CAARA Newsletter

AN ARRL AFFILIATED CLUB JULY ISSUE- 2012

President's Corner

by Stan-W4HIX

Another June, another Field Day, right? I don't think so. This was the "What could possibly go wrong" Field Day (thanks, Jon). The first issue was severe electrical noise on the site, detected two weeks ahead, and tracked down one week before FD. Calls to National Grid got an engineer out to confirm our location of the problem, but we weren't high enough on the priority list to get repaired. Fortunately, the noise subsided, but never fully disappeared during FD.

The second surprise was a girl's softball tournament going on at the field. After some negotiations on boundaries, a compromise was worked out and most of the outfield was clear of antennas, guy lines and coax.

The third thing was a severe squall line that came through in the evening that picked up our two large garage tents and moved them downfield like Tom Brady often does with the Patriots. Unfortunately, the tents looked pretty bad afterwards and some reconfiguration of the operation was necessary.

There were some bright spots. The second annual showing of "The Fifth Element" went off as planned on Friday night with some rigging of tent parts on our new trailer. And on Saturday, Mayor Kirk paid us a visit and was very enthusiastic about CAARA and our contributions to the City. We saw a couple of City Counselors and Bruce Tarr, State Senator and club member came by on Sunday as we were closing down.

One saving grace was our new EmComm trailer, that guarded our rigs during the storm, provided space for the SSB station and the Field Day office and made pack up so much easier.

I want to thank everyone who helped out—the operation was carried off with great professionalism after a very trying set of circumstances. I'm already thinking of FD 2013—what could possibly go wrong?

See you around the clubhouse.

73 de Stan, W4HIX

Clerk's Corner

Well summer is here and as always there will be no member's meetings and no Emergency Communications Group meetings for July and August. Usually there are no Board of Directors meeting for the months of July and August but the CAARA Board has vote to CONTINUE having Board of Directors meeting for July and August. Actually that's a good thing. There is so much going on at the club to plan that it was easier just to continue with meeting once a month. As always the club's ANNUAL meeting will be held in September. The date of the meeting will be announced in the next newsletter.With the Annual meeting coming up here's a reminder for all Caara members to take a look and review the clubs constitution. If you haven't yet please do so as it contains all the information you need to know what will go on during the Annual meeting. The Constitution can be found in the members section of the club's website at www.caara.net . By the way, we'll be looking for at least two new Director positions on the Board so this is the time for the newer members to step up to the plate and help represent the membership during Board meetings. We will also have a review of the clubs finances and a State of the club address by CAARA President Stan Stone W4HIX so there's transparency for you. In other news the ARRL has announced that as of March 2012 the are over 715,000 licensed amateur

(continued on 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 with antennas located on the Cingular 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 with antennas located in Magnolia is now located at the CAARA clubhouse and has a very 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 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.

CLERK'S CORNER (continued from page 1)
radio operators in the United States so ham radio keeps on growing even with all the other technology we have today.Speaking of the ARRL have you renewed your yearly membership yet?Better yet,for the newly licensed hams in the club please consider joining the Amateur Radio Relay League. At least take a look at all the ARRL does for its members and the ham radio hobby itself at www.arrl.org . There are currently over 154,000 members in the ARRL. By the way,did you know that there are about 13,054 licensed amateur radio operators in Massachusetts and Nationwide over 15% of licensed hams are female.Don't forget as well that the ARRL New England Division Convention in Boxboro is coming up in August.This convention is held every two years.For those who are new to the hobby I highly recommend a day trip down there.The convention is packed with ham radio equipment vendor,workshops and a nice big flea market.For more information on the convention please go to www.boxboro.org .That's it for the Clerks corner for this month.
73
Dean Burgess KB1PGH

Original 13 Colonies Independance Day Special Event

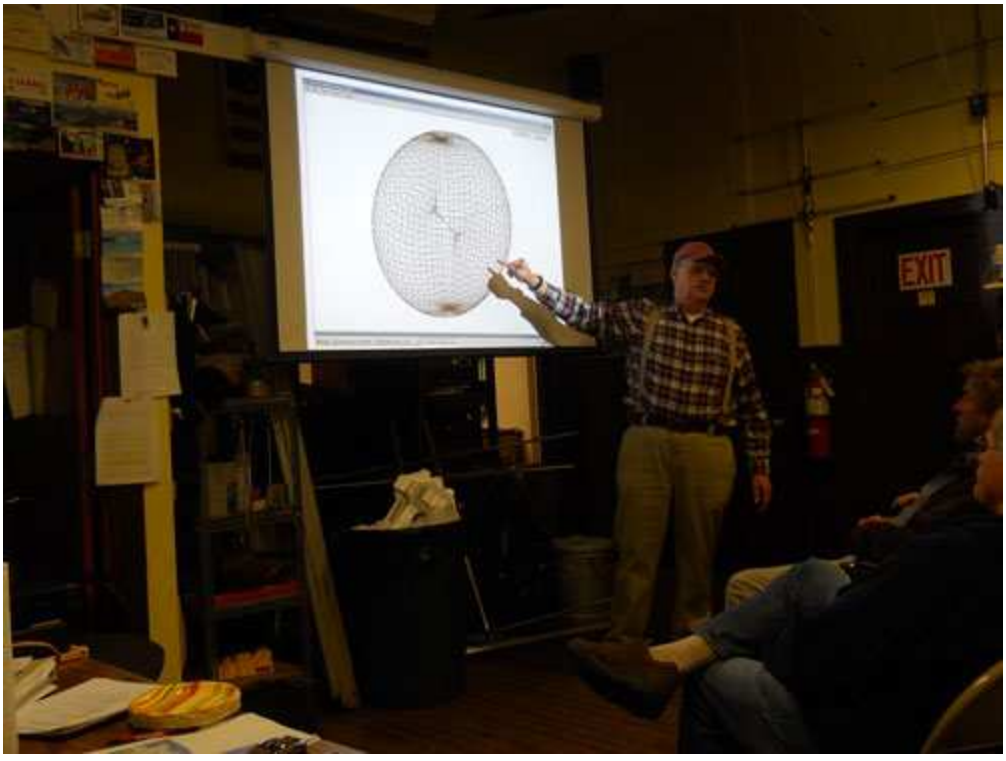
Special event stations in the original 13 American colonies will be active on the Amateur Radio Satellites and HF to commemorate Independance Day from Saturday, June 30 until Thursday, July 5
These special event stations will be on the air:
NY- Pete WB2OQQ/K2A
VA- Steve NL7VX/K2B
RI- Larry N1MIW/K2C
CT- Mark WA8SME/K2D
DE- Jeff KB2M/K2E (SSB Birds)
Paul W3FIS/K2E (FM Birds)
MD- Bruce WA3SWJ/K2F
GA- Tim N3TL/K2G
MA- Dave KB1PVH/K2H
NJ- Jeff KB2M/K2I (When not in DE)
NC- Marc W4MPS/K2J
NH- Bob NE1H/K2K
SC- Art K4YYL/K2L
PA- Elizabeth KB3WSW/K2M
The 2012, 13 Colonies stations will operate from 12:01 AM Eastern (0401Z),on July 1st, (That's one minute after midnight, early Sunday morning, July 1st) to 11:59 PM Eastern (0359Z July 6) ending on July 5th (One minute to midnight, late Thursday night, July 5th).

