



December 2014

ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

Hello DRC Members,

Winter sure came a little early didn't it? We were lucky to miss most of it while on a short trip to Texas. Not much has changed or happened with the club since last month, so this will be a fairly short message. We had a very large turnout for our November meeting. Thanks to all of you who came to the meeting and especially to the visitors and new members. That volume of support is a big part of what makes the DRC the quality club that it is. To the several new members, thanks for making the DRC your club! Please continue to come to meetings and support the club activities. Your name and call sign will be listed in this issue of the Round Table.

The technical committee continues to look at improvements and updates to our systems. The next update will be the replacement of the VHF and UHF repeaters at our Centennial Cone site. The equipment is currently being tested off site and will be installed in the near future. The Squaw Mountain 449.350 repeater and antennas have been inspected and found ready for the winter. We always keep our fingers cross on this system because access in the winter months is very difficult.

Thanks to Barry, KA0BBQ, for a very interesting and informative presentation of D-STAR at our November meeting. I have not been a D-STAR user myself but, learning the many features and capabilities of this world wide system sure peaks my interest to try it. Barry thanks for a great Job!

Last but far from least is our Annual Holiday Party. Don't miss it; mark that calendar for December, 17th at the Golden Corral 3677 South Santa Fe Drive. It is at Santa Fe Drive and Hampden Ave. Starting at about 5 to 5:30 p.m. we will enjoy a great meal and fellowship with members and visitors. About 7pm we will begin our program. Our member Larry Irons, KOLAI, will do a presentation on his trips to the Antarctic, New Zealand, Pago Pago and Hawaii. Larry will explain how radio waves are used in geophysicists to explore for oil and gas and show pictures and tell interesting stories about his travels to these fascinating places on our planet. We will close out the evening with several prize and cash drawings. Hope to see you there!

Gerry, W0GV
President

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NOVEMBER MEETING - WHAT'D I MISS

By Bill – W6OAV

There were 62 attendees this month. After attendee introductions, W0GV announced that the HF weather net has moved to 3.989 MHz.

The meeting was then turned over to the guest speaker, Barry, KA0BBQ. Barry presented a very interesting PowerPoint titled "D-Star 101". He began by discussing the types of communications available with D-Star: simplex, local repeaters, and Internet gateways for multi-site long distance communications via the international D-Star network. A companion digital channel allows the transmission of text, pictures and GPS information between users. Also digital voice, unlike analog FM, is crystal clear no matter the strength of the signal.



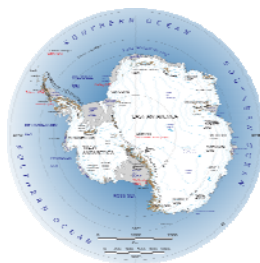
Barry discussed the features of the various D-Star repeaters and transceivers. He followed this with maps and hardware pictures of the various Colorado D-Star repeaters. Barry then covered ways to access the D-Star network without a radio by using D-Star devices such as the DV-Dongle and the D-VAP. He also showed how to use an Android device to control a D-Star radio. Barry ended his presentation with a discussion of the D-Star Emergency Mode.

The presentation was followed by many questions from the audience. There were indications that quite a few in the audience were interested in getting involved with D-Star!

DECEMBER MEETING PRESENTATION RADIO ECHO SOUNDING

By Larry – K0LAI

The term Radio Echo Sounding was used in the 1970s to 1980s to describe the use of radar to map ice thicknesses and detect objects buried beneath sheets of ice. Many years were spent flying over Antarctica and Greenland to map the ice thicknesses and estimate the volume of ice in those immense glaciated regions. Larry will relate to us his two journeys to Antarctica, New Zealand, Pago Pago, and Hawaii showing some beautiful scenery and talk about radio waves and ham radio, too.



