



CAARA Newsletter



CAPE ANN AMATEUR RADIO ASSOCIATION

APRIL 2014

President's Desk by Stan-W4HIX



March 2014

I'm feeling a great vibrancy around the club these days. There are a lot of things going on.

We're still working on the details of a remote station. We've also added a Winlink 2000 configuration. The club can now send e-mail directly on HF. It isn't fast, but it does get through. We may consider adding the server capability so that we can receive messages—especially from sailors, but this will require some consideration due to the dedicated nature of the station. If you are interested in Winlink, let me know and I will give you a demo.

I attended a Boston Marathon Medical Symposium this month. This was mostly for the medical volunteers on what to expect this year and the ham radio operators were invited. It was pretty interesting learning the other side of the equation. The Boston Athletic Association had to turn away between 600 and 800 medical volunteers this year, even though they needed more for the additional 7,000 runners. The amateur radio side is largely the same with the addition of commercial radios for ambulance calls that will go directly to MEMA for dispatch. I'm looking forward to it—this will be my fifth year. Pray for good running weather!

I'm signed up for the NH ARES Academy—I'll report on that next month. And don't forget, April 19th is Tech in a Day, so if you know anyone who is interested in getting their license, have them drop me a line at techinaday@caara.net.

I hope lots of folks will sign up for the communications support we provide for the events around Cape Ann. This list keeps

growing, and the folks who organize and participate are grateful for our help.

73 de Stan, W4HIX
stan@w4hix.com

Information Desk by Dean-KB1PGH



Well the "CQ" Magazine drama continues to unfold. I never did receive my January or February Issues from them so I e-mailed customer service. I got an e-mail back stating that they are STILL having printing issues and I will not receive any print issues of the January and February editions until mid march, then I will receive the March edition sometime after that. What they did send me in the e-mail though were the Digital editions of the January and February Issues and that my subscription was going to be extended another two months because of the delays.

They stated in one of their issues that the reorganizing of their magazine was to "Economic Conditions" and that "CQ" was pretty much subsidizing Popular Communications. So the woes continue for "CQ" magazine. It's too bad to get a product two months late with outdated information when you already prepaid for it. The digital editions were ok to read, but I still like having the tactile feel of a magazine in my hands. If they get their act together I will probably just get their digital edition of "CQ PLUS" which contains Popular Communications.

Not trying to be Debbie Downer here but the woes also continue for "Radio Shack". As you may have already heard they are going to close 1100 stores out of the 5000 they have left due to really disappointing holiday sales.

Any ham who has gone into Radio Shack within the past 5 years knows that the store is a mere shadow of its former self selling mostly



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.

All material published in the CAARA Newsletter may be reproduced for noncommercial use provided such use credits both the CAARA and the author of the article. Copyrighted material will not be accepted without accompanying written permission to publish.

The opinions expressed in the CAARA Newsletter are solely those of the editor or other contributors and do not necessarily reflect the opinions of either the Board of Directors or membership of CAARA.

Jon Cunningham- K1TP Editor
Dean Burgess- KB1PGH Reporter

Board of Directors- 2013-14

President: Stan Stone W4HIX
Vice Pres: Jake Hurd K1LDL
Treasurer: Hank McCarl W4RIG
Clerk: Roger Smith- KB1YTJ and Assistant. Jon-K1TP

Directors:

Ross Burton- W1RAB
Paul Anderson KA1GIJ
Pete Chadbourne -K1LJO
Bill Poulin WZ1L
Larry Beaulieu AJ1Z
Dick Ober, K1VRA
John Graves WA1JG

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.

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

Information Desk by Dean-KB1PGH



cellphones. Gone are the days of shortwave radios, scanners, cb's and any accessory that goes with them. Not to mention stereos and the Tandy product line. So it's only a matter of time now that Radio Shack goes the way of Circuit City. No word if the closings affect the Gloucester or Beverly stores.

This month I would like to cover the "Elephant in the Room" topic of what do you do with all of your ham equipment when you go "SK"? Of course we never like to think about our passing but that's also leads us to never planning what happens if we do. I'm the same way but now since I have a 1 year old prospective future ham I have to think about getting a will made up and other things like that. So what would happen if you got run over by a steam roller tomorrow? What would happen to all of your ham radio gear? Would your wife, husband or family member know what the heck to do with it all? So let's take a look at some options. First you should really make a detailed list of all your gear and list the general resale price of it. Now really think of all of your hard earned money that has been invested in all your radios, amps, towers, antennas, etc? You want to make sure that your family does not get ripped off not knowing the real price of a piece of gear if they try to sell it on Ebay. Now the other option is do you want to will your equipment to a fellow ham friend? Someone you know that could really get some use out of your gear.

There is also the option of willing your gear to your local ham radio club as a legacy. This has been done several times at CAARA. Many past CAARA members have willed their gear to the club and the club has used their gear as a fundraising source to keep the club going and we have also used the gear in the clubhouse to transmit on. Technically you don't even have to legally "Will" your gear to your local club, just make sure that your loved one know what your wishes are to do with all your ham gear. This helps families as well as families of former "SK"s have contacted CAARA and club members have gone to their houses and organized and packed up the gear and brought it to the clubhouse. So this is just something to think about, if something happened to me tomorrow my wife would have no clue what to do with all my gear and how much its worth.

So if you are interested in Public Safety Scanning and don't have a scanner check out www.Broadcastify.com which has a bunch of online live scanner feeds. I think the only scanner company around now is the "Uniden" Bearcat series. Radio Shack no longer makes their own brand and the GRE Brand is discontinued. The "Uniden" Corporation just came out with a brand new line of high end scanners so not all is lost. One last thing, don't forget to spread the word about the next "Tech in a day" course which will be held on Saturday April 19th at the Lanesville Community Center. It's a great opportunity for those you know who want to get the Technician Class License. Who knows it may stop snowing by then. 73

Dean Burgess KB1PGH
A.R.R.L EMA Public Information Officer.

Editor Roundup by Jon-K1TP



I have been soaking up sun and reading a lot of books here in Venice, FL. I have not done much with ham radio, I have not even taken the Icom 7000 out of the car trunk. I have used the remote station in NH courtesy of my friend KB1WGU. It consists of a Kenwood 2000 with a dipole and a beam antenna. It has great coverage on all bands from 10-160 with autotune. Stan has been working on our Flex Radio and I have used the receiver remotely to listen, it is not ready for transmit yet. It still is not the same as having a nice radio right on your bench with knobs and buttons to play with, guess I am an old timer.

You might have noticed that I have been playing with the "look" of the newsletter by adding color, justified type, two and three columns, etc. I use the software package called Pagemaker 7.0 which I used to teach to high school kids in my past life. It is great for producing business cards, brochures, newsletters, magazines, and books. If any interest, I could spend some time at the club showing how it works. The software costs over \$600 and is rich with features.

I am still looking for help with the newsletter. I would like to groom someone for the future so the newsletter does not collapse when I decide it is time to move on. I spend hours each month to put this together and need articles and photos. Special thanks in to Dean, Curtis, Stan, and others who feed me stories each month.

WHAT'S GOING ON AT THE CAARA EMCOM CENTER?



Ron Beckley NIRJB photo's



Top Photo: W1LDL-Jake explaining the process of restoring the Viking transmitter to Dean- KB1PGH, donated by the SK Ralph Karcher-W1RK

Jake got it running for the AM contest which CARA participated in later in the month at the Club.

Bottom photo: Ross-W1RAB chatting with Jake on the first floor.

World Radiosport Team Championship 2014

July 8-14, 2014

Welcome to the home of WRTC2014!

The World Radiosport Team Championship (WRTC) is held every four years and consists of approximately 50 two-person teams of amateur radio operators competing in a test of operating skill. Unlike most on-the-air competitions, all stations are required to use identical antennas from the same geographic region, eliminating all variables except operating ability.

