

# Rainbow Canyons Amateur Radio Club

Cedar City, Utah

## Club Officers:

### President:

KR7KR  
Ken Richter

### Vice-President:

K7ZI  
Richard Parker

### Treasurer:

AL7BX  
George Gallis

### Secretary:

K6QOG  
Bill Stenger

### Local Repeats:

146.980 Mhz  
No Tone

146.940 Mhz  
Tone 100 hz

146.760 Mhz  
Tone 123.0 hz

Remote Base  
449.500 Mhz  
Tone 100 hz

Remote Base  
449.925 Mhz  
Tone 100 hz

IRLP/Echolink  
449.900 Mhz  
Tone 100 hz

Club meets on the second Tuesday of each month at Sheriffs Search & Rescue Bldg.

### RCARC NETS:

**Breakfast Net:** 7:00am 146.98Mhz, no PL tone required, every weekday.

**Friendship Net:** 9:00pm 146.98Mhz, every evening.

*Next club meeting is Tuesday, February 10, 7:30 pm*

### TOPIC:

**Propagation. Solar/Earth involvement,  
MUF, Gray line, Long path, etc.**



## Local News

### CERT

Community Emergency Response Team  
January 15, 2015 7pm Meeting

We had an interesting and informative presentation on “Animals in Disaster” by Julie Meron, the President and Founder of **UEARC – Utah Emergency Animal Response Coalition**. With most households having various pets, and in Utah we also have many with Horses, goats, chickens etc. her talks are full of many tips to prepare for disaster, how to rethink plans for our pets and their care, what trainings are available for anyone interested in animals in disaster as well as large animal rescue and pet sheltering. Julie has become the State of Utah’s go to person in this area when any event or disaster occurs and the care and sheltering of animals is needed. Her background, knowledge, and experiences makes her an invaluable member of our community.

### Local Emergency Planning Committee

Jan. 21, 2015  
Debra Frank KG7MAZ

A full crowd was present at this monthly meeting and although no program was presented on this day, Lt. Jody Marshall discussed his appreciation for the large turnout of representatives from various emergency services groups mentioning the Ham Radio attendees !!! That was a nice recognition.

KR7KR, AL7BX, KG7PBX, WA7HHE and KB7HHB attended LEPC for the first time.

N7TCE, KB7UMU and N7SIY were also there to represent the RCARC.

Jody stated that Iron County was fortunate to have someone as experienced and accomplished as John Higley as our new

Emergency Manager.

### ***News from ARES and the NECP*** Debra Frank KG7MAZ

“[A]mateur radio operators... can be important conduits for relaying information to response agencies and personnel when other forms of communications have failed or have been disrupted,” the NECP states. The NECP (National Emergency Communication Plan) also describes changes that lie ahead for emergency communication systems, such as 9-1-1 systems. “In the future, Next Generation 9-1-1 will enhance the capabilities of current 9-1-1 networks, allowing the public to transmit pictures, videos, and text messages that will provide additional situational awareness to dispatchers and emergency responders,” the NECP says.

The updated NECP stresses the importance of interoperability. It recommends that state, regional, and local administrations “assess their existing governance structures to ensure they are positioned to address current and emerging policy, technology, and planning developments.” This effort, the NECP continues, could include the addition of representatives from the Amateur Radio community to statewide interoperability governing bodies and executive committees.” Stated by the US Department of Homeland Security’s updated NECP (National Emergency Communications Plan) Nov. 12, 2014.

### **Up North News**

#### **Event: Power of Prevention Conference**

**Location:**  
Utah Cultural Celebration Center,  
1355 W 3100 S, West Valley City, UT

**Date:**  
March 3-7, 2015,  
5 summits... 5 days

We are all familiar with how community crime and violence issues impact our communities emergency plans, emergency preparedness and safety across all entities. You are all invited to attend the annual Power of Prevention Conference put together by the Utah Council for Crime Prevention, where an in-depth discussion will occur on mitigating crime and promoting prevention.

**Topics:** Crime Prevention, School and community policing, Neighborhood Watch, VIPS, Bullying and School Violence, Marijuana, Internet safety, tobacco prevention, underage drinking, Rx & OTC Drugs and

Drug Abuse, Pornography, Identity Theft, Gangs, etc.

**Audience:** Neighborhood Watch, VIPS, Law Enforcement, School Administrators, Educators, Youth, Clergy, Community, PTA. There will be national speakers and breakout sessions all week.

