



# THE OHM TOWN NEWS

*Voice of the Bridgerland Amateur Radio Club*

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

## September 2014

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# PRESIDENT'S MESSAGE

On September 4<sup>th</sup>, we have our end of summer BARC Pot Luck Fall Social @ 6:00 PM. The location is 360 East 450 North, Millville (Providence South State Center Pavilion). Everyone is invited to this social. You don't have to be a member of BARC to attend this social. This is a way to get to meet those voices you have talked to on the radios in person and have an eye-ball QSO. Just bring a food item to share with the group. Please bring your own plate, eating utensils, and cup. Hope to see you all there. After the social at about 7 PM, there will be a short LOTOJA meeting for last minute updates and to hand out the LOTOJA packets to those who are supporting LOTOJA on September 6<sup>th</sup>.

ARRL recently worked with members of the United States House of Representatives to successfully introduce a bipartisan bill, [H.R. 4969](#), that would extend [PRB-1](#) coverage to homeowners' association regulations and deed restrictions (also known as "covenants, conditions, and restrictions", or CC&Rs). Presently, PRB-1 only applies to state and local zoning laws and ordinances. The bill's primary sponsor is Rep Adam Kinzinger (R-IL). It received initial co-sponsorship from Rep Joe Courtney (D-CT), who attended the ARRL National Centennial Convention on July 19 to discuss the measure with visitors and League officials. Further information on H.R. 4969 can be found [here](#). Be sure to look at the "What are the key Talking Points..." as to why this bill is important.



This is a call to action for all ARRL members in Utah's 1<sup>st</sup> Congressional District to contact your Congressman -- Rep Rob Bishop --, to inform him of this bi-partisan legislation, and kindly request that he sign on to it as a co-sponsor. Please cut and paste the sample email below (or compose a similar one of your own, if preferred) -- FIRST MAKING SURE THAT YOU ADD YOUR NAME TO THE SIGNATURE -- and email it to Rep Bishop using his Congressional email form at: <http://robbishop.house.gov/contact/zipauth.htm> Within Rep Bishop's web page, enter in your zip code (if requested), then in the email page fill in the required fields. In the Issue box, select "Miscellaneous". Paste the letter in the Message box (be sure to have your name at the end at the message text).

Please forward a copy of your correspondence to Brian Milesosky (ARRL Rocky Mountain Division Director), [n5zgt@arrl.org](mailto:n5zgt@arrl.org), for his records so he can summarize the level of response from members of the Rocky Mountain Division to ARRL's government relations firm on Capitol Hill who is advocating on our behalf within the halls of Congress (please do not CC him in your original email to your Congressman, forward a separate copy afterwards).

*(President's Message Continued on page 3)*

Sample email follows:

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Dear Congressman Bishop,

Please cosponsor H.R. 4969.

I am a constituent in your District and wish to bring an important issue to your attention. I am a federally licensed Amateur Radio operator, one of over 3,870 whom reside in your District. We provide wireless communications support for community events; provide public service, search-and-rescue, severe weather, and disaster communications for local governmental agencies and non-governmental agencies (NGO) such as the Red Cross and Salvation Army; provide communications support to the United States military through its Military Auxiliary Radio System (MARS); for our neighbors when mainstream communications degrade or become inoperable; and contribute towards the advancement of wireless communications as developers and experimenters of new, novel, and further efficient means of communicating and transferring information.

Our ability to conduct the above public services is hindered by prohibitions that disallow the placement of even the simplest antenna on our property.

Recently a bi-partisan Bill, H.R. 4969 (the "Amateur Radio Parity Act of 2014"), was introduced by Rep Kinzinger (R-IL) and Rep Courtney (D-CT) which would extend the ability to properly negotiate with developments that have restrictions which routinely preclude Amateur Radio operators from putting up even a barely visible wire antenna in a tree. We already have this ability with local zoning ordinances; however an extension of similar reasonable accommodation to federally licensed individuals residing under land use restrictions remains sorely needed.

As your constituent, I am asking that you support H.R. 4969 by signing on to it as a co-sponsor. Please contact Rep. Kinzinger's office to do so.

Should you have any questions about Amateur Radio or the importance of this legislation, please contact me. Thank you.

