BARC
BRIDGERLAND AMATEUR RADIO CLUB

THE OHM TOWN NEWS

Voice of the Bridgerland Amateur Radio Club

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

September 2011

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ARRL Affiliated

PRESIDENT'S MESSAGE

During the past month of August there have been some of the largest solar flares since the last solar cycle. We currently are in Solar Cycle 24 and, sunspots and solar flares are becoming more numerous as this solar cycle is predicted to reach its maximum peak in mid 2013.

A solar flare occurs when magnetic energy that has built up in the solar atmosphere is suddenly released. The flare ejects clouds of electrons, ions, and atoms through the corona into space. Solar flares affect all layers of the solar atmosphere (photosphere, chromosphere, and corona), when the medium plasma is heated to tens of millions of kelvins and electrons, protons, and heavier ions are accelerated to near the speed of light. They produce radiation across the electromagnetic spectrum at all wavelengths, from radio waves to gamma rays, although most of the energy goes to frequencies outside the visual range and for this reason the majority of the flares are not visible to the naked eye and must be observed with special instruments. X-rays and UV radiation emitted by solar flares can affect Earth's ionosphere and disrupt long-range radio communications. A sudden increase of x-ray emissions resulting from a flare causes a large increase in ionization in the lower regions of the ionosphere on the sunlit side of Earth. This disturbance can affect very low frequencies as a sudden phase anomaly or a sudden enhancement of signal. This disturbance may last from minutes to hours, depending upon the magnitude and duration of the flare.

Flares occur in active regions around sunspots, where intense magnetic fields penetrate the photosphere to link the corona to the solar interior. Sufficiently large or long-lived solar flares are sometimes accompanied by the ejection of large clouds of plasma (ionized gases) into interplanetary space. These plasma clouds are called coronal mass ejections (CME). Here are some pictures from the Solar & Heliospheric Observatory (SOHO) of the solar corona. A CME travels through the solar wind in interplanetary space and sometimes reaches Earth. This results in a world-wide disturbance of Earth's magnetic field, called a geomagnetic storm. Another type of solar activity, known as a coronal hole, produces high-speed solar wind streams that buffet the Earth's magnetic field, also causing geomagnetic storms. The ionospheric disturbances from geomagnetic storms can have adverse effects on radio signals over the entire frequency spectrum, especially in auroral latitudes.

Solar Flare Classifications

Ranking of a solar flare is based on its x-ray output. Flares are classified according to the order of magnitude of the peak burst intensity (I) measured at the earth in the 0.1 to 0.8 nm wavelength band as follows:

Class	(Watts/square meter)	Effect on Earth
A	10^{-8} to 10^{-7}	Is the weakest that can be categorized, no effect on Earth
B	10^{-7} to 10^{-6}	Has no effect on Earth
C	10^{-6} to 10^{-5}	Small; has very few noticeable effects here on Earth
M	10^{-5} to 10^{-4}	Medium; can cause brief radio blackouts that effect Earth's polar regions
X	$>10^{-4}$	Big; major events can trigger planet-wide blackouts and long lasting radiation storms

A multiplier is used to indicate the level within each class.
For example: M6 = 6 X 10-5 Watts/square meter

(Continued on page 4)

UPCOMING ACTIVITIES

**** Club Meeting - Fall Pot-Luck Social - 8 September, 6:00 PM ****
360 East 450 North, Millville (Providence South Stake Center Pavilion)
Bring a food item to share and your eating utensils
The club will provide BBQ sandwich and drinks (lemonade and home made Root Beer)

LOTOJA Bicycle Race - 10 September

Top of Utah Marathon - 17 September

RACES HF Net - 17 September, 8:00 AM 3920 KHz

Bear 100 - 23-24 September

Boulder Amateur Radio Club BARCfest (Longmont, CO) - 25 September

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Swaptoberfest - 8 October

Jamboree on the Air - 15 October

RACES VHF Net - 20 October, 8:00 PM

Club Meeting - 12 November, 10:00 AM

RACES HF Net - 19 November, 8:00 AM 3920 KHz

Club Meeting - Christmas Party - 7 December, 6 PM
At the Coppermill Restaurant

RACES VHF Net - 15 December, 8:00 PM

BARC Club Meetings are normally on the 2nd Saturday of the month at 10:00 A.M. on the 3rd floor of the Cache County Sheriffs Complex on 200 North and 1225 West, Logan, Utah.

