CLALLAM COUNTY AMATEUR RADIO CLUB

QTC
OCTOBER 2008

BV Rambles:

First let me thank those individuals who stepped up and offered to help out ARES with the NOAA radio setups at Wal-Mart, especially in Sequim where no one had volunteered until after our CCARC meeting. Thank you, I am sure Dan would have appreciated the support if Wal-Mart had not cancelled.

The October QST magazine had the major portion of it devoted to contesting, I especially like the article about K3LR (we showed the Icom video about his tremendous contest station in Pennsylvania). It was interesting to read how he got his start and the amazing amount of support he gets to build and keep his station running, talk about a team spirit.

Some of you have asked what happened to the Salmon Run for me. Bob and I had talked about getting as many new people over and operating, however Bob got the call to go help move a daughter to a new house and I had the Technician/General Classes to do. I had hoped a couple of guys from south and east of here would come up and operate but last minute work loads and family obligations worked against their operations. The rest of the weekend for me was spent digging post holes for 400 feet of chain-link fence to keep Riley, our dog, happy (and Karen and me also).

From Ward N0AX in the ARRL "Contest Update for October 1, 2008":
"So will Cycle 24 be the last cycle for analog radio technology? Given the rate of change we've witnessed over the course of Cycle 23, I'm betting that analog radio will be largely found on the same shelf where the 6L6 and modulation transformer now reside. To be sure, there will always be a home for analog technology in amateur radio, but it will no longer be the subject of cutting-edge product reviews and late-night post-meeting discussions before contest season.

With the certain knowledge of the coming changes, it is at our own peril we ignore them. It's time to start paying attention to those tutorial articles, demonstrations, and new product reviews. Radio-the-technology won't displace the enjoyment we receive from radio-the-art. As Cycle 24 emerges, opening bands long closed, we'll find new call signs on the air from unexpected places. Just as surely, we'll also find and enjoy new technology creeping onto our operating desks, replacing equipment long used, bit by bit."
This is something I had never given any thought to, but this is the decade to come we are talking about!

On the bright side of propagation, from the ARRL ARLP041 Propagation de K7RA: "This week NASA announced that 2008 so far is the "blankest year of the space age," with over 200 spotless days. The minimum following Cycle 18 in 1954 had 241 days without sunspots, and it preceded the solar max in 1959 for Cycle 19, which had the highest sunspot numbers on record." We can but hope!

Please remember Becky, W7RJW is our Net Coordinator. She says she is available anytime to take input on net functions etc. Please keep her in the loop as the saying goes.

Mark your calendars, the CCARC Christmas Pot Luck will be December 14th 1300. Where - St. Andrew's church in Port Angeles.

Thanks for the time and space. Chuck N7BV

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OCTOBER CLUB MEETING PROGRAM

"Why all of these Digital Modes"

That will be the subject of Octobers Ham Club presentation. The purpose isn't to convince you to use digital modes. Its purpose is just to make you aware of where Ham Radio may be heading. You will not be left behind.

First there was Spark Gap Transmitters. Then CW, AM, FM, Sideband, TV etc. Well, you may be left behind if you still want to use Spark transmission. But it may be time to think digital.

Christmas Party

David, KE7JEJ, and his wife Susanne advise they have 1pm on 14th of December at the St. Andrew's Church in Port Angeles booked for the CCARC Christmas Dinner. More to follow from the Christmas committee, however, keep this data open for the annual Christmas party event.

For Sale

Technician, General and Extra books available from Tom. Also CW training set.

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Fundamentals (Unit-7)
Resonance

Space is permeated with electromagnetic waves - Gamma, X-ray, visible light, radar, television, radio,…You name it. It's everywhere, 24/7. So how can we choose one specific signal out of the millions that are bombarding us?
The traditional approach has been to use a **tuned, resonant circuit,** and, just as traditionally, this has been accomplished by using the reactance characteristics of capacitors and inductors either in series or in parallel. But before we get started, let me define some terms.

