



N.E.W.S. LETTER

The Publication of the North East Weak Signal Group



July 2011

Volume 20

Issue 4

President: K1WHS, Dave Olean
Vice President: WZ1V, Ron Klimas

Current Officers
NEWSLetter Editor: W1FKF, Don Twombly

Secretary: W1GHZ, Paul Wade
Treasurer: WA1MBA, Tom Williams

Annual N.E.W.S. picnic July 9, 2011

MDS and ERP Testing 5.7 GHz and 10 GHz

**Elections
swap shop**

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Don't Forget

**The North East Weak Signal Group
2 Meter VHF and Above Net
Every Thursday at 8:30 PM Local 144.250
W1COT, WZ1V or K1PXE Net Control**

MEMBERSHIP in the N.E.W.S Group is \$15 per year. Apply to Tom Williams, WA1MBA. Email [tomw\(at\)wa1mba.org](mailto:tomw(at)wa1mba.org) You may download an application from our web page

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

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The President's Corner

Our next meeting promises to be a very popular one, and all sorts of activities are planned. In addition to our fantastic cook out with hotdogs and hamburgers, we will be having the Microwave "MDS" testing for both 5 and 10 GHz. Now this is not quite like the typical CB "Shootout" where the good ole boys rev their engines, key their mikes and see how many pounds they can put out, taxing their 3 phase alternators and 3CX3000A7 foot warmers, all while setting brush fires with the RF arcs. No this is a bit more civilized where the most action we see is a wiggling needle on a milliwatt power meter. I call it the Official Microwave Geek Evaluation, or simply the OMGE. Bring your systems to see how well it is working. The summer microwave season is upon us.

This is also the time for elections and we have the full slate of officers up as well as all but one member of the Board of Directors up for grabs. I am really impressed at how the NEWS gang has stepped up to the plate in running the Microwave Update. There is all sorts of volunteerism and action in evidence, and that can translate to a healthy change in our group's officers through the elections. Change is good, after all, and, between the officers and the Board, the club can stay vital and enthusiastic as time goes on. Our charter is to promote VHF UHF activity, and there are all sorts of ways to do that. No one has a monopoly on all the good ideas. Please consider what you can accomplish in a leadership position and feel free to jump in. In the past we have promoted VHF contests, digital EME, weekly nets, and even the production of a VHF UHF club video as a marketing tool for new blood. These efforts are ongoing and should provide much fun and stimulation in the months ahead.

I hope to see you all at the meeting.

Dave Olean K1WHS

From our Treasurer

Another year gone by - it seems like it was only a little while ago when we had our last annual meeting and picnic. Don't forget that the annual meeting is when we elect new officers and pay our dues. I will try to bring a large printed version of the database as is our custom so folks can check it for accuracy and make any updates. Our dues are still \$15 a year, and although checks are easier I will bring change if you have cash.

Our membership is quite strong at the moment. Our membership number tends to peak in July, and then drop in August as people forget to pay their dues, slowly recovering over the rest of the club year.

I trust many of us had a good June contest experience. I managed to get 50 through 430 MHz on the air and put in a few hours, racking up a few distant grids on 6. Clearly the upper bands need work if I am going to enjoy September. See you at the picnic!

Tom WA1MBA

From our Secretary

4 May 2011

President K1WHS called meeting to order 1320

Treasurers Report:

Balance \$4050

103 paid members + 14 permanent members

OLD BUSINESS:

Microwave Update Update

- K1WHS and W1GHZ will co-chair and act as session conveners
- Publicity WA1MBA - possible Haystack Observatory tour
- WW1M investigating
- K3TUF is setting up PayPal
- W1TDS will assist with flea markets
- KA1ZE is Treasurer of Eastern VHF/UHF Conference
- additional volunteers needed for registration and hospitality
- bring extension cords
- WZ1V has negotiated favorable contract with hotel

NEW BUSINESS:

-K1JK took video during microwave sprint. Please take video

of operations and events, N1JFU will edit them into a video

in the fall.