WRTC2014 will include 59 competing teams from 29 qualifying regions around the world. This will be the largest and most competitive WRTC ever!

WRTC2014 is looking for volunteers

The World Radiosport Team Championship (WRTC) will be held in Massachusetts July 12-13, 2014. Like the Boston Marathon, this event draws the “best of the best” from around the world. Fifty-nine two-operator teams will be set up with Field-Day-style stations on 16 properties around the Route 495 corridor, from Pepperell in the north to Plymouth and Taunton in the south.

The international teams will compete to see which team can make the most contacts with the most countries and take home the gold medal. This Olympic-style world championship will be widely covered in the local, regional, and national media and provide excellent publicity for amateur radio.

The WRTC2014 organizers need volunteers to help with this once-in-a-lifetime event. The biggest need at the moment is for people to help set up and keep an eye on the stations and provide local transportation for the teams between the headquarters hotel in Westborough and the sites.

MMRA has a long history of successful support of events like this, and WRTC2014 can use your help. Please visit www.wrtc2014.org/volunteer to sign up and tell us how you would like to help in making this exciting event a success.

Learn more about WRTC2014 at www.wrtc2014.org.

73,

Doug Grant, K1DG

Please send replies to: DougK1DG@gmail.com



Rats! by Curtis-AA3JE

It's time to let out a little known secret. There is a secret society at work in Rockport. It is dangerous, furtive, moves under cover of darkness, and only the fact the members can't vote has kept it from sweeping the ballot.

It's the rats. Warf rats, wood rats, field rats, warehouse rats, house rats, Norway rats, Black rats, and some rats I do not even recognize. (Others I never want to meet.)

They have been giving woodchucks, chipmunks and squirrels a bad name. Last year I had just nursed my poor straggling native corn (that was the year that I learned that "organic" means "don't grow worth a darn") to maturity, but the night before harvest, a strange group of animals moved in and cleaned it all out. At the time I wondered if they were deer, or perhaps rabbits, so I went to the barbershop and got a lot of hair clippings and scattered them around the garden. To my surprise, the hair was all picked up by the nocturnal marauders, who then moved on to clean out the beans, nibble holes in the pumpkins, and generally ruin the entire crop.

I blamed the chipmunks, or perhaps the rabbits, but was puzzled, as my sainted mother, known for fierce protectiveness of her crops and livestock, had always said rabbits hate human hair. My puzzlement continued till I had an attack of insomnia one night, (gets more common as you age), and I heard something on the patio. I sneaked over to the window, flipped on the light, and watched as one of the biggest wharf rats I had ever seen bolted from the porch.

The next morning, my wife disbelieved me.

"THE WHARF RATS LIVE UP BY COVE, OR DOWN BY THE WHARF. NO WHARF RATS LIVE HERE."

Now my wife is a native of Rockport. Well, actually, of Pigeon Cove, which seems to have always considered itself a distinct community. But it has a harbor, and a wharf, and presumably rats as well. So I said I had no idea really what it was, but it was big, gray, and didn't have any fur on it's tail.

"NOT A PROBLEM, DAISY WILL TAKE CARE OF IT."

Daisy, for those who have not had the pleasure, is some kind of terrier, exactly what kind only DNA testing would reveal, but has barked and snapped her way to fame as a m i g h t y h u n t e r .

Walking Daisy is a sore psychological trial, as she "walks" in three foot increments, then sniffs industriously for five minutes, reveling in the scents and sounds of the wild (or as wild as South End Rockport gets, which is pretty wild in the summer, but that's a different kind of story). Anyway, she spends every walk giving every indication that if just let loose to do her thing, she would return with both ears and a tail from every rodent in town. So I ended up, as usual, at the hardware store.

"And what do you need today?"

"I seem to have rats in the garden. Oh, and on the porch."

These turned out to be the magic words. It seems that the local ACE hardware has anti-rodent devices of every imaginable kind, size, shape and method. There are "live traps" that leave you to figure out what to do with a very large and angry rodent, several kinds of neck breaking traps, some mysterious traps which have bait and some kind of adhesive goo inside, and lots and lots of poison. Since my dogs appear to consider anything that looks like birdseed as a gourmet treat, I went with several kinds of trap.

In short order I had several rats with fatal cervical injuries, and a "live trap" with a half pound gray rat who was NOT in a good mood. I was filling a trash can with water, when SHE WHO MUST BE OBEYED intervened.

"WHAT ARE YOU DOING?"

"Filling a water barrel. Trap and rat go into water, wait five minutes, dump rat in trash, reset trap. Easy."

"UNDER NO CIRCUMSTANCES! THAT IS A LIVE CREATURE. I WON'T HAVE IT."

"Well, what am I supposed to do?"

"TAKE IT OUT IN THE WOODS AND LET IT GO, POOR THING."

"OK"

Being suspicious by nature, I tagged the little vermin with orange paint before I let him go, and discovered



that rats are pretty good at finding their way home. It took a few days, but he was back on the porch by the end of the week.

I took him further way, but found I was just running "VERMIN DAY TOURS", since he always came back. Finally, I ended up putting DAISY (the terrier) on the job. Turns out that she is really good at tracking rats, but has not the least idea what to do when she finds one. The last time I tried this, the rats jumped off her head like Mycenaean bull riders.

So there you have it. I hope to borrow the son's cat, and have high hopes. I'll keep you posted. The hair? Seems it makes nice nest linings. The females were grateful.

FCC ISSUES PROPOSED \$25000 FINE FOR PART 15 VIOLATIONS

The FCC has issued a Notice of Apparent Liability in the amount of \$25,000 to Internet Service Provider Winchester Wireless of Winchester, Virginia. This for its alleged operation of intentional radiators not in accordance with Part 15 of the Rules and doing so without a license. Amateur Radio Newslines's Stephan Kinford, N8WB, has the details: -- Part 15 devices are license free but must be operated at what amounts to micro power so as to cause minimum interference to other Part 15 units sharing the same spectrum. So it was that on May 10, 2011, in response to a complaint, an agent from the Enforcement Bureau's Columbia Maryland Office inspected a transmitting device operated by Winchester Wireless on the roof of an area residence. During the inspection, the agent determined that a legal Motorola

Canopy System was connected to two external RF Linx 900 MHz amplifiers that in turn were individually fed into two separate antennas. When the agent later interviewed Winchester Wireless owner David Williamson at the company's main office, Williamson admitted to using the amplifiers. The agent subsequently reviewed the FCC rules for the Motorola Canopy System, which indicated that it is not certified for use with external amplification. On August 11, 2011, the Columbia Office issued a Notice of Unlicensed Operation to Winchester Wireless regarding its unauthorized use of the external amplifiers at the inspected location. On August 29th the company responded to the Notice. At that time it reported that the amplifiers had been removed but did not provide any information regarding Winchester Wireless's operations at other locations. Jump ahead almost two years. On May 29, 2013, in response to additional complaints, an agent from the Columbia Office inspected two transmitter sites operated by Winchester Wireless. At both locations, the agent observed signals emanating in the 902 to 928 MHz band. The agent observed the same Motorola Canopy System and RF Linx equipment that he had seen during the 2011 inspection. On July 29, 2013, the Columbia Office issued a Notice of Unlicensed Operation to Winchester Wireless regarding its continued unauthorized use of external amplifiers. On July 31, 2013, Winchester Wireless responded to the Notice indicating that it would inspect the two transmitter sites for compliance with the Part 15 Rules. Now in issuing the proposed fine, the FCC says that Winchester Wireless had the same type of violation less than two years earlier and that the 2011 Notice expressly warned that

the equipment certification for the Motorola Canopy System did not authorize the use of such external amplifiers. With the second violation the FCC says that Winchester Wireless's actions demonstrate a deliberate disregard for the Commission's requirements and as such a forfeiture of \$25,000 is warranted. For the Amateur Radio Newslines, I'm Stephan Kinford, N8WB, reporting. -- In addition to the proposed fine the FCC directed Winchester Wireless was ordered to submit a statement signed under penalty of perjury stating that it is currently operating its Wireless Internet Service in compliance with FCC rules and applicable authorizations. The company was given 30 days from the March 11th release of the Notice to respond to this demand (FCC)

