CAARA Newsletter

AN ARRL AFFILIATED CLUB MAY ISSUE- 2013

President's Desk

by Stan-W4HIX

April 2013

As many of you know, I volunteer to work the Boston Marathon as a ham radio operator. For the last three years I've worked the Elite Vans—we provide a taxi service for elite runners who drop out of the race early and this year was no exception We ran our usually operation, bringing in a couple of runners ranked around 20th in the marathon. Our operation was complete by 1:00 PM, but we remained on call until 2:00 PM when we were finally released. I decided to wander through Copley Square to watch the runners after they passed the finish line. I watched for 10 minutes or so, and then made my way to my car. Before I got home, I started hearing the reports of the bombing.

In some reports I received a few days later, I learned that the ham nets remained operational, even though the trailer in Copley Square that housed net control was evacuated. Even with the cellphone network shutdown, hams continued to direct busses, handle calls from first-aid tents and direct people in the finish area.

I'm not going to write a commentary on the bombing, we all know how horrible and despicable it was, but the volunteers that continued to do their job, and went beyond, are real heroes. No one knows when or where these kinds of things will happen, but they do happen, and they happen here. Keep that in mind.

On a lighter note, CAARA's Tech in a Day hosted 21 students, with all of them passing the Element 2 exam. This now brings to 101 new Techs this program has produced. Thanks to everyone involved!

We have new Internet at CAARA—very fast cable Internet. Dick Ober has most of the configuration done, plus we have a public hotspot, so anyone with a Comcast Xfinity account can log in—separate from our network. We also have new phone (same number) and basic TV service. Pretty cool.

73 de Stan, W4HIX

Clerk's Corner

by Dean-KB1PGH

The CAARA Board of Directors decided to clarify the descriptions of a couple of the club membership catagories at the last Board meeting.The Board had received a couple of inquiries from club members of what constitutes a"Retired" member and a "Family" member.There was also no real written explanation anyware so here`s what the Board voted on after some discussion.The Board did away with the "Retired" name and renamed that catagory as "Senior" and in order to receive the $15.00 per year due discount a "Senior" member must be 66 years of age or older-thats it. Now for the Family member discount.In order for a club member to pay the discounted rate of $10.00,that club member must be living under the same roof of a sponsoring club member who is paying the full $30.00 per year rate.Don`t forget the other club membership discount.If any prospective amateur radio operator tests with CAARA during one of our ARRL VE sessions and passes their Technician class amateur radio license exam they get the opportunity to pay half off the yearly dues rate for their first full year of membership which would be only $15.00.Hopefully this clears up any questions of these membership catagories.Now as a Easter Mass ARRL Public Information Officer I would like to remind everyone once again that CAAR will once again be participating in the ARRL Field Day Exercise which will be coming up on the weekend of June 22nd and

(cont. page 3)

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 Cub Reporter

Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz (PL 107.2) with antennas located on the ATT 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 (no PL) located at the CAARA Clubhouse with a very limited range. The former W1RK 443.700 (no PL) repeater with antenna at the CAARA Clubhouse in Gloucester, Massachusetts has a limited range.

The Association is one of the few amateur radio clubs that has its own clubhouse. Located at 6 Stanwood Street in Gloucester, it features multiple HF station's with rotatable 10-20 meter beam, G5RV wire antenna, and 2 HF vertical antenna's along with a 2 meter packet station and multiple 2/220/440 MHz transceivers. CAARA also has an impressive collection of older tube radios.

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.

CLERK'S CORNER (cont. from page 1)

23rd.Now as much as Field day is a emergency communications exercise,it is also ham radios biggest nationwide public relations event where we show off the passion of our hobby to the general public.So please mark that date down your calendar and make plans to attend.Also take the time to plan to invite as many people as you can to the Field Day site which is once again at the Fuller School Field in Gloucester, Mass. Don`t forget that the public will also have the opportunity to get on the air on the "GOTA" station. So if you know of any Boy or Girl Scout troops, public safety officials or any local leaders or elected officials,please let them know about this event.I`ll give another Field day shout out in the June newsletter as well.Now back to some clerk notes.Did you know that CAARA has a ham radio equipment insurance policy that covers the majority of our equipment at the clubhouse and the repeater sites? As by law the club has a liability policy and a policy for the building but they do not include the contents.This ham radio equipent insurance policy covers almost $15,000 of the clubs gear.In case of fire or theft or act of God we ae covered.This policy also covers equipment on club sponsored events the Field Day site or the Thachers Island trip.This is just another example of how the Board of Directors is taking care of the monetary investment made by the membership.Actually you too can get this same type of coverage for your equipment if you like,it is through the ARRL but of course the insurance vendor is Marsh Insurance.So please take a moment to see if all you ham radio equipment is covered by your home or renters insurance policy.If not please take a second to think if your equipment was ever stolen or got blown up by a lightning strike? We all know how much money we have spent on this hobby.What`s another meaning for HAM? Have Another Mastercard! 73 until June!

RESCUE RADIO: CELLPHONE FAILURE AT THE BOSTON MARATHON

Neither the Federal government nor any Massachusetts state agency or the Boston police ordered a shutdown of cellular telephone service in the Boston area following the terrorist bombing of the Boston Marathon on Monday, April, 15th. The systems simply failed of their own accord because too many people trying to use them at the same time.

