CLALLAM COUNTY AMATEUR RADIO CLUB

QTC

OCTOBER 09

DRT's Shack

Happy Autumn to all CCARC members.

I prefer the word Autumn, but no one uses it any more. It's one of those words if looked up in the dictionary, "Fall" has half a page of meanings, and "Autumn", it's simplified to two meanings. Why the lesson on the meaning of a word you ask?

The Clallam County Amateur Radio Club doesn't have half a page of meanings. By-laws, yes. But we're a simple group who come together to help others when needed, like the classes before a test session, planned activities that are fun in using our hobby, attend our meeting every month, and to socialize. Pretty simple. So why is it so hard to find those who want to help in making things 'simple'?

For instance, one occasion coming up is the Christmas Potluck. What a fun and happy gathering this always is. It's such a simple party to organize, yet no one wants to lead in bringing it all together. Everyone wants to help, which is much appreciated, but to take on the responsibility of Chairing this committee is being made into a complicated issue, when it's probably more simple then writing this page.

Christmas is a time to come together. That we all know. Remembering an e-mail I recently received on how "time flies", Christmas will be here before we know it. So the work must be done now! We have many members already agreeing to help set up, clean up, but no one to be the organizer. This DRT'S page is asking for a leader to step up and be that organizer. Many are already working on the entertainment, we have the Faith Lutheran church in Sequim scheduled, we just need someone to organize. Who brings the side dishes, the desserts, salads, and tell others what else is needed. Buy the turkey and ham, cook it, and get it to the "church on time"! How simple it is.

That's where the word Fall comes in.
When our Club does something, I've never seen any one fall down on a job they've been assigned to. If asked, someone always steps up, pitches in, always willing to lend a hand.

I'm asking now. Will you please take this on, knowing you'll have more then enough help to get this activity in gear?
Huge thanks in advance!

Happy Autumn, and always, 73!

Nita~KE7DRT
CCARC President

Get Your License Here!

The CCARC Amateur Radio License Classes will be in April 2010. Dates to follow.

During the Oct 3 testing, six people passed the technician and four people passed the general license material.

If you know of anyone who would be interested in a Technician or General Class license please have them call Chuck, N7BV 360-452-4672 or Tom, KE7XX 360-452-8228.

Thanks, Chuck, VE-L

We need articles for the QTC newsletter. This is your newsletter.

Tell us how you became interested in Ham Radio. What did you do over the summer (just like school) huh!

The more you submit the less we have to think of.

Thanks, the staff!

CCARC QTC Newsletter

Just a little back round on how the QTC works.

We use ccarcqtc@yahoo.com as a repository for information for the newsletter. So if you have something for the QTC, please send it to the yahoo address. Do not sent it to one of the editors as they will just have to turn around and resend it to the yahoo address.

Please make sure the article or information is complete. As we rotate editing the newsletter you cannot be sure which editor will be piecing the newsletter together.

Please remove as much formatting from within whatever program you are using (MSword, edit, clear, formatting) if you know how, before sending it to ccarcqtc. If you feel the creative urge to design a document—please open a design shop, but don't do it and then send it to us expecting to see your creative work transferred to the newsletter.

We do not edit, except to change fonts to a standard non-serf font (Arial which is easer to read than Times Roman). We will run a spell checker.

When first conceived the editors were given free license, it still is that way. It was understood they would endeavor to include everything submitted, within reason. For instance, off color jokes etc are not going to be printed.

Thanks,
Chuck, N7BV Bob K6MBY

PROGRAM FOR Oct 14th

See Page 12

2 METER NETS

CCARC :
Every Thursday 7:00 pm on the W7FEL Repeater.

ARES/RACES:
Every Tuesday except 1st Tuesday of the month at 7:00 pm on W7FEL Repeater.

W7FEL Repeater: 146.76 MHz., offset down 600 KHz. with a tone of 100 Hz.