FCC INVITES PUBLIC COMMENT ON 10-10.5 GHZ PETITION

Back here in the United States, the FCC has invited public comment on a Petition for Rule Making titled RM-11715. This is a proposal that would make a significant portion of the 10.0 to 10.5 GHz band available for wireless broadband services while to some extent protect amateur radio terrestrial and space operations from interference. According to the ARRL the petition by Mimosa Networks Inc. proposes a band plan for the spectrum from 10.0 to 10.5 GHz that the petitioner says would protect frequencies most often used by radio amateurs. The proposal would specify 10.350 to 10.370 GHz as an "Amateur Calling Band," and 10.450 to 10.500 GHz for Amateur-Satellite operations. channels and a small guard band.

FCC NEWS

Federal officials concerned with increased demand on radio spectrum are cracking down on amateur radio license holders that don't use their transmitting privileges. The announcement was made yesterday by the Federal Communications Commission. "If you're a ham radio operator and you don't actually operate a ham radio, we will ask you to return your license," said FCC special agent Augusto V. Landingham. The surprise move by the commission is in response to growing demand for radio waves. "The 'Load It Up, Or Give It Up' program will ensure that only those who are truly interested in generating radio signals get to do so. Plus, we have to make room for the growing number of people obtaining amateur licenses, which is skyrocketing because it's so easy to memorize the answers to the exam questions," said Landingham.

Federal officials are still determining how they will enforce the program. Amateur radio operators are encouraged to email the FCC with suggestions.

Gene Tingleman, a ham radio operator from Petaluma, Calif., agreed with the principle behind the new regulation. "If you don't know code or you're shy around the mic or don't even know where the push-to-talk button is on the radio, then maybe it's time you let someone else do the transmitting." There is one additional option, according to officials. Radio operators who don't actually transmit with a radio for more than six months may opt to exchange their license for a "listening certificate." This type of license will allow the user to listen to transmissions made by others.

They boast that the certificate is available by sending an SASE and will be "printed on premium paper; suitable for framing."

AM RALLY AT THE CLUB



Jake W1LDL works K1KBW out of Connecticut and KB3KRJ out of Delaware on 3872 MHz amplitude modulation during the AM Rally at the CAARA HQ on Saturday night March 15th. Jake is using his Collins 75A-4 Receiver with a Johnson Viking Ranger 1 Transmitter. For the antenna all Jake was using was a 30 ft piece of wire hanging off the roof of the clubhouse to a stake in the ground with a 50 ft radial going around one corner of the clubhouse tied into a Drake MN 7 antenna tuner. The tuner actually tuned the antenna to a 1 to 1.5 match. Jake got decent reception reports as well. It's pretty amazing that only a 30 ft piece of wire got out on 75 meters! The purpose of this event is to encourage the use of Amplitude Modulation on the Amateur Radio Bands, and to highlight various types of AM equipment in use today. This event is open to any and all radio amateurs who are running full carrier amplitude modulation (standard AM), and any type of equipment may be used. *courtesy kb1pgh*

Commonly used AM Frequencies: 160 Meters: 1880-1885, 1930, 1945, 1975-1995. 80 Meters: 3730-3740, 3870-3885. 40 Meters: 7160, 7280-7295. 20 Meters: 14286. 15 Meters: 21425 10 Meters: 29000-29200.

These commonly used frequencies can be good starting points. As activity grows, expand to other frequencies to prevent congestion and excessively large round tables. As always, **PLEASE** be considerate of existing QSOs and Nets, and ensure that the frequency is clear before calling "CQ, the A.M. Transmitter Rally".

QST COLLECTION

"It's the collection of a lifetime," says Mel Sallute. He solemnly glances at the room in his eastern Tartan Blackridge home dedicated to the orderly storage of QST Magazines. It seems like thousands of them, though he assures it's "not quite 2,000."

Sallute was born in Taran Blackridge in 1932 and became interested in amateur radio at a young age. "My Dad was a radio operator and shared the passion of the hobby with me. I was a General Class by my 17th birthday in 1949," he says. He joined the American Radio Relay League in the same year and began to receive their QST Magazine monthly.

"708 of the QSTs are mine from my personal subscription. I also have a few hundred from my uncle, also a ham for many years, and a dozen or so from my Dad. I also bought a large collection off another ham at a hamfest in 1973 for some reason. Mostly duplicates," Sallute said.

"Dad was famous as the 'Great Steady Carrier of the East' because he sorta became an SK and yet not at the same time... he passed away and his head fell on his straight key, sending a carrier for three weeks before they found him," he said.

Focusing back on the magazines, Sallute continued, "I guess I felt they would be a great resource, but I never read one after filing them away at the end of the month. I kept an orderly

collection, assuming they'd have some value someday. In 1988, I started to get worried the weight of the magazines would put my house's foundation at risk so I decided to sell them. I had my nephew bring his pickup truck over and we loaded boxes upon boxes into the back and took them down to the Waltville Hamfest. My initial asking price of \$7,500 for the collection was mostly getting sneers and laughs, so I dropped the price to free and still no takers. One ham did grab an issue and rip out pages to wrap some 3-500z tubes he'd bought and needed to transport home."

"I thought the turning point would



be when my great-granddaughter got her ham ticket last year. I figured her eyes would light up when I showed her my QST collection that could be hers, but it just wasn't so. She said, 'Grandpa, I can get all those on the ARRL website now in digital form!'" "I dang near cried," he said.

"At that point, I realized neither I nor anyone would ever read one of these again!"

At press time, Sallute was planning a large backyard bonfire fueled by QST Magazines, but he did have his great-granddaughter post an ad on QRZ.com for \$7500, just in case.

HRD SOFTWARE ACQUIRES RIGHTS TO SAM CALLBOOK HRD

Software has announced that it has acquired the rights to the SAM Callbook CD. HRD says that it will honor the current subscriber base and continue to send out the monthly CD's starting in March. HRD says that it will also be developing a Windows interface for the Callbook. Windows 32, 64 bit and Windows RT versions are planned, as well as incorporating the Callbook data into HRD Logbook. This will provide immediate downloads for United States and Canadian calls from the internet inside of HRD Logbook. More information about the SAM Callbook CD will be on the HRD Website in late March. HRD Software has also announced the release of Ham Radio Deluxe 6.2 Preview/Beta 2 This includes many fixes for issues the user-base has found. The list of the fixes and enhancements for Beta 2. is on the HRD website at www.ham-radio-deluxe.com. (HRD Software)

INTRUDER WATCH: UKRANE STATION SZRU ACTIVE ON 20 METERS

The IARU Monitoring System newsletter reports the Ukraine foreign Intelligence Service SZRU has been active every Wednesday on 14.280 MHz at 1010 UTC running full carrier AM. Reports say that a female voice spelled numbers and encrypted messages. The exact location is believed to be near Rivne. The newsletter also says that REA4 which is a call used by the Russian Airforce in Moscow was still active on 7 dot 018 MHz with Frequency Shift Keying at 100 Baud and a 1000 Hz shift. (IARU R1 Newsletter)

HOW TO SOUND LIKE A LID

Step One: Use as many “Q” signals as possible. Yes, I know they were invented solely for CW and are totally inappropriate for two meter FM, but they are fun and entertaining. They keep people guessing as to what you really meant. I.E. “I’m going to QSY to the phone.” Can you really change frequencies to the phone? QSL used to mean, “I am acknowledging receipt”, but now it appears to mean, “yes” or “OK”. I guess I missed it when the ARRL changed the meaning. It is also best to use “OK” and “QSL” together. Redundancy is the better part of Lid-dom.

