

Microvolt

March 2024



Going Digital with Ham Radio



The 7th annual *Utah Digital Communications Conference* was held 03 February, 2024, in Sandy Utah. The conference featured eleven presentations on many aspects of amateur radio including DMR, D-Star, satellites, fox hunting, remote station operation, decibels, DMR, designing antennas, NTS Digital, and more.



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**Online version only*



The first session of the day was a presentation by Chris Andrist KC7WSU and Spencer Ammermon NG6K, on a new multimode reflector they're building, that allows D-Star, DMR, P25, Yaesu System Fusion, and NXDN digital radios to communicate with each other. The reflector



will be installed and ready for amateur radio use later in February.

Tyler Griffiths N7UWX presented on how the National Traffic System is implementing digital modes such as Winlink and APRS to complement the current nets and traffic-passing capabilities.

The afternoon featured 3 hours of breakout sessions, and a hidden transmitter hunt inside the building.

This ARRL sanctioned event was sponsored in part by the Utah VHF Society who also held their annual business meeting at the end of the conference. The Utah VHF Society

elected their 2024 officers and amended the bylaws to allow the annual business meeting to be held any time during the calendar year.

More than 180 amateurs from Utah, Idaho, Arizona, and Utah attended this year's conference. Conference founder John Jacobs, W7DBO has already announced the date for the 2025 Utah Digital Communications Conference as Saturday 01 February. A call for presentations is planned to be announced in early October 2024.

Kevin Reeve N7RXE

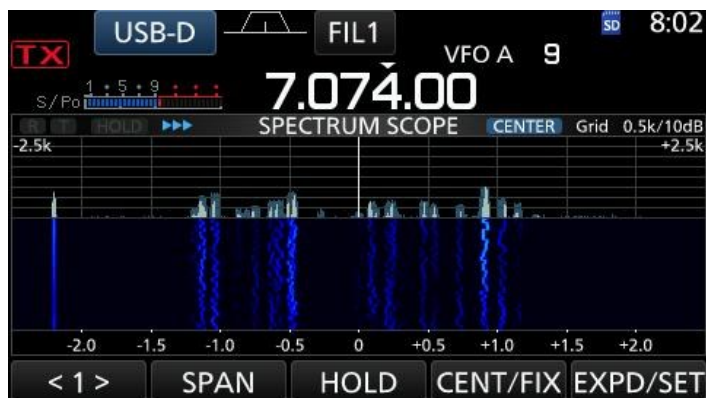


Editorial – The disruptive mode of FT8

In case you haven't heard of FT8, it's a digital data ham radio mode of communication, designed for weak signal decoding. Instead of using your voice to contact another ham, you use your computer or other digital communication device to make the contact with another FT8 station. FT8 can be used on any legal amateur data frequency, but is most often used on HF bands. It requires software that can control (and record) the exchange, and must be synchronized to an internet clock.

This weak signal decoding is one of the greatest strengths of FT8. Making a contact by SSB (single sideband) can be difficult if the signal is weak or accompanied by a relatively large amount of noise. Even DSP (digital signal processing) filtering can only help so much, before the signal strength is overpowered by the noise. FT8 uses FEC (forward error correction) and special DSP algorithms to distinguish a true signal from surrounding noise, and can therefore decipher signals far below the noise threshold of SSB.

Weak signal decoding has the advantage of allowing ham radio communication when conditions, such as sunspot numbers, are not favorable enough to support SSB. You might recall that higher numbers of sunspots will result in a greater amount of solar radiation, which promotes SSB propagation in the HF range. But even when sunspot numbers are low, FT8 can filter out the noise that hides the very weak signals, and make the contact.



Recently, FT8 has come under some criticism, due to the way it makes its contacts. It's possible, for example, that a station sending CQs on FT8 will get contacted and confirmed by a distant station running FT8, all without any user intervention from one or either end. The contention is that this method of



making contacts doesn't seem like the ham radio that we're used to. There's a feeling by some who have worked hard to obtain some award, such as DXCC, that this new method somehow cheapens their awards, thereby devaluing amateur radio as a result.

