



Counter UAS

Overview



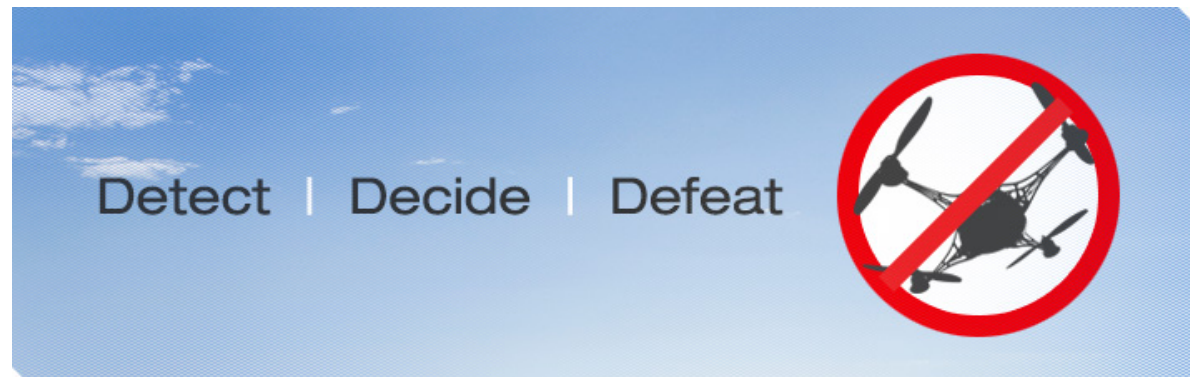
‘Whack a Drone’



Aim



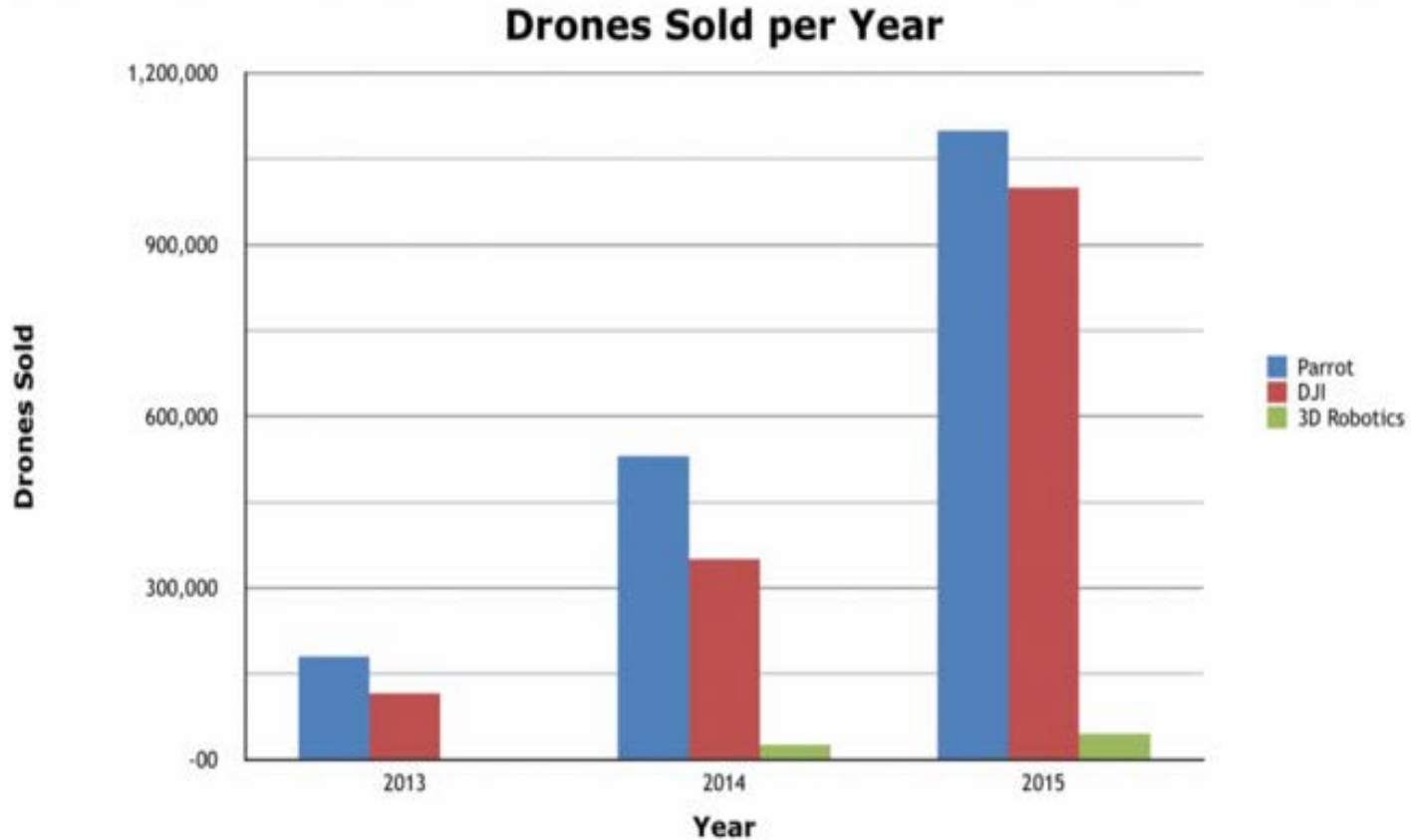
- Review the Threat
- Understand C-UAS Principles
- Options & Issues





