



CAARA Newsletter



AN ARRL AFFILIATED CLUB

APRIL ISSUE- 2013



President's Desk

by Stan-W4HIX

I'm writing this from a small eco-lodge near Tulum Mexico, a couple of hours south of Cancun. Xamach Dos is a small family run place with a few cabins and a tree house, all right on the water. You travel 22 km (13 miles) on a very rugged dirt road to get here. Like most of the places around here, there is no commercial power or services (though they do pick up the trash once a week), so they have a solar power system, well water and Internet via satellite. It is pretty amazing being this far out, but having most of the conveniences of home (even hot water). No radio yet, but I'd thought I'd try my SDR USB dongle and see what I could find.

March has seen a lot of activity at the club with meetings and Sunday mornings. We continue to explore new areas like tracking airplanes with ADS-B signals with the SDR dongle. This is now serving webpages from CAARA showing the activity. While not strictly amateur radio, it does show a lot of leading edge technology that will quickly make it into your next radio. We are also trying FreeDV, a digital voice mode for HF. I have this running on the FLEX-3000, but anyone can do it with an HF rig and a sound card interface. If you do PSK, you are pretty much ready to go.

There has been a lot of discussion about improving our Internet connection at CAARA. We believe that it will increase the services to our members, like broadcasting our meetings, broadcasting the repeater traffic so folks without Echolink can listen in, moving the Echolink station to CAARA for improved audio quality and many other things as we all become more connected not just by radio, but the Internet. Although this will increase our

costs, we believe this will increase the value of being a member of CAARA and to make us more prepared to help with emergency services.

If you haven't been to the club in a while, stop by some Sunday morning—I think you'll be pleasantly surprised.

73 de Stan, W4HIX

Clerk's Corner *by Dean-KB1PGH*



We still have two more club members meetings to fill with speakers and presentations so here's another call out to all the members to please help us out and get involved by organizing a members meeting by covering a topic of discussion and/or making a presentation related to amateur radio. Even if you can find a speaker that will cover a topic of history on Cape Ann, general broadcasting or anything else you think that the members would enjoy please let me know at dburg101@aol.com. Even though its April the yearly ARRL Field Day event is coming up in the last weekend in June. As you know field day is amateur radio's biggest public relations event of the year so plan accordingly. Please mark field day on your calendar now so you won't miss all the fun and as we get closer I'll keep reminding the membership to get as many friends, family and public in general to visit our field day site up at Fuller School. Field day is the best way to get others to learn about all the aspects of the ham radio hobby. Since it is already April, CAARA will be getting ready to award a few Scholarships in June to deserving Cape Ann High School students who are pursuing higher education in communications, mathematics or electrical engineering. So please don't forget to attend the next couple of Scholarship benefit breakfast's on Sunday mornings at the clubhouse so we can keep the Scholarship fund at a level to award as much as we can. Our goal every year is \$1000.00 so we can award 4 Scholarships: 2- \$ 250.00 for in Gloucester and 1c \$

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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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.

\$250.00 each in Manchester/Essex and Rockport. While these Scholarships benefit the students they also help in the public relations aspect of promoting CAARA and amateur radio as ham radio gives back to the communities on Cape Ann. If you can't make it down to the clubhouse and still would like to help you can still donate online on the club website at www.caara.net via Paypal or your credit card. All online donations are safe and secure and go directly to the club's Paypal account. Just so everyone knows, the CAARA Scholarship fund is completely separate from the club's regular operating budget. Please remember that ALL monetary donations done online, or by check, are completely 100% tax deductible as we are a IRS Registered 501 (C) 3 non profit charitable organization. That's it for now-see you around the clubhouse!



Here's the latest regarding Thatcher Island Activation

We had our first meeting Sunday March 3rd and got a good start on our planning and a great breakfast at George's.

I wasn't sure if KR1G was joining the team or not though I thought he was. I got confirmation from him that he has been planning to go.

Starting in April we have about 4 planning meetings to be held upstairs at the club before FD and 4 staging meetings at the club after FD. We probably won't need all that time and can change the schedule as we go along.

We've made a little progress in deciding what stations we want and some of the club gear we'll take out. We'll set up SSB, CW, PSK, and 2M stations. KD1NA

and WZ1B plan to bring their own stations (for PSK & CW). It looks like we'll use the club's IC-7000 for the SSB station. Two of the antenna's will likely be the club's G5RV again and the R5. KD1NA is bringing his Windom and mini G5RV. We might bring a Buddipole for a vertical if push comes to shove or use it for the 2M station. The club's Honda generator and Larry's Yamaha generator are going out too. We plan to test and stage the lighter coax (RG-58 and the like). One of the meetings will include some of us getting acquainted with the IC7000.

We will start a couple of W1T bins at our next meeting in April. The only thing planned so far to be in those before FD is RG-58 coax. If you need anything from those bins for FD, please let me know first.

Team members confirmed now are: AJ1Z, KB1TEO, KD1NA, KR1G, N1QEH, WZ1B, and WW1N (I'm leaving Saturday and KR1G replaces me). The event is Friday August 2nd thru Monday August 5th.

All the other preparation is done: getting the W1T call, posting the event in several places, reserving the launch and Keepers house, and getting the use permit for the North Tower. I completed updating the documentation for W1T so that the club is current with how all that is done. I emailed a copy of it to KB1PGH for the club and to WZ1B.

After the event, I'll enter the hand written logs into eQSL as usual and anyone on the team who does a digital log will email that directly to W4RIG. I discussed handling of the QSL cards with W4RIG and the club will be printing those as they come in ... see W4RIG for details.

73,

Ruth WW1N

2013 Thatcher Island Activation Chair



Hams in Arizona having a little fun with high voltage.

Manuals by AA3JE- Dr. Curtis Wright

I live on a rock.

Well, not literally. I actually live in a house, no matter what my significant other may say, but the house is on a big, big, granite rock, proudly pushed out into the stormy Atlantic swells, called Cape Ann.

It matters because the VHF repeater site is on one side of the rock, and I am on the other side, and there is a whole heap of granite in the middle.

Radio waves do not penetrate rock very well.

So when I said “Yes”, we would provide community service support for some road race, I neglected to ask just where the race would be held. Naturally, it was a race where they ran around the rock. At sea level, right next to the granite cliff edges.

So I got in the Ratmobile (so named by SHE WHO MUST BE OBEYED because it is small, gray, and squeaks when it runs), and drove around the course. I could hit the repeater for about 1/3 of the first leg, then nothing.

So it was either a simplex net, or I had to use the Lanesville repeater. This machine was put up by a very loyal ham who knew darn well that the 145.13 machine was “iffy” at best on the northwest corner of the rock, and who had gone to the trouble and expense of putting a 440 machine up to cover that area. He is a great guy, and readily agreed to loan the use of the machine for the event.

So I had one repeater (2 meter) down south, and one repeater up north (440). The easy fix was to cross-band the two repeaters for the event, such that any station could hit whatever machine they could, and everyone could hear it. Easy-peasy. I even have a radio that can do this.

Well, sort of.

There is a problem. Kinda. Well, actually, yes, a problem.

This requires using the manual.