C	**Capacitor measured in Farads (f)**
E	**Electromotive force measured in peak volts (V)**
F	**Frequency measured in cycles per second (Hz)**
I	**Current measured in Amperes (A)**
L	**Inductance measured in Henrys (H)**
Q	**"Quality", Ability to tune sharply (Q)**
R	**Resistance measured in Ohms (Ω)**
Xc	**Capacitive Reactance measured in Ohms (Ω)**
X_L	**Inductive reactance measured in Ohms (Ω)**
Z	**Impedance measured in Ohms (Ω)**
2π	**360° of rotation, or one full cycle of frequency (Hz)**

Also, before we begin, I'd better explain the terms **resonance** and "**Q**". If I tap a glass, it rings -- vibrates to emit a tone at a particular frequency. The tone will damp itself out in time as the vibrations become weaker and weaker. How long it takes for this to happen depends on a number of factors like the thickness and purity of the glass and so forth -- in other words, the *quality* of the glass. If it takes a long time for the tone to become inaudible and the emitted tone remains pure, the glass can be said to be "**high Q**". If I place a loudspeaker near the glass and drive it with an audio generator at the resonant frequency of the glass, the glass will vibrate in sympathy with the audio signal and produce a tone of it's own, but it will respond only to its own resonant frequency and to no other. Pour a little liquid into the glass and you will change its resonant frequency.

And so it is with a resonant electronic circuit. You can combine an inductor and a capacitor to make a resonant circuit that can be "excited" into "vibration" by a tiny input signal, it will continue to "vibrate" at its resonant frequency even after the input signal is removed. The strength and duration of its self-sustaining output will be dependent on the quality or "Q" of the circuit.

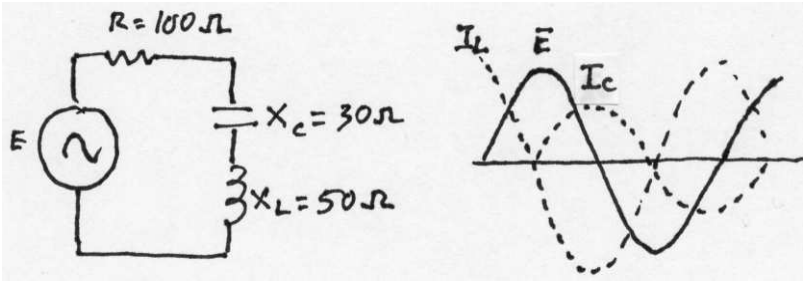
I don't suppose you are going to design a resonant circuit at this stage but you will need to know something about the mathematics involved in order to understand how resonance in electronics works. As we learned before, capacitors and inductors try to resist the flow of AC. The amount of resistance depends on the value of the component, and the amplitude and frequency of the source. To find the current in a capacitive circuit, we use the

formula **I = E / X_C**, substituting **X_C** for **R** in ohm's law. Current **(I),** is expressed in amps and electromotive force (**E**) in peak volts

To solve for **X_C**, we must use the formula **Xc = 1 / (2 πfC)** where **2π** = one complete cycle of frequency**, f =** frequency in cycles per second, and **C =** capacitance in farads**.** Notice that Xc is *inversely* proportional to both capacitance and frequency. *The higher the frequency or the greater the capacitance the less resistance there is to current flow.*

The formula for current in an inductive circuit is **I = E / X_L**, substituting **X_L** for **R** in ohm's law. Again, current **(I)** is expressed in amps and **E** is electromotive force in peak volts.

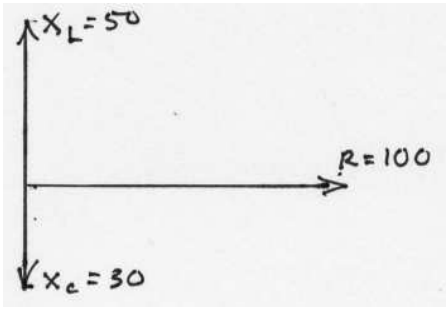
The formula for inductive reactance is **X_L = 2π fL** where **f** is frequency in cycles per second and **L** is inductance in henrys. From this, it can be seen that *reactance in an inductive circuit increases as frequency increases, therefore the higher the frequency or the greater the inductance, the greater the resistance to current flow.* Now, let's combine capacitive and inductive reactance and see what happens, First, we'll demonstrate a series LC circuit.



