RAINBOW CANYONS AMATEUR RADIO CLUB NEWSLETTER

CEDAR CITY, UTAH

Club Websites: www.rcarc.info OR www. rainbowcanyons.com Number 1 – Vol. 9 – October, 2019

Club Meeting Information

The RCARC meets at 7:00 p.m. on the 2nd Tuesday of each month at the Cedar City Senior Center, 489 E. 200 South.

2019 Club Officer's

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CQ, CQ, Happy Halloween

President's Message

Greetings
Fellow HAMs!

Fall is upon us! The breakfast and swap meet were great! It was great meeting with everyone and spending a delightful morning in the park. It is good to see so many people interested in radio and hopefully we got some people setup with the equipment that they needed. I hope everyone has been getting out on the radio and keeping busy as the weather cools. Had a great time talking about Raspberry Pi and related computers. These little computers have lots of uses and are a lot of fun!

Thank you to everyone who helped out with the half marathon. I think everything went really well and it is good that we can help out in these activities. We made a real difference this year and made a very good impression. Activities like this keep us sharp and working with our equipment under less than ideal conditions.

Continued on Page 2

RCARC Club Nets:
7:00 a.m. Breakfast Net - Monday – Saturday – 146.760.
12:30 p.m. Daily – Utah Beehive Net 0n 7.272.
7:30 p.m. Tuesday's - ORCA Digital Net. Using FLDIGI, FLMSG AND FLAMP – 3.581 +, 1500/MFSK32.
8:00 p.m. Wednesday – Panguitch Net – 147.160.
8: p.m. Saturdays – SSTV – 449.925.
9:00 p.m. Daily – Friendship Net – 146.760.

11: a.m. Saturdays (Mtn. Time) QCWA – 160 Net, Utah Chapter, 12: p.m. Freq. 7.272.
7:00 p.m. Every Thursday – RCARC CW Net on 146.980.

Local Repeaters:
146.980 MHz – Tone 100.0 hz
146.940 MHz – Tone 100.0 hz
146.760 MHz – Tone 123.0 hz
147.160 MHz + Tone 100.0 hz.
448.800 MHz – Tone 100.0 hz

Remote Bases:
449.500 MHz – Tone 100.0 hz
449.925 MHz – Tone 100.0 hz

ILRP/Echolink
449.900 MHz – Tone 100.0 hz

Save The Date

October, 2019

RCARC October's Meeting Presentation will be by Don Blanchard

November 2019

RCARC 2020 Board Member Nominations.

Gavin Hollinger KC7IHE will present Computer Security and Passwords.

December 2019

New Officer Elections

Club Christmas Party

Just a heads up the prize drawing is looking better every day. So far there is a Comet CCA-Mark II Antenna analyzer (HF, UHF & VHF). A Yeasu FT70DR Duel Band Digital/Analog Hand Held Radio. Several Dual Band J-poles made by Arrow Antenna. And many other items. Good luck to all.

Presidents Message Continued from page 1.

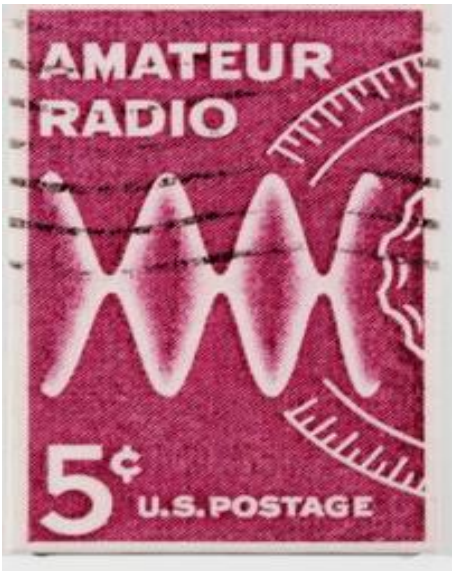
Remember if you need help with setting up your radio, software or other equipment please ask your fellow HAMs for help. Part of the fun is helping others! Remember you can always pick up the mic and see who is listening! As always, I would like to thank everyone who makes our meetings great by asking questions, providing food and drinks, and by agreeing to lead a presentation or discussion. I would also like to thank all of our net controls for the nets and everyone who participates!

Cheers!

