



October 2014

# ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

## PRESIDENT'S MESSAGE

By Gerry Villhauer – W0GV

Hello DRC Members,  
 Fall is here; time to get all those outside antenna projects you have been putting off all year completed. I have been trying to take my own advice. I recently put up a receiving loop antenna. Now I just need the time to use it. I guess that is what winter time is for. The results of our election of officers for the club resulted in a couple of changes. Jason, AC0UA and Larry, K0LAI, are newly elected board members. Thanks guys for accepting these important club positions. Also I want to thank the two members vacating these board positions; Frank, N3PQ and Doug, N4ATA. A big DRC Thank You for your valuable service during your tenure on the board. All other board positions and offices remain the same for the ensuing year.

Thanks to our V.P. Dave, K0HTX for stepping up and overseeing our last meeting in my absence. Thanks to David Stillman, K16YMZ, for his presentation at our September meeting on amateur balloon launches. David's presentation was well received and generated interest in our group on balloon launching and the amazing things that can be accomplished with balloons. Our October presentation will be given by Bill, W6OAV. There have been many questions asked by members such as, "How do I get on the air with Winlink?", the worldwide system for sending and receiving e-mail via radio.

Winlink was developed to provide e-mail service without a direct internet connection; like from a boat, RV or a disaster scene. You can probably see the value of this service. Come to our October meeting (October 15<sup>th</sup>) and learn about Winlink. I received a flyer from the 285 TechConnect Radio Club for their Fall TechFest which is held in Lakewood on November 1<sup>st</sup>. They always have interesting subjects, presenters and demonstrations at their annual event. Visit [www.na0tc.org](http://www.na0tc.org) for more information.

Our technical committee is asking for your help determining actual coverage of our repeater systems compared to the theoretical coverage presented by computer modeling programs. When you are in the mountains or East, North or South of the metro area, please give each of our repeater systems a try and report the results back to the tech committee. Which repeater, your location, type of antenna, power used and time of day is the information needed.

Gerry, W0GV  
President



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## SEPTEMBER MEETING - WHAT'D I MISS

By Bryan – KB0A



Our September program was presented by David Stillman, KI6YMZ. David's presentation covered his experiences launching amateur weather balloons. David did a great job discussing the basic information necessary to perform a launch. He

even discussed the relevant FAA regulations that govern balloon launches, flights and recovery. David shared his learning curve with the group via a nice presentation peppered with images from his launches. The presentation covered where to get weather balloons and the Arduino technology he used to gather and transmit basic flight information and position for recovery. David's enthusiasm for amateur balloon launches

really rubbed off to the group. We might see some of our members venturing into balloon launches, too.



Bill, W6OAV, will give a PowerPoint presentation covering the following topics:

- Why Winlink is so important.
- Overview of the Winlink network.
- Overview of the Winlink user's protocols.
- How the W0TX packet gateway fits into the Winlink network.
- How N4ATA's BPQ system fits into the Winlink network.

Time permitting, Bill will demonstrate using Winlink.

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## Who's New In The DRC

The DRC is a very active club in the Denver metro area and we'd like to have all of our members listen for these new calls and personally to make them feel welcome.

Charles Banks	KE4GUQ
Dunnigan MacIlwaine	K1DUN

Welcome to our newest members. We have a number of activities throughout the year and we'd like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication. Also please join us once a month at the regular club meeting on the 3rd Wednesday at 7pm. For new hams we have the Elmer session which starts at 6:00pm before the regular meeting.

More information can be found on the Denver Radio Club website at <http://www.w0tx.org>.



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## OCTOBER MEETING PRESENTATION

By Bill – W6OAV

Winlink is a worldwide system for sending and receiving e-mail via radio. Winlink was developed to provide services to those without Internet access; i.e., mariners, RV'er, agencies in devastated areas, etc. It proved invaluable when "normal" communications were lost during Katrina and in New York after the 9-11 attack.

### WHAT IF THE WEATHER CHANGES?

As every Coloradoan knows our winter weather can take a sudden change for the worse. If we should experience a turn in the weather on the day of our monthly DRC meeting it may be necessary to cancel the meeting. If this should happen listen for meeting status reports on 145.49 or 448.625 MHz repeaters during the afternoon on the day of the meeting.

# TESTING PORTABLE STEALTHY HF ANTENNAS

By Bill – W6OAV

A while ago I became interested in building an HF antenna that was not only stealthy but also easily portable. It should not stand out in my covenant controlled neighborhood and should allow easy portable operation at temporary locations. The question was what kind of portable antenna would be easy to setup and how efficient would it be.

