The Rochester VHF Group

The VHF Journal

Volume 62 , Issue 3 | November 2010

The next regular meeting of the Rochester VHF Group will be Friday, November 12th at 7:30 PM

Spencerport Wesleyan Church
2653 Nichols St., Spencerport

Map and directions in back

In this issue:

Topics:

W2FU's new Green Heron Engineering products

The Chairman Speaks!
Dave Hallidy K2DH

Groupers: I must apologize for missing the October meeting. I hear it was very interesting and WO2P's and N2KXZ's presentation on amateur TV in the Rochester area was quite good. They related their current experiences getting portable ATV operational for EMCOM purposes in our area- THANKS Fred and Judy, for filling in on short notice! I promise I'll make the November meeting, which also promises to be a great one- we'll have Jeff Ach W2FU speaking to us on his new Green Heron Engineering products, including his new Rig Boss USB radio/computer interface, his Rotor Controllers, and the GH Everywhere Wireless Cable products. This will prove to be an extremely interesting presentation, I'm quite sure!!!

This year's ARRL International EME Competition is history- did any of you try to work or at least hear any of the larger stations that were active on 144 or 432? I wasn't able to participate in the second weekend of the contest due to other commitments, but I've heard reports that 23cm activity was at its highest ever. Some of the larger stations have well over 100 QSO's in their logs! With the advances in microwave…

Continued….

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The Chairman Speaks! Continued…

… amateur technology, this is not surprising- many stations of the smaller class (3m dishes and say 150W) can be easily worked today because of the extremely low noise figures and high sensitivity of the current state of LNA's available out there.

Our December meeting will be our annual "Tune Up Clinic". This is always popular, as it gives members a chance to evaluate the performance of their receive converters and preamps (LNA's) BEFORE the January VHF Sweepstakes. We'll have, as usual, a couple of Noise Figure Analyzers, probable a Spectrum Analyzer, probably a Power Meter, and some other gear with which you should be able to not only look at receive performance, but transmitter characteristics as well. I'll provide more details as the event draws closer.

Don't forget our Monday and Thursday evening Nets on 2m SSB. They start at 9pm, are hosted on 144.260 (USB) usually by John WB2BYP, and with his good hearing, he can usually hear anyone from anywhere. After the 2m portion ends (around 9:30), many folks QSY to 50.200 for the 6m portion of the net. Try to check in and show support of the club!

Our next meeting is on Friday November 12th, 2010 at 7:30pm at the Spencerport Wesleyan Church. There's a map included with this Journal to show you where we meet if you haven't been there before. Please plan to attend what should be a most interesting evening.

Thanks!
73
Dave Hallidy K2DH

Secretary Report

Tom Jennings, KV2X

Rochester VHF Group Meeting Minutes for October 8, 2010

The general meeting, held at the Spencerport Wesleyan Church, was called to order at 736 PM by Vice Chairman John WB2BYP. John asked if there was a motion to accept Secretary's report as published in the Journal. Fred, WO2P made the motion and was seconded by John, W3OAB. Bob, W2CNS made a motion to accept the treasurer's report. Fred seconded it.

Attending the meeting were: WB2BYP, KV2X, WO2P, N2KXS, WB2QCJ, KA2LIM, AB2YI, W2CNS, N2PHB, W2UAD, W3OAB, Gloria Butterworth, Michael Stevens, and Betty Jennings.

Old Business

Tom, KV2, asked what the status of the beacon is. John, W3OAB, said that N2PA site is still available. John,WB2BYP, talked about how useful beacons are and popular. He would find out status and publish it on web site. Bob Nezelek made suggestion that we look at spectral purity of the beacon

Tom Jennings read a letter from Ed Gable regarding the estate of KB2BU. Discussion followed regarding who or how we can suggest somebody or organization which would be able to benefit. John Stevens suggested to that if any one has any ideas, they should tell to Ed Gable.

Tom, KV2X, asked for journal input.

Ken, KA2LIM, made a motion to conclude the business portion of the meeting. The motion was seconded by Dave, AB2YI. Meeting adjourned at 753 PM

After meeting we did introductions and what we did vhf wise the past month.

Dave, AB2YI did a show and tell about his 70 cm Moxon antenna.

Ken, KA2LIM, talked about Clean Sweep Award for Rovers. Awards will start at the next January VHF Contest. Ken also talked about how he made a quick deployed tower for rovers and showed pictures.