Civilian Drone Sales

Guestimated



- Short answer: *AT LEAST 3.4 million* out there...



Typical SUAS SWaP-C

Threat Capabilities



- DJI Phantom 2
 - Weight: 1 Kg
 - Payload: 300 gms
 - Endurance: 25 mins
 - Envelope: 14kft / 30kts
 - Control: FHSS 2.4 GHz
 - Cost: \$500
- Aeryon SkyRanger
 - Weight: 2.4 Kg
 - Payload: 800 gms
 - Endurance: 50 mins
 - Envelope: 15kft / 30kts
 - Control: FHSS 9 or 2.4
 - Cost: \$80,000
- Intuitive Aerigon
 - Weight: 11 Kgs
 - Payload: 12 Kgs
 - Endurance: 10 mins
 - Envelope: 7 kft / 25 kts
 - Control: FHSS 2.4 GHz
 - Cost: \$65,000



Low Slow Small

The LSS Threat



1. Minimal Signatures
2. Bird Discrimination
3. Short Reaction Times
4. Low Cost Barriers to Entry
5. High End COTS Tech
6. Remote & Autonomous
7. Civilian & Commercial
8. Swarm Capability
9. 'Airborne IED'





The 3 'I's

Ill-informed, Immoral, Illegal



Posted: 11 March, 2015 by Triple M Stuff

Woman Caught Sunbaking Naked By Drone ...and she wasn't very happy about it.

NBC NEWS HOME TOP VIDEOS

U.S. WORLD LOCAL POLITICS HEALTH

CA offer interruption

by Mariella Moon

NEWS > U.S. NEWS

NEWS
MAY 14 2015, 2:20 PM ET

SHARE
f Share
T Tweet

Islamic State threat: Isis plotting to use drones to bomb crowds at major British events

ISLAMIC STATE (Isis) are plotting to use toy drones to bomb major events like football matches and music festivals in Britain, it emerged today.

By NICK GUTTERIDGE

PUBLISHED: 07:02, Fri, Jul 24, 2015 | UPDATED: 07:38, Fri, Jul 24, 2015

SHARE f TWEET 10K 91





... The Hits Keep Coming!



World Home U.N. Conflicts Terrorism Disasters Global Economy Environment Religion Scandals Region

