

Amateur Radio: Science and Skill in Service to Your Community



ARRL — the national association for Amateur Radio

Amateur Radio: Science and Skill in Service to Your Community

At any given moment, millions of radio waves travel around, through, and out of Earth's atmosphere. In the age of instant communication, our society relies on the radio wave for maintaining government, commerce, and contact with our loved ones.

Wireless communication and infrastructure are so commonplace, we don't even give it a second thought — until we no longer have access to it. At those times, we realize how dependent we are on the radio wave to maintain our existence.

Since the implementation of wireless communications in the early 20th century, Amateur Radio operators have consistently provided a robust, reliable network that enables messages to get through under the most extreme circumstances. Amateur Radio functions completely independent of the Internet and telecommunications infrastructure, does not have to rely on the electrical grid for power, and can be set up in a matter of minutes at almost any location.

Your National Resource, Available In Your Area

Title 47 of the Code of Federal Regulations defines the basis and purpose of the Amateur Radio Service, in part, as *"Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications."*

As of December 2014, there are over 725,000 Amateur Radio operators in the United States — an all-time high. They are licensed by the Federal Communications Commission and are trained in the art and science of communication and basic electronics theory. With very few exceptions, radio amateurs live in every



Amateur Radio can be deployed almost anywhere within minutes. The use of solar power and no dependence on existing telecommunications networks makes it exceptionally valuable during emergencies. [Max McCoy, photo]



FEMA Administrator Craig Fugate signs a renewed Memorandum of Agreement with ARRL President Kay Craigle in July 2014. Fugate has long recognized the value of Amateur Radio's role in public service: "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." [Rick Lindquist, photo]

county in the country; few other radio services can claim such widespread coverage. They are prohibited by law from receiving payment for their services; Amateur Radio operators own and maintain their own equipment and regularly give back to their communities and their country out of a sense of service and duty, *at no cost to the communities they serve.*

ARRL, the national association for Amateur Radio, has built relationships with other national served agencies such as FEMA, the American Red Cross, the Salvation Army, the National Weather Service, Department of Defense, Boy Scouts of America, and several others.

The Value of Amateur Radio

What value would you place on a group of people who:

- Can provide instant wireless communication during a disaster or community event with little advance notice;
- Have established relationships with local served agencies and law enforcement;
- Take enormous pride in being able to give their technical expertise back to their communities when asked?

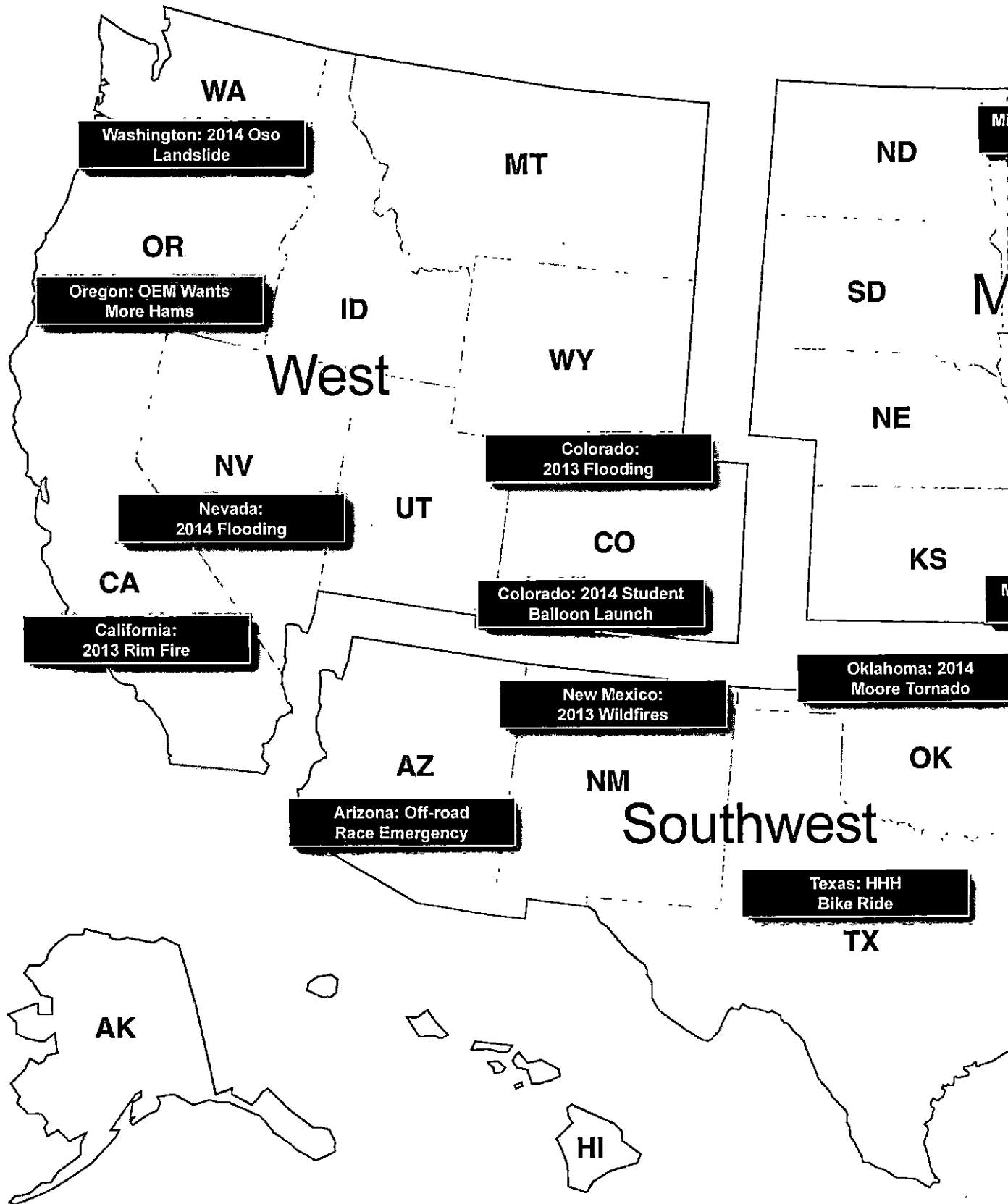
This level of organized communications, especially during a disaster, usually comes with significant financial liability to a community at a time when resources are critical. In times of need, Amateur Radio already provides this level of infrastructure, free for the asking.