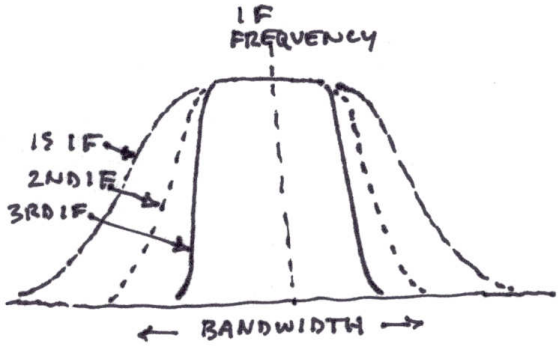
Electronic Fundamentals, Part-1 (Analog Circuits)
Unit -19 The communications receiver

Although the principles by which the broadcast AM receiver and the short-wave communications receiver are much the same, the HF Communications receiver is a great deal more complicated. It must pick very weak signals from a pileup of stronger ones; all fading in and out with changes in propagation. There are two basic requirements: a very low **noise floor** -- the weakest signal that can be heard above the internal noise of the radio's own circuitry, and a very large **dynamic range** or the ability to handle very strong as well as very weak signals without overloading or distorting. More often than not, the receiver must be able to tune several bands and detect a variety of modulation types. It must have an accurately calibrated dial or readout . It must be able to remain sharply tuned without drifting off frequency with power supply and temperature variations.

All of these things are very hard to do. It's no wonder the average communications receiver is expensive and complicated. There are so many approaches to these problem areas and so many variations on each that it would be impossible to talk about all of them here; only to give a few generalizations. One thing must be kept in mind. For every solution to a design problem, at least half a dozen new problems arise. My old boss and chief design engineer, Fred Cruise, used to say "There are no problems in electronic design, only challenges" Speak for yourself, Fred! The problems - er- *challenges* begin with the signal as it is received from the antenna. The one we want out of so many competing signals is usually weak and distorted. It may also carry with it some unpleasant side products which have to be got rid of *before* it is passed to the mixer or first detector This means some kind of filter must be used to eliminate these unwanted products.

Filters, by their very nature, can distort the signal and produce additional unwanted products. Filters also attenuate the signal so the loss has to be made up with a broad-band RF amplifier**.** An **RF gain control,** (very much like an audio volume control) is added to allow the gain to be reduced for very strong signals. The amplifier, not being a perfect device, will add some noise, thereby reducing the sensitivity to weak signals. Catch 22? You bet! Well, let's suppose we've gotten lucky and managed to obtain a clean, noise free signal with no unpleasant side products. It enters the first detector along with a beat frequency from a local oscillator. Harmonics of the two signals can produce additional outputs from the mixer called **spurious responses** and there can also be two-tone intermodulation **(IM)** distortion that can plague later stages in the receiver.

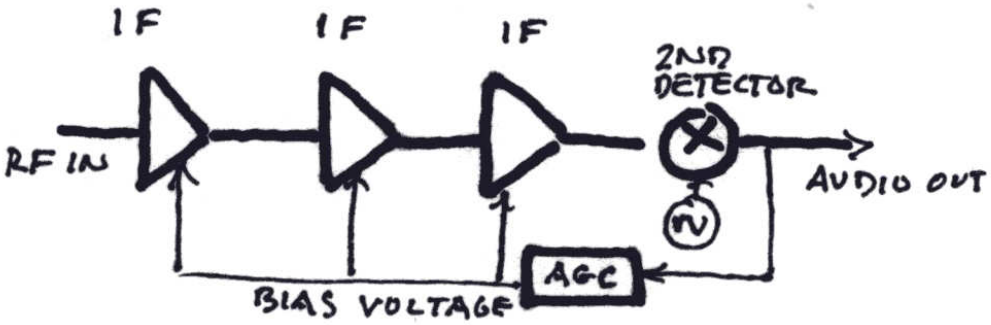
A major area of concern is receiver **selectivity** -- its ability to pick a desired signal from a lot of overlapping and competing signals. This is done, partly, by the use of several IF stages. By its very nature, an IF stage must be broad enough to handle the widest signal the receiver is intended to detect so it tends to admit strong nearby signals even though they are outside the theoretical pass band of the amplifier. IF stages are transformer-coupled so it is easy to tune them but there's considerable slope *outside* the desired tuning range By tuning all the transformers the same, the slope becomes steeper and steeper until it approaches the ideal bandwidth.



