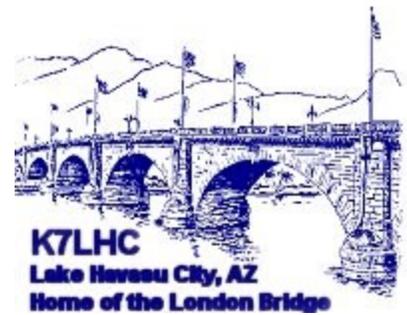


STATIC



October 2013

WORKING THE GRAY LINE

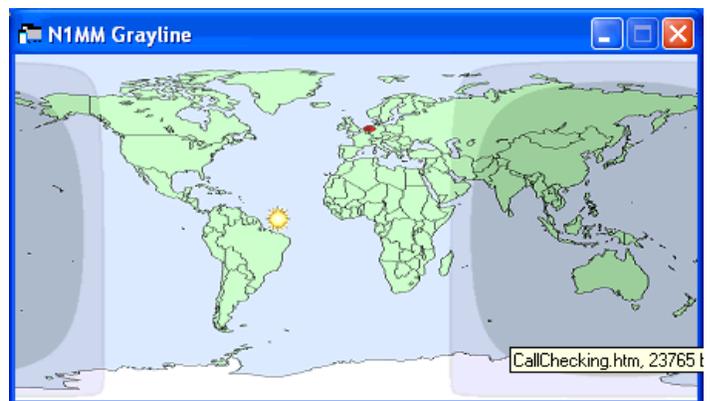
Paul Harden, NA5N

For those of you new to a solar cycle, an interesting form of working DX is called "working gray line." This simply means working 15m or 10m during twilight hours. *[Take notes, this is on the exam!]*

Here's what happens:

During the day, solar radiation collides with the molecules in our ionosphere, ripping off electrons. These electrons are called "free electrons" because they are not attached to an atom or molecule. All of these free electrons cause the density of the ionosphere to increase. The more dense the ionosphere, the higher the frequency that is reflected back to earth. Our electron density is what determines the maximum usable frequency (MUF), and the action of solar radiation separating electrons from the molecules is called *ionization*.

During the day, solar radiation causes ionization to stratify, that is, to form distinct layers. The layer closest to the earth is called the D-Layer. It does not reflect signals generally, but does absorb some of the energy, and hence the D-Layer is often called the "absorption layer." Higher up in our ionosphere, we find the E- and F-Layers. These layers *do* reflect the signals back to earth if they are below the MUF, and is exactly what causes "skip propagation." So during the day, the sun is ionizing the D, E and F layers (there are actually two F layers, called F1 and F2). Your 10m signal must travel through the D-Layer, getting attenuated, then bounces back from the E or F layer to some exotic DX spot, passing through the D-Layer for more absorption again. But since solar radiation has to travel the farthest to get the D-Layer, absorption is usually fairly minimal. So far, during the middle of the day, we have moderate absorption, and good skip propagation.



AT SUNDOWN ... solar radiation no longer strikes our ionosphere right above our heads, and ionization stops. This means there is no solar radiation to form free electrons. In fact, without this solar radiation, these free electrons tend to get attracted back to recombine with their host molecules. This is called "recombination" (gee, how original!). Recombination, when it starts to get dark, causes the electron density to go down, forcing the MUF to go down as well, which is why by total darkness, 10m (and a bit later 15m) are completely dead. The MUF is far below 28 MHz.

(continued page 3)

LBARA MEETING SCHEDULE

MONTH	BOARD	REGULAR
OCT	NOTE: BOARD	10/17
NOV	MEETINGS WILL NOW	11/21
DEC	TAKE PLACE ONE	12/19
JAN	HOUR PRIOR TO THE	1/16
FEB	REGULAR MEETING	2/20

ZL8R

RAOUL ISLAND, KERMADEC

The October program presents a great video of the 2006 DXpedition to Raoul Island by the Micro-lite Pengins. This amazing group of hams were able to produce over 40,000 QSO's in 8 days.....using only six brand new ICOM IC-7000 transceivers into simple wire dipoles strung in the surrounding pine trees.



