

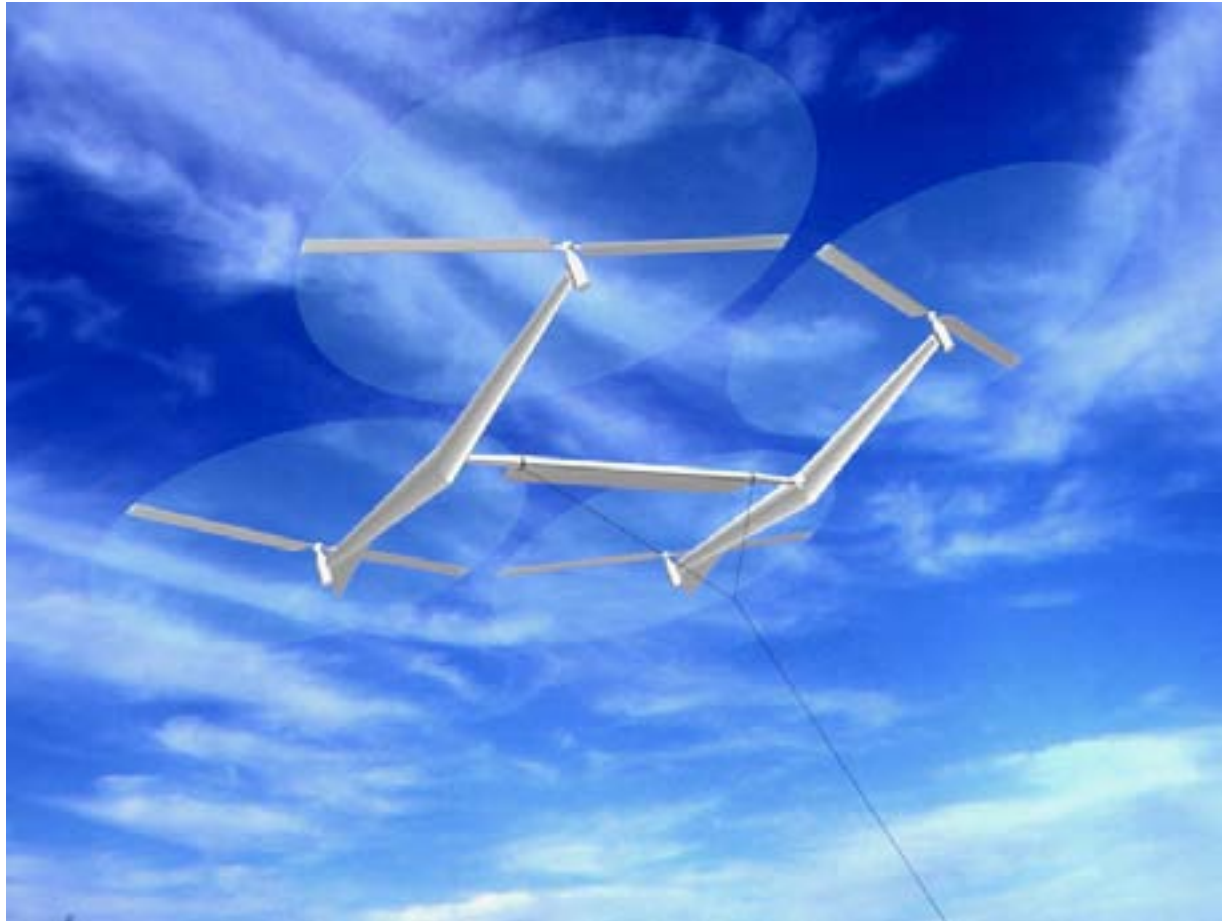


A GENERATION ABOVE™

Len Shepard and Bruce Weddendorf

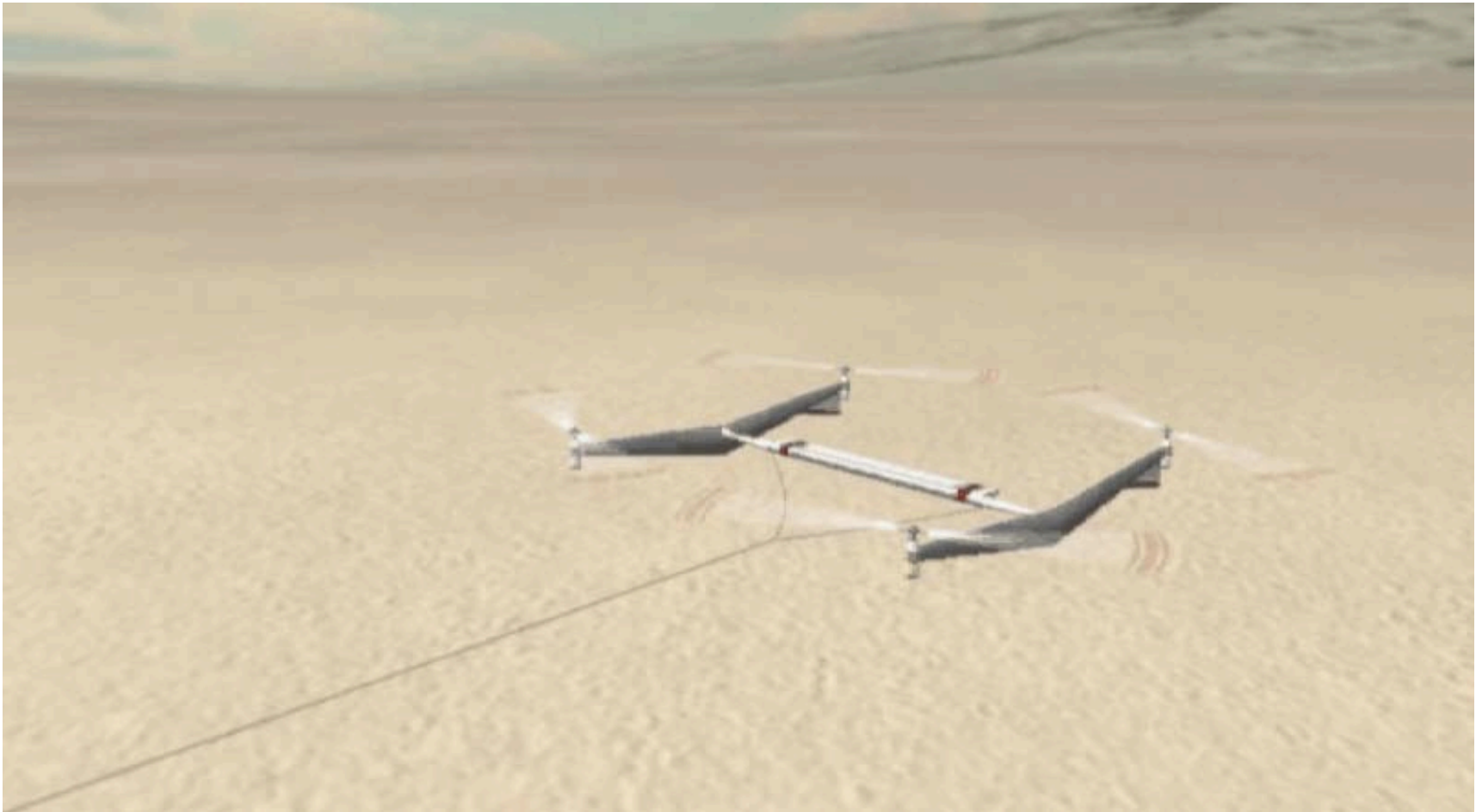


Idea: Harness the Jet Stream



Convert the power in high altitude winds into clean energy for a better world.

