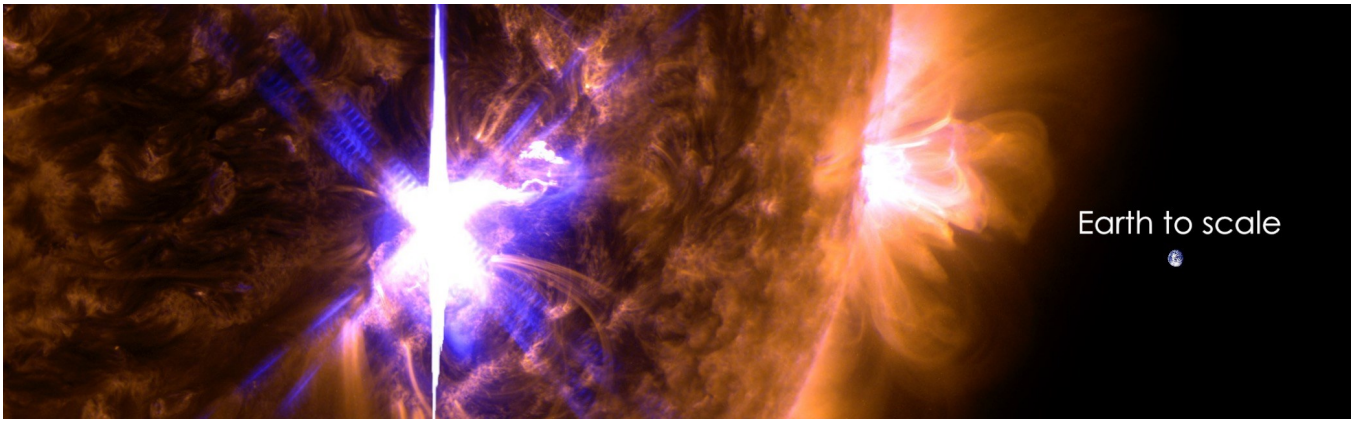

An X9.3 class solar flare flashes in the middle of the Sun on Sept. 6, 2017. This image was captured by NASA's Solar Dynamics Observatory and shows a blend of light from the 171 and 131 angstrom wavelengths. A separate image of the Earth provides scale. Credit: NASA/GSFC/SDO .

Wavelengths

Oct 2017

Xenia Weather Amateur Radio Net
XWARN (W8XRN)

147.1650+ (123.0) (Analog Only)
443.1000+ (123.0) (Analog + System Fusion)

Meetings: 2nd Monday, 7:30PM,
Greene Memorial Hospital (1141 N Monroe Dr, Xenia, OH)
Herman Menapace Auditorium

Online Newsletter: https://sway.com/UDISIuNOawom3cjH

President's Message

We are in the midst of our busy season for supporting public events, so I have been fairly busy organizing and spending less time waxing philosophic. I encourage all to consider joining in for the statewide Simulated Emergency Test (SET) to be held on Saturday, October 7. This exercise is organized by GCARES and commences around 9:00 AM. If you are able, please check in via the resource net which will be found on the XWARN repeater (147.165 +0.6 offset, 123.0 Hz ctcss). The exercise scenario in Ohio is similar to the actual situation in Puerto Rico where widespread power and communications are the result of storms sweeping through a very large area. Will you be ready to help in such a situation?

Coming up is one of those quirks of the calendar where a number of events line up:

- Friday Oct 6 DARA meeting with presentation by our own Jason Bowman WG8B
- Saturday Oct 7 SET (as noted, above)
- Sunday Oct 8 River Corridor Classic Half Marathon (more help is needed)
- Monday Oct 9 XWARN at GMH 7:30
- Tuesday Oct 10 is the Hamvention meeting

Looking for something to do?
73 de N8ADO

The Weather Outside is Frightful

The past month has been a very active month for mother nature. While most everyone has been aware of hurricanes Harvey, Irma, and Maria hitting Texas, Florida, and Puerto Rico, there has been a virtual bevy of "weather" including earthquakes both in Indiana and Mexico, the largest solar flares in a decade impacting the ability to communicate in the hurricane responses, and smoke from the fires in the Pacific Northwest descending on Ohio. More later in the newsletter especially concerning the impact to and the use of emergency communications.

