HAM RAG

Visit our website for more club and area ham information
In the Rockford area at ***http://www.w9axd.org***

ROCKFORD AMATEUR RADIO ASSOCIATION

RARA Mission Statement
A member association with common interest of public service to the community through the use of amateur radio.

Presidents Log

Greetings Fellow Hams!

This month's program will be presented by Dennis Johanson, K9VMY. The topic will be on his trip to the Twin Cities in Minnesota to see a radio Museum. Radios on display date from the spark gap era to the present. There is some really neat stuff to learn about. As a History Buff. I will be looking forward to his presentation

Tom Shouler N9VJU

The Museum of Broadcasting houses one of the world's finest collections of antique radio, television, and broadcast equipment. The Museum has gained international recognition for its continuing efforts in preserving and documenting the history of an industry that has made monumental changes in the fabric of modern life. Please read our mission statement.

1912 spark-gap transmitter
The foundation of our programming is the Joseph R. Pavek Collection containing hundreds of radio receivers, transmitters, and televisions from the first half of the Twentieth Century. Highlights include a working 1912 rotary spark-gap transmitter, similar to the one used aboard the Titanic, crystal radios of the early Twenties, a chronologically ordered collection of vacuum tubes (including several of the original DeForest Audions), and one of the most extensive treasuries of radio literature ever assembled.

Jack Mullin Collection
Other attractions include the Charles Bradley Collection, representing more than sixty radio manufacturers from the Twin Cities area, and the Jack Mullin Collection, documenting one hundred twenty-five years of audio recording technology. From the earliest days of the phonograph to talking pictures to the revolution of magnetic recording, the Mullin Collection preserves the entertainment technology that has forged the cultural achievements of the modern era.

1960s radio studio
We are dedicated to the preservation of these collections and the creation of new opportunities for learning and discovery. Children can actually create their own radio broadcasts in an authentic 1960s era studio or participate in Saturday morning basic electricity classes. Amateur operators can make world-wide contacts from our state-of-the-art Ham Shack, and people of all ages can enjoy a variety of classic programs and interviews with local broadcast pioneers.

Simple and graceful movements of the hands produce and control the tone of the RCA Theremin. The young lady is playing a note of rather high pitch (note position of right hand) and powerful volume (controlled with left hand).
Please stop in and play our original 1929 RCA Theremin, listen to our Western Electric theater speakers, or perform live radio shows in our 1960s era studio.
The Museum is located at 3517 Raleigh Avenue in Saint Louis Park, just east of Highway 100, off the West 36th Street exit. We are open to the public five days a week and are also available for special tours and evening meetings.
Call the Museum at (952) 926-8198 begin_of_the_skype_highlighting
(952) 926-8198 end_of_the_skype_highlighting
to make reservations for group tours or just stop in for a visit.

Latest news and events on our web page: http://www.w9axd.org

July 2011

INSIDE THIS ISSUE

NEXT MEETING

FRIDAY
July 8, 2011
7:00P.M.
Location:
Foundation Room
Saint Anthony OSF
5666 East State Street
Rockford, Illinois
Program
Twin Cities Radio Museum

Treasurer's Report:

For the period 28 MAY 2011 to 26 JUNE 2011

submitted to the Ham Rag by John G. Olson 2011 RARA treasurer.

Income :	$ 27.00
Expenses:	$ 410.00 (Pekin Insurance)
Ending Checkbook Balance:	$3602.25 (per check register 26 JUN 2011)
Ending Repeater checking balance:	$ 300.00 (per 31 MAY 2011 statement)
Ending Savings Balance	$3218.03 (per 31 MAR 2011 statement)***
Ending total cash on hand:	$7120.28 (net decline of $383.00)

*** Savings account statements are issued by Alpine Bank quarterly

Secretary's Report

RARA Meeting Minutes June 2011

The June 10, 2011 meeting of the Rockford Amateur Radio Association was called to order at 7:07 PM by President Tom Shouler N9VJU with 17 members and guests present.

All present introduced themselves. Tom Shouler N9VJU thanked Kurt Eversole KE9N for donating the new power supply to be used on the 146.61 repeater to replace the one Chuck Ingle mailed back to the factory twice for repairs.

The minutes from the May 2011 RARA general membership meeting were read aloud by Secretary John Lawrence N9OTC. Dave Bond W9MG moved we accept the minutes as read, Fred Minor W9WOQ seconded.

The Treasurers report was read aloud by Treasurer John Olson W9JGO. Motion to accept as read by Chuck Derwent K9SAN, second by Kurt Eversole KE9N, passed.