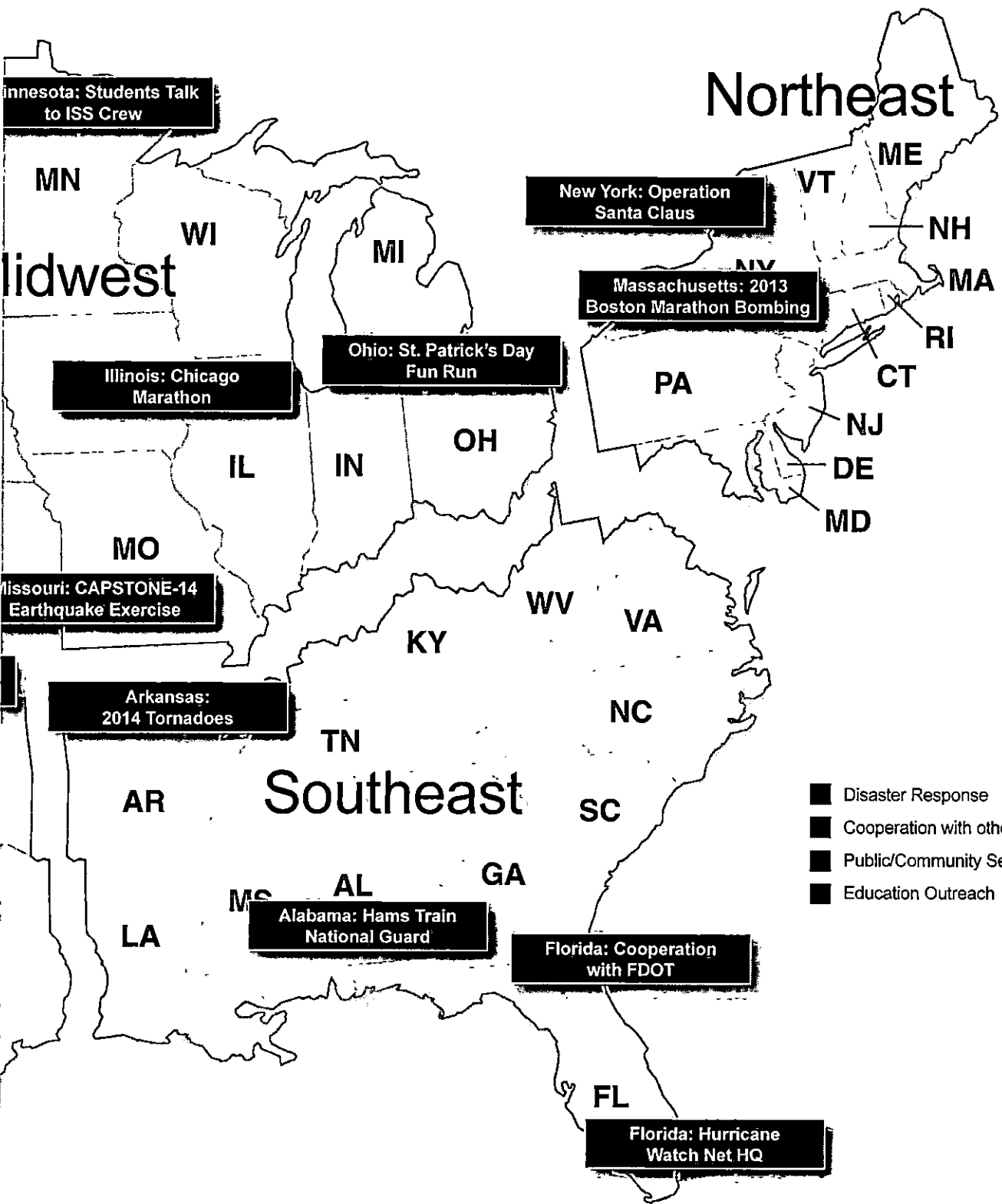
Communicate Globally, Volunteer Locally

In all areas of the country, Amateur Radio operators serve their communities through disaster communications, public service, and facilitating the instruction of STEM (Science, Technology, Engineering, and Math) topics at all educational levels. For the past century, through FCC encouragement, Amateur Radio has been a valuable laboratory for wireless communications technology development, which ultimately flows to the benefit of consumers and business.

