



THE OHM TOWN NEWS

Voice of the Bridgerland Amateur Radio Club

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

January 2015

Happy New Year

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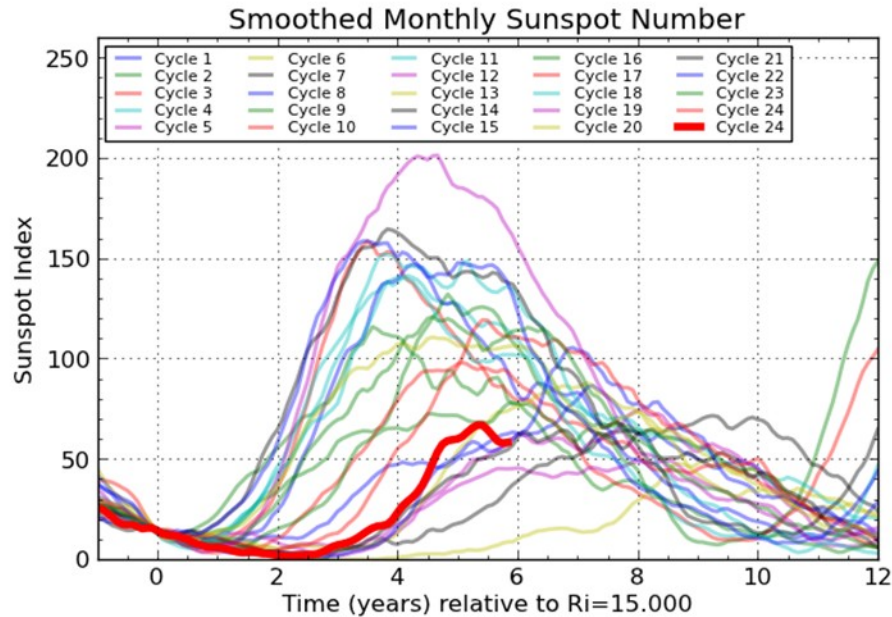


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PRESIDENT'S MESSAGE

Here we are into a new year and we are currently over half way through Solar Cycle 24. Solar Cycle 24 began on January 4, 2008 but there was minimal activity until early 2010. During 2008 and 2009, the sunspot numbers were far lower than scientists expected, making it hard to predict the behavior of the sunspot cycle. The solar flares, which were associated with sunspots numbers and the sun's magnetic activity, also fell quite. Eventually the sunspots started to appear and gradually increased. The graph on the right shows how the cycle 24 compares with previous solar cycles.



The current predicted and observed size makes this the smallest sunspot cycle since Cycle 14 which had a maximum smoothed sunspot number of 64.2 in February of 1906. Cycle 24 maximum smoothed sunspot number of 82 occurred in April 2014. Last year during the peak of the solar cycle, we have seen some interesting events. The sun's magnetic field had flipped, there were many developments of long coronal holes, and the sunspot counts were cresting lower than expected. Many solar cycles are double peaked but this is the second time in which the second peak in sunspot numbers was larger than the first. The graph below shows the recorded and predicted sunspot numbers of cycle 24.

However cycle 24 still has some surprises. In October 2014 the biggest sunspot observed in 24 years occurred on the Sun. The region dubbed AR 12192 was 129,000 kilometers across, big enough for ten Earths to sit side-by-side along its diameter. In its trip across the face of the sun, this sunspot unleashed six X-class flares, enough to disrupt radio and satellite communications and navigational equipment on Earth.