(Fig-1)

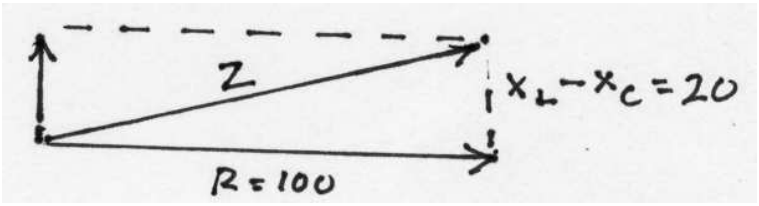
All circuits have some internal resistance so I've included a resistor in the circuit. The reactances of the capacitor and the inductor are 180° out of phase with each other. The current flowing through the capacitor **leads** the voltage by 90° and the current flowing through the inductor **lags** the voltage by 90°, so that, in an LC circuit, the smaller reactance can be subtracted from the larger to give a net reactance that is either inductive or capacitive. If the two are exactly opposite in value, they cancel each other and the only thing that limits current in the circuit is the circuit resistance.

Perhaps the best way to visualize this is with a **vector diagram.** Let's assume an **X_L** of **50Ω**, an **Xc** of **30Ω**, and a circuit resistance, **R,** of **100Ω**. We begin by plotting the value of **R** on the horizontal line and values of **Xc** and **X_L** above and below it on the vertical line.



(Fig-2)

Next, we'll re-plot, subtracting the smaller capacitive reactance from the larger inductive reactance leaving a net inductive reactance of **20Ω**

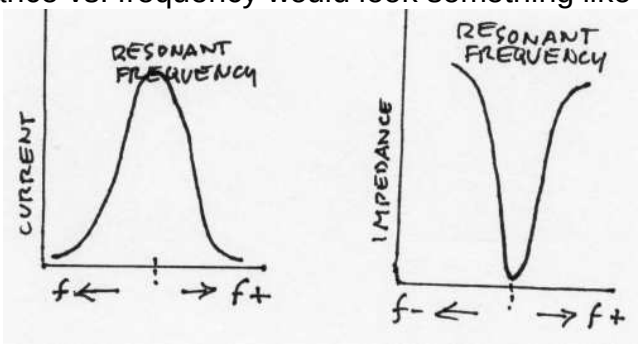


(Fig-3)

The resultant circuit impedance can be calculated using the standard formula for the hypotenuse of a right triangle, $\mathbf{Z^2 = 20^2+100^2}$

Answer: $Z^2 = 400+10000$, $Z = \sqrt{10400}$, $Z = 102\Omega$

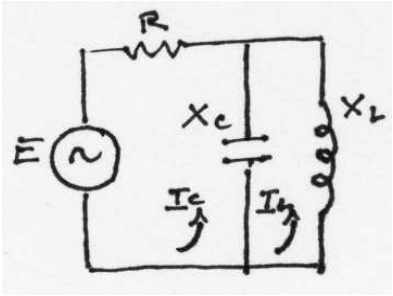
At resonance, the reactive values of the capacitor and inductor are equal and opposite so they cancel each other, leaving only the circuit resistance to limit current flow. Therefore, it can be seen that, for a series circuit, the current will be maximum at resonance. At all other frequencies, the circuit will appear to the source as a capacitive or inductive reactance. A plot of current or impedance vs. frequency would look something like this:



(Fig-4)

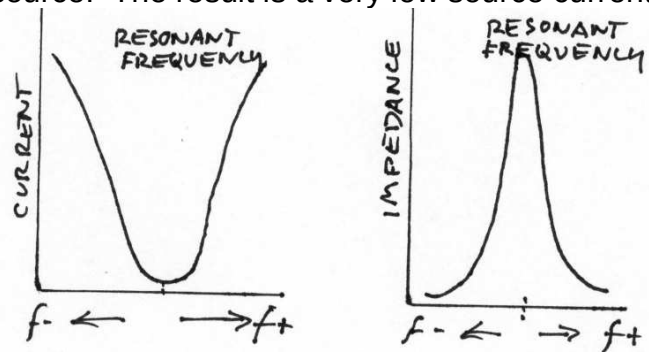
The sharpness of the tuning is dependent on the circuit resistance and, in general, the sharper the tuning, the higher the Q of the circuit. In a receiver, this is referred to as **selectivity** -- the ability of a receiver to pick one particular station from a cluster of adjacent ones.

