



# N.E.W.S. LETTER

The Publication of the North East Weak Signal Group



July 2010

Volume 19

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 10, 2010

### MDS and ERP Testing

### clinic on the lower microwave bands

### swap shop

The President's Corner.....	2
From our Secretary.....	2
From our Treasurer.....	2
MDS and ERP Testing .....	3
36th EASTERN VHF/UHF CONFERENCE... Pictures.....	4
10 GHz Antenna range measurements.....	5
Flea Market Pictures.....	5
NEWS Calendar & Comments .....	6
Arecibo KP4AO.....	7
Converting UHF TV SSPA to 432 MHz N1JEZ.....	8
Membership Application.....	10
Directions to picnic K of C.....	10
Our Sponsors.....	11

### 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/>

The N.E.W.S. LETTER is the publication of the North East Weak Signal Group. Articles may be reprinted with proper credit given to the author and the N.E.W.S. LETTER. Send articles to Don Twombly, W1FKF 23 Maura Drive Woburn, MA 01801 Preferably via email with "Newsletter" in the subject line to [donw1fkf-news\(at\)yahoo.com](mailto:donw1fkf-news(at)yahoo.com)

## The President's Corner

Hello NEWS members

The annual NEWS picnic will have a new twist. In addition to the MDS testing of 10 and 24 GHz equipment, we will have a clinic on the lower microwave bands to include antenna testing on a detailed level. Not only will antennas be tested for gain if you so desire, but we will also do a more individual test to account for interaction between antennas, VSWR of systems, isolation between bands etc. We hope to cover 900 thru 5760 MHz. The goal is to provide a tweaking service for rovers, as well as a test bed for fixed station antenna performance.

The test system will be centered around an HP 8753D vector network analyzer with capability to 6 GHz. In tandem with the 8753D will be a laser printer to provide a printed record of the test results. Fred, N1DPM and I will provide the gear and help you to unravel any potential problems in your lower microwave setup. We will bring antennas for each band as well as cabling and such to make a variety of measurements during the picnic. This is not a gain competition. In fact we will not be setting up a highly accurate antenna range, but concentrating on providing resources for solving individual problems in rover gear or microwave antennas themselves.

A swap shop of sorts is also planned, so bring any goodies you are inclined to trade off. We will set aside an area to display your junk aka treasures!

All this promises to be a fun experience and a profitable exercise to evaluate your microwave systems. In short, a perfect geek holiday! I hope to see many of you at the annual picnic.

73,

Dave K1WHS

## From our Secretary

No Board meeting or secretary report from last meeting.

W1GHZ

## From our Treasurer

Its Annual Meeting and Picnic Time again. We have fun at the picnic, do microwave rig testing, elect officers and collect dues. Our dues remain \$15 per year. At the meeting I can take checks and cash, and everyone is invited to make sure that their database entry is correct. If you can't make it to the picnic meeting, please renew by mail. If you don't know if you have paid in advance, just send me an email and I will check your status. My email address is [tomw@wa1mba.org](mailto:tomw@wa1mba.org)

Please make checks payable to N.E.W.S. Group and mail to Tom Williams, PO BOX 28, Shutesbury, MA 01072

Thanks! and see you there

Tom WA1MBA

## Note from the Editor

A few weeks ago I broke my left arm and did some damage to my shoulder .. I am not very nimble at the computer, so please ignore any mistakes you may find in the NEWSLetter!!

See you all at the picnic.

73,

Don W1FKF

## 44th Annual CSVHFS Conference

- July 22–24, 2010, Bridgeton, MO
- Doubletree Inn

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

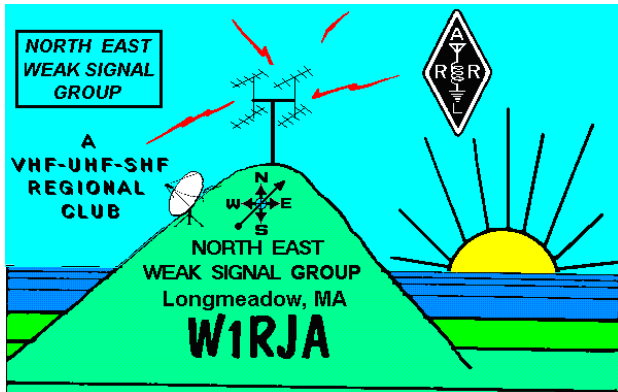
## Mid-Atlantic States \*\*\*VHF Conference\*\*\* Saturday, Sept 25, 2010