The following map highlights some examples of how Amateur Radio has benefitted communities across the country within the last two years.

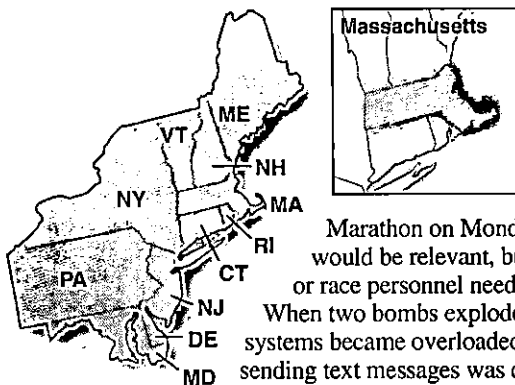
At Your Service: Amateur Radio in the U.S. 2013-2014





- Disaster Response
- Cooperation with other Agencies
- Public/Community Service
- Education Outreach

Northeast



Massachusetts: 2013 Boston Marathon

Radio amateurs have been providing communications at the Boston Marathon for years, and in 2013, over 200 Amateur Radio operators provided public service communications during the Boston

Marathon on Monday, April 15. In years past, communications would be relevant, but routine; a dehydrated runner needed water, or race personnel needed to be moved to a more desirable location.

When two bombs exploded near the finish line in 2013, cell phone systems became overloaded within minutes; making phone calls and sending text messages was difficult. Amateurs sprang into action, working seamlessly with the Massachusetts Emergency Management Agency (MEMA) and providing real-time status updates along the course, via

Amateur Radio, to the State Emergency Operations Center.

Throughout the day, hams shadowed medical personnel stationed at triage centers, were deployed to several makeshift shelters in churches and schools along the race route, and handled "health and welfare" messages from their base at the Heartbreak Hill first aid station. In addition, Amateur Radio was instrumental in helping to communicate the sheltering plan and subsequent transport of runners from shelter locations and give out information on Boston bus and train operations.



A few of the many volunteers at the Amateur Radio Net Control station during the 2013 Boston Marathon. Bruce Tinker, photo]

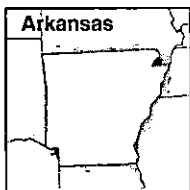
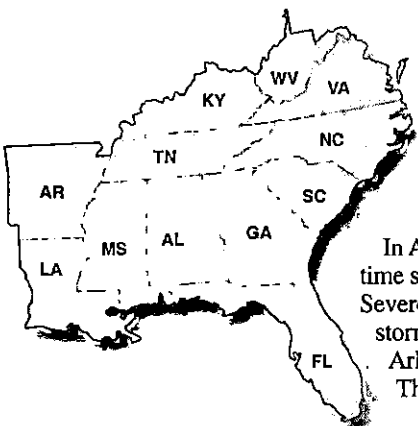


New York: Operation Santa Claus

Every holiday season at JFK Airport in New York, members of the New York District Amateur Radio Emergency Service® (ARES) provide communication support for Operation Santa Claus, sponsored by Community Mayors Inc. The event takes place each holiday season at Port Authority Hanger #19, which is transformed into an improvised North Pole. During the invitation-only event, more than 5000 special youngsters and caregivers from the Greater New York City area meet Santa and Mrs. Claus, enjoy snacks, and receive toys.

"Op Santa" attracts one of the largest turnouts of Amateur Radio operators at a public service event. For ARES members, the annual celebration is a true test of operator skill. Many volunteers at Operation Santa Claus are from uniformed services, such as the New York City Fire Department, the Port Authority Police of New York and New Jersey, the NYPD, the Secret Service, FBI, TSA, and branches of Homeland Security. Because each service has its own radio frequencies and modes, ARES acts as the communication "glue" between volunteers and members of the uniformed services. Before guests arrive, ARES operators are assigned to shadow a uniformed service member throughout the event as they go about their duties. Net control operators coordinate ARES members' locations and traffic. For the ARES members, it's an exciting operational challenge, and the gratification of volunteer work is immediate.