Now there are hams that love manuals. They sit at night reviewing their favorite manuals, rollicking and rejoicing in exotic features buried six levels deep in the menus that allow them to adjust nearly every



feature of their radio in a way that is unique, personal, and very, very intimate. (These are not the guys that dress their radios in provocative outfits, give them pet names and post pictures of their radios in sexy positions on the shelf on websites. That’s a different group).

Then there is me.

Oh I try. I download the manual, I print it out, I put it in a nice binder, I sit down and I try to read it.

“..... the “left” side multi-function key has as its primary function the adjustment of transmitter power, unless there has been a previous activation of the alternative functionality by pressing the “left” dial knob that triggers a functionality that enables it to switch the memory channel display to “alpha numeric format”. This can be cleared by holding the key for ½ second. Care should be taken not to hold the key for more than 2 seconds, since this invokes the third “nested” function which stores the currently active settings in memory, clearing the register for a new entry.”

OK, this button adjusts the power, except if you press some other button first, but only for a half-second, but if you press it for 2 seconds it does something else again.

Well, that’s OK, except that there are six of these little B@#\$ards on the left side and six on the right, not counting the 47 hidden menu items

Be afraid, be very afraid.

The inevitable result is that the radio gets so mucked up it no longer works. This would be fine, except that “Extra” class radio operators are supposed to be able to program their own radios, for Pete’s sake.

So it’s time for subterfuge. Clever ploys.

“Stan? Can you come up here and go over this procedure with me, more than one of us should know it.”

This is a great ploy. You never actually SAY that you know how to do it, and you never ACTUALLY have to confess that you don’t know how either. You just hand the other person the manual and wait till they find the part that applies. Usually it is in there, somewhere between the warnings that you should not suck on the antenna while transmitting and the detailed instructions for how to set up the automatic tone search function.

So, you set the left side, setting band, frequency, offset, tone. Then you set the right side, setting band, frequency, offset, tone. Then you save both, somehow triggering the “WIRES” feature that adds an annoying “beep” to your transmission, then you turn to the fatal page.

Now you follow the instructions for cross banding, and nothing happens.

There follows a highly amusing, but somewhat embarrassing episode while both of you try to figure out what EXACTLY went wrong, and how not to do it again. In the meantime, the radio sits and sulks, not actually doing anything very much.

Turn off power, turn on power, set left side, set right side, press the menu key, select item #45, press button for ½ second only, press again for ½ second only, (repeat several times).

At this point a technician class club member comes on up, listens politely to discussion of problem, and asks if we are doing something really tricky, or is it important that the radio be connected to the antenna.

We advise that failure to connect to a proper dual band antenna will result in the radio’s safety circuits to shut it down. Technician holds up end of antenna cable, suggests we attach it to the radio.....

Anyway, manuals can be a problem at times. I was able to get that kid’s number. He’s really helpful.....

The Art & Skill of Radio-Telegraphy - 5th Revised Edition

The K9YA Telegraph staff is very pleased to announce the long-anticipated fifth revised edition of *The Art and Skill of Radio-Telegraphy: A Manual For Learning, Using, Mastering And Enjoying The International Morse Code As A Means Of Communication* by William G. Pierpont, NØHFF (SK) is now available.

Since its first edition in 1992, *The Art and Skill of Radio-Telegraphy* received accolades from the amateur radio community and is recognized as the standard reference work for newcomers and veteran CW ops alike.

Two years in the making, the fifth revised edition includes hundreds of improvements to the text, an updated index, the addition of many new illustrations, a selection of historic telegraphy quotations and a new cover.

The Art and Skill of Radio-Telegraphy guides readers through all facets, technical and psychological, of first learning the International Morse code and then using time-proven techniques to improve operator speed and

accuracy.

Pierpont discusses the Koch, Candler and Farnsworth techniques for acquiring the code. He also offers an overview of many of the mechanical learning devices used through the years to achieve proficiency. Telegraph keys and their proper use are described in detail. Other chapters cover amateur licensing and military training, banana boat and other “swings,” speed contests, abbreviations, the Phillips code and Marshall Ensor’s, W9BSP, on-the-air code and theory course. To avoid pitfalls on the path to code a chapter on methods not recommended is included. For those wishing to broaden their code knowledge, one chapter is devoted to jump-start learning the American Morse (landline) code using what they already know. Published by the Robert F. Heytow Memorial Radio Club, K9YA, *The Art and Skill of Radio-Telegraphy* is sold at cost, plus shipping, through the Lulu.com Web site. From concept to completion this book has been a labor of love for all involved in its creation and in its several revisions. As its creator stated: This book is dedicated to lovers of telegraphy and to those yearning to learn to play the “music of the ether.”

To purchase the book, please visit:

<http://www.lulu.com/spotlight/K9YA>

Record-breaking cyberattack hits anti-spam group

A record-breaking cyberattack targeting an anti-spam watchdog group has sent ripples of disruption coursing across the Web, experts said Wednesday.

Spamhaus, a site responsible for keeping ads for counterfeit Viagra and bogus weight-loss pills out of the world’s inboxes, said it had been buffeted by the monster denial-of-service attack since mid-March, apparently from groups angry at being blacklisted by the Swiss-British group.

“It is a small miracle that we’re still online,”

Spamhaus researcher Vincent Hanna said.

Denial-of-service attacks overwhelm a server with traffic — like hundreds of letters being jammed through a mail slot at the same time. Security experts measure those attacks in bits of data per second.

Recent cyberattacks — like the ones that caused persistent outages at U.S. banking sites late last year — have tended to peak at 100 billion bits per second. But the furious assault on Spamhaus has shattered the charts, clocking in at 300 billion bits per second, according to San Francisco-based CloudFlare Inc., which Spamhaus has enlisted to help it weather the attack.

TOP FIVE STATION ACCESSORIES EVERY HAM SHOULD HAVE BY DON KEITH N4KC

Okay, so you have studied the manuals, answered hundreds of exam-pool questions on-line, and happily passed your licensing exam. Congratulations! You've finally gotten to the point where you can say your mouthful of a call sign without stumbling. And you have purchased your primary station transceiver, something for VHF/UHF in the car, and have a decent antenna or two. You may even be on the air already, making contacts and flinging RF all over the globe.

Now is the time to start thinking about what else you need in your shack to enhance your enjoyment and the fulfillment offered by our amazing hobby. I have some suggestions for you, based on my own opinion and experience. Others may have different ideas and I assure you they will not hesitate to express them in this worthy venue.

First thing, I am NOT going to include on this list some items others may consider to be essential. I believe each of the following are "nice things to have" but not absolutely required to have yourself some fun and fully enjoy being a ham. The other accessories I will then list in rank order are those I think should come first.