During the TX7G Marquesas Islands DXpedition that occurred from 18 through 26 October 2014, many of us may have experienced the effects of these X-class flares when trying to contact TX7G and were unaware of what was happening with the ra-

(Continued on page 4)

UPCOMING 2015 ACTIVITIES

- 10** January, 10:00 AM — **BARC Club Meeting**
Antenna modeling software 4NEC2, Kelby Davis AD7VO
- 14** January, 7:30 PM - ARRL Rocky Mountain Division Net IRLP Node: 9871
- 17** January, 8:00 AM — RACES HF Net 3920 KHz
- 17** January—Northern Colorado ARC Winter Hamfest (Loveland, CO)
For more information see www.RockyMountainDivision.org or [click here](#)
- 21** January, 7:00 PM – Cache County ARES meeting at the Sheriff's Office
- 24** January, 8:00 AM—5:00 PM — Ogden One Day Tech Ham Class & Test
Test approximately 3:00 PM (For more info click [Here](#))
- 31** January, - Albuquerque Ham Radio Winter Tailgate (Albuquerque, NM)
For more information click [Here](#) or [Here](#)
- 07** February, 8:00 AM—5:00 PM — One Day Ham Class—Tech License
USU Engineering Building Room 302 (For more info click [Here](#))
- 08** February—The Swapfest (Brighton, CO) For more info click [Here](#) or [Here](#)
- 14** February, 10:00 AM — **BARC Club Meeting**
PC Security, Rik Stallings N7XZ
- 18** February, 7:00 PM – Cache County ARES meeting at the Sheriff's Office
- 19** Feb, 8:00 PM - RACES VHF Net 147.18 Snowbird 147.20 IRLP 146.72 Mt. Logan

For more calendar information see the barconline.org/calendar

Local Radio Nets:

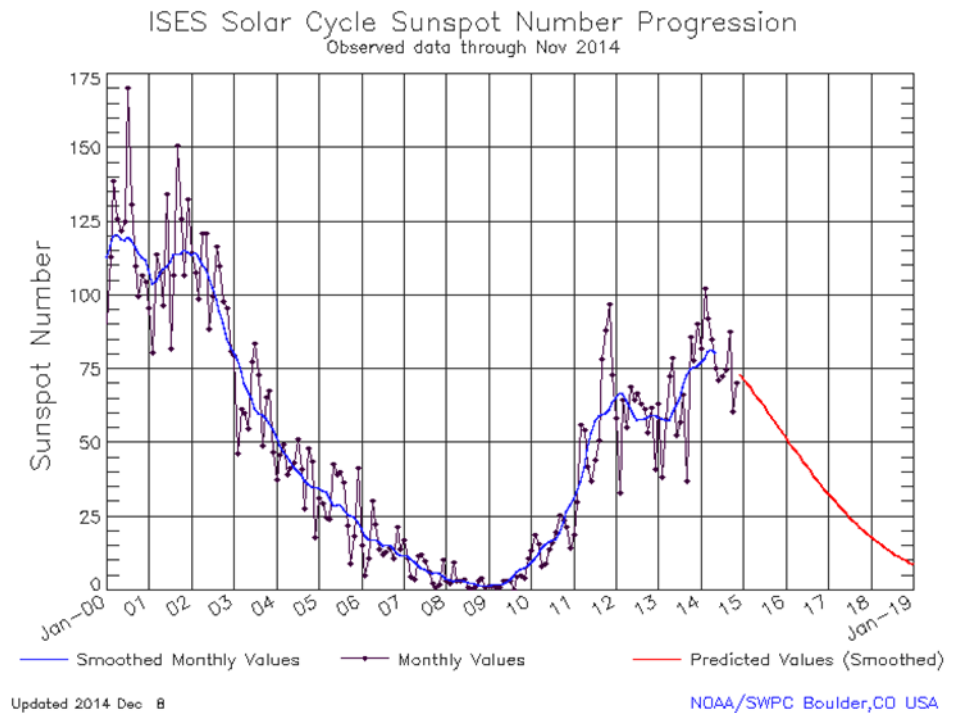
The **Weekly BARC net** is for BARC members and anyone else that would like to check in, held **every Tuesday night at 9:00 p.m.** local time on the Mt Logan BARC Repeater and Linked Systems (146.720)

The **BARC Ladies Net** is every **2nd and 4th Tuesday at 8:00 p.m.** on the BARC Repeater and Linked Systems (146.720). All licensed lady amateur radio operators are welcome to check in.

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.