Recognizing that the 4th comes in the middle of the week (Wednesday) and that some operators will be going to their work on the 2nd, 3rd and 5th, we will add a BONUS DAY on Saturday, 30 June 2012!! Stations will operate from 09:00 AM Eastern (1300Z) right through until the 5th. Keep in mind that there may be fewer operators available on the work days so, please be patient!

NEW DATA TRANSFER METHOD PROMISES UP TO 2.5 TB PER SECOND
American and Israeli scientists have developed a new technology of wirelessly transmitting data using twisted beams of light that could produce a theoretical throughput of 2.5 terabits per second. Amateur Radio Newsline's Heather Butera-Howell, KB3TZD, has the story of the science making this possible: — The new method of high speed data transfer reportedly uses orbital angular momentum or O-A-M to increase the amount of information that can be carried by a single stream. To accomplish this feat, the researchers twisted together eight 300 Gigabytes per second visible light data streams using O- A-M technology over a space of one meter to achieve speeds of 2.5 terabits per second. The development comes just one month after it was finally proved that orbital angular momentum is actually possible. Using this new orbital angular momentum technology an infinite number of conventional transmission protocols such as WiFi and LTE, can be twisted together for faster speeds without the need for more spectrum. For perspective, that's more than 8,000 times faster than the fastest home Internet connection at 300 Megabytes per second.

W1A CELEBRATES TELSTAR AT 50
A celebration of the world's first telecommunications satellite will take place on July 7th. This when the Radio Adventurers of Maine activate the callsign W1A to commemorate the first messages through the Telstar bird. They will be operating on site at the Andover, Maine satellite facility, the original earth station which broadcast the first messages via Telstar was uplinked on July 10th, 1962. The clubs commemorative operation will begin at 1300 UTC on both 40 and 20 meter phone. Other bands will be added as propagation allows. QSL as directed on the air. (Radio Adventurers of Maine)

CLUB NEWS



CAARA JUNE MEMBERS MEETING WRAP-UP !!

CAARA held its monthly members meeting on Wednesday June 6th at the clubhouse on 6 Stanwood Street in Gloucester. For June‘s meeting CAARA member John Graves WA1JG gave a presentation on Vertical HF Antennas. John showed several slides of the EZNEC software which displays the radiation patterns of different antenna configurations.

Many topics of High Frequency Vertical antennas were discussed such as: Ground planes and grounding, beamwidths, take off angles and antenna heights, counterpoises and radials, artificial grounds and feedpoint impedences,and the dbi gains in 1/4 wave,1/2 wave and 5/8 wave antennas.

John recommends purchasing the ARRL Antenna Book for all the detailed information on all sorts of HF antennas.

Thanks goes out to John-WA1JG for a great presentation !

Unden Bearcat ESP 20 External Speaker Review
by Dean Burgess KB1PGH
As you know I like to operate portable so I try to aim to make as much room in my carry case for supplies.I had a larger regular small stereo speaker but it took up alot of room in the carry case so I started to look around for a smaller portable speaker.I like to use an external speaker on my Icon IC 7000 as the internal speaker on that radio is pretty lame,but that‘s mostly the case on all HF ham radios,large and small.Mostly speakers on HF radio are more for basic monitoring than long time listening and clarity.Plus the speaker on the Icom 7000 is located on the top of the radio and with the tilt bar up it is even facing more to the back.So I went to www.eham.net and clicked on their equipment review section and they had many reviews for speakers.I saw many reviews but one caought my eye,especially for the price.I saw that the Uniden Bearcat ESP 20 external speaker was getting good reviews from hams and CB‘ers alike.So I went to ebay and looked up a supplier and ordered one.I had better luck finding the ESP 20 at CB equipment suppliers since Uniden markets this speaker for cb‘ers and public safety scanner users.After getting this speaker in the mail and checking it out I was impressed by the build quality. IT doesn‘t feels cheaply made considering the $15.00 price tag.The speaker has a heavy duty molded plastic case and the front grill is also made of heavy duty plastic.One good thing about this speaker for portable us is that the 4 and 1/2 inch speaker cone is made out of plastic which makes it less vulnerable to water damage and tearing in a mobile envioronment.The ESP 20 also comes with a nice metal mounting bracket which works great as a stand as well.The cord is 10 ft long and has your typical mono plug.Uniden makes this style of speaker in a 10 watt model,a 20 watt model,which I have and a powered one as well.

The big test came when I operated portable at the last Tech in a day.Now before I say anything more I know that everyone has different hearing abilities and what they want out of a speaker.The ESP is not a stereo speaker,it will not put out a 50 HZ to 20,000 HZ audio response like a stereo speaker.The Uniden Bearcat ESP 20 was made specifically for scanners and ham and CB radios.When your listening to HF SSB and CW signals you don‘t need or want the same acoustics as if you were listening to FM radio.The ESP 20‘s frequency response is made to emphasize the human voice and CW signals which lie around 300 HZ to 5,000 HZ.You don‘t need the extra frequency respone which contains static and other high pitched garbage.By cutting all that out your ear and brain can focus more on the voice thus helping with weak signal readability.
Well I hooked the ESP 20 up to the Icom IC 7000 and turned it on.I activated the IF level DSP and tuned to twenty meters and started to scan around.I will have to say that I was quite impressed with the ESP 20.I was actually able to better hear the ssb voice transmissions on this speaker than I was with the bigger stereo one I had.The selectivity of the digital IF filters on the Icom 7000 really matched well with the matched frequeny respone of the Uniden bearcat ESP 20.I had another long time ham next to me and even he was impressed with the audio.This speaker really does make the voices pop out of the background.I would recommend this speaker for those operating HF portable,of course nothing beats a pair of headphones but theres no going back once you get away from the internal speakers of HF rigs.

