ROUNDTABLE

The Denver Radio Club Newsletter

March 2014 Since 1917

PRESIDENT'S MESSAGE

By Gerry Villhauer – W0GV

Hello DRC Members,

Looks like spring is on the horizon! It has sure been a trying winter season. On the bright side…it's much better here in Colorado than other areas of the U.S.

As I have reported on the nets, we have relocated one of our VHF Repeaters to a location between Franktown and Elizabeth for site testing. The frequency is 147.330 with a standard + 600 khz split and a ctcss tone of 131.8 hz. I am asking our members to check it's coverage in all areas of the Denver area including the foothills. Your input will be helpful in determining the value of this proposed site.

Another area I will be asking help on is our EmComm Operations. As spring approaches we need to address our readiness to respond to an emergency for our served agencies. An area that has not seen much activity is our station at The Salvation Army. We will be planning a coordinated exercise using the equipment at that site. This will be headed up by our EmComm Coordinator Jack Mc Comb, W0JMC. Please refer questions and comments concerning any EmComm activity to Jack. Jack's phone number and email is on our website, *www.w0tx.org.*

Welcome to our new members that have recently joined the DRC. Your names and call signs are listed in this publication. I encourage you to be active in YOUR club and please ask questions. Sometimes we forget that our new members need a little help in getting up to speed on club activities.

Thanks to Jim, K0TOR, for last month's presentation on static discharge and the effects on electronic equipment and on us personally. Many good questions came after the presentation. Our March presentation will be given by Paul Deeth, WA2YZT. Paul is the Chief Transmitter Engineer for CBS Channel 4 here in Denver. His presentation will be on a favorite ham subject…Antennas; particularly, antennas used in TV and Radio Broadcasting. Paul's presentations and style always provide an informative, interesting and entertaining evening. I hope to see you all at the next meeting March 19th and remember spring is officially on March 20th!

73, Gerry, W0GV
President

INSIDE THE ROUND TABLE

FEBRUARY MEETING - WHAT'D I MISS

By Bill – W6OAV

There were 50 attendees. After introductions, W0GV announced that a test 147.33 repeater has been installed at K8ZTT's location north east of Elizabeth. Tests will determine if this site can function as part of the voter system.

The meeting was then turned over to the guest speaker, Jim, K0TOR. Jim's topic was titled "Overview of electrostatic charge, generation and discharge risks".

Jim started his talk with a description of the Martin Failure Analysis Lab where he studied electrostatic discharge (ESD) and how it impacts sensitive electronics. He and his team were also charged with the task of looking into flight control computer failures caused by ESD. He continued his discussion on the investigation of how ESD affected failures in the space programs TTL integrated circuits. He also discussed how failure analysis is accomplished, the use of a scanning electron microscope, as well as SEM imaging modes and how they are created. As a result of their investigation and testing Jim and his team made specific recommendations regarding suppression of ESDs through training and certification, use of ESD wrist straps, establishing ESD controlled work stations, as well as the use of ESD protective packaging.

The meeting was then turned over to Dick, K8ZTT, who is the "W1AW/0 Centennial Celebration" Coordinator for Colorado who gave an over view of the W1AW/0 schedule for May 21st and July16-22.

Please watch for more information about W1AW/0 Centennial Celebration operations in the April issue of your newsletter.

MARCH MEETING ANNOUNCEMENT

Paul, WA2YZT, will discuss broadcast antennas for both FM and TV. Most are custom made and can cost 1/2 million dollars or more. Paul will review what ERP is and how it used to measure the gain of a broadcast antenna. He will also talk about how big towers are built and how antennas are mounted to them.

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.

Joe	Jurneke	WB0PJZ
Stephen	Brown	AD0HG
Don	Gautier	KD0ZDU
Michael	Swanger	KD0YPK

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 6:30pm before the regular meeting.

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

FEBRUARY TECH COMMITTEE REPORT

By Bill – W6OAV

This report provides an overview of the items discussed at the February meeting.

TS-940 Repair (K0TOR)

Goal: Determine if re-soldering and cleaning connectors will fix radio.

Work is still in progress as K0TOR's busy schedule permits.

