



FEEDBACK



Warminster Amateur Radio Club Web Page www.k3dn.org

March 2000

The weather did not cooperate for our February meeting and annual auction. Due to very slick road conditions and a fair turnout, we decided to post-pone the auction until the March general membership meeting on Thursday March 2nd. I apologize to all that braved the weather and took the chance to drive out to the meeting. In all fairness to those who could not make it, we had to delay the event. So, there is still time to clean out your shack and help out the club. Remember, the proceeds of all auctioned items go to the club.

I had the pleasure of again hearing Kay Craigie, WT3P, speak at a recent meeting of Montgomery County R.A.C.E.S. I'm sure you all remember Kay from our November annual ARRL night when, as Atlantic Division Director, she filled us in on the latest ARRL happenings. Kay has recently been elected Vice President. Bernie Fuller, N3EFN, formerly Vice Director, has become Atlantic Division Director and Bill Edgar, N3LLR, Vice Director. We will miss Kay, who I'm sure will do a great job as VP, but will look forward continued leadership from Bernie and Bill. Congratulations to all!

One item of interest shared by Kay was the approval by the ARRL for development and implementation of a certificate program. The concept is to inspire and credit amateurs who have advanced beyond the knowledge and expertise required by the FCC for licensure. Possible areas of certification might be propagation, code proficiency, emergency communications, etc. This program is still in the planning stage; so let them know what you want!

See you at the auction!

73,
Rocky, N3FKR

Skywarn training

Wednesday, April 12, 2000 at 8:00 pm at the Franklin Institute in Philadelphia. A fun and informative program given by a local meteorologist. This program is free and you do not have to be a ham to attend. For more information call: Art at 215-698-1606.

March's program will be our postponed club auction to be hosted by Tom WA3TQJ. Many items for the auction are ready to go but if anybody wanted to bring stuff but decided to stay home due to the weather during the last meeting, please bring it with you. Since March is also our traditional equipment homebrew month, we will also devote a little time to that. Unfortunately, equipment homebrew has been on the decline. However, if you have something you would like to show the membership, please bring it in.

RACES Meeting on Saturday March 10 at 10:00 am at the new EMS building on Jacksonville road in Warminster. This meeting is for RACES members and anyone who wants to join RACES,

at the new emergency management building. It is the old fire station 69 on the air base at the north end of the complex on the runway side This meeting will be open to any ham that wants to participate.

RACES weather exercise

There will be a RACES weather exercise on March 23, at the EOC building at 50 north Main street in Doylestown. The time will be at 10:00 am and RACES members are requested to attend. For more information, contact either Bob Phillips KA3VKU or George Brechmann N3HBT.

Earth and Space Science

The Solar Cycle

Sunspot and solar flare activity change from year to year in what is termed the solar cycle. This variability has been tracked by ham radio operators for some time now as they await the increases in atmospheric ionization that result from increased solar cycle activity and the ability to engage in long distance DX communication. The solar cycle was discovered by Samuel H. Schwabe, a pharmacist and amateur astronomer, whose night job prevented him from observing at night; so he studied the Sun during the day. The solar cycle varies in intensity approximately every eleven years. Plotting the years since 1860 against the number of sunspots observed provides a good estimation of the episodic variability of the solar cycle. For example, the cycle had peaks in 1947, 1958, 1969, 1980, and 1990. If history repeats itself-- and in this case it seems to-- we are entering the initial phase of the next peak of 2001.

Sunspots are large, dark appearing blemishes observed on the surface of the Sun. They range in size from a few hundred kilometers (1 kilometer = 0.6 miles) to many thousands of kilometers across. Sunspots are a form of solar magnetic activity. They are darker than the surrounding gas because they are "cooler"(4500K versus 6000K), and they are cooler because they contain strong magnetic fields. Sunspots give birth to solar flares. A solar flare is a brief but intense eruption of hot gas in the chromospheres (lower atmosphere) of the Sun. This explosive expansion of gas results in the gas escaping from the Sun and being forced out into the inner solar system. These bursts can create spectacular auroral displays as atoms in the Earth's upper atmosphere are disturbed by solar magnetic radiation and emit light, i.e. the Aurora Borealis.

What causes the solar cycle? The differential rotation of the Sun, of course. As the Sun rotates, gas near its equator circles the Sun faster than gas near its poles-- it spins differentially.

The Sun's differential rotation is such that its equator rotates in about 25 days while its poles rotate in about 30 days. Thus, points on the Sun's equator actually move out in front of points at either pole (kinda like the "V" formation created by flying geese). This differential rotation distorts the Sun's magnetic field, sort of "winding" it up. Although the exact mechanism is not well understood, scientists believe the Sun's rotation wraps the solar magnetic field into "coils."

These coils make the magnetic field stronger (think of wire coils used to help generate electricity). Because the magnetic coils and gas are tightly connected, differential rotation causes the gas at the equator, which is moving faster than the gas at the poles, to drag the magnetic field with it. As the magnetic field is wound around, loops develop. Later as the "magnetic field-gas loop" becomes wound tighter and tighter, it develops "kinks." This cycle ends when the field twists too tightly and collapses, and the process repeats.

