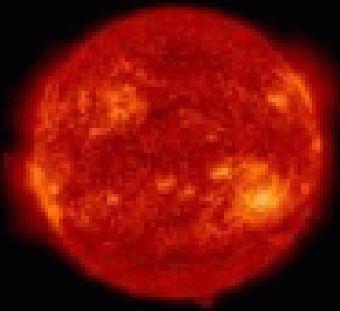


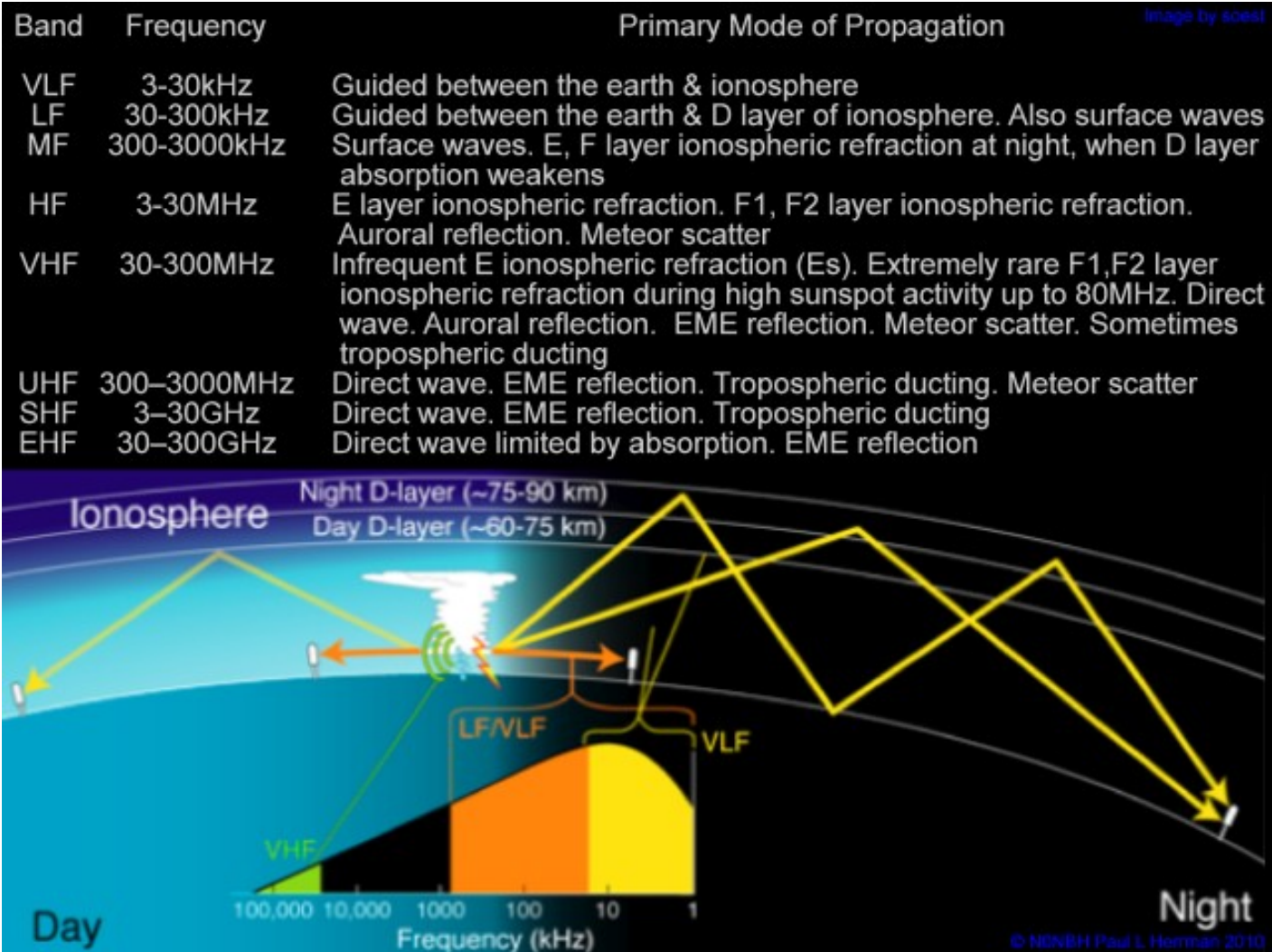
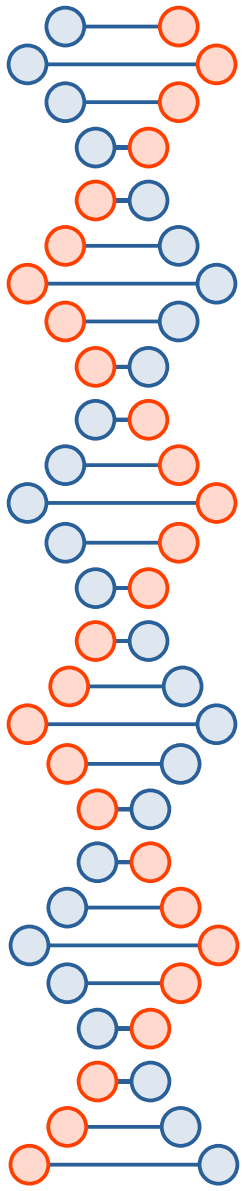
Understanding the HF Propagation Banner