Fred (KI7TPD)

RCARC Club Breakfast

Come join us the first Saturday of every month at 9:00 a.m. for breakfast at the Pastry Pub located at 86 W. Center Street, Cedar City. Check out their website at: www.cedarcitypastrypub.com



RCARC Supports the Cedar City Half Marathon with Race Communication.

On September 7, 2019 Rainbow Canyons Amateur Radio Club (RCARC) supported the Cedar City Half Marathon with race communications. Aid Stations for the runners were set up along the race course and at each of these stations the club members were assigned to provided reports back to Race Command on the status of the leading runners. In addition, our Ham Operators provided logistical communication support for moving aid station supplies between the different stations.

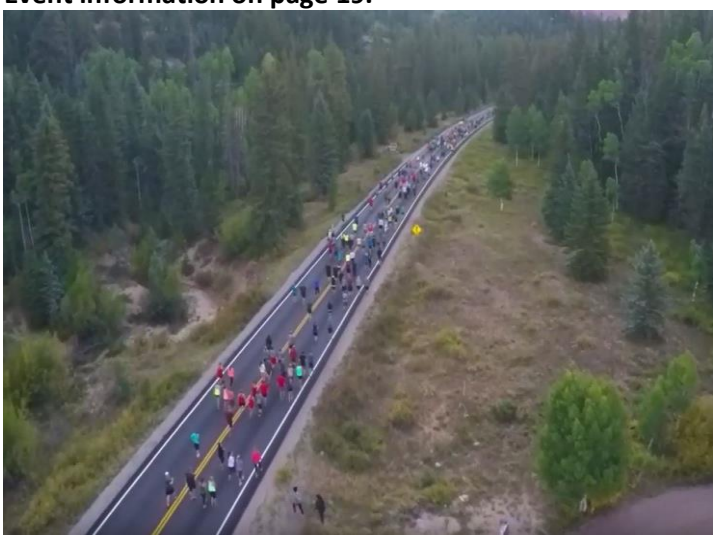
The Cedar City Half Marathon is a perfect high-altitude trainer for those preparing for full marathons, including the Saint George Marathon which is held only a few weeks later.

Continued next column

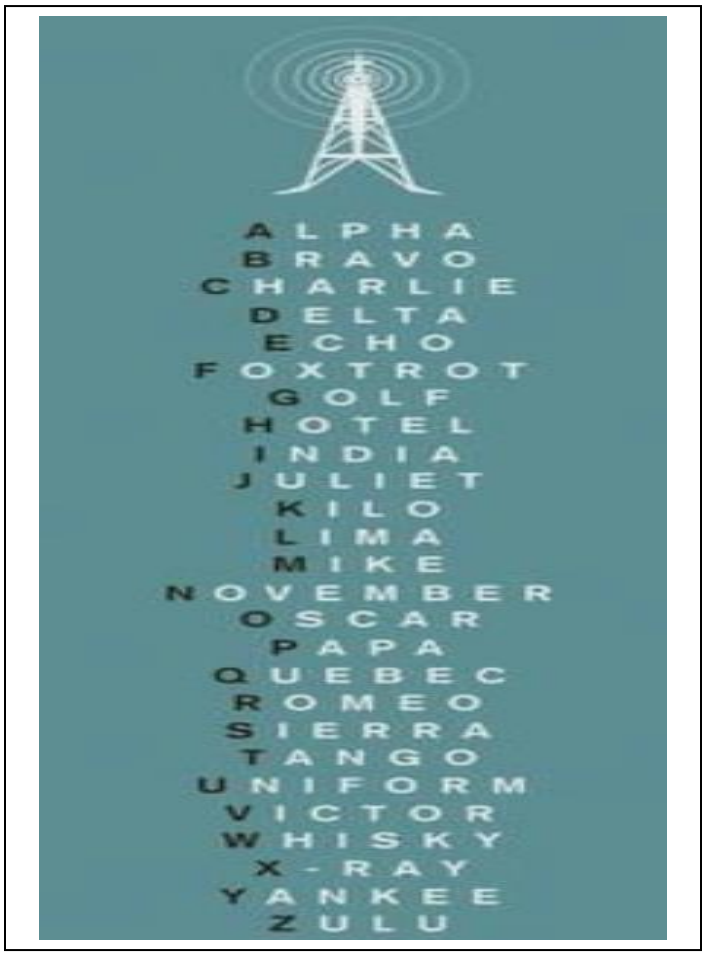
This 13.1-mile closed-canyon course is one of the nation's fastest. Runners descend from 8,408 feet in elevation to 5,600 feet at the finish line.

