



www.W1NRG.com

# KEY KLIX

Monthly Newsletter of the Meriden Amateur Radio Club



## Christmas Party 2012

Our annual Christmas party was well attended this year. The event was held at the newly re-opened Brother's Restaurant in Wallingford, Connecticut. The year in review was presented by our club president, John Bee N1GNV, and various members' achievements were acknowledged. The 2013 slate of club officers were presented as:

President	John Bee	N1GNV
Vice-President	Jim Savage	N1ZN
Treasurer	Jonathan Winslow	KB1HCC
Secretary	Dan Murphy	W1DMM
Station Activities Mgr.	Rich Aubin	WA1TRY

Over forty members and guests were in attendance and welcomed special guest Betsey Doane, K1EIC, our ARRL CT Section Manager. The food was great, and the setting very nice. The banquet room was set up with about a

dozen large round tables each sitting 8 to 10 people. The buffet style serving was quite varied and delicious. This year's Ham of the Year was presented to "Haggie, KB1HCC. Haggie, was everywhere in the world of MARC



this year. If there was an event or club contest effort, Haggie was there to help. Unfortunately, the party was the only event he missed. While the rest of us were enjoying the party, and the frigid New England Winter, Haggie was roughing it on a cruise ship to Hawaii. The Adolph Goodsell W1ICQ Elmer of the Year went to Bob, KB1FYL who scheduled a year of interesting and informative activities each month.

A round of applause went up for Bill, W1KKF who put together this year's party. Everyone had a great time.

## January 2013

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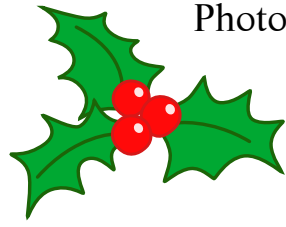
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# Snapshots from the MARC Christmas party



Photos N1API



## From the Editor:



Like the phoenix, the Key Klix has risen from the ashes. I was hoping someone would step in and take over the job of editor/publisher but after 3 months, there were no takers. My problem is a simple one. One that many of us have. Time. I've cut back as much as I could but there just isn't enough time in my life to get half the things I need to do finished.

So starting with this issue, there will be some changes that are going to free up some of my time and allow me to get this newsletter out on a timely basis. The change is the format and the actual publishing. I've gone to a new desktop publisher at last. This new version I have should save me some time in that it's a lot easier to format things and layout various pages. We are going to be running a new page format. The Key Klix will now be formatted on a standard letter sized page at 8.5 x 11. It won't be a folded and collated booklet and instead will be full sized single pages.

And probably the biggest change is that as the editor and publisher, I will no longer be mailing out copies via the U.S. Postal service. The Key Klix will be produced in PDF format and distributed to the members via our forum in electronic format. Anyone can download and view the current or past issues from this page at [www.w1nrg.com](http://www.w1nrg.com). Just click on the "newsletter" link and you will find all the issues.

Of course if someone in the club wants to take on the job of printing and mailing a hard copy version to the members, please volunteer. I don't miss having to run out for paper or toner (seemed that I always ran out when it was KK printing time) Or the printing, collating, folding, sealing, labeling, stamping and of course the trip to the post office. Anyone up for the job? I have a list of members who opted out of receiving the newsletter, and they have been getting the electronic version. All you need to do is send the Key Klix to the rest of the members. But if all the members would subscribe to the PDF version, the club would save a lot of money.

This new version of Key Klix is going to a lot of fun. I plan to have more photos and member articles in 2013. We'll visit our members and put some shack photos up for all to enjoy.

You'll notice some text a different color and underlined. Those are imbedded hyperlinks. Now when reading an article, you can click on a link and be brought to an article, reference or web site or other Internet area. Much more to come over the upcoming months. **73, Rich WA1TRY Editor**

## Verticals & Radials

HF Vertical antennas have long been popular with hams and for many good reasons. They can be very effective antennas for their size, and have the advantage of taking up very little space. Vertical antennas are lower in cost than a tower and a beam, are easier to install, usually lighter and easier to handle, and some say the verticals are better in several respects for DX contacts. The typical vertical radiates at a low angle of elevation, usually the most effective angle for working extended ground wave and for working DX when skip is in. Of course there are detractors out there. Verticals don't have the gain of a beam or are marginally equal to a dipole. If poorly installed, verticals are very poor radiators – of course that is true with any antenna system. They are noise prone, and having a vertical polarization is counter to the normally standard horizontal polarization used in the HF bands.