BIO – Larry Irons, K0LAI

Radios have been part of Larry's early life. He received his private pilot's license from the FAA before graduation from high school in 1972 and worked in his father's business which used two-way radios. His father's business was an excavation company which owned and operated an FM repeater on a very tall tower near Lincoln, Nebraska.

Larry attended the United States Military Academy at West Point studying engineering and military science. After WestPoint, he earned his bachelor's and master's degree in geology from the University of Nebraska at Lincoln with minors in computer science, mathematics, and physics. Continuing his education he attended the University of Colorado at Boulder and Denver studying post-graduate computer science and computer engineering classes.

He has been a geophysicist for 37 years working in academic, petroleum, and environmental and engineering industries. Two-way radios were used during the acquisition of geophysical data to image subsurface geology or to look for buried objects. Larry provided geophysical support to the general staff at the Rocky Mountain Arsenal near Commerce City, Colorado. Part of this work involved the writing of Standard Operating Procedures (SOP) for the clearing of explosive and chemical ordnance for a U.S Army EOD team.

As a geophysicist, Larry has enjoyed traveling to many parts of the world. He speaks German fluently and can converse in Spanish and Russian. He also can read several other foreign languages.

Currently, Larry works for Fairfield Industries, a large, independently-owned international geophysical services company, as a senior geophysical analyst. His current job involves the imaging of seismic data for the exploration and development of oil and gas fields all over the world.

Larry received his technician license as KDOMXC in October 2010. He upgraded his license to general and extra in 2011 and then received his vanity call sign, K0LAI, in June 2011.

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 Robert's call and personally to make him feel welcome.

Robert Clark	K0GPA
Christopher McKinney	KC0JM
Dean Larson	W6HAB
Ed Luwish	Call Pending
Greg Brewer	KD0YMM
Joel Zachrich	N0KEX
John Bridges	N0QOP
Jon Schuessler	KE0BZQ

Welcome to our newest member. 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.

Meeting information can be found on the Denver Radio Club website at www.w0tx.org

INSTALLING AN HF STATION RF GROUND

By: James Adkins – KB0NHX

Enough was enough! I had some RF problems and they just needed to be fixed. For example, when I used my HF amplifier on 80- meters, my audio comes across my Radio Shack WX radio up in our bedroom. If I use the amplifier on 40- meters, it turns my house thermostat up to 95 degrees in heat mode! Lastly, anytime I talked on 20- meters, I turned my daughters TV on upstairs. I was pretty much unable to work DX on 20, 40 or 80m, especially at night when everyone was asleep.

To fix the problem, I bought an 8' copper clad ground rod and some #6 stranded ground wire. I know, driving a ground rod is normally no fun, but here in Lees Summit, and in most of north Missouri, it's quite an easy task. After digging a 6" deep hole, I turned on the water hose and began pushing the ground rod into the ground by hand. After I got it in the ground 6', I broke out the hammer drill and chucked up the ground rod and sank it the rest of the way.

As usual, I didn't get to this project right away, so I had to purchase a Poly-phaser Copper Cleaning Kit (CCK) to clean the rod. I don't have access to any cad welding equipment, so I went with the standard lug with some of the copper goo (Photo on Right) to make sure the connection was good. I then used electrical tape to tape around the rod, and then used some nice



butyl tape to really cover up the connection to keep it from ever getting corroded. (Photo on Left) One final coating of 3M Super 33 tape, then a dose of liquid 3M electrical tape and the wire connection to the ground rod was complete.

