



# M.E.T.E.R.S. Newsletter – OCTOBER 2011

A monthly publication of the Middle East Tennessee Emergency Radio Service (METERS), Inc.

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## Mars Feels Sun's Wrath By Ian O'Neill October 27, 2011 Air & Space – SCITECH Discovery News NASA

A gigantic solar eruption shoots out from the sun -- straight towards the Red Planet.

The sun battered the Earth's magnetosphere with an "epic" geomagnetic storm over the last couple of days, generating beautiful aurora displays at low latitudes. Now it's Mars' turn.

On Saturday (Oct. 22), a large bubble of solar plasma was blasted from the sun's surface. Unlike the coronal mass ejection (CME) that struck us on Monday, Saturday's CME was sent in a different direction -- toward the Red Planet.

As per simulations carried out by NASA's Goddard Space Weather Laboratory, the CME should have arrived in Mars orbit by now (Oct. 26). However, its impact on Mars will be very different than a CME's impact on Earth.

For starters, Mars doesn't have a protective global magnetic field -- instead it has a "patchy" magnetic field distributed all over the planet. One of the many problems future Mars explorers will face is the increased radiation environment on the Martian surface -- the lack of a protective magnetic "shield" and a thin atmosphere means CME impacts and solar flare events are a health risk.

It is believed Mars suffered a cataclysmic impact event in its early history that damaged the planet's internal "dynamo." Therefore, its magnetosphere was shut down and any residual magnetic field acts as mini-magnetic "umbrellas."

It is thought that these magnetic umbrellas maybe the root cause of the thin Martian atmosphere. As the solar wind continually buffets Mars, the magnetic umbrellas get "pinched off," carrying atmospheric gases into space. This might explain why the planet's atmosphere is 100 times thinner than Earth's.

According to Spaceweather.com, there is circumstantial evidence from data collected by the NASA's Mars Global Surveyor (1996-2007) that suggests these magnetic umbrellas also generate their own aurorae when particles from the sun impact the Martian atmosphere.

Like the satellites in orbit around the Earth, the three satellites in orbit around Mars (NASA's Mars Reconnaissance Orbiter and Mars Odyssey, plus the European Mars Express) are vulnerable to damage by the sun's high-energy particles impacting their circuitry. Fingers crossed this latest solar assault passes without incident.

<http://www.foxnews.com/scitech/2011/10/27/mars-feels-suns-wrath/?test=faces>

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## FCC Tightens BPL Interference Rules -- But Not By Enough 10/27/2011

On October 24, 2011, the FCC released the Second Report and Order in its proceeding -- now in its 9th year -- to adopt rules for Access Broadband over Power Line (BPL) systems. The Second Report and Order is the final step in the Commission's effort to comply with the directives of the United States Court of Appeals for the District of Columbia Circuit, which in April 2008 ordered the FCC to correct errors it had committed in the course of adopting rules in 2004. The Court acted in response to a Petition for Review filed by the ARRL.

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In July 2009, the FCC issued a Request for Further Comment and Further Notice of Proposed Rule Making in which it proposed slight modification of measurement standards for determining whether a BPL system is in compliance with the maximum allowable levels of radiated emissions. In response, the ARRL argued that coupled with a scientifically valid extrapolation factor for determining those levels, mandatory notching of the amateur bands to a level 35 dB below the general emission limit would reduce the likelihood of harmful interference to amateur stations to a level that would permit any remaining harmful interference to be remedied on a case-by-case basis (see below). The ARRL noted that its request for mandatory notching simply reflected the best practices of the BPL industry.

In the Second Report and Order, the Commission decided not to adopt its own proposal and also declined to adopt the ARRL's request for mandatory notching. Instead, the Commission has increased the requirement for BPL systems to be able to notch frequency bands to at least 25 dB, an increase of 5 dB from the existing requirement of 20 dB. The Commission also made technical adjustments to its rules for determining the distance between a power line and a measurement antenna and for determining site-specific extrapolation factors.

“We were prepared to be disappointed, and we were,” commented ARRL Chief Executive Officer David Sumner, K1ZZ, after reviewing the 76 page Second Report and Order. “The increase in notch depth is a step in the right direction, but the value of the change is greatly diminished by the notches not being mandatory. The FCC acknowledges that a compliant BPL system will increase the noise floor below 30 MHz at distances of up to 400 meters from a power line, but characterizes that as ‘a relatively short distance.’ How many amateur stations are located more than a quarter-mile from the nearest power line?”

