



ROUNDTABLE

PRESIDENT'S MESSAGE

By Robert White – K0RCW

As I write this, spring is just three weeks away. We're way behind on moisture however heavy weather is normal in the next couple of months. Make sure those HT batteries are charged up in the event we lose power. Of course we'll have some days of very nice weather too to get outside and repair whatever damage the winter may have caused to our outdoor antenna systems.

I want to welcome our new members, Rich Kuberski – W5CS, Thomas Loughlin – N8BG, and Jason Smallwood, AC0UA. We extend a hearty welcome and hope you that you will get a lot of value from your DRC memberships, our presentations and the camaraderie of our group. I also want to congratulate Ron Castle – N3TOA on his recent upgrade to Extra Class. This is a great accomplishment, Ron!

Did you realize that Field Day is now just a little more than three months away? I want to thank Dave– K0HTX for stepping up to chair the event. A group of us including Frank – NP3Q and Bob – KB0BZZ are meeting at 5:30 pm the **fourth Wednesday** evening of each month at **The South Restaurant**, 3535 S. Huron in Englewood to plan the event. Everyone is welcome to attend this meeting.

Regarding Field Day, I hope each of you are planning to attend and support this event. All weekend would be great, but a few hours are also appreciated. On June 24th, Friday, we roll up our sleeves and clean up the Hudson Repeater site. On Saturday June 25th and Sunday June 26th we operate multiple radios simultaneously on multiple bands. I hope to see everyone attend this year. This activity is a culminating, bonding event for our club. It is also an opportunity to:

- Strengthen our mission to our served agencies by honing our skills.
- Demonstrate the Amateur Service to the community especially youth.
- Shake out equipment and test it.
- Learn something new or teach others.
- Participate in a workshop (PSK31 mode)
- Enjoy food and fellowship
- Operate remotely outside your QTH
- Operate on any band supervised by Extra Class holders.
- Support the club and form friendships.
- Tour a repeater site

For more information see <http://www.arrl.org/field-day>

During my remarks on our Sunday evening 8:30 pm net, I will speak in a little detail on these points over the next three months.

In other news, I am thrilled to announce that St. Anthony's Hospital has agreed to pay for the commercial antenna we plan to install at the new site. This represents an investment of several hundred dollars, though we are still researching the exact price. This development is wonderful because it demonstrates that the hospital and the club are both committed to a successful partnership. Thank you Gerry – W0GV for facilitating the acquisition and specifications for the 70cm antenna.

We will see you at next month's March 16 meeting where Bill – W6OAV will give a technical presentation on Wi-Fi security.

Until then, 73 and good DX.

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FEBRUARY MEETING - WHAT'D I MISS

By Robert White – KC0RW

Frank Smith, W7FES, gave an excellent technical presentation to the DRC at the February meeting regarding the operation of Light Rail Vehicles (LRV). LRVs were manufactured by Siemens Company. The RTD LRV system operates roughly 22 hours per day. 1-2 hours per day the trains are offline for cleaning and inspection.



There are two types of trains out there right now, the ones using older technology, #101-149 and the ones using newer technology #211-309. Practically speaking the newer ones give more information to the operator about errors and faults rather than just a "fault" alert as the older ones tend to do.

The operator has to have his foot on a Dead Man Peddle on the floor. You can't just use a cinder block to hold it there, the tension has to be somewhere in the middle. The train stops if the Dead Man is not constantly depressed.

The newer LRVs have Video Displays in the cab. Buttons and dials reveal things like train speed, opening and closing of doors, and a couple of voice transmit buttons. For example, pushing the Transmit 1 button announces station information and pressing it a second time announces that the doors are closing. Pushing Transmit 2 button announces that people should stand clear of the doors to allow the train to move.

Learning to operate an LRV takes four weeks of super intensive training with a supervisor. Maximum speed of an LVR is 55 mph. There are two braking systems, one is a friction breaking system using the disc and track

breaks and the other one is a dynamic braking system reversing the drive motors. Frank says it is quite scary stopping a train when the rails are wet or icy. The stopping characteristics in those circumstances of a train are vastly different than under dry rail circumstances.

During the morning and evening commute a train goes through the Broadway Station every 90 seconds.

There is an Automatic Block System (ABS) in place which prevents two trains from being in the same block. The ABS consists of green, yellow or red signals. If the Operator sees a yellow signal he knows that the next one is red.

Operators must never go through a red light signal, If they so do, they will be drug tested and serve a suspension for the first offense. A second offense within twelve months, will result in termination. If possible, RTD will try to find another position for the Operator.