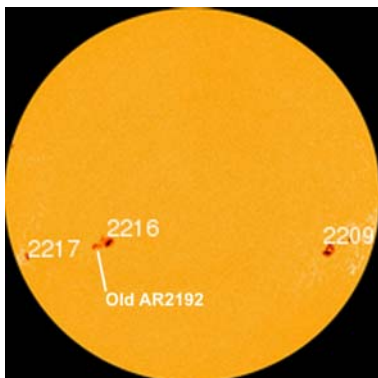
I wanted to make sure that the ground wire was not resonant on any of the HF bands, so I made sure and cut it to a non-resonant length and trenched it to the side of the house (about 2'), drilled a hole, then ran it down to the shack. After mounting the Harger Ground Bar to the wall, the ground wire was connected. I then ran a ground wire to the ground bus on the electrical breaker box (about 2 feet away from my ground bar!) and still need to run one to my antenna mast lightning ground bar to make sure everything's at the same potential. Now came the time to hook up the ground wires to the equipment. Always run separate wires from the piece of equipment to the ground bus, NEVER daisy chain the grounds from device to device. So, a ground wire was run to the Henry 3KA amp, another to the Yeasu FT-920 HF rig, and a third to the MFJ 986 tuner. With the work done, it was time to play. And, as planned, everything worked great! Bye-bye RFI!!! It's amazing how well things work when physics is on your side!

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SOALR UPDATE QUIET WITH A CHANCE OF FLARES

BY GEORGE – AG0S

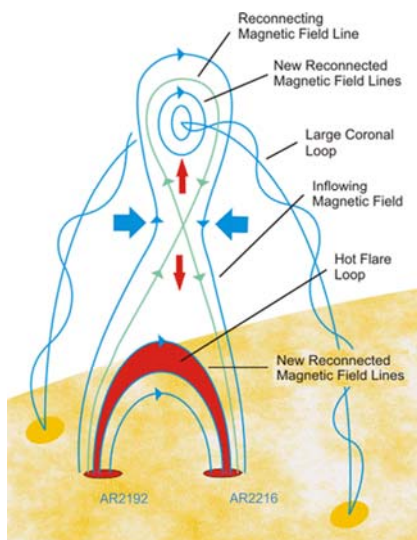
The sun has been relatively quiet for several weeks but AR2216 is back around to the visible solar disc in close proximity to AR2192. The two sunspots, one old and one new, could break the quiet. AR2192 and AR2216 have tangled magnetic fields poised to crisscross and explode. NOAA fore-casters estimate a 25% chance of an X-flare on or about the 24th of November. By the time you read this, however, it will be old news. The real news here is an opportunity to study the effect of magnetic fields combining to create an X-flare with extraordinary power.



The reconnection of two magnetic fields could be the Universe's favorite way to make things explode. It operates anywhere magnetic fields pervade space--which is to say almost everywhere. On the sun, magnetic reconnection causes solar flares as powerful as a billion atomic bombs. In Earth's atmosphere, it fuels magnetic storms and auroras. In laboratories, it can cause big problems in fusion reactors. The problem is, researchers can't explain it.

The basics are clear enough. Magnetic lines of force cross, cancel, re-connect and Bang! Magnetic energy is unleashed in the form of heat and charged-particle kinetic energy.

At RIGHT: A graphic model of magnetic reconnection on the sun.



But how, how does the simple act of crisscrossing magnetic field lines trigger such a ferocious explosion?

"Something very interesting and fundamental is going on that we don't really understand -- not from laboratory experiments or from simulations," says Melvyn Goldstein, chief of the Geospace Physics Laboratory at NASA's Goddard Space Flight Center.

Gordon Holman an astrophysicist and RHESSI, (Ramaty High Energy Solar Spectroscopic Imager), Co-Investigator at NASA's Goddard Space Flight Center in Greenbelt, Maryland, says: "It is well established that the hot, magnetic loops associated with solar flares appear to expand outward after the most explosive phase of many flares. This apparent expansion is believed to be a manifestation of the formation of new magnetic loops in the corona through magnetic reconnection."

