

Microvolt

August 2024



Emergency Communication



Emergency communication, or *EmComm* for short, has been part of amateur radio since very early on; in fact, it's so integral that it's written into Part 97 as **the very first rule**:

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.

Amateur radio started out as a project, a science, an experiment in wireless technology, but it wasn't long before its value in rescue communication became obvious. Today, a fun hobby notwithstanding, emergency service is by far the most quoted reason for new amateurs to become licensed. Maybe you're one of them.

From the Titanic to ARES, let's look back to our roots at one of the purposes of amateur radio, even before it became a casual pastime. Many new hams have entered the craft because they want to be part of the solution. How can you get involved with emergency communication?

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**Online version only*



Cover – Emergency communication



Amateur radio did not start out being an **emergency service**, but following the sinking of the *RMS Titanic*, the value of the wireless medium aboard neighboring ships proved indispensable. Since those days, numerous people have become the beneficiaries of emergency communication provided by radio amateurs.

While you have a license and a radio, it might benefit you to get some formal training on how to use them during a bad situation. Here are a few good services that could help you get involved:

ARES (Amateur Radio Emergency Service)

An ARRL sub-group (ARRL membership not required), the purpose of ARES is to train an "army" of volunteer amateur radio operators to help with communication during a disaster or other need. They provide levels of certification to gauge their training in operation, procedures, and appropriate equipment.

RACES (Radio Amateur Civil Emergency Service)

Stand-by service that's active only when the President of the United States invokes the War Powers Act, which suspends amateur radio operation, except as governed by RACES, who accredits and trains their participants.

AUXCOMM (Auxiliary Communications)

A program and team that's answerable to the Department of Homeland Security, which augments local emergency communication teams, such as ARES and government radio services.

CERT (Community Emergency Response Team)

Owned and regulated by FEMA (Federal Emergency Management Agency), CERT is a program that trains individual citizens on how to get organized, establish leadership, and provide communication during a widespread disaster. While emergency communication was not a primary focus of CERT, its inclusion is slowly gaining nationwide momentum.

ERC (Emergency Response Communications)

The ERC is the emergency communication arm of Utah's predominant faith, the Church of Jesus Christ of Latter-day Saints. At the direction of church leaders, church sub-leaders establish a communication network that connect the leaders with each other, and provide a way for them to address incidents involving most of the membership. The church provides continual training for their membership

through the ERC nets, websites, and church calling instruction. Any licensed amateur can be part of the ERC, and does not need to be a church member.

TERT (Timpanogos Emergency Response Team)

Under the direction of UCARES (Utah County ARES), TERT is an organization that provides several voluntary teams of trained communicators, medics, and climbers, to serve on Mt. Timpanogos during summer weekends. An injured hiker can call 911 while on the mountain, and dispatch routes the call to a TERT team member currently serving. The TERT member communicates patient information by ham radio to the team leader or directly to dispatch. Other mountains / wilderness areas have similar communication solutions.

Check out [these short accounts](#) of hams who have used their radios to help others (available at noji.com/hamradio/moreham.php#noji_action):

- [Canadian flood](#)
- [Off-road slip in New Hampshire](#)
- [Colorado mishap](#)
- [Nepali earthquake](#)
- [Alberta crash](#)
- [Michigan rescue](#)
- [Stuck in a Wyoming canyon](#)
- [Katrina lifeline](#)
- [Broken arm in Utah](#)
- [Chilean rescue](#)
- [Rescue in the San Gabriel Mountains](#)
- [Seizure in Exmoor](#)

Now that you know where to get started, and some examples of others who have done the same, you too can be part of the solution.

Microvolt editorial staff

Editorial – Working an emergency



The Jazz game is about to start in six minutes, and you're fresh out of pizza. To some, that's an emergency. All joking aside, exactly what constitutes an **emergency**, and what are we amateurs legally permitted to operate during one? These and numerous related questions have surfaced on social media *ad nauseam*.

Although the actual word *emergency* is never defined in Part 97, according to section 97.403, ***No provision of these rules prevents the use by an amateur station of any means of radiocommunication at its disposal to provide essential communication needs in connection with the immediate safety of human life and immediate protection of property when normal communication systems are not available.***

Ok, so, what's an amateur station? According to section 97.3(a)(5), an amateur station is ***a station in an amateur radio service consisting of the apparatus necessary for carrying on radiocommunications.***

This seems to imply that a person can use any amateur equipment on any frequency to provide communication that's directly related to the safety of life and property. Since it states nothing about the licensure of the operator, it seems to further imply that an unlicensed person can legally use amateur equipment to save a life during an emergency.