ARES Meetings are usually held on the Third Wednesday of each month at 7 P.M. at the Cache County Sheriffs Complex. Contact Tyler Griffiths for more information.

(Presidents Message Continued from page 2)

On August 9th, the sun emitted an X6.9 flare as measured by the NOAA GOES satellite. These gigantic bursts of radiation cannot pass though Earth's atmosphere to harm humans on the ground but they can disrupt the atmosphere and GPS communications signals. There was also a CME associated with this flare but its direction was not towards Earth so there were minimal Earth-bound effects. Here is a chart that describes the different solar flare classification.

In 1859 there was a solar flare that caused a giant aurora which was visible as far south as the Caribbean Islands and essentially charged the air on Earth with electricity, taking out telegraph offices across the globe. According to NOAA, some telegraph operators received electric shocks and papers within offices caught fire. The interference even caused telegraph equipment to continue to distributing signals once the equipment had been turned off.

Here is some information on the sun's wrath and a Solar Dynamics Observatory (SDO) QuickTime movie, (at bottom of description) showing some interesting events seen during its first year of operation.

What does this all mean to radio amateurs? Just before, during, and just after the peak of a solar cycle, the increased number of sunspots sends more ultraviolet radiation to impact Earth's ionosphere. This results in much greater ionization of the F region of Earth's atmosphere. That allows the ionosphere to refract higher radio frequencies back to Earth. When the CME hits the Earth's atmosphere, the low bands will be depressed and signals will be weaker the lower the frequency. The absorption rate will be most severe on 160 meters, less on 80 and somewhat better on 40 meters. The maximum usable frequency (MUF) the highest frequency by which a radio wave can propagate between given radios by ionospheric propagation alone, independent of power, will be lower and auroral propagation on the VHF bands is quite possible.

In particular, HF radio operators attempting to communicate through the auroral zones (the regions of visible aurora, or "Northern Lights") during storms can experience rapid and deep signal fading due to the ionospheric irregularities that scatter the radio signal. Auroral absorption, multipathing, and non-great circle propagation effects combine to disrupt radio communication during ionospheric storm conditions. During large storms the auroral irregularity zone moves equatorward. These irregularities can produce fluctuations of radio waves caused by the solar wind that adversely impact phase-sensitive systems on frequencies above 1 GHz (e.g., the Global Positioning System). Geomagnetic storms may last several days, and ionospheric effects may last a day or two longer.

Space Weather is a consequence of the behavior of the Sun, the nature of Earth's magnetic field and atmosphere, and our location in the solar system where the conditions in space that affect Earth and its technological systems. The Space Weather Prediction Center (SWPC) is part of the National Weather Service and is one of the nine National Centers for Environmental Predictions. SWPC provides real-time monitoring and forecasting of solar and geophysical events to assist users in avoiding or mitigating severe space weather. Check the site out, it has an Education/Outreach section that has space weather information and short reference papers that give additional information on the subjects.

Here is a little trivia about the Sun. It is a prodigious energy machine, manufacturing about 3.8 x 10^{23} kilowatts (or kilojoules/sec). If the total output of the Sun was gathered for one second it would provide the U.S. with enough energy, at its current usage rate, for the next 9 million years.

73,
Cordell
KE7IK

Report on Bob Bruninga Visit

Bob Bruninga, WB4APR, spent about 3 hours with the BARC club on August 9th. Bob is the developer of the APRS (Automatic Packet Reporting System) message standard. He usually attends Utah State University's Small Satellite Conference in August of each year. Most years he finds the time to spend an evening with us.

After being presented a club hat and honorary membership to the BARC club by club president Cordell Smart, Bob started his presentation talking about APRS support of the Hike Across Maryland event last May (http://aprs.org/HAMsupport.html). For this event, Bob tried something new: split digipeaters using 144.99Mhz to avoid the high radio traffic on the APRS standard 144.39Mhz. Bob also spoke about the Golden Packet event that is a VHF packet radio field event along the Appalachian Trail (http://aprs.org/at-golden-packet.html). During this exercise, Bob described the benefits of the TEMPn-N system to have an ad-hoc ready APRS network available. More on that at http://aprs.org/TEMPn-N.html. Bob also reminded us that "higher isn't always better." Broadcasting from the top of a mountain with 10 other high powered antennas from other services probably isn't a good idea. Think about what you're trying to accomplish and set up your antennas and radios to do that job. No need to hike the trail if you have the line-of-sight you need from the parking lot.