A picture of the Icom 7000 with the Uniden Speaker to compare the size of the speaker to the rig.

Buddistick learning session

CAARA member Ruth Hodsdon recently purchased a Buddistick antenna system and brought it down to the clubhouse on a Sunday morning so Larry Beaulieu AJ1Z, another owner of the Buddistick, could show her how to property set up and tune the antenna system.They spent time assembling the antenna and how to tune it for the desired bands. For more information on the Buddipole portable antenna system please got to www.buddipole.com .

Picture above: Ruth and Larry with their Buddisticks
Picture on the top of next column: Larry shows Ruth how to properly tune the Buddistick for low SWR.As you can see larry is showing Ruth how to “Rake” the coil by moving the coil clip up and down the coil until maximum signal strength is heard on the FT 817. Once maximum noise is heard then he attaches the clip to the coil and you can fine tune the antenna from there.

CAARA member Larry Beaulieu- AJ1Z shows off the Buddistick portable HF antenna system

Ruth- WW1N and Larry- AJ1Z listen in on the CW portion of the 20 meter band with the Buddistick and Ruths Yaesu FT 817

On Saturday, June 9th, a group of hams from CAARA got together and setup some gear and antennas at the Field Day site in preperation for the big June contest. Myles Schlicte stopped by and talked to us about CERT and the newly donated 25 foot boat which we are welcome to be a part of in the future after training. We made a few contacts on the air and found the operating conditions to be fair at best with a S9 lever of noise. Fun was had by all!

Larry- AJ1Z

Jake “Honey Badger”- K1LDL

Matt

Dean- KB1PGH

FIELD DAY TEST RUN FOR GEAR & ANTENNA’S

CAARA JUNE ARRL VE SESSION

The club held its monthly ARRL VE Test session on Sunday, June 10th at the clubhouse. Here is CAARA VE member Bill Poulin -WZ1L presenting CAARA member Robert Mckeown -KB1VIN with his new FCC General Class Amateur Radio operators license. Congrats Rob on upgrading your ham ticket!

Students build Supercapacitor battery for next ARISSAT

Penn State students have built a state-of-the-art supercapacitor battery for the next amateur radio ARISSat satellite.

On Feb. 3, 2006, astronauts tossed an old spacesuit off the International Space Station. Inside was an amateur radio transmitter, a temperature sensor and some batteries.

The suit was a DIY satellite. It circled the Earth twice, repeating a greeting recorded in multiple languages; ham radio operators listened in as it passed overhead. Then the batteries died.

The Radio Amateur Satellite Corporation, or AMSAT, tried again in 2011. The battery in that satellite, a more traditional box design, also failed.

For the next model, AMSAT, a volunteer group, turned to the School of Engineering at Penn State Erie, The Behrend College. Three students designed a brand-new battery: a 1.8 kg cube powered by 15 supercapacitors, each roughly the size of a film canister.

The battery was built to handle 16 charge cycles in a 24-hour period. That will power the satellite in dark orbits, when the solar panels are not facing the sun.

To activate the battery before those solar panels charge, the students – David Jesberger, of St. Marys; Kathleen Nicholas, of Pittsburgh; and Jacob Sherk, of Elizabethtown – added four 9-volt Duracells.

AMSAT hopes to fit the satellite into a rocket payload and onto the International Space Station sometime in 2013. The astronauts won't have to do much with it.

"It's simple by design. They flip a switch, and they throw it out," said Dakshina Murthy Bellur, an assistant professor of electrical and computer engineering at Penn State Behrend. He supervised the battery work, which counted as the students' senior capstone project.

All three students have since graduated. All three have jobs: Nicholas and Jesberger signed on with defense contractors, and Sherk works at the Three Mile Island nuclear power plant.

They continue to track the AMSAT project. They want to know when their battery, upon which they laser-etched with their names and a Nittany Lion paw print, gets a launch date.

"That's going to be cool," Jesberger said. "We'll have our signatures in space."

Red Racer by Curtis Wright- AA3JE

I was working in rural Pennsylvania when my motorcycle was stolen. I had to take a trip into Philadelphia to pick up some test equipment, and while I was in the store, a pickup truck picked up my motorcycle. The police found it again (the license plate on the truck led them to the bike, which was in the front yard of the house), but when I went to court to press charges, I had to give my address. You guessed it, my bike was stolen from outside my house the very next day. So now I had no wheels, a paycheck of $365 every 2 weeks, and was sunk. While the insurance company decided what to do, I needed to get around. I discussed it with my parents, and they suggested I borrow the Overland.

The Overland, a luxury car in 1927, was looking a bit tired by 1967, and it had suffered the inglorious fate of having been cut down in the 1940s to make a dirt track racer. While it had a certain rakish appeal, the 50 gallon oil drum that served it as a fuel tank and the complete lack of most things we take for granted (shock absorbers, lights, brake lights, a working muffler, seat belts and anything to keep the rain out) made it an imperfect vehicle at best. Since my job did not require travelling on the highway, only private roads, it would do.
Sort-of.

The problem was the fuel system. The dirt track racers put a lot of stock in a big fuel tank, but fuel pumps as we know them did not exist in 1927. Most cars used a "vacuum tank" system. This was a method of using the manifold vacuum generated when you took your foot off the gas to suck fuel from the main tank into a small tank on the firewall, where it would drain down by gravity when you accelerated again. Evidently the boys who raced the car never took their foot off the accelerator, and they needed a better fuel system. They solved the problem by means of a bicycle pump and the 50 gallon drum, which fed the carburetor. You pumped up the tank, pressurizing it, and fuel squirted into the carburetor.

