CAARA Newsletter

AN ARRL AFFILIATED CLUB JANUARY ISSUE- 2009

SPAR Announces Winter Field Day 2009

Greetings all- I hope your holidays are full of warmth and wonder and that good health and fortune follow you all throughout the New Year (and may the bands open up too)!

Field Day is perhaps the most popular of the many activities enjoyed by Amateurs. Every June the bands come alive with improvised signals proving the ability to respond to emergencies. The event also offers an opportunity for camaraderie and a chance to test ourselves in less than ideal circumstances, however, emergencies and natural disasters don't always happen in the summer. Winter winds, icy limbs and bitter cold replace the thunderstorms and blistering heat of summer. To test our abilities to operate in the winter, in 2007 SPAR established a Winter Field Day event and invited all Amateur Radio operators to participate. In both 2007 and 2008 the event was enjoyed by many and considered a success and has been designated an annual event to be held the last full weekend each January. Therefore it is time to issue the invitation for the Third Annual SPAR Winter Field Day!

The 2009 WThe object of the event is familiar to most Amateur Radio operators: set up emergency-style communications and make as many contacts as possible during the 24 hour period. The rules encourage as many contacts on as many bands and modes as possible, because during a real emergency, the most important factor is the ability to communicate, regardless of band, mode or distance.

Mark your new calendars for the weekend of January 24 & 25 and make plans to stop by the clubhouse and help us operate "Winter Field Day!" This is the third annual WFD sponsored by the Society for the Preservation of Amateur Radio (SPAR) and is load of fun in the middle of the Winter doldrums. We're doing this with a minimum of planning and mostly for fun and camaraderie, and we want everyone to stop by and nail a few QSOs with us at the CW, Phone, or Digital operating positions. While you're there, the kitchen will be open, the coffee pots full, and who knows what will be served for breakfast on Sunday. How can you miss a deal like this?

For more info: visit the SPAR website at: http://www.spar-ams.org/contests/winterfd/index.php

Hope to see old faces and new there. All are invited and please bring guests too! This is a great chance to show off Ham Radio to your friends and relatives. Who knows, maybe the bug will bite them too!

Briggs- AB2NJ

Hank-W4RIG was the guest speaker at the December Club meeting and hosted a roundtable on preferred techniques of grounding the ham shack/antennas. Many of the members in attendance explained how they grounded their station and radio towers and shared a little theory as well. Many articles researched by Hank were available and passed around to the group and as a bonus, a CD of all the articles was available free of charge to all those that attended the meeting.

Jon-K1TP brought along his tennis ball antenna launcher and showed it to the members and explained how he built it and where to get the parts.

Curtis-AA3JE will be presenting a "hands on" presentaion at the next meeting where all in attendancecan build a 2 meter J-Pole antenna.

Edwin Howard Armstrong, the father of FM

It's now the 75th anniversary of the development of Frequency Modulation by Edwin Howard Armstrong.

The story begins in 1904 when his father gave him The Boys' Book of Inventions and following year a publication entitled Stories of Inventors. At age 14 he told his parents he wanted to become an inventor.

Inspired by Faraday, Marconi and others, he experimented with wireless telegraphy, later holding the office of President in the Radio Club of America.

While an undergraduate at the Columbia School of Engineering in 1914 he created the regenerative circuit, using a triode tube invented in 1906 by Lee De Forest.

In 1917 he enlisted in the army signal corps to be stationed in France testing and developing radio equipment.

He returned home for a 19-year legal battle that ended with the regeneration method awarded to De Forest.

Armstrong had moved on, developing the superheterodyne receiver. Then he took out a patent for wideband FM on the 26th of December 1933.

In 1936 he set up FM stations and amazed the public by their broadcast quality. In 1940-41 he helped adapt FM for mobile military communications.

To keep his FM broadcasting dream going he started court action seeking unpaid royalty payments on FM radio receivers. Armstrong was financially ruined, depressed and he ended his life in 1954 aged 63.

His wife Esther continued the battle to gain millions of dollars for patent infringements.

