Detecting Organised Crime Group Activity by Detecting GPS Jamming

Security and Policing - Farnborough
5-7th March 2019

Charles Curry BEng, CEng, FIET, FRIN
Chronos Technology Ltd

Presentation Contents

- Background Research
- The Law and Jammers
- Where to buy your Jammers
- Jamming – Who and Why?
- Jamming Case Studies
- On-Going Research
- Conclusions

UK Research since 2008

Testing at Sennybridge since 2010

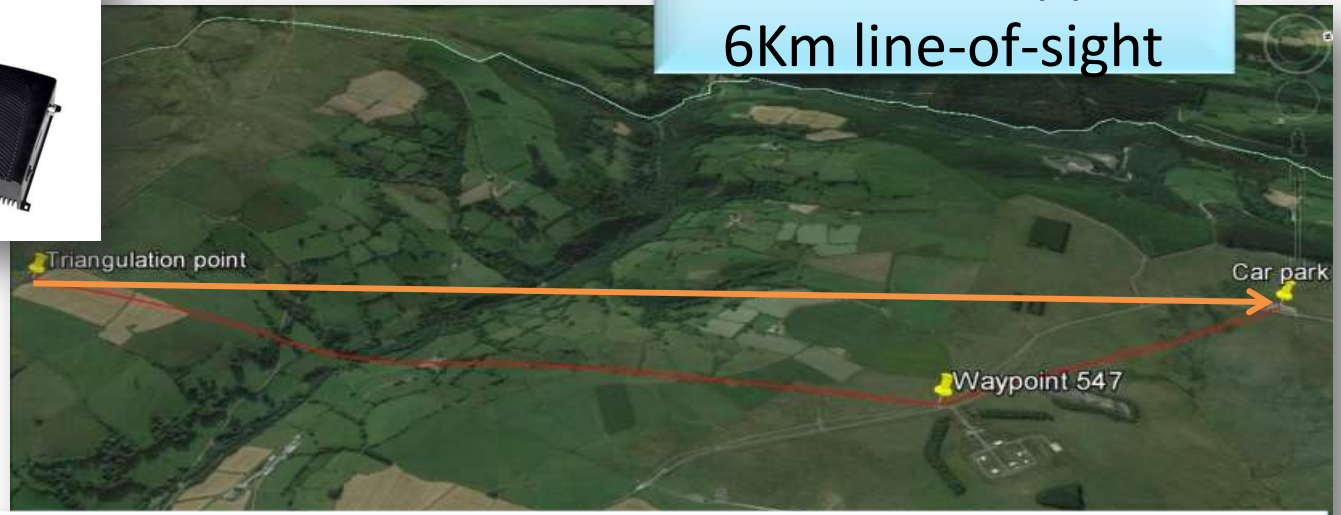
- UK Mod Range in Brecon Beacons
- Distance Testing of 3W Jammers
- Detection of Jammers in Container
- Photographing a Passing Jammer

World Firsts!

©Chronos Technology: COMPANY PROPRIETARY

Detection of 3W Jammer

Detected at approx.
6Km line-of-sight



GPS jamming - much more powerful than GPS from the sky
Easy to detect at distances greater than the “damage distance”
GPS jamming may be an indicator that TETRA jamming is up ahead!

©Chronos Technology: COMPANY PROPRIETARY

Jamming Detection Technology

- Handheld with logging – CTL3510
- Handheld with Direction Finding - CTL3520
- Jammer Trap - Live photos of vehicles with jammers – CTL3530

©Chronos Technology: COMPANY PROPRIETARY

UK “Jammer” Law

- Not illegal to possess
  - However - No legal reason for use!
- Offence under Wireless Telegraphy Act 2006
  - Causing Deliberate Interference
  - Maximum 2 years in prison - Unlimited Fine
- Offence under EMC Directive EC89/336
  - Electromagnetic compatibility Regs SI 2006/3418
  - Supplying Jammers – Fine of up to £5000
- Google ‘Ofcom Jammers’ for more info

https://www.ofcom.org.uk/spectrum/interference-enforcement/spectrum-offences/jammers

