Sidebands

The Newsletter of the EAST GREENBUSH AMATEUR RADIO ASSOCIATION

www.egara.club

May 2017

EGARA Elects Officers for 2017-2018

EGARA's April meeting saw the club's general membership elect officers for 2017-2018, with three incumbent officers being re-elected. For the next business year, the club's leadership team will include:

- President - Tom Scorsone, KC2FCP (incumbent)
- Vice President - Ridge Macdonald, KB2HWL (incumbent)
- Secretary - Steve VanSickle, WB2HPR
- Treasurer - Bryan Jackson, W2RBJ (incumbent)

"I am honored to have been elected to serve as President for another year," said Scorsone.

VanSickle and Scorsone

"I look forward to working on their behalf to enhance their enjoyment of amateur radio and to meet the club's mission of education and community service." he said.

For newly elected Secretary Steve VanSickle, the election marked his return to the board, having previously served as the club's Vice President.

President Scorsone also thanked Russ Greenman, WB2LXC, for his service as the club's Secretary during the 2016-2017 term.

Check Out the New Features on EGARA's Website! www.egara.club

In This Issue

Next Stop: Hamfest!

If it's May, it must be Hamfest. EGARA's April membership meeting inluded a review of what's planned for the May 13th event, as well as the preparations needed to make it a success.

During the meeting, there was a quick review of the jobs that will need to be staffed -- from helping with parking, to food preparation and raffle sales. Based on past experience, at least 12 to 14 members will be needed to run the event smoothly. At the April meeting, 13 members indicated that they will be on hand to help. A final recap will be held at the May 12th meeting.

This year's EGARA Hamfest will offer a Grand Prize of a Yaesu FT-7900 dual band mobile radio, with a host of other prizes to be raffled off as well. Funds raised by the event are used to support the club's many activities and community services. Last year, over 200 hams attended the event and additional publicity will hopefully boost that number this year.

Save the Date! - Next EGARA Monthly Meeting is May 10th!
Now Pay Your Dues Online! www.egara.club/pay-dues It's Fast, Easy & Secure!

Count, Clean & Catalogue

Part of the EGARA crew that made quick work of the club's inventory project

Despite some cold and threatening weather, a hardy band of EGARA members turned out on Saturday, April 1st to inventory and reorganize the club's equipment and supplies that are stored at the Masonic Temple. The goal of the project was to make an official canvass of the club's various radios, antennas, computers and accessories -- as well as to get a handle on the supplies available for the upcoming 14th Annual Hamfest.

"It had been some time since we had taken stock of all of the club's gear and property," said Steve VanSickle, WB2HPR. "It was especially helpful to know what we had in stock as we prepare for Hamfest."

Special attention was given to eliminating clutter, as well as to consolidating equipment and accessories so they can be easily located in the future for events such as Field Day. Items deemed broken, unusable or obsolete were discarded. With a solid crew on hand to help, the project was completed in about 90 minutes, with the group being treated to lunch afterwards.

"I want to extend my personal thanks to all of those who turned out to lend a hand," said EGARA President Tom Scorsone, KC2FCP. "They say many hands make light work, and that certainly was the case with this project."

EGARA Set to Aid Run for Literacy

Members of the club will once again provide communications support for the annual Rensselaer County Literacy 5K Run/Walk on May 7th at Schodack State Park in Schodack Landing on Route 9-J. The event has been relocated this year from its previous site at the RPI Technology Park.

The flat terrain of the new site will allow club members to use simplex for communications, eliminating the need for an on-site repeater. Plans are to use 146.550 mhz. The club plans to staff eight locations on the course, relaying important information to race officials, as well as handling emergency communications that may be needed.

The annual event raises money for Literacy Volunteers of Rensselaer County. providing a wide range of services to those who need assistance reading, writing and speaking English.

Founded in 1968, the program helps more than 200 local residents each year improve their literacy skills.

Save these Dates!

May 13th - 6 am to 3 pm - Hamfest

All hands on deck please ! It's our biggest event and fund raiser of the year! We need volunteers to help with every aspect of Hamfest -- cooks, parking attendants, admissions, raffle sellers, floaters, setup and clean up. If you haven't signed up yet and are available to help, please email Tom Scorsone at: *kc2fcp@nycap.rr.com*

May 20th - VE Session

If it's time to upgrade your ticket, here's your opportunity! EGARA's next FCC exam session will begin at 10 am at the East Greenbush Community Library.

June 23 - 24 - 25 - Field Day 2017

Field Day kicks off at 5 pm on Friday, June 23rd with preparations at the Masonic Temple, including antenna and equipment setup. Official Field Day operations begin at 2 pm on Saturday, June 24th and run continuously for the next 24 hours. Food and beverages will be provided. Club members are asked to sign up to staff shifts.

Historic Shortwave Site to be Demolished

The remains of shortwave radio station WOO — for decades the Atlantic coast hub of American Telephone & Telegraph's high seas radio service — will likely disappear in the coming weeks.