"In the simplest picture, oppositely directed magnetic field lines that are roughly vertical relative to the solar surface pinch together, where they reconnect and form new field lines that snap both upward and downward, away from the reconnection region (see illustration below left). The new, upward-moving field lines form a large coronal loop that may become a coronal mass ejection (CME). The new downward-moving field lines form a relatively compact coronal loop or arcade of loops. This compact loop continues to build up, somewhat like adding more and more layers to an onion, as long as the magnetic reconnection continues above it. Magnetic reconnection also extracts part of the energy from the original magnetic field. This heats the plasma contained in the reconnected magnetic field lines and accelerates many of the charged particles in the plasma to high energies. Thus, the newly formed magnetic loops are freshly heated, while the older loops in the layers below are cooling. This continued buildup of new, hot magnetic layers is seen as the apparent outward expansion of the flare loop."

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

When: December 17th
Where: Golden Corral Buffet Restaurant
 3677 South Santa Fe Drive
 Sheridan, CO
Time: 5pm Dinner / 7:00pm Presentation and
 Drawing
For map & directions check www.w0tx.org

A Holiday Snack

What's better than a cookie? Well, maybe a cookie-shaped puzzle! And what better to help work out such a puzzle than a REAL cookie? I hereby give you permission to go right to the kitchen and grab one of whatever you've been telling yourself not to eat since you ate too many of them already this month, didn't you? Well, one more won't hurt, especially since you're going to be burning off the extra calories by thinking so hard about this puzzle. Excellent! Have a good New Years and see you in 2009!

By H. Ward Silver - NØAX

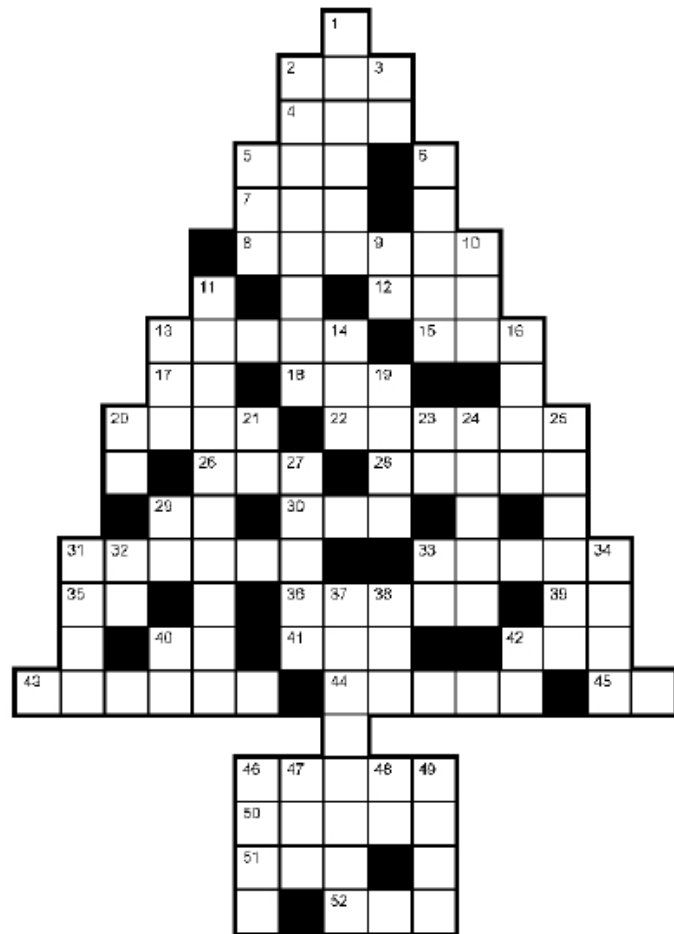
NOTE: Puzzle solution is located on page 6.