(Continued from page 2)

dio propagation. Jared Smith, N7SMI, one of our club members was part of the TX7G DXpedition team and he experienced firsthand the effects of the X-class flares when operating from the island of Nuku Hiva. In [Jared's presentation](#) on his TX7G DXpedition experience at our November 2014 club meeting, he described a radio blackout. Jared said that he was working a North America pileup one afternoon on 10 meters, noticing that stations calling were getting quieter, then only hearing callsign area 6 and 7 stations and they were getting quieter, and in a few seconds the North America stations were gone. Then he heard the JA stations coming in strong, in another 3 to 4 seconds they all disappeared. At that point, the 10 meter band was absolutely silent. The TX7G team tuned through all the bands and could not hear a single signal. The blackout lasted about an hour then the radio signals came back again.



Here is a [movie](#) that shows 8 days, from 19-27 Oct 2014, of the AR 12192 sunspot, including five X-class flares erupted during that time. The last three of AR 12192's flares caused high frequency radio blackouts. The X3.1 flare that began on October 24 @ 2107 UTC was the one which caused the radio blackout that Jared referenced. The last call that Jared logged was at 2113 UTC before the band went dead. The X3.1 flare peaked at 2140 UTC and was over at 2141 UTC. Unusually though, the high class flares were not accompanied by coronal mass ejections, where clouds of electrified gas are flung out from the Sun by the power of the flare. This meant that the flares weren't accompanied by geomagnetic storms or auroras here on earth.

So what does the rest of solar cycle 24 have in store for us? Next month I'll discuss that and propagation tools to help determine propagation to that distant station.

73,
Cordell
KE7IK

Membership in **The Bridgerland Amateur Radio Club, Inc. (BARC)** is open to anyone interested in Amateur Radio. You do not need an amateur license to join. Learn more online at <http://www.barconline.org/> or by emailing membership@barconline.org.

The Bridgerland Amateur Radio Club provides the following to its members:

- A repeater system that covers northern Utah from Bear Lake to Salt Lake Valley.
- Events where you can practice your radio skills in a fun learning environment.
- Club meetings are held the second Saturday each month from October to May. An opportunity to meet and learn from other amateur operators.
- Social activities where members can make friends and interact with other members.



Your tax deductible membership supports club activities and the BARC repeater system.



The Bridgerland Amateur Radio Club, Inc.

Membership application for the year 2015

Dues are in effect January 1, 2015 through December 31, 2015

Please indicate if you or family member is an American Radio Relay League (ARRL) member

Name _____ Call Sign _____ Date Paid _____

ARRL member

P.O. Box _____ Street Address _____

City _____ State _____ Zip Code _____

Home Phone () _____ Work Phone () _____

E-mail _____

(The club's newsletter, THE OHM TOWN NEWS, is sent to the E-mail Address)

Individual Membership - \$25 \$ _____

Addition Family members in same household - \$3 ea \$ _____

Donation for Repeater upgrades / equipment purchases \$ _____

Total \$ _____

Names and Call Signs of additional family members

Name _____ Call Sign _____

ARRL member E-mail _____

Name _____ Call Sign _____

ARRL member E-mail _____

Name _____ Call Sign _____

ARRL member E-mail _____



Bridgerland Amateur Radio Club is an ARRL affiliated club

Mail your completed form and a check to: B.A.R.C., P.O. Box 111, Providence UT 84332-0111 or pay online at <http://www.barconline.org/join-barc> via PayPal

B.A.R.C. is a non-profit organization

The ARES E-Letter for December 17, 2014

Amateurs Support Utah Desert Wilderness Rescue Training Exercise

On November 3-6, 2014, the members and operators of Utah's Sinbad Desert Amateur Radio Club (SDARC) participated in a wilderness-based rescue training exercise in conjunction with the Emery County Sheriff's Office Rope Rescue Team, Emery County Search and Rescue Rope Team, Black Dragon Rescue Systems and National Guard Civil Support Teams (CST) from New Mexico, Colorado, Idaho and Oklahoma.



The training took place among the high red rocks and deep canyons of Utah's picturesque San Rafael desert in eastern Utah. The exercise consisted of multiple medical emergency rescues, from one of the many canyons that are favored by climbers and hikers alike. The 300-foot vertical medical rescues were exciting to watch.

