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ROBOTIC HARDWARE SYSTEM
UNMANNED AERIAL VEHICLE (UAV)

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MAIN COMPONENTS

Presentation Outline

02

#1 Physical Design for various applications
#2 Propulsion System
#3 Navigation System (Sensors) & Control
#4 Data Collection
#5 Data transmission
#6 Power Management

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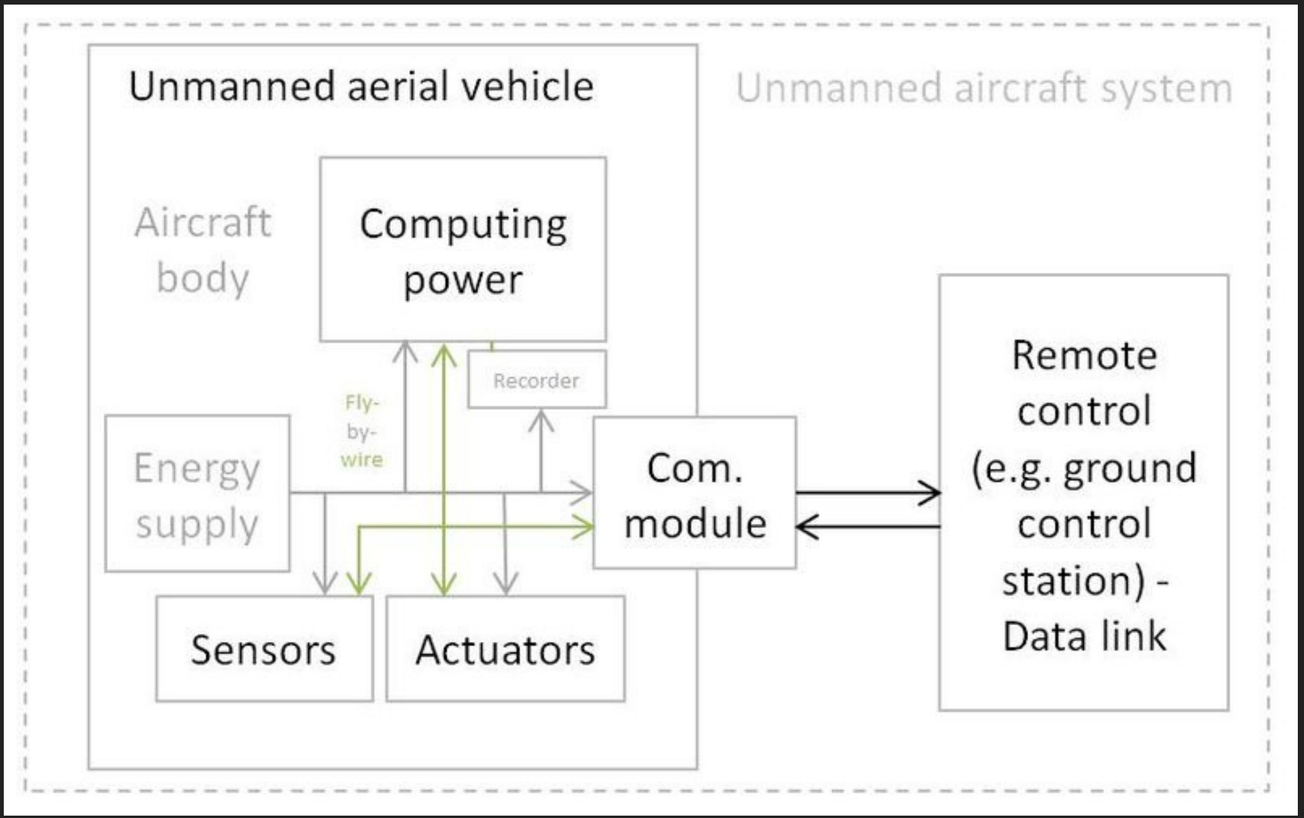

Physical Design

for any UAV robot these are the basic compnents that must exist in the body of the robot, where the the actuators will provide the movement of the robot and the sensors will provide the the needed data to the system and the more info will be prvided about them in the upcoming slides

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U.S. RQ-4 Global Hawk

Larger UAV is a jet-powered craft 44 feet (13 metres) long and with a wingspan of 116 feet (35 metres). The Global Hawk has a cruise speed of 400 miles (640 km) per hour and an endurance of some 36 hours, and it carries a variety of photographic, radar, and electronic sensors.

