THE DUMMY LOAD

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serving the community since 1964

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Meetings

Meetings held at 8:00pm on the second Monday of each month , Board Room Preston Arena (Bishop St at Hamilton St) No meetings in July or August. Visitors always welcome.

Club Net

on the
VE3SWR repeater 146.790 Mhz
every Wednesday
at 2100R

VE3SWA
DXCC HONOR ROLL
(332/332)
WAZ, WAC, WAS.

Next Meetings

Mon Mar 8th 2010
Mon Apr 12th 2010
Mon May 10th 2010
Mon Jun 14th 2010
Mon Sep 13th 2010
Mon Oct 18th 2010
Mon Nov 8th 2010
Mon Dec 13th 2010
usual location and time

CLUB NEWS

Excellent attendance for our Feb meeting with 14 smiling faces seated around the tables which included 3 new members VA3AVR Tony, VA3CMN Ken, and VE3USP Steve, they were joined by VA3CBE Calvin, VA3MP Mike, VE3ANT,Scott, VE3BGG Bert, VE3BHZ Dave, VE3FC Fraser, VE3IHM Hugh, VE3KVZ Steve, VE3MAH Tom, VE3NXV Gerry, and VE3OAV Robin. Meeting was opened with Gerry reading the minutes of the January meeting which were accepted as read then Fraser gave us a brief financial report indicating we were still financially healthy. The only old business was the annual dinner, Scott confirmed that this had been arranged at the usual place for April 24th 7:00pm for drinks and 7:30pm for dinner price remains the same as it has for the past several dinners $20.00 per person, let's have our usual good turn-out. Unlike last year, this date does not clash with the Ontario QSO party which is on the weekend of 17/18. Robin advised the membership that the ARES meeting at the fire hall went very well with an interesting tour of the hall afterwards. As most of you probably know, our 3 new members came to us as a result of the ARES recruiting carried out by Robin VE3OAV. It was suggested that the years club meeting dates be promulgated in the bulletin and as can be seen, this has been done. The Oct meeting highlighted in red is the third Mon because the second falls on Thanksgiving when the arena is closed.