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- XWARN Trailer / Public Service,
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  trailer@xwarn.net or
  publicservice@xwarn.net
- Newsletter, Jason Bowman, WG8B
  newsletter@xwarn.net

Calendar of Events

- Oct 8. Sun 8–3 River Corridor Classic Half Marathon. Riverscape Metro Park Start & along rivers. Big event, needs many eyes [N8ADO]
- Oct 21 Sat 8–3. Dayton District Cross Country Meet. Cedarville Univ XC course. Big meet. Need 10–12 volunteers. Lunch provided [N8ADO]
- Nov 18 Sat 9–11. Mid East Cross Country Regionals. Indian Riffle Park, Kettering. Easy event, need 12–15 volunteers [N8ADO]
- Dec 9 Sat. Reindeer Run.
- Dec 31 Sat 1900-2100 (7-9PM). Resolution Run. Beavercreek HS, Dayton-Xenia at Fudge. 5k, VE test session, potluck snacks before. We provide comms and light the course with our headlights—we are never short of volunteers for this one, but don't miss out! [N8ADO]

Interested in communications for small teams at the tactical edge? Pictured at the left are a pair of goTenna mesh devices and a single Beartooth mesh device, which you pair with your smart phone via Bluetooth. More information about the use of these devices in the recent hurricane disaster relief is given at the end of this newsletter. Hopefully in next month's newsletter I can begin to describe my experience with these devices and how they might play a role in emergency communications. I may also introduce tools such as CASM, the Communication Assets Survey and Mapping tool, and TAK, the Tactical Awareness Kit, (think APRS on steroids) next month as well and how they might work these devices.

2017 USAF Marathon

The 2017 USAF Marathon is in the books (https://goo.gl/9SgkZ3). Over 65 amateur radio operators — some from as far away as Michigan and Wisconsin — participated in the event providing logistics and medical support at water stations, medical stations, tail ends, and two nets—one run out of the DARA van and the other run out of the XWARN trailer.

> *"USAF Marathon Race Director Robert Aguiar said race officials consider the Amateur Radio volunteers a vital resource and have come rely on their professionalism and communication skills. He said it would be extremely difficult, if not impossible, to have the race without Amateur Radio-provided emergency, logistic, and medical communications among the race director, his staff, the Wright-Patterson Air Force Base (WPAFB) incident commander, and the hydration and medical stations."*

XWARN Mission

The mission of the Xenia Weather Amateur Radio Net (XWARN) amateur radio club is to conduct weather spotting nets during severe weather and other communication services for the City Of Xenia and all other Greene County communities.

In this capacity, we are set up to provide communication services as required to the Greene County Ohio Public Service Agencies and other local government entities. The communications services provided to the supported agencies may be for emergency purposes or to simply enhance their communications abilities. On an as needed basis XWARN provides similar services to various government entities of our surrounding counties.

Additionally, XWARN provides communications support to various community organizations in support of marathons, 5K runs, 10K runs, bicycle events, etc. to provide health and safety assistance to the participants and sponsors of said events.

In support of these goals, XWARN operates and maintains amateur radio repeaters and other equipment in Greene County.

Minutes from September 11, 2017

President Bob Baker opened the meeting with the Pledge of Allegiance. All members observed a moment of silence to honor the 9-11-2001 disaster

Cracker Barrel. Several people had items for sale or distribution—books, batteries, and ballcaps

Minutes. The Minutes from last month -Dick Bray/Jim Simpson moved to accept as read

Treasurer Report. The Treasure report Jim Simpson/Dick Bray moved to accept as read

Committee Reports

Public Service

- Air Force Marathon is September 16th
- MS Bike Dayton WS and SAGs Sept 17th needs volunteers
- Zero Prostrate Cancer Run/Walk Sept 23th needs more volunteers

Trailer. A new roof vent was installed on the trailer

Repeater. N/A

Membership. Phil Verret reports 58 members.

Newsletter . Jason always is looking for news or articles to include in newsletter.

Old Business

Jim Simpson reports he will start the on-line tshirt sales starting with the Hamvention mtg tomorrow

New Business. Ballots for upcoming election will be presented next month

Meeting Presentation. "Change to part 95 and 97" was presented by Jason

General Notes. Next meeting October 9,2017

Submitted by Karen Baker-recorder

Approved by Jason Bowman, Secretary (Acting)

Fight Like You Train, Train Like You Fight

In September's ARES e-letter (https://goo.gl/YAeH7k), Mike Urich, KA5CVH, Assistant SEC and PIO, ARRL South Texas Section, Harris County ARES (the area affected by Hurricane Harvey), states,

> *… we also need to continue to practice our on air skills. Personally, I find that most nets are not fulfilling their potential in the practicing of emergency/disaster response communications skills.*

I generally agree with KA5CVH. Training nets are definitely NOT meeting their potential. One good example is the SET coming up this weekend. I won't be participating. Why? I think I actually participated one year but was very disappointed — check into Net #1, then check into Net #2, check out with Net #1 again. It turns out the scenario didn't matter because no one actually exercised it. Net check-ins are not training. While I am too busy at the present time to lend a hand turning these SETs into actual exercises, I encourage those of you sitting there quietly to get involved in planning one. ARRL's EC-001 course (https://goo.gl/vrwewa) is a good resource.

