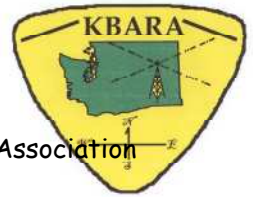




KBARA GAZETTE



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KBARA, PO Box 30801, Spokane WA 99223-3013

Grayline Propagation

by John, W7OE

What is grayline propagation? Grayline propagation occurs near sunrise or sunset and allows for enhanced propagation due to unique changes in the ionosphere. As you SHOULD know, the ionosphere consists of several layers. For the purpose of this discussion, I will refer to the D and F layers. During the daytime, the D layer, which consists of relatively closely spaced ions, builds in density and tends to absorb low frequency signals. The low frequency signal must be at a relatively high angle to break thru the D layer (about 50 miles above the earth) to get to the higher F layer and



be reflected back to earth. Low angle signals are absorbed and do not travel to the reflective F layer. Hence propagation is shortened on the low bands during the day. The higher bands are shorter in wavelength and the molecular density of the D layer has less of an effect on these bands (20 meters and higher). That is why propagation is great during the day on the higher bands. At nighttime, the D layer is reduced in density so the low-frequency signals can escape the D layer at low angles, and hence, longer distance propagation is possible on the low bands. Paradoxically, the F layer is often too thin to sustain nighttime propagation on the



higher bands. The F layer, which can be several hundred miles above Earth, also consists of ionized particles. The F layer increases in density during the daytime and propagation would be enhanced on the low bands if the low-angle signals could break thru the D layer instead of being absorbed during daytime. Fortunately for DXers, at sunrise the F layer builds up while the lower D layer is still in the earth's shadow. At sunset, the F layer is still being enhanced by the sun while the D layer dissipates in the Earth's shadow. This is the Grayline Effect. Propagation is enhanced anywhere

along the terminator. On 40 meters especially, stations can often be heard both long path and short path during sunrise and sunset. Even on 80 meters, I have worked Europe and Africa via Long Path Propagation. Sometimes I have heard my own signal going around the world on full-break-in C.W. There is also enhanced propagation perpendicular to the terminator (i.e. to the west during sunrise). The first hop is perpendicular to the terminator and takes advantage of the enhanced F layer while the D layer is still dormant. This effect is especially prominent on 160 Meters. March 14, 2010 I worked BU2AQ in Taiwan on 160 Meters. I could not hear him until 30 minutes before sunrise, he was copyable 15 minutes before sunrise and I called and worked him 3 minutes before sunrise with a 559 report both directions. His signal disappeared into the noise 15 minutes past sunrise. This is the Dxcitement experienced on the Low Bands during Grayline, and even a caveman can do it.



KBARA 2009 Holiday Luncheon
Longhorn BBQ Restaurant
Spokane
Photos
By Betsy, N7WRQ

VHF Contesting by Mark, K7HPT

Why?

Why compete in a radio contest? Probably for the same reason that people play golf, fish or play bridge...for the fun of it. We get to see new places, meet interesting people, try out our equipment and hone our operating skills. That's important, because this mobile contest station can be quickly and easily converted to emergency service use, providing crucial communications support to law enforcement and emergency response teams when and where disaster strikes. What we learn about our equipment and operating techniques during a contest may make a critical difference in an emergency.

What is a Weak Signal "Rover"

In the VHF and up contest world the term "Weak Signal" does not imply QRP (low power). You could be running a kilowatt or more. A weak signal contact could be line of sight, sporadic "E" propagation, bounced off the moon, or the underside of an airplane, meteor showers or a mountain. Stations in Western Washington and Western Oregon point their beams at Mt. Rainier or Mt. Adams to bounce their signals to Eastern Washington in order to make those rare contacts with us. While most contestants operate from fixed



locations at home, there is a "Rover" class for mobile stations such as this one that move from location to location. In VHF/UHF and microwave contests, only one contact per band is allowed with another station unless at least one of them moves to a different Maidenhead Grid location (see below). Rover stations like mine must operate from at least two different grids during a contest; most cover four or more grids during the contest period. Because of limited Ham population in our part of the state, Rovers are very popular with the stations on the coast but you must go up in elevation "Mountain Topping" to make contacts with distant stations.