ANNOUNCEMENTS:

- show and tell:

- W1GHZ showed pictures from Germany

- N1JEZ showed Wavenode

PROGRAM:

Contest discussion by KX9X, Sean, from ARRL

- picture of 6 meter folding Yagi from Japan

- VUCC is on Logbook of the World, catching up

- VUCC fees restructured to \$0.15 per QSL

- suggested a VHF operating education handout for Field Day

- Sean is planning an expedition to FN67, a rare 6M grid

- distance scoring is being considered by VUAC

- F6FVY website finds grid squares on Google Maps

- Why aren't all contest scores in QST? Contest scores

are online and available to non-members. All contest data is available as .csv. A QST page costs \$6900 (circulation is 169K).

- Cabrillo robot accepts Cabrillo 2.0 and 3.0

Meeting adjourned 1513

N.E.W.S. MDS and ERP Testing

5.7 GHz and 10 GHz

At the annual N.E.W.S. picnic, we will do MDS (Minimum Discernable Signal) and ERP testing on 5.7 GHz and 10 GHz.

To test for MDS, we set up a distant signal source. After everyone has a chance to peak up on the signal, the signal level is reduced one dB at a time - when you can no longer hear it, then you have found the MDS for your system. You decide how well it works, and whether you can hear as well as Don and Dale. As a double-check, the frequency is moved a few KHz, then the signal level is increased one dB at a time (this is the "backup" number). If you weren't kidding yourself, you should be able to find it at the same level as before. Usually, it takes a few more dB to find a signal.

Finally, we also check relative ERP, transmitting one at a time and recording the relative power received at the distant point. Results in 2010 were pretty good, with participants on 10 GHz and 24 GHz, plus a couple of higher frequency stations for show. This isn't a competition, just a chance to check out the gear with friends around to help. Most folks had 10 GHz stations that worked pretty well, while a few found problems to fix before the 10 GHz & Up contest in August. Not only do we know our equipment works, but also that there will be some other good stations to work.

Paul W1GHZ.



Paul enjoying a brew on his last trip to

England. photo was taken by g4swx

Current N.E.W.S. GROUP OFFICERS:

PRESIDENT: K1WHS, Dave Olean

Lebanon ME 04027, FN43mj

k1whs @ metrocast.net

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 2304, 3456, 5760, 10 GHz, 24 GHz.

VICE PRES: WZ1V, Ron Klimas, 52 Jefferson Cir,

Clinton, CT. 06413, FN31rh

wz1v @ arrl.net

ACTIVE ON: 2, 432.

SECRETARY: W1GHZ, Paul Wade,

W1ghz @ arrl.net

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 5760, 10GHz, 24GHz.

TREASURER: WA1MBA, Tom Williams,

Shutesbury, MA 01072, FN32sl

tomw @ wa1mba.org

ACTIVE ON: 6, 2, 432, 903, 1296, 2304, 3456, 5760, 10, 24, 47,78 GHz.

NEWS Letter Editor: W1FKF, Don Twombly,

Woburn, MA 01801, FN42jk

donw1fkf-news @ yahoo.com

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 2304, 3456, 5760, 10, 24, 47, 78 GHz

SPECTRUM MGR: K1MAP Mark Casey

Hampden, MA. 01036, FN32

Map @ mapinternet.com

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 2304, 3456, 5760, 10 GHz

BOARD OF DIRECTORS:

KA1OJ Mark Foster

(1 yr) Northboro, MA 01532, FN42eh

Mcfoster @ charter.net

ACTIVE ON: 6, 2, 432, 903, 1.2, 2.3, 3.4, 5.7, 10, 24, 47, 78 GHz.

N1DPM: Fred Stefanik,

(1 yr) Feeding Hills, MA. 01030, FN32qb

n1dpm @ verizon.net

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 2304, 3456, 5760, 10 GHz

N1JEZ Mike Seguin

(1 yr) Burlington VT 05401, FN34im

N1jez @ verizon.net

ACTIVE ON: 6, 2, 222, 432, 903, 1296, 10 GHz, 24, 47, 78 GHz.