There are a series of Traction Power Sub Stations (TPSS) every 1/4 to 1 mile or so to power the trains. The TPSS system supplies 855 VDC via the catenary wire which is then converted to AC and then back to DC to support various train functions. If one TPSS fails, there are failure procedures that allow power to be extended past the normal TPSS limits, allowing train operation under restricted conditions. TPSS are sometimes taken offline for maintenance or repair making LRV operation interesting. Motor control circuitry works better with AC, hence the back and forth between DC and AC.

The power is supplied via a catenary wire that is suspended via drop lines from a messenger line. The voltage differential is between this catenary line and the rails. A pantograph is the name of the device that connects the LRV to the catenary line and provides a good connection because it is made of graphite.

Trespassing on RTD property is bad and dangerous – do not do it. People do not have enough regard for the danger of a moving LRV. Cross behind the vehicles and never in front of them. (Duh!)

Snow depths are not an issue – the trains are equipped with cow-catchers and are operated frequently on the lines to keep the rails clear of snow. More importantly, they keep the catenary lines free of ice which is the biggest worry.

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RTD uses a two channel repeater system: Light Rail 1 and Light Rail 2. Frequencies are 452.975 and 425.85 MHz respectively. Light Rail 1 is used by yard personnel and Light Rail Security. Light Rail 2 is used to communicate between trains and Light Rail Control. Frank mentioned that their HTs are a little flakey in a few places but the base units in the trains are solid.

More information can be obtained going to <http://rtd-denver.com> or <http://rtd-fastracks.com>.

MARCH MEETING PRESENTATION

Wi-Fi — YOU AND HACKERS

By Bill – W6OAV

Using Wi-Fi, both at home and in hotspots, is a way of life these days. Unfortunately, Wi-Fi exposes users to identity theft. There is only one way to completely protect one's self. If you're interested in learning how hackers work and how to protect yourself, plan to attend the March DRC meeting. Bill, W6OAV, will give a presentation covering the following:

- Overview of how Wi-Fi works.
- Properly configuring home Wi-Fi networks.
- Security tips.
- Configuring laptops for safe hotspot operation.
- Hacker tricks.
- Defeating hackers.

FEBRUARY TECH COMMITTEE REPORT

By Bill – W6OAV

This month's meeting was devoted entirely to discussing the plans for the 147.33 voter system. Paul, WA2YZT, and Bryan, KB0A, with the assistance of Orlen, WW0LF, created block diagrams of proposed configurations and shared them with the Tech Committee. More research will be done before a decision is made on the final configuration. The committee agreed that using DCS coding should be used between the voter site transmitter and Station 4 receiver. DCS decoding is very fast, does not add any audio to the signal and will provide an obstacle for anyone wishing to interfere with the voter site links.

Next steps:

1. Paul will wire the interface connector for the Mastr II radio and the controller Interface board.

2. Lance, N1ETV, will purchase a 20A 12 volt power supply for the remote voter site radio.
3. Bryan will research current dual-band radios for cross-band repeat capabilities, PL and DCS encode/decode and price.

ARRL NEWS *MEMBER ACTION REQUIRED*

From ARRL Colorado Section Manager
Jeff Ryan – K0RM

All:

The following is forwarded from ARRL HQ.

As you may have read, Rep. Peter King (R-NY) has introduced the "Broadband for First Responders Act of 2011" and the bill has been assigned HR 607 as its number. The full story about the Bill's introduction can be found on the ARRL web at

<http://www.arrl.org/news/spectrum-management-bill-threatens-amateur-frequencies>

As you will read, while the ARRL supports spectrum for the Public Safety needs, we oppose HR 607 in its current form because of the inclusion of the 420-440 MHz spectrum (most of the Amateur 70-cm UHF allocation) as part of a spectrum swap.

At the request of ARRL President Kay Craigie, N3KN, we are asking ARRL members to contact their local Representative asking them to oppose HR 607 in its current form. Members should be directed to

<http://www.arrl.org/sample-letters>

for resources tools to assist them in their letter writing. These include:

- A sample letter opposing HR 607 in its current form.
- A link to the ARRL Webpage that gives the ARRL member the contact information for their Members of Congress.
- A link to information sending their letters to our Washington lobbyist to hand-deliver to Capitol Hill.

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A couple of key points to remember when discussing our opposition to HR 607:

1. We understand and support the principle that Public Safety and First responders should have the D-Block frequencies.
2. Our opposition to the bill stems from the inclusion of the 420-440 MHz Amateur allocation as part of the proposed "frequency swap".