(Fig 19-1)

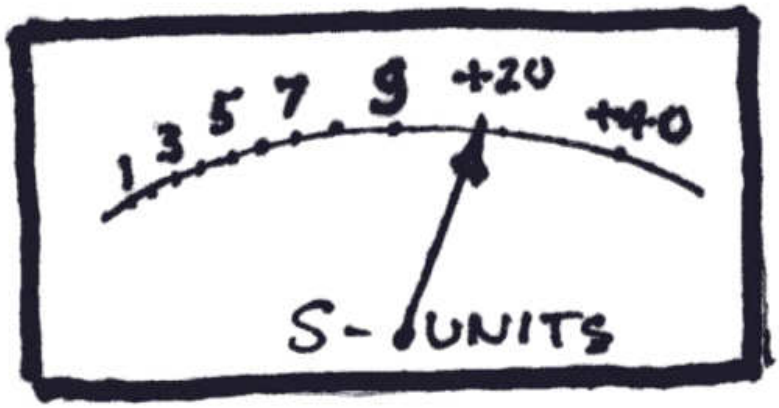
Of course, more stages mean more noise. Everything is a compromise. Additional selectivity is often provided by adding specially tailored crystal filters between the IF stages. Crystals are very high Q and can be made to resonate sharply to a specific frequency, helping to reject unwanted signals.

Automatic gain control or **AGC** can be switched in**,** to maintain a reasonably constant audio output with widely varying signal strength. This is accomplished with a feedback voltage from the 2nd detector output that is rectified and used to provide a variable bias voltage to the IF stages. As the signal strength increases beyond a pre-determined level, the rectified DC voltage is applied to the IF tubes or transistors to reduce their gain and maintain a constant signal level. Of course there is a slight delay after the strong signal is detected until the bias signal can reduce the amplifier gain and another, usually longer, time delay for the gain to "recover", so AGC will produce a sort of "breathing" effect that can become annoying at times. Usually, a variable AGC control is provided to adjust these time delays to a an acceptable value.



(Fig 19-2)

A signal strength meter -- **S Meter,** is associated with the AGC and provides a way to estimate the strength of a received signal and to help tune to its precise frequency. The scale, in **S units**, is logarithmic and calibrated in decibels referenced to a milliWatt (**dBm)**, . "S-9" is located mid scale and is the reference point for signal strength measurements. It is supposed to represent a 50 microvolt signal at the receiver's antenna jack but it rarely does.



(Fig 19-3)

The scale is divided into "S-numbers" at 6 dBm intervals. Therefore an S-8 signal would be 6 dBm below S-9 in strength, S-7 would be 6 dBm below S-8, etc. Obviously, the measurement is somewhat subjective since it is dependent on the performance of the individual receiver and antenna. Nevertheless, it is customary to give a transmitting station a report of signal strength in terms of S-units, 9 being ideal, with stronger signals in dB over S-9. For instance, "S-9 plus 10dB."

. Although a simple diode can be used as a detector, most HF communications receivers use a mixer and a second BFO as a **product detector.** The second BFO is a fixed frequency oscillator tuned to the IF frequency Since the BFO and IF frequencies are the same, the difference between them is zero. They cancel each other, leaving only their sum and the modulating waveform. The sum is eliminated in the mixer and the modulating waveform is passed on to the audio stages.

The audio portion of the receiver may contain one or more class A or B amplifiers and filters to help "clean up" and clarify the signal. The ultimate filtering technique is **D**igital **S**ignal **P**rocessing (**DSP),** where the signal is converted from an analog waveform to digital format. Various algorithms are then applied from a microprocessor to shape and filter the signal before converting it back into an analog waveform again. DSP provides software control over the signal, allowing sharp notch filtering, waveform shaping, etc, not practical by other means

There is no standard configuration for communications receivers. They can be simple one-stage affairs, (**single conversion)** or elaborate dual conversion and even triple conversion receivers with multiple IF stages and local oscillators, cascading downward **(down conversion)** or upward **(up conversion)** in IF frequency **.** They can have coarse and fine RF tuning **(Bandspread)**, or microprocessor tuning controlled by an optical encoder. It's pretty much a matter of expense and personal preference. The important factors in choosing a receiver are **noise floor** and **selectivity.** The rest is window dressing.

Few hams choose separate transmitters and receivers these days. Most use **transceivers** They combine both transmitter and receiver into a single package, using some of the same components to do both jobs. For instance the tank circuit in the transmitter output is also used as the receiver front-end tuning circuit. Local oscillators also do double duty in both receiver and transmitter and a great deal of the circuitry is under microprocessor control, allowing for more complexity and cheaper construction. No matter how they appear -- as discrete components or as monolithic microcircuits, the building blocks are the same. If you've mastered the theory behind them, you can approach the problem of troubleshooting the same way in every case.

In this unit, I've provided a broad overview of the communications receiver. Next, I'll discuss some of the more important pieces of test equipment needed to align and troubleshoot your receiver or transceiver.