Program: Judy and Fred gave talk about their ATV Repeater.

Rochester VHF Group
Treasurer's Report – October, 2010

CHECKING ACCOUNT

Previous Balance (as of 10/08/2010):	**$2,064.09**
Income:	
Membership dues	$10.00
Expenses:	
Renew Post Office Box	$44.00
Website Support	$100.00
Current Balance	**$ 1,930.09**

Respectfully submitted,
Tom Jennings, KV2X, Treasurer

The Vice Report November 2010

A big thank you goes out to Fred Miller WO2P and Judy Stonehill N2KXS for the presentation at the October meeting on the topic of utilizing Amateur Television to fill a requirement for emergency communications in Monroe County. They certainly have some interesting portable hardware to do the job, and an equally interesting story as to how to solve some of the propagation difficulties in a cluttered urban environment.

On **Friday November 12**, we are looking forward to the visit from **Jeff Ach**, **W2FU** who will be updating us on some of the new technology in use with Green Heron Engineering. Jeff's GH Everywhere is a pretty clever problem solver for the dense interconnection environment at any multi-band station, and really is an impressive how he has integrated it into his HF/VHF/UHF contest station. Photo on left shows the Independent / Slaved yagis located at W2FU's QTH.

The **Monday Night and Thursday night nets at 2100L on 144.260 USB** have continued to be well attended. We had one evening in which thirteen stations checked in on 2M SSB, and another dozen on 6M SSB. To list the usual suspects: Ken W2UAD, Al KA2EKI, Mark K2CAN, John W3OAB, Bill KB2BLS, Mike WB2SQS, John N2DCH, Len WA2ZNC, Dave K2DH, John N2DCH, Ken KA2LIM, Paul W2TAU, Mark K2QO Mark, Freddie WB2GFZ, Len KC2PCD, Gary KC2TEP, David AB2YI, Carl WA2GAI and Al K2MPE.

It is a pretty informal net, so I would encourage you to stop by and checkout your gear. We go to 50.200 USB at 2130L and if there is interest, on to 222, 432 and up. It is a great way to see the differences between station antennas, power, polarization and general propagation consistency.

I have a new 432 MHz Preamp, and will bring it to the meeting. It is made by Tommy Henderson WD5AGO, and a good example of a very successful architecture of preamps, especially for the 432 MHz band where adjacent services (and a lot of home appliances these days) can be troublesome, and correspondingly a significant amount of pre-selection is desired. The input circuit is fed in shunt with a very high Q resonator, and measures about 0.4 dB NF, which by today's standards is "pretty good". What's better than "pretty good"? Well, there have been circuits published and many implemented that can come in down in the 0.15 to 0.3 dB NF range with 20-30 dB gain. The trade-off of input loss, preselection, overload susceptibility, large signal handling and ease of construction repeatability all play into the results. Does that mean a 3 dB NF preamp won't hear anything? Certainly not the case, and for other than space communications the differences may get lost in what your antenna "sees" in the pattern. Low noise figure is generally a good thing and easy to test with the right equipment.

That makes a nice lead into the topic of next month's meeting, which is the traditional **December tune-up session** on **Friday, 10 Dec 2010**. Please bring out any and all preamps and converters that you would like to have checked for Gain and Noise Figure. This always is educational – if only to see how various homebrew and commercial preamplifiers fare side to side on a good commercial analyzer. We will rig for all bands 50 through 10 GHz.

We are also going to set up and measure antennas (I'll qualify this with weather permitting), so if you have something you have built recently and would like to see how it looks in a swept return loss set-up, bring it along. The only limits are you have to be able to hold it up in the air.

News from Area 26: Bob W2CNS, Jim Hastings W2RFM and Dick WA2IKC came out to assist the placement of some steel spacers in the dish, which fixed a frame misalignment that inhibited the dish from de-elevating. I've been concerned with the fine-tuning of the hydraulic drive for elevation for a month or two, and it seems to now work right. Thanks for the help guys!

See you on the air,

John
wb2byp

Roving with Moxons, 6m, 2m and 432

David Muller, AB2YI

If you don't happen to be familiar with the Moxon antenna, it's basically a 2 element beam with the ends folded towards each other into a rectangle. This makes for a compact, easily-built antenna with a very close match to 50 ohm coax, when constructed to specified dimensions.

