

Microvolt

Monthly newsletter of the Utah Amateur Radio Club

October 2024



The Joy of DX



Many hams today enjoy *DXing*, the pastime of communicating with hams in other countries. Numerous amateurs have entered the craft on the premise of being able to communicate globally without reliance on either cellular or internet infrastructure.

Whether you're working **portable**, casually calling CQ, or contacting during a contest, let's explore what it's going to take for *you* to make an international contact, starting with a good antenna and a little courage.

Cover story	2
Editorial	3
Letters to the editor	4
Club news	5
For your information	6
Spotlight on KC7XP	7
Tech corner	9*
Strays	14*

*Online version only



Cover – Working DX

The term “**DX**” is an abbreviation for *distance*. Technically, a **DX contact** is one made with an amateur operator outside one’s country of transmission. The US uniquely defines DX as any country outside the CONUS (continental United States) except Canada and Mexico, yet considers Hawaii and Alaska as DX locations because of their distances from the mainland. When an amateur is seeking DX contacts, we say that he or she is *chasing DX* and that “**DXing**” is a colloquialism of that term. A **DXer**, therefore, is slang for an operator who pursues DXing.

The strongest signals being radiated from your antenna are collectively transmitted in an average direction whose angle relative to level ground is known as its *takeoff angle*. Making a DX contact often requires an antenna with a relatively low takeoff angle, the lower the angle, the farther away the signal will strike the ionosphere before returning to the Earth.

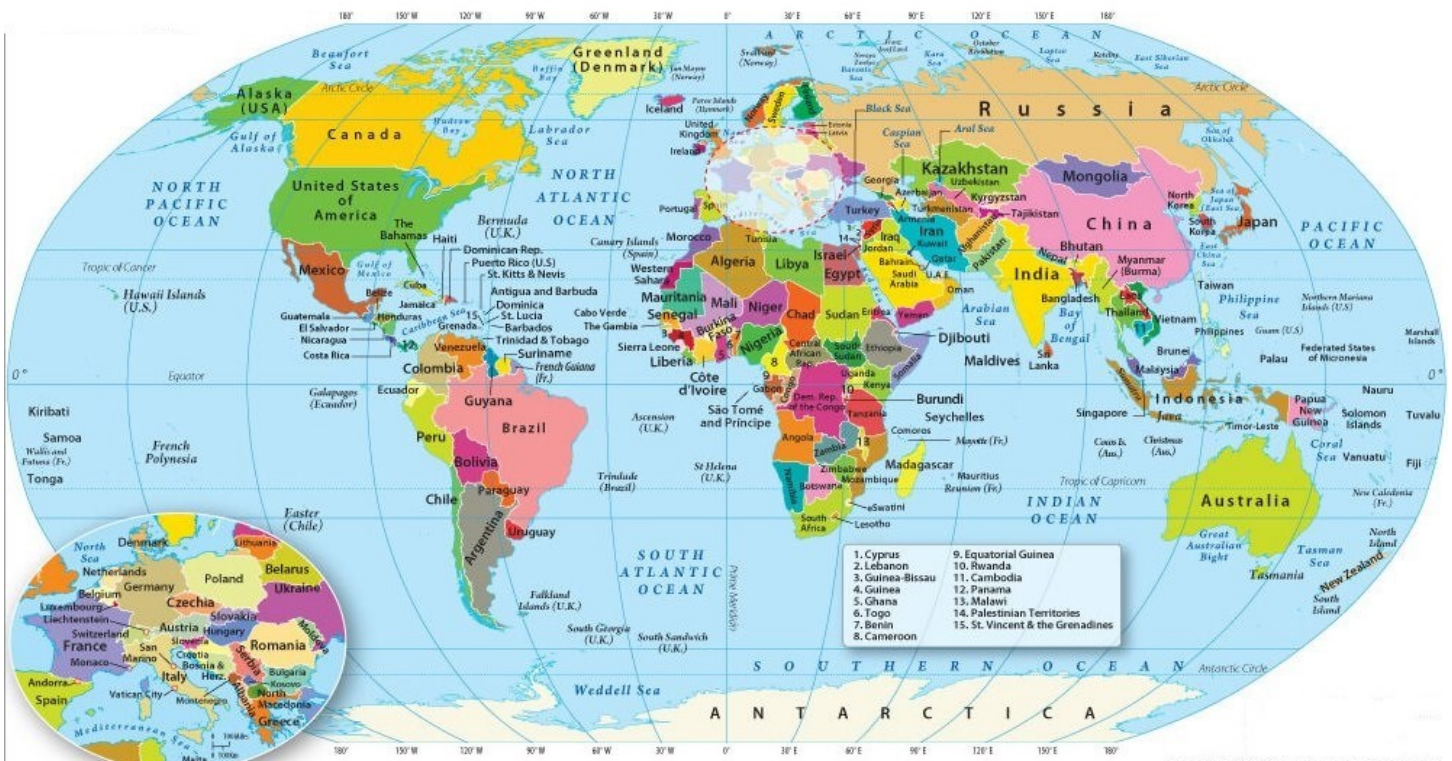
You can make a DX contact by an antenna with a higher takeoff angle, but more than one up-and-down trip (“*hop*”) might be required to reach its destination, and the more hops, the more the signal is attenuated (reduced in strength) with each hop. A *vertical antenna* tends to have a very low takeoff angle, especially if it uses radials. A *Yagi beam* can also exhibit a low takeoff angle if it’s mounted up high with respect to its supported frequencies.