Step Two: Never laugh when you can say “HI HI”. No one will ever know you aren’t a long time CW rag-chewer if you don’t tell them. They’ll think you’ve been on since the days of Marconi.

Step Three: Utilize an alternative vocabulary. Use words like “destinated” and “negatory”. It’s OK to make up your own words here. I.E. “Yeah Tom, I “pheelbart zaphonix” occasionally myself.”

Step Four: Always say “XX4XXX” (Insert your own call) “for I. D.” As mentioned in Step One, anything that creates redundancy is always encouraged. That’s why we have the Department of Redundancy Department. (Please note that you can follow your call with “for identification purposes” instead of “for I. D.” While taking longer to say, it is worth more “LID points”.

Step Five: The better the copy on two meter FM, the more you should use phonetics. Names should be

especially used if they are short or common ones. I.E. “My name is Al... Alpha Lima” or “Jack.. Juliet Alpha Charlie Kilo.” If at all possible use the less common HF phonetics “A4SM... America, Number Four, Sugar Mexico.” And for maximum “LID points”, make up unintelligible phonetics. “My name is Bob... Billibong Oregano Bumperpool.”

Step Six: Always give the calls of yourself and everyone who is (or has been) in the group, whether they are still there or not. While this has been unnecessary for years, it is still a great memory test. You may also use “and the group” if you are an “old timer” or just have a bad memory. Extra points for saying everyone’s call and then clearing in a silly way “K2PKK, Chow, Chow.”

Step Seven: Whenever possible, use the wrong terminology. It keeps people guessing. Use “modulation” when you mean “deviation”, and vice-versa.

Step Eight: If someone asks for a break, always finish your turn, taking as long as possible before turning it over. Whenever possible, pass it around a few times first. This will discourage the breaker, and if it is an emergency, encourage him to switch to another repeater and not bother you.

Step Nine: Always ask involved questions of the person who is trying to sign out. Never let him get by with just a “yes” or “no” answer. Make it a question that will take him a long time to answer.

Step Ten: The less you know on a subject, the more you should speculate about it in the roundtable. Also the amount of time you spend on the subject should be inversely

proportionate to your knowledge of the subject even though you have no damn clue.

Step Eleven: Always make sure you try to communicate with only a handheld and a rubber duck antenna. Also, make sure you work through a repeater that you can hear very well, but it cannot hear you. This will put out a kind of “LID mating call”: “Well, Joe, I can hear the repeater just fine here. I wonder why it can’t hear me?” You will score maximum LID points if you are mobile, and with the radio lying in the passenger seat.

Step Twelve: If you hear two amateurs start a conversation, wait until they are twenty seconds into their contact, and then break in to make a call, or better yet to use the auto-patch. Make sure you keep the repeater tied up for at least three minutes. This way, once the two have re-established contact, they won’t even remember what they were talking about.

Step Thirteen: You hear someone on the repeater giving directions to a visiting amateur. Even if the directions are good, make sure you break in with your own “alternate route but better way to get there” version. This is most effective with several other “would-be LIDs”, each giving a different route. By the time the visiting amateur unscrambles all the street names whizzing by in his mind, he should have moved out of the range of the repeater. This keeps you from having to stick around to help the guy get back out of town, later.

Step Fourteen: If an annoying station is bothering you, make sure your other “LID” buddies have a “coded” frequency list. Even though “CODES” are strictly forbidden on

Amateur Radio, it's really neat to practice "James Bond" tactics.

Step Fifteen: Always use the National Calling Frequency for general conversations. The more uninteresting, the longer you should use it. Extra points are awarded if you have recently moved from an adjacent frequency for no reason. Make sure when DX is "rolling" in on 52.525 that you hang out there and talk to your friends five miles down the road about the good old CB days!

Step Sixteen: Make sure that if you have a personal problem with someone, you should voice your opinion in a public forum, especially a net. Make sure you give their name, call, and any other identifying remarks. For maximum points, make sure the person in question is not on the repeater, or not available.

Step Seventeen: Make sure you say the first few words of each transmission twice, especially if it is the same thing each time. Like "roger, roger" or "fine business, fine business". I cannot stress enough about encouraging redundancy.

Step Eighteen: If you hear a conversation on a local repeater, break in and ask how each station is receiving you. Of course they will only see the signal of the repeater you are using, but it's that magic moment when you can find a fellow "LID", and get the report. Extra points are awarded if you are using a base station, and the repeater is less than twenty-five air miles from you.

Step Nineteen: Use the repeater for an hour or two at a time, preventing others from using it. Better yet, do it on a daily basis. Your quest is to make people so sick of hearing your voice every time they turn on their radio,

they'll move to another frequency. This way you'll lighten the load on the repeater, leaving even more time for you to talk on it.

Step Twenty: See just how much flutter you can generate by operating at handheld power levels too far away from the repeater. Engage people in conversations when you know they won't be able to copy half of what you're saying. Even when they say you're un-copyable, continue to string them along by making further transmissions. See just how frustrated you can make the other amateur before he finally signs off in disgust.

Step Twenty - One: Use lots of radio jargon. After all, it makes you feel important using words ordinary people don't say. Who cares if it makes you sound like you just fell off Channel 19 on the citizen's Band? Use phrases such as "Roger on that", "10-4", "I'm on the side", "Your making the trip" and "Negatory on that".

Step Twenty -Two: Use excessive microphone gain. See just how loud you can make your audio. Make sure the audio gain is so high that other amateurs can hear any bugs crawling on your floor. If mobile, make sure the wind noise is loud enough that others have to strain to pick your words out from all the racket.

Step Twenty -Three: Start every transmission with the word "Roger" or "QSL". Sure, you don't need to acknowledge that you received the other transmission in full. After all, you would simply ask for a repeat if you missed something. But consider it your gift to the other amateur to give him solace every few seconds that his transmissions are being received.

Step Twenty -Four: When looking for a contact on a repeater, always say your "listening" or "monitoring" multiple times. I've always found that at least a half dozen times or so is good. Repeating your multiple "listening" ID's every 10 to 15 seconds is even better. Those people who didn't want to talk to you will eventually call you, hoping you'll go away after you have finally made a contact.

Step Twenty - Five: Always use a repeater, even if you can work the other station easily on simplex ... especially if you can make the contact on simplex. The coverage of the repeater you use should be inversely proportional to your distance from the other station.

Step Twenty -Six: When on repeaters using courtesy tones, you should always say "over". Courtesy tones are designed to let everyone know when you have un-keyed but don't let that stop you. Say "over", "back to you" or "go ahead". It serves no useful purpose but don't worry, it's still fun!

Step Twenty - Seven: Use the repeater's autopatch for frivolous routine calls... especially during morning or evening commute times. While pulling into the neighborhood, call home to let them know you'll be there in two minutes.... or, call your spouse to complain about the bad day you had at work. After all, the club has "measured rate" service on their phone line so they get charged for each autopatch call. Your endeavor is to make so many patches in a year that you cost the club at least \$20 in phone bills. That way you'll feel you got your money's worth for your dues!

Step Twenty - Eight: Never say "My

name is" It makes you sound human. If at all possible, use one of the following phrases: a) "The personal here is ..." b) "The handle here is..."

Step Twenty - Nine: Use "73" and "88" incorrectly. Both are already considered plural, but add an "s" to the end anyway. Say "73's" or "88's". Who cares if it means "best regards" and "love and kisses." Better yet, say "seventy thirds"! (By the way, seventy thirds equals about 23.3).