Bob also talked about his dreams of a "Universal Ham Radio Texting Initiative." So many devices from cell phones, computers, ham radios, and other portable devices can send and receive text messages. Bob wants to be able to seamlessly send a message from any device to any device (ex. from a cell phone to a ham radio). He believes all the technology is there. It just takes someone with the know-how to develop the software to tie everything together.

Of course, it wouldn't be a Bob Bruninga presentation without talking about solar power. He noted that solar power is now cheaper than coal back east. He described why he thinks its better to be on grid than off when using solar power. Being off the grid you need batteries. Lots of batteries. After they're charged, you gain nothing from the solar power being generated. Better to be on the power grid and use that power to roll your power meter backwards. It's like free power storage from the power company! No need to purchase and maintain batteries. He noted this doesn't do anything for emergency power, where you'll need batteries. "Keep the economics of solar energy production separate from emergency power." They're separate topics, he says. Keeping that in mind, the angles of the solar panels are less important when considering the power generation over the course of a year. You can use online calculators to determine local solar energy production (http://www.nrel.gov/rredc/pvwatts/).

We hope to see Bob again next year!

Jared B. Luther - K7LRX

BRIDGERLAND AMATEUR RADIO CLUB ROCKET RECOVERY
JUNE 15-18, 2011

This year's Rocket Recovery activity with the Experimental Sounding Rocket Association (ESRA) was held at the same site, about 20 miles WSW of Green River City, Utah, as last year, but that was about all that was similar. As the date approached, we were informed that as many as 16 rockets were entered in the competition, where last year there were four launches. This meant we needed to be prepared with additional search personnel and with at least six beacon transmitters. We also needed a few more Yagi antennas, so last year's design was modified slightly and a series of three build parties were held, producing five new antennas. The field training meeting that followed at Lundstrom Park helped new participants learn about radio direction finding with the new Yagi's.

A parallel activity was to design and build a 4-band (40, 20, 15, and 10 meters) HF antenna for deployment at the Green River observation site, which is on the top of a small hill with no trees and with very dry, rocky ground. However, the horizon is less than 2 degrees elevation in all directions, making the challenge all the more attractive for some evening radio fun. After considerable searching, a 4-band antenna design by Ralph Crumrine, N0KC, in Kansas City was found in the ARRL Antenna Compendium, Vol. 7. Ralph designed and built it for stationary use, but we wanted a car-portable system, requiring a minimum of tools to set up and with no small parts to get lost. Ralph generously shared his EZNEC data file, which was imported into 4nec2 to evaluate the dimensional modifications needed for telescoping tubing elements. Guy Hatch, N7WAT, involved Brent Carruth, AD7VF, Stan Wellard, W7SJW, and Kelby Davis, AD7VO, in optimizing the RF design. A 3D solid model and drawing set was then created in SolidWorks to guide fabrication. Several build parties were held, resulting in all the tubing sections being cut, welded, glued and assembled. Wayne, KC7DKP, and Diane, KF7OWB, Reese, and Darrell Robison, KD7BWV, also came to the park to help when we first attempted to erect the antenna. Unfortunately, a Texas Towers catalog had been rolled up and inserted, unnoticed, in the "bottom" pipe, where the feed line needed to go, and got stuck there when the pipe was washed after fabrication. After several man-hours (and a few very special words) to extract the gooey mass from the pipe, the antenna was ready. When the antenna was finally erected at the park a few days later, Kelby used his graphic antenna analyzer to find all four resonances close to their designed frequencies and each with a very favorable SWR sweep. We fired up a generator, tuned up Guy's Kenwood TS120 transceiver, listened to several very clear signals, and called a few "CQ's," on 20 meters, but made no contacts in the few minutes of late evening before we took it all down and packed it for transport to Green River.

