



ROUNDTABLE

PRESIDENT'S MESSAGE

By Gerry Villhauer – W0GV

Are we all happy that we live in Colorado? I should say so when looking at the terrible weather in the Eastern parts of the United States. The phrase "it is a privilege to live in Colorado" has a lot of value when you look at other places. We have found an Eastern location to test our second 147.330 repeater. This hopefully will be a replacement site for the Hudson Tower Site that we were forced to vacate a couple years ago. It is my belief this new location will be superb and a much needed location for our voter system and coverage not only in the metro area but into the mountains. Testing will commence as soon as we get equipment in place. We will be calling on the membership to help test the site and report results. I don't have a startup date, but, I expect equipment to be in place in February. Other than that, there has not been much club activity to report.

If you have recently joined the DRC, Welcome! Thanks for choosing us as YOUR CLUB. Your name and call will appear in the body of the news letter.

Thanks to Orlen, WW0LF and Dr. Frederic Sarazin from the Colorado School of Mines physics department for a very interesting

presentation on cosmic rays, how they affect us here on earth, how they are detected, measured and that data relayed via radio to processing location. By the volume of questions from the audience, I would say we had a very successful presentation. Great Job!

Electrostatic Charge is prevalent in our lives every day. Electrostatic Discharge (ESD) can be costly to our equipment and in some cases even life threatening. This will be the subject of our February program by Jim Beall, K0TOR. Jim will tell you how ESD Latent Damage can affect transistors life and degraded performance. He will show you procedures you can use to protect you and your equipment. All this and more in terms we can all understand at the February meeting.

An overdue thank you goes out to long time member Claude Maer, W0IC. Claude has graciously assisted the club on legal issues that arise from time to time. Thank you Claude, your valuable service to the DRC is very much appreciated.

73,
Gerry, W0GV
President

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JANUARY MEETING - WHAT'D I MISS

By Bill – W6OAV

There were 49 attendees. After introductions, W0GV gave an over view of the Saturn Network. He then indicated that the DRC is considering putting together a VHF Saturn net.

The meeting was then turned over to our guest speakers, Dr. Frederic Sarazin, one of the collaborators of the Pierre Auger cosmic ray observatory project and Orlen, WW0LF, a research associate at the Colorado School of Mines.

Dr. Sarazin's presentation covered the following items (plus many more):

- The nature of protons, neutrons, and charged particles.
- The cosmic ray spectrum.
- The nature of ultra high energy cosmic rays and the problems with detecting them.
- Why very large ground arrays are necessary to detect high energy cosmic rays.
- Surface detectors and florescent detectors and how they function.
- Details of the Auger Observatory located in western Argentina's Mendoza Province.
- Details of the Auger North Observatory located near Lamar, CO.
- Colorado School of Mines to participate in research to develop a telescope to be deployed on the International Space Station for detecting high energy cosmic rays.



WW0LF's presentation, titled "Communications Ties it All Together" covered the following items:

- The Argentina Auger Observatory communications network.



- The Lamar North Auger Observatory communications network.
- What was involved in setting up the Lamar communications network:
 - The problems encountered, and the solutions developed, due to the hilly terrain.
 - Field test processes to determine path loss, best frequencies, antennas, etc.
 - Analyzing antenna performance problems.

For more information on the Pierre Auger Observatory, go to <http://www.auger.org>. Also, there is a nice summary of this topic on Page 2 of the January 2014 issue of the RoundTable.

FEBRUARY MEETING ANNOUNCEMENT

By Jim Beall – K0TOR

Electrostatic Charge is prevalent in our everyday surroundings. Its' presence is generally not obvious. But Electrostatic Discharge (ESD) can be costly and in some instances life threatening.



This presentation will primarily address ESD as related to semiconductors but will describe other ESD risks. How ESD was first identified as causing Bipolar transistor failures, what are the semiconductor degradation/damage mechanisms, how degradation effects semiconductor operating life and reliability and how to control ESD, will be presented.

In the mid 60's a MOSFET failure was reported as suspected to be caused by ESD. This was not surprising when one realizes that a MOSFET device is basically a micro-miniature low voltage capacitor type of device. When a Bipolar transistor was identified as susceptible to ESD damage it raised an enormous controversy. The history that followed is quite interesting.