Step Thirty: If the repeater is off the air for service, complain about the fact that it was off the air as soon as it's turned back on. Act as though your entire day has been ruined because the repeater wasn't available when you wanted to use it. Even though you have never paid a penny to help out with the upkeep of it.

These easy steps should put you well on your way to "LID-Hood". I hope these helpful hints will save you some time in your quest to sound like the perfect "LID". I should also note that these steps need not apply to simplex operation, as nobody really gives a crap because that HTX-202 isn't going to get out too far with just a rubber duck.

Spring Hike to Profile Falls

by Jim WIPID

It was gorgeous today. Tim W3ATB and I headed to Profile Falls and set up right alongside the Pemigewasset River. We worked Russia, the Canar Islands, PA, OH, NC, and Belgium. We had lunch in Bristol and then drove out the back road toward Hill Village. We turned left toward the Smith River and parked the car not far from Profile Falls.

We walked through the woods about a half mile toward the Pemi. The Corps of Engineers has a picnic area along the river. We set up right under an 85 foot pine tree. Tim brought his HB-1B and tossed a line over the pine branch and pulled up his portable Par antenna. He was running about 4 watts with internal batteries on 20 meters and snagged W1AW/8 in Ohio within a few minutes of sitting down. He was ecstatic.

I set up on a nearby table. I tossed a line over a second pine branch and pulled up a 33 foot wire. I was using the earchi.org 9:1 unun with the internal tuner on the KX3. I set up on 12 meters with 5 watts. I worked Alex RA6MQ in Russia almost immediately. He was a 599 and gave me a 559. Within two minutes, I worked another station... EA8/OH2OT in the Canary Islands. We exchanged quick 5992s.

I switched to 10 meters, and worked ON6MG in Belgium followed by Alex RA6MQ again. He had also switched to ten meters. It was fun to work him on two bands. By now my fingers were getting a bit chilly so I built a small fire in the grill by the table and listened while Tim racked up



the QSOs.

Tim had a long chat with Don, KD3CA in PA and told him we were operating outdoors alongside the river. When they finished Tim made a quick contact with K4DJ in North Carolina and exchanged SKCC numbers.

We packed up and walked along the river to enjoy the remarkable scenery... sparkling water, deep blue sky and brilliant snow. We stopped for a minute to soak up

some warm sun before heading back down the trail towards the car.

From here, it only gets better... warmer days, melting snow and finally spring!



Daily App: RepeaterBook is a repeater guide for amateur radio enthusiasts

Little known fact about me — I am an amateur radio operator and have been dabbling in radio technology for about a decade now. I picked up the hobby when I lived in a rural part of Vermont with no cellular service. The only way to communicate over any distance was via ham radio using the local repeater network.

Repeaters are the lifeline of the ham radio operator. They are the towers that relay messages between ham radios, accepting the weak incoming signal and then transmitting it at a higher power, so it can cover a greater distance with minimal loss in quality. Depending on the location and power of the repeater transmitter, you can talk to someone a hundred miles away. And if that repeater is connected to a network, you can extend that distance even further.

One handy tool for the ham radio operator is an iPhone app, RepeaterBook from ZBM2 Software. The basic app takes the community repeater database of RepeaterBook.com and packages it into an iPhone-friendly format.

You can either browse through all the repeater entries for the US and Canada or enable location services and let RepeaterBook display a list of nearby repeaters. Each entry contains detailed information on the repeater so you can key in those details into your ham radio. The app stores its data on your phone, so you don't need an active Internet connection to browse through the repeater entries.

A handy filter allows you to show only those repeaters that meet your license class, radio type or preferred connections. For example, I have a basic handheld radio and set my filters to show only repeaters in the 2M and 70cm band. When you find a mistake with the repeater information, you can edit an entry and submit those details to the database administration.



The database is thorough for the area in which I live, but not perfect. It lists almost all the repeaters in my vicinity, missing only one less known repeater a few miles away. The best part about RepeaterBook is not what it does, but what I don't have to do now that I have it installed on my iPhone. Thanks to the RepeaterBook app, I no longer have to carry around my paperback repeater resource, which is bulky and comparatively inconvenient to thumb through.

RepeaterBook is available for free from the iOS App Store. It's compatible with the iPhone and requires iOS 5.1.

ARRL to FCC: 'Grow Light' Ballast Causes HF Interference, Violates Rules:

Website: <http://www.arrl.org/>

ARRL to FCC: 'Grow Light' Ballast Causes HF Interference, Violates Rules:

The ARRL has formally complained to the FCC that a "grow light" ballast being widely marketed and sold is responsible for severe interference to the MF and HF bands. The League urged Commission action to halt sales of the Lumatek LK-1000 electronic ballast and to recall devices already on store shelves or in the hands of consumers. In a March 12 letter, ARRL General Counsel Chris Imlay, W3KD, told the FCC Enforcement Bureau and its Office of Engineering and Technology (OET) that, during ARRL Laboratory testing, the Lumatek device exhibited conducted emissions that exceeded FCC rules.

"ARRL has received numerous complaints from Amateur Radio operators of significant noise in the medium and high frequency bands between 1.8 MHz and 30 MHz from 'grow lights' and other RF lighting devices generally," Imlay said in the complaint. "The level of conducted emissions from this device is so high that, as a practical matter, one RF ballast operated in a residential environment would create preclusive interference to Amateur Radio HF communications throughout entire neighborhoods."

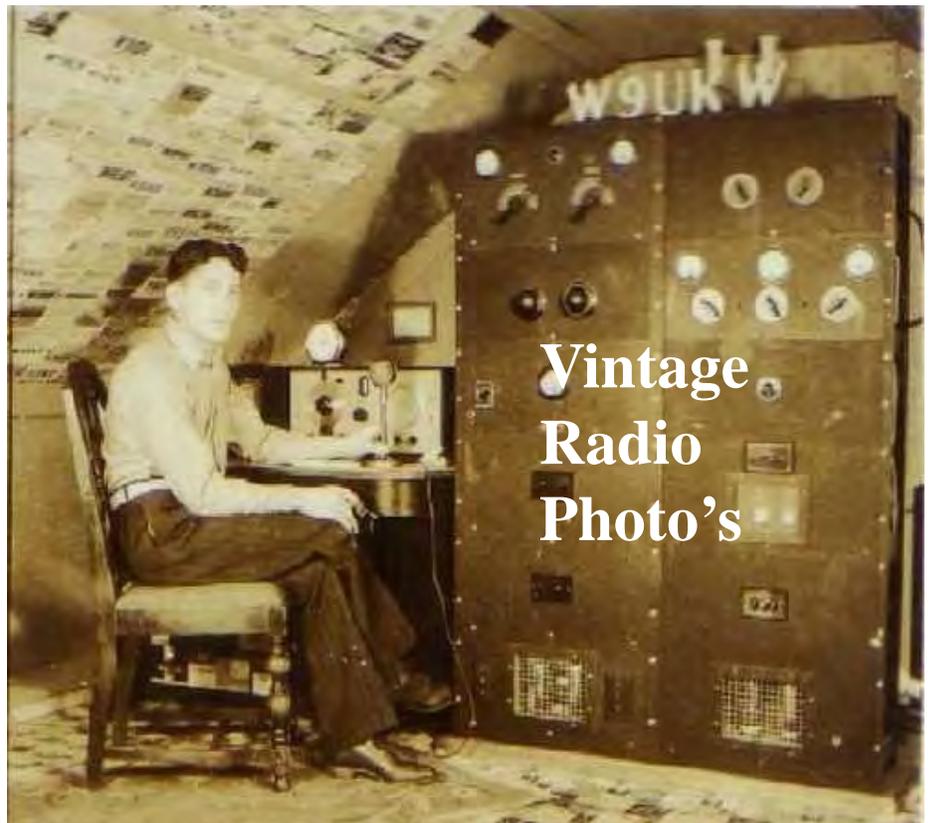
"[T]he Report concludes from the conducted emissions tests that the six highest emissions from the device in the HF band vastly exceed the quasi-peak limit specified in Section 18.307(c) of the Rules," Imlay told

the FCC. The ARRL further pointed out that, while an FCC sticker had been affixed to the device, it lacked FCC compliance information. FCC Part 18 rules require RF lighting devices to provide an advisory statement with such a device, notifying users that it could interfere with radio equipment operating between 0.45 MHz and 30 MHz.

