ROUNDTABLE

The Denver Radio Club Newsletter

January 2010 Since 1917

PRESIDENT'S MESSAGE

By Robert White – K0RCW

It is hard to believe there are but a handful of days left in 2010 as I write this. Hopefully your holiday season has been full of joy spending it with friends and loved ones, operating a contest or two, and not overindulging (too much) in all the cookies and confections that seem to inhabit the last two months of the year. It is exciting to think about the prospects of the year ahead. What do you plant to develop? Learn to operate a new radio? Learn a new skill? Build a radio? Offer service to the club? Let one of us know if you'd like to serve the club in some way – we're always looking for people to help out in one way or another.

It was great to see so many of you at our annual holiday party at the Country Buffet. You can see a full recap of this meeting elsewhere in the Roundtable. We are grateful to Frank Smith, W7FES for his informative and witty program on what it means to be a light rail driver for RTD. Frank rightly emphasized the safety side of competing with RTD vehicles (hint: it is unlikely you will win a race with one). It was rather incredible to hear about the number of people who try and do not win.

As you may know, I like to use this space to feature the diverse activities of various members of the DRC. You never know what the reach of the Denver Radio Club might be. In late October Dave Baysinger, WG0N, asked and received board permission to borrow the club's Honda 2k generator for a very important project. Dave works for the Denver Museum of Nature & Science which was mounting a huge educational project in New Mexico from Chaco Canyon, at a location where there is no electrical power, (no internet and no cell phone coverage). In order to power the satellite transmission gear, battery chargers, communications network, cameras, lights for a night show and more, they needed more than the Museum's Honda 2k could supply. If you'd like more information about the Chaco Canyon project go to http://www.nps.gov/chcu/index.htm.

The DRC generator humming next to its "brother" provided the extra "kick" to bring the ancient Chaco culture to more than 1400 school students at the Museum, across Eastern Colorado, 2 school districts in Texas, and 8 schools in Montana. All two-way video feeds were accomplished by the Chaco site feeding the Internet through the SES-1 satellite in geo-stationary parking orbit over the equator.

The Denver Radio Club is always providing help to the community by solving technology problems.

The January meeting will return to its regularly scheduled location, the El Jebel Shrine, East Room, 2nd floor, 4625 W. 50th Avenue. The Elmer Session and Tech Meeting will start at 6:30 pm followed by the regular meeting and program at 7:30 pm sharp. There is marking on the east side of the building.

73
Robert – K0RCW
President

INSIDE THE ROUND TABLE

DECEMBER MEETING - WHAT'D I MISS

By Bill – W6OAV

HOLIDAY DINNER A HUGE SUCCESS

This year's Holiday dinner was a fun and very successful event. There were 65 folks in attendance. In the photo below you can see only about a third of the group (I need to buy a wide angle lens!).

Robert, K0RCW, began the meeting by introducing our guest speaker, Frank, W7FES. Frank has been with RTD for 5 years and has operated Light Rail trains for 4 ½ of those years. He gave a video presentation about RTD Light Rail and continued with an overview of the system, the signal control systems and the future Light Rail routes. He ended by emphasizing the safety procedures people must practice around the Light Rail system. During the presentation, Frank also provided anecdotes of some of the crazy things the Light Rail operators have seen people do around the system.

Audience interest in the presentation was high as there were many good questions from them. Thank you, Frank.

The meeting ended with a raffle for some great door prizes.

JANUARY MEETING PRESENTATION

UI-VIEW32/APRS

By Bill – W6OAV

Are you interested in tracking mobile stations and communicating with them using only your PC, transmitting local weather information onto the Internet for the world to see or doing a lot more "fun" things? If so, plan to attend the January club meeting. Doug, N4ATA, will present a tutorial on Ui-VIEW32, which fits into APRS, he will also give live demonstrations.

TECHNICAL COMMITTEE REPORT

There was no Technical Committee meeting this month due to the Holiday Party. Meeting information from the January meeting will be reported in the February Roundtable.

