



8 September 2015

## **ACQUISITION OF DEPARTMENT 13 LLC**

Kunene Resources Limited refers to the ASX announcement on 3 September 2015 advising that it has entered into an agreement to acquire. Department 13 LLC

A corporate presentation on Department 13 LLC is attached.

department 13

Innovation in:

Counter Drone Defense Program

Communication and Networking Technology

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# Who are we?



Technology to address  
new challenges



D13: a diverse team of former military operators, scientists & engineers applying proprietary innovative technology for unmet needs in a fast evolving world

3

Three major areas:  
Electronic Warfare/Information Operations  
Wireless Systems  
Mobile Devices



High Level Strategy – To develop transformative technology for Defense and then rapidly transition to the commercial market



Immediate strategy to roll out our innovative Drone Defense technology to the Market



D13 controls significant IP in wireless and networking relevant to commercial and defense sectors

# How We Do It

- Development of wireless protocol manipulation and communication networking software
  - Applications in Drone Defense, Communications, Intelligence, Cyber Security for mobile devices, and sophisticated applications in the Radio Frequency (RF) environment
  - Cutting edge software and communication systems that will transform the networking and communication field
- Growing sales in commercial and defense sectors
- Strong US Government Relationships
- Strong Patent Portfolio.



# Achievements

## Company History

Founded in Feb 2010 as an R&D company

Leveraged IP of Founders from 2001 to present

Key Patents issued:

- CMIMO
- Subspace Coding
- LPI/LPD
- Network Dominance

Department 13 is a lead researcher and has a strong IP position with long patent life.

## Key Relationships

### Prime Contracts

Agency of the US Department of Defense (DoD)

Major US Research Applied Physics Lab

### Contracts

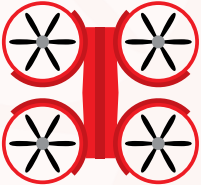
Office of US Secretary of Defense (OSD)

US Defense Advanced Research Projects Agency (DARPA)

- US\$1.8 million in Research Contracts since company formed
- US\$800,000 in DoD Mobile Applications development contracts
- Lead Researcher in Protocol Manipulation

# Product Portfolio Pipeline

## Drone Defense



**Mesmer-D**  
Drone Defense System

**Mesmer- WAT**  
Wireless attack toolkit for penetration testing and CEMA

## Cyber Security



**LPI/LPD**  
Military and Intelligence

Commercial use cases for spectrum sharing and reuse

**Deckard**  
Secure Enhanced Android based ecosystem for mobile devices

## Communication Networking



**COOP MIMO**

Sub Space Coding  
Random Linear Network Coding

## Cyber Security



Bluesphere RF Tracking Technologies and Counter RF Monitoring



# Product Priorities

- The market is urgently demanding a **Drone Defense System**, globally and across a wide range of applications – defense, security and commercial
- Our **MESMER-D Drone Defense System** can be fielded rapidly, is being demonstrated with US Government Agencies and has significant differentiators from other drone defense approaches available.
- Mesmer-D is a priority product being advanced with US Government Agencies