Fundamentally, a vertical antenna may be thought of as a classic dipole rotated upwards ninety degrees at the mid-point. The two elements of the classic dipole are fed with each feed line conductor (coax center and shield conductors) during opposite phases, but each element radiates during its half cycle. All real world antennas need two opposed elements to work. In the case of the vertical, the opposite element is... ground? The ground or ground image serves as the necessary other element with a vertical antenna. All verticals work against a ground system. This ground image may be thought of as a mirror with the upper element rising from the center of it. What is desired is a good ground system that will reflect the RF into the ionosphere.

A vertical antenna ground system comes in several different flavors; a driven single point ground, radials, a counterpoise, or a ground plane. A single point ground provides little RF coupling to the earth ground and provides almost no reflectivity of RF energy dissipating that energy as heat, unless the surrounding area is salt water or a salt marsh. There is little consensus on the use, the design, the best, even the definition of the remaining ground systems. For ground mounted antennas radials are the only realistic way to achieve a good ground system that will reflect the RF into the ionosphere. A radial ground system is usually defined as a series, up to 120, conductive leads horizontally fanned out from the base of the vertical element. Each radial is a half wavelength of the desired

frequency, or the lowest designed frequency in a multi-band antenna. In some cases, fewer and shorter radials have been effective. Each radial is at or just below the surface of the ground.

The terms counterpoise and ground plane are often used, or misused, interchangeably. After much research, L.B. Cebik W4RNL (SK) concluded "...there is no such thing as a counterpoise in antenna analysis." Where a radial ground system is at the level of the earth, a counterpoise/ground plane system is raised above the earth from a few inches to several feet. The raised counterpoise/ground plane image capacitively couples the vertical antenna element to the natural earth ground and acts as a reflector for the RF energy back into the atmosphere. A counterpoise/ground plane is most often used when the vertical element is not at ground level because of design or desire. For example, your typical automotive mag mount antenna uses the car body as an irregular ground plane system. Typically, the quantity and length of the elements used in a counterpoise/ground plane are fewer and shorter than those used in a radial ground system.

The choice and implementation of a ground image system for a vertical antenna is subject to a host of variables, compounded if the antenna is intended for multi-band operation. Nearby structures, soil composition, height above the earth, center frequency or frequencies, and construction material all are "field adjustable" variables with a vertical antenna system. Some of these variables may contribute to the poor reputation that verticals have in the HF amateur world. Ideally the radials would radiate from the base equidistant in spacing. But in reality the radials will work fairly well anywhere they are put. Bending a radial around a corner, a tree, the doghouse etc. or running it next to the driveway are all perfectly acceptable variations. Radial wire can be any copper wire from about #20 and larger, insulated or bare. Aluminum or steel wire will work, but are harder to get good connections with, and tend to corrode more rapidly.

The concept of a reflecting ground image on RF energy is probably the strangest and most confusing part of a vertical antenna system. When the ground image footprint is small in area, the RF signal is reflected up. As the footprint increases, the RF energy is increasingly reflected in a more horizontal fashion. In theory, an infinite footprint would reflect in a full horizontal manner. This horizontal component adds or supplements the propagation from the vertical element to give the long distance and stronger signal output of a vertical antenna system.

Some manufacturers advertise "no radial" vertical antennas. Some even quote positive reports on success-

ful DX. If these reports are true and in light of the above, then the "no radial" verticals may be enhanced with a good ground image system. Other manufacturers have designs that are trapped verticals or incorporate the ground system into folded elements parallel to the vertical element. Evaluation of these designs is beyond the focus of this column.

Are you lot restricted, cost or effort restricted from a beam and a tower, just want to try a new flavor? Then a look at a DX reaching HF vertical may be in the cards for you. **GD**

## The Forum Is Back !

As most of you know, our club forum has been off-line for a few months. I'm happy to announce that the forum has been replaced with newer and more feature rich software version. For almost four months I have been struggling to find out what the problem was. Thinking it was the software program, I wasted a lot of time trying to fix what wasn't broken.

