RAINBOW CANYONS AMATEUR RADIO CLUB NEWSLETTER

CEDAR CITY, UTAH

Club Websites: www.rcarc.info OR www. rainbowcanyons.com Number 2 – Vol. 12 – December 2020

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. On Hold UFN. COVID-19

2020 Club Officer's

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1-435-559-2682
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CQ, CQ, Merry Christmas

Presidents Message

Greetings fellow HAMs!

Hope you had a good month and a great Thanksgiving! It sure feels like Winter outside! Even with the cold we still have many opportunities to get on the air! See the ARRL special events page at: http://www.arrl.org/special_events/search/page:2/model:Event for more information of events that are happening this month. Make this a great month for having fun on the radio.

Winter Field Day is just around the corner and will be held on January 30-31, 2021. We will be using the N7U callsign and we will be setting up at the Iron County EOC located on Kittyhawk this year. We also have our yearly giveaway coming up at our December meeting. For those who are interested in participating please let me know! Be prepared for cold weather!

Our next meeting will be on the air on December 8th and we will be giving away three duel band mobile rigs, three LiFePO4 batteries (12 volt), a J-pole antenna and a Skywarn book! Should be fun! We will also have our officer elections and will hear from Ken (N7KM) who will present on antennas.

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 On 7.272.
7:00 p.m. Tuesday's Southwestern Utah Digital Net. Using FLDIGI, FLMSG AND FLAMP – 146.680, 1500/MT63-2KL
8:30 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. Thursdays – 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
146.680 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

December 8, 2020

RCARC Club Meeting.

Christmas Radio meeting

2021 Board Nominees to be voted for and seated.

Be sure to attend to possibly win a Christmas Prize.

Zoom Presentation: Ken Munford (N7KM) will present a talk on antennas.

January 12, 2021

RCARC Club Meeting.

Radio meeting

Meetings start at 7 pm. on the Iron Mountain Repeater - 146.760, minus offset with a PL of 123.0

Also available through Echolink – KG7PBX.

President's Message

Continued.

We had a great Elmer session for our November meeting. Thank you everyone who participated.

As always, I would like to thank everyone who makes our meetings great by participating and asking questions. I would also like to thank all of our net controls for the nets and everyone who participates!

I hope everyone has an opportunity to get out and play on the radio! We have our local nets as well as opportunities to participate on HF contests so get out there, have fun, and play on your radio.

Stay safe and healthy!

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

A Riddle

(Answer on page 9)

You have me today, tomorrow you'll have more. As your time passes. I am not easy to store; I don't take up space, but I am only in one place; I am what you saw, but not what you see.

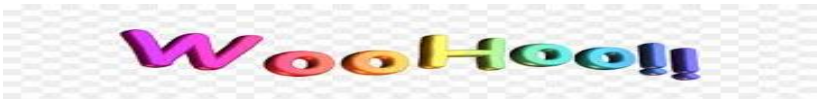
What am I?

Please try to figure it out before you look at the answer.

Happy Birthday and Anniversary to those celebrating in December

Rainbow Canyons Amateur Radio Club Board Nominees for 2021

President	Vice President	Secretary	Treasurer	Newsletter Editor
Fred Govedich KI7TPd	Ron Shelley K7HDX	Bonnie Bain KI7WEX	Linda Shokrian KG7PBX	Dennis L. West W6DLW



Breakfast & Friendship Net Awards

Breakfast Net		Friendship Net	
First Place	**Second Place**	**First Place**	**Second Place**
KI7WEX - Bonnie	KB7UMU - Sylvia	KI7WEX - Bonnie	K7ZI - Dick
KI7TPD - Fred	KF7WIY - Denise	KI7TPD - Fred	KJ7ZLTQ - Brant
KG7PBX - Linda	K7ZI - Dick	KA7J - Lance	**Third Place**
N7SND - Larry	**Third Place**	KJ7OZI - Paul	KB7UMU - Sylvia
KI7SDA - Jerel	K7DVP - Vernile	KI7SXJ - Isaiah	K7NKH - Lee
KK7ZL - Ed		KG7VEJ - Jack	
		N7TCE - Merlin	
		KI7LUM - Bruce	
		N7WWB - Darlene	
		K7HDX - Ron	
		W6DLW - Dennis	

Radio Equipment for Sale

Make	Band	Model	Comments	Price $$
Alnico	**220 MHz.**	**DR 235 MKIII**	**VHF FM Transceiver. Includes, Radio, Power Cable, Mounting Bracket and Microphone**	**$ 140.00**
Radio Shack	**10 Meters**	**HTX 10**	**10 Meter Transceiver. Includes, Radio, Power Cable, Mounting Bracket and Microphone.**	**$ 85.00**
Cobra	**Citizen Band**	**Sound Tracker 25 WX/STRX/TX**	**40 channel CB radio, with built in Weather Channels and built-in Public-Address System. Includes, Radio, Power Cord, Mounting Bracket and Microphone.**	**$ 30.00**
Kenwood	**2-Meter**	**TM241A**	**2 -Meter FM Transceiver. Needs Microphone.**	**$ 30.00**

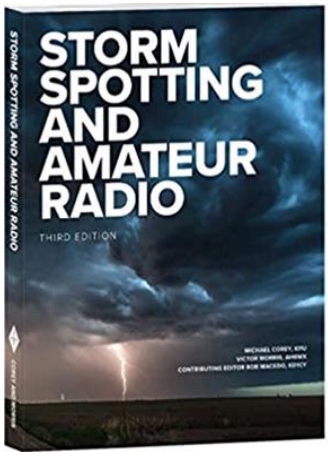
All radios are in very good condition. If you are interested in any of the items above please e-mail Dennis West (W6DLW) at W6DLW@Outlook.com. Items will be sold on a first come first serve basis.

