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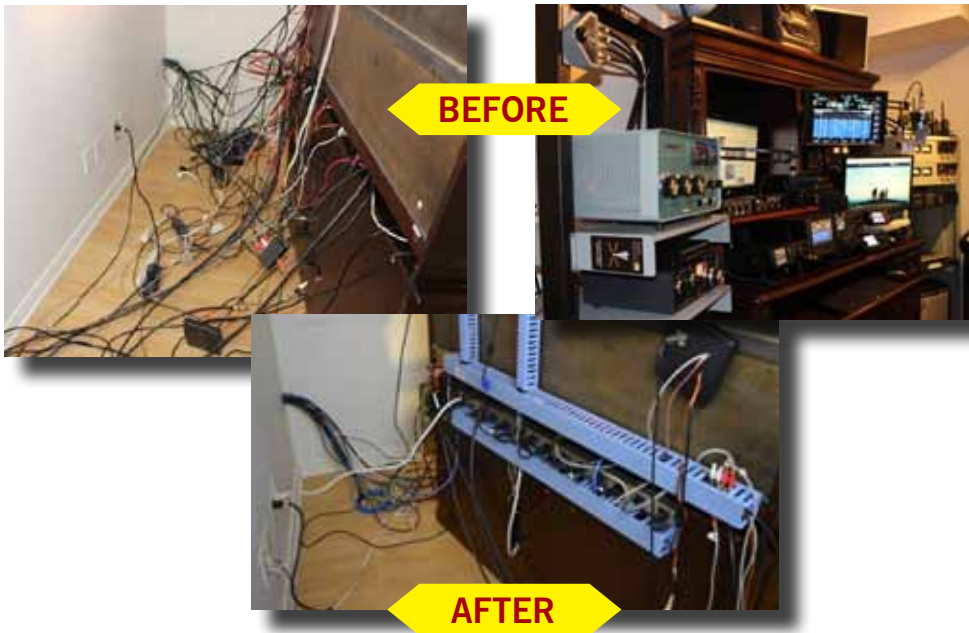
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*Reorganizing the Ham Shack Cabling*  
*by Pascal Villeneuve VA2PV*

Is your shack a mess? Are you like me? Saving your money for fancy equipment and been neglecting the foundation of a very well organize ham shack? I've been thinking about this for a long time.



In 2013 I went to the Dayton Hamvention for the first time and when I saw a table with crimpers, Anderson Powerpole and RIGrunner power bar I stopped and told myself I have to do this, but I went for the radio instead.

Every time I look behind the desk this project kept coming back in my mind, thinking, something bad is going to happen if it stays like this.

I just had to do something about it. So, I decided in my Christmas vacation 2015 to order the necessary accessories to do the job. Here's what I ordered, the RIGrunner 4012 power bar, one pack of Anderson Powerpole 15 amps and 30 amps (12 pairs each) and the PWRcrimp.



\* PWRcrimp Tool

## Reorganizing the Ham Shack Cabling



Now I have no excuse, I just need the time to do the job. So while I'm at it, why not reorganize every cable in the shack? So I went to our local electronic store and bought some cable organizers.

Then I planned for the weekend of the 16 and 17 of January 2016. As usual I made a video for our YouTube channel announcing the upcoming project. See Part 1 - Reorganizing the ham shack cabling (English version).

<https://youtu.be/fecx3jDCzhM>

I planned my Saturday, step by step;

1. Identify all cables with the P-touch
2. Unplug and removed all expensive equipment from the shack, there's nothing worse than a dent from a stupid mistake
3. Strip everything: wires, plug, power bar, etc.
4. Clean everywhere for any dust
5. Install the wire organizer, AC power bar and DC power bar (RIGrunner 4012)
6. Convert any DC cable to Anderson Powerpole connectors
7. Reinstall and organize all cables
8. Reinstall the equipment
9. Test everything

I have to tell you, reorganizing all the cables was not an easy task. Here's a few tips, 1) Add as much organizer as possible so you can segment by type of cable, it will be easier to access without everything's popping out as you open! 2) If you have items that you move frequently, like your computer, leave the attach cable outside the organizer, because it will be too tight to be move after, unless you give just enough loose.

