

## November 2013 Edition - Vol 2 Issue 5

A publication of the Four State QRP Group and OzarkCon QRP Conference

[www.4sqr.com](http://www.4sqr.com)

Group callsign WQ5RP

# Ozark QRP BANNER



4SQR.COM

Little Radios

Big Fun!

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## The new EZ Keyer

**First time builders please note:** This kit is a very easy kit to build. All parts are through hole parts and are wide spaced on the board making installation easy. All connectors and switches are board mounted which eliminates point to point wiring, and after all the parts are installed it's ready to try out.

The kit includes all the components required to build the keyer - switches, connectors, speaker, programmed PIC, components, AND the enclosure.

### Specifications and Design Features

- Beautiful blue silk screened and easy building PCB enclosure
- Command List is silk screened on bottom of enclosure
- New PIC Microcontroller.
- New Delay and Repeat (D) command especially for Contesters, Beaconeers and QRPers. [More Info Here](#)
- Three easy-to-use memories Two with 47 character capacity and one with 79, stored in non-volatile memory (EEPROM).
- Three high quality, full size, panel mount (top cover) pushbuttons.
- 5-55 wpm speed range.
- Iambic A or B, straight (Cootie) key, and Bug modes.
- Sequenced Mute Line (Goes low for receiver mute or T/R switch).
- Speed and operating modes stored in non-volatile memory (EEPROM).
- Speed entered by command or easily changed on-the-fly via the paddles.
- Tune Mode.
- Very long (essentially shelf) battery life - no power switch required..
- Operating voltage 3-5 volts, 3 AAA alkaline batteries are ideal.
- Low power - 1ma active and 1uA in sleep mode.
- 600 Hz sidetone (may be turned off).
- Autospacing between characters (may be turned off).
- Dash/Dot paddle swap command
- Keyed line goes low when active

### Ordering Information:

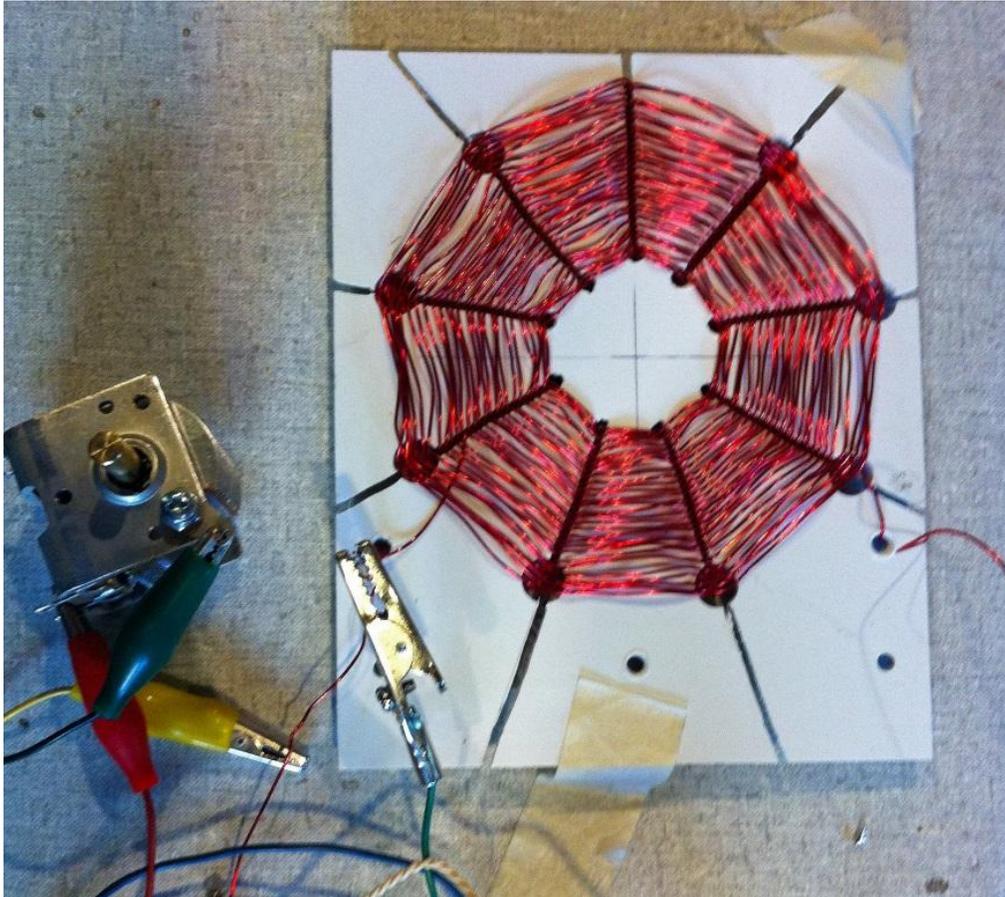
The cost of this kit is \$30, shipping is additional.

