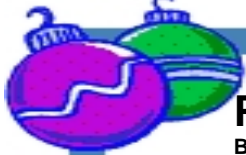




# ROUNDTABLE



### PRESIDENT'S MESSAGE

By Gerry Villhauer-W0GV

Hello DRC Members,  
 Where has the time gone? Here we are in December. The main item to put before you is our annual DRC Holiday Party. We will have many prizes of cash, gift certificates and carry away items. Make sure you reserve December 16<sup>th</sup> for this gala event. I always remind you that everybody in attendance, member or not, licensed ham or not, is eligible for all the drawings *EXCEPT*: the grand prize drawing. To win that you must be a current paid DRC member. If your dues are not current or you would like to join DRC and be eligible for the big drawing; Bob, KC0OUQ, our membership chairman will be there to accept your applications. If you are paid up prior to the drawing...you could be the Big Winner!

The highlight of the evening will be our program. We have a special program for this meeting; which will be given by Tim Samaras, WJØG. Tim is an engineer who spends May and June in a van outfitted with GPS, radios, scanners, monitors, wireless Internet connections and satellite tracking equipment. His goal is to put himself in the path of a tornado and then deploy weather probes that he designed and built, to "measure metrological conditions in the vortex of the beast."

You may have seen Tim on the Discovery Channel show Storm Chasers.

We are honored to have him at our party...don't miss it! Thanks to Jim, K0TOR (with very little assistance from me) for our November program on the FLEX SDR. We are planning additional programs on SDR, so more will be coming.

I would like to welcome new DRC members: Jack Dowd, N0QHF, Arlene Dowd, N0RGZ, Frankie Freeman, KC0JAV, Rick Maher, KA0GRT and Rick von Glahan, N0KKZ. Please check in on the nets, come to the meetings and activities and remain an active member.

**Please join us at the Country Buffet 8100 W. Crestline Ave. Littleton, CO for a truly exciting and special Holiday meeting.** The meeting will start at 6:30 PM. We suggest that you arrive by 5:30 so that you have enough time to enjoy your meal and socialize with the other club members. After paying at the front door we will be meeting in the private room at the rear of the restaurant. [Map and Directions](http://www.w0tc.org) at [www.w0tc.org](http://www.w0tc.org). Family and friends are welcome.

Wishing you and your family a happy holiday season!

Gerry, W0GV,  
 President



### INSIDE THE ROUND TABLE

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## NOVEMBER MEETING - WHAT'D I MISS

By Bill – W6OAV

Sixty five folks attended this month's meeting! Gerry, W0GV, began the meeting with introductions. He reminded the attendees about the upcoming DRC Christmas dinner. Gerry also announced that we are looking for volunteers for an antenna party on December 5<sup>th</sup> at the Pennsylvania Salvation Army location. Bob, KC0OUQ, our membership chairman, then announced that he will have the new roster ready by the Christmas dinner. He needs anyone to immediately advise him if their membership information is not correct. After Bob's announcement, Bryan, KB0A, reminded the attendees that the DRC does have a Yahoo group. This group is used to provide timely club information to club members. This group does not provide chat facilities.

The meeting was then turned over to Jim, K0TOR. Jim gave a great presentation about Software Defined Radios (SDR). He covered the history of SDR development, described the benefits of SDR compared to "standard" radios, and compared the block diagrams of SDR to those of "standard radios". Jim then specifically described the features of the Flex Radios and gave a demonstration using pre-recorded HF captures of various modes.



The meeting concluded with several lucky attendees winning door prizes.

## TECHNICAL COMMITTEE REPORT

By Bill – W6OAV

This report provides an overview of items discussed during the November Technical Committee meeting.

### Pennsylvania Salvation Army Station Move

Goal: Determine a schedule, and the processes required, to disconnect and move the DRC ham station from the Pennsylvania site to temporary storage location:

A work party was scheduled for October 31 to remove the coaxes and roof top antennas. A heavy snow caused cancellation of the project. A work party is scheduled for December 5<sup>th</sup>. Volunteers are needed. Contact [w6oav@arrl.net](mailto:w6oav@arrl.net) if interested.

