



Federal Ministry  
of the Interior



## The Potential of Light UAS for Police Applications

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### Potential users (German Authorities)

- **Federal Police – BPOL**  
(border, railway, aviation and maritime security)
- **Federal Criminal Police Office – BKA**  
(investigation of organised crime: weapons, explosives, drugs, counterfeit, money laundering and terrorism)
- **Federal Office of Civil Protection and Disaster Assistance – BBK**  
(civil protection, protection of critical infrastructures, disaster relief)
- **Federal Agency for Technical Relief – THW**  
(natural disaster relief, technical assistance, search and rescue)
- **Federal Office for the Protection of the Constitution – BfV**  
(counter espionage and -sabotage, Left/right-wing extremism)
- **16 State Police forces – Landespolizei**  
(crime prevention, traffic security, pollution control)



### Operational requirements

- **24 hours on 365 days / year (24/7)**
- **during day- and nighttime**
- **mostly unaffected by weather conditions** (wind, rain, temperature)
- **flexible, independent from location/situation**
- **without longer preparatory actions** (preventative and repressive)
- **everywhere** (populated and unpopulated areas, mountains, sea etc.)
- **In German civil airspace** (uncontrolled and controlled airspace, non-segregated airspace)
- **according to rules of general (civil) aviation**



### Technical requirements

- **autonomous flight including take-off and landing**
- **high technical reliability**
- **good endurance – medium range**
- **slim maintenance program**
- **wide variety of payloads**  
(detectors, stabilized daylight/infrared cameras)
- **secure and stable frequencies / datalink**
- **custom-tailored to particular needs**



### UAS currently in use by German police forces

#### Technical Data

Fancopter



Sensocopter



AirRobot



ALADIN



Dimensions	Diameter 69 cm	Diameter 93 cm	Diameter 100 cm	146 x 157 cm
Mass	up to 1,3 kg	0,9 kg	up to 1,0 kg	3,5 kg
Speed	max. 40 km/h	max. 40 km/h	max. 40 km/h	max. 70 km/h
Endurance	25 minutes	20 minutes	20 minutes	60 minutes
Mission range	max. 500 m	max. 500 m	max. 500 m	max. 8 km
max. windspeed	4 m/sec	4 m/sec	4 m/sec	10 m/sec



### Current limitations

- **UAS with a take-off mass below 5 kg**
- **in uncontrolled airspace**
- **within operator's line-of-sight**
- **in sparsely populated areas**
- **below the minimum safe altitude** (manned aviation)
- **exceptions only under usage of exclusive governmental rights**  
(under section 30 of the Civil Aviation Act)



### Future needs

- low altitude (< 3.000 ft GND) medium range (< 100 km)
- maximum take-off mass up to 200 kg
- larger numbers than today





### Advantages

#### **Tactical operation**

- offers options which conventional technology can not
- covert reconnaissance by air (invisible and inaudible at a short distance)
- flexibility and mobility

#### **Self-protection**

- no deployment of staff in the perpetrators' surroundings
- no deployment of staff in contaminated areas

#### **Economy / Ecology**

- operational costs; maintenance costs; human resources
- noise abatement







### Limitations / Problems

#### **Weather conditions**

- wind speed and turbulence; precipitation (rain / hail etc.)

#### **Operational safety**

- operation above populated areas / crowds
- no (technically) proven airworthiness, lack of type approval / certification
- prevention of collisions – sense and avoid

#### **Data link**

- no exclusive, secure frequencies; interruption-free data link is mandatory

#### **Legal aspects**

- proving of airworthiness / type certification
- qualification of the operator/pilot (licensing)
- regulations for the use of airspace



