

# WG I Meeting

Deliverables: Status and Discussion



**COST Action ES 0802, WG 1 Meeting,  
Burkhard Wrenger, Palma de Mallorca (ES), 2013/02/21**

# Scientific Work Plan – methods and means

- Compile informations about
  - Possible and best practise UAS configuraitons
  - Auto pilot systems
  - Flight control techniques and systems
- Discuss management of data compiled with UAS including structure, deployment, evaluation and processing

# Scientific Work Plan – methods and means

- GCS: Specify a set of software interfaces, operation procedures, map and digital elevation model.
- Investigate UAS platforms and operation with respect to atmospheric research capabilities.
- Exploit recent advances in lightweight composites, aerodynamics, propulsion and automatic control.
- Propose next generation UAS designs.

# Memorandum of Understanding: WG I deliverables

- Novel airframe configurations utilising latest advances in composite materials and aerodynamics
- Leopoldo Stefanutti (SunDrone), Hanfried Hesselbarth (UMARS I and II), Jens Dünnermann and Burkhard Wrenger (AMOR multicopter), Andreas Scholtz (P360), Nicolae Constantin (WG I Report), Anders La Cour Harbo I (Jet engine powered Helicopter design), Martin Müller and Christian Lindenberg (Airframe with scalable wings and easily accessible payload compartments), NORUT and Andoya Rocket Range (Cruiser II platform)
- Composite material developments → C. Soutis

# Memorandum of Understanding: WG I deliverables

- Assessment of clean propulsion technologies for UAS
- Heinrich Warmers (electric propulsion in WG I report)
- Anything else?

# Memorandum of Understanding: WG I deliverables

- Low cost, light weight, autonomous flight control system designs to minimise human intervention
  - Martin Müller (Paparazzi autopilot)
  - Anders la Cour Harbo (Autopilot)
  - Thomas Krüger (adaptive avionics design)
  - Andreas Scholtz (using flaps for altitude control)
  - New autopilot by TU Braunschweig
  - Jens Dünnermann, Burkhard Wrenger (AMOR platform)

# Memorandum of Understanding: WG I deliverables

- Assessment and recommendations for high speed data links for telemetry, mission management, and measurement data transfer
- See COST database
- Andoya Rocket Range, NORUT and the Cyprus Institute are using the Iridium satellite communication

# Memorandum of Understanding: WG I deliverables

- Ground station designs which utilise latest advance in human factors to ensure high quality mission management tools
- Jens Dünnermann and Burkhard Wrenger (AMOR scientific ground control station)
- NORUT scientific GCS as presented in the first ISARRA meeting
- Paparazzi und ArduPilot GCS
- SkyCircuits Plan and Flight



# WG I Report: Actual Status

- Requirements from the ABL science (Burkhard Wrenger, fine tuning required)
- Modern Composite Material in Manned and Unmanned Aerial Vehicles (Costas Soutis, References)
- Aerodynamics, stability and aerodynamic control (Nicolae Constantin, done)
- Lightweight design fo UAVs for meteorological and environmental measurements (Hanfried Hesselbarth, References)
- Avionics for Small Unmanned Aircraft Systems (Thomas Krüger, References)
- Helicopters (Morten Bisgaard, References )

# WG I Report: Actual Status

- Propulsion (Heinrich Warmers, work in progress)
- Sense and Avoid Techniques (Eduardo Silva, fragments)
- Fixed Wing Systems (tbd)
- Multicopters (tbd)
- Telemetry and ground control station (tbd)

# Questions?

# Memorandum of Understanding: WG 5



- New operation scenarios beyond those available with state of the art UAS
- Roland von Glasow (LTA RPA)
- Jens Dünnermann and Burkhard Wrenger (Multicopter ABL applications)
- ?

# Memorandum of Understanding: WG 5

(!)

- Compilation of fields of attention and promising new technologies for Micro UAS (?)
- Recommendations for top priority work related to atmospheric research by micro size UAS (?)