DETERMINE PROPAGATION CONDITIONS

By Bill – W6OAV

Have you wondered, when wanting to make an HF contact to a specific area, what band would be the best for that given time and distance? Have you wondered what band to use to make NVIS contacts? This article will provide information on a tool that will help answer those questions.

DEFINITIONS

Let's begin with definition of terms used in this article.
Skip Zone – The area between the end of the ground wave and the point where the first refracted radio wave returns to earth.

NVIS (Near-Vertical Incident Skywave) - A process where an antenna is configured to direct a radio wave straight up from the ground. The radio wave is reflective back by the ionosphere and "fills" the skip zone.

MUF (Maximum Usable Frequency) - The highest frequency which the ionosphere will reflect back to earth. Frequencies higher than the MUF will pass through the ionosphere and out into space.

Ionosonde - High frequency "radar" which transmits short high frequency RF pulses straight up into the ionosphere. These pulses sweep approximately between 1 MHz and 22 MHz.

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THE TOOL

The Australian Space Weather Web site has many useful propagation charts. Among the many charts, the site provides HAP charts. The HAP charts will answer the two questions posed at the beginning of this article. So, what is a HAP chart? HAP is the acronym for "Hourly Area Prediction". The HAP chart, which is updated every 40 minutes past the hour, uses ionosonde sounding data to predict the frequencies usable between a central area and remote areas.

The ionosode provides two major parameters:

MUF - The ionosode determines the MUF by noting the upper frequency at which a particular frequency pulse is not reflected. This frequency is the MUF.

Height of the various reflective layers – The ionosonde, as it sweeps between 1 MHz and 22 MHz, determines the height of the reflective layers by recording the time delay between transmission and reception of the pulses at the various frequencies.

The heights of the various reflective layers vary with frequency. Generally, the higher the frequency, the higher above earth is the reflective layer for that frequency. The higher a reflective layer at a particular frequency, the further that frequency will propagate at a particular angle of radiation. For example, if both a 20 meter and a 10 meter signal are transmitted at 20 degrees above the horizon, the 10 meter signal will propagate much further.

Fortunately for Colorado hams, an ionosode system exists in Boulder. This allows Colorado users to determine coverage from our area.

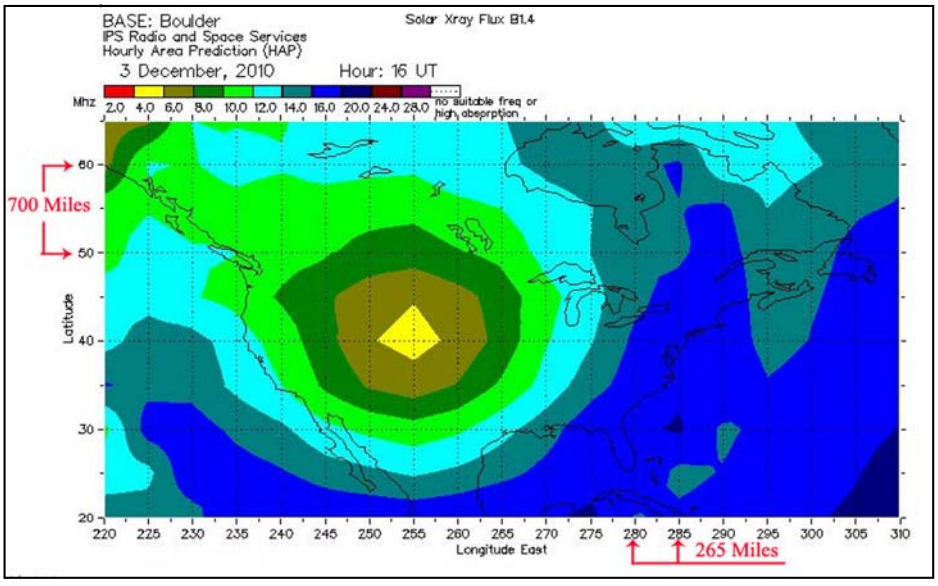
The chart below left shows a typical HAP chart centered on Boulder. Note that Boulder's longitude is shown at the bottom of the chart as approximately 255 E. Since we are used to seeing Boulder listed at about 105 degrees longitude, why does the chart show Boulder at about 255 E? Because the Australian system starts at the meridian and counts degrees counter clockwise around the earth. "Our system" starts at the meridian and counts out around the earth in both directions. Hence we are used to seeing Boulder at approximately 105 E.