In This Issue

RCARC December Meeting Book Giveaway

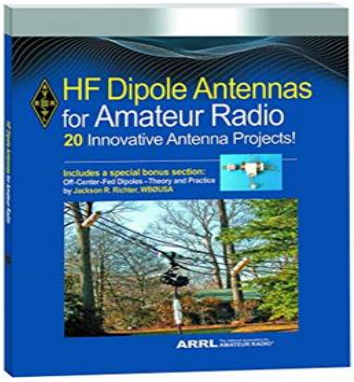
The book shown below will be awarded to one of our RCARC members at our club meeting on December 8, 2020.

This book is being donated by Linda Shokrian (KG7PBX).



RCARC Book Giveaway Winner.

The winner of the November 10, 2020 book giveaway, ARRL's HF Dipole Antennas for Amateur Radio is: Jerel (KI7SDA)



Congratulations Jerel

Contact Us.

Mailing Address:
195 E. Fiddler's Canyon Road #3.
Cedar City, Utah 84721

Club E-mail:
cedarcity.rcarc@gmail.com

Newsletter E-mail:
rcarcnewsletter@gmail.com

Website
www.rcarc.info
www.rainbowcanyons.com

Face Book Page:
https://www.facebook.com/groups/440325486875752/

Contact us through any of the forums above.

Phone numbers for Club Officers are on page 1

Thank you

Notice

Zoom Antenna Presentation

Mark your calendar

On December 8th after the RCARC monthly radio meeting club member Ken Munford (N7KM) will do a presentation on Antennas.

Ken is a founding member of the club.

Please join us.

Radio meeting starts at 7:00 pm. on the Iron Mountain 76 Repeater. 146.760, minus, PL Tone 123.0. Zoom after.

Buzz's December Safety Tips

Snowstorms & Extreme Cold

Winter storms create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storms including blizzards can bring extreme cold, freezing rain, snow, ice and high winds.

A winter storm can:

- Last a few hours or several days.
- Cut off heat, power and communication services.
- Put older adults, children and sick individuals at greater risk.

IF YOU ARE UNDER A WINTER STORM WARNING, FIND SHELTER RIGHT AWAY

- Stay off roads.
- Stay indoors and dress warmly.
- Prepare for power outages.
- Use generators outside only and away from windows.
- Listen for emergency information and alerts.
- Look for signs of hypothermia and frostbite.
- Check on neighbors.

HOW TO STAY SAFE WHEN A WINTER STORM THREATENS:

Prepare NOW

- Know your area's risk for winter storms. Extreme winter weather can leave communities without utilities or other services for long periods of time.
- Prepare your home to keep out the cold with insulation, caulking and weather stripping. Learn how to keep pipes from freezing. Install and test smoke alarms and carbon monoxide detectors with battery backups.
- Know your winter weather terms.
- Pay attention to weather reports and warnings of freezing weather and winter storms.
- Sign up for your community's warning system. The Emergency Alert System (EAS) and National Oceanic and Atmospheric Administration (NOAA) Weather Radio also provide emergency alerts.
- Gather supplies in case you need to stay home for several days without power. Keep in mind each person's specific needs, including medication. Remember the needs of your pets. Have extra batteries for radios and flashlights.

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Snowstorms & Extreme Cold Continued

- Create an emergency supply kit for your car. Include jumper cables, sand, a flashlight, warm clothes, blankets, bottled water and non-perishable snacks. Keep a full tank of gas.
- Learn the signs of, and basic treatments for, frostbite and hypothermia.

- Frostbite causes loss of feeling and color around the face, fingers and toes.
  - Signs: Numbness, white or grayish-yellow skin, firm or waxy skin.
  - Actions: Go to a warm room. Soak in warm water. Use body heat to warm. Do not massage or use a heating pad.
- Hypothermia is an unusually low body temperature. A temperature below 95 degrees is an emergency.
  - Signs: Shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech or drowsiness.
  - Actions: Go to a warm room. Warm the center of the body first—chest, neck, head and groin. Keep dry and wrapped up in warm blankets, including the head and neck.

Survive DURING

- Stay off roads if at all possible. If trapped in your car, then stay inside.
- Limit your time outside. If you need to go outside, then wear layers of warm clothing. Watch for signs of frostbite and hypothermia.
- Avoid carbon monoxide poisoning. Only use generators and grills outdoors and away from windows. Never heat your home with a gas stovetop or oven.
- Reduce the risk of a heart attack by avoiding overexertion when shoveling snow and walking in the snow.
- Watch for signs of frostbite and hypothermia and begin treatment right away.
- If it is safe to do so, check on neighbors.

Additional Information check out the below Websites.

- Winter Safety Social Media Toolkit
- Winter Storm Information Sheet (PDF)
- National Weather Service
- American Red Cross
- When, The Sky Turns Gray - Animated (Video)

How Does Ham Radio Work During Disasters?

Many folks who have heard about the wonderful service ham radio operators provide during disasters don't have the slightest idea how the whole system works. If they had to guess, there would be no mention of the structure and complex organization that goes into preparing for a disaster and managing the communication aspect of disasters by ham radio operators.

By the nature of the law and policy in place, operators of ham radio make their services available as volunteers. But they are not a disparate group of independent-minded people who have no rules or guidelines to follow during emergencies or disasters.

As a matter of fact, the government's trained emergency professionals must as a matter of principle and exigency include these wireless radio hobbyists as part of the resources to use during actual emergencies. This contingency plan for emergencies is known as the Comprehensive Emergency Management Plan (CEMP).

So how does ham radio work during a disaster? It is important to understand the underlying communication strategy employed by various disaster experts to comprehend how amateur radio works during emergencies.

Identifying and Integrating ham radio operators into the CEMP

Before ham radio volunteers can be conscripted to be on standby for emergencies, they have to pass through a process of certification and registration. Every qualified ham has to register with the local Amateur Radio Emergency Service (ARES) close to them. ARES was established in 1935 by the national body of amateur radio operators known as the American Radio Relay League (ARRL).

Continued next column

Once an individual registers at the local ARES, they have agreed to be called upon to render emergency communication services by the civil authorities when disasters occur.

During the registration process, the volunteer must prove they have the requisite qualifications, experience, and expertise. For instance, they must show evidence they have passed the licensing exam and also have all the right equipment.

