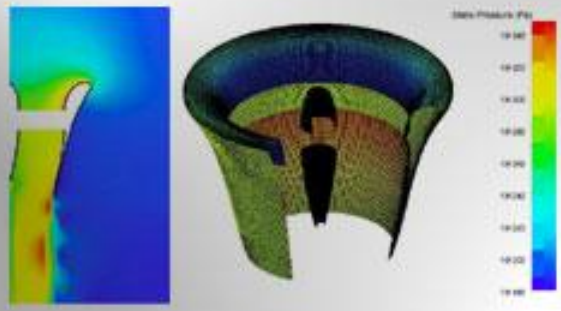
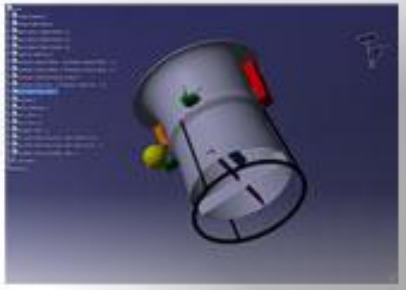
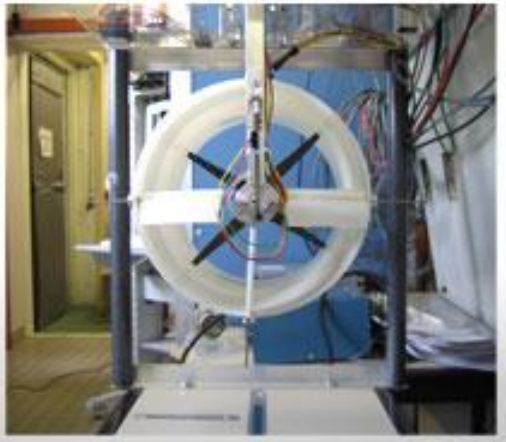
CLUB MICRO-DRONES