Now comes the fun part, reorganizing the DC distribution. With the crimper and the Anderson Powerpole this was the easiest part of the project. Take a look at my power supply bellow before I installed the RIGrunner 4012. This represent a potential risk of short and it was very painful to add and remove equipment. The other picture is showing the DC cable behind the desk before the reorganization. It was jam!

What a difference when done properly, with the right tools! Take a look below, nothing else to say, the pictures speak for itself!



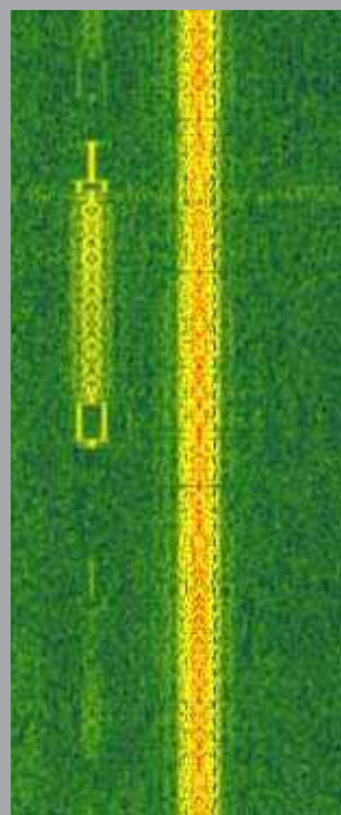


# Clean Up Your Act!

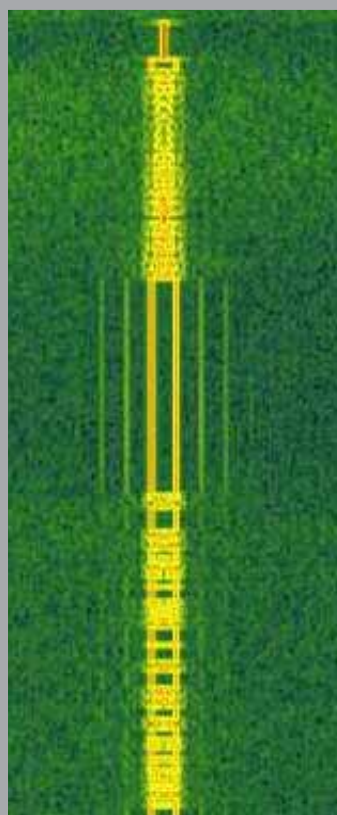
## Proper digital mode level adjustment in Windows 10

by Sholto Fisher K7TMG

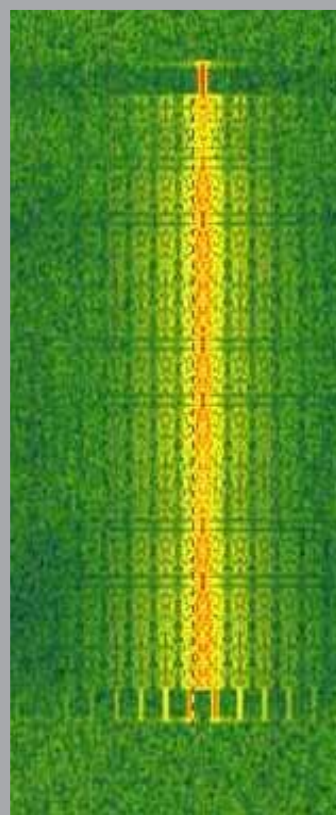
Most of us have been guilty of this at one time or another while learning to operate digital modes but here is why excessive volume drive for digital modes is a bad thing:



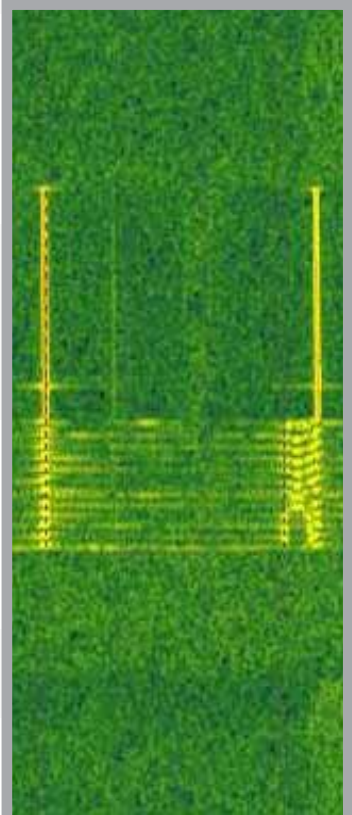
PSK31 signals properly modulated. Even though relatively strong, the signal is a good "neighbor".