When a state, county or district want to map own the CEMPS template for the area, they can contact the local ARRL representative listed on ARRL's website who would them use the register to help them identify amateur radio operators living in the locality.

With this simple method, the authorities can integrate experienced local hams and not just anybody who claims to be one.

When and How to Use Ham Radio During disasters

In an ideal world, there won't be any need for backup communication when disasters strike because the communication network would still be active.

But in the real world, depending on the nature of the disaster, communication services or networks are likely to fail. Hence, the need for a means of coordinating relief and rescue missions with a wireless network.

However, how this supplemental communication is deployed depends on the severity or complexity of the disaster. As part of the national CEMP strategy, the National Incident Management System (NIMS) categorized 3 levels of incident complexity for the use of hams.

These are:

NIMS Type 4 or 5 incident – Here, the complexity of the crisis is not critical enough to use ham volunteers. In this scenario, all communications needs can be effectively handled by normal commercial services.

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When and How to Use Ham Radio During disasters

Continued

NIMS Type 2 or 3 incident – In this case, the regular communication systems are overloaded and limited aid might be sought from local hams to bridge the gap. The volunteers would remain active until the regular communications services are restored.

It is also possible to bring in additional emergency communication resource from other jurisdictions if there is a need for that.

NIMS Type 1 incident – This is the category one incident complexity level where the communication infrastructure of the affected area is either completely overloaded or down. Other infrastructural failures are in the electrical grid, Internet, public radio systems, cellular phone network, and commercial FM and AM radio systems.

In this category, all available hams and their equipment would be needed for an extended period, or at least, until normal communication services are restored.

Who can ham radio operators talk to during disasters?

Who hams can communicate with during disasters is codified in the relevant FCC regulations? The policy permits amateur radio operators to makes their services available by communicating with such entities as the National Weather Service, FEMA, the military and other government agencies and non-governmental organizations involved in responding to the incident.

Further directive on who to communicate with can also emanate from the local emergency management team.

Continued next column

When called upon to serve the community, hams deploy their equipment to places such as:

- Evacuation sites,
- Fire stations,
- Hospitals and other convenient medical facilities,
- Buildings housing security agencies such as the police,
- Auxiliary communication centers,
- Emergency command centers,
- Mobile disaster trucks,
- etc.
-

Ham radio operators can also use their expertise to provide data services.

When deployed, they use their experience to improvise antennas (or come with an already assembled unit} and power sources (using batteries and renewable energy like solar power).

To send radio messages anywhere, they use hundreds of frequencies and can quickly establish active networks linking different agencies together to aid the relief effort.
Messages can be sent anywhere using part of the atmosphere to propagate the signals by bouncing them off the atmosphere.

Who is a typical Ham radio operator?

There is no deep mystery surrounding the people who dedicate their time to helping communities that need them, especially during natural disasters. This is a hobby comprising people from all walks of life. Each qualified operator has passed several tests covering various subjects related to wireless communication.

Specifically, they have varying degrees of knowledge covering topics and subjects like electronic circuits and principles of electricity; basic receiver and transmitters problems and how to troubleshoot these problems; antenna dimensions and issues and how to resolve the issues; how AC power circuits work: and safety precautions among others.

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ARRL Pacific Division Director Jim Tiemstra, K6JAT, SK

ARRL Pacific Division Director Jim Tiemstra, K6JAT, of Oakland, California, died October 30. An ARRL Life Member, he was 65.

Tiemstra was ARRL Pacific Division Vice Director from 2009 through 2017, sitting on the Administration and Finance, and Programs and Services Committees of the Board. He became ARRL Pacific Division Director in January 2018. He was a member of the Administration and Finance Committee, the Legal Structure Review Committee, chair of the Legislative Advocacy Committee, and an advisor to the Amateur Radio Legal Defense and Assistance Committee, among other Board assignments.

Licensed in 1970 as WN9ELU in Chicago, Tiemstra was the president of his high school radio club in Illinois. Early on, he built most of his own gear from Heath kits. In 1977, he married Lilah Greene, KE6EHD, and they moved to California, where Tiemstra became N6OIK, later choosing K6JAT as a vanity call sign. He'd also held V26JAT and 3D2TJ and had operated from Curacao and Hawaii.

Primarily a contester and DXer, Tiemstra had been a DXpedition member and had long been involved in the public service aspects of the hobby.

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As a member of the Oakland Amateur Radio Emergency Service (ARES) group, he was among those responding to the Loma Prieta earthquake in 1989 and the Oakland Hills firestorm in 1991, receiving a Certificate of Appreciation from the American Red Cross. He championed the Emergency Communication Ham Operation (ECHO) proposal to install amateur radio equipment in his city's Emergency Operations Center and in each of its 30 fire stations.

Tiemstra worked with his ARES group to gain RACES recognition, wrote the *RACES Operations Manual*, and was instrumental in forging a formal *Letter of Understanding* with the City of Oakland. He served as Oakland's RACES Radio Officer for more than 14 years, was on the mayor's Emergency Management Council, and was ARRL East Bay Section Emergency Coordinator. In 2002, he was recognized by the Oakland Fire Department as Community Volunteer of the Year.

Tiemstra retired in 2018 as a federal practitioner in the private practice of law. He was an ARRL Diamond Club and Maxim Society member.
He and his wife have twin sons, Robert and Matthew, KI6IHP.

2021 RCARC Board Nominees

Listed on page 2 are the RCARC Board nominees for 2021. At the December 8, 2020 RCARC radio meeting additional nominees will be excepted prior to the attendees voting for their candidate.

If you or someone you know would like to participate as a Board Member over the next year please enter their name(s) at this meeting or notify Bonnie Bain the club's secretary.

Riddle Answer from page 2

Memories

A HAMS Night Before Christmas

Twas the night before Christmas,
And all through two-meters,
Not a signal was keying up
Any repeaters.

The antennas reached up
From the tower, quite high,
To catch the weak signals
That bounced from the sky.

