



# CAARA Newsletter



CAPE ANN AMATEUR RADIO ASSOCIATION

MARCH 2017

## President's Desk

by Jon- K1TP



It has been another busy month at CAARA with Saturday CW classes, VE sessions, Tuesday night open houses, planning the club siding job, and a terrific monthly member's meeting. Your CAARA dues might be the best bargain in ham radio today.

A friendly reminder that your dues are needed and now due, if you have forgotten, paypal them or send a check please. Without your continued financial support we could not possibly continue all the activities we offer as well as maintaining our elderly club building.

Dave- KA1LKX has joined the BOD in the last month and has already has made an impact on the club. Dave has created a suggestion sheet and suggestion box for the club members. It is here you can suggest what you think we need to do to become a club that supports your needs, the activities you would like to see, building improvements, etc. He has also placed a clearly marked barrel by the front door to collect your bottles and cans that will be redeemed at the collection center and the money collected deposited in our general fund: **painless fundrasing.**

Another good idea Dave has come up with is posting a list of items the club uses in the course of the year, such as soap, toilet paper, cofffee, napkins, paper towels, etc., with the hope that members could donate one or more items per year to the club. It would save the club money and would be greatly appreciated. We had our first donations the other day: copy paper, staples, magic markers, clip boards, and a container of Dawn dish detergent!

The Winter Field Day event was held Saturday at the club with CW classes as well as a

scheduled Emergency Services event and was a fun time. Jake- W1LDL and Chris- K1TAT have been setting up a Kenwood TS-830 with all the matching accessories in the vintage room on the second floor of the club. They had to wire a new cable to connect the external VFO to the radio, stop up and see it in action on any Tuesday night during the open house.

Last but not least, we have a new signout sheet for loaned club equipment posted on the first and second floor on clipboards. It is possible to borrow certain items for 30 days, the equipment must be recorded down on the sheet and ok'd by a member of the Board. Thanks for your cooperation.

## Information Desk

by Dean-KB1PGH



As per usual the March Board of Directors meeting will be held on March 1st at 7 :30 PM at the CAARA clubhouse on 6 Stanwood Street in Gloucester and the March members meeting will be held the following wednesday March 8th at 7:30 PM at the clubhouse as well.

I think for this months column I will give some info and tips on my experiences with portable HF antennas for any newbies out there who want to operate portable. I think this especially applies to antennas like my Buddipole and antennas close to the ground. Now if your going to operate with HF antennas close to the ground say around 20 ft high in a tree or on a mast you are going to have some issues with SWR. Your going to have to realize that there are going to be some factors that come into play into affecting the SWR of your radiated signal. You just can't park your antenna a couple feet away from a building and not expect to have your 100 watt HF signal be reflected back to you. Even something such as a steel playground set can affect it. You also have to remember since you are closer to the ground



"Awesome" describes the Blizzard of 1978 and the February Member Meeting.



**CAARA Newsletter**  
**Cape Ann Amateur Radio Association**  
*6 Stanwood Street*  
*Gloucester, MA 01930*

CAARA Newsletter is a monthly publication of the Cape Ann Amateur Radio Association (CAARA). It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to CAARA members, and space is available. Material is accepted on a first come, first serve basis. Articles and other materials may be submitted by internet to Jon at k1tp@arrl.net. If possible, material should be in Word format. Material may also be submitted as hard copy to Jon-K1TP or any Club Officer.

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Jon Cunningham- K1TP Editor  
Dean Burgess- KB1PGH Reporter

**Board of Directors- 2016/17**

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## Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the cell tower in the Blackburn Industrial Complex in Gloucester Massachusetts. It has an average effective radius of 60 miles, and serves Eastern Massachusetts, Cape Cod, Rhode Island, Southern New Hampshire, and maritime mobile stations. CAARA also operates the W1GLO repeater on 224.900. The former W1RK 443.700 repeater is now on the ATT cell tower in the Blackburn Industrial Complex with greatly enhanced performance.

The Association is one of the few amateur radio clubs that has its own clubhouse. Located at 6 Stanwood Street in Gloucester, it includes a permanent HF station with rotating beam and vertical antenna along with a 2 meter packet station and 2 meter voice and 220 MHz transceivers.