(Continued on page 3)

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Characterizing the ESD damage parameters and their relation to the human body and semiconductor damage thresholds was very challenging. In the mid 60's to early 70's there was no relevant data. Without these data it is impossible to identify what needs to be done to protect semiconductor reliability. Developing these data was a slow process.

Understanding the semiconductor degradation or damage mechanisms was very important to electronic system reliability. These mechanisms are described in simple terms. One of the buzz words that evolved is "ESD Latent Damage". In simple terms, can ESD degradation lead to early semiconductor failure in system operation?

Awareness of the generation of Electrostatic Charge is important to our day to day living. Basic procedures can be effective in controlling ESD while troubleshooting electronic circuits. Effective procedures can pay big benefits.

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.

Dennis Kochevar KD0GEH

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>.

TECH COMMITTEE REPORT

By Bill – W6OAV

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

TS-940 Repair

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

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

[W0GV found and is investigating a possible good site.](#)

Existing Voter System Tune Up

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

[W0GV and WA2YZT hope to complete project by end of January.](#)

147.33 Auto Patch

Goal: Program the auto patch controller to allow calls to the 720 exchange.

[WW0LF plans to complete project by end of January.](#)

Echolink Server

Goal: Find a new "home" for the Echolink server.

[W6OAV is investigating re-configuring the server and finding a new home for it.](#)

145.49/448.625 Repeater - New Controller Programming

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

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.](#)

Station 4 Site Maintenance

Goal: Clean up "shack" and reconfigure equipment mounting.

[Scheduled for spring](#)

Centennial Repeaters

Goal: Ground DRC & Intermountain Repeater Association hard lines.

[Scheduled for spring](#)

ETHICS IN THE AMATEUR RADIO COMMUNITY

BY FRED – AA0JK

eth-ics

plural noun

1. *The rules of conduct recognized in respect to a particular group, culture, etc.*
2. *Moral principles, as of an individual: His ethics forbade betrayal of a confidence.*
3. *That branch of philosophy dealing with values relating to human conduct, with respect to the rightness and wrongness of certain actions and to the goodness and badness of the motives and ends of such actions.*

Welcome to the world of ham radio. This article is meant to help us to better enjoy this wonderful hobby, and a hobby by definition is something you enjoy!

The reader should not let themselves be deterred by all the many rules expected of one to exercise when participating in our hobby. The rules established by the F.C.C. and the amateur radio community are not meant to lessen the pleasure and satisfaction of exercising our hobby. These rules are easy to understand and will rapidly become an automatic code of conduct for every ham of good will.

Many newcomers enter the world of amateur radio with very little, if any, help, without clear instructions or teaching on how to behave on the air. Imagine being released on the roads, in heavy traffic, without anyone having instructed you on how to drive a car or how to behave on the roads?

This idea by itself seems frightening to most of us. Appearing on the ham bands without being prepared for this wonderful experience could be equally intimidating. To say the least. Don't panic though, everybody someday drove a car for the first time, and every ham was a novice at first.

For the most part what one hears on the air is well behaved conduct in the Ham community. But on occasion we have someone who fails to conduct themselves within to code of conduct.

On occasion we have an individual who fails to follow protocol in a net environment. Not feeling they need to wait for net control to acknowledge them for check-in or following the sequence of participation set-out in the precedence, order, decorum of the net.

Deliberate interference is in violation of FCC 97 101 (d) regulations and can result in loss of your license.

Our hobby is a privilege and we must exercise care as not to lose our access to the spectrum allotted us.

There are many publications available to us that outline proper operating procedures. The ARRL provides the Amateur Radio Handbook, an excellent text that should be in every hams collection. Also the ARRL Operating Manual is a good book to have on hand.

Getting your license is only the beginning. There is a lot more to this hobby than learning just enough to enter the ranks of the amateur community. The learning is ongoing.

The Code of Conduct goes a long way towards enjoying our hobby,

The Amateur's Code

Paul M. Segal, W9EEA 1928

The Radio Amateur is...

Considerate ...never knowingly operates in such a way as to infringe upon the pleasure of others.

Loyal ...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through whom Amateur Radio in the United States is represented nationally and internationally.

Progressive ...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

Friendly ... slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

Balanced ...radio is an avocation, never interfering with duties owed to family, job, school or community.

Patriotic ...station and skill always ready for service to country and community

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.