<http://www.4sqr.com/ek2.php>



# MY SPOUSE SENDS PERFECT: “S,” “H,” and “5” MORSE CHARACTERS!

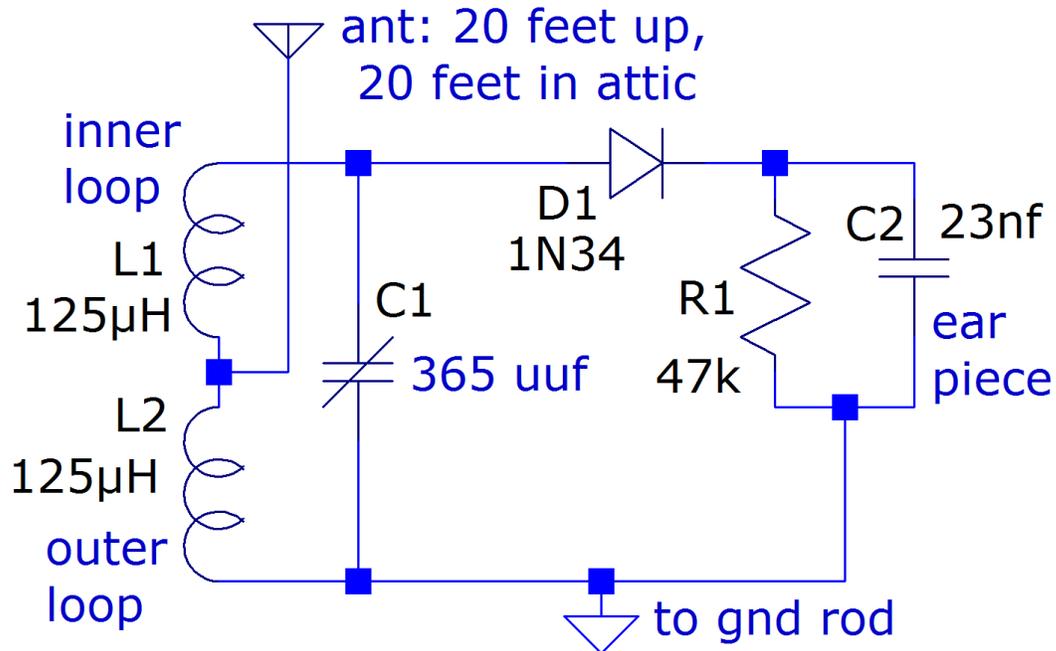
By: Uncle Phil, WØXI



You see, I discovered this while wiring up my first spider-web crystal set in the basement. An aside, I thought this spider web would provide company for the real ones here and there in the corners. My spider coil is shown in the picture at right. It consists of 55 turns of #22 AWG enamel wire wound on a 1/8<sup>th</sup> inch thick 5 by 6 inch piece of ABS plastic. The inner diameter of the coil is about 1.5 inches and the outside diameter is about 4.5. Total inductance turns out to be about 250 uH, perfect for an AM band crystal set.