KA5CVH also notes,

> *During the Harvey disaster, I observed that net operators and net control stations could use more net discipline for great efficiency and efficacy.*

Another great point that I agree with. Having gotten my initial radio training in the aviation community and then in the Navy as a Surface Warfare Officer, I find typical amateur radio conversations in public service events to be way too verbose, add extra information that isn't necessary, and sometimes even stray off point. So of course that has a tendency to carry over into actual emergency communications as KA5CVH noted.

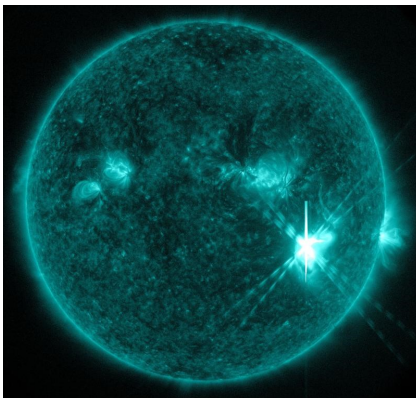
The military has a saying: Fight like you train, and train like you fight. In addition to the point above, I have decided to start doing as much as I can on Incident Command System (ICS) forms as a net participant. Why? In most examples I can think of, you'll be using and be apart of the Incident Command System if you are working with a served agency.

ICS 214 is the Activity Log. You can use that to record when the first and last runner passes by . You can also use it to record events at your location that are not occurring on the radio net. By the way, this becomes a legal record if something "eventful" occurs. It is important for everyone to keep a log. Like witnesses at a trial, everyone has a different perspective of the "truth".

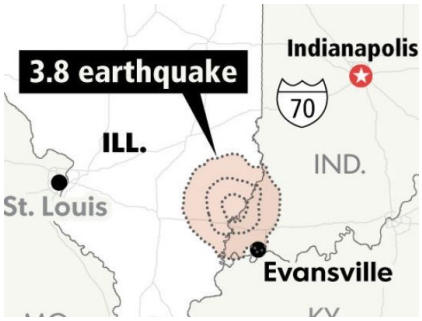
The person organizing the event can use ICS 201/202/204/205 "Incident Briefing" / "Incident Objectives / "Assignment List" / "Incident Radio Comm Plan" to pass event information that would normally be passed in the body of an email message. Yes, it adds work for the organizer, but train like you fight. Or are those just words?

Jason, WG8B

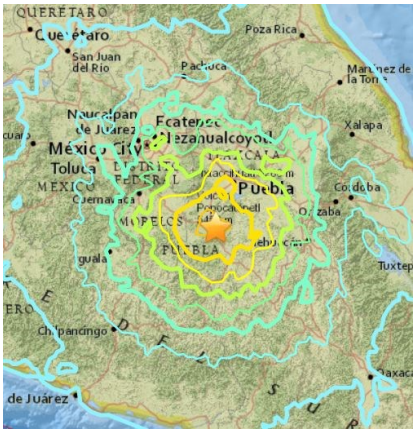
Space Weather & Earthquakes



On Sep 6, two solar flares (https://goo.gl/pXyX8b) measuring X2.2 and X9.3 erupted. Another erupted on Sep 7 with a strength of X1.3. Another on Sep 10 had a strength of X8.2. The coronal mass ejections (CMEs) arrived a couple of days later over the weekend. One event was strong enough to knock out the Hurricane Watch Net (https://goo.gl/NkLkXi) for several hours. "X" is a measure of X-ray flux, and X-class (https://goo.gl/EcY9Bv) flares are the strongest. The X9.3 event was the strongest flare in the last 10 years, which scientists have called odd since the sun is nearing the minimum of its solar cycle. NASA has more information (https://goo.gl/u8FzaR) about these flares with extensive pictures, animations, and video.



