



CAARA Newsletter



AN ARRL AFFILIATED CLUB

MAY ISSUE- 2010



President's Corner

by Curtis AA3JE

Well! Spring is finally here, with buds on the trees, hailstones in the air, and everyone getting ready for the summer season. We had a great April, with the SkyWarn Training at the Lanesville community center being very well attended (I just got my card in the mail) the spring dinner was fun (new restaurant next time, I'm taking suggestions) and the final few dollars from the hamfest tricked in (about \$2300 in all for our net gain).

May is, of course, the month where we plan for the big event of the year, FIELD DAY, coming up in June. Jim (W1DDX) has been holding meetings and we are going to be a serious contender this year. Rick's CW crew are polishing their skills, and the second floor of the club is awash with contests (Spring QSO Party) and gear and preparations.

May is a sad month for me, since we will have no meetings in July and August, the June meetings will be consumed with preparations for FIELD DAY and September with the preparations for the ANNUAL MEETING. My tenure as club president is drawing to a close and I would like to take a few minutes to exhort potential candidates and to express my opinion on CAARA as a club.

We are, in the opinion of the ARRL, one of the strongest clubs in New England. We license new hams, we train new hams, we operate as hams and we celebrate older hams. We are recognized by our communities as a force for good, and we can be rightly proud of a spotless record of community and civic service.

It is all due to you. You have given me such pride and such hope that I cannot express it, so I won't even try.

Talk among yourselves, find a candidate who will let your natural champions rise to the surface and risk expressing themselves. Bless you all!

New England QSO Party Day 2

When: Sunday, May 02 2010 @ 09:00 AM EDT - 08:00PM

Where: CAARA Club House

Description:

CAARA will be participating this year in the New England QSO Party. This is a two day event. There will be stations for all to work in all modes. This is your chance to operate in a HF contest and sharpen your skills before Field Day. Control operators will be available for those not licensed or on frequencies not covered by your license. Further information will be supplied by Caaramail and via this web site.

Samuel Morse, who introduced telegraph communications in the United States, was born 219 years ago today on April 27, 1791 in Charlestown, Massachusetts.

On 24th of May 1844, he famously sent the message "What hath God wrought" (quoting Numbers 23:23) by telegraph from Washington D.C to Baltimore.



The telegraph Morse code used in those days differed in a number of respects from the International Morse code used today and a description of the differences can be found at

http://en.wikipedia.org/wiki/American_Morse_code

BREAKING NEWS: Charlie Anderson-W1IU, our former club P resident, is now a silent key. Watch the Gloucester Daily Times for funeral arrangements.

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

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

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Jon Cunningham-Editor
K1TP

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Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the 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 W1RK 443.700 repeater with antennas located in Magnolia is owned and operated by club member Ralph Karcher and it too is available for club use.

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.

Ham Radio Growing In The Age Of Twitter

Only a few years ago, blogs listed ham radio alongside 35 mm film and VHS tape as technologies slated to disappear.

They were wrong.

Nearly 700,000 Americans have ham radio licenses — up 60 percent from 1981, a generation ago. And the number is growing.

Ham radio will never have the sex appeal of the iPhone, but it does have a certain nerd appeal, says Allen Weiner, an analyst at the technology research firm Gartner.

“If it creates its own experience, that’s really what’s key here,” he says. “If it just emulates an experience that you can get online, it’s not going to grow.”

Newcomers to ham radio include Helen Schlarman, 89, who has a compact, two-way radio in her home in suburban St. Louis. She looks up a friend across town by pushing the talk button, announcing the letters and numbers of his call sign (W-0-S-J-S), and then announcing her own (W-0-A-K-I).

Steve Schmitz’s voice crackles through Schlarman’s radio.

“Hi Helen, how you doing, W-0-S-J-S?” he says, ending his response with his own call letters.

Many “hams,” as they’re known, hang postcards from global contacts on their walls, the way hunters show off deer antlers, but Schlarman’s chats are mostly local. She says this hobby is perfect for an outgoing person who spends a lot of time inside.

“It’s a different community,” she says. “There [are] no stereotypes of age; it’s just talking and sharing and enjoying.”

Until recently, ham radio was declining as older operators died. Then the Federal Communications Commission phased out the Morse code test that many saw as a stumbling block to getting a license. Last year

more than 30,000 new applicants signed up to become ham radio operators, according to Maria Somma, an official with the American Radio Relay League.



At a ham radio convention near St. Louis, the crowd swapping antenna parts and other equipment is mostly male, and over 50. But 15-year-old Jonathan Dunn is attending along with his father. He says Facebook and texting are fun, but making friends using a \$200 radio that doesn’t come with monthly fees is more rewarding.

“With ham radio you can talk to new people, all kinds of ages, races, and it’s just amazing what a little radio can do. Because no matter where you’re at, if you have the right stuff and the right power you can talk to anyone,” he says.

Jonathan’s dad, Steve Dunn, says the polite chitchat between ham radio operators is good for teenagers. “If young people have the opportunity to communicate with a wide range of people, that instills a certain amount of confidence in their ability to carry on the lost art of small talk,” he says.

Even the most die-hard hams concede that amateur radio will never be a mainstream hobby. With smart phones and other devices, people are more plugged in to the Internet than before. But people are still discovering the joy of communicating with a technology that’s existed for nearly a century.

I think most of us can remember the time when Radio Shack actually sold amateur, cb, and shortwave radios, and we can certainly remember those yearly catalogs that Radio Shack use to print. Well if you want to be nostalgic here’s a website that shows every page of every catalog that Radio Shack produced. Click on www.radioshackcatalogs.com and take a trip down memory lane.

73’s

Dean Burgess KB1PGH

Caara Clerk

New England QSO Party

Are you ready for a little more contest operating or a little warm-up for the upcoming Field Day?

Join us at the club house as we participate in the:

We will be operating on Saturday May 1st from 4PM until 1AM and then again on Sunday May 2nd from 9AM until 8PM. We will have at least three stations set-up, operating on 80-40-20-15-10m with Phone, CW, and Digital modes.

Come have some fun and make some QSO's and get your callsign in the logbook. Challenge yourself and try to operate on more than one mode.

Maybe work all three. Learn how to operate our radios plus how to log contacts with our contest logging software.

In this contest New England Stations will try to work non-New England Stations. And best of all non-New England Stations will be trying to work New England Stations (that's us !!!!).