My AM band antenna runs 20 feet up to the eave and then another 20 feet into the attic, east-to-west. The antenna feed attaches to the single tap I provided on the coil, about midway. Next time I'll add more taps to the coil to aid in tuning the antenna a bit better across the AM band. The full coil is paralleled with an air variable 365 uuf cap and attaches to the anode of a 1N34 germanium diode. The ear piece attaches to the diode cathode and in parallel with the

47K detector resistor to ground. That's the rig! Compared with a cylindrical coil, this set is hotter; I could hear five stations immediately, including Topeka (W1BW, 580), KC SPORTS (810) and of course the local, KLWM at 1320 on the dial.



Now back to the Morse! During my initial testing, I kept hearing brisk and loud TAT TAT TAT and TAT TAT TAT TAT, and TAT TAT TAT TAT TAT. It was perfectly sent, all at a steady 15 WPM. Wha???? I pulled off the earpiece and went upstairs to check on the source.

Dang! I walked into the kitchen and the plumber was there repairing our gas range. Each time he tuned the front burner on you could hear TAT TAT TAT TAT. Just like power line interference, the spark creates both RF and air tsunamis.

So now my spouse sends lots of S, H, and 5 characters most days at 7 AM, sometimes noon, and usually around 6PM! 73, WØXI.





## Build It, Ideas !!! #1

This little tool was inspired by a similar item I saw on You Tube.



## A Coax Tester For Short Circuits

By: Geoff Haines, N1GY

<http://mysite.verizon.net/cpthaines/id82.html>

As I was browsing around the web this morning I saw a video by another ham in which he used what he called his coax tester. He did not explain the circuit for his tester but it gave me an idea. Obviously what he had was a form of continuity tester with specific design elements for attaching it to a newly installed coax connector. It took only a moment to come up with a workable circuit. The functionality of the tester is obvious. I have installed many PL-259s over the years and testing for a short with a regular digital meter sometimes seems to require three hands. This tester allows one to simply screw the PL-259 onto the tester to get an immediate "GO/NO GO" indication. If the LED lights up- you have a short circuit either in the coax or the connector. Start over. If the LED does not light up, the installation of the connector has no short circuit.

I mounted the components in a small plastic box left over from a previous project and labeled the box with instructions on its use. I included a test button in the circuit so that the user could make sure that the unit would give a proper indication when used. The button momentarily short circuits the tester so the LED will light up. If it does not then it is probably time to replace the two 1.5 Volt AAA batteries that power the LED. The actual size of the batteries is not critical, AA or AAA will work just fine. The important thing is to power the unit with 3 volts DC. That way, no dropping resistor is required. If you want to use a 9 volt battery just add the appropriate dropping resistor to the circuit. A 330 Ohm 1/8 watt resistor will do the trick just fine for 9 volt power. I suggest the use of a battery holder to make exchanging the batteries as easy as possible.

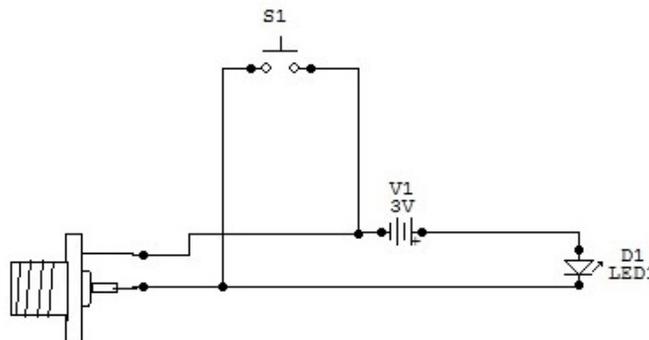
A protective ring wall was installed around the test push button to prevent inadvertent short circuits while it is stored in a tool box, pocket, or go-kit. The ring wall is nothing more than a section of a PVC tubing connector, hot glued around the push button. It has to be higher than the button, but only by a fraction since you want to be easily able to operate the button when using the tester.

