ECARO project
Preparation and coordination UAS flight tests in Grottaglie airport

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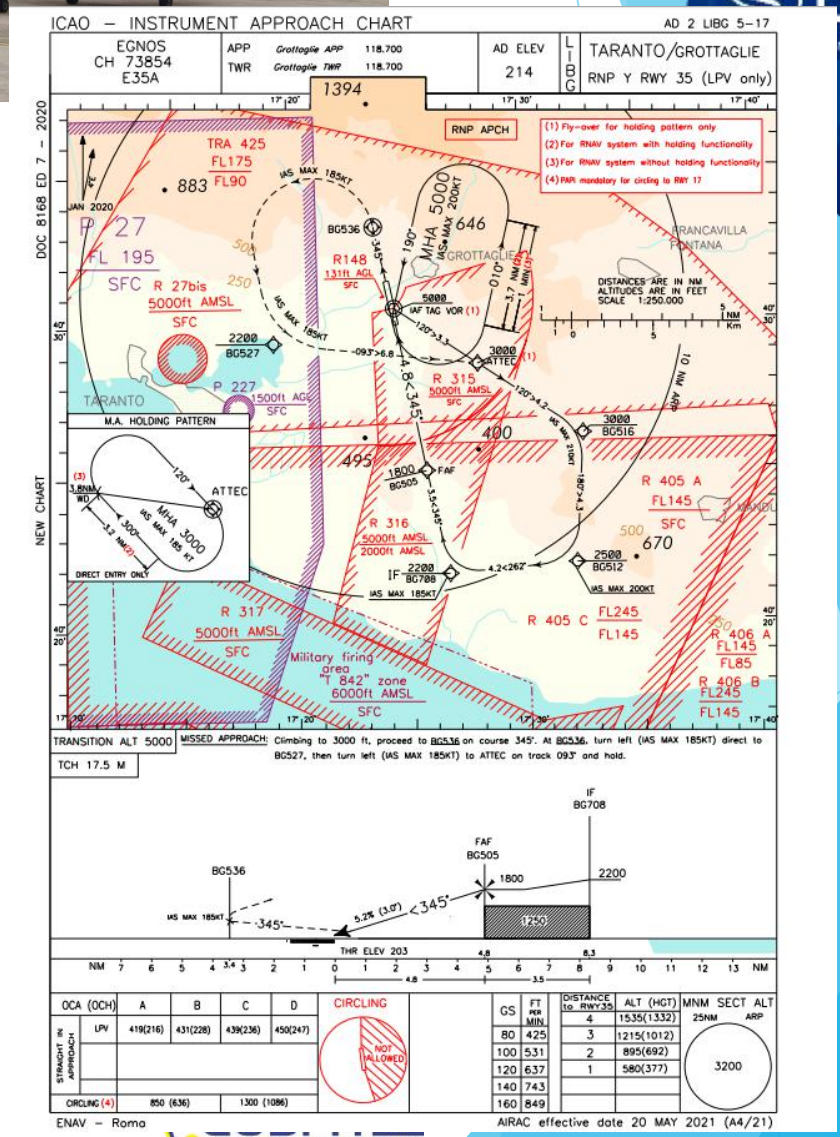
RPAS operations

Design, validation and publication of RNP APCH at Grottaglie (LIBG) airport for RWY 35