Amateur radio exams are held on the second Sunday of each month at 10:00AM at the CAARA clubhouse. Anyone who is considering a new license or an upgrade, is welcome to test with us. There is no pre-registration necessary. Contact the head of our VE team Bob Quinn if you have any questions about monthly testing. Monthly member meetings are held on the first Wednesday of each month at 7:30 PM except for July and August

Each Sunday evening at 9:00pm, the club operates a 2 meter net on 145.130. This is an open and informal net which disseminates club news and prepares operators for emergency communications work. All are invited to check into the net as club membership is not a requirement.

**New! The club is open every Tuesday from 4-8PM for CAARA members to stop by and socialize, as well as use the extensive collection of ham radio gear.**

## Information Desk

by Dean-KB1PGH

that your HF signal is going to be reflected from the ground as well. Please remember that the electromagnetic energy from your antenna is going to go into the ground and then come back up to be reradiated but some things come into play. Is your antenna on a giant slab of granite or is it hovering above 30 ft of sand or soil? You will get a higher SWR off the granite and a lower SWR off the soil. One other thing. Is the soil wet or dry? You will get conductivity with wet soil compared to dry soil. One other thing. If you can get your antenna closer to a body of water then your signal will radiate better. So as you can see many factors come into play into how much of your signal is reflected back to you in your surroundings.

To another related topic. The general theory is that if you want to get the proper "take off" angle of your HF signal for good DX you need to get your antenna at least half a full wavelength of whatever band your are on.

Let's say you want to operate on 20 meters portable. So 20 Meters is 60 ft and take half of that so your antenna needs to be at least 30 ft to get DX right? Well in theory yes but in the real world no. My Buddipole HF portable antenna is 19 FT high which is 10 ft short of the proper DX take off angle and I still am able to operate great DX all over the world with it. One thing I use to my advantage is setting up the antenna on a hill.

Here's another example. Let's say you want to work 40 meters. Your antenna should be at least 60 ft high in theory to work DX. Well I saw someone work DX on 40 meters with their Buddipole



are working HF portable please remember these tips and don't freak out if your antennas SWR is high.

By the way, don't get all bent if you can't get a perfect 1 to 1 SWR match on your portable HF antenna, or any antenna for that matter. Like the saying goes even a dummy load has a perfect 1 to 1 SWR match but you still can't transmit with it! So good luck with your portable HF antennas!

For this month's prepper tip take a moment and think of the scenario of having to evacuate your house in 5 minutes due to an emergency. What would you bring? Do have the supplies to last 3 days in a shelter?

Could you be self sufficient for 72 hrs? Take the time to plan for just this type of situation and you will be far more prepared than most.

See you next month. 73, Dean

### **Amateur Radio Balloon to be Part of K2BSA Activities at 2017 National Scout Jamboree**

A high-altitude Amateur Radio balloon, K2BSA-11, will be launched from the 2017 National Boy Scouts of America Jamboree in West Virginia. The balloon is expected to reach an altitude of 48,000 feet and will transmit on 144.390 MHz APRS. An onboard GPS/computer will shift APRS frequencies based on the balloon's location around the globe.

Carrying out the July 20 launch from the Summit Bechtel Reserve will be Bill Brown WB8ELK; Keith Kaiser, WA0TJT, and other members of the K2BSA Radio Scouting

antenna 6 FT off the ground! So compromised antenna heights shouldn't stop you from working DX. So if you

working HF portable

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### **HAARP Goes Classical During New Experimental Campaign**

The just-concluded run of ionospheric investigations conducted from Alaska's High Frequency Active Auroral Research Program (HAARP) observatory — quite likely the most powerful HF transmission facility in the world — revived the latent short-wave listener (SWL) lurking within most radio amateurs. Operating under Part 5 Experimental license W12XFX, HAARP this month even aired some classical music as it conducted its first scientific research campaign since being taken over 18 months ago from the military by the University of Alaska Fairbanks (UAF) Geophysical Institute.

UAF Space Physics Group Assistant Research Professor Chris Fallen, KL3WX, focused on two experiments — one called "air-glow" that literally aimed to light up the ionosphere, and another to demonstrate the so-called "Luxembourg Effect," first noticed on a 1930s Radio Luxembourg broadcast. Public engagement was part of his plan, and Fallen this week said the Twitter and e-mail feedback from his transmissions had been "fantastic," and that his science campaign had become "quite an event."