W1ZC: Dick Wilborg

(2 yr) Mason, NH. 03048, FN42dr

dwilborg @ surfglobal.net

THE GREENING OF "DAVE'S STATION". PART II

Dave K1WHS FN43 mj

Introduction

I have been making a solar photovoltaic system for use at my remote shack. As most of you all know, I have to generate my own electricity so that I can get on the air to work DX. That system has been evolving over the years. I started with an old 4-cylinder gas generator with a 10KW capacity. It drank about a gallon an hour, and with gas at around \$1.00 per gallon, it worked out pretty well. After many years of use, high maintenance, and increasing gasoline prices, I switched to a diesel power plant. The over riding reason to switch is that we started some serious multi operator contest efforts and 10 KW was not enough to run 1500 watts on the lower four bands. The old gasser would run three, but that fourth station would do it in. I got a "Mr. Fixit" Special 30 KW diesel military generator. It worked very well but drank 1.7 gallons per hour. It died a horrible death in 2007. The latest power system has been a 20 KW diesel of modern manufacture. It drinks about a gallon per hour under full load and maybe 0.6 gallons if I am operating as a single operator with only one band running. Maintenance is very simple with diesels but still the cost of operation has been creeping up over the years. With diesel fuel now at over \$4.00 per gallon, I hate to have the big diesel running in anticipation of a band opening. I use a small 3300-watt gasoline genset for monitoring the band, but even that is expensive lately. What to do? I started investigating solar power!

PART II

The intricacies of solar power and photovoltaic systems in general, are not hard to comprehend. Any ham worth his salt will feel at home when calculating the numbers while designing a small system. There are some fine points that are not so obvious though. My grasp of solar panels in the past indicated that it was almost impossible to collect the rated power of the panel. If a panel was rated for 10 amps of current, then it would probably deliver 7 or 8 amps in a typical installation. The first thing I learned was that solar panels put out maximum power when they are cold. I also found out that my calculation for my 25 amp charge controller was in error. It is entirely possible that a cold winter day with clear skies and snow cover on the ground will allow the panel to deliver more than their rated current. A 25% allowance must be made for the extra current in such instances. My two panels had a 24 amp short circuit current and my initial charge controller was rated at 25 amps. I really needed at least 30 ampere capacity in my controller. I risked burning it out on a sunny winter day. Back to the drawing board!!

I decided to use the original Blue Sky Energy Solar Boost 2000E MPPT controller on my smaller 34 watt panels and purchased a larger 45 amp Morningstar MPPT controller for the two large Evergreen 215 watt panels. I did some reading on PV systems in the National Electrical Code and found that special wiring is needed, and some of the tricks used in normal house wiring are taboo with DC PV systems. For example, the strain reliefs must be plastic compression types, and not metal as is used in normal house wiring. The wiring must be of high temperature design and immune to UV etc. DC circuits must all be protected with fuses or circuit breakers that are rated for DC. AC breakers are usually not adequate unless they are rated for high voltages in excess of 400 volts. Any crimped connections are suspect and must be made with industrial ratchet type crimpers, and not normal hand crimpers. Crimped connections tend to fail in DC circuits with higher amperages typically encountered. You should never use twist on "wire nuts" as well. Solar panel wiring must be safe as high voltages can be present in larger systems. My small system has about 40 volts coming out of the panels.



The panels on the right are 2 X 215 watt Evergreen polycrystalline panels while the two smaller ones on the left are 2 X 34 watt (old 1992 vintage) panels. You can see that I have some tree trimming to do to get rid of some shading!



The 45 amp MPPT (Maximum Power Point Tracking) charge controller shown bolted to the wall and using plastic strain relief bushings. This unit keeps a running log of power usage,

The new 45 amp charge controller is made by Morningstar, and can utilize any range of input voltage from the panels and can charge 12 thru 48 volt battery banks. I decided to connect my two big solar panels in series for a nominal "24 volts". The actual output voltage is around 40 volts and the regulator handles it nicely. The charger portion is a three stage charger and also provides an equalization mode (much higher charge voltage for about ½ hour) for flooded type batteries to guard against sulfation. Equalization is not used on sealed PV batteries as I have in place. I turned the equalization feature off. The wiring from the panels is high temperature (90 degreesC) #10 wire with special locking interconnects (called MC4 connectors) so that panels can be disconnected one at a time from the system. These connectors are designed so that no one will get electrocuted while playing around the panels. A few big panels when series connected, could produce lethal voltages.