On top of this there are four other contests running during our contest: (1) MARAC County Hunters Contest, (2) Indiana QSO Party, (3) ARI International DX Contest (Italian DX), (4) 7th Area QSO Party. And finally, when not working those non-New England Stations, work those New England Stations to help the club qualify for the following awards: Worked All New England Award; Worked all Maine Award; Worked all Massachusetts Counties Award; Worked All Rhode Island Counties Award; Connecticut Counties Award; Worked all NH Award; Worked Vermont Award.

COME HAVE SOME FUN ! WE NEED YOUR OPERATING HELP!



CAARA Emergency Communications Group held a meeting at the Lanesville Community Center. The guest speaker did a great job.



Have you ever wondered why CAARA Field Day runs so smoothly? Well, it's all about the planning meetings that occur Sunday mornings at the club on a regularly scheduled times...get involved!



An authentic 1933 ham radio station - From the left: A 1932 Hammarlund Comet Pro receiver, speaker, coil box and the QSL card of the first owner Dare Aucott, W3CRY, of Atlantic City, NJ. Right: a well-made homebrew 300 watt transmitter built by Joe Hoffman, W2DST of New York. Table and wall: the 1933 station log, license, lamp and chair of Earl Abbott, W2FTT, Manahawkin, NJ, and a collection of 1930's QSL cards from southern New Jersey hams.



This is what you are missing if you are not present at the monthly meeting on Wednesday evening.



Radio Timtron Worldwide is a rock and roll variety show hosted by Timtron, WA1HLR. One of the most entertaining programs on WBCQ, Radio Timtron Worldwide combines rock music, comedy, and the occasional skit into a show always worth tuning in to.

Radio Timtron Worldwide can be heard Saturdays at 7PM eastern time and Wednesdays at 5PM eastern time on WBCQ 7.415 MHz.

Timtron is the nickname of Tim Smith, WA1HLR. Tim is famous as an AM radio enthusiast, known for a vast knowledge of AM radio engineering. On most

evenings, he can be heard operating his ham station on or near the AM window of 3885 KHz. He is closely associated with WBCQ, and assisted Allan Weiner in the construction of the station. He also is a frequent WBCQ on-air personality. Timtron's radio show, Radio Timtron Worldwide, has entertained listeners for over eight years on WBCQ.

Timtron resides in a compound in Skowhegan, Maine. In the early 1990's, his home was destroyed by a fire. Today, his primary transmitter facilities are in an old school bus parked on his property.



The CAARA VEC team working hard correcting tests and handling the paperwork for the new hams and upgrades.

Amateur Radio Military Appreciation Day

Hello Fellow ARMAD Operators:

If you are planning on operating this year, please let us know, and also post on the Amateur Radio message boards. Radio stations, and groups are looking to help us with publicity as we work with National Military Appreciation Month. (NMAM)

Each local club, or individual can run its own ARMAD set up over HF, VHF, D-STAR, Echolink, IRLP or other modes.

The purpose is to ask for people to honor our Troops and Veterans over the air with messages of appreciation.

Operation times are at your discretion.

VISIT: www.armad.net for more information.

Let's "HAM IT UP FOR THE TROOPS"

Sincerely,

Emery, KB9IBW

FCC CITES IPAD AS ANOTHER REASON FOR BROADBAND SPECTRUM

The FCC is using the high level public response over the release of Apple's iPad to put in a plug for finding more spectrum for wireless broadband use. In a blog posting on April 2nd, the FCC's chief spectrum policy analyst, Phil Bellaria teamed with deputy Wireless Bureau Chief John Leibovitz to pointed to the long lines at Apple stores as evidence that broadband is going mobile fast and in a big way.

According to Bellaria and Leibovitz, more and more Americans seemingly do not want to be tethered to a desktop computer or even a laptop. They want a light mobile device they with which they can curl up on the sofa with to watch an online movie, stow in a backpack for subway reading, or pass around the office with the latest vacation pictures. Bellaria and Leibovitz say that the broadband connections that enable this flexibility are wireless and points out the need for more spectrum for mobile broadband that the FCC has identified in the National Broadband Plan.

They point out that many of the iPads currently rely solely on WiFi to connect to the Internet. They said that the FCC should know before long what the impact of the iPad will have on spectrum use. (Published Reports)

PRODUCER DAVE BELL W6AQ LOOKING FOR FILM COPY OF "THE HAMS WIDE WORLD"

If you are old enough to remember back to when movies in school classrooms and on television were shown on film, then you also may remember that most non theatrical movies were shot and distributed on 16 millimeter film. Almost all of the early movies about ham radio were photographed on 16 millimeter including the 1969 Dave Bell, W6AQ, classic titled "The Hams Wide World."

Well Dave would like to restore that movie and several others but so far no really decent prints of "The Hams Wide World" have been found. The only projectable one located so far is very faded. A video transfer done some 25 years ago used a film print that was severely scratched. A few months ago the ARRL was contacted

to see if they might have a viewable print but none could be found.

Well, when "The Hams Wide World" went into distribution back about 40 years ago, it was a loan out program from what was then the ARRL Film Library. Its estimated that there were two to three dozen copies of "The Hams Wide World" in circulation, and in the off chance that one or two never got returned to League headquarters, we are turning to all of you. Especially any old timers who were responsible for getting programs for radio club meetings back in the early to mid 1970's. .

Perhaps you borrowed a copy of "The Hams Wide World" and forgot to send it back. Maybe its still sitting in your attic, closet or basement. If you do happen to have such a film print, Dave would love to borrow it for the restoration process.

You can contact Dave Bell, W6AQ, by e-mail to dbamovies@aol.com. He says that he would sincerely appreciate your help. (ARNewsline™)

Morse code practice via Echolink

You can now get Morse code practice sessions on your 2m FM hand held by using Echolink to connect to the W1AW Conference Server 'W1AWBDCT' Node 37374.

Audio from W1AW's CW code practices and CW/digital bulletins is now available using EchoLink via the W1AW Conference Server "W1AWBDCT" Node Number 37374. The 9:45 PM ET phone bulletin is currently unavailable via W1AWBDCT. The audio is sent in real-time and runs concurrently with W1AW's regular transmission schedule.

According to W1AW Station Manager **Joe Carcia, NJ1Q**, this server is currently at an experimental stage: "Since the server is located at ARRL — and uses the ARRL's Internet connection — there may be an issue as to how many users can connect to W1AWBDCT via EchoLink. The current number of connections is set to 350. If the current system can properly handle these connections without adversely affecting the performance of the conference server, this number will be bumped up higher."

All users who connect to the conference server are muted. Please note that any questions or comments should *not* be sent via the “Text” window in EchoLink. Please send any questions or comments to w1law@arrl.org.