THALES



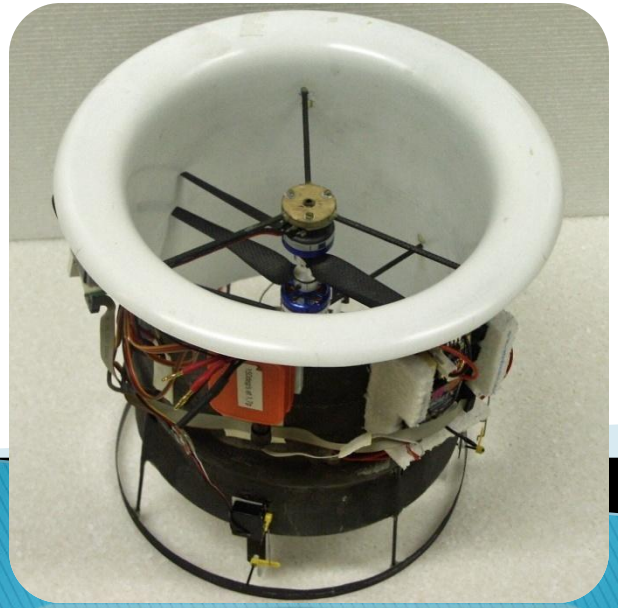
BR2C





SUPAERO

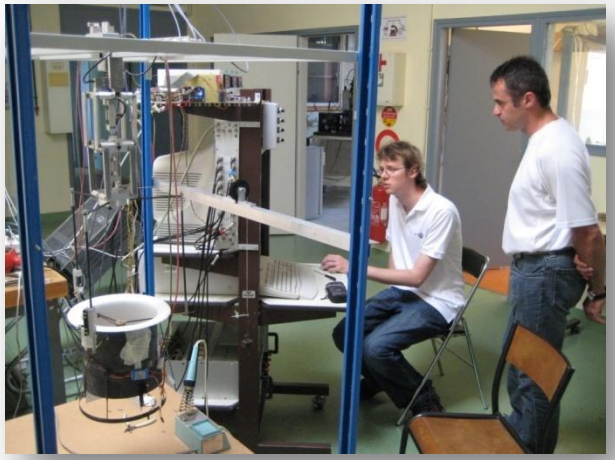
Br2C Project



The project

CLUB MICRO-DRONES
Cmd@supaero.fr

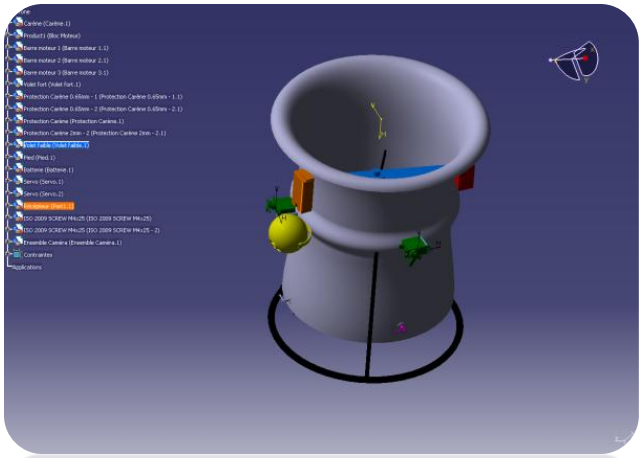
- 9 students team (in first year at Supaero)
- Launched in January 2007
- Research with Supaero's labs



SUPAERO

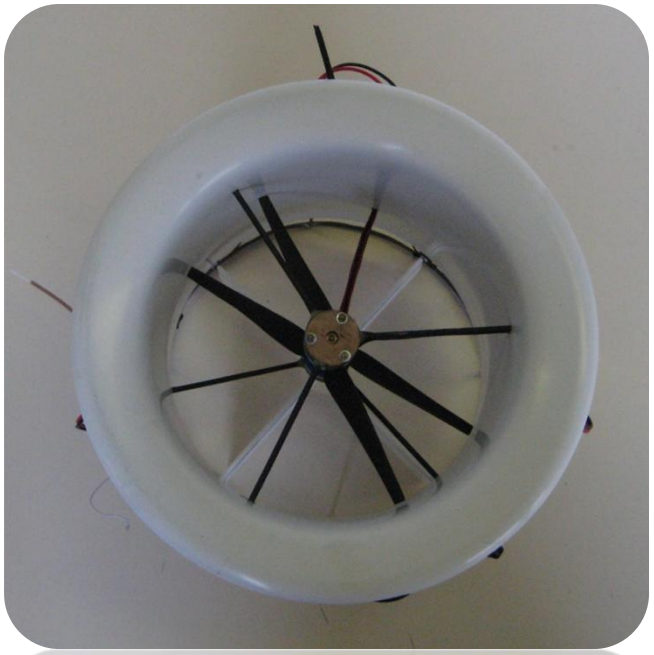
The project

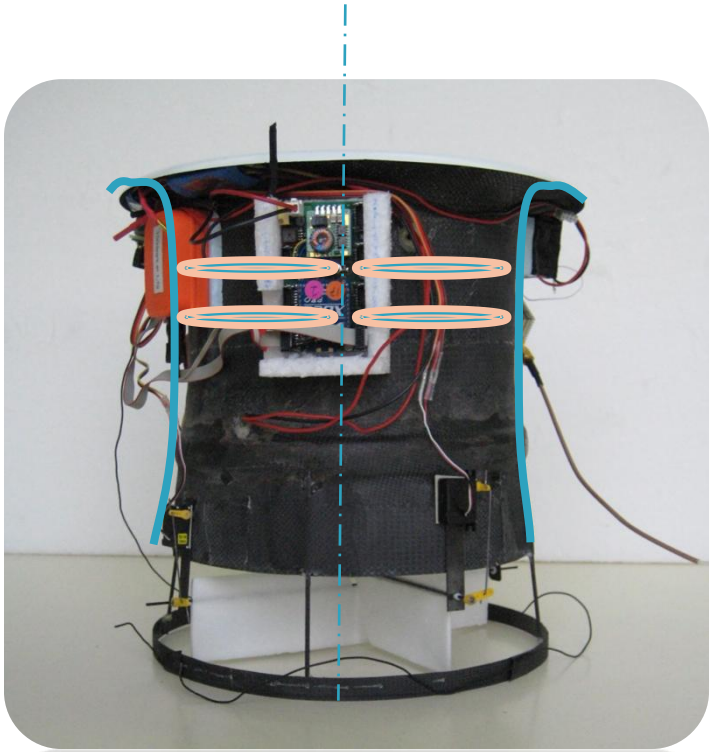
- Stationary flight for indoor missions
  - Resistant
  - Efficient
  - Completely autonomous
  - VTOL capability



How does it work ?