Terms to remember

Bandspread	**"Magnifying" the tuning range with the addition of a second, tuning capacitor in parallel with the main tuning capacitor**
Down conversion	**IF frequency below the RF**
DSP	**Digital Signal Processing**
Dual conversion	**2nd mixer and LO to raise or lower the IF Frequency**
Dynamic range	**Range of maximum to minimum signal detection**
Gain control	**Controls gain of RF or AF stage**
Noise floor	**Lowest perceptible signal above circuit noise**
Selectivity	**Ability to select one signal from among many closely-spaced signals**
Single conversion	**Single mixer and LO to obtain a n IF**
Up conversion	**IF frequency above RF**

Paul Honore' W6IAM
(rev-2 Sept '09)

Electronic Fundamentals, Part-2 (*Digital Circuits*)
Unit-8 (Displays)

It's been estimated that at least 75% of all neural connections to the human brain are from the eyes. If this is true, we depend a whole lot in visual input to interact with the world around us. This seems to be borne-out by the amount of time and money spent on improving the image quality of television and digital photography. In any event, much of the output of our electronic equipment is visual in nature. Let's look at some of the more common electronic displays and their digital interfaces.

The simplest form of digital display is the 7-segment **L**ight **E**mitting **D**iode (**LED**) display. It looks like this.

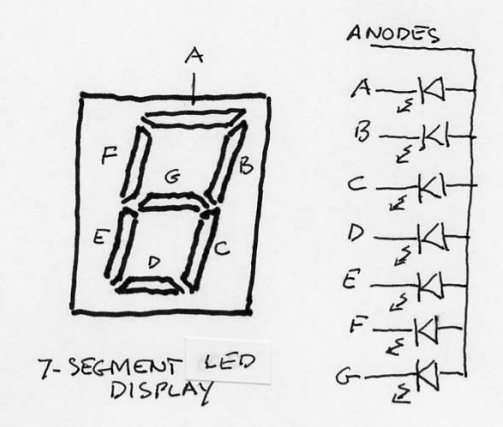


Fig 8-1

In this device, seven LEDs are arranged in the form of independent segments that can be illuminated in combination to display any number between 0 and 9. A circuit to count pulses and display consecutive numbers would look something like this. It uses two off-the-shelf chips - a *74LS90* BCD Counter and a *74LS47* 7-Segment Driver.

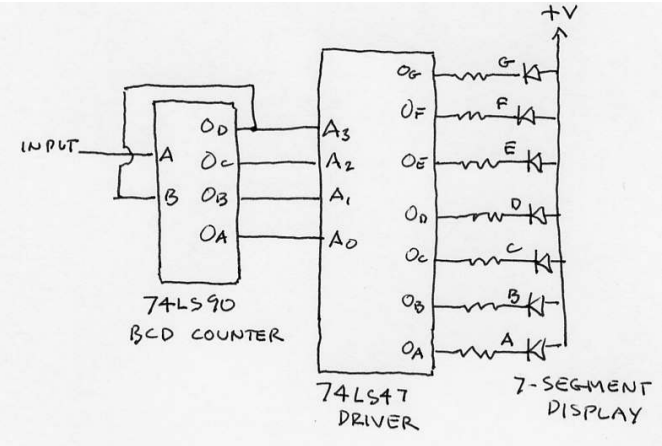


Fig 8-2

You can't tell much about the chips from the standard diagram so let's take a peek inside. We'll look at the BCD Counter first. Here's the equivalent schematic and its truth table.