The League noted that the device is imported into the US and marketed and sold by Sears, where ARRL purchased its test sample, as well as by Amazon.com and other retail outlets. The ARRL also called on the FCC to consider enforcement proceedings against the importer, Hydrofarm Horticultural Products of Petaluma, California. Read more <http://www.arrl.org/news/arrl-to-fcc-grow-light-ballast-causes-hf-interference-violates-rules>.

Source:

The ARRL Letter



Tube or not Tube: That is the Question

from Eric P. Nichols, KL7AJ

No book about Amateur Radio, much less a book about Amateur Radio *lore* would be complete without a discussion of electron tubes. These glowing globes were the workhorses of all electronics equipment for most of the last century, and still have a secure position in modern Amateur Radio, as well as industry.

The electron tube, alternately known as the *Valve* in Great Britain, the *Lamp* in France, and just plain *tube* in a lot of other places, represents a surprising level of mechanical, chemical and electrical engineering. It was the most sophisticated piece of hardware produced in the early part of the twentieth century, except for, perhaps, the precision pocket watch.

For most of this chapter, we're going to be talking mainly about one particular variety of electron tube, the *vacuum tube*, a term which has often been used interchangeably but somewhat inaccurately, with *electron tube*. Be that as it may, it is a fascinating device in any form.

Recall that in our introduction to the electron, we dealt with electrons in *conductors*. We demonstrated that, though electrical energy in a conductor traveled at nearly the speed of light, the actual electron movement, or *electron drift*, was painfully slow.

Not so in the electron tube. The electron tube is full of *free electrons*, which can, indeed travel near the speed of light. You might be asking yourself how a "vacuum" tube could be full of *anything*, which is probably

a good question. Vacuum is a relative term, in this case. But, be assured, there is indeed very little inside a vacuum tube.

Now, although the free electrons in a tube can move very fast, in most applications we keep them somewhat below the speed of light. They are *non-relativistic* electrons, meaning they behave pretty much as mere particles, and, for the most part, follow the standard mechanical laws of Newton. This is a good thing, because vacuum tubes are complicated enough as it is. There are "tubes" of sorts that indeed use relativistic electrons, such as the *free electron laser*, but you won't see many of these around the average ham shack.

So, with that background, let's get started. The first thing we need is a bottle of free electrons. A light bulb is actually such a device. An incandescent filament in a glass bottle will "boil" off a certain number of electrons. The problem with a light bulb, however, is that there's a lot of other stuff that gets in the way of our electrons. Our free electrons need a clear path to work in, and in a typical light bulb, you don't have that. You have a lot of Argon atoms clogging up the works. They put Argon in light bulbs to prevent oxidation of the filament, which is supposed to make the bulbs last a long time. Obviously, that doesn't work, so it must be a conspiracy of the Argon companies to sell a lot of Argon. Be that as it may, we have to work with our light bulb a bit to make them suitable free electron bottles.

The first thing we need to do is create a *hard vacuum*. It's called a hard vacuum, because it's very hard to do. We need to get EVERY atom (or ion)

we can out of the thing, which you can't do by just sucking on a straw. There's a three-step process. The first is to use a mechanical vacuum pump to get the pressure down just as far as possible, then you use a *diffusion pump* to get the pressure down even farther. Don't even *ask* how a diffusion pump works; I don't even think the guy who *invented* it knows. They're weird looking things that sort of resemble a percolator wrapped with a tornado-shaped coil of stainless steel tubing. Anyway, with your diffusion pump, you can get the pressure down to something like what you have in intergalactic space. The last step is to seal off the tube where you put the sucker-doodle in, and then you fire off the *getter*. The getter is a little ring of a very reactive metallic compound, which reacts with any remaining ions inside the tube, and deposits the results on the glass envelope, in a little silvery spot. The getter is "lit" by means of a radio frequency induction heater placed outside the tube near the getter. This process itself is actually very advanced; it was probably the first industrial application of anything resembling the microwave oven. The getter will continue to pick up stray ions for the life of the tube (in theory).

So, now we have a light bulb with a hard vacuum, with lots of elbowroom for those electrons to strut their stuff. Ahh, but how do we get electrons in there in the first place, since the tube is hermetically sealed?

Well, the best source of electrons is in the metal of the filament. When the filament gets white hot (or actually just sort of reddish-orange hot in most tubes), you actually boil electrons out of the metal. Well, perhaps *boil* isn't the best word, but it's pretty descriptive. If you recall

our chapter “Bent Radio,” we learned that in the ionosphere gas atoms are ionized by getting hit with ultraviolet radiation from the Sun, which slaps the electrons out of orbit around those atoms. In a vacuum tube, it’s *heat* that slaps the electrons out of orbit. This process is called *thermionic emission* because the metal the filament is made out of is ionized by *heat*. It’s actually a rather complicated process, (and a somewhat *noisy* one, we might add). The main difference between a vacuum tube and the ionosphere however, is that in the tube, the ions are held firmly in place, because they are in solid form. The ions can’t wander off like they can in the ionosphere.

So, now we have all these electrons free of their metallic atoms. Since they are all negatively charged, they all repel one another. Ordinarily, because of the mutual repulsion, the electrons would quickly fill the whole “bottle.” But they don’t.

The reason is, now that the metal filament is ionized, it has a net POSITIVE charge, which tends to pull the electrons back toward itself. So just as the ions in the ionosphere keep a sort of rein on the free electrons, the presence of the ionized filament keeps rein on the free electrons. Actually it keeps a TIGHTER rein on the free electrons, because, as mentioned above, the ions are in a solid state. As in the ionosphere, some of these free electrons recombine with their metallic mother ships; others are continually boiling off. A state of *thermionic equilibrium* sets in, where the *average* number of free electrons stays about the same. Hey, doesn’t this sound an awful lot like the electron density profile of the

ionosphere?

So, we now have this mob of semi-free electrons hovering around the filament. (Let’s rename our filament the CATHODE, because that’s a better electrical description of the element, while FILAMENT is more a physical description). This electron mob is called an *electron cloud*, and it has a net *space charge*. Sometimes space charge and electron cloud are used interchangeably, but to be really persnickety, the space charge is a *property* of the electron cloud.

If you were able to poke a probe into the electron cloud, you could measure a minuscule *contact potential*. Some tube circuits actually use this contact potential in a useful manner, but for the most part, it’s a mere curiosity.

All *righty* then. Our one-element vacuum tube isn’t particularly useful, except as a really lame light bulb. However, if we stick a metallic plate in the tube, a certain distance from the cathode, and bring an electrical lead from the plate through the glass to the outside world, we can now actually do something with our electron cloud.

Remember our ionized cathode has a net positive charge. Well, if we put an even BIGGER positive charge on our newly installed PLATE, by means of a battery between the plate and the cathode, we can pull electrons away from the cathode to the plate. (In old-fashioned radioese, this battery is called the “B” battery, and the voltage it supplies is called “B+” voltage). These electrons are actually absorbed INTO the plate and conducted out of the tube to the positive terminal of the battery. They are then forced out the negative terminal of the battery into the

cathode to replenish the electron cloud. We now have a one-way electric valve, known as a DIODE. (Oh, yes, we should rename the PLATE the ANODE, because all our tube elements should end with an “ODE”). Electrons cannot flow from the Anode to the Cathode inside the tube, because the cold anode has no spare electrons of its own.

