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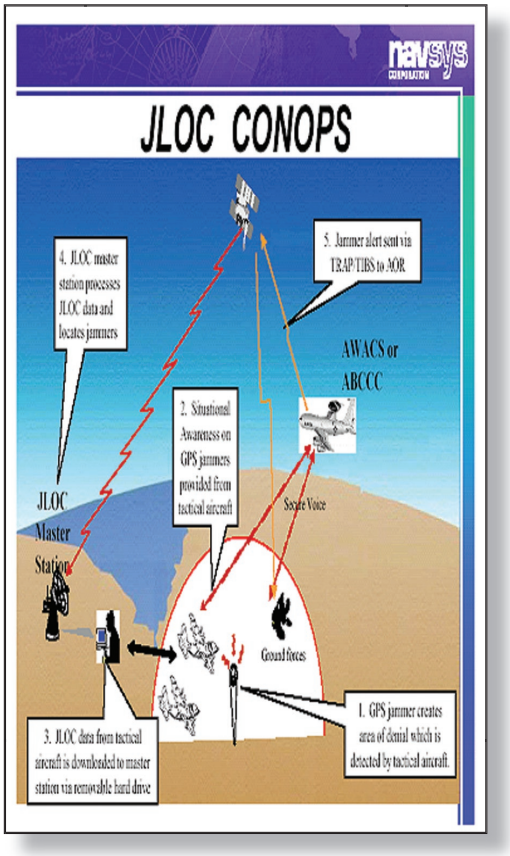
Science and Technology for Tomorrow's Air and Space Force

Air Force SBIR/STTR Celebrating 100 Years of Air & Space Innovation

Success Story

GPS JAMMER DETECTION LOCATION SYSTEM



The Sensors Directorate managed a Small Business Innovation Research Phase III project with NAVSYS Corporation of Colorado Springs, Colorado, to develop a global positioning system (GPS) jammer location (JLOC) system. The JLOC system's architecture is a method of accurately locating interference sources in a timely and efficient fashion. This qualifies the GPS system to be used for safety of life-critical applications. It also provides a solution that offers situational awareness on navigation warfare threats in a tactical environment.

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Accomplishment

The directorate's research and development efforts, along with NAVSYS, have resulted in significant technological advancements and product development. The GPS JLOC system architecture solves interference problems through a network-centric approach where data is collected from conventional GPS user equipment acting as jammer sensors. Current GPS user equipment generates diagnostic data on the quality of the received GPS signals. This data is relayed to a JLOC master station where it is processed to deduce the location of the jammer or interference source.

Background

GPS performs a crucial role in enhancing national defense. Due to low broadcast signal architecture, the GPS signal is particularly susceptible to intentional and unintentional interference. Under such circumstances, detecting and locating the interference in a timely manner would greatly minimize this risk. This also is significant in light of the growing interest by certain countries to explore low-cost, low-power methods of disrupting the GPS signal.

GPS interference also is a significant concern to the Federal Aviation Administration (FAA), as the air transportation system is becoming increasingly reliant on the use of GPS. Before GPS can be approved for use in approach and landing, any GPS interference sources in the vicinity of an airport must be located and disabled. Currently, there is no cost-effective method for the FAA to detect and locate these sources.

In addition, the JLOC system architecture will support the civil need for an interference detection and location system. Civilian users are increasingly dependent on GPS for navigation (including aircraft landing), power grid synchronization, and communications synchronization (including the cellular phone system). It is critical that researchers and engineers develop receivers to promptly identify and locate GPS jammers, which may pose potential disruptions to these operations.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-SN-16)