A slightly over-driven PSK31 signal. In practice still mostly decoded but beginning to spread.



Considerable overdriving leads to signals much wider than they need to be. Decoding ability is reduced.



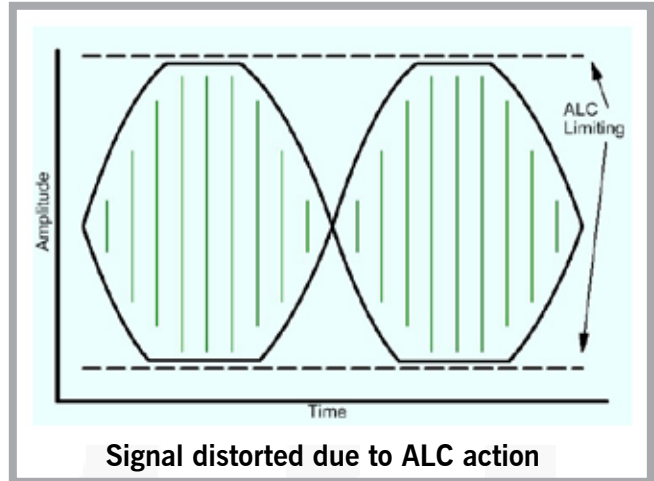
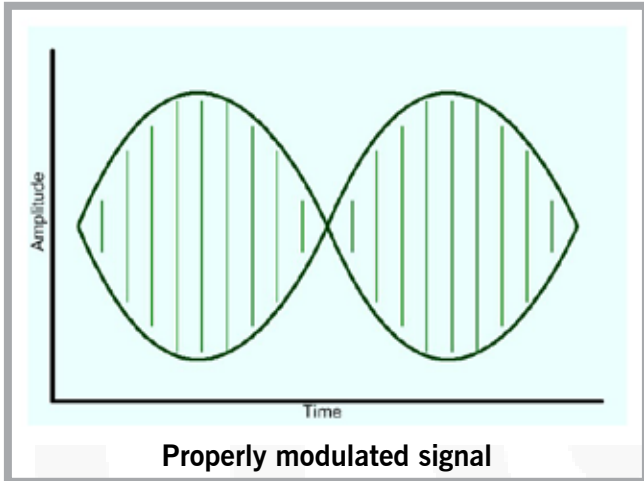
This signal is so badly over-driven it is unrecognizable as PSK31. No chance of decoding.

### Less really is more

It may sound counterintuitive to hams new to digital mode operating but increasing transmit power by jacking up the volume control on your digital interface (or Windows "slider") may be the worst thing you can do to improve your chances of a QSO. What happens is your input signal becomes so big your transmitter will try to throttle-back your signal using its ALC circuit (Automatic Level Control) so your signal is no longer completely in the linear amplification region of your transmitter. The results of this are the peaks of your transmission become flattened (or clipped) and as we know from basic radio theory anything resembling a square wave is going to be rich in harmonics . . .



## Clean Up Your Act! Proper digital mode level adjustment in Windows 10



If you keep driving your audio even harder the ALC will be completely ineffective and most of your signal will be distorted which looks to be the case with the fourth waterfall picture above. You may see an increase of power out on your radio meter but this has nothing to do with how well your signal is modulated or its ability to be decoded. Worse than this is you will be not a good “HF neighbor” potentially disrupting other QSOs.

### How to set your transmit drive volume optimally

Because most RIGblasters are connected to the radio's microphone jack which enables very efficient switching between SSB phone and digital modes, you first need to set your radio's MIC gain to suit your microphone and RF power to whatever you normally use for phone operation. This is usually maximum and for most radios 100W. Now this does not mean we are aiming for a 100W PSK31 signal. Far from it. Setting for maximum will give us enough headroom for our “30W” PSK31 signal without the danger of running into ALC action.