Sincerely,

(\*\* Add your full name here \*\*)

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73,  
Cordell  
KE7IK

# UPCOMING 2014 ACTIVITIES

- 4** September — Pot Luck Dinner/BARC Club Meeting (Thursday before LOTOJA)
- 6** September — LOTOJA Bicycle Race ([more info](#)) (Tyler & Ted)
- 10** September, 7:30 PM - ARRL Rocky Mountain Division Net IRLP Node: 9871
- 13** September — Pueblo Hamfest (Pueblo, CO)
- 20** September, 8:00 AM — RACES HF Net 3920 KHz
- 20** September — Top of Utah Marathon (Tyler & Laurie)
- 26-27** Sept - Bear 100 – BARC does support for Utah portion of Race (Cordell & Ted)
- 27** September — Bike the Bear (Kelly Hadfield)
- 8** October, 7:30 PM - ARRL Rocky Mountain Division Net IRLP Node: 9871
- 9** Oct, 7:03 PM - VE Test Session
- 12** October — Swaptoberfest — Club Meeting/Swap Meet (Bill Neville)
- 16** Oct, 8:00 PM - RACES VHF Net 147.18 Snowbird 147.20 IRLP 146.72 Mt. Logan
- 18-19** October — JOTA - BSA Jamboree-on-the-Air ([more info](#))
- 25** October — One Day Ham Class and Test for Technician License

For updated calendar information see the [barconline.org/calendar](http://barconline.org/calendar)

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## Local News

**Phillip Rasmussen N7JFG** is headed to England. Many thanks to him for the time and effort he has provided in managing the BARC VE sessions over the past years. **Richard Elwood KE7GYD** has accepted to be the ARRL VE Team Liaison for BARC.

On August 5 Bob Wood sent out the following silent key information:  
It is my sad duty to report the passing of **Les Seeley, W7QCD** of Hyrum last night. He was a good friend and really enjoyed the ham radio hobby. He will be missed by many of us in the BARC club.

73, Bob WA7XMZ

Marginal Notes - The oldest word in the English language is town.

# A Few pictures from activities this year



Field Day



# A few more pictures



# The ARRL Letter for August 14, 2014

## Radio Amateur Named to FEMA National Advisory Council

A Nevada radio amateur is among 12 new members appointed to the Federal Emergency Management Agency (FEMA) [National Advisory Council](#) (NAC). FEMA announced the appointments by FEMA Administrator Craig Fugate, KK4INZ, this week. New NAC member Chris Smith, W4HMY, of Sparks, Nevada, was one of the speakers at this year's ARRL Nevada Section Convention.



Chris Smith, W4HMY. [Photo courtesy of Mike Corey, K11U]

"FEMA is just one part of our nation's emergency management team," Fugate said in a statement. "The National Advisory Council serves a vital role in guiding our plans and strategies by ensuring we remain informed by diverse viewpoints and experiences from every sector of society. I value the expertise and input of each of these members, and appreciate their dedication and commitment to ensuring effective emergency management."

Chris Smith comes from an Amateur Radio family. His father is Bill Smith, W7HMY, an ARRL Life Member and Emergency Coordinator for Clark County Nevada.

The NAC, which can include up to 35 members, provides recommendations to the FEMA Administrator on a variety of emergency management issues. "For example," a FEMA news release said, "the NAC recently made [recommendations](#) regarding regional response and recovery capabilities as well as regarding mutual aid agreements among different units of government."

Most NAC appointments are for 3-year terms.

## Ham Radio Payload to Circle the Moon

A lunar flyby with a ham radio payload transmitting JT65B mode on 145.990 MHz is expected to take place toward the end of this year, giving earthbound radio amateurs the opportunity to receive some otherworldly DX signals as the payload flies around the Moon.

China has [announced](#) plans to launch a lunar orbiter carrying a 14 kg battery-powered payload known as 4M-LXS, which was developed at LuxSpace. Signals from the Amateur Radio payload can be decoded using the free [WJST](#) software by Joe Taylor, K1JT.

The orbiter is one of the test models for Beijing's new lunar probe *Chang'e-5*, which will land on the moon, collect samples, and return to Earth. The launch, planned for 4th quarter 2014, is aimed at testing technologies that are vital for the success of the spacecraft. The orbiter will be launched into Lunar Transfer Orbit and then perform a lunar flyby before re-entering Earth's atmosphere after 9 days.