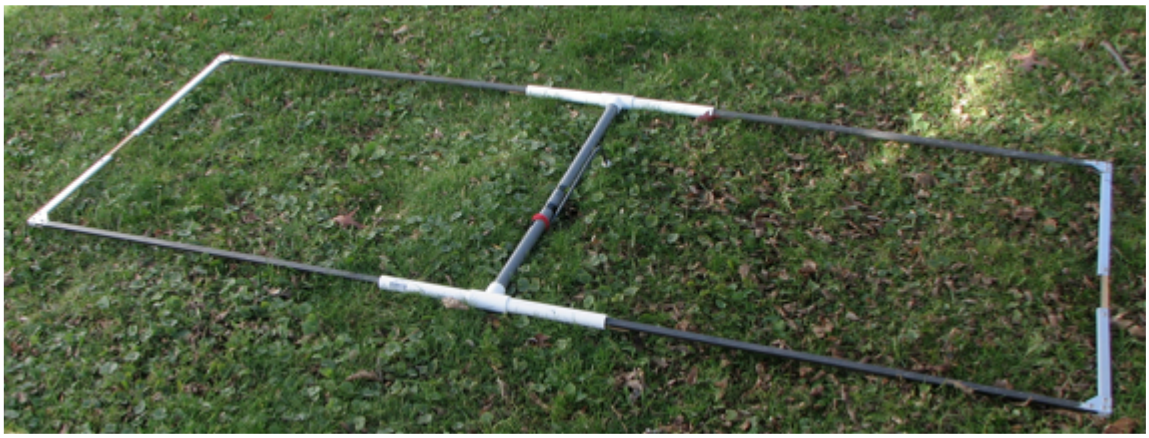
So, why consider a Moxon for roving? Basically, gain and pattern. The trade-off is always gain vs. coverage. While a Yagi provides good gain, you may miss stations outside the beam pattern. A horizontal Moxon provides a cardioid pattern with a deep null to the rear and -3dB beam width points spread about 80 degrees, or as wide as 144 degrees when vertical. Gain at 2 wavelengths above ground is around 11 dBi. This is not as omni directional as stacked loops, so it does require some rotation, but I like the advantage of having a compact antenna with good gain covering a general direction.

The bandwidth of a Moxon is very broad, and it is quite easy to flip one into vertical polarization and still have a good SWR at the FM frequencies. The null to the rear can run about -30 dB and is quite sharp, allowing you to reduce QRM, or to determine a bearing.

On 6 meters, the Moxon is my only antenna, but on 2m and 432 I can switch between Moxon and Yagi, and may be adding one for 222 if mast space permits.

The late L. B Cebik W4RNL has published a wealth of information on Moxons (and every imaginable antenna) which is available free online with simple registration. I recommend the Moxon index page as a great starting point (http://www.cebik.com/content/a10/moxon/moxpage.html) which includes a dimension calculator at the bottom of the page. All of my specifications and antenna patterns come from Cebik, and in respecting the copyright, I refer you to the original, while I will generalize.

Here are a few examples of putting the Moxon to work with a simple design. Half-inch aluminum screen channel sold in 84" lengths is just big enough to make a 6 meter Moxon cut for 50.5 MHz which covers the lower band edge easily.



My first design simply involved cutting a notch in the flat 1/4" side of the screen channel to insert the blunt end of the joining piece, and drilling for a sheet metal screw. An inserted hardwood strip 1/4x1/2 kept the joint from flattening, and also spaced the Moxon gap, with screws fixing the dimension.

That simple construction was used on 2 meters:

A wood or Plexiglas strip also spaces the feed point, with short copper wire to an SO-239, or coax leads directly under the screws. My original 6 M antenna was mounted to 3/4" tees on the ends of a PVC boom at feed point and midpoint of the reflector, but somewhere on a rove, either wind load or a tree over stressed that configuration, and so I've redesigned it with more strength.

Mounting a nominal 8" length of SCH 40 PVC in each end of the tee, and sliding a wood strip between the channel and the PVC makes a solid friction fit with very broad support. Coax is threaded from the feed point through the tee before mount-

ing the support pipes, and emerges through a hole in the boom. It would be easy to form a coax choke wound on the boom, although Cebik has never suggested that.

I decided to use the usual plastic corner inserts and to cut aluminum gussets from 1-1/2 flat stock, 1/16" thick. Placed top and bottom with 3 stainless screws, the joint is strong, and with some care can be disassembled if needed. Taking it apart becomes possible if you fix the tees with screws instead of glue. The gap is the same as before with wood or Plexiglas strip and screws.

