

# THE PLATTSMOUTH AMATEUR RADIO CLUB

# Communicator

# May 2017

## FCC Issues Rules for New Bands

(ARRL 03/31/2017) It's been a long time coming, but the Amateur Service will get two new bands in the near future. The FCC on March 28 adopted rules that will allow secondary Amateur Radio access to 472-479 kHz (630 meters) and to 135.7-137.8 kHz (2,200 meters), with minor conditions. The FCC Report and Order (R&O) spells out the details. It allocates 472-479 kHz to the Amateur Service on a secondary basis and amends Part 97 to provide for Amateur Service use of that band as well as of the previously allocated 135.7-137.8 kHz band. The R&O also amends Part 80 rules to authorize radio buoy operations in the 1900-2000 kHz band under a ship station license. Just when the new Part 97 rules will go into effect is difficult to determine just yet; more on that below.

"It's a big win for the Amateur community and the ARRL," ARRL CEO Tom Gallagher, NY2RF, said. "We are excited by the FCC's action to authorize Amateur Radio access for the first time on the MF and LF spectrum. As amateurs begin using these new allocations in the next few weeks, we encourage the entire Amateur Radio community, as secondary users, to be especially attentive to the rules."

It has not been an easy win, however. ARRL has been trying since the 1970s to convince the FCC to allow amateur access to parts of the spectrum below the Standard Broadcast Band. Through the Utilities Telecoms Council (UTC), electric power utilities have opposed Amateur Radio use of the MF and LF spectrum, raising unsubstantiated fears of interference to unlicensed Part 15 power line carrier (PLC) systems used to manage the power grid. The FCC said the Amateur Radio service rules it has adopted for 630 meters and 2,200 meters allow for co-existence with PLC systems that use the two bands.

### Here are the highlights:

- Amateurs operating on 472-479 kHz will be permitted a maximum equivalent isotropically radiated power (EIRP) of 5 W, except in parts of Alaska within 800 kilometers (approximately 496 miles) of Russia, where the maximum would be 1 W EIRP. [EIRP is the product of the power

*(Continued on Page 3)*

## Solar Storms Can Drain Electrical Charge Above Earth

(JPL April 10, 2017) New research on solar storms finds that they not only can cause regions of excessive electrical charge in the upper atmosphere above Earth's poles, they also can do the exact opposite: cause regions that are nearly depleted of electrically charged particles. The finding adds to our knowledge of how solar storms affect Earth and could possibly lead to improved radio communication and navigation systems for the Arctic.

A team of researchers from Denmark, the United States and Canada made the discovery while studying a solar storm that reached Earth on Feb. 19, 2014. The storm was observed to affect the ionosphere in all of Earth's northern latitudes. Its effects on Greenland were documented by a network of global navigation satellite system, or GNSS, stations as well as geomagnetic observatories and other resources. Attila Komjathy of NASA's Jet Propulsion Laboratory, Pasadena, California, developed software to process the GNSS data and helped with the data processing. The results were published in the journal *Radio Science*.

Solar storms often include an eruption on the sun called a coronal mass ejection, or CME. This is a vast cloud of electrically charged particles hurled into space that disturbs the interplanetary magnetic field in our solar system. When these particles and the magnetic distur-

*(Continued on Page 3)*

**Meeting Calendar**

**8am, April 29, 2017**

**8am, May 27, 2017**

**at Mom's Café**

**Field day is June 24-25**

**2017  
PAID MEMBERSHIP**

- AGØL.....Steve Loyd [E]
- AIØN..... Chuck Engberg\* [E]
- K3CRF .....Dave Smith [E]
- K5LBS.....Jerry Gault [E]
- KA0IJY ..... Keith Keene [E]
- KBØFSI .....Pat McCollum [T]
- KBØLF .....Fred Ericksen [E]
- KBØOGO ..... Roger Behrns\* [E]
- KBØSJB.....Tom Katalenich [G]
- KBØZZT..... George Bellairs [T]
- KCØDTK..... Joan Bellairs [T]
- KCØHYD.....John Titsworth [G]
- KCØHYE.....Shirley Titsworth [T]
- KDØNMD.....Dudley Allen [G]
- KDØBxB ..... Kim Allen [T]
- KEØXQ..... Bill McCollum [E]
- KGØKR .....Beth Engberg\* [E]
- KIØPY .....Kevin Faris [E]
- N5SEZ ..... Ray McNally[E]
- WØDBW.....Derek Winterstien [G]
- WØZY.....Dave McLaughlin[E]
- WØZYD.....Debbie McLaughlin[G]