In my youth, I remember mowing many lawns so I could purchase the local ice cream fad : a Triple-decker Hecker. When I was finally able to pay for one, I saw another kid simply get handed one by his dad. Suddenly, I felt cheated, like all the work I had put into that cone was somehow devalued, cheapened. It wasn't until years later that my more mature self realized another person's experience doesn't need to define my own. For all I know, that kid completely deserved that cone, but I'm not his judge. I knew I had earned my Triple-decker Hecker, and once I realized nothing was going to change that, it was a lot easier to feel happy for somebody else's successes, because I stopped comparing them to mine.

Bottom line is that FT8 doesn't devalue amateur radio, but enhances it. I have a friend who has found *traditional* amateur radio very difficult, due to his speech impediment. When I introduced him to FT8, he thought he had finally found ham heaven, and really took off with it, because he could still enjoy one aspect of ham radio, without having to stumble over his words. Now, instead of enduring the embarrassment of having to repeat nearly everything he says, he sends his information, then reads the reply on the screen, and logs the contact.

So, FT8 might not be for all, but it's yet another way for some to do ham radio, especially if that's their only mode, and it's gaining popularity daily.

Anything to add? Email editor@utaharc.org

Letters to the editor

Dear Editor:

As I understand it, the ionosphere is made of layers called the D layer, the E layer, and the F layer. Are there also A, B, and C layers as well?

Todd in Eagle Mountain

Dear Todd:

In 1924, **Edward Appleton** began exploring the refraction of radio waves off the ionosphere, and coined the term **E layer** because it seemed to reflect the **electric field** of a radio wave. He then discovered a higher ionospheric layer of even greater ionic density, and called it the **F layer** because of its high apparent **reflectivity**. Appleton later identified a lower ionospheric layer that's responsible for **daytime** radio wave absorption, and called it the **D layer**. As far as I know, there's no A, B, or C layer.

Dear Editor:

In today's world of smartphones, why would anybody still do ham radio?

Son of a ham in Murray

Dear Son:

In today's world of grocery stores, why would anybody still go fishing?

Editor:

My name is Ted Cowan, NA7C, with a response to a statement attributed to me in the December 2023 Microvolt. The single sentence, which had friends calling and asking me about it, read, "NA7C's expostulation of the POTA CW rules is enough to make you disconnect your key after the first CQ."

I called the author, and we think this may have been a misunderstanding of something I had said at the UARC Steak Fry last summer. To clarify, I am an avid Parks on the Air (POTA) hunter and nothing could be easier than making a valid POTA contact. All that is required is a callsign for CW, voice, or data. Not even the park designator or a signal report is necessary, although a signal report is usually exchanged. I have made over 3,000 POTA contacts as a hunter, with over 2,800 on CW.



My CW is not even that good, especially since my stroke 3 years ago; I found POTA hunting a great way to relearn CW. I want everyone to know about my love of the POTA program, and making CW POTA contacts is something I do seven days a week. I also enjoy making Straight Key Century Club (SKCC) CW contacts on my J-38, although a valid SKCC contact is a little more involved, requiring an exchange of a callsign, name, state, and your SKCC number. It's actually not that difficult, but this may have been what I was talking about at the Steak Fry, and I regret any misunderstanding that I may have caused. Long live POTA!

Ted Cowan NA7C, Sandy

Dear Editor:

I think the new Microvolt sucks. It looks like it was written by a third-grader.

Anon

Dear Anon:

I know some really intelligent third-graders, so thank you!

Dear Editor:

On many nets and other places, I keep hearing people give only the last part of their call signs. Are partial call signs on the air legal?

Simon in Millcreek

Dear Simon:

There's no such thing as a *partial call sign*. A call sign is the entire sequence or it's something else. And "something else" could just as well be your name or a tactical call sign. But your FCC call sign is still required every ten minutes and at the end.