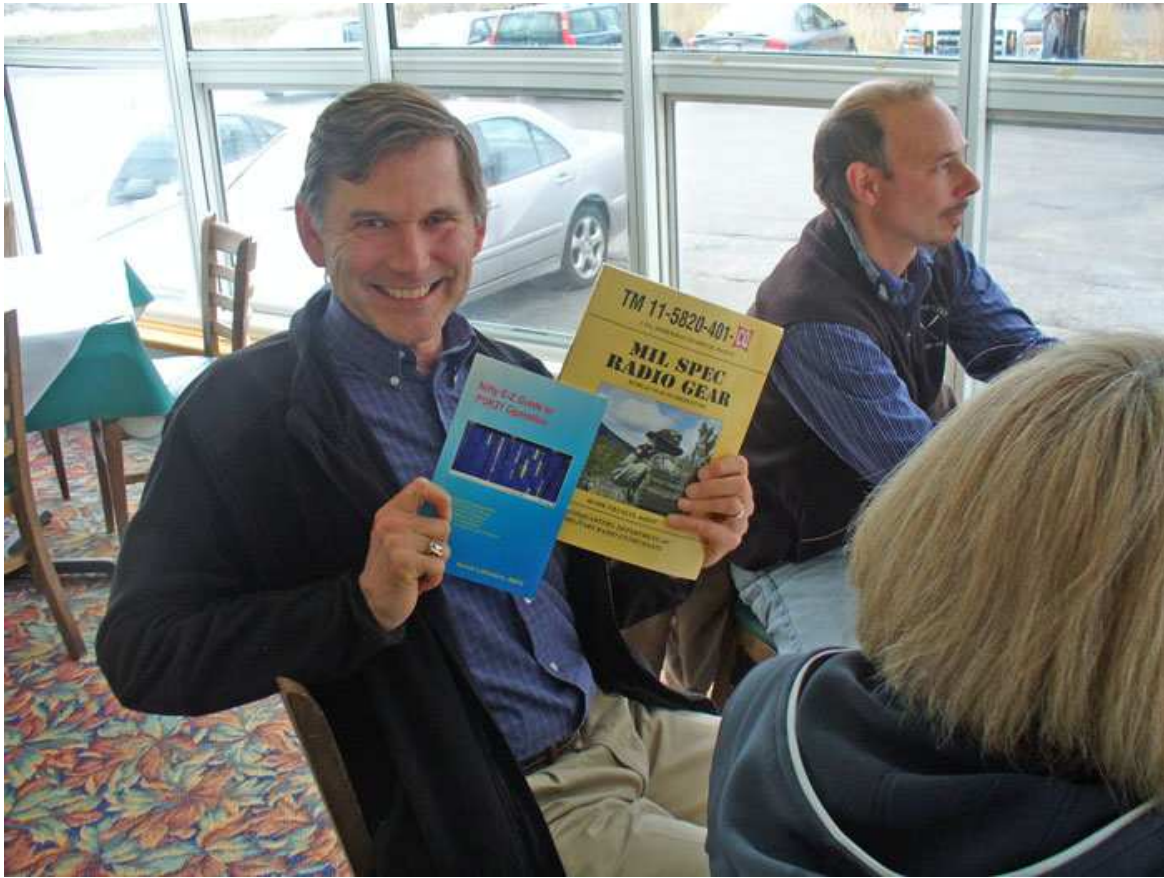
Source: <http://www.arrl.org/news/w1law-offers-code-practice-bulletins-via-echolink>



Department of Commerce engineers looking for radio pirates in 1922 (before the FCC)



Picture circa 1925 of the Dartmouth College Radio Station



The Club Spring Dinner was held at Fortune Palace in Essex. We had about 12 members attend and enjoy a fine meal with plenty of good conversation. Stan- W4HIX and his wife won two of the door prizes donated by Curtis-AA3JE and Dick's-WB1W wife won the other book.



Time for a New Portable Power Pack?

By Chris J. Smith, K1CJS

The summer season is here again, and for those of us who get out of the shack and into the backyard or those wide open spaces, the thought of bringing that rig with you and making a few contacts may be on your mind. On the other hand, hurricane season is also here again on the east coast, and there are some who are thinking of updating those emergency go kits that some of us keep in readiness.

Those were a few of my thoughts when I started going through my equipment from last year, especially when I contemplated having to lug around a car battery so I could power my gear and other 12 volt goodies out where there is no power readily available. I figured on using a car battery because I had a spare, and for the past seven or eight years, I had run off a pair of garden tractor batteries. One of those batteries had gone too far to save and the other was not much better off—they were both old. However, the car battery I thought about using weighed more than those two batteries combined. There was also the fact of the dangers of wet cell batteries, tolerable in smaller, lighter batteries, but increasingly greater in larger, heavier ones. With all those considerations in mind, it was obviously time for a newer, safer power pack.

I had thought about getting one of those car starting power packs, but in my opinion there were too many strikes against them to make that a viable option. Modifying the pack to eliminate the extra connectors on it which were useless to me (my vehicle has an aftermarket dual battery system) and putting Anderson Power Poles on it, the length of time those packs may have been sitting on the shelf waiting to be bought (or in transit in those cargo containers from overseas), getting the right size battery replacement if the battery did go bad, and other considerations led me to believe a better alternative was to plan and build a new portable power pack, even though the initial cost may be more than an off the shelf unit.

I started with the consideration of the gel cells themselves. I figured that replacement batteries, although not an issue now, may be in the future. I chose a commonly found and readily available battery, the 12 volt 7 amp hour size that have been and still are common as replacements in burglar and smaller fire alarm panels. They're readily available at most electrical supply houses and electronics stores and cost \$20 to \$25 each. For extended operating time, I chose to build the pack with four of them wired in parallel.



The type battery selected for the project, Approximate size is 6 1/2" x 2 1/2" x 3 1/2".

Each battery weighs approximately 8 lbs.

I then measured and figured what would be needed to construct the pack, and came up with a minimum size for the box that would house the unit—but what kind of box should I use? I wanted something that would be easily transportable and durable and would “cushion” the batteries inside. I was about to go shopping for a box when I remembered my habit of saving things I may use again—maybe something in the garage would do? After a little looking I had the perfect box—an old polyethylene tool box that was sturdy enough to do the job and just about

the right size. The box itself is water resistant, but that was a moot point because of the construction of the power pole socket.