I decided to build and compare a vertical magnetic loop with a vertical Hamstick dipole on 20 meters. The reason both are vertical is because they will produce a low angle of radiation when erected only a few feet above ground. If they were mounted horizontally, then they would have to be at least 1/2 wavelength high to produce a low angle of radiation. On 20 meters this would equate to 32' above ground. At this height, it is hard to remain "stealthy".

The following describes the two antennas, how they were tested and how they compared.

## The Magnetic Loop

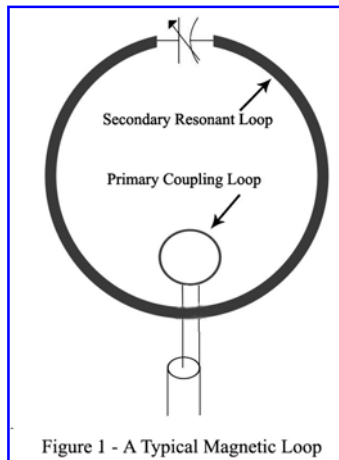


Figure 1 shows the configuration of a typical magnetic loop antenna. Magnetic loops have been very popular for years in many countries and are becoming very popular in the United States. The reason is because more hams are moving to covenant controlled areas which do not allow antennas or into condos or townhomes where installing outside antennas is an issue.

I choose a magnetic loop because of the following features which make magnetic loops popular:

- Relatively stealthy.
- Multiband.
- Usually smaller in circumference than a quarter wavelength at the highest operating frequency.
- Very close to the efficiency of a high dipole.
- Do not require radials.
- Can be operated very close to the ground when mounted vertically.
- Very low receive noise.

Figure 2 shows my portable AEA magnetic loop. The loop is supported by a fiber glass pole which is in turn supported by a roof mount tripod.



## The Hamstick Dipole

I chose to build a vertical dipole out of two Hamstick mobile whips because they are light weight, inexpensive and relatively invisible compared to other whips, such as the Hustler mobile whips.

Two versions of Hamstick vertical dipoles were tested. The first was a center fed dipole and the second was an end fed dipole.



The center fed dipole, *Figure 3*, consisted of two Hamstick whips mounted on a Hamstick Dipole Adapter (Lakeview Company, Catalog Item 901). This adapter isolates the whips and provides an SO232 connector between them for the coax center feed. The adapter is in turn mounted to a fiber glass pole. The pole is supported by a roof mount tripod.

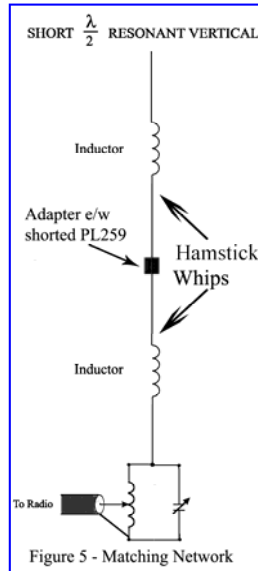
The center fed dipole was converted to an end fed dipole by removing the coax from the Dipole Adapter and replacing it with a PL259 with the center conductor shorted to the shell. The shorted PL259 electrically connected the Hamstick whips. The tip of the bottom whip was connected to a matching network. As shown in *Figure 4*. This arrangement eliminated the issue of having to run the coax horizontally for some distance from the vertical to avoid interaction between the coax and the antenna.



(Continued on page 4)

(Continued from page 3)

The matching network contained a tapped parallel matching circuit. Shown in *Figure 5*. This is the same matching network used to match full length  $\frac{1}{2}$  wavelength verticals. The advantage of this vertical dipole is that, unlike a  $\frac{1}{4}$  wave length vertical, it does not require radials as it is a self resonant antenna. For more information, Google "end fed dipoles".



**Comparison Test**

The test consisted of comparing the performance of the two portable antennas to that of a reference antenna. The reference antenna was a 23' wire vertical base tuned with an SGC 230 auto tuner set on a 35' by 4' chicken wire ground plane hidden under rocks.

The first test involved comparing the magnetic loop with the reference vertical on 20 meters over a period of a week. During each of the many contacts, the transceiver was switched between the reference vertical and the magnetic loop. The far station was asked to note the peaks of the transmitted signal strength from each antenna. When the far station transmitted, the peak receive S meters reading on both antennas were recorded. In most cases, the magnetic loop heard better and was heard better by the far station. Occasionally signals were equal on both antennas. One thing stood out. The signal to noise ratio was much better on the magnetic loop. Very weak signals were copy-able on the magnetic loop but not on the reference vertical.