Emery County Sheriff's Office brought their emergency response vehicles to the desert deep canyon site, which included the recent addition of their Amateur Radio/Public Safety Communications trailer.

All on scene communications by Public Safety and the Military were run on VHF hi-band frequencies, and supplementary communications for the event were handled by members of the Emery County ARES group who are all members of the SDARC. Amateur contacts were handled on 40 meters and 2 meters using the SDARC's extensive 2 meter repeater system, and 2 meter simplex, and HF contacts were made to the State of Utah Department of Public Safety EOC at the State capitol.

Logs were maintained of all communications between the National Guard CSTs and Emery County rescuers. Special thanks went out to all members of the SDARC who spent many hours working the radios and logging during the exercise, modifying the trailer and installing the communications equipment.

Exercise organizers and evaluators stated that communications during this exercise were the best they have ever been for any of their exercises in this type of remote location and that the Sinbad Desert Amateur Radio Club is a valuable asset to Emery County and the State of Utah.

For more about Amateur Radio communications in eastern Utah, please visit the [Sinbad Desert Amateur Radio Club](#) website. -- *Bret Mills, WX7Y, Castledale, Utah*

Letters: Former OFDA Communications Specialist on Emergency versus Disaster

A matter of language to consider: the difference between an emergency and a disaster. IMHO, these words are not interchangeable. So, what's the difference? An emergency is an event that must be addressed quickly to avoid more serious consequences. Examples: a gas leak, broken power lines on the ground, a heart attack, a localized fire, a nasty road accident, etc. A disaster is a catastrophic event that exceeds the ability of the community to cope. "Community" can be small, as a household;

or large like a region or a country. The important distinction is that responding to a disaster requires help from OUTSIDE the affected area.

The lava flow in Hawaii is a disaster ONLY if Hawaii can't handle the situation on its own.

Hurricanes, like Andrew, Katrina, and Sandy, created disasters because victims in the affected areas required outside help. A point to keep in mind is that, in a disaster, local responders (including hams), may be as affected by the disaster as everyone else in their community and, therefore, will not be able to respond.

This distinction, needing help from outside, gives hams a huge advantage in disasters -- we're used to working with each other taking advantage of common frequency plans and on-air protocols, no matter where we're from. - *Art Feller, W4ART, Communications Specialist (retired), Office of US Foreign Disaster Assistance (OFDA), Agency for International Development (AID), Department of State*

Tips for Public Service Communicators

Here is a great set of tips from the St. Louis (Missouri) Metro ARES/RACES Group, with the permission and courtesy of EC Steve Wooten, KCOQMU, and AEC for Operations Gary Hoffman, KB0H.

Things to avoid saying on the air, Number 1

"Okay, I'll do it. But it's not actually my job. The guy who's supposed to do that is always away from the table doing something else." The other operator doesn't want to hear any of that and it ties up the frequency. Make a note of your complaints in your log and bring them up at the debriefing, but keep them off the air. -- *Gary Ross Hoffman, KB0H*

The value of tactical call signs

Tactical call signs such as "Shelter 5", "Net Control", and "EOC" are descriptive and give immediate information. They can be very useful during planned events and during emergencies. Do not, however, forget to include your FCC call sign at ten minutes intervals and at the end of each contact.

Never alter a message

Do not alter a message, even to correct a typographical error. What you think is right may actually be wrong. Moreover, any change you make might subtly alter the meaning of the message. Send or write it exactly as you receive it.

Do not use VOX

VOX stands for voice activated transmitter. VOX devices are handy gadgets, but should not be used in an emergency setting. Ambient noise might activate the transmitter and tie up the frequency. Also, you do not want your casual comments to go out over the air.

