In Defense of existing Part 97 Allocations in the 3 GHz Band

The FCC ET Docket 19-348 will severely curtail growth of one of the newest, fastest growing, and most effective technologies Amateurs have to support emergency communications. Existing installations will be severely curtailed or, with no reasonable alternatives, be forced to cease operations. Thousands of hams have built or are in the process of constructing high-speed data networks in the 3 GHz ham microwave allocation.

Background

The AREDN (Amateur Radio Emergency Data Network) Project is a volunteer open-source software development project. It was an outgrowth of the ARRL (the national association for Amateur Radio) working group on High-Speed Multimedia (HSMM). Since then the AREDN Project has developed custom software for nearly 70 commercial wireless routers---shifting their operating frequencies from Part 15 allocations into adjacent Part 97 allocations in the .9, 2, 3, and 5 GHz bands---providing an inexpensive and easy way for hams to implement high-speed data (up to 144 Mbps) networks in support of Emergency Operations Centers (EOCs), Non-governmental Organizations (NGOs) and first responders. The project has been recognized multiple times for the significance of its achievements by the ARRL, the International Association of Emergency Managers, the Emergency Management Association of Texas, and others.

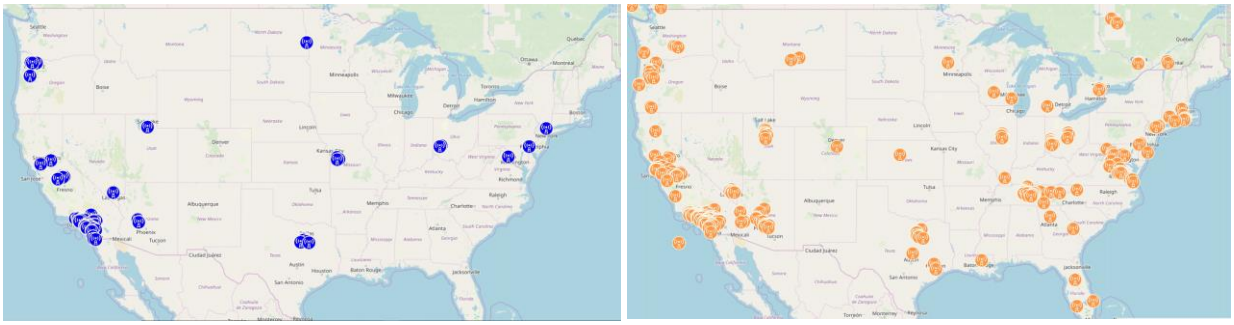


Figure 1- US Ham deployed AREDN 3 GHz Networks *US Ham deployed AREDN 5 GHz Networks*

From our website statistics (https://www.arednmesh.org/content/aredn-map-0) we estimate that over 2700 hams have or are in the process of building these networks. The above illustration depicts currently active locations, voluntarily disclosed (hams need to notify the AREDN Project to appear on this map). We believe approximately 60% report their locations (referred to as “nodes”).

The devices that form these links are comprised of inexpensive ($45-$95) commercially available wireless ISP routers (primarily from Ubiquiti, TP-Link, and MikroTik) which have been repurposed for ham use by the substitution of original manufacturer’s software with that developed by The AREDN Project. A detailed discussion of how these networks are constructed and operate can be found at https://www.arednmesh.org/content/qst-june-2017.

These “nodes” transport data via 802.11n WIFI-like encoding in “ad-hoc” mode forming a “mesh” network. Using TCP/IP, the same protocol utilized on the Internet, much of what is possible over the Internet is also possible across these networks. This empowers hams to provide agencies with texting, email, Voice-over-IP (VoIP) telephone service, video surveillance and video conferencing, as well as agency-access to their respective Internet-based cloud services.

Successful implementations can be found around the country, but the network in Southern California (SoCA) is a good illustration of what is being accomplished by committed hams willing and able to offer their expertise and capital. Today, a federation of these networks blanket SoCA from the Mexican border, north to Ventura, and east to Coachella Valley (Palm Springs/Indio).