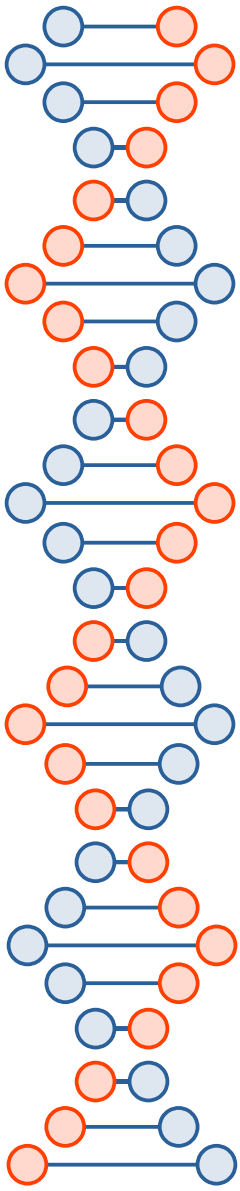
<https://www.hamqsl.com/>

Solar-Terrestrial Data - <http://www.n0nbh.com>

06 Jun 2024 1738 GMT		Current Solar	HF Conditions		
SFI	SN		Band	Day	Night
195	126		80m-40m	Poor	Good
A 7	K 1 / P1ntry		30m-20m	Poor	Good
X-Ray	C4.1		17m-15m	Good	Good
304A	165.0 @ SEM		12m-10m	Good	Poor
Ptn Fix	201		Geomag Field	VR	QUIET
Elc Fix	1710		Sig Noise Lvl	S0-S1	
Aurora	1/n=1.99				
MUF Boulder	NoRpt				
				(C) Paul L Herrman 2023	

Presented by:
Paul Reedy
KA5PMV





HF Conditions		
Band	Day	Night
80m-40m	Poor	Good
30m-20m	Poor	Good
17m-15m	Good	Good
12m-10m	Good	Poor

HF Conditions

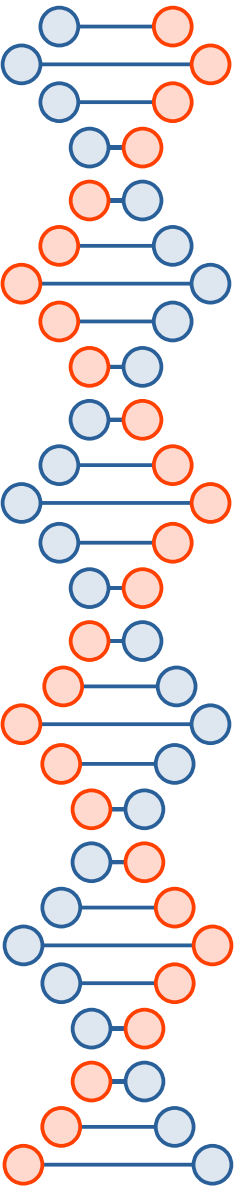
The HF Conditions column is often where people glance first, to get an idea of the general propagation conditions across the HF bands, and is fairly self-explanatory. Each pair of bands is listed with a separate general condition report for daytime operation and nighttime operation, as Poor, Fair, and 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. In general, here are what the three reports mean:

Good : Able to communicate with distant (DX) stations via multiple hops

Fair : Able to communicate with in-country stations via one or two hops at the most

