



www.arrl.org



# St. Paul Radio Club Ground Wave

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## KØAGF

www.stpaulradioclub.org  
Club Repeater: 145.310 MHz  
PO Box 9375  
North St. Paul, MN 55109

## NEWS AND NOTES FOR APRIL 2017 — Volume 77, Issue 4

### Monthly Meeting

April 7, 2017

UST OWS LL54

7:00 pm Socializing

Membership Meeting 7:30 pm



PROGRAM

### Foxhunting Orcy Lyle, WØQT

Orcy has presented her program on foxhunting (finding a hidden radio transmitter) to at least five ham radio clubs, and will bring it home to SPRC on April 7<sup>th</sup>. Foxhunting is not only fun, it can be instructional about vhf propagation. It is truly fascinating to see how the signal can bounce around and confuse the foxhunter.

The program includes the basics of foxhunting, but even experienced foxhunters may learn new tricks. Hams who have never foxhunted have found the fox after attending Orcy's program.

The program is being given to prepare new foxhunters for the sport and, it is hoped, to inspire club members to participate in upcoming SPRC foxhunts. The SPRC Circuit Builders group will sponsor an upcoming foxhunt led by John Thurow (NØVYX).

Orcy has been a ham since 1999 and has been a member of SPRC for most of the time since then. She served as SPRC President for four years and has coordinated a number of activities, including a Special Event and a Foxhunt.

### Annual SPRC Banquet Saturday April 29

Our speaker will be author, religious scholar, storyteller, and adventurer Olaf Danielson.

www.olafdanielson.com

**Please see the attached flyer  
and be sure to return it  
no later than April 14th**

### Presidential Ponderings

Plenty of antenna work is scheduled by ice storms, but the real antenna season is coming now that the weather is getting better. Unfortunately, people don't realize that my moving date is getting closer when they call for help taking down, putting up and repairing their antennas.

I'm not sure where I'm going to end up yet—I'm hoping that the location will not be an issue with doing nets and a little hunt and pounce DX (I'm still getting some, just not as much and nothing new for a long time).

*(Ponderings, Continued on page 2)*

The OWS building is located on the **University of St. Thomas (UST) South Campus.**

From I-94, take Cretin Ave south about a mile to Grand Ave. Turn right, then park in the ramp on your left or the surface lot on the right. In general, on-campus parking restrictions are not enforced after 6:00 p.m. on Fridays, but do not park in spots with parking meters unless paying or displaying a handicapped placard.

Enter the building just north of

### Let's Talk Podcasts Scott Holisky, NØAR

I was very surprised to learn only four out of ten people have listened to podcasts! Podcasts are a way to deliver digital audio content—you can download the files to your computer or smart phone. If you subscribe to a podcast program, the latest episodes are delivered as they are produced. Did I mention that they are all free?

If you Google "ham radio podcasts" you will get a sample of what is out there. Thousands of podcasts geared for a specific audience roll out of home or commercial studios every day. Then there are generic ones with a broad appeal. They are there for you to download or stream live, as you wish

Like everything on the Internet, podcasts come and go. Some have been around for years and continue to have a great following. One that I've been listening to is "Solder Smoke" that has its roots in home brewing. A new kid on the block is the ARRL's "The Doctor Is In" biweekly podcast. It is geared towards the technical side of our hobby. I'd recommend you check them out.

the parking ramp and take the elevator (in the hallway to the right) or stairs to the lower level. LL54 is not far from the stairs.

For detailed maps, see [www.stthomas.edu/campusmaps](http://www.stthomas.edu/campusmaps).

OWS: Owens Science Hall

Contact Kim Schumann in Disability Services at 651-962-6315 or [kjschumann@stthomas.edu](mailto:kjschumann@stthomas.edu) for any accessibility requests.



*(Ponderings, Continued from page 1)*

A friend is moving and has a Rohn 45, a big beam, and lots of wires that we'll be taking down soon. For another, I put up a new Rohn 25 about 50' with a Hex beam; now he wants to go a little higher and spend the big bucks--a SteppIR beam. I have to go over the specs to make sure that it can be done; even with additional guys (house bracket now) it may be more wind load than a Rohn 25 can handle.

For my own projects, I agree with Pa Kettle—"I'm going to fix that one of these days" (Remember the Ma & Pa Kettle movies?). I got a new toy for doing some of this--an electric capstan winch. One of the most troublesome issues the last few years doing tower work, sometimes even with a large ground crew, has been lifting on the gin pole trying to get a large beam up (like that 45 we're taking down now). We put the beam on top of one of the guys and the ground crew pulled the cable that brought the beam up the tower, I was surprised how much effort it took.

