



International Committee on  
Global Navigation Satellite Systems

# **Interference Detection and Mitigation and GNSS Jammers**

This presentation does not cover government sponsored jamming and testing



# Why Are Jammers Prohibited?

- **Jammers do not just weed out noisy or annoying conversations and disable unwanted GNSS tracking.**



Jammers can prevent emergency phone calls from getting through

Can interfere with law enforcement communications



Jammers can interfere with safety of life services



# Known incidents of Interference

- Jammers' overwhelm anti-theft devices on cars and Trucks. 46 luxury cars returned to Port of Los Angeles discovered with GPS jammers attached to the batteries
- Have disrupted aircraft traffic flow during taxi, departure and approach operations when in close proximity of airports



- Establishing quiet zones and text-free zones in Churches and Schools



- Used to disrupt communications during commission of a robbery
- Used in vicinity of a major port disabling GNSS on large cruise ships attempting to dock



- Used to defeat personal vehicle or fleet tracking devices in company cars and trucks for theft of high value pharmaceuticals
- Used to defeat attempts to document road use for taxes

- **These uses of jammers were all illegal!**

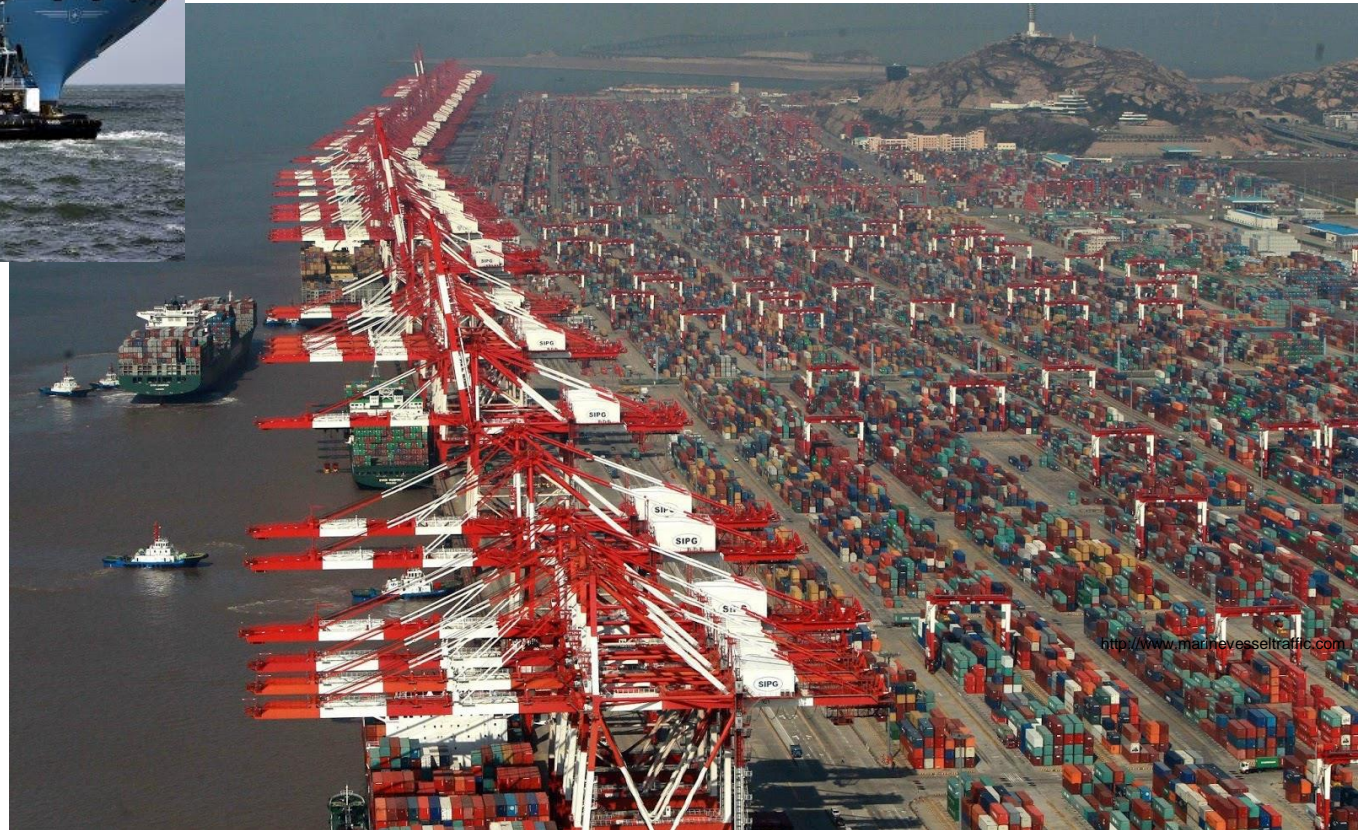


# Interference at a “Highly Automated Container Port” facility

Estimated throughput:  
33.62 million TEUs in 2013



One ship  
can bring  
as many as  
19,000 20ft  
containers



ICG International Committee on  
Global Navigation Satellite Systems

TEU = One 20 ft container

# GNSS Interference Reporting in the U.S.

- U.S. civilian process starts with user problem reports to DHS USCG NAVCEN or DOT FAA WAAS
- Different than ITU form
  - Problem Rpt vs After action Rpt
- Operation Centers Collaborate to confirm user submitted event
- Joint interagency conferences formulate a coordinated government response
- Event priority assigned during joint conferences will determine level of response and agencies with required actions
- Conference system connects all stakeholders with level of event priority and actionable tasks



**ICG** International Committee on  
Global Navigation Satellite Systems



**NAVIGATION CENTER**

The Navigation Center of Excellence

U.S. Department of Homeland Security

UNITED STATES COAST GUARD

## GPS PROBLEM REPORTING

\* Denotes a required field

1) Your Name: (Our Privacy Policy)

2) Email Address:

3) Telephone number: [i.e. - (703) 313-5900]

4) Preferred method and time to be contacted if additional information is necessary:

5) \*What was the start time and date of the GPS disruption? Date:  Time:  Zone:

6) \* Is the GPS disruption ongoing?

7) \* Where did the disruption occur? (LAT/LONG; Nearest City or landmark)

Lat	Long	City/Landmarks
<input type="text"/>	<input type="text"/>	<input type="text"/>



**Federal Aviation  
Administration**

AIRCRAFT AIR TRAFFIC AIRPORTS PILOTS & AIRMEN

## GPS Anomaly Reporting Form

\* indicates a required field.

\* Name:

\* Email:

Phone:  e.g. (123) 456-7890

\* Date of anomaly:

\* Approximate UTC time of anomaly:

Aircraft type and tail number:

# Operational impact of disruption determines priority level assigned

- **SEVERE (Active or Intermittent)**

- Operational Effects: Severe
- GPS anomalies or disruptions affecting one or more user segments or Critical Infrastructure

- **MODERATE (Active or Intermittent)**

- Operational Effects: Moderate

- **LOW (Active or Intermittent)**

- Operational Effects: Minimal (or None)

» E-mail lists provide for situation report distribution to all who sign up for that level of priority event

» Initial Priority level assigned may be upgraded once operational impacts are confirmed.

» Additional interagency conference calls may raise level of priority and determine additional resources/agencies required for actions



# U.S. Federal Statutes – Communications Act

47 U.S.C. § 302a(b) Manufacturing, importing, selling, offer for sale, shipment or use of devices which do not comply with regulations are prohibited

- “No person shall manufacture, import, sell, offer for sale, or ship devices or home electronic equipment and systems, or use devices, which fail to comply with regulations promulgated pursuant to this section.”





# Regulations in the U.S.

**Comprehensive GPS jamming prohibition provisions must be incorporated under four different authorities:**

- *National Statutes – Legislation Communications Act*
- *Telecom Agency Rules – FCC*
- *The Criminal Code – Penalties*
- *International Treaties*



# International

- The United Nations Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation is a multilateral treaty that was adopted by the International Conference on Air Law at Montreal on 23 September 1971.
- The Convention signatories agree to prohibit and punish acts that threaten the safety of civil aviation. It entered into force on 26 January 1973 after ratification by 10 nations. As of today, the Convention has 188 signatories.
- Several of the U.S. laws relevant to intentional interference and spoofing of civil aviation GNSS applications were enacted to satisfy obligations made per this Convention.



# Spectrum Enforcement Actions

Complaint from a cell provider in Florida that its cell phone tower sites had been experiencing interference:

- Forfeiture Order affirms proposed \$48,000 forfeiture against a man for using a cell phone signal jammer in his car while commuting to and from work on a Florida highway over a 16-24 month period.

Anonymous complaint alleging that a company was operating signal jammers to prevent its employees from using phones:

- The company will pay \$20,500 in civil penalties for unauthorized use for over 2 years of a signal jamming device purchased and mounted in the company's warehouse to prevent employees from using the cell phones while working.



# Spectrum Enforcement Actions

- Forfeiture Order proposing a \$34,912,500 forfeiture against manufacturing company for marketing 285 models of signal jamming devices
- A retail business sold a cell phone signal blocker device to a private citizen for use in a child care center.
- Omnibus Citation and Order to 20 Online Vendors for marketing signal jamming devices to consumers via the Internet in the United States or its territories.



