

Colorado QRP Club

The Low Down

Promoting QRP Since 1994

Club News...

Colorado QRP Club awaits ARRL affiliation

After the November CQC meeting steps were taken to affiliate the Colorado QRP Club with the ARRL. In December the club received news that our membership application had been received and sent on to the Rocky Mountain Section Director for consideration and a vote at their next meeting. The club is now awaiting the results of the meeting and vote.



Heathkit SB-102 and matching speaker/power supply

The CQC Garage Sale

It started as a way to generate some funds for the club. It has grown to a remarkable traveling museum of ham radio. At the January 2006 meeting the Colorado QRP Club became the recipient of three Heathkit rigs from the estate of Don Roof, WA0GKP SK. Donated by Mel Minnick, KØMEL to club these rigs will be available for purchase starting at the Aurora Repeater Association hamfest at the Adams county fairgrounds February 12, 2006. The three rigs are an SB102 transceiver with the matching power supply and speaker, an HW22 40 meter transceiver and an HR-20 receiver. All three rigs are in great shape and reflect an owner/operator that really took care of their equipment. There is a full set of manuals and spare set of tubes for the SB-102 including power cords for the SB-102 and the HW22.

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For more information, visit our website at www.cqc.org

Issue 57 Jan/Feb 2006

Picture credits to

Vince Kumagai - KI0RB

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Our next Regular meeting will take place
Saturday, March, 11 2006 at
10:00 am
Meeting Location: Offices of
Milestone Technologies
10691 East Bethany Drive,
Suite 800
Aurora, Colorado

CQ CQ CQ Net controllers

The Colorado QRP Club is in need of Net Controllers for the Monday night 2M nets. It's easy and it's fun. We provide you with the script and you can take it from there to develop your own "Net-tique". If you live on the Denver Front Range from Ft. Collins to Colorado Springs please consider a try at the mike. Contact Jim Pope - KG0PP at Ejim@aol.com



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The Low Down

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QRP Information Net: The Colorado QRP Club also meets on the air every Monday evening at 2000 local time on the 147.225 repeater serving the eastern slope of the Rockies from Cheyenne, WY, to Pueblo, CO, with linked repeaters in Boulder (145.46) and Colorado Springs (145.16). Backup frequency: 145.145. The Club's Denver metro simplex liaison frequency is 146.445. Meeting Dates: 2004 Meetings: Jan. 10, Mar. 13, May 8, July 10, Sept. 11, Nov. 13 at a location to be determined. Annual Picnic: Sat. Sept 18, 2004. Annual Banquet: To Be Announced. Changes will be announced on the Monday evening Net and posted on the [WWW,CQC.ORG](http://WWW.CQC.ORG) website, if time permits.

Informal Monthly QRP Gatherings: Members meet informally at a local restaurant -- details on the web-site. Annual Dues: \$12.00. Join via the internet at WWW.CQC.ORG. Or, send dues and requests for membership applications to: CQC, POB 17174, Golden CO 80402-6019.

Internet: WWW.CQC.ORG. Information, membership, renewals, officers, activities, CQC Swap List and CQC-List subscriptions.

Correspondence: Editor, The Low Down POB 17174. Golden CO 80402-6019.

CQC Logo mugs

Don't leave your shack without it!! Vince, our club Secretary, arm-wrestled a half dozen vendors until we got a good deal on a few dozen of these beautiful, cobalt-blue coffee mugs. Get yours while supplies last!!

Photo courtesy Marshall Emm N1FN



Photo courtesy Marshall Emm N1FN

\$10.00 (Pick one up at our meeting or other gathering)
\$4.00 (Shipping and handling if we mail one to you...)
Order from our web site using our PayPal secure service.

Photo courtesy Marshall Emm N1FN

CQC RFL-10 QRP Dummy Load Kit

The kit consists of 2 5W metal oxide resistors an SO239 socket and includes adaptors for connecting to either SO239 or BNC antenna sockets. Rates to 10W continuous power for at least 60 seconds, with a flat SWR across the HF spectrum.



\$7.00 - Members
(Includes Shipping and Handling!)
\$9.00 - Non Members
(Includes Shipping and Handling!)

New
CQC Logo Tee Shirts

These beautiful tees are 100% cotton with the club logo and motto. Your call sign and name call can be added for \$2 Available in sizes XXL, XL, L and M

Photo courtesy Marshall Emm N1FN



Photo courtesy Marshall Emm N1FN

\$12.00 plain or \$14.00 with Call and/or Name
\$4.00 Shipping and handling
Order from our web site or pick one up at the next meeting and please specify size.