While that usage does appear to be legal, it's also not likely that an unlicensed individual will have the skills necessary to operate such a station. And because the only way to learn how to use one is by usage and experience, the only legal way to obtain that experience is with a license.

According to section 97.101(b), none of us ***owns*** a frequency, and according to section 97.101(c), we must ***give priority*** to an emergency communication. But does that apply to repeaters? I mean, if somebody has an emergency, and I'm already using the repeater, yes, I understand that I must relinquish the repeater. But just as easily, why doesn't the operator take the emergency to another frequency? It's because repeaters, especially "ragchew" repeaters (those that are heavily used to shoot the breeze) are great for emergencies, since using them will give you the best chances of being heard by somebody who can render assistance.

And if you're concerned about somebody who's calling for help on their FRS radio, is it ok to answer their call on your ham radio that's been modified for FRS? According to section 97.111(a)(3), it is.

Is amateur radio the only way to communicate in an emergency? Of course not. ***Your phone is the first and best choice for emergency communication***, if the infrastructure is working. If it isn't, then you can resort to other forms, such as amateur, GMRS, FRS, and more.

Working an emergency takes patience and training. It's not easy to remember everything you're supposed to do and say when your bloodstream is pure adrenaline and you're hyperventilating. Even when things are crazy, it's a good idea to step back for a second and take a deep breath. Slow down your speech, or you'll say things you're going to regret later. Get involved with a couple of weekly nets to keep your skills up and your equipment ready. Volunteer to present a few training topics on the nets. Get involved with ARES and climb the ladder of certifications to make yourself even more useful.

Finally, here are a few other considerations for handling emergency communication:

- **[How to set up a relay station](#)**
- **[Radio preparation prior to an emergency](#)**
- **[How to relay emergency messages](#)**
- **[Using tactical call signs](#)**
- **[How to answer a call for help](#)**
- **[How to help somebody in distress](#)**
- **[How to call out for help](#)**
- **[You are not a cop](#)**

And so much more, that had to be omitted.

Anything to add? Email editor@utaharc.org

Letters to the editor

Dear Editor:

I've never heard of anybody making a contact with China. Are we allowed to make radio contact with a ham in China?

Justin in Orem

Dear Justin:

We licensed American hams are indeed permitted to communicate with licensed amateurs in China. In fact, I know of several, including myself, who have made radio contact with ham radio operators there. However, we are not permitted to carry out a **third-party communication** with an unlicensed person in China.

Dear Editor:

Will painting my antenna affect how it works?

Orson in Spring City

Dear Orson:

I'm not aware of any type of paint that will noticeably affect your transmission, reception, or SWR, if you're operating under about 600 MHz. Then again, you might also want to avoid using conductive paint if it's going to come in contact with both conductors of your antenna.

Dear Editor:

Will operating ham radio affect my pacemaker?

Randy in Fruit Heights

Dear Randy:

According to **the ARRL**, it likely will not, but consult your doctor to be sure.

Dear Editor:

I attended a club meeting a few months back, in which the presenter encouraged people to upgrade their licenses if they haven't already. One of the reasons he gave for upgrading was to help with commu-



nication during an emergency. But isn't it true that during an emergency, a person can communicate by any means necessary if life or property is in danger? If so, why would I need to upgrade, if I only do HF for an emergency?

Daniel in Park City

Dear Daniel:

You are correct, that you may use any communication means necessary to save life and property. Let's say you and a friend are in the middle of the desert, away from all cell towers and ham repeaters, and your car breaks down. Then, while attempting to repair your vehicle, your travelling companion falls and impales a leg artery. You just happen to be hauling a complete HF station in your vehicle (maybe you're transporting it to another friend). That moment sounds a lot like an emergency, so it appears you're legally permitted to set up the station, fire it up, and call for help. Will you know how to set it up and turn it on? Ok, it's not rocket science, so you figure it out. Will you know how to use it to call for help? On what band? On which frequency? Using what mode? What's the protocol? And what's all that noise you hear? Do you know whether your antenna will require a tuner? You might have known, if you had learned about and practiced all of that ahead of time. But you can't practice doing all of that without a license. And that's why you need to upgrade, if you plan to work HF during an emergency. (BTW, **a very similar thing happened** just this past April in Death Valley.)

Send your thoughts to editor@utaharc.org

Club news

Welcome to the first-known August issue of *Microvolt* ever published! Although this issue will not be submitted for print, it'll start a new trend in access to the online versions.