Old Business: None

New Business: Dave Bond W9MG suggested we send out statements to members reminding them to pay their dues especially for the members who do not attend our meetings but still wish to support the club. Consensus was to do so.
John Olson W9JGO said he has purchased a copy of the book "Mr Lincoln's T Mails" Dave Bond W9MG spoke about last month to loan out. Other positive discussion on this book followed.
Kurt Eversole KE9N talked about our proposed participation with "On the Waterfront" this year. He will be chairing this event for RARA, Gordy Seaman will be representing the Pine Tree Pistol Club which will be teaming with us on this project this year. Monies earned will be split based on man hours worked by members of each organization.

The business portion of the meeting ended at 7:35 PM followed by 2 videos. One on balloon launching and another on getting started in Packet Radio.

The 50/50 was won by Dennis Johnson K9VMY who donated his winnings back to RARA.

Motion to adjourn by Jim Holich AB9SX, second by Dennis Johnson K9VMY

Respectfully submitted
John Lawrence N9OTC
Secretary; RARA

The K7RA Solar Update

The average daily sunspot numbers were up 2.5 points from last week, despite the fact that there were no sunspots at all this week on June 15-16. A new sunspot group 1082 emerged yesterday, June 17, and yielded a daily sunspot number of 14. A nice thing about this spot is that it is all the way over on the east side of the visible solar disk, meaning we will probably see its effects as it moves across the Sun. All other recent sunspots emerged toward the west side, meaning that they went over the horizon fairly quickly and disappeared. Sunspot numbers for June 10-16 were 41, 43, 46, 46, 12, 0 and 0, with a mean of 26.9. The 10.7 cm flux was 72.9, 74.6, 76.2, 76.3, 72.8, 70.1 and 71.6, with a mean of 73.5. The estimated planetary A indices were 6, 5, 3, 6, 5, 10 and 19, with a mean of 7.7. The estimated mid-latitude A indices were 5, 4, 1, 5, 3, 9 and 13, with a mean of 5.7.

Last week, there were four sunspot groups visible at different times: Group 1078 disappeared on June 12; 1079 and 1080 both were gone on June 14, and on June 15, 1081 was gone.

Geomagnetic activity peaked on June 16 with the planetary A index at 19 and high latitude College A index at 42. This should decline over the next couple of days. We did not receive a prediction from Geophysical Institute Prague this week, but NOAA/USAF say that the expected planetary A index for June 18-28 is 10, 5, 5, 5, 5, 5, 8, 12, 15, 15 and 8. This shows unsettled to active geomagnetic conditions for Field Day weekend, June 26-27. The same prediction shows solar flux at 70 on June 18-24, then 75 for June 25-30.

Glen Stuart, N7NRA, of Mesa, Arizona sent this in about recent 10 meter activity: “Dave Jones, N7YU, in Chandler, Arizona, and I had QSOs into Rarotonga at 0045 on June 14 on 28.445 MHz. The op on the other end was Jim Ditchburn, E51JD. Signals were fading in and out, but we were reporting 57 on both ends. I don’t know how much power Dave was running. I was using 100 W. We both use Butternut HF-9Vs. His is ground mounted, mine is roof mounted with the base at about 15 feet above ground. When I built my shop, I had the roofers install a carpet of chicken wire between the shingles and the tar paper. My counterpoise is about 16×50 feet and works well. Things are looking up for the higher frequencies.”

On that same date, June 14, the K0KP 6 meter beacon was copied in the Netherlands. Rex Greenwell, K0KP, lives in Duluth and operates a 100 W beacon on 50.073 MHz at the 50 foot level on a commercial broadcast tower in grid square EN36wt. Here is the message from Rex. “This is an e-mail I received from PF7M today from the Netherlands. This was at 1:50 AM Central Daylight Time -- 6 meters, Europe to Minnesota in the wee hours of the AM!

‘Hello Rex, This morning round 0650 UTC I have received your K0KP/B beacon on 50.073MHZ. Just audible at 419 with my 6 element Yagi at 20 meters. Locator here: JO33BA. Six meters was open from here to GM and OY, so think it was some extended Es into EN36. Not any NA present on 6 meters at this time. 73, Johan, PF7M.’”

Several readers sent in links to articles on our Sun’s recent strange behavior, including this one and this one on the NASA Solar Observatory.

The K7RA Solar Update

In last week's bulletin, we raised the question about adjusted solar flux values and why they are adjusted to compensate for the variation in the distance between Earth and Sun. The solar flux values we present here are the values as measured at the observatory in Penticton, British Columbia. You can see them here. They come from the 2000 reading in the third column from right, with the heading "fluxobsflux." The next column to the right, "fluxadjflux," is the adjusted value. They are adjusted up or down to reflect a value based on the average distance of our planet from our Sun.