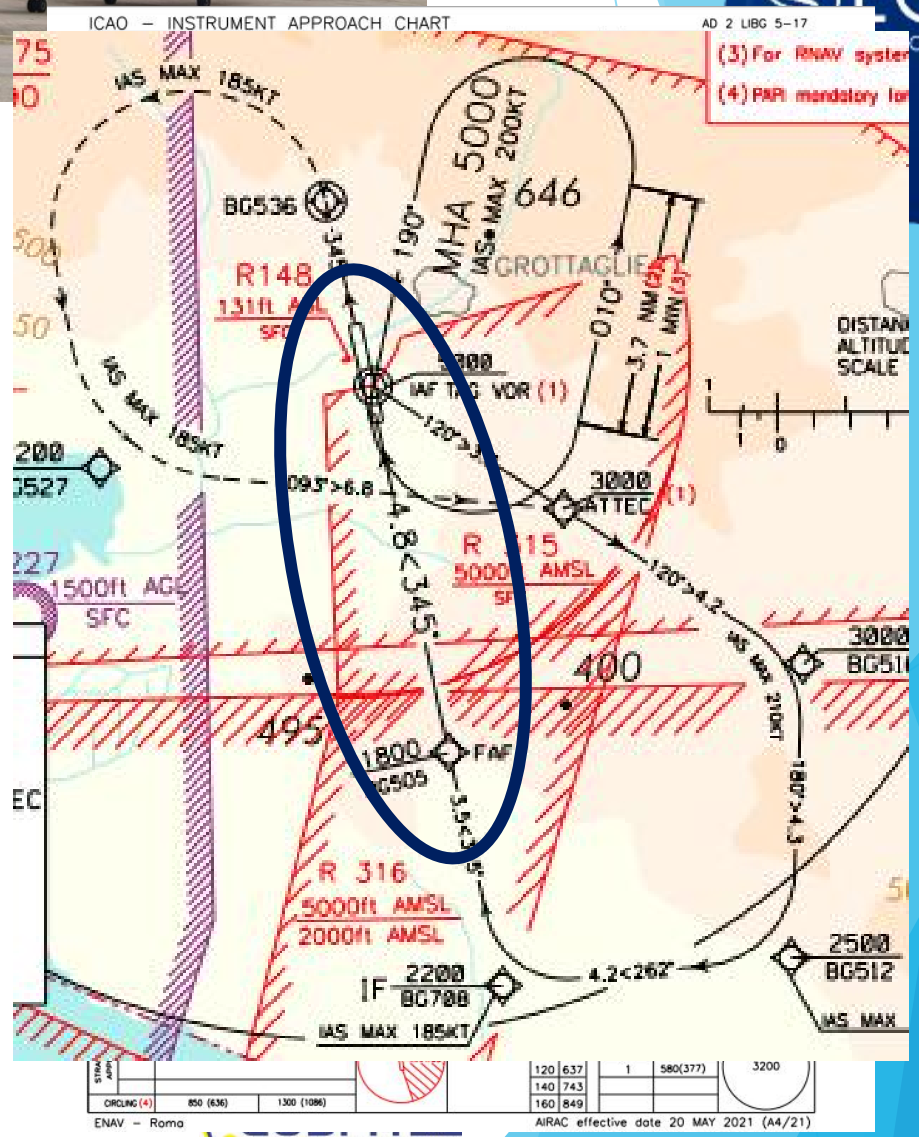
RPAS operations

Design, validation and publication of RNP APCH at Grottaglie (LIBG) airport for RWY 35

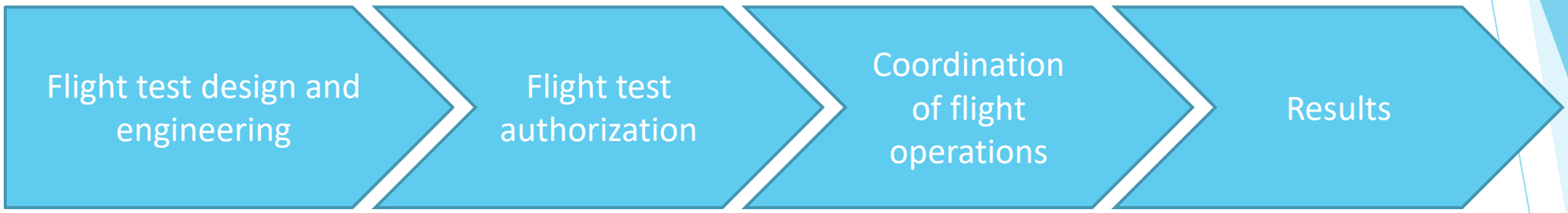
Development of knowledge about capacity of RPAS to operate a satellite-based approach procedure

- Flight tests realization
- Results here after

GNSS interference monitoring system



RPAS operations



Development of knowledge about capacity of RPAS to operate a satellite-based approach procedure