Jammers for sale

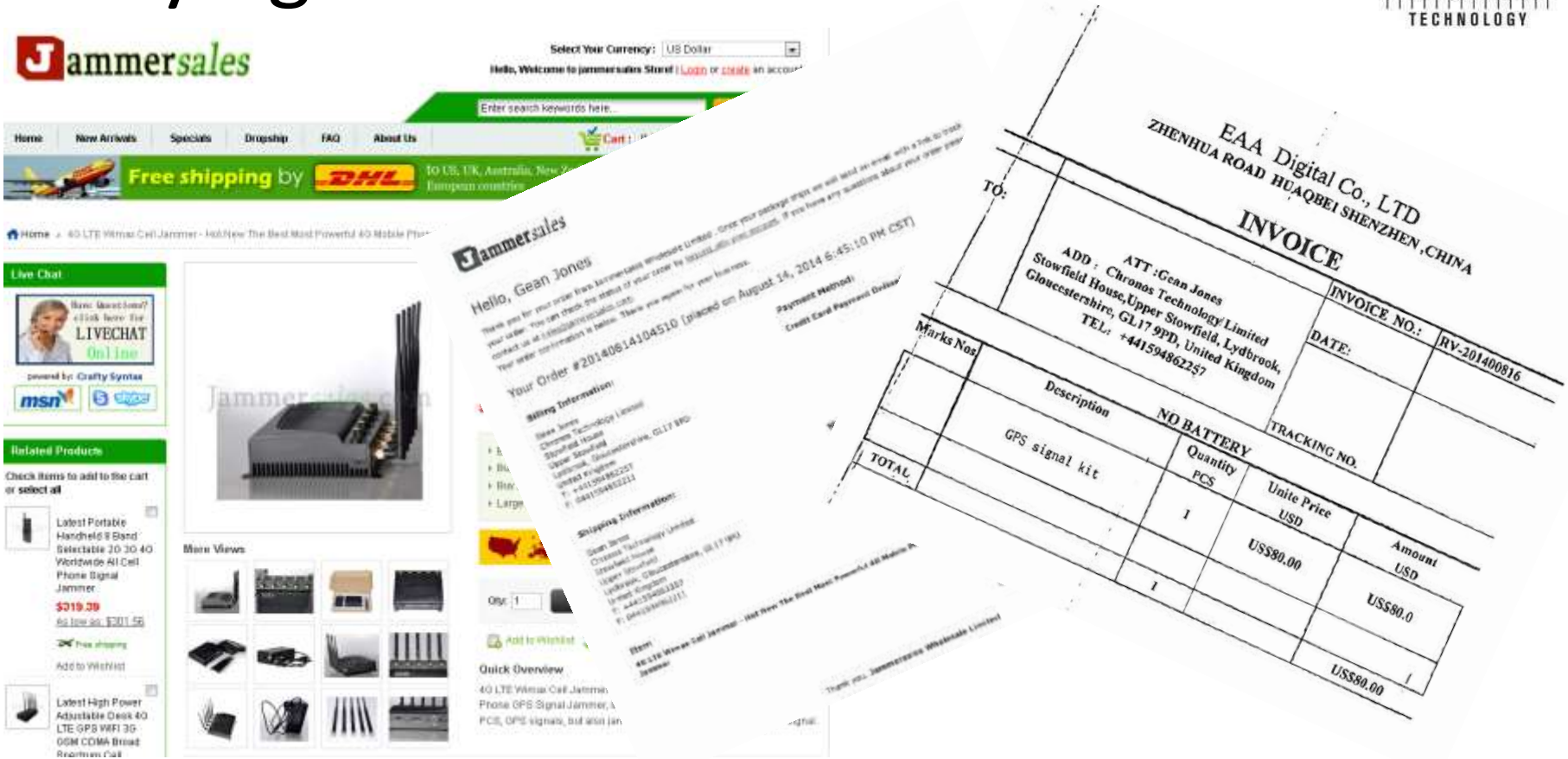
- Over 70 active Web Sites
  - Mostly Chinese
- Power ~ 100mW to 50W!