The U.S. Fish and Wildlife Service has hired contractor Amec Foster Wheeler Environment & Infrastructure Inc., to remove more than 500 antennas and poles that stud 222 acres of salt marsh on New Jersey's Barnegat Bay.

Good Luck Point - The ruins of AT&T high seas radio station WOO at Ocean Gate, N.J.

The site at Good Luck Point was the transmitter station for WOO, which from the early 1930s onward was a shore-to-ship critical link to U.S. bluewater and coastwise shipping. Up to the dawn of cellular telephones, mariners could place telephone calls by contacting the AT&T marine operator on marine channels.

Also known as the Ocean Gate site, the transmitter worked in tandem with a receiver site about 15 miles south on the marsh at Manahawkin, N.J.

Both were part of AT&T's national "long lines" system, along with stations KMI near San Francisco and WOM near Miami.

As technology changed and users began falling away, the stations still provided single-sideband (SSB) radiotelephone service up to February 1999 when AT&T announced it was ceasing operations. Satellite service had usurped the old shoreside station model, and the company was selling customers on its own Sea Call service using Inmarsat technology.

High seas and overseas radio operators at AT&T's New York City switchboard in 1943 handling calls through station WOO.

The New Jersey sites were soon abandoned, and the Good Luck Point tract was purchased in 2003 by the non-profit Trust for Public Land, to be donated to the Edwin B. Forsythe National Wildlife Refuge.

Among boaters passing on Barnegat Bay, the decaying antenna array is jokingly called "the telephone pole farm." U.S. Fish and Wildlife biologists always wanted to clean up the site and restore the marsh to improve its value for wildlife, but never had the money.

That changed after Hurricane Sandy hit the region in October 2012. Parts of the 47,000-acre Forsythe refuge were inundated with wreckage from flooded homes and marinas, and the wildlife service eventually got $15 million out of federal Sandy relief funding for the cleanup. Some $1.7 million of that will go to clearing the Good Luck Point site, which is getting priority with the limited funding. Contractors will use airboats to work in the marsh and bring cut-up poles and steel in for disposal. Some poles will be left standing, for use as osprey nest platforms.

A Ham Remembers WOO...

I grew up directly across Barnegat Bay from this facility… on Coates Point. Maybe one mile as the crow flies. Through the 1960's and 70's, I will always remember when WOO went into the "transmitting mode" for there was no watching television until they were through. In the back of my mind, I can still hear my dad "cussin up a storm" because the transmission interrupted "All In The Family," NFL Football and such. Today, as a ham radio operator, it's fun to research the systems that served so many for so many years. But now I know how they worked! And, I can't even begin to imagine what worth WOO was during WW II.

So long WOO but, unlike the masses, I'm certain you mean a bunch more to me than most who will read anything about you. Not just the sounds of muffled Single Side Band and Amplitude 15,000 watt transmissions, but, looking out across the Barnegat Bay through so many years at this brick... but now meaningful… structure -- Gregory Marino, NU4R.

EGARA March Meeting Minutes

- The April meeting of the EGARA was called to order at 7:10 PM by President Tom Scorsone, KC2FCP. The minutes of the previous meeting were not read. In accordance with EGARA constitution and bylaws, annual election of officers was conducted. One nomination from the floor was made for the office of Vice President. Accordingly, the results of the election are as follows:

  President: Tom Scorsone - Vice President: Ridge Macdonald - Treasurer: Bryan Jackson - Secretary: Steve VanSickle

- The Treasurers report was presented by Bryan Jackson. He noted that the club's annual insurance premium is paid. Proof of coverage is being delivered to entities that require it. Announcements by VP Ridge Macdonald included Field Day for June 24 and 25, with staging operations on Friday, June 23. Sign-up sheets were circulated for participants in Field Day and the upcoming Run for Literacy at the Schodack Island State park on May 7th. Also, Ridge reviewed the programs of the past year, and solicited membership input for upcoming meetings. Construction of the lazy H antenna is scheduled for next January. The annual Hudson River cruise is planned for August 19th, and the annual Oktoberfest is scheduled for October 11th.

- A discussion concerning the upcoming Hamfest on May 13th was led by Tom Scorsone, with a sign-up sheet for volunteers. The club has purchased a cash register and programming of the cash register is being handled by Ridge Macdonald. The May meeting will focus on finalizing plans for the event. Proceeds are used to help defray club operating costs throughout the year.

- Bryan Jackson asked for listings for the Buy/Sell/Swap listing in the club newsletter Sidebands. Ads are free for all members.

- Bryan Jackson led a discussion about the new club website: EGARA.club and invited any additions, suggestions or corrections. He noted that the site is generating increasing traffic. Chris Link and Tom Scorsone discussed the club QSL policy. Lee Hatfield announced the upcoming Orange County hamfest on April 30th and Framingham, Mass. on April 23rd. Other new business included information about the Adirondack Scenic train to Montréal.