- **Flight tests realization**
- Results here after

Flight test design and engineering

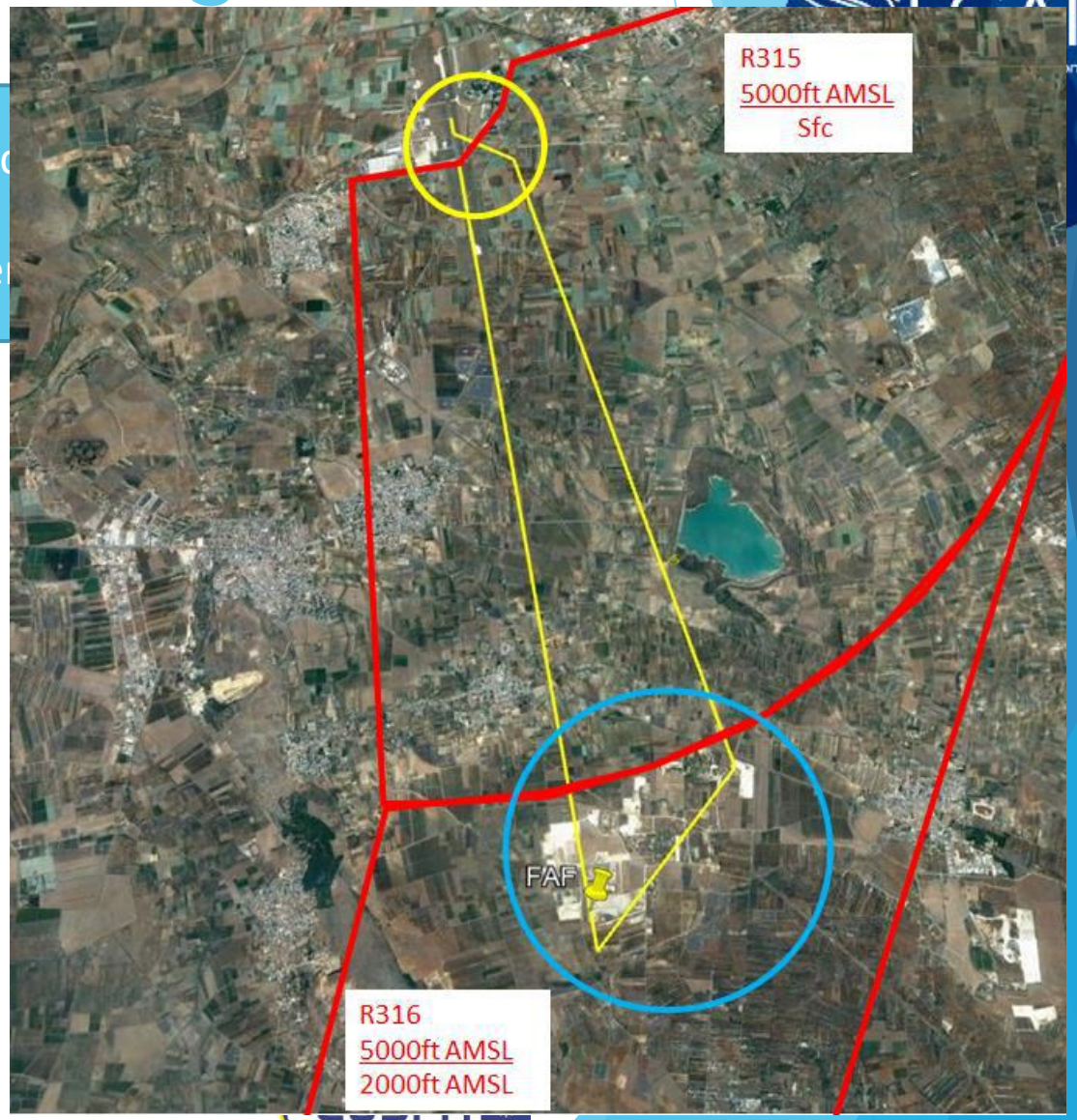
Flight test design and engineering → Flight test authorization → Coord of oper