The children, Technicians,
Took their HT's to bed,
And dreamed of the day
They'd be Extras, instead.

Mom put on her headphones,
I plugged in the key,
And we tuned 40 meters
For that rare ZK3.

When the meter was pegged
By a signal with power.
It smoked a small diode,
And, I swear, shook the tower.

Mom yanked off her phones,
And with all she could muster
Logged a spot of the signal
On the DX Packet Cluster,

While I ran to the window
And peered up at the sky,
To see what could generate
RF that high.

It was way in the distance,
But the moon made it gleam -
A flying sleigh,
With an eight-element beam,

Continued next column

And a little old driver
Who looked slightly mean,
So I thought for a moment
That it might be Wayne Green.

But no, it was Santa,
The Santa of Hams,
On a mission this Christmas
To clean up the bands.

He circled the tower,
Then stopped in his track,
And he slid down the coax
Right into the shack.

While Mom and I hid
Behind stacks of *CQ*,
This Santa of hamming
Knew just what to do.

He cleared off the shack desk
Of paper and parts,
And filled out all my late
QSLs, for a start.

He ran copper braid,
Took a steel rod and pounded
It into the earth
Till the station was grounded.

He tightened loose fittings,
Resoldered connections,
Cranked down modulation,
Installed lightning protection.

He neutralized tubes
In my linear amp...
(Never worked right before –
Now it works like a champ).

A new low-pass filter
Cleaned up the TV.
He corrected the settings
In my TNC.

Continued on page 11

A HAMS Night Before Christmas
Continued

He repaired the computer
That wouldn't compute,
And he backed up the hard drive
And got it to boot.

Then, he reached really deep
In the bag that he brought,
And he pulled out a big box.
"A new rig?" I thought!

"A new Kenwood? An Icom?
A Yaesu, for me?
An Elecraft, TEN-TEC
Or Flex, could it be!"
(If he thought I'd been bad
It might be QRP!)

Yes! The Ultimate station!
How could I deserve this?
Could it be all those weekends
I worked Public Service?

He hooked it all up
And in record time, quickly
Worked 100 countries,
All down on 160.

I should have been happy.
It was *my* call he sent.
But the cards and the postage
will cost me a month's rent!

Will cost He made final adjustments,
And left a card by the key:
"To Gary, from Santa Claus.
Seventy-Three."

Continued next column

Then he grabbed his HT,
Looked me straight in the eye,
Punched a code on the pad,
And was gone - no good bye.

I ran back to the station,
And the pile up was big.
But a card from St. Nick
Would be worth my new rig.

Oh, too late, for his final
Came over the air.
It was copied all over.
It was heard everywhere.

The Ham's Santa exclaimed
What an old ham expects:
"Merry Christmas to all,
And to all, good DX."
Gary Pearce KN4AQ

Grey Line HF Radio Propagation

Grey line or gray line propagation is a form of radio signal propagation that provides surprisingly long-distance radio communications at dawn and dusk sometimes when other forms of ionospheric propagation may not be expected to provide signal paths of these distances.

Grey line propagation is only present around dawn and dusk and therefore it cannot be used to support global radio communications at any time. Accordingly, it tends to be used chiefly by radio amateurs and a few other users who can accommodate the timing and other limitations of its availability.

Grey line propagation basics

For grey line propagation signals travel along the grey or twilight zone between night and day. This is area where night and day meet and it is also known as the terminator. In this region signals on some frequencies are attenuated much less than might normally be experienced and as a result signals can be received at surprisingly high levels over very long distances - even from the other side of the globe.

The improved propagation conditions around the grey line are most noticeable primarily on the lower frequency bands in the HF portion of the spectrum where the level of ionization in the D layer has a much greater effect on signals that on those frequencies higher up.

The diagram below shows how the illumination remains on the F region much longer than on the D region, and this creates a situation where the D region has faded away, but the F region remains intact.

In reality, the D region fades before dusk as the illumination from the sun reduces around dusk at the Earth's surface. The level of ionization in the D region drops very quickly around dusk and after dark because the air density is high and recombination of the free electrons and positive ions occurs comparatively quickly.

This occurs while the level of ionization is still high within the F layer, which gives most of the radio propagation for long distance radio communications. This occurs because the F region is much higher in altitude, and as the Sun sets it remains illuminated by the Sun's radiation for longer than the D region, which is lower down.

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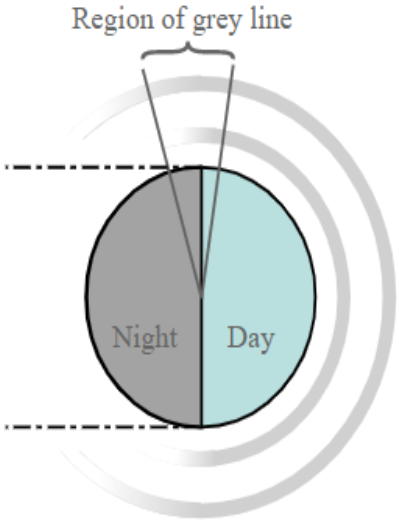

Grey line propagation concept - the F region remains illuminated longer than the D region

Note that due to the exaggerated heights and the fact the D region decays before dark, the grey line appears on the diagram after dark, whereas it actually occurs around dawn / dusk.

Also, recombination of the ions takes longer because the air is very much thinner at the altitude of the F region compared to that of the D region.

The same occurs in the morning as the Sun rises. The F region receives radiation from the Sun before the D region and its ionization level starts to rise before that of the D region. As the level of the D region ionization is low, this means that the degree of attenuation to which the lower frequency signals are subjected to is very much less than in the day. This also occurs at a time when the F region ionization is still very high, and good reflections are still achievable. Accordingly, this results in much lower overall path losses around the grey line than are normally seen.

In terms of the diagram above, the altitude of the D and F regions have been highly exaggerated to show the mechanism behind the grey line. This means that the fading of the D region starts to occur well before dusk and the F region remains in place until after dusk - and grey line propagation occurs around the region of dusk and dawn.