MY SKYHOOK

By Irv – K6DUX

THE PROBLEM

Earlier this month my Cushcraft R7000 vertical suddenly failed during the strong windstorm that we had here in our area. The R7000 was installed on top of my back patio cover which is about eight feet above the ground. So I got out my ladder and climbed (once again) on top of the patio cover to inspect the antenna. Initial inspection of the R7000 didn't reveal why it wouldn't resonate in the ham bands and a check of the lead-in coax passed summary. So, down came the R7000 for a more thorough inspection on the ground. Mechanically the R7000 was fine as all of the extensions were tight. The traps were dipped with my antenna analyzer and they resonated at the proper frequencies. Inspection of the matching unit didn't reveal anything either. So, instead of resorting to re-placing parts I decided to investigate if there were any other vertical antennas that would fit my budget.



Several days later I was talking to a friend of mine, Bill Rinker W6OAV, who now lives outside of Denver, Colorado. We talk fairly often and usually discuss antennas and their problems. He mentioned that there was some information on the web about fixing the Cushcraft matching units, which I suspected had gone bad, and decided to investigate. Sure enough there was information about rebuilding those units and after thoroughly reading the articles decided it was time to replace the antenna instead of trying to fix the unit due to the cost of replacement parts.

THE SOLUTION

Bill (W6OAV) sent me an article about a vertical antenna that he had purchased that seemed to fit my budget as well as my problem. The antenna was an LNR EndfedZ EF-20H which is a half wave vertical for 20 meters. Yes, a full half wave! They make a series of antennas for various bands. What intrigued me was that this antenna didn't require any ground radials. He, and several of his friends in Denver, had purchased this type of antenna and reported good results with it. Bill uses his as a portable antenna because it can be hung upside down from a motel or hotel

window if he is on an upper floor or as a sloper with the end tied to something appropriate. I tried to find out more information on this configuration of antenna but found little. I was curious as to why the ARRL antenna handbooks didn't have any articles on half wave verticals. I had purchased a fiberglass sectional push up mast several years ago, which at times held up my magnetic wire inverted V, and found that its stretched out length was almost a perfect fit for a half wave on 20. The push-up mast is very similar to the current MFJ-1906 (33' 6 section mast). So, out came the credit card and via the web had one antenna on the way in short order.

In a few days the antenna arrived in a small mailer box which weighed only a few ounces which was a surprise. I don't know exactly what I expected but was surprised as to the weight. It consisted of a small matching unit, several light weight insulators and a coil of wire. I noticed that the coating on the wire was especially heavy which, I assume, was designed to take considerable sunlight for a long period of time.

I ran the wire through the inside of the push-up mast and discovered that the mast was too short by about a foot and a half. I had some small 3/8" tubing which just fit over the upper end which extended the mast length so that all of the wire was enclosed. The matching unit was installed on the outside of the mast at the bottom after drilling a small hole so that the antenna wire could be pushed through to the matching unit.

THE TESTING

I was a little hesitant about raising the mast on top of the patio cover due to its height so I decided to just use a wooden pole as a base unit mounted on the ground until I could see what the results were. I was surprised as to how easily it was to raise the mast to a vertical position...no, there wasn't any wind at that time. Since my patio cover top is composed of 1"x 1" redwood slats spaced 1" apart I just pushed the mast between a couple of those slats at the end for a test position. With a little "adjustment" of two of the slats the antenna easily fit into place and was held in a vertical position with the wooden base on the patio concrete. A small piece of rope secured the antenna to the patio cover so any wind couldn't bring it down. Using my antenna analyzer I discovered that the resonate frequency on 20 meters was a little higher (14.16) than I wanted since my primary operating frequencies are 14.070 (PSK31) and 14.076 (JT65HF) and that the SWR was about 1.2:1 at resonance. The instructions that came with the antenna indicated that I could change the resonate frequency by adding a small piece of wire at the bottom end but since I didn't want it to stick out next to the matching unit I just added a small section (6") to the top instead since it would fit into the plastic tubing extension.