An alternate design for 6M Moxon is to use wire supported by wood strips bowed in an X pattern. A 3/4" piece of plywood is cut-in top and bottom to provide a channel to hold the 1/2" x 1/4" wood strips. A single #10 machine screw goes through the strips, plywood block, and an angle iron which is held to the mast by a hose clamp. The wood strips need to be of good quality straight grain and perhaps due to their flexibility, have so far proved durable despite light weight. At the ends, a short piece of 1/2" vinyl tubing is slipped over the strip, and a 1/4" nylon bolt, drilled for #14 wire passes through the tubing, securing the corner, but easily removed. The strips are long enough to bow slightly and maintain tension. At the wire gap, another pair of drilled nylon bolts clamp to heavy nylon fish line to adjust spacing.

I haven't tried traveling with this type of Moxon mounted in the wind stream, although the wind load seems minimal. Its light enough and flexible so that is can be easily slipped inside a hatchback.

At 2 meters and above, its easy to fabricate a Moxon from 1/8 inch aluminum or brass rod. For material check out: http://www.speedymetals.com/c-8366-2011.aspx I prefer to use white SCH 40 PVC as it may have better RF characteristics, but I have used the gray conduit as well. I mount the 1/8 rod to Plexiglas or to the PVC, and usually solder to coax directly.

Because of the value of having a vertical antenna for FM, I've designed a simple pivot that rests at horizontal from the weight of the coax, but can be rotated to vertical by pulling a rope attached to the other side of a diagonal dowel.

Hose clamps mount a piece of PVC that serves as a stop against the dowel.

For the rotating fitting I have used a threaded coupler or a 1/2" tee drilled out carefully with a 7/8" Forstner bit, which accepts 1/2" SCH 40 very nicely.

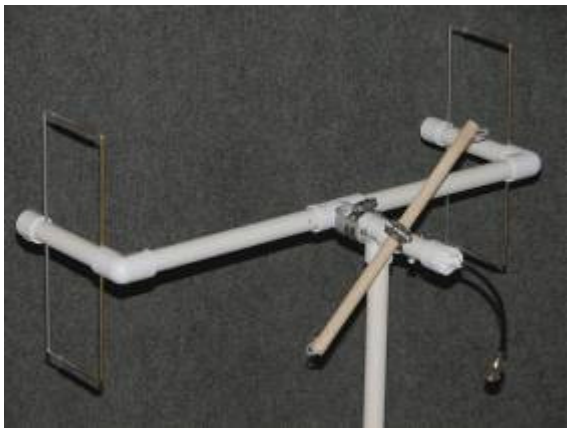
Vertical

Horizontal

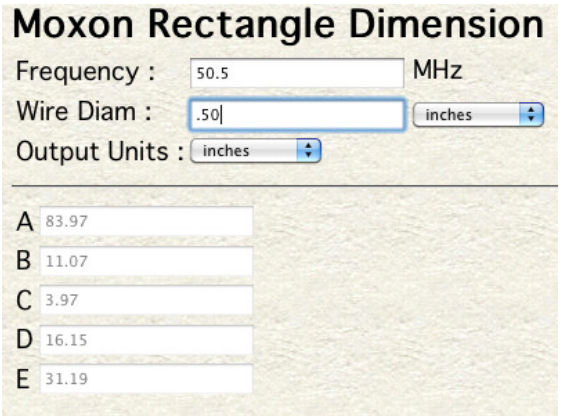
The Moxon gap dimension can be aligned with vinyl tubing, heat shrink, or possibly by drilling a long nylon bolt to accept the 1/8" rod (which I have not yet tried.) It may be necessary to provide a spacer inside the tubing as alignment is quite important but many Moxons work anyway.