Parts List:

- 1 SO-239 connector
- 1 Red LED
- 1 Momentary Push Button (Normally Open)
- 1 Battery Holder for battery(ies) of choice
- 1 330 Ohm resistor (only needed if using a 9 volt battery for power)
- 1 Suitable enclosure
- 1 protective ring to go around push button (section of PVC connector)

Assorted hookup wire, hot glue, etc.

As you can see, the circuit is very simple. If there is a short circuit in the cable under test then voltage will be passed to the LED and it will light up. If the push button is activated then the circuit is also completed and the LED will light up.





## Build It, Ideas !!! #2

# A Simple Tilt-over Mechanism for Mast Mounted Antennas

By: Geoff Haines, N1GY

<http://mysite.verizon.net/cpthaines/id38.html>

### **This is a simple idea I came up with when I put up my GAP Eagle antenna for HF**

When I first moved into my current abode, the question of antennas was an important factor in setting up my ham shack. Because of power lines that were in close proximity to the back of our home, any kind of wire antenna was out. We live in a hurricane prone area of the country, and the thought of wires waving about in the breeze, looking for power lines to hit, did not make me comfortable. I decided that a vertical antenna, mounted toward the front of the house was the only way to go. The presence of the house was enough to keep the vertical antenna from ever coming in contact with the power lines. I still needed a way to bring the antenna down safely when faced with an oncoming hurricane. A tilt-over mount seemed to be the only sensible option.

There are a number of tilt-over mounts available from suppliers in the pages of QST and other ham radio publications. All of them appear to be very good and I have no doubt that many amateurs will choose one of these with great success. My specific situation was a little different, so I took an alternate path. Under the spot where I chose to erect my vertical antenna, the surface is solid concrete, my driveway in fact. This would make the installation of a commercial tilt mount problematic. The antenna mast, when erect, is anchored on two sides to the eaves of my roof. A different type of tilting mechanism was called for.

My son-in-law, Gabe, who at the time worked for a new car dealer, came up with the solution. He found a steering shaft from a wrecked automobile which had a universal joint at about one third the way up the shaft. I took this to a local welder and had a pipe welded on to the shorter end of the shaft. Using a 10 foot length of masting material and a level, I determined the exact location for a hole to be drilled through the concrete pad, allowing for the diameter of the masting. This allowed the antenna and mast to be dead-on vertical when butted up against the eaves of the roof. A three quarter inch hole was drilled with a masonry bit. Testing with a blumb-bob confirmed that it was in the correct spot.

I then assembled the antenna (a GAP Eagle) onto the masting section and slipped one end of the steering shaft into the lower end of the mast. The other end of the steering shaft, with the welded on extension, into the hole in the concrete. Before I did this assembly, I made sure that the hardware that I was going to use to anchor the mast to the roof was already in place on the mast. The mast/antenna combination was then simply walked up to its vertical position and secured to the house. In order to present a more finished appearance at ground level, a plastic flower pot was cut and slipped over the mast and down to cover the universal joint. Coax runs from the Eagle and other antennas in that area of the house were dressed down the back side of the mast and attached with black wire ties. This presents a neat and clean view from the street.

When a hurricane or tropical storm is forecast to be headed our way, it takes about ten minutes to release the mast from the roof, lower the mast and antenna to the ground, and secure it under the carport until the winds have past by. In over four years of operation, the antenna has worked flawlessly. During the

2004 Hurricane season, the system was lowered and raised 4 times. No damage to the antenna or to the house was noted.

One caveat about this method is warranted. Make sure that the method used to secure the mast to the eaves of the house is fully capable of holding the system. I used a combination of U-bolts and mountaineering gear to secure the mast in two directions, North-South and East-West. I also added a third method as a safety when lowering and raising the mast. Any one of these is strong enough to retain the mast, but redundancy is a must. If the mast/antenna falls, anything in its path will sustain damage. Don't ask me how I know, trust me on this.