One thing to keep in mind when running digital modes is depending on the mode chosen there can be a big difference between the waveform peak power (P-peak) and the average power (P-avg). Most radio power meters are designed with SSB or CW in mind so are not particularly accurate when transmitting digital modes, especially for modes with a very high P-peak/P-avg ratio.

PSK31 has a ratio of around 0.8 (or 80% if expressed as a percentage) which means when you see 30W on the radio meter the chances are good that you are actually putting out a bit more than this. You will only be able to tell exactly how much if you have access to a PEP reading meter, preferably with a hold function.

An extreme case is the mode MT63. This has a ratio of around 0.1 or 10%. Roughly speaking an average reading power meter will indicate 10W output but your signal will be 100W on the peaks! It is very easy to overdrive an MT63 signal and this accounts for the lack of success many people have with this mode. What we want to do is to allow only enough audio drive from the computer interface to reach the power level we are seeking without any ALC indication being present on the radio. This ensures a clean, properly modulated signal.

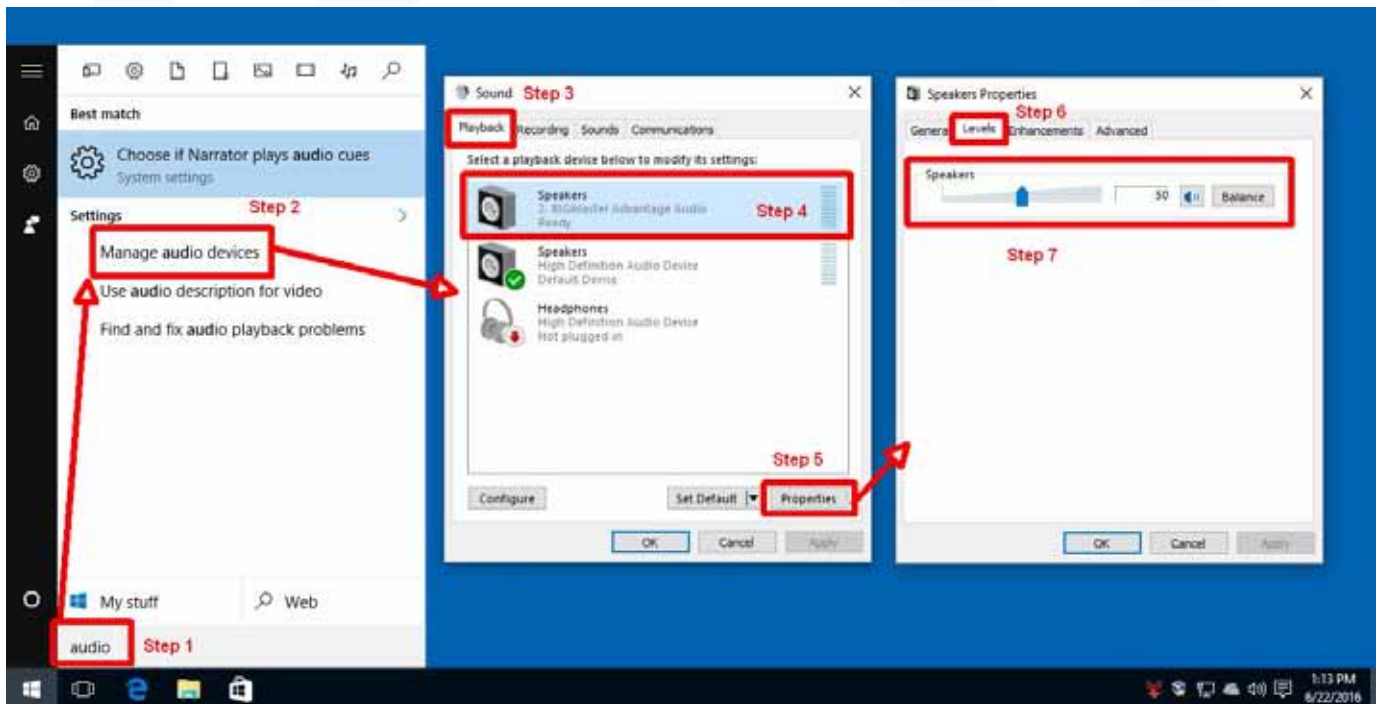
If we take the example of the RIGblaster Advantage which has a built-in USB sound card there are a number of things we need to configure to reach the correct drive level. We have already covered two, the radio's MIC gain and RF power level but next we need to consider the volume level of the sound card itself.