### Voter System

Goal: Design and build a 147.33 voter system:

WA9TVH described the modifications he is making as he puts together the first remote test station. N1ETV has installed the antenna system for the first remote test station.

### 147.33 - Hudson Site

Goal: Repair bad audio:

Several committee members have conducted tests which have determined that the "tinny" audio is always present. This indicates that the problem is pre-emphasis/de-emphasis or some similar problem. WA9TVH will go to the site to test when time permits.

### TS-940 Failure at Station 4

Goal: Determine what to do with the failed TS-940

KB0A, time permitting, will take the TS-940 home and take a look at it. The failure symptoms indicate the possibility of an intermittent, or corroded, connectors).

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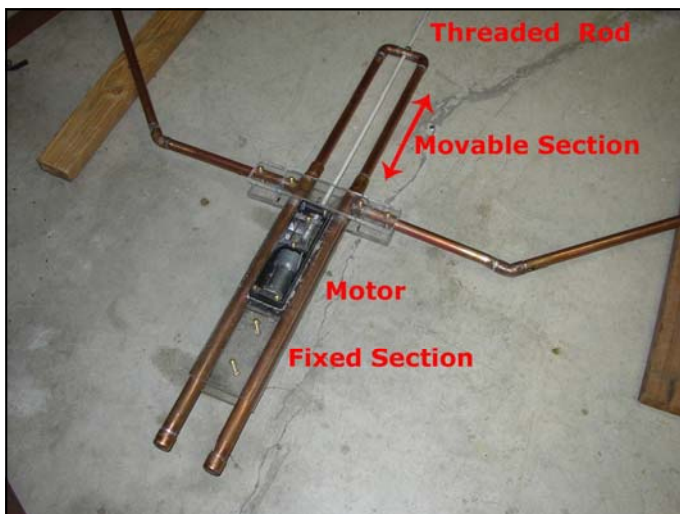
**Happy Holidays**

## MY LOOP ANTENNA EXPERIENCE – PART 1

By Irv – K6DUX

Many years ago I built a 10 meter DDRR loop antenna as an experiment since I lived in a restricted antenna area. It was built on a very large piece of copper clad circuit board with the  $\frac{1}{2}$ " copper tubing loop mounted a few inches above the board. It was installed in my attic with the control cable and coax dropping directly down to the shack. I was certainly surprised as to how quiet the loop was and was even more surprised when several Japanese stations responded to my test calls. After reviewing my CC&R's I discovered that it only restricted TV antennas and after consulting with the city I put up a crank-up tower with a small beam. As a result the loop went into the "been there-done that" pile.

One day I came across an article by Bill Jones, KD7S in the November 1997 QST which caught my interest and I began to build a library of information on small transmitting loops. In that article he described how to build a trombone capacitor for a loop antenna. I considered the capacitor the main stumbling block against building loop antennas due to the high voltages developed across it. I remembered that Bill, W6OAV, had designed a trombone type capacitor earlier and used it for his loop and wondered if Bill Jones had used his design. Fortunately the internet had a lot of information about loop antennas which made my research quite easy. One day I was talking to Bill and commented on the trombone capacitor and loop antenna article and said that I would like to build another antenna again. He then graciously offered me a small drive motor that I could use for the capacitor and I was on my way again.



### The Trombone Capacitor

I elected to build a 40 meter modified loop using  $\frac{3}{4}$ " rigid copper pipe in the form of an octagon instead of a round loop since I couldn't find suitable flexible copper tubing. The first project was to build the trombone capacitor. **See photo above.** Simple calculations revealed that the trombone capacitor had to be quite large in order to span the frequencies that I wanted to operate.

The outside of trombone capacitor was made out of  $\frac{3}{4}$ " copper tubing and connected directly to the loop while the inner section was made out of  $\frac{1}{2}$ " copper tubing. The inner U section was made first. Mylar sheets were obtained from the local plastics store and served as the dielectric. The Mylar sheets were wrapped around the outside of the  $\frac{1}{2}$ " tubing several times to insure a good tight fit and then inserted into the  $\frac{3}{4}$ " trombone sections. Copper T's were then soldered on the ends of the outside trombone sections so that the loop antenna could be directly connect. The finished trombone capacitor was then laid on the loop and very careful measurements were made so that a small section could be cut out of the loop to accommodate the capacitor.

