# *Italy – Japan Business Group*

## Leonardo Aircraft Division
## Company Profile – Perspective on Unmanned Aircraft Systems

November 25th, 2016

LEONARDO
AIRCRAFT

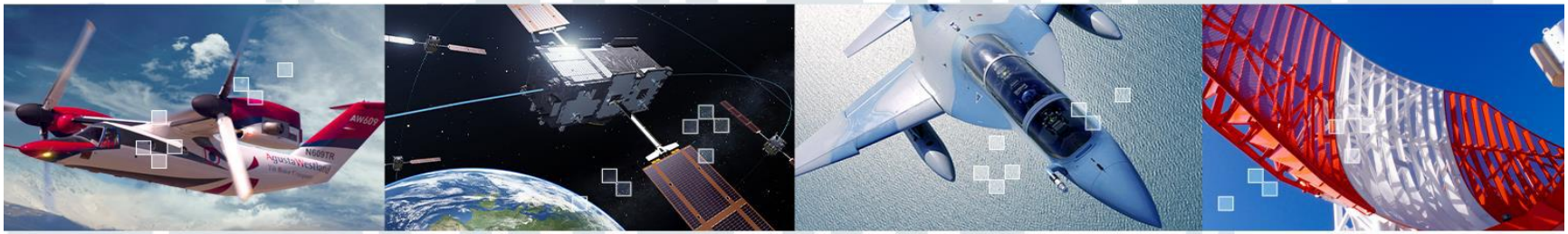
# 2016: A new beginning

## *One Company, Stronger Together*

**1 January 2016:** we absorbed the activities of **AgustaWestland, Alenia Aermacchi, Selex ES, OTO Melara** and **WASS** into One Company, while maintaining Parent Company and Corporate Centre functions for **DRS Technologies, MBDA, Telespazio, Thales Alenia Space,** and **ATR.**

## *Finmeccanica is now Leonardo*

**28 April 2016:** our name changed to Leonardo, inspired by Leonardo da Vinci, a universally recognised symbol of **creativity and innovation. Leonardo** represents the **ideal bridge** between historical legacy and our future in the high-tech industrial sectors.



# Our Business

Leonardo is a global high-tech company and one of the key actors in Aerospace, Defence and Security worldwide.


## SUBSIDIARIES AND JOINT VENTURES

- **DRS Technologies** (100% Leonardo)
- **Telespazio** (67% Leonardo and 33% Thales)
- **Thales Alenia Space**
  (67% Thales and 33% Leonardo)
- **MBDA** (37.5% BAE Systems, 37.5% Airbus Group, 25% Leonardo)
- **ATR** (50% Leonardo and 50% Airbus Group)

# AIRCRAFT

- **Military training**
  - trainer aircraft (**SF-260**, **M-345 HET, M-346);**
  - **Ground Based Training System** (GBTS) for pilots and ground crew

- **Military aircraft**
  - tactical airlifter **C-27J**, and special versions **MC-27J** and **SAR;**
  - **ATR 42/72 MP** (Maritime Patrol) and **ATR 72 ASW** (Anti-Submarine Warfare)

- **International collaborative programmes**
  - **Eurofighter Typhoon**, **F-35 Lightning II.**

- **UAS – Unmanned Aircraft Systems**
  - Technology Demonstrators (**Sky-X** and **Sky-Y);**
  - European Programmes **nEUROn** and **MALE.**

- **Regional transport aircraft**
  - **ATR 42 and 72** turboprop realised in partnership.

# AEROSTRUCTURES

Large structural components in composite and traditional material for the major civil aircraft programmes in Europe and in the US:

- **Boeing**, advanced composite aerostructures for the 787 Dreamliner (2 fuselage sections and the horizontal stabilizer), 767 and 777.

- **Airbus**, aerostructures for the A380, A320 and A321.

- **ATR** (joint partnership), production of all fuselages complete with tail surfaces.

# Leonardo Aircraft UAS BACKGROUND

Leonardo Aircraft has since many years a firm vision on UAS:

- Began deep studies and research in early ’90s
- Participates in all major European research, teamed with Academia and SME
- Built its own technology and operational demonstrators, Sky-X (first flight in 2005) and Sky-Y (first flight in 2007) achieving noteworthy results
- Participates (22%) in Neuron advanced UCAV demonstrator, bringing crucial proprietary technologies
- Participates with equal shares to the European MALE RPAS Definition Study, funded by Italian, German, French and Spanish MoD

In these years, through flying technology demonstrators and research programs, Leonardo has matured critical capabilities enabling the development of future competitive UAS products for both civil and defense worldwide markets

# TECHNOLOGY DEMONSTRATORS

**Sky-X**, UAV/UCAV,
1° flight May 2005

European record breaker: first UAV over a 1 ton class to fly

| | |
|---|---|
| Length | 6.94 m |
| Span | 5.78 m |
| MTOW | 1.450 kg |
| Payload | 150 kg |
| Altitude | 25000 ft |
| Endurance | 2 h |