Time is of the essence on this request, as the bill is gathering steam in Congress. So please make your membership contacts as soon as possible. Finally, please include my address n1nd@arrl.org in what you distribute to the ARRL membership (for our records here at HQ.)

Thanks for stepping up to the plate to assist with the direct threat to our Amateur Radio spectrum. What you bring to the table helps us keep this ship heading in the right direction. Please contact me if you have any problems or questions with this request.

73

Dan Henderson, N1ND
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ARRL, the national association for Amateur Radio(tm)
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FOOD FOR THOUGHT

By Bill – W6OAV

Here's an interesting thought....you're probably sitting in a quiet room where not much is happening as you are reading this article. Well, even though not much is happening in your quiet room a lot is happening around you! You're sitting on a globe, called earth, which is revolving at 800 mph and traveling around the sun at 67,000 mph. In turn, that globe is traveling through space at 568,000 mph as our solar system spins around the center of our galaxy. Subsequently, our globe is traveling at 320,000 mps (that's miles per second) through space. Then, consider that "zillions" of other galaxies are doing the same in different directions! So, enjoy your peace and quiet.

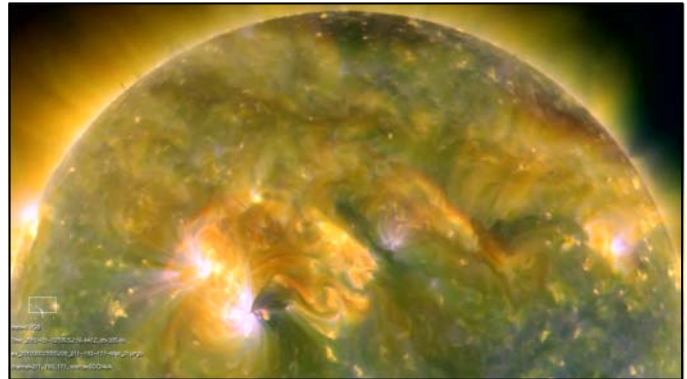
GLOBAL ERUPTION ROCKS THE SUN

By Dr. Tony Phillips | Credit: Science@NASA

Dec. 13, 2010: On August 1, 2010, an entire hemisphere of the sun erupted. Filaments of magnetism snapped and exploded, shock waves raced across the stellar surface, billion-ton clouds of hot gas billowed into space. Astronomers knew they had witnessed something big.

It was so big; it may have shattered old ideas about solar activity.

"The August 1st event really opened our eyes," says Karel Schrijver of Lockheed Martin's Solar and Astrophysics Lab in Palo Alto, CA. "We see that solar storms can be global events, playing out on scales we scarcely imagined before."



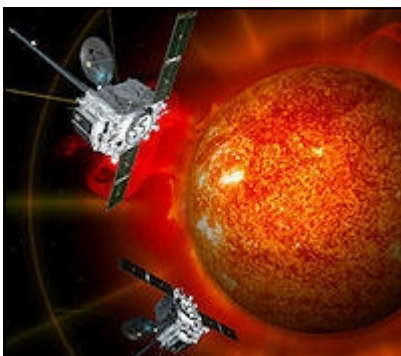
Above is an extreme ultraviolet photo of the August 1st global eruption. Different colors represent different plasma temperatures in the range 1.0 to 2.2 million K. Credit: Solar Dynamics Observatory.

For the past three months, Schrijver has been working with fellow Lockheed-Martin solar physicist Alan Title to understand what happened during the "Great Eruption." They had plenty of data: The event was recorded in unprecedented detail by NASA's Solar Dynamics Observatory and twin STEREO spacecraft. With several colleagues present to offer commentary, they outlined their findings at a press conference today at the American Geophysical Union meeting in San Francisco.

Explosions on the sun are not localized or isolated events, they announced. Instead, solar activity is interconnected by magnetism over breathtaking distances. Solar flares, tsunamis, coronal mass ejections--they can go off all at once, hundreds of thousands of miles apart, in a dizzyingly-complex concert of mayhem.

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At left, NASA's twin STEREO spacecraft surround the sun.

To predict eruptions we can no longer focus on the magnetic fields of isolated active regions," says Title, "we have to know the surface magnetic field of

practically the *entire sun*."

This revelation increases the work load for space weather forecasters, but it also increases the potential accuracy of their forecasts.