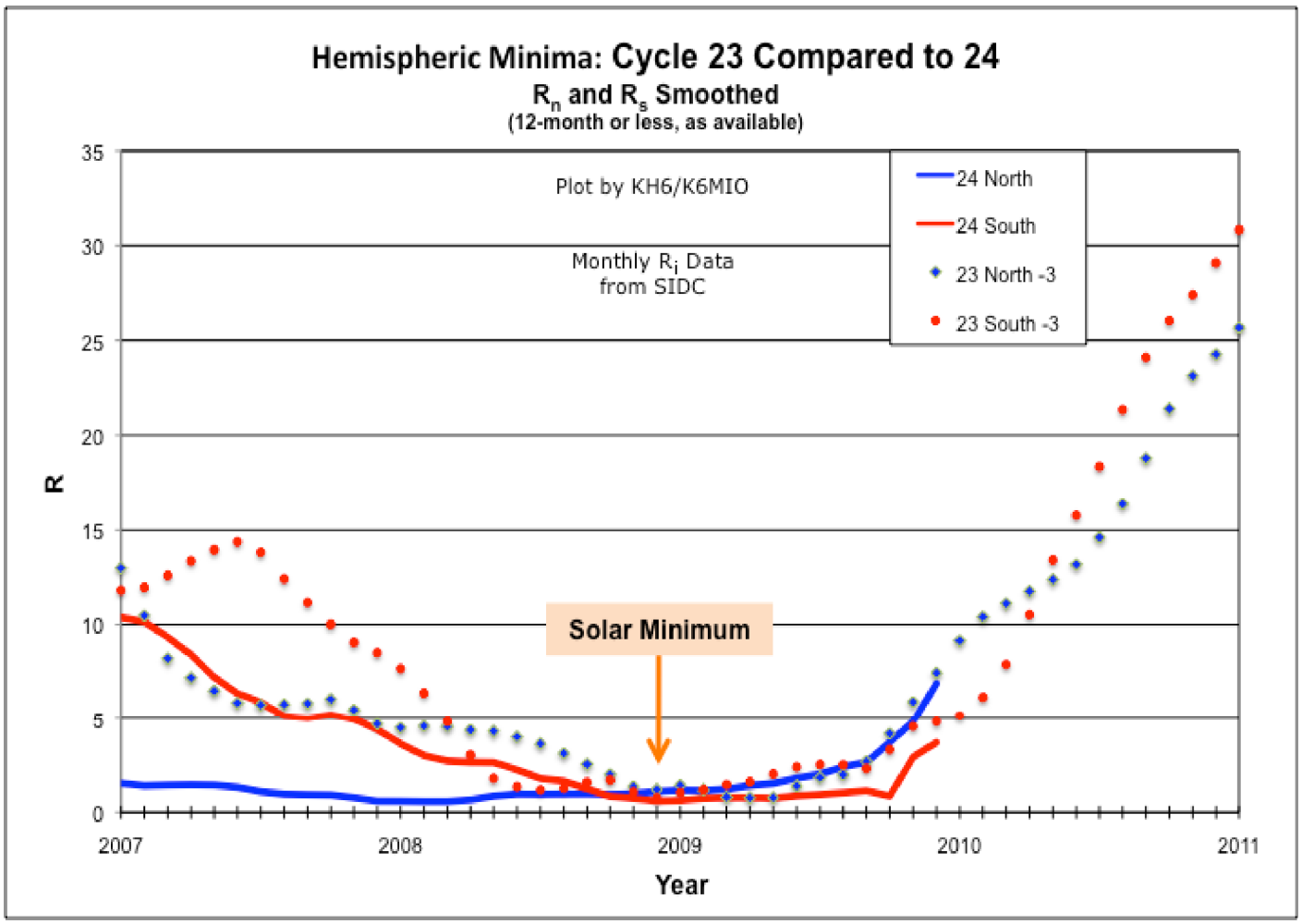
A NEW LOOK AT CYCLE 24

K6MIO/KH6

K6MIO/KH6, Jim Kennedy, has been a student of propagation since Cycle 19 and is a physicist and active HF/VHF DXer who over the years has written extensively about six-meter propagation. He has a PhD in physics and, until retiring recently, was an Associate Director of the Gemini Observatory in Hawaii and Chile. Prior to Gemini, Kennedy was the Project Manager for the Global Oscillation Network Group (GONG) at the National Solar Observatory in Tucson. "One of the key goals of the (ongoing) GONG program has been to provide observational data on the solar interior to help explain the origins of the solar cycle", Jim says. Below is a recent post he made to one of the VHF reflectors that might help us all. Thanks Jim!

In October I made a presentation on Cycle 24 noting that the Cycle 23 minimum occurred around early December 2008. This "officially" signaled the start of Cycle 24. (Of course we have been seeing occasional Cycle 24 spots and magnetic regions in both solar hemispheres since December 2007.) I also presented a plot that showed the R-sunspot-index values separately for the northern and southern solar hemispheres, since differences in the northern and southern solar hemispheres' behavior have played a key role in the unusual character of Cycle 23. The sluggish southern solar hemisphere seems to be responsible for dragging out Cycle 23 for so long (12.6 years). (The total Ri is the sum of Rn and Rs.) That plot compared the behavior of the solar minimum that began Cycle 23 to the 2008 solar minimum that began Cycle 24. I reported that the then most recent data (through September 2009) were consistent with the northern solar hemisphere beginning to track the upward climb in Rn, signaling the long awaited "upswing" of Cycle 24 activity. I also suggested that we should be seeing a clear indication of the upswing by the beginning of 2010, IF the cycle was really starting up in a way consistent with Cycle 23. I am happy to report that the most recent data are consistent with a real beginning of Cycle 24 activity.