On June 17, 2010 at 2000, the raw observed value was 70.4 and the adjusted value was 72.7. This is because we are now further away from the Sun than other times of the year. Of course, we are interested in the observed value, because that is a measure of the radiation hitting our ionosphere. But if we wanted to keep track of adjusted solar flux to gauge solar activity, this would show us more realistically what the sun is actually doing. Back on April 5, the observed and adjusted readings show the same value, but in January, we were closer to the Sun, so the value was adjusted downward.

This weekend is the All Asia CW DX Contest, and HF conditions should be fair. There are no predicted geomagnetic disturbances.

The new issue of WorldRadio online should be out this Sunday, June 20, and there is always an informative column on propagation by Carl Luetzelschwab, K9LA

All times listed are UTC, unless otherwise noted.

Amateur solar observer Tad Cook, K7RA, of Seattle, Washington, provides this weekly report on solar conditions and propagation. This report also is available via W1AW every Friday, and an abbreviated version appears each Thursday in The ARRL Letter*. You can find a guide to articles and programs concerning propagation here. Check here for a detailed explanation of the numbers used in this bulletin. An archive of past propagation bulletins can be found here. You can find monthly propagation charts between four USA regions and 12 overseas locations here. Readers may contact the author via e-mail at k7ra@arrl.net.*

FRIDAY MORNING BREAKFAST

Meets every Friday morning from 8 am until about 9:30 am. An informal gathering of ham folks, no affiliations necessary, good food and good company.

Everyone is welcome to attend.

"The Stockholm Inn"
2420 Charles Street
Rockford, IL 61108

AMATEUR RADIO EXAM NOTICE

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June 18th there were 5 applicants resulting in 1 new license and 1 upgrade.

Upgrade:
Charles T Derwent K9SAN - Extra

Amateur Radio exams are held in Rockford IL on the 3rd Saturday of every month. The next session is July 16, 2011 at 9:00 AM.

Location:
St Anthony Hospital
5666 E State St
Rockford IL

Exams will be held in the St Francis Room (just right of the front entrance after you enter).

Check-in is from 9:00 AM til 10:30 AM.

What You Need To Bring To A W5YI-VEC Session

1. Your ORIGINAL Amateur Radio license AND A COPY, not the wallet version.
2. Any valid CSCE that you are using for exam credit AND A COPY.
3. Two forms of Identification with your signature on them. One must be a picture ID (drivers license, passport, school ID, library card, credit card, etc.)
4. Test fee $14.00 cash or check payable to W5YI-VEC.

Rusty Cordell, WB9QYV
wb9qyv@aol.com

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AREA Repeaters

146.610 -	ENC/DEC pl 114.8	W9AXD
147.000 +	ENC/DEC pl 114.8	W9AXD
223.880 -	ENC/DEC pl 118.8	W9AXD
ATV	input 1250 Mhz/ 434 Mhz output 421.25 Mhz	W9ATN
146.805 -	ENC/DEC pl 114.8	K9AMJ
224.440 -	ENC/DEC pl 118.8	K9AMJ
147.255 +	ENC/DEC pl 114.8	WX9MCS
444.725 +	ENC/DEC pl 107.2 Linked to FISHFAR	WX9MCS

2010 RARA Officers and Board

Officers:
President - Tom Shouler, N9VJU, 815-877-9129
Vice President - OPEN
Secretary - John Lawrence, N9OTC, 815-397-4624
Treasurer - John Olson W9JGO

Directors:
Gordon Seaman,KC9NEX, 815-234-5034
Steve Thorne, K9LLI, 815-399-9161
Web Master - Robert Larson, KC9ICH, 815-226-1875
Ham Rag Editor - Jim Holich, AB9SX, 779-522-8796
Repeater Chairman - Chuck Ingle, AB9KA, 815-979-1049

Hamfest Information

South Milwaukee Amateur Radio Club
Swapfest 2011
Saturday July 9th, 2011
6:30 a.m.
American Legion Post 434
9327 South Shepard Avenue
Oak Creek Wisconsin
Tickets $5.00
Talk in Freq. 146.52

Western Illinois Amateur Radio Club
WIARC Swapfest
August 6, 2011
Eagles Alps
3737 North 5th Street
Quincy, Il 62301
Talk –in 147.030 (PL-103.5)
dpease@adams.net

Hamfesters Radio Club Hamfest
August 7, 2011
Will County Fairgrounds
701 South West Street
Peotone, IL 60468
Talk-in 146.52 Simplex
Kw_nelson@earthlink.net
708-335-4574

Peoria Superfest 2011
September 17th and 18th, 2011
Exposition Gardens
1601 West Northmoor Road
Peoria IL, 61601
Talk-in 147.075 (PL + 103.5)
n9fam@comcast.net