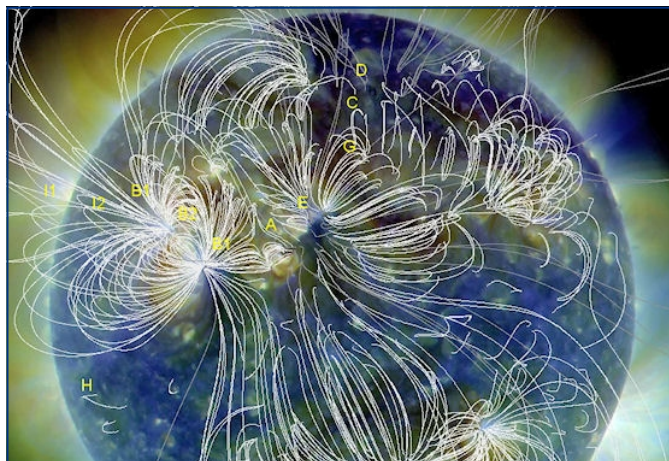
"The whole-sun approach could lead to breakthroughs in predicting solar activity," commented Rodney Viereck of NOAA's Space Weather Prediction Center in Boulder, CO. "This in turn would provide improved forecasts to our customers such as electric power grid operators and commercial airlines, who could take action to protect their systems and ensure the safety of passengers and crew."

In a paper they prepared for the Journal of Geophysical Research (JGR), Schrijver and Title broke down the Great Eruption into more than a dozen significant shock waves, flares, filament eruptions, and CMEs spanning 180 degrees of solar longitude and 28 hours of time. At first it seemed to be a cacophony of disorder until they plotted the events on a map of the sun's magnetic field.

Title describes the *Eureka!* moment: "We saw that all the events of substantial coronal activity were connected by a wide-ranging system of separatrixes, separators, and quasi-separatrix layers." A "separatrix" is a magnetic fault zone where small changes in surrounding plasma currents can set off big electromagnetic storms.

The photo above right depicts Locations of key events are labeled in this extreme ultraviolet image of the sun, obtained by the Solar Dynamics Observatory during the Great Eruption of August 1st. White lines trace the sun's magnetic field. Credit: K Schrijver & A. Title

Researchers have long suspected this kind of magnetic connection was possible. "The notion of 'sympathetic' flares goes back at least three quarters of a century," they wrote in their JGR paper.



Sometimes observers would see flares going off one after another--like popcorn--but it was impossible to prove a link between them. Arguments in favor of cause and effect were statistical and often full of doubt.

"For this kind of work, SDO and STEREO are game-changers," says Lika Guhathakurta, NASA's Living with a Star Program Scientist. "Together, the three spacecraft monitor 97% of the sun, allowing researchers to see connections that they could only guess at in the past."



At left, is an artist's concept of the Solar Dynamics Observatory.

To wit, barely two-thirds of the August event was visible from Earth, yet all of it could be seen by the SDO-STEREO fleet. Moreover, SDO's measurements of the sun's

magnetic field revealed direct connections between the various components of the Great Eruption—no statistics required.

Much remains to be done. "We're still sorting out cause and effect," says Schrijver. "Was the event one big chain reaction, in which one eruption triggered another--bang, bang, bang--in sequence? Or did everything go off together as a consequence of some greater change in the sun's global magnetic field?"

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Further analysis may yet reveal the underlying trigger; for now, the team is still wrapping their minds around the global character of solar activity. One commentator recalled the old adage of three blind men describing an elephant--one by feeling the trunk, one by holding the tail, and another by sniffing a toenail. Studying the sun one sunspot at a time may be just as limiting.

"Not all eruptions are going to be global," notes Guhathakurta. "But the global character of solar activity can no longer be ignored."

As if the sun wasn't big enough already....



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*Happy
St. Patrick's
Day*

You May Be a HAM If
You walk through the plumbing section of your hardware store and see antenna parts.