Poor : Largely unable to communicate by skywave propagation



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Solar-Terrestrial Data
06 Jun 2024 0130 GMT
SFI 195 SN 193
```

The date and time UTC

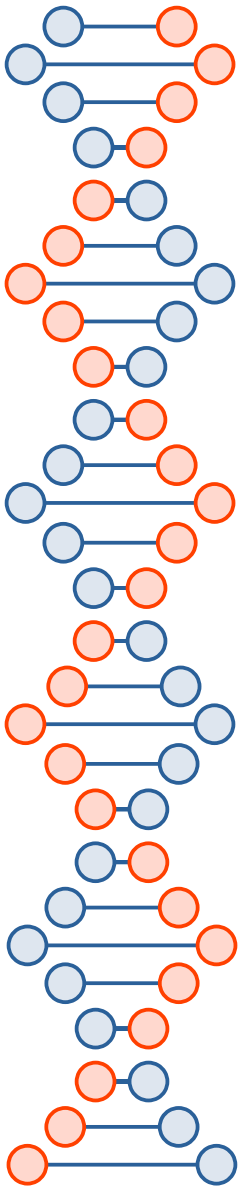
The displayed date and time represent the last time the banner was updated at the moment your browser was last refreshed, in GMT (Greenwich Mean Time), which today is called UTC. So, in the sample banner, the time equates to 06 Jun 2024 at 8:30 pm CST.

Solar Flux Index - SFI (70 = poor / 160 = good / 280 = fabulous)

The SFI (62.5 to 300), as mentioned in the previous issue of the UVARC Shack (Nov 2018, Brass Tacks), is the amount of solar radio noise measured at 2800 MHz (10.7 cm), and is updated daily. 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. Numbers below 75 are quite poor, while those above 160 are very good.

Sunspot Number - SN (2 = poor / 90 = good / 220 = fabulous)

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, and is updated daily. The SN typically follows the SFI, and offers another indicator of F-Layer ionization.



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

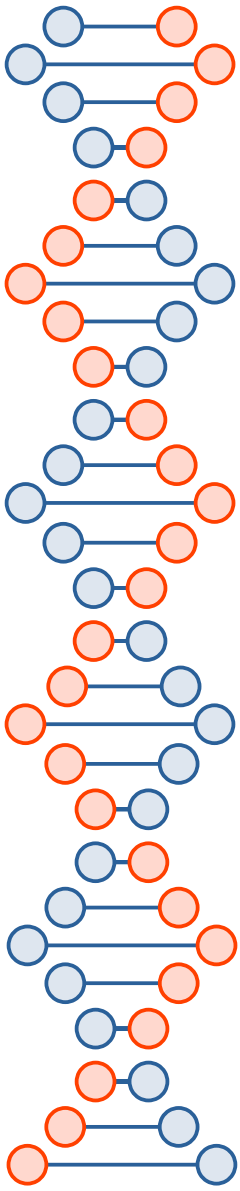
304 Angstroms The 304A (0 to unknown) is the relative strength of total solar radiation in the UV (ultraviolet) range, originating primarily from ionized Helium in the Sun's photosphere, and often follows the SFI value. The designation following the 304A value (@ EVE, @ SOHO, @ SEM) indicates the instrument used to take the measurement, and the value is updated hourly.

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

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, and is updated once daily.

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, and is updated once daily.



Geomag Field QUIET

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, and is updated every three hours.

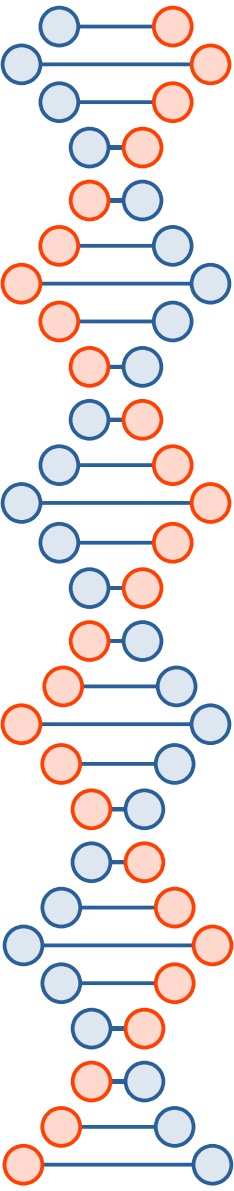
Bz 1.5 SW 372.8

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. Values range from 50 to -50, updated hourly.

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

Solar Wind Average speed of solar wind particles in km/s, with figures greater than about 500

impacting HF communication. Values range from 0 to 1000, updated hourly.