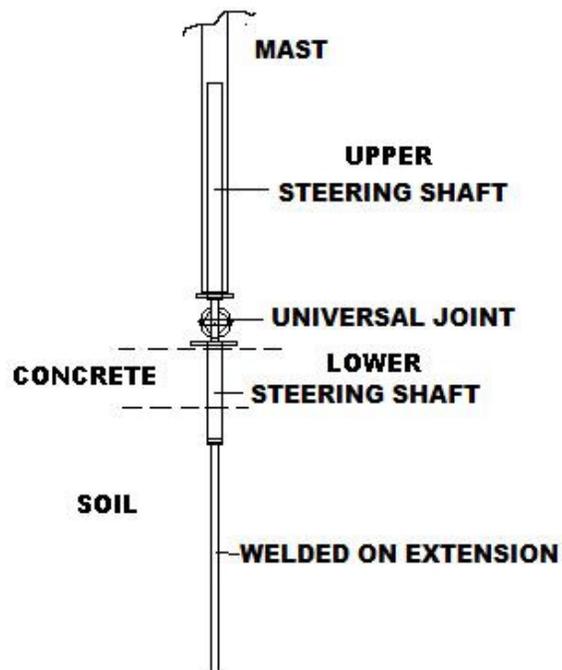
The sum total of all the parts and hardware used in this tilt-over mount came to about \$30.00, not including the mast or the antenna. This is considerably less than the commercially available products. This system is not suitable for a freestanding mast away from a house or other structure unless guy ropes are used. That said, it does still obviate the problem of such a mast from having the base walk or shift during the erection process.

When a house or other structure is available to secure the mast in an upright position, the "steering shaft" method is easy and simple. It can even be used with portable antenna masts used with emergency communications trailers or vans, where the base of the mast tends to be difficult to control. Securing the mast to the side or end of the trailer or vehicle can be as easy as a block of wood cut to accept the mast and secured temporarily or permanently to the trailer. The putting up of the antenna then becomes a one or two person job at the mast. Not the least advantage is the removal of fingers and other portions of the anatomy from positions of risk at the bottom of the mast.

I hope that this article gives you some ideas for your own situation. Other devices may work as well, such as automotive axles or drive shafts. The important part is the universal joint which makes the whole thing possible.



The drawing shows how the steering shaft supports the mast





**October 31, 2013**

**The Mid-MO ARC, Jefferson City, MO is having a  
Halloween Funexpedition to Frankenstein, Missouri.**

Work WØO on Halloween. We will be operating from approx. 1700 UTC Oct. 31 through 0400 Nov. 1, 2013.

**Operating frequencies: (+/- QRM)**  
**CW - 3.538, 7.038, 14.038 MHz**  
**SSB- 3.963, 7.170, 14.170 MHz**

*Special Event QSL card can be obtained with a SASE and contact info. to:*

**K9ZTV**

**KENT W TRIMBLE  
2210 HEARTLAND RIDGE  
JEFFERSON CITY, MO 65109-9048  
USA**





## Build It, Ideas !!! #3

# *External HT Power*

By: Geoff Haines, N1GY

<http://mysite.verizon.net/cpthaines/id75.html>

**Here is a way to get that old HT back in the battle again.**



**My old Alinco DJ-F1T was still functional but its battery pack was not.**

Recently, I hauled an old handheld down off the shelf and discovered, not surprisingly, that the battery pack was deader than the proverbial doornail. I like my old HT even though it does only one band (2 meters). I had one just like it back in my Civil Air Patrol days so I decided to see if I could build an external battery pack to power it. (Kind of like the old Quantum Ham Pack, now long gone, that I used for the HT in the old days.

A little persuasion separated the back of the pack from the rest of the enclosure and I found 10 cells about 2/3 the size of an AA cell welded together to provide 12 volts to the HT. Of course they no longer were capable of doing that. The cost of having a local battery store rebuild the pack was not unreasonable, but they did not have the cells in stock and it would take several weeks to get them in.