If you’re attempting to make a DX contact, you can call out “**CQ DX**” instead of simply “CQ”. But when you do, expect a *pileup*, or several operators who are answering simultaneously. And when you encounter an international operator who’s calling CQ, you might discover that he or she is working *split operation*, or receiving by one frequency while transmitting on another. And if that operator is transmitting from a remote island, he might be part of a *DXpedition*. Finally, once you’ve made that DX contact, don’t forget to *log* it, especially on **QRZ**, so others can see it.

You can find more [thoughts about DXing](#) by the ARRL on arrrl.org/chasing-dx

Microvolt editorial staff



Copyright © 2020 www.mapsofindia.com

Editorial – Operating with SSB

In the brand new world of FM repeaters, recently licensed hams tend to become accustomed to the hushed world of squelch, believing the quiet is normal for radio. An amateur who first encounters SSB (**single sideband**), however, is often surprised at the sound of the background atmospheric noise, which is how radio (actually, demodulated audio) really sounds, because the squelch is turned off.

SSB is the preferred voice mode with which to make DX contacts because it requires less power and **bandwidth** than AM or FM, and it's the primary voice mode for both casual contacting and contesting. Other modes, such as FT8, CW, PSK31, Olivia, and more, can make use of low transmitting power and bandwidth even more efficiently to make DX contacts, but our focus is on SSB voice.

SSB does come with a price. Depending on the noise level at your QTH (transmitting location), the band conditions, and the relative receive signal strength, hearing the other station, or them hearing you, can be a little rough. While communicating with others on 2 meters FM, we typically use the phonetic alphabet *only when people ask us to* (because over-use tends to irritate people). But on SSB, we use phonetics by default when stating our call signs because of the noisy environment.

Whether we're operating on SSB or quiet FM, when using phonetics, be sure to **slow down**. No matter how long we've been licensed, we're simply not used to hearing **wisskeyehoseven** and deciphering it as quickly as we can **double-you-ee-seven**, especially if our native language is not English. In fact, you might not even realize that you rattle off your name or call sign phonetically as fast as you do. In many cases, it might take you three seconds to rapid-fire your call sign, then four seconds for the other person to ask you to repeat it slowly, then five seconds for you to repeat it slowly. Had you said it slowly to begin with, the entire exchange would have taken five seconds instead of the twelve that it took because of your machine-gun approach. Those five seconds might seem painfully slow to you, but it can save you from repeating yourself, and them from the embarrassment of having to ask you to.

And when you do use the phonetic alphabet, and happen to forget that "N" is November, is it alright to use a substitute word, like Nancy? There is no strict



rule demanding that we amateurs must use a particular set of phonetics, although using the ITU Phonetic Alphabet has become a standard. It's perfectly acceptable to use an **alternate set of phonetic words**, *if it helps to clarify*. When working DX, you might find that some alternate phonetic words are commonplace, because many international folks find it difficult to say Zulu, Sierra, or Golf, for example.

For most HF contacting, SSB can occupy a bandwidth up to 3.0 kHz (3000 Hz), although typically a little less. The ideal human ear possesses a detection range of about 20 Hz to 20 kHz, but human speech falls far short of this range, depending on gender and whether you have a cold. Modern telephony sets the usable human speech and hearing range to between 300 Hz and 3.4 kHz by convention, so amateur radio SSB fits well within that bandwidth.

Single sideband can be manifest as either LSB (lower sideband) or USB (upper sideband), and many amateurs are confused about which amateur bands conventionally use which sideband. The following table clearly shows the gentleman's agreement for SSB:

Band	SSB
160 meters	
80 meters	LSB
40 meters	
All others	USB

Some amateurs like to say that frequencies below 10 MHz use LSB, but that's not always the case. 60 meters and RTTY are exceptions, for example.

Anything to add? Email editor@utaharc.org

Letters to the editor

Dear Editor:

When I hear somebody on HF calling CQ DX, and I find that the caller is operating from a grid that I need, is it ok to answer him, even though I'm not DX to him?

Grayson in Kearns

Dear Grayson:

An answer to a CQ by an operator who doesn't fit the description of the intended target contact is generally considered not in keeping with good amateur radio practice. However, that's not a strict rule, and so the response is left to the judgment of you, the answering station. If you really feel that you need to make the contact, I recommend waiting until few or no others are responding to his CQ, then answer it apologetically. Something like, "KJ7ABC, I'm not DX, but may I please contact you for your location?" or similar.