It turns out that the problem was an SQL file glitch on the server. Let me be the first to say that I'm really not up with the ins and outs of programming and maintaining an Internet server. When I purchased the existing forum software it came with full support. All I had to do when a problem occurred (which was rare) was to call the software people. That was fine for the several years the forum was up and running, but about a year ago, the software company went out of business. I tried to solicit help, but was not able to find anyone who could work with both the server database and the PHP programming language.

So over the last month, I've been learning what I can. And I decided to replace the forum software with something more modern and better supported. Commercial software like V-Bulletin and others run around 3 to 4 hundred bucks. As it was, I only paid \$100 for the old software. I guess I got what I paid for.

The new forum software is an "open source" program. It's free and is in constant development by volunteers who maintain it and support it. Open Source software can sometimes not only be a bargain (read free) but can rival commercial versions that cost hundreds of dollars. They do accept donations, which are entirely voluntary.

I've done a lot of research and ended up installing a forum named "MyBB". You can access it by going to the [www.w1nrg.com](http://www.w1nrg.com) web page and selecting the link for the forum. Or you can access it directly at [www.w1nrg.com/forum](http://www.w1nrg.com/forum). Please keep in mind that the

forum is only a couple weeks old. So it is still in need of a lot of work.

The entire layout is still in a state of flux, and will be more organised over the next few weeks. I'm happy that AI, N1API is helping out in this endeavor.

First things first .. When you first log onto the main page, you'll be automatically a "guest". Guest accounts can browse navigate to any public forum listed. So anyone can learn all about MARC and our club and our activities. However only registered users can replay to existing messages or post new ones.

In the top of the pages there is a small area where you can register. Registration is easy. If you have a ham license then we would like to use your ham call-sign as your user name. During the registration process you can fill out the forms and create a password. There are in place things to keep forum spammers at bay. For one, you will see the captcha which is a small block of mixed up and randomly formatted letters. You will have to type the letters in the supplied box. This letters make it difficult for a non-human (spam robot) to decipher. Truth be told, I also have trouble reading them <grin> If you can't figure it out you can toggle the text until you fine line of text you can read.

There are some other things in place that work in the background to keep the spammers out. You must have a valid email address to join the forums. Registration is automatic. Once you finish filling out the form, a message will be sent to your email address with a link which will activate your account.

Much more in next month's issue. Please join the MARC forum and register. By the way, as in the past, all the notifications for downloading the club newsletter will be forwarded to you each month via the forum.

AI, is setting up a nice calendar that has all the activities for MARC as well as dexpedition notices and contests. Click on the calendar link in the top right corner of each page. If you see something in a day on the calendar, clicking on it will send you to an info page or directly to the event web page if available.

[www.w1nrg.com/forum](http://www.w1nrg.com/forum)

## Simplify Things Please

There has been discussion about the club's web presence on the web. A call was made to organize things a little bit.

Right now we have various MARC entities located on different servers with different ISPs around the Web.

I've set up what should help organize things a bit. We now have the old original MARC web site. There is also a new site being worked on as well. There is the Castle Craig Chapter 10/10 web site. And of course the club forum. I understand there is even a club mailing list available for those who are "forum shy" and prefer the old fashion email reflectors. And they all have different URLs and some have more than a few ways to log on to them .. All different.

I've set up yet another web page. Egads .. Yet another MARC web page. But wait. This page is a simple and clean road map to all things MARC.

Every ham has a call sign. It's the thing we all have in common. Our club has a call sign as well, It's a memorial call sign and it's W1NRG.

You don't have to remember how to get to anywhere in the Meriden Amateur Radio Club world. All you need to know is the club call sign. Plug it into your browser ([www.w1nrg.com](http://www.w1nrg.com)) and you'll get a page with links to any area you wish. At present there are four links: The club web page, the club forum, the Castle Craig Chapter 10/10 web page and a link to the Key Klix archives. As soon as I get the info on how to join the reflector I'll put a link up for that. If we end up changing the club web page or it's moved, the link will be updated. So anyone looking for us will get to the right place, wherever that place may be.

.Can't remember how to get to the club forum? Stick [w1nrg.com](http://w1nrg.com) in your browser .. Ditto for the other club web entities. You can find them on [W1NRG.com](http://W1NRG.com).