Send your thoughts to editor@utaharc.org

Club news



In the February 2024 club meeting, our repeater engineer Clint Turner KA7OEI taught us about how repeaters perform their magic. He showed us what controls their propagation area and how to make the best use of it, even with HTs (handheld transceivers). In particular, Clint educated us about the 146.620 MHz voting repeater system, and how that works to extend their reach, with *two repeaters operating as one*.

Clint explained that the voter system between the Farnsworth Peak and Scott Hill repeaters, are both on the same frequency, 146.620 MHz, and that the voter selects between the two repeaters by the receive



noise level. *It's a wonder we can make the darn things work at all.*

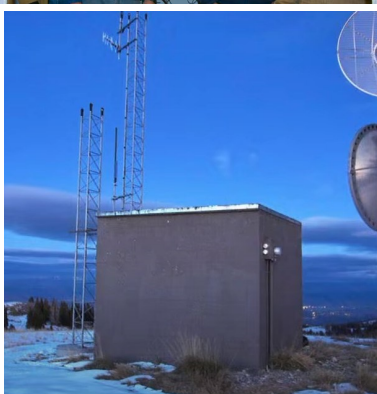
Clint also shared some pitfalls associated with communicating by an HT with a repeater, that a voter can help overcome.

You can see the video presentation here: <https://www.youtube.com/live/zQGrofy5s3M>. You can also view past club meeting presentations on our YouTube channel: <https://www.youtube.com/@UtahAmateurRadioClub>

(Photos courtesy Mike McAinsh KI7MTI, et al)



146.620 transmitter



Scott Hill repeater

Letters to the editor

Starting with this (March 2024) issue of *Microvolt*, we'll print selected letters to the editor (see page 4). Please email submissions to editor@utaharc.org. We invite thoughtful, humorous, technical, and even controversial comments and questions, but please include your name and town. Entries will be accepted and edited for content at the discretion of the editorial staff. Speaking of which, if you're interested in joining said staff or would simply like to help proofread issues prior to publication, please also contact us.

For your information

Microvolt has expanded!

Your club newsletter *Microvolt* is now longer than the 8 pages you're used to. See the rest of the story in the online version, located at

user.xmission.com/~uarc/Microvolt/2024/March2024.pdf

Field Day 2024

Saturday noon 22 June through Sunday noon 23 June near **Payson Lakes**. We plan to start setting up Thursday night about 6:00 pm.

Annual UARC Steak Fry

Saturday 20 July 2024 the **Spruces Campground**, site **GRP7** starting at 5:00 pm.

License classes

Salt Lake:

Technician : 10 Mondays, 6:30 to 8:00 pm
starting Jan 8 (by Zoom only)

Email ki7mti@gmail.com to register

General : Tuesdays 7:00 pm to 9:00 pm
147.160+ MHz (127.3 Hz tone)

Bluffdale:

Technician : 4 Thursdays, 7:00 to 9:00 pm
Feb 29, Mar 7, Mar 14, Mar 21
2222 W 14000 S, Bluffdale (City Hall)
No charge

Call Chris Fielding at 801-450-9539 to join

Orem:

General : 4 Tuesdays, 6:30 to 8:30 pm
Mar 19, Mar 26, Apr 2, Apr 9

Extra : 5 Tuesdays, 6:30 to 9:30 pm
Jul 16, Jul 23, Jul 30, Aug 6, Aug 13

Visit psclass.orem.org to register (\$10)

Orem Traffic Training Room, 95 E Center St

HamStudy.org account required

Email nojiratz@hotmail.com for info

Eagle Mountain:

General : 5 Thursdays, 7 to 9 pm

Apr 04, Apr 11, Apr 18, Apr 25, May 02

Technician : 5 Thursdays, 7 to 9 pm

May 23, May 30, Jun 06, Jun 13, Jun 20



Technician : 5 Thursdays, 7 to 9 pm

Aug 29, Sep 05, Sep 12, Sep 19, Sep 26

Email ki6oss6365@gmail.com to register (free)
Eagle Mountain City Hall, 1650 Stagecoach Run

Exam sessions

Salt Lake County:

- Email Garth Wiscombe W7PS w7ps@arrl.net
Mar 25, Apr 29, May 20, Jun 24, Jul 29, Aug 25, Sep 30, Oct 28, Nov 25
- Email Rick Morrison W7RIK w7rik@arrl.net

Bluffdale:

- 2222 W 14000 S, Bluffdale (City Hall)
Mar 23, Noon to 3:00 pm

Utah County:

- Sat 16 Mar 2:30 pm : **Provo** : [signup](#)
- Wed 20 Mar 7:00 pm : **Provo** : [signup](#)
- Sat 02 Mar 10:00 am : **Eagle Mtn** : [signup](#)
- Sat 04 May 10:00 am : **Eagle Mtn** : [signup](#)

Club repeaters

Farnsworth Peak : 146.620– MHz (no tone)

Scott Hill : 146.620– MHz (no tone)

Lake Mountain : 146.760– MHz (no tone)

SDRs and Beacons

Northern Utah WebSDR : sdrutah.org

KK7AVS SDR : k7xrd.club

KJ7L beacon 28.2493 MHz

How can I help?

Reach out to the club leadership by sending an email to uarc@xmission.com. Also, add to this page by emailing editor@utaharc.org

Spotlight – Robert Gunnell KI7FUJ

It was through an interest in electronics that Robert Gunnell KI7FUJ first learned about amateur radio. He studied by taking practice tests on the internet. In July 2016, Robert received his Technician-class license during the **Great Salt Lake Hamfest** at the Salt Lake Community College campus in Sandy, and he's currently studying for his General-class license.

He says he's fascinated with how amateur radio has evolved, from only Morse code to voice, and now digital modes. Robert said when handhelds first came out, they were heavy, but now you can put one in your pocket and enjoy EchoLink and digital at your fingertips. Today, he owns a Yaesu handheld radio and a Kenwood base that has 6 meters, 2 meters, and 70 centimeters. He enjoys listening to far-away stations, and is looking forward to getting his General-class license so he can also talk with them on all the bands.

Robert enjoys helping people with antenna projects and giving presentations for ham radio clubs, and has even given a couple for UARC. In one presentation, Robert explained how to use handheld multimeters and how to troubleshoot electronic problems. Vicki Chaplin KI7PQR was so impressed with Robert's presentation that she built her own continuity tester using capacitors, resistors, and

whatever else she could find around the house, even a speaker. She showed it off at homebrew night to Robert's credit, which was cool. In **another club presentation**, Robert taught us about soldering irons, solder, and soldering methods.

Robert holds a Bachelor of Science in electronics, which he received at Utah Technical College. He's currently the owner and manager of **Standard Supply Electronics**, buying, selling, and evangelizing electronic parts and supplies. Robert enjoys golfing, camping, skiing, and snowboarding. He and his wife Christine have one son. Robert's a member of both UARC and a the **Davis County Amateur Radio Club**.

Robert, we wish you the best in all of your endeavors and the best of luck getting your General-class license!

Linda Reeder N7HVF



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We encourage you to submit original pictures (highest resolution), articles, book reviews, software and hardware descriptions, nuggets of humor, and responses to editorials. Email the content, pictures attached, to the editor at editor@utaharc.org by the 24th just prior to the target month.

The **Utah Amateur Radio Club** was organized under its present name in 1927, although its beginnings may date back as early as 1909. In 1928, it became affiliated with the **American Radio Relay League** (club #1602) and is a 501(c)(3) non-profit organization. It holds a club station license with the call sign W7SP, a memorial to Leonard "Zim" Zimmerman, amateur radio pioneer in the Salt Lake City area.

The club meets each month except July and August. The meetings are usually held on the second Thursday of the month at 7:30 PM in the University of Utah's **Warnock Engineering Building**, room 2230.

Club membership is open to anybody interested in amateur radio; a current license is not required. Dues are \$20 per year, including a *Microvolt* subscription. The *Microvolt* and membership cannot be separated. Those at the same address as a member who has paid the \$20 can obtain a membership without a *Microvolt* subscription for \$12. Send dues to club secretary James Bennett, 4960 W 5400 S, Kearns, Utah 84118.