Four of the fifteen initial rocket competition entrants canceled just prior to the competition, leaving eleven potential launches:

***"Basic" Category (Rocket with 10-lb payload closest to 10,000 feet AGL):**

Arizona State University
California State University-Long Beach
Ecole Polytechnique de Montreal
Embry-Riddle Aeronautical University (Daytona Beach campus)
Ryerson University
University of Arizona
University of Nebraska
University of Washington
University of Waterloo

***"Advanced" Category (Rocket with 10-lb payload closest to 25,000 feet AGL):**

Arizona State University
California Polytechnic University-San Luis Obispo
California State University- Long Beach
Embry-Riddle Aeronautical University (Daytona Beach campus)
University of California-Los Angeles
University of Washington
(*from ESRA website)

Two additional beacon transmitters were purchased, and all six were programmed and batteries charged. Kathie Felsted graciously consented to plan, purchase and cook the food for the group, which was a great help. The Cache Valley group included Guy Hatch, N7WAT, Jonathan and Andrew Hatch, two of Guy's grandsons who live in Richmond, Stan Wellard, W7SJW, Val Campbell, KE7QHT, Jeanette Campbell, KF7GSR, Ron Felsted, KF7EQQ, and Ron's wife, Kathie (soon to get her ticket!). We loaded up two pickups, a borrowed trailer and a car and started for Green River on Wednesday morning, June 15. We were joined by Kevin Bosworth, W7BOZ, and Jeff Stork, KD7BCJ, as we left Logan and stopped several times on the way to pick up three of Ron and Kathie's grandchildren, including Jacob Hansen, KF7KPR, and James Hatch, one more of Guy's grandsons who lives in Kaysville, and arrived at the site a little after 3 p.m. On arrival, it was sunny, warm, and dry with a light breeze, so we set up tents and started supper preparations. We were joined at the camp site by one of the Felsted's daughters and three more grandchildren. About 6 p.m. the sky darkened and a stiff wind came up. By dark, we had sustained winds of at least 30 mph, with gusts up to 50 mph; then came a down-pour! We all retreated to our vehicles because of lightening all around us and waited out the worst of the storm, which abated some by about 8 p.m. The wind continued most of the night, but by sunrise there was just a light breeze, with partly-cloudy skies and dry ground. While it was cool and calm Thursday morning, we attempted to erect the HF antenna. It was all the way up and stable, but, when we tried to tie off the guy ropes, it wobbled and broke at the feed point insulator just above the ground plane hub. Since there was no way to repair it at the site, we just packed it up again; hoping to repair it before Field Day.

After drying out their camp stuff and eating a quick breakfast (thanks Kathie!), Guy and his three grandsons, Andrew, Jonathan and James Hatch, drove into Green River to orient the competition teams about the beacon transmitters and our search assistance just prior to the teams giving their presentations to the judges. Several of the other camp members took the day off and went for some sight-seeing to Goblin Valley. When they returned from Green River City, Guy and his boys went on a hike to explore 9-Mile Reservoir about a mile to the east. Later Thursday afternoon, another storm came up. However, by this time, the tents had been well secured, rain flies added, and little additional damage was done.

Friday, Launch Day #1, dawned sunny and calm – great rocket launch weather! The teams came to the site in a long caravan and, by 3 p.m. the first two launches were ready. Embry-Riddle's launch was filmed by the KSL news photographer for a **special report** on the rocket competition on the KSL 10 o'clock news, presented by Mr. John Hollenhorst, that evening. Very fortunately, that launch and descent went beautifully. Unfortunately, the next rocket, from UC-Long Beach, failed to deploy its parachute and "lawn-darted" into the top of the mesa about a mile from launch. Jeff Stork and Kevin Bosworth went with the UC-LB team and Jeanette Campbell and Jacob Hansen went to help the Embry-Riddle team search for their rocket. UCLA's rocket was placed on the rail next, but failed to ignite – three times.