A great big thanks to all who participated.

See photo below and more on page 6.
Event information on page 19.



Vintage Pic's of the Past



Winter Driving Tips

Cold Weather Driving Tips

1. Keep a bundle of cold-weather gear in your car, such as extra food and water, warm clothing, a flashlight, a glass scraper, blankets, medications, and more.

2. Make certain your tires are properly inflated and have plenty of tread.
3. Keep at least half a tank of fuel in your vehicle at all times.
4. Never warm up a vehicle in an enclosed area, such as a garage.
5. Do not use cruise control when driving on any slippery surface, such as on ice and snow.

Tips for Driving in the Snow

Stay home. Only go out if necessary. Even if you can drive well in bad weather, it's better to avoid taking unnecessary risks by venturing out.
Drive slowly. Always adjust your speed down to account for lower traction when driving on snow or ice.
Accelerate and decelerate slowly. Apply the gas slowly to regain traction and avoid skids. Don't try to get moving in a hurry and take time to slow down for a stoplight. Remember: It takes longer to slow down on icy roads.
Increase your following distance to five to six seconds. This increased margin of safety will provide the longer distance needed if you have to stop.
Know your brakes. Whether you have antilock brakes or not, keep the heel of your foot on the floor and use the ball of your foot to apply firm, steady pressure on the brake pedal.

Continued next column

Don't stop if you can avoid it. There's a big difference in the amount of inertia it takes to start moving from a full stop versus how much it takes to get moving while still rolling. If you can slow down enough to keep rolling until a traffic light changes, do it.
Don't power up hills. Applying extra gas on snow-covered roads will just make your wheels spin. Try to get a little inertia going before you reach the hill and let that inertia carry you to the top. As you reach the crest of the hill, reduce your speed and proceed downhill slowly.
Don't stop going up a hill. There's nothing worse than trying to get moving up a hill on an icy road. Get some inertia going on a flat roadway before you take on the hill.

Tips for Long-Distance Winter Trips

Be Prepared: Have your vehicle checked by a AAA Approved Auto Repair facility before hitting the road.
Check the Weather: Check the weather along your route and when possible, delay your trip if bad weather is expected.
Stay Connected: Before hitting the road, notify others and let them know your route, destination and estimated time of arrival.
If you get stuck in the snow:
Stay with your vehicle: Your vehicle provides temporary shelter and makes it easier for rescuers to locate you. Do not try to walk in a severe storm. It is easy to lose sight of your vehicle in blowing snow and become lost.
Don't over exert yourself: When digging out your vehicle, listen to your body and stop if you become tired.
Be Visible: Tie a brightly colored cloth to the antenna of your vehicle or place a cloth at the top of a rolled-up window to signal distress. At night, keep the dome light on if possible. It only uses a small amount of electricity and will make it easier for rescuers to find you.

Continued on page 7

Concerns Aired that 5G Spectrum Expansion Could Affect Weather Data Collection

An April report in *Nature* magazine says the National Oceanic and Atmospheric Administration (NOAA) and NASA are asking the FCC to work with them to protect frequencies used for Earth observation from interference as 5G rolls out. The FCC in April auctioned the first block of 5G spectrum with minimal protection to other users. The sale reaped nearly $2 billion. Some of the 5G-bound frequencies are close to those used by satellites for Earth observations, and meteorologists have expressed fears that 5G transmissions could interfere with their data collection.

The worry is that NOAA won't be able to detect concentrations of water vapor in the atmosphere accurately. Meteorologists rely on those data to feed into their models, and without it, weather forecasts worldwide could suffer.

"Because the United States is such a large communications market, the decisions the government makes about how to deploy 5G are likely to influence global discussions on how to regulate the technology,"
the *Nature* article said. The article noted that telecommunications regulators will gather in Egypt in October and November for World Radiocommunication “Astronomers, meteorologists and other scientists have long worked to share the spectrum with other users, sometimes shifting to different frequencies to prevent conflicts," the article points out.

"But 'this is the first time we've seen a threat to what I'd call the crown jewels of our frequencies -- the ones that we absolutely must defend come what may,'" said Stephen English, a meteorologist at the European Centre for Medium-Range Weather Forecasts in the UK.

