

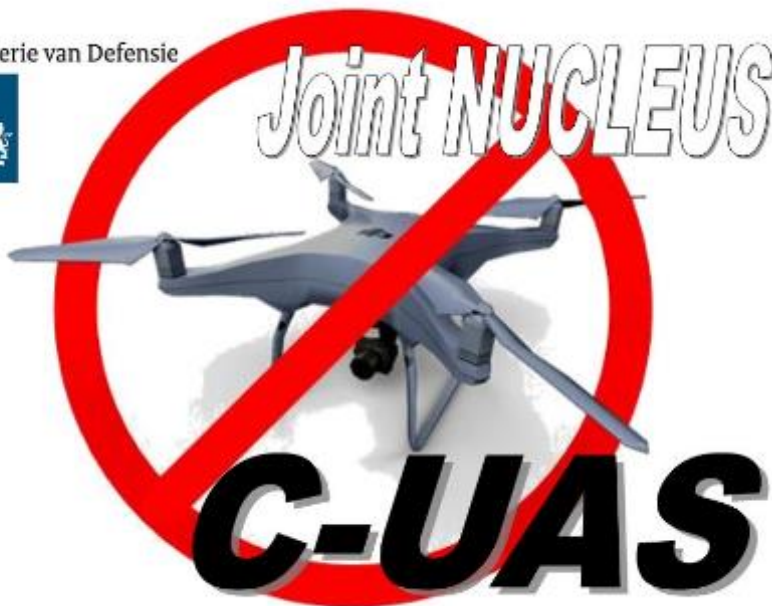
Ministerie van Defensie

# THREAT

## Counter Unmanned Aircraft Systems

MSG\_SET-183 RSM

Ministerie van Defensie



For SCIENCE AND TECHNOLOGY ORGANIZATION  
NATO MODELLING & SIMULATION GROUP  
SENSORS & ELECTRONICS TECHNOLOGY PANEL

27<sup>th</sup> April 2021

25 juni 2021

# WHAT'S IN A NAME



- Drone:** Unmanned Target Aircraft
- UAV:** Unmanned Aerial Vehicle
- UAS:** **Unmanned Aircraft System**
- LSS:** Low Small and Slow
- RPAS:** Remotely Piloted Aircraft System



## Average idea of a drone:

- Low
- Slow
- Momentary
- Hoovering
- Line of Sight



## Actual:

- High Altitude
- High Speed
- Battery Life
- Agile
- Autonomous





1. UAS Threat & Incidents
2. Challenges



# INCIDENTS 2018





# INCIDENTS 2019



# INCIDENTS 2020



Home / Live news

## Pakistan shoots down Indian drone as Kashmir tensions rise



Issued on: 09/04/2020 - 09:20 Modified: 09/04/2020 - 09:19

Islamabad (AFP)

ADVERTISING



SIA "UAVFactory" piederošais drons, pār kura vadību 2. maijā kontrole pazaudēta.