On April 18th outgoing FCC Chairman Julius Genachowski said the FCC would follow up on cellular service issues at the Boston Marathon. This while emphasizing that broadband services had not been shut down after the bombings.

Genachowski conceded that the event again raised issues of communications and public safety like those the FCC has been working on for some time. However he went on to acknowledge that wireless networks were so overwhelmed by the temporary surge in traffic, that there were incorrect media reports that mobile services had actually shut down when they had not been.

What appears to be a fact is that most cellphone subscribers erroneously believe that the phone in their pocket should function perfectly 100 percent of the time. The reality is that the no cellular system currently in use can handle 100% of all of its subscribers at any one time. Or even 50% for that matter.

Most experts say that when most cellphone systems reachbetween 15 to 20 percent of its subscribers simultaneously using the service that it is at a point of limited network density. In other words it cannot handle any more subscribers more until those on-line hang up.

And that's what appears to have happened in Boston after the two bombs at the marathon finish line went off. It's also why the autonomous Boston Marathon ham radio communications networks continued to function flawlessly even when the cellphones failed.

Genachowski said that the FCC will certainly pursue this issue along with other agencies. He called it an institutional imperative for the FCC. Meantime an excellent reference guide on what you can really expect from your cellphone including in emergency situations has been published on-line by the FCC.

news reports)

PHOTO on left: Old Western Union Code Machine

Here We Go Again

by Dr. Curt Wright-AA3JE

Those familiar with the family farm will remember last Fall's disaster. For those who do not remember, it was the end of an amateur bee-keeper's first season. What I did not know, (but do now) was that the particular strain of Italian honeybees I was trying to raise were gentle, productive, kind to strangers, and not very aggressive.

This created a problem when the nectar supplied dried up in late summer, as the bees already in the neighborhood were seasoned local residents. This meant they were experienced, well-established, knew the area, and all carried weapons. My bees were fine at 8 AM when I went to work, and by 5 when I got home, the entire hive had been looted. By the local bees. They had figured out that they could either make 35,000 trips to flowers all day long, or just a few hundred trips to clean out my hive.

My bees, whom I expected to resist aggression, fighting to the last, took one look at the locals, and promptly decided that changing sides was the best thing to do. Anyway, when I got home, it was to find that the hive I had nurtured all summer had been cleaned out. No honey, no bees, no nothing.

So I packed it away, and decided to try again this year.

Now for those who have never bought bees, it's a little strange. You can buy them over the internet, but it makes the UPS, FEDEX and Post Office guys a little nervous. If they bang up the typical package, no big deal, but if a 3 pound package of bees (roughly 10,000 or so) springs a leak en-route, it can be a bad day in the big brown truck.

I buy my bees from a local suppler, mostly because it' s a family business. Which makes it a little weird. You place your order, pay the $97, and they call you when the husband and the son arrive from Florida. Now they go down there to buy bees, towing this typical "U-Haulish" trailer, and drive back, having packed the trailer with package after package after package of bees. They must have 300-500 packages in there, and at 10,000 bees per package, they have 3-5 megabees on board.

(Safety tip. If on the highway, give the pickup hauling a black trailer with a bumper sticker saying "Support Your Local Apiary" plenty of room. Really. Don't follow too close. It's not smart.)

So the word spreads, and from all over Essex county, cars and trucks converge and create a small traffic jam. Into the store, show the receipt, get the precious ticket, and get in the line.

The line snakes around the building, and is kind of like a poorly cleaned amusement park. Bees are shipped with leaky pint cans of sugar syrup as food, and after a thousand miles of bouncing, the trailer is, well, sorta drippy. And very sticky. A few packages have burst, too, so there are a few thousand dazed bees circling around and looking for home. As "most" of the people in line are bee-keepers, this causes no problem, but someone always brings a "civilian" with them, and there are a few people in line who are palpably nervous when errant bees land on them, thinking they have found home. The bee-keepers, all anxious that they did not get there in time and will not get bees, pass the time in line sharing tales as to why they need a new pack of bees. The reason is usually illness, occasional bear or raccoon problems, some robbing (as in my case), and the occasional bee-keeping mishap. We shuffle along, watching the happy few carrying their sticky prizes away form the trailer, and note the "brushing station" on the way out. This is where you get the excess bees brushed off. The "lost bees" tend to try to join with the bees in the packages, and you can find out on the way home that all the bees in your purchase are not "INSIDE" the package. They are "INSIDE" the car.

So, get the bees, brush off the stragglers, get to the car, and put the bees inside. Now most of us are trying to save money on gas these days, and I had taken advantage of this trip to "bundle" my spouse into the car and make the trip to the craft store at the same time. So I put the bees in the back, and join her in the front. She seemed a bit pale.

"DO THEY ALWAYS DO THAT?" She asked.

"Do what, dear?"