Dear Editor:

I've heard people talk about contests here and there. So, what do people actually win in a ham radio contest? Money? A new radio or antenna? I guess I don't get it.

Tamra in Salt Lake City

Dear Tamra:

Most hams don't engage in *contesting* to win anything, but for the thrill and the HF experience. Yet the top winners of many contests do receive a placard, an honorable mention, or more. And you're right: if you don't participate, you won't get it!

Dear Editor:

Now that the ARRL is no longer printing the QST magazine, and that yearly membership is costing more, I'm seriously considering not renewing this year. What reason is there left for me to renew my ARRL membership?

Dennis in Pharmington

Dear Dennis:

It's true that ARRL no longer automatically distributes the print version of *QST*, and that their annual



membership is costing more, due to rising operating costs. If you hear about a family who just lost their home to a fire, and an account was set up for them, and you want to contribute to help them, do you ask what you're going to get from your payment, what's in it for you? In the end, while your ARRL membership actually buys you quite a lot (spectrum, representation, education, leadership), it's not really about *you*, but about your contribution to the greater good of amateur radio, by helping others.

Dear Editor:

Do I need to turn off my background music when I'm transmitting? In other words, if I happen to leave my MP3 or my favorite FM station, playing in the background, and I key up, is that an illegal transmission?

Mobile in Kaysville

Dear Mobile:

According to the applicable Part 97 (section 113c) rules, we are not allowed to transmit music of any kind on the amateur bands, even incidental music, except in conjunction with a manned spacecraft communication, and that only by permission from NASA. So yes, to be compliant, you do need to turn off your music before you press your PTT. But I do know that it's easy to forget.

Send your thoughts to editor@utaharc.org

Club news

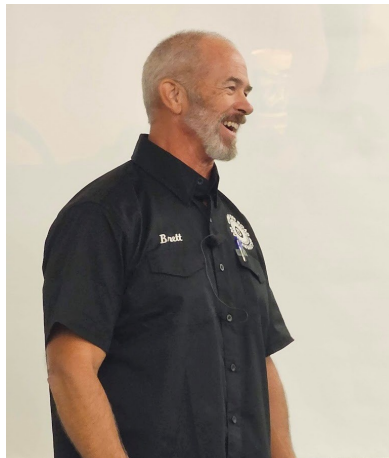
UARC Bylaws amendments

We asked, and you responded. As required by the Bylaws, we needed at least 34 club members (10% of the membership) to attend the September 2024 meeting in-person and vote on amendments to those very rules. So, we broadcast an invitation for attendance to as many members as we could reach. Nearly 50 of you showed your support and answered the request to attend, allowing us to proceed with a modification vote for the first time in more than twenty years.

We voted to modify sections IV (amendments) and VII (meetings), to modernize the amendment process and better distinguish the associated tasks. **These changes** alone will help us reduce the time required to further amend the Bylaws as we move forward to modernize other sections.

UORRT presentation

Following the Bylaws vote, we were treated to a presentation by Brett Davis KJ7Y of **Utah Offroad Recovery**. His team of volunteers uses ham radios to coordinate vehicle (not people) rescues using trucks, tow ropes, and other gear to help people get back on the road or recover their rides. Once a victim becomes stranded in snow or mud, or has slid off the road, the UORRT goes to work.



Because of the Bylaws vote, Brett was greeted by probably the largest meeting crowd we've seen in many years. Several said that this was one of the most enjoyable meetings they've attended, and that it might just prompt them to attend more regularly.

You can see the video presentation here: <https://www.youtube.com/watch?v=ShI86xbWlhE>. You can also view past club meeting presentations on our YouTube channel: <https://www.youtube.com/@UtahAmateurRadioClub>

(Photos courtesy Gary Crum KK7DV, et al)

UARC is now officially a 501(c)(3) non-profit

After long last, UARC has finally received the letter from the IRS in July 2024 indicating our club is officially designated as 501(c)(3) non-profit status, paving the way to a number of opportunities going forward.

End of the printed and mailed Microvolt

We're about to reach the end of a long era. Or rather, we're about to embark on a new era. Starting with the January 2025 issue, *Microvolt* will no longer be mailed out in printed form, and will be available in digital form (online) only. The December 2024 issue will be the final issue that we plan to print and mail to members generally. If you'd like a printed copy, and don't have reasonable access to a color printer, please reach out to us at uarc@xmission.com

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

<https://user.xmission.com/~uarc/Microvolt/2024/October2024.pdf>

Homebrew Night 2024

Thursday 10 October 2024 is our annual Homebrew Night, starting at 7:00 pm. This is a time for you to bring a homemade or home-built project to show the rest of us what you did and how you built it. Bring your ideas, your gear, and your enthusiasm to the Warnock Building!