The attached (below) update of the October plot shows the northern and southern R indices through December 2009. The northern hemisphere shows a clear jump in activity that continued to increase through October, November, and December (and appears to be continuing into January); and it is tracking quite close to the Cycle 23 northern-hemisphere trajectory. Even more encouraging is that in November and December, there is a similar jump in the southern hemisphere R, which appears to be approaching the Cycle 23 track. I must point out that, while the Cycle 23 data are the traditional 12-month running average values, the last six month's of Cycle 24 data (July-December 2009) are averages of only the available data to date (e.g. July is an 10-month average, and December is a one-month average). Consequently, the "real" values for this last period may change over the coming months as additional months are averaged in to complete the 12-month average. (IF a normal pattern is followed, they should actually increase slightly.) The current, very preliminary, indications continue to suggest that solar maximum may occur around the Northern Hemisphere winter of 2012-13, if normal rules apply (they may not). I do not make any inferences about the impact on the solar maximum peak Ri value at this time.



SOME ANNOUNCED DXPEDITIONS

PITCAIRN ISLAND
VP6AL
Jan 1 - Mar 1
Mainly SSB on 20 meters
QSL eQSL or direct to QRZ.COM address

AFGHANISTAN
T6LC
Jan 1 - Mar 3
By W4JJ Mainly 40 and 20 CW/SSB
QSL K4MJN

WILLIS ISLAND
VK9WBM
Jan 1 - May 1
All bands and modes
QSL VK4DMC

THAILAND
HS0ZJF
Jan 12 - Mar 12
By ON4AFU
All bands CW only
QSL ON4AFU

GUINEA BISSAU
J5UAP
Jan 15 - Mar 31
By HA3AUI
All bands mostly digital
QSL HA3AUI

TANZANIA
5I3A
Jan 20 - Mar 1
By UA3DJY
All bands CW & SSB
QSL RK3AOL

UGANDA
5X1NH
Jan 21 - Mar 21
By G3RWF
All bands CW & Digital
QSL LOTW, direct or bureau to G3RWF

IARU NATIONAL RADIO SOCIETY TO CELEBRATE ITS CENTENARY

The Wireless Institute of Australia turns 100 ìn 2010 making it the world's oldest National Radio Society.

WIA President **Michael Owen VK3KI** says he wants the world-wide amateur radio community to join in the celebration.

In the October edition of the WIA's Amateur Radio magazine he announces a program that includes a special callsign **VK100WIA** that will be operated next May by the WIA, and then by many affiliated clubs around Australia for the next five months.

A commemorative QSL card will be issued for contacts with VK100WIA between May and October 2010.

A limited edition operating award, called the **WIA Centenary Award** is also to be available and two contacts with VK100WIA are required under its rules.

A program of events will occur around the WIA's annual meeting in the nation's capital Canberra in May 2010, while radio clubs are planning events to promote the centenary of organised amateur radio in Australia.

It all began in 1910 with a meeting of wireless pioneers in Sydney to protect their interests and rights against what they considered to be harsh treatment by authorities and a high licence fee.

The Wireless Institute of Australia has continued since to protect and enhance the privileges of it's resident radio amateurs and also to further advance and promote the hobby of amateur radio.

Details of the centenary program can be found on the WIA website **www.wia.org.au**

THOSE WWV FIGURES

What do they tell us

One of the key skills for any HF Dxer is to know how to judge what band conditions may be like. Conditions may be excellent one day with many stations audible from all over the world, but a few days later it may be that only a few stations are audible. To be able to gain an idea about conditions, three main indices are used: solar flux, and the Ap and Kp indices. A good working knowledge of what these numbers represent and what they mean is an advantage even for the ham the the most well equipped station.

Synopsis

The ionosphere can be visualized as containing a number of layers. In fact, there is ionization throughout the ionosphere, the layers are really peaks in the levels of ionization. The ionosphere affects radio waves because according to the level of ionization the signals are refracted, i.e. bent away from travelling in a straight line. Often the level of ionization is sufficiently high to enable the signals to be returned to Earth.

Conditions are continually varying on the HF bands as a result of the varying levels of ionization in the ionosphere. The radiation coming chiefly from the Sun hits the upper ionosphere causing molecules to ionize, creating positive ions and free leectrons. A state of "Dynamic Equilibrium" exists. The free electrons that affect radio waves recombine with the positive ions to reform molecules. When levels of ionization are higher (when there are more free electrons) the ionosphere is more capable of bending back radio signals to Earth. Also, high levels of ionization mean high maximum usable frequencies and better HF conditions.