System	Location	Freq	Offset	PL
MCARS	Bullhead City	145.27	-	131.8
	Kingman	146.76	-	131.8
	Kingman	448.25	-	131.8
	Lake Havasu	146.62	-	131.8
	Willow Beach	147.12	-	131.8
CRRA	Lake Havasu City	146.96	-	162.2
	Lake Havasu City	224.24	-	156.7
	Lake Havasu City	146.64	-	156.7
	Lake Havasu City	449.95	-	141.3
BARN	Lake Havasu City	447.54	-	136.5
	Las Vegas, NV	449.95	-	136.5
	Onyx(Palm Springs)	449.34	-	136.5
	Orange County, CA	447.54	-	100



(continued from page 1)

WORKING THE GRAY LINE

The D-Layer is the *first* layer where ionization stops, since the sunlight no longer reaches near the surface of the earth, but is still illuminating (and ionizing) the ionosphere far above our heads. (For the same reason, we can see satellites pass overhead in the early evening ... it's dark on the ground, but the satellites are still being illuminated.) As the D-Layer goes into recombination, the electron density goes down, and the absorption does down. This is why signals appear stronger at night, because there is less absorption by the D-Layer at night.

BUT DURING TWILIGHT ... OR IN THE "GRAY LINE" ... the D-Layer suddenly causes little absorption to signals passing through it, while the E and F layers are still being ionized by sunlight. This makes for about 45-60 minutes of interesting operating, *especially for QRPers* (low power operators). There is almost no signal attenuation, but the MUF is still very high, so long-distance skip is still possible. However, when the sun quits illuminating the E and F layers, the MUF can drop dramatically ... sometimes with only a few minutes of warning, sometimes between heartbeats. So when you establish a contact, get the QSL info fast!

One other advantage of gray-line DX is that your signals tend to reflect off the edge of the ionized portion of the upper layers. This means propagation will often be in a southerly direction, bouncing along the shadow, or terminator, between sunlight and darkness. This is good for working into South America and the South Pacific. Your signals can also bounce northward along the terminator, bending around the pole, and down the *morning terminator* across eastern Europe, the Middle East, and into Africa (depending on the time of year). So gray-line DX also affords an opportunity to work portions of the world not usually accessible during the day, where propagation tends to be more east-west circuits.

The same principles apply at sunrise. The upper ionosphere begins to become ionized, while the D-Layer is still dark and offers low absorption, although, the MUF in the morning generally does not support propagation on 10m, so most people enjoy gray-line work on 20m or 15m (if open). Morning gray line can even be eventful on 80m and 40m, due to the low absorption before the sun starts heating the D-Layer.

And remember, 10m and 15m (and often down to 30m) are *not* generally bothered by a geomagnetic storm. So even during major geomagnetic storms, the higher bands may be open and fairly quiet. And even if a bit noisy, the short period of gray-line operating can still produce a couple of good QSO's.

Hope this helps to explain the "gray line" phenomenon, and hope it helps you snag a few new ones.

AMAZINGLY SIMPLE HOME REMEDIES (That Really Work!)

AVOID CUTTING YOURSELF WHEN SLICING VEGETABLES BY GETTING SOMEONE ELSE TO HOLD THE VEGETABLES WHILE YOU SLICE.

AVOID ARGUMENTS WITH THE FEMALES ABOUT LIFTING THE TOILET SEAT BY USING THE SINK.

FOR HIGH BLOOD PRESSURE SUFFERERS ~ SIMPLY CUT YOURSELF AND BLEED FOR A FEW MINUTES, THUS REDUCING THE PRESSURE ON YOUR VEINS. REMEMBER TO USE A TIMER.