License classes

Salt Lake:

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

Orem:

Technician : 4 Tuesdays, 6:30 to 8:30 pm
Jan 21, Jan 28, Feb 4, Feb 11
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:

Technician : 5 Thursdays, 7 to 9 pm
Feb 6, Feb 13, Feb 20, Feb 27, Mar 6
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
May 20, Jun 24, Jul 29, Aug 25, Sep 30, Oct 28, Nov 25
- Email Rick Morrison W7RIK w7rik@arrl.net

Utah County:

- Wed 19 Jun 7:00 pm : **Provo** : [signup](#)
- Wed 17 Jun 7:00 pm : **Provo** : [signup](#)
- Sat 22 Jun 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](https://sdr.utah.org)
KK7AVS SDR : k7xrd.club
N7RIX SDR : <https://sdr.n7rix.com>
K7JL beacon 28.2493 MHz

HF remote and club transceiver stations

If you'd like to learn how to get started using the remote stations, visit the [HF Remotes link](#) on [the club website](#):
<https://user.xmission.com/~uarc/HFRemote.html>

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 – Doryl Lish KC7XP

I was probably about 10 years old when I first read the words "ham radio" in a book called "Mad Scientist's Club". That piqued my interest, but it wasn't until I was in 8th grade that I started trying to find out about how to get a license. That year, our science teacher offered to take a group of us to a town about 50 miles away where a Lafayette store had all sorts of kits that could be used for science fair projects. I bought a small module that I only had to add a few resistors, a speaker, and a microphone, and could transmit on the AM band. That got me hooked. The next year, I built an FM transmitter from discrete components. I found a book on how to get my license, but the formulas were too intimidating for me, so I put away my ambition for a while.



When I was in high school, I found that my band director was licensed. He was the first person I had ever known that actually had an amateur license, and at a band camp I watched as he operated his mobile station and spoke with a relative that was 750 miles away. I was blown away. I started trying to study again, but still just couldn't settle down enough to really understand the material. Fast forward a few more years. I had taken an electrical engineering class or two in college, and found a copy of the ARRL license manual. I asked my band director's son, a good friend who also had his ham license by then (now K7ATO), to make a cassette tape of random CW characters. I studied the manual during my lunch breaks at my summer job and listened to the random characters whenever I was in my car, and signed up for the test with the FCC.

At that time, we had to wait for the FCC to come to town to administer the test once per year. The licenses were different then, with the Novice, Technician, General, Advanced, and Extra. The Novice and Technician required 5 wpm code, the General and Advanced 13 wpm, and Extra 20 wpm. The Technician and General licenses had the same written test. I didn't quite make the 13 wpm the first year, so had to settle for a Technician license, and my call sign was N7DBD. I didn't like that call sign because no one could hear it correctly over the air. The next year, I studied and practiced the code, and when the FCC came around I passed the Advanced license exam. That's when I got my call sign of KC7XP, which I have proudly now for more than 40 years. In 2012, I finally decided to get my Extra license and access to the few added sections of the bands, but mostly so I can hopefully start helping with exams.

My favorite aspect of ham radio is the fact that I can have a radio and a piece of wire, and be connected to just a battery, and talk to someone with nothing else in between. I have listened many times to amateur radio in action during emergencies that were far away. I listen WAY more than I talk.

My station is modest, with a VHF/UHF mobile in my vehicle, some handhelds, and an HF radio with two antennas: one 80 meter dipole that has a feed point only 20 feet high, and a 4-band Mosley vertical that someone gave me early in my experience as an operator. It had a broken base, and finally two years ago I contacted Mosley to see if they happened to have parts for the antenna that had ceased production in the mid-1960s. They gladly provided the part for me at a very reasonable cost.

Amateur radio has provided much enjoyment for me. It's the reason I took electrical engineering classes, although I ended up with a degree in Mechanical Engineering. I've been helped along the way by many hams, and I hope to be able to help others as I continue my journey. When mobile, my radio is always on scan, and if I hear somebody call on 146.520, I try to answer.

– 73 from KC7XP

Microvolt is the official publication of the Utah Amateur Radio Club, Inc. (UARC), 3815 S 1915 E, Salt Lake City, UT 84106, and is published monthly. Reprints are allowed with proper credits to *Microvolt*, UARC, and authors. Online versions located at <https://user.xmission.com/~uarc/Microvolt>

We encourage you to submit original pictures (highest resolution), articles, software and hardware descriptions, appropriate 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 now 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, which cannot be separated from membership. 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. Email address changes to kk7avs@gmail.com

Tax-deductible monetary contributions are gladly accepted. Send directly to club 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.

Call the **UARC Ham Hotline** at 801-583-3002 for amateur radio information, including club, testing, meeting, and membership information. Leave a message, and we'll make an effort to return your call.