Across

- 2 Units of reactive power
- 4 A very small unit of energy
- 5 The single tube in most oscilloscopes
- 7 VFO with a tunable inductor
- 8 Only one
- 12 First commercial logic family
- 13 Holding off the sweep
- 15 Measure of solar irradiation (abbr)
- 17 Between VE and XE (abbr)
- 18 One side of a rhombic
- 20 Enlarge or shrink
- 22 Repetitive convert to digital data
- 26 Laughing hard (abbr)
- 28 Where cooling air goes
- 29 Thanks! (CW abbr)
- 30 Possess
- 31 Large or big antenna array
- 33 Remove the finish
- 35 Ionizing solar radiation (abbr)
- 36 Manufactured classic twins
- 39 Needed for strong bones (chemical symbol)
- 40 Abbreviation for what's generated by transmitters
- 41 Cheating is one of these
- 42 Key that gets you out of something
- 43 Multiple receivers that choose the strongest signal
- 44 Post-holiday state of torpor
- 45 Prefix of Turkmenistan
- 46 Soon to be an open sea
- 50 Circular chart
- 51 Unlicensed band (abbr)
- 52 What the complete antenna system radiates © Copyright ARRL 2007

Down

- 1 Hams always keep the originals
- 2 Common name for quarter-wave antenna
- 3 Begins most coax designators
- 5 Old frequency abbreviation before MHz
- 6 Measure of potential



- 9 Abbreviation for a tube's control element
- 10 Both a frequency range and Santa's helper
- 11 Ability to discern between measured values
- 13 A pair
- 14 Morse abbreviation is "C"
- 16 Not doing anything
- 19 Amplification factor
- 20 Prefix of British military base in Mediterranean
- 21 Show-me state (postal code)
- 23 Home of Lake Wobegon (postal code)
- 24 Another name for tube anode
- 25 Rules for fairness and honesty
- 27 An antenna accepting power
- 29 Prefix of transceivers made by 36 Across
- 31 QSL service (abbr)
- 32 Car that runs only on batteries (abbr)
- 33 Prosign to end a contact
- 34 Rate of making contacts
- 37 Time it takes a signal to increase to a certain level (two words)
- 38 Circuit that restricts noise
- 40 Constant used to calculate reactance
- 42 Electromagnetic field components
- 46 Largest continent
- 47 Effective energy content of a waveform
- 48 Network manager's department
- 49 Switch scope display between two channels very rapidly

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.

December 17 – DRC Holiday Dinner Meeting
 More information on Page 7.

2015

January 17 – NCARC Hamfest
 Loveland, CO Larimer County Fair grounds. 1st National Bank Building.
<http://www.ncarc.net>

February 8 – The Swapfest
 Brighton, CO Adams County Fairgrounds
<http://www.n0ara.org>



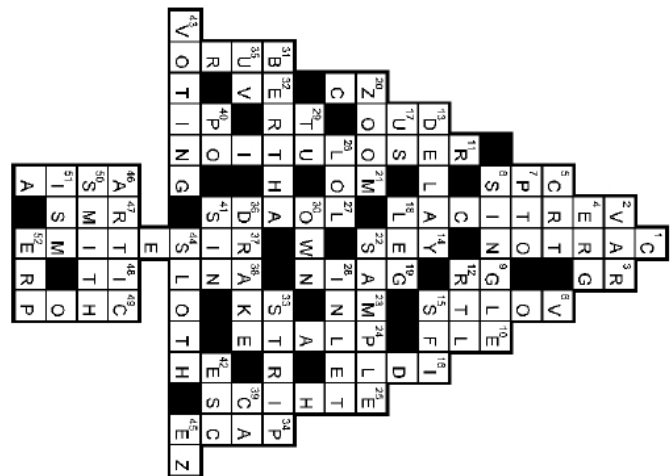
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WHAT IF THE WEATHER CHANGES?

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.