# Competitive Landscape



# Drone Market – Key Stats

**100%**

Per annum growth in the drone market experienced last year

**1 Million**

Drones estimated to be sold this year

**\$111Bn**

Forecasted to be spent over next 5 years

**+\$8.4Bn**

Estimated to be spent solely in the small drone market by 2018

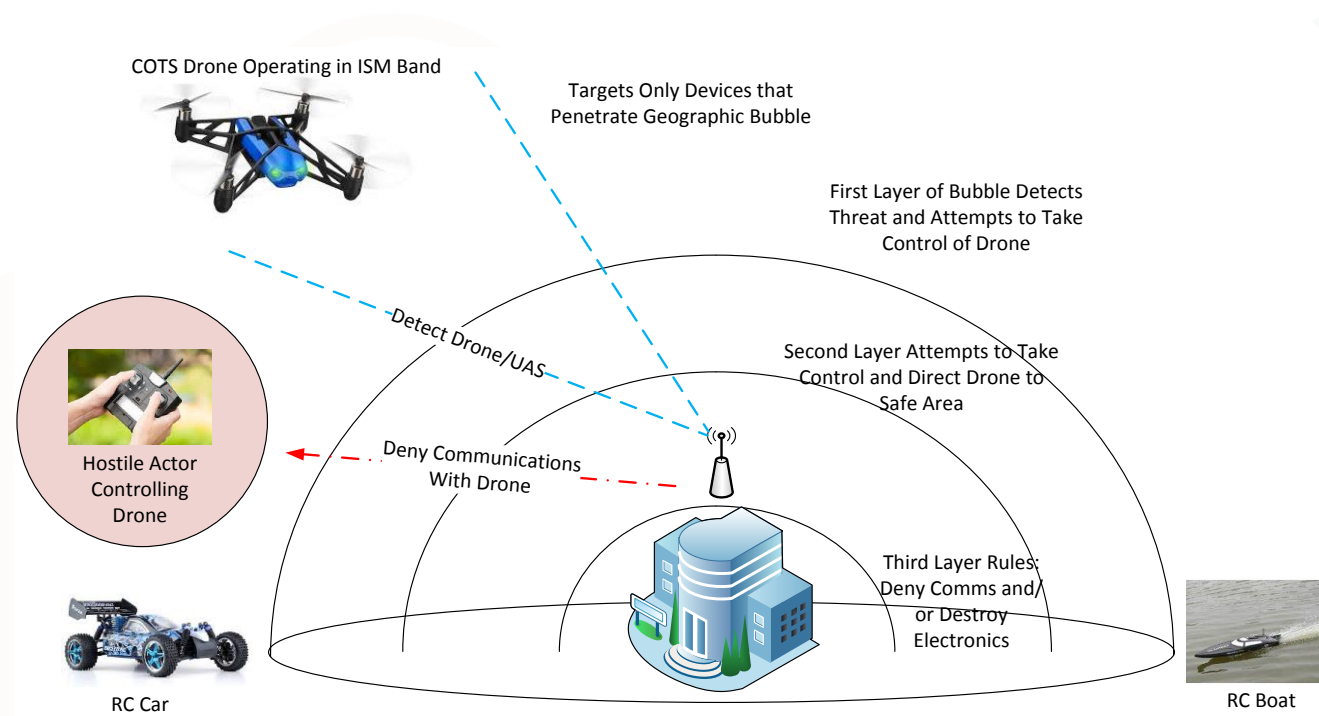
**12 Million**

ISM band “hobby drones” operating by 2020

**\$1Bn**

Revenue expected from leading COTS drone manufacturer

# Drone Defense Solution **Mesmer D**



- MESMER – D identifies and takes control of commercial drones. It can defend points, perimeters, or areas against one or many more drones (Swarm).
- Mesmer **lands drones safely** and does not cause uncontrollable crashes
- Especially attractive relative to traditional EW systems since it **does not effect other** communications.
- D13 currently has the only COTS Drone solution that is low energy and surgical.
- MESMER - D solution already **handles 90-95% of COTS drone threats**.
- MESMER - D solution is highly attractive to Secret Service, DoD, Power, Water & Nuclear Facilities, Airports, sensitive infrastructure, and Sporting Events

# Cyber Security – LPI LPC Mobile

- D13's holds innovative Low Probability Intercept- Low Probability Detection (LPI/LPD) IP for communications
- “hides secret communications with a cell phone in a remarkably innovative way”
- Highly attractive to:
  - defense and Security customers
  - commercial corporate market concerned about corporate espionage
- Possible as a software upgrade