To convert the longitude reading to "our system" just subtract the longitude value at the bottom of the chart from 360. For example, to convert for Boulder: 360-255=105. However, it is not necessary to convert systems to use the chart.

To determine distances on the HAP chart, just remember the following. Each longitude degree increment on the HAP chart represents approximately 53 longitude miles. Each vertical grid represents approximately 265 longitude miles. Each latitude degree increment on the HAP chart represents approximately 70 latitude miles. Each horizontal grid represents approximately 700 latitude miles.

To use the chart, note the color of the frequency band of interest in the color bar located at the upper left of the chart. Then note the location of that color band on the chart. The color band represents the beginning and the end of coverage for that frequency. The area between Boulder and the beginning of the color band is the skip zone.

This HAP Chart to below represents the propagation conditions from Boulder at 16 UTC (9 AM MST). A Denver station can communicate with stations in the approximate ranges shown in the table at the top of the next page. Note the lack of propagation at the very low frequencies and the lack of propagation above 15 meters (The MUF). Keep in mind that there are MANY variables that can effect propagations in the bands shown in the HAP charts.



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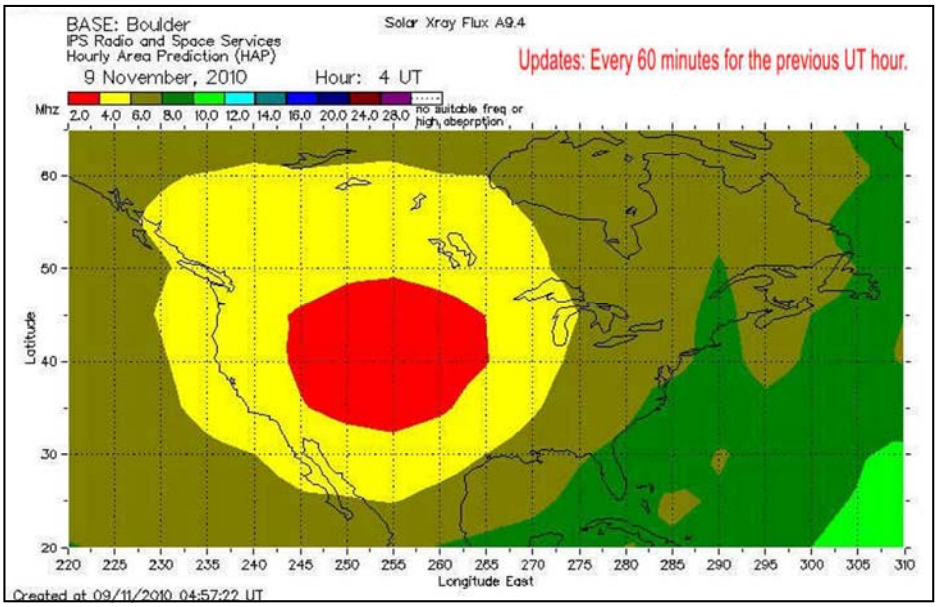
Band (Meters)	Color	Start of Skywave (Miles)	End of Skywave (Miles)	Notes
75m	Yellow	0	180	NVIS
40m	Brown	180	450	
30m	Light Green	450	650 to >900	Depends on direction
20m	Gray	1000	1000 to >2200	Depends on direction
17m	Blue	1300	1300 to >3000	Depends on direction
15m	Dark blue	3000	?	Depends on direction



The HAP Chart above depicts the propagation conditions from Boulder at 4 UTC (10 PM MST). Note the predominance of propagation at the very low frequencies and the lack of propagation above 30 meters (The MUF). As depicted on the HAP Chart a Denver station can communicate with stations in the approximate ranges shown in the table above right.