Now, let's see what happens when the capacitor and the inductor are placed in parallel.



(Fig-5)

In this case, the voltage across the parallel components is the same but the individual currents can be quite high - much higher, in fact, than the line current flowing from the source. At resonance, the reactances cancel each other, so the circuit appears as a very high impedance to the source. The result is a very low source current.



(Fig-6)

Meanwhile, currents within the closed LC loop can be very high. This is because the capacitor and inductor alternately swap energy back and forth, the capacitor stores energy as an electric field during charge and releases it to the inductor on discharge. The inductor stores the energy from the capacitor as a magnetic field and releases it back to the capacitor when the cycle reverses. The circuit behaves much like a mechanical flywheel, maintaining its momentum from stored energy and requiring only a small amount of input to keep it going. Both series and parallel resonant circuits are used to "tune" a transmitter to emit a signal at a particular frequency and to "tune" a receiver to reject all but a particular frequency of signal. Well explore this in more detail in later units

In this unit, we have explored the concept of resonance and seen how LC circuits behave with applied AC; particularly at resonant frequencies. In the next unit, we'll introduce the vacuum tube.

Terms to remember

LC circuit	**Inductor and capacitor placed in series or parallel to make a resonant circuit**
Resonance	**Condition where X_C and X_L are equal**
Q	**Quality or sharpness of tuned circuit**
2π	**One complete cycle of AC (6.28)**

Paul Honore' W6IAM

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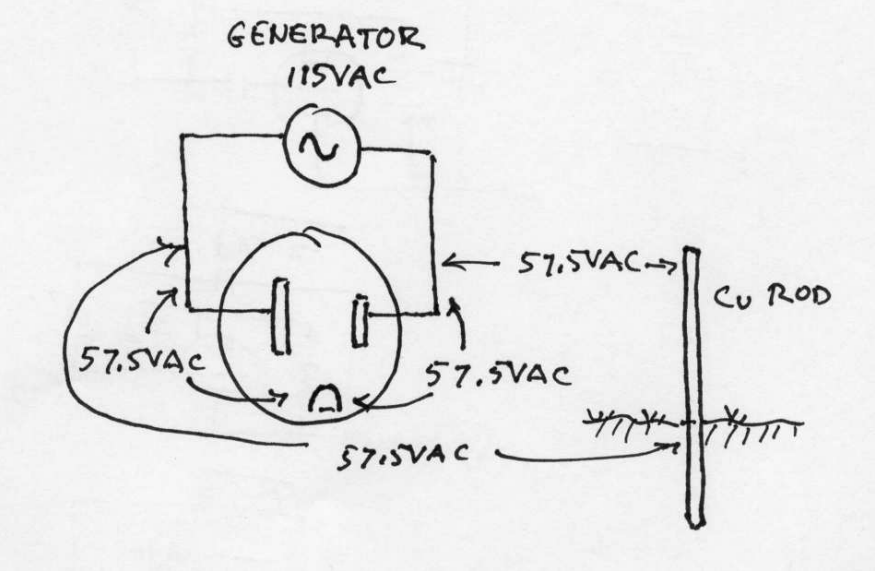
SAFETY ALERT!

Since being appointed Field Day "Safety Officer" -- without authority to shut anyone down, I felt it my duty to at least appear to be on top of safety issues, especially as they related to strangers wandering about the real estate in what the FCC calls as an "uncontrolled environment" So far as RF emissions are concerned, what I observed was a tacit adherence to the rules by all who set up and manned operating stations. Good job!

What did constitute a potential safety hazard, however, was the use of motor generators to power equipment. Let me explain. The rule stated rather ambiguously by the *National Electrical Code* is that the neutral connection of the 115 Volt electrical outlets need not be bonded to the generator frame. The rule states, however, that 3-wire electrical cables must be used to connect the generator to any powered equipment. The unstated implication is that the equipment itself -- meaning the power supply that is being run by the generator -- must be grounded. I measured voltages from several different Field Day generators to a copper rod driven in the earth and found, without exception, the following: **57-½ VAC from the hot lead to ground and to the u-ground connection at the outlet and 57-½ VAC from neutral to ground and to the outlet u-ground.**



To my mind, this constitutes a potential safety hazard. I therefore recommend that in all future cases where generators are used to power radios, the power supply enclosures be connected to an earth ground for safety.

