



# The Challenging Task of the A321XLR Development and Flight Test

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11. January 2024

<https://doi.org/10.5281/zenodo.10572041>

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# A321 XLR

The single-aisle  
Xtra Long Range route opener



## A world of opportunities

Linking primary and secondary cities all around the globe



Flying up to  
**4,700nm/ 8,700km**



Seating capacity  
**180 to 244**



## Higher Efficiency

**30%** lower fuel burn and CO<sub>2</sub> emissions  
and **50%** smaller noise footprint\*



## Unique passenger experience

**AIRSPACE**

Ambience, comfort, design & services



## Full aircraft connectivity

**skywise** and **AIRSPACE** Link

Data-driven operations and passenger services



## Flying with Sustainable Aviation Fuel

Up to **50%** today | **100%** by 2030



## A320

Launched 1984

First Flight February 1987

CFM56 & IAE Engines

MTOW 79t

# A321

Launched 1988

First Flight

March 1993

CFM56 & IAE

MTOW 93.5t

Range 3200NM

PX max 230



# A319

Launched 1993

First Flight

Aug 1995

MTOW 75t

Range 3700NM

PX 160



# A318

Launched 1999

First Flight

Jan 2002

MTOW 68t

Range 3100NM

PX 136



# A320/321

Sharklets

Started 2006

Launched 2009

Delivered 2012



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# A320neo

Launched 2010

First flight 2014

Delivered 2016

CFM & PW



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# NEO: innovation where it matters

**Sharklets**  
State of the art  
aerodynamics



**Innovative cabin enablers**  
Optimization of cabin space  
More seats



**Lower maintenance  
cost**



**New generation engines**  
Optimized fuel efficiency  
Lower noise

# neo Family

Delivering Today:

**20%** fuel  
savings vs. CEO

Up to  
**4,700NM**

# Airbus delivers 1,000<sup>th</sup> A320neo Family

A320neo unbeatable fuel efficiency



The most successful aircraft family ever

 **-50%**  
reduction  
in noise footprint  
and NOx emissions  
vs previous generation aircraft

**-20%**   
fuel burn per seat  
vs previous generation aircraft

 **100+**  
A320neo Family  
customers

Altogether  
IndiGo  
has ordered   
**530** A320 Family  
aircraft

 **The world's  
biggest**  
customer and operator  
for the A320neo Family

IndiGo fly to  
International **22**  
destinations within  
**17** different  
countries

IndiGo

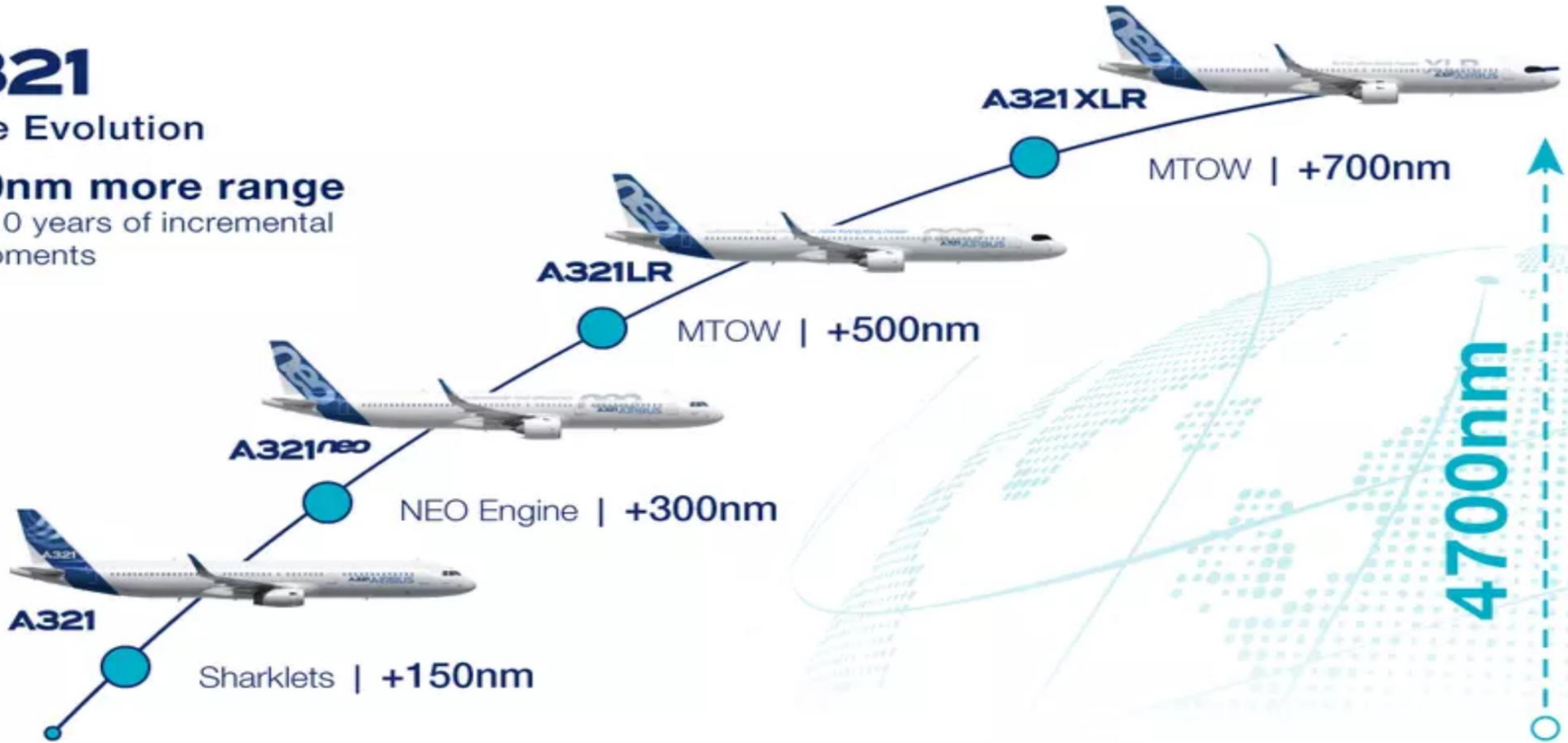
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# A321