The orbiter, which arrived by air in Xichang, Sichuan, on Sunday, August 10, has been transported to the Xichang Satellite Launch Center. -- *Thanks to AMSAT-UK*



Marginal Notes—The Ostrich has only 2 toes

# The ARRL ARES E-Letter for August 20, 2014

## A Brief History of ARES

As we celebrate one hundred years of the ARRL, we've reached a seminal moment in time when we are sparked to reflect on the past while looking to the future with a sense of inquiry and wonder. That has certainly been the theme of the ARRL's centennial celebration this year. *QST* has featured fascinating look-backs at pivotal points in the League's and Amateur Radio's history this year, with more to come. Continuing this theme, let's take a brief look at the role of Amateur Radio in public service, disaster, and emergency communications over the past hundred years.

In the early days, Amateur Radio and hams were considered irritations and nuisances to the "real" communicators - the commercial sector and the military. We were almost outlawed, and ultimately relegated to the "useless" frequencies of "200 meters and down." That was until it was demonstrated that we could actually be of use as a service. In 1913, college students/hams in Michigan and Ohio passed disaster messages when other means of communications were down in the aftermath of severe storms and flooding in that part of the country. A Department of Commerce bulletin followed, proposing a dedicated communications network of radio amateurs to serve during disasters. Five special licenses were reportedly issued. A magazine article noted that amateurs - who were once considered nuisances - were now considered to be essential auxiliary assets of the national public welfare.

The ARRL was formed in 1914, and disaster response communications as provided by radio amateurs became organized and useful. In 1920, Amateur Radio was used to help recover a stolen car, of all things! Soon, the use of Amateur Radio for natural disasters that we traditionally think of now emerged with hams active in deadly flooding in New Mexico and an ice storm in Minnesota.

More organization followed, with an "MoU" emerging with the American railroad system for Amateur Radio support when the railroad's wire lines were down: There was an ARRL Railroad Emergency Service Committee. There was even a Q-signal designated: *QRR*, a kind of land SOS.

More reports of disaster response communications provided by amateurs appeared in *QST*, much as they do here in this newsletter today. A major New England flood had amateurs supplying the only efficient means of communications from the devastated areas to the outside world, prompting the chairman of the Federal Radio Commission to say the future of radio depends on the amateurs.

Hams worked with the Burgess Battery Company for emergency radio power. Many of us old-timers including myself have used those batteries when we were kids for our crystal radio kits; they looked like tall, thick candle columns!

More organization followed, and traffic handling was recommended as the best way to gain discipline and proficiency to prepare for the efficiency and effectiveness needed in response communications situations.

ARRL Field Day was started to prepare amateurs for portable operation, as was necessary in disaster situations when commercial power and means of communications were down.

In 1935, the ARRL Emergency Corps was formed with the goal of having an Amateur Radio Emergency Station in every community -- a goal that remains just as urgent today as it did then! To wit, just look at today's emphasis on the neighborhood and community as "first responder" and on self-reliance in the post-disaster survival chain.

More "served agencies" emerged as potential partners, including the Red Cross. In 1936, major flooding across a 14-state region served as the ARRL Emergency Corps' first major testing, serving well, and solidifying Amateur Radio's status as a critical disaster response communications asset and public service. Communications operating protocols and the appointment of Emergency Coordinators followed.

Technical advances supported this evolution. Spark gap transmitters gave way to the vacuum tube, making portable operations more viable. Articles on portable transmitters and receivers appeared in *QST*. Exploration and experimentation in the VHF region also spurred more development of portable equipment. The development of the variable frequency oscillator or VFO, something that modern generations of hams take for granted, was at the time a liberating breakthrough offering more versatility and flexibility, and more efficiency of course in meeting the demands of a disaster response communications situation.

World War II meant a shut-down of Amateur Radio, but many hams joined the War Emergency Radio Service, which did provide some communications during the war period for natural disasters. After the war, the ARRL re-



constituted its disaster response communications programs and networks, and the first Simulated Emergency Test was run in 1946.