Continued next column

The recent FCC auction focused on two bands of spectrum -- between 24.25 and 24.45 GHz and between 24.75 and 25.25 GHz. Wireless equipment transmitting near the lower end of that range could interfere with the 23.8 GHz water-vapor measurement. *Nature* said the FCC did not respond to its request for comment on the matter.

The FCC auction set a noise limit on the US 5G network of -20 dBW, much noisier than thresholds under consideration most other systems around the world. The European Commission has settled on -42 dBW for 5G base stations; the World Meteorological Organization (WMO) is recommending -55 dBW.

"NOAA and NASA have reportedly finished a study on the effects of differing levels of noise interference, but it has not been made public, despite at least one formal request from Congress," *Nature* reported. The Department of Commerce, which oversees NOAA, "strongly supports the administration's policy to promote US leadership in secure 5G networks, while at the same time sustaining and improving critical government and scientific missions."

Congratulations to Don Breinholt (KJ7JAQ) who just became a new Ham. Welcome aboard Don.

Breakfast & Friendship Net Awards

Breakfast Net	Friendship Net
First Place	**First Place**
Sylvia - KB7UMU	Fred - KI7TPD
Fred - KI7TPD	Bonnie - KI7WEX
Bonnie - KI7WEX	Dennis - W6DLW
Johnny - KE6ZIM	Bruce - KI7LUM
Jerel - KI7SDA	**Second Place**
Second Place	Lee - K7NKH
Daniel - KI7JUA	Sylvia - KB7UMU
Linda – KG7PBX	**Third Place**
Third Place	Lance - KA7J
Vernile – K7DVP	

October Safety Tip

"Heating Your Home Safely"

Did you know? Home fires occur more in the winter months than any other time of the year. Follow these heating tips to help prevent winter fires and to stay safe this winter season:

1. Keep anything that can burn at least 3 feet from all heat sources including fireplaces, wood stoves, radiators, space heaters or candles.

2. Never use an oven to heat your home.

3. Turn space heaters off when leaving the room or going to bed.

4. Maintain heating equipment and chimneys by having them cleaned and inspected each year by a professional.

Be safe and think safety all year.

Half Marathon Pictures continued from page 2

Continued from Page 4

Tips for Long-Distance Winter Trips

Clear the Exhaust Pipe: Make sure the exhaust pipe is not clogged with snow, ice or mud. A blocked exhaust pipe can cause deadly carbon monoxide gas to leak into the passenger compartment of the vehicle while the engine is running.
Stay Warm: Use whatever is available to insulate your body from the cold. This could include floor mats, newspapers or paper maps. Pre-pack blankets and heavy clothing to use in case of an emergency.
Conserve Fuel: If possible, only run the engine and heater long enough to remove the chill. This will help to conserve fuel.

Ham Hints and Tips

1. To keep RFI out of your shack (does nothing for your neighbors) at termination point of antenna use 6-8 wraps of 6" coil dia coax. Don't let 1st wrap touch last wrap is all you need to look out for.

2. Do not set external tuner directly on top of rig. The older manual tuners would distort the audio on some bands. I keep my Z-100 auto tuners about 1 inch above my rig (use anything non-conductive for the spacer). This may not be a problem with the newer tuners but I keep the separation anyway.

3. I like to keep a small fan blowing on the back of the rig or power supply to help things out. If you rig or ps fans keep coming on this will do the trick.

4. I keep my laptop at least 2-3 feet away from my rig and have never had RFI problems. It helps to ground the rig too.

5. I always keep my signal and audio cables as far away from the power cords as possible. If you have them all bunched together, you will have problems one day. Have A Nice Day! John F. Reisenauer, Jr. KL7JR