250mW

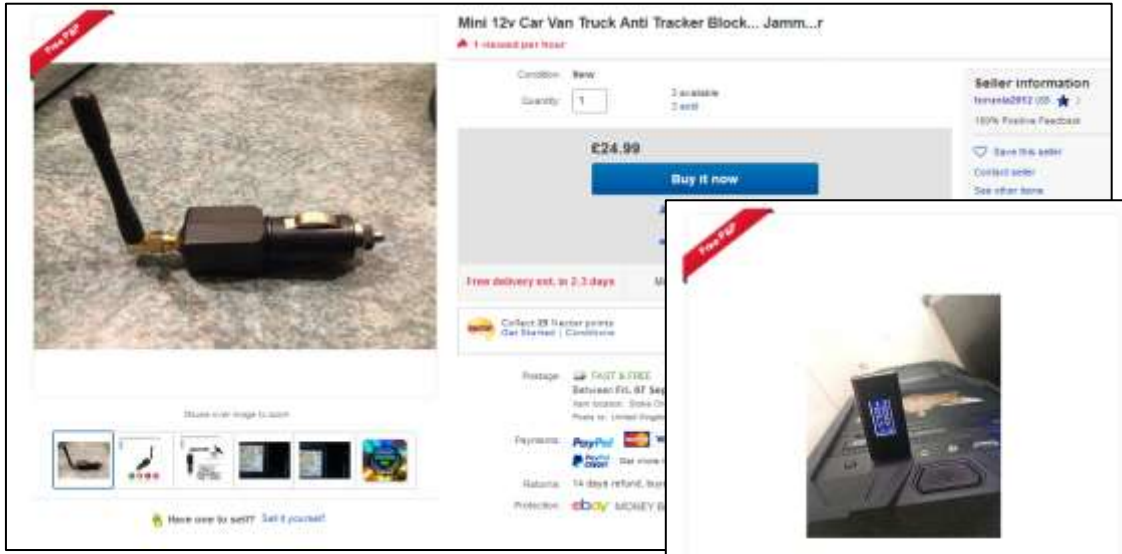
3W

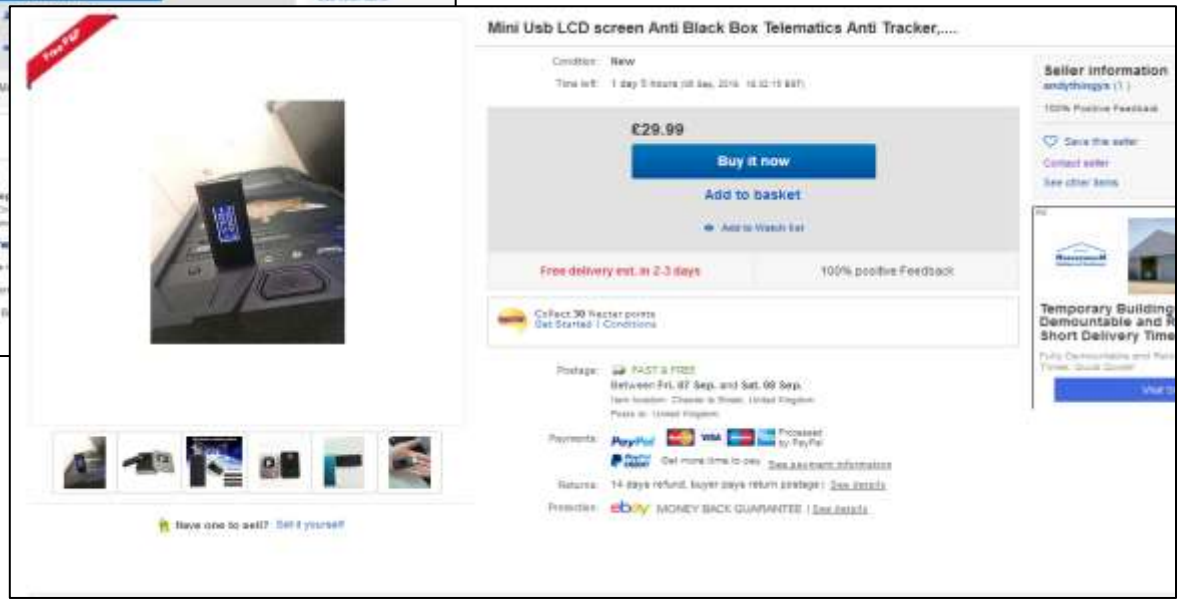
500mW

Buying a Powerful Jammer



Jammers for sale in the UK on eBay





Jamming - Who and Why?