Chicago FM Club
Saturday and Sunday September 10th and 11th, 2011
Boone County Fairgrounds
8791 Route 76
Belvidere, Illinois
6 a.m. to 3 p.m. both days
Complete listing at http://www.chicagofmclub.org/radioexpo2011.html

59th Annual W9DXCC Convention & Banquet
Saturday September 17th 2011
Holiday Inn—Elk Grove Village
630-844-8301

Southeast Iowa Hamfest
Sunday, October 2, 2011
Muscatine County Fairgrounds
101 Clay Street
West Liberty, ,Iowa
7 a.m. Tickets $5.00
Repeater 146.31/91, CTSS 192.8 Hz
Tom Brehmer n0loh@arrl.org

By Mark Bradley, K6TAF

What Can You Do with a Dip Meter?

Quite a bit! The dipper is one piece of test equipment that can replace a whole shelf of expensive gear—if you know how to use it.

As radio amateurs we are often interested in resonance. What is the resonant frequency of that antenna I just put up? Is that trap resonant at the frequency I think it is? That crystal, the one with the strange markings, is it good for anything? Do I have an inductor in the junk box that will work in the next project? How do I find the value of those mica capacitors with the cryptic markings? Is that chunk of coax really a ¼ wavelength at the frequency I hope it is?

These are all questions that can be answered by using a dip meter or "dipper" to measure resonance—just one of the instrument's many uses. A dipper makes a very sensitive absorption wave meter for measuring a signal frequency. Since a dipper is an oscillator, I have used it as a signal source to troubleshoot receivers, as well.

All this versatility comes at a price; a dip meter is not a precision instrument. There are techniques to reduce errors to acceptable levels, which will be discussed later. In case you haven't guessed by now I am a big fan of dip meters—mine has allowed me to make many tests that would normally require an extensive array of laboratory equipment.

What is a Dip Meter?

A dip meter is nothing more than an oscillator with the frequency-determining coil exposed, so that it may be coupled to other electrical circuits. A frequency control is included so the oscillator's approximate frequency is known and can be adjusted. A meter indicates the level of oscillation. Most dip meters come with a set of plug-in coils for wide frequency coverage in several ranges. Older vacuum tube units, in which the meter monitored the grid current of the tube to indicate the level of oscillation, were called grid dip meters. With the availability of high frequency transistors, dip meters went high-tech and battery operation became practical.

The typical dip meter is contained in a small case, with provisions for external plug-in coils. A dial to control the oscillator frequency will be conveniently located on the unit. The meter is located for easy reading while the frequency is being adjusted. Most dippers will also have a control to adjust the level of oscillator activity. This control allows the operator to keep the meter indication at a convenient level over a wide frequency range. If it is a solid-state unit, a battery is included in the case, while vacuum tube units will have an ac power supply that may be self-contained or separate.

Sometimes there is a switch to kill the oscillator to facilitate its use as an absorption wave meter. On others it is possible to turn the activity control down far enough to stop the oscillator. On the front panel there may be an audio output to listen to the modulation of a carrier. Figure 1 shows some common types of dip meters.

Figure 1—Several common types of dip meters are shown with their plug-in coils that determine the oscillator's frequency.

Using the Dipper

When the coil of the dipper is placed near the resonant circuit under test, some of the energy from the oscillating dipper is coupled to the circuit. This coupling reaches a maximum when the frequency of the dipper and the resonant frequency of the circuit are the same. This coupled energy is supplied by the dipper's oscillator, which causes the amplitude of the oscillation to drop. Since the meter indicates oscillation level, a pronounced dip in the meter will be seen as the dipper is tuned through the resonant frequency of the circuit. The oscillator frequency at the minimum or bottom of the dip is the frequency of resonance of the circuit under test. The nice thing is that the circuit being tested does not have to be powered up to measure its resonant frequency.

Placing the axis of the dipper's coil adjacent and parallel to the axis of the coil in the circuit under test results in inductive coupling (Figure 2). This method gives the deepest and most easily found dip on the meter. The dipper's oscillator frequency is "pulled" by the additional load of the resonant circuit—this is one of the major sources of error in making dip meter measurements. Reading the dipper frequency with loose coupling

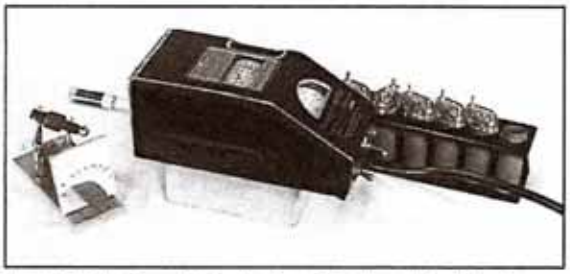

Figure 2—The dip meter's plug-in coil is aligned for inductive coupling with its axis parallel to the inductor of the resonant circuit.