Voter System Redesign (W0GV)

Goal: Find a site east of Denver which will provide good coverage into the Denver Metro area and which will support the voter system.

A 147.33 test repeater has been installed at K8ZTT's site. Members have been asked to provide signal reports to the Tech Committee. W6OAV will develop a RadioMobile coverage chart ASAP. Reports will be compared to the coverage chart.

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Existing Voter System Tune Up (W0GV/WA2YZT)
Goal: "Tune up" the existing test voter configuration consisting of the Station 4 central voter site and the N1ETV remote receiver site:

- Items to be completed:
  - Rewire link receiver to voter controller interface. KB0A to obtain configuration from WA2 YZT.
  - Adjust UHF link transmit antenna position - KB0A will use analyzer to check the receive antenna system.
  - Sync the hang times of Station 4 and the remote.
  - Calibrate the local and remote audio levels and responses - KB0A will use IFR to set levels.

W0GV and WA2YXT hope to complete project by end of February.

147.33 Auto Patch (WW0LF)
Goal: Program the auto patch controller to allow calls to the 720 exchange.
WW0LF plans to complete project by end of February.

Echolink Server
Goal: Upgrade and find a new "home" for the Echolink server. **(W6OAV)**
The server will be temporarily installed at K0HTX's work location.

145.49/448.625 Repeater - New Controller Programming (AC0UA)
Goal: Program and test our 7330 controller to allow the splitting of the repeaters when D13 ARES uses the 145.49 repeater for emergency activities (plus other features).
AC0UA is working on programming and testing a 7330.

145.49/448.625 Repeater - Controller and Radio Upgrade (WW0LF)
Goal: Replace the S Com 7k with the preprogrammed S Com 7330 and replace the Sytnors with Kenwoods.
Project to be scheduled once the 7330 is programmed and tested
Note: Red indicates project coordinators.

The DRC needs YOUR help!

Due to the rise in postage rates the Denver Radio Club needs you to attend the next meeting to pickup your Membership Roster.

ELMER AND EDUCATION COMMITTEE

NO Report This Month

POWERPOLE CONNECTORS

Here is a handy guide on the correct way to assemble Anderson Powerpole connectors.

Powerpole General Assembly Instructions

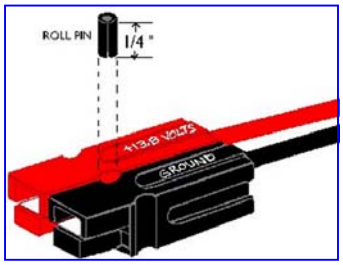
Assemble the red and black plastic housings together correctly on the first try, they fit snugly and can be difficult to get apart. See the picture below for ARES / RACES standard orientation. Note that you can assemble the red and black insulated housings in other ways for special applications.

Put the connector housings together before putting the connector pins in, this is easier, especially when using heavy paired wire.

Before soldering or crimping the contacts on to heavy paired wire, orient the contacts so that they are both facing the correct direction so that they go in the housings without twisting the wire.

The plastic housings are held together with dovetail joints. Always slide these joints together! They will be damaged if you try to snap them together or apart. They ONLY slide together in one direction. This should be obvious by looking at them carefully.

Powerwerx recommends the use of slotted retaining pins. Others do not like the possibility of them falling out in service. If your application is critical and that you want to make the pairing permanent you can use cyanoacrylate glue (Crazy Glue) to hold the connector bodies together.



The contacts go in the housings in only one way. Insert the contacts with their sharp edge down against the flat spring that is in the housing. They should slide in and click. If you do not hear a click or they are not fully seated. When they are inserted