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THE RESULTS

It was fairly late at night and the 20m band appeared to be dead since I couldn't see any activity on the waterfall or hear any signals. In place of a call I used the phrase "IMD TESTING" and turned on my IMD meter to set the audio to its proper level. After sending the message several times and correcting my audio level to its proper setting I suddenly got a reply from UA0ZS who inquired as to what I was testing. After a short explanation along with a signal report and he signed off. Before I could shut the station down I got a call from BG6IMK which resulted in a short QSO with the same question and answer. Rather than conclude that this was a result of the performance of the antenna I suspect that conditions had a far more impact than the antenna. Only continued operating over a fairly longer period of time with varying conditions will prove the performance of the antenna. However, it appears that there is some chance for optimism.

I have elected to remove the antenna from its test position and place it on the ground when it is not in use. For safety reasons I plan on covering the matching unit since there is high voltage at that point and when in use the matching unit is within reaching distance from the ground. Even with 40 watts or so the voltage there is probably around 1-2 thousand volts since the impedance is almost 4000 ohms or more.

I think that I will wait until next summer to move the antenna to a more permanent position on top of the patio cover if I don't receive too many curious inquiries from my neighbors. I suspect that by now that they are now used to me putting up and taking down all sorts of weird configurations of antennas. I got a lot of curious inquiries about the various magnetic loops and DDRR antennas that I had built and experimented with previously.

Presently I have a reconstructed MFJ loop, primarily for 10 meters, mounted on a rotator at the far end of the patio cover so the addition of another weird antenna won't come too much as a surprise.

Looking at the antenna on the ground gives you some idea of just how tall the antenna really is. However, and luckily, it seems to blend into the surroundings and isn't that noticeable from the front of the house.

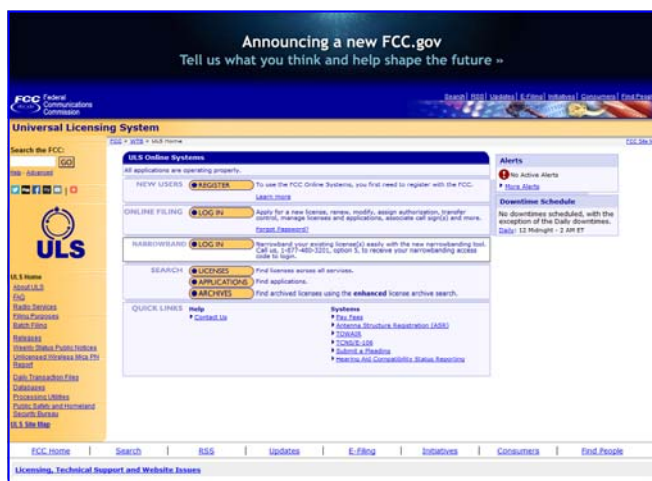


Don't forget to join in Wednesday nights at 7:30pm for the DRC Learning Net !
145.49/448.625 machines
Watch the RoundTable for changes to Learning Net Schedule

**SIMPLE & FREE
 FCC LICENSE RENEWAL**

By Mel – KOMEL

Open your internet browser and go to:
<http://wireless.fcc.gov/uls/index.htm?job=home> .



This is the FCC Universal Licensing Website.

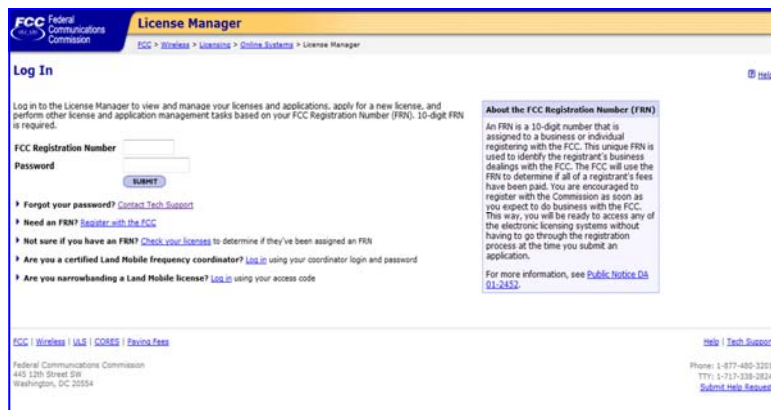
Click the "LOG IN" link you will be redirected to the "Log In" page. There (top of page 7) you will see a "Log In" area as well as several linked options including:

1. Forgot your password? [Contact Tech Support](#)
2. Need an FRN? [Register with the FCC](#)
3. Not sure you have an FRN [Check your licenses](#) to determine if they've been assigned an FRN
4. Are you a certified Land Mobile frequency coordinator? [Log in](#) using...
5. Are you narrowbanding a Land Mobile license? [Log in](#) using...