```
X-Ray: C4.3  
304A: 163.0 @ SEM  
Ptn Flx: 1490  
Elc Flx: 2020
```

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

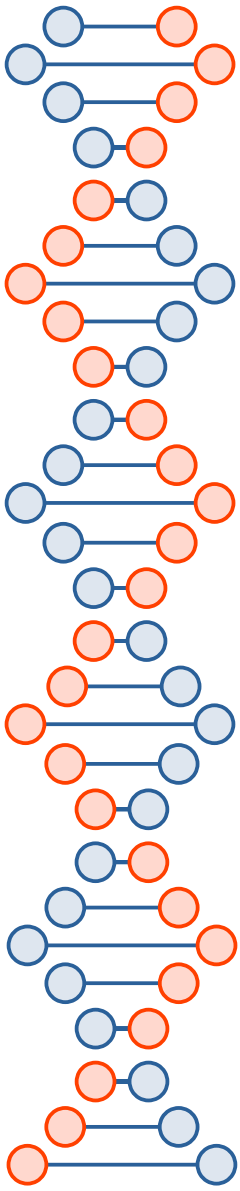
X-Rays X-ray emissions most heavily impact the ionospheric D-Layer, such that the stronger the radiation, the lower the ability of radio waves to propagate by skywave refraction. The intensity of X-ray radiation striking the atmosphere, ranging from A0.0 to X9.9, is defined by a class (A, B, C, M, and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

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. Values range from 0 to unknown, updated hourly.

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

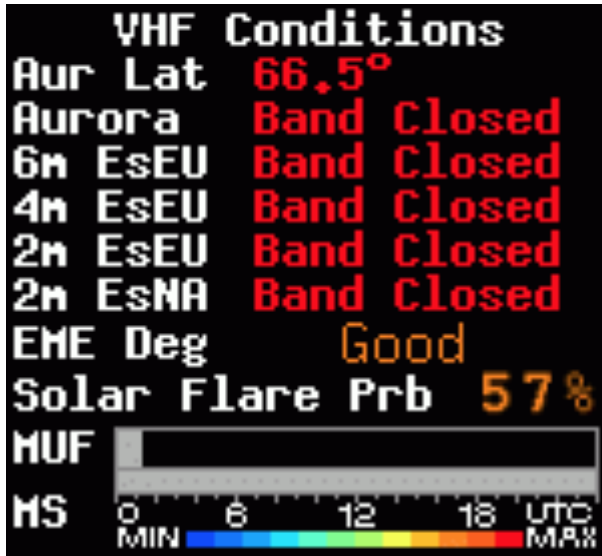
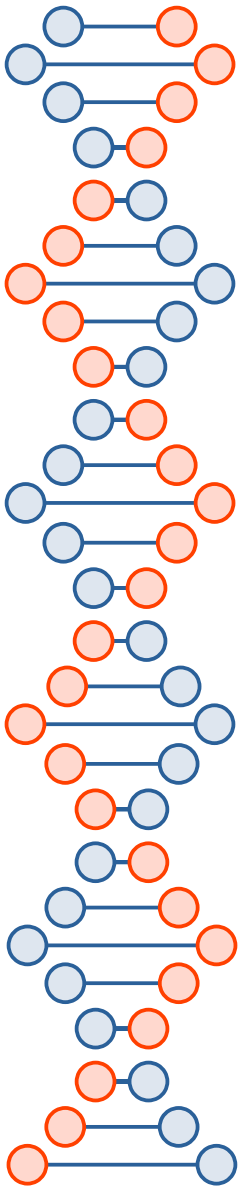
Electron Flux Density of electrons in the solar wind, such that the higher the value, the greater the impact on the ionospheric E-Layer. Values range from 0 to unknown, updated hourly



Aurora: $2/n=1.99$

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. If populated, values range from 0 to 10++ (over the normalization factor, such that $n < 2.0$ shows a high confidence, and $n > 2.0$ shows a low confidence), updated every 15 minutes.



