telstar

THE NEWSLETTER OF STARS (SOUTHTOWNS AMATEUR RADIO SOCIETY) MAY 2010 VOL 43 Issue 9

W1AW OFFERS CODE PRACTICE, BULLETINS VIA ECHOLINK

Audio from W1AW's CW code practices and CW/digital bulletins is now available using EchoLink via the W1AW Conference Server "W1AWBDCT." The 9:45 PM ET phone bulletin is currently unavailable via W1AWBDCT. The audio is sent in real-time and runs concurrently with W1AW's regular transmission schedule. According to W1AW Station Manager Joe Carcia, NJ1Q, this server is currently at an experimental stage: "Since the server is located at ARRL -- and uses the ARRL's Internet connection -- there may be an issue as to how many users can connect to W1AWBDCT via EchoLink. The current number of connections is set to 350. If the current system can properly handle these connections without adversely affecting the performance of the conference server, this number will be bumped up higher." All users who connect to the conference server are muted. Please note that any questions or comments should *not* be sent via the "Text" window in

HAPPY MAY BIRTHDAY!

W2IV John Czuba
KF2JY Jay Clark

MAY MEETING

This month's club meeting will begin at 7:00 PM on Thursday May 6 at the NIKE Base Clubhouse.

All interested in amateur radio are invited to attend. Neither club membership nor an amateur radio license is required.

Hope to see you there!

EMCOMM EAST RETURNS TO ROCHESTER

The third annual EmComm East emergency communications conference is slated for September 18, 2010, in Rochester, New York.

EmComm East is an ARRL-sanctioned Amateur Radio emergency communications conference where operators can attend training sessions on technical topics, learn from served agencies, obtain VE testing for license upgrades, and interact with other emcomm operators from all over the area.

The hosts are currently seeking presentation proposals. If you have an idea for a presentation, or if you know of someone who might be willing to present, let them know.

Send an e-mail to program@emcommeast.org. The deadline for presentation proposals is July 1. Visit www.emcommeast.org for more information, or to sign up for e-mail announcements.

ONE-DAY TECH HAM RADIO CLASS TO BE TAUGHT AT HAMVENTION

A one-day Technician Amateur Radio License class will be held at Hamvention 2010. Slated for Saturday, May 15th, the class will be taught by Mitch Stern, W1SJ, from 8 AM to 4 PM behind the Luso Tower in the East Hall.

Exams will be conducted at the conclusion of class and a new Technician class license should be issued by the next day just in time to do some last minute radio shopping.

Pre-enrollment for this course is required via http://www.hamclass.net/hamvclass.htm

DAYTON HAMVENTION

MAY 14—16

AMATEUR RADIO CLUBS WORLDWIDE: THE LIFELINE

http://hamvention.org

SPECIAL SERVICE CLUB

STARS has been designated a Special Service Club by the ARRL.

STARS MAY VE SESSION

STARS will be holding a VE Test Session on Saturday May 15th. The session will be held at the Hamburg Youth Center (corner of Prospect and Hawkins Aves.)

All candidates should arrive by 9AM. Walk-ins will be allowed, but pre-registering will help speed up the processing the day of the test.

All candidates should bring the following to the test session:

1. An original photo ID or two other original forms of ID, plus a photocopy of the ID(s) to be turned in to the examiners for their records.
2. Your current amateur radio license (if any) plus a photocopy of it.
3. The original copies of any applicable Certificate of Successful Completion of Examination (CSCE) plus a photocopy of each.
4. A test fee of $15.00
5. Your Social Security Number (SSN) or your FCC Federal Registration Number (FRN). Your application for a new or upgraded amateur radio license will be rejected by the FCC if you do not provide one of these numbers.

For more information, or to register for the test, contact John Crawford KB2VWC 649-5933.

2010 CLUB OFFICERS

President:	Wayne Carpus W2ZDP
Vice President:	Jim Starr N2TFA
Treasurer:	Jack Cullum KB2ESM
Secretary:	Keith Patterson KC2DGC
Financial Secretary:	Judy Levan N2TEZ
Director:	Ken Pokigo KC2AYK
Director:	John Crawford KB2VWC
Clubhouse Chair:	Don Niles K2PMC
Telstar Editor:	Judy Levan N2TEZ
Webmaster:	Marc Fruth N2UBT