\*\*\*NEW LOCATION\*\*\*  
QUALITY INN CONFERENCE CENTER  
969 Bethlehem Pike  
Montgomeryville, PA, US, 18936  
(215) 699-8800  
[www.qualityinn.com](http://www.qualityinn.com)

- Join your amateur radio VHF colleagues and fellow microwave enthusiasts for a one day conference. Presentations for experts and beginners alike.
- Friday night Hospitality room
- Price Includes: CD, light breakfast, lunch, refreshments & buffet dinner
- Saturday night buffet banquet with speaker—XYL & family invited
- Proceedings CD, Raffles and door prizes
- Limited Indoor seller tables until 4PM
- Outdoor tailgate selling area in the late afternoon
- VHF equipment testing area
- FREE 3 HR BEGINNERS' SESSION (must register)



Hosted by the Mt Airy VHF Radio Club  
Detailed information and registration after May 1 at  
<http://www.packratvnhf.com>  
Registration, proceedings and banquet until 8/27 \$70 pp  
\$80 pp from 8/28-9/18 and \$90 pp thereafter  
Additional banquet tickets \$30 pp, add'l proceedings CD \$5  
Hotel rate til 8/27 only \$79+tax per night (mention Mt Airy VHF)  
Abstracts, papers and presentations may be sent to  
W2PED pdrexler@hotmail.com  
Questions to chairpersons  
KB1JEY@arrl.net or rick1ds@hotmail.com



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

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

At the annual N.E.W.S. picnic, we will do MDS (Minimum Discernable Signal) and ERP testing on 10 GHz and 24 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.

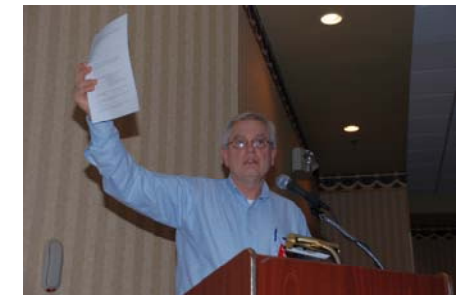
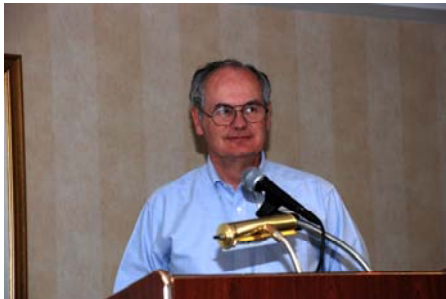
Finally, we also check relative ERP, transmitting one at a time and recording the relative power received at the distant point.

Results in 2009 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



36th EASTERN VHF/UHF CONFERENCE:  
APRIL 16-18, 2010





## 36th Eastern VHF/UHF Conference, 2010 10 GHZ Antenna Measurements

W1GHZ

		<u>Reading</u>	<u>Gain</u>
W1GHZ	Scientific-Atlanta Standardd Gain Horn	0 dB	22.45 dBi
W1FKF	36" wide Primestar dish, modified Primestar feed	13.6	36.05
W1FKF	36" wide Primestar dish, dualband 10&24 feed	12.6	35.05
W1JHR	18" RCA DSS dish, dualband 10&24 feed	10.8	33.25
WW1Z	18" RCA DSS dish, modified LNB feed	10.5	32.95
K3TUF	0.6 Meter prime-focus dish, Directive Systems 5&10 dualband feed	2	24.45
W1FKF	Gunnplexer horn	-1.9	20.55
W1GHZ	Horn	-2.7	19.75
W1AIM	Horn	-3	19.45



**COMMENT** Setup was adjusted for best results on higher gain antennas. As a result, lower gain horns look better than expected - a Gunnplexer horn should be around 17.5 dBi. The dish gains might be a bit optimistic also, but relative gains are pretty good, and informative.