The last item needed in my system was a 12 volt DC to 115 volt AC inverter. I have used a cheap 150 watt square wave inverter and had all sorts of problems with RFI and weird performance when running the more delicate gear. Transformers tend to fry with these things, and I could not stand the RFI on 10 and 6 meters. I did a bunch of reading and finally decided on getting a top of the line 1000 watt pure sine wave inverter. Now pure sine wave is a new buzzword and there are all sorts of knockoffs from China that purport to be pure sinewave and the prices are quite low, but after careful investigation, I decided to skip the cheap route and purchased a top shelf hard wired inverter with built in transfer switch. The Xantrex ProSine series use 1600 segments to generate the AC sinewave and produce a picture perfect sinewave on a scope. In addition, the frequency of operation is crystal controlled and insures that any birdies that might be detected will not move as the load changes. Apparently the ProSine 1000 and the larger 1800 watt version are commonly used by trucker radio amateurs to power their various ham rigs on the road. I liked the idea of a built in transfer switch as I can hard wire it and it will automatically bypass itself when AC power is present, and then switch to the 12 volt buss when AC power is lost. The ProSine 1000 will run intermittently at 1500 watts for 30 seconds or so. I have visions of it powering that new Elecraft 500 watt solid state HF amplifier in the future. This inverter is available with ground fault AC receptacles or the hardwire option with transfer switch. The inverter is hooked to both my 12 volt battery bank (1/0 cable) and the main circuit breaker panel. (standard #12 house wiring) The 12 volt input line has a 125 amp DC circuit breaker installed. The 115 volt output of the inverter is also routed through a 20 amp breaker and then to two AC strips for powering the various rotator control boxes. There are currently seven rotator boxes for 10, 6, and 2 meters. When I get 10 meters all installed, there will be 11 control boxes.

I wanted to make the switch from AC to DC a simple task and that required some planning. I ended up using steering diodes for low power gear such as preamps and 24 volt coax relays. My 100 watt 144 MHz solid state amplifier required a different approach as steering diodes have too much of a voltage drop.. I purchased some heavy duty 25 amp 12 volt relays and mounted them right on the RF PA. When energized from the AC mains power supply the relay connects the AC powered supply to the amplifier. When the AC is turned off, the relay drops out and connects the amplifier to the solar powered battery bank. I did the same thing with my 12 volt distribution panels. When AC power is available a heavy relay is engaged and the AC supply powers the Rigrunners. When AC is not running, the relay connects the solar battery system up and I am running on battery power.

I played around a bit during the June Contest and ran a few things off the solar batteries all day Sunday. There was no sunlight at all, so the 144 MHz K3 and the 20 watt output transverter along with preamps and coax relays all ran off battery power. That all functioned perfectly and I still had 12.7 volts at 9:30 PM Sunday night.



Rear view of solar panels.

You can see the locking connectors at the center bottom of the picture. They are cable tied to the frame. A short run of the #10 wire runs into the shack.



The Battery Bank! (140 and 50 AH pairs) during initial testing. I have since relocated the small 50 AH batteries inside the relay rack and out of sight. The smaller batteries power the second system to deliver 24 VDC. The wiring has been changed as well to remove the clutter during the testing phase



Here is a picture of my solar control panel. The 45 amp charger is on the left. The 25 amp charger for the 24 volt system is on the right. The circuit breaker box in between has DC breakers to separate the batteries and solar panels from the chargers. Small wires exiting each charger are for temperature compensation of the batteries. A temperature sensor gets clamped on a battery terminal and lets the charger know how warm or cold the battery is. This allows proper charging at all temperatures, winter and summer. Note the plastic strain reliefs for the DC wiring.