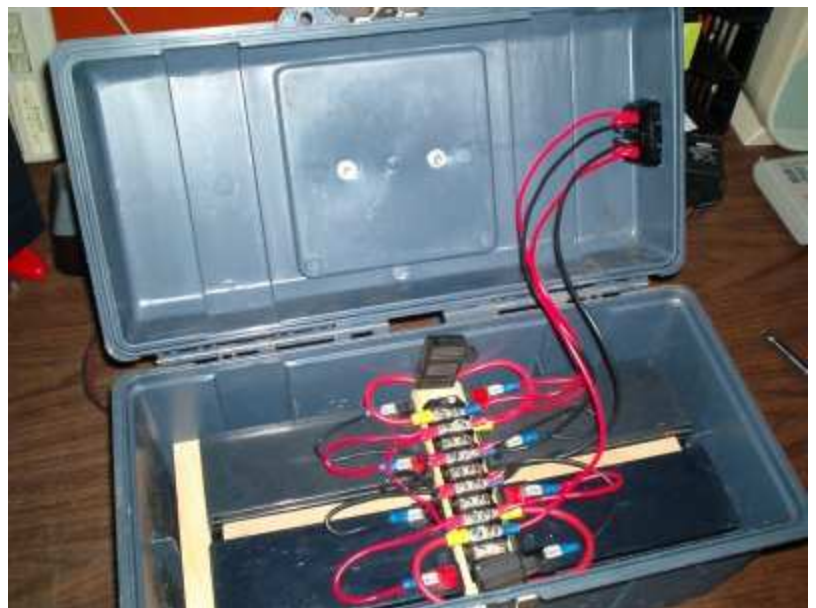
Then I looked in the ol' shack junkbox, and came up with a terminal strip, two blade type in-line fuse holders and the 4 needed 30 amp fuses (two spares). Each fuse protects two of the Anderson Power Pole pairs. A couple of years ago I had bought three power pole sockets like the one shown here to use in the shack and had only used two—now, as you see, the third one has found a home.



The Anderson Power Pole socket cut into one end of the toolbox top.

Add to the parts list a few lengths of ten and twelve gauge wire and a couple of pieces of wood to mount the terminal strip and to use as spacers. Total time spent modifying, assembling and wiring the unit came to about four hours. The result of all this, as you can see, is a custom built power pack, probably a little more expensive than an off the shelf unit, but with none of the unneeded bells and whistles. Charging is easily accomplished by connecting a battery charger to the powerpole connector.

The inside wiring. The fuse holders are at the top and bottom of the terminal strip. A later refinement will probably be circuit breakers, set into the lid on either side of the 4 power pole sockets, for easier access.



If everything needed for this mini-project were bought new, the cost would probably be in the \$120 to \$140 dollar range—my cost for the needed materials for the one I built was about \$85—reduced by some junk box contributions and one ‘save it, it may be useful’ old tool box.

Of course, some of you have different requirements for your standby pack, you may need greater capacity or not as much. One nice part of this idea is you can modify it as you need to—make it larger or smaller, or convert/plan for extra space for a place to hold harnesses or other needed accessories. Other plusses are you can build it as you see fit and you don't have to go with something pre-made and possibly not suitable for your uses.

One cautionary note—if you build one of these power packs, make sure the toolbox you use is made of heavy gauge polyethylene—especially if you use a larger box to house more or larger batteries. The cheap \$7 to \$10 toolboxes readily available at discount stores (Wal-Mart and K-Mart) just will not stand up to the weight of the batteries—my finished pack weighs in at just under 40 lbs. Either the box will crack open spilling the batteries and tearing out the wiring or the handle will pull off the box itself and the whole thing will fall. Believe me, you don't want your toes under those batteries if they do fall!

CLUB PROJECT? 75 METER AM TRANSCEIVER RIG



This project is a frankly nostalgic look back at our hobby of 50 years ago. It's now been updated using all modern components.

Features:

- Board size 3.5" x 5.27"
- Tunable Receiver- 50 kHz, selectable, varicap-tuned
- 4 kHz receiver crystal filter
- Room-filling speaker volume
- Crystal-controlled Transmit- 3885 kHz supplied
- Board pads for 2nd crystal frequency, remotely switchable
- Transmitter output power: 2.5W carrier/ 8W peak
- Transmit and Receive ALCs
- Uses readily-available and inexpensive dynamic mics
- Built-in Alignment function

Ordering: \$65 (US/Canada), \$70 (all others)- includes shipping- via PayPal to nn1g@earthlink.net

or check/money order to:

Small Wonder Labs, P.O. Box 187, Newport NH 03773 USA

Our product line:

- CW Transceivers: [The SW+ series](#)
[The RockMite Series](#)
- PSK31 Transceivers: [The PSK Series](#)
[The 'Warbler'](#)
- AM Transceivers [The 'Retro-75'](#)
- Accessories: [The Freq-Mite](#)

K9HI ANNOUNCES ARRL SECTION MANAGER CANDIDACY FOR 2011-2012 TERM

Phil Temples, K9HI has announced that he will be a candidate in the upcoming ARRL Eastern Massachusetts Section Manager election to be held this fall. Temples announced his candidacy at recent meetings of the Boston Amateur Radio Club and the Framingham Amateur Radio Association.

"I will release additional information over the next sixty days outlining my current concerns, planned changes, and future goals for the section field organization," said Temples.

A veteran Section Manager, Temples held the SM post from 1994-1996, and again from 2001-2004. He has served in a number of ARRL leadership roles ranging from Public Information Coordinator to Affiliated Club Coordinator. In the 1990s, Temples served nationally on the League's Public Relations Advisory Committee. At present, K9HI is an Assistant Director in the New England Division; he is also an active volunteer instructor for the Courage Center Handiham program based in Golden Valley, Minnesota.

"I'll be happy to make myself available to comment and answer questions at club meetings, should clubs wish to learn more about my goals or the role of the Section Manager," Temples added.

Temples, an Extra class licensee, has been a radio amateur for 40 years. He lives in Watertown, Massachusetts. A biography of Phil Temples' Amateur Radio achievements can be found at <http://www.qrz.com/db/k9hi>.

Official nominations for the Eastern Massachusetts SM position will be

solicited beginning in July. If contested, ballots for an election will be mailed to all ARRL section members on October 1, 2010. The new term of office will begin on January 1, 2011.

The Section Manager is accountable for carrying out the duties of the office in accordance with ARRL policies established by the Board of Directors. The SM recruits, appoints, and supervises section-level staff to administer the field organization's principal areas of responsibility in the section. These areas include, but are not limited to: emergency communications, message traffic relay, technical activity / problem solving, volunteer monitoring, government relations, public relations in the general community, information services for amateurs, and cooperation with affiliated clubs. For additional information about the role of the ARRL Section Manager, see <http://www.arrl.org/FandES/field/org/sm.html>.