Tax-deductible monetary contributions are gladly accepted. Send directly to the treasurer Shawn Evans, 1338 S Foothill Dr, #265, Salt Lake City, Utah 84108-2321. For in-kind contributions, please contact uarc@xmission.com to make arrangements.

UARC maintains the 146.620– and 146.760– repeaters, which are administered by the **UARC Repeater Committee**. Direct comments and questions to any committee member. The 146.760– repeater is on IRLP node 3352.

The **UARC Ham Hotline** at 801-583-3002 is for information regarding amateur radio, including club, testing, meeting, and membership information. Leave your name, number, and a short message, and we'll make a good-faith effort to return your call.

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POSTMASTER: Send address changes to *Microvolt*, c/o James Bennett, 4960 W 5400 S, Kearns, Utah 84118.

UARC 2024 Board

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For late breaking news listen to the UARC Information Net Sundays at 9:00 pm on 146.620– or visit the [announcement page](#).

We are grateful to the management of our internet service provider XMission, for the donation of our web service. For account information go to <http://www.xmission.com/> or call 801-539-0852

EIN : 99-0407768

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Tech corner – Maidenhead grid squares

The **Maidenhead Locator System** is a way of describing one's location anywhere in the world. The system was devised by John Morris G4ANB and was originally presented in 1980 in Maidenhead, England. They were originally meant to help calculate distance in VHF contesting (points per kilometer being important).

Maidenhead locators are sometimes referred to as QTH locator, grid locator or grid squares, and are based on latitude and longitude. Each Maidenhead locator will have an even number of characters, either 2, 4, 6 or 8. The more characters, the more precise the location.

The first two characters are called the **field** and are always letters. The earth is broken down into 324 (18^2) fields, each of which is 10° latitude by 20° longitude.

When the second two characters are added, this is called a **square**. These next two characters are always numerals. There are 100 (10×10) squares in a field. Each square is 1° latitude by 2° longitude. In Utah, this is roughly 69 miles $\times$ 107 miles (not exactly square). These locators are often the ones people are looking for in the contests called *grid chases*.

Two more letter characters may be added for greater precision. This six-digit locator is called a **subsquare**. There are 24×24 (576) subsquares in a square. The size of a subsquare is roughly 2.9×4.4 miles in Utah.

Even more precision may be provided with the **extended square**. This is done by adding two more digits to the locator. This gives us eight characters. In Utah, the size of the subsquare becoming about 0.3×0.4 miles.

Note that the military uses different grid systems based on either latitude, longitude, or UTM grids, depending on the branch of the service. Furthermore, as I understand from a source within Utah County Search and Rescue, they use longitude and latitude as well, so a Maidenhead locator would probably be of little use to them either, for example.

As far as Utah goes, there are 14 squares that either are entirely or partially in Utah. For the cities in Salt Lake and Utah Counties, a bulk of cities are in the grid square DN40 as are Park City and Heber City. In Salt Lake County, many of the cities on the west side



of the valley (like West Valley City) straddle DN40 and DN30, as is the case with Eagle Mountain in Utah County. Much of Tooele County is in DN30. The line between DN40/DN30 and DN41/DN31 is on the northside of Farmington in Davis County. These two grid squares run all the way to the Idaho border. DM49 starts near Santaquin and includes Nephi, Sanpete County, Price, and Huntington.

DN31	DN41	
DN30	DN40	DN50
DM39	DM49	DM59
DM38	DM48	DM58
DM37	DM47	DM57

Utah, with its grid squares

What I had mentioned previously about Utah being part of 14 grid squares is mostly true, but with a slight exception. In the 1800s when the boundaries were surveyed, they were slightly off the exact integers of latitude and longitude. As an example, the Four Corners Monument Navajo Tribal Park is located entirely in DM56lx in spite of containing the southeast corner of Utah.