A MOUSE TRAP PLACED ON TOP OF YOUR ALARM CLOCK WILL PREVENT YOU FROM ROLLING OVER AND GOING BACK TO SLEEP AFTER YOU HIT THE SNOOZE BUTTON.

IF YOU HAVE A BAD COUGH, TAKE A LARGE DOSE OF LAXATIVES. THEN YOU'LL BE AFRAID TO COUGH.

YOU ONLY NEED TWO TOOLS IN LIFE - WD-40 AND DUCT TAPE. IF IT DOESN'T MOVE AND SHOULD, USE THE WD-40. IF IT SHOULDN'T MOVE AND DOES, USE THE DUCT TAPE.

IF YOU CAN'T FIX IT WITH A HAMMER, YOU'VE GOT AN ELECTRICAL PROBLEM.

THE HANDYMAN'S GUIDE TO SOLAR/GEOMAGNETIC CONDITIONS

by Paul Harden, NA5N

GEOMAGNETIC INDICES AND CONDITIONS (Kp and Ap Indices)

Kp Index	Ap Index	GEOMAGNETIC FIELD CONDITIONS	HF NOISE	AURORA
0	0 - 2	Very Quiet	S1-S2	None
1	3 - 5	Quiet	S1-S2	Very Low
2	6 - 9	Quiet	S1-S2	Very Low
3	12 - 18	Unsettled	S2-S3	Low
4	22 - 32	Active	S3-S4	Moderate
5	39 - 56	MINOR Storm	S4-S6	High
6	67 - 94	MAJOR Storm	S6-S9	Very High
7	111 - 154	SEVERE Storm	S9+	Very High
8	179 - 236	SEVERE Storm	Blackout	Extreme
9	300 - 400	EXTREMELY SEVERE	Blackout	Extreme

Kp	Planetary K-index, averaged over past 3 hours and tends to be a measure of current conditions
Ap	Planetary A-index, 24-hour average and represents overall geomagnetic field conditions for the UTC day
HF Noise	Approximate "S-meter" noise level <10 MHz Approximate level of auroral activity
Aurora	<ul style="list-style-type: none"> • High conditions usually extends to: Latitude 45 deg. • Very High conditions extends to about: Latitude 35 deg. • Extreme conditions can extend to below: Latitude 35 deg.
Solar Wind	averages 350-450 km/sec and density <10 p/cm ³ >500 km/sec or high density can trigger geomagnetic activity
Shock Wave	from a solar flare or Coronal Mass Ejection (CME) arrives at the Earth about 55 hours after the solar event.

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SOLAR FLARE CLASSIFICATIONS

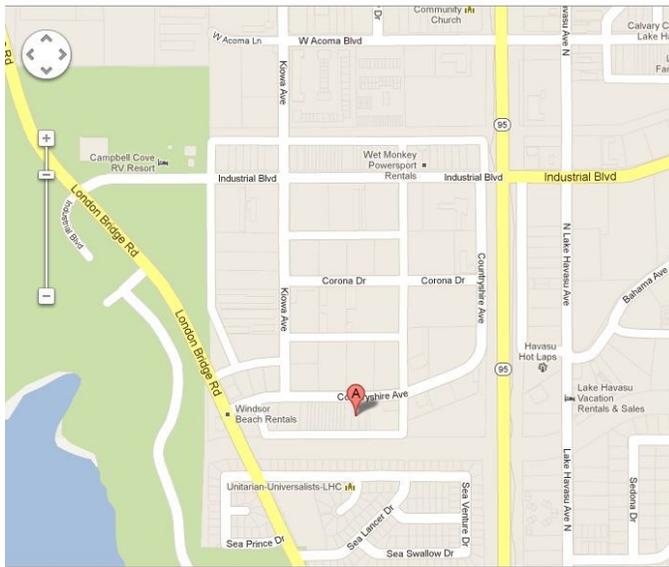
FLARE CLASS	TYPE OF FLARE	HF RADIO EFFECTS	RESULTING GEOMAGNETIC STORM
A	Very small	None	None
B	Small	None	None
C	Moderate	* Low absorption	* Active to Minor
M	Large	* High absorption	* Minor to Major
X	Extreme	* Possible blackout	* Major to Severe