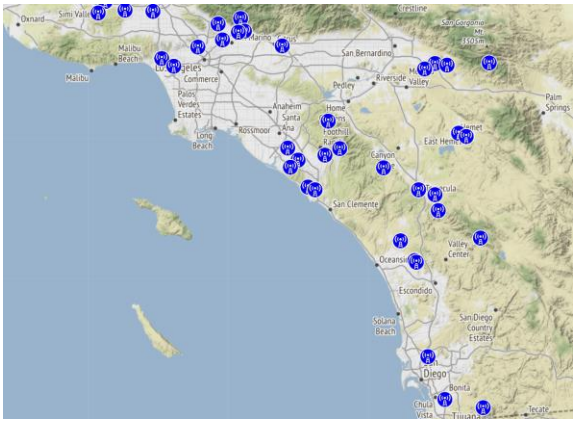
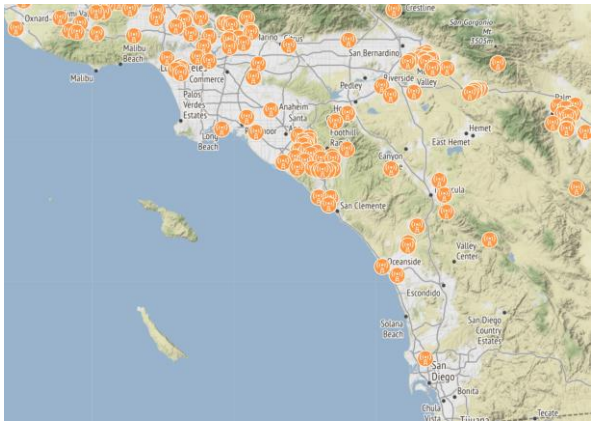


Figure 2 - Part 97, 3 GHz SoCA AREDN Network Nodes



Part 97, 5 GHz SoCA AREDN Network Nodes

This network stands ready to support high-speed communications between deployed hams in support of memoranda of understandings (MOUs) with civil agencies such as municipal and county EOCs and NGOs across a base of over 18 million people. A rapidly growing number of agencies and hospitals in this area are allowing hams to permanently install nodes at their facilities.

In building a network to provide these services, best practice is to start with a "backbone" of nodes on the highest ground available followed by lower-lying distribution nodes closer to the communities they support. Generally, all these locations coincide with where Wireless Internet Service Providers (WISPs) have placed their equipment. It is impossible for hams to compete with WISPs in spectrum where Part 97 and Part 15 allocations overlap, so as a result AREDN-based networks are configured to operate on channels inside the Part 97-only portions of the 5 GHz band, and the 3 GHz band where no commercial allocations currently exist in the US.

The Current FCC Proposals

The current ET Docket 19-348, "Facilitating Shared Use in the 3.1 – 3.55 GHz Band" and ET Docket 19-138, "…a fresh and comprehensive look at the 5.9 GHz band rules" will devastate these networks. In particular, 19-348 will eliminate use of the most effective resource hams have to build these networks.

The AREDN Project is able to leverage these low-cost commercial devices solely because they are designed to operate on allocations adjacent to ham allocations. Moving to other allocations would be difficult if not impossible without a complete redesign, manufacture, purchase, and installation of new custom Amateur hardware and software… raising the price out of reach for the great majority of hams.

If this Docket succeeds:

- Hams will be forced to replace their 3 GHz links with 5 GHz links, however, another FCC Docket 19-138, proposes curtailing the useful slice of the 5 GHz ham allocation as well. Either one of these proposed changes will severely impact these networks. If both succeed, they will effectively kill the use of this technology for ham radio;
- It will have a significant potential impact on the EOCs, NGOs, and other disaster responders which depend on the backup services they are currently being provided by the ham community;
- It will negatively impact the influx of new hams, as an ongoing stream of computer technical types are flowing into our hobby due to their interest in and the success of this ham radio technology;

- It will completely devalue a large part of the investment made by the amateur radio community. Their investment includes tens-to-hundreds of thousands of dollars and likely as many hours freely given in support of public service. Many amateurs may be induced to wonder about the wisdom of attempting to provide any public service if their efforts are so capriciously thrown away.

We respectfully oppose ET Docket 19-348.

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