# Cyber Security- **Deckard** Secure Enhanced Mobile Operating System

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- Open Source, One-Touch installer, Secure Operating System for the Android Platform
- Allows users to use own phones securely, resistant to hacking and exploitation
- Incorporates Features to:
  - secure a smart phone from cyber attack, standard monitoring etc
  - protect against physical data theft as well as other attacks
  - protect against man-in-the-middle attacks and signal monitoring. Could also include our LPI/LPD technology and Sub Space Encoding
- Business opportunities include law enforcement, IC, DOD, financial industry, legal, or any business needing to protect important information
- Leverages a number of D13 patents



# Communications Networking – Coop MIMO

A hugely significant technology which can transform the telecommunications industry

At a fraction of Capex and Opex could supplant:

- cellular providers by enabling long-range, low-power Terrabyte WiFi networks;
- ISPs by linking subscribers to Terrabyte front-haul networks at a fraction of CAPEX & OPEX.

Solves the cellular bandwidth problem. Enables practically unlimited bandwidth.

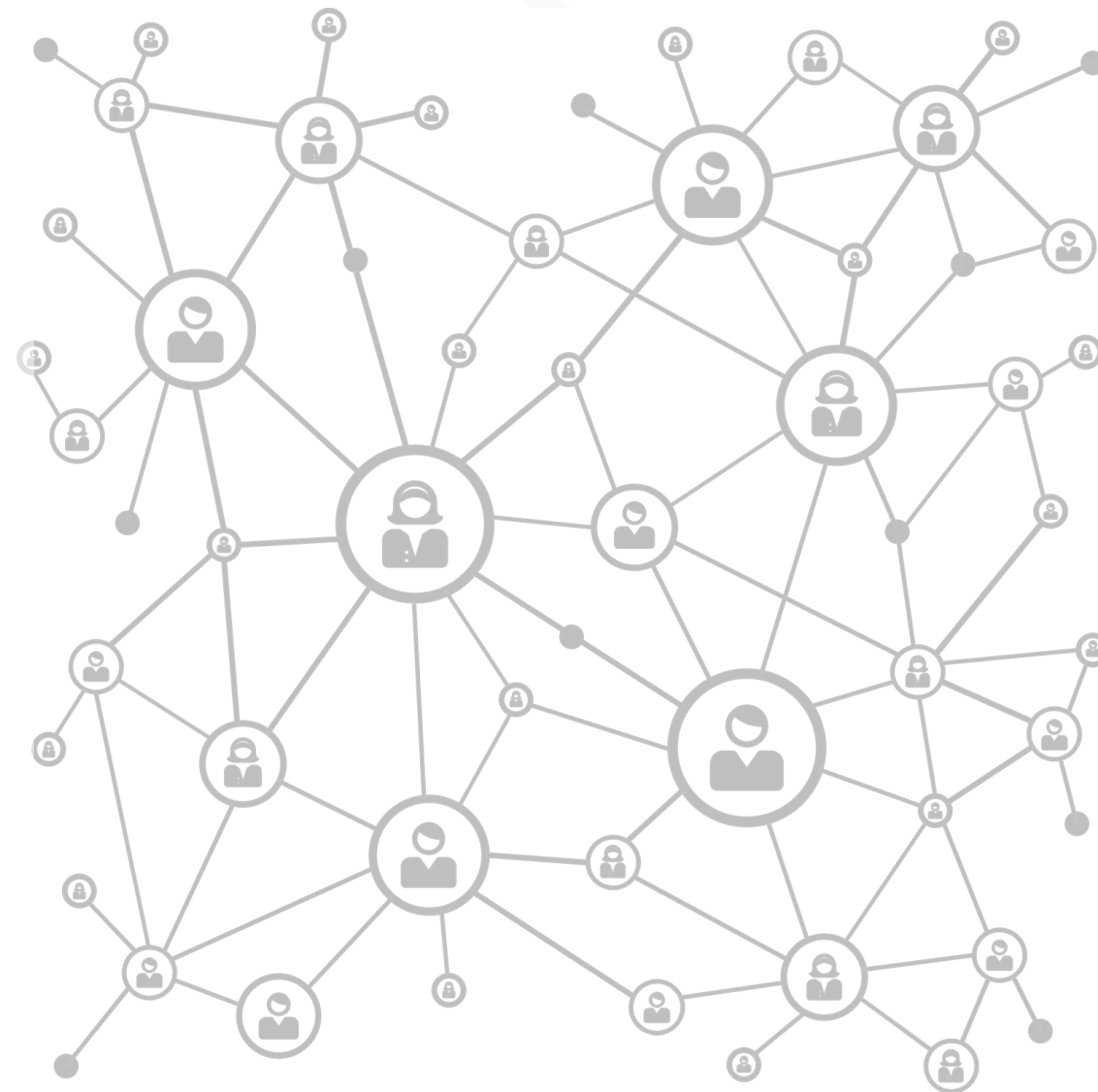
Exploits interference to dramatically improve performance