Greetings All,

Thank you to those of you who attended the Field Day meeting Sunday morning. The next meeting is scheduled on May 16, Sunday at 10:30 AM at the CAARA Communications Center at 6 Stanwood St. Gloucester. To ensure I have accurate email addresses for the Field Day Team please send your email address to me at Slvrspur1@comcast.net.

Thanks and 73,

jim mondello jr, w1ddx

Field Day Chairman

FCC Seeks Comments on Newly Proposed Rules for Amateur Radio Operators and Emergency Drills

To all radio amateurs
In March, the FCC released a Notice of Proposed Rulemaking (NPRM) that proposed to amend the Part 97 rules governing the Amateur Radio Service. The new rules would provide that, under certain limited conditions, Amateur Radio operators may transmit messages during emergency and disaster preparedness drills, regardless of whether the operators are employees of entities participating in the drill.

On April 22, a summary of the NPRM was published in the Federal Register and the FCC is seeking comments on it. Comments must be filed on or before May 24, 2010 (30 days after publication in the Federal Register); reply comments must be filed on or

before June 7, 2010 (45 days after publication in the Federal Register).

The NPRM is available on the web in PDF format at, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-45A1.pdf.

New Radio for Cuba

During the 8th Congress of the Cuban Ham Radio Federation (*FRC*), recently held in Cuba, was presented a prototype of radio transceiver, with the brand name *Caiguaran*.

The simple design of the *Caiguaran*; 20 watts power level; work in the 160 meters; and with the adding a device, can also work in the bands of 80 and 40 meters.

Pedro Rodriguez CO2RP, Chairman of the *FRC*, told to a Cuban News Agency, that the first 600 units of *Caiguaran* are ready for delivery to the Cuban Amateur Radio Operators.

This prototype of Radio transceiver can help to support emergency communication in Cuba.



CAARA would like to welcome these new members into our club.

Robert Cook- KB1TQZ

Ken Ekstrom- KA1OH

Pete Chadbourne- No callsign yet

Marco Carnovale- KB1TZG

Marianne Brinker- KB1TEO

Amateur radio satellites to launch early May

The secondary payloads on the Indian PSLV-C15 launch, currently slated for May 5, will be two Amateur Radio CubeSats along with a Norwegian satellite.

One of the CubeSats, **STUDSAT**, was built by Indian students and will operate on 437.505 MHz, further details at

<http://www.southgatearc.org/news/january2010/studsat.htm>

Daniel, VA3KKZ, has posted this information about the other Amateur Radio CubeSat **TIsat-1** and the Norwegian Defence Research Establishment **AISSat-1** on the AMSAT bulletin board:

The Space Flight Laboratory (SFL) at the University of Toronto Institute for Aerospace Studies (UTIAS) would like to announce the delivery of Nanosatellite Launch Service 6 (NLS-6) cluster payload to Satish Dhawan Space Centre in Sriharikota (SDSC-SHAR), Andhra Pradesh, India, for launch on board PSLV-C15.

PSLV-C15 will be launching from the First Launch Pad at SDSC-SHAR into 637 km sun-synchronous orbit with 10:30 Local-Time of Descending Node. NLS-6 shares this launch with Cartosat-2B primary, Alsat-2A co-primary, and STUDSAT auxiliary payload.

NLS-6 is the 6th launch by SFL. The NLS-6 cluster comprises of two nanosatellite: AISSat-1 and TIsat-1.

NLS-6 launch updates are being posted to

<http://www.utias-sfl.net/NLS-6/>

About AISSat-1

AISSat-1 is built by SFL for the Norwegian Defence Research Establishment (FFI). It is intended to demonstrate a new maritime AIS receiver that has been developed by FFI. The AIS receiver will be used to monitor ship traffic in Norwegian waters. The design of AISSat-1 is based on SFL Generic Nanosatellite Bus (GNB).

The spacecraft has a main structure measuring 20 cm by 20 cm by 20 cm and it is stabilized in three-axes using reaction wheels. It has a fixed 46 cm long VHF payload monopole antenna for the AIS receiver and four UHF uplink monopole antennas for the command receiver. The downlink is in the S-Band. AISSat-1 has an overall dimension of 80 cm by 45 cm by 37 cm and an overall mass of 6.5 kg. AISSat-1 will be secured to the launch vehicle using the XPOD GNB separation system.

AISSat-1 is not an amateur satellite and, as such, has coordinated appropriate frequencies. Its ground segment is located at Svalbard and its control centre is at FFI, near Oslo, Norway.

More information on the spacecraft can be found at

<http://www.utias-sfl.net/nanosatellites/AISSat-1/> and

<http://www.spacecentre.no/?module=Articles;action=Article.publicShow;ID=51389>

About TIsat-1

TIsat-1 is a 1 kg CubeSat of 10 cm by 10 cm by 10 cm and is built by students and staff at University of Applied Sciences of Southern Switzerland (SUPSI). The primary mission objective is to involve students in systems engineering, development and test with a very challenging project and to provide students and staff at SUPSI with space mission knowledge. TIsat-1 will monitor the durability of material probes exposed to space environment, will test a micro electromechanical device and will validate the redundant, fault tolerant hardware and firmware design of the bus.

Two monopole antennas (VHF and UHF) will be deployed after separation. Housekeeping and payload data will be communicated to the ground as orbital data profiles. TIsat-1 will be secured to the launch vehicle using the XPOD Single separation system.

TIsat-1 communicates over amateur radio frequencies, as coordinated through the IARU, and they have been

working with radio amateurs in Switzerland during the spacecraft's development. They have a Morse Code and data beacons. More information can be found at <http://www.spacelab.dti.supsi.ch/tiSat1.html>

Future Launches by SFL

SFL has signed its 7th launch contract with ANTRIX for NLS-7 in late 2010/early 2011. NLS-7 will launch the twin-satellite CanX-4 and CanX-5 formation flying mission.

SFL will be signing its 8th launch contract for NLS-8 momentarily, for the launch of two astronomy nanosatellites: BRITE-Austria (CanX-3A) and UniBRITE (CanX-3B). NLS-8 will also launch one partner spacecraft.

In addition, SFL is under discussion for NLS-9, NLS-10, and NLS-11 launches in 2011/2012 time frame, and would like to extend an invitation to spacecraft developers world-wide to join our launches.

Selecting a Multi-Band Vertical ..a long but very informative article...

