licensed \_\_\_\_\_ Previous Calls: \_\_\_\_\_

*Preferences:*

ARRL Member? \_\_\_\_\_ Other Clubs? \_\_\_\_\_

Bands/Modes Frequently Operated \_\_\_\_\_

Emergency Power? \_\_\_\_\_ Portable/Mobile? \_\_\_\_\_

*Favorite Amateur Radio Activities: (note all that apply)*

- |   |                                       |  |  |
|---|---------------------------------------|--|--|
| <input type="checkbox"/> Awards         | <input type="checkbox"/> Traffic      | <input type="checkbox"/> Contesting      | <input type="checkbox"/> Digital Radio       |
| <input type="checkbox"/> Rag Chewing    | <input type="checkbox"/> MARS         | <input type="checkbox"/> Field Day       | <input type="checkbox"/> QRP                 |
| <input type="checkbox"/> Projects       | <input type="checkbox"/> Newsletter   | <input type="checkbox"/> Fund Raising    | <input type="checkbox"/> Renewable Energy    |
| <input type="checkbox"/> DX'ing         | <input type="checkbox"/> Fox Hunting  | <input type="checkbox"/> Public Service  | <input type="checkbox"/> QSL Card Collection |
| <input type="checkbox"/> County Hunting | <input type="checkbox"/> Packet Radio | <input type="checkbox"/> Rig Restoration | <input type="checkbox"/> _____               |
| <input type="checkbox"/> Education      | <input type="checkbox"/> Hamfest      | <input type="checkbox"/> Antennas        | <input type="checkbox"/> _____               |

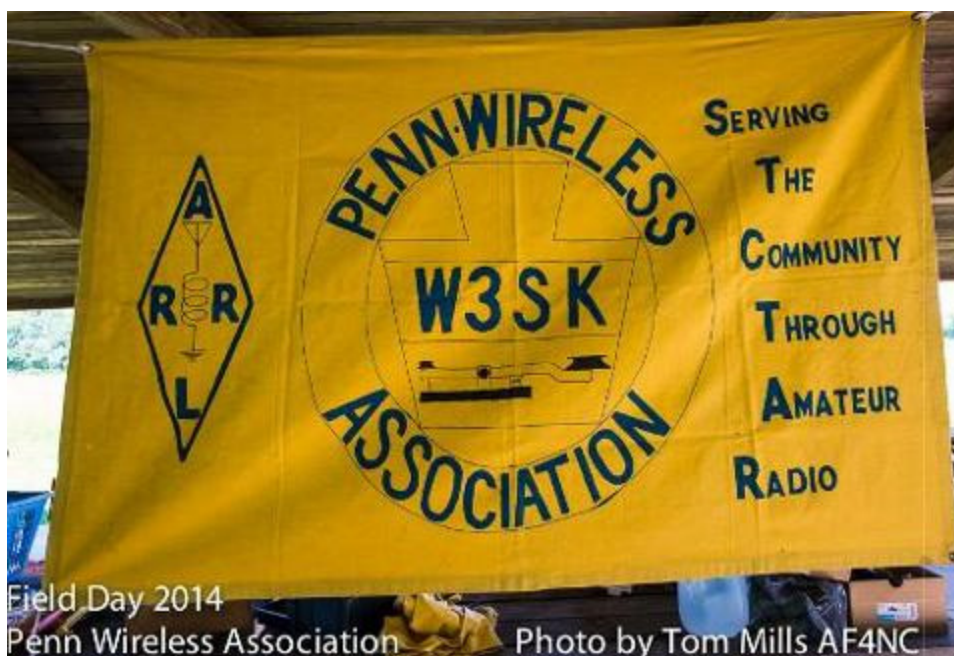
Comments: \_\_\_\_\_

Sponsored By: \_\_\_\_\_ Annual Dues: \$20. Paid \_\_\_\_\_

## PENN WIRELESS ASSOCIATION

### Executive Board ...

PRESIDENT	PAUL CEGLIA, N3TMX 610-608-9584	cegtv1@aol.com
VICE PRESIDENT	TOM STAFFORD, KE3QC 215-584-3428	ke3qc@ke3qc.com
RECORDING SECRETARY	JIM PETROSKY, KE3LA 215-943-7654	ke3la@comcast.net
TREASURER	HOWARD RUBIN, N3FEL 267-304-6949	n3fel@arrl.net
CORRESP. SECRETARY	ALEX GROSS, KB3SYY 215-639-8306	kb3syy@yahoo.com



### *Silver Service Award*

Penn Wireless Association sponsors the Silver Service Award to recognize amateurs who have performed outstanding service to their club, their community and Amateur Radio. Nominations are accepted throughout the year and a candidate is selected to be honored at our annual banquet or holiday dinner. Nominations should be mailed to PWA Silver Service, c/o Penn Wireless Association, P.O. Box 925, Levittown, PA 19058.



## PENN WIRELESS ASSOCIATION

**Field Day is a time for amateur radio operators to show the world what grass roots communication is all about.**



Photo by Tom Mills, AF4NC

### THE COMPLETE 2015 [ARRL FIELD DAY](#) PACKET IS NOW ONLINE

There are no rule changes for 2015. Field Day 2015 takes place June 27-28.

“Following a successful Centennial QSO Party with on-the-air activity at an all-time high, we are very excited for this year’s event and hope that individuals and clubs will carry their enthusiasm over to Field Day,” said ARRL Contest Branch Manager Matt Wilhelm, W1MSW.

ARRL Field Day is the most popular on-the-air event held annually in the US and Cana-

da. On the fourth weekend of June, more than 35,000 radio amateurs gather with their clubs, groups or simply with friends to operate from remote locations.

Participants are encouraged to register their Field Day operations using the [FD Site Locator](#). Field Day gear will be available by March 1.

If you have questions about Field Day, [e-mail](#), or call 860-594-0232.



**X-MITTER  
P.O. BOX 925  
LEVITTOWN, PA 19058**

*If undeliverable as addressed,  
return requested*