- **Privacy & Covert Operations – Mainly Jamming**
  - Neutralising SatNav Tracking
  - Personal Privacy
  - Young Driver Insurance
  - Criminal Privacy
  - Organised Crime Groups (OCG)
- **Cyber Security – Service Denial – Jamming & Spoofing**
  - Taxi (Uber) Fraud
  - Cyber Crime
  - Civil Disruption/Terrorism
  - Nation State

Criminal Privacy

- Organised Crime Groups
  - Drug dealing, Gang wars
- Car and Plant Theft
  - Disables tracker systems, Hijacking
- Offender Tagging
  - System thinks they are at home!
- Driving company vehicle
  - Taking without permission
  - Driving without valid insurance

Detection of GPS Jammers aids crime detection

Case Study - Works Van

Gloucestershire Police heading north on the M5 detected a works van going southbound

Spun round intersection, caught up and pulled driver into southbound Services

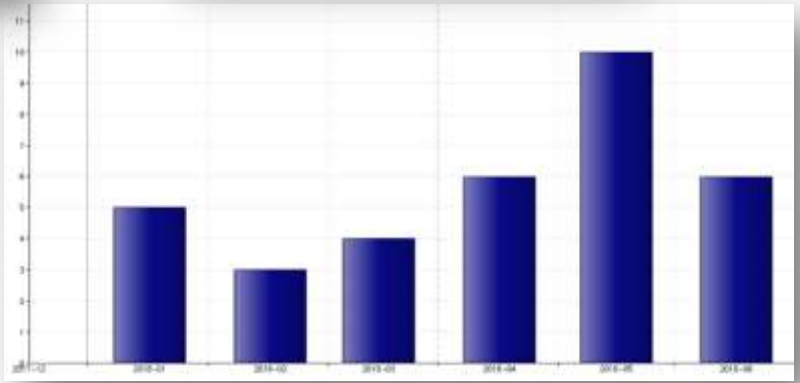
Play Video

https://sentinel.chronos.co.uk/index.php#

https://www.youtube-nocookie.com/embed/yxMhBNRbz1Y

©Chronos Technology: COMPANY PROPRIETARY

Gloucester JammerCam Hits



https://sentinel.chronos.co.uk/index.php#

©Chronos Technology: COMPANY PROPRIETARY

Case Study – Hampshire Police

Call to unconnected RTI at a Chandlers Ford Supermarket

Detector lit up near unattended works van

Officer waited for driver to appear.
Smelt alcohol, breathalysed – positive!
Also shoplifting and using company van without permission

©Chronos Technology: COMPANY PROPRIETARY

Case Study – Young Driver

Hampshire Officer detected a Jammer being used by an 18 year old to jam his in-car black box so that his insurance company was not aware of his driving habits and time of driving.

A CR was issued and the device seized and then written up as a WTA offence but CIMU claimed not a WTA offence and should be reclassified as "Insurance fraud"

Illustrates the disconnect re legal interpretation between MoJ and Ofcom!

Policy has been cancelled – Insurance Co had never heard of jammers!
So…. Apart from WTA offence - was he driving without insurance?
Also who is chasing eBay seller? CIMU now aware of WTA!

©Chronos Technology: COMPANY PROPRIETARY

Case Study – CV Driver's Hours

JammerCam Detection 14/9/18 at Portsmouth

Loaded onto ANPR database enabled stop/check early Oct on the A34

Roadside GFPN for £600
Traffic Commissioners Enquiry

A driver's hours database check of the tachograph revealed incidences of two card use and daily rest and daily drive offences.

"Example of using one piece of intelligence data to target a stop. This enabled a thorough examination for other linked digital evidence of offences"

©Chronos Technology: COMPANY PROPRIETARY

Case Study – Truck Hijacking

Close liaison between fleet tracking desk informing police that vehicles have “disappeared”. 3 new Kenmore trucks and 1 beer load!
Police using CTL3520 detected jamming 100m before they saw the trucks.

Closer Look at 8 Band Jammer

- GPS L1 1575.42 MHz **2W**
- GPS L2 1227.60 MHz **2W**
- GPS L5 1176.45 MHz **2W**
- WIFI 11b/g/n 2.4 GHz **2W**
- Remote Control 315MHz **3W**
- Remote Control 868MHz **3W**
- Remote Control 433/434MHz **3W**
- Lojack 173MHz **3W**

- Disables……
  - All GPS bands
  - Remotes for Cars, Garages, Gates - 315/433/868 MHz
  - CCTV, UAVs, Quadcopters, Drones - 2.4 GHz
  - “Tracker” VHF band (Lojack)