I decided, as I mentioned before, to try my hand at building an external pack and converting the stock pack to include a power connection after removing the cells that it contained.

In my radio room I have several file cabinets that contain a whole lot of various parts, enclosures and other devices that I keep around just because I might need them someday. With a little searching, I came up with a suitable enclosure, two 8-cell battery holders and a coil cord with two conductors. A quick trip to my local Radio Shack and I had the male and female coaxial power connectors.

I started the project by removing the stock cell stack from the battery pack of the HT. The stack was held in with a little double sided tape, so slight prying with a small screwdriver got them out easily. A suitably sized hole was drilled in the side of the battery pack for the female power connector and it was installed. I then soldered wires from the connector to the two contacts on the cover of the pack that make contact with the rest of the HT. A little adhesive to keep the cover in place and the repurposed battery pack was installed back on the HT.

The external pack started with an ABS project enclosure that measured about 6" x 3" x 2". I got mine from Radio Shack some time ago just to have it on hand, but they are available from many sources. As it turned out, that was the perfect size to fit the two 8-cell battery holders side by side. With AA cells in place in both holders and the two holders wired in parallel, I get a nominal 12 to 13 volts from the combination. You may ask why I chose to use non-rechargeable AA batteries instead of ni-cads. My thought process was that in a time of emergency one may have difficulty finding 110 Volt AC to run the charger but any retailer of any size will have more AA batteries in stock. A hole was drilled in the side of the enclosure for the coil cord and a salvaged belt clip from some unknown project or device from long ago was bolted to the outside of the cover of the enclosure.

The coil cord was soldered to the wires from the battery holders after first passing the end of the cord to the inside of the enclosure. At the other end of the cord, the matching male coaxial power connector was soldered on and the joint covered with heat shrink tubing. This did require a little pre-planning to get several short lengths of heat shrink over the correct wires and cables in the correct order.

To keep the battery holders from rattling around in the enclosure, a piece of scrap rigid packing foam was carved to be a snug fit inside the enclosure and the cover with the belt clip was then screwed into place with the four screws provided.

The coil cord was plugged into the female connector on the side of the HT and testing commenced. Because the HT had been idle for so long, the memories were all gone, but the HT powered up on the first try. A brief test transmission on 146.52 showed that the radio was putting out a full 5 watts and further testing showed that all of the functions of the radio were A-OK. I then programmed the radio with a few of our local repeater frequencies, offsets and tones. I was able to hit all of them without difficulty.

With the external power pack on my belt where it weighs no more than other HT's I have used, the HT it powers can now be kept in a shirt pocket or clipped to my ARES vest. Since there are no batteries in the HT itself, it is much lighter and easier to handle. In use, I just lean my head slightly toward the HT and push the PTT button without actually having to unclip it from my clothes.

If you have an old HT whose battery pack has gone west, you may want to try building an external pack for it and bring it back to life.

Here you can see the inside of the stock battery pack with the cells removed and the new connector installed and wired to the Ht contacts.



Here is a view of the coaxial power connector after installation.

I chose a fairly large one to ensure that there would be the least impedance to the flow of power to the HT.



This is the inside of the 6 x 3 x 2 enclosure that I used as the external battery pack. Next to it is the foam insert that keeps everything in place.



The completed external power pack, ready to power up the HT.



## Four State QRP Group

is now meeting at the Country Cupboard Restaurant in downtown Seneca, Mo.



The Country Cupboard has a nice menu and they have a separate meeting room we can use.

The Country Cupboard restaurant is located in the first block north of the blinker light in downtown Seneca. From Barney's, head north on Cherokee Street (that's the main street of town). Go across the railroad tracks and keep going past the blinker light stop. The restaurant is located at 1038 Cherokee street, on the west side of the street.

Caution: If you are headed north, do not make a left "J turn" into a parking spot. "J turns" are illegal in the downtown area. Keep going north past the restaurant till you reach the residential area north of downtown where a "U turn" is permitted. Make a U turn there (it's a wide street) and come back to the parking in front of the restaurant.