HF Vertical antennas have long been popular with hams and for good reason. They can be very effective antennas for their size, and have the advantage of taking up very little space. The typical vertical radiates at a low angle of elevation, usually the most effective angle for working extended ground wave and for working DX when skip is in. All verticals work against a ground or a ground image. The ground or ground image serves as the necessary reverse half of the antenna. (By way of illustration, the classic dipole antenna has two sides fed in opposite phase, usually by coax cable. In a simple dipole, one side of the antenna is fed by the center of the coax, the other by the coax shield. All real world antennas need two opposed sides so that the feed line, usually coax cable, can drive them. For verticals, the opposed side to the coax center lead may be the earth if the antenna is ground mounted and used with radials, tuned radials if elevated, or some form of counterpoise. When considering vertical antennas, a good way to think of the ground image is like a mirror, with the vertical antenna rising from the center of it.

The coax center goes to the vertical, the braid of the coax is attached to the ground side. The ground may

be nothing more than a metal rod pounded into the ground plus the shield of the coax feeding the antenna, which capacitively couples to the earth it is lying on. But such grounds are very poor, like a very dark mirror, letting your RF energy be wasted in the earth as ground losses instead of transmitting it into the air. What is desired is a good ground system that will reflect the RF into the ionosphere. For ground mounted antennas radials are the only realistic way to achieve a good ground system.

For some reason several manufacturers' marketing departments have spent a great deal of money marketing "No-Radial" verticals. Indeed, they have tried to turn "radial" into a dirty word. They propose to modify the laws of physics in suggesting that their vertical antennas need no ground. But all vertical antennas need a ground to work against, and the better the ground the better the performance. Why do they trash this time honored antenna technique that gives outstanding results and requires a hour or so of work to install in such a way that it is invisible to the eye and lawnmower? Clearly, to obtain market advantage for their products. Their antennas do have a ground - the mounting stake pounded into the ground, and the coax running on the ground to the antenna.

Consider this: virtually every AM broadcast station on the air today uses a vertical with a well developed radial system. These are stations designed by professional engineers who use lab grade field strength test instruments. If the radio station's customers don't hear the station they are out of business. So they use radials. If a better antenna design existed they would use that instead.

Surely, some amateurs have limited space for an antenna, and an extensive radial system is not possible. But there is almost always a way to install an effective vertical one way or another that makes provision for a decent ground. In return, the operating benefits of a good antenna installation are most rewarding.

A "no radial" vertical will work people - sometimes even some pretty good DX - but a well designed vertical working against a good ground system is a substantially better antenna. A good ground - a bright and shiny mirror - has good conductivity and dielectric qualities, and serves to reflect and thus radiate the

power fed to it. It is an active partner in the radiation of the RF energy from the transmitter. A poor ground, on the other hand, is a silent partner - it sucks up resources and gives little or nothing back in return, other than perhaps a good match to the transmitter. (A poor ground can also lead to RFI problems, such as TVI, telephone interference etc.)

Offering a good match to the transmitter is not the same thing as radiating RF. Far too many newer hams have been lead to believe that because an antenna has low SWR all is well. A vertical with a poor ground is entirely capable of offering a perfect match to the transmitter, with 1:1 SWR, yet with the ground absorbing much of the RF and turning it to heat, cooking earthworms perhaps but emphatically not radiating into space.

The same is true of a vertical of inefficient design in the antenna itself. Engineering analysis has proven that an inefficient vertical antenna needs only an inefficient ground, and that a superior ground under an inefficient vertical will not significantly improve its performance. This fact has proved a blessing to those antenna manufacturers who advertise their antennas as needing no radials.

This, by the way, also explains one brand of verticals that actually advertise their products as being “quiet” antennas. The antennas are quiet because they are horrendously inefficient and ineffective! (The company making these claims quotes from product reviews in several smaller ham magazines about how quiet and how effective their antenna was in tests. Curiously, they don’t quote the review of the same antenna published in the world’s largest ham radio magazine, which pointed out that the antenna was strangely DEAD on several important bands, both receiving and transmitting, even though that company advertises heavily in that magazine.)

Verticals have a reputation of being “noisy” antennas - and so they should - a good vertical receives signals from all directions, unlike antennas with definite patterns, such as yagis, quads or even dipoles. If a vertical is “quiet” something is wrong. Even if the SWR is good.

If you live along the east coast, working a log-full of European and African DX is no big deal, even with

an inefficient “no radial” antenna. After all, there are easily a hundred DXCC countries little further from you than California, and with a path that is mostly salt water, frequently over easier north/south paths. But if you live in the dryer parts of the west, over thin and rocky soil, such antennas are guaranteed to lead to DX’ing frustration. East or West, there is no valid reason not to try to put up the best antenna you can, and if it is to be a ground-mounted vertical then you should try to get the best ground system under it you can reasonably manage.

What constitutes a decent ground? The ideal ground is considered to be 120 radials, of half a wavelength long, equally spaced around the antenna. Of course few can manage such an ambitious approach. A good ground would consist of 15 radials 1/4 wavelength long, using the wavelength of the lowest frequency band to be considered. An acceptable ground can be made of 8 radials at least 1/8 wavelength long - which would be only 16 feet on 40 meters. And even three or four radials of 10 feet or more is a good deal better than the casual stake in the ground. But putting down more radials will be well worth the effort, even if some of them can not be as long as others. More is better.

Ideally the radials would radiate from the base equidistant in spacing. But in reality the radials will work fairly well anywhere they are put. Bending a radial around a corner, a tree, the doghouse etc. or running it next to the driveway are all perfectly acceptable variations. Radial wire can be any copper wire from about #20 and larger, insulated or bare. Aluminum or steel wire will work, but are harder to get good connections with, and tend to corrode more rapidly.

Radials need not mess up a lawn either. A little trick works wonders - if you are putting down a radial system in a lawn, purchase some very large nails at the hardware store, preferably at least 4 inches long. Put a turn of radial wire around a nail, press the nail all the way into the earth. Draw the radial out perhaps ten feet, take a turn around another nail, lay it on the grass and pull it tight, then press that nail into the dirt. Draw the remaining wire out further, put another nail in, etc. If necessary, in between nails push in wire staples, perhaps cut and bent from a few inches of the wire from old coat hangers, to hold the wire tight to the

ground. If done right, within about 6 weeks the radials will disappear into the thatch and will never bother the lawn or lawnmower.