Monitoring both HF propagation beacons and HF packet stations' beacons, I find that the HAP charts are fairly accurate. To access the HAP charts, go to "http://www.ips.gov.au/HF_Systems/6/6/1".

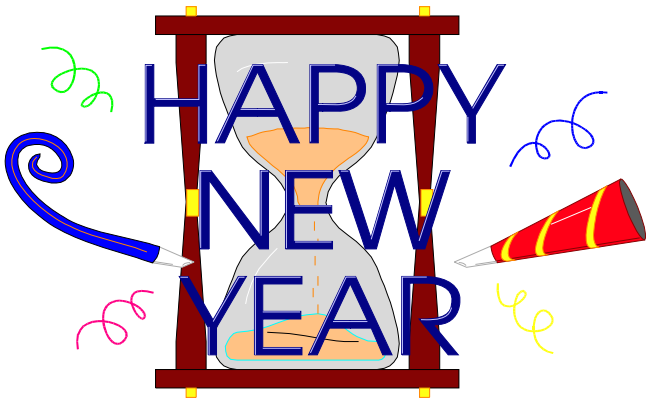
Select "Boulder" from the drop down menu and you will see a HAP chart for this area. Note that you can select HAP charts for many other cities around the world.

Band (Meters)	Color	Start of Skywave (Miles)	End of Skywave (Miles)	Notes
160m	Red	0	550	NVIS
75m	Yellow	550	1000	
60m	Brown	1000	1500 to ?	Depends On direction
30m	Light Green	2900	?	Depends On direction

An Interesting Ham Broadcast

By Bill – W6OAV

When you're getting ready for our Sunday evening net, you might want to go to your ham shack a half an hour before net time and fire up your HF receiver. At 8 PM MST tune to 6.050 MHz. Arnie Coro, CO2KK, moderates a program called "DXers Unlimited" on Radio Havana Cuba. The program lasts for 18 minutes. Arnie covers all kinds of technical topics from antennas; home brewing; testing; theory and more. He concludes the 18 minute program with a propagation report. The program is well worth listening to. Radio Havana Cuba has a great signal into Denver as they are using a curtain array pointing to our area.



REMEMBER WHEN?

By Bill – W6OAV

The purpose of this article is to let newer hams know what ham radio was like in the late 50s and early 60s and to bring back memories to the older hams.

The HF bands were an interesting place in the late 50 to early 60s. A new mode called SSB appeared on the bands. In those days the SSB technology was expensive and complex compared to AM technology. AM stations were easy to build and adjust. SSB stations required special filtering or phasing and had to be extremely stable.

COLLINS KWM-1 First SSB Transceiver introduced in 1957. Cost $860

As SSB began to appear on the ham bands, the AM'ers cussed out the "Slop Bucket Boys" and the "Donald Duck" sounds they made. Often the AM'ers would tune up on top of the SSB'ers for hours to demonstrate their displeasure with SSB. The SSB'ers would make degrading remarks about the frequency hogging "Ancient Modulation". Unfortunately, for a time the electronic war got pretty nasty.

As time progressed, AM'ers began to see the advantages of SSB and the electronic war pretty much disappeared by the mid 60's. Hams had become aware that Air Force General Lemay had successfully converted the worldwide SAC network from AM to SSB with amazing results. Many articles began appearing in QST covering the merits of SSB. Also, companies began coming out with relatively inexpensive SSB rigs. Some rigs used sharp filters to generate SSB. Others used phasing systems to generate SSB. Both modes had advantages and disadvantages.

I was converted from AM to SSB after I was sent to Germany with the USAF. I went over with a AM transmitter and had to work hard to communicate with friends in the US. A ham friend loaned me a SSB rig to use.

The results were very impressive! I had little trouble working friends in the US. With that, I bought a SSB rig and joined the SSB crowd. The 9 dB S/N advantage of SSB over AM was obvious!