"Make that noise."
I listened. There was a muted buzzing from the back seat.
"That's a happy bee sound. If they are unhappy, you can tell."
"THAT'S THE NOISE THEY MAKE WHEN THEY ARE HAPPY?"
"Yeah, sort of."
"WHAT ON EARTH DO THEY SOUND LIKE WHEN THEY ARE UNHAPPY, THEN?"
"You don't want to know."
"THEY CAN'T GET OUT, CAN THEY?"
"Not usually. If they get loose we just keep the doors and windows closed."
"WE DO WHAT!"
"Well, that's what they taught us at bee class. If you open the windows, your bees escape."
Next time, I think I'll go alone. My wife is one of those who can intellectually realize that honeybees are like sheep, sort of mild, docile and rarely a problem, but emotionally, to anyone who lives with the annual New England late fall yellow jacket swarms, anything that buzzes makes her a little nervous, like wolves.
So we get home, and I take my bees into the warmest bedroom, since it's too late in the day to put them in the hive. Honeybees lock up solid below about 60 Degrees F, and it was too cold for them. For some reason, keeping the package in the house made the family a little nervous. Some people are weird.
The next morning, it was into the suit, out to the hive, open the package, put the queen in, then dump in the bees. If you've never done it, it's like pouring puffed wheat. Open the package, dump, shake, pour and whack the sides of the cage to get them all in the hive, then close it up, pour in the sugar syrup into the feeder, brush off the bees on the suit, and back to the house.
She who must be obeyed was up.
"SO ALL THE BEES ARE IN THERE?"
"More or less. A few are out scouting the local area, but it's too cold yet, they will all ball up in there, sucking up the sugar."
"I WISH YOU HADN'T DONE THIS."
Now I want you to know that I refrained, I don't know how, from saying anything like, "The time to tell me that was BEFORE I poured 10,000 bees into the box". What I actually said was, "Why is that, dear?"
"I WORRY ABOUT THEM SO. I THINK THEY ARE NOT GETTING ENOUGH NECTAR AND THE WIND IS SO STRONG DOWN BY THE BEACH, HERE."
"They are an adaptable species, they will do fine."
Oh well, off on another year of bee-keeping.

VINTAGE PHOTO COLLECTION

1936. Camden, New Jersey. "RCA Victor Final Inspector — testing radio frequency alignment and making final test of chassis. This takes place in a room entirely surrounded by copper screening in order to protect testing from any interference.
This is the job requiring the highest skill. Even technical training, such as an electrical engineering course, must be supplemented by a course of training at the plant for this particular work."

CAARA SERVES CAPE ANN

CAARA Emergency Communications Group leader Curtis Wright AA3JE discusses the communications plan for an upcoming road race with the clubs emergency communications group during the April meeting.

The CAARA Emergency Communications group meets on the first wednesday of every month at 7 PM at the CAARA clubhouse on 6 Stanwood Street in Gloucester, MA (except during July and August). The group discusses and plans for providing amateur radio emergency back up and public service communications for the Cape Ann area.

We serve under the ARRL‘s ARES plan in Eastern MA and we also serve under Gloucester’s CERT Team. We train and drill year round to provide portable communications under disaster conditions. We also assist the American Red Cross and the Cape Ann Emergency Planning team. We also take part in the yearly ARRL Field Day activities in June.

This group is open to all who are interested and all are welcome to join. More information on emergency communications can be found in links in the clubs website at www.caara.net .

HIGHLIGHTS OF THE CAARA MONTHLY MEETING: DAVE ROBINSON PRESENTS JUMA TRX 2 TRANSCEIVER HE BUILT

The CAARA members met up for their monthly members meeting on Wednesday, April 3rd at the clubhouse. This month we had club member Dave Robertson- KD1NA with a great presentation on HF radio kit building using surface mount technology. Dave brought in his Juma TRX 2 HF Transceiver and the Juma PA 100D amplifier. The Juma TRX 2 is a 10 watt, 160 to 10 meter HF Transceiver and the Juma PA 100D gets 150 watts out from a minimum 3 watts in. Dave said it took two months straight, a couple hours each day, to build both radios. All of the components use surface mount technology and Dave explained the diffferent ways he used to solder the tiny parts onto the boards. We thank Dave for the presentation and more information on these radios can be found at www.jumaradio.com . courtesy Dean- KB1PGH

General

JUMA TRX2 is a high dynamic range transceiver for SSB and CW, using the quadrature sampling technique for demodulation and modulation with the low noise phasing method. JUMA TRX2 includes a DDS controlled VFO for a good frequency stability and signal purity. An internal microcontroller is controlling all functions of the transceiver.

JUMA TRX2 is available as a discrete kit with components and bare circuit boards. The enclosure is machined and printed. Only few coils need to be wound when constructing JUMA TRX2. A completely assembled transceiver and other building help is also available with the help of the JUMA community.

Additionally there are two models: The two band model TRX2 for 80m and 40m ham bands and the all ham band model TRX2A with a general coverage receiver. The two band model can be upgraded any time into the all band model by adding related modules. Several add on option modules are also available for both models.