That "nice to have but not essential" list includes:

- A linear amplifier. Yes, they are wonderful to have when the going gets rough, but a good transceiver (which, when I say "good," means a decent receiver with some modicum of filtering and noise suppression) and an efficient antenna system will open up the world for you with 100 watts. Save your pennies and get you an amp someday. I operated without one for the first 47 years of my ham radio tenure and have had a blast. Now, I'm often glad I have the extra 9db of signal, but I still would not rate the amp as an essential accessory.
- A tall tower and multi-element HF beam. Again, nice to have, but not an option for many. A well-designed vertical or wire antenna system will still allow you to work the world. I did it with a G5RV and a multi-band trap vertical. And I've done it with tri-band beams and my current hexbeam. Beams are better but not essential.
- An "antenna tuner." I can make a good argument for this being a required accessory. If you have read previous articles by N4KC then you know I am an advocate of having at least one of your antennas being a long piece of wire (dipole or loop) fed with open wire feedline so you can use it on multiple bands. If you have gone that route then yes, you must have a "tuner." The auto-tuner available in most radios these days may or may not be robust enough to cover all the bands and their segments

on which you wish to dance. However, for the purpose of this article, and because not every ham will require one, we will keep the antenna matching device in the "nice to have" category. But keep in my mind it can also be a must-have gadget, depending on your antenna situation.

Now, what do I think you DO need? What do I believe should be your top five accessory purchases as you delve into the hobby? Here goes, in what I believe is the order of importance:

1. A good watt meter. And by "good," I mean it should be reasonably accurate (lab grade not required) and ideally have the ability to see both forward and reflected power. A cross-needle display is really nice so you can see forward and reflected power at the same time and get a decent idea of your antenna SWR.

Those who have seen my previous articles here on eHam and in my book RIDING THE SHORTWAVES: EXPLORING THE MAGIC OF AMATEUR RADIO know that I believe SWR is a highly over-rated commodity. Still, it is good to have an instant visual check on the integrity of your antenna system. If the SWR is suddenly 10:1, you know something is haywire with either your antenna matching device, feed line, or antenna. And as long as we are talking ideal, I would also get a watt meter that has a peak-reading function. I am sure you remember from your studies that many watt meters do not react in such a way as to allow you to see what actual peak power is for such modes as SSB. If you glance at that swinging meter movement over there, it may appear that you are only putting out 60 or 70 watts even though you are sure you set the transceiver's output power at 100 big ones. A peak-reading meter will show you more accurately what you are actually doing.

Nowadays, there are several manufacturers that make good peak-reading watt meters with either dual displays or a single cross-needle meter face. Be sure it will handle the power you intend to shoot through it and that it will work on the frequency range for which you will need it. I have seen—and purchased—several such meters, good for HF frequencies, for less than \$100 new. Add capability up to UHF and they get pricier, or you may want to just get a separate VHF/UHF meter. Be wary of used meters at flea markets as they may have been scorched beyond repair, but you can also get a good

bargain there, too.

2. A dummy load. Yes, a dummy load. Stop airwave pollution while you fiddle with that new radio or tuner. Avoid entertaining the rest of us and the shortwave-listening world while you adjust your transmit audio processing for hours on end with that oft-heard yodel, “H – e – l – l – l – o – o – o – o, radio – o – o – o!”

Again, be sure the dummy load you buy can handle the amount of power you intend to send coursing through its oily innards. Read the manual to be sure you know what the tolerable on-and-off cycle should be so you don't fry its resistors or send its oil bubbling over like a witch's cauldron.

3. A volt/ohm meter. Look, I know not everyone gets into ham radio to learn all there is to know about electronics. There is nothing wrong with that, and many other aspects of the hobby besides the technical part attract folks to its ranks. However, a decent volt/ohm meter can serve a number of purposes in your shack.

I confess I usually go for the cheapest model Radio Shack has on its shelves (using those nice Shack gift cards my kids give me for Father's Day) or something I pick up at hamfests. As with the watt meter, you are not looking for something NASA might use. If you do yearn to learn more and construction and kit-building are in your wheelhouse, invest in something heftier and more fully featured. However, ninety percent of my VOM usage is checking continuity on coaxial cables and jumpers or making sure my 13.8 volt power supply—the one without benefit of a voltmeter on its plain-Jane face—is somewhere in the general vicinity of 13.8 volts. That and checking the veracity of refugees from that pile of discarded AA batteries. For this reason, I usually prefer an analog meter as opposed to a digital readout. Take your pick. Or have one of each.

4. An antenna switch. Even if you are new to the hobby and only have one antenna out back or stretched across the attic, trust me, you will soon have more. I suspect mine are mating back there and having babies. I put up a G5RV and a 2-meter/70 CM j-pole, and before I knew it, wires crossed my backyard with such regularity that birds can no longer safely fly through the maze.

My rig has two antenna outputs. I have five HF antennas. Simple solution: a 4-position coax switch (my big horizontal loop goes to a second output on my auto-tuner). Read the reviews here on eHam on the

various switches available. Most are perfectly okay for amateur use. Expect to pay up to \$100 for a solid, manually-switched device and well above that if you opt for something you remote outside and switch electronically. Either way, you prevent carpal tunnel from constantly screwing connectors on and off. Using such a switch also neatens up the shack considerably.

5. A computer. I almost left this one off since it is so obvious anymore. But I still talk with hams who have the computer upstairs and the rig downstairs. When I became active again in 2005, I had my shack in my son's old room and my office/computer in the old family room next door, both in the basement part of the house. I somehow did not realize how firmly the 'puter had become entrenched in the day-to-day operation of a ham shack.

It did not take me long to move the shack into the office with the transceiver right next to the desktop computer. And I also keep my laptop on the desk, too, so I can interface easily with the radio for firmware updates, memory programming, and the like. I use it to program my two HTs and the mobile HF/VHF/UHF radio, too. The main computer is hooked up to the main rig through a SignalLink USB external sound card for digital modes. And I usually keep DX Summit and QRZ.com open in the browser on one or the other machine for quick reference. I love looking up the guy with whom I am ragchewing to see what he has on his QRZ page, enabling me to launch into conversation about some of the relevant things I might find there. Of course, other logical uses of the computer in the shack include rig control and logging. I came from an era in which we had to keep a paper log. You cannot imagine the hassle when a QSL card floated in from the bureau and I had to try to find the logbook in which that particular QSO was logged. Or when I figured I had worked up to another DXCC plateau and tried to track down the various countries to include by riffling through multiple spiral-bound logbooks. I am still a casual user of computer rig control. Old-timer that I am, I still kind of enjoy twisting knobs. But it is there when I want to use it. And many now prefer it. Note that a whiz-bang game-worthy computer is not necessary for most amateur radio use. An Internet connection—and a reasonably fast one—is almost a necessity, though.

I suppose if you wanted to pick nits, you could say logging, digital mode, and rig-control software, and the digital interface between computer and rig are additional “accessories,” and I have actually named

nine here. Maybe so, but I think you get the point. And as previously noted, I bet many of you can think of numerous ideas you might suggest in addition to or instead of the ones I have ranked above. If so, I hope you will list them here with justification for why they are recommended.

After all, the best “accessories” of all are probably an Elmer’s heart and an open mind.

(N4KC maintains two web sites” his personal/professional site at www.donkeith.com and his site dedicated to amateur radio at www.n4kc.com. He also blogs on the subject of rapid technological change and its effect on media, society and amateur radio. That blog is at <http://n4kc.blogspot.com>)



Here We Grow Again: The 440 repeater that was at Ralph’s QTH in Magnolia has found a permanent home at the cell site on top of our new 2 meter repeater. The frequency of the repeater is 443.700 and up 5MHZ with no pl tone and is running barefoot at about 15 watts. It does not have the coverage that the 145.130 machine has but has decent coverage around Cape Ann.