Dang, wish I still had a shop, because while doing this I imagined building some type of trolley that would make it much easier—then add the capstan winch and make it a breeze.

Remember to collect up lots of pillows and cushions to put at the base of your tower projects because falling is not the problem, landing is.

73 de John, KDØCAC

## Dale's Details

### Dale Maroushek, NØPEY

Another month passed by and not much to report. Need to do some outside work with coax and antennas when the temp gets higher.

I did have a pleasant experience with MFJ repair on my 259 analyzer. To get proper instructions, I first looked at the web site and then called to clarify the procedure. I enclosed a note outlining the problems with my return information, and packed it into a well cushioned box. USPS insured and tracked mail cost me \$16, off it went about Feb. 21st. On March 2nd, I received a letter saying that it had arrived and I should expect a 4 to 5 week turnaround (same thing they told me when I called). A couple hours later, they called me. I had asked what the price of a new meter would be, mine had yellowed. He said \$6.75, I said go ahead. He took my payment info and said they should be working on it soon. On March 6th they called again, said it cost \$95 and it was being shipped. It arrived March 10th, so less than 3 weeks turnaround.

In the shack, the super structure is built, and from the pictures you may or may not recognize the material. The levels are created with plastic shelving, available at most big box stores. Simply cut the tube legs to the required length, modify the front end if needed and/or add support

pieces if the load is heavy. My table is a used one hundred inch dining room table from a thrift store.

Hopefully, we should have this Fusion machine up and running shortly. A few jumpers and programming to do yet. I like to turn all the lighted gear on and the room lights off just to see the pretty picture.

The pictures, from left to right: top shelf is for HT charging and room for storage. Mid shelf is VHF/UHF with meters. Table has the FT-767GX and SP-102 speaker.

Mid-section top shelf above the monitor is for rotors and meters. The right column has a rotor control, tuner, switch and MFJ-259, all above the AL-80A amp. Table top is an antenna switch built into a speaker box next to my IC-756.

The right side is the Fusion repeater and duplexer above my FT-857 and the Clubs FT-1000.

Last is my computer desk with the cable box, router and office supplies above the Dell 960.

It sure was a challenge to redesign and rebuild, but the labor is almost over.

Dale, NØPEY



## Circuit Builders = Good Ideas

Orcy Lyle, WØQT

Two members of the SPRC Circuit Builders group, John Thurow (NØVYX) and Jay Maher (NJØM) have come up with good ideas.

John has offered to stage a foxhunt this spring, and perhaps more foxhunts if they draw enough interest. He has built an Arduino-based HT controller to use for sending out the fox signal. The program for the SPRC April meeting will be on foxhunting, as described on page 1.

Jay has several ideas for projects that he wants to spearhead—for learning both building and electronics. He is proposing a series of *Ground Wave* articles with links and resources for builders and basic radio

Both hams have written articles that appear elsewhere in this newsletter.

One reason that I became a ham was that I was interested in learning to solder and in building projects, such as those we do in the Circuit Builders group. I found opportunities for both after my first attempts at soldering with a clunky pencil soldering iron. I destroyed six PL259s before I got one that was halfway usable. I had liquid dielectric streaming out of one of the PL259s that I wrecked. I needed help to get things to work after I had built them. But now, things I build work right off. It just takes practice. I would encourage anyone who might be interested, to give building a chance.

**FACEBOOK USER?**

**Look for our group:**

**“St. Paul Radio Club”**

## Building Blocks Jay Maher, NJØM

What drew me into amateur radio was the desire to build things and learn about how they function. Electronics has been an interest since my teens, but it competes for time with other interests and that other thing—work. My training is in fisheries and biology, so what knowledge I have of electronics has all been picked up informally. I sometimes envy those of you who work in an electronic field but, then again, you might imagine I spend my work days fishing. My occasional electronics hobby will sometimes cross over into my work life if I am repairing electrofishing equipment or building some sort of device for the lab. The problem was that those times were sufficiently infrequent that I often forgot what bits I’d learned from lack of reinforcement. The radio hobby was intended to be a way to keep active in electronics and climb the learning curve.

That was the plan and, well, I just did my first license renewal this month. I can’t believe it has been ten years since I went to an SPRC VE session and came to my first club meeting. The past three or four years have gone especially fast under the influence of a rather crushing long term project at work. As I lift my head from that, it seems I’ve slipped back down that learning curve. It’s time to get back at it.

