Applying Directional Antennas to the Field of Emergency Communications: A Comparative Performance Analysis

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In the field of disaster response, fast message relays are vital. To fulfill this need, Ham radio offers people who are willing to assist during emergencies, when typical communications aren't working. The purpose of my experiment is to discover if directionality makes any difference in antenna performance. From my research, I determined that the Yagi antenna would be the best candidate for use during disasters, being the most portable and sturdy. In addition, its predicted Front to Back Ratio was the highest out of my three antennas. In the experiment, I test the Signal to Noise Ratio of each antenna to evaluate how well they reject noise. I also test their Radio Frequency (RF) Field Strength in 20 degree increments to assess directionality. My results showed that the Quad antenna received the least noise. However, the Yagi was less cumbersome and had higher directionality and gain, proving my hypothesis correct. Surprisingly, the Moxon, another directional antenna, received more noise than any other antenna. If I conducted the experiment again, I would make sure that each antenna's Standing Wave Ratio (SWR) was 1:1 at my chosen frequency. I would also find an area to test in free of buildings.

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