Sunspots form when the kinks in the magnetic field rise to the Sun's surface and break through the photosphere (the visible surface of the Sun). At the "breakthrough" point, the magnetic field slows the outward flow of heat, making that part of the surface cooler and darker than the surrounding areas and thereby creating what we see as sunspots. Each kink breaks the surface in two places— one where it leaves and one where it re-enters. Therefore, it is usually expected that spots will occur in pairs or groups. In such pairs, one breakthrough point, either exit OR entrance, has a "north" polarity while the other breakthrough point, either entrance or exit, has a "south" polarity. In other words, in one area the field emerges from the surface, while in the other area the field descends into the surface. In addition, the solar cycle is NOT always 11 years! This cycle may be as short as 7 years or as long as 16 years. Moreover, if you consider the polarity of sunspot groups, the cycle averages 22 years, rather than 11 years, because the polarity of the Sun's field REVERSES at the end of each 11-year cycle. It therefore takes TWO 11-year cycles for the field to return to its original configuration. This means that the full solar cycle of magnetic activity actually takes 22 YEARS on the average.

So what does all this mean for amateur radio operators? Well, if your into sky-wave propagation-- when a signal is returned to Earth by the ionosphere, you know that it is determined by two variables: the frequency in use and the level of atmospheric ionization. The ionosphere refracts or bends radio waves. If a radio wave is bent enough, it returns to the Earth; if not, it travels off into space. Ionization of the Earth's atmosphere (specifically ionosphere) results from solar radiation. The amount of solar radiation that reaches Earth's ionosphere is closely related to the number of sunspots on the Sun, i.e. the sunspot cycle. The more sunspots, the more ionization of the ionosphere. As a result, the maximum usable frequency (MUF), the highest frequency at which the ionosphere will bend radio waves back to a desired location on Earth, increases. Bottom line, higher frequency radio communication is enhanced during times of increased sunspot activity. According to NOAA's Space Physics Interactive Data Resource site, solar activity is predicted to increase substantially from January, 2000 until approximately the spring of the year 2001, with peak solar activity occurring during the first several months of the year 2000. This should open up a number of the higher frequency bands for long distance contacts. So get ready for the coming propagation bonanza!

Keep Looking Up!

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SOLAR UPDATE

Solar sage Tad Cook, K7VVV, Seattle, Washington, reports: Solar flux and sunspot counts increased the week before last but fell last week. The averages for both weeks were about the same, however. Average solar flux was down about 11 points last week, and average sunspot numbers were off by a little more than a point. Last weekend had a surprising burst of geomagnetic activity, when Saturday's planetary A index was 52.

For the next five days, solar flux is predicted to be 155, 150, 150, 145 and 145. Planetary A index for those same days is forecast to be 5, 5, 12, 8 and 8. For best HF conditions, we want a low A index in the single digits, and rising solar flux. So Sunday, February 20 with a planetary A index of 12 could be somewhat unsettled. Solar flux for the short term is expected to bottom out near 130 around February 25, then rise to about 150 by March 1, but peak broadly and fairly low near 175 around March 4-8.

Sunspot numbers for February 10 through 16 were 172, 184, 157, 147, 158, 158 and 182 with a mean of 165.4. The 10.7-cm flux was 175.7 170.2, 163.2, 159.9, 158.7, 156 and 160.2, with a mean of 163.4. The estimated planetary A indices were 7, 13, 52, 14, 29, 11 and 5, with a mean of 18.7.

GEORGIA AMATEURS RESPOND TO TORNADO DISASTER

Amateur Radio operators responded in force after tornadoes struck rural extreme southwestern Georgia this week, killing at least 18 and injuring around 100 others. The storms wiped out nearly 200 houses. Georgia Section Emergency Coordinator Tom Rogers, KR4OL, reports that hams from nearby communities including Moultrie and Albany turned out to help.

Twisters generating winds in excess of 150 MPH leveled a housing development in the town of Camilla, in Mitchell County late Sunday and early Monday. The town was one of the worst-hit areas. The storm also tore roofs from houses and flattened mobile homes. The storm caught many by surprise since warnings were not issued until after residents had retired for the night.

Georgia Gov Roy Barnes declared a state of emergency in Colquitt, Grady, Mitchell and Tift counties. Georgia Emergency Management Agency reports emergency shelters have been set up in Camilla and Moultrie. The Salvation Army and the Red Cross also were involved in the recovery effort.

"Shelters are open, and the Georgia Baptist Hams are setting up feeding locations and assisting with the cleanup," Rogers said. An HF emergency net was established on 75 meters to coordinate activities, but the need for emergency communication was minimal since the telecommunications infrastructure was still intact.

Damage was put at \$25 million. Thousands were left without power in Georgia and elsewhere as a result of the severe weather. The storm that wreaked havoc on Georgia was part of a system that also struck Arkansas, Tennessee, Mississippi and Alabama before moving into Georgia, Northeastern Florida and the Carolinas.

Courtesy The ARRL Newsletter

FCC FINES TWO TEXAS AMATEURS FOR MALICIOUS INTERFERENCE

The FCC has fined two Texas hams \$8000 apiece for allegedly interfering with a local repeater and failing to identify. Paul E. Holcombe, K4TOF, and Robert L. Myers, N5WLY, both of Houston, were notified last month by the FCC's Houston office. The fines come in the aftermath of an FCC investigation undertaken last year that involved the use of direction-finding equipment. The FCC says it's been hearing complaints of interference to the Memorial Emergency Repeater Association's system for more than five years now.

On separate occasions in February and May, FCC personnel from the Houston field office used direction-finding gear to track transmissions interfering with MERA's 145.47 repeater to Holcombe's and Meyers' vehicles. As a result, Holcombe and Meyers each received a Notice of Violation from the FCC last June. Since being cited, both men have denied the allegations in statements to the FCC.

In both cases, the FCC determined otherwise and ordered Holcombe and Meyers to pay the fines within 30 days or to file written statements showing why the forfeitures should be reduced or canceled.

Courtesy The ARRL Newsletter

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