Figure 3—A coaxial cable "link" with a coil at each end is used to extend the reach of the dip meter's plug-in coil.

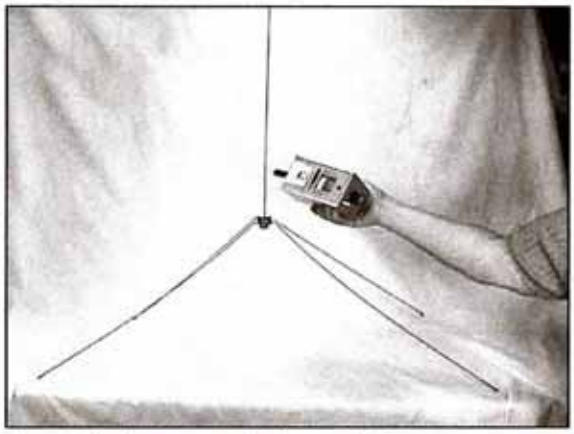

Figure 4—A dip meter may also be coupled to an antenna to determine its resonant frequency.

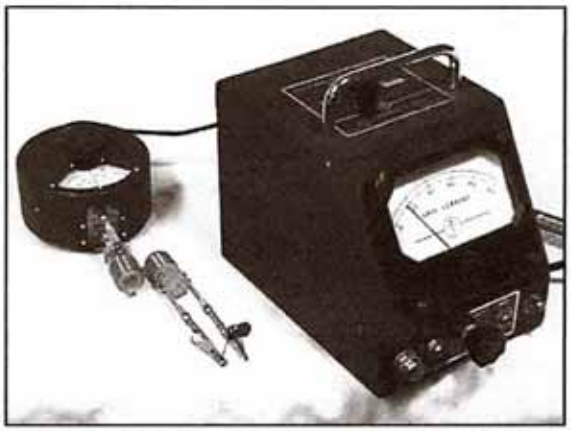

Figure 5—Tune the dip meter's frequency until the unit's meter reaches a minimum—or "dips." The plug-in coil is attached to the capacitor with slide-on alligator clips.

will reduce this error to acceptable levels. After the dip is found I decrease the coupling (move the two coils apart) and recheck the frequency of the dip.

A variation of inductive coupling is link coupling. This allows the dipper to be coupled to circuits in some very cramped places. The link I use is a 2-foot length of coax with a two-turn coil on each end (Figure 3). As the frequency of interest increases, links with fewer coil turns on each end should be used. Two turns can be used up to 70 MHz. Couple one link to the dipper and the other link to the circuit under test.

Capacitive coupling, in which the axis of the coil is perpendicular to the item under test, is useful when there is no inductor present or it is difficult to get to, such as with an antenna (Figure 4). Using capacitive coupling usually produces a shallow dip that is more difficult to see as the dipper is tuned.

Finding the Resonant Frequency of an LC Circuit

Coupling the dipper's coil to the circuit under test, inductive coupling will produce an easily found dip as you tune the dipper through its frequency range (Figure 5). When you find a dip, move the coils apart to reduce coupling. If the depth of the dip does not decrease, you may find the dip is internal to the dipper. I usually move the coils apart so the dip is no more that 20% to 30% of the maximum meter reading. Loosening the coupling to this point prevents the circuit under test from pulling the dipper's oscillator too badly, and the resonant frequency may then be read off the dipper's dial with a fair degree of confidence.

Can't find a dip? The LC circuit could be outside the range of your dipper. It is helpful to have an idea where to expect resonance and to tune slowly. Occasionally I have found the coil under test to be open, or the resonating capacitor to be faulty, when I could not find a dip. A good way to gain some confidence in using your dipper is to make a parallel resonant circuit from a coil and capacitor. Support the circuit on a nonconductive surface. Practice coupling to the coil of the resonant circuit in every manner you can think of and note the characteristics of the dip.

Finding the Value of an Unknown Inductor

Connecting a suitable capacitor of known value in parallel with the unknown inductor creates a resonant circuit. Using the dipper you can now find the resulting resonant frequency. I keep fixed-value 5, 20, 100 and 200 pF mica capacitors with my dipper just for making resonant circuits. I also have a calibrated 100 pF variable capacitor for doing quick checks on inductors.