Flight test objectives:

- to fly the RNP APCH procedures satisfying the ICAO procedures requirements
- GNSS signal configuration:
  - GPS L1 L2 + GALILEO E1 E5
  - GPS L1 L2 + EGNOS
  - GPS L1 L2

Flight profile: (part of) the RNP APCH

- BVLOS, distance about 10Km (5.6NM)
- Operation category: SPECIFIC
- ENAC engaged already in this phase



Flight authorization (1/2)

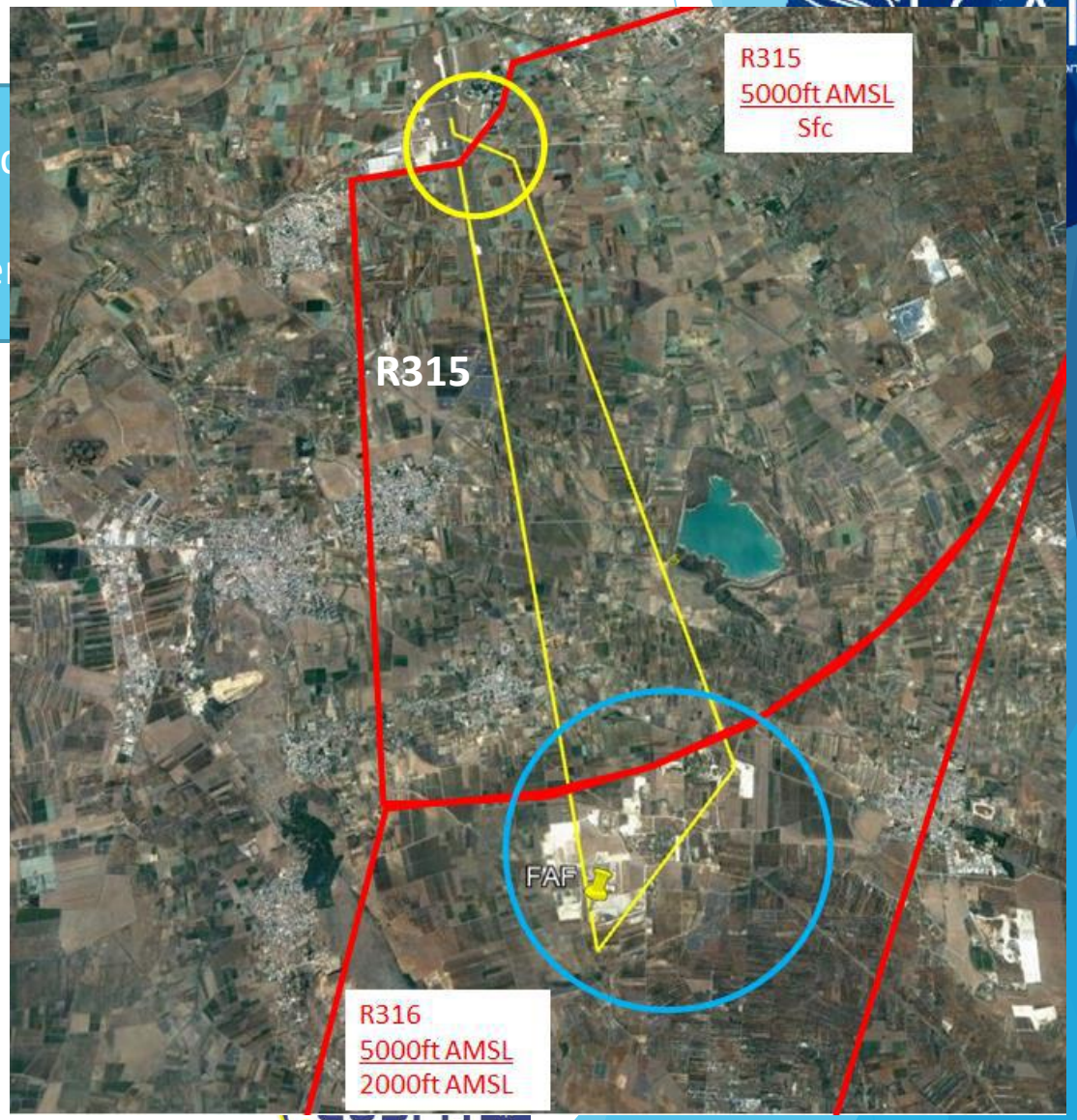
Flight test design and engineering → **Flight test authorization** → Coord of oper