- Refreshments were on hand for all in attendance: gourmet pizza from Mercato's and fudge fancies brought by Tim Antonacci. The meeting was closed at 8:30 PM. -- de Steve VanSickle WB2HPR, Secretary

EGARA Overseas: Meet UK Member Martyn Griffiths, G6IVC

Hi to all you guys in the EGARA from the wild West coast of the old British Isles! I am one of your overseas members located in the seaside town of Southport Lancashire, 20 miles North from the city of Liverpool -- Beatles country!

Martyn, G61VC, in one of his many restored classic vehicles

Chris Linck introduced me to your club and we met some years ago via the Internet initially. Chris came over to our home here in the UK and we have occasionally worked each other, usually with difficulty! Six meters was the interest that Chris and I shared and we attended a 6 meter group AGM together many years ago.

I was born in the last days of the first half of the last century -- I know that sounds a long time ago but time travels fast and here we are in 2017 with just over 67 years on the clock. Amateur radio has always been an interest of mine along with a number of other interests and I obtained my ticket in 1982 after failing the original exam when I was a young lad in 1966. I operate mainly on the HF bands with VHF and 6 meters thrown in should they be open (but very rarely from my electrically noisy home base), usually from a static caravan located 500 feet up in the hills of the English Lake District. This location is a great take off to North and South America really quiet electrically and I have worked quite a few American stations using a FT897 and a FT100d, running a meager 100 watts. I build a Moxon for 20 meters which performed very well but was a bit of a handful to keep in the air, so I am still looking for a suitable HF antenna that I could use at this location.

I was trained as an engineer by Leyland Motors (the truck maker) in the 1960's and therefore enjoy building my own antenna's and have an engineering workshop where I cast and machine any parts I require. Another of my interests is Vintage cars and the engineering workshop comes in handy for maintain these. I currently have a 1928 Austin Saloon, a 1931 Morris Minor Van, a 1938 Austin Sports and a more modern 1972 MGB GT. Previously I had owned a 1930 RHD Model A Ford fitted with a Victoria Body (many of you will know the A well) imported from South America. I think this had gone round the clock many times and although I replaced many parts getting it to stop was a real challenge.

Good wishes to you all from "G" land and I hope to catch you on the air soon! 73, Martyn, G6IVC

Interesting Gadgets I Wish I had Time for...

By Dan Romanchik, KB6NU

I'm on a lot of mailing lists and participate in a bunch of amateur radio forums. As a result, I see a lot of interesting gadgets that guys are buying or are thinking about buying.

Dan Romanchik, KB6NU

Here are three of the latest that look interesting to me. I just wish I had the time (and money) to purchase all of these to try them out.

Android antenna analyzer

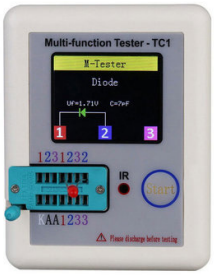
Some hams on the Internet discussion boards have been talking about the Mini60 Antenna Analyzer. Its frequency range is 1 – 60MHz, but the cool thing about this device is that you can use it standalone with the built-in LCD display or with an Android tablet if you get the version with Bluetooth built in.

Of course, this is made in China, but how can you beat the price? They are easily found on Ebay for around $125.00.

Multi-functional component tester

Here's another marvel of Chinese engineering and manufacture – a smart component tester for only $30, including shipping.

It identifies and characterizes NPN and PNP transistors, capacitors, resistors, diodes (including Zener), N-channel and P-channel MOSFET, IGBT, JFET, triacs, and batteries.



This isn't the first smart component tester to hit the market, but the unique thing about this unit is that it has a graphical display that not only identifies the type of component that you've connected to it, but also draws the schematic symbol of the part.

It's for sale here: ***http://www.banggood.com/3_5inch-Colorful-Display-Multi-functional-TFT-Backlight-Transistor-Tester-p-1083042.html.*** You can see a video of this tester in action at ***https://www.youtube.com/watch?v=07FH6tjzwWg.***

Make your Raspberry Pi into a desktop PC

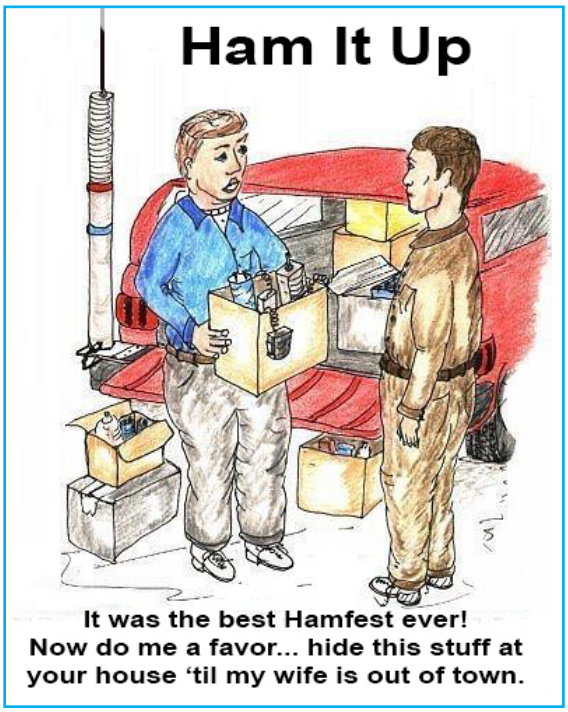
Newark/element 14 will soon start selling a kit of part that will make it easier to turn your Raspberry Pi into a desktop PC . The kit includes:

- Intelligent and Safe Power Controller
- Interface to connect mSATA SSD (upto 1TB)
- Real Time Clock to keep track of time
- Heat Sink
- Enclosure

They don't list the price just yet, but this might be what I need to actually make use of the Raspberry Pi 3 I bought several months ago. Visit here to learn more and reserve your kit: ***https://www.element14.com/community/docs/DOC-83477/l/convert-your-raspberry-pi-into-a-desktop-pc.***

If you have one of these gadgets, or buy one in the future, please let me know how you like it. I'll put your review up on my blog, so that everyone can benefit from your experience.

When he's not drooling over electronic gadgets, Dan blogs about amateur radio at KB6NU.Com, writes the "No Nonsense" amateur radio study guides, and teaches ham classes. You can contact him at: cwgeek@kb6nu.com.



Roadtrip! EGARA's Guide to Historic Radio Sites

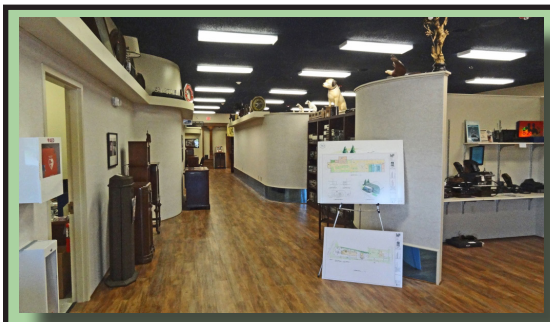
Travel season is upon us again and what better way to enjoy a roadtrip than to check out one of the many historic radio sites in the region! So pack up the XYL and plan a weekend or day trip to one of these nearby places offering a connection to the early days of radio communications...

The New England Wireless and Steam Museum, located at 1300 Frenchtown Road in East Greenwich, Rhode Island, is an electrical and mechanical engineering museum emphasizing the beginnings of radio and steam power. The museum honors engineers who achieved greatness and served the public good by analyzing and solving tough engineering problems.

The wireless collection includes the original Massie coastal wireless station, which was moved to the museum from Point Judith, Rhode Island. This station, built in 1907 to communicate with marine shipping, is the oldest surviving, originally equipped wireless station anywhere. The museum also houses rare early radio and steam apparatus–much in working order. Just a few of the remarkable things on display are:

- A Marconi distress transmitter, the same as Titanic's.
- A Marconi 1900 coherer and jigger.
- The oldest equipped radio station in the world.
- An Edison 1882 diode – the first of all radio tubes.
- An 1881 Professor Dolbear radio receiver. It still works.
- The first commercial transistor.
- Exhibits and displays honoring radio pioneers such as Edwin Armstrong, Marconi, Karl Braun and Reginald Fesseden.

The museum is both archival and educational, ***but hours are limited,*** with museum visits usually arranged for Thursdays between 9 am & 12 noon. Contact the museum through its website to arrange your tour. **http://newsm.org.**



The Antique Wireless Association Museum, located at 6925 Route 5 in Bloomfield, NY, was started in 1952 by Bruce Kelley, George Batterson, and Linc Cundall – amateur radio operators and radio collectors from upstate New York. Their initial goal was to collect and preserve early wireless and radio equipment and historical information before it was lost to future generations. Their successful AWA legacy continues after nearly six decades. Today. AWA is an organization of some 2,000 members linked by a common interest in the history of electronic communications.

The AWA Museum and its extensive collection, along with the Museum's staff -- provide a wonderful opportunity for visitors to see and learn about radio-related technologies -- while also meeting and becoming friends with others of similar interests. You can begin your experience by touring its website, at **http://www.antiquewireless.org**. Next, plan a visit, and perhaps attend one of the museum's many events.

The Antique Wireless Museum, with its world-class collection of radio artifacts, offers a visitor the opportunity to drop back in time to explore and discover the history of the technologies we use today in our everyday life. A visit to the Museum will show just how far communications has evolved

Museum's hours are Tuesday 10:00 AM to 3:00 PM and Saturdays 1:00 to 5:00 PM. Adult admission is $7, kids and teens are free, and AWA members are also free. The AWA Museum is closed holiday weekends and Tuesdays, if that day is a holiday. (find more Radio Roadtrips on page 8)

On the Beam
News & Notes

New Bands! FCC Issues Amateur Radio Service Rules for 630 Meters and 2,200 Meters

Amateur radio will officially get two new bands in the near future.