Once resonance has been found, the value of the inductor can be found from the following equation:

$$L = \frac{1}{4\pi^2 f^2 C} \qquad \text{(Eq 1)}$$

where

π=3.1416
f is in MHz
C is in µF, and
L will be calculated in µH

Since I dislike doing the math, I have acquired two circular slide rules that will solve resonance problems. Some textbooks have resonance nomographs that can be used. [Chapter 6 *of The 2002 ARRL Handbook* contains a reactance chart that can be used for this purpose.—Ed.]

If you check the same inductor at different frequencies, you will get slightly different values due to the distributed capacitance of the inductor. If the inductor has a metal core, this will also cause inductance to vary with frequency. It is best to check inductors near the frequency of intended use.

Finding the Value of an Unknown Capacitor

As with the unknown inductor, form a resonant circuit with the unknown capacitor using an inductor of known value. A good source of inductors is the plug-in coils that came with the dipper. As described in the preceding section you can find the inductance of the coils and use them as your inductance standards. To avoid soldering the plug-in coils to capacitors, I found that Mueller makes some alligator clips that slip over the pins of my dipper coils just fine (Figure 5).

Once you find the resonant frequency of the circuit formed with unknown capacitor and known inductor, calculate the value of the capacitor as follows:

$$C = \frac{1}{4\pi^2 f^2 L} \qquad \text{(Eq 2)}$$

where

$4\pi^2 = 39.48$

f is in MHz

L is in µH, and

C is calculated in µF

The frequency range of the dipper and the values of the known inductors limit the range of capacitance values that dippers can measure. The largest value of capacitance that can be measured is usually about 1 nF (1000 pF).

Finding Q of an Inductor

The Q (or Quality Factor) of an inductor is a figure of merit for an inductor. For example, Q is an indication of how sharply a resonant circuit formed with this inductor will tune. There is a good explanation of Q in chapter 6 of *The 2002 ARRL Handbook*. Form a resonant circuit with the inductor to be tested and a mica capacitor. Since the Q of a mica capacitor will be in excess of 1200, the resultant Q of the resonant circuit will be almost totally dependent on the Q of the inductor.

An estimate of Q may be obtained in the following manner. After noting the frequency F and the depth of the dip at resonance, tune the dipper higher in frequency until the dip has been reduced by 30%—this is frequency F_1. Now tune lower back through the dip to where the dip has again been reduced by 30%. This frequency is F_2. Calculate Q using the following equation:

$$Q = \frac{F}{F_1 - F_2} \qquad \text{(Eq 3)}$$

To make a precise measurement of the frequencies involved, I track the frequency of the dipper with a calibrated receiver as discussed in the section on measuring crystals. Obviously the results are highly operator-dependent but are good enough to tell the difference between a coil with a Q of 20 and one of 50.

Measuring Quarter- or Half-Wavelength Transmission Lines

The physical length of ¼ wavelength of a coaxial cable may be calculated using the following equation:

$$\frac{1}{4}L = \frac{246}{f}VF \qquad \text{(Eq 4)}$$

where

VF is the velocity factor of the coaxial cable (assumed to be 0.66).

f is in MHz, and

length is in feet

To prepare a ¼-wavelength section of cable, calculate the length of cable using Equation 4 (including the length of any connectors or adaptors), add a few percent and cut. Short one end with a loop and leave the other end open circuited. Couple the dip meter to the loop and look for the lowest frequency dip. This is the frequency at which the cable is approximately ¼ wavelength long.

It is slightly short, due to the detuning effect of the loop. Making the loop smaller will minimize the effect. Page 27-8 of *The ARRL Antenna Book* describes a more accurate method that replaces the loop with a series tuned circuit that resonates at the desired frequency. If you need a half wavelength section, you can use the ¼-wavelength technique at half the desired frequency.

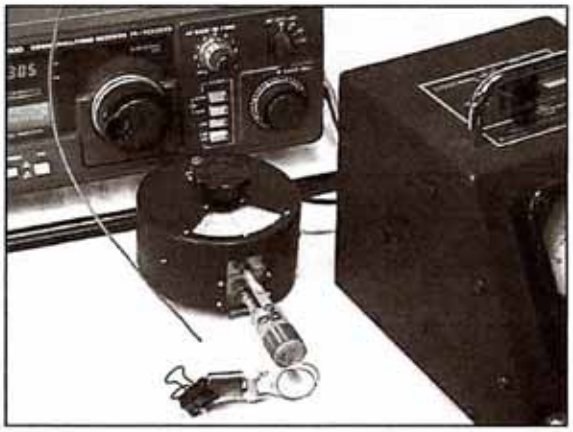

Figure 6—A calibrated receiver is used to monitor the dip meter's exact frequency while a crystal is "dipped."