*\*Charter Members #New Ham*

Note: Thanks to all who have paid their dues and many who have given additional donations. All donations are greatly

**Meetings are 8am the last Saturday of most months at Mom's Café in Plattsmouth.**

**Tuesday night get-togethers at Plattsmouth Burger King at 7 PM**

**PLATTSMOUTH AMATEUR  
RADIO CLUB**

**KBØSMX**

**P.A.R.C. Officers**

**President**

**KBØOGO .....Roger Behrns  
rb55930@windstream.net**

**Vice President**

**KCØHYD .....John Titsworth**

**Secretary**

**N5SEZ.....Ray McNally**

**Treasurer**

**KIØPY ..... Kevin Faris**

**Newsletter Editor**

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**Louisville, NE 68037**

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**Repeaters:**

443.45<sup>+</sup> is located in downtown Omaha  
443.225<sup>+</sup> is located in Murray.  
147.48 Simplex is also in Murray.

**Web Site**

**www.kb0smx.com**

Maintained by Derek

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**MINUTES of  
the  
MEETING**

The March 25, 2017 meeting was held at Mom's Café. The meeting was called to order at 0803 by President Roger Behrns.

Those in attendance were Roger (KBØOGO) and Linda, Kevin (KIØPY), Derek (WØDBW), Ray (N5SEZ), John(WR5I), John (KCØHYD), Shirley (KCØHYE), Keith (KA0IJY) and Steve AGØL.

The Minutes of the January meeting were approved on a motion by Shirley and second by John.

The treasurer reported \$15 in Dues and donations which leaves \$260 in the repeater fund and \$947.85 in the general fund for a balance of \$1207.85.

Fred wanted to remind everyone of the Nebraska QSO party in April.

Kevin was checking on a donated MS5000 Repeater and it needed only minor tuning.

Shirley reported that a weather class was sched for Glenwood.

Ray is working on the band pass filters.

The meeting adjourned on a motion by John and second by Shirley at 0808.



**Please note the Paid Membership list. 2017 paid memberships are in black. I apologize in advance if I missed listing your payment. Please let me know.**



Field Day  
June 24-25 2017.  
Young Memorial Park  
Murray NE

PLATTSMOUTH ARC MEMBERSHIP REGISTRATION FORM					
Name		Call Sign		Class	
Address		City	State	Zip	
E-Mail			Phone #		
Spouse Name			Call Sign		Class
Membership Type	<ul style="list-style-type: none"> <li>● Additional donations are gratefully accepted.</li> <li>● New Hams are free during the year they receive their first license.</li> <li>● Please give this form and dues to the club treasurer or any club officer.</li> </ul>		Donation for:	Amount:	
<input type="checkbox"/> Primary(\$15) <input type="checkbox"/> Spouse (\$5) <input type="checkbox"/> Student (\$5) <input type="checkbox"/> New Ham			<input type="checkbox"/> Repeater fund <input type="checkbox"/> Insurance <input type="checkbox"/> Other _____ <input type="checkbox"/> General	<input type="checkbox"/> I prefer my donation to be anonymous.	
Any additional e-mail or cell phone #s?					

**Bands** (Continued from Page 1)

supplied to the antenna and the antenna gain in a given direction, relative to an isotropic antenna (absolute or isotropic gain). EIRP is equal to ERP multiplied by 1.64.]

- Amateurs operating in the 135.7-137.8 kHz band will be permitted to run up to 1 W EIRP.
- The FCC is requiring a 1-kilometer separation distance between radio amateurs using the two new bands and electric power transmission lines with PLC systems on those bands. Amateur Radio operators will have to notify the UTC of station location prior to commencing operations. The FCC Wireless Telecommunications Bureau will provide details on the notification process later, but ARRL is urging radio amateurs interested in operating on either band to register at the earliest opportunity, to avoid having to protect any “post-notification” PLCs.
- The FCC placed a 60-meter (approximately 197 feet) above-ground-level (AGL) height limit on transmitting antennas used on 630 meters and 2,200 meters.
- The bands would be available to General class and higher licensees, and permissible modes would include CW, RTTY, data, phone, and image. Automatically controlled stations would be permitted to operate in the bands.