# Canada



## Spectrum Management and Telecommunications

What's New

Online Services

Broadcasting

Radiocom

600 MHz

Advanced Wireless Services

Air-Ground Services

Amateur Radio Service

Broadband Radio Service

Broadband Wireless Access

Cellular Services

Emergency Telecom

Family Radio Service

General Mobile Radio Service

Local Multipoint  
Communications SystemsMandatory Roaming and  
Antenna Tower and Site  
Sharing

### Jamming Devices are Prohibited in Canada: That's The Law

July 2011

The importation, manufacturing, distribution, offering for sale, sale, possession and use of radiocommunication jamming devices in Canada are prohibited under sections 4, 9 and 10 of the *Radiocommunication Act*.

#### What is a radiocommunication jamming device?

A radiocommunication jamming device, also known as a signal silencer, blocker or disabler, is a radiocommunication transmitter designed to interfere with, disrupt, or block radiocommunication signals and services. Although most jamming devices are manufactured for the purpose of disrupting the functioning of wireless cellular networks and low-power communication devices (cordless telephones and cameras, Wi-Fi networks and reception of GPS signals), they can also prevent communication to emergency services (9-1-1, ambulance, fire, police, aeronautical service, etc.).

Over the past few years, Industry Canada has encountered several cases of illegal importation, possession and use of radiocommunication jamming devices.

#### Legislation

A conviction under the *Radiocommunication Act* carries a fine of up to \$5,000 and/or imprisonment not exceeding one year (individual) or a fine of up to \$25,000 (corporation), as well as forfeiture of the radio apparatus and possibly an injunction to refrain from activity related to the offence.

For further information on the associated Canadian regulations, please consult: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01329.html>.

#### Importation of Equipment

In Canada, radio apparatus, interference-causing equipment and terminal equipment are subject to Canadian regulations. Canadian consumers and others seeking to import radio transmitting equipment into Canada should verify that the equipment meets Industry Canada's technical regulations prior to making any purchases. Jamming devices may be detained or seized at the border, and the importer may, on prosecution, be liable to a fine or to imprisonment.

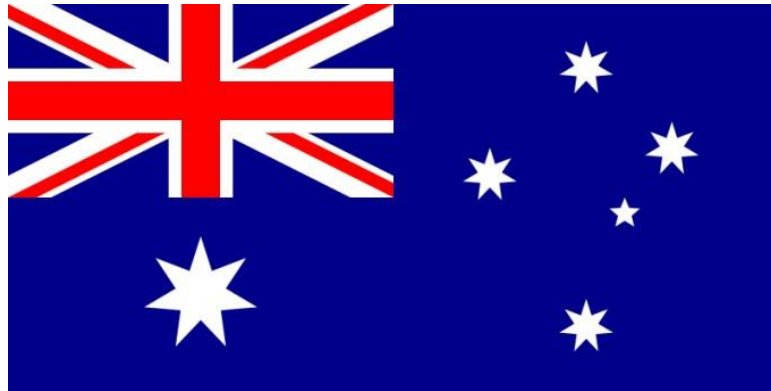


# Penalties

- Administrative Monetary Penalties
  - Civil penalties
  - Up to \$10 million (\$15 million for subsequent violation) for companies, \$25,000 (\$50,000 for subsequent violations) for individuals
- Regulatory Offence
  - \$5,000 fine and/or one year in prison for individual
  - \$25,000 fine for companies



# Australia





# Australian Offences and Penalties

- Operation or supply of a prohibited device, **2 years' imprisonment or \$165,000 fine.**
- Causing interference likely to prejudice the safe operation of vessels, aircraft or space object, **5 years' imprisonment or \$550,000 fine.**
- Causing interference in relation to certain radiocommunications (including rescue and emergency call service police, fire, ambulance, etc), **5 years' imprisonment or \$550,000.**
- Causing interference likely to endanger safety of another person or cause another person to suffer or incur substantial loss or damage, which attracts a penalty of **5 years' imprisonment or \$550,000 fine.**
- Reckless conduct which causes substantial interference with radiocommunications, or substantial disruption or disturbance of radiocommunications, which attracts a penalty of **1 year imprisonment.**



## Melbourne



By Ry Crozier on  
Filed under *Hard*



An ACMA inspector monitors a Melbourne taxi rank. (Photo credit: ACMA)