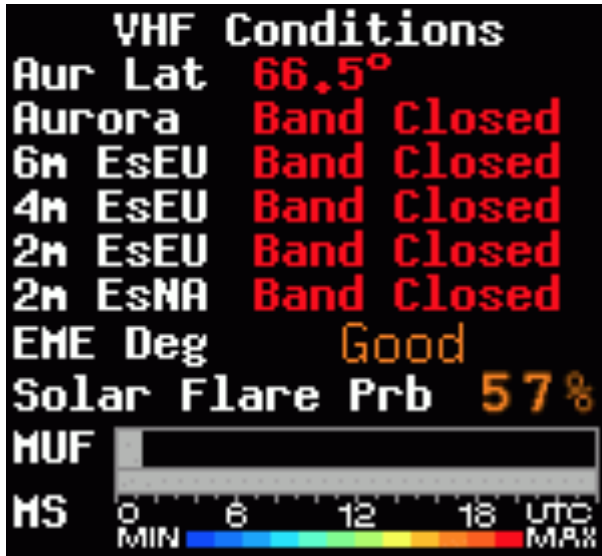
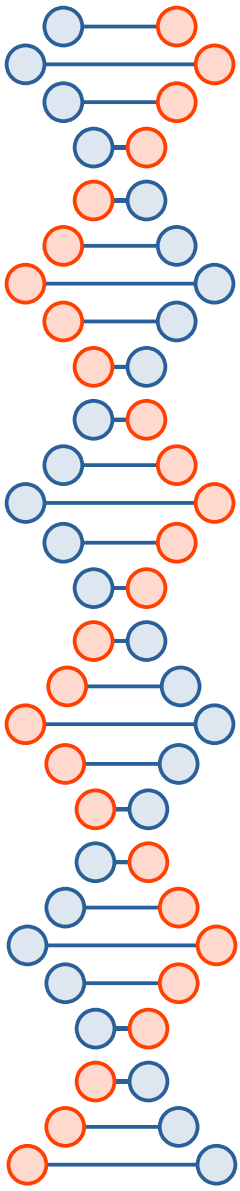
Aur Lat (70 = weak / 60 = moderate / 50 = strong)

Aurora Latitude Lowest estimated latitude impacted by an aurora, in degrees N Latitude. Values range from 67.5 to 45.0 or No Report, updated every 15 minutes.

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, updated every 30 minutes.

These reports don't mention anything about ducting, because tropospheric propagation by ducting is primarily a weather effect, and not directly predictable by solar measurements.



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

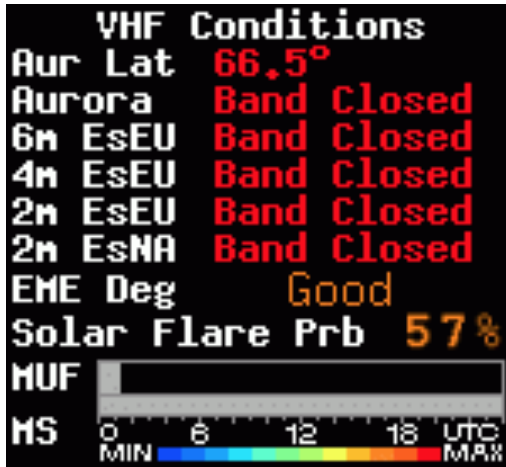
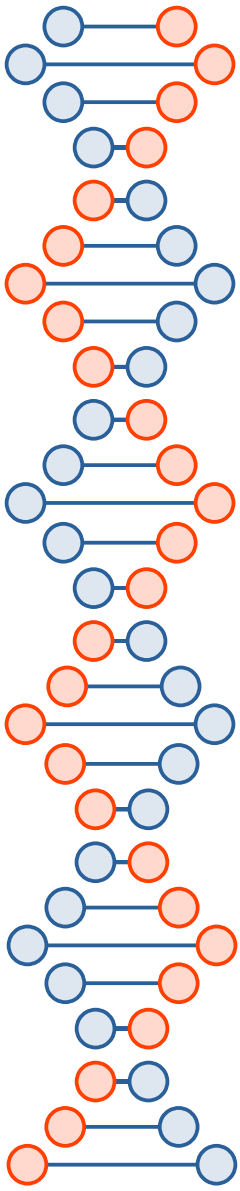
Auroral activity, updated every 30 minutes.

6m EsEU - 6-meter Activity, Es over Europe 50MHz ES indicates 6 meters is open for Es.

4m EsEU - 4-meter Activity, Es over Europe 70MHz ES indicates 4 meters is open for Es.

2m EsEU - 2-meter Activity, Es over Europe 144MHz ES indicates 2 meters is open for Es, or High MUF to indicate conditions support 2 meter Es propagation.

2m EsNA - 2-meter Activity, Es over North America 144MHz ES indicates 2 meters is open for Es, or High MUF to indicate conditions support 2 meter Es propagation