# Secretary Report & Minutes of Meriden Amateur Radio Club

## October 2012

The business meeting opened at 1934 on October 11, 2012 with approximately 10 people in attendance. A quorum was present. VP Jim N1ZN chaired the meeting.

### Announcements -

- Introductions – none needed.
- Activity meeting – Oct 25<sup>th</sup>. K1MVM Internet/eBay buying and selling.

### Secretary's Report -

- Previous minutes accepted as presented.

### Treasurer's Report -

- No report

### Contributions –

- None

### Correspondence –

- Sympathy cards sent to families of Dan Biernacki WX1D and Don Steele W1NFG, both of whom passed away recently.

### Scholarship – (KE1AY)

- No award due to lack of applicants. Some discussion on increase scholarship interest.
- Motion Don KE1AY second Al N1API to increase 2013 scholarship award to \$500.00. Passed.

### Club Station & Facilities - (WA1TRY-SAM)

- Station will be ready and available for the November Sweep Stakes contests (CW & Phone).
- The HF antenna for SS will be a temporary arrangement.
- WA1TRY and KB1FYL will work to set up a WiFi hotspot.
- A motion by W1DMM to hold 2013 Field Day at the club station as a class 2F was withdrawn pending SS results.

### Club Activities & Program (KB1CIW & KB1FYL-P&E Co-Chair)

- Upcoming activity meetings
- Oct – Internet/eBay buying and selling.
- No activity meetings in November and December
- Jan – Mars mission Curiosity
- Potential future activities: LOTW by ARRL, trip to W1AW, and Tune-Up Night by K1VDF
  - MARC 2013 Marathon Challenge started on October 1<sup>st</sup>. Get your 2012 results to W1DMM by Nov20<sup>th</sup>.
- Upcoming contests
- ARRL Sweepstakes CW & SSB. First and third weekends of November.
- 10/10 CW QSO Party. October 20-21.
- ARRL School Club Roundup. Oct 15-19. Give the kids a couple of points.
- Several state QSO parties. Boost your WAS or 5BWAS standing.

### Nets - All nets are doing well. Reports in Key Klix & MARC forum.

- HF-SSB 28.375 Tuesdays at 8:00 PM, Primary NC John K1VDF.
- VHF-FM 147.36R Tuesdays at 7:00 PM, Primary NC Todd K1TDO.
- VHF-SSB 50.175 Mondays at 8 PM, Primary NC Jim N1ZN.
- Six meter net has had several non-club members, including out-of-staters, check in on a regular basis.

### Castle Craig - (N1API-CM & CP)

- 10/10 QSO parties: SSB Aug 4-5, 2012; Digital Apr 28-29, 2012 & Nov 10-11, 2012; CW May 5-6, 2012 & Oct 20-21, 2012.
- Band conditions poor. Hope for better conditions by February QSO party.
- Castle Craig and Ten/Ten Int'l web pages now reflect the 2013 convention hosted by MARC. Some details remain (W1AW trip and convention station setup still open).
- Member help will be needed during the event with the station, as greeters and as ombudsmen.

### Membership - (KB1HCC)

- Fifty-two (52) 2012 members more or less.

### Interference and Technical - (WA1TRY)

- No reported problems.

## Secretary Report & Minutes of Meriden Amateur Radio Club October 2012

### Instruction & Testing - (VE-KE1AY, Instruction Facilitator - Open)

VE session at Nutmeg Hamfest on October 7<sup>th</sup> a success.

Additional testing and classes will be announced.

We need a training coordinator/facilitator. Step up and help!!

### Candy Store - (N1ZN)

- See Jim N1ZN for availability and details.

### Club Media - (WA1TRY & W1DMM & staff)

- Key Klix (WA1TRY) back in business after problems with publishing software. See Key Klix article.
- MARC Forum (WA1TRY) is down due to major and obsolescent software problems. Working with Mark K1PU to correct. Key Klix may be 100% mailed until corrected.
- MARC Web (W1DMM) typo in new location notice will be corrected.

### Field Day (June 23 & 24)

- A short discussion on 2013 class, location and other points. More sure to follow.