Next, the center fed vertical dipole was mounted exactly in place of the magnetic loop. This placement insured that the surrounding environment would equally affect the antenna's patterns. Again over a week, comparisons, as described above, were made on 20 meters between the reference vertical and the vertical dipole. Most of the time the vertical dipole was about the same as the reference vertical on transmit and receive. The signal to noise ratio was about the same. The tests were repeated with the end fed dipole. Both the center fed and the end fed verticals performed the same.

**Conclusion**

The comparison test wasn't very scientific but did give a decent evaluation of the antennas. Both antennas make excellent portable stealth antennas. I did work a couple of DX stations on both antennas using 100 watts when 20 meters was marginal at best. The pros and cons of the antennas are shown below.

Items	Magnetic Loop	Vertical dipole
Efficiency compared to a high dipole	Nearly equal	Less
Signal to noise ratio compared to a high dipole	Better	Worse
Bandwidth compared to a high dipole	Much narrower	Less
Ease of setup	Somewhat awkward *	Easy
Multiband?	Yes with remote tuning	No. Must change whips
Cost?	Expensive #	Inexpensive
Weight?	Somewhat heavy	Light

\*Top heavy.

# Commercial versions are expensive. However, they can be built relatively expensively. For a wealth of information on building a inexpensive magnetic loop, Google "magnetic loops".



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Special Service Club  
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Join the ARRL TODAY



ROUNDTABLE NEWS

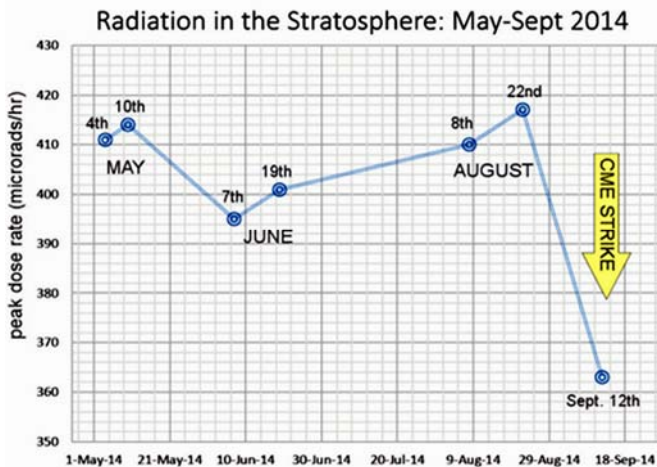
DRC IS LOOKING FOR A NEW EDITOR

After 7 years, George the RoundTable Editor has decided it is time to pass the gauntlet to another. In those 7 years we have grown as a club and gained many friends around the world. At one point the RoundTable was distributed to 19 states in the US and 4 countries outside the US. (Hams in other states joined the DRC as out-of-state members just to receive the RoundTable.) And the RoundTable travels with a group of RV hams every month. Contact George - AG0S or Bill - W6OAV.

## STUDENTS MEASURE 'FORBUSH DECREASE'

Excerpted From [www.spaceweather.com](http://www.spaceweather.com)

On September 12th, a CME hit Earth's magnetic field, igniting the most intense geomagnetic storm of the year. The students of Earth to Sky Calculus quickly launched a helium balloon to the stratosphere to see what effect the storm was having on Earth's upper atmosphere. They expected to measure more radiation than usual. Instead, they measured less. This plot shows a sharp drop in high energy radiation on Sept. 12th compared to previous flights in May, June, and August:



What caused this counterintuitive drop? Answer: When the CME swept past Earth, it swept aside many of the cosmic rays that normally surround our planet. The effect is called a "Forbush Decrease," after American physicist Scott F. Forbush who first described it.

Wherever CMEs go, cosmic rays are deflected by magnetic fields inside the CME. Forbush decreases have been observed on Earth and in Earth orbit onboard Mir and the ISS. The Pioneer 10 and 11 and Voyager 1 and 2 spacecraft have experienced them, too, beyond the orbit of Neptune. Now high school students have detected a Forbush Decrease in the stratosphere using little more than an insulated lunchbox and a helium balloon.

The balloon's lunchbox-payload is shown here suspended more than 100,000 feet above the Sierras of central California:



Inside the payload, there was a high-energy radiation sensor, a cryogenic thermometer, multiple GPS altimeters and trackers, and three cameras. During the 2.5 hour flight, the buoy collected more than 50 gigabytes of video and science data ranging in altitude from 8500 ft to 113,700 ft above sea level. The analysis is still underway.