Our group is an informal organization with no officers, no rules, no dues or any other things to get in the way of having fun with QRP. **We get-together monthly for lunch and the sharing of ideas and information, parts swapping and just plain fun on our normal third Saturday of a month.**

All ham radio amateurs (or prospective hams) are invited to participate.



## Dan - KB6NU's Column

Uno, Dos, Tres...

If you have done any amount of listening to shortwave radio outside of the ham bands, you have undoubtedly run across "numbers stations." The broadcasts from these stations consist streams of numbers or letters, often in a computer-generated female voice speaking in Spanish. Every now and then, a numbers station pops up on 30m, sending five-character groups in Morse code.

According to the Conet Project (<http://www.irdial.com/conet.htm>), "Shortwave Numbers Stations are a perfect method of anonymous, one way communication. Spies located anywhere in the world can be communicated to by their masters via small, locally available, and unmodified

Shortwave receivers. The encryption system used by Numbers Stations, known as a 'one time pad' is unbreakable. Combine this with the fact that it is almost impossible to track down the message recipients once they are inserted into the enemy country, it becomes clear just how powerful the Numbers Station system is."

The Conet Project sells a CD with a number of recordings for \$55, but you can find a bunch of mp3 files at <http://www.archive.org/details/ird059> for free.

Recently there was a thread on the Glowbugs Google Group about numbers stations. One fellow mentioned "The Numbers Station," a movie released earlier this year starring John Cusack. IMDB (<http://www.imdb.com>) says that The Numbers Station is about "a disgraced black ops agent dispatched to a remote CIA broadcast station to protect a code operator. Soon, they find themselves in a life-or-death struggle to stop a deadly plot before it's too late." It's currently available for streaming on Netflix, and I watched it recently. It's kind of violent (lots of people get shot), but it's a decent thriller.

Jim, K6FWT mentioned ENIGMA 2000 (<http://www.apul64.dsl.pipex.com/enigma2000/>). The group's website describes ENIGMA 2000 as "a UK based online group, whose aims are to bring together listeners and enthusiasts who monitor and gather information on 'Number Stations' and other related radio transmissions. Through our Yahoo Group monitors can share their logs, discuss frequencies, thoughts and opinions on this most emotive subject." Jim says, "These folks are SERIOUS enthusiasts. I have heard that they surpass many intelligence services with their thoroughness. You can get in up to your eyeballs if you don't watch it."

These stations have been around since World War II. I remember as a kid in the 1960s and 1970s, reading articles about numbers stations in Popular Electronics and Electronics Illustrated. They're as much of a mystery today as they were back then.

=====

When he's not listening to numbers stations, Dan, KB6NU enjoys working CW on the HF bands and teaching ham radio classes. For more information about his operating activities and his "No-Nonsense" series of amateur radio license study guides, go to KB6NU.Com or e-mail [cwgeek@kb6nu.com](mailto:cwgeek@kb6nu.com).



**Daylight Savings Time  
NOTICE  
Sunday, November 3,  
2013: 2:00 AM back to  
1:00 AM**  
<http://www.timeanddate.com/time/dst/events.html>

## **Second Sunday Spring**



**November 10th .. 7-9pm cst**

The Four State QRP Comfortable nets meet each Wednesday night beginning at 7:30 PM CDT, 0030z.

Note: on Nov 6 we'll be on CST.

If we have to QSY, I like to move up, Wayne likes to move down, and Dick doesn't have to move much at all.

Add anything to the exchange that you wish, temp rig, ant, etc. Checking into all sessions is encouraged.

7:30 CDT 0030z ... 40M CW Net on 7122, KCØPMH NCS  
8:00 CDT 0100z ... 80M CW Net on 3564, WAØITP NCS.  
8:30 CDT 0130z ... 40M CW Net on 7122, KCØPMH NCS  
9:00 CDT 0200z ... 80M PSK Net on 3580.5, NØTGR

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