The Cold War followed, and the Radio Amateur Civil Emergency Service (RACES) was formed by the government for civil defense (CD) purposes, the forerunner of the modern emergency management model that we know so well today.

Throughout the sixties and later up to today, the role, procedures, protocols, equipment and techniques of Amateur Radio in public service, disaster and emergency communications continue to evolve, ebb and flow. This evolution is fueled by advances in Amateur Radio technology and its application, lessons learned from each and every incident that involves amateur communications support. - *K1CE, based on an excellent article by Gil McElroy, VE3PKD, that appeared in September 2007 QST -- QRR: The Beginnings of Amateur Radio Emergency Communications*

## **Notable Events on the Timeline of Amateur Radio Disaster Communications**

Far from an exhaustive list, here are a few events involving Amateur Radio communications support over the past hundred years that may help define our role over time and its evolution.

**1906** - Radio amateur Barney Osborne, later W6US, provides emergency traffic handling during the San Francisco Earthquake and fire, according to family lore.

**1913** - Hams provided emergency communications during Midwest storms and floods with spark gap transmitters and crystal receiver sets, as vacuum tubes wouldn't emerge until after World War I and 1919.

**1916** - A national traffic relay system was organized to provide relay of messages cross-country, and 9XE in Illinois originated a message that was received in California in 55 minutes and on the East Coast an hour after that.

**1926** -- The cover of the May issue of *QST* featured a drawing of a railroad engineer holding an ARRL radiogram with the caption reading "Amateurs Give Emergency Service for Railroads When Wires Are Down"

**1920s** - A motor provided emergency power to the plates of newly-invented vacuum tubes in a station of an "RM" - a "Radio Man" - during a Mississippi flood.

**1925** - Amateur Radio provided the only communications (5 watts CW) during the failed rescue attempt of caver Floyd Collins.

**1933** - Radio amateurs at W6BYF provided disaster communications for the Long Beach, California earthquake. Although his house was demolished, famous ham Don Wallace, W6AM, operated a portable station through his surviving extensive antenna farm with the help of the Navy in supporting the relief effort.

**1935** - Predecessors to ARES established. ARRL had a vision of them in 1917.

**1936** - The catastrophic floods of the northeast (from Maine through to the Ohio River valley) wrecked the ARRL HQ station in Hartford (along the Connecticut River), with Amateur Radio again providing support. Famous VHF pioneer and ARRL HQ staffer Ed Tilton, W1HDQ and his wife provided communications.

**1937** - Dr. Joseph Vancheri, W8BWH, was a key relief communications asset, arranging for aid to refugees from the Johnstown floods.

**Late 1930s** - Commercial emergency Amateur Radio gear appeared and was advertised: an example was the battery-powered 50-S transmitter from Harvey Radio Laboratories of Brookline, Massachusetts.

**1948** - Flooding of Vanport, Washington, after the rupture of a Columbia River dike prompted an Amateur Radio Emergency Corps response under EC W7DIS, with amateurs using hand-held radios (walkie-talkies).

**1957** - RACES was involved in providing communications support during the Malibu-Topanga Canyon (California) fires. Deputy Chief Radio Officer W6QJW operated under RACES tactical call sign CPT19

and controlled a net on 3995 kHz. The Gonset Communicator was an iconic Cold War/Civil Defense portable transceiver.

**1964** - The Great Alaskan Earthquake hit Anchorage, drawing a massive amateur response in handling emergency and health-and-welfare traffic. It was the most powerful earthquake in North American history, and the second most powerful in recorded history of the world. There was sweeping destruction in the city and the region. George Hart, W1NJM, wrote about the amateur response in the July 1964 issue of *QST*: 314 Alaskan amateurs supported the disaster relief effort, with 1200 more from around the rest of the country actively supporting them. "KL7DVY reports he operated 20 hours on two meters, relaying messages from the Alaska Native Hospital to c.d. headquarters in Anchorage." See the August 2014 issue of *QST*, Public Service column, "Alaska Shield 2014."

**1979** - Hurricanes Frederic and David wrought destruction on the Gulf Coast and East Coast, respectively. Amateur Radio support of relief efforts was in evidence in both cases.