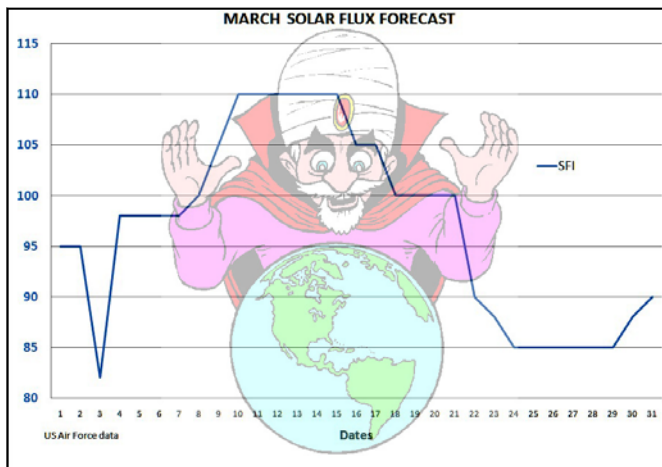
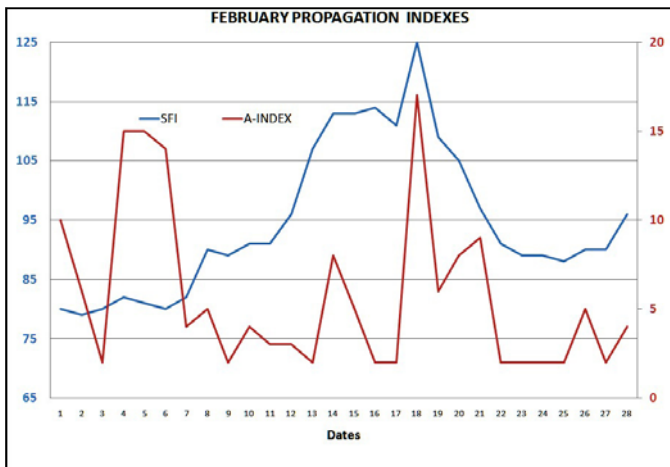
PAST & FUTURE PROPAGATION CONDITIONS

By Bill – W6OAV

This article provides two charts: the propagation conditions for last March and a forecast of next March's propagation conditions.

USING THE PROPAGATION INDEX CHART

Note two things on the chart: the trend of the SFI and A indexes and the date of largest SFI peak. The trend of the SFI shows the progress of the solar cycle during the past March. The SFI peak allows the rough forecasting of the reoccurrence of SFI peak in the next March. In order to "forecast" the next SFI peak, note the date when the SFI peak occurred and project out to about 28 days. Due to the sun's 28 day rotation, the SFI peak will often reoccur in about 28 days. The reason is because the sun spots causing the SFI peak move with the sun's rotation and face the earth every 28 days. This 28 day repetition will become more pronounced as the solar cycle improves. Refer to the September 2010 *Roundtable* for more complete information on the "SFI" and "A" indexes.



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NO HF FREQUENCIES BEING USED IN NEW ZEALAND EARTHQUAKE OPERATIONS

02/25/2011 ARRL Website

The ARRL has just received word from the New Zealand Association of Radio Transmitters ([NZART](#)) -- that country's [IARU](#) Member-Society -- that amateurs there providing communications support in the [aftermath of the 6.3 earthquake](#) are using 2 meters (144 MHz). No HF frequencies are being used. If this changes, the information will be posted on the ARRL website.

UP COMING EVENTS

HAMfests

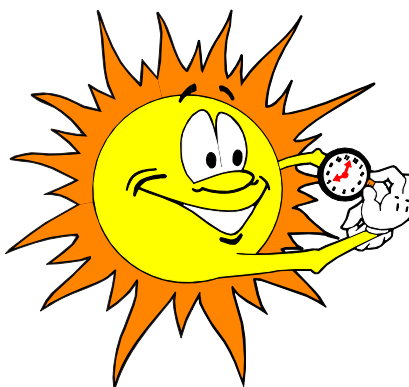
April 2 – Longmont ARC, LarcFest, Boulder County Fairgrounds Longmont, CO

July 16 – PPRAA Megafest, Lewis Palmer High School, Colorado Springs

June 25-26 – ARRL Field Day More info later

August 21 – DRC HAMfest, Jefferson County Fair Grounds

September 25 – Boulder Amateur Radio Club, BARCfest, Boulder County Fair Grounds, Longmont, CO



DON'T FORGET
DAYLIGHT
SAVINGS TIME!
AND SPRING IS
JUST AROUND
THE CORNER TOO!

MARCH 2011							DRC Net Sunday 8:30pm Local
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1	2 <i>Learning Net</i> 7pm <i>Dr. Seuss Birthday</i>	3	4 New Moon	5 <i>ARRL Int'l DX Contest Phone</i> Begins 0000U	
6 <i>ARRL Int'l DX Contest Phone</i> Ends 2400U	7	8	9 <i>Learning Net</i> 7pm	10	11	12 First Quarter	
13 DAYLIGHT SAVINGS TIME	14	15	16 <i>DRC Meeting</i> Elmer 6:30pm General 7:30pm	17 	18	19 Full Moon	
20 FIRST DAY OF SPRING 	21	22	23 <i>Learning Net</i> 7pm	24	25	26 Last Quarter	
27	28	29	30	31			

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DRC REPEATERS

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

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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 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 AG0S@comcast.net. Submission deadline is the 25th of the March. **Editor**