Outstanding dynamic range and good sensitivity
Excellent AGC with slow and fast modes
Dual DDS controlled VFOs with a split TX/RX function
First-class optical VFO encoder with 480 steps per revolution
7 digit frequency display with 10Hz display resolution
Three selectable VFO tuning speeds Slow/Fast/Very Fast
VFO lock feature
RIT with it's own tuning knob
Graphical S-meter range S1...S9+40 dBm
Non volatile memory for VFOs, modes, settings and calibration

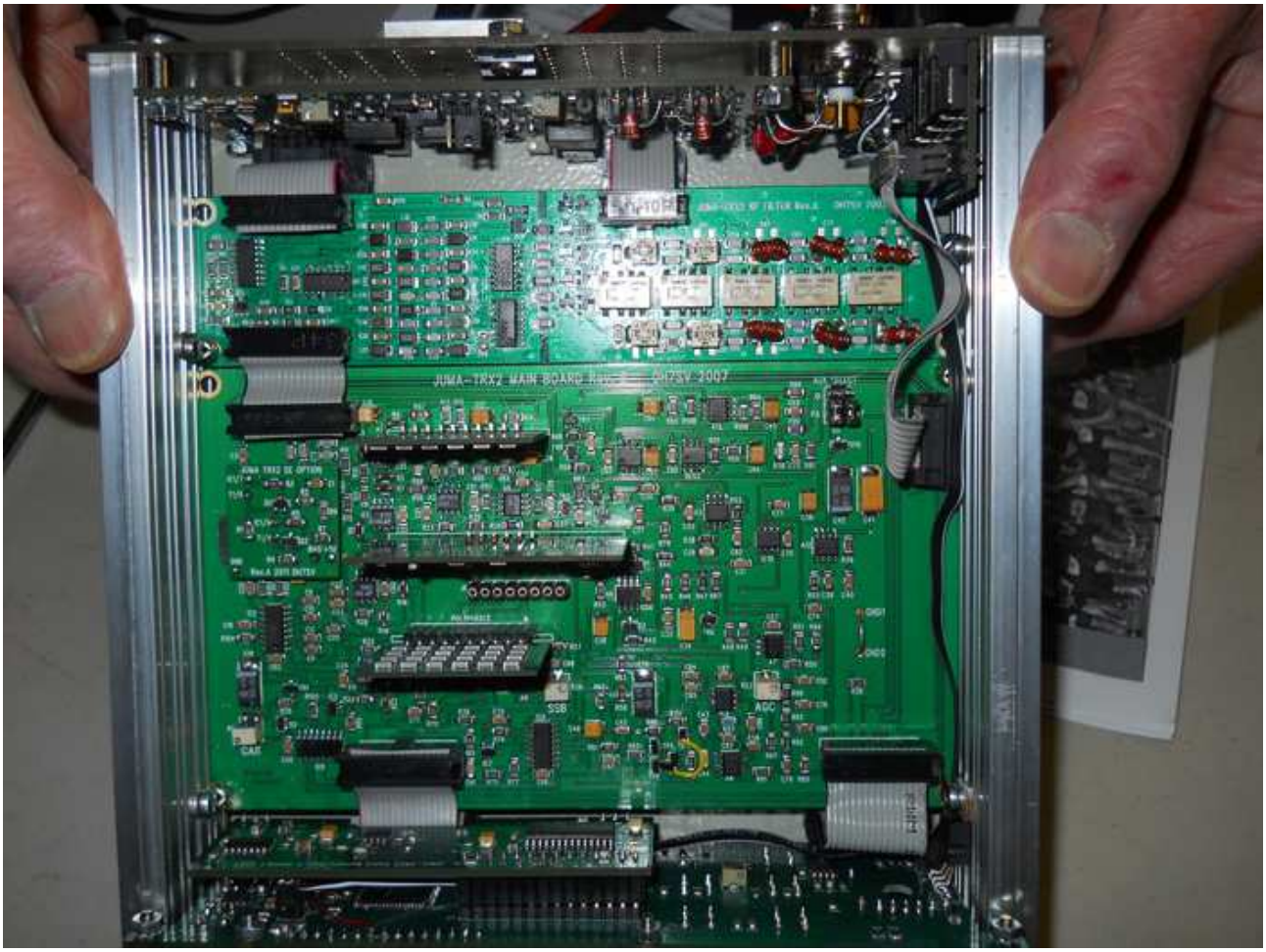
Features
The all band model has all ham bands, RX 100 kHz-30 MHz The two band model frequency coverage is 2 MHz...8 MHz

Transmit modes LSB, USB, CW and tune
Output RF power 10 W RF output, SWR, voltage and PA current displays in LCD

Built in keyer: Dot priority, Iambic A, Iambic B and straight modes

Good clickless CW keying with adaptive 'VOX' time
Three filters: Wide, Medium and Narrow with a good shape factor The filters are user adjustable.

Dave- KD1NA



CAARA Vice President Jake- K1LDL, our current king of boat anchor memorabilia, has added another piece of Collins Gear, a KWS-1, to his growing and glowing hamshack.

The self contained unit boasts 1kw on SSB and CW from 10-80 meters. Only 1600 were produced and sold for around $1995.00.

Thw final amp tubes are twin 4X250B's, popular at the time and still available.....listen for Jake on 75 meter AM.