The position for the trombone capacitor in loop antenna was carefully measured once again before the cut was made. The outer sections of the trombone capacitor were very carefully aligned so that the inner section would easily slide back and forth and then soldered. Although the outer section was directly soldered to the loop it was found that additional support was required to keep the trombone exactly aligned so that it wouldn't bind. Additional support was added by using  $\frac{1}{4}$ " plastic sections bolted together on both sides of the capacitor.

A threaded plastic rod was then cut and connected to a bolt that was soldered at the center end of the U inner section. This allowed the drive motor to pull or push the inner sleeves up or down to change the resonance frequency of the antenna. The drive motor was then installed between the upper outer sections and carefully insulated by using  $\frac{1}{4}$ " plastic supports. A small hole was drilled into one of the top sections of the loop and the control voltage line was inserted and threaded through the inside of the loop to the bottom of the loop where it exited.

*Part 2 will cover the construction of the loop.*

## Cosmic Rays Hit Space Age High

Dr. Tony Phillips

Heliophysics News Team

Planning a trip to Mars? Take plenty of shielding. According to sensors on NASA's ACE (Advanced Composition Explorer) spacecraft, galactic cosmic rays have just hit a Space Age high.

"In 2009, cosmic ray intensities have increased 19% beyond anything we've seen in the past 50 years," says Richard Mewaldt of Caltech. "The increase is significant, and it could mean we need to re-think how much radiation shielding astronauts take with them on deep-space missions."

The cause of the surge is solar minimum, a deep lull in solar activity that began around 2007 and continues today. Researchers have long known that cosmic rays go up when solar activity goes down. Right now solar activity is as weak as it has been in modern times, setting the stage for what Mewaldt calls "a perfect storm of cosmic rays."

"We're experiencing the deepest solar minimum in nearly a century," says Dean Pesnell of the Goddard Space Flight Center, "so it is no surprise that cosmic rays are at record levels for the Space Age."

Galactic cosmic rays come from outside the solar system. They are subatomic particles--mainly protons but also some heavy nuclei--accelerated to almost light speed by distant supernova explosions. Cosmic rays cause "air showers" of secondary particles when they hit Earth's atmosphere; they pose a health hazard to astronauts; and a single cosmic ray can disable a satellite if it hits an unlucky integrated circuit.

The sun's magnetic field is our first line of defense against these highly-charged, energetic particles. See *artist Concept on page 5*. The entire solar system from Mercury to Pluto and beyond is surrounded by a bubble of solar magnetism called "the heliosphere." It springs from the sun's inner magnetic dynamo and is inflated to gargantuan proportions by the solar wind. When a cosmic ray tries to enter the solar system, it must fight through the heliosphere's outer layers; and if it makes it inside, there is a thicket of magnetic fields waiting to scatter and deflect the intruder.

"At times of low solar activity, this natural shielding is weakened, and more cosmic rays are able to reach the inner solar system," explains Pesnell.

Mewaldt lists three aspects of the current solar minimum that are combining to create the perfect storm:

1. The sun's magnetic field is weak. "There has been a sharp decline in the sun's interplanetary magnetic field (IMF) down to only 4 nanoTesla (nT) from typical values of 6 to 8 nT," he says. "This record-low IMF undoubtedly contributes to the record-high cosmic ray fluxes."
2. The solar wind is flagging. "Measurements by the Ulysses spacecraft show that solar wind pressure is at a 50-year low," he continues, "so the magnetic bubble that protects the solar system is not being inflated as much as usual." A smaller bubble gives cosmic rays a shorter-shot into the solar system. Once a cosmic ray enters the solar system, it must "swim upstream" against the solar wind. Solar wind speeds have dropped to very low levels in 2008 and 2009, making it easier than usual for a cosmic ray to proceed.
3. The current sheet is flattening. Imagine the sun wearing a ballerina's skirt as wide as the entire solar system with an electrical current flowing along the wavy folds. That is the "heliospheric current sheet," a vast transition zone where the polarity of the sun's magnetic field changes from plus (north) to minus (south). The current sheet is important because cosmic rays tend to be guided by its folds. Lately, the current sheet has been flattening itself out, allowing cosmic rays more direct access to the inner solar system.