"Thank you for making a difference and advancing Amateur Radio as well," Doug Howard, VE6CID, tweeted. Another Twitter follower enthused, "You're running the coolest DX station in the world." Fallen said he also received "a lot of great waterfalls," as well as video and audio recordings from hams and SWLs.

## WHAT'S GOING ON AT THE CAARA CLUBHOUSE?



Gardi accepted an award for 2016 Flotilla of the Year in behalf of the Gloucester Coast Guard Flotilla. Gardi held the monthly Flotilla meeting at the clubhouse before the CAARA monthly meeting was held.

It was fitting for the Coast Guard members to hear about the speaker's experience at sea during the 1978 blizzard while just 19 years old.

Our speaker, Peter, is also a licensed ham, works part time in retirement as a sales associate at HRO in Salem, NH and is also a NH State Rep. The whole meeting was a wonderful experience and tribute to the crew of the ill-fated Can Do pilot boat.



We had an audience of twenty listening to the presentation featuring Gardi Winchester, Sen. Bruce Tarr, and NH Rep. Peter Torosian. The first floor room looked great and the overhead was playing a Power Point presentation of the Can Do pilot boat that was lost at sea with CAARA Club President Curley aboard.





Member Meeting: It was great to have Sen. Bruce Tarr, a CAARA member and ham, share his experience about growing up in Gloucester and his scanning activities. Pete Torosian gave a great talk on his experience aboard a 210' cutter **Decisive** during the Blizzard of 1978 making a rescue attempt of the grounded **Global Hope** tanker. It was chilling to think about being aboard any boat during that storm.





Peter Tibbetts talks with Tony and his wife.....below our guest speakers answer questions informally after the meeting. It was one of the best meetings we have ever had, thanks to Gardi- KA1BTK for setting it all up.





**TRIP TO THE SOUTH CAROLINA  
SCIENCE MUSEUM**  
*by Bob Spanks- WAIUCG*





## SC STATE MUSEUM MISSION

Through innovative partnerships, comprehensive collections, and stimulating exhibitions and programs, the South Carolina State Museum provides educational environments that entertain, inspire imagination and creativity, and enrich the lives of visitors.

## MUSEUM OVERVIEW

The South Carolina State Museum, the state's largest and most comprehensive museum, is located along the banks of the beautiful Congaree River in downtown Columbia, South Carolina. Founded in 1988, the State Museum is the primary storyteller of the history of South Carolina. Through rich and diverse collections displayed through interactive and engaging exhibitions, the State Museum strives to honor the groundbreaking nature of its setting, providing both residents and visitors an in-depth picture of the state's past, present and future. There is much to see and do every day at the State Museum through a variety of exhibitions and educational programs both offered at the museum and through distance learning programs, as well as through entertaining community events of all kind.

**Science & Technology** – The science and technology floor provides historic and contemporary exhibitions and activities. Explore space, science, discover the principles of flight and learn about the inventor of the laser. The State Museum is undergoing a multi-dimensional expansion project, Windows to New Worlds which will position South Carolina on the cutting edge of education, particularly in the critical areas of science, technology, engineering and mathematics (STEM).

Windows to New Worlds, slated to open in 2014, has several innovative elements, including enhanced guest services, an on-site and online observatory and classroom with a distance learning studio, a 55-foot digital planetarium dome and theater, a 4D multisensory theatre, an historical telescope gallery and an outdoor telescope viewing terrace.

In the capital city where three interstates converge, no one in the state will be more than 3.5 hours away. Some 75,000 additional visitors are anticipated in the first year alone and earned revenue is expected to double to \$3,000,000 per year.

## A look at the LIDO mount system *by Dean KB1PGH*



Well as you know most cars today are not amateur radio friendly when it comes to mounting equipment but if you have a radio with a detachable head you should check out the LIDO line of mounts. There are several models available and you can check them out on the Ham Radio Outlet website at [www.hamradio.com](http://www.hamradio.com). As you can see in the photos I have a Yaesu FT 7800 rig with the detachable head. The head is connected to the Lido mount. You can also see in the photos that the mount has an adjustable snake like tube which you can configure to any angle. In the other photo you can see that the mount is bolted down to the passenger car seat bolt. This system is working great for me and the price of the mount was about \$35.00. I would recommend taking a look at the different types of LIDO mounts available to suit your needs.