**Sky-Y**, MALE UAV,
1° flight June 2007

European record breaker with 8+ hours endurance flight

| | |
|---|---|
| Length | 9.7 m |
| Span | 9.9 m |
| MTOW | 1200 kg |
| Payload | 150 kg |
| Altitude | 25000 ft |
| Endurance | 14 h |

**Neuron**, UCAV demonstrator,
1° flight 2012
Alenia contribution includes:

- Program Management, Complete System Engineering, Flight Testing
- Development of the **Attack Mission System**
- Development and Integration of **Electrical Generation and Distribution system**
- Development and Integration of **Low Observable Air Data system**

# UAS Technology Maturation

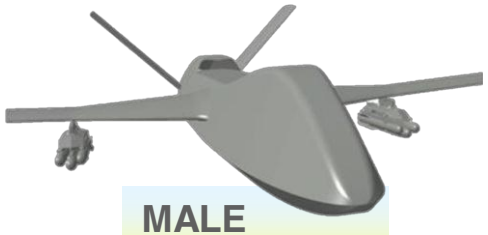
Leonardo Aircraft is sustaining technological and infrastructural investments for being able to offer UAS products that satisfy future customer needs

**Sky-X**

GCS - A/C integration
Data Acquisition & Distribution
Automatic TO & Landing
Rapid Prototyping

**Sky-Y**

Diesel Propulsion integr.
FCS certification
Mission automation
WBDL integration
Remote Sensing Sensors
Low Cost Manufacturing



**MALE Product**

ATM compatibility
Autonomous Mission
Autonomous Attack
C4I Integration
Aut. All Weather Op.s

**UCAV**

Full Certification
Full Autonomous Op.s
Full Situation awareness
Integrated Weapon Sys
Fleet coordination
Full Net-Centric Op.s

UCAV - Combat

MALE Intelligence & Surveillance

2000 2010 2020 2030

# Integration of UAS in Civil Airspace

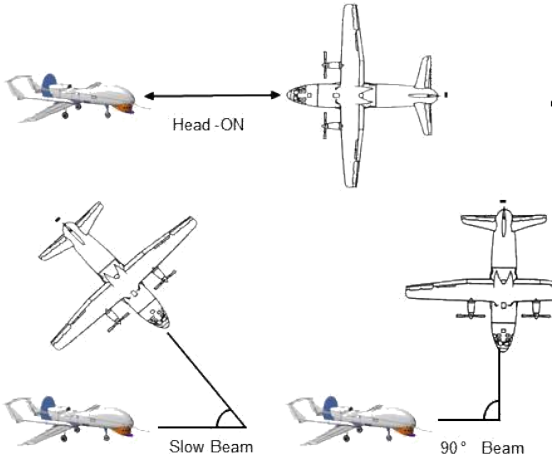
## One of the Enablers: Sense & Avoid Technology

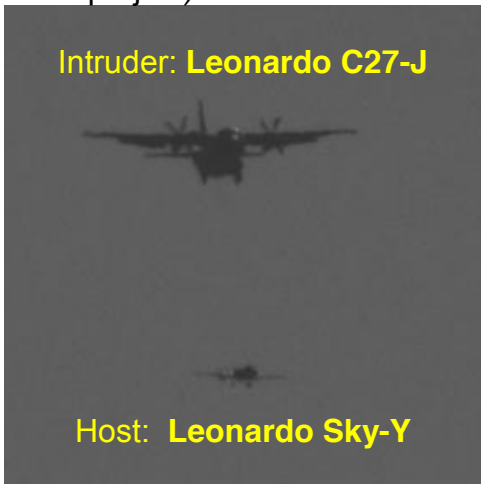
- The integration of UAS in civil airspace is the objective of many on-going international activities, due to potential of a true Civil and Military Dual Use and growth of the Market

- The Sense and Avoid technology is one of the key enabling technology: to reproduce onboard the capability of a pilot to identify conflicting traffic and act to avoid the collision

- Leonardo conduced in Flight Demonstration of «Sense & Avoid» capability with own assets, demonstrating the feasibility of such capability

*First time in Europe to conduct flight tests with a real intruder intentionally put on collision course with UAS, executing Several Automatic Collision Avoidance manoeuvre (*within the context of the European MIDCAS project*)*



# European MALE RPAS Programme

MALE = Medium Altitude Long Endurance

- In August 2016, the contract for a Definition Study of the European MALE UAS Programme was awarded to Leonardo and partners, as initial phase to deliver this important European capability.

- First UAS to fly seamless in European sky, in 2025 frame

- First system conceived in the era of cyber-security threats

- An opportunity to enhance capabilities in several strategic technologies

THANK **YOU** FOR YOUR ATTENTION

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