## Flea Market 36th VHF/UHF Conference



**2010 North East Weak Signal Group VHF**

**CALENDAR:**

**Tentative 2010 dates:**

June 12-14, 1800Z-0300Z - ARRL June VHF QSO Party

July 10, 11AM - 4PM - N.E.W.S. Group Picnic

July 17-18, 1800Z - 2100Z - CQ Worldwide VHF Contest

August 7-8, 1800Z - 1800Z - ARRL UHF Contest

August 12, ?????Z - Perseids meteor shower

August 21-22, 6AM - 11:59:59PM - ARRL 10-GHz & up Cumulative Contest

September 11-13, 1800Z-0300Z - ARRL September VHF QSO Party

September 18-19, 6AM - 11:59:59PM - ARRL 10-GHz & up Cumulative Contest

September 20?, 1900-2300 Local - 144 MHz Fall Sprint

September 25-26 - Mt. Airy VHF PackRats Conference and Hamarama

September 28?, 1900-2300 Local - 222 MHz Fall Sprint

October 2, 1PM - 4PM - N.E.W.S. Group Meeting

October 6?, 1900-2300 Local - 432 MHz Fall Sprint

October 15-16? - New England Amateur Radio Festival - Deerfield, NH

October 16?, 0600-1200 Local - Microwave Fall Sprint

October 21-24 - Microwave Update

October 23?, 2300-0300 UTC - 50 MHz Fall Sprint

November 13, 1PM - 4PM - N.E.W.S. Group Meeting

November 18, ?????Z - Leonids meteor shower

December 14, ?????Z - Geminids meteor shower

I have a new C3I 4 way 903 MHz power divider that needs a new home. It is still in the sealed shipping box. \$50 postpaid. Contact:: K1WHS 207 658 9076

**44th Annual  
CSVHFS Conference**

- July 22-24, 2010, Bridgeton, MO
  - Doubletree Inn
- <http://www.csvhfs.org/conference/index.html>

The new 2010 36th Eastern VHF/UHF Conference CD is available for purchase at the PayPal link below. Please note, the 2009 CD was available recently and this is a new 2010 version. Thanks Bruce N2LIV Conference Chairman

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

**- ARRL UHF Contest**

August 7-8, 1800Z - 1800Z

**ARRL 10-GHz & up Cumulative  
Contest**

August 21-22, 6AM - 11:59:59PM

September 18-19, 6AM - 11:59:59PM

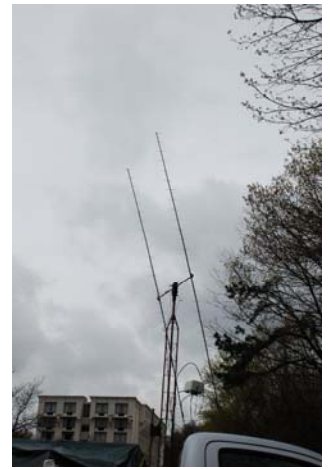
**Reminder**

**10 GHz Contest**

Mt Wachusett Auto Road will be closed until summer 2011

The 38th Annual Mt. Washington Auto Road Bicycle Hill climb 08/21/2010 from 8:30 am — 12:30 pm





**World Moon Bounce Day**  
echoesofapollo.com  
April 17th  
**2010**

**36th Eastern VHF Conference**  
Hosted by  
the New England Weak Signal  
Group

**W1RJA contact with KP4AO**  
at the Arecibo Observatory

<http://www.youtube.com/watch?v=ZutOfYLPIMY>



For a good laugh, you might want to see what we were confronted with when we switched to JT65B on the final day of KP4AO EME operations:

[http://www.physics.princeton.edu/pulsar/K1JT/KP4AO\\_JT65B\\_1.png](http://www.physics.princeton.edu/pulsar/K1JT/KP4AO_JT65B_1.png)

JT65 is supposed to be a weak-signal mode, and by WSJT standards most of these signals are anything but weak! We did our best to pick out and reply to some of the weaker ones, during the all-too-short time we allocated to JT65.