# Tower Work

by Curt- AA3JE

(Legal Disclaimer. DO NOT DO THIS AT HOME! Ask someone who really knows or pay the \$50 to have them do it!!! I guarantee you that everything I do is done by a RANK AMATEUR. I PROMISE you *IDO NOT KNOW WHAT I AM DOING!*)

It's winter. It's cold. The wind is blowing. It is icy and slippery.

That means it's time for antenna and tower work!

Why? I don't know. It's a ham thing.

I had been putting off fixing the kitchen stove vent for three years, quite successfully, when I got caught. It's not big deal, just a small problem with leaking.

It's on the North wall, and when we get a Nor'easter it leaks a little.

“WHAT IS THAT BULGE IN THE PLASTER OVER THE STOVE!!!”

“Just a small leak, dear, it gets moist every nor'easter.”

“THE WALL IS GOING TO ROT! IT LOOKS DISGUSTING! IT MUST BE FIXED!”

“It takes a long time to rot a wall, dear. We'll be dead.”

“GET SOMEONE IN HERE TO FIX IT!”

“I was going to fix it.”

“ARE YOU TOTALLY CRAZY! DON'T YOU REMEMBER THE LAST TIME?”

The sad story of “MY 911” will never be told. I can report, however, that it is vitally important to set your safety line so that it holds you “head up”. It may be a long wait for the Fire Department. Home made safety lines are problematic.

Anyway, this time I was going to do it right.

But there is a problem. People differ in their reaction to heights. Bob Quinn, of Gloucester legend, amazed us all by climbing up any tower, no matter how decrepit, with the agility of a monkey, the wisdom of Solomon, the strength of King Kong, and nerves of steel.

Me? I get queasy on escalators. Caves, sailboats, crawl under barbed wire under machine gun fire? No problem. Been there, done that.

Heights? Eeeewwwuuuhhhh!

I am one of those people who goes to the scenic lookout and clutches the guardrail with a death grip. I can feel the void reaching out to me. Beckoning. Like Odysseus and the Sirens.



Anyway this one was a toughie, since it called for having both hands free to do the work. I am used to keeping one hand on the ladder in a death grip, white knuckles and all, the whole time. Takes days to get the muscle soreness out.

So I looked at the job. I thought. I looked again. I thought. And finally I knew.

I had to buy a climbing belt.

Now I have looked at climbing belts many times. And face a dilemma.

“Best US Quality Safety Gear, The Professional’s Choice!- \$685

“US MADE- OSHA Certified- Tested and approved- \$395”

“Wang Ping, #1 Safety Belt- Very good! BEST QUALITY, You like!- \$29.95”

You see the dilemma.

So I looked and looked, and looked, and finally found a US made belt that I could afford. Now my instinct was to go to Ace, and mickey-rig the straps, but I thought a minute. I could save, at best, \$50 by making my own. One trip to AGH after falling was at least \$12,000 in surgical repairs. HMMM. But I might not fall! This required multiplying the risk of falling by the \$12,000 to get the probable utility of buying the better straps.

Tough Decision. So I closed my eyes, clicked, and bought the good straps.

Now the next problem. Ladders are inherently unsafe. Even with someone holding the foot. I did not know a roofer in Rockport that had not spent six months on disability at some time from a ladder accident.

So, I decided that the only way to keep the ladder from slipping was to bolt the damn thing to the house.

This sent me back to the Internet, and the “withdrawal strength” of screws.

I was amazed to find out I had been installing screws incorrectly all my life. Turns out that you need to drill a pilot hole 80% of the thread diameter, and NOT to tighten them down so hard they strip. They strip, holding power goes to 30%. STRIPPING IS BAD!

According to the chart, I needed a two,  $\frac{3}{4}$  inch, #8 screws at each bolt station.

I used four, 1  $\frac{1}{2}$  inch #14 screws.

36 of them.

So, after spending in excess of \$200, I was ready to start. Now I am considerate of my wife. So I made sure she was sleeping. If I fell, I had a cell phone. I knew from experience I could use one upside down. With luck they could get me down before she finished her shower.