Photo courtesy Marshall Emm N1FN

Tentative Meeting
Schedulde for 2005/2006:

- Nov 12 - Regular
- Dec 10 - Chat 'N Chew
- Jan 14 - Regular
- Feb 11 - Chat 'N Chew
- Mar 11 - Regular
- Apr 8 - Chat 'N Chew
- May 13 - Regular
- June 10 - Chat 'N Chew
- June 24 - Field Day

Regular Meeting Location:
Offices of Milestone Technologies
10691 East Bethany Drive,
Suite 800
Aurora, Colorado



Heathkit HW-22 Transveiver

garage sale

The current garage sale inventory contains all sorts of items including an MFJ1278 multimode data controller, and yes evens a SBC linear amplifier. I can only claim I have no knowledge on how the linear works or even if it works as it is quite foreign to this author but it is available to a good home. "We value everyone's options" as stated in the 2M Net script. To balance things out there is a Rockmite kit and accessories currently available as well. The CQC Club would like to thank Mel Minnick and the estate of Don Roof for their generous contribution. The contributions will be used to further the club contribution to QRP and ham radio.

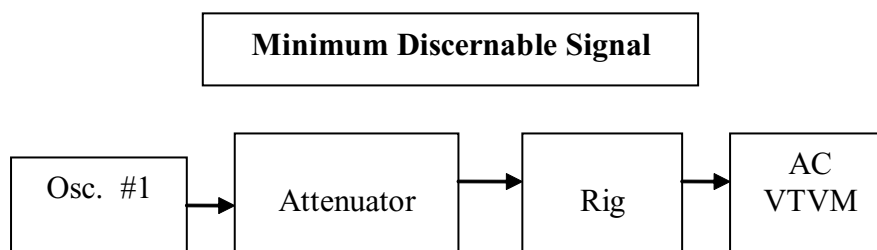
Using the Elecraft XG2 Receiver Test Oscillator

By Stephen C. Finch, AI0W

At the November, 2005, Colorado QRP Club Meeting, I gave a presentation on measuring receiver performance specifications – minimum discernable signal, dynamic blocking range, and 3rd order intercept. Due to some technical difficulties, we could not measure the 3rd order dynamic range. However, using homebrew test equipment except for a step attenuator, we looked at the specs for the FT-100D. Some other rigs were tested too.

The Setup and Test

The first test was the minimum discernable signal (MDS). Here is the test setup.



Equipment:	
Osc. #1	Homebrew 20 meter crystal oscillator (14.060 mhz), output measures -92 dbm. (designed for stable output into 50 Ohms)
Attenuator	Commercial attenuator 0-100 db in 1 db steps (swapfest - \$25.00)
Rig	FT-100D with 500 Hz xtal filter
AC VTVM	Heathkit IM-38 (swapfest - \$15.00)

The AC VTVM was connected across an 8 ohm 2-watt resistor that was plugged into the speaker jack of the 100D. The AC VTVM has a “DB” scale and the rig was turned on and the volume was set for the noise level at -3 db on the db meter scale. The attenuator was set to 50 db of attenuation and the oscillator was turned on. (A fresh 9 v. battery was used to assure an accurate output level.) The attenuation was decreased until the AC VTVM read 0 db on the meter scale. Thus, the signal was +3 db above the noise floor. This is the point where the minimum discernable signal is determined.

For this test, the attenuator was at 42 db. This made the MDS equal to the oscillator output less the attenuator setting or -92 dbm -42 db = -134 dbm. Some members were curious to see what the rig measured for 80 meters and 20 meters. However, I did not have an accurate signal for those bands.

My 20 meter test oscillator was designed with a Colpits crystal circuit with a tuned output into a 6 db 50-ohm attenuator. The attenuator assured a good 50 ohm output. The 9 v. battery supply was regulated using a 6.1 volt

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Heathkit HR-20 Receiver

How Copy?