Southeast

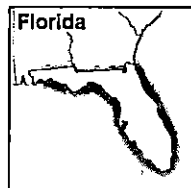


Arkansas: April 2014 Tornadoes

On April 27 and 28, 2014, a line of severe thunderstorms and tornadoes rolled through northern Arkansas and several other states in the Southeast. All along the front, amateurs — who were also storm spotters with training from a National Weather Service (NWS) program called SKYWARN — took to their vehicles and set up along the advancing storm front, reporting their observations via Amateur Radio.

In Arkansas, this information was relayed to the NWS office in Little Rock, who used that real-time spotting information coupled with data from Doppler radar as the basis for issuing Tornado and Severe Thunderstorm Warnings. This scenario was repeated throughout the states affected by this storm, including Alabama, Mississippi, Missouri, and several others. Sixteen people died in Arkansas alone as a result of these storms, and property damage totaled in the millions of dollars. The community of Vilonia, Arkansas was especially hard hit.

“Arkansas SKYWARN [has their headquarters] in the operations center at the NWS Little Rock Forecast Office,” explained Arkansas SKYWARN Program Coordinator Danny Straessle of Little Rock. “This provides a direct benefit to the forecasters to have a direct ear-to-the-ground truth our operators provide.” While local and national TV stations could only show images of radar signatures and debris balls, Arkansas SKYWARN Amateur Radio storm spotters provided a virtual play-by-play, as the storm made its way through this part of central Arkansas. While the forecasters had their eyes glued to the radar, their ears were glued to reports coming in from Arkansas SKYWARN.



Florida: Cooperation with FDOT

Florida’s Department of Transportation (FDOT) had a problem: how to keep a statewide network of DOT workers, tasked with keeping the roadways safe, in touch with each other. With thousands of hand-held radios and several dozen hubs, reliable, statewide communications was a serious issue. A new Voice Over Internet Protocol (VOIP) network that functions independent of the Internet showed great promise, but needed significant testing before it could “go live.” This was deemed a potential safety risk to the DOT workers, due to the likely outages of the new communications system while it was being established.

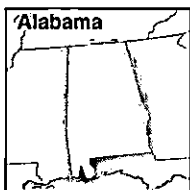
FDOT recruited the Amateur Radio community and allowed them to link their own communications hubs over the new VOIP network to test the new statewide system. During testing, amateurs were able to identify several problems during the implementation of the FDOT network, which were quickly solved without endangering FDOT personnel. This collaboration has resulted in a “win-win” for Florida: tech-savvy, volunteer communicators provided their expertise, resulting in significant financial savings while testing the new VOIP system, and the state is allowing amateurs to use and test the system as part of their own emergency communications plan in the event of disasters, such as hurricanes.

Florida: Hurricane Watch Net HQ

The National Hurricane Center (NHC), on the campus of Florida International University in Miami, Florida, uses Amateur Radio as part of its data-gathering system. The station, which has the call sign WX4NHC, has been providing assistance during hurricanes since 1980 and has been established by a group of volunteers using donated equipment. The Amateur Radio station activates whenever a hurricane is within 300 miles of landfall in the areas of the western Atlantic, the Caribbean, or the eastern Pacific. They also provide emergency backup communications from the NHC to National Weather Service offices and other agencies in case a hurricane affects Miami. By gathering surface reports from other radio amateurs in an affected area of a storm, WX4NHC is able to provide the forecasters with supplemental weather and damage data that are not normally available; this data is frequently incorporated into advisories as they provide a human perspective and eyewitness accounts of what people are experiencing during a hurricane. The WX4NHC team has been nationally recognized for their volunteer international humanitarian efforts by the National Hurricane Conference and the South Florida Hurricane Conference.

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Dr. Richard Knabb, Director of the National Hurricane Center, says, “When I was a hurricane specialist here at NHC, especially during the extremely busy year of 2005, I frequently relied on information from dedicated ‘ham’ radio operators in the US and in many other countries. They are key partners with us as we disseminate forecasts and warnings, and collect all available data both while an active tropical cyclone is out there, and after the event when the crucial task of documenting the impacts is conducted.”



Alabama: National Guard Trained by Ham Operators

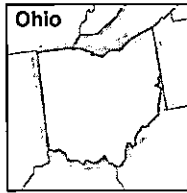
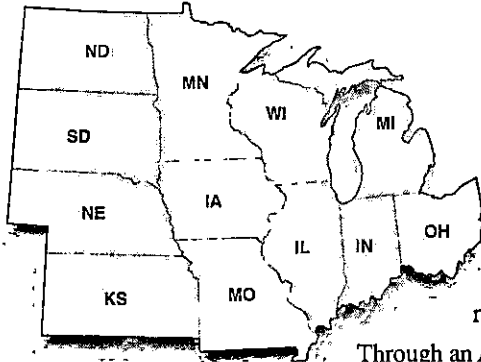
In 2014, eight Prattville, Alabama Army National Guard members from the 231st Military Police Battalion armory traveled to Fort McClellan in Anniston, for specialized training in Amateur Radio communications techniques.

Joel Black, a member of Army Military Auxiliary Radio Service, or Army MARS, said HF radio is much more efficient than satellite communications. “Today’s military has started to depend more on satellite communication. However, HF communications is a more rapidly deployable communication system,” Black explained.