The students wish to thank Caisson Biotech LLC for sponsoring this flight. Note their logo on the upper right corner of the payload!

## SCIENTISTS USE VENUS TRANSIT

We have an intimate relationship with our sun. Its light, gravity and storms profoundly affect our planet's motions, weather, oceans, and life, as well as all other objects in our solar system. Ancient cultures observed and worshipped it. Galileo observed sunspots as evidence of imperfections. Modern scientists use solar missions to study it as an example of the closest star, and examine how its radiation, energetic particles, and powerful magnetic field affects our planet. Others try to model the complex layers and processes within the sun, and analyze particles from the sun to learn more about the formation of the solar system. (For more information about the sun's influence on our magnetic field, check out the YSS topic: "Magnetospheres")



And like those ancient cultures, people around the world still observe the sun, particularly during special events where an object blocks part of our view of the sun -- during eclipses by the Moon, and transits of the planets Mercury and Venus. The transit of Venus is used to accurately measure the distance of the Sun from Earth.

## NEW PRODUCT ANNOUNCEMENT

By Bill – W6OAV

It's been a while since FAKE Industries has introduced a new product in the ROUNDTABLE. Well, on April 1 FAKE brought out a brand new product increasing the radiation efficiency of any antenna LAUNCH-WAX. The product which is called LAUNCH-WAX takes advantage of the fact that RF flows on the outer surface of a conductor; in this case, the antenna elements. LAUNCH-WAX is a special wax that the user spreads over the surface of the antenna elements. This wax: makes the surface slippery which allows the RF to flow faster with less loss along the element. Hence, the antenna launches a stronger faster radio wave into space. Only one application of LAUNCH-WAX will increase the antenna efficiency by 20 dB.



**FAKE Industries, a Division of WACK Inc.  
If it's a fantastic product, it's out of WACK"**

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## THE ROUNDTABLE ARCHIVE

Have you been looking for back issues of the RoundTable? Many are available on the DRC web site.



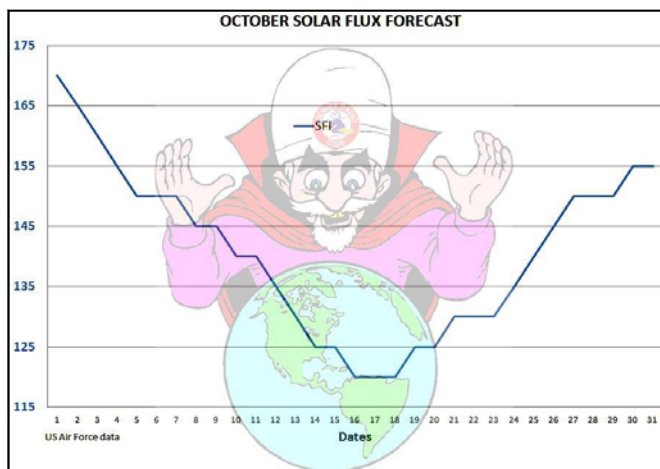
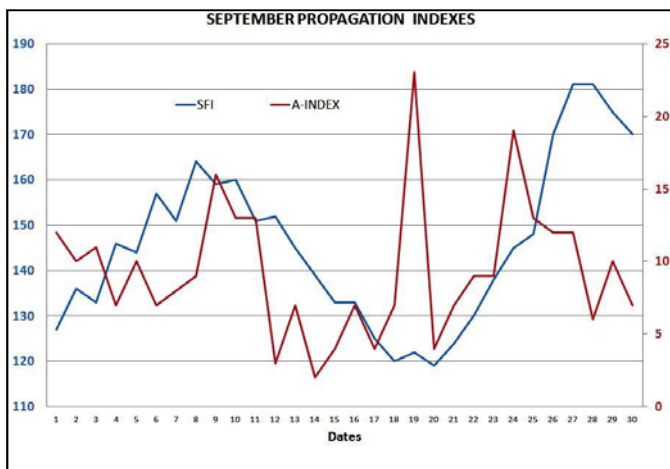
Scan the QR code or go to <http://www.w0tx.org/RoundtableAccessPage.htm>

## PAST & FUTURE PROPAGATION CONDITIONS

By Bill – W6OAV

The charts below show the Solar Flux and "A" indexes for last month and the forecast for this month's Solar Flux index.