MAY CONTESTS	
MARAC SSB QSO Party	0000Z, May 1 to 2359Z, May 2
MARAC CW QSO Party	0000Z, May 1 to 2359Z, May 2
10-10 Int. Spring Contest, Digital	0001Z, May 1 to 2359Z, May 2
SBMS 2 GHz and Up WW Club Contest	0600 local, May 1 to 2000 local, May 2
Microwave Spring Sprint	0600-1300 local, May 1
7th Call Area QSO Party	1300Z, May 1 to 0700Z, May 2
Indiana QSO Party	1600Z, May 1 to 0400Z, May 2
ARI International DX Contest	2000Z, May 1 to 1959Z, May 2
New England QSO Party	2000Z, May 1 to 0500Z, May 2 and 1300Z-2400Z, May 2
RSGB 80m Club Championship, SSB	1900Z-2030Z, May 3
MIE 33 Contest	1100Z-1500Z, May 4 and 2300Z, May 4 to 0300Z, May 5
NCCC Sprint Ladder	0230Z-0300Z, May 7
VOLTA WW RTTY Contest	1200Z, May 8 to 1200Z, May 9
CQ-M International DX Contest	1200Z, May 8 to 1159Z, May 9
FISTS Spring Sprint	1700Z-2100Z, May 8
Nevada Mustang Roundup	1700Z, May 8 to 1700Z, May 9
50 MHz Spring Sprint	2300Z, May 8 to 0300Z, May 9
SKCC Weekend Sprint	0000Z-2400Z, May 9
CWops Mini-CWT Test	1100Z-1200Z, May 12 and 1900Z-2000Z, May 12 and 0300Z-0400Z, May 13
RSGB 80m Club Championship, Data	1900Z-2030Z, May 12
QRP Minimal Art Session	1900Z-2300Z, May 13
His Maj. King of Spain Contest, CW	1200Z, May 15 to 1200Z, May 16
WAB LF Phone	1000Z-1400Z, May 16
Run for the Bacon QRP Contest	0100Z-0300Z, May 17
NAQCC Straight Key/Bug Sprint	0030Z-0230Z, May 20
RSGB 80m Club Championship, CW	1900Z-2030Z, May 20
NCCC Sprint Ladder	0230Z-0300Z, May 21
UN DX Contest	1200Z, May 22 to 1200Z, May 23
EU PSK DX Contest	1200Z, May 22 to 1200Z, May 23
Manchester Mineira All America CW Contest	1500Z, May 22 to 2359Z, May 23
Baltic Contest	2100Z, May 22 to 0200Z, May 23
SKCC Sprint	0000Z-0200Z, May 26
NCCC Sprint Ladder	0230Z-0300Z, May 28
CQ WW WPX Contest, CW	0000Z, May 29 to 2359Z, May 30
ARCI Hootowl Sprint	2000 local - 2400 local, May 30
MI QRP Memorial Day CW Sprint	2300Z, May 31 to 0300Z, Jun 1

TWO UPCOMING WEBINARS FROM THE POTOMAC VALLEY RADIO CLUB

K4RO/NCJ Contesting 101 – Maximize your score and fun – May 7
W3ZZ's Webinar – VHF Contesting: What to Do and How to Win – May 25

Register at: http://www.pvrc.org/webinar/upcoming.html

WHAT ARE THE SPACE WEATHER SCALES?

The Space Weather Scales of the National Oceanic and Atmospheric Administration were developed by NOAA's Space Weather Prediction Center (SWPC) to improve understanding of space weather events among technical operators and the general public alike. The scales serve as a sort of Richter scale that correlates space weather events with their likely effects on technological systems. To many who see space weather as an obscure field, the NOAA Space Weather Scales will convey useful information and perhaps pique new scientific interest.

The SWPC has forecasted the space environment for more than 35 years, alerting users to existing conditions between the Sun and Earth. Demand for these services has grown as technology susceptible to space weather damage has increased in use. Satellites, for example--which were once rare and only government-owned-- are now numerous, and many are commercially owned. Transmissions to and from those satellites now carry weather information and military surveillance, television and other communications signals, credit card and pager information, navigation data, and cell phone conversations.

As our dependence on satellites for communication and information become more sophisticated, the number of people that use this and other technologies vulnerable to space weather events has increased dramatically. Inevitably, an alert about a space weather event evokes the question, "What effect will that have?" among more and more people and organizations.

SWPC's mission is to describe the environment, not to report how systems are affected; and in any case, satellite-based communications engineers and others are in a better position to address particular potential problems or implement mitigation actions. Yet, customers and reporters who call SWPC deserve an answer about the effects of space weather that is meaningful for them. A more clear way to communicate with the general public and the expanding group of technical operators who may be new to and naive about space weather jargon was therefore needed.