### EmComm - (WA1VXH)

Chris WA1VXH will be stepping aside as EC for Wallingford. FB job Chris.

Anyone interested in being EC contact Chris and/or DEC Douglas WA1SFH.

### Nutmeg Hamfest (October 7, 2012)

- It's over and a reported success.
- Bill W1KKF gave a summary. Gate was lower than in the past, but the reason is not yet understood. Lower costs lead to increase in net gain. Details will be available after Alliance BOD meet and close out the event year details.
- Club table made \$530.00.
- Thanks to those volunteering to make this a success.

### Miscellaneous

A deposit has been sent to Brother's of Wallingford for the Christmas Party in December. The facility is now a banquet only place but promise to be in business in December.

50/50 – None

Meeting Adjourned about 20:50

*Submitted: Dan Murphy W1DMM, Secretary*

## Secretary Report & Minutes of Meriden Amateur Radio Club November 2012

The business meeting opened at 1928 on November 8, 2012 with approximately 12 people in attendance. A quorum was present.

### Announcements -

- No introductions needed.
- The November business meeting is also the Annual Meeting, as required in our bylaws.
- Next meeting is the annual Holiday Party on Thursday, December 13<sup>th</sup> at Brothers Restaurant, 33 No. Cherry St., Wallingford (behind the RR station).
  - Social assemblage, dinner and meeting – 6:00 PM

### Secretary's Report – (W1DMM-Secy)

- Accepted as presented.

### Treasurer's Report – (KB1HCC-Treas)

- Accepted as presented.

- The Treasurer reminds all that 2013 dues (which now include the repeater membership) are due at or before the December 2012 Christmas Party. Mail early and give Haggie a break.

Contributions –

- Donation (\$500) to MARC in memory of Dan Biernacki WX1D from his family.

Correspondence –

- None.

Scholarship – (KE1AY)

- Will start again in the Spring of 2013.

Club Station & Facilities - (WA1TRY-SAM)

- Station was/is ready and available for the November Sweep Stakes contests (CW & Phone).
- SS-CW set up generally ran well. Running about 500-600 watts. Some initial laptop probs at start, but rectified, G5RV at about 42 feet in Vee configuration.
- Haggie KB1HCC to chair the SS-Phone contest at the club station.
- A WiFi access point, T-Mobile 4G Mobile Hotpot, was purchased for the club to use during club activities using presidential discretionary funds. The access point will allow internet access during activities such as, contests, Field Day, special events, and activity demonstrations. This is a per use subscription service, with an estimate of \$25-\$30 for a contest weekend usage.
- Motion by W1DMM second KE1AY to hold 2013 Field Day at the club station as a class 2F. Discussion. Passed.(7/12).
- Motion by W1DMM second by KE1AY that a recommendation committee by empanelled to determine the type, brand, location, and permissions for the club to purchase and install a multi-band HF vertical antenna for the new station. Passed.

Club Activities & Program (KB1FYL-P&E Chair)

- Upcoming activity meetings
  - No activity meetings in November and December
  - Jan – Mars mission Curiosity
- Potential future activities: LOTW by ARRL, trip to W1AW, and Tune-Up Night by K1VDF
- MARC 2013 Marathon Challenge started on October 1<sup>st</sup>. Get your 2012 results to W1DMM by Nov 20<sup>th</sup>.
- Upcoming contests
  - ARRL Sweepstakes CW & SSB. First and third weekends of November.
  - 10/10 CW QSO Party. October 20-21.
  - ARRL School Club Roundup. Oct 15-19. Give the kids a couple of points.
  - Several state QSO parties. Boost your WAS or 5BWAS standing.
- Potential future activities: LOTW by ARRL, trip to W1AW, and Tune-Up Night by K1VDF
- Upcoming contests
  - ARRL Sweepstakes CW & SSB. First and third weekends of November.
  - 10/10 RTTY QSO Party. November 10-11.
  - CQWW-CW November 24-25.
  - ARRL 160 meter November 28 – December 2.
  - ARRL 10 meter December 8-10.

Nets - All nets are doing well. Reports on MARC forum.

- HF-SSB 28.375 Tuesdays at 8:00 PM, Primary NC John K1VDF.
- VHF-FM 147.36R Tuesdays at 7:00 PM, Primary NC Todd K1TDO.
- VHF-SSB 50.175 Mondays at 8 PM, Primary NC Jim N1ZN.