A recent design effort by several manufacturers has involved adding a limited counterpoise as a standard part of the antenna. Such a counterpoise generally consists of a few rods or tubes perhaps six or seven feet long radiating horizontally from the antenna. The idea behind this is to capacitively couple with the real earth below. While such a counterpoise is definitely better than nothing, they do present several problems. For one, they are limited by the quality of the earth below them. Damp, loamy earth gives far better results than does sandy or rocky dry soil. Regardless of the soil quality, such a counterpoise works better for the higher bands than the lower bands, where it becomes progressively less efficient.

Another problem is that because of the variable nature of the soil the antenna is above, some tuning of the antenna will surely be required, even though the manufacturer is trying to keep the antenna installation extremely simple. However, lossy antennas with poor grounds may not require tuning for good SWR - the losses mask the matching problems - and also the weak signals. In such cases, the manufacturer's marketing department tries to make lemonade out of a lemon by calling the product "quiet", and bragging that their antenna requires no tuning.

When considering a "no-radial" vertical, remember - virtually every AM broadcast station uses verticals with radials - lots of radials. If professional broadcasters with years of research and experimentation behind them thought there was any better way to build a vertical than to use radials, they would certainly do so. Don't be confused by gobbledygook buzz words like "elevated asymmetric feed." If that is so good, why isn't it used by professional broadcasters? Answer - it isn't.

Verticals With Traps

Most hams prefer to work multiple bands. When antenna possibilities are limited, this indicates a multi-band antenna. Unfortunately for the user, the most common design approach for multi-band antennas is to use traps. A trap is a combination of a coil and a

capacitor. The combination is designed to prevent RF above the trap frequency from passing through the circuit, while RF below the frequency can move through.

This sounds great, but unfortunately traps force serious compromises. For one thing, ALL traps are lossy. The ARRL Handbook states that traps attenuate RF between .5 and 1.5 db for every trap RF passes through. Consider for a moment a 40 - 10 meter trapped vertical, with traps for 10, 12, 15, 17 and 20 meters. The antenna should work well on 10 meters - on that band it is full size and there are no traps. But on say 20 meters, the RF has had to pass through the 10, 12, 15 and 17 meter traps. If the traps are "efficient" and only attenuate .5 db each, then your signal has lost 2 db - almost half your power! But if the traps are inefficient, you can lose as much as 6db - 75% of your signal! Wasted. And in a vertical, this loss is before we even get to grounding problems! Always remember, especially when reading expensive four color advertisements, that the term "High Performance Trap" is a classic oxymoron, like "Jumbo Shrimp".

Worse, that is not the entire problem with traps. Since each trap includes a coil, the antenna is physically shortened for the lower frequency bands. A full sized quarter wave vertical for 40 meters is about 33 feet high. But a trapped multiband vertical such as described above is typically somewhere between 15 and 18 feet high. While being physically more compact can be an advantage in some cases, it also inevitably means that the antenna is significantly less efficient, even ignoring trap losses. Further, all else being equal, the bandwidth is considerably narrower. And, being shorter, the antenna does not stick up as far, which means in turn your transmitted RF is more likely to get squirted into the trees, the powerlines, the neighbor's VCR etc., and not over the horizon into the DX station's log.

Another significant disadvantage of a trapped antenna is that the radiating part of the antenna is always at the bottom. The RF travels up the antenna from the coax feed point until it reaches the trap appropriate for that band, and stops there. So on 10 meters, the bottom of the antenna up to the first trap is hot, the rest cold, RF wise. On 15 meters, the RF passes through the 10 meter and 12 meter traps and travels up to the 15 meter trap and stops there. All the length of the

antenna above that point is wasted for that band. But it would be better if the antenna could radiate at the top - clearer of trees, houses, TV feeds etc. But trapped antennas simply can not give you that option.

Taken in sum, traps are a poor way to design a multiband antenna. Traps are lossy, narrow the bandwidth, and on most bands do not fully utilize the full physical length of the antenna. There are other issues, such as impedance matching, that come in to play as well with trapped verticals, however we suggest you modestly avert your eyes, shudder, and move on.

But for the designer of trapped multiband verticals, all is not lost. Remember from above, research has demonstrated that having a significant ground system under a shortened antenna is a waste anyhow. A rather reliable rule of thumb is that the radials need be no longer than the vertical is high. Since the ground makes the image the vertical requires, the antenna only needs and can only use an image as good as the vertical radiator. A short, lossy antenna needs only a small and lossy ground - it simply can't do much better with more.

Clever marketing departments immediately jumped on this - "Since we have an inherently lossy antenna that won't work any better with a decent ground, we can offer it as a 'No Radial' antenna! And without a decent ground, we can get better bandwidth too!" And so they did. (A good ground actually narrows the bandwidth, because the efficiency is higher. For a complete technical explanation of this and some other points briefly touched on here, see our Tech Notes entitled "Dirty Little Secrets" for a more exhaustive explanation.)

The Low Bands

For most hams, working bands like 80 and 160 meters is going to require something of a compromise in antenna size. But if shorter antennas were all that great, as some manufacturers would have you believe, the big guns on 80 and 160 would be using an eight foot whip with a big coil attached. Trust us on this - they don't.

Still, selection of a multiband vertical antenna based

on the physical length of the antenna can be a major mistake. One commercial antenna for example is 45 feet tall. But that antenna has a feed point well above the base, so that the portion below the feed point is actually a part of the ground system, and the actual length of the radiating upper portion is significantly less. Also, that antenna brags about having "no radials", but states that a counterpoise of three wires of 57 feet each is required. But even though the wires are called a counterpoise instead of a radial system, they still are a radial system. And a pretty poor one at that. So, even though the antenna is taller, which is good, the efficiency is poor, which is bad. Adding more radials would seemingly make it work better, but the manufacturer tells you that more radials, sorry - counterpoise wires - in fact hurt the antenna. Which in reality confirms its very poor efficiency. But at least that antenna has a well deserved reputation of being "quiet." And that's why.

Another well known brand of vertical, featuring "high-efficiency" traps, offers an 80 meter add-on to the top, bringing it to over 34 feet tall. This antenna configuration too requires several counterpoise wires. So, not only does it suffer from a poor ground, but 80 meter rf must pass through SIX traps. These traps are an rf killer, "high efficiency" or no. But here again, an antenna of poor efficiency coupled with a poor ground gives a good match for good SWR, good bandwidth - and lousy performance.

A Better Way

Could there be a better way to design a multi-band vertical?

WØDN, Don Newcomb, then a professor at a major midwest university, thought so. Don developed and secured several patents on what is a truly superior design - the Butternut vertical. Don's patented antenna design is entirely different from other commercially offered vertical antennas. He started with a basic vertical, 26 feet long, and instead of festooning and limiting it with traps, he designed a multi-band matching network whose sole purpose is to match the 50 ohm coax to the antenna. Don's unique design uses the whole antenna to radiate on each band, with the exception of 6 and 15 meters, which will be discussed later.