The level of ionization at any given point above the Earth is dependant upon a number of factors including the time of day, the season and most important of all the sunspot cycle. It is found that the level of radiation increases as the number of sunspots increases. Accordingly, the level of radiation received from the Sun peaks around the top of the sunspot cycle. In fact it is the area just around the sunspot called the PLAGE that emits most of the extra radiation.

It is not all good news though. At the sunspot peak the level of geomagnetic activity also rises. This happens as the Sun emits large quantities of particles. There is normally a steady flow of these particles, but at times such as when there are solar flares the level of theses emissions greatly increases. When they hit the Earth's magnetic field it becomes disturbed, creating a magnetic storm that can be detected at points around the globe. Another effect is that the ionosphere itself can be disturbed giving rise to an ionospheric storm. This will degrade HF communications and when particularly bad it can lead to a total HF blackout.

Solar Flux

A measure known as the SOLAR FLUX is used as the basic indication of solar activity, and to determine the

level of radiation being received from the Sun. The solar flux is measured in solar flux units (SFU) and is the amount of radio noise or flux that is emitted at a frequency of 2800 MHz (10.7cm). The Penticton Radio Observatory in BC reports this measure daily. The solar flux is closely related to the amount of ionization and hence the electron concentration in the F2 region. As a result it gives a very good indication of conditions for long distance communication.

The figure for the solar flux can vary from as low as 50 or so to as high as 300. Low values indicate that the maximum useable frequency will be low and overall conditions will not be good, particularly on the higher HF bands. Conversely high values generally indicate there is sufficient ionization to support long distance communication at higher than normal frequencies. However, remember it takes a few days of high values for conditions to improve. Typical values in excess of 200 will be measured during the peak of the sunspot cycle with high values of up to 300 being experienced for shorter periods.

Geomagnetic Activity

There are two indices that are used to determine the level of geomagnetic activity: the A index and the K index. These give indications of the severity of the magnetic fluctuations and hence the disturbance to the ionosphere. The first of the two used to measure geomagnetic activity is the K index. Each magnetic observatory calibrates it's magnetometer so that it's K index describes the same level of magnetic disturbance, no matter whether the observatory is located in the auroral regions or at the Earth's equator. At three hourly intervals starting at))))UTZ each day, the maximum deviations from the quiet day curve at a particular observatory are determined and the larges value is selected. This value is then manipulated mathematically and the K index is calculated for that location. The K index is a " quasi logarithmic" number and as such cannot be averaged to give a longer term view of the state of the Earth's magnetic field. Thus was born the A index a daily average. At each 3 hour increment the K inde is converted to an equivalent "a" index using a Table and the 8 "a" index values aare then averaged to produce the the A index for the day. It can vary up to values of around 100. During very severe geomagnetic storms it can reach values of 200 and very occasionally more. The A index reading varies from one observatory to the next, since magnetic disturbances can be local. To overcome this, the indices are average over the globe to provide the Ap index, the planetary value. Similarly, the Kp index is the planetary average of all the K indices at observatories around the globe. Values between 0 and 1 represent quite magnetic conditions and this would indicate good HF band conditions, subject to a sufficient level of solar flux. Values between 2 and 4 indicate unsettled or even active magnetic conditions and are likely to be reflected in degradation of HF conditions. Moving up the scale 5 represents a minor storm, 6 larger storm and 7 through 9 very major storm that would result in a blackout of HF communicatons. Although geomagnetic and ionospheric storms are interrelated, it is worth noting that they are different. A geomagnetic storm is a disturbance of the Earth's magnetic field and an ionospheric storm is a disturbance of the ionosphere.

Interpreting the Figures

The easiest way to use these figures is to enter them into a propagation prediction programme. This will provide the most accurate prediction of what might be happening. If you don't own this type of software you can gain a good insight by assessing the figures mentally. Obviously higher levels of solar flux are good news . Generally the higher the solar flux levels the better conditions will be on the higher HF bands and even 6 meters. However, the levels need to be maintained for some days in order that the ionization levels in the F2 layer will build up. Typically values of 150 or more will ensure good HF band conditions. The level of geomagnetic activity has an adverse effect depressing the maximum usable frequencies. The higher the level of activity as reflected in higher Ap and Kp indices the greater the depression of the MUFs. The actual amount of depression will depend not only the severity of the storm but also on duration.

