INTRODUCTION (AR): HISTORY, CURRENT TRENDS, MANNED VS UNMANNED.

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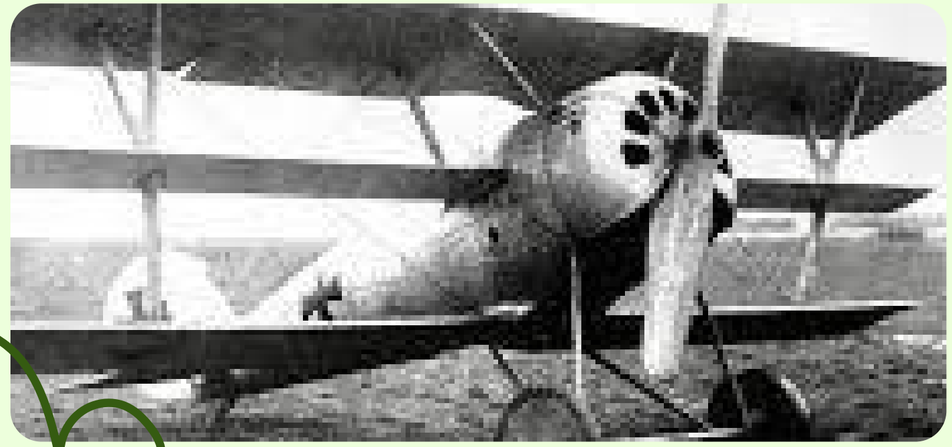
HISTORY OF AERIAL ROBOTICS

- **Aerial robotics has evolved significantly since the first unmanned flights in the early 20th century. The earliest UAVs were developed during World War I, such as the Kettering Bug (1918), a crude precursor to modern drones.**



- **The Cold War era witnessed accelerated development for military surveillance purposes, particularly by the United States and the Soviet Union. By the early 2000s, aerial robotics began transitioning into civilian and commercial sectors, due to advancements in:**
  - Miniaturized sensors
  - Battery technology
  - AI and autonomy
- **Pioneers like DJI (China) revolutionized the consumer drone market in the 2010s, while Insitu's ScanEagle became a staple in military surveillance and maritime security.**

CURRENT TRENDS IN AERIAL ROBOTICS

Modern aerial robotics has grown far beyond simple remote-controlled aircraft. Current trends include:

- **Autonomy & AI Integration**
- **Dual-Use Technology (Commercial + Defense)**
- **High-Precision Mapping & Agriculture**
- **Modular Payloads**

AUTONOMY & AI INTEGRATION

- Skydio X10 uses onboard AI (powered by NVIDIA Jetson) to perform fully autonomous inspections, ideal for GPS-denied environments.

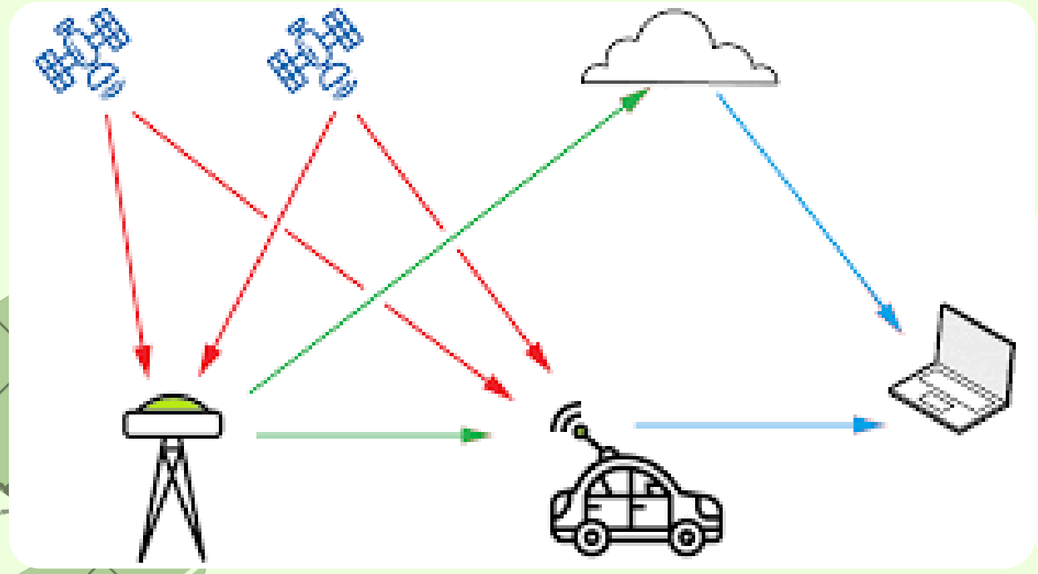
- DJI Matrice 300 RTK uses AI-based route planning and object tracking for infrastructure inspection and mapping.

DUAL-USE TECHNOLOGY (COMMERCIAL + DEFENSE)

- **Parrot Anafi USA is designed for both military and civil applications, offering encrypted data links and thermal cameras.**
- **Drones are now used for public safety, search and rescue, fire detection, and law enforcement.**

HIGH-PRECISION MAPPING & AGRICULTURE

- Delair UX11 represents the rise of fixed-wing UAVs for large-scale surveying in agriculture, mining, and land development.



- Equipped with PPK GNSS and cloud-based analytics, it supports BVLOS (Beyond Visual Line of Sight) operations.

MODULAR PAYLOADS

- Most high-end UAVs (like the Matrice 300) allow interchangeable payloads (LiDAR, RGB, thermal cameras).

- Supports various industries with customizable data collection.

MANNED VS. UNMANNED AERIAL SYSTEMS

Feature	Manned Aircraft	Unmanned Aerial Vehicles (UAVs)
Crew	Requires human pilot onboard	Operated remotely or autonomously
Cost	Expensive to operate & maintain	Lower cost, especially for short missions
Risk	Human life at risk	Minimal human risk
Use Case	Long-range transport, passenger flight	Surveillance, mapping, inspection, delivery
Examples	Helicopters, fighter jets, commercial planes	DJI Matrice 300, ScanEagle, Anafi USA

UAV EXAMPLES

UAV Model	Main Domain	Highlight Feature
DJI Matrice 300 RTK	Commercial/Industrial	AI inspection, RTK GPS
Boeing Insitu ScanEagle	Military/Maritime	Long endurance, satellite comms
Parrot Anafi USA	Defense/Public Safety	32x zoom, encryption
Delair UX11	Surveying/Mapping	BVLOS, GNSS-PPK
Skydio X10	Autonomous Inspections	360° obstacle avoidance, onboard AI

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THANK YOU