Edwin Howard Armstrong, a genius, the father of FM, did more than anyone other individual to develop radio technology which the world enjoys today.

Ham Radio Flea Market- February 14, 2009
Algonquin Amateur Radio Club
http://www.n1em.org
Talk-In: 147.27+ (PL 146.2) & 449.925- (PL 88.5)

Contact: Tim Ikeda, KA1OS
c/o AARC
PO Box 258, Marlborough, MA 01752
Email: fleamarket@n1em.org

The Holiday Party was held Saturday evening on December 13th at the Pigeon Cove Circle hall in Rockport. Each member was asked to bring a covered dish to go along with the glazed ham that Curtis-AA3JE provided. The meal was outstanding as were the full compliment of deserts/beverages.
The door prizes included a 2 meter mobile radio, a MFJ antenna, a 2 meter walkie, 2/440 walkie, a packet terminal, a morse code key (remember them?), macadamia nuts, plants, etc.
The Yankee Swap was fun and plenty of good gifts and laughs were had by all. A great event for the club, if you missed it, mark your calendar for next year!

Our President, Curt, handled the door prize raffle with the help of our youngest member!

The Pigeon Cove Circle was a great spot to have the Christmas party with lots of club members and family in attendance.

Don 't Forget The Dipole Antenna..

The dipole antenna is very well known among the amateur community so this may be old hat to many. I am providing this page because the dipole antenna is often overlooked nowadays as an effective means to getting on the air. Many hams these days believe it is necessary to purchase an expensive commercial antenna or have a large antenna at great heights in order to be successfull at HF/VHF communications. On the other hand, when other simple antennas are constructed many of the designs chosen require an extensive ground system to be effective. The loss due to an inadequate return (ground) system can be substantial. For an inexpensive, low profile, high performance antenna the dipole antenna simply can't be beat. The dipole described on this page will not give you all band performance but I believe it is better to have a very good signal on one band rather then a poor one on all bands.

The word dipole has several different meanings depending on the audience and context in which it is used. In this text it will be assumed that a dipole is an antenna that is a resonant 1/2 wave in length. The word "dipole" being derived from the word "di", meaning double and the word "polo", meaning electric (or magnetic) pivot. Therefore, a dipole has 2 electric poles (at the ends) of opposite polarity at any given instance. A dipole can be fed with RF energy anywhere along its length although center feed is the most common followed by end feed.

dipoles are very easy to construct and they are guaranteed to work, even if they must be installed at low heights. They are independant of ground by nature and therefore require NO ground to properly function as an antenna. If fed in the center, no matching network is usually needed since the impedance is very close to that of standard 50 ohm coaxial cable although the impedance does very slighty with the height above the ground.

Some variants of the common dipole are the end-fed halfwave antennas such as the End-Fed Zepp (originally strung behind Zepplin airships), and the VHF J-Pole which simply uses a transmission line transformer instead of a tuned circuit to match the coax to the high impedance at the end of a dipole.

How to Construct a Dipole

1. First, find some wire. The gauge isn't critical although it should be strong enough to support its own weight without breaking. The thicker the wire the greater the operating bandwidth of the antenna. Also, some local codes may require a certain gauge wire for outdoor antennas. Often 12 AWG is required. If invisibility is a requirement then use as small as you can get away with. Insulated wire will work fine and in fact I recommend it.

2. Next you will need to cut the wire for the frequency at which you want to operate. The wire needs to be equivalent to a 1/2 wave in length of course and the tried and true formula below will get you in the ball park:

Length (feet) = 468 / Frequency (MHz)

or

Length (meters) = 144 / Frequency (MHz)

I usually add a enough extra length to these dimensions to account for whatever I need to wrap around the insulators. Using these dimensions the antenna will usually be close enough to the correct length to work well even without manual pruning of the antenna for lowest VSWR

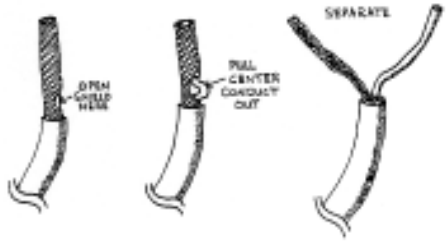
but sometimes other factors can influence the required length. For instance, insulated wire will cause the antenna to need to be a little shorter due to the added dielectric of the insulation. Also, proximity to the ground will create the same effect due to dielectric loading of antenna from the Earth.