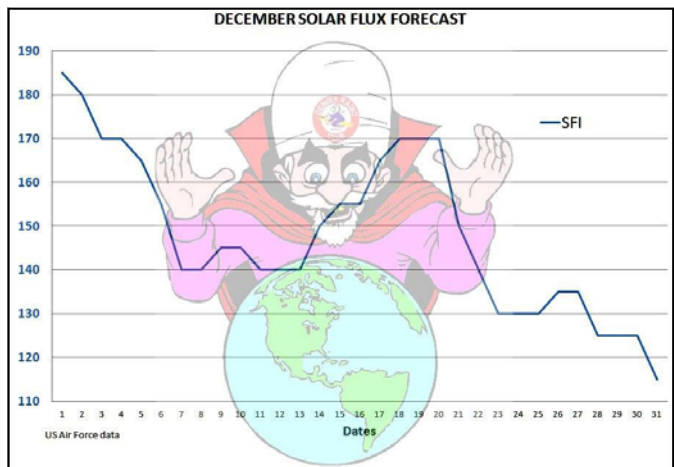
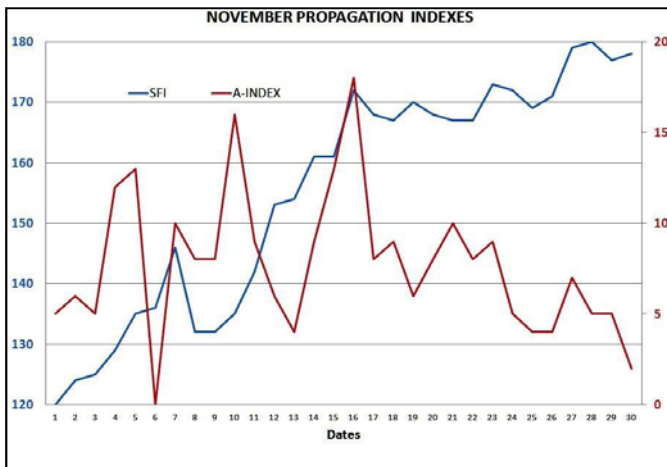


PAST & FUTURE PROPAGATION CONDITIONS

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>.







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

When: December 17th

Where: Golden Corral Buffet Restaurant
3677 South Santa Fe Drive
Sheridan, CO

Time: 5pm Dinner / 7:00pm Presentation and Drawings
For map & directions check www.w0tx.org

December 2014							<i>DRC Net Sunday's at 8:30pm Local on 145.490 & 448.625 (No PL)</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
	1	2	3 <i>Learning Net</i> 7:30pm 145.49/448.625 Machines	4	5 <i>ARRL</i> 160m CW Begins 2200U	6 <i>ARRL</i> EME 50-1296MHz Begins 2200U Ends 7th at 2359U Full Moon	
7 <i>Pearl Harbor Day</i> <i>ARRL</i> 160m CW Ends 1600U	8	9	10 <i>Learning Net</i> 7:30pm 145.49/448.625 Machines	11	12	13 <i>ARRL</i> 10m Contest Begins Saturday 0000U	
14 <i>ARRL</i> 10m Contest Last Quarter Ends 2359U	15	16	17 <i>Club Holiday Dinner & Meeting 5pm</i>	18	19	20	
21 <i>1st Day of Winter</i> <i>ARRL</i> Rookie Roundup 1800U thru 2359U	22 New Moon	23	24 <i>No Learning Net</i>	25 	26 	27	
28	29	30	31 <i>New Year's Eve</i> <i>Learning Net</i> 7:30pm 145.49/448.625 Machines				

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Web Master	N0LAJ	Bill Hester	<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	Linked to the 70cm - 448.625MHz machine.
2m	147.330MHz (+) 100Hz PL	Local Area, Members Auto-Patch Does Not TX a PL!
2m	147.330MHz (+) 131.8Hz PL	Test Mode Operation. Send signal reports to Tech Committee.
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS-073; NB 12.5; +/- 2.5	Saint Anthony's Note: This is a narrow band repeater requiring DCS.
70cm	448.625MHz (-) 100Hz PL	Linked to the 2m - 145.490MHz machine.
70cm	449.350MHz (-) 100Hz PL	Wide area coverage with Echolink Node # 4140.
70cm	446.7875MHz (-)	MotoTRBO Repeater Slot 1 – DMR-MARC WW, Slot 2 – Local

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**