Home > Aerial

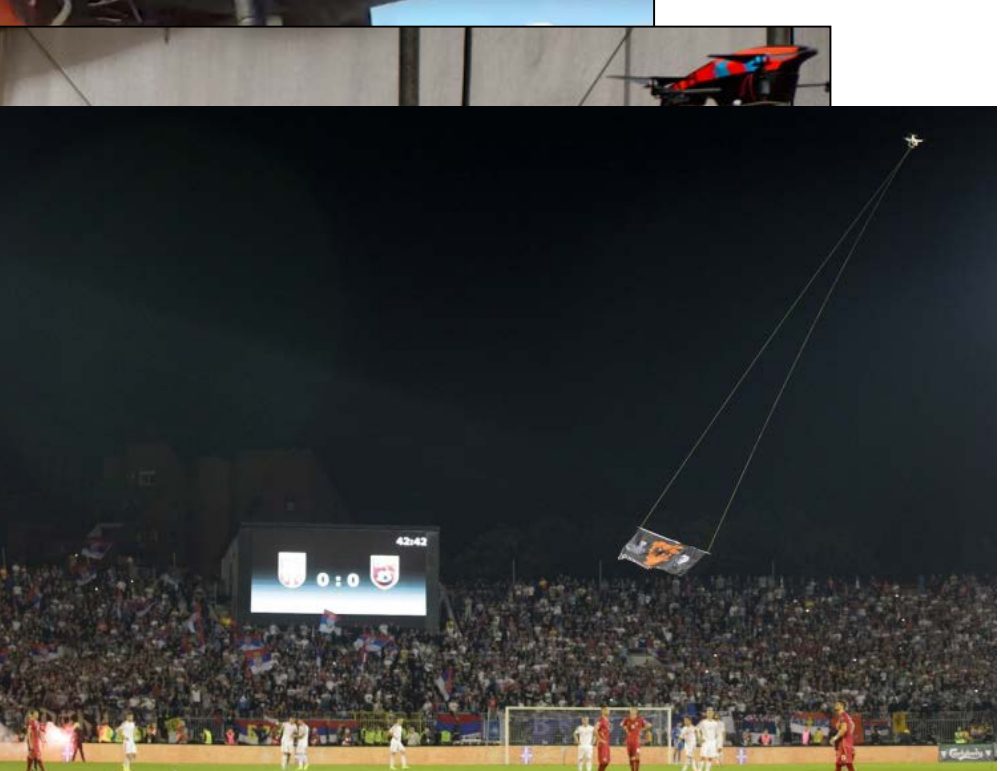
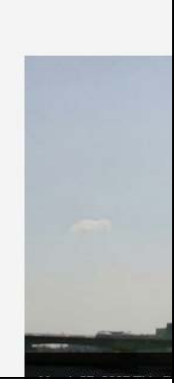
Drone Strikes West Hollywood Power Lines

Bootnotes

Flying drug mule crashes in Manchester prison

Drone vs Phone: Samsung Galaxy S IV - Drone Strike

Strange





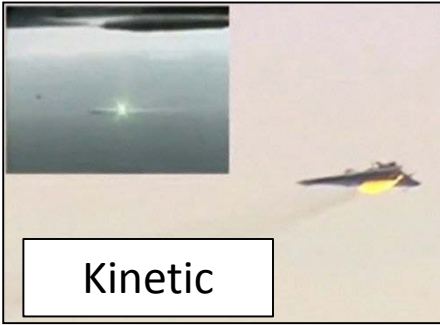
C-UAS Principles



- Detect
- Track
- Characterize
- Identify
- Target
- Defeat
- Active or Passive?
- Point Defense & Close In
- Signatures
- Discriminators
- Rules of Engagement
- Proportionate & Cost



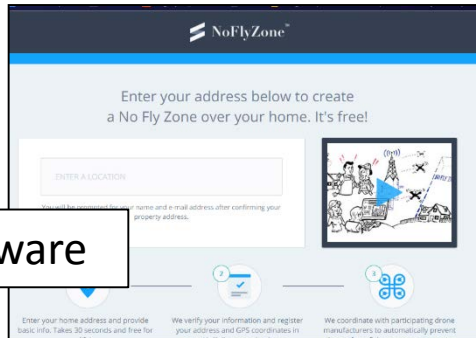
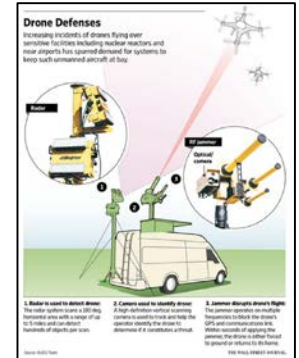
The Defeat Options



Kinetic



EW



Software & Hardware



... ask about the Pumpkin Video!

Example: AUDS

- D: Blighter A600
 - AESA Ku Radar
 - Mini-UAS to 8km
 - Micro-UAS to 2km
- T: EO and IR System
- I: Track Progression
- D: 4x Band Inhibitors
 - Main Control bands & GNSS
 - + EO Disruptor
- \$800k





Civil C-UAS Issues



- Detect
- Track
- Characterize
- Identify
- Target
- Defeat
- *Privacy / Warrantless Search*
- *As above*
- *Hobby, Civil, Commercial, Legal*
- *Registration? Owner, Operator?*
- *Very dangerous legally!*
- *Shooting down 'aircraft'*
- *ROE?*
- *Collateral damage*



Civil C-C-UAS

The Arms Race begins...



- Fake / No Registrations
 - Black Market
- Non GPS
 - E-LORAN
 - Anti-Jam Antennae
- Fully Autonomous
 - Fire & Forget
- Hacked





Bottom Line

- A New Real Threat but with few active counters and latent regulations...





Questions



Consultancy

Advice

Training

Zero to Hero



Managed Services

ISR & UAS Provision