CAARA provides public safety service communication for Yukan Run !

by Dean-KB1PGH

On Sunday April 14th several members of the Cape Ann Amateur Radio Association‘s emergency communications group provided public safety service communications for the Yukan Run 5K and Half Marathon. The weather was sunny and cool for the over 660 runners who particpated in the Half Marathon which started at the O‘Maley middle school in Gloucester, looped around Granite and Phillips Streets in Rockport, and then back to O’M aley Middle school again. Communications support started at the 5k started at 8 AM and the Half Marathon started at 9:00 AM and communications support for both races wrapped up at noontime.Curtis Wright AA3JE was race net control relaying the Rockport 440 MHZ reapeter traffic at the CAARA clubhouse while Stan Stone W4HIX was shadowing the race safety officer.Hank McCarl W4RIG was stationed at the Addison Gilbert Hosptial‘s Emergency Room and Ron Beckly N1RJB was in the trail car following the last runner. Dean Burgess KB1PGH, Sue Downey N1XQW, Ross Burton W1RAB and Nate Dewolf KB1VST were stationed along the far half of the race route from Leonard sreet in Gloucester to Granite Street in Rockport. A total of 30 man hours of volunteer time were donated by CAARA members to support race net control and to provide real time race infiormational awareness to Gloucester and Rockport Police. Providing supporting communications is one way that amateur radio operators give back to their communities,not just providing volunteer time alone,but by also using their own equipment which as purchased by them.Another example is that CAARA was using our new repeater for this race and the new repeater cost $1300 which all the funds to purchase the repeater has been provided by private donations. CA big thank you goes out to Ross Burton, W1RAB for allowing the use of his 440 repeater for race communications in Rockport. Ron Beckly also used his own car as the trail car. Just other examples of amateur radio operators donating the use of their own equipment, purchased on their dime, for the good of public service. In the photo provided you can see the lead womens pack of runners going by the Annisquam Village church on their way towards Rockport.

The New England Amateur Radio Festival (NEAR-Fest XIII) at DEERFIELD Fairgrounds
Friday, May 3rd, 0900 through Saturday, May 4th, 1500, 2013.

GRAND PRIZE DRAWING ELECRAFT K-3 TRANSCEIVER. YOU NEED NOT BE PRESENT TO WIN.

ALL radio enthusiasts are invited to attend the Spring 2013 convocation of NEAR-Fest XIII at the magnificent Deerfield (NH) Fairgrounds. Thanks to you NEAR-Fest has become the Northeasts largest and best hamfester! Gates open Friday at 9:00 AM sharp. General admission is still $10.00 per person and $10.00 per vehicle into the flea market. There are no tailgating sellers fees.
You may purchase advance tickets and vehicle passes at HAM RADIO OUTLET in Salem, NH (cash only) and at the Flea at M.I.T in Cambridge Massachusetts.
Overnight camping: RVs, Campers, Travel Trailers is available. Such a deal! Ample free parking is available just outside the fairgrounds.
Plan on joining us after 3:00PM Thursday for the camp-over and pre-hamfest get-together and help get the fun started early!

In addition to the hundreds of tailgaters in the flea market there will be numerous educational forums, the traditional Friday night Jam Session and three buildings packed full of commercial vendors and dealers offering everything from the latest in radio equipment, books, accessories and who knows what else? You never know what treasures, old and new, you will find at Deerfield!
The Deerfield Fairgrounds is located on Route 43 approximately 15 miles NE of Manchester NH. Take Exit 3 off Highway 101 East and follow Highway 43 north to the fairgrounds. GPS coordinates: N43° 5 57.4 W71° 14 33.5 (Lat 43.099286 Lon -71.242663). Talk-in on K1JEK/RPT 146.700 MHz (-600 PL 88.5).
PLEASE NOTE: The Deerfield Fair Association rules prohibit alcohol and open fires anywhere on the grounds. These provisions are in our contract with them and are STRICTLY ENFORCED. Charcoal grills, barbeques, gas grills are okay!

Tentative Fall NEAR-Fest XIV Dates: Friday October 11th & Saturday October 12th 2013.
CHECK THIS WEB SITE FREQUENTLY FOR NEWS & INFORMATION.

Mission Statement

The “Grand Tradition” Continues…..
It has been suggested that I provide a Mission Statement for the NEAR-Fest. My first thoughts were that our mission is to buy, sell and swap as much stuff as we can, cruise and peruse the grounds until we can walk no more, drink a lot of Coca-Cola, eat plenty of greasy junk food, socialize with friends and generally just have a good time every 6 months. However I also figured if I am going to have a Mission Statement then I should also have a mission. So, here it is:
Weve all noticed that the average age of the amateur radio operator increases every year. There is also an attrition rate as many of our ranks become Silent Keys. The number of hams is declining every year. We rarely