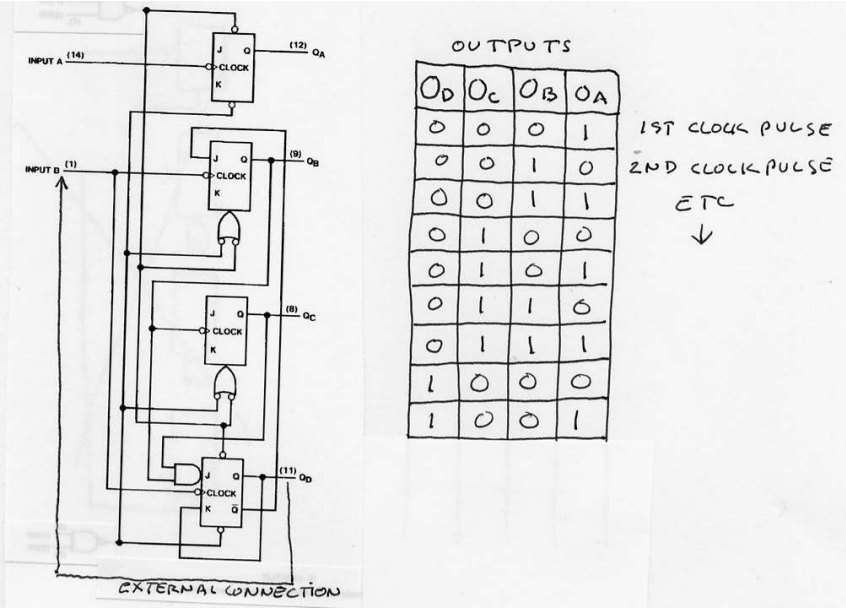


Fig 8-3

Look familiar? It's a string of J/K flip flops interconnected so as to provide a 4-bit binary output. As the truth table shows, each input pulse raises the count by one bit. Now, let's see what the driver does with the output from the counter.

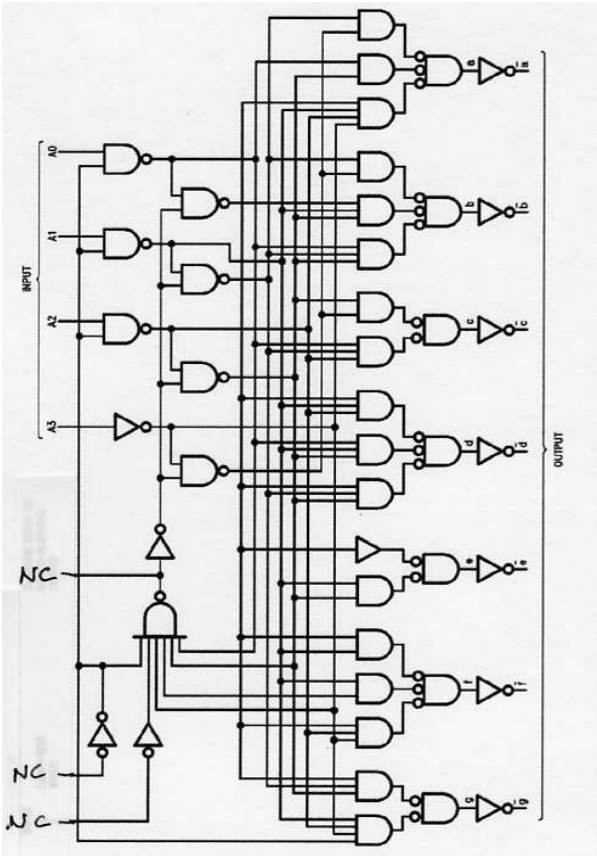


Fig 8-4.

This circuit should look familiar, too. It's just a variation of the D/A converter, except that instead of providing an output that's an analog voltage,. It takes the logic from the counter and outputs

voltages to energize individual display segments.

The same circuit works to activate a **(LCD) L**iquid **C**rystal **D**isplay. A liquid crystal matrix is neither liquid nor crystal but something in-between. It operates on the principle of electrical polarization. In its normal state, the liquid crystal lattice is twisted into a spiral. When an electric field is applied, the spiral "untwists" and aligns itself with the field..

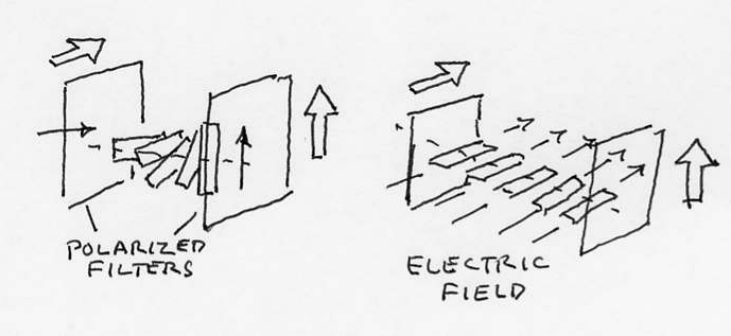


Fig 8-5

If a polarized filter is placed at one end of the lattice and another polarized filter is placed at the other end of the lattice and the filters aligned with the orientation of the crystals. Light will pass from the input to the output. If an electric field is created so that the crystal lattice "untwists", light is blocked at the output filter. All we have to do is to provide a "window" in any shape we choose, and we can create an image of that shape whenever light is allowed to pass through the polarized filters.