Microvolt (USPS 075-430) is printed monthly except August, by the Utah Amateur Radio Club. Periodicals postage paid at Salt Lake City, Utah.
POSTMASTER: Send address changes to *Microvolt*, c/o James Bennett, 4960 W 5400 S, Kearns, Utah 84118.

UARC 2024 Board

- President: [Marvin Match](#), KA7TPH
- Exec. Vice President: [Linda Reeder](#), N7HVF
- Vice President: [Bruce Fereday](#), KF7OZK
- Secretary: [James Bennett](#), KK7AVS
- Treasurer: [Shawn Evans](#), K9SLE
- Microvolt* Editor: [Noji Ratzlaff](#), KNØJI
- Asst. *Microvolt* Editor: [Ricky Asper](#), AC7RA
- Program Chair 1: [Mike McAinsh](#), KI7MTI
- Program Chair 2: [Jeri Brummett](#), WJ3RI
- Immediate Past President: [Morris Farmer](#), AD7SR

For late-breaking news listen to the UARC Information Net, Sundays at 8:30 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 <https://xmission.com/> or call 801-539-0852

EIN : 99-0407768

Utah Business Registration : 575790-0140



Tech corner – Band conditions



Those of us who chase DX and are interested in making DX contacts are often interested in **band conditions**, because that's one of the most important factors that can determine a successful skywave contact.

The graphic of Solar-Terrestrial Data shown below is a quick glance of the current solar and geomagnetic conditions, which can determine ionospheric and other radio propagation, also known as band conditions. Created and produced by **Paul Herrman, NØNBH**, I refer to it as the **Band Conditions Banner**. Many of us have seen this on websites and Facebook group pages.

But it occurs to me that most of us find much of the information presented on the banner a little cryptic. While not all of the banner information is immediately relevant, this might help you to decipher some of the content, based on the field names it presents, grouped here more by function than appearance in the banner.

SFI (70 = poor / 160 = good / 280 = fabulous)

Solar Flux Index The SFI (62.5 to 300) is the amount of solar radio noise measured at 2800 MHz (10.7 cm). The SFI gives us an idea of how well the ionospheric F-Layer can support radio communication on HF, and more especially on 20 meters through 10 meters.

SN (2 = poor / 90 = good / 220 = fabulous)

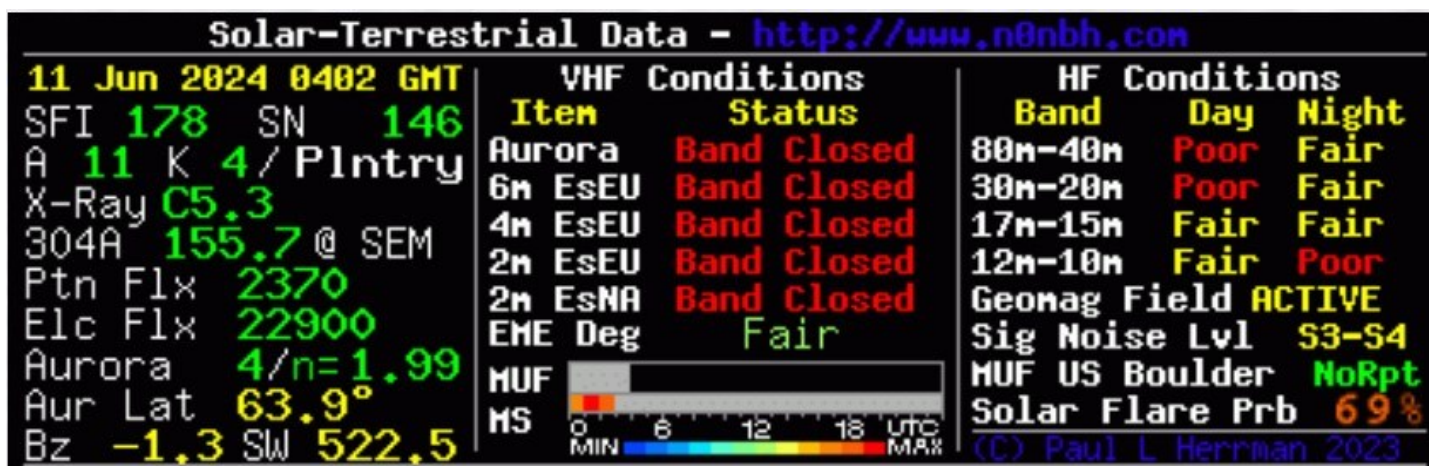
Sunspot Number The SN (0 to 250) is a calculation that is roughly 10 X the number of *sunspot groups facing us* + the number of *individual sunspots facing us*. The SN typically follows the SFI, and offers another indicator of F-Layer ionization.