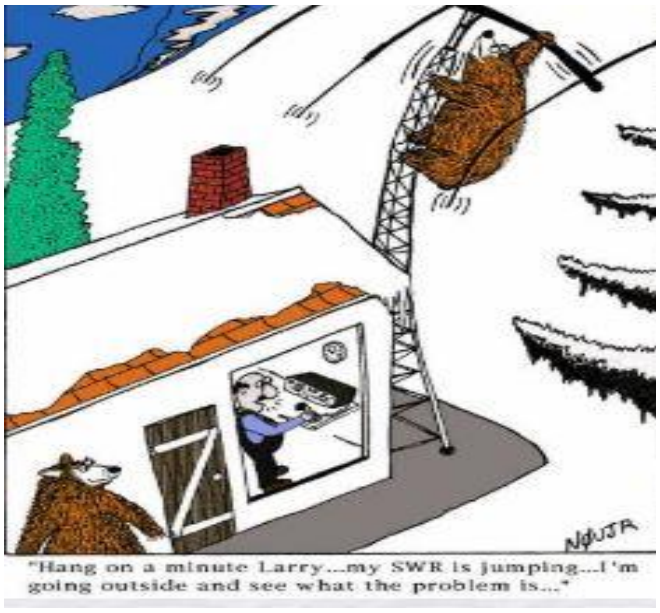
Trade or Sell your HAM Gear

Hello everyone Buzz here. **Just a reminder** that you are now able to list and sell your Ham Equipment in the RCARC newsletter.

So how does it work? On or before the 20th of each month send to me Buzz an e-mail at rcarcnewsletter@gmail.com Your name, call sign, a description of what you are selling, the cost, condition and either a phone number or e-mail address. This information will be placed in the newsletter.

For our members wishing to purchase or get further information please contact the listed seller direct. The listing will stay posted for two months and then be deleted. However, if you sell your item before the two-month period end, please e-mail me and let me know that you've sold the item. **See sample form on page 14.**

Have fun and happy sales to you.



QST Congratulates its Key Competition Winners

Ingenuity and craftsman abound within the Amateur Radio community, as shown in the results of the 2019 *QST* Key Competition. Hams have been building their own Morse keys since the dawn of Amateur Radio, and some creations have become legend. The competition sought Morse key and paddle designs in four categories: Straight key, semiautomatic key (bug), paddle, and sideswiper.

Each was a mechanical work of art, but there could only be four winners, who were chosen based on ingenuity of design, ergonomics of operation, and overall craftsmanship.

The winning straight key by Ron Spooner, W6FIF, was inspired by "steampunk" aesthetics

Participants had to submit their individual keys, which were returned following judging, as well as detailed construction drawings with dimensions, lists of materials, photos, and written descriptions.

More than two dozen entries were submitted, and the judges gathered in late July to evaluate them.

The winner in each category will receive $250.

Juergen Malner, NV1Q, won his category with these skillfully machined paddles.

Gary Johnson, NA6O, topped the field with his semi-automatic key (bug) design.

Stan Levandowski, WB2LQF, won in the sideswiper category.

2019 CW USA Assisted Zone 3 CQWW 160 Meter Contest

Congratulations! to our very own Riki Kline (K7NJ) for his winning a Trophy during the 2019 CW USA Assisted Zone 3 CQWW 160 Meter Contest. The complete article and results can be found on page 15 of the August 2019 issue of CQ magazine. Great Job Riki!

Motorhome Installation of a Screwdriver Antenna

By, Ted Trostle, WB2LOU

I have found out over the past year and a half that a motorhome installation of HF antennas is probably the toughest to achieve.

Using a Tarheel Screwdriver antenna, I have tried many different locations on the rear and at the top of the ladder. Even with the best ground, either the ladder or the motorhome itself acted as part of the antenna and caused RF coupling and feedback into the transceiver. The efficiency was so poor, contacts were limited and only a few DX stations were contacted.

Since I do not operate while traveling in the motorhome, I decided that locating the antenna away from the rear of the motorhome was the answer. So, I now if we are located at a campground for a while, I will install the antenna as a ground plane with 8 radials about 8 to 30 ft long. I use a good ferrite choke on the control cable at the base of the antenna which stops motor noise and RF coupling onto the cable.

The antenna tunes perfectly and gives me 1.2 to 1.5 SWR across the bands. When band conditions are good, I can work just about any station I hear.

As for operational efficiency, I can only state that because I have made contacts with Europe, mid-Russia, Africa, many South American stations and much of the US with 57 to 59 reports from here in Lake Wales, Florida, the antenna set up must be OK.

I am using only an early model ICOM-706 running on battery power with ferrite chokes on the power leads to quiet electrical noise from the RV appliances, etc.

Overall, I am quite pleased with the installation, particularly since I struggled so hard with other configurations that did not work well at all.

RCARC September General Membership Meeting Pictures

Left Fred Govedich KI7TPD discuss meeting business with attendees at the September General Membership Meeting.