Photo:  
Civillās  
aviārijas  
aģentūra

## Runaway drone still on the loose over Latvia





## Current threat "UAS & BM"

Nagorno-Karabach, Autumn 2020



Armenia

-ISR



-BM STRIKE

Azerbaijan

-ISR

-Loitering munition

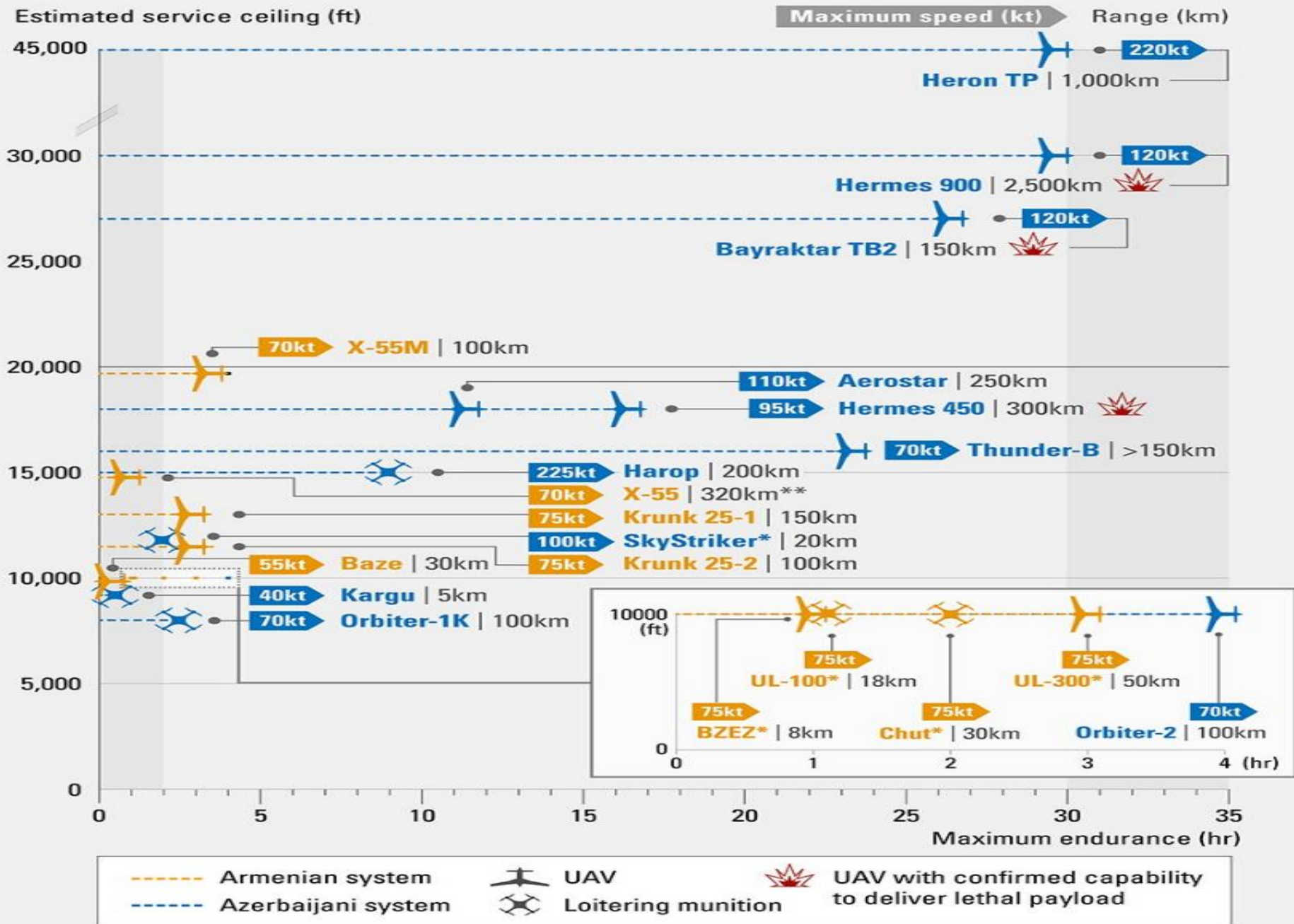
-UCAV





# Armenian and Azerbaijani military weapon capabilities

## Assessed systems



\*IISS estimates \*\*Range claimed by Armenia

# INCIDENTS 2021



Saudi Arabia, Abha int Airport 10 FEB 2021



“Houthi militants in Yemen conducted an UAS attack on Abha Int Airport, southern Saudi Arabia”

# UAS THREAT



1. Civil domain:
  - a. Methods
  - b. Vital Infrastructures
  - c. Events
  
2. Asymmetric conflict
  
3. Symmetric conflict (High Intensity)





1. Reckless behaviour
2. Deliberate disturbance
3. Propaganda / Intimidation
4. Smuggling
5. ISR (intelligence / surveillance / reconnaissance)
6. Direct Attack – without payload
7. Attack – with payload (explosive / CBRN)

**Drone terror attack by jihadists in Britain is 'only a matter of time', security sources warn**







## Vital Infrastructure (Fixed locations )

- Energy supply
- Water Purification Plants
- Government buildings
- Airports
- Trainstations
- Prisons