Please note that after we installed the 440 machine and

tested it’s coverage we noticed the id and tone features to remote control the unit did not work. Ross-W1RAB volunteered to take the repeater to Kendecom in Groveland for an estimate to fix it. It should be back shortly.

NEWS UPDATE: 3/27/13

The 440 repeater repair was over \$300 dollars but we believe it was the best option at this time. Additionally the 2 meter repeater is back utilizing both rx and tx antennas at the cell site due to some swr problems we encountered trying to go to a one antenna system. We now need to find a spot to put the 440 repeater. We are thinking about several locations at this point so the 440 machine will probably be located at the clubhouse for a while while we do some thinking! The repeater range will be very limited so have patience! Special thanks to Dick-KR1G for the repair of the two meter amplifier with new finals. Dick also fabricated new jumpers for the 2 Meter repeater duplexers.

Voice of America cuts shortwave broadcasts

Voice of America is reducing some of its radio transmissions this weekend and ending shortwave broadcasts to regions where audiences have alternative ways of receiving VOA news and information programs

The transmission reductions allow VOA to comply with budget cuts required by sequestration and to avoid furloughs of staff members.

When the new broadcast schedule goes into effect on March 31st, cross-border shortwave and

medium wave broadcasts to Albania, Georgia, Iran and Latin America will be curtailed, along with English language broadcasts to the Middle East and Afghanistan.



The new broadcast schedule calls for reductions in some shortwave and medium wave radio broadcasts in Cantonese, Dari/Pashto, English to Africa, Khmer, Kurdish, Mandarin, Portuguese, Urdu and Vietnamese.

Read the full announcement at

<http://www.insidevoa.com/content/voa-reducing-radio-frequencies/1629194.html>

WHAT'S HAPPENING AT THE CLUB? LOT'S.....



The CAARA March member's meeting was held in the wide open spaces of the second floor.

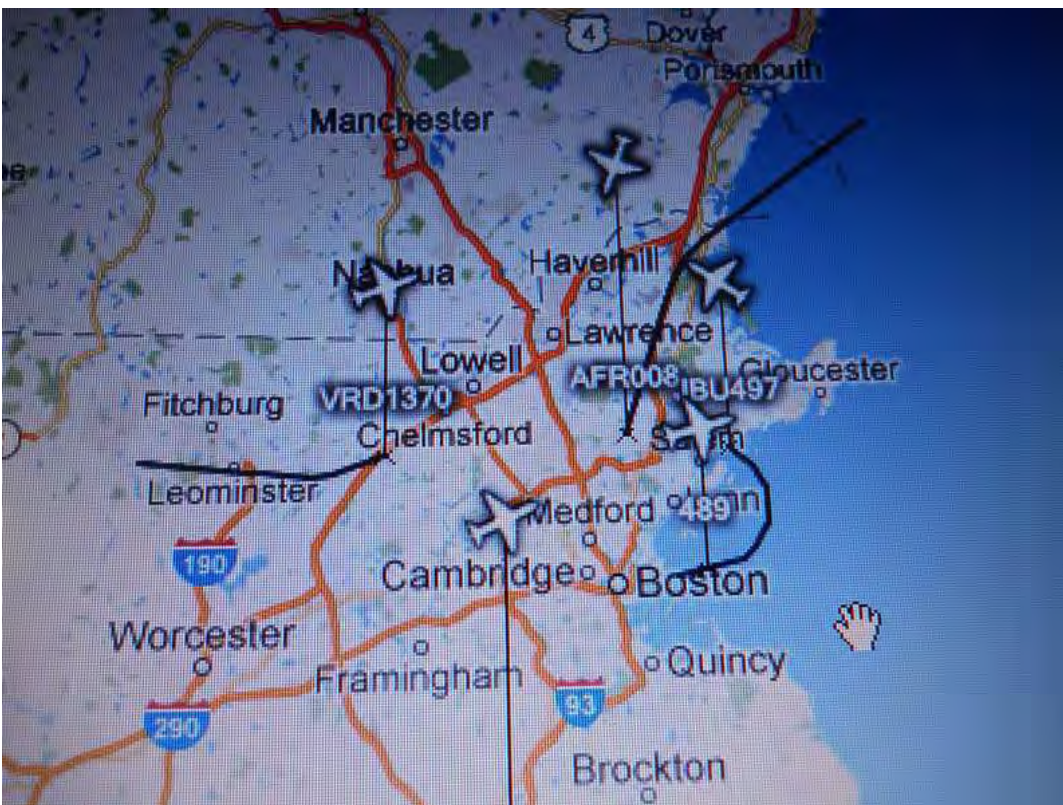
The second floor place is great for smaller groups wishing for a quieter area to congregate for their meeting/activities.

“

“There goes Stan again!”

One topic at the March member's meeting was a discussion of how Stan-W4HIX figured out a way to track the trajectory and flight paths of passenger planes departing and approaching Logan Airport.

Stan used one of the club's laptops and a cheap SDR USB dongle, he talked about last month, and the club's discone antenna. Photo on the left.



World Amateur Radio Day 2013

This year's theme for **World Amateur Radio Day**, April 18, is *'Amateur Radio: Entering Its Second Century of Disaster Communications'*

The International Amateur Radio Union (IARU) E-letter reports:

Each year the IARU Administrative Council selects a theme for World Amateur Radio Day (WARD) for the following year. WARD takes place each year on April 18. At the November, 2012 Administrative Council meeting the AC adopted the following proposal: "The theme 'Amateur Radio: Entering Its Second Century of Disaster Communications' was adopted for the next World Amateur Radio Day, April 18, 2013."

The selected theme for 2013 is an excellent opportunity for amateur radio emergency communications or disaster communications groups to take advantage of the WARD to highlight the role amateur radio plays in disaster communications and disaster response. IARU member-societies could arrange amateur radio demonstrations in public places such as parks or shopping areas. Prepared handouts could explain the benefits of amateur radio in times of emergency or disaster. A ham radio demonstration in public areas usually generates inquiries and questions from the public about amateur radio and it also provides a great opportunity to attract new ham radio operators. If you plan on such a demonstration, don't forget to include some young people from your society so that young people who happen by the demonstration can see that amateur radio activity can be enjoyed by people of all ages.

In 2013, April 18 is a weekday. However, that doesn't prevent the public activity from taking place on the weekend before or after April 18. The idea is to gain as much exposure and publicity for amateur radio as possible.

Emergency communications groups might also combine a public demonstration for WARD with a simulated emergency test (SET).

WARD also provides an opportunity for amateurs to give presentations about ham radio to such groups as civic organizations, charitable groups, etc. For

example, Rotary Clubs and Lions Clubs are only two of many worldwide organizations who have weekly meetings and these organizations are always looking for interesting and informative programs to present to their membership. There are very few experienced hams who can't talk for 15 or 20 minutes about ham radio in a positive fashion. Don't make the talk too technical. Stress the fun aspects of ham radio and the opportunity to assist in times of disaster. Keep the presentation to about 20 minutes to allow time for questions.