On Sep 19, a relatively small 3.8-magnitude earthquake (https://goo.gl/ca8vTt) occurred centered in Albion, Ill. While the Midwest does not typically experience large earthquakes — the last "big one" was in 1811 at New Madrid, MO — many buildings have been constructed in the past 200 years without the benefit of building codes that are concerned with earthquakes. The extensive clay in southwest Ohio also increases the effect of the earthquake. A large earthquake anywhere in the Midwest will likely result in significant regional damage including infrastructure used for regular and emergency communications. Expect everyone's comms to be greatly degraded.

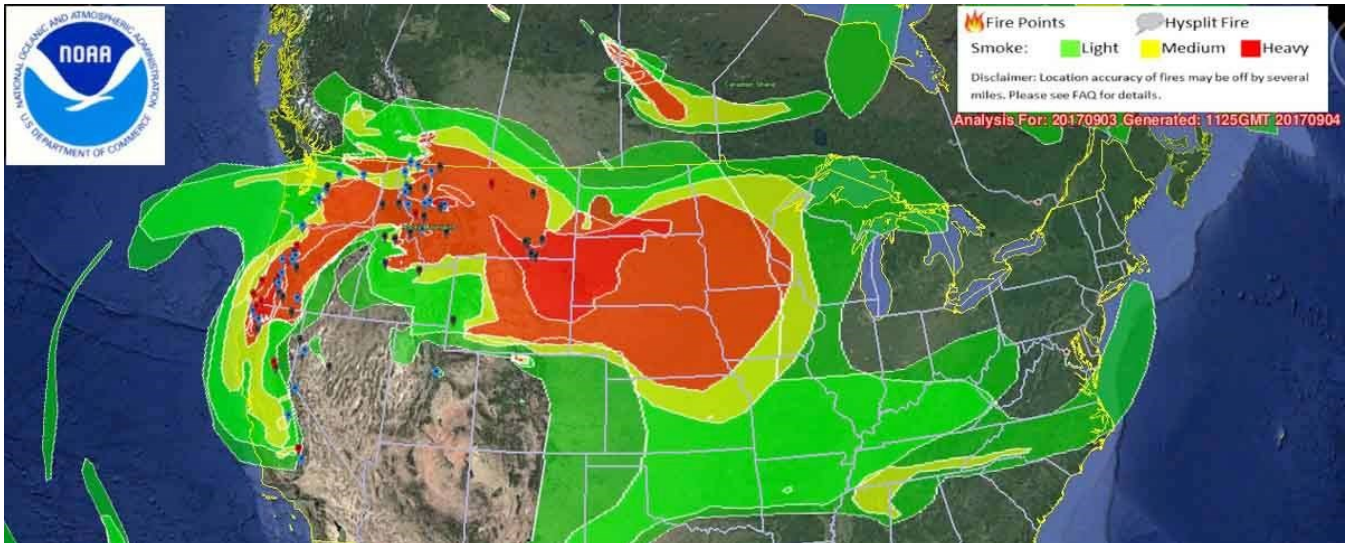


On Sep 19, a magnitude 7.1 earthquake hit near Mexico City.

FMRE President Al Tomez, XE2O, said participation from Mexican radio amateurs has been excellent, and two mobile communication units have been deployed, one south of Mexico City, where communication problems have been reported, and the other in communities surrounding the city, where communication problems exist. A FMRE representative has been stationed in the emergency operations center in Mexico City, too.

Most of the traffic, Tomez said, has involved missing persons. Tomez said communication problems persist because of the heavy volume of calls and message traffic over the cell telephone networks. Around 300 people have been killed and 30 buildings collapsed, he said.

Think Globally



Wild fires having been raging in the Pacific Northwest all year. In the graphic above, we see the extent of the smoke in early September. Did you happen to smell smoke and didn't know where it was coming from? Did you see a similar scene in the picture above on Sep 5? That picture is of the sun at 9:30AM! The sun was so dim I could take a direct picture of it. The picture doesn't do it justice. It was the thickest layer of haze I've seen in a while and completely abnormal. Now we know why.

The reason I bring this up is because not all weather that impacts us has a local source. Sometime in the near future, perhaps as late as May of next year, I will do a story on the 1980 eruption of Mt. St. Helens in the Pacific Northwest and the amateur radio operators that were involved in monitoring the mountain. One was even killed during the eruption. Volcanic eruptions can have an even greater regional and global impact than wildfires and hurricanes.

Jason, WG8B

Hurricanes Harvey, Irma, and Maria

September has been a very active month for Atlantic Hurricane season. First Harvey hits Texas, then Irma hits Florida, then Maria slams Puerto Rico. Harvey illustrates what happens when the government, emergency responders, and infrastructure is well-prepared. The devastation caused by Maria in Puerto Rico illustrates what happens when they are not.