UARC does not normally hold a July meeting. So, no meeting news at this time, but there was considerable chatter by email, collaborating for the Steak Fry and other club business.

UARC Steak Fry

On Saturday July 20, about 45 of us gathered at the Spruces Campground up Big Cottonwood Canyon away from the triple-digit heat to enjoy a little beef together. Several brought transceivers and antennas, and set up HF stations to make contacts, mostly out of the state. We've posted a few photos from that event starting page 13.

Change is inevitable

One final announcement: We've reached the end of a long era. Or rather, we're about to embark on a new era. Starting with the January 2025 issue, *Microvolt* will no longer be sent out for print, and will be available in digital form (online) only. The December 2024 issue will be the final issue that will be printed



by the club and mailed to members generally. If you'd like a printed copy, and don't have reasonable access to a color printer, please reach out to us at uarc@xmission.com

A night to remember

One thing we don't plan to change anytime soon is Homebrew Night, coming up on Thursday October 10 in the Warnock Building room 2230. We're looking for new and old ideas to design, build, and share with the rest of the club, whether that's an antenna, special circuit, or some other project, like an antenna launcher or a 3-D printed holder.

Notice to all UARC members in good standing

The Utah Amateur Radio Club is governed by its bylaws, last amended in October of 2002, and a lot has taken place in 22 years. As a result, our bylaws have fallen out-of-date, requiring us to update them, but the proposed changes must be approved by a vote of the membership. We are required to notify the voting club members in good standing at least 48 hours prior to taking such a vote, ***so this serves as your notification.***

We're also required to hold the bylaws modification vote at an in-person meeting with a quorum of 10% of the voting membership in attendance, and because we have members scattered across the country, this will not be a trivial task. We plan to vote on proposed bylaws changes at the start of our 12 September 2024 in-person meeting if we can attract enough members to constitute a quorum.

So, if you're able, please, PLEASE attend at least the first part of the September meeting, and invite any fellow club members you know. The location of the September club meeting is room 2230 of the Warnock Engineering Building on the University of Utah campus. This only serves as a meeting notice; we'll post the details of the actual proposed amendments at a later date.

Thank you,
UARC Board

UARC is now officially a 501(c)(3) non-profit

After long last, UARC has finally received the letter from the IRS in July 2024 indicating our club is officially designated as 501(c)(3) non-profit status, paving the way to a number of opportunities going forward.

For your information

Microvolt has expanded!

Your club newsletter *Microvolt* is now longer than the 8 pages you're used to. See the rest of the story in the online version, located at

<https://user.xmission.com/~uarc/Microvolt/2024/August2024.pdf>

Homebrew Night 2024

Thursday 10 October 2024 is our annual Homebrew Night, starting at 7:00 pm. Bring your ideas, your gear, and your enthusiasm to the Warnock Building!

License classes

Salt Lake:

General : Tuesdays 7:00 pm to 9:00 pm
(Held weekly over the repeater)
147.160+ MHz (127.3 Hz tone)

Orem:

Technician : 4 Tuesdays, 6:30 to 8:30 pm
Sep 17, Sep 24, Oct 1, Oct 8
Visit psclass.orem.org to register (\$10)
Orem Traffic Training Room, 95 E Center St
HamStudy.org account required
Email nojiratz@hotmail.com for info

Eagle Mountain:

Technician : 5 Thursdays, 7 to 9 pm
Aug 29, Sep 05, Sep 12, Sep 19, Sep 26
Email ki6oss6365@gmail.com to register (free)
Eagle Mountain City Hall, 1650 Stagecoach Run

Exam sessions

Salt Lake County:

- Email Garth Wiscombe W7PS w7ps@arrl.net
Aug 25, Sep 30, Oct 28, Nov 25
- Email Rick Morrison W7RIK w7rik@arrl.net

Utah County:

- Wed 21 Aug 7:00 pm : **Provo** : [signup](#)
- Wed 18 Sep 7:00 pm : **Provo** : [signup](#)
- Sat 21 Sep 2:30 pm : **Provo** : [signup](#)
- Sat 21 Sep 10:00 am : **Spanish Fork** : [signup](#)



Club repeaters

Farnsworth Peak : 146.620– MHz (no tone)

Scott Hill : 146.620– MHz (no tone)

Lake Mountain : 146.760– MHz (no tone)

SDRs and Beacons

Northern Utah WebSDR : sdrutah.org

KK7AVS SDR : k7xrd.club

N7RIX SDR : <https://sdr.n7rix.com>

K7JL beacon 28.2493 MHz

HF remote and club transceiver stations

If you'd like to learn how to get started using the remote stations, visit the [HF remotes link](#) on [the club website](#):

<https://user.xmission.com/~uarc/HFRemote.html>

How can I help?