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UAV-SF15B

SF15B is a single-rotor turboshaft industrial civil unmanned aerial vehicle (UAV) that weighs 300 kg and has a load capacity of 650 kg. The structure of SF15B uses a modularised layout design. The large loading cabin in the front module can carry devices for use in reconnaissance, sensing and measurement missions.

LOCOMOTION SYS TEM AND ACTUATORS

The actuation system is very important to be focused in UAV since it has the importance of saving the components in the air, so if the actuation system is weak it may damage the vehicle. Most of the UAV drones are the same in the actuation idea which is based on the matched propellers but they are diffirent in the way of operate them.

Mejzlik Propellers

Mejzlik is a leading developer of both commercial off-the-shelf and custom propeller solutions for UAVs. The company provides precision aerospace- and military-grade carbon fiber drone propellers for multirotor, fixed-wing and hybrid platforms.

Navigation System (Sensors) & Control

A typical UAV Navigation (UAVN) Flight Control System (FCS) consists of:

Onboard Elements

On Ground Elements

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Onboard Elements

Autopilot

UAV Navigation: VECTOR-600
The VECTOR-600 is a fully integrated autopilot for use in advanced aerial target and UAV platforms where ultimate performance is required. It is suitable for all types of platform

Datalink

UAV Navigation: TELEM07
The TELEM07 is a radio datalink compatible with all UAV Navigation (UAVN) autopilots (AP).

Peripherals

UAV Navigation:

- External Magnetometer (MG01) :

The MG01 is a self-contained magnetometer unit designed to provide precision 3D magnetic field readings in highly dynamic environments.

On Ground Elements

GCS Hardware: Modem

UAV Navigation: Modem with external datalink (GCS03-NR)
The GCS is the hardware interface used to handle communications with the AP (via either an internal or external datalink) and to communicate with the PC running Visionair.

Datalink

UAV Navigation: TELEM07
The TELEM07 is a radio datalink compatible with all UAV Navigation (UAVN) autopilots (AP).

GCS Hardware: Joystick

UAV Navigation: JY02
Where manual control of a UAV is required, UAV Navigation (UAVN) offers the JY02, a radio-control style joystick, for use with its system. The JY02 connects via a cable to any of the Ground Control Station (GCS) units offered by UAVN:

- GCS03
- GCS03-NR

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DATA TRANSMISSION AND COLLECTION

The standard setup configuration consists of: VECTOR autopilot, a Joystick, an external radio (not supplied by UAVN), GCS03-NR and Visionair software.

Power Management

To increase endurance and achieve good performance, UAVs generally use a hybrid power supply system architecture. A hybrid power architecture may combine several power sources such as fuel cell, battery, solar cells, and supercapacitor. The choice of a suitable power source hybridization architecture with an optimal energy management system are therefore crucial to enable an efficient operation of advanced UAVs.

800W Power Distribution Unit

The 800W PDU converts unregulated battery voltage down to a set of regulated outputs suitable for distribution within small to medium-sized UAVs.

Three main outputs are provided, each of which may be user-configured for voltage. The avionics and servo power supplies are fully duplicated internally to maximise system reliability through redundancy. The Power Distribution Unit has dual battery inputs with automatic lossless switchover between the two. An umbilical input ensures that batteries are not depleted during pre-flight checks prior to take-off. The PDU is a joint project between Millswood Engineering and VISIONAIRtronics.