Paul Honore' W6IAM

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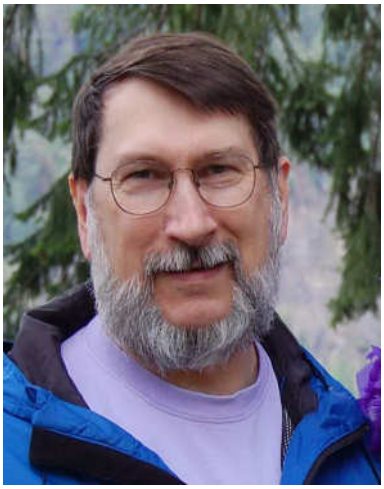
How I Got My Amateur License

by Paul Benadum, WB8BVK



This past August I had to renew my ham license and realized that this is my 40th year in ham radio. So, I thought I'd tell the tale of my experience taking the exams, pre-VE sessions. It was the summer of 1968 between my junior and senior years of high school. I lived in a small town near Dayton, OH. Yep, that's Hamvention territory. I had been studying for my license for a couple of years using a 1960 copy of the ARRL's "The Radio Amateur's Handbook" and the "The Radio Amateur's License Manual". There was a question pool back then but only the FCC had it and they weren't publishing it except on test forms. The License Manual consisted of questions (or paraphrased equivalents) that had been provided by the FCC along with explanatory answers. Initially I was studying for my Technician Class license since it only required a 5 word-per-minute (wpm) code test and the possibility of voice. Besides, that's what my Dad, K8GCZ, had. Youthful confidence made me think that I might be able to pass the written element so I decided to try for the General Class and its 13-wpm code test and HF privileges. The written test for the General was the same as the Technician (remember this is 1968). Learning the Morse code turned out to be no more difficult than learning the circuit theory (which included tubes *and* transistors). Early in the year I made a habit of listening to the ARRL station's, W1AW, code practice sessions every chance I got. This was accomplished with a converted WWII aircraft receiver (BC-224 for you old-timers) with a long-wire antenna. The receiver was located in an unheated garage so wintertime listening required turning the receiver on about an hour before the code practice session to let the tubes warm everything up. Oh yes, proper attire was a winter jacket, gloves and a wool sock hat. By the time school let out for the summer my speed was up to 15-wpm and I could even "copy" most of the 18-wpm bulletins. Allowing for test day jitters I just might be able to pass the 13-wpm test. I sent my application, on a Form 610, to the FCC office, in Detroit, for the testing session in Columbus, OH in July along with a $9 application fee (non-refundable). I don't remember the exact date but a reply came back stating the location and the time to be there. Testing sessions at that time were given weekly at the FCC field offices (like Detroit) and every month at satellite locations (like Columbus). In this case the satellite location was an office building in downtown Columbus which was about a 1-1/2 hour drive from where I lived. I remember standing in a stairwell along with 20 or 30 adults (all male) waiting for the zero hour to arrive. Once the specified time arrived we were escorted into the testing room which looked more like a classroom with rows of student desks. The examiners were FCC employees. No volunteer examiners here! Code tests were administered first. Since the bulk of us were taking the General test (one person was testing for the Extra – 20 wpm) the 13-wpm was first up. They said there would

be a preamble of three V's sent first followed by the actual text. It would have helped if they had given more detail (or maybe my nerves filtered out the rest) but what I heard was: "VVV…VVV…VVV@#$$#%....". Well, I didn't catch the first word of text as there was no gap between the last V and the first letter of text. Once I got past that stumble I quickly settled into copying the code. Good thing I had practiced receiving 18-wpm. When the sending was finished (it lasted about 5 minutes) the examiner said, "Pencils down!". There was no multiple choice test with questions about what was sent to follow, but rather, the examiners would check all the individual copies for errors. You had to have copied 1 solid minute of text (including spaces and punctuation) without error. So when the examiner said, "Pencils down!" he meant it!

