Amateur Radio Bands and Propagation

Band (meter)	Frequency (MHz)	Use (band conditions vary for many reasons)
160	1.8 – 2.0	Night
80	3.5 – 4.0	Night and Local Day
40	7.0 – 7.3	Night and Local Day
30	10.1 – 10.15	CW and Digital
20	14.0 – 14.350	World-wide Day and Night
17	18.068 – 18.168	World-wide Day and Night
15	21.0 – 21.450	Primarily Daytime
12	24.890 24.990	Daytime During Sunspot Highs
10	28.0 – 29.7	Daytime During Sunspot Highs
6	50 – 54	Local to World-wide
2	144 – 148	Local and Medium Distance
70 cm	430 – 440	Local

The ionosphere is a layer in the Earth's atmosphere that lies in a range of 80 to 300 miles above the Earth's surface that reflects radio waves. As the sun shines on the ionosphere it changes composition and height, which affects the propagation characteristics. In general signals below 30 MHz bounce off this layer and return to Earth while signals above 30 MHz go through the layer into outer space. Radio signals that are bounced or refracted off the ionosphere are also affected by the time of day and season of the year.

During the 24-hour cycle the ionosphere changes in height above the Earth and bounces some signals while absorbing others. During the day the higher frequencies (above 10 MHz) tend to propagate while lower frequencies are absorbed. At night the reverse happens. There are many exceptions to this but it is a good general guideline.

Seasons also affect propagation. Summertime in the northern hemisphere means that higher frequencies have better propagation while in the winter the lower frequencies improve. An interesting time of the year for propagation is when the seasons change from fall to winter and from winter to spring. This is often when the best DX can be found. Because the seasonal change is occurring in both hemispheres but in the opposite direction DX from North American to Australia or southern Africa can be at its best.

Another phenomenon that affects radio propagation is the 11-year sunspot cycle. A peak occurred during the year 2000 and the next peak will occur around 2011. A sunspot low occurs at the midpoint of this cycle. When the sunspots are at their maximum propagation is at its best. At this time the higher shortwave frequencies exhibit the best propagation extending to 6 meters, which becomes quite popular during this time of the cycle. 10 meters can easily work stations worldwide with low power (even qrp) and a modest antenna.