I am still playing around with the solar power system. It is a work in progress and changes a bit as I learn more. So far I am very pleased with the results. I can go up to the shack and listen on six meters for an entire day without having to run any generator and burn any fuel. Al Gore would probably give me a medal except that I did not hire anyone, or pay off a union to install it, so I am not eligible for any tax credits. Solar power is not cheap. I think I have about \$1700 into the system so far, but with fuel costs at \$3 per hour or more, I should recoup my expenses in short order. In the past I ran the generator about 300 hours per year. I believe it will pay for itself in less than two years. The generator initial cost was quite high as well, and I am not putting that into the equation! If I ever get to retire, I can spend many great hours in the shack monitoring the band at virtually no cost. The diesel generator can be remote started, so I am rigging up a remote start switch in the shack to start the engine and then close the big contactor to connect up the 3 phase AC power to the shack. If I run six conductor wire, I can start the engine, monitor the AC voltage, and then connect up the power to the shack all while sitting at the six meter operating position. My six meter amplifier is instant on, so I can be on the air with 1500 watts output in less than 30 seconds. Still, the 100 watt level on solar power is quite adequate for most contacts on the bands. I have worked KA1ZE in FN01 with 90 watts on 144 MHz solar power as well as a number of DX stations in Europe and South America on six meters using just the power of the Sun..

One final note. As I was tuning around on six meters one day while using solar power, I heard some rustling leaves outside. I thought it was someone walking through the woods nearby. I went out to check and saw a nice deer come walking by the shack about 40 feet away. It did not know I was there and happily cruised by. That would not have happened with a noisy generator running!

August

6-7 August UHF Contest

20-21 10 GHz and Up Contest (round 1)

September

10-12 September VHF QSO Party

17-18 10 GHz and Up Contest (round 2)

45th Annual CSVHFS Conference

The Central States VHF Society, Inc (CSVHFS) invites you to attend the 45th annual conference in Irving, TX, July 29-30, 2011. The Planning Committee has a fun-filled, educational event in store for you!

- July 29-30, 2011, Irving, Texas
- WestIn DFW 4545 W. John Carpenter Frwy Irving, TX 75063

<http://www.csvhfs.org/2011conference/index.html>

For Sale

Cardo Systems BTA II Bluetooth Adapter

2 for \$10.00

With wall charger

Make your Transceiver Wireless

Plug Bluetooth Dongle into Transceiver, use with your cell phone Bluetooth headset .. VOX on TX without adding additional circuit, just add mating connectors..

Don W1FKF donw1fkf-news@yahoo.com



FOR SALE 144, 432 and 1296 MHZ ANTENNAS: Four Directive Systems 45 element loop yagis for 1.2 GHZ mounted on Directive Systems on H frame with Directive Systems power divider with Directive Systems phasing lines installed and waterproofed. New cost over \$1000, selling for \$600 or best offer. Cushcraft 17B2 two meter yagi. 31 foot boom. \$100 or best offer. Directive Systems 25 element 432 MHZ yagi \$100 or best offer. Dick, K1HC dick.bean@verizon.net 781-461-0101 Conveniently located off Rt. 95/128 at Exit 15B in Westwood, MA.

2011 North East Weak Signal Group VHF CALENDAR:

July 9, 11AM - 4PM - [N.E.W.S. Group Picnic](#)
July 16-17, 1800Z - 2100Z - [CQ Worldwide VHF Contest](#)
August 6-7, 1800Z - 1800Z - ARRL UHF Contest
August 13, 0300Z - Perseids meteor shower
August 20-21, 6AM - 11:59:59PM - ARRL 10-GHz & up Cumulative Contest
September 10-12, 1800Z-0300Z - [ARRL September VHF QSO Party](#)
September 17-18, 6AM - 11:59:59PM - ARRL 10-GHz & up Cumulative Contest
September ??, 1900-2300 Local - [144 MHz Fall Sprint](#)
September ??, 1900-2300 Local - [222 MHz Fall Sprint](#)
October 2 - [Mt. Airy \(PackRats\) Hamarama](#)
October ?, 1900-2300 Local - [432 MHz Fall Sprint](#)
October 14,15 2011- [New England Amateur Radio Festival - Deerfield, NH](#)
October ??, 0600-1200 Local - [Microwave Fall Sprint](#)
October 13-16 - [Microwave Update hosted by NEWS Group](#)
October ??, 2300-0300 UTC - [50 MHz Fall Sprint](#)
November 19, 1PM - 4PM - [N.E.W.S. Group Meeting](#)
November 17, ?????Z - Leonids meteor shower
December 14, ?????Z - Geminids meteor shower



HAMARAMA

40th Annual Pack Rat Flea Market

Sunday October 2, 2011

Rain or Shine
Gates Open: Buyers at 0700 Sellers at 0600

Middletown Grange Fair Grounds

Penns Park Road, Wrightstown, PA
Food, Beverages & Facilities on Site ----No Overnight Parking

HUGE PARKING AREA !