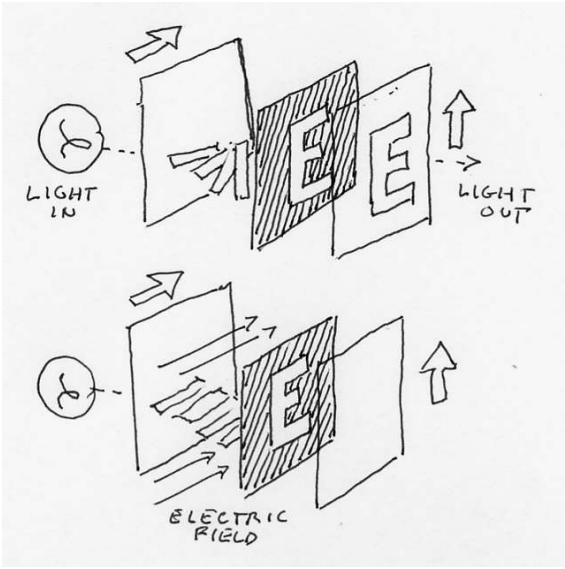


Fig 8-6

Much is being made these days about plasma displays. Using this technology, a gaseous layer is sandwiched between conducting grids to create a screen that is divided into tiny "pixels" at the intersection of the grid lines.

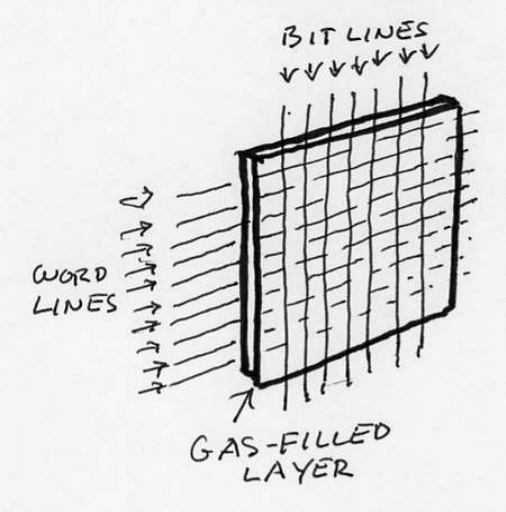


Fig 8-7

When individual bit lines and word lines are activated, the gas is ionized at the intersection of the lines and glows to provide a visual output.

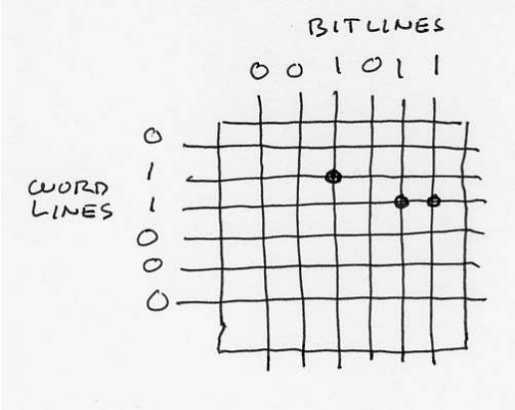


Fig 8-8

As you can see from the diagram, as individual bit lines and word lines are addressed by the driver, gas discharge takes place at the intersection of the lines A variation of this type of display uses tiny transistor/capacitor “switches” at each of the pixel locations to accomplish the discharge. Whichever method is used, the video screen can be made as large as desired and can provide very high resolution images. It is a major player in flat, wide-screen, high resolution television and computer monitors.

In this unit, we’ve explored the major types of digitally-driven visual displays In the next unit, we’ll begin to put it all together.

Terms to remember

LED Light Emitting Diode
LCD Liquid Crystal Display

Paul Honore’ W6IAM

CLALLAM COUNTY RADIO CLUB
Minutes of the General Meeting September 9,2009

The meeting was called to order by club president, Nita Lyman, KE7DRT.
The Pledge of Allegiance was given. Self introductions were made by those present.

Minutes of the previous meeting and the Board meeting of August 27 were not available to be read. Chuck Jones, N7BV, said the copy of the minutes he received for the QTC were not complete and Lee, KE7TTY, said she would review and change them as needed.