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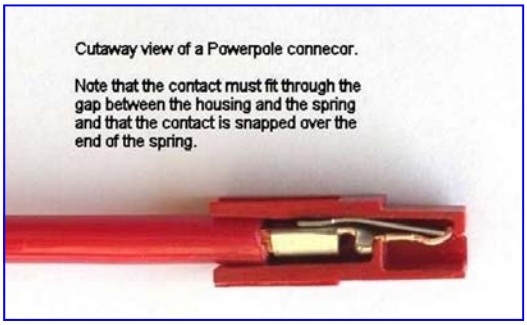
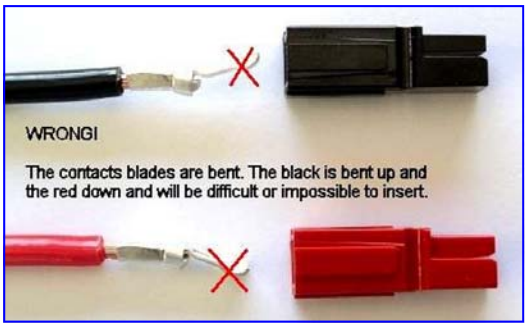
fully you should notice that the contact and its wire "floats" slightly inside its housing. When looking in from the front of the housing the contact tip should slide over the top of the internal hosing spring. This is the clicking sound that you hear.

Be careful when crimping. You may make the contact out of round and it will not slide into the contact easily. This may occur with different types of crimpers and various gauges of wire. To fix this situation you may have to rotate the contact 90 degrees from the original crimping orientation and re-crimp either with the original crimper or a pair of pliers. In any case you need to make the barrel of the contact round again so it can slide in the housing.





Tug slightly on the assembled connector to make sure the contacts are locked in place. If you have trouble getting the contact to lock in to the housing you may have squashed the contact wider deformed it somehow. Look at the side profile of the contacts before and after crimping, you may have to bend it back straight before inserting it in to the housing.

When soldering the contact pins, be careful not to use too much solder. Keep the solder inside, where the wire goes. If a blob of solder gets on the outside of the connector body you may have trouble putting the contact into the housing. If you get solder on the contact surface area you will not make a good contact.

When crimping the contact pins use a crimp that contains the wire completely inside the pin and doesn't spread the connector apart. A good crimp is one where the dimensions of the crimped portion are no more than an un-crimped pin. If the crimp is flattened out you will not be able to easily push the pin in to the body. If you bend the contact blade in relation to the crimp area you should straighten it before putting it in to the body.

It is possibly to use larger or smaller gauge wire with the 30 and 45 amp connectors. The 30 amp contacts will work with difficulty with #10 wires if you cut the end cleanly and carefully put each and every strand of that wire in to the pin. It may be is easier to use 45 amp connectors on #10 wire. Using 16 gauge or smaller wire in a 30 amp contact requires that you double or triple up the wire to fill the crimp receptacle of the contact to get a good crimp.

A properly crimped contact should have a minimum hold on the wire of more than 25 pounds. A pair of connectors should snap together with 6 to 8 pounds force.

Last but not least, MAKE SURE you have the polarity correct before plugging in you equipment. "Measure twice, cut once" as the saying goes.

Read more:
http://www.powerwerx.com/assembly.asp#ixzz2rXz5xp9V

Don't forget to join in Wednesday nights at 7:30pm for the DRC Learning Net ! 145.49/448.625 machines

USING APRS & REPEATERBOOK COMMUNICATE WITH A TRAVELLING HAM

By Bill – W6OAV

Last fall, Jim, N0BED, and I performed a test which might be of interest to other hams. The object of the test was to see if several of us in Denver could communicate reliably with Jim via VHF/UHF as he drove to and from Indianapolis. We planned to use Echolink, APRS and RepeaterBook to accomplish this test goal…… which we did! (If you are not familiar with RepeaterBook , refer to the RepeaterBook article in the December 2013 issue of the Roundtable, available at www.w0tx.org).

So, how did we successfully accomplish our objective? First of all, Jim setup the RepeaterBook filters on his smartphone to list only VHF/UHF Echolink nodes within 30 miles of his route. This allowed RepeaterBook to dynamically list Echolink nodes and their access codes within 30 miles of Jim as he drove down the highway. The closest Echolink node is always at the top of the RepeaterBook's list. At the beginning of the trip Jim, after consulting RepeaterBook, entered the nearest Echolink node access code into his APRS beacon and tuned his transceiver to that node's frequency. When the Echolink listing dynamically changed as they drove, Jim's wife entered the newest and nearest Echolink node access code into Jim's APRS beacon and tuned the transceiver to that node's frequency. Jim then verified that he could key up the Echolink node. If not, he would try the next nearest Echolink node and repeated the process. Jim's radio automatically added the current frequency, PL tone and offset into his APRS beacon.

