FENYX – Large Aircraft for Research and Experimentation

Modifications in an Aerial Platform for Research and scientific operations and advantages

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1. What is a PAI?

An Aerial Platform for Research, by the Spanish acronym PAI, is a modified and instrumented aircraft for collecting data from the Earth's atmosphere. It provides support for research into the field of atmospheric science, remote sensing and the development of instrumentation that requires testing under real flight conditions.
2. FENYX Project

Problem: Obsolescence of the main INTA platforms. (C212-301, C212-270).

Decision: Acquiring and putting into operation a new high payload and long endurance aircraft.

Acceptance by the Spanish Ministry of Science, Innovation and Universities.

Manufacture, modification and certification of the airplane.

Operation of an Aerial Platform for Research unique in Europe.

What is a PAI?

FENYX Project

Main goals of the project

FENYX’s characteristics

Modifications

Operations

Planification

CIAR
2. FENYX Project

- **Lot 1**: Aircraft. Acquisition of a new airplane with a large life span and flexibility in operation.

- **Lot 2**: Modifications. Transformation into a PAI.

**What is a PAI?**

**FENYX Project**

**Main goals of the project**

**FENYX´s characteristics**

**Modifications**

**Operations**

**Planification**

**CIAR**
3. Main goals of the project

**FENYX Project**

- Atmospheric research, remote sensing and microbiology
- Development of equipment and instrumentation
- Research and development of aeronautical and industrial studies
- International and multidisciplinary collaboration
- Knowledge through personal advising

ENCOURAGE

**FENYX’s characteristics**

- Planification
- Operations
- Modifications

**What is a PAI?**

**CIAR**
4. FENYX´s characteristics

- **Maximum Payload**: 8,000 kg
- **Ceiling**: > 25,000 ft (7,620 m)
- **Cruise speed**: > 400 km/h
- **Range**: 5,000 km
- **STOL: Landing distance**: < 800 m
- **STOL: Take-off distance**: < 800 m

7,000 kg → 6 hours
5. Modifications

- Wing hard points
- Holes and Windows with lid
- Remote sensing opening
- LIDAR opening
- Air intakes in the cabin
- Nose probe support
- Ice monitoring system
5. Modifications

Electrical modifications

Wireless communications

GPS antennas

Video cameras

FTI (Flight Test Instrumentation)
### 6. Operations

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<td><strong>Atmosphere</strong></td>
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<td>• Cloud microphysics, aircraft icing and aerosols.</td>
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<td><strong>Flight testing</strong></td>
<td>• Study of the aircraft flight conditions.</td>
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<td><strong>Development of instrumentation</strong></td>
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<td>• Test RPAS systems: navigation, communication, etc.</td>
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### Key Terms

- **PAI**: Payloaded Autonomous Aircraft.
- **FENYX Project**: A project focused on the development and testing of autonomous aircraft systems.
- **CIAR**: Center for Innovation and Research in Autonomous Systems.

### Project Goals

- **Main goals of the project**
  - Environmental studies.
  - Map environmentally degraded areas, archeological studies, etc.

### Modifications

- **Operations**
  - Validate and calibrate new scientific instrumentation.
  - Test RPAS systems: navigation, communication, etc.

- **Planification**
  - Study of the aircraft flight conditions.

- **FENYX´s characteristics**
  - In situ measurement of atmospheric parameters.
  - Cloud microphysics, aircraft icing and aerosols.
  - Air quality studies, climate change, etc.
7. Planification

What is a PAI?
FENYX Project
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Planification
CIAR

- Proposal selection
  - Agreement signing
- Definition of the specifications
  - Market consultation
  - PPT and PCAP
- Public procurement
  - Supplier selection
  - Contract signing
- Manufacturing phase
- Delivery
The **Rozas Airborne Research Center** (CIAR) integrates both the airborne research platforms existing today in INTA as well as the newly developed unmanned aerial systems (UAS), in a test center that offers the necessary infrastructures for the development of the aircraft and the evaluation of the campaigns to be carried out. These characteristics make CIAR an adequate base of operations for the FENYX aircraft.

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Thank you for your attention