3. Find a small sturdy tree or pole and run the wire around it once. Pull the wire around until both ends meet and stretch them tight. While keeping the wires tight, walk up the length of the wire until you reach to tree or pole. Cut the wire on the opposite side from the open ends. You now should have two equal lengths of wire.

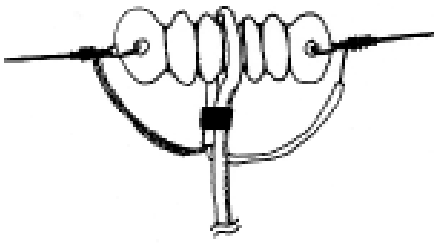
4. Find 3 insulators. Dog bone insulators are the easiest to use but just about anything with insulating properties will work such as plexiglass retangles with holes drilled in them, PVC pipe sections, cut-up sections of platic clothes hangers, or whatever else you can find. Just keep in mind the insulators should support the weight of the wire, withstand ultraviolet radiation from the sun, and not absorb moisture. If you plan on using anything greater then about 100 watts of power I would highly recommend high voltage insulators designed for the purpose at the ends of the dipole. The center insulator will only have a small voltage across it and therefore isn't nearly as critical.

5. Now strip, if needed, enough wire to wrap around each insulator and wrap several turns around back onto itself. There should be a wire attached to each end of the center insulator and one insulator to the end of each free wire.

6. This version of the dipole will be fed with coax cable. For 100 ft runs or greater choose RG-8 or similiar for 14 MHz and above and RG-58 for below 14 MHz. For less then 50ft, RG-58 will be adequate for 30 MHz and below. RG-8M style coax will be adequate for up to 100 ft lengths below 30 MHz. Prepare the antenna end of the coax by first cutting the vinyl off of above 4 inches of the end of the coax. Next, with some needle nose pliers reach in between the braids of the outer shield and grap the center conductor and its dielectric. Do this near where the vinyl starts again. You should be able to pull the center conductor out from within the shield. This should leave you with two seperate conductors.



7. Some sort of strain relief should be provided for the coax. My favorite method is to simply wrap the coax around the center insulator once and TyWrap or tape the coax back onto itself. The two stripped ends of the coax will now be hanging down. Solder one conductor to one antenna wire and the other conductor to the other wire. Besure that the points where the antenna wire wraps around itself near the center insulator is soldered too. Since a large amount of current flows in the center of a dipole, it is very important to have low resistance and preferably soldered connections.



8. Water proofing of the exposed coax connections must be provided. Thoroughly spraying the connections with a sealant is the easiest.

9. Since this is supposed to be a simple antenna, I didn't include a balun in this design. A balun (balanced to unbalanced transformer) is often used to choke off undesired RF currents from flowing externally on the coax cable. This can occur due to the unbalanced nature of the coax. As long as the feedline is run a right angles to the antenna wire for about 1/4 wavelength or greater and the antenna length / coax diameter ratio is large there usually isn't much of a problem. However, at the higher frequencies where the antenna is shorter this can become a problem. My favorite simple method to reduce these stray currents is to simply coil up about 8 turns of the coax into about a 6 to 8 inch diameter circle up very near the antenna. You will have to be the judge to determine if the added weight at the center of your dipole is worth the effort.

10. To support your dipole you will need some rope to attach to the end insulators of your dipole. Wire can be used although it will capacitively couple to your antenna somewhat and may make tuning a bit of a trick. I prefer to use rope.