If the flattening continues as it has in previous solar minima, we could see cosmic ray fluxes jump all the way to 30% above previous Space Age highs," predicts Mewaldt.

Earth is in no great peril from the extra cosmic rays. The planet's atmosphere and magnetic field combine to form a formidable shield against space radiation, protecting humans on the surface. Indeed, we've weathered storms much worse than this. Hundreds of years ago, cosmic ray fluxes were at least 200% higher than they are now. Researchers know this because when cosmic rays hit the atmosphere, they produce an isotope of beryllium,  $^{10}\text{Be}$ , which is preserved in polar ice. By examining ice cores, it is possible to estimate cosmic ray fluxes more than a thousand years into the past. Even with the recent surge, cosmic rays today are much weaker than they have been at times in the past millennium.

*(Continued on page 5)*















## It's Time Once Again For The Annual Holiday Meeting & Dinner

*When:* December 16th

*Where:* Country Buffet  
8100 W. Crestline Ave.  
Littleton, CO

*Time:* 5- 5:30pm Dinner / 7pm Presentation and Drawing  
For map & directions check [www.w0tx.org](http://www.w0tx.org)

December 2009							<i>DRC Net Sunday 8:30pm Local</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1  Full Moon	2 <b>Learning Net</b> 7pm	3	4 <b>ARRL 160m Contest</b> Begins 2200U	5 <b>ARRL Int'l EME Comp</b> Begins 0000U	
6 <b>ARRL 160m Contest</b> Begins 1600U <b>Int'l EME Comp</b> Ends 2359U	7 <b>Pearl Harbor Remembrance Day</b>	8  Last Quarter	9 <b>Learning Net</b> 7pm	10	11 <b>ARRL 10m Contest</b> Begins Saturday 12th 0000U	12  <b>Hanukkah</b>	
13 <b>ARRL 10m Contest</b> Ends 2359U	14	15	16 <b>Club Holiday Dinner &amp; Meeting 5pm</b>  New Moon	17	18	19	
20	21 <i>First Day of Winter</i>	22	23 <b>Learning Net</b> 7pm	24  First Quarter	25 	26 	
27	28	29	30 <b>Learning Net</b> 7pm	31 New Year's Eve  Full Moon			

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

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Education	K0ROR	Robert Rude	303-841-6443	K0ROR@comcast.net

## DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
<b>10m</b>	29.620mHz (-100kHz) FM	<b>Not In Service</b>
<b>6m</b>	53.090mHz (-1mHz)	
<b>Packet</b>	145.05mHz<>14.105mHz	
<b>2m</b>	145.490mHz (-) 100Hz PL	<b>Linked to the 70cm - 448.625mHz machine.</b>
<b>2m</b>	147.330mHz (-) 100Hz PL	<b>Local Area, Members Auto-Patch Does Not TX a PL!</b>
<b>2m</b>	147.330mHz (-) 131.8Hz PL	<b>NE Area Remote Does Not TX a PL!</b>
<b>1.25m</b>	224.380mHz (-) 100Hz PL	
<b>70cm</b>	448.625mHz (-) 100Hz PL	<b>Linked to the 2m - 145.490mHz machine.</b>
<b>70cm</b>	449.350mHz (-) 100Hz PL	<b>Wide area coverage with Echolink Node # 4140.</b>