- 2 ducted counter-rotating propellers

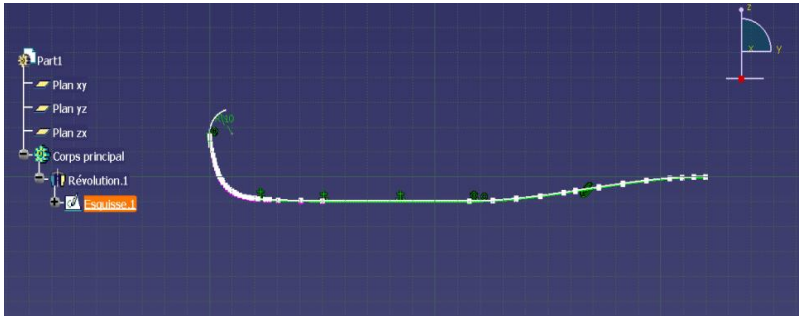


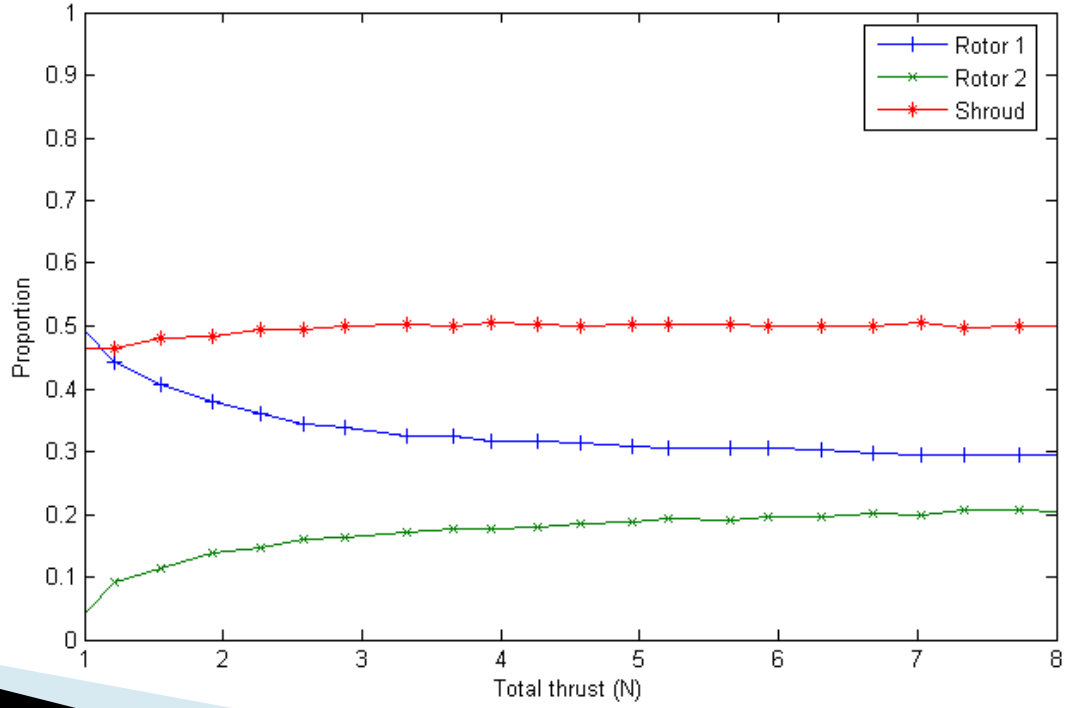


How does it work ?