Saturday, Launch Day #2, had almost as nice weather as the day before; at least in the morning. Brief spells of wind and clouds occurred, but did not delay any launches. The delays that did occur were technical. We signed out all five of our remaining transmitters, but only four launches happened that day. Unfortunately, again, one blew up on the rail and parachutes failed to open on the other three (scratch four more transmitters)! The last launch of the competition was UCLA. Their beautiful 16' long x 10" diameter rocket was hybrid fueled, using compressed liquid nitrous oxide and solid rubber/aluminum powder. Their fourth launch attempt achieved ignition and began with great beauty and promise – attempting for 20,000 feet. Sadly, the motor quit at about 500 feet and the rocket just coasted silently to a spectacular, angled crash–explosion about 600 yards away from the launch rail (about 1000 yards away from us!). There was no fire, but pieces of rocket were scattered over a large area when the nitrous tank ruptured on impact. We left our one remaining transmitter in the Waterloo rocket, whose team planned to launch Sunday morning. We also left one of our Yagi antennas with Doug Sin-

clair, VA3DNS, one of the officials, who planned to help with the recovery. Sadly, that rocket reportedly ignited poorly at first and barely cleared the rail before it heeled-over to fly horizontally – and picked up speed! It headed in the direction of the road leading to the launch site and crashed only a few yards from the road about a mile away.

Well, how's that? What an adventure! Only eight of the eleven rockets that came to Green River this year were launched. Everyone involved encountered at least some significant adversity, several more than their fair share, but we all survived and, I think, learned a lot from the experience. The overall BARC portion of the competition combined a good deal of preparation work with a very challenging camping experience. Our anticipation of needing to do as many as eleven search hikes did not pan out, due to the few un-launched and many crashed rockets. However, if called upon, we were prepared to provide useful assistance. We were reimbursed $75 for each of the six destroyed beacon transmitters and will order some more for next year. The young people who came with us seemed to appreciate the significance of the work being done around them. They met with several of the competition officials and participants and got to see the inner workings of many of the rockets. We all observed the utility of radio communication, especially in a challenging and remote setting. Much of the wildlife in the area was gently caught and closely examined and photographed by Jonathan, who then carefully returned each creature to its home territory. Kathie Felsted exceeded all expectations with her delicious menu, all prepared and available as needed. We all slept reasonably warm and dry, despite the wind and rain, and most of our equipment survived. Chalk up another great BRRR event!

Guy Hatch
N7WAT

The ARRL ARES Letter for June 15, 2011

Q&A: ARES® Versus RACES

Q: I would enjoy reading an article about the similarities and differences between the ARES® groups and the RACES groups. I am part of an ARES® group, but I really don't know why ARRL has two organizations that seem to be doing the same thing. -- Mike Sallee, KC9FWL, Bloomington, Illinois

A: After World War II, it became evident that the international situation was destined to be tense and the need for some civil-defense measures became apparent. Successive government agencies designated to head up such a program called on amateur representatives to participate.

In the discussions that followed, amateurs were interested in getting two points across: First, that Amateur Radio had a potential for and capability of playing a major role in this program; and second, that our participation should be in our own name, as an Amateur Radio Service, even if and after war should break out. These principles were included into the planning by the formulation of regulations creating a new branch of the amateur service, the Radio Amateur Civil Emergency Service, RACES.

RACES is administered by local, county and state emergency management agencies, and supported by FEMA. It is a part of the Amateur Radio Service that provides radio communications for civil-preparedness purposes only, during periods of local, regional or national civil emergencies. These emer-

gencies are not limited to war-related activities, but can include natural disasters such as fires, floods and earthquakes.

RACES operation is authorized by emergency management officials only, and this operation is strictly limited to official civil-preparedness activity in the event of an emergency communications situation.

Operating Procedure

Amateurs operating in a local RACES organization must be officially enrolled in the local civil-preparedness agency having jurisdiction. RACES operation is conducted by amateurs using their own primary station licenses and by existing RACES stations.

The FCC no longer issues new RACES (WC prefix) station call signs. Operator privileges in RACES are dependent upon, and identical to, those for the class of license held in the Amateur Radio Service. All of the authorized frequencies and emissions allocated to the Amateur Radio Service are also available to RACES on a shared basis.

While RACES was originally based on potential use for wartime, it has evolved over the years, as has the meaning of civil defense (which is also called civil preparedness), to encompass all types of emergencies.

While operating in a RACES capacity, RACES stations and amateurs registered in the local RACES organization may not communicate with amateurs not operating in a RACES capacity. Such restrictions do not apply when such stations are operating in a non-RACES--such as ARES®--amateur capacity. Only civil-preparedness communications can be transmitted.