Now, there’s an awful lot you can do with just a diode. It can be a power rectifier, a radio detector, a logic gate, a current limiter, a timer, even an X-RAY generator!

Before we get too carried away with our enthusiasm, however, we need to know a couple more things about the diode.

Remember we said that our electrons are non-relativistic, meaning they follow the rules of Newtonian Mechanics? Let’s look into this a bit, because we have to understand this fact before we can move onto the next level.

As with ANY particle, electrons have a finite mass. A very SMALL mass, granted, but very real, nonetheless. They take TIME to accelerate from the electron cloud to the anode. You may remember from high school physics that $F=MA$, Force equals Mass times Acceleration. The force in this case, is electromotive force, which comes in the form of Plate Voltage. This is the voltage we supply with our external “B” battery. When a voltage is applied to the plate, the electrons slowly drift out of the electron cloud and accelerate toward the plate. But, unlike gravity, the acceleration is not constant. There is a double-whammy here. The attractive force of the plate, for

a given voltage, increases *drastically* as you get closer to the plate. So not only do electrons accelerate on their way to the plate, but their *rate of acceleration* also increases during the trip! This actually turns out to be a very useful property; it just makes the math involved pretty *hairly*.

Let's talk about a new term, *plate resistance*. In the process of electrons hitting the plate, a certain amount of "friction" is involved. In fact, with enough current, the plate of a vacuum tube of any type can get very hot due to the electrons striking the surface. Actually, the plate can, under certain circumstances, get hot enough to become a cathode, which is generally not a good thing.

Several design features of tubes, however, prevent the anode from acting TOO much like a cathode, at least relative to the true cathode. First, cathodes are generally made of materials with high thermionic efficiency—that is; they emit lots of electrons at relatively low temperatures. Materials that do this are things like thoriated tungsten and barium oxide. On the other hand, anodes are made (or coated with) materials that are really lousy thermionic emitters, such as graphite. They are also made much more MASSIVE than the cathode, so they are unlikely to reach the same TEMPERATURE for a given amount of heat dissipated.

Because of the inefficiency (and subsequent heating) of electrons being absorbed by the anode in any tube, there is an equivalent resistance through a diode, just as if it were a real resistor. This is pretty straightforward "ohmic" heating. The major contributor of "plate resistance" however, is strictly due

to the finite number and availability of free electrons AND the fact that they have real mass that needs to be accelerated. It is this acceleration aspect of the electrons that makes PLATE RESISTANCE very non-linear. In other words, the plate resistance not only depends on the plate voltage, but depends on it in a rather complex manner.

But let's forget the complexity of the plate resistance for a moment. We can ignore the entire hairy math aspect and STILL grasp a very important thing about this electron acceleration.

All we need to know is that the electrons start out very slow, and end up very *fast*. If we can grasp that, we can easily explain the next topic: amplification.

Leveraging Electrons: The Triode

Imagine for a moment that you're a lumberjack standing on a plateau above a valley. Your plateau starts to gradually roll off in front of you, almost imperceptibly, perhaps dropping only an inch every ten feet. Beyond that, it slopes down a little more steeply, two inches every ten feet. Beyond that, three inches every ten feet. Beyond that, four inches every ten feet. Five hundred feet ahead, it's sloping down at a 45 degree angle. Half a mile ahead, it makes a vertical drop to the valley floor.

You have a log you want to roll down the plateau. You give it a kick, and it starts rolling down the hill, barely accelerating, because it's only dropping an inch every ten feet. It hits a one-inch pebble after rolling ten feet and comes to a dead stop. You remove the pebble. The log starts rolling again, this time a little faster.

It rolls right over another one-inch pebble, but comes to a dead stop once again, after it hits a two-inch pebble. You remove the two-inch pebble. The log starts rolling again, even faster. It rolls right over another two-inch pebble, but comes to a dead stop when it encounters a three-inch stone. You remove the three-inch stone, and the log starts rolling again. Until it hits a four-inch rock.

Being the brilliant woodsman you are, you are finally able to conclude that the farther the log rolls, the bigger the rock you need to stop the thing. In fact, once the log reaches the vertical drop off, NO boulder is big enough to stop it.

The plateau you're standing on is your cathode. The valley floor is your plate. The log rolling down the hill is an electron. The gravity that wants to *make* the log roll down the hill is Plate Voltage. And the pebbles that get in the way of the progress are your third tube element, the *control grid*.

Actually, we could, in all good conscience, end the discussion right here, as we have described the principle of amplification completely. There is really little more to say on the matter.

But we should probably talk a little about the control grid anyway.

If we insert another electrode between the cathode and the plate, we have what's called a TRIODE. The control grid can be in the form of a screen, a helix, a zig zag, or any other "porous" configuration. Its job is to act as a pebble in the path. The *sooner* it gets its job done, that is, the closer it is to the cathode, the more effective it is. Once the log...er...the *electron* builds up kinetic energy on its way to the plate,

the bigger that pebble has to be to slow it down.

The way a grid slows down an electron (actually an electron mob) is that you apply a small negative voltage to it. This voltage is called a *bias* voltage. This small negative voltage REPELS the electrons back toward the cathode. If the grid is close enough to the cathode, it can completely cut off the flow of electrons to the plate with a small bias voltage. This condition is called, oddly enough, *cutoff*. If we move the grid farther toward the plate, we need more bias voltage to cut off the electron flow, because the electrons would have already been accelerated a bit. You might have cleverly deduced that the amount of bias voltage is equivalent to the size of the rock. You would have been absolutely correct!

So you see, the more speed the electrons pick up, the bigger the bias voltage necessary to stop them in their tracks.

When the grid is very close to the cathode, however, we can control a very large amount of plate current with just a tiny amount of bias voltage. This is called amplification. A little signal controls a big signal.

Now, calling this process amplification bothers lots of folks; it seems to be just the *opposite*. Our input (bias) signal can only REDUCE the plate current, not increase it.

The point to remember here is that the tube doesn't generate any power in the first place. Any power the tube "puts out" actually comes from our plate battery. The purpose of the triode, then, is to simply "modulate" the plate current, in accordance with

our commands. We supply our commands through the control grid.

Incidentally, since the control grid is negative with respect to the cathode, zero current flows through the grid. This means that the grid draws absolutely no power. We theoretically have INFINITE power gain with such a situation!

As you might imagine, it's not so rosy in the real world, but you can still have incredible power gains with a triode.

At this time we should mention that *acceleration* of electrons in a vacuum tube is not really the end goal, except in some exotic applications. There is no real advantage to super high speed electrons. Our goal is controlling CURRENT, that is, the *number* of electrons, not their *speed*. However because of plate resistance we NEED to have rather high voltage in order to get usable currents. (Yes, as convoluted and contrived as plate resistance is, it still follows Ohm's Law). And since we can't have high voltage without accelerating electrons, we end up with high speed electrons anyway.

Actually, we don't want our electrons to move *too* slowly, or we end up running into *transit time* problems. If an electron takes too much time from the cathode to the plate, it may not work very well at radio frequencies. We can reduce transit time by making the space between ALL the elements very small, while keeping the ratio of grid spacing between the cathode and the plate the same. In other words, we can *scale* the tube for higher frequency. But we can't go too far in this scaling business, or we end up risking *arc-over*, that is electric sparks jumping between elements

inside the tube. Not a good thing. So we can reduce plate voltage to prevent arc-over, but guess what? Lower plate voltage means longer transit times. Hmm...do we even *begin* to grasp the problem of the tube designer? We have all these conflicting requirements that need to be met. The astonishing thing is that the early tube engineers were indeed able to pull this off, using no more number-crunching power than a *slide rule*!