Preparation of SORA analysis and related documents

- **GRC** is **3** (scale 1/low-8/high).
- The ARC for the described CONOPS with the V-150 is **ARC-a**
- **Operation SAIL: 2**

Several meeting with ENAC representatives to inform about the process, the approach, the Operator copacity and UAV configuration

Application for UAS operations authorization on 26/02/2021
(as for the *new regulation ENAC UAS-IT del 04/01/2021!*)



Flight authorization (2/2)

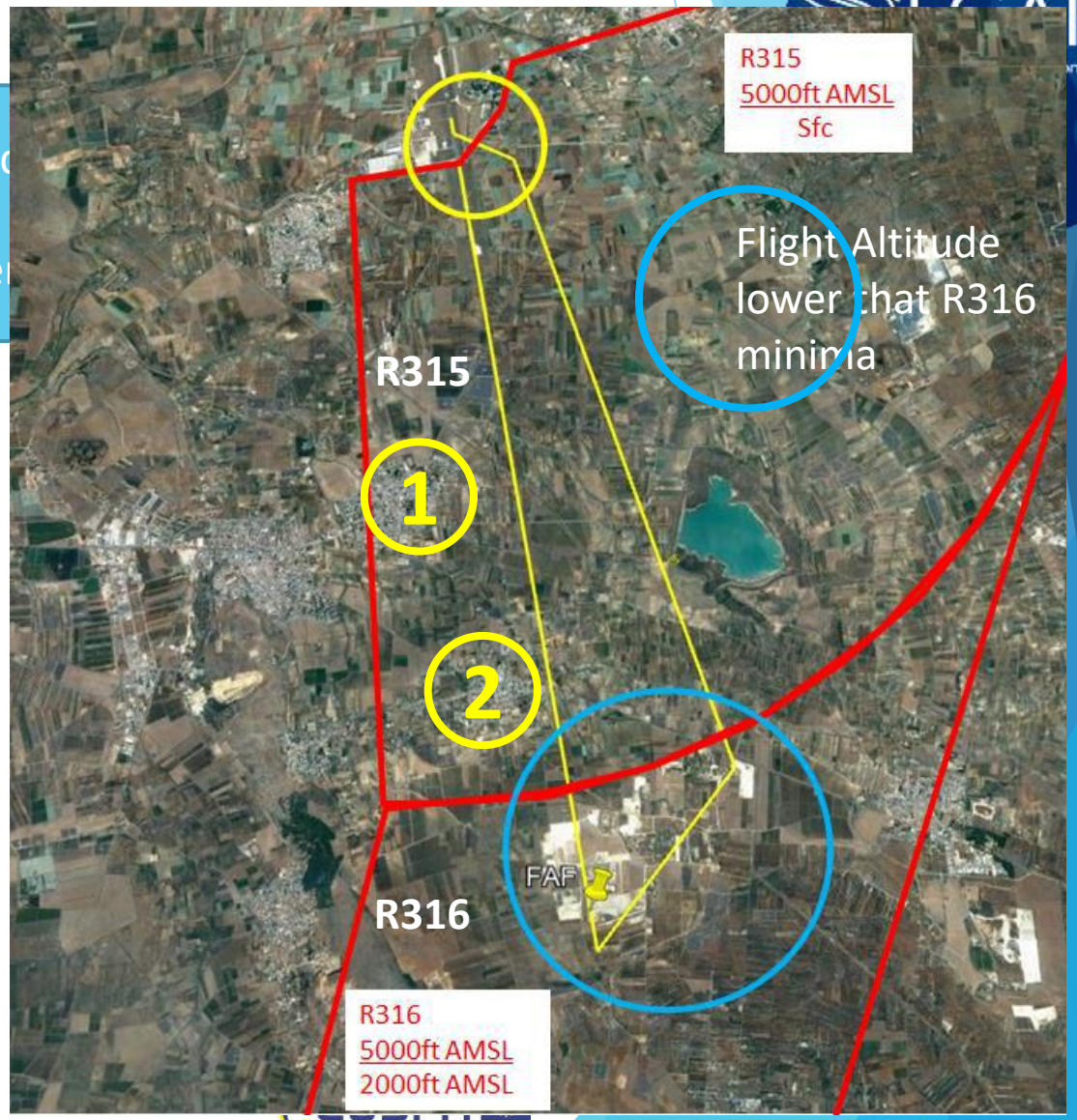
Flight test design and engineering → **Flight test authorization** → Coord of ope