I put on the belt. I tie the bucket to the belt. I attach the restraint lanyards to the belt.

I climb up 6 feet. I bolt the ladder to the house. No problem.

I climb up 12 feet. I drop the drill. I climb down get the drill and climb back and bolt.

I climb up 18 feet. I forget the drill bit. I climb up down and up again. More bolting.

I climb up 24 feet. I forget the other drill bit. I climb down and up again. Bolting.  
I climb up 30 feet. I drill, I screw, I panic, I come down.

After an hour, the ladder is attached firmly to the house wall running up 30 feet. And I am beat. I never knew my pulse could get up to 225.

So I go rest. I spend the time reading the instruction book that comes with the belt.

It scares the pee-waddle out of me. I had assumed #1000 pounds was enough retention. Turns out it is supposed to be #5000 pounds for a static load, double that for a fall. Check the Internet. Each of the screws pulls out at 1200 pounds. There are 4 screws at each level. Almost good enough. EEEEEWWWWW.

Now the job is simple. It could not be easier. Calk existing vent. Screw on new beautiful wooden box carefully color matched to side of house. Easy, right?

Climb up ladder holding beautiful new wooden box. Drop box. Box breaks. Go down and repair box. Not as nice as before. But OK. Lots of glue. And screws. Can barely see where it split. Sort of.

Look for rope. Do not find rope. Finally find rope behind seat of truck. Tie rope to box. Rope slips. Re-tie rope with proper knots. Climb up. Cannot hold box up and screw in box at the same time. This requires three hands.



Go get wooden cleat. Climb ladder. Screw cleat in nice and level. Notice house is not level. Remove cleat and change angle to match house.

Now this is the hairy part. To screw in the box I have to put my weight on the belt and LET GO OF THE LADDER! ERRRRRRRGGGGHHHH!

It held me fine. I calked it, screwed it in, and came down.

Then spent an hour unbolting the ladder.

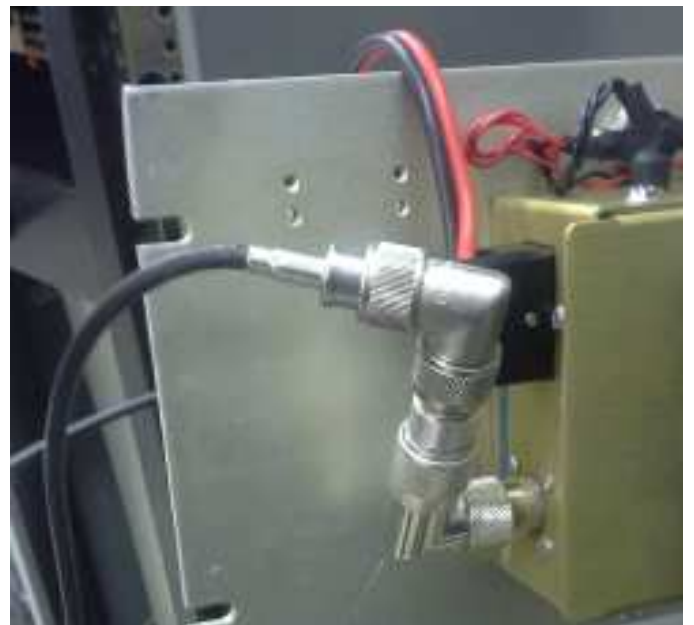
Now why do all you guys think tower work is so hard and dangerous?

It's a breeze.



**HAVE YOU PAID YOUR 2016-7 DUES YET?  
A FRIENDLY REMINDER FROM THE  
TREASURER.**

# INSTALLING NEW 440 AMPLIFIER AT THE BLACKBURN ATT TOWER REPEATER SITE



The slew of adaptors we needed to go from N to PL259 connector to connect the Bird Wattmeter for a power and SWR reading....not the way to go but in a pinch you do what you have to do!