Continued on page 13

Grey line propagation basics

Continued

In fact, when looking at the region of the radio terminator it should be remembered that there are a variety of variables that mean that it does not exactly follow the day time / night time terminator as seen on the Earth's surface. The ionized regions are well above the Earth's surface and are accordingly illuminated for longer, although against this the Sun is low in the sky and the level of ionization is low. Furthermore, there is a finite time required for the level of ionization to rise and decay. As there are many variables associated with the "radio signal propagation" terminator, the ordinary terminator should only be taken as a rough guide for radio signal propagation conditions.

Although it may be obvious to mention, grey line propagation can only exist for stations at locations that fall along the grey line or terminator. This significantly limits the number of areas for a given station at a particular location to set up long distance communication, although there will be slight changes over the course of the year for many stations.

Frequencies affected by grey line propagation

Frequencies that are affected by this form of propagation are generally limited to frequencies up to about 10 MHz. Frequencies higher in frequency than 10 MHz tend to be attenuated to only a minor degree by the D region and therefore there is little or no enhancement around dusk and dawn by this mechanism.

Grey line propagation is particularly noticeable on lower frequencies, for example the 3.5 MHz amateur radio band. Normally signals may be heard over distances of a few hundred kilometer's in the day, and possibly up to or two thousand kilometers at night for those stations with good antennas.

Grey line propagation regularly enables long distance radio communication contacts to be made with stations the other side of the globe at very good strength levels.

The optimum times are normally around the spring and autumn equinoxes as neither end of the link is subject to the propagation extremes of summer and winter. It is at these times of year that long distance radio communication can be established with stations on the other side of the globe at remarkably good signal strength levels.

Continued next column

Similar mechanisms for higher frequencies

It is still possible for higher frequency signals to be affected by a grey line type enhancement. This occurs as a result of the fact that a propagation path is opening in one area and closing in another giving a short window during which the path is open on a particular frequency or band of frequencies.

Looking at the MUFs over the course of the day can demonstrate the way in which this occurs. The level of ionization in the F layer falls after dusk, and rises at dawn. This results in the MUF falling after dark.

Accordingly, stations experiencing dawn find the MUF rises and those experiencing dusk find it that it falls. For frequencies that are above the night time MUF, and for stations where one is experiencing dusk and the other dawn, there is only a limited time where the path will remain open. This results in a similar effect to that seen by the lower frequency grey-line enhancement.

Grey line enhancements over the course of the year

The path of the grey line changes during the course of the year. As the angle subtended by the Sun's rays' changes with the seasons, so the line taken by the terminator changes. This results from the fact that during the winter months, the Northern Hemisphere of the earth is titled away from the Sun, and towards it during the summer months.

The converse is obviously true for the southern hemisphere. In addition to this the width of the grey line also changes. It is much wider towards the poles because the line between dark and light is less will defined as a result of the fact that the Sun never rises high in the sky at the poles. It is also much narrower at the equator. This results in grey line propagation being active for longer at the poles than at the equator.

Grey line propagation provides an opportunity for long distance radio communication contacts and links to be made, often with stations the other side of the globe. Signals travel along the grey line, or terminator and suffer comparatively little attenuation. An opening via grey line propagation may only last for half an hour, but it gives the opportunity for radio communication to be established between stations as far away as the other side of the globe.

See below UTUBE URL for further information.

https://www.youtube.com/watch?v=mXdkBnI3dMU

A Little Humor

Who is a typical Ham radio operator? Continued

Conclusion

While the importance of ham radio operations during an emergency can't be overstated, it is not expected that the services they provide would ever come to replace all communications.
That said, many communities around the world are more than grateful for the establishment and sustained provision of the much-needed ad-hoc communication in situations that are less than ideal and, in some cases dangerous.

Due to their dedication in honing their skills even when disasters are rare, they more often than not, possess the requisite expert knowledge on how to coordinate communications in emergencies.
Essentially, hams understand that different situations require different approaches, and without interference from the local authorities, they can swiftly setup the emergency communication needs for the area. End

What Is Universal Time?

By Konstantin Bikos

Universal Time (UT) is a time standard that reflects the average speed of the Earth's rotation. It is not measured by clocks but by looking at the stars.

Definition of Universal Time

Universal Time is a solar time standard that reflects the average speed of the Earth's rotation. Using the prime meridian at 0° longitude as a reference point, it shows the actual length of an average solar day on Earth, which is the time from one solar noon to the next.

During a solar day, our planet completes a full rotation around its axis in relation to the Sun. Because of Earth's slowing rotation, a solar day is a little longer than 24 hours on average.

When is solar noon in your city?

UT Measured by the Stars

Despite being defined as a solar time standard, Universal Time is usually measured by the stars. This ensures a higher degree of accuracy.

As Earth spins around its axis, the Sun and other immobile celestial bodies appear to move across the sky. By registering the moment a fixed star passes a location's meridian (longitude) every day and comparing that observation with a super-consistent time standard like International Atomic Time (TAI), astronomers can determine the exact length of each solar day and, by extension, the precise speed of the Earth's rotation. Universal Time reflects the average duration of that time span.

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What Is Universal Time?

Modern technology allows us to determine UT with an unprecedented level of accuracy. Procedures like Very Long Base Interferometry (VLBI), where an array of radio telescopes is used to intercept radio signals from distant celestial bodies, such as quasars, achieve a precision of less than 4 milliseconds in relation to TAI.

Find planets in the night sky

Sidereal Time vs. Solar Time

The time measured by the stars is called sidereal time. It is not the same as solar time, so scientists have to mathematically convert their measurements to arrive at UT. Sidereal time reflects the period it takes Earth to complete a full rotation around its axis *in relation to a fixed object outside of Earth's orbit around the Sun*. Universal Time, on the other hand, refers to the time it takes Earth to complete a full rotation *in relation to the Sun*. Since the Earth revolves around the Sun, moving in the same direction as it spins around its axis, it has to rotate a little further each day to catch up with the Sun. This makes a solar day a little longer than a sidereal day—just under 4 minutes on average.