A virtual base station provides each user with its own local cell

Cloud computing dynamically adapts to changing user load.

Client devices use a fraction of the power

Rapidly deployed.



# Communications Networking – Coop MIMO

- When devices join the network, they become the network infrastructure
- Result is Increased bandwidth
- Ideally Suited for Distributed Applications: Cloud storage/ Cloud Computing Content Delivery Networks
- Proven to dramatically increase data rates in both wired and wireless communications (5X-20X)
- Greatest improvements where it's needed most: where there is high congestion and poor channel quality
- Subspace coding is implemented entirely in software at the Application Layer. No special hardware needed
- Can run on top of any transport-layer protocol: TCP/IP, UDP, etc
- Ideal for streaming media, communications, sensor networks, and any client-server apps.



# Communications Networking – Coop MIMO



## In Licenced

Exclusively Licenced in from GenghisComm Holdings

Long Patent Life

Novel Patents

Inventor and owner of patents is Steve Shattil who is D13's CSO

Steve is the Inventor of dozens of U.S. and foreign patents essential to wireless and radio protocols standards, including 3GPP (3G cellular), LTE (4G Cellular), 802.11n (WiFi), 802.16 (WiMax), and 802.20 (Mobile Broadband).



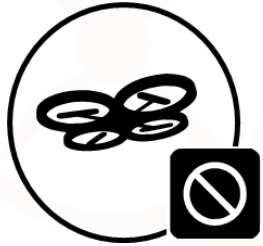
## Market Strategy

MIT, Cal Tech, and other universities have validated the technology

Markets include 1) every device connected to a network, 2) every media delivery application & service, 3) Cloud storage, 4) Cloud computing, 5) every communication protocol, 6) every client-server app

Very attractive solution to government for video over IP on satellite networks, (a major issue)

# Compelling Advantage



Lead researcher in the field of counter drone defence



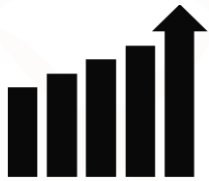
Innovative Technology, D13 has demonstrated the ability to bring novel and innovative technologies to the Market place



First to Market few competitors, working with government and commercial partners to define use cases



Strong IP Portfolio, D13 is well positioned for exponential growth through several Product Areas



Major focus on sales

Drone Defense Mobile  
Cyber Security



Development Areas

Radiometrics-Bluesphere  
Network & Communications products



Validation by strong and growing DoD, DOJ, and DHS relationship + commercial pipeline



D13 has routinely shown itself to be unequalled in the marketplace with innovation. D13 is genuinely at the cutting edge of RF innovation.