- Special shroud design :

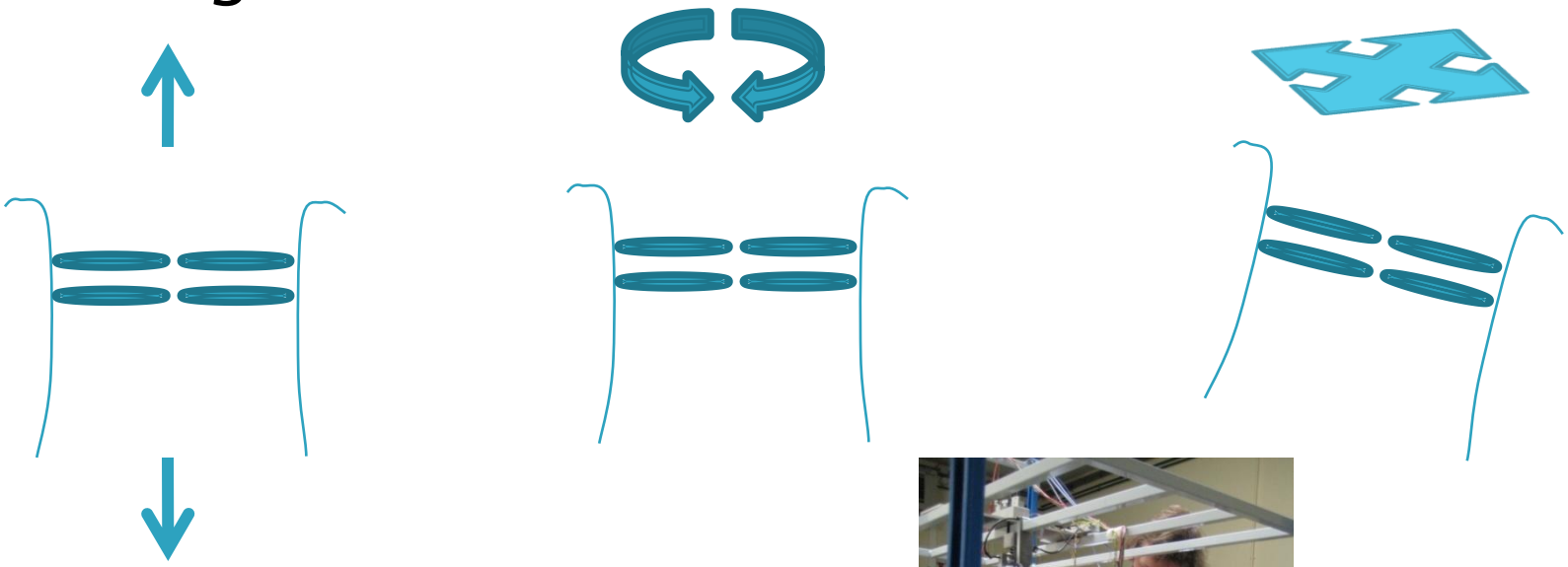
  ½ of the thrust produced by the duct





How does it work ?

- 4 Degrees of Freedom



  - Proportioned flaps
  - Study on mass position

The embedded system

Sensors

Attitude control system

-3 accelerometers

-3 gyrometers

-3 magnetometers

GPS 4Hz

Specifics sensors

-Pitot tube

-Magnetic heading

-Ultrasonic sensor …

Onboard calculator

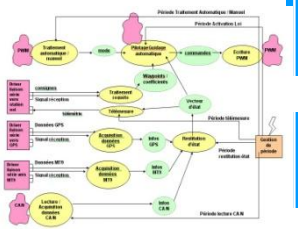
Radio modem
2,4GHz

Software architecture

Generic

Synchronous real time

C++ coding



COMMUNICATION
SWITCH
MANUAL/AUTO

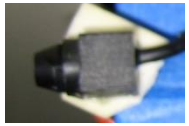
Security
module

Receiver
RC

Actuators

Motors & servos

Embedded
camera



Telemetry

PC remote
control

Video

Ground Station

2 operational
modes :