With Windows 10 it is a little more difficult than other version of Windows so refer to the screen captures.

## Clean Up Your Act! Proper digital mode level adjustment in Windows 10



1. Click the start menu and type the word “audio”.
2. A search dialog will open and you should see an option to “Manage Audio Devices”. Click on it.
3. Select the “Playback” tab.
4. Left-click (once) the RIGblaster Advantage device to highlight it.
5. Click on the “Properties” button.
6. Select the “Levels” tab.
7. Change the volume level by dragging the slider. A good value to use is 50.



Now we have set the radio RF power to 100W, the MIC gain for normal microphone operation and the internal RIGblaster sound card to 50%\*. That only leaves one control to precisely adjust the drive – the RIGblaster front panel “XMIT LEVEL” potentiometer.

First set this control all the way counterclockwise. This will ensure no audio reaches the radio when we start to transmit. At this point tune up on the bands (or connect a dummy load) and launch your digital mode software. There is usually a “tune control” in the software which provides a fixed tone output and keys the radio. If not, simply select PSK31 mode and start a transmission. If nothing is typed the PSK31 idle signal will be sent which is perfect for this final adjustment.

Slowly rotate the “XMIT LEVEL” potentiometer clockwise while observing your radio's power meter and ALC indicator. You are aiming for around 30W output with no ALC showing. That is it! You have now set your digital mode transmission optimally and are putting out a clean signal of around 35W.

One last word of warning: Before setting your level or transmitting on-air remember to disable the radio's speech processor! It's perfectly OK to use for SSB phone but will totally wreck a digital mode signal!

\* If you find the RIGblaster XMIT level control is a bit “touchy” when setting a precise power level, try reducing the Windows 10 volume slider to 25% or even less. There's also a jumper in the RIGblaster Advantage which can reduce TX audio by 10dB – see the manual for details.



## *Project Lead The Way* Technology & Education in Our World, Now for Kids by Fred Schwierske

If you are reading this, it is a good bet you pride yourself on being pretty “tech savvy”. Most West Mountain Radio customers have a life-long interest in electronics and technology. In fact, you probably have trouble understanding why EVERYONE does not have this same fascination with all things high-tech. And for most of us, that interest dates back to early school days.

But sadly, science and math education in the U.S. leaves much to be desired. In spite of spending over \$12,700 annually per high school student in 2011 - surpassed only by Austria, Luxembourg, Norway and Switzerland - the US compares poorly to other leading nations when it comes to technology education. Out of 63 advanced nations, the US rates a disappointing 27<sup>th</sup> in Science and even worse 35<sup>th</sup> in Math, as measured by standardized test scores. <sup>(1) (5)</sup>

If you’re a parent (or grandparent), this general lack of US educational focus on Science, Technology, Engineering, & Math (STEM) should be of great concern. But all is not lost. It is quite possible there is a **Project Lead The Way** (PLTW) initiative in your local area. Across all 50 States there are over 9,000 PLTW programs in more than 8,000 schools. PLTW trained over 10,000 teachers in 2015 and has trained more than 29,000 teachers since 1997 with the goal of enhanced learning experiences for Grade K-12 students and teachers in computer science, engineering, and biomedical science. <sup>(2)</sup>

Here at West Mountain Radio, this technology knowledge gap really bothered us, too. So we came up with several ideas to apply our engineering skills and products to the problem.

### **New Energy Science Lab Kit (“ESLK”)**

West Mountain Radio’s Computerized Battery Analyzer (CBA), now in its 4<sup>th</sup> generation, has long been successfully applied in ham radio, hobby, and industrial applications. Its ability to precisely measure, record, display and compare performance of all common battery technologies seemed like an ideal platform to capture student’s interest and teach basic engineering concepts.