Registration info available online:  
[www.utahcrimeprevention.org](http://www.utahcrimeprevention.org)  
or call 801-486-8691, or 1-800-280-8824

### **From ARRL Newsletter**

#### **ARRL Library Goes Live!**

After several months of planning, The ARRL Library is now live! The online Library is a free repository of educational presentations and oral histories. It is aimed at helping to preserve Amateur Radio’s history and to educate clubs and individuals.

“This long-term project will be home to what I hope will eventually become one of the largest repositories of Amateur Radio-related papers and presentations, created by and for the Amateur Radio community,” said ARRL Media and Public Relations Manager Sean Kutzko, KX9X. “This is your opportunity to submit material for the betterment and education of all radio amateurs.”

Kutzko said the Library will initially consist of three major areas. These will include PowerPoint presentations that may be used at club meetings, for outreach to the general public, or for other public presentations; PDFs of general educational material about Amateur Radio, and oral histories of radio amateurs describing their personal experiences with Amateur Radio.

Current content includes presentations on operating digital modes, HF basics, and impedance matching. While the available material is sparse right now, Kutzko invites all radio amateurs to submit material for consideration -- as long as it relates to Amateur Radio. The Public Relations Committee will vet all submissions, and once a submission is approved, it will be added to The ARRL Library.

### **ARRL Rocky Mountain Division update January 2015**

===== **ARRL Rocky Mountain Division Net** =====  
Here are the details:

**DATE:** Second Wednesday evening of each month  
(next: February 11)

**TIME:** 7:30 PM mountain time

**IRLP NODE:** 9871

**ECHOLINK NODE** (experimental): 415699  
(K0JSC-R)

## 2015 Rocky Mountain Division Convention

The good folks in Utah are in the midst of planning the 2015 Division Convention, returning to gorgeous Bryce Canyon, Utah. Mark your calendars for July 31-August 2, 2015 for a special convention, packed with many of the activities and events our Division's conventions have become known for. Many more details are forthcoming

### Upcoming On-Air Activities

In addition to chewing the rag with fellow hams, here are some additional on-air activities which await you on the airwaves.

**UPCOMING SPECIAL EVENT STATIONS:** [HTTP://WWW.ARRL.ORG/SPECIAL-EVENT-STATIONS](http://www.arrl.org/special-event-stations)

**UPCOMING CONTESTS:** [HTTP://WWW.ARRL.ORG/CONTEST-CALENDAR](http://www.arrl.org/contest-calendar)

**UPCOMING STATE QSO PARTIES:** [HTTP://QSOPARTY.EQTH.NET](http://qsoparty.eqth.net)

**OPERATING AWARDS:** [HTTP://WWW.ARRL.ORG/AWARDS](http://www.arrl.org/awards)

### What Happened at the last Meeting?

President Cameron Abbaticchio KF7YWY called the meeting to order at 7:30pm.

Those present were:

KF7WIY	Denice Sheffield
KF7GPZ	Fred Sheffield
KG7PBX	Linda Shokrian
KG7AHS	Travis Horton
N6OJS	Fred Getman
KB7HHB	Mardi Biedermann
WA7HHE	Brad Biedermann
KG7NYJ	Devin Elliott
K7VNH	Dave Owens
KG7HTJ	David Williams
AL7BX	George Gallis
KF7YWY	Cameron Abbaticchio
KR7KR	Ken Richter
K7ZI	Dick Parker
KG7MBA	Neal Forbes
WA7GTU	Don Blanchard
N7SIY	Joel Clements
KB7UMU	Sylvia Clements
KG7MAZ	Debra Frank
KG7OOW	Bryan Lamoreaux
N7TCE	Merlin Mackay

KG7ECK Louise Saw  
K6QOG Bill Stenger

Visitors & Guests:

KG7CLN Steven Rossberg  
John Higley  
Pat Higley  
Caleb Williams  
Dennis Gaede  
Bill Heston  
Gary Westfall

Cameron thanked the club officers for their support during his term in office. He call Ken Richter KR7KR to the desk and handed over the reins to the newly elected club President. Ken's first act as President was to give Cameron a Certificate of Appreciation for his service this past year.

George Gallis AL7BX, Treasurer, reported beginning of December balance as \$1098.43. Payments for Christmas dinner and electric power bill \$210.86. Ending balance of \$887.57. Fred Getman N6OJ motioned to accept the report, 2nd by Don Blanchard WA7GTU and vote was unanimous.

Bill Stenger K6QOG, Secretary, asked for corrections, additions or deletions. None given. Don Blanchard WA7GTU motioned to accept the minutes, 2nd by Cameron Abbaticchio KF7YWY and vote was unanimous.