Refer to the September 2010 *Roundtable* for more complete information on interpreting these charts. Issues of the *Roundtable* are available at <http://www.w0tx.org/RoundtableAccessPage.htm>.



## UP COMING EVENTS

### HAMFESTS & CONVENTIONS

The following are the HAMfests & Conventions which have been registered with the ARRL so far. More information can be found on [www.arrl.org/hamfests](http://www.arrl.org/hamfests).

**Nov. 1 – TechFest 2014**  
Lakewood Elks Club  
ARRL Convention  
<http://na0tc.org>  
[techfest@cnetury.net](mailto:techfest@cnetury.net)

### 2015

**Jan. 17 – Winter 2015 Hamfest**  
The Ranch - Larimer County Fairgrounds  
<http://www.ncarc.net>

**Feb. 8 – ARA The Swapfest**  
Adams County Fairgrounds  
<http://www.n0ara.org>

**HF**— On the calendar indicates a HamFest is on that date.

### 7TH FALL TECHFEST 285 TECHCONNECT RADIO CLUB

About six weeks away – 285 TechConnect Radio Club's 7th Fall TechFest – Nov. 1

There is still time to register for 285 TechConnect Radio Club Fall TechFest. The TechFest will be held on Saturday, November 1, 2014. Topics include: MFJ-259 Operation and Calibration, DXpedition to Dry Tortugas, Go Take a Hike (portable QRP), Estes Park, CO Flood Communications, Amateur Radio Mesh Networking. Lunch hour will have participant demos along with MFJ-259 Testing for output and harmonic level (MFJ-259 will continue after workshop as time permits).








Attached is a flyer with additional details. Also information is available on our website <http://www.na0tc.org/>

Please pre-register by e-mail – [techfest@centurylink.net](mailto:techfest@centurylink.net) . Payment (\$10) will be due at the door and includes your 2015 club dues.

Early registration is recommended. Questions can also be directed to [techfest@centurylink.net](mailto:techfest@centurylink.net).

Thanks for your interest and we hope you can join us this year.

73, Nancy Stitt, KØNNC  
TechFest Director  
285 TechConnect Radio Club  
na0tc.org

OCTOBER 2014							DRC Net Sunday's at 8:30pm Local on 145.490 & 448.625 (No PL)
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
			1 <b>Learning Net</b> 7:30pm 	2	3	4	
5	6	7	8 <b>Learning Net</b> 7:30pm 	9	10	11	
12	13  COLUMBUS DAY	14	15 <b>DRC Meeting</b> Elmer 6:00pm General 7:00pm 	16	17	18	
19	20 <b>ARRL</b> School Club Roundup	21	22 <b>Learning Net</b> 7:30pm	23 	24 <b>ARRL</b> School Club Roundup	25 <b>ARRL</b> EME 50- 1296MHz Begins 000UTC	
26 <b>ARRL</b> EME 50-1296MHz Ends 2359UTC	27	28	29 <b>Learning Net</b> 7:30pm	30			

Check [www.ARRL.org](http://www.ARRL.org) for Contests and Rules!

## DRC BOARD OF DIRECTORS

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Board Member	W0JMC	Jack McComb	303-885-9098	W0JMC@arrl.net
Board Member	K0LAI	Larry Irons	303-763-8112	<i>Check Roster</i>

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Web Master	N0LAJ	Bill Hester	<i>Check Roster</i>	<i>Check Roster</i>

## DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	
2m	145.490MHz (-) 100Hz PL	<a href="#">Linked to the 70cm - 448.625MHz machine.</a>
2m	147.330MHz (+) 100Hz PL	<b>Local Area, Members Auto-Patch Does Not TX a PL!</b>
2m	147.330MHz (+) 131.8Hz PL	<b>Test Mode Operation. Send signal reports to Tech Committee.</b>
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS-073; NB 12.5; +/- 2.5	<b>Saint Anthony's Note: This is a narrow band repeater requiring DCS.</b>
70cm	448.625MHz (-) 100Hz PL	<a href="#">Linked to the 2m - 145.490MHz machine.</a>
70cm	449.350MHz (-) 100Hz PL	<a href="#">Wide area coverage with Echolink Node # 4140.</a>
70cm	446.7875MHz (-)	<a href="#">MotoTRBO Repeater   Slot 1 – DMR-MARC WW, Slot 2 – Local</a>

## EDITOR'S NOTE

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DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart of The Denver Radio Club, if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to AG0S@arrl.net. Submission deadline is the 25th of the Month. **Editor**