The FCC has adopted rules that will allow hams access to the 630 and 2,200-meter bands, with minor conditions. The Report and Order (R&O) was released on March 29th and the new rules will become effective 30 days following publication in The Federal Register. The R&O, which also addresses several non-Amateur Radio issues, allocates the 472-479 kHz band (630 meters) to the Amateur Service on a secondary basis and amends Part 97 to provide for Amateur Service use of that band as well as of the previously allocated 135.7-137.8 kHz band (2,200 meters). The R&O also amends Part 80 rules to authorize radio buoy operations in the 1900-2000 kHz band under a ship station license.

"It's a big win for the Amateur community and the ARRL," ARRL CEO Tom Gallagher, NY2RF, said. "We are excited by the FCC's action to authorize Amateur Radio access for the first time on the MF and LF spectrum."

The FCC said the Amateur Radio service rules it has adopted for 630 meters and 2,200 meters allow "for co-existence with Power Line Carrier (PLC) systems that use these bands." Utilities have opposed Amateur Radio use of the MF and LF spectrum, fearing interference to unlicensed Part 15 PLC systems used to manage the power grid.

Amateurs operating on 472-479 kHz would be permitted a maximum equivalent isotropically radiated power (EIRP) of 5 W, except in parts of Alaska within 800 kilometers (approximately 496 miles) of Russia, where the maximum would be 1 W EIRP. Amateurs operating in the 135.7-137.8 kHz band could run up to 1 W EIRP.

The FCC is requiring a 1-kilometer separation distance between radio amateurs using the two new bands and electric power transmission lines with PLC systems on those bands. Amateur Radio operators will have to notify UTC of station location prior to commencing operations.

The FCC also placed a 60-meter (approximately 197 feet) above-ground-level (AGL) height limit on transmitting antennas used on 630 meters and 2,200 meters. The bands would be available to General class and higher licensees, and permissible modes would include CW, RTTY, data, phone, and image. Automatically controlled stations would be permitted to operate in the bands.

Silent Key: Oldest Known Amateur Dies in Russia

Centenarian World War II Veteran Victor M. Sokolov, U5FS, of Izmail, Russia, died on March 25th. Prior to his passing at age 103, he was among the oldest -- if not the oldest -- licensed radio amateurs in the world.

There is no formal system for tracking the age of the world's radio amateurs, but records indicate Sokolov remained licensed, although he apparently had not been active on the air for several years.

Sokolov lived through World War I, the Russian Revolution, and World War II, and told interesting stories of his wartime experiences, including the Kerch landing where Russian troops crossed the Kerch Strait in December 1941 in an effort to regain control of Crimea.

More Radio Roadtrips!

Chatham Marconi Maritime Center, located at 847 Orleans Road in North Chatham, Massachusetts, preserves the wireless station built in 1914 by Guglielmo Marconi. The receivers were in Chatham and the transmitters were forty miles west, in Marion. The station was paired with a station in Norway to provide wireless communication between the two continents, using Morse code. Operations were interrupted by World War I, but after the war, the station was bought by RCA and, except during World War II, stayed in operation as a wireless maritime station for over seventy years until 1997.

This museum tells the story of Marconi, whose company built the station, and how the station's Morse code operators were able to communicate with ships across the world over a hundred years ago. And it tells the story of the secret role that the station played during WWII. Previously classified, Chatham Station C helped break the German's Enigma Cipher Machine Code - intercepting Enigma-encrypted wireless messages between German headquarters and its ships at sea, then passing the intercepts on to Washington, DC for decoding. In addition, as the control station for the east-coast direction-finding network, Station C directed the search for telltale radio signals that allowed enemy vessels to be located and tracked.

Not all of our exhibits are within the walls of the museum buildings. Plan a few extra minutes to walk the reconstructed trail that marks the path of the original Marconi Antennas. The museum also operates amateur station WA1WCC.

Regular Summer Season begin Friday June 16th, and end on Sunday October 9. Hours are Tuesday through Saturday 10:30AM until 4:30PM, and Sunday 1:00 until 4:00PM. It is closed on most Mondays. Visit its website for more information at: **http://chathammarconi.org.**

The InfoAge Museum is located at 2201 Marconi Road in Wall, NJ in the historic 1914 Marconi Hotel which served as the U.S. base for Marconi's Wireless Telegraph Network, later to become part of the Radio Corporation of America (RCA). In the 1940's, the site was the top secret Camp Evans of the U.S. Army Signal Corps and the birthplace of radar. The radar station for Project Diana is still there with the dish antenna used to bounce a radar signal off the moon - starting the era of satellite communications and weather radar.