Castle Craig - (N1API-CM & CP)

- 10/10 QSO parties: SSB Aug 4-5, 2012; Digital Apr 28-29, 2012 & Nov 10-11, 2012; CW May 5-6, 2012 & Oct 20-21, 2012.
- Band conditions poor. Hope for better conditions by February QSO party.
- Castle Craig and Ten/Ten Int'l web pages now reflect the 2013 convention hosted by MARC. Some details remain (W1AW trip and convention station setup still open).
- Member help will be needed during the event with the station, as greeters and as ombudsmen.

Membership - (KB1HCC)

- Fifty-six 2012 members more or less.

Interference and Technical - (WA1TRY)

- No report.

Instruction & Testing - (VE-KE1AY, Instruction Facilitator - Open)

- VE session -- TBD.
- Additional testing and classes will be announced.



- We need a training coordinator/facilitator. Step up and help!!.

Candy Store - (N1ZN)

- See Jim N1ZN for details.

Club Media - (WA1TRY & W1DMM & staff)

- Key Klix (WA1TRY) back in business after problems with publishing software.
- MARC Forum (WA1TRY) is down due to major and obsolescent software problems. Working with Mark K1PU to correct. Key Klix may be 100% mailed until corrected.
- MARC Web (W1DMM) typo in new location notice was corrected..

EmComm - (Wallingford EC - Open)

- Chris WA1VXH has retired as Wallingford EC after a extemporary tenure. Anyone interested in the position contact Chris or Douglas WA1SFH (DEC).
- There will be a group training session at the Senior Center on Tues Nov 22<sup>nd</sup> 6-8 PM for Wallingford MRT newbies. FEMA courses ICS 100 & ICS 200 will be used. These can also be completed on-line.

Nutmeg Hamfest (October 7, 2012)

- Bill W1KKF President of Nutmeg Hamfest Alliance reviewed some of the 2012 event data. Generally good, but smaller due to short planning period, location change and general economy.
- Bill will make a formal donation presentation at the Christmas Party.
- A big thank you and FB was extended to all those that helped make this years event successful.

Miscellaneous

- Annual Christmas Party will be catered at Brothers Restaurant, Wallingford starting at 6:00 PM. Bill collected majority choices for menu selection.
- Motion by N1GNV second by W1KKF to rescind a previous motion (June 2012) to charge \$10 per attendee. The previous rule of paid 2013 membership or \$5.00 per guest will remain in effect. Passed.

Annual Meeting -

- The November business meeting is the Annual Meeting per our bylaws. K1VDF took the floor as teller and presiding officer. The current officer slate has agreed to run again.
- Nominations from the floor were: None.
- The uncontested slate of officers were accepted by acclamation.
- The reelected 2013 officers are:

President	John N1GNV	Secretary	Dan W1DMM
Vice President	Jim N1ZN	Treasurer	Haggie KB1HCC
Station Facilities Manager	Rich WA1TRY		

- Elmer/Ham of the Year - Secret ballots were collected for the Ham of the Year and Elmer of the Year. Results and presentation to be made at December Holiday Party.

50/50 – None

Meeting Adjourned about 20:51      *Submitted Dan Murphy, W1DMM, Secretary.*

## MARC Marathon Challenge

**Challenge 2013.** The MARC Marathon Challenge runs between 0000Z October 1<sup>st</sup>, 2012 to 2359Z September 30<sup>th</sup>, 2013. The Marathon repeats annually. The rules are simple; just turn on your rig, grab your mike or key or PC, tune in any band, and call CQ DX. Log any DX entity on the ARRL DXCC list and you have a point. The operator with the highest number of DX entities wins. The maximum allowed contacts are 340, one for each DXCC entity. Any mode, any band, any power - within your license parameters - may be used. A copy of the rules and sample submission sheets are on the MARC web page.