That brings us up to the modern era and the emergence of the contemporary emergency management model. A few of the major events beginning in the eighties that come to mind are Hurricanes Gilbert (1988) and Hugo (1989), and the spate of four hurricanes in 2004 that affected us here in Florida extensively. Hurricane Andrew (1992) also wreaked incredible devastation in Florida. Hurricanes Katrina (2005) and Sandy (2012) were game-changers for emergency management thinking and policy for this country. Amateur Radio was extensively involved in all cases. And, of course, Amateur Radio was involved in the colossal relief effort in the aftermath of the 9/11 attacks.

*[Much of the above was culled from an excellent presentation given at the ARRL Pacificon convention in San Ramon, California, 2010, by Bart Lee, K6VK, ARRL State Government Liaison, ARRL Volunteer Counsel, Historian and Archivist, California Historical Radio Society, and lecturer, Antique Wireless Society. A tip of the ARRL fedora to him. - K1CE]*

## **FEMA and ARRL Sign Agreement; FEMA Administrator Calls Ham Radio "Resilient"**

The ARRL and the Federal Emergency Management Agency ([FEMA](#)) have announced a Memorandum of Agreement (MOA) that will enhance cooperation between the League and FEMA in the area of disaster communication. FEMA Administrator Craig Fugate, KK4INZ, and ARRL President Kay Craigie, N3KN, signed the agreement July 18 during the ARRL National Centennial Convention at the Connecticut Convention Center in Hartford, Connecticut. "Radio is one of the most resilient communications technologies we have," Fugate said. "When the power is out and telecommunications are down, the Amateur Radio community can serve as a vital resource in support of emergency responders and survivors during a disaster. This MOA will strengthen FEMA's partnership with ARRL and build upon our work to expand emergency communications capabilities and the use of Amateur Radio in emergency management." Complete report [here](#).

## **The ARRL Letter for August 21, 2014 Webinar Helps to Build Ham Community Cohesion, Momentum for H.R. 4969**

An August 13 webinar on "The Amateur Radio Parity Act of 2014" -- [H.R. 2014](#) -- attracted some 450 online participants who wanted to learn more about the proposed legislation and how they could get involved in speeding its passage. US Rep Adam Kinzinger (R-IL) introduced H.R. 4969 in June, with US Rep Joe Courtney (D-CT) as its first co-sponsor. This bipartisan initiative would direct the FCC to apply the "reasonable accommodation" three-part test of the [PRB-1](#) federal pre-emption policy regarding antennas to private land-use restrictions (CC&Rs). The ARRL Atlantic Division sponsored the webinar, and Director Bill Edgar, N3LLR, served as moderator.

"I think the webinar really helped to bring members together on H.R. 4969," Edgar said afterward. More than 900 registered for the event. During the webinar, ARRL General Counsel Chris Imlay, W3KD, and ARRL Hudson Division Director Mike Lisenco, N2YBB, discussed the measure and what it would mean for ARRL members and the Amateur Radio community, and explained how individuals could help. Edgar said he's heard a lot of positive feedback from members, who thanked his Division for putting on the webinar and said they were going to assist the campaign by contacting their members of Congress.

Lisenco said this week that 17 co-sponsors now have signed on to H.R. 4969, and he's confident that several more will add their names to the list once Congress reconvenes after its August recess. He said the webinar helped members of the Amateur Radio community to realize that they must become "activists" in order to make things happen.

"The overwhelming majority of [ARRL] members have been extremely positive," he said this week, although he conceded that some radio amateurs do not favor H.R. 4969. "You're going to find people who are against it, because that's their political philosophy," he said, "but a lot more want to send letters or visit their representatives. It's just a matter of getting people motivated."

Lisenco views H.R. 4969 as a "mom-and-apple-pie" issue. "It's a no-brainer," he said in the wake of the webinar. "'Reasonable accommodation.' How can you say 'no' to that? The more people who see how simple this is, the greater the likelihood that it will get done." Getting the bill passed is a matter of building consensus, and he believes that this is the time to act. "If we don't do it now, the opportunity may not present itself again very soon," he said.