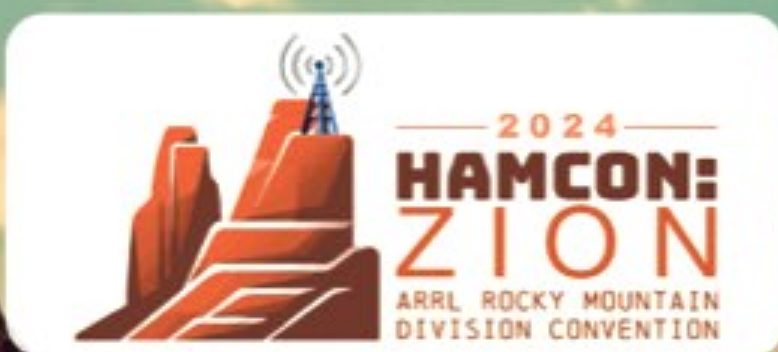
You can look up your own grid square by town or call sign at

https://www.levinecentral.com/ham/grid_square.php

Frank Liebmann WX5LOK, American Fork



the premier amateur radio
convention experience...
made specially for the West



July 12-13, 2024
St. George, Utah

Visit us online at:

<https://HamConZion.com>



Silent key– Don Blanchard WA7GTU

On Saturday 04 September 2021, friend, elmer, and teacher Don Blanchard passed away at his home in Cedar City.

Don's many service achievements include

- Idaho National Guard
- EdD from Arizona State University
- Teacher of the Year at SUU
- Department Chair at SUU
- First SCUBA instructor at SUU
- Iron County Emergency Coordinator
- CERT certification
- Cedar City Radio Control Club president
- Cedar Valley Lions Club president
- Iron County Merit Commission
- LDS mission to Northern California
- LDS High Councilor
- LDS Temple Worker
- Volunteer Ski Patrol at Brianhead
- Silver Beaver in Scouting
- Second Miler Award in Scouting
- Woodbadge in Scouting

The following is an excerpt from his obituary:

Don's first love was amateur radio. He's been known by his call sign WA7GTU for over 50 years, and remained an active ham operator until days before his death. Don was instrumental in building, installing, and maintaining a network of repeaters now known as the Intermountain Intertie System, comprised of 23 continuously linked repeaters in five states. Don's was a friendly and familiar voice on the airwaves, especially on the Beehive Utah Net, where he often served as net control. He served as Vice President of the Utah VHF Society for 22 years and obtained non-profit status for the club.

Don is survived by his wife Linda, his children, and many grandchildren. He has always been a kind, helpful, and thoughtful elmer to many people.

73, Don.



Strays – An unusual bunch

As I drive around the valley, I find myself constantly looking for signs of the ham enthusiast. On cars and trucks, it's a dead-giveaway when you see a call sign license plate. But if they don't advertise by plate, you can often spot the mag-mount antenna, and sometimes more than one antenna sits atop the vehicle to make sure you notice.

On homes, it may be a little more subtle, like the simple wire antenna stretched from a tree limb to a simple mast made from pipe. And then you notice the proud 16' x 10' beam mounted high in the air on a sturdy Rohn 45G tower with low-flying aircraft warning lights mounted on top. Regardless of the installation, the ham station is set up and ready to go. The ham operator is making a best effort to keep the hobby alive.



And of course, there's our way of talking. Someone might ask, *How to you spell vacuum?* and most people will respond V-A-C-U-U-M. But, a ham might say,



victor-alpha-charlie-uniform-uniform-mike. Yes, we do things a little differently!

We're trained to use the international phonetic alphabet when we need to identify our station or clarify wording. And we're in good company, because internationally you'll hear much of the same disciplined responses. The military also uses a language similar to ours in their communication protocols.

Today, we don't hear much CB (Citizens Band) talk such as, *Hey K7XYZ, you got your ears on?* or *Calling K7XYZ, you out there, good buddy?* I don't think I've ever heard anyone say, *Hey, we got us a ham radio convoy!* Although I have heard some amount of cross-over from the CB era, we hams like to do things in our unique way.

Oh, wow, look at that big Screwdriver antenna on the back of that little car! I hope it doesn't flip the car over...

Yes – we are an unusual bunch!

Rulon Swensen K7BTU