see any young people at our events because there are so many activities competing for their time. Even grade-schoolers have their schedules. They are truly busy even at a young age. It is also a hard fact of life that if we dont attract new blood to our hobby its going to slowly wither and die of old age. And, wed better do it soon!
Many seem to think now that the Morse Code is no longer a barrier that people will flock to our exam sessions. I dont agree. People want instant gratification and studying for an exam doesnt fit that parameter. Besides there are Internet applications that pretty much replicate the radio experience provided you dont know what the real thing is like, of course.
Anyways the mission of the NEAR-Fest is to attract young people to our hobby. Towards this end we will be inviting anyone under the age of 18 to attend free of charge as our guests. We are hoping that many of the clubs in the area will prepare exhibits and conduct demonstrations of some of the different aspects of the hobby. I fail to see how operating a satellite station or talking to an Astronaut in the Space Shuttle can not grab someones interest. We've got to get them off the 'Net and on the Air!
In addition once the Fest has amassed some financial assets to conduct future events we can look at utilizing any surplus towards this mission by doing something to showcase our hobby to young people like, perhaps, offering scholarships to college students where the prerequisite would be an amateur radio license. We are always open to suggestions!
It was with this objective in mind that in October 2007 NEAR-Fest committed to donate an amateur radio station to the Christa McAuliffe Planetarium (now known as the McAuliffe-Shepard Discovery Center) in Concord NH. The station was inaugurated in February 2011 and is now fully operational as KA1SKY!
Visit KA1SKY! http://www.starhop.com/education-and-exploration/ka1sky.aspx
So, there you have it; our mission statement. It is what it is! See you at Deerfield!
73, Mister Mike, W1RC
E-Mail: W1RC@near-fest.com

Bob Quinn- WV1A Receives A Special Award of Recognition For His Years of CAARA Service.

Stan presents Bob-WV1A with a placque in honor of all the effort and work he has done over the past 30 years for CAARA. We all know Bob has been handling the CAARA VEC sessions for many years but for the new comers to the club that only scratches the surface of what Bob has contributed to the radio club.

I remember climbing the tower (swaying in the breeze) at the Clubhouse installing the tribander with Bob many years ago, as well as installing the repeater tower and antennas at Varian for the 2 meter repeater in the 1980's.

Bob has made every club job fun and always had the knowledge not to mention the tools to handle any job. He loans us his gas generator every year for Field Day. He managed to get us a Hot Dog/ Sausage vending cart for one of our early Field Day's in Rockport. It was one of the best Field Days I can remember.

Bob has been involved at every level with the growth and evolution of our radio club. He has produced video's of past Field Day's which have been played on the local Cable Community Channel. His talents include Elmering new hams, machining metal parts, welding, woodworking, carpentry, woodcarving signs, gunsmithing, scrimshaw, video production, camera buff, etc. It goes on and on, we are lucky to have such a devouted CAARA member! *jon-k1tp*

TOWER PARTY AT THE CLUB ON SUNDAY MORNING, APRIL 14TH.

A great effort by Stan W4HIX, Ross W1RAB, Hank W4RIG and a host of other hams installed I was told this was Stan's first tower job and he did a great job on top of all the other things he does for the club.

After the install, the club 440 repeater was hooked up and is running fine after the recent repairs. It is our hope to have the 440 repeater back at the cell site in the near future.

Meanwhile in the clubhouse, Bob Quinn WV1A, our VEC coordinator, was ready to test any hams who arrived but little did he know he was about to receive an award for his years of service to the club.

In another corner was Curtis-AA3JE was elmering a ham who was studying for a general test.

Bill-WZ1L had broght dozens of donuts and a dozen hams were in heaven talking about field day, radio's, and digital modes.

Jake K1LDL brought his new Collins transmitter for a show and tell session. The club was buzzing with activity, if you haven't been around Sunday mornings, your missing out!

Technical Corner: The Supercapacitor

The supercapacitor, also known as *ultracapacitor* or *double-layer capacitor*, differs from a regular capacitor in that it has a very high capacitance. A capacitor stores energy by means of a static charge as opposed to an electrochemical reaction. Applying a voltage differential on the positive and negative plates charges the capacitor. This is similar to the buildup of electrical charge when walking on a carpet. Touching an object releases the energy through the finger.

We group capacitors into three family types and the most basic is the *electrostatic capacitor,* with a dry separator. This capacitor has a very low capacitance and is used to filter signals and tune radio frequencies. The size ranges from a few pico-farad (pf) to low microfarad (uF). The next member is the *electrolytic capacitor,* which is used for power filtering, buffering and coupling. Rated in microfarads (uF), this capacitor has several thousand times the storage capacity of the electrostatic capacitor and uses a moist separator. The third type is the *supercapacitor,* rated in farads, which is again thousands of times higher than the electrolytic capacitor. The supercapacitor is ideal for energy storage that undergoes frequent charge and discharge cycles at high current and short duration.

*Farad*is a unit of capacitance named after the English physicist Michael Faraday. One farad stores one coulomb of electrical charge when applying one volt. One microfaradis one million times smaller than a farad, and one pico-farad is again one million times smaller than the microfarad.

Engineers at General Electric first experimented with the electric double-layer capacitor, which led to the development of an early type of supercapacitor in 1957. There were no known commercial applications then. In 1966, Standard Oil rediscovered the effect of the double-layer capacitor by accident while working on experimental fuel cell designs. The company did not commercialize the invention but licensed it to NEC, which in 1978 marketed the technology as "supercapacitor" for computer memory backup. It was not until the 1990s that advances in materials and manufacturing methods led to improved performance and lower cost.

The modern supercapacitor is not a battery per se but crosses the boundary into battery technology by using special electrodes and electrolyte. Several types of electrodes have been tried and we focus on the double-layer capacitor (DLC) concept. It is carbon-based, has an organic electrolyte that is easy to manufacture and is the most common system in use today.

