

Response to: PS Docket No. 17-344 Question C. 8.

**ARC/ARRL
Puerto Rico Hurricane Maria
Deployment of Ham Radio Operator to Juncos**

Overview I was one of the 22 amateur radio operators deployed to Puerto Rico after Hurricane Maria. The comments and recommendations in this document are mine alone.

The original mission of the ARRL/ARC mission was to pass ARC Safe & Well information to ARC HQ via HQ Winlink. Once on the island that mission was abandoned and amateur radio operators were deployed to assist in filling critical communications gaps where they were known to exist.

I was deployed Puerto Rican Urban Search and Rescue HQ in Juncos PR a town of approx 40,000. The town was without power, cell coverage and the 800MHZ Police and Fire department communications system was not functioning. The Puerto Rican USAR team was completely without communications.

I was able to provide coverage from Juncos into the FEMA EOC and the ARC HQ in San Juan using a 2M Yeasu FT-7800 radio and via the amateur radio 2M repeater KP4IA. I maintained this coverage for 15 days until cell coverage was restored to Juncos and portions of the PD/PD 800MHZ comm system was restored.

Administrative traffic was passed to and from us via email using HF Winlink.

Another effort was not so successful. During the day the majority of USAR members are deployed away from Juncos. Working with members of the Chicago Fire Department who were deployed to Puerto Rico attempts to provide reliable communications to the deployed teams using both VHF and UHF systems were made but due to limited range of UHF, a lack of VHF radios in the USAR vehicles, the low power/battery life of hand held radios, the terrain and wide dispersal of the team members no reasonable, reliable system of communications to these teams was found.

Comments/Recommendations:

1. The simplicity, area covered and ease of setting up VHF communications make it a good means of initial disaster communications
2. Using communications systems manned by amateur radio operators should be an obvious solution when an area is struck by a disaster that eliminates all communications. Most of them are trained in setting up communications systems in difficult circumstances, running off car batteries and doing things like making antennas from pieces of wire etc. These 20 amateurs were an ad hoc group formed roughly 36 hours before deploying to Puerto Rico. 20 strangers came together with no real leadership present. Even so, in less than 2 days of arrival they organized themselves, redesigned the mission and deployed. There needs to be some kind of standing amateur radio teams ready to respond with an assigned leader.
3. A cache of portable VHF repeaters ready to deploy should be established. In the beginning only the KP4IA repeater was functioning covering about one third of the island. Over time other repeaters came on line.

4. There should also be a cache of Mag-mount 2M mobile radios. I was able to locate four PRC-7332 hand held transceivers at the SAR HQ. These were the only units capable of operation in the VHF band. They were low power and had a short battery life. Had there been more time it would have been fruitful to pursue obtaining VHF radios for the USAR vehicles. These would have had more power and better antennas therefore better coverage.
5. Users will not use systems that are complex to use or have unreliable coverage. This system had both. There was a lack of island wide communications. No one was sure what areas had repeater coverage and what did not. The various frequencies of the various repeaters was too confusing for SAR members. I don't have a good answer for this one. We tried to develop a coverage map but ran out of time. With a little more time and training we may have been able to overcome some of these issues.
6. Due to its limited range, UHF is not an effective means of communications in an area like rural Puerto Rico. The Chicago Fire Department had with them a UHF repeater and we were able to locate another one. These were set up but due to the wide dispersal of the teams around the island, these repeater were never used.
7. Winlink was a very effective means of passing administrative traffic and complex messages in an area with no internet. The use of Pactor 4 for amateur radio was approved but since we had no Pactor modems it was not used
8. Local amateur radio operators are critical and vital resource in the time immediately after the disaster. We arrived one week after hurricane Maria. The local hams already had two excellent systems up and running that I was able to use: the KP4IA repeater and the "Montecillo Control" 2M relay system.