You are your own safety officer

When setting up or operating a station of any size, the very first thing on your mind should be, is it safe? Am I going to irradiate anyone with RF energy? Could my battery spill acid? Can it fall on anyone's foot? Have I created an electrical hazard? Could anyone trip over my feedline or get poked in the eye by my antenna? The safety of your station is your responsibility. Make sure that it cannot harm you or anyone else. -- *KB0H*

Every piece of equipment can break, including you

We all have limits. Don't overtax yourself during a deployment. Watch for signs of fatigue, stress, adverse reactions to the environment and so forth. Stop and take a break if you need one. It is better to

have a silent radio than a fresh casualty. -- *KBOH*

Listen to the Net Controller's instructions

One of the most common mistakes on regular nets is that operators assume that they know what the Net Controller is going to say. They miss the Net Controller's instructions and wind up giving inappropriate responses. This can be calamitous in an emergency situation. One way to develop the habit of paying attention is to write down the key elements of what the Net Controller is saying. You might be surprised to find that it's not always the same thing. -- *KBOH*

Keep it brief

Air time is precious, especially when there are numerous operators on the same frequency. Refrain from over-explaining things, engaging in personal greetings and chats, and anything else that might prevent important traffic from getting through. -- *KBOH*

Are you following procedures?

Operating procedures are developed from many hours of examining what went wrong during disasters. Familiarize yourself with the procedures and practice them in exercises. Arriving at a disaster scene and trying to freestyle it will only cause problems. -- *KBOH*

Check the transceiver for overheating

Digital modes are great for sending forms, long lists, images and so forth. They also use a lot more duty cycles of your transceiver than ordinary voice communications. Check to make sure that your rig is not overheating. Reduce the transmit power level if your unit feels hot. -- *KBOH*

Have fuses handy

Much of your equipment has one or more fuses. Check each item, make a list of the fuses you might need, then put together a small fuse kit. Be sure to replace any fuses you wind up using. -- *KBOH*

Yes, you are ready to participate

Caution is good, but don't let it prevent you from participating and volunteering. Everyone makes mistakes on their first try, or first dozen tries, and everyone survives them. You will find that most other hams will be sympathetic and supportive of your efforts. -- *KBOH*

Don't avoid the exercises

It's a mistake to ignore an exercise because you are already familiar with what it is about. There are always surprises, new elements, and things that you've forgotten. Your presence will also help those participants who are less familiar with the exercise's concepts. -- *KBOH*

Keep learning

Everything is dynamic, including emergency communications. Procedures and techniques that were standard ten years ago are out of date today. Never sit back and feel that you've learned everything you'll need to know. -- *KBOH*

You brought your radio to the emergency, but will you be able to power it?

Antenna connectors are fairly generic, but what about power connections? ARES groups around the country use Anderson Powerpoles as the standard power connector on their equipment.

Push THEN Talk

Pause for a second after keying up your transmitter. It may be slower to react than you realize. -- *John Weis, N0UFB*

Maintain a fire extinguisher near your battery charging station

This applies primarily to larger batteries, but every battery is a chemical device and you will be pumping energy into it. Having a fire extinguisher handy is a reasonable precaution. -- *Jim Conley, N0OBG*

Mark your equipment

Be sure that every piece of your equipment is marked with at least your name and call sign. After the emergency, you'll want any property you left behind to find its way back to you.

It's going to be noisy, so have a set of headphones

It's always a good idea to have a set of headphones around, but it may be an absolute necessity in an emergency. You may be placed in an area where other operators are working on different bands, you may be out in the open, or you may even be in the middle of a noisy shelter. A headset should be a vital part your equipment. You can't communicate if you can't hear.

Outdoors isn't indoors

Even in an urban or suburban setting, working outdoors isn't like working indoors. You may have taken your equipment into consideration, but don't forget yourself. Think about your allergies, the sun, heat, cold, bugs and everything else that might affect you. Treat your outside deployment or exercise as if it were a camping trip and prepare for it accordingly. -- *KB0H*

Think about next time

During every deployment or exercise, think about the next time. You will always find that something is missing, broken, doesn't work as expected, wasn't planned for and so forth. Keep a mental record, or better still a written one of everything that is wrong. Be sure to look it over carefully after the event so you will be better prepared next time. -- *KB0H*

Eat

Do not skip meals just because things are busy. You may not think that you need to eat anything, but volunteers have suddenly fainted without feeling any early symptoms that something was wrong. At the very least, consume an energy bar or a quick snack. --*KB0H*

Is no one responding on the secondary frequency?