EME Deg

Earth-Moon-Earth Degradation Measurement of the best Earth-Moon-Earth (Moonbounce)

propagation path attenuation, displayed as Very Poor (high attenuation), Poor, Fair (medium

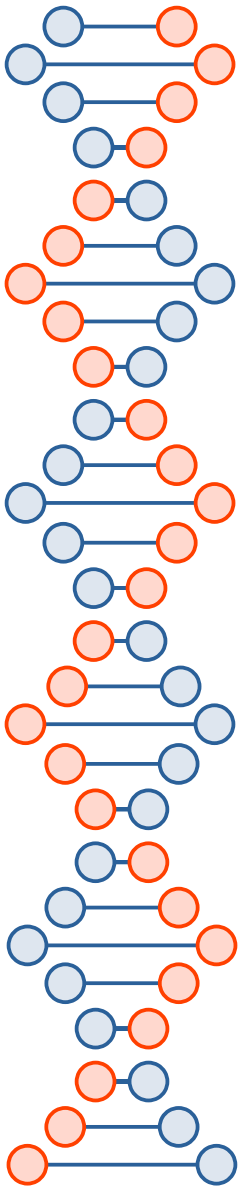
attenuation), Good, and Excellent (little attenuation), updated every 30 minutes.

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, updated every 30 minutes. 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, updated every 15 minutes.



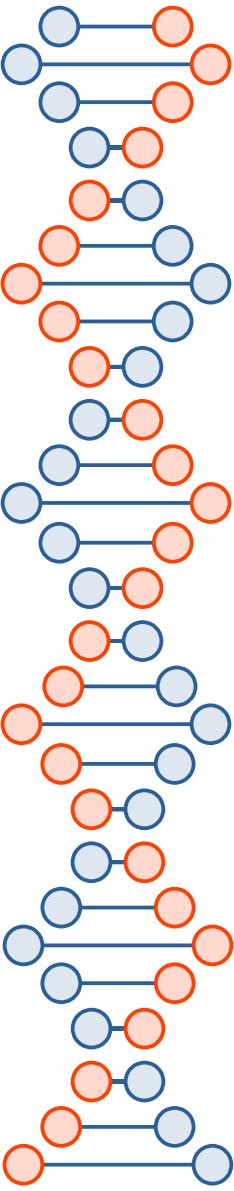
```
Geomag Field QUIET  
Sig Noise Lvl S1-S2  
MUF US Boulder NoRpt  
Solar Flare Prb 57%
```

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, and is updated every 30 minutes.

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, and is updated every 15 minutes.

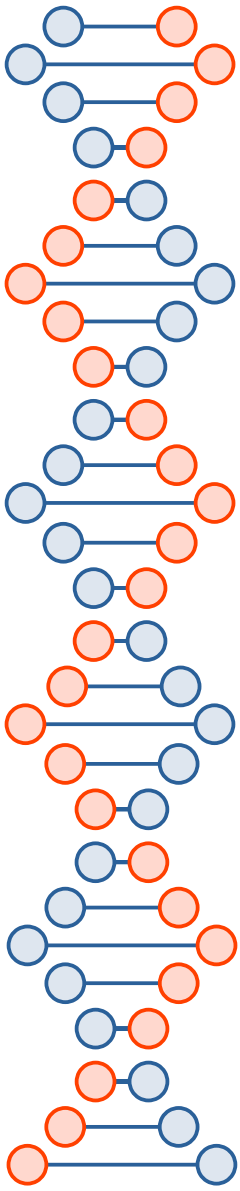


```
Geomag Field QUIET
Sig Noise Lvl S1-S2
MUF US Boulder NoRpt
Solar Flare Prb 57%
```

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, and the value is updated hourly.

After all of this... Get On The Air
(Conditions are always changing)





More information from:

<https://www.hamqsl.com>

<https://noji.com/hamradio/pdf-ppt/noji/Noji-Article-Band-Conditions-Banner.pdf>