Dennis Tilton, AD7TV, announced the availability of lots of free cable, both low loss and RG8, and commercial grade antennas. These antennas can be adjusted to 2 meter or 440 MHz. beams. They have a "T match with a hairpin" and would be a good "home brew" VHF antenna. Chuck Jones added that there is some ½ inch and 1 inch heliax also. Contact Dennis if you want antenna parts. LMR 400 would be better for it but not as flexible. Dennis has lengths of ¼" heliax. It is pretty stiff but has virtually no resistance. Contact Dennis if you are interested; don't just show up there.

Chuck Jones: Dennis and I found out we are going to get kicked off Ellis Peak. Richmond vacated the spot. It is Casey's equipment. David Luchini, KE7WGR, is a supervisor at the phone company in Forks. His company has a place on Ellis Peak with empty racks. It has to be approved by higher ups but maybe we could put Casey's stuff there. Al Dawson, W7YLV. There is a good possibility we could put in a repeater. Steve DeBiddle, W6MPD, has one ready to go he might give us.

Tom Newcomb, KE7XX, said the Elwah CERT members have been working very hard to obtain and upgrade their ham licenses. Now they would like to have their own net and want to use our repeater at 5:30 Monday evenings for this purpose. In the discussion that followed, Dennis Tilton said they should use a script that included a provision that in the event of a real emergency they would go to a certain simplex frequency. Janet Parris mentioned that we were dealing with a sovereign nation. David McCoy said the permanent agreement should be negotiated and include a time frame. Chuck Jones made a motion that Dennis provide Tom with a copy of the LODS formt. Dennis said that should take the ARES script instead because the LDS one has a lot of things that would not be included. Chuck's motion, which was seconded and passed, was that they be allowed to operate our repeater provisionally. John Moore made a comment about this being an excellent example of changing guidelines that should not be made from the floor but the Board should amend the by-laws.

The Board already has a copy of the tribe's request (from Tom). What is needed to confirm the conditions under which they have permission to use the repeater should be put into a MOU. Tom will give verbal approval for the provisional use to Phil Simpco, KE7KWP, who is the coordinator for the tribe. Tom is the liaison with the club.

After the break, the speaker for the evening was Chuck Jones. First there was a presentation of a tour of the HyGain Antenna Plant showing how antenna rotators were constructed and assembled.

The second part was about radio transmissions called Numbers Stations, voices saying a series of numbers which were actually coded secret information. This is a method governments can use to get information to field operatives.

Next month's speaker will be Jamye Wisecup.

Meeting was adjourned at 8:35.

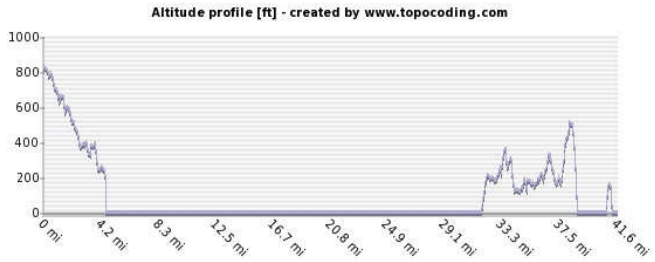
Antenna Launch Profile

Here is a site http://topocoding.com/ that can be used to see where some hills/mountains might be interfering with your angle of take off.

1. Select English Units
2. Enter your address
3. Using the tools on the top left of the map get a view about 10 miles away in the direction of interest. Click there.
4. Click Update Altitude button
5. At the bottom is a chart showing your location on the left and where you clicked on the right.

This is what my take off looks like to North Africa, Southern Europe from my QTH. Right hand location is centered going over San Juan Island.
Emacs!
Hope the graphic comes through Yahoo.

73, Chuck



October 14 Meeting Presentation Outline:

Alphabet Soup & Duct Tape...
Learn more about the many different emergency management volunteer response teams.
Who does what, when, & where?
Cross-training opportunities in Clallam County.
Holding it all together...Clallam County Emergency Management's Role.

Actual Presentation Objectives:
Intro about me & CCEM
The Alphabet Soup Pre-Test
Presentation on CCEM Volunteer Workers' missions
Presentation on the roles of these response teams during mitigation, planning, preparedness, response & recovery.
Duct Tape Exercise
CCEM programs & projects that work to develop stronger volunteer response teams.
The Alphabet Soup Post-Test
??Questions??

(Continued)

Bio
I have been working in Clallam County Emergency Management for a bit over 5 years now. I often share that "I am suited for working in emergency management based on my experiential background in surviving disasters, some that included needing the deployment of Federal Assets" ....that could be a whole other presentation.