Figure 1 - N0BED's APRS Beacon

In Denver, using our favorite APRS software (such as APRS-FI), we see Jim's beacon. Figure 1 shows an example of Jim's beacon when he was passing through Grand Island, NE.

The beacon showed that he was monitoring Echolink node 686210. Once we saw the beacon information we used our favorite APRS software to connect to that Echolink node and call Jim. Jim said later that it was strange to be driving in the middle of nowhere and all of a sudden hear one of his friends in Denver calling him.

The advantage of us calling Jim rather than Jim trying to call the DRC Echolink node is that as a visitor, he didn't have Echolink nodes' access codes.

Jim was using a Yaesu FTM350 APRS transceiver. Most other APRS transceivers, such as the Kenwood D700 and D710, also have the ability of allowing the operator to program text into the APRS beacon as described here.

Note: When using RepeaterBook to locate Echolink nodes, note the color of the call sign text. Green indicates that the Echolink node is on line. White indicates that the Echolink node is off line.

FACT OF THE DAY

RF AMPLIFIER IMPEDANCE MATCHING

It often has been written and most people seem to believe that the output impedance of an RF amplifier should match the load impedance; so that for example, if an amplifier is driving a 50 ohm load, the amplifier output impedance should be 50 ohms.

That generally isn't true for the simple reason that contrary to popular belief, the efficiency would be poor. Consider a 1 KW amplifier with 50 ohms resistive source impedance driving a 50 ohm resistive load (both source and load tuned to resonance). The source and load impedances are in series, so 500 watts would be dissipated in waste heat within the amplifier and 500 watts would be delivered to the load.

To have high efficiency the source impedance must be small compared to the load impedance. Note that high efficiency is not the same as maximum power transfer which is the reason for the common misunderstanding.
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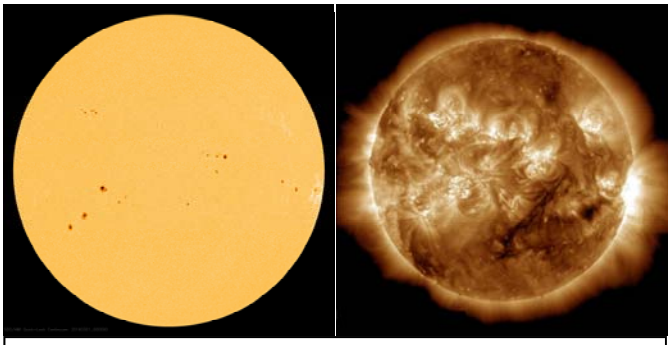
SOLAR UPDATE

By George – AG0S

Have you ever wondered what the sun really looks like? That is if you could see it without being blinded by the light. Well you can thanks to the advanced orbital technology onboard the SDO, Solar Dynamic Observatory.

SDO was launched in February 2010 from Cape Canaveral, and was the first mission to be launched for NASA's Living With a Star (LWS) program designed to understand the causes of solar variability and its impacts on the Earth. The goal of SDO is to understand how the Sun's magnetic field is generated and structured and how the sun's stored magnetic energy is converted and released into the Heliosphere and geospace in the form of solar wind, energetic particles, and variations in solar irradiance. This is accomplished through an imaging package comprised of three scientific experiments. The results are astounding. Taking 1 image of the sun every second SDO's images are 4 time greater resolution than SOHO, Solar and Heliospheric Observatory. Below are two images from SDO on the left is the solar disk we are accustomed to seeing, showing the solar disk with the sun spots on the Earth side of the sun. This image derived from the HMI, Helioseismic and Magnetic Imager. The image on the right is derived from the AIA, Atmospheric Imaging Assembly which images the solar atmosphere in 10 different wavelengths every 10 seconds to link changes in the surface to interior changes.



Note the sunspot locations on the left image and the locations of the visible disturbances on the right hand image.