11. Now your antenna is ready to be strung up. It can be hung by the ends as a horizontal flattop, supported in the middle as an inverted-vee, or just about any other way you can get it up. Here are some rules of thumb to follow:

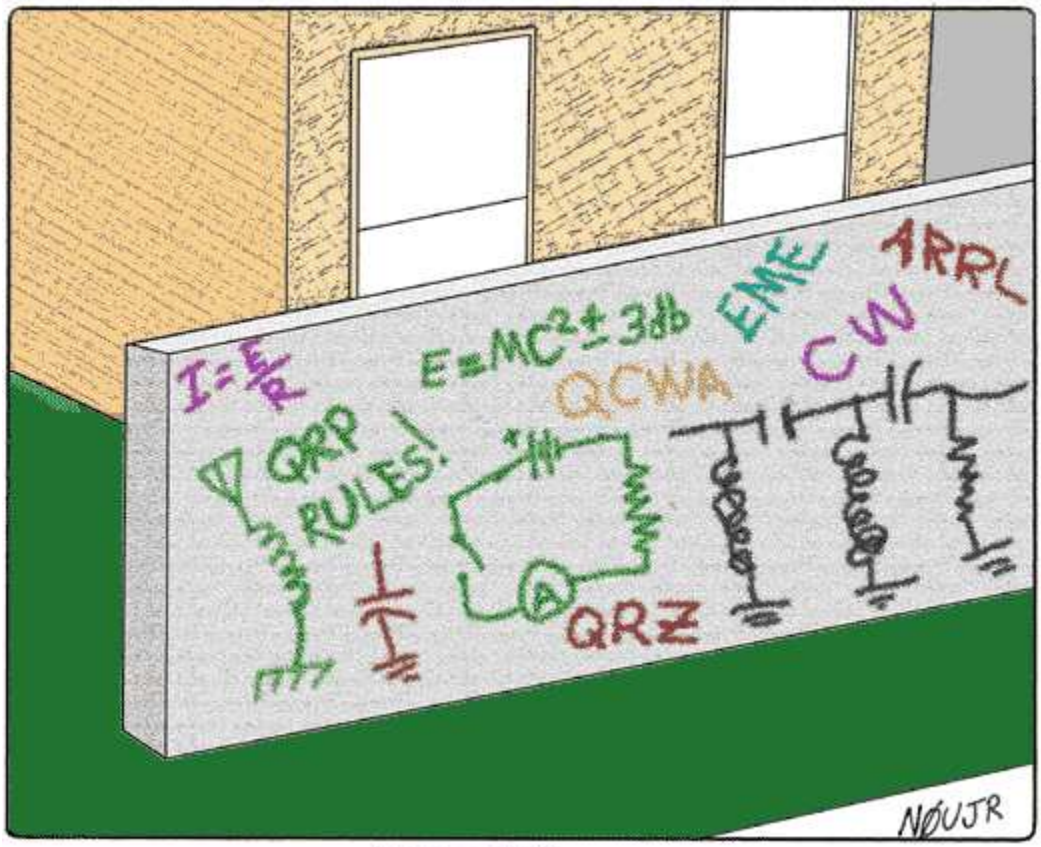
- Do NOT install your dipole ANYWHERE near power lines!
- Try to keep your dipole symetrical. This ensures that you are feeding it in the electrical center.
- The antenna may be folded to accomendate small lots but try to keep the bends shallow and no more acute then about 90 degrees. Fold the ends before you fold the center. The larger the center area, the greater the efficency.
- The higher the better for long distance work, especially at low frequencies.
- A low antenna can work very well on short paths on 10 MHz and below. This is called • NVIS (Near Vertical Incidence Scattering) and is a popular mode with the military and government.
- The dipole can be strung vertically although this would lend itself better to end feeding. For VHF use horizonal mounting for SSB and vertical mounting for FM.
- If you can't meet all of the above criteria, just put it up the best way youcan.