In an unrelated action, the FCC allocated 1,900-2,000 kHz to the maritime mobile service (MMS) on a primary basis for non-Federal use in ITU Regions 2 and 3, and limited the use of this allocation to radio buoys on the open sea and the Great Lakes.

“We are persuaded by ARRL’s comments to adopt final rules that are better tailored to the places where the commercial fishing fleet can make reasonable and productive use of radio buoys,” the FCC said.

Amateur Radio was upgraded from secondary to primary in the 1900-2000 kHz segment in 2015. The FCC said it believes Amateur Radio and radio buoys “can continue to share this frequency band as they have done for many years.” It declined to make additional spectrum available for radio buoy use.

**Effective Date**

The fact that the new rules contain a new information-collection requirement — notification of operation to the UTC — makes it difficult to guess at an effective date. The FCC R&O says the Office of Management and Budget (under the Paperwork Reduction Act) must first approve the information-collection requirements (in §97.303[g][2]). Once that happens, the revised Part 97 rules sections will become effective after the FCC publishes a notice in The Federal Register “announcing such approval and the relevant effective date.”

<http://www.arrl.org/news/new-bands-fcc-issues-amateur-radio-service-rules-for-630-meters-and-2-200-meters>

[https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-17-33A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-17-33A1.pdf)

**Solar** (Continued from Page 1)

bances encounter Earth's magnetic field, they interact in a series of complex physical processes, and trigger perturbations in the Earth's magnetic field. Those perturbations are called geomagnetic storms. The interactions may cause unstable patches of excess electrons in the ionosphere, an atmospheric region starting about 50 miles (80 kilometers) above Earth's surface that already contains ions and electrons.

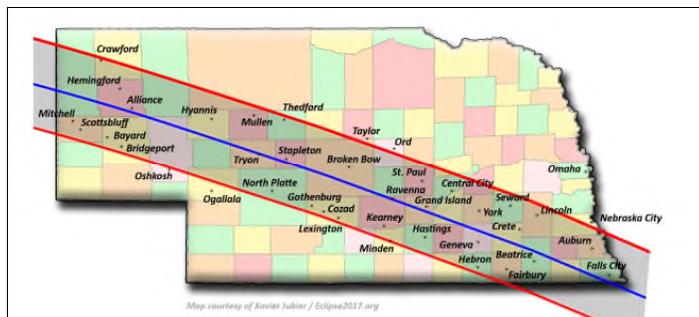
The 2014 geomagnetic storm was a result of two powerful Earth-directed CMEs. The storm initially produced patches of extra electrons in the ionosphere over northern Greenland, as usual. But just south of these patches, the scientists were surprised to find broad areas extending 300 to 600 miles (500 to 1,000 kilometers) where the electrons were “almost vacuumed out,” in the words of Per Hoeg of the National Space Research Institute at the Technical University of Denmark, Lyngby. These areas remained depleted of electrons for several days.

The electrons in the ionosphere normally reflect radio waves back to ground level, enabling long-distance radio communications. Both electron depletion and electron increases in this layer can possibly cause radio communications to fail, reduce the accuracy of GPS systems, damage satellites and harm electrical grids.

“We don't know exactly what causes the depletion,” Komjathy said. “One possible explanation is that electrons are recombining with positively charged ions until there are no excess electrons. There could also be redistribution -- electrons being displaced and pushed away from the region, not only horizontally but vertically.”

The paper is titled “Multiinstrument observations of a geomagnetic storm and its effects on the Arctic ionosphere: A case study of the 19 February 2014 storm.” Lead author Tibor Durgonics is a doctoral student at the Technical University of Denmark. Richard Langley (University of New Brunswick, Canada) provided data sets and interpretation.