Requests on:

- Pilot license and training
- ATM-09 and air spaces access (R315 + CTR), authorization from IAF achieved (potential conflicting procedures)
- Distance from towns (1 and 2 in figure)
- Operational volume
- Emergency landing points

Authorization to UAS operation issued by ENAC on 01/06/2021

By product: new operational procedure for the Grottaglie airport



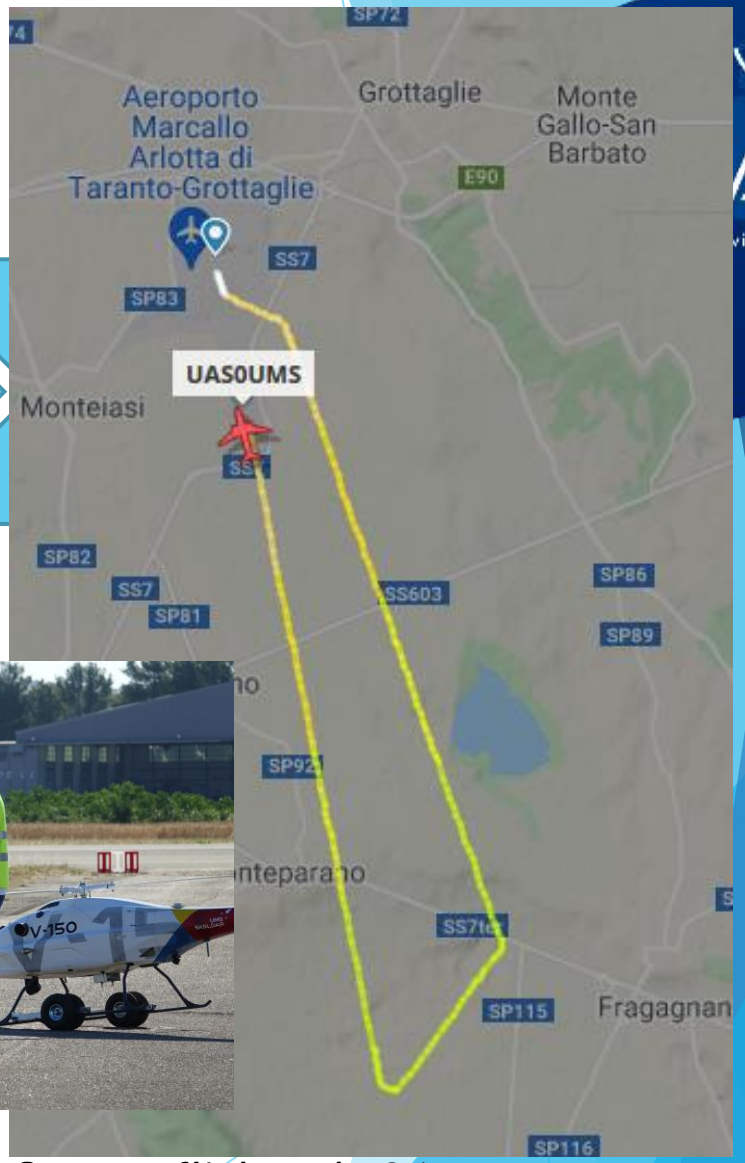
Coordination

Flight test design and engineering → Flight test authorization → **Coordination of flight operations**