12. Now that your antenna is up, it's time to check its VSWR. While transmitting at the frequency that you cut the dipole for measure the SWR. If it is less then 2:1 it will perform fine and no one will ever notice a difference if you try to improve upon it. Your radio might. Some radios will reduce their power output if the VSWR goes much above 1.5:1. With a little length adjustment this should be easy to accomplish. Measure the VSWR at the ends of your band. If

the SWR is lower at the lower frequencies then it is too long. If it is lower at the higher frequencies then it is too short. Adjust the length at about an inch at a time until it is where you want it. If the antenna is too short simply attach a pig tail of wire at the end of each wire. Be sure to make the length adjustments to both wires at the same time. If for some reason the VSWR is still too high at its lowest point, try adjusting the height of the antenna. As mentioned earlier height will effect the overall impedance of the antenna.

13. Now that your antenna is all checked out be sure to solder the ends if needed so that they won't pull loose from the insulator.

Now get on the air and enjoy the really inexpensive antenna that you built!



Ham graffiti.

FCC CHAIRMAN MARTIN UNDER CONGRESSIONAL FIRE

A year-long Congressional investigation of Federal Communications Commission Chairman Kevin J. Martin is alleging egregious abuses of power. However it was unclear whether the nation's top telecommunications regulator broke any rules or laws during his leadership.

The report released on Wednesday, December 10th is titled "Deception and Distrust." It was led by Representatives. John D. Dingell who is Chairman of the Committee on Energy and Commerce, and Bart Stupak the Chairman of the Subcommittee on Oversight and Investigations. The report alleges that the FCC's Martin suppressed information and manipulated data to serve his agenda.

For some time, Chairman Martin has been criticized by his own FCC staff members for pushing his proposals to free up media ownership rules and pushing requirements for a la carte pricing of cable television. This, through such tactics as suppressing agency studies that do not support his plans.

FCC spokesman Robert Kenny said that the agency's review of the report indicated the it did not violate any rules, laws or procedures, but Congress will ultimately have the final say in this matter.

CAARA 2 year Historical P&L (e) & Approved Budget for 2009

	2007 Actual	2008 Budget	2008 Actual	2009 Budget
Dues	$2060	$2500	$2881	$2750
Donations	2357	1000	4367	1500
Coffee fund	1115	800	906	800
Interest		65	192	90
Fundraising	2107	1000	1409	1500
Miscellaneous			138	100
Total	$7639	$5365	$9893	$6740
Utilities	$2325	$2500	$2932	$3500
Insurance	300	500	273	550
Postage	90			100
Lease	200	600	200	1000
Supplies	1275	1250	875	1000
Miscellaneous	645	300	275*	300
Total	$4835	$5150	$4555*	$6450
Surplus	$2804	$ 215	($ 762)#	$ 290

*Not including $6100 for new roof # Including roof

The Russian Woodpecker was a notorious Soviet signal that was heard on the shortwave radio bands worldwide between July 1976 and December 1989. It sounded like a sharp, repetitive tapping noise, at 10 Hz, giving rise to the "Woodpecker" name. The random frequency hops disrupted legitimate broadcast, amateur radio, and utility transmissions and resulted in thousands of complaints by many countries worldwide.

The signal was long believed to be that of an over-the-horizon radar (OTH) system. This theory was publicly confirmed after the fall of the Soviet Union, and is now known to be the Duga-3 system, part of the Soviet ABM early-warning network.

History
The Soviets had been working on early warning radars for their anti-ballistic missile systems through the 1960s, but most of these had been line-of-sight systems that were useful for raid analysis and interception only. None of these systems had the capability to provide early-warning of a launch, which would give the defenses time to study the attack and plan a response. At the time the Soviet early-warning satellite network was not well developed, so work started on over-the-horizon radar systems for this associated role in the late 1960s.

The first experimental system, Duga-1, was built outside Mykolaiv in the Ukraine, successfully detecting rocket launches from Baikonur Cosmodrome at 2,500 kilometers. This was followed by the prototype Duga-2, built on the same site, which was able to track launches from the far east and submarines in the Pacific Ocean as the missiles flew towards Novaya Zemlya. Both of these radars were aimed east and were fairly low power, but with the concept proven work began on an operational system. The new Duga-3 systems used a transmitter and receiver separated by about 60 km.