The fact that World Amateur Radio Day only happens one day each year shouldn't prevent IARU member-societies from promoting ham radio all during the year of course. Some member-society officials have expressed concern about a decrease in the number of new amateurs entering ham radio in their country. Upon further examination and discussion, it turns out there are many activities that societies could be involved in to increase public exposure to amateur radio but many are not taking advantage of those opportunities. WARD provides an opportunity to get out and make the effort to show the public what ham radio is about.

FCC SEIZES UNLICENSED FM BROADCAST STATION IN BROCKTON MA

Federal authorities have shut down and seized equipment reportedly used by an unlicensed radio station in Brockton, Massachusetts. A station that is alleged to have interfered with air traffic communications in the Boston area.

The equipment was confiscated by the US Marshals Service, which executed a warrant March 1st. According to an affidavit filed in January by FCC Engineer Emmanuel Domkam, officials began investigating the unlicensed station operating on 91.7 FM in Brockton, in February 2010. However the station's transmitter moved three times before it ended up on at the location the seizure occurred.

Domkan wrote that each time the move occurred after the FCC has issued and posted a written warning at the transmitter location.

The interference was likely from spurs generated by the station's transmitter. The FCC said the investigation became a top priority because this kind of interference could be dangerous to air to ground communications and public safety.

CAARA CONGRATULATES DEAN-PGH AND XYL ON FIRST BORN CLIFFORD.....WITH A VHF PACIFIER!



**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.
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 Northeast's 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.

New Buddipole Accessory-Knurled whip sleeves by Dean-KB1PGH

The Buddipole Antenna Company has made a new accessory for their line of antennas. This accessory is called a “Knurled whip sleeve”. In this report I will show you how the sleeve is installed, what it does and why they are making them. In the first photo you can see the three parts of a Buddipole antenna—the Versatee which the telescoping antenna whips attach to, the knurled whip sleeve and the large size telescopic whip. In the second photo you can see a real close up look of the knurled whip sleeve which is made up out of aircraft grade aluminum and has a gripping knobby design on it.



In this photo you can see the base of the long telescoping whip. As you can see the base of the whip has a double set of crimps to strengthen it at the base of the Versatee because when extended the whip is almost 10 ft long when fully extended in either a horizontal or vertical deployment!

In this photo you can now see that the knurled whip sleeve has now been screwed onto the base of the whip and the two crimps are now covered.



In this last photo you can now see how the two knurled whip sleeves look on the long telescopic whips now attached to the Buddipole Versatee which goes on the mast. These knurled whip sleeves were made to further strengthen the base section, even though I have never heard of a long telescopic whip bending at the base because of its own weight. The Buddipole website says that they are making these to prevent the whip antennas

from coming loose at the base of the versatee during windy and horizontal deployments. This is true because after using my Buddipole in the 20 meter dipole configuration the whips did start to come a little loose after a while. One other reason they are making these is that if you are using the Buddipole outside in the cold with gloves on it is a pain to tighten and loosen the whips. When I installed these sleeves I noticed that it was much easier to tighten and loosen the whips from the versatee, especially due to the knobby design. It feels like the whips are now "Locked" in place to the versatee. This will also help due to the fact that some Buddipole owners have overtightened the whips thus causing them to clamp into place and damaging the inside of the versatee. In the end I would recommend these knurled whip sleeves to every Buddipole owner. These whips also fit the smaller sized whips as well. These sleeves are built well and are only \$6.50 a piece. You may purchase these at the Buddipole website at www.buddipole.com.





Congratulations to Ron Richards WB1EAZ, earned his 5 Words Per Minute Award, Bob Edwards, AB1LT was presented with his 13 Words Per Minute Award. Not shown, congratulations to Ruth Hodsdon, WW1N earned her 12 WPM award and Larry Beaulieu, AJ1Z earned his 20 WPM Advanced CW Operator award.

GOOD OPERATING PRACTICES AND PROCEDURES FOR THE HAM BANDS

Presented by Tim, AJ4D

As I fade from the VHF/UHF bands back to HF, I hope I can share some of the things that really might help other operators become better operators.

I am not the best in the world. I make mistakes on HF that most new hams would not make.

Even on VHF, I sometimes “get in a big way of talking” and forget to ID on time.

But, below are some of the things that might help everyone out somewhere down the line, QSL ? (just had to throw that in there to show how stupid it looked).

I really believe that the reason a lot of the new hams don’t operate as much as they could is that they *simply cannot figure out what the heck is being said!!* It makes them afraid to talk.

The other thing is that some operators on repeaters have their own little “group” and that little group is the only one they will respond to or talk to. I hear so many new callsigns being correctly “ thrown out’ on repeater frequencies and no one goes back. I try to jump in and talk to them if no one goes back to them by the second try.

It makes them feel left out, looked down upon , and more like giving up on the HOBBY than anything else when they hear people talk for 30 minutes and then when they get the courage to key up, no one comes back!

What happened to being courteous!

I truly believe that is the reason there is not that much traffic on repeaters now. Why should 2,000 operators in East Tennessee keep trying over and over for days to get someone to talk to them or sit there and listen to a bunch of garbage that they have never heard of?

Remember guys and gals.....you’re the “Elmers” and teachers of the newer hams!

Get on there and tell the new ham,

” Good to hear you, just get on here and if you talk on it like a telephone in plain english and ID every 10 minutes with the repeater ID timer, and sign off by saying your ID , you will learn a lot from the people on here and will be made to feel welcome”.

The last paragraph above in bold text sums up how to talk on a repeater in one sentence.

Another one heard on most repeaters “ Man, what did you do, you are loud on me , looks like you are putting a 9 ‘ on me!”

NO.... Both stations through the repeater are hearing the repeater, not each other directly. **THERE IS NO WAY TO TELL A STATION WHAT THEY ARE “PUTTING ON A REPEATER”** as far as signal strength.

They may be able to tell the other station that “white noise”, (static), is heard on their signal or that they are “picket fencing”, (clipping in and out) , **but without being at the repeater receiver with an S-meter hooked to the repeater receiver you cannot tell what signal strength the repeater is receiving.**

Listening.... Monitoring.... or calling “ CQ” CQ **-.-. — .-**

Again, **when using CW**, “CQ” is a lot shorter than “calling any station”.

ON FM, SIMPLY KEY UP AND SAY YOUR CALLSIGN OR ASK IS ANYONE ON THIS REPEATER. Make sure you don’t “double”, (talk at the same time), in any circumstances or band!!

HF SSB:

SSB = sideband, LSB/USB

LSB = lower sideband (used on 40m through 160m.)

USB= upper sideband (used on 20m,17m, 15m, 12m, 10m and also on 6m, 2m, and 440 band.)

When making a call, be sure to listen for a few minutes, which is a good rule to use on any frequency or band! Just because you cannot hear anyone for a minute on HF does not mean that someone else is not listening to a reply from a distant station that they can hear and you cannot. This happens all the time. Someone will tell a friend to move to “ so and so frequency” and they go there and just start talking.... well, Ol’ Jim in kentucky may be sitting there listening to Ol’ John in California giving a parts list out for an amplifier and Ol’ Jim may be using a directional antenna pointed west while your antenna is going north and south. You can’t hear John and and Jim is listening to John. If you say your call, Jim should politely tell you “standby’. Chances are he will either remember your call or jot it down so he can return your call when he gets the chance.