Mission mode

Debug mode

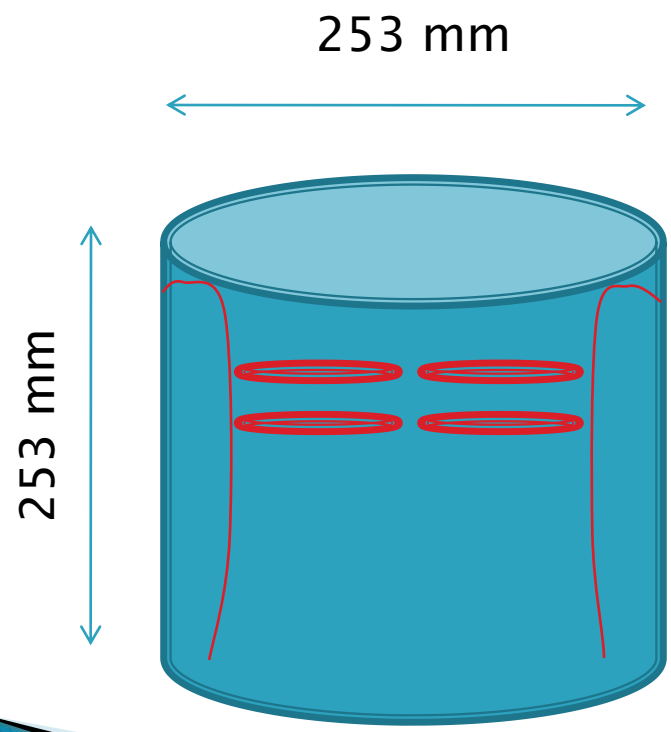
Remote control

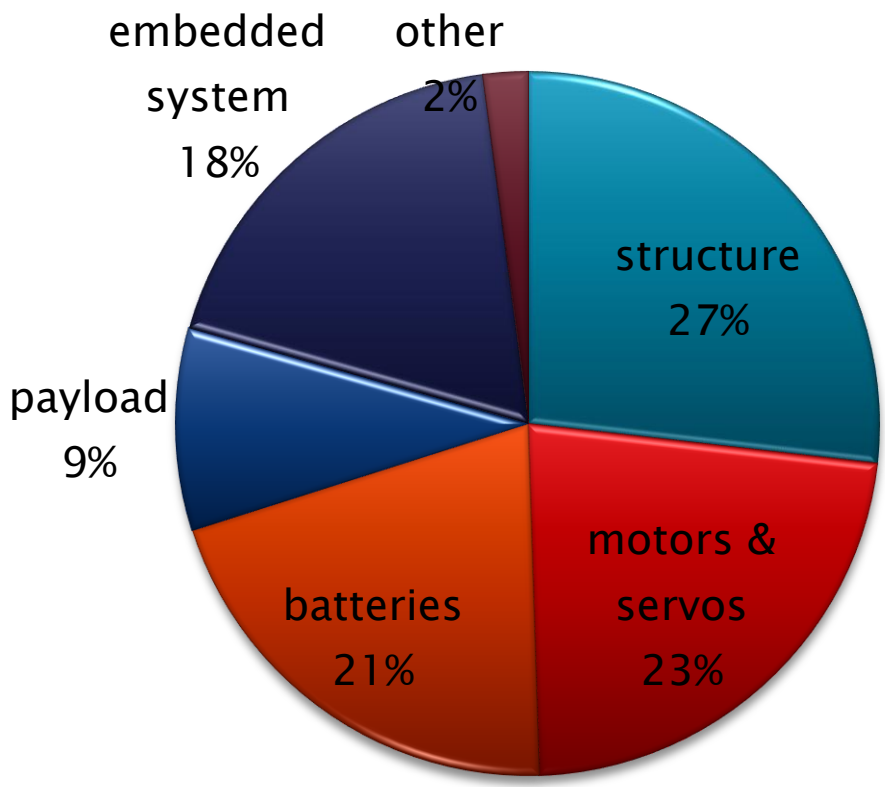
The embedded system

- Stabilized through the embedded system
- High level orders
- Not yet fully autonomous : need for a pilot

Some figures

- 488 grammes
  - Carbon fibre structure





Future developments

- Further the automatic pilot
- Find and fix noise sources
- Vision, obstacle avoidance capability

Thank you !

- Contact

  erik.steenbakker@supaero.fr

- Team members

  Bonnet Matthieu
  Galvin Pierre
  Petitfils Enguerran
  Szalkiewicz Alexandre
  Chapuzet Corentin
  Petit Tristan
  Maurice Guillaume
  Toullec Benjamin

- Special thanks to

  Pr. Barènes, Chief of Aerodynamic and Propulsion Department of SUPAERO
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  Boris Bataillé
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  Dominique Bernard
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