The Revolutionizing Prosthetics program was a multi-year, multi-million-dollar enterprise aimed at producing a new generation of upper-extremity prostheses. The Johns Hopkins University Applied Physics Laboratory formed and led an international team of more than thirty corporate, government, and academic partners to develop a system to mimic and replace the human limb. It was an enormous scientific research and development effort involving many exciting new technologies. This special issue of the Johns Hopkins APL Technical Digest begins to chronicle the extraordinary achievements of the program and highlight many of its challenges, successes, and derivative technology applications.