On FM repeaters though, listen,..... then just “drop in your callsign” Chances are no one will

come back , but dont give up. Maybe all the “QSL’ers” will someday learn to send CW and learn they had been using the wrong operating procedures and come back and talk to you like a normal person on the repeater.

Last but not least

ZED is NOT listed as a phonetic for the letter “Z”.

ZULU is the correct phonetic.

This may not matter much to some on FM , but in an **emergency** on simplex or any HF voice mode, **PHONETICS ARE IMPORTANT AND THEY WERE CREATED SO THAT ALL STATIONS WOULD HAVE A STANDARD TO GO BY WHEN PASSING TRAFFIC IN BAD CONDITIONS.**

Zed’ may be picked out the noise incorrectly as “head” and a broken leg may be transmitted as a “head” injury due to the station misinterpreting ZED’ Give us a break people! QSL?????? .

.....We copied Tim! Thanks!.....N4UJW

Tim AJ4D

US Postal Service Introduces Global Forever Stamp

In addition to an **increase** in postal rates in January 2013, the US Postal Service introduced a new **Global Forever First-Class Mail International stamp**. Priced at \$1.10 each and offered in a pane of 20, the *new* stamp offers a single price for any First-Class Mail International 1-ounce letter to any country in the world, as well as 2-ounce letters to Canada. The stamp is available **online**, at post offices in the US or by calling 1-800-782-6724. — *Thanks to ARRL Oklahoma Section Manager Kevin O’Dell, NOIRW, for the information*



You can get your

FCC Technician Amateur Radio License

in One Day with

TECH-IN-A-DAY

***Note: Morse code is no longer needed
for any amateur radio license.***

How?

If you can spare one Saturday, chances are very good you can get your FCC amateur radio Technician license. Don't worry if you're not technically inclined, this method depends much more on short-term memory than technical knowledge or background. By spending six hours studying the questions and answers from the FCC exam question pool, you'll remember enough to pass the exam given at the end of the class. The test is 35 multiple-choice questions and you need 26 correct to pass. This method has worked with teenagers to senior citizens.

Why?

With a Technician license, you can use VHF and UHF amateur radio bands, meaning when the phones go dead and your cell phone doesn't get reception, you will be able to get a message out with a simple hand-held radio. For emergency workers, adding Amateur Radio capability adds to your communications abilities. And, it is great fun with interesting people to meet.

Help!

So after I get my license, what next? The Cape Ann Amateur Radio Association is ready and willing to teach you the practical matters on getting "on the air". We can answer your questions on how to operate, what radio to buy, etc. We get together every Sunday morning for coffee and donuts—come join us sometime. We also have members' meetings once a month with interesting presentations.

Schedule

Date: **Saturday, April 27th, 2013**

Time: 8:30 AM to 5:00 PM (includes exam)

Place: Lanesville Community Center

8 Vulcan St

Gloucester (Lanesville), MA

Contact

Stan Stone, W4HIX

978 283-2015 e-mail: techinaday@caara.net

You must pre-register for this course.

Cost & Requirements

Fee: \$5 (includes materials & snacks)

Test Cost: \$15 (required by FCC)

Bring photo ID & Social Security Number

Local ham radio operator KB1TRG a graduate of CAARA 's Tech-in-a-Day class has published a thriller based in the metropolitan Boston area, including Gloucester.

Bill Conors, a successful businessman, is driven by memories of fistfights, meatless casseroles, unpaid utility bills, and a proud mother who smelled of tobacco and cheap perfume. He's no superhero, just a guy who gets the job done on time and on budget. He owns an environmental engineering company with a reputation for transforming hazardous waste sites into valuable real estate. He bets everything on turning the Chelsea waterfront into Boston's next financial district and in the process attracts the attention of "a colorful cast of good guys and bad boys."* The sludge, the leaking drums and the contaminated buildings are the least of his problems. The project is barely underway when bad stuff happens and Conors is on the run trying to keep ahead of both the Mob and the FBI. His street smarts and technical savvy eventually overcome the seemingly insurmountable obstacles preventing his return. His journey takes him from the streets of Boston, Cambridge, Chelsea and Gloucester to Cleveland and an island off the coast of Maine. It's a trip that challenges and changes Bill Conors as it "skillfully weaves all the components of a fast-paced, hold-your-breath work of crime fiction into a novel that has it all" — "culminating in a surprising and complex confrontation."*

Besides Conors and his family, others caught up in the chaos include: an addicted ex-cop; a scheming Brahmin; a young FBI agent, who's more successful in her career than her private life; mobsters who effortlessly shuttle between drug dealers and corporate boardrooms; and a broken DEA agent who abandons his double life. These characters linger after the last page and contribute to "A crafty, clever page-turner to the very end."*

* *Kirkus Reviews* (Indie)



Old Wives' Tales In Amateur Radio

Chapter I: "An Antenna Tuner Does Absolutely Nothing Except Make The Transmitter Happy."

by Cecil Moore, www.W5DXP.com

Introduction

Judging from the number of Old Wives' Tales that abound in amateur radio, there must be more old wives in amateur radio than can be found in The Call Book. The author hears this one at least twice a week on some ham radio newsgroup. This article is an attempt to debunk that myth using the most simple of examples hopefully that everyone can understand. This will be the first in a series of "Old Wives' Tales" articles that will be compiled into chapters on the author's web page.

Let's not quibble over whether a transmitter is capable of human-like feelings or not. What is meant by "making the transmitter happy" is the concept that an antenna tuner presents a resistive load of 50 ohms to a transmitter designed to drive a 50 ohm load, usually of the solid-state variety. The author concedes the idea that an antenna tuner "makes the transmitter happy". The question remains: Is "making the transmitter happy" all that an antenna tuner does or does the antenna tuner also have an effect at the antenna, i.e. does that 50 ohm Z0-match that "makes the transmitter happy" also have a system-wide effect that makes the entire system, including the antenna, happy? If a transmitter can be happy, why can't an antenna be happy?

We are going to look at some simple examples. The source will be a voltage source, (V_s), with an associated source impedance of the complex form ($R_s \pm jX_s$). Any transmission line will be one wavelength long and lossless (1WL T-Line). The load will represent an antenna feedpoint impedance of the complex form ($R_L \pm jX_L$). We will represent such systems using one-line diagrams of the form:
 $(V_s) - (R_s \pm jX_s) - \text{—————} - (R_L \pm jX_L)$

The Maximum Power Transfer Theorem

The maximum power transfer theorem was first used with DC circuits. Given a source and a load, the
(continued on page 22)

DX from the Winnepesaukee River by Jim W1PID

Today I hiked along the Winnepesaukee River. I worked Sweden, Slovenia and Russia. What a great hike! ukee River. The river flows from Lake Winnepesaukee in Laconia to the Merrimack River in Franklin. The trail passes through some beautiful farm land.

After about a mile I turned north toward the river. A piece of land juts out into the river. I setup on a large rock with a fantastic view. I'm using an HB-1B on 20 meters with a half-wave wire.