# Patent Portfolio

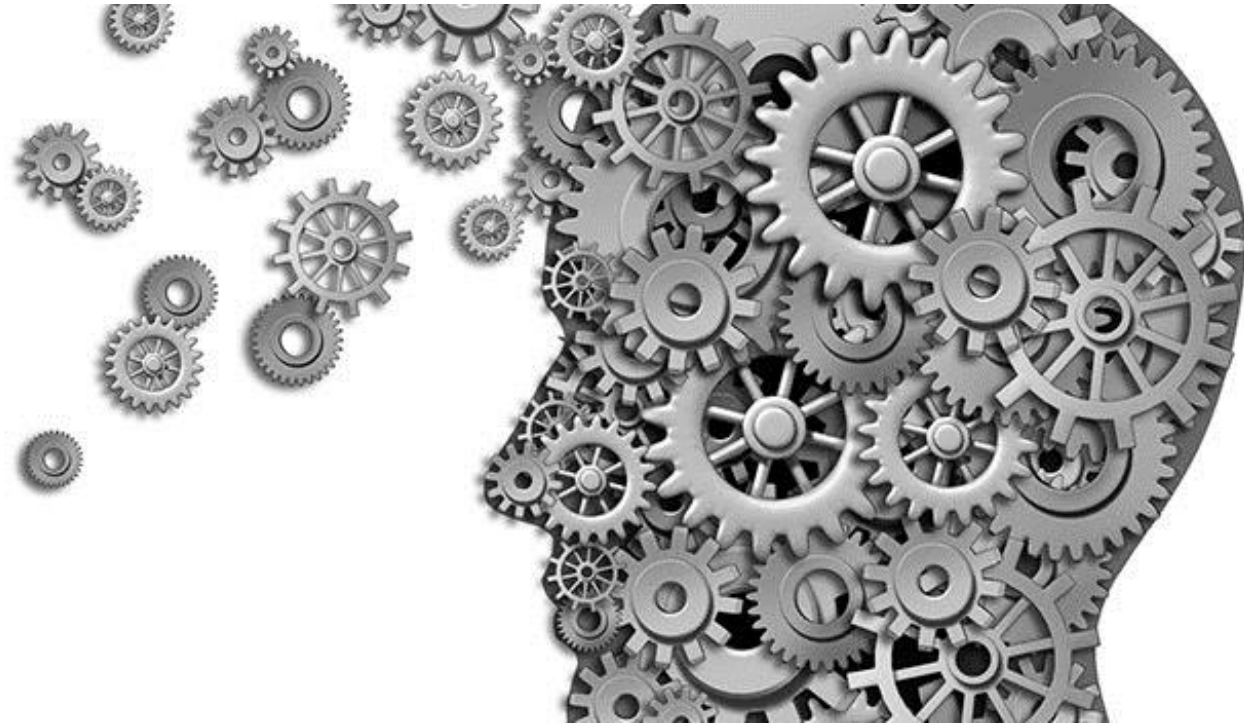
## Strong and Growing

Over 10 patents and 9 applications in the networking and communications sector and many more in development.

Multiple Patents related to Drone Defense, Detection, and Defeat.

Trade secrets/Know How

Industry Knowledge of Defense and Commercial markets



# Board of Directors



## Gavin Rezos – Executive Chairman

- Extensive international investment banking experience
- Held CEO positions in companies in Australia, the UK, US & Singapore
- Non Executive Director of Iluka Resources Limited , Metalys Plc and Chairman of Alexium International



## Jonathan Hunter – CEO and Executive Director

- Degree in Criminal Justice with a MBA in Technology Management
- Former Advisor to the National Academy of Science on defense technology applications
- Over 25 years experience in leadership positions within the US Military and Government Advisory Committees



## Robi Sen – VP of R&D, Executive Director and Remuneration Committee

- Degree in Mathematics and Computer Science and a Master's Degree in History
- Industry professional with a 25 yr career in IT, engineering, and research on cutting edge projects for NASA, DoE, & DoD
- Authored and co-authored numerous technical books including three books on Android.
- Over 15 years experience in Senior and Executive management



## Al Teller – Non-Executive Director and Remuneration Committee

- Former Chairman and CEO of the MCA Music Entertainment Group
- Two engineering degrees from Columbia University; MBA from Harvard Business School
- President Bill Clinton's appointee to National Information Infrastructure (NII) Advisory Council.