# Demonstrations Needed

**Example I:** Joint approach with baltic states for cooperation in open sea surveillance





# Demonstrations Needed

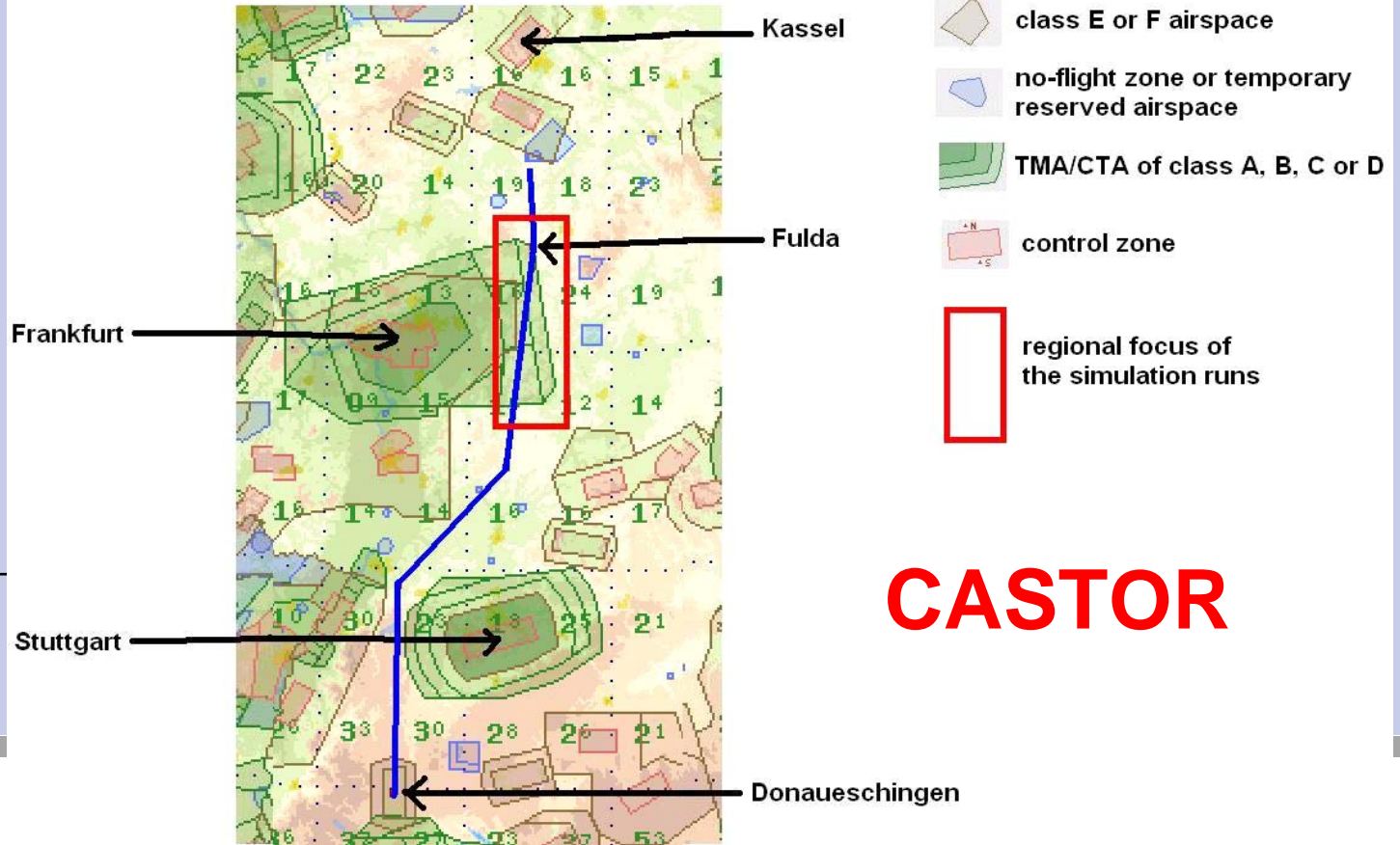
### Example I: Baltic Watch – Key Factors

- Surveillance of maritime vessels → e.g. illegal spillage monitoring and documentation
- SAR support
- Identification and tracking of maritime vessels
- Communication relay functionality UAS→SatCom→UAS
- Mission duration: 3 hours (typical) up to 8 hours in special cases under multishift conditions
- Necessary data link reliability for navigation and sensing very high (SatCom)



# Demonstrations Needed

**Example II:** Transport of used nuclear fuel and waste to final storage site





### Demonstrations Needed

#### **Example II: CASTOR Transport**

- Transport of used nuclear fuel and waste to final storage site
- 24/7 „all-weather“ mission shifts
- Distance 300 nm and more (→ SatCom)
- 500 to 3000ft GND
- Sensors: IR + optical
- LOI Level 5 = Control and monitoring + launch & recovery



### Conclusions

- Rapid **technological development** will continue.
- Opening up **options of use** which no other technology can offer.
- Outstanding advantages in the field of **self-protection**.
- Current fields of use primarily in the field of **surveillance**.
- **Legal questions** must be clarified (harmonized regulations)
- **No replacement for police helicopters** – but a good supplement.



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**THANK YOU!**