<https://www.jpl.nasa.gov/news/news.php?feature=6804>



**August 21 2017 Solar Eclipse Path  
See Article and links on page 4**

## NVIS Research Paper Available

(ARRL 03/23/2017) A thorough and fully annotated discussion of Near Vertical Incidence Skywave (NVIS) is available in the research paper, "Radio Communication via Near Vertical Incidence Skywave Propagation: An Overview," by Ben A. Witvliet, PE5B/5R8DS, and Rosa Ma Alsina-Pagès.

First investigated in the 1920s, NVIS propagation was rediscovered during World War II as "an essential means to establish communications in large war zones such as the D-Day invasion in Normandy," the paper notes, adding that the US Army subsequently sponsored a lot of NVIS field research, especially between 1966 and 1973. More recently, NVIS has become a popular means to enable close-in communication on Amateur Radio HF bands between 3 and 10 MHz. NVIS can be used for radio communication in a large area (200-kilometer radius) without any intermediate manmade infrastructure, and it has been found to be especially suited for disaster relief communication, among other applications, according to the paper.

"A comprehensive overview of NVIS research is given, covering propagation, antennas, diversity, modulation, and coding," the Abstract explains. "Both the bigger picture and the important details are given, as well as the relation between them." As the paper describes it, in NVIS propagation, electromagnetic waves are sent nearly vertically toward the ionosphere, and, with appropriate frequency selection, these waves are reflected back to Earth.

"The great reflection height of 80 to 350 kilometers results in a large footprint and homogeneous field strength across that footprint," the paper says. "Due to the steep radiation angles large objects such as mountain slopes or high buildings cannot block the radio path."

As for NVIS antennas, the paper stipulates that important parameters are antenna diagram, polarization, and bandwidth. "As only high elevation angles contribute to NVIS propagation, optimizing the antenna diagram for these elevation angles will increase the effectively transmitted power and improve the signal-to-interference ratio at reception."

<http://www.arrl.org/news/nvis-research-paper-available>

<http://link.springer.com/article/10.1007/s11235-017-0287-2>



## Canada May be the Best Place for Hams to Experience the Solar Eclipse, Says VE7DXW

(ARRL Letter 4/20/17) Alex Schwarz, VE7DXW, who developed the online Scanning RF Seismograph to determine which bands are open, is among the many looking forward to the solar eclipse on August 21, 2017. Although the path of totality will move over Oregon then southeastward toward South Carolina, he believes radio amateurs north of the border can take advantage of this "very exciting celestial event," as those in the US will be doing, and may have an edge of sorts. Members of the Ham Radio Science Citizen Investigation (HamSCI) in the US will sponsor a Solar Eclipse QSO Party (SEQP) to conduct their own research.

"This will be spectacular when viewed with our eyes," Schwarz said. "The effects of the solar radiation on the propagation of radio waves will be equally or more exciting." Schwarz said it may appear that Canada won't be a part of the solar eclipse, but British Columbia (BC) will have up to 95% coverage, he pointed out.

"As the solar eclipse is moving over the planet, it is leaving a canyon of de-ionized gas on the ionosphere in altitudes of about 100 to 300 kilometers," Schwarz said. "This puts Canada -- and especially Ontario -- in a very good position to get really long signal paths to the horizon toward the south. Southern Ontario will be in the best location to make contacts into the southern and western US and Central America. In southern BC, we can aim our antennas right down the length of the propagation anomaly and reach the Caribbean and southeastern US." Schwarz said timing is important, because the gas will ionize again after the solar shadow has passed. The entire passage across North America will be approximately 90 minutes.

Schwarz said that during the 1999 solar eclipse in Europe, radio amateurs recorded long-distance contacts on 160 and 80 meters. "We want to inform all amateurs about the opportunity of experiencing the solar eclipse on a totally different level by operating radios in their shacks," he said.

Schwarz encouraged all ham radio clubs to participate in the opportunity, not only to view the eclipse but to experience its effects on radio propagation.

<http://www.arrl.org/arrlletter?issue=2017-04-20>

<http://hamsci.org/basic-project/2017-total-solar-eclipse>

<https://eclipse2017.nasa.gov/eclipse-who-what-where-when-and-how>

<http://www.eclipse2017.org/2017/states/NE.htm>

<http://www.eclipse2017.org/>