SOME THOUGHTS

- I just took a leaflet out of my mailbox informing me that I can have sex at 68. I'm so happy, because I live at number 72. So it's not too far to walk home afterwards. And it's the same side of the street. I don't even have to cross the road!
- Answering machine message: "I am not available right now, but thank you for caring enough to call. I am making some changes in my life. Please leave a message after the beep. If I do not return your call, you are one of the changes."
- Aspire to inspire before you expire.
- My wife and I had words, but I didn't get to use mine.
- Frustration is trying to find your glasses without your glasses.
- Blessed are those who can give without remembering and take without forgetting.
- The irony of life is that by the time you're old enough to know your way around you're not going anywhere.
- God made man before woman so as to give him time to think of an answer for her first question.
- I was always taught to respect my elders but it keeps getting harder to find one.
- Every morning is the dawn of a new error.
- The quote of the month is by Jay Leno: "With hurricanes, tornados, fires out of control, mud slides, flooding, severe thunderstorms tearing up the country from one end to another, and with the threat of bird flu and terrorist attacks, are we sure this is a good time to take God out of the Pledge of Allegiance?"

SATURDAY MORNING'S BREAKFAST HAS MOVED!

You're all invited to join LBARA members for a great breakfast each and every Saturday morning at a new location, Peggy's Sunrise Café. Peggy's is located at 1584 Countryshire. Breakfast is served at 6 a.m. (or earlier if you want a good seat!) Most important, the food is great!!!!



Upcoming Activities and Hamfests

Quartzfest/ARRL Convention, 1/19-26,2014, Quartzsite, AZ (www.quartzfest.org)

Yuma Hamfest, Yuma, AZ, 2/14-15, 2014 (www.yumahamfest.org)

Are you looking to upgrade your license?

Give our VE Exam Team a call.

See Ed Gillespie, AB7EM at #453.7412

FOR SALE

FOR TRADE: Would like to trade a Kenwood 271 2 meter radio for a 440 radio. You can contact Bob at <bovan@yahoo.com>. Bob Evans, K7RCE.

RADIOS FOR SALE OR TRADE

YOUR AD CAN GO HERE.....K7LY.....855.7941

During a recent password audit at a company, it was found that a blonde receptionist was using the following password:

"MickeyMinniePlutoHueyLouieDeweyDonaldGoofySacramento"

When asked why she had such a long password, she said she was told that it had to be at least 8 characters long and include at least one capital.

LBARA OFFICERS AND DIRECTORS

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Jerry France(K7LY)	Static Editor
Lana Lotspeich(N7WST)	Membership Chair

VISIT OUR WEBSITE

www.lbara.net

FROM THE EDITOR

If you have anything you would like to see included in these issues, please let me know. I'm always looking for articles, news items, construction articles, or anything that might be of interest to our readers. You can contact me at 928.855.7941 or email at grf@uneedspeed.net or francej@ajsinsurance.com.

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STATIC

ATTENTION READERS

Please note that this issue represents a “work-in-progress” and there are a number of changes to be made in subsequent issues. I would greatly appreciate your comments, both good and bad, as well as any suggestions for future issues. This issue also begins our first attempt to deliver the **STATIC** to your doorstep electronically. Please keep me abreast of any email address changes you may have and I promise to have this delivered promptly and accurately. Also, I still have a number of articles awaiting publication and will do so in the future. This is your newsletter, so keep the articles, letters, and pictures coming. I can be reached at home (855.7941) or via email at grf@npgcable.com .

EQUIPMENT FOR SALE

EDITOR’S NOTE: List your items for sale here. Ham radio related only, please. Include a picture if you like (please use a jpg format). Email all to me at grf@npgcable.com) along with your name and phone number.