## Events (NLD)

- 27 april Kingsday
- 4 may National Commemoration
- 1, 2 & 3 may F1 Zandvoort
- 12 - 16 may Eurovision Songfestival
- 19 - 21 june Pinkpop
- 30 june Veteransday
- 21 - 24 July 4 Days March Nijmegen
- 21 - 23 aug Lowlands Concert
- 4 - 6 sep World Harbour Days
- 19 sep Prince's Day

examples



# THREAT: MILITARY

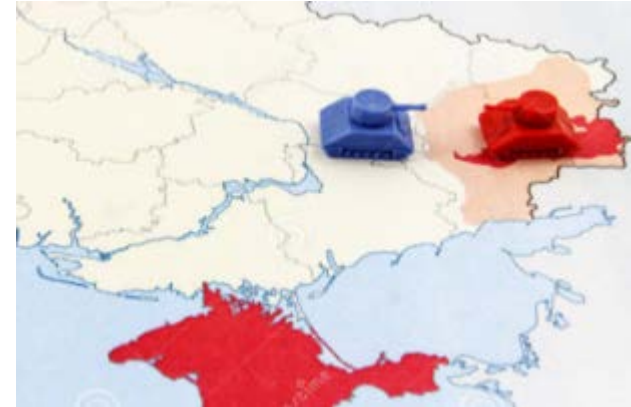


## 1. Symmetric conflict:

### a. ISR

- i. Information
- ii. Fire Control
- iii. BDA

### b. EW



## 2. Asymmetric conflict:

### a. ISR

1. Information
2. Fire Control (incl. VBIED)

### b. EW

### c. Attack

1. Without payload
2. With payload



# THREAT: MILITARY



# UKRAINE



## Unmanned Aerial Vehicles



UAV "Eleron-3CB"



UAV "Takhion"



UAV "Orlan-10"



# THREAT: MILITARY



# IRAQ



# THREAT: MILITARY



# SYRIA





1. UAS Threat & Incidents
2. C-UAS Operations Concept
  - Classification
  - Protection Model
  - Operating Lines
3. Joint NUCLEUS C-UAS
  - Structure
  - Activities
  - Test Center C-UAS
  - CD&E
4. Challenges & Way Ahead





# CLASSIFICATION



## NATO UAS Classification guide

ATP-3.3.8.1

NATO UAS CLASSIFICATION						
Class	Category	Normal Employment	Normal Operating Altitude	Normal Mission Radius	Primary Supported Commander	Example Platform
Class III (> 600 kg)	Strike/ Combat*	Strategic/National	Up to 65,000 ft	Unlimited (BLOS)	Theatre	Reaper
	HALE	Strategic/National	Up to 65,000 ft	Unlimited (BLOS)	Theatre	Global Hawk
	MALE	Operational/Theatre	Up to 45,000 ft MSL	Unlimited (BLOS)	JTF	Heron
Class II (150 kg - 600 kg)	Tactical	Tactical Formation	Up to 48,000 ft AGL	200 km (LOS)	Brigade	Hermes 450
Class I (< 150 kg)	Small (>15 kg)	Tactical Unit	Up to 5000 ft AGL	50 km (LOS)	Battalion, Regiment	Scan Eagle
	Mini (<15 kg)	Tactical Subunit (manual or hand launch)	Up to 3,000 ft AGL	Up to 25 km (LOS)	Company, Platoon, Squad	Skylark
	Micro** (<66 J)	Tactical Subunit (manual or hand launch)	Up to 200 ft AGL	Up to 5 km (LOS)	Platoon, Squad	Black Widow





## CLASS I ( $< 150$ kg)

- MICRO ( $< 66$ J) BLACK HORNET
- MINI ( $< 15$  kg) DJI PHANTOM RAVEN ELERON 3SV
- SMALL ( $> 15$  kg) SCAN EAGLE ORLAN 10

## CLASS II (150-600 kg)

- TACTICAL SHADOW PREDATOR FORPOST

## CLASS III ( $> 600$ kg)

- MALE REAPER
- HALE GLOBAL HAWK

# AIR DEFENCE

# CLASSIFICATION



# CLASSIFICATION



## DJI Phantom 4

MTOW 1.4kg  
Diameter 30cm  
Max speed 70kmu



## ORLAN 10

MTOW 16.5kg  
Wing span 3.1m  
Max speed 150 kmh  
Max ceiling 5000m



## DJI Mavic 2 pro

MTOW 0.9kg  
30x20cm (20x9cm)  
Max speed 70kmh



## ELERON 3

MTOW 5.3kg  
WING SPAN 0.9m  
Max speed 130 kmh

Max ceiling 4000 m



- Speed of technological developments
  - Swarm & Swarming
  - Independent Operation / Navigation
  - Stealth
- Deconfliction: X-mas present, pizza or terroristic attack
- Development opponents