Test and drills are permitted only for a maximum of one hour per week. All test and drill messages must be clearly so identified. With the approval of the chief officer for emergency planning and applicable state, Commonwealth, district or territory, however, such tests and drills may be conducted for a period not to exceed 72 hours no more than twice in any calendar year.

ARES® and RACES

Although RACES and ARES® are separate entities, the ARRL advocates dual membership and cooperative efforts between both groups whenever possible for an ARES® group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility. Using the same operators and the same frequencies, an ARES® group also enrolled as RACES can "switch hats" from ARES® to RACES and RACES to ARES® to meet the requirements of the situation as it develops. For example, during a "nondeclared emergency," ARES® can operate under ARES®, but when an emergency or disaster is officially declared by a state or federal authority, the operation can become RACES with no change in personnel or frequencies.

This situation is still not well understood and accepted throughout the United States; both ARES® and RACES still exist, separately, in many areas.

Where there is currently no RACES, it would be a simple matter for an ARES® group to enroll in that capacity, after a presentation to the civil-preparedness authorities. In cases where both ARES® and RACES exist, it is possible to join both or to be involved in either. As time progresses, the goal would be the merger into one strong organization, with coordination between ARES® and RACES officials using the same groups of amateurs. In some sections of the U.S. today, the ARES® structure has also been accepted as the RACES structure.

FEMA Administrator: Amateur Radio "The Last Line of Defense"

In an FCC forum on earthquake communications preparedness, Federal Emergency Management Agency (FEMA) Administrator Craig Fugate described the Amateur Radio operator as "the ultimate backup, the originators of what we call social media." The forum-- held May 3 at FCC Headquarters in Washington, DC -- brought together officials from the White House, the Department of Homeland Security (DHS), the United States Geological Survey (USGS), FEMA, the FCC and the private sector. Fugate and FCC Bureau of Public Safety and Homeland Security Chief Jamie Barnett gave the opening remarks.

Later in the forum, Fugate spoke more on Amateur Radio. "During the initial communications out of Haiti, volunteers using assigned frequencies that they are allocated, their own equipment, their own money, nobody pays them, were the first ones oftentimes getting word out in the critical first hours and first days as the rest of the systems came back up," he told the forum. "I think that there is a tendency because we have done so much to build infrastructure and resiliency in all our other systems, we have tended to dismiss that role 'When Everything Else Fails.' Amateur Radio oftentimes is our last line of defense."

Fugate said that he thinks "we get so sophisticated and we have gotten so used to the reliability and resilience in our wireless and wired and our broadcast industry and all of our public safety communications, that we can never fathom that they'll fail. They do. They have. They will. I think a strong Amateur Radio community [needs to be] plugged into these plans. Yes, most of the time they're going to be bored, because a lot of the

time, there's not a lot they're going to be doing that other people aren't doing with Twitter and Facebook and everything else. But when you need Amateur Radio, you really need them."

Readers can watch a video of the forum on YouTube. Fugate's remarks begin at 18:55.

The ARRL Letter for July 7, 2011

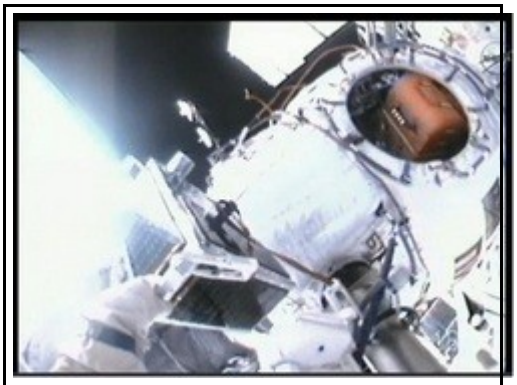
Space Weather Prediction Center to Continue Broadcasts on WWV and WWVH

In April 2011, the Space Weather Prediction Center (SWPC) informed the public that as of September 6, 2011, it would no longer broadcast its geophysical alert message on WWV and WWVH. The ARRL has now learned that the SWPC will keep broadcasting these messages that inform listeners of the solar flux, the mid-latitude A and K indices and space weather storms, both current and predicted. Due to listener feedback, the SWPC is considering updating the broadcast; in addition to providing the current daily solar flux at 2800 MHz, the SWPC is considering adding more frequent observations at 2695 MHz. According to the SWPC website. other improvements to the message content will also be evaluated.