Nice system, but it meant that you had 20-30 gallons of fuel in the tank under pressure, and in the hot summer sun (it was a summer job), the pressure could get so high that gas would fountain out of the carburetor onto the hot exhaust manifold. This was easy to see from the driving position, since they had cut off the hood as un-needed excess weight (along with the aforementioned lights, brake lights, shocks, top, and rear fenders). The fear of becoming the "flaming ball of death" meant that I had to let the air out of the tank when I parked the car, and then pump it up again when I wanted to go somewhere.

I thought I could make it until my insurance check came in, and I would have, except for Martin. Martin was a friend from college who had taken a summer job with me, and he became enamored of one of the student nurses at the local hospital. He had borrowed my bike for most of the summer, but when the bike was stolen, his romantic adventures looked like they were coming to an end. He was more willing to take risks than I was, (or perhaps driven harder by youthful urges), and he asked one evening to borrow the Overland. I expressed concern about taking the car onto the highway (perhaps 5 miles) but he assured me that the "historic" license plate would be OK if he got back by dark. Full of misgivings, I said "OK" and he putted off in his dashing chariot (I would have given him the keys, but the thing had no ignition lock).

The evening shadows came, went, and the moon rose on the lovely rural countryside. No Martin. No sign of Martin. I was just about to call my parents and face the music, when he walked up to the door.

"Where's the car?" I said.

"I had a little trouble. I had a gas leak." He replied.
Since he was obviously not incinerated, my heart descended from my throat (where it had lodged) to about mid-chest and I pressed him for details.

“I parked the thing, and when I came out it was in a pool of gas about 50 feet wide. So I walked.”

He had not pulled the bung on the tank, and the pressure was enough to blow the gas out of the tank through the carburetor. We struggled with what to do. I knew where I could get a can of gas, and I really did not want to call my folks and confess my misdeed.

“Perhaps we could walk back with some gas and get the car”

:”In the dark?”

“The moon will be up soon and it’s not a heavily travelled road.”

Martin was not keen on walking another 5 miles, but agreed to come and we carried my parent’s gas can (borrowed from the garden shed without disturbing them), and found the car. It was in a huge puddle of gas soaked earth, but with both of us pushing we got it a good distance away, filled the tank, pumped it up, and jumped in. That was when the trouble began. The problem was more serious than I had thought, and the gas had come not from over-pressurization, but from a crack in the fuel line near the tank. Once I pumped the tank up, gas began to leak over the rear of the car, slowly turning it into a fuel-soaked mess.

Now the Overland’s timing had been advanced by the boys who raced it, and it tended to backfire when you slowed down, as we did when we ran through the little town of Marshaltown. Marshaltown had only one industry, the local speed trap, and there was indeed a policeman on duty who woke up when his radar detected a speeder. We all knew this, and took great care to slow down at the town limits. I took my foot off the gas, the .Overland backfired through its defective exhaust, and the rear end caught fire. Martin pounded on my arm (conversation was impossible when the engine was running) and screamed something about our being on fire. I looked back, and there was a lovely blossom of flames over the rear of the car, moving toward the fuel tank.

My worst fear was realized. I was toast (or would soon be toast). I remembered my marine safety lessons (driving school had never covered this particular problem) and decided that the only thing to do was to go faster. Thus it was that a flaming, cut-down, dirt track racer roared through Marshalltown at about 50 miles an hour, waking Patrolman Stoltzfuss. He must have been deeply asleep, however, since we almost over the hill and out of sight before we saw his red lights click on. Now I am law abiding, (actually terrified of what my mother would do if I were arrested), but I was not going to slow down till the fire went out.

So on we roared. The Overland speedometer was long broken, but it seemed like we were doing about 80. Certainly the Marshalltown patrol car (a 65 Dodge Dart) was falling behind. The old car leaped and swung like a demented thing, but the flames were diminishing and finally went out. We made it to the farm and pulled in just in time to see a string of local and State police cars roar past. Fortunately the driveway was downhill, and we go the car back by the house in silence broken only by the thudding of our hearts.

We were anxious for a few weeks, but evidently the descriptions of the car that led the police on a high speed chase were a little confused, and we never had to answer for our misdeeds. My check from the insurance company came, I bought a very respectable used sedan, and the Overland went back into an honorable retirement hauling children in the local parades. Only Martin and I know the truth about the “flaming car” incident, and I hope to keep it that way.

The Overland? The next time we took it out we discovered that somehow the old wood wheels had loosened, and all four needed to be repaired. My parents expressed their gratitude that I had not had an accident. If only they knew.

What is Cross Band Repeating

Cross band repeating is a relatively inexpensive means for extending the range of handheld radios. The purpose of a cross band repeater is the same as any radio repeater. It allows stations to communicate that ordinarily would not be able to do so because of the distance or terrain between them. In Figure 1, for example, the people with handheld radios on the left side of the hill are able to talk to net control by communicating through the cross band repeater located in the vehicle parked on top of the hill. If the cross band repeater were not present, the folks with the handhelds could not talk to net control because the hill would block their signals.