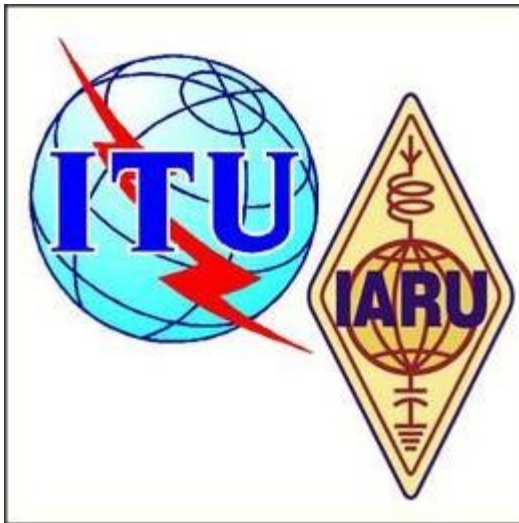
If you have a transceiver capable of handling two frequencies simultaneously and no one is responding on that second channel, the problem may be as simple as the volume has been turned down. -- *KB0H*

See the complete list of excellent tips on the [St. Louis Metro ARES/RACES](http://www.stlouismetroares.com) website.

The ARRL Letter for December 18, 2014 IARU President Addresses ITU Telecom World '14 in Qatar

International Amateur Radio Union ([IARU](http://www.iaru.org)) President Timothy Ellam, VE6SH/G4HUA, highlighted the benefits of Amateur Radio during disasters in remarks at the International Telecommunication Union ([ITU](http://www.itu.int)) Telecom World '14, December 7-10 in Doha, Qatar.

Ellam told the participants that radio amateurs are already in place in 170 countries, that Amateur Radio does not rely on commercial networks, and that hams have the technical know-how to disseminate



information during disasters. One example was the response of Amateur Radio volunteers this month during Typhoon Hagupit in The Philippines.

The 4-day international gathering in Qatar attracted some 3500 participants representing various fields of information and communications technology.

Speakers offered examples of how information technology is helping to save lives or mitigating the effects of natural disasters and climate change. Read [more](#).



IARU President Tim Ellam, VE6SH/G4HUA.

Through Ellam, the IARU is a founding Advisory Board member of the ITU's Smart Sustainable Development Model ([SSDM](#)) initiative. The initiative is aimed at developing an action plan to deploy necessary crucial telecommunication infrastructure to offer prompt assistance in the event of natural disasters. The Advisory Board will guide the IARU's approach to the initiative.

The Advisory Board met in Doha, Qatar on December 6, one day before the kickoff of ITU Telecom World 2014. The IARU played a key role in the development of the Board's final [report](#), adopted at the meeting and available soon, in which the Amateur Radio Service features prominently. Read [more](#).

Preparations Under Way for January DXpedition to Iran

Preparations continue on the part of the Rockall DX Group to make Iran -- #33 on ClubLog's [DXCC Most Wanted List](#) -- available through a DXpedition to Kish Island (IOTA AS-166). Look for [EP6T](#) beginning on January 16. While the emphasis will be on 160 meters, the DXpedition will operate on all bands, 160 through 10 meters. EP6T plans to remain active until January 26. Organizers say the theme of the expedition will be "friendship and cultural tolerance."



"We hope to make a lot of people happy," team member Luc Kerkhofs, ON4IA, said.

A dedicated 160 meter station will be on the air starting at local sunrise and sunset for the first two nights, in order to work as many Europeans as possible and to check when signals peak to North America. The planned transmitting antenna is a 26-meter (85.3 feet) vertical with 50 quarter-wave radials. Kerkhofs said the operators will attempt to be fair in giving all continents a crack at working Iran on 160. After that, the operators will concentrate on listening for North American stations, although they concede that paths to North America on Top Band will be dicey and of short duration.