The ARRL ARES Letter for August 4, 2011

Amateur Radio in Space: After Delays, ARISSat-1 Deployed from ISS

Amateur Radio has a new satellite! Despite concerns that led to an almost four hour delay in deployment from the International Space Station, ARISSat-1/KEDR is in operation. According to reports flowing in from around the world, both the transponder and telemetry are working. Cosmonauts Sergei Volkov, RU3DIS, and Alexander Samokutyaev, successfully deployed Amateur Radio's newest satellite: ARISSat-1/KEDR. The deployment -- originally scheduled to occur at 1457 UTC on Wednesday, August 3 -- was delayed due to antenna concerns. Read more here.



Sergei Volkov, RU3DIS, holds ARISSat-1 in his hand shortly before the decision to delay its deployment. [Screengrab from NASA TV]

Amateur Radio in Space: Hams Report ARISSat-1's Linear Transponder Is Working

After its eventful deployment yesterday, ARISSsat-1 is definitely working. Hams from all over the world have reported hearing the voice, CW and SSTV transmissions. Despite concerns that the UHF antenna was either missing or damaged, the linear transponder is working and some people are already making contacts with it. The August 3 deployment was delayed nearly four hours after cosmonauts Sergei Volkov, RU3DIS, and Alexander Samokutyaev, expressed concerns that only one antenna -- the VHF antenna -- was visible.

"I was able to hear myself with as little as 1 W on the 0425 UTC pass," AMSAT Vice President for Operations Drew Glasbrenner, KO4MA, wrote on the AMSAT e-mail reflector. "Antennas are a M2 CP42 on RHCP up, and a 10 element horizontal Yagi down. ARISSat -1 sounded *very* good, and cycled on and off with the telemetry. I also managed to grab two frames of telemetry right after AOS." Glasbrenner posted a video of his transponder test.

Calling it a "very good first day," ARISSat-1/KEDR Project Manager Gould Smith, WA4SXM, said that hams are submitting SSTV images to ARISS SSTV Gallery, and BPSK-1000 telemetry and experiment data is coming into the telemetry server. "ARISSat-1/KEDR continues to work well with good reports coming in from around the world," he said. "The satellite is warmer than we expected, so we will continue to monitor this."

ARISSat-1 is seen floating in space -- connected to the ISS only by a tether line -- shortly before it is jettisoned off into space. [Screengrab from NASA TV]

The 435 MHz/145 MHz linear transponder operates in Mode U/v (70 cm up, 2 meters down). It is a 16 kHz wide inverting passband, and the convention is to transmit LSB on the 435 MHz uplink and receive USB on the 145 MHz downlink.

The ARRL Letter for August 11, 2011

FCC News: Vanity Call Sign Fee to Go Up in September

On August 10, the FCC announced via a *Final Rule* in the *Federal Register* that the cost of an Amateur Radio vanity call sign will increase 90 cents, from to $13.30 to $14.20. The new fees take effect 30 days after publication, making September 9, 2011, the first day the new fee is in effect. The vanity call sign regulatory fee is payable not only when applying for a new vanity call sign, but also upon renewing a vanity call sign for a new term. The first vanity call sign licenses issued under the current Amateur Radio vanity call sign program that began in 1996 came up for renewal five years ago. The FCC is authorized by the *Communications Act of 1934, As Amended*, to collect vanity call sign fees to recover the costs associated with that program. Read more here.

The ARRL ARES E-Letter for August 25, 2011

Basic Training: ICS

The government's Incident Command System (ICS) was developed in the 1970s following a series of fires in California's urban interface. Property damage ran into the millions, and many people died or were injured. The personnel assigned to determine the causes of these outcomes studied the case histories and discovered that response problems could rarely be attributed to lack of resources or failure of tactics. Surprisingly, studies found that response problems were far more likely to result from inadequate management than from any other single reason.