I don’t know about you, but I learn the most from building and experimenting with kits or designs others have documented. When someone has taken the time to explain how a circuit works, or why they made certain design decisions, that is a bonus which moves a project beyond soldering practice and makes it more valuable and even more fun. I’m ok on the basics, but the art and craft takes longer to learn.

There have been some excellent resources for this type of project

where the documentation still exists though the kits are no longer available. Two that come to mind were the Elmer 101 project utilizing a 40 meter transceiver from Small Wonder Labs and the book *Electronics of Radio* by David Rutledge which followed construction of a 40A transceiver from the NorCal QRP club. There are other opportunities and resources out there and if our editor Don Kelly (WA6ZMT) allows the space, going forward I intend to push them out there to encourage others to learn by doing. After this intro, I’ll try to be less windy and more matter of fact. I can’t promise not to bore you because there are a lot of you who know more about this stuff than I ever will. What I hope is that, even if it is old news, it might spark you to point me (and others) further down the road.

If you have any interest in building, you should join the SPRC Circuit Builder group led by Orcy Lyle, (WØQT). Subscribe to the Circuit Builders email group on Google for notifications of upcoming meetings (held most Saturday mornings in a lab on the UST campus). There are members of all different skill levels and it is a good place to go for support. You can bring in your project or check out what others are doing. For my part in upcoming Circuit Builder meetings, I plan to go back to basics and work through the “Hands on Radio” experiments from Ward Silver’s (NØAX) column in QST (as well as any other fun tangent) and will share those setups at the lab with anyone interested. I will report back on how that goes, as well as giving a glimpse of some of what others are doing, in the hope of getting more participation.

I will leave you with an easy project that also supports a good cause. The Humanalight is an LED light that is based on a “Joule thief” type circuit. It uses an oscillating amplifier to boost the voltage in what would be considered a dead AA battery and pulse the

*(Building Blocks, Continued from page 3)*

LED on at a rate which looks constant to the eye. Kits are available from Universal Radio or Gigaparts for about \$16.00. That isn't cheap, considering the simplicity, but I believe at least half of the money goes to supporting Ears to Our World, a non-profit providing radios and appropriate technology to people in need around the world.

Please see the links, below.

### **What I Wish I Knew Before Buying a DMR HT** **John Thurow, NØVYX**

I knew nothing about Digital Mobile Radio (DMR) before Trygve's (Trygve Svård, KDØPNQ) presentation at the March SPRC meeting. His presentation was excellent. I own several D-STAR radios and a DMR HT, and SPRC owns a Fusion repeater. With several choices for digital VHF/UHF, I needed to know on which technology should I spend my limited time and money. So, why use DMR now and what would be nice to know before buying a DMR HT?

I found four reasons for adopting DMR now as compared to the other digital choices. First, the cost of DMR HTs has dropped to around \$100 from over \$400. The other digital technologies still cost well over \$300 for a HT. Second, the

battery life has been estimated to be 40% longer compared to Fusion and D-STAR. Third, DMR bandwidth is 6.25 KHz compared to 12.5 KHz for Fusion which produces greater "talk power". Fourth, DMR is much easier to learn than D-STAR. I base my four reasons on the material in the 'nvcon' link, below. A bonus reason to adopt DMR now could be: get in on the ground floor and help influence adding new features and best practices for hams.

I wish I knew these 4 things before buying a DMR HT:

First, I need to apply for a DMR ID before using DMR repeaters. The process is free and simple but could take several days to receive an ID. I did not need a DMR radio to request an ID. I only need one ID for all my DMR radios. One reason I may want a second ID would be if I operated two radios at the same time. Then, each radio must have a separate ID.

Second, digital radios use an AMBE circuit or licensed software which encodes the voice digitally. See the 'Wikipedia' and 'mit' links, below. The vocoders used by Fusion, D-Star and DMR are licensed and proprietary. Digital voice for HF has an open source vocoder but not VHF/UHF digital. Other parts of Fusion, D-STAR and DMR are not proprietary and anyone could design and build these radios if they pay the fees for

the AMBE.

Third, DMR radio standards came from Europe which allowed unlicensed operators like GMRS here. Thus, DMR radios are not front panel programmable. This means, the radios must be programmed even to use the analog simplex mode. Yes, the radios may transmit on some default frequency when pressing the push-to-talk button but you cannot change the frequency or mode from the front panel.

Fourth, few hams are using DMR so information is a little hard to find. The DMR radio instruction manuals provide no help as they are not written in proper English and they are not meant to be tutorials to learn DMR. I found the last two links, below, helpful.

I plan to have fun with DMR.