The site began in 1914 as the Marconi Belmar Trans-Atlantic Wireless station, which opened world-wide wireless communications. It played an important role in WWI Trans-Atlantic communications, and later played a key role in the development of radar as an effective WWII secret weapon. It moved into space communications in 1946, and was a cold war technology site, which included work on nuclear weapons research. In the 1950s, Senator Joseph McCarthy visited the facility because he suspected a communist spy ring may have been operating from it, It is also the birthplace of satellite-based hurricane tracking,.

The NJ Shipwreck Museum is also located here since Marconi's wireless communications revolutionized shipping from the early 1900's. There is an impressive collection of recovered artifacts from many historic vessels and be sure to note the artifacts from the Andrea Doria. You can take a self-guided tour or benefit from the many well-informed tour guides that are on duty.

The museums are open for public tours from 1 to 5 p.m. Wednesday, Saturday and Sunday. General admission is $5 per person. For more information, visit the website at: **http://infoage.org.**

Thunderstorm Season: Is Your Shack Protected?

"A good ground is one of the most essential parts of a solid HAM station."

By Don Young, N7DY

A good ground system is an essential part of a good ham station for various reasons. First and foremost, grounding is for the safety of your family, home, and ham equipment. Lightning not only destroys ham radios, but often starts house fires, jeopardizing the safety of your family. An elevated antenna or a tower protruding into the atmosphere naturally increases the odds of a lightning strike. But statistically, most lightning damage comes from the AC power or telephone lines running into your home.

Simple ham station grounding is often done with a water pipe. Indeed a metallic cold water pipe can serve as a basic ground for ham gear -- since outside water pipes normally are buried well below the soil's surface, so it does serve some purpose. But remember that a cold water pipe ground should be considered merely one level above having no-ground system at all. You can do much better.

A fact significant to hams is that a good ground will not only increase the receiver's sensitivity, but also its transmitting propagation. I have often observed a decrease in surrounding ambient noise from S9 to S5 on 40 meters by simply changing the station's ground from a cold water pipe ground using 12 gauge wires to a proper RF grounding system. Your regular ham contacts will usually notice the improvement to your signal, too.

As you probably know, HF antennas work best when they work against a good counterpoise ground reference. Good RF grounding technique is misunderstood and difficult to explain in simple terms. It is a basic phenomenon of impedance. RF grounding requirements are very real, somewhat difficult to measure, and unseen in operation. A common term that is used in RF grounding is "skin effect." In a ground system the majority of electrons run along the surface (or skin) of the conductor. A good RF ground has the least amount of resistance to electrons being conducted to ground. This is obtained by having the largest amount of conducting surface area that is practical. The goal of a good RF ground system is to obtain as little resistance as possible from the antenna/tower to ground and then from the radio to ground. Thus, the more conductor surface area, the more ground path conductivity.

Effective grounding is measurable. A good grounding system will measure less than 12 ohms from the radio to ground. A typical cold water pipe ground will measure fewer than 35 ohms, assuming the water pipes are not made of PVC. Measurement is both rare and difficult since most hams do not have a 'Megger' type instrument required to make the measurement accurately. For this reason, a well planned and properly installed ground system is the best alternative. Even without an actual measurement you'll know it's as good as you can provide within your means. This article will assist you by giving examples of relatively good RF ground systems that are often within the means of the average ham.

OK then, here we go. Several things need to be contemplated before deciding on your plans for an RF grounding system.

- You should consider your budget and the amount of effort that you are willing to invest to obtain a good RF grounding system. It is not to your advantage to be cheap or lazy – if so, you might just as well use the cold water pipe. Then be prepared to buy new equipment when you get your first lightning strike.

(continued on page 10)

Grounding: Your Key to Safety and Performance

- Dissimilar metals (as it pertains to electrolyzing/galvanic action) can pose a significant problem to the systems' longevity and minimizing maintenance issues to your ground system. One rule is NEVER connect copper to galvanized or aluminum towers - use a stainless steel interface between the two metals with a stainless steel clamp, bolt, washer, and nut!
- Copper oxide (the greenish copper corrosion) is NOT conductive! Eventually compression clamps WILL allow corrosion to migrate into joints, causing a reduction in conductivity and increase the connections' overall resistance. Weld or solder ALL joints when possible. This will ensure long life and maintain stable good conductivity between connections. If a stainless steel clamp is used, a conductive grease is required to minimize connection moisture degradation. Eliminate ground loops and multi-point ground connections when possible. A ham shack ground loop gives lightning another path to your equipment. Always use a single-point ground between the interior and exterior of your ham shack.
- Run your coax/hard-lines to the base of your tower or antenna mast and directly connect to the coax/hard-line shield clamps to the tower/mast base. This will allow the lightning to get as close to the actual ground connection before attempting to enter the house. When creating a drip bend in coax/hard-line, use a minimum radius of nine inches for the curves.
- Grounding-rod depths are critical. You can find the recommended grounding depth by checking your local plumbing or building codes. In central Wisconsin the minimum depth is six feet; in central Texas it is eight feet; and in part of Arizona it is ten feet -- so check out your local conditions. The ideal grounding situation is in having your ground system make physical contact with the water table, but this is not very likely.