I'm looking toward the east... that seems to be where the signals are coming from too. My first contact is with Steve SM4OTI in Sweden. He gives me a 599 and sends "HI" when I tell him I am running 4 watts. He's running a KW to a 4 element beam. "UR doing FB WID 4W," he sends. Of course, he is very strong to me. I've worked Steve nearly a dozen times over the years.

I move up the band a bit and answer S57KW. Jure in Slovenia doesn't get my call sign on the first try, but he gives me a 559 report. "UR 4W QRP doing good job," he sends.

Finally, I work Vlad RU6AV near Moscow. He gives me a 579. When I tell him I am running 4W / P, he asks about my antenna. I tell him it's a 10 meter wire. "FB CONDX HI... UR 4W FB Jim." Then he tells me he is running 200 watts to a 3 element yagi. I have been operating for only 10 minutes. It's exhilarating! A beautiful spring day... glorious river scenery and some nice DX for icing on the cake.

My view to the west is perfect. Hopefully we're seeing the last of the snow. I'll hike more often now that the days are getting warmer.



100th anniversary of Amateur Radio's entry into disaster service

“SOS Hilltop Business Men's Association wants city to sendboats... Supplies will last until about tomorrow.... Men are hanging on trees.... Send supplies.... Water is receding....Try and get us water and gas.... People are suffering.... Send this to Mayor Karb at once.... SOS.”

It was with these words sent by a 15 year-old teenager 100 years ago that Amateur Radio entered into Disaster Service.

Herbert V. Akerberg was a student at West High School in the Hilltop neighborhood of Columbus, Ohio when he anxiously tapped out that Morse code message on the afternoon of March 26, 1913.

A slow moving storm had dumped 11 inches of rain over much of Ohio's already saturated soil.

In Zanesville the Muskingum River was cresting at 27 feet and 20 feet of water stood in her intersections. Five of the town's seven bridges were washed away. Only the tips of the lamp posts of the famous “Y” bridge could be seen.

In Defiance, Ohio the Maumee River rushed in 10 feet above flood stage and covered 268 homes. Row boats plucked people from trees and rooftops everywhere.

In Tiffin help came too late for several. Nineteen people waiting on their roofs for help, perished when their homes collapsed and they were swept away by the Sandusky River

On the west side of Columbus, where young Herb Akerberg was manning his station, the Scioto River crashed through the downtown dumping flood waters 17 feet deep into his neighborhood. Thirteen people were rescued from the branches of a single tree.

“For about three days and nights, practically continuously for seventy-two hours, young Akerberg remained on duty at his radio set, in communication with the radio station on top of the Huntington Bank Building, sending messages to the mayor and keeping the public advised as to the conditions on the devastated West Side. Many messages were sent to the friends and relatives of those in the devastated district.”

C. B. Galbreath-Author “The History of Ohio”

The greatest destruction was in the areas around Dayton, where the rushing waters of the Great Miami River washed away homes and bridges claiming hundreds of lives.

In Dayton 360 souls were lost, 3,400 domesticated animals and horses perished, 65,000 people were displaced and 20,000 homes were destroyed. Damage, in today's dollars, exceeded \$2 Billion.

The flow of the Great Miami River through Dayton during that Easter week storm in 1913 was equivalent to the same amount of water that spills over Niagara Falls in a month!

In nearby Hamilton four-fifths of the town was covered and 400 people lost their lives.

“People talked about how fast the waters rose, sometimes one or two feet per hour, and there wasn't any way of sending warnings downstream because of the downed wires. There was no radio then except for a few ham radio operators, and the 1913 Flood is what triggered the legislation to create an emergency broadcast system.”

...Trudy E. Bell-Author “The Great Dayton Flood of 1913”

Back in Columbus, Herbert Akerman, pounding brass from his home shack is joined by the station from Ohio State University. Unlike Akerman, the OSU students are not proficient in Morse Code.

To the North of Ohio, B.N. Burglund at the University of Michigan station was unaware of the flooding in Ohio until he intercepted a call from a operator in Freemont, Ohio who reported that the town was under water and that the Captain of the Port Townsend Life Saving Station had drowned while attempting a rescue. The operator reported that all telegraph and telephone lines were down.

This call was followed by one from D. A. Nichols in Wapakmeta, Ohio that his town was also cut off from the world.

Burglund put out a General Call to any station located in the flooded areas. This call was responded to by operators in Mansfield, Springfield, and Mt. Vernon, as well as the OSU station in Columbus.

Burglund, assisted by engineering students George Norris, Worth Chatfield, and Mr. Watts (who had once been a commercial operator) began handling Health and Welfare traffic from the devastated area.

The Ohio State University station was now being manned by a capable operator, J. A. Mercer who pounded the key for more than 70 hours before he collapsed from exhaustion and was temporarily relieved by operators from

the U.S. Army Signal Corps.

Young Mr. Akerberg, the first Ham ever to use Amateur Radio in a disaster would go on to honorably serve with the men of the Army Signal Corp during World War I.

In 1923 he directed the building of Radio Station WPAL in Columbus. Six years later he joined the start-up network CBS, where he built much of their network of radio and television stations.

Herbert Akerberg passed away in Scottsdale, Arizona on November 6, 1964.

“Wireless has shown itself up so beautifully during this great crisis, that a bill is pending in the State Legislature of Ohio providing for a large central station or stations and each city to have a permanent local station, so in case of need all cities so isolated are in communication with the different central stations. By all means let this bill pass. This is a step in the right direction and it is a good example for other States to follow.”

“Wireless in the hands of the amateur, while it is used by some as a plaything, is capable of doing excellent service in time of need; and we hope the work done by these men who did all they could to maintain communication between the flood stricken cities and the rest of the world, will long be remembered.”

B.N. Burglund –Modern Electrics, April 1913

Written by

John Bigley-N7UR

President-Frontier Amateur Radio Society
Las Vegas, NV

Retirement home installs ‘ham shack’ for short-wave operator

Tom Morgan of Marshalltown may be the envy of every short-wave radio operator in Iowa.

Morgan, 81, a short-wave or “ham” radio enthusiast much of his life, has use of three operating stations with a 500- watt amplifier in a comfortable ham shack at the Embers Retirement Community.

And that is not all.

Tom Morgan of Marshalltown’s Embers Retirement Community is shown adjusting a short-wave or “ham” radio in the facility’s



“ham shack” Monday. Morgan, a veteran ham radio user, was explaining the technical capability of the equipment. Embers recently built the room and installed equipment for users like Morgan.

On the roof is a new antenna, which Morgan said can be pointed optimally for contact.

“It is highly directional; if you want to speak to someone in Europe, you would point it to the east, northeast,” Morgan said. “If you wanted to speak to someone in the south, you point it in a southerly direction.”

Morgan, Vicki Bogner, Embers director and staff, have been celebrating the opening of the ham shack recently. Ham shack is slang for a place where short-wave radio operators hang out.

Morgan and Bogner were quick to explain the ham shack and equipment were all made possible by Brad Lee, of Phoenix.

Lee is an avid short-wave radio operator and CEO of Trilogry-Embers, the company that owns Embers and a number of other retirement centers in the United States.

“Brad picked up interest in short-wave from his father,” Bogner said. “He started installing ham shacks in his Phoenix properties for residents when he learned some who had been ham operators in their homes had given up the hobby after moving in to one of his properties.”