“You can set up an antenna, tune into the right frequency and start talking within minutes. It takes much longer to set up a satellite system.”

The licensed Army MARS trainers shared their expertise in proper use and selection of radio frequencies, how radio waves work, communications technology, safety and techniques of antenna installation. Army MARS, which began in 1925, is a Defense Department organization of Amateur Radio operators that train on a daily basis for providing incident communication for both military and government agencies.

Midwest



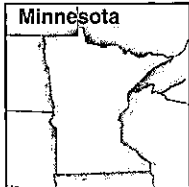
Ohio: St Patrick's Day Fun Run

Nine operators supported the St. Patrick's Day activities in Toronto, Ohio, on March 15, 2014. These annual events include a Fun Run, a 5K Bicycle Ride and a 5K Run. Operators from the Jefferson County Amateur Radio Emergency Service® (ARES) group as well as radio amateurs from the surrounding area worked together for the overall success of the operation.

Communications included service as the "eyes and ears" of the event, with operators reporting locations and numbers of the first male and female runners in each group. All runners were advised to locate a radio operator if there was a problem or injury.

Through an Amateur Radio protocol called the Automatic Position Reporting System (APRS), which functions like a radio beacon, locations of support vehicles along the route were available on a computer monitor in the Command Center Room where race officials were stationed. The screen showing the APRS data quickly became a point of interest for many involved in managing the race. APRS gave officials the ability to visualize the locations of the runners, making it easier to monitor the progress of the race.

Community officials were so impressed with communications functions and the APRS tracking, they subsequently asked Jefferson County ARES to provide communications support during the town's 4th of July festivities.



Minnesota: Students Talk to Astronauts

Students at Hidden Oaks Middle School in Prior Lake, Minnesota had the opportunity to speak directly to Astronaut Koichi Wakata on May 1, 2014 while he was in space aboard the International Space Station (ISS) 250 miles overhead, traveling 17,000 miles per hour. Members of the Polk County (Wisconsin) Amateur Radio Association provided the equipment and technical expertise necessary to make the contact possible.

Hidden Oaks was selected to participate in a program known as ARISS (Amateur Radio on the International Space Station), which is co-administered by the ARRL, NASA, and the Radio Amateur Satellite Corporation (AMSAT).

Through the program, students use Amateur Radio to talk directly with astronauts on board the ISS. Students asked questions ranging from inquiries about scientific research to what astronauts do aboard the ISS when they have free time.



Several hundred students, teachers and administrators crowd the gymnasium at Hidden Oaks Middle School in Prior Lake, MN. Through Amateur Radio, students were able to speak directly with astronaut Koichi Wakata as he orbited overhead, as part of the Amateur Radio on the International Space Station (ARISS) program. [Rick Radke, photo]

ARISS is instrumental in bringing STEM topics into the classroom at all levels of education. In addition to talking with astronauts, students have the opportunity to learn about space technologies and the technologies involved with space communications through exploration of Amateur Radio. Hundreds of Amateur Radio operators around the world work behind the scenes to make these educational experiences possible.



Several members of the Polk County Amateur Radio Association volunteered time, equipment and expertise to make the ISS contact possible. [Rick Radke, photo]



Missouri (and others): CAPSTONE-14 Earthquake Exercise

The Midwest is home to the New Madrid Seismic Zone (NMSZ), which contains the New Madrid Fault. The New Madrid Fault is a regional earthquake threat with national implications. While the last earthquake to affect the area was more than 200 years ago, many seismologists agree the threat of another quake remains undiminished. Increased population density, coupled with commercial and national interests in the region, would make an earthquake in the NMSZ a grave incident.

The Central United States Earthquake Consortium (CUSEC) was formed in 1983, and has received funding support from the US Department of Homeland Security (DHS) and FEMA. Its CAPSTONE-14 initiative was a 3-year, multi-state scope of planning and preparedness activities culminating in a major, multi-state earthquake exercise in June 2014.

In its after-action report, in a section on communications, CUSEC recognized that a major earthquake situation could cut off conventional means of communication, and has emphasized the need for effective alternative communication technologies and capabilities for use when normal ones go down. The report cited satellite communications as an alternate service, but noted they were costly to acquire and sometimes difficult and challenging to operate. "Other means of alternate communications include the National Warning System (NAWAS), and Amateur Radio (ham radio) operations," the report said, and referred to FEMA Administrator Craig Fugate's July 2014 comments on the resiliency and value of Amateur Radio. A "critical task" of the CAPSTONE-14 initiative was identified: "Utilize Amateur Radio assets to establish communications with local, state, federal, and private sector partners." The report concluded that "Regularly scheduled training and functional exercises conducted by RACES and MARS [Amateur Radio] operators will improve speed and understanding during real world emergency operations."

