

Quiet Electric Aircraft Propulsion



**2022-2023 PDAC
Submission**

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Need: Quiet Electric Propulsion

Challenge:

- **Defense:** Traditional aircraft propulsion systems (e.g. turbofans, propellers) are noisy and limit DoD mission effectiveness due to their acoustic footprint
- **Commercial:** The growing Advanced Air Mobility (AAM) market will face significant barriers to public acceptance due to community noise emissions

Solution: Quiet Electric Ducted Fan Propulsors

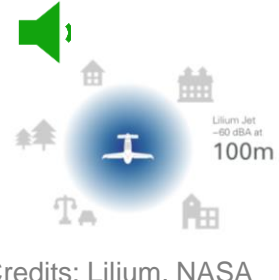
- Unmatched acoustic performance (5x lower noise footprint)
- Enables unique electric and hybrid-electric aircraft configurations for high power payloads and reduced carbon emissions
- Applicable to wide range of aircraft sizes for both defense and commercial applications (eVTOL, eSTOL, eCTOL)

Open Propellers



Open propeller eVTOLs
~80 dBA projected at
220m

Quiet Propulsors



Lilium Jet
~60 dBA at
100m

Image Credits: Lilium, NASA

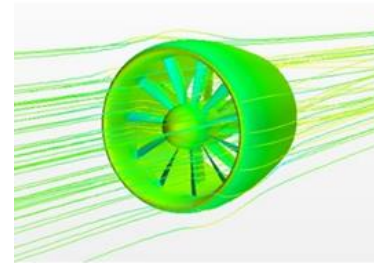


CRG Quiet Electric Aircraft Propulsors



CRG is a national leader in design and integration of quiet electric propulsion systems

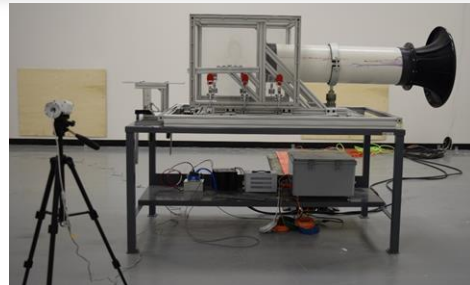
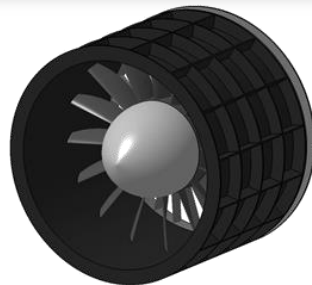
- Custom aero-acoustic design tools demonstrated across broad size/power range (3.5" to 35" explored to date)
- Demonstrated on multiple experimental and prototype U.S. Gov't aircraft
- Designed and built in Dayton using local manufacturing partners and domestic components



Project Overview

Project Overview

- Design and demonstrate 200-350kW class electric propulsor for next-gen DoD aircraft
- Develop affordable manufacturing processes
- Create non-proprietary electric ducted fan performance database for DoD hybrid-electric aircraft trade studies



AF TACFI/STRATFI

- SBIR/STTR:Gov matching funds up to \$15M

Non-Defense Applications

- CRG sells quiet propulsors commercially through its spinout Lectratek, LLC
- Lectratek is a trusted domestic supply chain and integration partner for eAviation powertrain components (propulsors, batteries, power electronics) **made in Ohio**



Making Big Bets on Great Ideas

SUPPLEMENTAL FUNDING PILOT PROGRAM
STRATFI, TACFI

PURPOSE	1	2
Catalyze relationships between Air Force and Space Force end-users and innovation professionals, private sector innovators, and investors.	Bridge the capability gap between current SBIR/STTR Phase I and Phase II scaling efforts, and taking delivery of strategic capabilities for the Department of the Air Force.	

	MATCHING: 2 OPTIONS!		FY20 STRATFI RESULTS
	Defense-Only	Dual-Use	
TACFI Tactical Funding Increase \$375K-\$1.7M	1:1 SBIR/STTR: Gov	1:1 SBIR/STTR: Private	★ 18 SBIR/STTR endorsements awarded
STRATFI Strategic Funding Increase \$3M-\$15M	1:2 SBIR/STTR: Gov	1:1:2 SBIR/STTR: Gov/Private	\$ \$101M in SBIR funds \$102M in matching government funds \$342M in matching private funds over a five year period of performance

Notice of Opportunity

→

AF Customer RFP Release and Contract Award

\$

11 Matched funding committed by **31 government organizations** and **67 sources of private capital**.