

International Committee on Global Navigation Satellite Systems

Proliferation of GPS/GNSS Jammer Devices

Jamming vs. Spoofing

- Jamming is intended to <u>prevent</u> a receiver from acquiring, tracking, or navigating with GNSS signals
- Spoofing is intended to <u>fool</u> a receiver so it provides false position, navigation, and/or time (PNT)
 - Thus allowing the Spoofer to control the victim's PNT
- Smart-Jamming is intended to cause receivers to <u>acquire false signals</u>, which either:
 - Prevents navigation (with less power than for jamming),
 - Or, causes false (but uncontrolled) PNT results



What Are Jammers?

Generally includes devices commonly called signal blockers, GPS jammers, cell phone jammers, text blockers, etc

- Illegal radio frequency transmitters
- Designed to block, jam, or otherwise interfere with authorized radio communications







How do jammers work?

- A jammer can *block all radio communications* on any device that operates on radio frequencies within its range.
- *Emits radio frequency waves* that prevent the targeted device from establishing or maintaining a connection.
- Generally *does not discriminate* between desirable and undesirable communications.
- Jammers can:
 - prevent your cell phone from making or receiving calls, text messages, and emails;
 - prevent your Wi-Fi enabled device from connecting to the Internet;
 - prevent your GPS unit from receiving correct positioning signals; and
 - prevent a first responder from locating you in an emergency.



The Near/Far Problem



Jamming Sources

- Thrill seekers interrupt GPS "for the fun of it"
- "Privacy" jammers, e.g., cigarette lighter devices
- Criminals
- Terrorists
- Government authorized services
 - Powerful adjacent channel signals causing overload
 - Higher order intermodulation products, e.g., $2f_1 f_2$





Jammers for Sale