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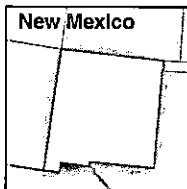
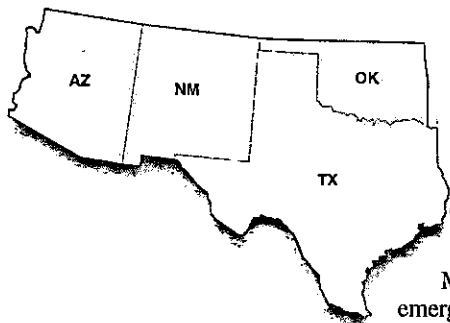
Illinois: 2014 Chicago Marathon

A huge turnout of Amateur Radio volunteers supported communications on October 12 for the 2014 Bank of America Chicago Marathon and its 2000 volunteer medical teams. One hundred and twenty radio amateurs from six states representing nine clubs participated. This marked the sixth year that the ham radio community has supported this event. For the first time this year, the Amateur Radio volunteers also shadowed the nine triage units that attended to runners within Grant Park, the marathon's finish line. The hams communicated with the ambulance service if further medical support was needed. Some 45,000 runners from every US state and more than 100 countries took

part in the Bank of America Chicago Marathon.

The ham radio volunteers were on duty at 6:30 AM on race day, to let organizers know when the medical teams were on site and to assure that medical services and supplies were in place and ready. Eight operators worked at the Forward Command tent with event officials, Chicago City Services, and other agencies, to provide health-and-welfare traffic to the physician in charge as well as with the medical logistics teams and the ambulance service.

Southwest



New Mexico: 2013 Wildfires

New Mexico Amateur Radio operators assisted local government officials in the wake of the 2013 Tres Lagunas wildfire in steep, rugged terrain 15 miles north

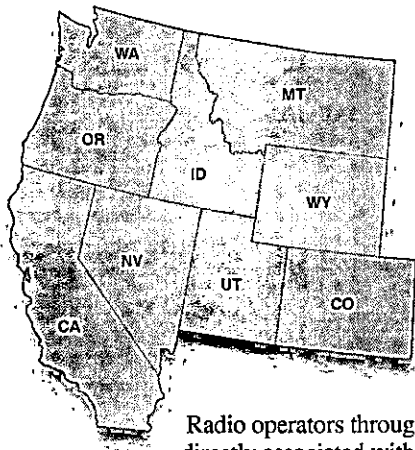
of Pecos. The San Miguel, New Mexico, Amateur Radio Emergency Service® (ARES) team activated May 31 in response to a request from the county's emergency manager to support communication for the San Miguel County Emergency Operations Center (EOC) in Pecos. The blaze, caused by a downed power line, was aided by high

winds and dry conditions, and covered more than 10,200 acres.

Ten San Miguel ARES volunteers provided communications support for 5 days at the county communications trailer at Pecos High School. ARES team members operated radios in the EOC, maintained a relay station in Las Vegas, New Mexico, and traveled with three volunteer fire departments in the county. In Santa Fe, their ARES group monitored the situation and was available to assist if requested.

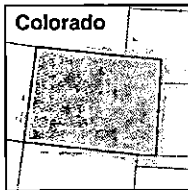
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West



Radio operators throughout the disaster are directly associated with saving at least two lives and supporting dozens of evacuations, including scores of schoolchildren.

These volunteers received national- and state-level commendation for their efforts, including recognition from FEMA. Colorado Congressman Cory Gardner and the Boulder County Office of Emergency Management also recognized the group for their tireless efforts during and after the flooding. The Mountain Emergency Radio Network (MERN) also received extensive news coverage for their work facilitating the evacuation of students trapped in Estes Park.



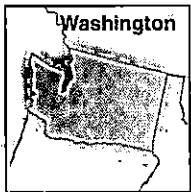
Colorado: 2013 Flooding

Record flooding in northern Colorado in September 2013 affected 17 counties and was featured prominently on national and international news outlets. The flooding decimated northern Colorado, killing at least 15, damaging over 11,000 homes and crippling power and communications grids. Dozens of amateurs throughout the affected area worked for weeks, providing communications links with state and county Offices of Emergency Management, evacuation centers, Red Cross shelters, and local fire and rescue, and assisting with evacuation, search and rescue, and damage assessment.

The efforts of Amateur



Dave O'Farrell (L) and Doug Tabor (R) spent the first four days of the 2013 Colorado flooding in the parking lot of the Estes Park (CO) fire department, maintaining communications links between Emergency Management officials, shelters and other Amateurs. Dozens of hams across northern Colorado served similar roles. [Dave O'Farrell, photo]

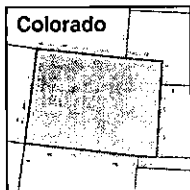


Washington: 2014 Oso Landslide

On March 22, 2014, a landslide swept an avalanche of trees, wet soil, rocks, and debris across the rural Northwest Washington communities of Oso and Darrington. The slide leveled about two dozen houses and blocked a mile-wide stretch of State Route 530. The governor's office declared a state of emergency in Snohomish County. The landslide also blocked the North Fork of the Stillaguamish River near Oso, raising the threat of localized flooding and the potential for downstream flooding should the blockage let go. Forty-three people were killed and property damage was extensive. Normal communications to Darrington were cut off.