Don Blanchard WA7GTU gave a VHF Society report. He mentioned the 146.98 Mhz repeater was replaced and working. Rowberry Repeater has a problem on the VHF side. Please be patient when a problem arises as many people put lots of time and money to keep the repeaters up and running.

Dick Parker K7ZI asked if anyone has been having a problem with the 146.76 Mhz repeater. None stated.

Sylvia Clements KB7UMU requested someone to take over her Friday night NCS position. Fred Getman N6OJS volunteered to help anyone who feels like they want to take on a new challenge as NCS.

Everyone in the room went around and introduced themselves.

### Program:

George Gallis AL7BX projected a picture of a program that Brad Biedermann WA7HHE has to predicts the possibility of communications between two points: Newcastle Reservoir and Iron Mountain. George and Brad set up a simulated test message sent in digital mode that indicated the reservoir had the potential to begin leaking, the names and address of family/homes

that would be affected and a picture of a portion of a road that was already washed out. The digital information was sent through the 146.98 Mhz repeater into the Iron County Sheriff's Search and Rescue Building. Questions and Answer session followed the demonstration.

### **Guests:**

Debra Frank KG7MAZ introduced Steve Rossberg KG7CLN from the Southwest Utah Public Health Department. Steve talked about the SW Region Amateur Radio Drill last month and showed a sample of the IC 7000 transceivers and accessories that are installed in several hospitals and that will be install in more hospitals and long-term care facilities in the future.

Debra also introduced John Higley, the new Iron County Emergency Management Coordinator. John mentioned that he wants to have a ham radio station set up in the CERT trailer.

Debra urged everyone to consider attending the **Citizen Corp Conference** February 28th, 9am to 4pm at the Heritage Center (105 N 100 E, Cedar City, UT 84720). The conference is free and so is the lunch. To registration click this url:  
<https://docs.google.com/a/swuhealth.org/forms/d/1NA M8du5gz8Q3Rga6uUNqvVhX9SDjwT9cC97fbgQFqJs/viewform>

Ken past around the group a list of possible topics for upcoming radio club meetings. He asked them to check those they are most interested in return the form before they leave.

### **Up Coming Events:**

Dick Parker brought up several events that will be happening this year:

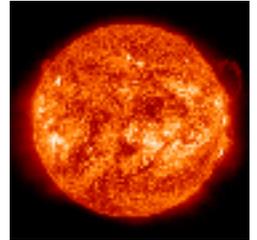
- \*Zion 100, April
- \*Field Day, June 27 & 28. A coordinator is needed.
- \*Equestrian Endurance Ride, October
- \*Special Event Station for Iron Mission Days, in November.
- \*Fox Hunt, summer
- \*Annual BBQ, summer

No further business, Fred Getman N6OJS motioned to adjourn, Denice Sheffield KF7WIY 2nd and Ken adjourned the meeting at 8:33pm.

## ***The K7RA Solar Update***

Sunspot numbers and solar flux rose again this week, while geomagnetic indices were relatively quiet. Average daily sunspot numbers increased from 108.1 in the first week of 2015 to 112.6 in the 7 days following. Average daily solar flux rose from 144.7 to 151.3.

Predicted solar flux for the near term is 140 on January 15-16, 135 on January 17-18, 130 on January 19-20, then 125, 135, and 140 on January 21-23, 130 on January 24-26, 135 on January 27-28, 140 on January 29-30, and, 145 on January 31 through February 7. Flux values then peak at 180 on February 11-12, and dip down to 130 on February 20-22.



Predicted planetary A index is 15, 10, 8, and 12 on January 15-18, 8 on January 19-21, then 15, 5, 10 and 18 on January 22-25, and 15, 8, 5, 10, and 12 on January 26-30 and 15 on January 31 through February 1.

This weekly "Solar Update" in The ARRL Letter is a preview of the "Propagation Bulletin" issued each Friday. The latest bulletin and an archive of past propagation bulletins is on the ARRL website.

### ***The Sun, the Earth, the Ionosphere: What the Numbers Mean, and Propagation Predictions -- a brief introduction to propagation and the major factors affecting it.***

By Carl Luetzelschwab, K9LA  
Part One

The sun emits electromagnetic radiation and matter as a consequence of the nuclear fusion process. Electromagnetic radiation at wavelengths of 100 to 1000 Angstroms (ultraviolet) ionizes the F region, radiation at 10 to 100 Angstroms (soft X-rays) ionizes the E region, and radiation at 1 to 10 Angstroms (hard X-rays) ionizes the D region. Solar matter (which includes charged particles--electrons and protons) is ejected from the sun on a regular basis, and this comprises the solar wind. On a "quiet" solar day the speed of this solar wind heading toward Earth averages about 400 km per second.