<http://www.meridenarc.org/shack-hd/marathon.html>

**Challenge 2012** ended on September 30<sup>th</sup>. Check over your logs for all those DX QSOs you made this year. No QSL cards or logs need be submitted – we trust your honesty. Don't forget to include one of your USA contacts, so now you only have 339 to go! New licensees and recent upgrades, don't forget your bonus points. Get your DX lists together and send them along with any suggestions or comments to Dan W1DMM (W1DMM@ARRL.NET) by November 20<sup>th</sup>. Sample Marathon Challenge submission sheets are included with the rules. Awards and scores will be published at the December Holiday Party.

## Vertical Antenna Evaluation

A permanently installed HF multi-band Vertical antenna can be a beneficial addition to the W1NRG compliment. While not a perfect solution, HF verticals provide a small ground footprint, most or all HF band coverage (excepting 160 meters), low take-off angles for DX or near-DX work, availability for occasional or contest or special event operations. A permanently installed vertical eliminates or greatly reduces the need to erect and take down a temporary antenna for each W1NRG on-the-air activity.

### Specifications

Several manufacturers offer a Vertical for HF operations. Although not extensive or complete, the following is a table of the manufacturer's specifications and claims:

	Comet CHA250	Cushcraft R-8	Butternut HF-6V	Butternut HF-9V	GAP Titan	GAP Challenger	HyGain AV-640	HyGain AV-680
Bands (meters)	6 -- 80	6 -- 40	10 -- 80	10-- 80	10 -- 80	2, 6 -- 80	6 -- 40	6 -- 80
Bandwidth (kHz)								
80 Meters	All band	N/A	40-100	40-100	100 kHz	130 kHz	N/S	Adjusted
40 meters	All band	150	250-300	250-300	All band	All band	150	All band
30 Meters	All band	50	All band	All band	All band	All band	175	All band
20 Meters	All band	350	All band	All band	All band	All band	500	All band
17 Meters	All band	100	N/S	All band	All band	All band	500	All band
15 Meters	All band	450	All band	All band	All band	All band	500	All band
12 Meters	All band	100	N/S	All band	All band	All band	500	All band
10 Meters	All band	1500	All band	All band	All band	1 MHz	1500	All band
6 Meters	All band	1500	N/S	N/S	All band	All band	1500	All band
Power Rating	250 W	1500 W	2000 W	2000 W	2000 W	2000 W	1500 W	1000 W
Height	23.5 ft	28.5 ft	26.0 ft	26.0 ft	25.0 ft	31.5 ft	25.5 ft	25.5 ft
Weight	7.0 lb	23.0 lb	12.0 lb	12.0 lb	25.0 lb	18.0 lb	10.5 lb	10.5 lb
Wind Rating	N/S	80 mph	80 mph	80 mph	80 mph	80 mph	80 mph	80 mph
Wind Surface	N/S	2.5 sq ft	2.0 sq ft	2.0 sq ft	N/A	N/A	2.5 sq ft	2.5 sq ft
Ground/Radials	No	No	Yes	Yes	No	3 @ 25 ft	No	No
Cost(MSRP)	\$400	\$590	\$450	\$550	\$430	\$370	\$450	\$550
Notes	N/A = Not available, N/S = Not supported or specified. Users have improved claimed bandwidth using an appropriate tuner or trans-match.							

### Location

A first choice would be mounted at the center of the building roof and guyed to the corners. This would provide a clear 360 degree field and secure from any potential vandalism. The negative of a roof mount is that a weatherproof base mount needs to be included.

A second choice is to use an 8 to 10 foot pole as a base secured to the chain-link fence surrounding the existing tower. This location and height above ground provides a measure of security and only needs to be clamped to the fence posts. On the negative side, there may be an RF shadow caused by the building or tower.

Many vertical users find that these antennas work better when located away from any buildings to reduce "RF in the shack" and other interference. A location near the property edge (back or along the school fence line) would serve this desire, but reduces security and would require a buried feed line to the building.

### Radials

Several of these manufacturers claim radials are not required, actual installation and earth conditions may dictate otherwise. Some of the manufacturers provide an integral counterpoise or folded ground plane as the solution. Users seem to add and test various radial layouts to improve the claimed specifications.

### Conclusion

The two Gap (Titan and Challenger) and the HyGain AV-680 antennas seem to fit the needs of a permanent W1NRG station. (The Comet CHA250 does not support power above 250 watts) The HyGain model is new and has very little user feedback. It seems either of the two Gap vertical antennas will fit the club needs.