My favorite part of this work is that every day I am tasked with new projects and challenges to resolve. This is the best opportunity to have to think on your feet ..my brain cells are always in high gear. The least liked part of my work...all the deadlines, especially the short turn around ones.

I started my career as a Recreational Therapist at the University of Washington Medical Center and Seattle's Children's Orthopedic Hospital several decades ago. There have been different career and education paths taken to get me to CCEM, but I'm glad because I love what I do!

Jamye Wisecup
Clallam County Emergency Management (CCEM)
360-417-2525 (v) 360-460-2932 (c) 360-417-2485 (fax)

Club Yahoo Group

For those of you that have Yahoo accounts and would like to join the clubs group mail reflector please search for CCARCWA in the group search area.

The group mail reflector is a method for club members to communicate with **all** other members of the group at one time. Why would you want to do that?

One reason is to access the knowledge pool of those in the group. A propagation question, an antenna question, an operating question are examples.

At the moment there are 9 members of the group and it would be nice to have more.

Bob, K6MBY

Lunch with the Victoria Shortwave Club on August 16, 2009

FROM OUR TREASURER:

As of Sept 31, 209

First Federal Savings & Loan of Port Angeles Balance: $ 7,324.87
Outstanding Cheques: - 0.00
Current Checkbook Balance: $ 7,324.87

Also, to the best of my knowledge, there are 15 Raffle Tickets yet to be sold.
To make a purchase, contact:

1. Al Dawson W7YLV (457-0752),
2. Bill Carter W7WEC (681-4375), or
3. David McCoy KE7JEJ (457-8550).

New CCARC Club Members

We welcome new club:

Fromm, Robert E., Sr. & Nancy WB7EGD Sept. 2009
Rouleau, Robert A. KF7EFL Sept. 2009

BIRTHDAYS:

Birthdays for Oct, and the first week of Nov:
Lapin, Allen KD7JTH Oct-05
Fromm, Robert E., Sr. WB7EGD Oct-16
Bouck, Bob KE7GUO Oct-17
Sampson, Robert F. K6MBY Oct-21
Blatter, Wilburt KN7R Nov-02
Gallauher, Don Theron W7DTG Nov-04

YL Birthdays
Edes, Glo (Richard, WA6CUE) Oct-21
Scott, Kathy (Travis, KB0PWP) Oct-30
McCoy, Susanne (David, KE7JEJ) Nov-06

FOR SALE OR TRADE

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COMING EVENTS

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NEXT YL LUNCHEON

Fortune Star
145 E. Washington

Time: 11:45 a.m.

***Find us on the web* at www.olyham.com Check it out. Lots of information about ham radio in Clallam County!**

2009 YL Luncheons:

October - Fortune Star -145 E. Washington - Sequim
November - Chestnut Cottage - 929 E. Front - Port Angeles
December - Paradise - 703 S. Sequim Ave. - Sequim

Description	Time/Date	Location	Contact
Clallam County ARES/RACES meeting	7 pm, first Tue of every month	Clallam County Courthouse EOC, 223 E. 4th St., PA	Dan Abbott N7DWA 360-582-3824
Clallam County Amateur Radio Club general meeting	7 pm, second Wed of every month	Olymp Med Center Basement Linkletter Room	Tom Newcomb KE7XX 360-452-8228
Clallam County Amateur Radio Club social breakfast	8 am, first Sat of every month	Joshua's Restaurant Hwy. 101 & Del Guzzi Dr.	Tom Newcomb KE7XX 360-452-8228
Clallam Country Amateur Radio Club YL social lunch	11:45 am 2d Fri of every month	Rotates - announced on Thursday night Net	

CLUB OFFICERS For 2009

President: Nita Lyman KE7DRT 360-457-5022 Nita_lyman@yahoo.com
Vice President: Dennis Tilton AC7TV 360-452-1217 3tiltons@wavecable.com
Secretary: Lee Diemer KE7TTY 360-683-5102 pathfindernorth@aol.com
Treasurer: David McCoy KE7JEJ 360-457-8550 mccoy.d.r@olypen.com
***Board Member* (Chairman):** Bill Carter W7WEC 360-6814375 w7wec@arrl.net
***Board Member*:** Johan Van Nimwegen KO6I 360-681-7300 jvn@olypen.com
***Board Member*:** Al Dawson W7YLV 360-457-0752 adawson@tfon.com