While the affected area was deemed too hazardous for all but the most skilled search and rescue teams, amateurs in the Snohomish County Auxiliary Communications Service (SACS) provided communications between Red Cross shelters, the Snohomish County Emergency Operations Center (EOC), and the county command vehicle in Darrington.

Colorado: 2014 Balloon Launch



In what has become a growing trend, Amateur Radio played a big role in students' exploration of near-space in Douglas County, Colorado in October 2014. Through a program called the Edge of Space Sciences, the Douglas County, Colorado, STEM School and STEM Academy and Spartan Amateur Radio Club sponsored and coordinated an Edge of Space Sciences (EOSS) balloon flight. The mission — dubbed EOSS-202 — involved students from several schools and school Amateur Radio clubs in Colorado and New Mexico.

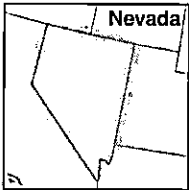
It carried seven student-designed payloads to an altitude of over 104,000 feet. Amateur Radio was used to relay the balloon's position and altitude during the balloon's voyage, along with a data stream reporting live results on a number of the experiments during flight. The balloon landed in rural Cope, Colorado, approximately 70 miles from the launch site. Parents, teachers, and other community members used Amateur Radio to track and recover the balloon's payload, which sustained no significant damage.

Amateur Radio was used to relay the balloon's position and altitude during the balloon's voyage, along with a data stream reporting live results on a number of the experiments during flight.

"It was awesome," said Paul Veal, ARRL Assistant Director of STEM and Education for the Rocky Mountain Division. "Data from the various experiments, along with photos and videos from EOSS and spectators, will be collected in the next few weeks." Veal expects the students' conclusions will result in more Amateur Radio applications in Colorado and New Mexico classrooms.



Students and faculty prepare the payload of a high-altitude balloon for launch in Deer Trail, Colorado. The Edge Of Space Sciences balloon mission included Amateur Radio beacons to track the course of the balloon, and a data stream which provided real-time status on several onboard experiments. These balloon launches are but one way Amateur Radio is being used in classrooms nationwide to engage students in STEM (Science, Technology, Engineering and Math) subjects. The balloon climbed to over 104,000 feet and travelled over 70 miles. [Paul Veal, photo]



**Nevada:
September 2014
Flooding**

Amateur Radio Emergency Service® (ARES) and Radio Amateur Civil Emergency Service (RACES) members in Clark

County, Nevada, activated Monday, September 8, 2014, after heavy rains sparked flash flooding. A slow-moving storm that spun off from Hurricane Norbert dumped nearly 4 inches of rain within 90 minutes onto the town of Moapa. Heavy flooding and mud closed nearly 50 miles of Interstate 15, stranding motorists and truckers, and buckling or washing away pavement in many areas. The flooding was called the worst in more than 30 years.

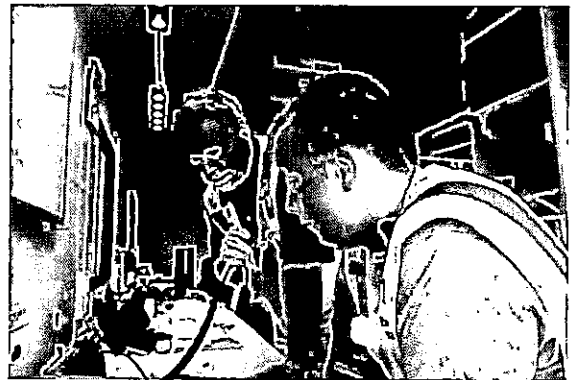
The Amateur Radio volunteers deployed after being called up by local emergency managers to support communication during recovery efforts in the Moapa Valley northeast of Las Vegas. At least two people died as a result of the flooding. ARES personnel staffed the Emergency Operations Center in Las Vegas, and the Clark County Mobile Communications Vehicle was on the scene. Emergency shelter was needed for nearly 200 tribal members of the Moapa River Reservation, as well as nearly 90 elementary and high school students.



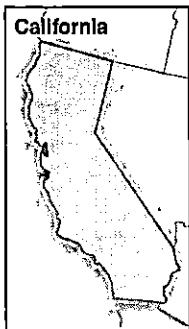
**Oregon Office of Emergency Management
Asks for More Hams**

Oregon's Office of Emergency Management already recognizes the value of Amateur Radio as a needed resource. When it coordinated the largest-ever test of the state's emergency communications network in 2013, it found that some regions needed more communications resources. In a news story by Oregon Public Broadcasting (OPB), reporter David Noguera said, "While the exercise was considered a success, it also shed light on one of the system's vulnerabilities — a lack of qualified Amateur Radio operators east of the Cascades." The exercise scenario over the weekend of November 2 – 3 simulated a crippling cyber-attack on the power grid that took out telephone and Internet access. In such situations, emergency planners "have identified Amateur Radio as the fallback method of communication," the OPB story said.