Right Fred Govedich KI7TPD discusses Raspberry Pi with the group and the many ways that Raspberry Pi can be used with amateur radio.

See more pictures on Page 11

RCARC General Membership Meeting Pictures

Continued from Page 10

Left Ron Shelley K7HDX talks to the group about using Raspberry Pi with digital applications.

Right George Gallis AL7BX talks about how he uses Raspberry Pi applications plus much, much more.

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RCARC General Membership Meeting Pictures

Continued from Page 11

This picture shows a number of types of Raspberry Pi units and applications of how it can be used.

For additional or more detailed information about Raspberry Pi's contact Fred, Ron or George.

RCARC Swap Meet and Pancake Breakfast Pictures

Continued on page 13

RCARC Swap Meet and Pancake Breakfast Pictures

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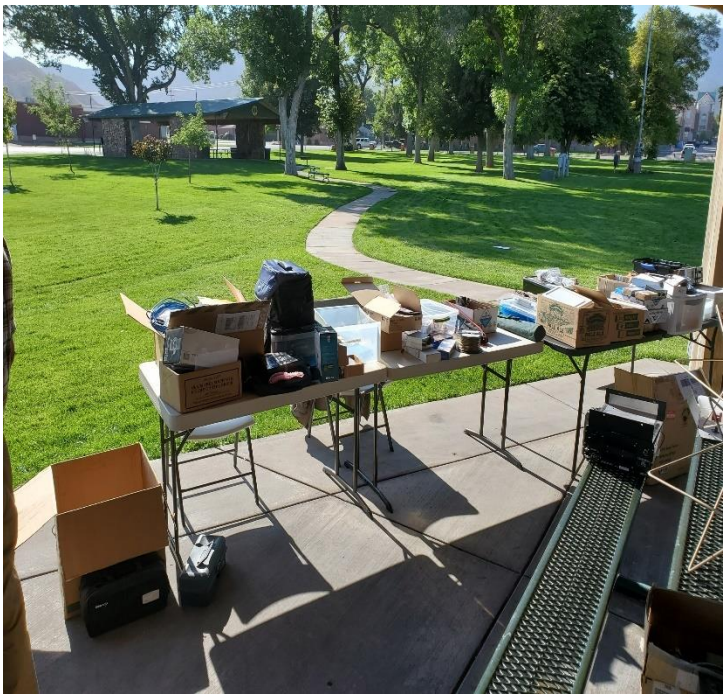

RCARC Swap Meet and Pancake Breakfast Pictures

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RCARC Members Ham Gear for Sale Information

Name	Call Sign	Description of item for sale or trade.	Cost Dollars	Condition	Your contact Information. E-mail or Phone #
Jim Beam	W6JBW	Yeasu FT7900 Mobile Radio	$ 150.00	Very good condition	w6jbw @....
		This is a Sample Example of what an entry would look like.			

See how to sell or trade your ham gear on page 7.

Incident Command System (ICS) 100 & 200 Classes Coming in November.

Class dates are: Wednesday November 6 and 20th at 6:00 pm. Classes will be held at the Head Quarters Fire Station at 291 N. 800 W., Cedar City. If you are interested please contact George Colson at gcolson@ironcounty.net as soon as possible as books have to be ordered for attendees.

Course Overview ICS-200 **enables responders to operate efficiently and effectively during an incident or event within the Incident Command System (**ICS**). Focusing on the management of single resources,** ICS-200 **builds upon knowledge gained from** ICS-100 **to assist responders who are likely to assume a supervisory position within the Incident Command … There is no charge to take these classes.**

ARLB019 FCC Seeks to Streamline its Hearings Process

ZCZC AG19
QST de W1AW
ARRL Bulletin 19 ARLB019
From ARRL Headquarters
Newington CT September 13, 2019
To all radio amateurs

SB QST ARL ARLB019
ARLB019 FCC Seeks to Streamline its Hearings Process

The FCC is asking for public comments on procedural changes that, if adopted, would streamline many administrative hearings under the Communications Act of 1934, as amended.

"Currently, these hearings typically are conducted like trials in civil litigation and include, among other things, live testimony before an administrative law judge, cross-examination of witnesses, and an initial decision by the administrative law judge that is subject to review by the Commission," the FCC said in a Notice of Proposed Rulemaking (NPRM) in EB Docket 19-214.