ARRL Atlantic Division Director Bill Edgar, N3LLR



ARRL Hudson Division Director Mike Lisenco, N2YBB. [Rick Lindquist, WW1ME, photo]

Lisenco said that most questions during the webinar came from those who already live in deed-restricted communities and wanted to know how H.R. 4969 might affect them. He pointed out that some 65 million Americans live in deed-restricted households, and that number is growing. As he explained, the measure would give hams in deed-restricted communities an opportunity to negotiate in good faith with homeowners associations to arrive at a "reasonable accommodation" of their antenna requirements -- nothing more.

"Everybody wants the biggest antenna they can put up," he said, "but you have to be practical, you have to be pragmatic. Folks who have not had an opportunity to put up *any* antenna will be happy with any antenna they can get." Each community is different, he said, and the bill does not specify any particular types of antennas.

Lisenco said that with many members of Congress on vacation, it's difficult to get appointments to meet with them to seek their support. Some 1500 members from all over the US signed letters at the ARRL National Centennial Convention urging their representatives to co-sponsor H.R. 4969. Another 500 or so letters went out to members of Congress a week later. But, Lisenco added, face-to-

face meetings between members of Congress or their staff members and constituents have proven to be the most successful approach.

Lisenco anticipates that activity to gain additional support for the measure will ramp up again next month.

## Chasqui-1 Amateur Radio CubeSat Deployed from ISS

A team of Russian cosmonauts has deployed the Peruvian [Chasqui-1](#) Amateur Radio CubeSat into orbit during a spacewalk from the International Space Station (ISS). Expedition 40 Flight Engineers

Alexander Skvortsov and Oleg Artemyev released the tiny, 1 kg spacecraft at 1423 UTC on August 18. Chasqui-1 is a project of the Peruvian National University of Engineering (Universidad Nacional de Ingenieria or UNI), in collaboration with the Southwestern State University in Kursk, Russia. [According to AMSAT-UK](#), the CubeSat's batteries were charged last week. It traveled to the ISS in February 2014 on board a Progress cargo craft.

As Peru's first satellite, its main goal is improving UNI's satellite technology, its builders said. The satellite is intended to take pictures of Earth and relay them to the ground station. It carries two cameras, one operating in the visible light spectrum and the other in the infrared spectrum. Amateur Radio is a secondary payload.

Chasqui-1's beacon on 437.025 MHz ( $\pm 10$  kHz Doppler shift) can transmit either 1200 bps AFSK AX.25 or 9600 bps GMSK. As of August 19, the beacon had not been heard.



Chasqui-1 Team Members Persing

## Venerable LUSAT-1 (OSCAR 19) Takes to the Dark Side

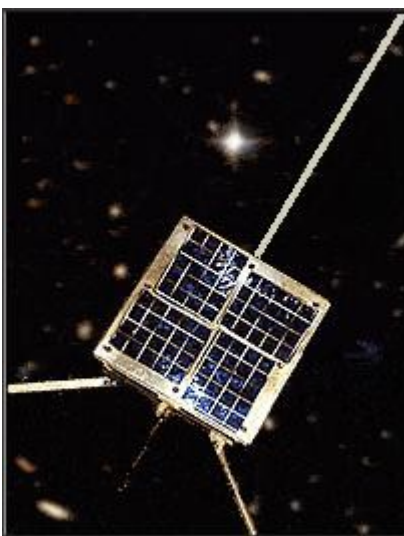
Set to celebrate its silver anniversary next year, [LUSAT-1](#) -- which is also known as OSCAR 19 or LO-19 -- appears once again to be functioning, sort of, when not in sunlight. At this point, OSCAR 19 is only transmitting telemetry; its digital transponder has not been reported to be operational.

"We knew that our LUSAT started transmitting again a couple of years ago, but only when illuminated by sunlight and was not heard during the night," Pedro Converso, LU7ABF, reported to the AMSAT-BB. During a recent nighttime pass, though, he was surprised to hear "the usual strong 900 mW continuous carrier on 437.125 MHz," 22 minutes after LO-19 had emerged from Earth's shadow.

"It's almost a miracle that after almost 25 years, LUSAT's vintage Ni-Cd batteries can receive and hold [a] charge," he said.