# Appendix



# Patents

## Issued Patents

- **Pat. No. 8,942,082 (Jan 27, 2015)**  
**Title:** Cooperative subspace multiplexing in content delivery networks
- **Pat. No. 8,929,550 (Jan 6, 2015)**  
**Title:** LPI/LPD Communication Systems
- **Pat. No. 8,750,264 (Jun 10, 2014)**  
**Title:** Cooperative wireless networks
- **Pat. No. 8,670,390 (Mar 11, 2014)**  
**Title:** Cooperative Beamforming in Wireless Networks
- **Pat. No. 8,254,847 (Aug 28, 2012)**  
**Title:** Distributed Wireless Communications for Tactical Network Dominance
- **Pat. No. 9,042,333 (May 26, 2015)**  
**Title:** Cooperative Wireless Networks
- **Pat. No. 9,048,897 (Jun 6, 2015)**  
**Title:** Cooperative Wireless Networks

## Published Applications

1. Pat. Pub. No. 20150023202 Cooperative Wireless Networks  
Summary: Multi-user MIMO in distributed antenna systems
1. Pat. Pub. No. 20150009945 Sharing Resources Between Wireless Networks  
Summary: Symbiotic exploitation and sharing of licensed spectrum
1. Pat. Pub. No. 20140247895 Cooperative Wireless Networks  
Summary: Server-side cooperative-MIMO
1. Pat. Pub. No. 20140241296 Cooperative Wireless Networks  
Summary: Cooperative-MIMO joint processing in Coordinated Multipoint systems
1. Pat. Pub. No. 20140146924 Cooperative Subspace Demultiplexing in Content Delivery Networks  
Summary: Client-side processing of cooperative subspace coded data
1. Pat. Pub. No. 20140140189 Cooperative Subspace Demultiplexing in Communication Networks  
Summary: Network adaptations of cooperative subspace coding for cloud storage, improved file-sharing networks, and simultaneously using multiple network paths for each downlink channel.
1. Pat. Pub. No. 20140140188 Cooperative Subspace Multiplexing in Communication Networks  
Summary: Pre-coding techniques employing linear subspace codes.
1. Pat. Pub. No. 20140098685 Content Delivery in Wireless Wide Area Networks  
Summary: Algorithms for selecting paths through a network that quickly converge to an optimal solution with minimal computations.

# The Security Challenge Example 1

Small COTS drone possibly containing radiological material lands on the roof of the Japanese Prime Ministers office:



# The Security Challenge Example 2





# The Security Challenge Example 3

Drone flown by protestors to within 6ft of German Chancellor



## The Security Challenge Example 4

Drones can be used for reconnaissance or deliver a variety of hazardous payloads at little or no risk to the operator



# The Security Challenge Example 4

**Newsweek**

HOME POLITICS BUSINESS CULTURE TECHNOLOGY SCIENCE HEALTH THIS WEEK'S EDITION



**LAW & ORDER**

## Most French Nuclear Plants 'Should Be Shut Down' Over Drone Threat

By **Catherine Phillips**, **Conor Gaffey** 2/24/15 at 12:45 PM



The Electricite de France (EDF) nuclear power station of Cattenom near Thionville, Eastern France, is seen at night February 8, 2012. Vincent Kessler/Reuters

## French police continue hunt for mystery Paris drones

Government official seeks "new legal tools" to stop illegal use of drones in sensitive areas after multiple incidents.