Measuring Crystals

A crystal's resonant frequency can be found by inductively coupling it to the dipper. I keep several different types of crystal sockets around with two turn loops soldered to them. It's then a simple matter to couple crystals to the dipper. The Q of a crystal is very high, so the dipper must be tuned slowly and watchfully. Because of the high Q, the dipper's frequency may be pulled significantly. For this reason I listen to the dipper on a receiver during the tests (Figure 6). A foot or two of wire lying in the area of the dipper and hooked to the antenna terminal of the receiver is enough coupling. Be sure the BFO of the receiver is on. The crystal frequency found by this method will not be exact but will usually be within 0.2%. The crystal's frequency can be specified only to operate in a circuit with a specified capacitance.

Sometimes a dip will be found at a frequency that doesn't make sense. You may be checking an overtone crystal. Check other harmonically related frequencies for a dip. Even crystals not intended for overtone operation will usually show some activity near their odd overtones.

As a Tuned Detector

Most dippers may be used as detectors by turning the oscillator completely off or by turning the activity control down to the point that oscillation just stops. In the first case the dipper will act as a diode detector and in the second case as a regenerative detector. The approach you use will be dependent on the features of dipper.

Many times I have found that a superheterodyne receiver was not functioning because the local oscillator was dead or off frequency. If you are suspicious of an oscillator, dig out the dipper. Couple the coil of the dipper to the oscillator coil. With the dipper in the detector mode, tune the dipper and look for an upward deflection of the dipper's meter as the frequency of the oscillator is found. If there is no upward deflection, the oscillator may not be doing its thing.

For those of us with vacuum tube power amplifiers, the dipper acting as a detector is an excellent indicator of parasitic oscillations that require neutralization. Follow the manufacturer's instructions and be aware that tube amplifiers use lethal high voltages.

Many times we would like to check the operation of a transmitter that has an integral antenna. Radio control models and garage door openers are some examples. A dipper acting as a detector can serve as a field strength meter to check the frequency and level. If your dipper has an audio output, you can confirm the carrier is being modulated, as well.

As a Signal Source

Since a dipper is a tunable oscillator, it can be used as a signal source to align or troubleshoot a receiver. It will never replace the RF generator but when nothing else is available, it will do. To adjust the signal level, vary the activity control and the coupling to the dipper coil.

Measuring Impedance

Heathkit, Millen and Eldico made impedance bridges designed to be driven by a dipper. Since these bridges have no means of compensating for reactance, measurements are best made at the frequency of resonance. The range of these bridges is around 10 to 400 ohms.

Sources of Dippers

Eico, Heathkit, Millen and Measurements Corporation models show up at ham flea markets fairly often. Even some military surplus units are sometimes seen. Pricing seems to be from $3 to $50 depending on the condition and desirability of the particular model involved. If you are looking for a small useful project, why not build a dipper? *The 2002 ARRL Handbook* has construction information in chapter 26. Coil forms are available from Antique Electronic Supply.[1]

Summary

I hope the information presented here will create some interest in dippers in general and will stimulate the discovery of other applications. For those of us who must pursue our amateur radio activities on a tight budget, the dipper represents great value for the dollar. The dipper is not inherently extremely accurate but with good technique and attention to detail, errors can be reduced to acceptable levels.

All photos by the author.

Mark Bradley, K6TAF, of San Carlos, California, was first licensed in 1955. After college, he spent 19 years working for Ampex Corporation, developing various video tape recorders, instant replay machines and television cameras. He joined a start-up company, Acuson, in 1983 and spent the next 18 years working on various aspects of medical ultrasound imaging. On retirement last June he began home-brewing Amateur Radio projects.

[1]Antique Electronic Supply, 6221 S Maple Ave, Tempe, AZ 85283, tel 480-820-5411, fax 800-706-6789 (US and Canada) or 480-820-4643; www.tubesandmore.com/; info@tubesandmore.com.

55 Northam Ave
San Carlos, CA 94070
northam55@earthlink.net

QST

ARRL Midwest Division Convention

& Summerfest 2011

August 5-7, 2011

Cedar Rapids, Iowa

Sponsored by Cedar Valley ARC

http://convention2011.cvarc.rf.org

Friday & Saturday, August 5th & 6th:

Clarion Hotel & Convention Center - Cedar Rapids, Iowa (IA)

525 33rd Avenue S.W., Cedar Rapids, Iowa 52404

- **Friday August 5th (3 – 6 PM), "OMAP/BeagleBoard-xm" embedded computer tutorial—** focusing on amateur radio and SDR uses of the technology
- **Saturday August 6th evening Banquet** – *Limited Seating*, please register early!