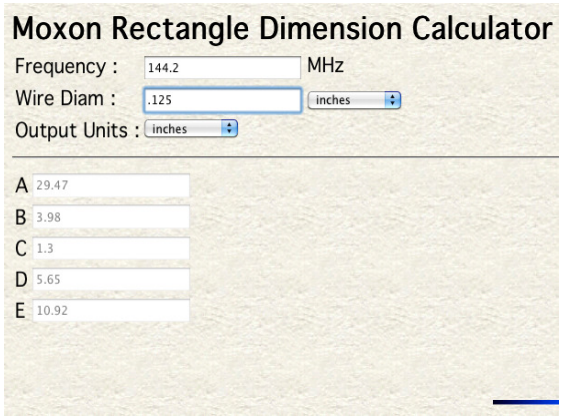
Stacking Moxons

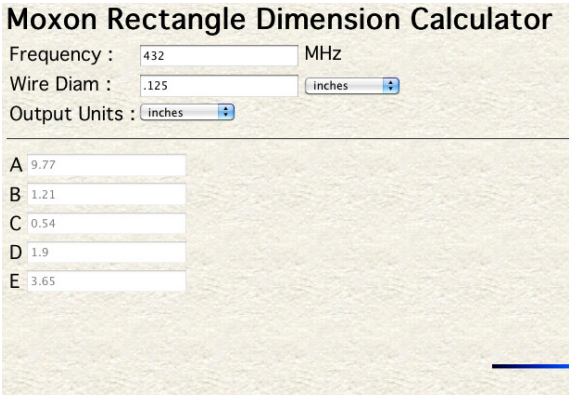
Do read the Cebik articles on this, if you are interested, but its possible to improve the gain and take off angle while hardly changing the feed impedance. Interesting things also happen with the pattern. Horizontally the f/b drops, but two vertical Moxons separated 1.3 wavelength can achieve -51 dB front to back! When those Moxons are vertical but stacked horizontally, the pattern is more of a clover leaf with one larger forward lobe. I decided to try stacking a pair on 432 yielding 15 dBi gain horizontal and 12.6 dBi when vertical. I wanted broad coverage, but also some nulls to reduce the possible 40-over signal of close rovers or big amps. Conditions for this year’s 432 Sprint never provided enough activity to test that idea, but the broader coverage against my stacked 11 element Yagi's was useful. Here’s the 432 stack:

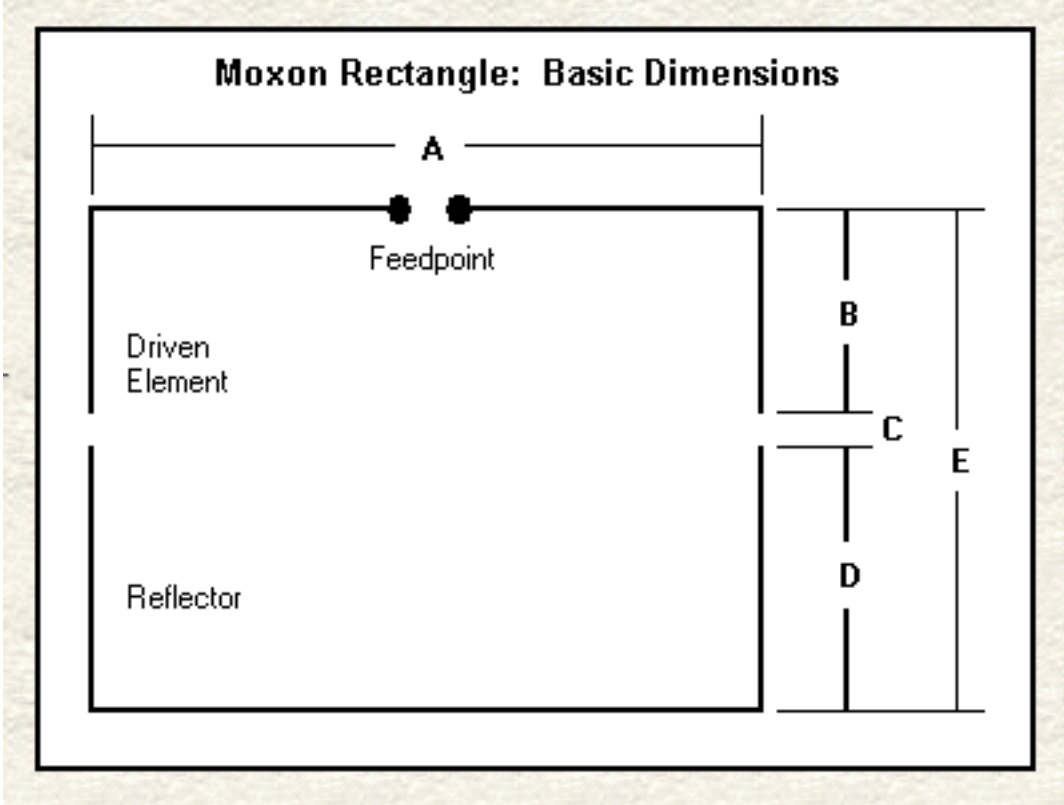


Once again it is designed to pivot, and two 3/4 WL 75 ohm phasing lines are housed in the PVC to where they join to the N jumper. SWR measured 1:1 at 446 MHz, and 1.7:1 at 432MHz. It might need a solder blob at the corners to tune. The brass tubing is the driven element and coax is soldered into the open tube ends.
If anyone would like more specifics for these antennas, please contact me, AB2YI.
If you go to the Cebik Moxon page you can determine the exact dimensions for your frequency and conductor size. Here are some examples:





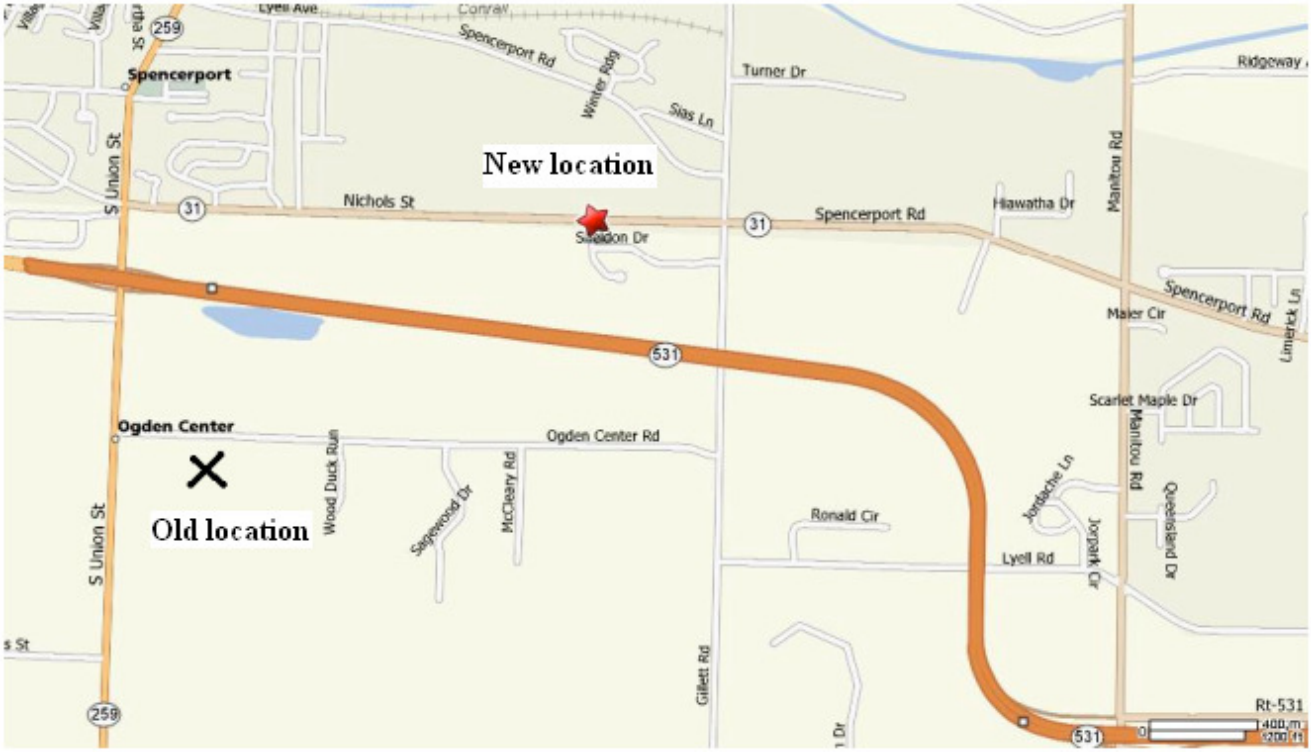




Classified Listings

None this month

Meeting Location and Directions



Spencerport Wesleyan Church on 2653 Nichols St. (actually Hwy. 31).

Directions from Rochester:

531W exit RT. to 259N

259N turn Rt. on 31E (first Rt. at traffic light)

Look for Spencerport Schools Bus Garage on left

Take first Rt. on Sheldon at A-framed church, park in rear lot.

Enter gray metal door under fire escape.