304A (80 = poor / 150 = good / 240 = fabulous)

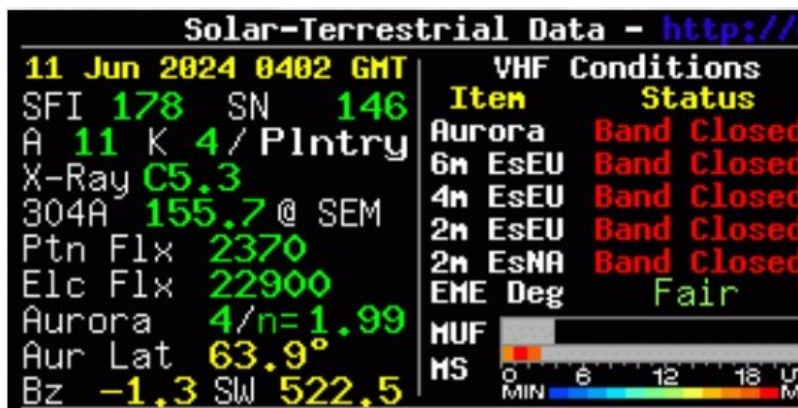
304 Angstroms The 304A is the relative strength of total solar radiation in the UV (ultraviolet) range, originating primarily from ionized Helium in the Sun's photosphere, and often follows the SFI value. The designation following the 304A value (@ EVE, @ SOHO, @ SEM) indicates the measuring instrument.

A PIntry (4 = calm / 40 = minor storm / 80 = severe storm)

A, planetary The Ap index is the daily average long-term stability of Earth's magnetic field, the subscript 'P' meaning planetary, or averaged from several locations around the earth. The value ranges from 0 to 400, with anything over 100 indicating unfavorable conditions for radio propagation.



Tech corner – Band conditions, cont'd



K PIntry (1 = calm / 5 = minor storm / 7 = severe)

K, planetary The Kp index is the daily average short-term stability of Earth's magnetic field, the subscript 'P' meaning planetary, or averaged from several locations around the earth. The value ranges from 0 to 9, with anything over 5 indicating unfavorable conditions for radio propagation.

Bz (20 = good / 2 = ok / -2 = not ok / -20 = disruptive)

B sub Z Interplanetary magnetic field vector (strength and direction) perpendicular to the plane of Earth's orbit, with positive values enhancing Earth's magnetic field and negative values canceling it.

X-Ray (A1.1 = good / C5.0 = moderate / X2.3 = severe)

X-Rays X-ray emissions most heavily impact the ionospheric D-Layer, such that the stronger the radiation, the lower the ability of radio waves to propagate by skywave refraction. The intensity of X-ray radiation striking the atmosphere, ranging from A0.0 to X9.9, is defined by a class (A, B, C, M, and X), followed by a logarithmic quantity (0.0 to 9.9) that defines the intensity within the class.

Ptn Flx (0.10 = good / 2.0 = moderate / 20.0 = heavy)

Proton Flux Density of protons in the solar wind, such that the higher the value, the greater the impact on the ionospheric E-Layer.

Elc Flx (<1000 = little impact / >1000 = heavy impact)

Electron Flux Density of electrons in the solar wind, such that the higher the value, the greater the impact on the ionospheric E-Layer.

SW (100 = good / 500 = moderate / 700 = disruptive)

Solar Wind Average speed of solar wind particles in km/s.

Aurora (1/n=1.99 : weak ... 6/n=0.8 : moderate)

Aurora Possibility Relative strength in GW of ionospheric F-Layer, affecting DX over polar regions, such that the stronger the ionization, the greater chance of aurora at lower latitudes.

Aur Lat (70 = weak / 60 = moderate / 50 = strong)

Aurora Latitude Lowest estimated latitude impacted by an aurora, in degrees N Latitude.

Tech corner – Band conditions, cont'd



VHF Conditions

The **VHF Conditions** column provides an idea of favorability for SSB operation in frequencies between roughly 50 MHz and 150 MHz. Except for Auroral Activity, the status for each applicable band reports how well Sporadic-E (Es) conditions over the particular continent support the band, and **Band Closed** for low or no activity. (EU = over Europe and NA = North America).

Aurora

Auroral Activity General report of the current Auroral activity, displayed as MID LAT AUR to indicate activity extended to between 30 and 60 degrees N Latitude, High LAT AUR to indicate activity confined to higher 60 degrees N Latitude, and Band Closed to indicate little or no Auroral activity.

MUF

Maximum Usable Frequency, Es The MUF, relative to Sporadic-E (Es), is the highest frequency that can be reliably used for skywave communication by Sporadic-E propagation. In this column, the banner displays the MUF as a colored bar for each VHF band: 6 m = blue, 4 m = green, 2 m EU = yellow, 2 m NA = red, and gray for no activity. The **SEASON BREAK** label indicates that Sporadic-E is not normally active this time of year.

MS

Meteor Scatter The Meteor Scatter activity bar shows relative meteor scatter activity for the times of the day listed in UTC, using the MIN...MAX color scale below it. The bar displays colors for the active times, and gray for no activity.