What is Terrestrial Time?

Versions: UT0, UT1, and UT2

Universal Time is issued in several variants, which deviate from one another by only a few milliseconds. Each version is used for different purposes.

UT0

UT0 is the version of Universal Time measured at a specific location. Since it does not take into account distorting factors like the constant movement of the Earth's poles (polar motion), it deviates from one location to another, making it a variant of Universal Time that, strictly speaking, is not quite universal. For this reason, it is rarely used.

UT1

UT1 is the most widely used type of Universal Time, and it is usually implied where times are stated simply as "UT." It is a derivation of UT0 that takes into account polar motion.

Astronomers generally use this flavor of UT to time their observations. It is also one of the two fundaments of Coordinated Universal Time (UTC), the global time standard used to calculate local times worldwide. Earth's rotation slows down over time, so UT1 deviates increasingly from International Atomic Time (TAI), the second fundament of UTC, which is measured by highly precise atomic clocks. Before the difference between the UT1 and UTC reaches 0.9 seconds, a leap second is added to UTC, so our clocks reflect the speed of the Earth's rotation (UT1) as closely as possible. For this reason, while UTC and UT1 are not exactly the same, the difference between the two-time standards is always less than a second.

As a time standard reflecting the mean solar time at the prime meridian in Greenwich, UK, UT1 is a successor of the original version of Greenwich Mean Time (GMT). Before UTC was introduced as the world time standard in 1972, GMT was a solar time standard that also acted as a reference point to determine local times worldwide. Today, GMT is a common time zone deriving its local time from UTC.

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What Is Universal Time?

UT2

UT2 is a rarely used version of Universal Time that is adjusted to account for both polar motion and variations in Earth's rotation due to seasonal factors, such as changes in vegetation and water or snow distribution. From 1956 to 1972, UT2 was the international standard recommended for radio broadcasting.

Other Versions

Apart from these main strands of UT, there is a number of sub-types, such as **UT1R** and **UT1D**. These account for other factors affecting the speed of the Earth's rotation, such as the tides, but they are only used in few scientific contexts.

Terrestrial Time (TT)

Terrestrial Time (TT) used to be known as Terrestrial Dynamical Time (TDT).

The unit for TT is the SI second, one second in International Atomic Time (TAI).

TT is used for calculating planetary positions in relation to the Earth's center. Delta T is the difference between Earth's rotational time (UT1) and dynamical time (TT). TT has been in use since 1984. Prior to this, astronomers used a time measure known as Ephemeris Time (ET).
Before atomic clocks, Ephemeris Time (ET) was the closest available approximation to a uniform time for planetary motion calculations.

Other Time Systems

- Barycentric Dynamical Time (TDB), the independent argument of ephemerides and dynamical theories that are referred to the solar system barycenter. TDB varies from TT only by periodic variations.
- Barycentric Coordinate Time (TCB), which is a coordinate time having its spatial origin at the solar system barycenter. TCB differs from TDB in rate.
- Sidereal Time, with unit of duration the period of the Earth's rotation with respect to a point nearly fixed with respect to the stars, is the hour angle of the vernal equinox.
- Geocentric Coordinate Time (TCG), a coordinate time having its spatial origin at the center of mass of the Earth.

UTC – The World's Time Standard

By Anne Buckle and Vigdis Hocken

Coordinated Universal Time (UTC) is the basis for civil time today. This 24-hour time standard is kept using highly precise atomic clocks combined with the Earth's rotation.

Standard, Not a Time Zone

UTC is the time standard commonly used across the world. The world's timing centers have agreed to keep their time scales closely synchronized - or coordinated - therefore the name Coordinated Universal Time.

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UTC – The World's Time Standard

Continued

The Greenwich Meridian in London, England.

Atomic and Solar Time

Two components are used to determine UTC:

- International Atomic Time (TAI): A time scale that combines the output of some 400 highly precise atomic clocks worldwide, and provides the exact speed for our clocks to tick.
- Universal Time (UT1): Also known as astronomical time or solar time, it refers to the Earth's rotation. It is used to compare the pace provided by TAI with the actual length of a day on Earth.

UT Started in 1884

Universal Time (UT) was created at the International Meridian Conference in 1884. This is the basis for the 24-hour time zone system we know today.

At the time, Greenwich Mean Time (GMT) was chosen as the world's time standard. The reference line or starting point, the Prime Meridian, was determined to be the transit circle at the Royal Observatory in Greenwich, London. The transit circle is a part of the telescope's mechanics and it is still cited as the prime meridian's original reference (0° longitude).

From GMT to UTC

In 1960, the International Radio Consultative Committee formalized the concept of UTC, and it was put into practice the year after. The name Coordinated Universal Time was officially adopted in 1967.

Why UTC – not CUT or TUC?

UTC was adjusted several times until 1972, when leap seconds were introduced to keep UTC in line with the Earth's rotation, which is not entirely even, and less exact than atomic clocks.

GMT is now a Time Zone

Until 1972, Greenwich Mean Time (also known as Zulu time) was the same as Universal Time (UT).

The difference between GMT and UTC

Since then, GMT is no longer a time standard. Today, Greenwich Mean Time (GMT) is only the name of a time zone that is used by a few countries in Africa and Western Europe, including the UK during winter and all year in Iceland.

UK uses BST – not GMT – in the summer

Topics: Timekeeping, Time Zone, History

You can hear UTC Time by calling 1-(303)-499-7111. End.

ARRL Petitions FCC for Reconsideration of Order Removing 3.4 GHz Amateur Allocation

ARRL has petitioned the FCC to reconsider its order removing the secondary amateur allocation at 3.3 - 3.5 GHz and requiring that amateur operations in the 3.450 - 3.500 GHz band cease "on a date consistent with the first possible grant of flexible use authorizations to new users."

"The amateur services in this band long have been operated on a secondary allocation status, functionally similar to the de facto secondary status of Part 5 experimental licenses, whose continued operation was (correctly) approved in the same proceeding," ARRL told the FCC. "Continued operation of amateur stations similarly should be permitted in the vacant portions of this spectrum that otherwise will go unused."