More than 17 pages of the Second Report and Order are devoted to defending the Commission's choice of a 40 dB/decade extrapolation factor for measuring emissions at distances other than 30 meters from the power line. “It was particularly disappointing to read that ‘...ARRL asserts that there is only one scientifically correct and valid answer of an extrapolation factor of 20 dB...,’ Sumner said. “That is a gross mischaracterization of our position. Our argument was that the 40 dB/decade value chosen by the Commission was demonstrably inappropriate for BPL, which the FCC acknowledges does not behave as a point-source emitter. Lacking an unambiguous scientific basis for a single value that would be equally valid across the entire frequency range from 1.7 to 30 MHz, the Commission fell back on the single value that defies physics -- while at the same time acknowledging that ‘...ARRL is correct with regard to the physics of this issue.’”

One FCC statement with which the ARRL is in strong agreement occurs toward the end of the extrapolation factor discussion: “Whether the extrapolation factor is 20 dB or 40 dB or somewhere in between is far less important than the fact that harmful interference must be corrected under any circumstances.” Unfortunately, Sumner observed, the FCC's deeds do not back up these words: “The Commission notes that there are not many interference complaints about BPL systems that are currently in operation, but inaccurately attributes that to the adequacy of its rules. In fact, it is the marketplace failure of Access BPL -- coupled with voluntary steps taken by the few system providers -- that are still in business that is responsible for this fortunate result.” The one interference complaint that the FCC acknowledges receiving was filed by the ARRL on December 29, 2010, and which the Commission says was “...submitted recently [emphasis added] and is under investigation at this time.” “A well-documented interference complaint languishing for months is a perfect illustration of why mandatory notching is needed,” Sumner said.

The Second Report and Order states that “...the BPL system database shows that BPL systems are currently operating in 125 ZIP codes across the United States.” In fact, once non-existent ZIP codes are eliminated, there are 200 ZIP codes listed in the BPL system database. The FCC offers no explanation for why it has discounted this figure to 125, but neither figure reflects reality. “The BPL system database is filled with listings for ‘paper’

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systems that were never deployed, systems that have been taken out of service and systems that are at some planning stage or are only offering service to customers within a small pilot area,” Sumner said. “The FCC’s own report on the status of Internet access services as of December 31, 2010 shows no more than 6000 customers nationwide receiving service via ‘power line and other’ connections, and about half of those appear to be ‘other.’ There is no reasonable explanation for why the Commission cites a flawed industry source for data when it possesses better data itself.

“One of the most puzzling sections of the Second Report and Order is that devoted to a discussion of the noise floor,” Sumner concluded. “The thrust of the Commission’s argument is that while natural and manmade radio noise is extremely variable, there is no point in regulating BPL emissions down to a reasonable level because in some locations and at certain times, it will be obscured by other noise sources. Imagine if that sort of logic were applied to air and water pollution -- and make no mistake, BPL emissions pollute an irreplaceable natural resource, the radio spectrum.”

While a thorough technical analysis of the FCC’s latest BPL document will take some time, Sumner predicted that the ARRL will file a Petition for Reconsideration. “While BPL has failed in the marketplace as a medium for delivering broadband connectivity to consumers, the technology is perceived to have some ‘smart grid’ applications,” he said. “Now is the time to fix the rules, principally by mandatory notching, so that any new entrants will be competing on a level playing field with the existing BPL firms that have recognized the need for notching of the amateur bands.”

<http://www.arrl.org/news/fcc-tightens-bpl-interference-rules-but-not-by-enough>

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## **FCC, FEMA, NOAA to Conduct First Nationwide Test of Emergency Alert System** **10/25/2011**

The FCC, in coordination with the Federal Emergency Management Agency (FEMA) and the National Oceanic and Atmospheric Administration (NOAA), will conduct the first nationwide test of the Emergency Alert System (EAS) at 2 PM EST (1900 UTC) Wednesday, November 9. According to FEMA, EAS participants -- broadcasters, satellite and digital radio and television providers, and cable and wire line video providers -- “provide a critical public service to the nation as the resilient backbone of alert and warning when all other means of communication are unavailable.”

During the test -- which should last approximately three minutes -- listeners will hear a message indicating that “This is a test.” Although the EAS test may resemble the periodic monthly EAS tests that most Americans are already familiar with, there will be some differences in what viewers will see and hear. The audio message will be the same for all EAS participants.

“Due to limitations in the EAS, the video test message scroll may not be the same or indicate that ‘This is a test,’ FEMA advised on its website. “This is due to the use of the live EAN code -- the same code that would be used in an actual emergency. The text at the top of the television screen may indicate that an ‘Emergency Action Notification has been issued.’ This notification is used to disseminate a national alert and in this case, the test. In addition, the background image that appears on video screens during an alert may indicate that ‘This is a test,’ but in some instances there might not be an image at all.”

According to the FCC, the Commission and FEMA plan to reach out to organizations representing people with hearing disabilities to prepare that community for the national test. In addition, FEMA and the FCC will work with EAS participants to explore whether there are solutions to address this limitation.