Whew! We now took a rest as the examiners poured over the code tests and gave the Extra his 20-wpm test. Finally they finished the grading and began calling names of those who had failed and could leave. About half of the people left and to my surprise I was not one of them! But I still had to take, and pass, the morse code sending and the written test itself. The written tests were passed out and we started working on them while one-by-one we were called up to the front of the room to try our hand at sending with a straight-key. When I was called there was a 3x5 card with a typewritten message on it next to the straight-key. My goal was to send at 13-wpm and then get back to the written test as fast as I could. Everything seemed to go well until the examiner had me repeat a "period". "Yessir, by golly, I can do that!", "._._._". I have to admit that even to me it sounded a lot like, "._ ._ ._", 3 "A's" strung together. That's what it must have sounded like to the examiner too because he had me repeat it 2 more times. Arrgh! He's going to flunk me for a lousy period! Who uses periods except W1AW?!! The examiner either felt sorry for this 16/17-yr old kid or I managed to actually make 3 A's sound enough like a period. Either way, he said I could go back to the written test and finish that. Finally, I finished the written test, handed it in. Elvis, slide-rule in hand, left the building! When I got back in the car with my parents I started marking every test question in the License Manual that came close to what I had seen on the test just in case I had to do this all over again.

Had I passed? Well, yes but I didn't know right away. I had passed the code test but I wouldn't get credit for it unless I had passed the written also. I had to patiently wait for about a month to find out. They didn't grade the written test while you waited. Maybe they did after you left the test session, but it didn't matter. They didn't tell you whether you passed or failed (except for the code test) even if they knew. The only way you knew was after waiting for up to 6 weeks you got a letter in the mail with your new license. And I did get that letter and it did have a license in it, WB8BVK. That's how I got my license.

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Dear Ham Radio Operators,

A call for help! The Military Vehicle Preservation Association is planning the reenactment of the original 1919 Transcontinental Motor Convoy. What is that you ask? Let me explain:

After WWI the United States Military was concerned that the nature of warfare was becoming mechanized. The days of horses and mules for the transport of soldiers and supplies were coming to an end. The nation was also trying to promote the construction of a highway that would run from the east coast to the west. This was to become the Lincoln Highway. Today most folks know of it as US 30. There was also the concern of invasion on our west coast by forces from Asia .

As a result of these concerns the U.S. Army decided to form a convoy of soldiers and vehicles and test them by sending them from Washington D.C. to San Francisco. This convoy rolled in the summer of 1919. A young Lt. Colonel by the name of Dwight D. Eisenhower was assigned to the convoy. The convoy was very successful. The convoy acted as a thank-you tour of the nation to say thanks to the citizens for supporting the efforts in WWI. It also did wonders in promoting the construction of the Lincoln Highway from coast to coast. This would open up new markets and provide jobs for many. The convoy also put the new trucks the Army was starting to use to a rigorous test. It also showed the great need for a better transportation system in the U.S.

The MVPA tries to preserve the history of those who served in our armed forces by preserving and displaying the vehicles and equipment that was used by those service men and women. That has lead the MVPA to plan for the 90th anniversary a reenactment of the 1919 convoy. We are asking for the support of ham radio operators to help make this event even better. We would like to have displays along the convoy route of original radio equipment used during this convoy. We have contacted the ARRL to see if there is some interest among the radio operators along the route.

We envision that at way points along the route, ham clubs would set up displays of early AM radio sets and perhaps even provide “vintage” communications for the convoy participants. Maybe hams around the world would like to make contact with the convoy and receive a QSL card from the convoy. It’s really up to you how you would like to participate. The radio gear does not have to be from 1919 but gear from the earlier part of the 1900’s would be very interesting and fit in with the flavor of the convoy.

The convoy will roll during the summer of 2009 and will probably have over 200 restored military vehicles of all wars going the entire length. In addition there will be many vehicles that will join the convoy for shorter segments. We are also trying to enlist the Boy Scouts of America to help with the

convoy as path finders and to restore highway markers originally set by the scouts back in 1923. In addition, there will be a film crew of the History Channel type embedded in the convoy to document the event.