Conveying Concepts to the Public

The three categories of descriptive scales for space weather devised by NOAA, and which are most relevant to the possible effects on satellite-based and other systems, are:

- Geomagnetic storms: disturbances in the geomagnetic field caused by gusts in the solar wind that blows by Earth
- Solar radiation storms: elevated levels of radiation that occur when the numbers of energetic particles increase
- Radio blackouts: disturbances of the ionosphere caused by X-ray emissions from the Sun

This is because weather and storms are familiar terms that convey meaning to the public, describing disturbances in the space environment as "space weather" has aided in improving the public's understanding and comparing events to storms has been equally effective.

Each scale is based on a physical measure and has proven to be effective in conveying, to the lay public and experts alike, the relative seriousness of an event. The NOAA Space Weather Scales break the continuum of possible event severity into categories, each of which is designated by a number and a single word descriptor.

Each scale provides lists of possible effects seen with each category of activity, the physical measure that determines the category of an event, and a climatological assessment that explains how often we can expect to see events of each magnitude during a solar cycle.

For space weather, we use five levels or categories of severity, because effects can be usefully binned in five levels, and because the historic alerting system used by SWPC easily maps to those levels (for example, the geomagnetic index of disturbance, Kp, in the ranges of 5-9; X-ray flare of M5, X1, X5, X10, X20). A finer gradation would be less meaningful for users; a coarser one would have levels with enormous ranges of conditions.

The simplicity and the usefulness of the scales for

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Category		Effect	Physical measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects		
Geomagnetic Storms			Kp values determined every 3 hours	Number of storm events when Kp level was met; (number of storm days)
G 5	**Extreme**	**Power systems:** : widespread voltage control problems and protective system problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. **Spacecraft operations:** may experience extensive surface charging, problems with orientation, uplink/downlink and tracking satellites. **Other systems:** pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.) **.	Kp = 9	4 per cycle (4 days per cycle)
G 4	**Severe**	**Power systems:** possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. **Spacecraft operations:** may experience surface charging and tracking problems, corrections may be needed for orientation problems. **Other systems:** induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.)**.	Kp = 8, including a 9-	100 per cycle (60 days per cycle)
G 3	**Strong**	**Power systems:** voltage corrections may be required, false alarms triggered on some protection devices. **Spacecraft operations:** surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. **Other systems:** intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.)**.	Kp = 7	200 per cycle (130 days per cycle)
G 2	**Moderate**	**Power systems:** high-latitude power systems may experience voltage alarms, long-duration storms may cause transformer damage. **Spacecraft operations:** corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. **Other systems:** HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.)	Kp = 6	600 per cycle (360 days per cycle)
G 1	**Minor**	**Power systems:** weak power grid fluctuations can occur. **Spacecraft operations:** minor impact on satellite operations possible. **Other systems:** migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine)	Kp = 5	1700 per cycle (900 days per cycle)

Category		Effect	Physical measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects		
Solar Radiation Storms			Flux level of >= 10 MeV particles (ions) *	Number of events when flux level was met (number of storm days**)
S 5	**Extreme**	**Biological:** unavoidable high radiation hazard to astronauts on EVA (extra-vehicular activity); passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.*** **Satellite operations:** satellites may be rendered useless, memory impacts can cause loss of control, may cause serious noise in image data, star-trackers may be unable to locate sources; permanent damage to solar panels possible. **Other systems:** complete blackout of HF (high frequency) communications possible through the polar regions, and position errors make navigation operations extremely difficult.	10^5	Fewer than 1 per cycle
S 4	**Severe**	**Biological:** unavoidable radiation hazard to astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.*** **Satellite operations:** may experience memory device problems and noise on imaging systems; star-tracker problems may cause orientation problems, and solar panel efficiency can be degraded. **Other systems:** blackout of HF radio communications through the polar regions and increased navigation errors over several days are likely.	10^4	3 per cycle
S 3	**Strong**	**Biological:** radiation hazard avoidance recommended for astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.*** **Satellite operations:** single-event upsets, noise in imaging systems, and slight reduction of efficiency in solar panel are likely. **Other systems:** degraded HF radio propagation through the polar regions and navigation position errors likely.	10^3	10 per cycle
S 2	**Moderate**	**Biological:** passengers and crew in high-flying aircraft at high latitudes may be exposed to elevated radiation risk.*** **Satellite operations:** infrequent single-event upsets possible. **Other systems:** small effects on HF propagation through the polar regions and navigation at polar cap locations possibly affected.	10^2	25 per cycle
S 1	**Minor**	**Biological:** none. **Satellite operations:** none. **Other systems:** minor impacts on HF radio in the polar regions.	10	50 per cycle