VHF PROPAGATION EXPLAINED

By Ron Cook – VK3AFW

How do you know if the extended range VHF/UHF contacts we enjoy at this time of year is due to sporadic-E, tropospheric ducting or meteor scatter? Sometimes the answer is not obvious. However usually it is possible to identify the propagation mode by considering clues such as the band used, signal strengths, time of day, and distance covered.

Ron Cook VK3AFW has provided the following handy tips for the summer VHF'er who is prepared to do more than just speculate.

Ron suggests reading an authoritative book such as the RSGB's VHF/UHF DX Handbook. If you don't want to buy one, ask your local library or library extension service to get a copy for you to borrow for two weeks while you read the "Propagation" chapter.

For those that can't wait, here is some very general guidance. Please note that the distances are approximate and it all is based my understanding of what happens.

The most common propagation enhancement is one of the "tropo" modes, which are useable for distances between 100 and 3,000 km. The enhanced propagation can be linked to weather patterns. Certain combinations of pressure, pressure gradients, temperature, temperature lapse rate, relative humidity and its gradient all are involved. The Hepburn index is an easy way of checking if "troppo" conditions are likely to be different from normal. It is available on the Web at http://www.iprimus.ca/~hepburnw/tropo.html.

Sporadic-E (or E's) propagation results from ionization in the E layer, distances worked are determined by geometry and intensity of ionization, meaning contacts are usually in the range 400 km to 2,300 km. Distances of around 3,000 km may have been worked by double hop
E's but this sort of occurrence is not common and needs some evidence of there being two clouds of E ionisation at the right places.

F mode propagation uses a higher layer and has a single hop range of around 3000 km. There are reasons why F layer propagation tends to give wider coverage and multiple hop propagation and E's generally does not and this behavior helps differentiate between the two.
Also the ionosound records show where the ionization was and how intense it was. Go to the Web site of the IPS Australia, http://www.ips.gov.au/ and check out the ionosound data.

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Trans-equatorial propagation (or TEP) requires specific geographic relationships for both stations. This means roughly equal spacing north and south of the magnetic equator and for the stations to be aligned within a limited arc. Contacts between Northern Australia and Japan on two meters use this mode.

Auroral modes are characterized by the distortion of the signals and the need to point the beam South rather than at the station. Distances worked in VK are usually in the range 100 to 1,000 km.

Most propagation modes that are seen on six meters are seen on ten and two meters, generally at the same time. Thus tropo contacts are often made on six, two and higher frequencies all via the same enhanced conditions between the same stations. Ron has never experienced tropo enhancement on ten meters or non TEP F modes on two meters, but maybe they do happen.

More than one mode can occur at the same time, with mode linking being suggested as the means of some extended range contacts. This may be so, but I would always look for the simplest explanation first.

And that was a summary on VHF propagation, prepared by Ron VK3AFW for the VHF/UHF internet mailing list. For the average station, sporadic-E is most common on 28 and 50 megahertz, while tropospheric propagation is dominant on 144, 432 and higher frequencies. Both modes will become most prevalent over the next three months or so.

This article, and a lot more informative articles, can be found at on the Queensland Digital Groups web site at: http://www.qdg.org.au/qdgari.htm