Reach out to the club leadership by sending an email to uarc@xmission.com. Also, add to this page by emailing editor@utaharc.org

Spotlight – Carl Pockrus WE7OMG



Years ago I came into the possession of a Hallicrafters S-53A receiver. Using a long wire, I heard somebody in South Africa, and that started my interest in radio. I eventually got into the military at 17, in a communications MOS, and operated MARS stations. After my military discharge in 1976, I took a job down in Kwajalein, Marshall Islands, and started studying ham radio back then, but could never get past the (Morse) code. It was always in the back of my mind to get it done.



Fast-forward many years later, my son Nick became interested in getting his ham radio license, but never got around to it, so he left his license study book when he left on his mission. I picked up the book, learned that they had dropped the code requirement, and started studying again. At the same time I was taking a local CERT course, and from overhearing conversations, heard about Steve Whitehead's one-day course, so I signed up. I took the test right after the class, passed, and the rest is history.

Love the voice modes, love DX, but mostly love whatever's working at the moment. Almost have WAS (Worked All States), missing Nevada on 20 meters. I love ham radio...what can I say? After all, my last name means, "crazy Russian"

Among Carl's ham radio gear:

Yaesu FT dx 1200 HF transceiver

Yaesu FT-2900R VHF transceiver (home)

Yaesu FT-7900R VHF / UHF transceiver (truck)

"Pockrus" dual-band J-pole antenna

Arrow 6-meter half-wave vertical antenna

Buckmaster 6-meter to 80-meter OCF antenna

— 73, WE7OMG



Note from the editor: Carl has quite a list of accomplishments under his belt, only a few of which I'll list here. After years of diligent work, Carl has earned his DXCC. He serves as part of the rotation for Net Control of the weekly 76ers Net on Wednesday night, serves on the UVARC Board of Directors, has the station that racks up the lion's share of contact points at Field Day, and is the one and only maker of the "Pockrus" J-pole that has helped so many get their signals in the air.

73, and thanks for all you do, Carl!

Microvolt is the official publication of the Utah Amateur Radio Club, Inc. (UARC), 3815 S 1915 E, Salt Lake City, UT 84106, and is published monthly. Reprints are allowed with proper credits to *Microvolt*, UARC, and authors. Online versions located at <https://user.xmission.com/~uarc/Microvolt>

We encourage you to submit original pictures (highest resolution), articles, software and hardware descriptions, appropriate humor, and responses to editorials. Email the content, pictures attached, to the editor at editor@utaharc.org by the 24th just prior to the target month.

The **Utah Amateur Radio Club** was organized under its present name in 1927, although its beginnings may date back as early as 1909. In 1928, it became affiliated with the **American Radio Relay League** (club #1602) and is now a 501(c)(3) non-profit organization. It holds a club station license with the call sign W7SP, a memorial to Leonard "Zim" Zimmerman, amateur radio pioneer in the Salt Lake City area.

The club meets each month except July and August. The meetings are usually held on the second Thursday of the month at 7:30 PM in the University of Utah's **Warnock Engineering Building**, room 2230.

Club membership is open to anybody interested in amateur radio; a current license is not required. Dues are \$20 per year, including a *Microvolt* subscription, which cannot be separated from membership. Those at the same address as a member who has paid the \$20 can obtain a membership without a *Microvolt* subscription for \$12. Send dues to club secretary James Bennett, 4960 W 5400 S, Kearns, Utah 84118. Send address changes to kk7avs@gmail.com

Tax-deductible monetary contributions are gladly accepted. Send directly to club treasurer Shawn Evans, 1338 S Foothill Dr, #265, Salt Lake City, Utah 84108-2321. For in-kind contributions, please contact uarc@xmission.com to make arrangements.

UARC maintains the 146.620– and 146.760– repeaters, which are administered by the **UARC Repeater Committee**. Direct comments and questions to any committee member. The 146.760– repeater is on IRLP node 3352.

Call the **UARC Ham Hotline** at 801-583-3002 for amateur radio information, including club, testing, meeting, and membership information. Leave a message, and we'll make an effort to return your call.

Microvolt (USPS 075-430) is printed monthly except August, by the Utah Amateur Radio Club. Periodicals postage paid at Salt Lake City, Utah.