ARRL said the public interest is in using the spectrum, not in leaving it vacant waiting for some future application. "The Commission's decision in this proceeding undermines its long-standing policy objective to provide for and encourage more intensive use of spectrum," ARRL said.

"The Commission's decision to remove the amateur secondary allocation throughout the 3300 - 3500 MHz band," ARRL said, "appears to be based upon a mistaken conclusion that amateur secondary 'sharing' of this spectrum is equivalent to the type of 'sharing' that occurs with primary government and other primary commercial users, when in fact amateur secondary operations are quite different in usage, scope, and signal range."

ARRL outlined a number of ways radio amateurs use the band.

ARRL said that weak-signal point-to-point amateur communication often applies new technologies, methodologies, and coding to improve the communications capability of equipment. "Since the purpose of this type of activity is to hear or decode weak signals, operators use every possible means to avoid frequencies with other signals."

Amateurs also operate radio beacons to study propagation, contributing to a better understanding of propagation in the 3.4 GHz range, ARRL said. "Amateur beacons are fixed and low power, and therefore, relatively easy to engineer into the environment if other users initiate operations, or to relocate or shut down if they cannot be 'engineered in.'

Continued next column

ARRL's petition also cited moonbounce as another aspect of amateur operation. "This field of activity has led to a chain of improvements in antennas and equipment design in the 3.4 GHz spectrum," ARRL asserted, and is extremely unlikely to interfere with terrestrial services.

Amateur satellites could also use the 3.4 - 3.41 GHz band with minimal likelihood to present interference concerns due to the signals' low power and narrow antenna beamwidths. Additionally, uplinks employ antennas that point skyward, further minimizing any possible area of concern.

"Other frequencies will not necessarily be available when needed, and this limitation threatens to constrain future experiments with space communications technologies as the number of amateur satellite experiments increase in number and purpose," ARRL said.

The 3.3 - 3.5 GHz band also is used for digital high-speed data mesh networks and for amateur TV repeaters. "Design of and work with mesh networks has attracted an ongoing stream of computer-literate youth to the amateur ranks," ARRL contended.

"The networks themselves are commonly employed for digital experimentation with a wide range of technologies and services, with a bedrock purpose of emergency readiness and availability during actual emergencies. ARRL noted that the greater the number of available band choices, the more likely that a suitable link could be engineered for a specific path.

ARRL said that these and other amateur experimental activities make good use of the spectrum, "and should be permitted to continue on a secondary basis unless and until a new primary licensee is ready to operate in a geographic area where interference would result." End

HAMS HELP CHILDHOOD FRIENDS HAVE ONLINE REUNION

Amateur radio is all about making connections -- and in India, two long-lost childhood friends who aren't hams learned they could rely on radio to bring them together, at least virtually.

It is said that amateur radio is one of the best places to meet new friends. But a ham radio club in the northeastern state of Tripura recently showed that amateur radio is also one of the best ways to meet up with old friends.

Just ask Chandana Basu and Sabita Roy. The two women were schoolmates 40 years ago in northern India but after Chandana's family moved to West Bengal in 1981, the friends lost touch.

They both kept their childhood memories but also held onto hope they might see one another again someday.

That "someday" happened recently after Chandana acted upon her long-held wish to see her friend. She learned that the Tripura Ham Radio Club had members who might be willing to assist.

She gave them her friend's old address and club members eventually tracked Sabito to the city of Udaipur in Rajasthan, another northern state in India. This isn't the end of the story, however.

Graham Kemp VK4BB

Continued next column

The two women finally had the first face-to-face communications in four decades, arranged by the Tripura Ham Radio Club and the Calcutta Ham Radio Club. The reunion took place over a video conference which, at least for non-hams, is the closest thing to a meaningful QSO as one can get.

A Real Country Christmas

SKYWARN® Recognition Day 2020: COVID-19 Adjustments

Each year on SKYWARN Recognition Day, radio amateurs celebrate the relationship between the amateur radio community and the National Weather Service (NWS) SKYWARN program. The purpose of the event is to recognize amateur radio operators for their vital public service during times of severe weather, and to strengthen the bond between them and their local NWS office. The event is co-sponsored by ARRL and the NWS.

During the event, radio amateurs typically participate from their home stations and stations at NWS forecast offices, with the goal of making contacts with as many NWS forecast offices as possible. However, due to COVID-19 restrictions this year, participation from NWS forecast offices will be minimal. Because of this, the focus will shift to contacting as many SKYWARN-trained spotters as possible.

Operators are encouraged to exchange their name, location, SKYWARN Recognition Day number, and current weather conditions with other participating stations. Radio amateurs who wish to participate may sign up for a SKYWARN Recognition Day number by completing the registration form on the event website. For more information and full operating guidelines, visit **www.weather.gov/crh/skywarnrecognition**.

SKYWARN Recognition Day 2020 will be held from 0000 UTC to 2400 UTC on December 5.

Ham radio Winter Field Day

January 30 and 31, 2021

For the last few years Amateur Radio operators across North America have established temporary ham radio stations in public locations during Winter Field Day to showcase the science and skill of Amateur Radio. This event is open to the public and all are encouraged to attend.

For over 100 years, Amateur Radio — sometimes called ham radio — has allowed people from all walks of life to experiment with electronics and communications techniques, as well as provide a free public service to their communities during a disaster, all without needing a cell phone or the Internet.

Field Day demonstrates ham radio's ability to work reliably under any conditions from almost any location and create an independent communications network. "It's easy for anyone to pick up a computer or smartphone, connect to the Internet and communicate, with no knowledge of how the devices function or connect to each other," said **Sean Kutzko KX9X** of the American Radio Relay League, the National Association for Amateur Radio.

Continued next column

"But if there's an interruption of service or you're out of range of a cell tower, you have no way to communicate.

Ham radio functions completely independent of the Internet or cell phone infrastructure, can interface with tablets or smartphones, and can be set up almost anywhere in minutes. That's the beauty of Amateur Radio during a communications outage."