The broadcast story pointed out that while Oregon has some 700 ARES volunteers, most are in Western Oregon. Morrow, Grant, and Jefferson counties have no volunteers, however, and other counties have just one. Much of southeastern Oregon has an average population density of fewer than five people per square mile, making backup communications to this isolated part of the country extremely important.



Oregon Office of Emergency Management Communication Officer Fred Molesworth (left), and Amateur Radio volunteer Patrick Lewis do a demonstration at the Oregon State Fair in August. [Cory E. Grogan, Oregon Office of Emergency Management, photo]



California: 2013 Rim Fire

Amateur Radio volunteers supported the American Red Cross and local government for 16 days in the wake of the gigantic Rim Fire, in and near California's Yosemite National Park and the Stanislaus National Forest in August 2013. 236,000 acres of forest were destroyed, along with over 100 structures. The cost of the effort to combat the fire was estimated at \$77 million. The initial callout on August 19 responded to a request to assist the Red Cross in setting up an evacuation center in Groveland, California. Shelter operations relocated the following day to the Tuolumne County Fairgrounds in Sonora. On August 20, the Tuolumne County Office of Emergency Services requested Amateur Radio assistance to staff the Sonora Red Cross shelter and the community information telephone system at the Tuolumne County Emergency Operations Center.

More than two dozen radio amateurs were involved in the Rim Fire callout. The US Forest Service Type One Team stated that "The combined operation conducted by Tuolumne County Office of Emergency Management, Amateur Radio Emergency Service® (ARES) and Radio Amateur Civil Emergency Services (RACES) teams, the Tuolumne

chapter of the Red Cross, and the cooperation of the people of Tuolumne County will serve as an example for future operations."

Volunteers from Calaveras County and Fresno County ARES also participated in the activation.

Your Wireless Good Samaritans

These examples of Amateur Radio being used to support municipalities are only a small part of the work Amateur Radio operators do each year, throughout the country. It is easy to overlook what a valuable part of the community network Amateur Radio is, until it is needed. Our nation learned this value under extremely dire circumstances during the 9/11 attacks and Hurricane Katrina; others have seen the benefits during ordinary civic events or educational outreach in their schools.

Amateur Radio operators never want to be called up for a disaster. However, they are prepared to do so in a moment's notice, for the good of their community and fellow man, without hesitation and without expectation of payment. They help provide the most valuable of commodities to emergency services and management teams during a disaster: real-time information. But their ability to serve goes far beyond disaster scenarios. Reach out to your Amateur Radio population through your state, county, or local Office of Emergency Management. You will find an eager group of men and women who can help bridge the gap in your community's communications plan.

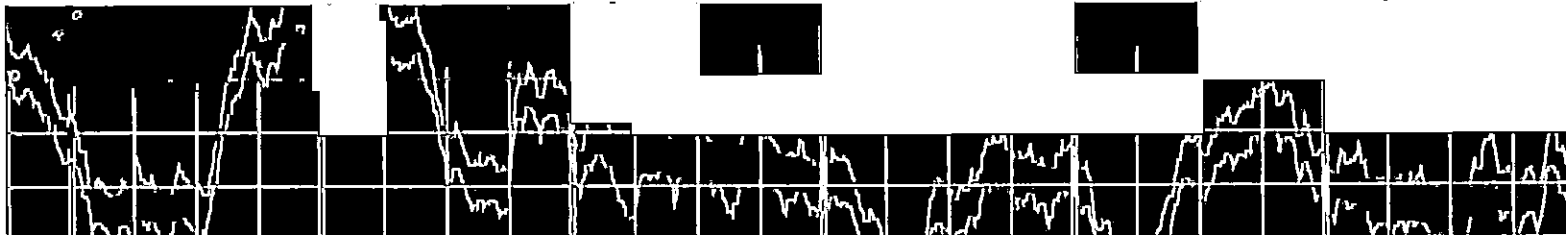


Public Service Communications To Go – EMCOMM-1 is a privately owned and financed communications trailer designed to support public service events and disaster response communications. The trailer, custom built by Dan and Marisa Sears of Chapel Hill, North Carolina, is based on a Pace American 5 x 10 foot cargo trailer. The ceiling treatment, overhead lighting, windows and receptacles were factory installed to their specifications. EMCOMM-1's local and national communications capability has been used extensively at more than 40 events in the past three years. [Ed Hall, photo]



ARRL The national association for AMATEUR RADIO®

ARRL can help arrange a meeting with your local ham community. Visit us online at www.arrl.org or call **860-594-0200** to learn more.



Basis and purpose of the Amateur Service

- (a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.
- (b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.
- (c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.
- (d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians and electronics experts.
- (e) Continuation and extension of the amateur's unique ability to enhance international goodwill.

Title 47, Code of Federal Regulations



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