Proliferation of GPS/GNSS Jammer Devices
Disclaimer

The views and opinions expressed herein do not necessarily reflect the official policy or position of any government agency.
Why Received GPS Signals are Weak

- Signals from each GPS satellite cover 38% of the earth or 194,244,017 sq km
- A 50 watt GPS transmitter thus provides ~2.6E-13 Watts per square meter on the earth
- A hemispheric L1 antenna “capture area” is ~0.006 m
- Received signal power thus is ~1.5E-15 Watts (-148 dBW) or ~1.5E-12 mW (-118 dBm)
- **Very weak signals!!!**

GPS defines the minimum C/A “open sky” signal power to be -158.5 dBW, 11 times weaker than calculated here
The Near/Far Problem

Processing Gain of $10^6/50$

Processing Gain of $10^7/50$

GPS Satellite

2.5 mW Equivalent C/A and P Signals

C/A Jammer

+ 43dB = 50 W

50 km

C/A Jammer

+ 23dB = 0.5 W

50 km

User

P Jammer

+ 53 dB = 500 W

50 km

P Jammer

+ 33 dB = 5 W

5 km

5 km

(Processing Gain of $10^6/50$)

(Processing Gain of $10^7/50$)
Jamming vs. Spoofing

- Jamming is intended to **prevent** a receiver from acquiring, tracking, or navigating with GNSS signals.
- Spoofing is intended to **fool** 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 **acquire false signals**, which either:
  - Prevents navigation (*with less power than for jamming*),
  - Or, causes false (*but uncontrolled*) PNT results.
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., $2f_1 - f_2$
• Due to Brownian motion, all things with a temperature above absolute zero produce “noise”

• The noise power from a passive device = $kT_B$
  – $k$ is Boltzmann’s Constant ($1.38 \times 10^{-23}$ Joules/ΔK)
  – $T$ is temperature in degrees Kelvin
  – $B$ is noise bandwidth in Hz
  – At ~ room temperature ($290^0$ Kelvin), the noise power density is -204 dBW/Hz or -174 dBm/Hz

• If the receiver “noise figure” is 3 dB, its noise floor is -201 dBW/Hz or -171 dBm/Hz
Available GPS Jammers

MP4 File
Jammers for Sale

To prevent GPS monitoring on your person, cell phone, or vehicle, a GPS signal blocker will stop tracking signals. Maintain your privacy, keep your movements private, and avoid unauthorized surveillance by utilizing a jamming device.

GPS Jammer

For car, truck, bus, van, or even boat security, stop GPS tracking signals by simply plugging this into any cigarette lighter, which will protect you from being tracked.

Cell and GPS

One of our most popular cell phone jammers, this device can be used on the go or as always on local signal strength.

GPS Tracker Detector

Locate bugs with a GPS Tracking Detector. Concerned about a covert GPS tracking device on your person or vehicle? Locate them with this GPS tracking detector. This high sensitivity GSM and GPS detector will not...

High Power Component

Not Rated

If you need a large area of coverage for military or law enforcement applications, this is for you. This high power unit will cover up to a 100 Meters, and is built into an attractive aluminum alloy case that is...

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Jammer Selection Advice

GPS Blocker Selection
Selecting the correct gps jammer can be easily done by determining your usage parameters. For vehicle tracking system protection, the small vehicle adapter gps jammer is best. For protecting your person and vehicle, the portable models offer take-with-you portability and tracking device countersurveillance protection. Our combination models offer both cellular and GPS jamming coverage.
Thank You

Questions?