KickOff Meeting with all airport operators (for the reference period) to share committment at coordination procedure

- Aeroporto di Puglia
- ENAV
- Italian Navy
- Italian Finance Police
- UMS Skeldar
- DTA

Few events need to reschedule time slots, no flight lost



Source: flightradar24

Results

Flight test design and engineering → Flight test authorization → Coordination of flight operations → **Results**

Data collected during flights and on the ground to study and compare position uncertainty in different conditions

Several flights with different GNSS signal configuration

Actual results of flight test in following speeches

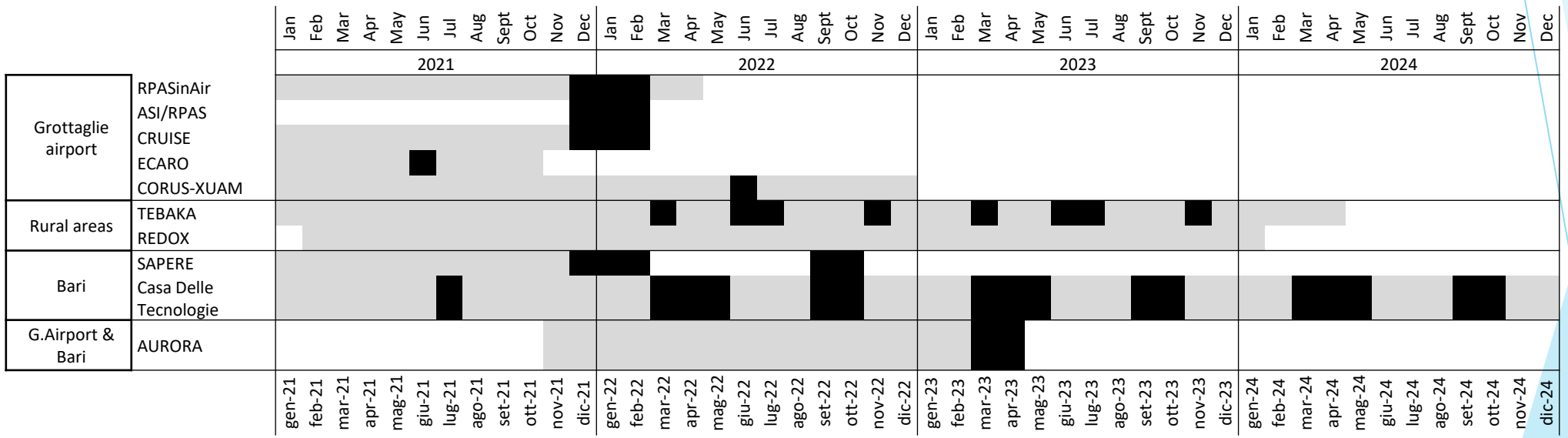
Accuracy horizontal 95%	Accuracy vertical 95%
16.0 m (52 ft)	6.0 m to 4.0 m (20 ft to 13 ft)

GNSS error target value in table

Results and lessons learnt

- RNP APCH at Grottaglie (LIBG) airport for RWY 35
- Updated of the ‘operational procedure’ for the Grottaglie airport to respond to new UAS regulation
- Flight tests’ results positive with respect to the ECARO project (*more in following speeches*)
  - Great motivation for DTA to deploy ground test infrastructure (proposals AURORA, ENAC lead, for ESA NAVISP E3 programme and others)
- Authorization to UAS operations achieved in 90 days. Valid motivations:
  - UMS Skeldar company new to Italian scenario, deep scrutiny from ENAC, positive feedback
  - Challenging air operations (UAS, BVLOS, small towns, air spaces used, IAF in the loop, …)
- Grottaglie airport and related air spaces are optimally suitable and flexible for UAS flight tests
  - Extremely positive feedbacks from UAS operators (great motivation for DTA …)

Next flight trials in DTA initiatives



- Thank you for attention

- For more information
  - Antonio Zilli, antonio.zilli@dtascarl.it