More details about the history of the convoy, the plans for the reenactment and information about the MVPA can be found at the MVPA's web site:
http://mvpa.org/

Click on the side bar link: 2009 Convoy.

Additional information about the Lincoln Highway can be seen at: http://www.lincolnhighwayassoc.org/

If you would like to help out, you can contact me by email or make contact with the MVPA. Contact information is located on their website: http://mvpa.org/

Thank you and keep 'em rolling.
Lew Ladwig
MVPA 2009 TMC pre run commander

lladwig@msn.com

VE Testing

The CCARC sponsored Amateur Radio classes held September 13, 20 with an exam session on the 27th produced eight new Technician licenses, three new Generals and one Extra Class.

Congratulation to all the candidates, instructors and Volunteer Examiners.

CLALLAM COUNTY AMATEUR RADIO CLUB
Minutes of the General Meeting September 10, 2008

The meeting was called to order at 7:00 P.M. by club president, Chuck, NTBV.

The Pledge of Allegiance was given; then self introductions were made by those present.

Chuck made announcements regarding the following:

LICENSE CLASSES AND VE EXAMS: All day Technician and General Classes will be held on September 19 and 20. The exams will be September 20 at 1300.

NEW FM RADIO STATION IN SEQUIM: Rich Perry, W7AV, and two other owners are starting a non-profit FM radio station using a public service format. The call will be KSQM at 91.5 MHz. They are looking for volunteers to do painting, etc., i.e. cheep labor jobs. They hope to be on the air by mid November.

HELP NEEDED FOR NOAH WEATHER RADIO PROGRAMMING DEMONSTRATION AT SEQUIM WAL-MART. ARES members are needed to help show people how to program NOAH weather radios on Saturday September 13 and 20. The presentations will be made at the Port Angeles Wal-Mart also but there are enough volunteers to staff both shifts both days. NO ONE volunteered to help Dan Abbott, N7DWA, in Sequim so members were urged to contact him if they could volunteer for one or more 10 AM to Noon and Noon to 2:PM shifts either or both days.

EQUIPMENT FOR SALE: Yaesu 2 meter transformers FT2400 and FT 2500 and a power supply. $50. See Chuck. (It was all sold)

NET CHECK-IN ORDER: Some people do not like the current system of calling by the last names and want to return to the practice of calling by the call letters suffix. If you want to retain the alpha system, let Chuck know. Otherwise he will recommend a return to the suffix system. Six or seven people spoke in favor of changing back to the suffix system.

REPEATER: Chuck will ask either Steve De Biddle, W6MPD, or Bob Sampson, K6MBY, to be chairman of a new repeater expansion committee. Both have asked to participate in a committee to research possible relocations and/or upgrades to the club repeater system. The Ellis Peak digipeater is weak because it is powered by a hand-held running on solar power. DNR has room for us at North Point or Ellis Peak. There is a question of costs associated with moving the digipeater and UHF control links. Bob Sampson's 440 repeater (as well as any other local repeater…added in editing by MBY) could be linked. Bob has IRLP *but,* IRLP was previously voted against because of concerns there would be too much

chatter. After the discussion Lee Diemer, KE7TTY, and Carol Harty, KE7OMR, volunteered to be on the committee. David, KE7TTT, had previously asked to be on the committee also.

CONTINUING EDUCATION: Johan Van Nimwegen, KO6I, volunteered to host a class in assembling an electronic kit. So far there has only been one person to express interest. Chuck also asked him about using his facility for Club HF familiarity contests, etc. and he said yes.

The scheduled program by Bill Carter, W7WEC, had to be cancelled due to his illness.

Paul Honore', W6IAM, commented on the above continuing education programs. He said that he and Johan think that modern hams are not interested in the technical aspect rather than just operating. During the past year, Paul conducted theoretical classes. Johan wants to provide hands on training by having students assemble a power supply kit costing about $10. Let Johan know if you are interested.

Paul noted current concerns with the current CERN Large Hadron Collider experiment and then presented an excellent extemporaneous discussion of particle acceleration programs and methods, past and present.

There was a break at 7:55.

Chuck won the raffle drawing.

Burt moved the meeting be adjourned, Leah seconded the motion, and the meeting was adjourned at 8:05.