Grounding Rods vs. Pipes

Due to economics and the effort required to drive rods, I've taken another approach in lieu of rods. (Besides four foot rods are worthless as they do not make enough soil contact for an adequate safety ground, much less an RF ground). I use ten foot pieces of 0.5" copper pipe fitted with a brass hose fitting. I purchase a brass hose fitting from a local hardware store and solder this fitting to the end of the copper pipe. This allows me to attach a garden water hose and easily hydra-drill the copper pipe into the soil. No mallet or "T" post sledge for me (most of the time, anyway). I dug a one foot square deep hole in the ground where the ground pipe is to be drilled. I drilled the pipe into the ground until the pipe top was 6" below the surface of the ground. This allowed working room to solder the copper tubing and then cover the hole, making it invisible to all and your lawn mower.

Ground Conductor Copper Buss-Bar vs. Soft Copper Tubing

Again, due to the economics and availability of copper buss bar material, I found the costs to be prohibitive to a normal ham's budget. Instead, I use soft copper tubing that is easily obtained at your local hardware stores. The trade-off is the amount of surface area the copper tubing will have in comparison to copper buss-bars. I highly recommend that you use 0.5" copper tubing for short runs, i.e. 10', or as your budget will allow -- but attempt to keep the conductor surface area high as near to 1.0" copper tubing as you can afford. Remember, the more surface area, the better the ground conductivity. I use soft copper tubing for practical reasons and ease of use. Where a soldered or clamped connection is to be made, I hammer the tubing flat. Then, using vice-grips, I wrap the flattened tubing very tight around the copper ground pipe/rod and make a good soldered connection. The copper tubing is buried at least 6" deep. This will keep you from hitting the ground system with the lawn mower or becoming a trip hazard. The buried copper tubing is also part of the energy dissipating ground system. In using buried interconnect bare copper tubing, the whole "ground system" conductivity can be increased by watering the lawn, as the near surface soil conductivity will increase. Watering should be done whenever you contest or when the soil becomes very dry.

Ground Plate

This item is controversial to some; few hams want to mount or put a fair sized hole in the side of heir house. The ground plate is a solid barrier to possible lightning entering your house via your coax/cables. Also this ground plate is the fundamental item that creates your "single point" ground and gives you the proper place to install other protective devices.

(continued on page 11)

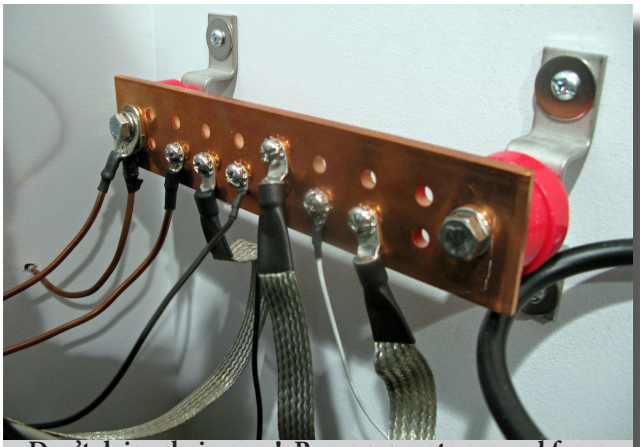
Grounding Your Shack: Practical Tips

These include devices such as your rotor cable protector, telephone line protector, etc. I recommend that the ground plate be made from 0.125" stainless steel. The dimensions depend on how many protectors will be mounted. Stainless steel eliminates the dissimilar metals' concern and allows for direct copper attachment. If you do not want to actually mount the plate into the wall of the house, then mount the plate ON the house perpendicular to the wall very near to the coax ham shack entrance. Run the coaxes on one side of the plate, clear of the house entrance, then from the opposite side of the plate run the cables and internal station ground conductor into the house. Connect the ground plate to a ground pipe that is within three feet of the house. The closer the connection between the nearest ground pipe and the ground plate, the better the conductivity. I would use 1" or three 5/8" copper tubing pieces between these two points and then reduce the copper tubing size to the other ground pipes. The ground plate is also used for mounting bulkhead surge/lightning protectors. The only such protection that I have used is the PolyPhaser brand. The PolyPhaser blocks and/or redirects the energy surge directly to your ground system. There are other brands of such protective devices that I haven't used. This type of protective device is your last and perhaps best line of defense.

Lightening Arrestors: The last line of defense

Obviously, use of these devices will require that you install a good enough ground system to fully dissipate the energy. One of the biggest issues facing you is HOW MANY ground pipes/rods should you install? This is hard to determine, as it is based on soil conduction, how potent is the lightning strike, how much room do you have, and what can you afford. If you look at a commercial system, they have multiple ground radials (seven or more) each 32 feet long and four ground rods on each radial. Some of the ground rods can be sunk as deep as 40 feet. Well, this is not in my budget or in most hams! Obviously, the more ground radials and ground rods the better.