POSTMASTER: Send address changes to *Microvolt*, c/o James Bennett, 4960 W 5400 S, Kearns, Utah 84118.

UARC 2024 Board

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For late-breaking news listen to the UARC Information Net, Sundays at 8:30 pm on 146.620– or visit the [announcement page](#).

We are grateful to the management of our internet service provider XMission, for the donation of our web service. For account information go to <https://xmission.com/> or call 801-539-0852

EIN : 99-0407768

Utah Business Registration : 575790-0140



Tech corner – Disaster station setup

According to CERT (Community Emergency Response Team) literature, an **incident** is any kind of problem, issue, hazard, or other event or situation that endangers people or property, including domesticated animals. An **emergency** is a sudden, unexpected critical incident, in which help is urgently required and likely on the way. A **disaster** is a critical incident, in which help is likely not on the way, primarily because the incident is so widespread that services and resources are simply unavailable.

Effective communication is useful no matter the situation, and can often be managed using cell phones, or radio by respective government services, even during most emergencies. During a disaster, such as an earthquake, hurricane, wildfire, or flood, however, these same fragile services might easily become compromised or overloaded, leaving most people in the affected area without a means of communication. This is where you come in.

Being ready for disaster communication means that you have the equipment for effective communication and the skills to operate it. The two typical communication situations that might require your station are **home** and **mobile**, and you likely want to be prepared for both cases. Remaining at home might mean that you're *sheltering in place*, taking care of a family member, or you simply have no reason to leave your residence. Being mobile might mean that you have a vehicle or are on foot, but typically *relocating away from home*.

Again, being ready means that you not only have the equipment, but that you know how to use it. And how ready you are might depend on how willing you are to take the time to educate yourself. *Please note that some of these links might no longer be valid a year or more after the publication of this article.*

Prepare beforehand

- **Obtain a General Class amateur radio license** (this will allow you to transmit both locally and around the globe without the need for internet or other infrastructure)
- **Check regularly into local nets** to a) learn how to work your equipment and the repeaters, b) ensure your equipment is in working order, c) become accustomed to common operating procedures and radio language, and d) connect with others who



share your interest in disaster communication

Become educated

- Ham radio **best practices**
- How to set up a **solar station**
- Emergency procedures (how to **call for help**, how to **answer such a call**, how to **relay**)
- Learn what and how long it will take you to gather everything needed for **an evacuation**
- Learn how to read GPS coordinates off your phone
- Learn to take notes on your smartphone

Your radio equipment

The following radio equipment checklist can be handy, to help ensure you have what you need when the time comes:

- **Portable HF / VHF / UHF transceiver**
- **Portable VHF / UHF antenna**
- **Portable HF antenna**
- Coax (**50 feet** and **100 feet**) with connectors
- **Barrel connector**
- **Over-ear headset** (especially if you're operating in a noisy environment)
- **List of necessary or useful frequencies**
- **Broadcast listening**, including weather

Power needs

- **30 A power supply**
- **100 Ah 12 V LiFePO₄ battery**
- **100 W solar panel**
- **8 A solar charge controller**
- **Inverter** with both **alligator** and **accessory plug**
- Batteries (AA, AAA, **small LiFePO₄**)
- **Optional: generator**

Tech corner – Disaster station, cont'd



Support equipment

- Smartphone, charger
- **Collapsible wagon**
- **Small folding table**
- Portable chairs (preferably with backs)
- Optional: Windows Laptop, charger
- **Headlamp, lantern, work light, flashlight**
- USB cable (for your phone or light or other)
- Hoodie or coat
- **Work gloves**
- **Sunglasses**
- **Masting, stakes, prybar, hand sledge**
- **Guy wire**
- **Utility knife, multi-tool**
- Scissors
- **Duct tape**
- Pen, paper, Sharpie
- Small bottles of water, water purifier
- Toilet paper, feminine hygiene
- Snacks, MREs
- **First-aid kit**, medicines
- Gallon Zip-loc bags
- Large duffel or case(s) to put all this in

You might also want to

- install **Powerpole connectors** on your transceivers, batteries
- install **MC4-to-Powerpole adapters** on your solar panel
- ensure your rechargeable batteries are fully charged and ready at any time

Decide on your contacts

- Relatives (especially out-of-state)
- Friends and neighbors
- ARES
- Public safety (fire, EMS, police, municipality, search-and-rescue, forest service, etc.)
- Anybody out there

Practice

- setting up your radio and antenna from complete disassembly
- manually changing to a repeater frequency and setting it to simplex (talk-around) and reverse

- setting up your solar equipment from complete disassembly
- asking for signal reports from somebody farther away
- testing with one power source, then switch to a different one
- Test, test, test

Every disaster is different

The point of this guide is to provide yourself with sufficient ability to communicate your needs or those of somebody else in a disaster. Will you need everything listed here? Maybe, maybe not, maybe more. We haven't addressed any long-term possible necessities, such as shelter, toilet, heat, shower, and bedding, because long-term self-sustainability is not the goal here.