To give you an idea of what's possible, here's what I decoded a few minutes ago, from a single one of the one-minute wave files: I've received many requests for the wideband recordings from KP4AO, so a selection of them have now been posted on the WSJT web site at the following URLs:

- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_1.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_1.wav) 4/16 startup
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_2.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_2.wav) 4/16 CW
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_3.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_3.wav) 4/16 CW
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_4.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_4.wav) 4/17 SSB
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_5.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_5.wav) 4/17 SSB
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_6.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_6.wav) 4/17 SSB
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_7.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_7.wav) 4/17 CW
- [http://www.physics.princeton.edu/pulsar/K1JT/EME\\_8.wav](http://www.physics.princeton.edu/pulsar/K1JT/EME_8.wav) 4/17 CW

Files number 2-7 are all about 1 GB in size. File 1 is about 0.7 GB and file 8 only 41 MB. You may want to start with the shortest file, EME\_8.wav, to get a feeling for what they all contain.

With SpectraVue you should check "Invert Spectrum" on the "Wave File Input Setup" screen, and enter 432040000 in the "File Center Frequency" box. SpectraVue gives you date and time markers on the waterfall, so you can tell where you are (however, I've noticed that on 4/17 the times are certainly not correct). The data is blanked during KP4AO transmissions. The extremely strong KP4AO echo immediately follows each blanked interval.

I prefer listening to these files with Linrad. This superb program is well worth the time required to learn how to use it effectively. If you already have some familiarity with the program, here's what you need to do to listen to the KP4AO files:

1. Create a file "adwav" with a line naming each of the EME\_?.wav files
2. Start Linrad, select the desired file, enter "A" for weak-signal CW
3. Answer "Y" to "Interpret as I/Q data?"
4. Answer "Y" to "Invert frequency scale?"
5. Enter "432.040" in the frequency control box

Beyond these few hints to get you started, you're on your own with both SpectraVue and Linrad. I will appreciate it if you send me a list of all callsigns you hear in these recordings.

With best wishes from the KP4AO gang,

-- 73, Joe, K1JT

## Converting an Acrodyne CH20 UHF TV SSPA to 432 MHz The short version

Mike, N1JEZ

Recently Vermont Public Television (VPT) scrapped their UHF TV transmitters on Burke Mountain in northeast Vermont. I happened to be on site as they were tearing racks apart getting everything ready for the scrap heap.

VPT ran two UHF transmitters on CH 20 – centered on 509 MHz. They had a 25 kW main and 10 kW backup unit. Acrodyne built both of these transmitters. Of interest to me were the 1 kW solid state driver cabinets that were still there.

I was able to salvage quite a bit a gear. This included two 650 watt and four 340 watt SSPA's with all their associated cabling and the switching power supplies to run them. I also salvaged all the documentation.

My first project was to see if I could convert one of the 650 watt SSPA's to 432 MHz. UHF Channel 20 is centered on 509 MHz. In reading the documentation, Acrodyne built two wide band version of this amp. The 'low band' version was for channel 14-20. The frequencies were 470 to 512 MHz. This looked like an ideal candidate for 432.

The amplifier is a self-contained unit. It was designed to be run – stand alone – on a bench for tune up and testing. It consists of a quadrature input splitter that drives two identical 340 watt sections that are combined into a single 650 watt output. The output combiner is integral to the unit as well. The amplifier uses two 28 volt 36 amp switching power supplies (which I salvaged). The front panel has metering for voltage and current of the 8 output devices.



Here are two pictures of a "drawer" as it's called. On the left you can see the front panel metering. Also exposed is one 340 watt section. The second 340 watt section is on the other side. Notice the two black fans at the base of the unit. Cooling is included! On the right, is a closer view of one 340 watt section. In the upper left you can see the combiner. There is an integral reject load on the other side.

