

SB PROP @ ARL \$ARLP043  
ARLP043 Propagation de K7RA

ZCZC AP43  
QST de W1AW  
Propagation Forecast Bulletin 43 ARLP043  
>From Tad Cook, K7RA  
Seattle, WA October 24, 2014  
To all radio amateurs

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Solar activity is making a healthy comeback, just in time for the SSB weekend of the CQ World Wide DX Contest. The contest begins tonight at 0000 UTC and ends Sunday October 26 at 23:59:59 UTC. See <http://www.cqww.com/rules.htm> for rules. The contest is always held on the last full weekend of October, while the CW contest is the last full weekend in November.

A series of large solar flares erupted this week, almost too many to count. Spaceweather.com says a single large sunspot has produced 27 C-class flares, 8 M-class flares, 2 X-flares. The most powerful was an X1.6 flare on October 22. On Wednesday evening in North America the sunspot was directly facing earth. By early Friday morning it had moved off dead center by about 15 degrees, according to the image on the STEREO website at <http://stereo.gsfc.nasa.gov/>. The magnetically active areas are represented by those white splotches.

Average daily sunspot numbers rose from 55.1 during October 9 to 15 to 83.9 this week, and average daily solar flux increased from 117.4 to 174.

The predicted solar flux for this weekend is 230, which is higher than on any day since January 7 of this year, when it was 237.1. Prior to that, we didn't see solar flux values this high since 11 years ago, in late October 2003. But accompanying the high solar flux back then was a great deal of geomagnetic activity. On October 29, 2003 the mid-latitude A index was 199! Several 3-hour K index values were 9, which I believe is the top of the scale. On that same day the daily sunspot number was 330 and the solar flux was 291.7. Those are huge numbers. You can read about it by looking in the archives of propagation bulletins at <http://arrl.org/w1aw-bulletins-archive-propagation>.

Now back to the present, predicted solar flux is 230 on October 24 to 26, 225 on October 27 and 28, then 220, 205 and 190 on October 29 to 31, and 130 on November 1 to 3. Solar flux drops to a low of 110 on November 8 and rises to 180 on November 19 and 20.

Along with that relatively high solar flux this weekend will be unsettled geomagnetic conditions.

Predicted planetary A index is 15 on October 23 and 24, 10 on October 25, 12 on October 26 and 27, 10 on October 28 and 29, 8 on October 30, 5 on October 31 through November 3, 8 on November 4, 10 on November 5, 8 on November 6 and 7, 5 on November 8 and 9, 8 on November 10 and 11, then 5 and 8 on November 12 and 13, 12 on November 14 and 15, 15 and 12 on November 16 and 17, 15 on November 18 and 19, then 12, 10 and 8 on November 20 to 22 and 10 on November 23 and 24.

OK1HH has his own geomagnetic prediction, and he sees the geomagnetic field as active to disturbed on October 24, quiet to active October 25, active to disturbed October 26 and quiet to active October 28, mostly quiet October 29, quiet October 30 through November 1, mostly quiet November 2, quiet to unsettled November 3, quiet to active November 4, active to disturbed November 5 (although

he is unsure about that date), quiet to active November 6, mostly quiet November 7, quiet November 8 and 9, quiet to active November 10, quiet to unsettled November 11 and 12, quiet to active November 13 and 14, active to disturbed November 15 and 16 (but he is unsure about November 15), quiet to unsettled November 17 and mostly quiet on November 18.

In an email Mark Challender, NG2G, said in part: "...nobody ever really says, in plain English -- the higher the solar flux the better the bands are going to be. There are a lot of people, I am sure, who could benefit from this information."

Thanks, Mark! OK, I will say it. Higher solar flux means a greater chance for long distance HF communications. It also suggests propagation at higher frequencies, so that is why 10 meters is better at the top of the solar cycle, when there is more solar activity and greater ionization of the ionosphere. Except when solar flares cause a geomagnetic storm, with higher A index numbers, right now the combination of the fall season and higher solar activity signals greater opportunities on HF radio.

You can use a propagation prediction program to get a sense of how seasonal variations, location and solar activity affect communications. K9LA has a free download of W6ELprop and a tutorial on how to use it, at <http://k9la.us/html/tutorials.html>. It is a Windows program that works great in Windows XP, but in Windows 7 I've only made it work using XP mode.

This week's solar activity generated a lot of interest from the press, and here are a few articles to check out:

[http://www.slate.com/blogs/bad\\_astronomy/2014/10/22/sunspot\\_2192\\_x\\_flare\\_seen\\_this\\_morning.html](http://www.slate.com/blogs/bad_astronomy/2014/10/22/sunspot_2192_x_flare_seen_this_morning.html)

<http://www.theweathernetwork.com/news/articles/mammoth-earth-swallowing-sunspot-blasts-out-x-class-flare/38243/>

[http://www.huffingtonpost.com/2014/10/22/solar-flares-disrupting-radio-communications\\_n\\_6029862.html?utm\\_hp\\_ref=email\\_share](http://www.huffingtonpost.com/2014/10/22/solar-flares-disrupting-radio-communications_n_6029862.html?utm_hp_ref=email_share)

<http://www.tampabay.com/news/science/space/ginormous-sunspot-makes-todays-solar-eclipse-much-cooler-wvideo/2203375>

Thanks to W9IND and David Moore for news tips.

A glance at geomagnetic indicators shows that the main geomagnetic effect was on Monday, October 20:

<http://www.swpc.noaa.gov/ftplib/latest/DGD.txt>

Note that in Fairbanks, Alaska the college A index reached 48, which is quite high.

Strangely, we received no reports from readers this week about on air activity or observations. Perhaps everyone was too busy on the air to write.

For more information concerning radio propagation, see the ARRL Technical Information Service at <http://arrl.org/propagation-of-rf-signals>. For an explanation of the numbers used in this bulletin, see <http://arrl.org/the-sun-the-earth-the-ionosphere>. An archive of past propagation bulletins is at <http://arrl.org/w1aw-bulletins-archive-propagation>. More good information and tutorials on propagation are at <http://k9la.us/>.

Monthly propagation charts between four USA regions and twelve overseas locations are at <http://arrl.org/propagation>.

Instructions for starting or ending email distribution of ARRL bulletins are at <http://arrl.org/bulletins>.

Sunspot numbers for October 16 through 22 were 66, 39, 60, 86, 93,

120, and 123, with a mean of 83.9. 10.7 cm flux was 139, 146, 160, 173, 185, 199, and 216, with a mean of 174. Estimated planetary A indices were 7, 8, 15, 11, 26, 15, and 14, with a mean of 13.7.

Estimated mid-latitude A indices were 5, 6, 11, 9, 17, 11, and 10, with a mean of 9.9.

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