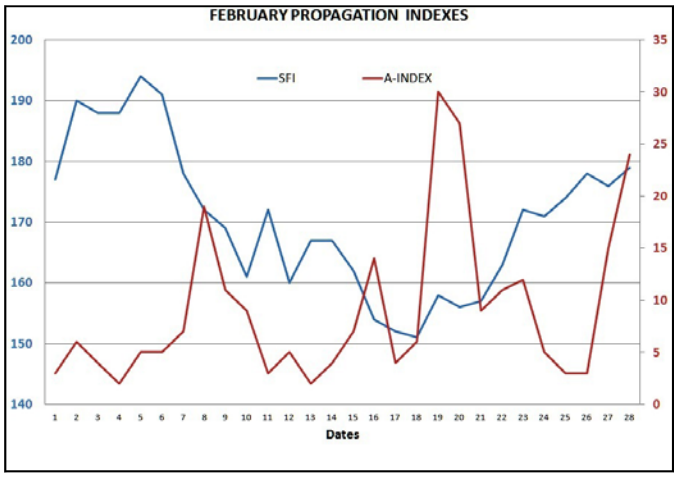
Happy St. Patrick's Day

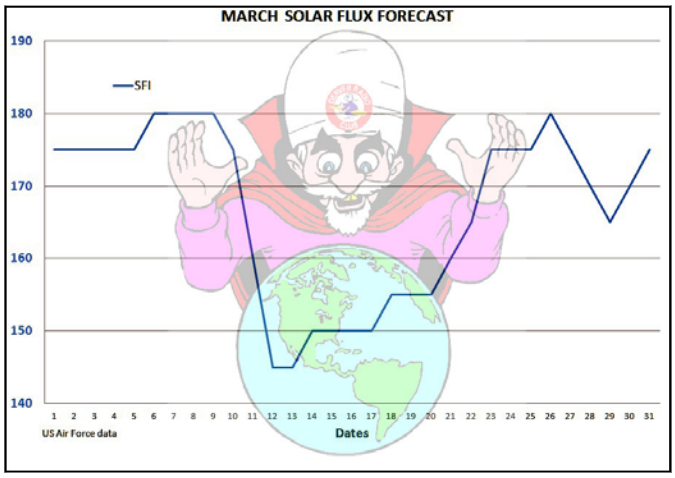
PAST & FUTURE PROPAGATION CONDITIONS

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****.*

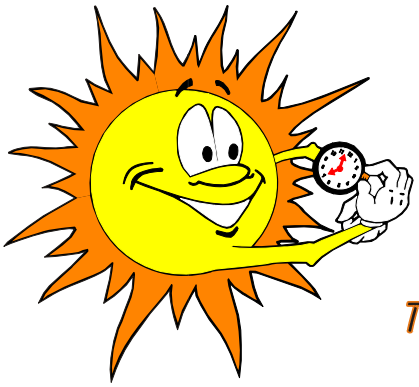
2014

April 5 – **LARCfest**
Boulder County Fairgrounds
http://w0eno.org

July 26 – **PPRAA Megafest**
Lewis-Palmer High School
http://ppraa.org/megafest

August 17 – DRC Hamfest
Jefferson County Fairgrounds
http://www.w0tx.org

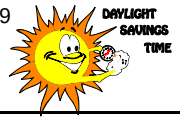
Sept. 28 – **PHC Pueblo HamFest**
First United Methodist South Building
Email: sworley.sw@gmail.com



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

MARCH 2014

DRC Net Sunday's at 8:30pm Local on 145.490 & 448.625 (No PL)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 ***ARRL Int'l DX Contest Phone*** Begins 0000U ● New Moon
2 ***Dr. Seuss Birthday*** ***ARRL Int'l DX Contest Phone*** Ends 2400U	3	4	5 ***Learning Net*** **7:30pm**	6	7	8 ◐ First Quarter
9 	10	11	12 ***Learning Net*** **7:30pm**	13	14	15
16 ○ Full Moon	17 	18	19 ***DRC Meeting*** Elmer 6:00pm General 7:00pm	20 	21	22
23/30	24/31 ◑ Last Quarter	25	26 ***Learning Net*** **7:30pm**	27	28	29

Check www.ARRL.org for Contests and Rules!

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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—Send signal reports to w6oav@arrl.net**
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

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**