A cross band repeater is similar in function to a standard repeater in that it contains a receiver and a transmitter that are linked together, but which operate on different frequencies. Voice signals that the repeater receives on its input frequency are automatically retransmitted on its output frequency. A repeater is a relay station. A cross band repeater is implemented using a dual band 2 meter - 70 cm radio. The repeater receives signals on one amateur radio band (for example 70 cm) and retransmits those signals on a second amateur band (2 meters). Thus the name cross band repeater. A cross band repeater is far less expensive than a conventional repeater. A conventional repeater can cost several thousand dollars. It is expensive because it operates on a single frequency band, 2 meters for example. As a result, its transmit and receive frequencies are only separated by a few hundred KHz. (600 KHz. on 2 meters). This close frequency spacing requires the receive section of the repeater to have extremely narrow filters that are quite expensive. The narrow filters are needed so that the repeater can continue to receive on its input frequency (for example 147.285 MHz) while transmitting on its output frequency (147.885 MHz). If it receive section overloaded by its own transmitter, as soon as it began to transmit. Once overloading occurs, the repeater longer receive input signals and thus ceases to operate as a relay station. The cost of a repeater drops significantly if its input and output frequencies are separated by several hundred MHz instead of a few hundred KHz.. With a wide spacing between the input and output frequencies, expensive input filters are no longer required. The frequency spacing between the 2 meter (147 MHz) amateur radio band and the 70 cm (447 MHz) band is 300 MHz. With this wide spacing, the standard low cost input filters on a 70 cm radio will prevent the receive section of the radio from being overloaded by a close 2 meter transmitter and visa versa. Manufacturers of dual band 2 meter - 70 cm mobile transceivers quickly picked up on this fact and added cross band repeating functions to their radios. When in the cross band repeating mode, a signal received on 70 cm is retransmitted on 2 meters. Likewise, a signal received on 2 meters is retransmitted on 70 cm. Generally, however, a transceiver can only transmit on one frequency at a time. Thus if signals are received on both 2 meters and 70 cm, the signal heard first is the only one retransmitted. As mentioned above, a cross band repeater is an effective way to expand the range of a handheld radio. The following example illustrates this point. CVARC provided radio communications support during a recent CROP Walk sponsored by Thousand Oaks area churches. The base station for the radio net was located at Nygreen Hall on the California Lutheran University (CLU) campus, the start and finish point for the walk. Two rest stops with water for the walkers were set up along the course. A CVARC radio operator was placed at each rest stop to provide communications from the rest stop back to Nygreen Hall. In addition, two mobile radio units drove along the course looking for people who needed help and also providing the rest stops with additional supplies (water and cups) as needed. Two meter simplex radio communications was used to avoid tying up the local Thousand Oaks repeaters. A handheld radio was used at Rest Stop 1 on the corner of Moorpark and Janss roads since there was not room on this street corner to set up a portable radio station and antenna. The hills between Rest Stop 1 and Nygreen Hall, combined with the handheld's low power and inefficient antenna, made radio communications between the two locations impossible. To over come this problem, a car with a dual band radio configured for cross band repeating was

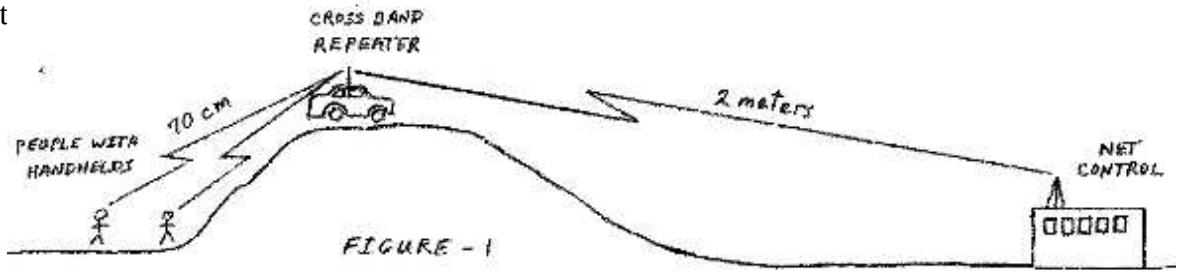


FIGURE - 1

parked across the street from Rest Stop 1 in the McDonnalds parking lot. By using the cross band repeater, Rest Stop 1 could easily communicate with Nygreen Hall, Rest Stop 2, and the two radio equipped mobile units. The handheld at Rest Stop 1 communicated with the car on 70 cm and from the car to the 2 meter simplex net via cross band repeating. In the more general case, shown in Figure 1, the vehicle containing the cross band repeater is parked on a hill to provide communications between net control and handheld units that can not reach net control because of distance, terrain, or both. One important observation is that people with handhelds can not only talk with net control via the cross band repeater, they can also communicate with each other. This capability is particularly usefully for Boy Scout troops, hikers, and search and rescue missions. People with dual band 2 meter - 70 cm handheld radios, capable of receiving on both bands simultaneously, can hear everyone on the net. Anyone anywhere on the net transmitting on 2 meters will be picked up by the cross band repeater and retransmitted on 70 cm. A person with a dual band handheld will receive the transmission on either 2 meters, or 70 cm, or both. Likewise, someone anywhere on the net transmitting on 70 cm will be picked up by the cross band repeater and retransmitted on 2 meters. A person with a dual band handheld will receive the transmission on ether 70 cm, or 2 meters, or both. People with single band 2 meter or 70 cm radios will not have quite as good coverage. Those with single band 70 cm radios can hear everyone who is transmitting on 2 meters since everything that the cross band repeater hears on 2 meters will be retransmitted on 70 cm. However, if a handheld person transmits on 70 cm, the cross band repeater will retransmit on 2 meters. Others with only 70 cm capability of course can not hear the 2 meter transmission. They will hear the 70 cm transmission only if they are in line of site with the person transmitting on 70 cm. A similar situation occurs if single band 2 meter handheld radios are used. In this case, the 2 meter handheld people can hear, via the cross band repeater, everything that is transmitted on 70 cm and those 2 meter transmissions which are in their line of sight. Obviously, the best situation is to use dual band handheld radios since people with th ese radios can hear everything that is transmitted on the net. Cross band repeating works best in simplex networks. Cross band repeating can be using on a standard repeater network, as shown in Figure 2, however, if this is done, more discipline is required by those operating on the net. The problem is that the cross band repeater will not switch into the 70 cm receive mode until after the carrier of the main 2 meter repeater has dropped. This makes the turn around times on the net (the time between the last person speaking and the next person beginning) abnormally long. If people on the main 2 meter net begin talking before the repeater carrier has dropped, the people with 70 cm handheld radios will rarely get a chance to speak. To provide for fairness on the net, anyone wishing to speak must wait until the repeater carrier has dropped before beginning to talk.