See it! Touch it! Buy it! Take it Home!

<http://www.packratvhf.com/Hamarama/hamarama.html>



15th International Earth- Moon-Earth Conference EME 2012

Cambridge UK
16-18 August 2012

www.eme2012.com

Joint Conference Announcement

<p style="text-align: center;">Microwave Update 2011 Sponsored by North East Weak Signal Group N.E.W.S.</p>	<p style="text-align: center;">37th Eastern VHF/UHF Conference Sponsored by North East Weak Signal Group and the Eastern VHF/UHF Society</p>
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October 13 – 16, 2011 Holiday Inn, Enfield, Connecticut *

	Microwave Update	37th Eastern VHF/UHF Conference
Thursday 13 Oct	TBD Tour Tour of ARRL Headquarters	Friday: No Activities
Thursday Evening	Hospitality Session hosted by DEMI	
Friday 14 Oct	Microwave Registration, Speakers, Auctions Technical Sessions	Hospitality Session hosted by N.E.W.S/ Pack Rats.
Friday Evening	7 PM — Swap session for registered attendees only plus invited surplus dealers	
Saturday 15 Oct	Microwave Speakers, Auctions Technical Sessions	VHF/UHF Registration Technical Sessions, Band Sessions & Noise Figure Lab
Saturday Evening	BANQUET Awards & Prize Drawing (First 10 prizes to Banquet ticket holders)	
Sunday 16 Oct	8 AM (no early birds) FLEA MARKET — in parking lot Open to all ANTENNA MEASUREMENTS Microwave Update Close Out	

CONFERENCE UPDATE PLEASE READ

Microwave Update early registration package deal \$79 (\$89 at the door) includes Thursday/Friday night Hospitality rooms, Friday/Saturday/Sunday registration, Proceedings (written and CD): also includes Friday Luncheon deli buffet (make your own sandwich, salad + hot soup) in private ballroom, Plus Saturday night Banquet in private ballroom with choice of dinner selections: Chicken Marsala, Baked Scrod, or Roast Pork Loin. Additional dinners for guests are available at \$35 each. This also includes Sunday morning outdoor flea market (both buyers and sellers) and antenna measurements.

We are also offering a Saturday/Sunday only venue which consists of the second half of Microwave Update with concurrent VHF/UHF Conference presentations (our traditional Eastern VHF/UHF Conference agenda). Early Pre-Registration for this venue is \$30 (\$35 at the door), and includes:

Friday night Hospitality Room, Saturday/Sunday registration, Proceedings (written and CD). Saturday night banquet is optional for an additional \$35, with choice of Chicken Marsala, Baked Scrod, or Roast Pork Loin. This also includes Sunday morning outdoor flea market (both buyers and sellers), and antenna measurements.

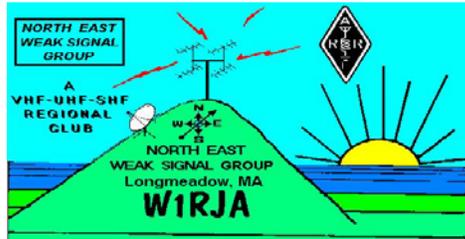
We have a block of Guest rooms (doubles) reserved at the Holiday Inn Enfield for \$99/night by mentioning Microwave Update, call them directly for reservations: 860-741-2211. This price is only valid through 09-23-2011 or until sold out.

Paul W1GHZ has been requesting papers for our Proceedings, please contact Paul directly if you have articles for publication.

We're very fortunate this year to have dedicated volunteers from both the NEWS Group and the PackRats helping out, but we can sure use an extra hand working the registration tables during the event. Please contact myself or Steve W1SMS if you're interested in volunteering.