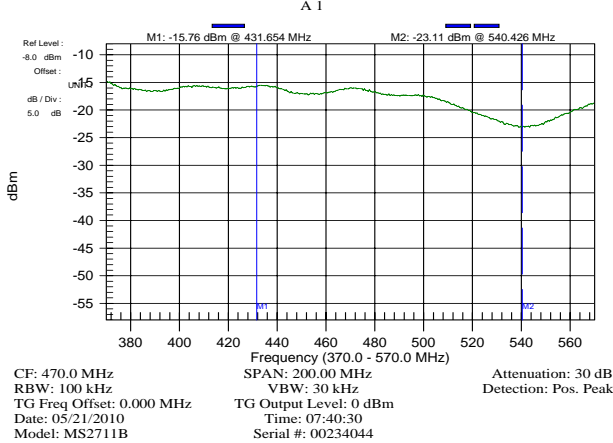


The 340 watt section consists of a Class A driver and 4 Class A/B output sections. Each output section has individually adjustable bias. The devices used are marked ACDN301. I believe this is an Acrodyne part number, but doing some research, I'm 99.9% sure the parts are UTV-8100B's. Specs on these parts go down to 400 MHz.

The amp is very linear and has high gain. The test sheet for the amp at 509 MHz showed 1.66 watts in for 650 watts out – +26 dB gain! I decided to see if 432 would pass through one 340 watt section unaltered. Driving 5 watt in, I saw 100+ watts out. That was encouraging.

First, I looked at the input match. I used an Anritsu Spectrum Analyzer/Tracking Generator with R/L Bridge that I borrowed from work.

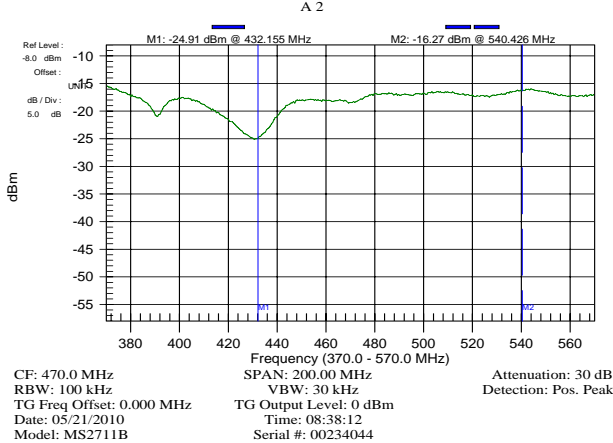
Tracking Generator Fast Tune



As you can see, some work needed to be done. I added 33 pf to the input tuning cap and the sweep looked like this:

With the input tamed, next it was time to look at the output. Since this is the “short version” of the modifications, and without going into great detail, I found 27 pf on the end of the output stripline section matched very nicely.

Tracking Generator Fast Tune



I finished all the modifications and each 340 watt section worked well. Next it was time to combine the two sections. The output combiner is a quadrature device as well. I reconnected it and ran the reject load port through my Bird wattmeter into a good load so I see the balance between the two amps.

I was thrilled with the numbers:

1.5 – 2 watts input (FT-817) = 650 watts CW output.

Efficiency 41 %

SSB peaks in excess of 1 kW

Reject load at 650 watts forward = 1.2 watts.

The 28 volt supplies are rated at 36 amps each. They run at about 30 amps at 650 watts. I hope to do a more detailed “show and tell” later this year.

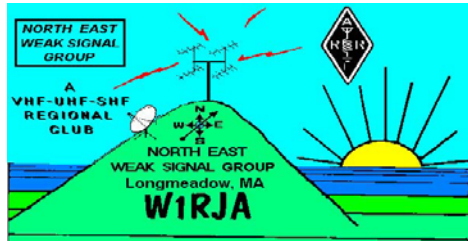
**Free.** HP 618C, 3.8-7.6 GHz, tubes light up but no output.  
**Free,** HP 612A, 450-1230 MHz, low output.

These can be delivered to the July Picnic. If no one wants them, they will be scrapped.