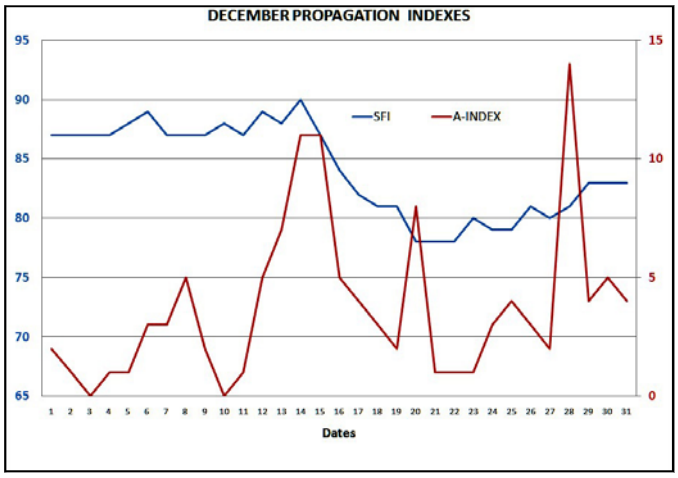
Past & Future Propagation Conditions

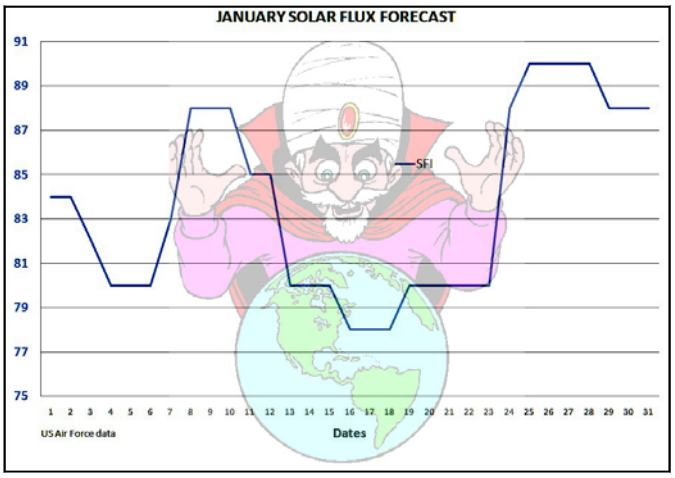
By Bill – W6OAV

This article provides two charts: the propagation conditions for last January and a forecast of next January'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 January. The SFI peak allows the rough forecasting of the reoccurrence of SFI peak in the next January. 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.





UP COMING EVENTS

PERSONAL HAM RADIO CALENDAR

During an Elmer session in January 2009 DRC Club meeting everyone was encouraged to create or update their personal ham radio activity calendar for 2009. It's that time of year again. Here are just a few of the items you may want to add to your 2010 calendar. As the Januarys go by watch the RoundTable for updates.

January 15 – NCARC Winterfest, Larimer County Fair Grounds, Loveland, CO
February 13 – ARA Swapfest, Adams County Fairgrounds, Brighton, CO
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 TBD – DRC HAMfest

You may wish to start a calendar of your own. Some other non-amateur radio dates you may want to remember are:

1. Your Anniversary (very important, if you want to live long)
2. Family member's birthdays (especially your mother-in-law)
3. Religious Holidays & Church events
4. Business Holidays
5. Special school events
6. Vacations (a personal favorite)

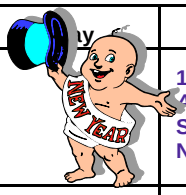
These are just a few dates which may be of importance to you. With out a doubt you will think of many more.

"Discovery consists of seeing what everyone has seen and thinking what nobody has thought."

-Albert Gyorgyi

JANUARY 2011

DRC Net Sunday 8:30pm Local

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 *ARRL* Straight Key Night
2	3	4 New Moon	5 *Learning Net* 7pm	6	7	8 *ARRL RTTY Round-Up* Begins 1800U
9 *ARRL RTTY Round-Up* Ends 2400U	10 Save The Eagles Day 	11 Amelia Earhart Day 	12 *Learning Net* 7pm First Quarter	13	14	15
16	17 *Martin Luther King Day* 	18	19 *DRC Meeting* Elmer 6:30pm General 7:30pm Full Moon	20	*21*	22 *ARRL* January VHF Sweeps Begins 1900U
23 / 30	24 / 31 *ARRL* January VHF Sweeps Ends 0359U	25	26 *Learning Net* 7pm Last Quarter	27	28	29

 Check www.ARRL.org for Contests and Rules!

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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.**

Editor's Note

DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart and sole of The Denver Radio Club, if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to AG0S@comcast.net. Submission deadline is the 25th of the January. **Editor**