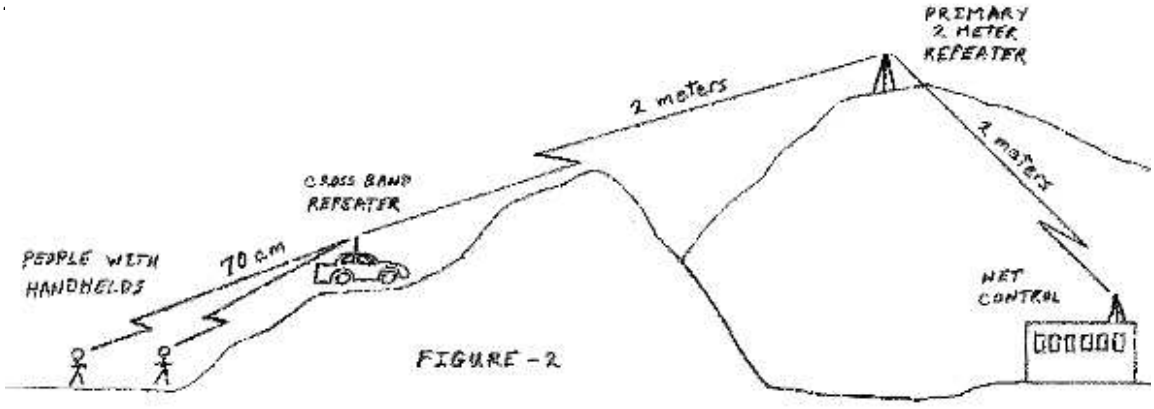


FIGURE - 2

There is a mode of cross band repeating that can allow people with dual band handhelds to avoid the long turn around delay. This mode is called (by Kenwood) locked-band repeating. This mode can be used when those with handhelds can hear the primary repeater (on 2 meters for example), but the low power and inefficient antennas of their handhelds prevent them from reaching the primary repeater directly. I experienced this situation at the Moorpark rest stop during last year’s Cruisin Conejo Bike ride. The Bozo 2 meter repeater was used for communications supporting the bike ride. I could hear the Bozo repeater on my handheld, but the transmit power of my handheld was not adequate to reach Bozo. In the locked-band mode, the cross band repeater receives only on 70 cm and transmits only on 2 meters (or visa versa). Thus anything that a handheld transmits

on 70 cm is immediately retransmitted by the locked-band repeater on 2 meters. The result is that the handheld sounds to everyone as if it were actually operating on 2 meters. There is no unusual turn around delay with locked-band repeating. However, nothing is free. The problem with this mode occurs at the handheld. As the person with the handheld speaks, he hears his voice, slightly delayed, being transmitted by the 2 meter repeater. This is very annoying. I solved this problem by using a hand mic/speaker unit plugged into my handheld. Whenever I push the mic push to talk key, the speaker is cut off so that I do not hear my voice repeated by the 2 meter repeater. This arrangement works very well. One final note. As with standard repeaters, cross band repeaters should be set up with a receive CTCSS tone on the frequency used by the handhelds. This should be done so that other stations on nearby frequencies do not inadvertently trigger the cross band repeater. This is important when the cross band repeater is working into a larger standard repeater net, particularly if it is a controlled net. Most dual band radios with cross band repeater capability support the standard CTCSS tones on the receive side of the radio as well as on transmit.

FIELD DAY 2012: WHAT COULD GO WRONG?

by Jon- K1TP

This years Field Day will go down in CAARA history as a classic. Several weeks before the actual event, Ruth-WW1N organized a group of enthusiastic hams to setup antennas and radios at the Field Day site to check out the radio's and a new antenna. After setting up a shelter and several antennas, we turned on the radio's and to our dismay we heard nothing but a S9 noise blanketing 3-30MHZ. We decided to come back last week and listen again and maybe it would be gone. Wishful thinking! What could go wrong? One week before Field Day and we can't hear anything but static and it it is too late to switch Field Day sites. We contacted Stan-W4HIX and told him of the dilemna and it was decided to call Mass Electric and plead for help. We found the culprit pole insulators with the help of the club MFJ noise detector and wrote down the problem pole numbers. We also contacted Myles Schlicte, the Gloucester Emergency Director and he called Mass Electric and told them about the emergency drill (Field Day) and was promised service as soon as possible.

We arrived at the clubhouse on Friday afternoon and loaded the new emergency trailer full of antennas, generators, coax, tower, etc. and head out to Fuller School. We arrived and I pulled out my noise detector and the dreaded noise was still there! Well, I figured we wouldn't make any contacts with all the noise but we could still setup the tents and gear, eat well, socialize, and watch a few movies.....What else could go wrong?

I should mention we spent the rest of the afternoon setting up tents, tables, chairs, running power lines, setting up the new trailer, etc in 90+ humid heat. It was not fun but this group of hams pulled together, never complained and got the job done.

About 6pm Friday night we were aware rain and thunder were on the way but had no idea of the severity of the incoming storm....what could go wrong? Well lot's can go wrong quickly if severe winds of up to 60 mph, torrential rain, and lightning strikes blast your field day site! I had just left the site and made it home for dinner and was listening on the scanner and watching the TV weather report when I started hearing all hell breaking loose at the Fuller School field day site via the repeater.

Our new $500 food tent blew down and was carried 500 yards down the field agianst the fence behind homeplate and was destroyed. Another tent blew off the field and was straddling the street entrance to Market Basket and was destroyed. The generator screen tent blew over but all the antennas survived!
During the storm our club clerk, Dean-KB1PGH heroically removed the tent from the road during the lighning storm.

The group fled to their cars and trucks and waited out the storm and by 7PM the storm had past.

The ruined tents and poles were rounded up and brought back to the emergency trailer. We had planned on watching a movie before this storm but now we had to regroup. We made up a tube frame from the wrecked tents and added it to the open end of the trailer and covered it with the white tent material. It would act as a rain/sun shelter for the rest of the field day exercise and it performed beautifully as a movie screen!