The fact of the matter is that you had a lot of the smartest people on the planet working on making tubes that ran faster, longer, and with more power. Tubes represented the culmination of all human knowledge. Until the discovery of the transistor, tubes were all we had to work with. We HAD to do it well.

Now, a tube by itself is of limited value. It has to actually work in a *circuit*. In the next chapter, we will talk about how tubes interact with other components. We will also introduce a few more tube elements, creating TETRODES and PENTODES.

In the meantime, next time you encounter a tube, you really should salute.



After reading this article on tubes, this ham comes to mind! Anyone guess who?

NEARFEST SPEAKERS FOR FRIDAY, MAY 2

12:00 PM: **“My Town Won’t Let Me Erect A Tower. What Do I Do Now?” presented by Jason Jarvin, WA1NH. (Located in the Entertainment Building, see map)**

Jason will give us a walk through of the appeal process and include information on how to get your zoning changed to accommodate amateur radio antenna systems. Jason tells us “I will use NH law and regulations in my examples. It will not touch on condominium covenants nor will it entail in depth discussion of PRB-1.” As you can see in his brief ‘Bio.’ below, Jason has real world experience in this topic and we hope if you are currently having an issue in your town, or are considering installing a tower, this presentation will prepare you for the work ahead !

1:30 PM: **“Achievements In The Early Days of Amateur and Broadcast Radio” presented by Donna Halper. (Located in the Entertainment Building, see map)**

We are delighted to announce that we will have local author and historian Donna Halper with an exciting talk about the achievements of New England’s amateurs from about 1912 - 1930— How these pioneering men and women not only advanced ham radio but created commercial broadcast radio too.

Donna Halper is a respected and experienced media historian, whose research has resulted in appearances on both radio and TV. These include Chronicle (WCVB, Channel 5 in Boston), Voice of America, PBS/ NewsHour, CTV News (Toronto), National Public Radio/Weekend America, New England Cable News,

History Channel, ABC Nightline, WBZ Radio (Boston), WBZ-TV, WGBH-FM (Boston), WGBH-TV, WBUR-FM(Boston), WRKO (Boston), WATD-FM (Marshfield MA), WSCA-FM(Portsmouth NH), WIBC (Indianapolis), and WNYC-FM (New York). She has also been quoted in a number of newspapers, magazines, and text-books. Ms. Halper often writes about media history for encyclopedias—for example, she has six essays in the Biographical Encyclopedia of American Radio, about pioneering women and minorities in early broadcasting.

Ms. Halper is the author of six books, the most recent of which is a newly revised and expanded second edition of “Invisible Stars: A Social History of Women in American Broadcasting,” published in March 2014. She is also the author of “Boston Radio 1920-2010,” a history of Boston radio in words and pictures, published in 2011. Her other books include “Icons of Talk: The Media Mouths that Changed America,” a history of talk shows (2008); and the first edition of “Invisible Stars: A Social History of Women in American Broadcasting” (2001). In addition, she has written about baseball history for several SABR books, including “Opening Fenway Park in Style: The 1912 World Champion Red Sox,” and “The Miracle Braves of 1914.” Ms. Halper has written book reviews for academic journals, and she also writes occasional free-lance articles for magazines and newspapers. One of her essays, about the importance of fact-checking, was the #5 most-shared article of 2013 on Skeptic

Magazine website. Ms. Halper has had a successful career in broadcasting, including more than 29 years as a radio programming and management consultant in markets of all sizes, both college and commercial stations, all over North America. She has hired and trained staffs, worked with and developed talent, helped to choose or improve formats, conducted music and market research, and helped her client stations to get better ratings. Prior to becoming a consultant, she spent thirteen years as an announcer, music director and assistant program director in four major markets. In addition to Ms. Halper’s long career in both radio and print, she is well-known for discovering the rock group Rush, who dedicated their first two albums to her. She is seen four times in the 2010 documentary about the band, “Beyond the Lighted Stage.”

3:00 PM: **” Introduction to Software Defined Radio Using Inexpensive USB TV Tuner Sticks” presented by Ron Senykoff, KB1UMH(Located in the Entertainment Building, see map)**

One of the latest cool things to do is to use Asian or European USB TV Tuner sticks and free SDR software to put together receivers for simple radio reception. This has grown into even more applications including trunked radio, digital signal decoding and Aircraft tracking of Mode S transponders. Ron will give us an introduction to this, reviewing some of the basic hardware and software options. Showing you how, using an existing computer and antenna, you can get a system up and running for less than \$25!

9:00 AM: **“DMR New England Update” moderated by Bill Barber, NE1B. (Located in the Entertainment Building, see map)** New DMR repeaters continue to pop up all over New England. Now with NEW DMR radios available for \$180, more and more people are getting active in this interesting mode. As Rick Zach, K1RJZ says “Resistance is futile” Bill Barber, NE1B, the contact for New England Digital Emergency Communications Network (NEDECN) will give us updates on whats going on in the DMR world and what you need to do to get involved .[/b] (Located in the **Entertainment Building**, see map)

10:30 AM: **Volunteer Exam Session conducted by Bruce Anderson, W1LUS and the NEAR-Fest VE Team** The exam session is located in the **Meeting Room (in the Arts & Crafts Building) right across from the flagpole. The entrance is around the back of the building,** (see map) The Volunteer Examination session begins at 10:30 sharp. Be sure to have two forms of identification (one with photo), original and one copy of your Amateur license (if you have one), documentation and \$15.00 exam fee ready. For more information on the Volunteer exams or if you are a ARRL accredited VE wishing to help, please contact the VE Coordinator at w1lus@verizon.net.

Despite what it says on the ARRL Web site, pre-registration is not required. Just show up and give it your best shot. Try the higher level exams even if you don’t feel you are ready - you never know.....at least you’ll know what to expect the next time. Good luck!

10:30 PM: **”D-Star Communications Symposium” moderated by Paul Anzalone, N1PA. (Located in the Entertainment Building, see map)** Worldwide, the D-Star network continues to grow. The “New England D-Star Go To Guys”, Terry Stader KA8SCP, Dave Taylor N1FCC, Paul Anzalone. N1PA and possibly other invited speakers will give us the “State of the State address on DStar and help guide you to get started with this very flexible communications mode.

12:00 PM: **TO BE ANNOUNCED** (Located in the **Entertainment Building**, see map)

2:00 PM: **Awards Ceremony and Door Prize Drawing** (Located in the **Relaxation Grove**, see map) More than simply a prize drawing, this is the time we honor individuals, present updates to the NEAR-Fest mission, and provide a little insight as to what lies ahead.

73,
John, KB1FQG,
Forums Co-Chairman

Tech-In-A-Day Class Reminder

The Cape Ann Radio Association sponsors a one day study course to earn your FCC Technician Class Amateur Radio license once or twice a year. The next class will be held on **Saturday, April 19th**. If you would like information about the next available course please contact course leader Stan Stone W4HIX at techinaday@caara.net.

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

FOR SALE:
ICOM 718 WITH LDG AUTOTUNER IN EXCELLENT CONDITION.
10-160 METER ALL MODE
100 WATT TRANSCEIVER.
ONE OWNER, \$575 for both- contact K1TP

The Building Center of Gloucester
1 Harbor Loop
Gloucester, MA 01930
Phone: 978-283-3060
Mon-Fri: 7am-5pm
Sat: 8am-4pm
Sun: Closed



building center
SINCE 1903
bc
GLOUCESTER • ESSEX

The Building Center of Essex
140 Western Avenue
Essex, MA 01929
Phone: 978-768-7151
Mon-Fri: 7am-4:30pm
Sat: 8am-2pm
Sun: Closed