# Excellence in Training: Seventh Annual New Hampshire ARES Academy To Be Held April 1

The ARRL New Hampshire Section has long been one of the most active in the country, and has served as a model for public service communication protocols and development. The section's annual NH-ARES Academy is no exception, continuing that tradition of excellence; it's been effective in recruiting and training new as well as veteran public event, emergency and disaster communications operators for many years. This year, the training program will be held at the New Hampshire State Fire Academy in the state's capitol of Concord, on April 1. The program is divided into blocks of training subjects critical to the development of ARES operators' skill sets.

The program will lead off with a presentation on Net Control functioning and how to work efficiently in a net environment, taught by Assistant Section Traffic Manager John Gotthardt, K1UAF, followed by ARES 101, an introduction to the New Hampshire ARES program for new members, taught by Section Emergency Coordinator Wayne Santos, N1CKM. Next, a new section for this year entitled Signals Intelligence (SIGINT), taught by Dave Colter, WA1ZCN, the section's Assistant EC for Training, introduces the concept and protocols for gathering disaster field intelligence for the state's department of Homeland Security and Emergency Management (HSEM) by monitoring other radio services.

Message formatting, seemingly always in a state of flux within the ICS framework, is a function that is at the core of the ARES mission, and will be another topic presented, by ARRL New Hampshire Section Manager and veteran traffic handler Pete Stohrer, K1PJS.

Hospital Support is another topic to be presented; New Hampshire's ARES program provides support to all of the state's hospitals. Operating plans and new protocols will be discussed by Merle Weber, KB1RJD, and the Hospital Amateur Radio Program (HARP) team. From the HARP operating manual, "the purpose of the [manual] is to provide guidelines, specific instructions, and reference information necessary to connect, configure, and operate a HARP Amateur Radio station in support of backup emergency communications at New Hampshire hospitals during readiness practice drills and actual emergencies, using analog and digital hardware and software for message exchange. "

A discussion of Go Kit Basics will be led by Alan Bradford, AE1H, from Southern Grafton County ARES, for new members and those needing to take a fresh look at their go kit.

The critical importance of the ARES Mutual Assistance Team (ARES MAT) protocol/concept was brought to the floor once again during Hurricane Matthew when demand for disaster response communicators outstripped the supply of ARES operators in many states. The academy's Introduction to ARES MAT will describe how the program works to supply operators from outside the affected areas in a system of mutual aid agreements, how to best use ARES MAT resources, and for the individual ARES MAT-deployed operator: what to expect, and how to prepare for deployment. This course will be presented by Colter.

For newcomers to HF operation in the context of emergency and disaster response communications, a course entitled HF for Emcomm, will discuss HF antennas and equipment, temporary station setups, and operating in the field, taught by Stohrer. An all new workshop course for students getting started with the NBEMS digital messaging system will be presented by George Blakeslee, N1GB.

A special course on WebEOC Training will be restricted to ARES members who are regularly assigned to a municipal EOC, and recommended by their Emergency Coordinators. The course will be taught by a member of the state's HSEM staff. Presentations/courses on Winlink Express and the Winlink 2000 world-wide radio email system and an APRS technical workshop will wind up the academy's curriculum. For more information and registration, contact Dave Colter, WA1ZCN, Assistant SEC for Training, ARRL New Hampshire Section.

## Diagnostic Error

by Curtis Wright- AA3JE

I have a small problem. It's shared by most amateur mechanics. It's because every job I do, you are doing for the first time. That is what "amateur" means. Means you don't really know what the (expletive) you are doing.

A professional does the same job over and over and over again, and knows what the likely problem is.

So when my big chain saw refused to run, I called the experts.

"Yeah, them old saws do that. Send it in."

"Er, how much might it cost?"

"Starts, won't take gas? About \$100."

"I'll get back to you."

Way too much money!

Now I have worked on 2-cycle engines before, so I decided to try it myself.

And after two hours trying to get into the engine, I sent off for the manual (\$29.95).

After the manual came, I removed the three screws and off it came.

Then I pulled the two screws, and pulled the carburetor. After careful cleaning, interrupted by SHE WHO MUST BE OBEYED,



**"WHAT ON EARTH IS THAT AWFUL SMELL?"**

I put the carb back on, and started her up! Well, actually, I started it, but it still would not run. So I pulled the spark plug and installed a new one (\$7.95). Sparked great, but still would not run.

So I checked on new carbs (\$80 US, \$20 China), and sent off to China for a new carb.