Minutes by Lee, KE7TTY

Treasurer's Report As of October 2nd, 2008:

First Federal Savings & Loan of Port Angeles Balance is:	$ 2,302.53
Outstanding Cheques:	- 154.00
Current Book Balance:	**$ 2,148.53**
CD at WestSound Bank (6-month, 2.50% APY):	+ 1,025.04
CD at WestSound Bank (18-Month, 5.13% APY):	+ 3,000.00
Total Cash Assets:	**$ 6,173.57**

Birthdays for October and the first week of November:

Mabbutt, Gail A.	N7GAM	Oct-03
Lapin, Allen	KD7JTH	Oct-05
Barrett, Warren E.	KC7VXT	Oct-11
Sampson, Robert F. (aka Bob)	K6MBY	Oct-21
Blatter, Wilburt	KN7R	Nov-02
Gallauher, Don Theron	W7DTG	Nov-04
Lawson, Matthew J.	KC7EQO	Nov-08

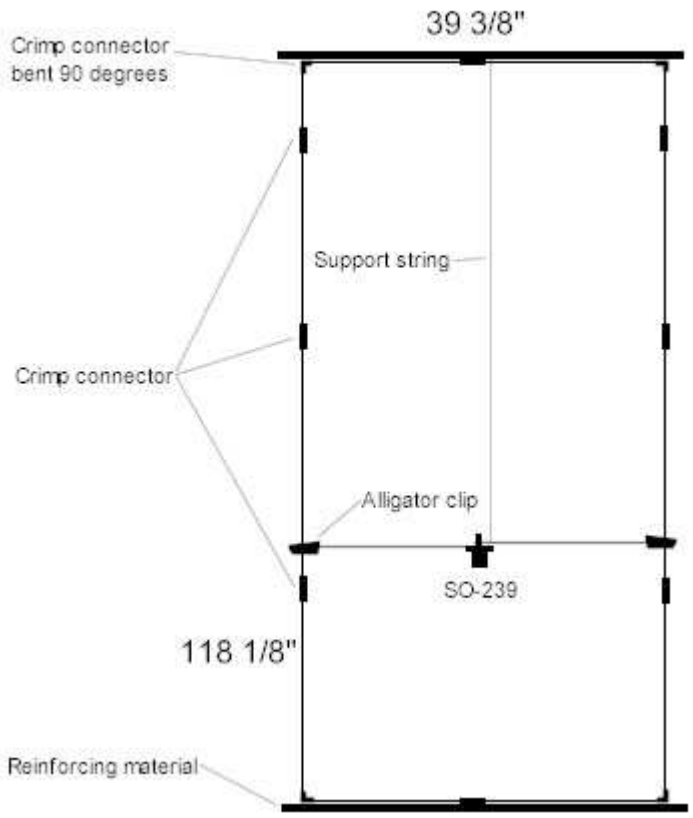
YL's Birthdays:

Mitchell, Miriam (Henry "Bud")	(W7HKF)	Oct-18
Edes, Glo (Richard)	(WA6CUE)	Oct-21
McCoy, Susanne (David R.)	(KE7JEJ)	Nov-06

The Hentenna Antenna

A simple wire antenna that provides gain and directivity is the Hentenna.

"The Hentenna antenna was designed in Japan back in the 1970's, and many JA stations are still utilizing them today! The Hentenna gains its name from the fact that it is "strange", or HEN in Japanese. By looking at the antenna one would think that it would be vertically polarized, but it is in fact horizontally polarized which is what you want for 6-meter DX openings. This antenna will give you 3dB gain over a dipole (dBd), is directional, has a low angle of take off, very little wind resistance, and is easy to build!" See: http://www.k5prk.org/articles/comments.php?id=328_0_2_0_C



Also see: http://www.hamuniverse.com/hentenna.html

The second reference gives all the formulas for designing a Hentenna to any band. Two trees at the right distance and your ready to go. On VHF bands you could use a PVC frame to support the antenna. See: http://www.wa0dx.org/wa0itp/hentenna.html

Do a Google search on Hentenna antenna and you will have 960 hits to review! Before you dismiss this antenna, please remember it comes from the land that gave us the Yagi-Uda antenna.

I am working on a 20m version now. 73, Chuck