Maidenhead Grids

Knowing the precise location of another VHF/UHF or microwave station is especially useful in aiming antennas, which on these higher frequencies are very directional. Approximately 30 years ago, European VHF and UHF amateur radio operators, meeting at Maidenhead, England, adopted a worldwide location-designation system. The Maidenhead Grid System divides the world, whether land mass or ocean, into rectangular grids. They're not really "squares" even though they are commonly referred to as "grid squares". Latitude and longitude lines are used to form the boundaries. Each grid is one degree of latitude and by two degrees of longitude, and is identified by a unique, four-character alpha-numeric designation. The Pacific Northwest is in the CN field, so common grid designators are in the CN70, CN80 or CN90 series. Farther east in Washington and Oregon, you will encounter the DN00 and DN10 series. Some examples: Spokane is DN17, Colfax, DN16, Colville DN18. With only short moves; I can operate from four different grids. Portland falls just inside CN85; Eugene straddles CN83 and CN84; and Medford is in CN82. Seattle is in CN87 and Vancouver BC is in CN89.

How do I know where I am?

For rover stations like this one, identifying the correct Maidenhead Grid locator is critical. Some rovers use detailed maps; however, many of us now also use Global Positioning System (GPS) receivers to pinpoint our exact location. With a system of orbiting

satellites overhead, the GPS unit can show the location within a few feet! Some of the more popular units even read out the position directly in the Maidenhead Grid system.

What kind of radios are we using?

My station uses a pair of transceivers and a transverter, an Icom IC-7000 for 6 meters and a transverter that converts 10 meters to 222cm, and an Icom IC-910H that covers 2 meters, 432cm and 1296cm. To get started you can often find an Icom 706 with 6 and 2 meters and 432cm for less than \$500 on Ebay. The 6 and 2 meter bands are VHF. 1 $\frac{1}{4}$ meter (222 MHz) and 70cm (432 MHz) are UHF and 23cm (1296 MHz) is Microwave. Some of the guys are regularly making contacts on bands as high as 10 GHz! With good conditions you can work EME (Earth Moon Earth) contacts with 100 watts a good yagi and your radio connected to the sound card of your PC running free software called JT65. The power levels I run range from 60 watts on 1296 MHz to 400 watts on the VHF bands. Most transmissions are done in the single-sideband voice mode; however, we also use FM, CW (Morse code) and Digital (PSK31, RTTY, JT65) when needed. Note that contacts made through a repeater system do not count. Two types of antennas are used. The loops cover the lower bands and are used primarily while traveling. They provide moderate gain and are essentially omni-directional. When stopped, we set up a small mast in the trailer hitch receiver mount for three or four high-gain Yagi antennas. An additional front mount supports additional Yagi antennas. All my antennas are manufactured by a company called M2 Inc. 3 elements for 6 meters, 9 elements for 2 meters, 10 elements for 222 MHz and 28 elements for 432 MHz. On 1296 MHz I use a pair of 22 element antennas phased together. These antennas provide much higher gain than the loops and are quite directional, allowing us to work over much longer distances. Contacts are logged on paper or a laptop computer running special software and then turned into the sponsoring organization after the contest is over. You do not have to be in the contest or have an all mode radio to help a contestant make points. All you have to do is make a simplex call to a contestant and he will get credit for it. (Hint... my next contest will be June 12th - 14th) If you would like to know more about this fun activity, contact Mark; K7HPT, John; W7OE or the Pacific North West VHF Society at www.pnwvhfs.org



Thanks to Jim, W7DHC for parts of this article.