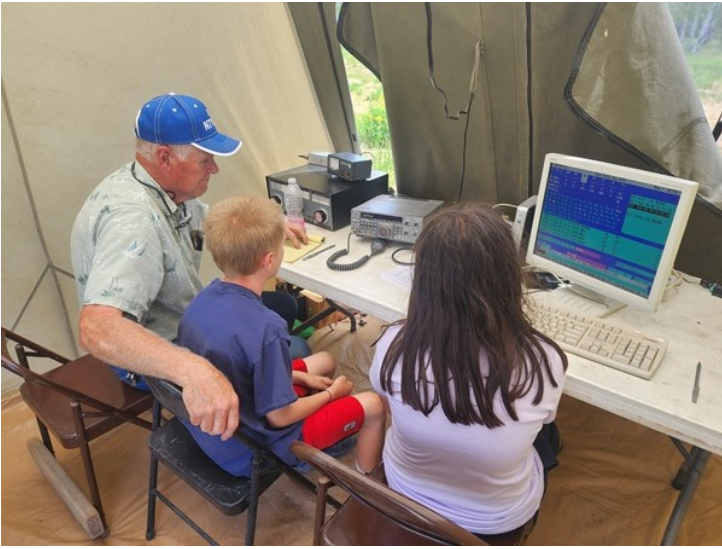
Furthermore, this guide is intended to help you and your family, not for you to replace the fire department. If it so happens that these guidelines can help you assist emergency personnel, then please feel free to serve in the capacities that best suit your circumstances and training, using your best means available.

The end of the world

If you can't afford to collect all of these items right away, it's not the end of the world. Take your time learning the things you need and to become prepared; you'll likely have plenty of time to upgrade your license and gather your equipment. And if it is the end of the world, chances are you'll have more important things to worry about than your ham radio gear. 😊

Noji Ratzlaff KNØJI

Field Day photos



Field Day photos, cont'd



Steak Fry photos



Steak Fry photos, cont'd



Strays – Actual emergency steps



Fortunately, you'll probably never experience a true disaster in your lifetime, yet they do happen, and it's your hope that you'll be prepared should such an incident affect you or your family. If you *are* involved in a possible life-threatening situation, you need to act quickly, so the last thing you want is a thick book of action items to remember. Collected and compiled from FEMA, the Red Cross, CERT, and ARES, then summarized here, is a set of emergency steps you should take immediately after a disaster strikes:

1. **Use your head — stay calm** (your brain is your most important tool, and staying calm requires practice, which is what nets and drills are for)
2. **Check yourself for injuries** (adrenaline can deaden pain)
3. **Check household members for injuries** (or people nearby you at work or at the store)
4. **Call 911** (you might not get through, but you need to try)
5. **Check your place for damage** (wherever you are at the moment)
6. **Notify your Block Captain** (whaddaya mean you don't know who your Block Captain is?)
7. **Grab your go-kit and your 72-hour kit** (you DO have one, right?)
8. **Gather your family and leave your place** (if it makes sense to do so)
9. **Check your neighbors for injuries** (knock — no — POUND on their doors)
10. **Go to your assignment or shelter** (determined by your Incident Commander)
11. **Inform your out-of-state contact** (TEXT your out-of-state relative or friend, if you have cell service)
12. **Set up your radio and check in** (to your local net, ARES frequency, or ERC)
13. **Adjust these steps to suit the incident** (see number 1, and be flexible)

Notice that some of these steps require you to do a little thinking. They are not necessarily listed in the order you need, not all of them are applicable in every incident, and many useful tips have been omitted, requiring you to be *resourceful*.

Also note that your ham radio doesn't come into play until way down the list. But if that's the case, what's the difference between you and anybody else, who might not have a radio and a license? The difference is that you are familiar with how to use your radio during moments like these. And where did all this supposed familiarity and training come from? **From participating regularly in local nets and drills.** And of course you do, right?