The Incident Command System was developed as a standardized management tool for meeting the demands of small or large emergency or non-emergency situations. The ICS represents "best practices" and has become the standard for emergency management across the country. It may be used for planned events, natural disasters, and acts of terrorism. It is a key feature of the National Incident Management System (NIMS).

The ICS is a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. ICS is used by all levels of government--Federal, State, local, and tribal--as well as by many private-sector and nongovernmental organizations. ICS is also applicable across disciplines. It is normally structured to facilitate activities in five major functional areas: **command, operations, planning, logistics, and finance and administration.** More in the next issue**.** - FEMA

The ARRL Letter for August 25, 2011

At the Workbench: Heathkit Returns to the Kit Business

A notice on the Heathkit website announces that the venerable kit manufacturer, well-known to all Amateur Radio operators of a certain age, will be reentering the kit business in late August. The notice states, in part: "Heathkit will debut their new line of Do-it-Yourself kits for common around-the-house items. The first kit will be a Garage Parking Assistant (GPA). The Garage Parking Assistant kit lets you build your own system that uses ultrasonic sound waves to locate your car as it enters the garage. The system signals to the driver using LED lights mounted on the wall when the car is detected and in the perfect spot for parking. Read more here.

The ARRL Letter for September 1, 2011

On the Air: Special Event Stations Mark Tenth Anniversary of 9/11

In remembrance of those who died in the terrorist attacks that occurred on September 11, 2001, several Amateur Radio Special Event Stations are being planned. Click here for a list of those stations that have notified the ARRL that they will be on the air. The dates, times and frequencies of these Special Event Stations are listed as they were reported to the ARRL, and as such, are subject to change. This list will be updated as more Special Event Stations notify ARRL HQ of their plans. We recommend that you bookmark the web page and check back periodically for any additions.

Questions for General Class License (from new question pool)

1.(G1B01) What is the maximum height above ground to which an antenna structure may be erected without requiring notification to the FAA and registration with the FCC, provided it is not at or near a public use airport?
A. 50 feet
B. 100 feet
C. 200 feet
D. 300 feet

2. (G2A09) Why do most amateur stations use lower sideband on the 160, 75 and 40 meter bands?
A. Lower sideband is more efficient than upper sideband at these frequencies
B. Lower sideband is the only sideband legal on these frequency bands
C. Because it is fully compatible with an AM detector
D. Current amateur practice is to use lower sideband on these frequency bands

3. (G3A13) What does the A-index indicate?
A. The relative position of sunspots on the surface of the Sun
B. The amount of polarization of the Sun's electric field
C. The long term stability of the Earth's geomagnetic field
D. The solar radio flux at Boulder, Colorado

4. (G4A10) What is the purpose of an electronic keyer?
A. Automatic transmit/receive switching
B. Automatic generation of strings of dots and dashes for CW operation
C. VOX operation
D. Computer interface for PSK and RTTY operation

5. (G5A10) What unit is used to measure impedance?
A. Volt
B. Ohm
C. Ampere
D. Watt

6. (G6C03) Which of the following is an advantage of CMOS integrated circuits compared to TTL integrated circuits?
A. Low power consumption
B. High power handling capability
C. Better suited for RF amplification
D. Better suited for power supply regulation

7. (G7C06) What should be the impedance of a low-pass filter as compared to the impedance of the transmission line into which it is inserted?
A. Substantially higher
B. About the same
C. Substantially lower
D. Twice the transmission line impedance

8. (G8A12) What signal(s) would be found at the output of a properly adjusted balanced modulator?
A. Both upper and lower sidebands
B. Either upper or lower sideband, but not both
C. Both upper and lower sidebands and the carrier
D. The modulating signal and the unmodulated carrier

9. (G9C13) Approximately how long is each side of a quad antenna driven element?
A. 1/4 wavelength
B. 1/2 wavelength
C. 3/4 wavelength
D. 1 wavelength

10. (G0B13) What must you do when powering your house from an emergency generator?
A. Disconnect the incoming utility power feed
B. Insure that the generator is not grounded
C. Insure that all lightning grounds are disconnected
D. All of these choices are correct

(For answers to test questions see page 14)

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Answers to questions on page 13: 1-C, 2-D, 3-C, 4-B, 5-B, 6-A, 7-B, 8-A, 9-A, 10-A