If you have an FRN and a Password (sent to you by the FCC) log in to access your license information.

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Input your FRN, Password and click "SUBMIT".

When you have completed your log in you will be redirected to a screen where you can manage any FCC-issued licenses you own.

Once the "My Licenses" page is open, click the "Renew Licenses" link in the left-hand column and follow the instructions. If your ham license doesn't appear in the box on the renewal screen, double-check to be sure you're within the 90-day renewal window. You will not be able to renew if your expiration date is more than 90 days out.

Once you've finished that process, click over to the other FCC database, called CORES, and choose the "Update" button. Log in with the same FRN and password you used to renew, and check to ensure your CORES information matches your license information. The FCC keeps two separate databases, so it's good idea to make sure they have the same information in both.

NOTE: Write your password & FRN in a safe location or on the frame backing of the original license. You can use **Reference Copy** from the ULS for other proof of license.

That's it! Now you can forget about this chore for the next 10 years, or until the next time you move. The same web sites also allows you to make email & address changes for free.

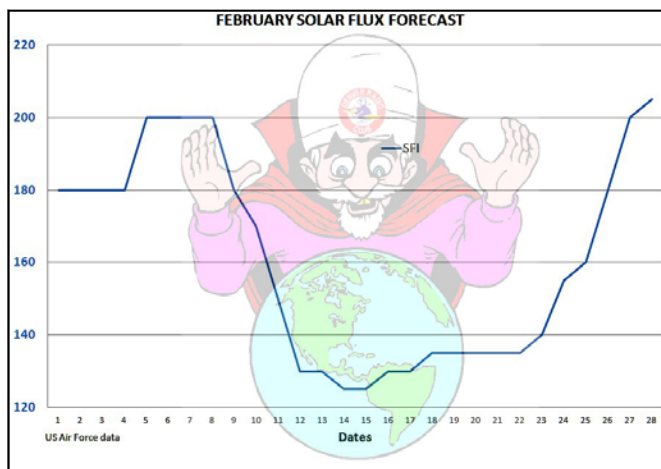
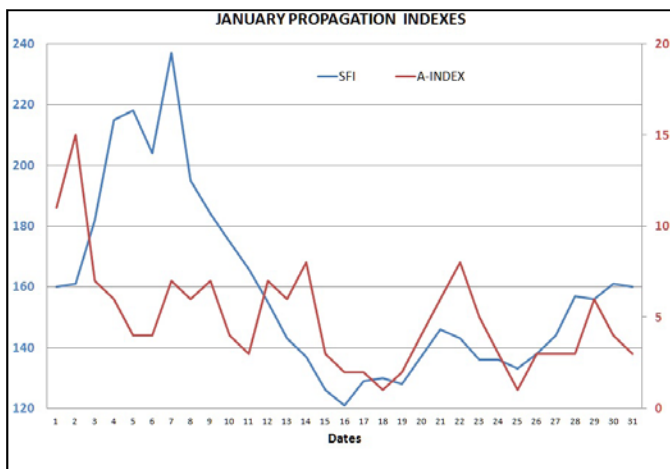


PAST & FUTURE PROPAGATION CONDITIONS

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>.



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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

- February 9** – **ARA Swapfest**
Adams County Fairgrounds
<http://www.n0ara.org>
- 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



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**NEW YEAR ~ NEW ELMER SESSION
START TIME**

The Elmer Session is Going to Start a 6pm beginning in January before the regular DRC Meeting!

Please Note the regular meeting start will remain unchanged.

February 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 National Freedom Day 	
2 Ground Hog Day 	3	4	5 Learning Net 7:30pm	6 	7	8	
9 ARA Swapfest	10 ARRL School Club Roundup Begins 1300U	11	12 Learning Net 7:30pm	13 Valentine's Day 	14 ARRL School Club Roundup Ends 2359U 	15 ARRL Int'l CW DX Contest Begins 0000U	
16 ARRL Int'l CW DX Contest Ends 2359U	17 President's Day 	18	19 DRC Meeting Elmer 6:00pm General 7:00pm	20	21	22 	
23	24	25	26 Learning Net 7:30pm Leap Day	27	28		

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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	Not in service at this time!
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**