This means that all of the antenna radiates on each band instead of a portion, as with the other allegedly comparable antennas offered. And, with the whole antenna radiating, the RF reaches the top of the antenna, instead of being choked off by lossy traps further down. Even though the physical length of the antenna is shorter than some competitive antennas for the low bands, the trap free design when coupled with a decent ground make it more than competitive on the bands.

There are other significant advantages too - being trap free the SWR bandwidth is considerably enhanced, even though an efficient ground serves to reduce it. (Which makes an interesting conundrum - a longer antenna has more bandwidth, but a more efficient ground narrows the bandwidth - the end result is that the bandwidth of an efficient antenna and an inefficient is often about the same. The only real difference then becomes that the efficient antenna radiates far more power than the inefficient antenna. Which would you want?)

At the higher bands the real length of the antenna exceeds 1/4 wavelength so that the angle of radiation is lower, enhancing DX performance.

The matching network used is an ingenious combination of high-Q coils fabricated from large diameter aluminum wire, and heavy duty high voltage ceramic transmitting capacitors. Needless to say, there are no traps, "high performance" or otherwise. Traps cause loss. Period.

On the Butternut vertical, for 15 and 6 meters a different approach is used. Decoupling stubs run parallel to the antenna, which result in the antenna radiating as a slightly extended, full-sized, trap free quarterwave vertical on fifteen meters, and as a 3/4 wavelength vertical on 6 meters.

The ingenious Butternut design lends itself to several different methods of mounting and installation. The antenna can be mounted above ground on a roof, and if that is the best solution a complete accessory roof mounting kit is offered. Also, roof mounted antennas require tuned radials for best efficiency. A compact set is offered as an option, but the manual accompanying the antenna describes the simple steps to make your own. Alternately, pieces of wire cut to length will do

very well, and again complete instructions are offered in the manual.

Perhaps the most common installation method is ground mounting. With Butternut verticals, it is very simple - a 24" tube is pounded into the ground, and the antenna is mounted on top of it. No guy wires are required. Radials are placed on the ground radiating from the base of the antenna, and are attached to it. If the radials are properly installed (see above) they soon disappear into the thatch of the grass and the resulting installation will offer many years of superb performance.

Another way the antenna can be installed is with the accessory Counterpoise Kit. The antenna is mounted on a post or mast so that the base of the antenna is about seven feet above ground. The counterpoise assembly is mounted immediately below it. Any counterpoise must be considered a compromise for any vertical HF antenna, and if a proper radial system or a roof mounted installation with tuned radials is possible that would be the preferred approach. But when that is not possible the Butternut counterpoise creates a fairly effective artificial ground that still easily outperforms the "no-radial" and trapped antennas, even with their built-in counterpoises.

It should be noted that in the last year or so other vertical manufacturers have begun singing the praises of counterpoises so that they can retain their "no radial" design purity. One example is particularly ludicrous - where the manufacturer offers an 80 meter kit that calls for several "counterpoise wires placed on the ground around the antenna." To any casual observer these would look like radial wires but since the associated antenna is widely promoted as a no-radial vertical clearly they can't be radials. So instead we put a fig leaf over them and call them counterpoise wires. Right?

In any case, that design, even though it uses radials, has so many traps its performance on the low bands in particular is very limited.

For most users, what is the problem with radials? Especially when they add a considerable boost to your signal? True, in a few installations any significant radial system simply is not practical for reasons beyond the control of the operator. But even in such a

setup Butternut verticals will work as well and usually outperform the no-radial designs, thanks to the trap free design that allows the whole antenna to radiate. An antenna with no radials is clearly better than no antenna at all, but if properly designed it will always work better with a radial or counterpoise system.

So OK. Instead of a Butternut you elect to put up a “no-radial” antenna and make it work better with radials. Right?

Maybe, maybe not. Indeed, probably not. How come? The problem here is that frequently the designer of the “no-radial” antenna was able to achieve a decent match and SWR on the amateur bands only thanks to the losses and poor coupling to ground inherent in his or her design. Adding radials to such an antenna improves the efficiency, and suddenly the losses that insured a good match start to disappear. The antenna impedance changes, beyond the controllable range of the tuning network. But not to worry - the manual for such antennas usually specifically tell you not to add radials - they warn you that the antenna will not tune - they just don't tell you why.

One last point to consider - all Butternut HF verticals work on 80 meters and can additionally be used on 160 meters with the accessory Butternut 160 meter Top Band Resonator. Only a few “competitive” vertical antennas operate on 80 meters even with accessory kits, and fewer still operate on 160.

There is a lot of gobbledegook around about multiband vertical antennas, most of it from manufacturers who are trying to gain sales by claiming to defy the laws of physics. Most of these claims are better suited to fertilizing roses rather than educating potential customers. They rely on a sad reality - almost any amateur who puts up their product will hear signals and work people, and then think he got his money's worth. He is excited, and tells all his friends what a great antenna he has. What that amateur does not realize is that other products that cost no more money will far outperform what he got snookered into buying, simply because he has no basis for comparison.

Another marketing technique you will see in the ads is comparing a certain vertical against another unnamed product, of course making the advertised product out to be far superior. And so it might prove - there have been some dreadful products marketed at one time and another, long since discontinued. Further often they have been in use for years, quietly deteriorating in the weather, and are fed with waterlogged coax. Then a new antenna with a new feed line is put up near by for the purposes of “A/B” testing. That it works better is then used in the advertisements to suggest that the advertised product is clearly better than ALL other such antennas. It should appear obvious that is probably not so.

If HF verticals without radials were as good as HF verticals with radials, Butternut would certainly manufacture such a product. After all, Butternut has been manufacturing verticals for over 20 years. No-radial verticals aren't rocket science. Anyone can make a lossy, low efficiency antenna. We know better - and so should you. If you purchase a Butternut vertical, and go to the trouble to install it properly, you will have installed the best multi-band design presently available, and the one that will give you the best results for years of trouble free operation.



A photo from Nearfest Fleamarket...Joe-K1JEK ,who manufactures Cobra Antennas, was installing a sample up in the tree and mangad to have the feedline drop right on top of some electrical lighting wires....A good picture of how not to do it!



I went up to Nearfest Friday at 9am and within one hour after opening this is what the Fairgrounds looked like. Excellent weather, good food, lots of ham gear, and the chance to have an eyeball with hams you talk to on the air.