KBARA REPEATER FUND MEMBERS 2009-2010

We wish to thank the following contributors for their very generous donations to our Repeater Fund.

Bronze Membership \$1-\$20

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Ed Johnson & Juanita Johnson

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KBARA CAMPOUT/ANNUAL MEETING

MARK YOUR CALENDARS

This year our KBARA campout will be at

KETTLE FALLS LOCUST GROVE GROUP SITE

just outside of Kettle Falls, WA

on the Columbia River, July 15th through the 18th. For more info contact markvanwinkle@comcast.net & <http://www.kbara.org/>

Please remember to renew your membership for 2010

Name _____

Call Sign _____

Address _____


City/State _____ Zip _____

Telephone _____ Amount Paid _____

E-Mail _____ ARRL Member? _____

Would you rather receive the newsletter via computer, instead of receiving it in the mail? YES NO

Dues are a minimum of \$15.00 per year for individuals and \$20.00 for a family (all must be living at the same address), but any amount will be greatly appreciated. Dues are due January of each year. If they are paid between September 1 - December 31, they will be applied through the entire following year. And any additional amount will be gratefully accepted to the Repeater Fund. To support KBARA, please send your contributions to: **KBARA, PO Box 30801, Spokane WA 99223-3013** Please visit our KBARA website for more information: <http://www.kbara.org>



KBARA Membership / Support Information The KBARA repeater system consists of several privately owned linked Amateur Radio repeaters. It covers an area from northeastern Washington to northeastern Oregon, and from western Montana to central Washington. The KBARA system is also part of the Evergreen Intertie, an interconnected group of repeaters located in western Washington and Oregon. The primary purpose of the KBARA repeaters is to provide a means for emergency communications within the above areas, and secondarily for routine radio traffic. It makes possible a single system of mobile communications coverage, extending the limited range provided by any single repeater operation. The KBARA FM repeaters operate in the VHF bands and are linked by UHF radios. The repeaters' frequencies, call signs, locations and owners are as follows:

KB7ARA REPEATERS

- 146.74 W7HFI** Kamiak Butte, near Pullman, WA, owned by Bob, W7HFI, John, W7OE, & KBARA, KB7ARA
- 147.02 K7HPT** Lookout Pass on I-90 on the Idaho-Montana border, owned by Mark, K7HPT, & John, W7OE
- 147.28 KD7DDQ** Pikes Peak in the Blue Mountains, SE of Walla Walla, WA, owned by Ken, KD7DDQ & Mark K7HPT
- 147.36 N1NG** Stensgar (Stranger) Mountain, near Chewelah, WA, owned by Mike, N1NG, & John, W7OE
- 147.38 W7OE** Mica Peak, east of Spokane, WA, owned by John, W7OE
- 223.90 AK2O** Stensgar (Stranger) Mountain, near Chewelah, WA, owned by Karl, AK2O
- 444.35 N1NG** Mica Peak, east of Spokane, WA, with a 192.8 Hz tone, owned by Mike, N1NG
- 53.750 N7ZUF** Kamiak Butte, near Pullman, WA, owned by KBARA, KB7ARA
- IRLP Node #3957 N1NG** South Hill of Spokane, WA, owned by Mike, N1NG

All licensed Amateur Radio operators are welcome to use this open repeater system. Your support would also be greatly appreciated.

Please visit these websites for more information: <http://www.kbara.org> and visit <http://groups.yahoo.com/group/evergreenintertie>

<p>To support KBARA, please send your contributions to:</p> <p style="text-align: center;">KBARA, PO Box 30801 Spokane WA 99223-3013</p>	<p>Annual support is \$15 per calendar year for a single membership and \$20 for a family membership. Dues are due in January of each year and if paid between September 1 and December 31, they will be applied through the entire following year. Also, any contribution will be gladly accepted to the Repeater Fund.</p>
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KAMIAK BUTTE AMATEUR REPEATER ASSOCIATION

PO Box 30801
Spokane WA 99223-3013