Since word first spread of the planned DXpedition, many groups and individuals have offered support, including the Northern

California DX Foundation. The organizers say that preparations are "progressing smoothly and according to plan." M0URX will be the QSL manager. The EP6T log will be uploaded to Logbook of The World ([LoTW](#)) once the DXpedition has concluded. Read [more](#).

Centenarian ARRL Member Says Congressional Gold Medal for CAP Was Overdue

A 100-year-old ARRL member from North Carolina was among those honored on December 10 when the Civil Air Patrol (CAP) received a Congressional Gold Medal for its World War II service, and, for Weldon Fields, W4AJT, of Greensboro, the recognition was long overdue.



Lt Col Weldon Fields, second from right, enjoys a moment with fellow CAP members (L-R) Sgts Edsel B. RivenBark, Bill G. Haire, Tyler B. Dunlap Jr, and Carl E. Lucas. Capt Edwin T. Howard is on the right. This photo was taken in 1944 at Tow Target Unit No 21, Monogram Field in Suffolk, Virginia. [Photo courtesy of CAP via the North Carolina Archives]

During the war, Fields volunteered to become a member of a CAP contingent at Base 16, near Manteo, on North Carolina's Outer Banks. CAP pilots were carrying out anti-submarine missions to thwart submarine attacks off the US East Coast, and volunteers like Fields were needed to provide aircraft-to-ground radio communication. According to CAP, Fields, who became a CAP lieutenant colonel, was responsible for maintaining communication from the base to the planes. He also contributed his own Amateur Radio gear to the base, back in an era when equip-



ment was anything but small and lightweight.

"I took my radio down there, and lo and behold, the stairs to the second floor [where the radios were located] were about as wide as my radio," Fields recalled. "We got it up there, and it worked okay, but it was kind of a chore." CAP observer planes flew each day from sunrise to sunset, Fields recalled, keeping the radio operators busy modifying and repairing aircraft radios. While his primary work was as a communications officer, Fields also flew some 200 to 300 hours as a mission observer.

"The wartime communications systems and procedures put in place by Col Fields and his peers laid the foundation for what is now a world-class, nationwide communications system operated by Civil Air Patrol, said CAP Col David Crawford, the North Carolina Wing commander.

"I'm proud to say that from the day we sent the first flight out, there was not another sinking of our boats or any kind of ship," Fields said. Once the German submariners learned of the CAP air patrols, they were afraid to surface.

Forty-six founding CAP members were on hand in Washington, DC, for the presentation, representing the more than 200,000 CAP volunteers during World War II.



That's "Doctor Bob" to You: Well-known Amateur Radio audio products manufacturer Bob Heil, K9EID, will [receive](#) an honorary doctorate on December 20 from the University of Missouri-St Louis. The school will grant Heil, the founder of [Heil Sound Ltd](#), an honorary Doctor of Music and Technology degree for his contributions to the world of broadcast, live, and studio sound and to the Amateur Radio industry. Heil will also speak at the school's winter commencement ceremony. -- *Thanks to SoundForums.net and Southgate Amateur Radio News*

Boy Scouts Recognize ARRL Amateur Radio Service to Scouting Award

The Boy Scouts of America's National Awards and Recognition Committee has officially recognized the ARRL "Amateur Radio Service to Scouting Award" as part of its family of [Community Organization awards](#). The ARRL award recognizes actively involved Scouting leaders who make a significant contribution to providing Scouts with a memorable and valuable Amateur Radio experience. This program allows Scouting leaders to wear the Community Organization Award square knot on their uniform, in recognition of their service within their community organization.



"This is yet another step in ARRL-BSA cooperation, one that will recognize the Scouting leaders who have worked tirelessly to introduce the science, technology, fun, and excitement of Amateur Radio to the youth involved in Cub Scouting, Boy Scouting, and Venturing," the Boy Scouts organization said in announcing its formal recognition of the League award.

This award was officially established through a resolution adopted by the ARRL Board at its 2013 Annual Meeting. It builds on the long-standing relationship between the BSA and ARRL, which began with the development of the Wireless Merit Badge in 1918 (now called the Radio Merit Badge). This relationship was formally recognized through a 2011 [Memorandum of Understanding](#) (view a [video](#) of the signing).