The sun's solar wind significantly impacts Earth's magnetic field. Instead of being a simple bar magnet, Earth's magnetic field is compressed by the solar wind on the side facing the sun and is stretched out on the side away from the sun (the magnetotail, which extends tens of earth radii downwind). While the sun's electromagnetic radiation can impact the entire iono-



THANKS TO DEBRA FRANK KG7MAZ for bringing the sweets and treats for after the meeting.

sphere that is in daylight, charged particles ejected by the sun are guided into the ionosphere along magnetic field lines and thus can only impact high latitudes where the magnetic field lines go into the Earth.

Additionally, when electromagnetic radiation from the sun strips an electron off a neutral constituent in the atmosphere, the resulting electron can spiral along a magnetic field line (it spirals around the magnetic field line at the electron gyrofrequency). Thus Earth's magnetic field plays an important and critical role in propagation.

Variations in Earth's magnetic field are measured by magnetometers. There are two measurements readily available from magnetometer data--the daily A index and the three-hour K index. The A index is an average of the eight 3-hour K indices, and uses a linear scale and goes from 0 (quiet) to 400 (severe storm). The K index uses a quasi-logarithmic scale (which essentially is a compressed version of the A index) and goes from 0 to 9 (with 0 being quiet and 9 being severe storm). Generally an A index at or below 15 or a K index at or below 3 is best for propagation.

Sunspots are areas on the sun associated with ultraviolet radiation. Thus they are tied to ionization of the F region. The daily sunspot number, when plotted over a month time frame, is very spiky. Averaging the daily sunspot numbers over a month results in the monthly average sunspot number, but it is also rather spiky when plotted. Thus a more averaged, or smoothed, measurement is needed to measure solar cycles. This is the smoothed sunspot number (SSN). The SSN is calculated using six months of data before and six months of data after the desired month, plus the data for the desired month. Because of this amount of smoothing, the official SSN is one-half year behind the current month. Unfortunately this amount of smoothing may mask any short-term unusual solar activity that may enhance propagation.

Sunspots come and go in an approximate 11-year cycle. The rise to maximum (4 to 5 years) is usually faster than the descent to minimum (6 to 7 years). At and near the maximum of a solar cycle, the increased number of sunspots causes more ultraviolet radiation to impinge on the atmosphere. This results in significantly more F region ionization, allowing the ionosphere to refract higher frequencies (15, 12, 10, and even 6 meters) back to Earth for DX contacts. At and near the minimum between solar cycles, the number of sunspots is so low that higher frequencies go through the ionosphere into space. Commensurate with solar minimum, though, is less absorption and a more stable ionosphere, resulting in the best propagation on the lower frequencies (160 and 80 meters). Thus, in general, high SSNs are best for high-frequency propagation, and low SSNs are best for low-frequency propagation.

Most of the disturbances to propagation come from solar flares and coronal mass ejections (CMEs). The solar flares that affect propagation are called X-ray flares due to their wavelength being in the 1 to 8 Angstrom range. X-ray flares are classified as C (the smallest), M (medium size), and X (the biggest). Class C flares usually have minimal impact to propagation. Class M and X flares can have a progressively adverse impact to propagation.

The electromagnetic radiation from a class X flare in the 1 to 8 Angstrom range can cause the loss of all propagation on the sunlit side of Earth due to increased D region absorption. Additionally, big class X flares can emit very energetic protons that are guided into the polar cap by Earth's magnetic field. This can result in a polar cap absorption event (PCA), with high D-region absorption on paths passing through the polar areas of Earth.

A CME is an explosive ejection of a large amount of solar matter, and can cause the average solar wind speed to take a dramatic jump upward--kind of like a shock wave heading toward Earth. If the polarity of the sun's magnetic field is southward when the shock wave hits Earth's magnetic field, the shock wave couples into Earth's magnetic field and can cause large variations in Earth's magnetic field. This is seen as an increase in the A and K indices.

In addition to auroral activity, these variations to the magnetic field can cause those electrons spiraling around magnetic field lines to be lost into the magnetotail. With electrons gone, maximum usable frequencies (MUFs) decrease, and return only after the magnetic field returns to normal and the process of ionization replenishes lost electrons. Most of the time, elevated A and K indices reduce MUFs, but occasionally MUFs at low latitudes may increase (due to a complicated process) when the A and K indices are elevated.

End part one of two. Continued next month.

**March Meeting Topic:** Antenna construction. Dipole, verticals, "Beam", basic theory, Tuners.