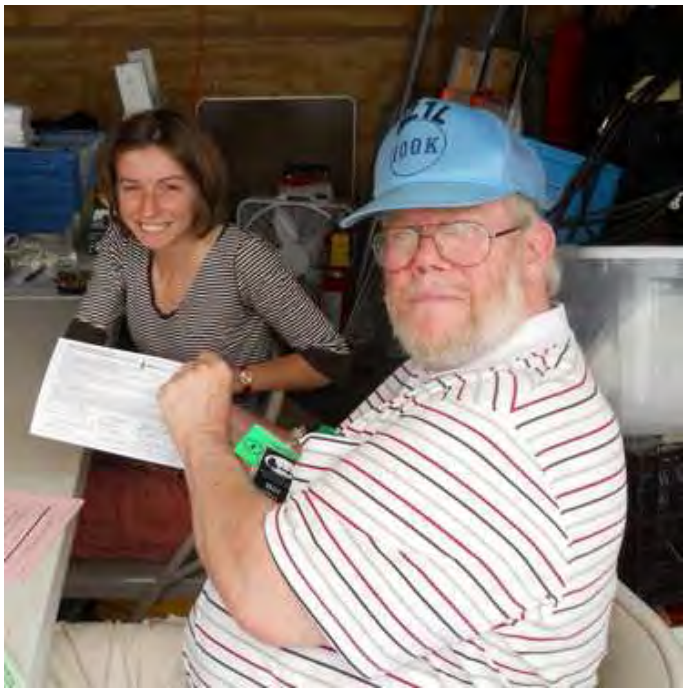
Now the good news: The S9 RF signal disappeared after the storm. We guess the strong wind and rain cleaned up the faulty insulators or was it the work of Silent Key CAARA member- Briggs-AB2NJ?

This is where the big white food tent was setup

This is where the tent landed after the violent wind burst.

The re-engineered shelter/movie theatre made from the ruined tents.

CAARA member and State Senator Bruce Tarr- N1UIU stopped by Sunday morning and presnted CAARA with the Proclamation from Governor Patrick making the last week in June Amateur Radio Week in Massachusetts.



CAARA VE Bill Poulin- WZ1L presenting Cheryl with her new General Class license at the FCC Amateur radio license test session held on Sunday morning.

Thank goodness for the ARRL Insurance program. We will have the mney to replace the tent!

CAARA had about 40 visitors overall for Field Day. There were some notable visitors this year as well. This year Gloucester Mayor Carolyn Kirk visited the site on Saturday along with Gloucester City Councilor Paul Mc Geary. We also had a visit from Gloucester Fire Deputy Miles Shlichtie and Gloucester CERT leader Carol McMahon. CAARA and amateur radio also got some media exposure as well. Rick Moore from www.moorestuffonline.com , a local webradio site, came by the field day site and made a short video interview with CAARA member Bill Poulin- WZ1L. Rick also did an audio interview with ARRL EMA Public Information Officer Dean Burgess- KB1PGH. Both of these interviews can be found on either the CAARA website at www.caara.net or Rick's website. On Sunday morning Massachusetts Senator and CAARA member Bruce Tarr- N1UIU stopped by to present the club with a proclamation from Govenor Deval Patrick making the last week in June Amateur Radio week in Massachusetts. CAARA member Bob Quinn- WV1A also stopped by and made a 30 minute video of all the happenings of field day with several interviews of other members of the club.This video should be on the club website in a view weeks. So for Public Relations we had the most successful field day in a long time.

THE CW STATION UTILIZED A 300 FOOT LONG WIRE TUNED IN WITH K1LDL'S HOMEBREW TUNER. Paul McDonough W1PLM operating...

FRIDAY NIGHT AFTER THE THUNDERSTORM, DEAN-KB1PGH TREATED HIM-SELF TO A HAMBURG BEFORE THE MOVIE ....

LOADING UP THE NEW EMCOMM TRAILER FRIDAY AFTERNOON AT THE CAARA CLUBHOUSE IN 90 DEGREE HEAT

RUTH-WW1N BANGING OUT 20 METER SSB CONTACTS IN THE CLUB EMCOMM TRAILER USING THE NEWLY ACQUIRED ICOM 7000

FIELD DAY 2012 WAS A TRUE EXERCISE OF EMERGENCY COMMUNICATIONS....

THE DOWNEY FAMILY COOKED AND SERVED GREAT FOOD ALL WEEKEND TO KEEP THE WEARY TROOPS HAPPY.

Chinese giant patents technology behind world's first solid state RF microwave oven

Chinese consumer electronics giant Midea has worked with Freescale Semiconductor to develop the world's first solid state microwave oven, using less power and giving a smaller footprint.

The solid state RF microwave oven has no magnetron or heavy transformer that has been the mainstay of microwave oven design since the first one was launched by Raytheon in 1947. Among key breakthroughs was the invention of an oscillation scheme that produces 2450 MHz using Freescale devices aimed at cell phone applications.

Moving to a solid state design allows more controllability and intelligence in the oven design and lower noise operation, as well as longer life, lower voltage operation, full DC operation capability and smaller footprint.

The design has seen seven key technology breakthroughs, each with a patent application, including four fundamental 'invention' patents. These include RF high-power synthesis technology, RF output power adjustable technology, RF microwave oven heating efficiency promotion technology, heating frequency automatic control technology, the technology of RF microwave feeding, RF power source load rigid lifting technology and RF microwave oven matching technology.

The first oven has three power levels including 150W, 300W and 600W output. Midea plans to continue research and development in order to launch higher output power microwave ovens using Freescale LDMOS solid state RF power semiconductor technology.

Established in 1968, Midea has grown from what was once a local workshop into a leading consumer appliances and air conditioning systems manufacturer with a global turnover of $22bn last year.

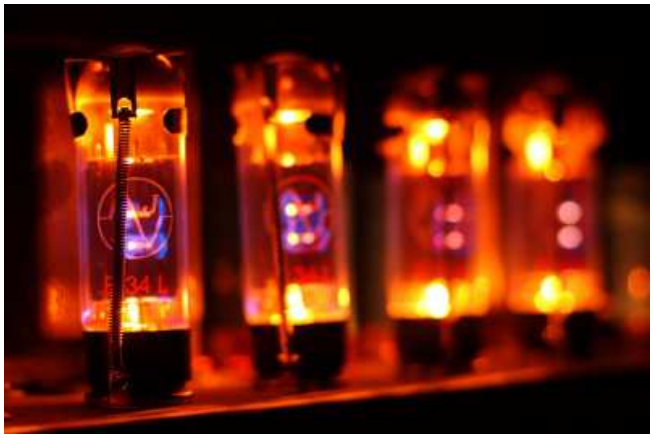
global.midea.com.cn

Return of the Vacuum Tube

Red hot again. Vacuum tubes fizzled out in the 1960s thanks to the invention of the transistor, but new research could fire-up the technology once more.Peer inside an antique radio and you'll find what look like small light bulbs. They're actually vacuum tubes—the predecessors of the silicon transistor. Vacuum tubes went the way of the dinosaurs in the 1960s, but researchers have now brought them back to life, creating a nano-sized version that's faster and hardier than the transistor. It's even able to survive the harsh radiation of outer space.