It never arrived. Finally I got note the boat would dock in a few months.

So I bought a new US one (\$80).

I installed it, ARE YOU MESSING WITH GASOLINE AGAIN? and guess what? The saw still would not run.

So I bought the Two Stroke Magic diagnostic manual (\$39.95).

It suggested that I might have a fuel filter or fuel line problem.

So I sucked on the fuel line, and after spitting out the mouthful of fuel-oil mix, (don't do this at home), I discerned that the fuel line was cracked. My pulmonary symptoms subsided after an hour or so.





So I bought a new fuel line (\$2), and installed it. This was fun as it involved cramming a soft and flexible object down a tight hole. But with string, forceps, and much cursing, I succeeded.

Tore the first one. Ordered a new one (\$2 plus \$8 overnight shipping).

Saw still fails to run.

Priced new chain saw (\$895).

Removed new carburetor, re-installed original carburetor.

Saw runs great.

There is a moral in here somewhere. To me, it means I fixed my chain saw by replacing a \$2 part!



Other members of the family have other opinions.

Darned if I can see it.



## DIY: Packet in a Bucket

As an ARES operator I frequently set up in the field taking along my trusted to-go box. Most recently it was put to use for the Trump/Clinton debate in Las Vegas, Nevada, and the Vigilant Guard Communications Exercise, in the County Mobile Communications unit. There, the mission was to provide voice and packet relay should the MACC (Multi-Agency Command Center) be unable to make contact with distant stations. After the Vigilant Guard Exercise, the local ARES District EC requested we bring our to-go boxes to an ARES training session as a show-and-tell for newer members to see what was possible.

I needed a new one to show, after my box was broken. I headed to the nearest home supply store to see what was available for a replacement. Our ARES members

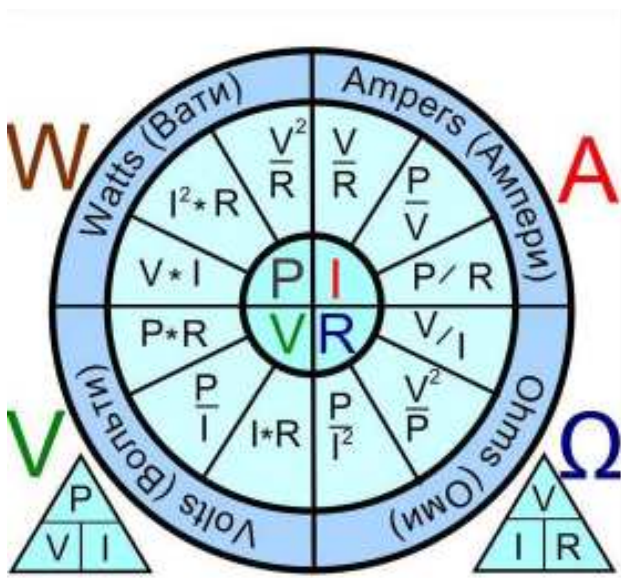
have boxes that range from the higher-priced 19 inch rack models, to tackle boxes and ammo boxes. After checking out the plastic toolboxes as options, some with wheels, some having pull-handles and stackable accessories, I decided to go with the utmost in simple: The bucket! I bought a food grade 5 gallon bucket, along with a screw-on top, purchased separately.

The top is purchased with the screw-on rim that must be pushed onto the top of the bucket where it is held on by friction. Total cost for the three items: \$12.00.

Inside there are 2 shelves. The top shelf is wood. The bottom is steel. Prior to cutting the wood and metal it was necessary to create cardboard templates. These templates were placed inside the bucket at the same time to check for measurements to ensure the packet radio modem/TNC (Kantronics KPC-3+) would fit in the space on top of the wooden shelf while the radio was hung under it. The metal shelf was sized to allow an on/off switch box to be placed under it while allowing room for the power supply, radio and power distribution box on top. The Powerpole distribution box is placed between the power supply and the radio. The radio and TNC remain plugged into the distribution box. The red and black Powerpole connectors between the radio and power supply were set so that either the power supply or an alternate power source could be easily plugged in. This provides the input to the power pole distribution box.