Visit our webpage often for the latest updates and registration: <http://www.microwaveupdate.org/>

Respectfully, Ron Klimas WZ1V, for Bruce Wood N2LIV wz1v@arrl.net



N.E.W.S. Group

Membership Application

Name: _____ Call sign: _____ Grid: _____

Street: _____

City: _____ State: _____ Zip: _____

Phone (home) _____ - _____ - _____ Optional (work) _____ - _____ - _____

Email _____

ARRL member? Y N Electronic Newsletter Delivery? Y N

Operational Bands (circle) 50 MHz 144 MHz 222 MHz 432 MHz 903 MHz

1.2 GHz 2.3 GHz 3.4 GHz 5.6 GHz 10 GHz 24 GHz 47 GHz

76 GHz Light Other (list)

The North East Weak Signal [N.E.W.S.]Group is being established to form a camaraderie among fellow VHF-UHF-SHF enthusiasts, and support a convenient means to exchange technical information. We currently have 6 meetings per year, held at a centrally located facility, and provide a "NEWSLETTER" that is distributed 2 weeks prior to each meeting. Any contributions to this publication are appreciated and can be sent to: Don Twombly, W 1FKF 23 Maura Dr. Woburn, MA 01801 Email: donw1fkf-news (at) yahoo (dot) com. Dues are \$15/year. Remember, this group is formed by VHF'ers for VHF'ers.

Mail to:

North East Weak Signal Group

c/o WA1MBA Tom Williams PO Box 28

Shutesbury, MA 01072

Email: [tomw \(at\) wa1mba \(dot\) org](mailto:tomw@wa1mba.org)

ARRL Affiliated Club

Directions to Picnic

K of C

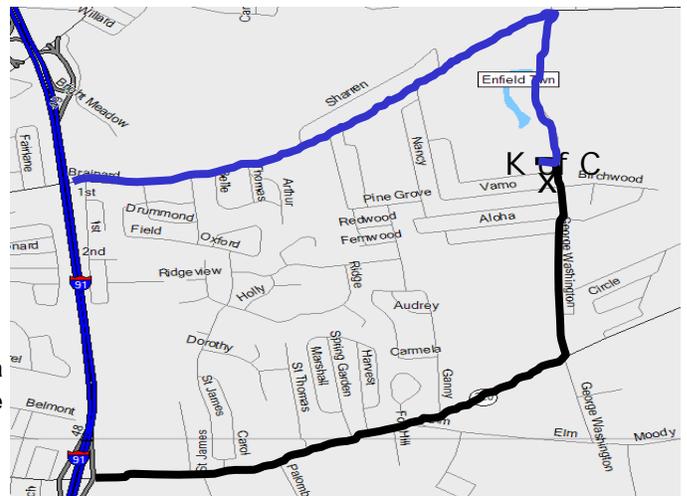
371 Washington Rd
Enfield, CT 06082

RT-91 exit 48 on to Route 220 East (Elm St). Bear left at the fork onto Shaker Rd. At the 9th traffic light from exit 48, turn left on to George Washington Rd., K of C is 1 mile on the left.

Lost going that way? Try this:

RT-91 exit 49, go south on Enfield St Rt.5. Drive 1/2 mile, take a left on Brainard Rd. Drive 2 miles, take a right on to George Washington Rd. K of C will be on the right.

GPS: 42.015805 -72.560183





SSB Electronic USA manufactures and distributes HF, VHF, UHF and SHF equipment covering 10 MHz to 47 GHz

124 Cherrywood Drive,
Mountaintop, PA 18707
USA

<http://www.ssbusa.com/ham.html>

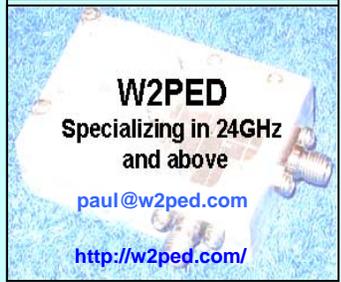


Chassis Kits & Custom Enclosures

Charles Byers K3IWK

<http://home.flash.net/~k3iwk/>
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Dover, PA 17315

Phone/Fax (717) 292-4901 k3iwk@flash.net
Phone between 6:00 - 9:30 P.M. EST



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