The Appearance Of The Woodpecker
Starting in 1976 a new and powerful radio signal was detected worldwide, and quickly dubbed the Woodpecker by radio amateurs. Transmission power on some woodpecker transmitters was estimated to be as high as 10 MW EIRP. As well as disrupting shortwave amateur radio and broadcasting it could sometimes be heard over telephone circuits due to the strength of the signals. This led to a thriving industry of "Woodpecker filters" and noise blankers.

One idea radio amateurs had to combat this interference was to attempt to "jam" the signal by transmitting synchronized unmodulated continuous wave signals, at the same pulse rate as the offending signal. This idea was considered, but abandoned as impractical. Simple CW pulses didn't appear to have any effect. However, playing back recordings of the woodpecker transmissions sometimes caused the woodpecker transmissions to shift frequency leading to speculation that the receiving stations were able to differentiate between the "signature" waveform of the woodpecker transmissions and a simple pulsed carrier.

Identification Of The Woodpecker
Triangulation quickly revealed the signals to come from Ukraine. Confusion due to small differences in the reports being made from various military sources led to the site being alternatively located near Kiev, Minsk, Chernobyl, Gomel or Chernihiv. All of these reports were describing the same deployment, with the transmitter only a few kilometers southwest of Chernobyl (south of Minsk, northwest of Kiev) and the receiver about 50 km northwest of Chernobyl (just west of Chernihiv, south of Gomel). Unknown to most observers, NATO was well aware of the new radar installation, which they referred to as Steel Yard.

Even from the earliest reports, it was suspected they were tests of an over-the-horizon radar and this remained the most popular theory during the cold war. Several other theories were floated as well, including everything from jamming western broadcasts to submarine communications. The broadcast jamming theory was debunked early on when a monitoring survey showed that Radio Moscow and other pro-Soviet stations were just as badly affected by woodpecker interference as Western stations. More speculative explanations were also offered, claiming it was a system for weather control or even an attempt at mass

subconscious mind control.

As more information about the signal became available, its purpose as a radar signal became increasingly obvious. In particular, its signal contained a clearly recognizable structure in each pulse, which was eventually identified as a 31-bit pseudo-random binary sequence, with a bit-width of 100 µs resulting in a 3.1 ms pulse. This sequence is usable for a 100 µs chirped pulse amplification system, giving a resolution of 15 km (10 mi) (the distance light travels in 50 µs). When a second Woodpecker appeared, this one located in eastern Russia but also pointed toward the US and covering blank spots in the first system's pattern, this conclusion became inescapable.

In 1988, the Federal Communications Commission conducted a study on the Woodpecker signal. Data analysis showed an inter-pulse period of about 90 ms, a frequency range of 7 to 19 MHz, a bandwidth of 0.02 to 0.8 MHz, and typical transmission time of 7 minutes.

Disappearance Of The Woodpecker
Starting in the late 1980s, even as the FCC was publishing studies of the signal, the signals became less frequent, and in 1989 disappeared altogether. Today Google Map photography of the area shows that the antenna has been removed. The original Duga-3 site lies within the 30 kilometer Zone of Alienation around the Chernobyl power plant. It appears to have been permanently deactivated, since their continued maintenance did not figure in the negotiations between Russia and Ukraine over the active early warning radars at Mukachevo and Sevastopol. The antenna still stands, however, and has been reported to have been used by amateurs as a transmission tower (using their own antennas) and has been extensively photographed.

LEDs and smart lighting could save trillions

According to a recent paper by two professors at Rensselaer Polytechnic Institute a 'revolution' in the way we illuminate our world is imminent.

ScienceDaily reports that innovations in photonics and solid state lighting will lead to trillions of dollars in cost savings, along with a massive reduction in the amount of energy required to light homes and businesses around the globe, the researchers forecast.