[Nominations](#) for the Amateur Radio Service to Scouting Award are made through the appropriate ARRL Section Manager. Read [more](#).

A Century of Amateur Radio and the ARRL

In July 2001, the ARRL petitioned the FCC to allocate 5.250 to 5.400 MHz to Amateur Radio.

At its July 2001 meeting, the ARRL Board of Directors endorsed the Logbook of The World (LoTW) concept, and Headquarters staffers began the massive push to make LoTW a reality.

In September 2001, the ARRL presented an Amateur Radio demonstration and tutorial to FCC commissioners and staff members. ARRL President Jim Haynie, W5JBP, headed the ARRL contingent, and the show-and-tell was deemed a great success.

Amateur Radio mobilized and provided communication support following the terrorist attacks of September 11, 2001, on the World Trade Center and the Pentagon. The following month, the FCC established a Homeland Security Panel to plan for restoration of communications links following terrorist attacks.

In October 2001, a rash of bio-terrorist (anthrax) threats to federal government facilities caused FCC processing of licensing and other matters to be significantly delayed.

The FCC announced that all applicants must register for and obtain a 10-digit FCC Registration Number (FRN), in order to do business with the Commission after December 3, 2001. -- *Al Brogdon, W1AB*

Questions for Extra Class License

1. (E1A06) Which of the following describes the rules for operation on the 60 meter band?
 - A. Working DX is not permitted
 - B. Operation is restricted to specific emission types and specific channels
 - C. Operation is restricted to LSB
 - D. All of these choices are correct
2. (E2C06) During a VHF/UHF contest, in which band segment would you expect to find the highest level of activity?
 - A. At the top of each band, usually in a segment reserved for contests
 - B. In the middle of each band, usually on the national calling frequency
 - C. In the weak signal segment of the band, with most of the activity near the calling frequency
 - D. In the middle of the band, usually 25 kHz above the national calling frequency
3. (E3B07) Which of the following could account for hearing an echo on the received signal of a distant station?
 - A. High D layer absorption
 - B. Meteor scatter
 - C. Transmit frequency is higher than the MUF
 - D. Receipt of a signal by more than one path
4. (E4C04) What is the definition of the noise figure of a receiver?
 - A. The ratio of atmospheric noise to phase noise
 - B. The noise bandwidth in Hertz compared to the theoretical bandwidth of a resistive network
 - C. The ratio of thermal noise to atmospheric noise
 - D. The ratio in dB of the noise generated by the receiver compared to the theoretical minimum noise
5. (E5A02) What is resonance in an electrical circuit?
 - A. The highest frequency that will pass current
 - B. The lowest frequency that will pass current
 - C. The frequency at which the capacitive reactance equals the inductive reactance
 - D. The frequency at which the reactive impedance equals the resistive impedance
6. (E6B01) What is the most useful characteristic of a Zener diode?
 - A. A constant current drop under conditions of varying voltage
 - B. A constant voltage drop under conditions of varying current
 - C. A negative resistance region
 - D. An internal capacitance that varies with the applied voltage
7. (E7E12) What is a frequency discriminator stage in a FM receiver?
 - A. An FM generator circuit
 - B. A circuit for filtering two closely adjacent signals
 - C. An automatic band-switching circuit
 - D. A circuit for detecting FM signals
8. (E8B08) What parameter does the modulating signal vary in a pulse-position modulation system?
 - A. The number of pulses per second
 - B. The amplitude of the pulses
 - C. The duration of the pulses
 - D. The time at which each pulse occurs
9. (E9F02) Which of the following determines the velocity factor of a transmission line?
 - A. The termination impedance
 - B. The line length
 - C. Dielectric materials used in the line
 - D. The center conductor resistivity
10. (E0A06) Why are there separate electric (E) and magnetic (H) field MPE limits?
 - A. The body reacts to electromagnetic radiation from both the E and H fields
 - B. Ground reflections and scattering make the field impedance vary with location
 - C. E field and H field radiation intensity peaks can occur at different locations

(For answers to test questions see page 14)

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