$1,250 www.jammer4u.com

©Chronos Technology: COMPANY PROPRIETARY

Closer Look at 12 Band Jammer

- GPS L1 1575.42 MHz **2W**
- GSM 920 - 965 MHz **3W**
- DCS 1805 - 1880 **3W**
- PCS 1920 - 1990 MHz **3W**
- 4G 790 – 880 MHz **3W**
- 4G1 2300 - 2400 MHz **3W**
- 4G2 2620 – 2690 MHz **3W**
- 3G 2100 - 2200 MHz **3W**
- UHF 400 – 460 MHz **3W**
- VHF 130 – 180 MHz **3W**
- WiFi 11b/g/n 2.4 GHz **3W**
- Lojack 173MHz **3W**

- Disables……
  - GPS L1 Band
  - All mobile phone bands
  - TETRA, ESN
  - CCTV, Bluetooth, WiFi – 2.4 GHz
  - UAVs, Quadcopters, Drones
  - "Tracker" VHF band (Lojack)

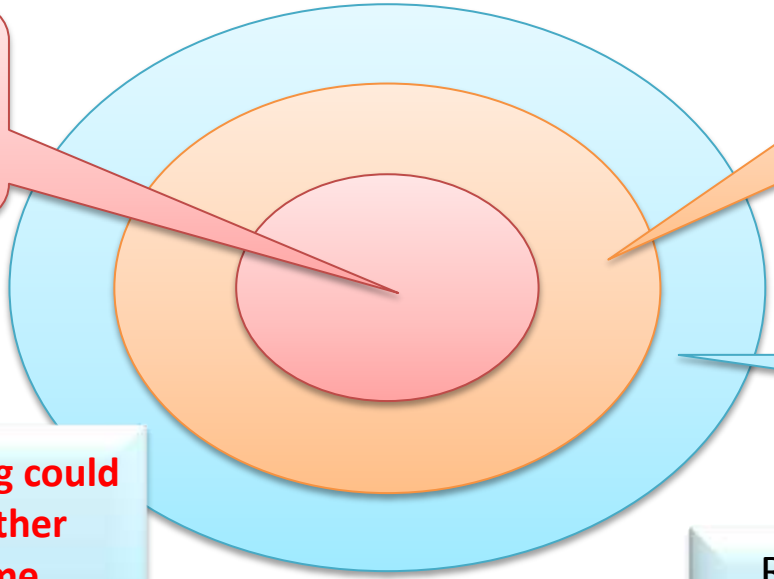
Recovered by Hampshire Sept 2018

16 Channel versions now available!

$650 www.jammer4u.com

©Chronos Technology: COMPANY PROPRIETARY

Detection & Damage Limitation



Denial of Service <50m
For VHF, UHF, TETRA, Lojack, Mobile, ESN, WiFi

Denial of Service
20-300m
For GPS Based Systems
Not Mil Grade Jammers!

Detection of GPS Jamming
>100m-6km
(3 Watts)

Detecting GPS Jamming could be a warning that other systems will become compromised as you get closer
e.g TETRA!

Relatively speaking GPS Jamming coverage is much greater than radio coverage

Vehicle Theft and Export

Photos courtesy of Na

http://www.bbc.co.uk/programmes/p014f7jk

http://webarchive.nationalarchives.gov.uk/video/NationalCrimeAgency/I8fe3nNUmBg

On-going Research

- Spotting Jammers from the air.
  - Chop Shops, RoRo Ports
- Lane based jamming detection and photos
  - Multi-lane carriageways
  - Toll Booths
- GPS Vulnerability Testing Research
  - Ankle Tags
  - Driver’s Hours Telematics
  - Black Box Insurance
  - Autonomous Vehicles
  - Smart Cities
  - Airport Security
  - Impact on CNI
  - Spoofing

©Chronos Technology: COMPANY PROPRIETARY

Resources

Police Poster

Internal notice boards

Use Case Scenarios

The Law

What jammers look like

Jamming Newsletter

Invited Circulation

Monthly

Update on jamming detections

Jamming stories, News

Test Reports

SENTINEL Report

Sennybridge Testing

Conclusion

- Detecting GPS Jamming helps detect crime
- GPS jamming often comes with other jamming capability
- UK Law not robust enough!
- New definitions of Criminality needed
- Learn with the SENTINEL Report
- Get your Poster from Chronos
- White Paper available on request

Acknowledgements

Supporting material and case study information

with thanks to Gloucestershire and Hampshire Constabularies, Federal Police, Mexico

Sennybridge photos with the permission of the Commandant, Sennybridge Training Area

Thank You

Time for Questions

www.chronos.co.uk

www.gpsworld.biz

charles.curry@chronos.co.uk