So, we decided to bundle the CBA IV with optional equipment, and add a unique series of six detailed Experiments aimed at High and Middle School science students. The point – to capture student interest by evaluating simple battery applications encountered on a daily basis – and in doing so teach basic electrical concepts: Voltage, Current, Resistance, Power, and Energy.

Each of the Six Experiments are presented in 3 versions.

- **Instructor** version includes all graphs, data tables, expected results, and tips to help the teacher present the material.
- **Student** version defines clear objectives and step-by-step instructions to perform each experiment.
- **Inquiry** version consists of two-page limited (open-ended) directions for advanced students.

Experiments included in the Energy Science Lab Kit --

1. Brand Name vs. No Name: Test AA off-the-shelf batteries to determine the best value for your money.
2. Typical - I’m Not Typical: Explore how different discharge profiles affect total Ampere-Hour capacity.
3. Older, But Not Better: Determine the effects of aging on batteries.
4. Size Really Matters: See the real energy difference between AAA, AA, C, & D cells.
5. Burr - I’m Cold: Explore how ambient temperature affects battery performance.
6. Cost vs. Value: Compare new specialty AA cell performance versus their higher cost.

## **Project Lead The Way Technology & Education in Our World, Now for Kids**



To assist teachers with curriculum development, each experiment references applicable Next Generation Science Standards (NGSS). West Mountain Radio's Energy Science Lab Kit is available to qualified school districts via normal Educational Distributor channels.

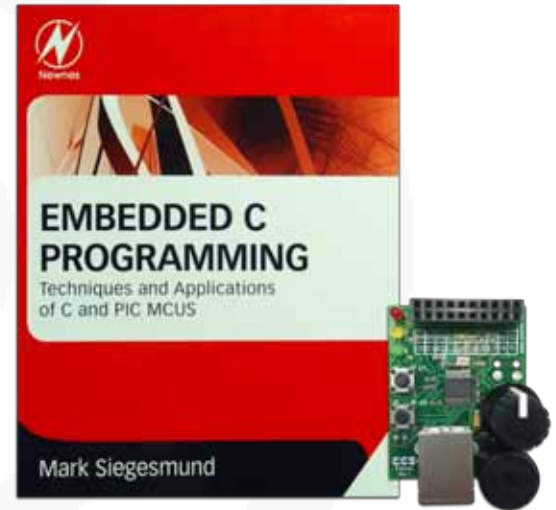
### **Other educational product comes from our sister company – CCS, Inc.**

CCS provides education specific development tools for the next generation of engineers. Students have opportunity to learn the high order C programming language and create powerful and sophisticated applications on PIC® Microcontrollers.

To provide students with real-world experience, we bundle new textbook, “Embedded C Programming” written by our President – Mark Siegesmund – with a companion E3mini development board. Hands-on textbook exercises have been tailored to the E3mini board.

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[http://www.ccsinfo.com/product\\_info.php?products\\_id=e3mini-book](http://www.ccsinfo.com/product_info.php?products_id=e3mini-book)



Schools are now preparing next year's equipment budgets. Being new to the Educational market, we would appreciate your help to spread the word of our new product offerings.

- Consider sending a copy of our Energy Science Lab Kit product flyer to your local High or Middle School science department by entering an email for additional information here:  
<http://www.westmountainradio.com/eslk>
- If your local school has a Computer Science program – our Embedded C Programming textbook and E3mini Development Board will also be of interest:  
[http://www.ccsinfo.com/product\\_info.php?products\\_id=e3mini-book](http://www.ccsinfo.com/product_info.php?products_id=e3mini-book)

But do not forget - the most valuable and rewarding way to get students interested in technology is to show it to them first-hand. Volunteer to be a coach or mentor. Get involved with their robotics club, or even consider donating a CBA to your local high school (or let them borrow yours for a while). But do not be surprised if they ask you to stop by to put on a demonstration!

Help us make science and technology fun again. The world's next crop of engineers and scientists are being developed right now – in a school near you!