John WW1Z, 603-673-1818, [ww1z\\_1@juno.com](mailto:ww1z_1@juno.com)

Microwave Update 2010  
October 21-24, 2010  
Sheraton Cerritos, California

<http://www.microwaveupdate.org/index.php>



**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**

I-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:*

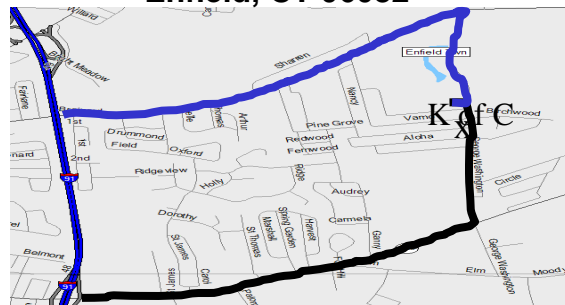
I-91 exit 49, go south on Enfield St Rt.5. Drive 1/2 mile, take a left on Brainard Rd. Drive 2 miles, take a right on to George Washington Rd. K of C will be on the right.

GPS: 42.015805 -72.560183

**Directions to Picnic**

**K of C**

**371 Washington Rd  
Enfield, CT 06082**

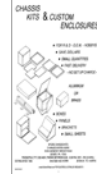




SSB Electronic USA manufactures and distributes HF, VHF, UHF and SHF equipment covering 10 MHz to 47 GHz

124 Cherrywood Drive,  
Mountaintop, PA 18707  
USA

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



Chassis Kits & Custom Enclosures

Charles Byers K3IWK

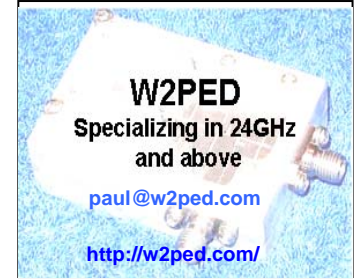
<http://home.flash.net/~k3iwk/>

5120 Harmony Grove Road

Dover, PA 17315

Phone/Fax (717) 292-4901 k3iwk@flash.net

Phone between 6:00 - 9:30 P.M. EST



**W2PED**  
Specializing in 24GHz and above

[paul@w2ped.com](mailto:paul@w2ped.com)

<http://w2ped.com/>

# West Mountain Radio



West Mountain Radio  
34 Smith Street  
Norwalk, CT 06851  
Phone 203.853.8080



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

**LUNAR-LINK SYSTEMS**  
B16 Summer Hill Road Madison, CT 06443-1804 (203) 421-3377

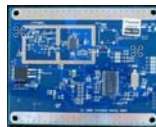


<http://home.cshore.com/lunarlink/>



**DOWN EAST MICROWAVE**

LIVE OAK, FLORIDA



**VHF/UHF/SHF EQUIPMENT AND PARTS 50 to 10,368 MHz**

Microwave Loop Yagis, VHF/UHF Yagis  
Linear Power Amps  
Coax Relays  
Chip Components  
RF Modules

No-Tune Linear Transverters  
Low Noise Preamps  
Coax Cable Connectors  
MMIC's, Transistors  
Crystals

Steve Kostro, N2CEI 19519 78<sup>th</sup> Ter. Live Oak, FL 32060 Tel. 386-364-5529

<http://www.downeastmicrowave.com>

**LeCroy**



John D. Seney *WD1V*  
Sales Engineer

[John.seney@lecroy.com](mailto:John.seney@lecroy.com)  
700 Chestnut Ridge Road  
Chestnut Ridge, NY 10977-6499  
Tel: (800)553-2769 Local: (603)627-6303  
Fax (845)578-5985 [www.lecroy.com](http://www.lecroy.com)

## DIRECTIVE SYSTEMS

Now Featuring K1FO 17' Boom Yagis for 144, 222 & 432 MHz!



Dave Olean, K1WHS RR1, Box 282, Lebanon, ME 04027 Phone 207-658-7758

<http://www.directivesystems.com/antenna.htm>

**FlexRadio Systems**  
Software Defined Radios

<http://www.flex-radio.com/>





**Annual N.E.W.S. picnic July 10, 2010**

**MDS and ERP Testing**

**clinic on the lower microwave bands**

**swap shop**

*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**

**North East Weak Signal Group**

c/o WA1MBA Tom Williams PO Box 28 Shutesbury, MA 01072



Check your membership  
expiration date on your mailing label!