By Vince Kumagai KI0RB

I one of those hams that still struggle with CW but I like to operate CW. I really enjoy the Fox Hunts and the 80 meter hunt put on this winter was a real hoot. One night after the hunt I was tuning around and came across the code practice put on by the ARRL station W1AW. I had worked the code practice before but as I was poking around the ARRL web site, www.arrl.org, I found that the audio and text from the on air code practice is also available for download in MP3 format. You can download the MP3 and then use your Windows Media player to play the practice session but I what I did was to load the MP3 files on to an MP3 player and I take it with me and practice whenever I want. You can download the text file with the code to check your copy. The practice sessions are just the right length and can be downloaded in code speeds from 5, 7 1/2, 10, 13, 15, 18, 20 up to 50 wpm. The typical session lasts about 4 to 5 minutes and are great for quick practice run. For further information go to the ARRL web site - <http://www.arrl.org/w1aw/morse.html>

zener diode. The entire circuit was built into a double sided pc-board box with the crystal oscillator shielded from the output circuit. A BNC connector was used for the output. The inside and outside of the box was rf sealed so no stray 20 meter signal leaked out of the box to interfere with the test. While the construction was simple, it did take quite awhile to build and test. The output was calibrated using a 100 mhz scope. The output was a very pure sine wave at -92 dbm (or 5.63 microvolts into a 50 ohm load).

If I wanted to test 80 meters and 40 meters, I would have to construct two similar oscillators for those bands. This was more work than I wanted to invest.

Enter the Elecraft XG2

I had read with interest about the Elecraft XG1³. The XG1 is a precision oscillator designed to provide a 7.040 mhz signal of 1 μ volt or 50 μ volts into a 50 ohm load. The 50 μ volts is used to measure the S-meter calibration and the 1 μ volt is used for measuring the MDS. Elecraft claims the design provides the output within +/- 2 db accuracy (+/- 1 db typical). QRP homebrewers have found this an invaluable tool for testing homebrew rigs. Unfortunately, the XG1 is limited to the 40 meter band.

Being a smart group, the Elecraft designers went back to the drawing board and produced the XG2¹, an 80, 40, and 20 meter test oscillator. Now the homebrewer has the 1 μ volt and 50 μ volt signals on all three bands.

The temptation was too much for me and I ordered an XG2 from Elecraft. I took only four days to arrive (great service). The resistors and caps are very small so I used my magnifying glass to make sure I could read the resistor color bands and the cap designations accurately. Once the parts were accurately sorted, I began constructing the XG2. While the assemble instructions are minimal, any QRP homebrewer will have no problem with the construction. From opening the bag to completed XG2 took only two hours. Testing the unit comprises inserting the 3 volt lithium battery, attaching the XG2 to a receiver, and turning both on. Immediately, I heard a clear note at 7.040 mhz on my FT-100D. I set the crystal filter for 500 Hz and the DSP for 60 Hz. and peaked the tone. My dial read 7.04030. So far so good.

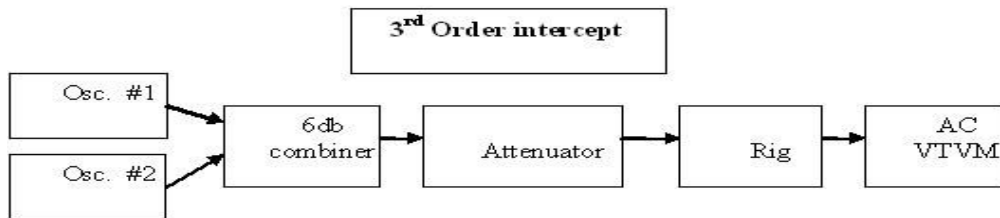
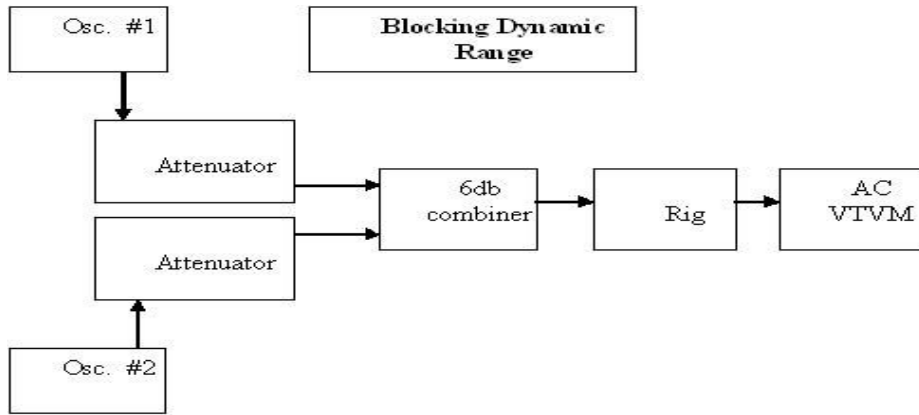
I then set up the test using the above setup only this time, I used the XG2. I compared my results to the ARRL White Paper on the FT-100². The FT-100 has an identical receiver as the FT-100D so the performance data are comparable. Here is my results:

Band	MDS-ARRL, dbm	MDS-Steve's measurements, dbm
80 meters (XG2)	-133	-138
40 meters (XG2)	-136	-135
20 meters (XG2)	-133	-133
20 meters (Steve's oscillator)	-133	-134

Wow! Look at how similar the readings are!! The ARRL used equipment that costs \$1000's and the total cost of my setup (including the \$60 for the XG2) did not exceed \$100. It just goes to show you that you do not need an expensive lab to do a VERY credible job of testing.

Blocking Dynamic Range and 3rd Order Intercept

Both of these tests require two oscillators to measure. Here are the two test setups.



I will tackle these tests in a future article.

It is Sunday evening, Oct. 9th. By morning the snow will have arrived and another winter will start in Colorado. It seems only yesterday that the CQC crew was enjoying a great picnic and QRP activities at Daniels park. It was not snowing at the picnic!

Winter does not mean QRP work stops, however. This is the best time of the year to be thinking about purchasing one of the many kits available on the market. Digging already purchased kits out from beneath other half finished projects might provide another excuse to melt solder. Sometimes we run across a kit that was forgotten, as I discovered earlier today when I stumbled across a Pic-EL. An added bonus was that fact that this particular kit has been discontinued. Keep in mind that with the solar flux down, geomagnetic storming on the wane, and longer evenings on their way, this is a perfect time to built an 80 meter transceiver, like the new OHR 100A - 80m. This is a band that few QRP builders have homebrew equipment on.

At the KG0PP QRP shack, a favorite winter activity is antenna construction. Yes, really. Antennas just seem to work better when put up in freezing temperatures with the wind blowing in your face. Actually, winter seems to be the only time available due to all of the summer activities we seem to get caught up in. Picnics, baseball (season ticket holder), camping and other Colorado favorites just seem to eat up every weekend.

In anticipation of several antenna projects, KG0PP has managed to procure an MFJ-259 antenna analyzer that should make antenna adjusting a breeze, so there should be antenna gossip for the nets this winter.

Keep your calendar marked for the second Saturday of each month. November, January, March, and May will be regular meeting months. Other months don't forget the CQC 'Chat and Chew" at Bennets BBQ in Aurora.

PRESIDENT'S MESSAGE - From Jim Pope KG0PP

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“What’s Been Going on in Your QRP Shack?”

More ramblings from KG0PP----

I love Shortwave Listening, it was one of my first exposures to radio other than a BC receiver. The shortwaves still attract my attention nearly daily, but that is a story for a different day.

Wanting a dedicated SW antenna, the decision was made to toss a dipole up into the tree, attaching one end to the house. Feeding at the center was out of the question as it would place the ladder line feed in the middle of the lawn. The most convenient feedpoint was selected and the dipole became an off-center fed dipole (OCFD). Now, OCFD’s are very interesting antennas in themselves, usually resonant on three ham bands, but that is another story for a different day. Check them out with EZNEC.

With no ham band operation in mind, the side lengths were chosen only for the ease of installation. The OCFD has been in use for about a year, SW listening only.

Sitting in the QRP shack today; however, the curiosity arose as to just where the antenna was resonant, or even if it WAS resonant. A quick check with the MFJ-209 gave surprising results. The antenna showed an SWR below 3:1 at 14 mhz, 18 mhz, and 24 mhz. Sometimes it is better to be lucky than smart.

So why not give it a try...a CQ was tossed out at 14.063 mhz and was immediately answered by John, W9BYN. John is located in Kokoma, IN and was a solid 599. He reported my QRP signal was also 599... amazing!

John is an “old-timer”, having held his call since 1939. His fist is still clean at the age of 83. His rig is a vintage TS-820 and sounded terrific. We chatted about our weather and our antennas for a bit, having a very FB QSO. The signals stayed solid and strong throughout the chat. The unexpected contact was enjoyed and proved that it can pay to experiment.

Who would have thought that the SW antenna would work so well on the ham bands, but then, you just never know what will happen in your QRP shack.....Jim