

High Frequency / HF Radio Solar Information

Category	Radio Blackouts X-Ray	Solar Radiation Storms Proton Flux	Geomagnetic Storms K-Index K-nT Aurora (Aur) Solar Wind (SW) Bz	Electron Alert Electron Flux
Extreme	X20 Flare (Average 1 per cycle) Complete HF blackout on entire sunlit side lasting hours	1,000,000 (Average 1 per cycle) Complete HF blackout in polar regions	K=9 nT=>500 Aur=10++ SW=>800 Bz=-40 to -50 (Average 4 per cycle) HF impossible Aurora to 40° Noise S30+	>1000 Alert Partial to complete HF blackout in polar regions
	X10 Flare (Average 8 per cycle) HF blackout on most of sunlit side for 1-2 hours	100,000 (Average 3 per cycle) Partial HF blackout in polar regions	K=8 nT=330 to 500 Aur=10+ SW=700 to 800 Bz=-30 to -40 (Average 100 per cycle) HF sporadic Aurora to 45° Noise S20-S30	
	X1 Flare (Average 175 per cycle) Wide area HF blackout for about an hour on sunlit side	10,000 (Average 10 per cycle) Degraded HF propagation in polar regions	K=7 nT=200 to 330 Aur=10 SW=600 to 700 Bz=-20 to -30 (Average 200 per cycle) HF intermittent Aurora to 50° Noise S9-S20	
Moderate	M5 Flare (Average 350 per cycle) Limited HF blackout for tens of minutes on sunlit side	1,000 (Average 25 per cycle) Small effects on HF in polar regions	K=6 nT=120 to 200 Aur=9 SW=500 to 600 Bz=-10 to -20 (Average 600 per cycle) HF fade higher latitudes Aurora to 55° Noise S6-S9	>1000 Alert Partial to complete HF blackout in polar regions
	M1 Flare (Average 2000 per cycle) Occasional loss of radio contact on sunlit side	100 (Average 50 per cycle) Minor impacts on HF in polar regions	K=5 nT=70 to 120 Aur=8 SW=400 to 500 Bz=0 to -10 (Average 1700 per cycle) HF fade higher latitudes Aurora to 56° Noise S4-S6	
Active	C1 Moderate Flare Low absorption of HF signals	10 Active Very minor impacts on HF in polar regions	K=3 to 4 nT=20 to 70 Aur=6 to 7 SW=200 to 400 Bz=0 to +50 Unsettled/Active Minor HF fade higher latitudes Aurora 60° - 58° Noise S2-S3	<10 Normal No impacts on HF
Normal	A1-B9 Nil / Small Flare Negligible impact to HF signals	1 Normal Negatable or no impact	K=0 to 2 nT=0 to 20 Aur=<5 SW=200 to 400 Bz=0 to +50 Inactive/Quiet No impacts on HF Aurora 67° - 62° Noise S0-S2	<1 Normal No impacts on HF

HF Band Opening Solar Flux (SN)
200 to 300 (SN=160 to 250) Reliable communications on all bands up through 6m Subjective: Reliable and widespread HF communication on several bands at many points during the day and night.
150 to 200 (SN=105 to 160) Excellent conditions all bands up to 10m+ Subjective: Excellent HF communication conditions most of the time. All HF bands regularly open for good communication.
120 to 150 (SN=70 to 105) Fair to good conditions all bands up through 10m Subjective: Good HF band conditions much of the time. Only modest equipment is needed to establish DX communication.
90 to 120 (SN=35 to 70) Fair conditions all bands up through 15m Subjective: Good band conditions with only higher bands absent. Pick the best time of day and band to operate.
70 to 90 (SN=10 to 35) Poor to fair conditions all bands up through 20m Subjective: Band selection and time of day become more critical to establish meaningful worldwide communication.
64 to 70 (SN=0 to 10) Bands above 40m unusable Subjective: HF communication, especially worldwide is limited. Only lower HF bands are open and only at specific times.