The FCC said its proposals "are designed to supplement the Commission's current administrative law judge referral process and promote more efficient resolution of hearings."

The NPRM can be found in PDF format at, https://docs.fcc.gov/public/attachments/FCC-19-86A1.pdf

If adopted, the proposals would:

* Codify and expand the use of a process that would rely on written testimony and documentary evidence in lieu of live testimony and cross-examination.

* Enable Commission staff to act as a case manager that would supervise development of the written hearing record when the Commission designates itself as the presiding officer at a hearing.

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ARLB019 FCC Seeks to Streamline its Hearings Process

* Dispense with the preparation of an intermediate opinion, whenever the record of a proceeding can be certified to the Commission for final decision.

According to the FCC, the proposed procedures would expedite its hearing processes, consistent with the requirements of the Communications Act and the Administrative Procedure Act (APA) while ensuring transparency and procedural fairness.

The FCC's current hearing rules provide that "any hearing upon an application shall be a full hearing in which the applicant and all other parties in interest shall be permitted to participate." The FCC noted that it has, on numerous occasions, curtailed the use of oral testimony and cross-examination in particular proceedings, in order to expedite the hearing process.

"In our experience, disputes in Commission proceedings typically involve criticisms by one party of the evidence proffered by another party or the legal significance of that evidence, not actual conflicts in testimony between two witnesses concerning outcome-determinative facts," the FCC said.

"We contemplate codifying and expanding the use of a written hearing process that can be used in most adjudicative proceedings, including those conducted by an administrative law judge. In particular, we propose to authorize the presiding officer to conduct a written hearing whenever factual disputes can be adequately resolved on a written record."

Among other proposed changes, the FCC would prohibit staff members who have taken an active part in investigating, prosecuting, or advocating in a case from serving as a case manager and from advising or assisting the case manager in the same case.

The National Institute of Standards and Technology Radio Station WWV

The National Institute of Standards and Technology Radio Station WWV will celebrate the 100-year anniversary of its call letters on October 1, 2019. WWV is not only one of the world's oldest continuously operating radio stations, but also one of the oldest scientific and technical services provided by the United States government.

History of Radio Station WWV

WWV has a long and storied history that dates back to the very beginning of radio broadcasting. The call letters WWV were assigned to NIST (then called the National Bureau of Standards) in October 1919. Although the call letters WWV are now synonymous with the broadcasting of time signals, it is unknown why those particular call letters were chosen or assigned. Testing of the station began from Washington, D.C. in May 1920, with the broadcast of Friday evening music concerts that lasted from 8:30 to 11 p.m. The 50 W transmissions used a wavelength of 500 m (about 600 kHz, or near the low end of today's commercial AM broadcast band), and could be heard out to about 40 kilometers. A news release dated May 28, 1920 hinted at the significance of this event:
This means that music can be performed at any place, radiated into the air by means of an ordinary radio set, and received at any other place even though hundreds of miles away.

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The music received can be made as loud as desired by suitable operation of the receiving apparatus. Such concerts are sometimes sent out by the radio laboratory of the Bureau of Standards in connection with trials of experimental apparatus. This music can be heard by anyone in the states near the District of Columbia having a simple amateur receiving outfit. The pleasant evenings which have been experienced by persons at a number of such receiving stations suggest interesting possibilities of the future.

Interesting possibilities, indeed! Keep in mind that KDKA of Pittsburgh, generally acknowledged as the first commercial broadcast station, did not go on the air until November 2, 1920.

On December 15, 1920 the station began assisting the Department of Agriculture in the distribution of market news to farm bureaus and agricultural organizations. A 2-kW spark transmitter was used to broadcast 500-word reports, called the Daily Market gram, on 750 kHz. The operating radius was about 300 kilometers out of Washington. These broadcasts continued until April 15, 1921.

By December 1922, it was decided that the station's purpose would be the transmission of standard frequency signals. The first tests were conducted on January 29th and 30th of 1923, and included the broadcast of frequencies from 200 to 545 kHz. By May of 1923, WWV was broadcasting frequencies from 75 to 2000 kHz on a weekly schedule. The accuracy of the transmitted frequency was quoted as being "better than three-tenths of one per cent." The output power of the station was 1 kW.