TEXTING UNDERGROUND

Brad Horn

Caves are some of the last places on the planet left to explore. Though caving is relatively safe, if something goes wrong deep inside the Earth, a rescue can take days — in part because cell phones and walkie-talkies don't work underground. But a remarkable teenager in New Mexico has invented a device that may significantly speed that process with the ability to text from underground caves. The young man's invention may have other applications, as well.

Underground Transmission

Alexander Kendrick, 16, won the 2009 International Science Fair for inventing this cave-texting device. The award got the teen from Los Alamos, N.M., a new computer, a trip to Switzerland and $12,000.A cave radio that allows you to beam data to the surface rather than visiting it in person can be extremely valuable. It could save the cave.

Diana Northup

I wanted to find out why this thing was such a big deal. The next thing I knew, I was hanging from a rope in the bowels of the Earth and groaning under my breath. I was with a team of cavers in Carlsbad Caverns National Park in New Mexico, heading 1,000 feet underground to test Kendrick's invention.

The device is something like a computer attached to a ham radio. It transmits data using low frequency radio waves that can penetrate rock more easily than high frequency transmissions, like those in FM broadcasts.

If this test succeeded, it would be the deepest known underground digital communication ever to take place in the United States.

The Difference Between Life And Death

Why would anyone want to text from nearly 1,000 feet underground?

Here's why: In a 1991 New Mexico cave rescue, it took 170 people four days to save a woman with a broken leg. The rescue team had to lay miles of telephone line in order to stay in touch with the surface.

If they'd had Kendrick's radio, the rescue time may have been cut in half.

Alexander Kendrick stands in the Lake of the Clouds after testing his invention.

He and the team of cavers executed the deepest known digital communication ever to take place in the United States.

That could make the difference between life and death.

'It Could Save The Cave'

The other reason this thing's a pretty big deal : science.

Diana Northup, a microbiologist at the University of New Mexico in Albuquerque, says cave scientists find microorganisms in these deep caves that might have the potential to kill superbugs.

"Microorganisms that live in such a low-nutrient environment actually put out antibiotics, they produce them," Northup says.

But scientists think one of the biggest threats to this emerging source of antibiotics is actually the scientists themselves.

In fact, researchers believe the more they visit a cave, the less likely they are to find antibiotics. People contaminate the sensitive cave environment just by being there.

Northup thinks that by connecting data recorders to Kendrick's radio, scientists could remotely transmit information about the cave environment.

"So a cave radio that allows you to beam data to the surface rather than visiting it in person can be extremely valuable," she says. "It could save the cave."

Success

Back in the cave, we arrived at the test spot exactly 946 feet underground. The radio was being set up on the edge of a big pool of blue-green water pocked with stalagmite islands. It was 68 degrees, but incredibly humid.

Kendrick and the team pulled pieces of white PVC tubing from their backpacks and assembled the radio's antenna, which looks like a 6-foot-wide tick-tack-toe frame with wire wrapped around it. Kendrick's dad, Brian, was about to hike to an identical unit sitting directly above us on the surface.

They synchronized their watches, and Brian Kendrick and another caver climbed the steep, dusty slope above us. Then we waited.

Two hours later, after calibrating the devices, Alexander Kendrick typed the word "happy" on a rubber keyboard and pushed send. Up above on the surface, his father stared at a small screen hoping to see the word.

The message "appy" appears. Not the entire word, but good enough. "That's digital data coming through at 950 feet," says Brian.

Now Alexander Kendrick has to fine-tune the radio to make it smaller and tougher and easier for rescue crews to get down into caves.

That will have to wait, though, because he's busy working on his 2010 science fair project — a device that finds underground rivers by measuring their electromagnetic currents.

I don't know what problem he'll solve next, but I hear there's this thing called global warming.

Alexander Kendrick, 16, won the 2009 International Science Fair for inventing this cave-texting device. The award got the teen from Los Alamos, N.M., a new computer, a trip to Switzerland and $12,000.