Developed early last century, vacuum tubes offered the first easy way to amplify electric signals. Like light bulbs, they are glass bulbs containing a heated filament. But above the filament are two additional electrodes: a metal grid and, at the top of the bulb, a positively charged plate. The heated filament emits a steady flow of electrons, which are attracted to the plate's positive charge. The rate of electron flow can be controlled by the charge on the intervening grid, which means a small electric signal applied to the grid—say, the tiny output of a gramophone—is reproduced in the much stronger electron flow from filament to plate. As a result, the signal is amplified and can be sent to a loudspeaker.

Vacuum tubes suffered a slow death during the 1950s and '60s thanks to the invention of the transistor—specifically, the ability to mass-produce transistors by chemically engraving, or etching, pieces of silicon.



Transistors were smaller, cheaper, and longer lasting. They could also be packed into microchips to switch on and off according to different, complex inputs, paving the way for smaller, more powerful computers.

But transistors weren't better in all respects. Electrons move more slowly in a solid than in a vacuum, which means transistors are generally slower than vacuum tubes; as a result, computing isn't as quick as it could be. What's more, semiconductors are susceptible to strong radiation, which can disrupt the atomic structure of the silicon such that the charges no longer move properly. That's a big problem for the military and NASA, which need their technology to work in radiation-harsh environments such as outer space.

"The computer you and I buy is what NASA buys, but they won't want it exactly the same way," says Meyya Meyyappan, an engineer at NASA Ames Research Center at Moffett Field in California. "It takes them a few years to radiation-proof it. Otherwise the computer you put in the space shuttle or the space station basically will get zapped and stop working."

The new device is a cross between today's transistors and the vacuum tubes of yesteryear. It's small and easily manufactured, but also fast and radiation-proof. Meyyappan, who co-developed the "nano vacuum tube," says it is created by etching a tiny cavity in phosphorous-doped silicon. The cavity is bordered by three electrodes: a source, a gate, and a drain. The source and drain are separated by just 150 nanometers, while the gate sits on top. Electrons are emitted from the source thanks to a voltage applied across it and the drain, while the gate controls the electron flow across the cavity. In their paper published online today in *Applied Physics Letters*, Meyyappan and colleagues estimate that their nano vacuum tube operates at frequencies up to 0.46 terahertz—some 10 times faster than the best silicon transistors.

The team's device isn't the first attempt at miniaturizing the vacuum tube. Contrary to previous work, however, the researchers do not need to create a "proper" vacuum: The separation of the source and drain is so small that the electrons stand very little chance of colliding with atoms in the air. This is a huge benefit, says Meyyappan, because it opens the door to mass production.

Electronics engineer Kristel Fobelets at Imperial College London agrees. "Vacuum technology within a semiconductor fabrication line would make fabrication costs very high," she says. Still, she cautions, the nano vacuum tube is more of a "proof of concept" than a working device, since its operational requirements do not

yet match modern transistors. As one example, about 10 volts is needed to switch the device on, whereas modern transistors operate at about 1 volt; in this respect, the nano vacuum tube isn't compatible with modern circuits.

Even so, the potential is great, says Meyyappan. The new vacuum tube's inherent immunity to radiation could save the military and NASA a lot of time and money, while its faster operation makes it a rare candidate for so-called terahertz technology. Sitting between the microwave and infrared regions of the electromagnetic spectrum, the terahertz region can pick out the "fingerprints" of certain molecules. The technology could therefore be used at airports to safely scan for illicit drugs, for instance.

So are vacuum tubes poised to make a comeback? Meyyappan thinks so. "We are combining the best of the vacuum," he says, "and the best of what we have learned in the past 50 years about integrated-circuit manufacture."

THATCHER ISLAND ACTIVATION IS COMING UP THIS SUMMER: STAY TUNED!

FORMER ARRL GENERAL MANAGER AND IARU PRESIDENT RICHARD, BALDWIN, W1RU - SK

It's yet another changing of the guard in amateur radio. This as we learn the sad news of the passing of former ARRL General Manager Richard Baldwin, W1RU, of Damariscotta, Maine, An ARRL Charter Life Member, Richard Baldwin capped a long career on the ARRL staff with service as General Manager from 1975 until his retirement in 1982. He served as Secretary of the International Amateur Radio Union (IARU) from 1976 to 1982. After retirement, he continued his involvement as a volunteer, serving as IARU President from 1982 to 1999 and as ARRL International Affairs Vice President from 1982 to 1986. According to his daughter Judy, Baldwin's life revolved around telecommunications. He first became licensed in 1934 as W1IKE. An Amateur Extra class licensee, he earned DXCC, WAS and WAC, as well as membership in the ARRL's A-1 Operator Club. Baldwin began his career at ARRL Headquarters in 1948 as an Assistant Secretary. After a brief hiatus to work in the private sector in the early 1950s, he returned in 1956 as Managing Editor of QST. In that position he was responsible for production of the monthly member journal and all ARRL publications. In 1963, Baldwin became Assistant General Manager and almost immediately got involved with international matters. He organized the Intruder Watch program and served as the ARRL Liaison between the amateurs who monitored the bands and the FCC. In 1975 he was named by the ARRL Board to succeed John Huntoon, W1RW, as General Manager on Huntoon's retirement, That's the position now titled Chief Executive Officer. In total, Baldwin wrote 234 articles and columns for QST. A graduate of Bates College in Maine, Baldwin earned an MS in Physics from Boston University in 1948. He spent five years in the US Navy during World War II. In March 1943, while serving as Communications Officer aboard the USS Coghlan, he participated in the longest American naval daylight firefight of the war. That being the Battle of the Komandorski Islands. After the war he served in the US Naval Reserve, achieving the rank of Commander. Richard Baldwin, W1RU, was age 92 when passed away on Thursday, June 21, after a long struggle with Parkinson's Disease. He is survived by his wife Phyllis, daughter Judy and son Glenn. A memorial service was planned for Friday, June 29 at Second Congregational Church in Newcastle, Maine. (ARRL)

CAARA 2 Meter Net every Sunday evening at 9PM on 145.130