There were numerous changes in both the broadcast schedule, format, and frequency of WWV throughout the 1920's. In January 1931, the station was moved from Washington to the nearby city of College Park, Maryland. A 150 W transmitter operating at 5 MHz was initially used, but the power was increased back to 1 kW by the following year. A new device, the quartz oscillator, made it possible to dramatically improve the output frequency of WWV. Quartz oscillators were first used at WWV in 1927, and by 1932 allowed the transmitted frequency to be controlled to less than 2 parts in 10^7.

The station moved again in December 1932, this time to a 10-hectare (25 acre) Department of Agriculture site near Beltsville, Maryland. By April of 1933, the station was broadcasting 30 kW on 5 MHz, and 10 and 15 MHz broadcasts (20 kW output power) were added in 1935. The 5 MHz frequency was chosen for several reasons, including "its wide coverage, its relative freedom from previously assigned stations, and its convenient integral relation with most frequency standards." The 10 and 15 MHz frequencies were chosen as harmonics, or multiples of 5 MHz. WWV continues to use all of these frequencies today, as well as another harmonic (20 MHz), and a sub-harmonic (2.5 MHz).

The Beltsville area was the home of WWV until December 1966 (although the location name for the broadcast was changed to Greenbelt, Maryland in 1961). During the years in Beltsville, many interesting developments took place. A fire destroyed the station in November 1940, but the standard frequency equipment was salvaged and the station returned to the air just 5 days later using an adjacent building.

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History of Radio Station WWV

Continued from page 17

An act of Congress in July 1941 provided $230,000 for the construction of a new station, which was built 5 kilometers south of the former site and went on the air in January 1943. The 2.5 MHz broadcasts began in February 1944, and are still used as a convenient way to reach the population nearest the radio station. Transmission on 20, 25, 30, and 35 MHz began in December 1946. The 30 and 35 MHz broadcasts were discontinued in January 1953 and the 25 MHz broadcast was stopped in 1977. With the exception of an almost 2-year interruption (1977-78), the 20 MHz broadcasts have continued to this day.

Much of the current broadcast format also took shape during the Beltsville years. The 440 Hz tone (A above middle C) was added to the broadcast in August 1936, at the request of several music organizations. The second pulses were added in June 1937, and the geophysical alert messages began in July 1957. And as quartz oscillator technology improved, so did the frequency control of the broadcast. The transmitted frequency was routinely kept within 2 parts in 10^{10} of the national standards by 1958.

WWV's most well-known feature, the announcement of time, also began during the Beltsville years. A standard time announcement in telegraphic code was added in October 1945, and voice announcements of time began on January 1, 1950. The original voice announcements were at 5-minute intervals. It is interesting to note that WWV continued to broadcast local time at the transmitter site until 1967.

In 1966, the decision was made to move WWV to its current location, near Fort Collins, Colorado. The LF station WWVB went on the air in July 1963 near Fort Collins, and it was decided that WWV would share the same 158-hectare (390 acre) site. The new site was about 80 kilometers from the Boulder laboratories where the national standards of time and frequency were kept. The proximity to Boulder and the use of atomic oscillators at the transmitter site would make it possible to control the transmitted frequency to within 2 parts in 10^{11}, a factor of ten improvement. Today, the station's frequency is controlled to within 1 part in 10^{13}.

At 0000 UTC on December 1, 1966 the Greenbelt, Maryland broadcast was turned off and the new transmitter at Fort Collins was turned on. In April 1967 the station began broadcasting Greenwich Mean Time (GMT) instead of local time, and began its current format of using Coordinated Universal Time (UTC) in December 1968. The time announcements were made every minute, instead of every 5 minutes, beginning in July 1971.

Many new features and programming changes have been added to the WWV broadcast over the past few decades.

More information available at the following URL

https://www.nist.gov/pml/time-and-frequency-division/radio-stations/wwv/wwv-and-wwvh-digital-time-code-and-broadcast

A few Cedar City Half Marathon Points of Interest

Continued from page 2

- Runners were up from 706 last year to 820 this year.
- 66% of runners were female
- 262 Runners were from Cedar City/Enoch
- 47% of runners came from 100 miles away.
- 599 runners from Utah.
- 131 runners from Nevada
- 26 runners were from California
- 23 runners from Arizona
- 2 runners from France
- 1 runner from England

This event brought in more revenue than any past event.

Welcome to FALL everyone