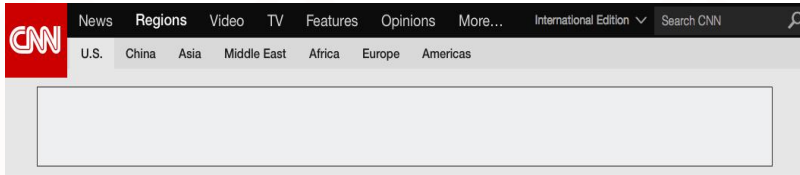
04 Mar 2015 12:02 GMT | Politics, Europe, France

f 39 t 170 r 1



Flights over Paris without authorisation from aviation authorities are illegal [AFP]

# Drones and Aviation



## 2 airliners fly within 100 feet of drone above New York

By Joshua Berlinger and Aaron Cooper, CNN

Updated 2342 GMT (0642 HKT) August 3, 2015 | Video Source: CNN



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\*For inclusions see [wickes.co.uk/newbury-store](http://wickes.co.uk/newbury-store)



### Technology

## Drones hamper US firefighting efforts

20 July 2015 | Technology



US firefighters have condemned drone owners who flew their craft near forest fires and grounded helicopters being used to douse flames.



National Security

## FAA records detail hundreds of close calls between airplanes and drones



# Drones and Prisons

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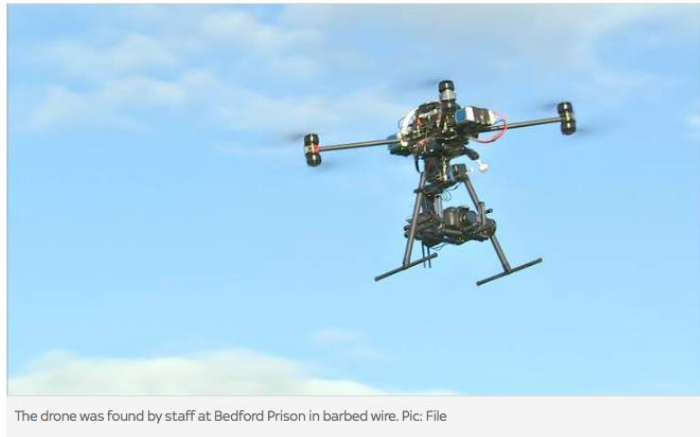
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## Smugglers Use Drone To Fly Drugs Into Prison

Bedford Prison staff believe the remote-controlled aircraft was being used to send drugs, a mobile phone and weapons to an inmate.



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Review: Louis de Bernières's *The Dust That Falls From Dreams*

**U.S. OHIO**

## Drone Caught Delivering Heroin and Marijuana to Ohio Prison Yard

Jack Linshi @jacklinshi | Aug. 4, 2015

Inmates immediately began fighting over the drugs

A drone dropped a package containing heroin, marijuana and tobacco in an Ohio prison yard last week, authorities said on Tuesday.

**Bangkok Post** NEWS

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## Drone caught smuggling phones into jail

22 Jul 2014 at 18:28 9,800 viewed 2 comments

WRITER: ONLINE REPORTERS

0 0 2

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RATCHABURI - A drone equipped with a video camera and two mobile phones were intercepted by guards at Khao Bin prison, widely known to have the best security protection system of all prisons in Thailand.

# Drones and Illicit Reconnaissance

INTERNATIONAL BUSINESS TIMES

News World Business Politics Technology

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Technology

UK burglars using quadcopter drones to identify potential targets with weak security



By Mary-Ann Russon

May 19, 2015

11:42 BST



Unmanned flying drones are being used by criminals to scope out residential properties for potential burglaries (Getty Images)

BloombergBusiness

News Markets Insights Video

## Some NFL Teams Are Being Probed for Using Drones to Film Practice

by Rachel Adams-Heard, Eben Novy-Williams and Alan Levin

June 26, 2015 – 6:25 PM BST

MailOnline

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### Illegal drone use a growing issue at sports venues

By ASSOCIATED PRESS

PUBLISHED: 19:34, 20 October 2014 | UPDATED: 19:35, 20 October 2014



LONDON (AP) — Long after drones became a key tool for militaries and spy agencies, authorities now realize the threat they can pose to sports events.