HF Conditions

The **HF Conditions** column is often where people glance first, to get an idea of the general propagation conditions across the HF bands, and is fairly self-explanatory. Each pair of bands is listed with a separate general condition report for daytime operation and nighttime operation, as **Poor**, **Fair**, and **Good**, compiled from other banner data. The subjective conclusions are based on the combined contributions of the Solar Flux Index, Sunspot Number, the 304A value, the Ap index, and the Kp index.

Geomag Field

Geomagnetic Field Relative label of the Earth's magnetic field activity, reflecting the Kp index. Labels include INACTIVE, VR QUIET, QUIET, UNSETTLD, ACTIVE, MIN STORM, MAJ STORM, SEV STORM, and EX STORM, in order of disruptive impact on radio propagation.

Tech corner – Band conditions, cont'd

Data - <http://www.n8nbh.com>

Conditions		HF Conditions	
Status	Band	Day	Night
Band Closed	80n-40n	Poor	Fair
Band Closed	30n-20n	Poor	Fair
Band Closed	17n-15n	Fair	Fair
Band Closed	12n-10n	Fair	Poor
Band Closed	Geonag Field	ACTIVE	
Fair	Sig Noise Lvl	S3-S4	
	MUF US Boulder	NoRpt	
	Solar Flare Prb	69%	

6 12 18 UTC MAX

(C) Paul L Herriman 2023



Sig Noise Lvl (S0 = great / S4 = fair / S7 = horrible)

Signal Noise Level The signal noise level is a logarithmic measurement (in 6 dB-increments, like you see on an S-meter) of the noise generated as a result of the solar wind, compared with the noise floor. The greater the disturbance in the solar wind, mostly due to interaction with Earth's magnetic field, the higher the S-value.

MUF US Boulder (14 = 20 to 10 no-go / 29 = 20 to 10 ok)

Maximum Usable Frequency From one of eleven locations worldwide, the highest frequency that can be reliably used for communication by skywave propagation. Normally listed in MHz, but also showing **NoRpt** if no info is available.

Solar Flare Prb

Solar Flare Probability A solar flare is a sudden burst of radiation, consisting of electrons, ions, and high energy electromagnetic radiation, over the surface of the Sun. This huge emission can reach Earth and strengthen ionization of the ionospheric D-Layer, absorbing radio signals and disrupting HF communication. The chance of a flare erupting on the solar surface gives you an idea of how much your HF communication might get disturbed by a solar storm in the next 24 hours.

Finally

Now you can impress your ham friends with your knowledge of the info presented on this cryptic banner. But maybe more importantly, you can glance at the info and get some idea of what to expect when you get on the radio, hoping the heavens will be in your favor.

Noji Ratzlaff KNØJI

Silent key– Ron Speirs K7RLS

Ron Speirs K7RLS, friend, teacher, and mentor, became a silent key on 22 September 2024.

Ron graduated from the University of Utah in Electrical Engineering and worked as an engineer at OEC Medical Systems with their fluoroscopic X-ray systems. He was an avid photographer who had his own dark room, and often developed his own photographs. Ron was a member of the Salt Lake Symphonic Choir, for which he played both piano and organ.

Although he was interested in amateur radio as a teenager, Ron didn't have any experienced friends or adults who could answer his questions or help him get started. Eventually, he got licensed in 1995 after a prodding from his son. Ron was perhaps best known as the *Microvolt* photographer, most recently as UARC Historian, and served occasionally as Net Control for the UARC Information Net. He was the local Extra Course instructor for many years, and was featured in the [Microvolt April 1999 issue](#). To many, he was the kind, helpful mentor everybody wanted to talk with.

Ron has been an institution at UARC. He has taught and elmered countless hams through formal classes and one-on-one mentoring. There is not much in the ham technologies with which Ron hadn't experimented and mastered. It was just a joy to spend time talking to Ron...he will be missed.

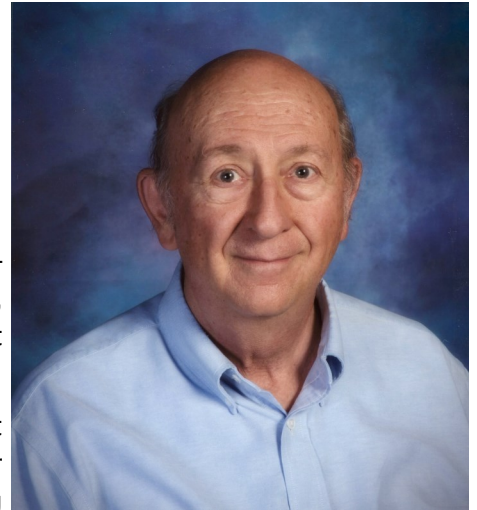
– Jeri Brummett WJ3RI

For many years, Ron was the photographer for the Microvolt. He used to always take pictures with his Minolta at Field Day, developed the slides at Field Day, Mount them, and then have a slideshow after the pot luck. He also took the photos for Member of the Month. He taught many hams and was just a delightful fellow.