"Hams can literally throw a wire in a tree for an antenna, connect it to a battery-powered transmitter and communicate around the world," Kutzko added.

RCARC's Winter Field Day Operations will be held at the Iron County Emergency Operations Center (EOC) facility on Kitty Hawk between Bull Dog Road and Airport Road across from the Cedar City Animal Control Office.

Ed (KK7ZL) and Ron (K7HDX) working 40 Meters on Winter Field Day 2020

ARRL Seeks Waiver of Proposed FCC Amateur Application Fees

ARRL has urged the FCC to waive its proposed $50 amateur radio application fee. The Commission proposal was made last month in a Notice of Proposed Rulemaking (NPRM) in MD 20-270. The proposal already has drawn more than 3,200 individual comments overwhelmingly opposed to the plan.

The fees, directed by Congress and imposed on all FCC-regulated services, are to recover the FCC's costs of handling and processing applications.

The NPRM can be found in PDF format at, https://docs.fcc.gov/public/attachments/FCC-20-116A1.pdf .

"Amateur radio applications were not listed when the Congress adopted its 1985 fee schedule for applications, and therefore amateur license applications were excluded from the collection of fees," ARRL said on November 16 in its formal comments on the proposal. "Similarly, a decade later when regulatory fees were authorized, the Amateur Service was excluded, except for the costs associated with issuing vanity call signs.

" The new statutory provisions are similar. Amateur radio license applications are not addressed in the application fees section and explicitly excluded from regulatory fees," ARRL said, and there is "no evidence of any intent by Congress to change the exempt status of amateur applications and instead subject them to new fees."

ARRL's formal comments can be found online at, https://www.fcc.gov/ecfs/filing/111762316365 .

Continued next column

ARRL argued that the FCC has explicit authority to waive the fees if it would be in the public interest, and should do so for the Amateur Radio Service. Unlike other FCC services, the Amateur Radio Service is all volunteer and largely self-governing, with examination preparation, administration, and grading handled by volunteers, who submit licensing paperwork to the FCC, ARRL pointed out.

"Increasingly, the required information is uploaded to the Commission's database, further freeing personnel from licensing paperwork as well as from day-to-day examination processes," ARRL said.

"The addition of an application fee will greatly increase the complexity and requirements for volunteer examiners."

The Communications Act, ARRL noted, also permits the FCC to accept the volunteer services of individual radio amateurs and organizations in monitoring for rules violations. In 2019, ARRL and the FCC signed a memorandum of understanding to renew and enhance the ARRL's Volunteer Monitor program, relieving the Commission of significant time-consuming aspects of enforcement.

These volunteer services lessen the regulatory burden - including the application burden - on the Commission's resources and budget in ways that licensees in other services do not, ARRL said.

Amateur radio's role in providing emergency and disaster communication, education, and other volunteer services also justifies exempting radio amateurs from FCC application fees.

For example, ARRL noted, last year more than 31,000 participated as members of the ARRL Amateur Radio Emergency Service (ARES), and local ARES teams reported taking part in more than 37,000 events, donating nearly 573,000 volunteer hours, providing a total value of more than $14.5 million.

Amateur radio also has motivated many students to develop critical science, technology, engineering, and mathematics (STEM) skills.

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RCARC Club Calendar

For those of you who may not know the RCARC offers a calendar of Club information and other Ham related functions that you may not be aware of.

To access the Calendar, go to www.rcarc.info. from the menu select Club Info and then Calendar. Once the Calendar has loaded it will show you the main topic and time. If you wish additional information place your cursor on the time and left click. This will open a new sub window that will give you more detailed information on the topic if available.

If you have something you would like placed in the Calendar send an e-mail to rcarcnewsletter@gmail.com

ARRL Seeks Waiver of Proposed FCC Amateur Application Fees

Continued

ARRL noted that the Amateur Radio Service contributes to the advancement of the radio art, advances skills in communication and technology, and expands the existing reservoir of trained operators, technicians, and electronics experts - all expressed bases and purposes of the Amateur Radio Service.

"Accomplishing these purposes entails working with young people, many of whom may have difficulty paying the proposed application fees of $50, $100, or $150," ARRL said. "The $150 fee would be the cost of passing the examinations for the three amateur license levels in three examination sessions," ARRL said. "Such multiple application fees to upgrade would dampen the incentive to study and demonstrate the greater proficiency needed to pass the examinations for the higher amateur classes."

ARRL concluded that the FCC should exercise its authority to exempt amateur radio from application fees generally. If the FCC cannot see its way clear to waive fees for all amateur radio license applications, the fees should be waived for applicants age 26 years and younger. Such individuals, ARRL contended, have the most to contribute to the future of radio technology and other STEM-related activities and are the most likely to find the proposed application fees burdensome. End.

Arizona Congresswoman Introduces National Amateur Radio Operators Day Resolution

US Representative Debbie Lesko of Arizona has introduced a resolution to designate April 18, 2021, as National Amateur Radio Operators Day, to recognize the important contributions of amateur radio operators.

Continued next column

"Amateur radio operators are critical in times of crisis and our communities are safer thanks to their dedication to sharing important information with the public," Lesko said. She was approached to introduce the resolution by 12-year-old Raymond, N7KCB, from Peoria, Arizona.

"I started Long Distance Responders so I can help prepare the community for emergencies with amateur radio," said Raymond. "There might be a price for a radio, but the ability and knowledge to help someone is truly priceless."

As Lesko's resolution notes, World Amateur Radio Day (WARD) is celebrated annually on April 18 to commemorate the founding of the International Amateur Radio Union (IARU) in 1925, and she said her resolution recognizes the amateur radio community with a national day in the United States in 2021.

The resolution cites the Amateur Radio Emergency Service (ARES®) for providing "invaluable emergency communications services following recent natural disasters, including but not limited to helping coordinate disaster relief efforts following Hurricanes Katrina, Wilma, and Maria and other extreme weather disasters." End.


MERRY
CHRISTMAS!


Merry
Christmas


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