I try to run at least three ground rods in a non-tower ham shack. One directly outside the ham shack at the coax cable entrance point (the shack ground), and at least two more ground radials with ground rods at their ends, separated by at least eight feet, from the shack ground. The tower increases the potential of a lightning strike, so in addition to the above scenario, two or more rods should be placed just for the tower. Put one rod near the tower base and the other rod eight feet away. Use 1" or two 5/8" pieces of copper tubing between the first tower rod and the tower. The goal of a grounding rod is to make contact with the water table. Falling short of that, it is to dissipate as much energy as possible by driving the ground rod directly down, attempting to traverse as many soil layers as possible, so energy can be dissipated into these various soil layers.



Don't daisy chain gear! Run a separate ground from each piece of equipment to a common grounding point.

Some soils conduct better than others, dry sand being the worst, followed by hard clay. But a hard clay layer may have some amount of water riding on the clay, seeking penetration points. Placing the ground rod at a 45° angle can increase the overall length of the radial and allow some energy to be dissipated. Angled ground rods are often used in rocky soil. The interior ground conductor is just as important as the exterior ground system. I have 5/8" copper pipe on the back of my bench. I use ½" tinned copper strap coming from each piece of equipment to the pipe. From the pipe, I use 1" tinned copper strap to go outdoors to my ground rods.

All my equipment grounds go to a central point (pipe) and then go outdoors with one strap. DO NOT daisy chain your gear together! Most radio equipment comes with an extruding bolt, washers, and a wing-nut - if not find a good chassis screw to place the braid with washer beneath. The goal is to have an effective ground connection with short ground straps and to keep a clean unobtrusive appearance to the ham shack.

CALENDAR

May 7, 2017 - Run for Literacy, 8 am - Schodack State Park, Route 9J - Volunteers needed for communications team.

May 13, 2017 - EGARA Hamfest 2017 - East Greenbush Fire Department - 7 am to 3 pm

May 20, 2017 - VE Session Sponsored by EGARA - 10 am at East Greenbush Library. Bring exam $15 fee, ID and FCC license.

June 23, 2017 - Field Day Preparation - 5 pm, East Greenbush Masonic Temple.

June 24-25, 2017 - Field Day 2017 - Beginning at 1800 UTC Saturday and running through 2059 UTC Sunday. East Greenbush Masonic Temple.

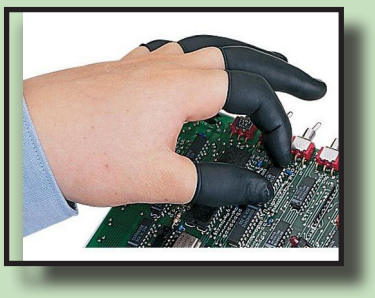
Pro Tip: I Can't Believe It's Not Butter Fingers

Your fingers are host to lots of oils. No, we're not talking about the leftover pizza grease from lunch. Even freshly washed hands have natural oils on them.

These oils, though seemingly harmless, can erode markings on electronic chips and other components. For many repairs, this probably won't be an issue, but play it safe by cleaning your hands before working.

Always handle boards from their edges and never rub your finger directly over a chip. When in doubt, slip on a finger stall, which keeps grubby fingerprints off of delicate components.

Finger stalls also protect against Electro Static Discharge and keep delicate electronics safe in case electrons get excited and discharge.



Finger Stalls: A safer way to handle electronics

Wanted to Buy

- ***WANTED: Front panel meter for Johnson Viking Valiant – Steve VanSickle -WB2HPR@ARRL.NET-***

For Sale

- ***Yaesu Model VX-8GR*** - hand held, dual band 2M/70M, with GPS, case and extra battery - $325.00. Contact Bob Stark at: bob.claudias@gmail.com
- ***Heathkit Antenna Tuner Model - SA-2060A*** Excellent condition - $ 300.00. Contact Tom Scorsone by e-mail at: ***kc2fcp@nycap.rr.com***.
- ***Ameritron Model Al-811H*** – Linear amplifier uses (4) 811's – with manual – great condition - $700 or best offer; Contact: Steve VanSickle, WB2HPR, by phone at ***326-0902***.
- ***Kenwood Ts-480 Hf Rig*** – 200 w PEP output, w/manual, cable, and microphone – like new - $800 obo; Contact: Steve Van Sickle, WB2HPR, by phone at ***326-0902***.

Looking to Buy, Sell or Swap?
Send your info to W2RBJ@outlook.com
Listings are posted on the club's website too!

The East Greenbush Amateur Radio Association

Organized in 1998, by Bert Bruins, N2FPJ, (Silent Key) and Chris Linck, N2NEH, the East Greenbush Amateur Radio Association, an ARRL affiliate, is committed to providing emergency services, educational programs, and operating resources to the amateur radio operators and residents of the Capital Region of New York State. The club station is W2EGB. The club also has several VHF and UHF repeaters open to club members and the public.