### **UST Tobacco-Free**

UST's St. Paul and Minneapolis campuses are tobacco free.

In the St. Thomas policy, "tobacco" is defined as any lighted cigarette, cigar, pipe, clove cigarette, hookah smoked products, electronic cigarettes and any other smoking product, as well as smokeless or spit tobacco, also known as kip, chew or snus. Promotion, sale and distribution of tobacco products and merchandise, including any items carrying tobacco logos, also are prohibited on the campuses or at any university-sponsored events.

### **Building Blocks Links**

Humanalight - <http://www.earstoourworld.org/humanalight>

Humanalight circuit description - <http://web.engr.oregonstate.edu/~traylor/ece112/labs/lab10.pdf>

Original Elmer 101 files - <http://www.gsl.net/kf4trd/faq.html>

SPRC Circuit Builders - <http://www.stpaulradioclub.org/gpage3.html>

### **What I Wish I Knew Before Buying a DMR HT**

<http://nvcon.org/data/uploads/2016-slides/digital-mobile-radio-dmr-101.pdf>

[https://en.wikipedia.org/wiki/Multi-Band\\_Excitation](https://en.wikipedia.org/wiki/Multi-Band_Excitation)

<http://dSPACE.mit.edu/bitstream/handle/1721.1/4219/RLE-TR-524-17691173.pdf?sequence=1>

[http://trbo.org/docs/Amateur\\_Radio\\_Guide\\_to\\_DMR.pdf](http://trbo.org/docs/Amateur_Radio_Guide_to_DMR.pdf)

<https://cdn-learn.adafruit.com/downloads/pdf/tytera-md-380-dmr.pdf>



St. Paul Radio Club, Inc.  
PO Box 9375  
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## ADDRESS CORRECTION REQUESTED

- Sat Apr 1 10AM VE testing. Ramsey County Library, 3025 Southlawn Dr., Maplewood. Contact Leon Dill, WØCOE@arrl.net or 651-688-9964
- Fri Apr 7 7PM Socializing followed by 7:30 PM SPRC Membership meeting. UST classroom OWS LL-54. See Page 1.
- Sat Apr 8 9AM Circuit Builders. OSS 415 UST Campus\*
- Fri Apr 14 7PM SPRC Board meeting, OSS 121 UST campus (Alternate location is OSS 415) \*\*
- Sat Apr 15 9AM SPRC Breakfast. Midway Perkins on University Ave east of Snelling.
- Sat Apr 15 After Breakfast. Circuit Builders and Orcy Lyle Tax Clinic. OSS 415 UST Campus\*
- Sat Apr 22 9AM – 5:30PM Northern Lights Radio Society Aurora 2017. First Lutheran Church, 4000 Linden St. White Bear Lake, MN 55110
- Sat Apr 22 9AM – 1PM Brainerd ARC Hamfest, Brainerd National Guard Armory, 1115 Wright St. Brainerd, MN
- Sat Apr 22 9AM Circuit Builders. OSS 415 UST Campus\*
- Sat Apr 29 9AM Circuit Builders. OSS 415 UST Campus\*
- Sat Apr 29 8AM-1PM Twin Cities FM Club Tailgate Hamfest, West Medicine Lake Community Club, 1705 Forestview Lane N., Plymouth, MN
- Sat Apr 29 6PM-10PM Annual SPRC Banquet, Doors open at 5:00, dinner at 6:00, Rogge-Leyden Room, UST Anderson Student Center
- Fri May 5 7PM Socializing followed by 7:30 PM SPRC Membership meeting. UST classroom OWS LL-54.
- Sat May 6 10AM VE testing. Ramsey County Library, 3025 Southlawn Dr., Maplewood. Contact Leon Dill, WØCOE@arrl.net or 651-688-9964
- Sat May 6 9AM Circuit Builders. OSS 415 UST Campus\*
- Fri May 12 7PM SPRC Board meeting, OSS 121 UST campus (Alternate location is OSS 415) \*\*
- Sat May 13 9AM Circuit Builders. OSS 415 UST Campus\*
- Sat May 20 9AM SPRC Breakfast. Midway Perkins on University Ave east of Snelling.
- Sat May 20 After Breakfast. Circuit Builders. OSS 415 UST Campus\*
- Sat May 27 9AM Circuit Builders. OSS 415 UST Campus\*

\*Circuit Builders is each Saturday morning if someone is available to open the lab and there is no conflicting activity. Check the SPRCCB Google Group to confirm that the lab will be open.

\*\* Depending on business to be considered, Board Meetings are sometimes held electronically. Check with an officer or board member to confirm that the meeting will be at UST.