A new generation of lighting devices based on light-emitting diodes (LEDs) will supplant the common light bulb in coming years, the paper suggests. In addition to the environmental and cost benefits of LEDs, the technology is expected to enable a wide range of advances in areas as diverse as healthcare, transportation systems, digital displays and computer networking.

"What the transistor meant to the development of electronics, the LED means to the field of photonics. This core device has the potential to revolutionize how we use light," wrote co-authors E. Fred Schubert and Jong Kyu Kim.

The ScienceDaily article says that in general LEDs will require 20 times less power than today's conventional light bulbs, and five times less power than "green" compact fluorescent bulbs.

The paper 'Transcending the replacement paradigm of solid-state lighting' by Jong Kyu Kim and E. Fred Schubert can be downloaded from http://tinyurl.com/6wnza7

Read the full Science Daily article

'LEDs And Smart Lighting Could Save Trillions Of Dollars, Spark Global Innovation'
http://www.sciencedaily.com/releases/2008/12/081217074908.htm

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FOR SALE/TRADE/WANTED/FREE

I am looking for tower sections, about 30 feet..contact Jon- K1TP@arrl.net

If you want anything posted here, just send an email with the info to any Board Member or K1TP@arrl.net

Presidents Corner:

Being president of CAARA is like being a member of the noble house of a very small and somewhat disorganized Balkan monarchy. (See "The Mouse That Roared" if you have no idea what this is like.) Every day is a surprise and most of them are delightful.

This December we got a small donation from the upcoming murder mystery movie "Hatteras Hotel".They needed radio equipment for props in the movie and we loaned them a few items. They returned them in good order and made a small donation to the club in appreciation of our efforts.

The Christmas party went off wonderfully (except for the hot cider which was AWFUL for some reason), and despite my anxiety owing to Linda's absence, club members and their spouses rallied round and we had wonderful food, good company and a grand time. The most sought after piece in the Yankee swap was the "COW CREAMER" which zipped around the room until it came to its final resting place.

January will bring Winter Field Day, and a few other contests. Come by and participate, the food is always great!

My own personal thanks go out to all the club members who called, stopped by, radioed, emailed and otherwise supported me during Linda's recent surgical adventure. She is recovering nicely, says that I rate only a low "C" as a privagte duty nurse, and she will be up and around in a few weeks, good as new.

EMCOM this month featured the SANTA PARADE and the ICE STORM. Be sure to come to EMCOM (third WED 730 PM) for a debriefing on the ice storm and ARES/RACES activity.

Till January, best wishes for a Merry Christmas and a happy New Year.

AA3JE - Curtis Wright

THEY CALL IT TREE POWER

Imagine being able to run a QRP station by powering it from a near-by tree. Sound strange? Well that's one of the possible uses for an emerging technology called tree power.

A voltage difference exits between a tree and the ground. Researchers have found that the metabolism of a tree works to maintain the voltage difference, whether it's day or night, rain or shine all year round.

Up to two volts is available, enough to trickle-charge a battery or power a wireless transmitter.

Tree-power will be helping to collect improved local climate data that is essential for computerized fire modeling.

The United States Forest Service is about to field test a tree-powered wireless network. It looks like being an alternative to installing intrusive solar panels in a forest.

The bio-energy source may have other applications too, such as border security and managing agriculture.

Could this lead to self-illuminated Christmas trees or even radio amateurs tapping in it for QRP operation.

Anyone pine for the day that this kind of energy becomes poplar?

HAM RADIO IN SPACE: L-BAND EXPERIMENT ON THE ISS

Another experiment using the ham station on board the International Space Station. From December 28th through January 3rd ARISS plans to reconfigure the on-orbit crossband repeater for test of its L-Band uplink capability, which, to date, has not been proven out. Plans call for an for an uplink of 1269.65 MHz and downlink on the standard frequency 145.80 MHz. The system will be in low power transmit. Given the substantial cable losses of the L-band system, ARISS hopes that some big gun stations on the ground will be able to penetrate through, keep up with Doppler, and make a contact. (ANS)