All capacitors have voltage limits. While the electrostatic capacitor can be made to withstand high volts, the supercapacitor is confined to 2.5–2.7V. Voltages of 2.8V and higher are possible but they would reduce the service life. To achieve higher voltages, several supercapacitors are connected in series. This has disadvantages. Serial connection reduces the total capacitance, and strings of more than three capacitors require voltage balancing to prevent any cell from going into over-voltage. This is similar to the protection circuit in lithium-ion batteries.

The specific energy of the supercapacitor is low and ranges from 1 to 30Wh/kg. Although high compared to a regular capacitor, 30Wh/kg is one-fifth that of a consumer Li-ion battery. The discharge curve is another disadvantage. Whereas the electrochemical battery delivers a steady voltage in the usable power band, the voltage of the supercapacitor decreases on a linear scale from full to zero voltage. This reduces the usable power spectrum and much of the stored energy is left behind. Consider the following example.

Take a 6V power source that is allowed to discharge to 4.5V before the equipment cuts off. With the linear discharge, the supercapacitor reaches this voltage threshold within the first quarter of the cycle and the remaining three-quarters of the energy reserve become unusable. A DC-to-DC converter could utilize some of the residual energy, but this would add to the cost and introduce a 10 to 15 percent energy loss. A battery with a flat discharge curve, on the other hand, would deliver 90 to 95 percent of its energy reserve before reaching the voltage threshold.

Rather than operating as a stand-alone energy storage device, supercapacitors work well as low-maintenance memory backup to bridge short power interruptions. Supercapacitors have also made critical inroads into electric powertrains. The virtue of ultra-rapid charging and delivery of high current on demand makes the supercapacitor an ideal candidate as a peak-load enhancer for hybrid vehicles, as well as fuel cell applications.

The charge time of a supercapacitor is about 10 seconds. The charge characteristic is similar to an electrochemical battery and the charge current is, to a large extent, limited by the charger. The initial charge can be made very fast, and the topping charge will take

extra time. Provision must be made to limit the initial current inrush when charging an empty supercapacitor. The supercapacitor cannot go into overcharge and does not require full-charge detection; the current simply stops flowing when the capacitor is full.

The supercapacitor can be charged and discharged virtually an unlimited number of times. Unlike the electrochemical battery, which has a defined cycle life, there is little wear and tear by cycling a supercapacitor. Nor does age affect the device, as it would a battery. Under normal conditions, a supercapacitor fades from the original 100 percent capacity to 80 percent in 10 years. Applying higher voltages than specified shortens the life. The supercapacitor functions well at hot and cold temperatures.

The self-discharge of a supercapacitor is substantially higher than that of an electrostatic capacitor and somewhat higher than the electrochemical battery. The organic electrolyte contributes to this. The stored energy of a supercapacitor decreases from 100 to 50 percent in 30 to 40 days. A nickel-based battery self-discharges 10 to 15 percent per month. Li-ion discharges only five percent per month.

Supercapacitors are expensive in terms of cost per watt. Some design engineers argue that the money for the supercapacitor would better be spent on a larger battery. We need to realize that the supercapacitor and chemical battery are not in competition; rather they are different products serving unique applications.Table 2 summarizes the advantages and limitations of the supercapacitor.

Advantages Virtually unlimited cycle life; can be cycled millions of time. High specific power; low resistance enables high load currents. Charges in seconds; no end-of-charge termination requiredSimple charging; draws only what it needs; not subject to overchargeSafe; forgiving if abused. Excellent low-temperature charge and discharge performance

Limitations Low specific energy; holds a fraction of a regular battery. Linear discharge voltage prevents using the full energy spectrumHigh self-discharge; higher than most batteries. Low cell voltage; requires serial connections with voltage balancing. High cost per watt

CAARA TECH IN A DAY CLASS AND VE SESSION DRAWS OVER 20 APPLICANTS ON SATURDAY, APRIL 27TH!

CAARA sponsored another of the popular “Tech License in a Day” class that drew over 20 prospective hams to listen to Stan- W4HIX prepare them for their first ticket! Bob Quinn- WV1A, CAARA’s Master VEC Coordinator had a team of 6 VEC examiners ready willing and able to help test and correct the exams.

CAARA VE Examiners busy at work correcting exams (examiners not shown in the picture were Jon-K1TP and Dean KB1PGH).

All 20 applicants **PASSED THE EXAM FOR THEIR TECHNICIAN LICENSE.** You should be proud to be a member of the most active club on the Northshore. Our VE team has helped license hundreds of New England hams in the past years.

Field Day and the Island Activation are the next events for CAARA! Get involved and enjoy all your membership offers.

Dean-KB1PGH set up his Icom 7000 and Buddipole portable antenna for the Tech-In-The-Day class and operated on 20 meters SSB to demonstrate ham radio. The weather was absolutely beautiful and the band was wide open, Dean made many contacts overseas as well as state side. Dean operated with a 12 volt car battery, a MFJ battery conditioner which stabilizes the voltage as the battery wears down.