Simulation



Development of Quad-rotor based Flying Electric Generators For Sky WindPower

Velocity-Cubed Technologies
October 28, 2010
AWEC Conference



The Velocity Cubed Team

History

- Aerospace (NASA), UAV (Army) and Computer Industry background
- Multi-rotor helicopter development since 2002

Team skills

- Aerospace Project management
- Aerospace Structures and Mechanisms
- Flight control systems simulation and modeling
- High voltage electronics and power systems
- Computer systems engineering

Community

- Huntsville Alabama: NASA MSFC and Army Aviation and Missile Command
- Highest PHD per capita in US
- Team has network of experts to draw on for special problems

Facility

- 7000 Sq Ft dedicated facility
- Fully equipped shops
- Engineering Offices and Software
- Flight testing area in side yard
- Hangar at Courtland Airport, large tow and flight test area

Technical Progress

6kW flight system

- Designed and built flight and ground systems to test FEG concepts
- Developed flight control system hardware and computer simulation model
- Tether constructed
- Maximum altitude ~1000 ft planned

Tests completed

- Power generation with lift on tow
- Flight Stability for Multi-rotor craft
- Flight control systems simulation and modeling verification
- Autonomous flight (video)

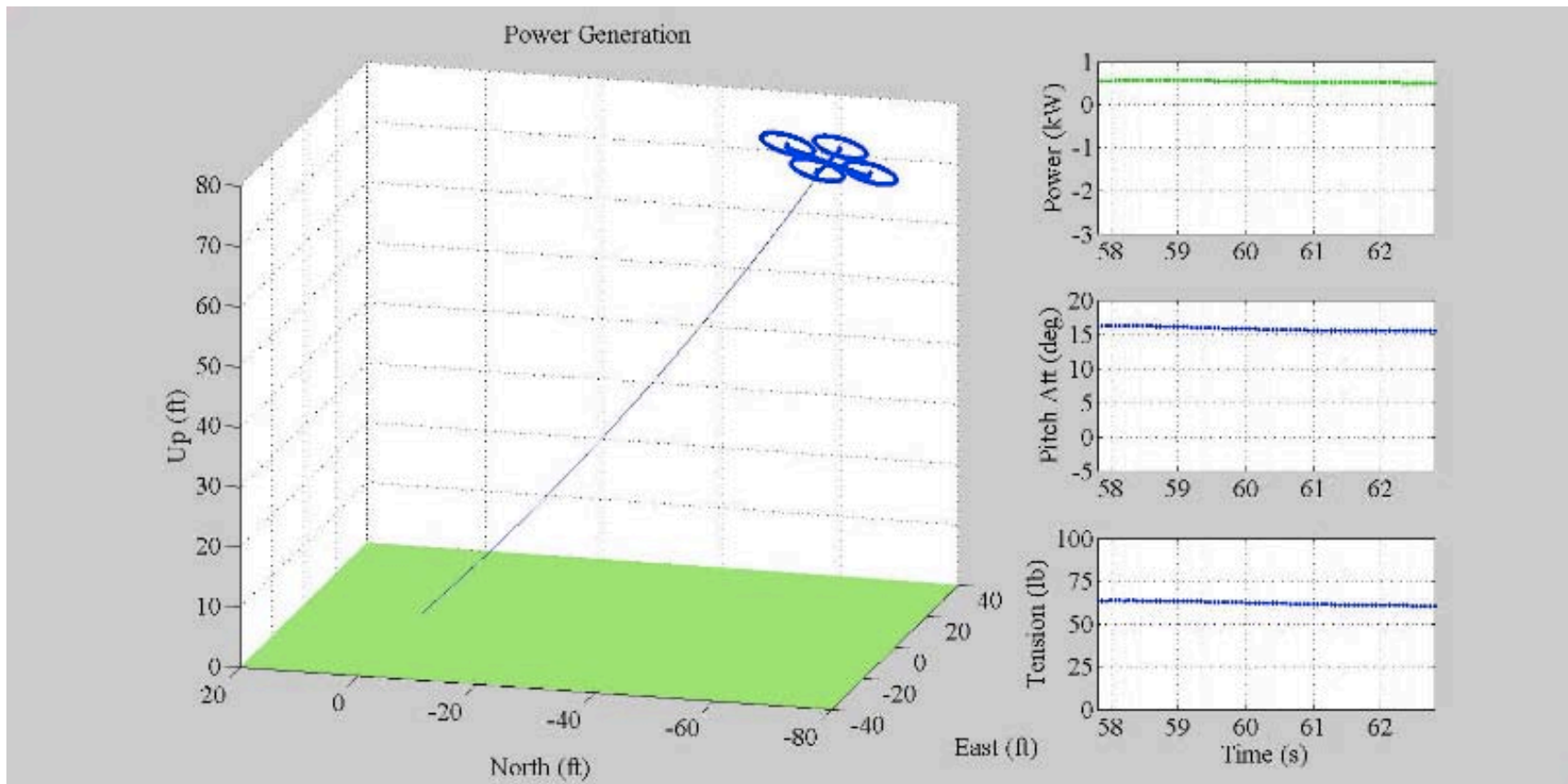
12kW flight system

- Airframe and mechanical construction completed
- Motor controllers in development
- Allows higher altitude ~ 5000 ft

30kW Per Rotor System

- 4 rotor vehicle top level design complete
- 30kw motor built
- Motor testing started
- Rotor components in construction

Simulation



Autonomous Flight



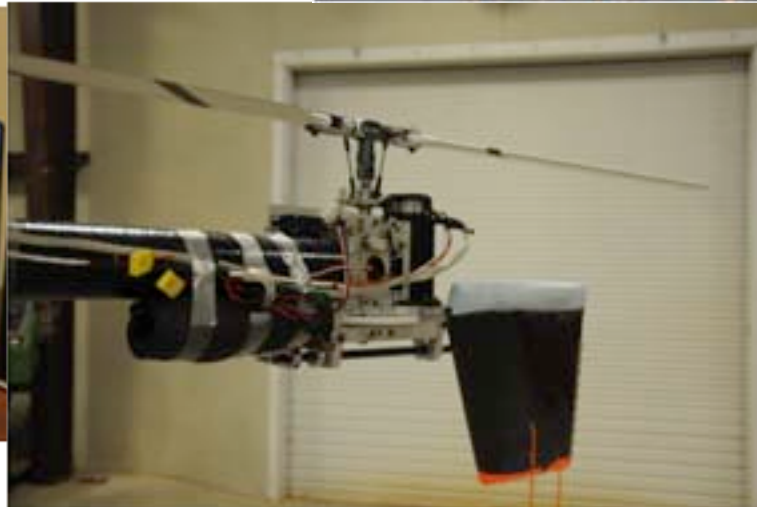
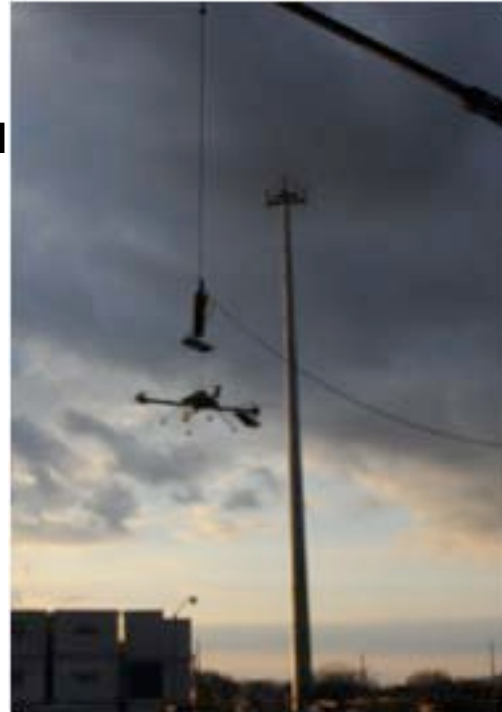
Future Work

6 kW system testing

- Demonstration flight as simulated

12kW vehicle Completion

- Complete ground tests
- High-altitude tether construction
- High-altitude flight tests
- Power generation in flight



Objectives

Collectively gain a category for funding

Secure a place where we can all experiment and test safely.



Together, we can make our world a better place.

Back to the Future

- Wright Brothers
- June of 1940
- November of 1980
- April 25, 2003
- May 25, 2011
- I'll believe it when I see it.



Thank you for supporting AWE!