Morgan, a Clemson, S.C. native knew he wanted to become an electrical engineer at age 12, he said.

That created an interest in electronics, which led to a fulfilling, professional career.

He discovered short-wave shortly thereafter.

A neighbor had a ham radio system, and, seeing him use it created an interest that hasn't waned despite the passage of time.

Beginning in the 1950s, Morgan embarked on building his own short-wave radios.

"Back in the day, you could go to a radio parts store and scrounge from television sets and pick up parts and build them," he said. "But nowadays, you can buy a self-contained receiver and transmitter, which operates on all modes. You look inside, and it appears to resemble the insides of a computer ... with microchips and printed circuits. One couldn't begin to build a newer piece of equipment. I think you could buy something like this for approximately \$1,500."

With the ham shack open for business, Morgan is extremely eager to share his hobby with fellow residents and others.

However, an operator must get a license.

Regardless, he and other short-wave aficionados in the area are willing to help interested parties earn one.

A club which meets at RACOM of Marshalltown, helped Morgan prepare for his licensing renewal and will also proctor exams.

"I really appreciated the opportunity to take that exam at RACOM versus having to drive to Des Moines or elsewhere," Morgan said.

The conversation returned to the newly outfitted ham shack and equipment.

"Embers spared no horses in getting the ham shack up and running," Morgan said.

"This, (ham shack) is all part of our efforts to engage residents in a variety of activities," Bogner said. "We've installed putting greens and a movie theater over the years, among other amenities. We know our residents like to be active."

(Antenna Tuner Old Wives' Tales from page 18)

theorem says that: ***Maximum power transfer will occur if the source resistance is equal to the load resistance.*** This is probably the origin of the myth that, for maximum power transfer to occur, an antenna must present a purely resistive, e.g. 50 ohm impedance, i.e. must be resonant.

When AC circuit theory was developed, it was apparent that the resulting reactive impedances would require the DC maximum power transfer theorem to be updated. That's when the conjugate matching theorem came into existence. Given an AC circuit: ***Maximum power transfer will occur if the source impedance is equal to the conjugate of the load impedance.*** Note that the conjugate of $100+j100$ ohms is $100-j100$ ohms and the conjugate of $50-j200$ ohms is $50+j200$ ohms. Both the above theorems apply to lumped-circuits.

When networks that are an appreciable percentage of a wavelength were introduced, it again became apparent that the maximum power transfer theorem needed to be updated since a transmission line with reflections is capable of transforming the complex load impedance to an infinite number of other complex impedances and also to some purely resistive impedances. Let's take a look at how the maximum power transfer theorem can be updated to handle distributed

networks. We can do that by looking at one characteristic of the maximum power transfer theorem for an AC circuit represented by the one-line diagram introduced above with point 'x' added.

$(V_s) - (R_s \pm jX_s) - x - (R_L \pm jX_L)$

The voltage source, (V_s) , just by itself is defined as having a zero impedance. So if we measure the impedance looking back from point 'x' toward the source, we will measure the source impedance, $(R_s \pm jX_s)$. If we measure the load impedance looking toward the load from point 'x', we will measure the load impedance, $(R_L \pm jX_L)$. So another way of stating the maximum power transfer theorem for an AC circuit is: ***From a point between the source and the load, if the impedance looking back toward the source is equal to the conjugate of the impedance looking toward the load, then maximum transfer of power will occur.*** That is also the definition of a "conjugate match".

When the maximum power transfer theorem is applied to a lumped-circuit, it is assumed that the only losses in the circuit are losses in the source resistance and the load resistance. If we adopt that same assumption for distributed networks, we can now take the liberty to state the maximum power transfer theorem for a

typical amateur radio antenna system (assuming lossless transmission lines.)

$(V_s) - (R_s \pm jX_s) - \text{Transmission-Line} - (R_L \pm jX_L)$

A maximum transfer of power will occur in an antenna system when, at any point on the lossless transmission line, the impedance looking back toward the source is equal to the conjugate of the impedance looking toward the load.

Once again, the above statement can be considered as a necessary and sufficient condition to define a conjugate match.

Numbered Step-By-Step Examples

For the remainder of this article, we will assume that $V_s=100\text{v}$, $R_s=50$ ohms, and $X_s=0$ ohms, i.e. a standard voltage source and $R_L=50$ ohms. Also remember that all transmission lines are lossless.

(1)Source(100v)—(50 ohms)————1WL T-Line—
————(50 ohms)Load

So here we have a matched system with 50 watts delivered to the load which is the maximum transfer of power. What happens to the power delivered to the load if we mismatch the system by adding -j500 ohms of capacitive reactance to the load?

(2)Source(100v)—(50 ohms)————1WL T-Line—
————(50-j500 ohms)Load

Only 1.92 watts are delivered to the load for example (2). The current through the load resistor is 0.196a and the voltage across the load resistor is 9.8 volts. What can we do to change those conditions at the load? How about adding a loading coil with a reactance of +j500 ohms?

(3)Source(100v)—(50 ohms)————1WL T-Line—
————(+j500 ohms)—(50-j500 ohms)Load

So the loading coil reactance of +j500 ohms neutralizes the load reactance of -j500 ohms and, once again, as in (1) above the maximum power of 50 watts is delivered to the load.

Question: Did the addition of a loading coil have an effect at the load (antenna)?

What if, instead of at the load, we install the loading coil at the source?

(4)Source(100v)—(50 ohms)—(+j500 ohms)————
—1WL T-Line————(50-j500 ohms)Load

Question: Does the loading coil installed at the source cause the same effects at the load (antenna) as it did

when it was located at the load (antenna), i.e. do the same conditions exist at the load in example (4) as in example (3)?

What if we put the “loading coil” in a box at the source and call it an “antenna tuner”?

Question: Does an antenna tuner have considerable effect at the antenna or does it “do absolutely nothing except make the transmitter happy”?

It seems to the author that since the “antenna tuner” has the same effect on the load whether it is located at the load or at the source, an Old Wives’ Tale has bit the dust. It stands to reason that if an antenna tuner causes the antenna to radiate more RF power then it is obviously having considerable effect at the antenna from whence that RF power is being radiated. In fact, the list of things that are changed at the antenna by the antenna tuner is just about as long as the list of things that are not changed.

Note that, no matter where the loading coil is located above, it has the same effect of establishing a system-wide conjugate match thus ensuring maximum power transfer. If we measure the impedance looking back down the transmission line from the load, we will measure the conjugate of the feedpoint impedance in both examples (3) and (4) above. The effect on the antenna (load) is the same whether the loading coil is located at the antenna or at the source (shack).

One can see for oneself the effect that an antenna tuner has at the antenna. Install a dummy load on the tuner input and at the antenna feedpoint, disconnect the feedline and connect it an antenna analyzer. Have someone twist the knobs on the tuner and observe the impedance change at the antenna. Then who can truthfully say that an antenna tuner has no effect at the antenna?

For the sake of simplicity, transmission line losses, which make the calculations much more complex, have not been taken into account. Failure to include losses does not negate the concepts presented in this article. Note that the conjugate matching theorem applies only to lossless networks and just comes close for low-loss networks.

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