Banquet Speaker: ARRL President, Kay C. Craigie, N3KN

- **Saturday August 6th Forums and Presentations** from 8 AM to 4 PM

ARRL Presentation and Informal Meeting Area	DX Forum
Numerous Technical Presentations	Classic Radios by Joe Veras K9OCO
Operating topics	Kit Building (AAØZZ CW keyer, NMØS "HamCan" QRP)
Youth in Amateur Radio Forum	Free Admission for kids 12 & under

- **ARRL-sponsored VEC session** 9 AM Saturday (convention registration not required)
- **ARRL Award Field checking** of QSL cards
- **Wouff-Hong Ceremony**

Registration deadline for banquet is August 1st, 2011 Kit building order cutoff is July 22nd, 2011
Banquet seating and kit building event numbers are limited; first come, first serve, so register early!
CHECK the http://convention2011.cvarc.rf.org website for updates and additional details as they become available or contact Barry Buelow, WØIY, at convention2011@rf.org

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Summerfest 2011

Sunday, August 7th 8:00 AM - 1 PM **$5** at door

Eastern Iowa's *premier* Hamfest

Location:
Teamster's Hall
5000 J Street SW
Cedar Rapids, IA 52404

Talk-In:
146.745 MHz -600 KHz no PL
or
146.520 Simplex

- **LARGE** outdoor **free** flea market, plenty of FREE parking.
- Well known vendors including **Radio City** and **WBØW.**
- Indoor Tables, in air conditioned comfort, are **$10** each.
- Vendor Setup August 6th evening and 6 AM August 7th see http://cvarc.rf.org for details.
- **ARRL VEC** testing available starting at 9:30 AM.

ARRL Midwest Division Convention

Friday & Saturday, August 5-7

Clarion Hotel & Convention Center - Cedar Rapids, Iowa

Friday, August 5, 2011 events:	Quantity	Price ea.	Subtotal
BeagleBoard-XM/OMAP Embedded processor uses in Amateur radio demo and tutorial (***INCLUDES*** Saturday Convention) Advance registration required. Limited seating! Bring your board and laptop! See our website for more details		**$20**	

Saturday, August 6, 2011 events:	Quantity	Price Ea.	Subtotal
Convention Registration		**$10**	
Banquet Ticket **Featuring ARRL President Kay Craigie N3KN** AUGUST 1st Deadline or until sold out—register early!		**$35**	

Saturday, August 6, 2011 extras:	Quantity	Price Ea.	Subtotal
Kit Building: AAØZZ PIC Keyer Kit JULY 22nd deadline or until sold out—register early!		**$20**	
Kit Building: NMØS "HamCan" 40m QRP transceiver JULY 22nd deadline or until sold out—register early!		**$30**	
VEC Testing (Pay VEC fee at the test session)		Reg NOT Required	
Wouff Hong (Convention Registration Required)		No Charge	
Please make checks out to: Cedar Valley ARC	Total	$	

Sunday, August 7, 2011	
Summerfest (Hamfest at Teamsters Hall approx 1 mile from hotel)	$5 Please pay at the hamfest

Name: _____ **Call:** _____

Address: _____

_____ **email address:** _____

_____ **Telephone Number:** _____

Mail this form to: **Convention**
Cedar Valley Amateur Radio Club
P.O. Box 2352
Cedar Rapids, IA 52406-2352

Please contact the Clarion Hotel directly for rooms. Request the "**ARRL Midwest Convention**" rate of $90/night by July 22nd, 2011. Reservations: 877-949-2992 Fax: 319-362-1420 Hotel Direct: 319-366-8671. For more information see http://www.clarioncr.com

P.O. Box 8465, Rockford, IL 61126
Website: www.w9axd.org
E-mail: jholich@comcast.net

Nets

Monday 8 PM	RARA Info.	146.610 - 114.8
Thursday 7 PM	ARES	147.255 + 114.8
Thursday 8 PM	SATERN	146.610 - 114.8

place address label here

July 2011

ROCKFORD AMATEUR RADIO ASSOCIATION MEMBERSHIP APPLICATION

Single Adult: $25.00 Adult w/Family: $30.00
Single Senior: $15.00 Senior w/Family: $20
Student: $15.00

Above rate includes the RARA monthly newsletter, Ham Rag, via email.

Ham Rag Via U.S. Postal Service: $12.00 extra

Name _____ Call Sign _____

Address _____

City _____ State _____ Zip _____

Home Phone _____

Work Phone _____

Email _____

Renewal _____ New _____ Retired _____

Radio Interests _____

_____

Other Interests _____

_____

Suggestions: _____

RETURN COMPLETED FORM TO:

ROCKFORD AMATEUR RADIO ASSOCIATION
P.O. BOX 8465
ROCKFORD, ILLINOIS 61126