– Brett Sutherland N7KG

Ron leaves behind his wife Judy and son Daland, along with a long legacy of friendship. You can read his obituary here : <https://starksfuneral.com/obituary/ronald-ron-leon-speirs/>

73, Ron. You'll be missed by so many.



Strays – Sunspots

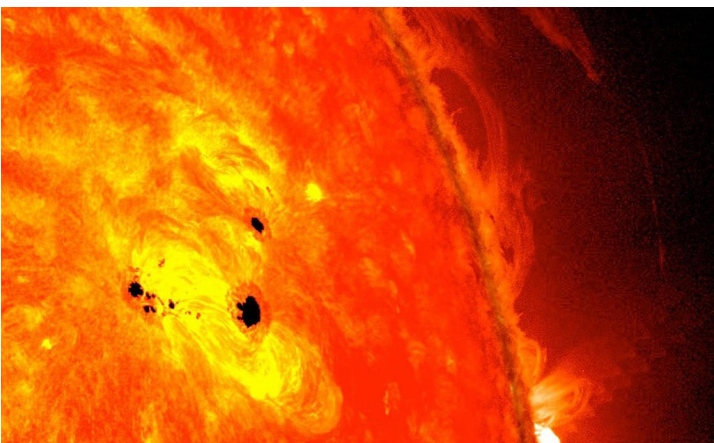
Every so often, we hear of one ham or another mentioning **sunspots**. What's so important about them that their reports are announced on nets, websites, and social media? I mean, you've likely been doing ham radio successfully for years without a care about sunspots.

Sunspots are large vent holes on the Sun's surface, through which hot plasma is released in huge quantities. They're so bright that you can't look at them with your unaided eye, but appear dark in photographs because of the heavy filtering. They're darker than their surroundings because their temperature is lower than that of the surrounding photosphere.

Sunspots also release huge quantities of UV (ultraviolet) radiation, some of which reach Earth. When the UV rays strike our atmosphere, they ionize the nitrogen (N_2) molecules into N_2^+ ions and electrons, forming an electrified spherical cloud called the **ionosphere** around the Earth. This atmospheric shell acts like the inside of a metallic reflecting bowl, off which radio waves can bounce, reaching far from the originating location, also known as *skip propagation*.

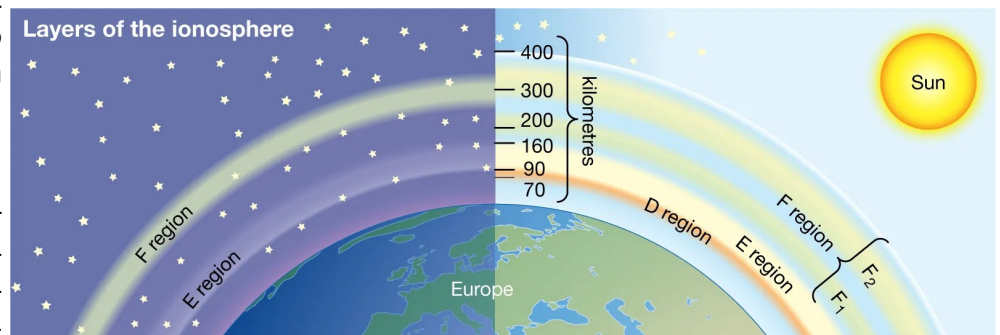
Eventually, the N_2^+ and e^- pair recombines, so new ions must be created constantly to sustain a reflective dome overhead. The more sunspots there are, the more UV radiation can reach Earth; and more UV radiation to the Earth means a stronger ionosphere. This is why hams keep track of sunspot activity. It's like keeping an eye on the Hawaiian surf, so you can know when to grab your board and shoot the curl.

In spite of the great benefit that sunspots provide



the amateur radio world, there is a downside. More sunspots can mean more solar flares, which can send increased amounts of charged particles to Earth in the solar wind, resulting in geomagnetic storms that can disrupt skip propagation.

Each sunspot has a lifetime of a few hours to a few days. Furthermore, some years the Sun produces more sunspots than in other years; in fact, the production of sunspots reaches a maximum approxi-



mately every eleven years, which we call the **sunspot cycle**.

During the daytime, lower-frequency signals, like those of 80 meters and 40 meters, do not possess the inherent ($E = hf$) energy to penetrate the ionospheric D layer, which is closer to the Earth's surface, and so are absorbed by that layer. 10-meter and 6-meter signals, on the other hand, do have sufficient inherent energy to penetrate the D layer, and will proceed to reach and bounce off the F2 layer, if the F2 layer is enhanced enough. And that enhancement can occur with a large outpouring of UV radiation, as a result of increased numbers of sunspots, in combination with the normal UV presented by the daytime Sun, allowing for worldwide propagation.