Launched in 1990 from Kourou, French Guyana, on an Ariane 4 vehicle, the satellite -- Argentina's first -- has completed more than 128,000 orbits, and is one of the oldest active Amateur Radio satellites. The satellite carries a digital store-and-forward packet transponder with uplink frequencies at 145.84, 145.86, 145.88, and 145.90 MHz 1200 bps FM, with AX.25 protocol downlink at 437.125 MHz SSB.

An audio clip, tracking information, and listener reports are available via the [AMSAT-LU](#) website. [Reports](#) are welcome via e-mail.



## Questions for General Class License

1. (G1A06) Which of the following frequencies is in the 12 meter band?
  - A. 3.940 MHz
  - B. 12.940 MHz
  - C. 17.940 MHz
  - D. 24.940 MHz
2. (G2D02) Which of the following are objectives of the Amateur Auxiliary?
  - A. To conduct efficient and orderly amateur licensing examinations
  - B. To encourage amateur self regulation and compliance with the rules
  - C. To coordinate repeaters for efficient and orderly spectrum usage
  - D. To provide emergency and public safety communications
3. (G3B09) What is the approximate maximum distance along the Earth's surface that is normally covered in one hop using the F2 region?
  - A. 180 miles
  - B. 1,200 miles
  - C. 2,500 miles
  - D. 12,000 miles
4. (G4D07) How much must the power output of a transmitter be raised to change the S- meter reading on a distant receiver from S8 to S9?
  - A. Approximately 1.5 times
  - B. Approximately 2 times
  - C. Approximately 4 times
  - D. Approximately 8 times
5. (G5C05) If three equal value resistors in parallel produce 50 ohms of resistance, and the same three resistors in series produce 450 ohms, what is the value of each resistor?
  - A. 1500 ohms
  - B. 90 ohms
  - C. 150 ohms
  - D. 175 ohms
6. (G6B14) What is the minimum allowable discharge voltage for maximum life of a standard 12 volt lead acid battery?
  - A. 6 volts
  - B. 8.5 volts
  - C. 10.5 volts
  - D. 12 volts
7. (G7B14) Which of the following describes a linear amplifier?
  - A. Any RF power amplifier used in conjunction with an amateur transceiver
  - B. An amplifier in which the output preserves the input waveform
  - C. A Class C high efficiency amplifier
  - D. An amplifier used as a frequency multiplier
8. (G8B03) What is another term for the mixing of two RF signals?
  - A. Heterodyning
  - B. Synthesizing
  - C. Cancellation
  - D. Phase inverting
9. (G9C17) Approximately how long is each leg of a symmetrical delta-loop antenna?
  - A. 1/4 wavelength
  - B. 1/3 wavelength
  - C. 1/2 wavelength
  - D. 2/3 wavelength
10. (G0A01) What is one way that RF energy can affect human body tissue?
  - A. It heats body tissue
  - B. It causes radiation poisoning
  - C. It causes the blood count to reach a dangerously low level
  - D. It cools body tissue

(For answers to test questions see page 14)

# BARC Club Officers

## *President*

Cordell Smart KE7IK  
[president@barconline.org](mailto:president@barconline.org)  
(435)245-4581

## *Vice President*

Ted McArthur AC7II  
[ac7ii33@gmail.com](mailto:ac7ii33@gmail.com)  
(435)770-9169

## *Secretary*

Tammy Stevens N7YTO  
[secretary@barconline.org](mailto:secretary@barconline.org)  
(435)753-2644

## *Treasurer*

Kevin Reeve N7RXE  
[treasurer@barconline.org](mailto:treasurer@barconline.org)  
(435)753-1645

## *Board Members*

Tyler Griffiths N7UWX  
[N7UWX@comcast.net](mailto:N7UWX@comcast.net)  
(435)752-7269

Theo Thomson K7TWT  
[Theo@tec-electric.com](mailto:Theo@tec-electric.com)  
(435)881-0525

Kelly Hansen KF7TDP  
[Kjhansen65@gmail.com](mailto:Kjhansen65@gmail.com)  
(435)213-5660

## *Newsletter Editor*

Dale Cox KB7UPW  
[newsletter@barconline.org](mailto:newsletter@barconline.org)  
(435)757-4063

## *Web Page Editors*

Kevin Reeve N7RXE and Bob Wood WA7MXZ  
[webmaster@barconline.org](mailto:webmaster@barconline.org)

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

