

## BULLET BACKGROUND PAPER

ON

### A SOLUTION FOR JAM RESISTANCE

#### - The Problem

- Net-centric warfare is the future of the Air Force. We will depend on a wireless internet, formed in theater with relays on every vehicle (connecting the Air Force, Army, Navy, Reserve, allies, etc). Jamming even part of this network could threaten operational success.
- Civilian GPS is critical. The FAA plans for GPS to replace VOR/DME/ILS. A terrorist will be able to wreak havoc by jamming GPS at a large airport.
- Every existing system fails. All known systems for jam-resistant, omnidirectional radio require a shared secret key. The sender and receiver must have the same key. The attacker must not have that key.
  - A shared secret is impractical for net-centric warfare. Almost every electronic device in the entire theater would need the same key, across all the services and all allies. If even one tactical radio is captured by the enemy, they could use the key in it to jam the network anywhere in the entire theater, until everyone receives a new key.
  - A shared secret is impossible for civilian GPS. 6 billion people would know the “secret”, including the terrorists.

#### - The Solution

- The BBC algorithm is a new invention that gives jam resistance without any shared secret.
- No exotic hardware is required. BBC can be fielded in next-generation radios and GPS.
- This builds on the existing Public Key Infrastructure (PKI). The users insert their CAC credentials into the radio to achieve security. For GPS, it does not need any smart card.
- BBC has been successfully demonstrated in the lab and proved mathematically. A full-scale prototype is under construction. An entirely new field of coding theory was invented.
- Nothing else in existence even tries to solve this problem. This solution is critical.
- BBC was invented at the Academy Center for Information Security (ACIS) at the U. S. Air Force Academy. A detailed report is available. Visitors are welcome, and we can travel to demonstrate the system or discuss it in detail. Contact Lt Col Baird for more information.