#### References:

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3. Education at a Glance 2014: [http://www.keepeek.com/Digital-Asset-Management/occd/education/education-at-a-glance-2014\\_eag-2014-en#page1](http://www.keepeek.com/Digital-Asset-Management/occd/education/education-at-a-glance-2014_eag-2014-en#page1)
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*A Visit to CN2016 Conference*  
Palac Brunow, Poland  
by Miroslav Skoric YT7MPB

**23rd International Science Conference on Computer Networks CN2016**  
**June 14-17, 2016, Poland**

The CN Conference is dedicated to all activities related to computer networks, distributed computer systems, communications and teleinformatics. The conference has been organized every year since 1994. The conference is the first and oldest in Poland on the subject of computer networks. In year 2016, it will be the twenty-third edition. In 2016, for the first time, the CN conference will include Computer Networks in Education as one of the subareas.

The conference CN2016 took place in Palac Brunow, a small village in southwestern Poland (Europe). That part of the country is a rural area, without much industrial activity, and there were no local radio amateurs whom to establish direct communication with. However, Palac Brunow location was good enough to activate a VHF FM repeater located at mountain Góra Szrenica, in small town called Szklarska Porba. However, I did not hear any data mode signal (i.e. packet-radio activity) in the area.

The amateur radio communications seminar (where I described RIGblaster Plug & Play) was announced in a slide show of the conference committee members.

After CN2016 was finished on June 17, I returned back to Wroclaw city to spend a few days there. Later in the evening from the hotel room, I called local radio amateurs on VHF. The first correspondent was Mike SQ6WEM who did some assistance by searching the websites for some additional info on local radio clubs. So the next day I visited SP6PWS radio club location. The visit was organized and conducted by Marcin SQ6POL whom I also contacted the previous evening.

There were few more hams in the club who came to welcome and greet me, so we exchanged information

about our ham equipment. I had the RIGblaster Plug & Play with me so I could perform a presentation for the club members – similarly as I did at the conference.

Interestingly, they had in the club a home-made interface of a similar shape and size as RIGblaster Plug & Play, but without any USB cable: It had two cables for the sound card input/output, and a 6-pin miniDIN connection cable to the radio. In addition, their interface had only 2 LED lamps (I cannot remember which one LED was 'missing' - compared to the RIGblaster Plug & Play). And they also claimed that their interface did not require any power supply (from the computer USB port or elsewhere).

However, I insisted that my RIGblaster Plug & Play must have been much better than their home-made interface because of implementing more cables & LEDs than their device :-)  
Another friendly meeting was made with Michal SQ6IYV, who is an employee at Wroclaw University of Technology /in Polish: Politechnika Wroclawska, and continued by an 'ice cream session' in a local bar with myself SP6/YT7MPB.

A couple of days later, I visited Krakow for a couple of VHF FM radio communications with Eryk SQ9KCN, and for visiting the famous Wawel Castle. It was a very hot day, so it

was interesting to compare the size of my AF-16 and a half-full glass of cold Polish beer.

The local voice calling frequency in Krakow was a simplex channel of 145.550 MHz. The second day in Krakow, I made some additional tests in a similar guest-house environment. While staying in Krakow, I was capable to hear very strong packet-radio signals within the city area (at 144.800 MHz). Unfortunately, as I said, I was not able to decode those signals.  
handy radio(s) during my trips. So the HF radios are not an option most of the time. Secondly, the packet-radio is my preferable data mode. Therefore the proper cabling is a necessity for me.

I noticed that packet-radio activity is relatively quiet in the southern Poland (except the Krakow area). Nevertheless, the next year's CN2017 is supposed to happen again in some part of the southern Poland, but also somewhere close to the national borders of Poland to Czech Republic, Slovakia, and/or Germany – probably with an intention to attract more conference participants from those countries as well.

I noticed from the ham media that in southern parts of Poland there were also some 70cm activities (mainly UHF FM repeaters, not sure about packet links).



## Upcoming Events



### Visit Our Booth

*Huntsville Hamfest  
August 20-21, 2016*

*Peoria Superfest  
September 17-18, 2016*

*Maker Faire Milwaukee  
September 24-25*

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