Jon- K1TP and Jake- K1LDL enjoying the day at the Lanesville Community Center during the testing session admiring Dean's- KB1PGH portable setup. Brigg's, the late AB2NJ, would be proud of this portable setup.

If your QTH limits your antenna setup, portable is the way to go. Dean worked a dozen countries while operating on 20 meters SSB running just 100 watts off a 12 volt car battery and simple antenna. If you are interested in portable operation, contact Dean and he can Elmer you. Dean has been operating portable for many years and knows what to do and not to do from actual experience. Larry-AJ1Z and Jon- K1TP also operates portable and are more than willing to help you as well.

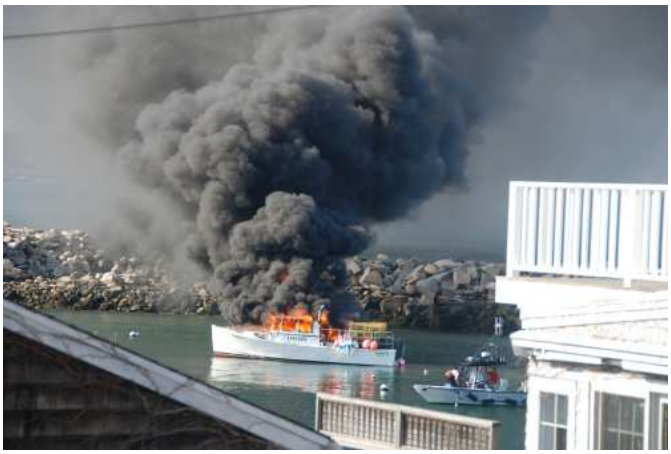
We get together and operate at different locations around Cape Ann during the summer and fall and would love to have you stop by and operate. Larry uses a Icom 7000 with a Buddipole antenna setup and Jon operates an Icom 718/7000 with a dipole antenna.

If you would like to try an Icom 817 QRP radio and a portable antenna, contact a BOD member and it may be possible to borrow a club rig for a weekend. We would go over the operation of the radio and antenna at the club with you and get you comfortable with it's operation.

Don't forget we have several operating HF stations on the second floor that you may operate anytime the club is open. If you are interested in learning how to tune up a vintage tube radio station, like a Kenwood 820 or 830, let us know and we will walk you thru the tune up procedure. It should be on everyones "bucket list"!

If you just bought one of the inexpensive BAOFENG 2/440 meter walkie radio's and are having a hard time programming it, we can help! Let us know and we can help you any Sunday morning with our programming software and cable.

I arrived home from the Tech Class in Lanesville and was sitting on the front porch relaxing when all of a sudden there was a large blast from the harbor. I ran in and got my camera after seeing the large plume of black smoke and by the time I got back to the porch the lobster boat was on fire. Within minutes the Rockport Harbor Patrol arrived and rescued the two lobsterman from the stern of the boat. Nobody was hurt but the boat burnt to the water line in the next hour. The Fire Department arrived and sprayed it down from a distance, concerned the fuel tanks may explode. It was a wild scene in Rockport Harbor. cb *-jon-k1tp*



MAY CAARA CLUBHOUSE MEETING DATES

Wednesday May 1st: Emergency Communications Group @ 7:00 PM
Wednesday May 1st: Members Meeting @ 7:30 PM
Wednesday May 8th: Board of Directors meeting @ 7:00 PM
Sunday May 12th: FCC Amateur Radio license/ARRL VE Test Session @ 10:00 AM to Noon
Sunday May 19th: CAARA Scholarship benefit Breakfast @ 8:30 AM to 10:00 AM
Sunday May 19th: ARRL Field Day Planning meeting @ 10:00 AM

History This Month

1770 Captain Cook lands at Botany Bay, Australia.

1780 William Herschel discovers first binary star, Xi Ursae Majoris

1789 Mutiny on the “Bounty” occurred, and sailed to Pitcairn Is.

1792 In Paris, at the place de Grève, the guillotine was used for the first time on a human.

1791 Samuel Morse born, Charlestown, Mass. USA.

1813 Patent for rubber was given to J.F. Hummel of Philadelphia, PA.

1849 A telegraph register was patented by Samuel F. B.Morse

1878 Phonograph shown for first time at Grand Opera House, NY.

1879 Electric arc lights used for the first time — in Cleveland, Ohio.

1880 The first U.S. patent for an electric hearing aid was issued to Francis D. Clarke and M.G. Foster

1884 Lismore’s first phone, Royal Hotel to Post Office.

1904 Hulsemeyer, Germany, patents first ‘radar’ system.

1877 A steam-engine driven helicopter model built by Enrico Forlanini rose 40 ft (12 m)

1846 First U.S. patent for a telegraph ticker to print letters was issued to R.E. House of New York

1892 The first Duryea automobile was operated by pioneer manufacturer Charles E. Duryea

1904 A rocket apparatus for taking photographs was patented in the U.S. by Alfred Maul of Dresden

1897 A U.S. patent was issued for a “Submarine Vessel” invented by Simon Lake

1941 Igor Ivor Sikorsky made the first helicopter flight for over one-hour in his Vought-Sikorsky VS-300

1956 The first practical black-and-white video recorder was demonstrated in Chicago