## Range Evolution

**1,700nm more range**  
within 10 years of incremental  
developments



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\*Compared to previous generation competition aircraft

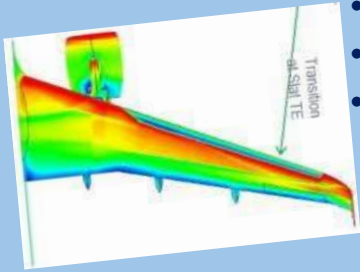
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# A321XLR - What's behind?

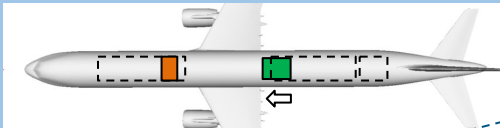
## ATA 27

- E-rudder introduction (incl. 2ELAC/2SEC architecture)
- Generic Laws
- Enhanced Take-off conf. (ETOC)
- Flap Load Relief System



## Wing & Movables

- Inner flap changed to single slotted and re-profiled



## Fuel

- Increased fuel capacity with a new Rear Center Tank (RCT)
- FWD ACT optional

## Fuselage

- Local reinforcement on all sections
- Specific modification for RCT
- Extended aft Belly Fairing

## Weight

- MTOW to 101t

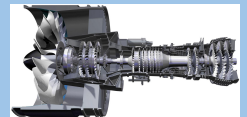
## Cabin

- Airspace as Standard (with 2 bin size options)
- Cabin comfort improvements (incl doors 1&4 insulation)
- Supplementary Potable Water & Waste capacity