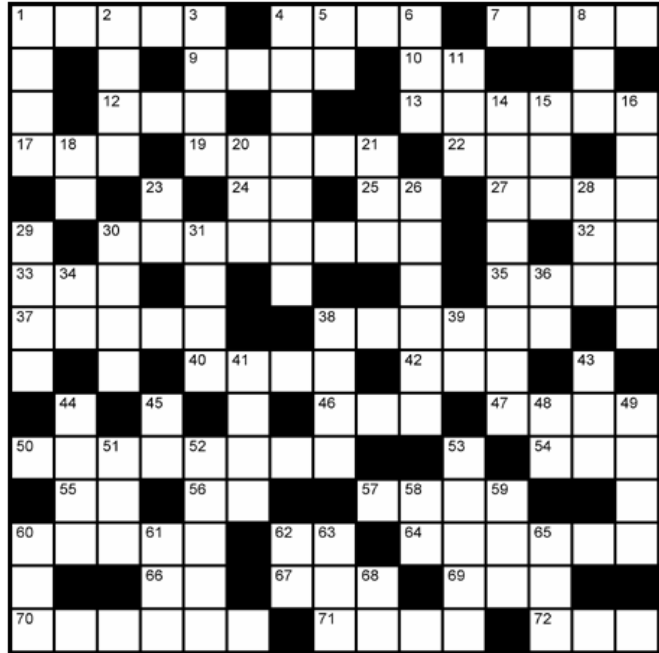
## EDITOR'S NOTE

*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 and sole 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 DRC\_RT@comcast.net. Submission deadline is the 25th of the December. Edi-*

## "On the Road Again!"

Isn't it fun to go for a drive with your trusty mobile rig? I love heading out with a book of maps and the logbook trying to find those elusive "magic" spots. This week's puzzle is all about mobile operation and its ins and outs. See you from that rare grid, maybe?

*Puzzle By H. Ward Silver, N0AX*



**Across**

- 1. An antenna driver
- 4. Mishandle or mess up
- 7. Used to fill the tank
- 9. A poor spot for radio
- 10. Stalling for time
- 12. A French friend
- 13. Where the vehicle stays
- 17. An attenuator
- 19. Repair
- 22. Slang for a million
- 24. Light (abbr.)
- 25. Coax connector prefix
- 27. Positive
- 30. Combines two bands
- 32. Assists the teacher (abbr.)
- 33. Assigns prefixes
- 35. Account (abbr.)
- 37. Insulating material
- 38. Desirable lines
- 40. Round antenna
- 42. Add to Viking and get a tuner
- 46. Independent (abbr.)
- 47. Best spot for a mobile antenna
- 50. Separates the passenger and engine compartments
- 54. Impedance matcher (abbr.)
- 55. ARES team leader (abbr.)
- 56. Gain antenna manufacturer
- 57. Runs the alternator
- 60. Causes interference from paths
- 62. Computer (abbr.)
- 64. Hit a bump
- 66. Powered
- 67. On the floor of the vehicle
- 69. Grow older
- 70. At each end of the vehicle
- 71. Oxidization of steel
- 72. No meters like these meters

**Down**

- 1. Propagation hop
- 2. Where mobiles operate
- 3. Long, flexible antenna
- 4. Rapid volume or strength variation
- 5. Add these two letters to change "crack" into a noise
- 6. On the windshield
- 8. Type of mount
- 11. What we are
- 14. Signal relay
- 15. Height in the air
- 16. Fake or substitute
- 18. While or in the manner of
- 20. Every bit
- 21. Color
- 23. Original country of S5, 9A, T9, and Z3 (prefix)
- 26. Common
- 28. World time (abbr.)
- 29. Opposite of 9 Across, best spot for radio
- 30. Two-band antenna
- 31. If the engine won't run
- 34. Central African Republic (prefix)
- 36. Small Canadian DX entity prefix
- 38. Loads the antenna
- 39. Abbreviation for both city and state
- 41. To leave or go
- 43. Energized
- 44. In the absence of
- 45. From (CW abbr.)
- 48. Country of Macchu Piccu (prefix)
- 49. Protective component
- 51. Three basic types of components (abbr.)
- 52. Caused by the alternator
- 53. Charge to maintain voltage
- 58. Separated by San Francisco Bay from SF section
- 59. Pull
- 60. Large unruly group
- 61. The peak
- 62. Afternoon (abbr.)
- 63. Passenger vehicle
- 65. Organized on-the-air group
- 68. Thanks! (CW abbr.)

**NOTE: Puzzle solution is located on page 5.**