The hallmark of Harvey was the large amount of rain that fell over an extended period of time. The system largely stalled over the region for a few days. While Harvey also brought extensive winds, the damage caused by Hurricane Ike back in 2008 — you do remember what Ike did to Dayton, don't you? — and Hurricane Katrina back in 2006 spurred local, state, and federal governments as well as power and phone companies to harden infrastructure and do better disaster planning. One result was that something like 95% of cell phone towers remained operational during and immediately after Harvey. EOCs also maintained their normal comms with the result being the many amateur radio operators who were waiting in Texas and Louisiana for assignments were not needed. In fact, the concern now is one of complacency (https://goo.gl/1bnZrb). That is, training and other preparedness may be allowed to slacken within the government, utilities, and amateur radio.

Unlike Texas, Puerto Rico was slammed by Hurricane Maria. Whatever the reason, Puerto Rico's preparations and infrastructure were no match for a direct hit by a major hurricane. The entire island basically lost power and is struggling to get it back. Something like 95% of cell towers lost service. The devastation is so total that the Red Cross made an unprecedented request (https://goo.gl/RbB4sA) for 50 amateur radio operators (2 teams of 25) to deploy to Puerto Rico just to pass Health & Welfare traffic to support the Safe and Well (https://goo.gl/U2qTFV) service. Amateur radio operators on the island ended up providing dispatching services (https://goo.gl/3ExHJL) for the power company because they had lost their own communications, and one amateur radio operator on the smaller island of Vieques (https://goo.gl/P9SJG6) managed to establish a radio link with the main island. One aircraft relief operation, Dominica Airlift — Angels to Eden (https://goo.gl/XzDGbX) — run (https://goo.gl/moUz7J) by pilot and amateur radio operator Brian Lloyd, WB6RQN — has requested (https://goo.gl/LvfHnF) that anyone with good comms into the region turn on the Automatic Link Establishment (ALE) (https://goo.gl/GK4Bm2) feature on their radios in order to support their operation.

Jason, WG8B

Communications at the Tactical Edge

Most amateur radio operators are familiar with our usual role in disaster communications, some of which have been discussed in this newsletter. For the most part, amateur radio operations sit above the tactical level. That is, we often provide backup comms between EOCs and regional and extra-regional communications such as health-as-wellness reports for the Red Cross using HF.

But what about the tactical edge where small teams are out surveying damage and conducting recovery operations? Nothing technically prevents amateur radio from participating. However, the relatively small number of amateur radio operators makes it often impractical for us to provide comms in those situations. Part 90 and Part 95 radios, such as those I described in last month's program, can provide part of the solution. However, another class of consumer product has emerged recently that can also fit the bill, namely the paired radio in the form of goTenna and Beartooth.

goTenna recently supported (https://goo.gl/ahMK7C) an All Hands Volunteers (https://goo.gl/TJLweV) effort to support recovery efforts in the US Virgin Islands. They put a goTenna mesh node up high on a ridge to support team communications down in a city. Because the islanders use landmarks to navigate and most landmarks were destroyed in the hurricane, they used the built-in mapping capabilities of the smart phone app to drop and share pins (think APRS). Shawn Hurt writes after having to evacuate the Virgin Islands because of Maria,

> *I left the units with All Hands in Puerto Rico. Every day will be a hodgepodge of options available as far as communication.*

There are similar reports of Beartooth units being used by teams in Texas as well as the Forest Service (https://goo.gl/F5dqPS). While I am uncertain of what waveform goTenna uses, Beartooth is interesting. It uses the LoRa (Long Range) waveform developed by Semtech for IoT (Internet of Things) devices. LoRa is essentially a spread spectrum (SS) technique that uses a chirp. Spread spectrum techniques are generally resistant to noise, and there is one claim that LoRa can pull signals from 20dB below the noise floor.

I recently began experimenting with these devices to determine their real range and to see if I could get my laptop to talk with one (think base station operations to link one of these nets with an amateur radio net). goTenna has an SDK available, but Beartooth doesn't at the present time. However, I was able to Wireshark the Beartooth packets and might be able to reverse engineer it. I hope to be able to report more next month.

Jason, WG8B

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Wavelengths

Wavelengths is published monthly by the Xenia Weather Amateur Radio Net. Our meetings are currently held on the 2nd Monday of each month at **7:30 pm** at the Greene Memorial Hospital Auditorium. You can find additional information about our organization at www.xwarn.net . We welcome new and experienced Amateur operators and those interest in becoming an Amateur operator to attend our meetings.