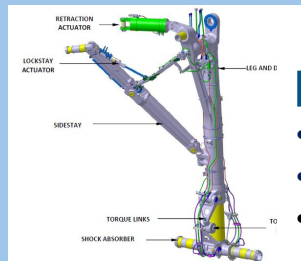
## Engine & Nacelle

- Current CFM/PW engines as baseline

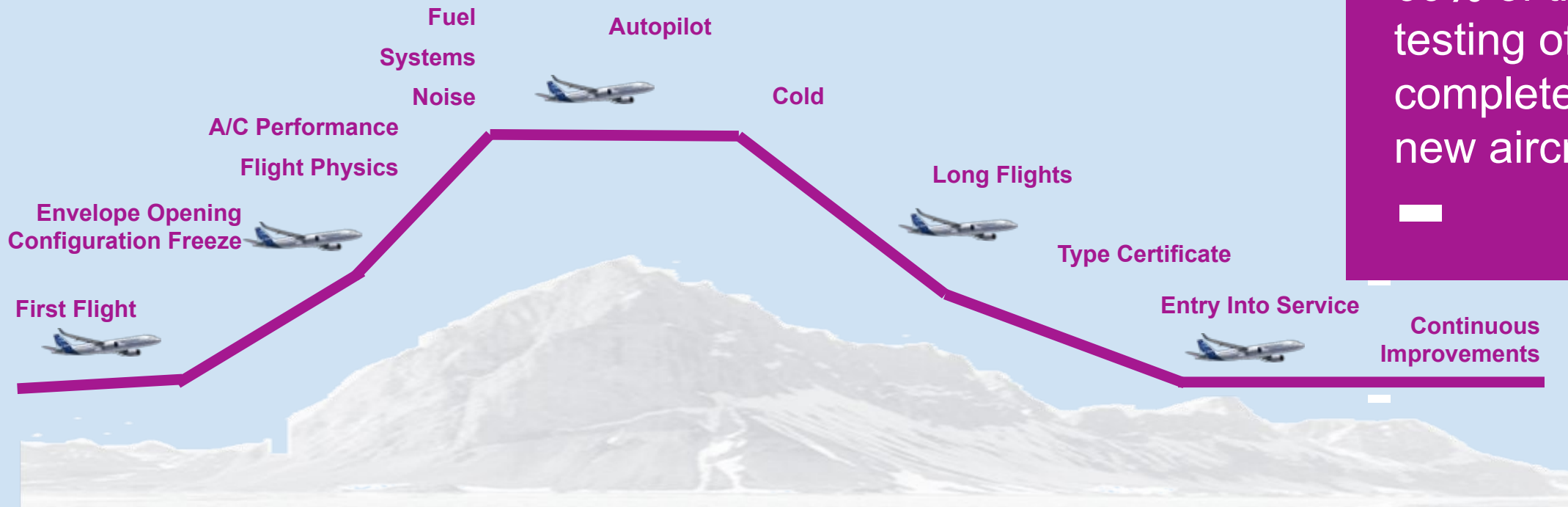
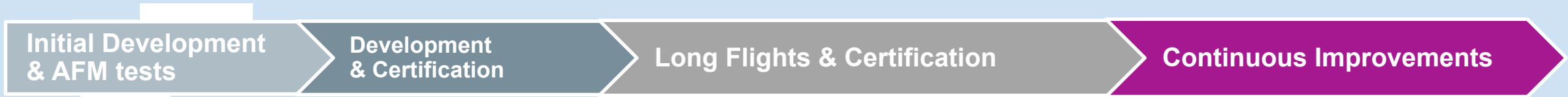


## Landing Gear

- Reinforced Nose & Main Landing Gear
- New wheels, tires
- Extended max brake energy



# A321XLR Flight Test Program: Airframe Development and Certification



A321XLR:  
60% of the flight testing of a completely new aircraft

# A321XLR Flight Test Campaign: Highlights for 2023



**4 Prototypes**

**FTI A/C**  
**MSN11000 (CFM)**  
 First Flight: 15 June 22

**FTI A/C**  
**MSN11058 (PW)**  
 First Flight: 23 September 22

**CABIN A/C**  
**MSN11080 (CFM)**  
 First Flight: 20 October 22

**MSN6839 (CFM)**  
 Early Flight test

Flutter

*Retrofit Fuel liner,  
 Belly Fairing  
 extension*

External  
 Noise

Brakes  
 Max Energy

Cold  
 Weather  
 ATA 29

Autoland

T/O  
 Perfo

Fuel  
 Certification

Cold  
 Weather  
 Cabin

Ice  
 Shapes

Cabin & Maturity Testing

VMU

Handling Qualities: Prot,  
 Flare law, Xwind, VMC,  
 Derotation, etc.

Braking

Certification  
 Flights



# Flight Test Installation



New Generation FTI  
+  
“Fully”  
Instrumented  
Aircraft



# MSN 11000: A321XLR First Flight - June 15, 2022



First Flight



# A321XLR Velocity Minimum Unstick (VMU)



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VMU

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# A321XLR Cold Weather



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# A321XLR Cold Weather



# A321XLR Flight Test Campaign: Achievements

- Anemometry/clinometry calibration
- Flutter tests
- Cruise & CLB performance (incl certification)
- Minimum Unstick Speed (VMU)
- Fuselage thermal model
- Cabin comfort
- Fuel max capacity flight
- Fire detection (Main Landing Gear Bay)
- Handling qualities & autopilot development (ongoing)









**The best  
keeps getting better**

**Questions ???  
After the Movie**

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# Thank you

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