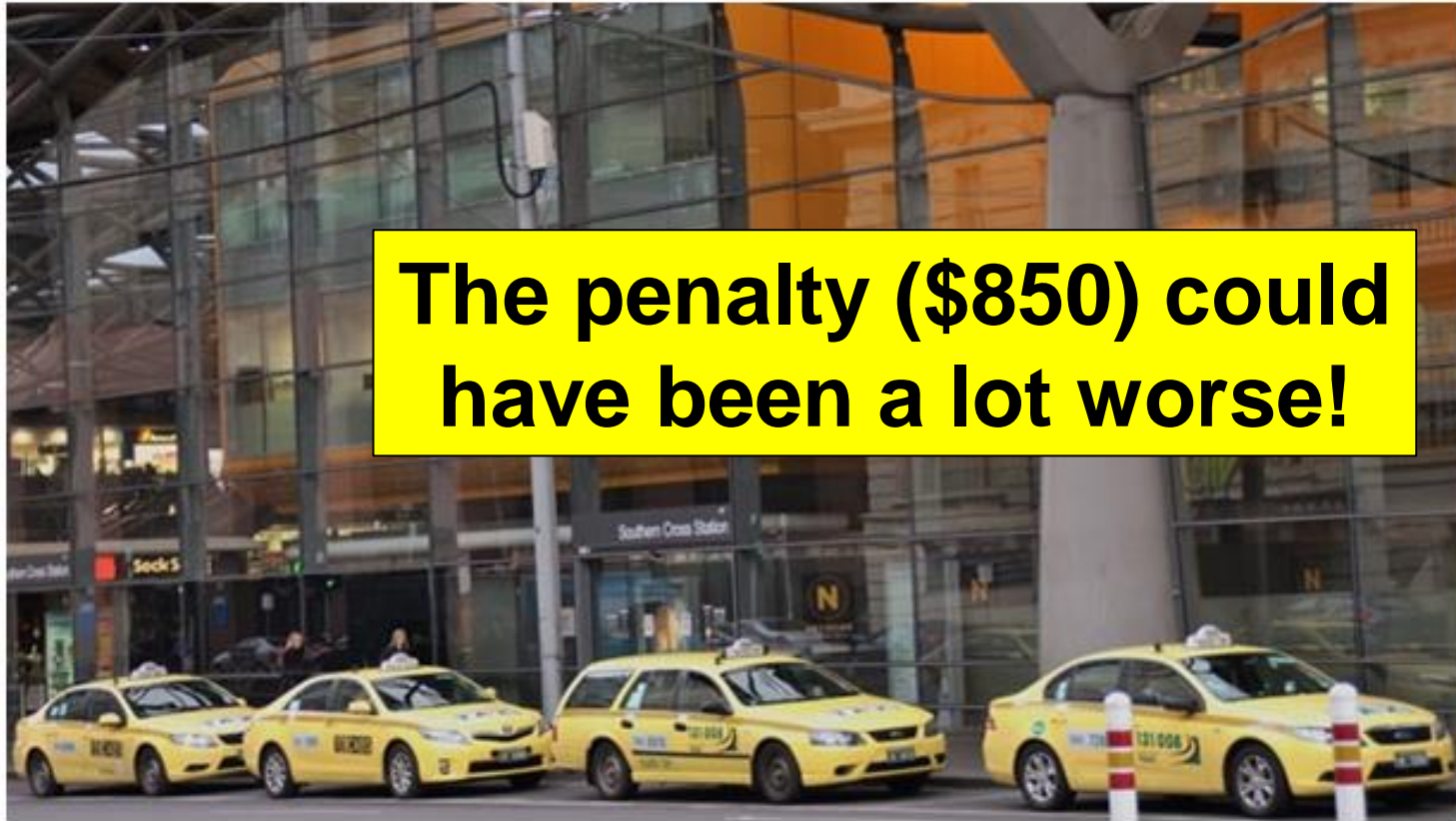
### Tags

melbourne, taxi, driver, fine, gps, jammer, illegal

### Related Articles

- Equinix commits US\$60m to Melbourne data centre
- Melbourne tries again for

# Taxi driver convicted



**The penalty (\$850) could have been a lot worse!**

A Melbourne taxi driver was recently convicted and fined \$850 by the Magistrates Court for recklessly engaging in conduct that would cause substantial interference to radiocommunications (section 197 of the *Radiocommunications Act 1992*).

The prosecution was the result of a joint operation between the Australian Communications and Media Authority and the Victorian Taxi Services Commission to combat GPS jammer use within the Melbourne taxi industry. The driver, who pleaded guilty, was detected operating a GPS jammer in the CBD through ACMA surveillance techniques.

# Australian Response to The Threat

## STEP 1

- Tighten the Communications Laws with regards to GNSS Jammer & Spoofer Ownership and Operation...  
*done*

## STEP 2

- Investigate technologies to DETECT and GEO-LOCATE Jammer & Spoofer operations in GNSS bands... *underway*



# Conclusion

- The threat from jammers is real and growing.
- Jammers are being used to commit crimes
- “Personal Privacy Jammers” are being used to defeat company tracking and road use monitoring
- To fully utilize all the benefits and efficiencies of GNSS, it is in all our best interests to consider enacting laws to combat the proliferation and use of illegal jammers in our countries