Category		Effect	Physical measure	Average Frequency (1 cycle=11 years)
Scale	Descriptor	Duration of event will influence severity of effects		
Radio Blackouts			GOES X-ray peak brightness by class and by flux*	Number of events when flux level was met; (number of storm days)
R 5	**Extreme**	**HF Radio:**Complete HF (high frequency**) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. **Navigation:** Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	X20 (2×10^{-3})	Less than 1 per cycle
R 4	**Severe**	**HF Radio:** : HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. **Navigation:** Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	X10 (10^{-3})	8 per cycle (8 days per cycle)
R 3	**Strong**	**HF Radio:** Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. **Navigation:** Low-frequency navigation signals degraded for about an hour.	X1 (10^{-4})	175 per cycle (140 days per cycle)
R 2	**Moderate**	**HF Radio:** Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes. **Navigation:** Degradation of low-frequency navigation signals for tens of minutes.	M5 (5×10^{-5})	350 per cycle (300 days per cycle)
R 1	**Minor**	**HF Radio:** Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact. **Navigation:** Low-frequency navigation signals degraded for brief intervals.	M1 (10^{-5})	2000 per cycle (950 days per cycle)

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some purposes leads to some unavoidable tradeoffs. Using only one physical measure for each scale leads to a description of events less precise than some users might like. Duration and timing, for instance, are not considered in a scale's assessment of an event; measures like integrated fluxes do not take into account the sometimes important aspects of spectral shape; and the cadence of the data or index may not be well-matched to the time-scale of the physical event, which complicates the climatology. (The average frequency was obtained from the National Geophysical Data Center's solar-terrestrial database covering the last several solar cycles). As an example, Kp values are derived and reported every 3 hours, al-

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though a single geomagnetic storm may last a day or more.

The requirements of providing real-time information to users, the reliance on established geophysical indices, and a desire for simplicity in interpreting the categories all argued against the use of more refined measures. The NOAA Space Weather Scales had to be based on repeatable, verifiable physical measures so that scientists and operators around the world could agree, independently, that a given event is of a certain category of severity.

Clearly stating the effects expected at each level was difficult, even more so at the category 5 level. Extreme effects are extrapolated from the rare known instances of effects at that event level. The obvious shortcomings inherent in the simplistic concept of the scales are outweighed by the usefulness of describing conditions and effects simply.

The categories of each scale are defined by the numeric value of a physical measure, but the intervals between the categories do not always scale uniformly with the physical measure's value. For geomagnetic storms, the categories differ by equal steps of Kp, which itself is a quasi-logarithmic index that is currently the best estimate of global geomagnetic activity available in near-real time. For solar radiation storms, each successive category is reached when the flux of greater than 10 MeV particles increases by a factor of 10, but the radio blackouts categories increase based on quantitative (and historically used) flare X-ray brightness levels, rather than "regular" intervals.

Use of the Scales

Consequences of space weather disturbances are often hard to attribute, and then are reported only sporadically. As a result, many are confused and frustrated, not knowing why we care about space weather events. The NOAA Space Weather Scales tie physical measures to possible outcomes, at least in general terms. SWPC products and forecasts describing the environment or specific events, and cast in terms of the new NOAA Space Weather Scales, now carry with them easily accessible information about the importance and consequences of space weather.

As the NOAA Space Weather Scales work their way into SWPC products and forecasts, space weather services will become more useful and intelligible to the operators of affected systems. Variations in the space environment will also capture the interest of the general public.

For further information, browse the
Space Weather Prediction Center Web Site
at http://www.swpc.noaa.gov/index.html

HAVE YOU CHECKED OUT THE "NEW" ARRL WEBSITE?

www.arrl.org

CLUB MEETINGS

Club meetings are held on the first Thursday of the month at 7:00PM at either the Hamburg Youth Center (Prospect and Hawkins Avenues) or the NIKE Base Clubhouse. Everyone is welcome. Board meetings are held on the fourth Thursday of the month at the Nike Base Club Station at 7:30PM and are open to all club members.

CLUB NETS

STARS WB2EZU Memorial HF net meets at 10AM local time on Saturdays on 3.925 MHz +/- QRM. Bob Lehning WA2YSJ is usually the net controller.

STARS Sunday morning RagChew Net at 9:30AM on 28.380 Mhz.