The components are held in place with 1 inch Velcro strips cut to each unit's width. I placed the thin metal shelf under the power supply to mount it using the original screws that hold the feet onto the supply. Measuring and accurate drilling of 4 holes for the mounting screws made it an easy installation. Quarter round wooden stock was used to conform the shelves to the shape of the bucket. Shelves are screwed to the quarter round then inserted into the bucket and secured to the bucket with screws from the outside. I used a flashlight inside the bucket when screwing from the outside to create a shadow, so I didn't miss the quarter round. The bucket will be complete once I add the soundcard interface and weather proof the 6 screws on the outside.

The on/off lighted switch box under the power supply is connected between the alternate power source and the powerpole distribution box. I used the lighted switch to indicate power was coming into the switch. This allows me to know when I've lost external power without having to dig my multi-meter out of my toolbox. Also inside the bucket I store a magnetic mount antenna, dual band handheld, and the power cord to connect to an external source. I will be adding the West Mountain NOMIC sound card interface in the bucket to use with an HF system for sound card modes. It will mount on the side between the shelves.



**HANDY FORMULA FOR FIGURING OHM'S LAW AND POWER CIRCUITS**



CLUB ANTENNA DURING A RECENT SNOWSTORM  
PHOTO BY TONY- N1JEI



**HOUSE COMMITTEE:** Ross-W1RAB and Jon- K1TP installing the donated 5 camera security system which records 24 hours a day and is accessible thru the web. We felt it was important to keep an eye on our assets and off hours club activity.



## MARS Refocuses Its Mission, Encrypts Data Nets

Today's Military Auxiliary Radio System (MARS) program has changed markedly from what it was just a few years ago. So says US Army MARS Program Manager Paul English, WD8DBY, who contends that MARS must adapt in order to remain relevant and useful to its sponsor, the US Department of Defense (DOD).

"Probably the most significant changes were the Navy's decision to 'sunset' the Navy Marine Corps MARS program and our move to refocus Army and Air Force MARS on providing contingency HF Radio communications support to the DOD and the services," English said. "In order to focus our support on the Department of Defense, MARS leadership had to rethink, essentially from the ground up, what it means to be a MARS member."

MARS relies on volunteers from within the Amateur Radio ranks. Among other things, recruits receive specialized training in military messaging formats and digital messaging protocols.

While the priority MARS mission is to provide contingency HF communication to support the DOD and the military, MARS also supports communication for combat commands providing humanitarian assistance and disaster relief, provides contingency communication for Defense Support to Civil Authori-

ties (DSCA), and provides "morale and welfare communications" in support of the DOD.

MARS still provides support for civil authorities, but it must follow DOD procedures for how that support is provided, English explained. "MARS leadership used to actively encourage our members to support civil authorities," he said, "and that put us in direct competition with the Amateur Radio community as well as with other federal agencies."

English said that in today's MARS program, the primary digital protocol is software that emulates Military Standard (MilStd) 188-110A

(M110A) serial phase-shift keying, which is compatible with what is used by the military. MARS members may still use Amateur Radio digital modes

on working channels, but M110A is the principal mode. There are no plans to transition to digital voice modes.

This year, MARS introduced an online encryption program that allows all digital radio traffic to be encrypted as it is being transmitted. MARS has also expanded its use of automatic link establishment (ALE),

although members are not required to use it.

Army MARS Program Manager Paul English, WD8DBY (left), demonstrates an ALE radio to Nick Wattendorf, N1NRW, during the

ARRL National Centennial Convention in 2014. "Our bread and butter remains single-channel HF communication," English said. "The majority of our members who do use ALE are using the MARS ALE software program. Some of our members

who support our national nets are moving to hardware ALE radios."

The MARS program supports quarterly contingency communication exercises supporting the DOD. These are based on "very bad day" scenarios, where traditional forms of communication are no longer available. "Through these exercises, the DOD -- via the MARS community -- reaches out to the Amateur Radio community to provide situational awareness information at the county/local level," English said.

That makes sense to MARS member Bill Sexton, N1IN, who was Army MARS public affairs officer from 2001 until 2014. "At least in theory, the blanketing omnipresence of hams across all 50 states offers a backup for blacked-out regions in the event of a catastrophic attack or natural disaster," Sexton allowed. "The challenge is mobilizing back-up operations in the total absence of internet, telephone, cell phone, or texting resources."

