D8 Series: MIT Subsonic Aircraft Concept for Reduced Environmental Impact

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Double-Bubble Design: Major Change in Airframe Configuration

Airframe Technology

- Lifting body with “pi-tail”
- Boundary layer ingestion (BLI)
- Reduced secondary structure weight
- Natural laminar flow on bottom wing surface
- Faired undercarriage

Engine Technology

- High bypass ratio with efficiency small cores
- Lean Direct Injection (LDI) advanced combustor
- Distortion Tolerant Fan

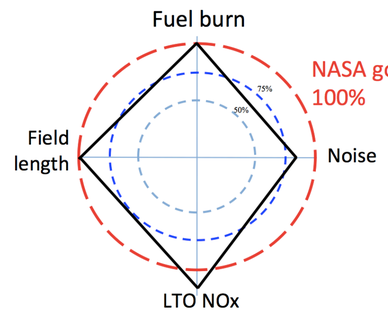
Operations Modifications

- Reduced cruise Mach number (0.72 – 0.74)
- Higher cruise altitude (~40,000 ft)
- Descent angle of 4 degrees
- Approach runway displacement threshold

Phase I: Concepts and Technologies to meet NASA N+3 Goals

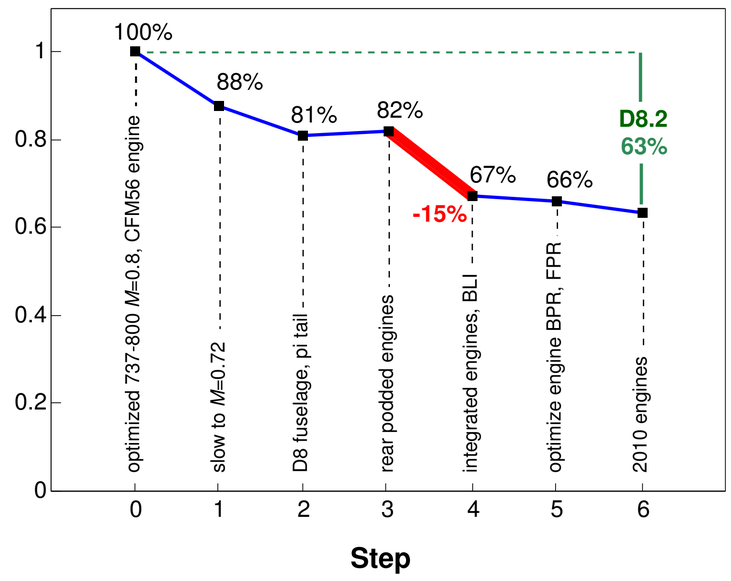
CORNERS OF THE TRADE SPACE	N+1 (2015)*** Generation Conventional Configurations relative to 1998 Single Aisle	N+2 (2020)*** Generation Unconventional Configuration relative to 1997 Large Twin Ais	N+3 (2025)*** Generation Advanced Aircraft Concepts relative to user defined referenc
Noise	- 32 dB (cum below Stage 4)	- 42 dB (cum below Stage 4)	- 71 dB (cum below Stage 4)
LTO NOx Emissions (below CAEP 6)	-60%	-75%	better than -75%
Performance: Aircraft Fuel Burn	-33%**	-40%**	better than -70%
Performance: Field Length	-33%	-50%	exploit metro-plex* concepts

*** Technology Readiness Level Range = 4-6
** An additional reduction of 10 percent may be possible through improved operational capability
* Concepts that enable optimal use of runways at multiple airports within the metropolitan areas

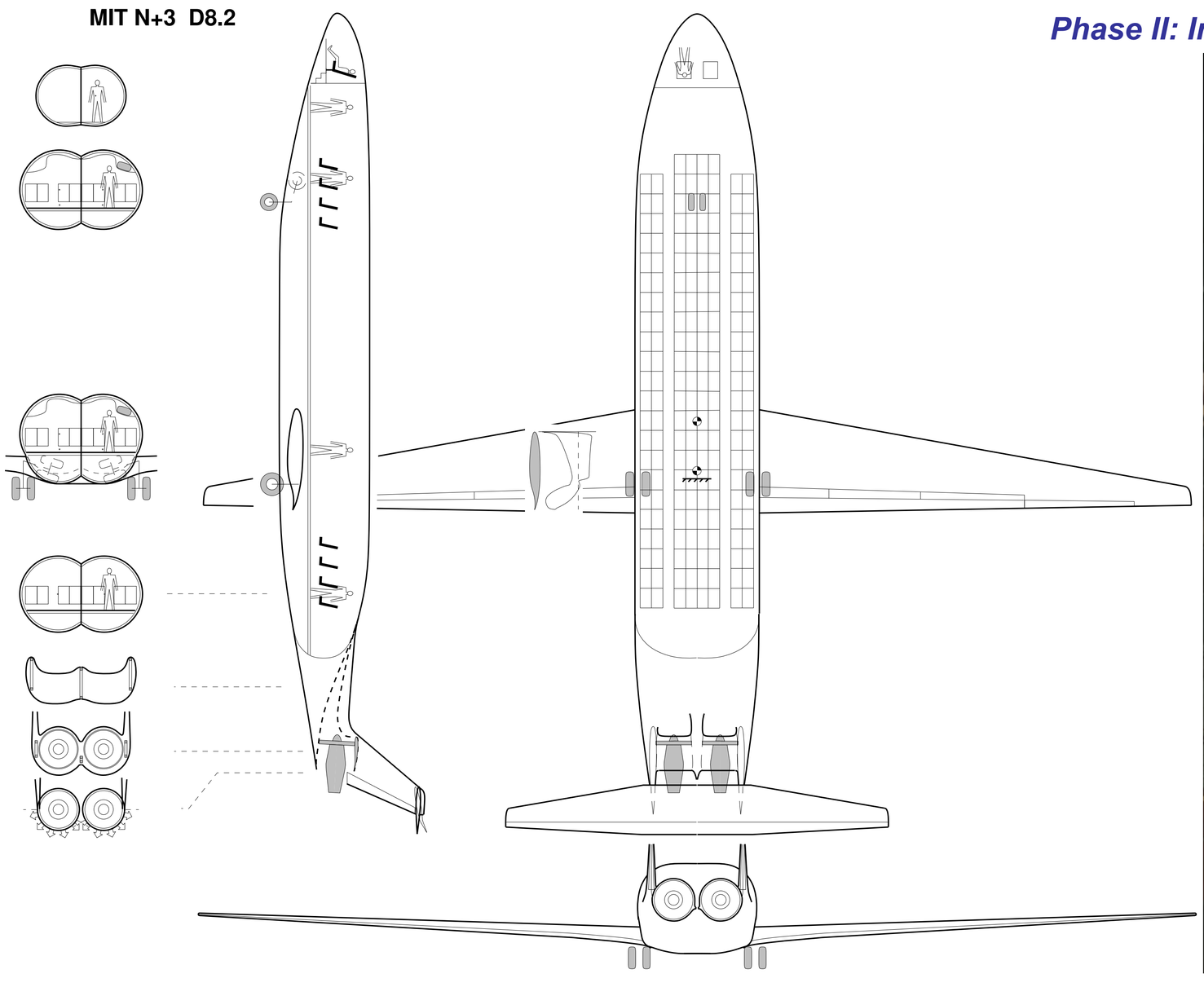


D8 Series concept with advanced technology meets or exceeds NASA N+3 goals for fuel burn, emissions, and field length

Key Technology: Boundary Layer Ingestion



MIT N+3 D8.2



Phase II: Investigation of Benefits of Configuration, BLI

Partners: *Sponsor:*