

The Aerospace & Defense Forum

Welcome to our SCV & SFV Joint Chapter Meeting  
September 16, 2021

**“Ampaire - a Trusted and Compelling Provider of Electrified Aircraft”**

Soon after logging in to the webinar, you will be placed in a Breakout room of 3-4 attendees for networking. Webinar will begin at 8:00 Pacific Time

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The Aerospace & Defense Forum

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September 16, 2021

Santa Clarita Valley Chapter Host and Sponsor

San Fernando Valley Chapter Host and Sponsors



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The Aerospace & Defense Forum

**Who We Are...**

- A 11-year-old global aerospace and defense leadership community of over 2,400 professionals that facilitates communication, collaboration, and commerce relative to the business of A&D
- Nine chapters – Los Angeles, San Fernando Valley, Santa Clarita Valley, South Bay, Orange County, San Diego, Ventura, Arizona and Dallas-Ft. Worth
- Conduct monthly meetings with presentations, panels and tours with industry leaders focused on some aspect of the business of A&D



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The Aerospace & Defense Forum

**Webinar Guidelines**

- Turn off camera video Alt+V ⌘+Shift+V
- Mute audio Alt+A ⌘+Shift+A
- Active Speaker View Alt+F1 ⌘+Shift+W
- Questions in Chat addressed to Everyone

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The Aerospace & Defense Forum


**“Ampaire - a Trusted and Compelling Provider of Electrified Aircraft”**

Presenter:

**Doug Shane**  
General Manager  
Ampaire, Inc.



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**AMPAIRE**  
Developing electric aircraft with real utility today.  
[www.ampaire.com](http://www.ampaire.com) | [www.ampaire.com](http://www.ampaire.com)

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### At Ampaire, we are upgrading airplanes with electric vehicle technology



We're **already flying** our upgraded Cessna 337 Skymaster with hybrid-electric power.

- \* Architected, designed, built, and tested the EV powertrain
- \* Integrated state-of-the-art components from the EV supply chain
- \* Analyzed, documented, and managed process for FAA regulatory compliance
- \* First aircraft of this type to receive FAA Experimental Market Survey approval
- \* Upon first flight, the world's largest hybrid-electric aircraft

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### We are building a flexible, scalable platform to electrify many planes




Our solution **integrates** with today's planes, while **de-risking** a transformative future.

- \* Complies with existing regulations
- \* Operates with existing infrastructure
- \* Resilient to technological change
- \* Positions us for scalability

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### This undertaking is paramount—we see airlines failing and climate suffering



Aviation's biggest problems can be **solved** by electrification:

- \* Exorbitant levels of CO2 and pollution
- \* Noisy flights that cause communities to shut down airports
- \* Crippling operating costs driven by expensive fuel and maintenance
- \* Low profits that create reliance on subsidies
- \* Reduced service offerings leaving routes unflown and communities underserved
- \* High ticket prices that decimate market size and passenger demand

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### Now is the time to unleash a new mobility market & revolutionize aviation

**\$178 Billion:** the projected hybrid-electric aircraft market 2020 - 2040, according to the Union Bank of Switzerland.




<b>4x increase</b> in profitability for airlines	<b>10x increase</b> in access to destinations	<b>low emissions</b> to easily meet CO2 mandates
Cost Savings: 70% - 90% on fuel 25% - 50% on maintenance	Impact: 500 serviceable airports today 5000 serviceable airports tomorrow	Communities: Reduced emissions & noise Airports are assets, not burdens

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### The Ampaire approach is visionary, yet practical, for the fastest path to industry adoption

Our lean, agile method maximizes learnings and **minimizes time & cost.**

<b>Today</b> Today we are upgrading aircraft to hybrid-electric on a case-by-case basis, using our proprietary technology and techniques. Applicable to thousands of existing planes.	<b>Tomorrow</b> Tomorrow we will partner with major OEMs to replace conventional engines with low-emissions technologies—scaling to dozens of aircraft types and hundreds of units per year.	<b>Beyond</b> The fully-electric future of aviation will be built on the foundation we pioneer today. Our solutions will unlock revolutionary designs, capabilities, impact, and value.
		

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<b>Kevin Noertker</b> Co-founder CEO Northrop Grumman Caltech	<b>Ed Lovelace</b> Chief Technology Officer Dir. Electric Power Sys., Aurora Flight Sciences CTO, XL Fleet	<b>Doug Shane</b> General Manager Pres., Karem Aircraft Pres., The Spaceship Co. Pres., Scaled Composites	<b>Susan Ying</b> SVP: Global Partnerships CIO COMAC Director of R&T, Boeing	<b>Jeff Spitzer</b> Director of Engineering Chief Engineer, Predator C Avenger Jet
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We have garnered support from investors, start-up accelerators and significant institutions

**\$30 Million** in funding to date  
2016 - 2021

**Accelerators** supporting our success

- Techstars
- Elemental Excelsior
- Los Angeles Cleantech Incubator
- Starburst Aerospace Accelerator

**Institutions** investing in our work

- NASA
- ARPA-E
- USAF

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We've successfully proven the benefits of electrification in trial flights across Maui

**40% reduction in cost** compared to traditional aircraft

- Traditional Fuel = \$100
- Near-Term Hybrid = \$90
- Long-Term Electric = \$30

**88% reduction in time** compared to arduous driving route

- Driving = 2hr 4min / 50.2mi
- Flying = 15min / 28.0mi

Hana Airport (HNA) | Kahului Airport (OGG) | Maui

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Ampaire set new records in October while flying from Camarillo to Hayward, CA

24 Flights  
28 Days  
33.5 Flight Hours  
100% Dispatch Reliability

CMA - HWD  
Record Electrified Flight

341 Miles  
2.5 Hours

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Ampaire made history last month by completing the first-ever airline flight trial along an actual airline route

22 Flights  
17 Days  
23.6 Flight Hours  
100% Dispatch Reliability

OGG - HNM  
First Ever Airline Flight Trial

\* Seven of the flights had additional crew on board (Mokulele pilots, program personnel, etc)

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NASA is continuing its support of Ampaire in electrifying the largest passenger plane ever

As a **trusted partner of NASA**, we have received \$7.2M to further study the Eco Otter SX, a Series Hybrid retrofit of the DHC6 Twin Otter.

**Validating Projections** & turning a roadmap into reality

- Noise: 22 - 32 decibel reduction
- Emissions: 20 - 30% reduction
- Fuel / Energy: 20 - 40% reduction

**Scaling Electric Technology** up to the DHC6 Twin Otter

- 19 PAX / 3700+ LBS
- 1 MW Aircraft
- Certifiable within FAA's Part 23 category

\* The new scope of work centers around Risk Reduction in the following areas: Energy Storage System, Turbogenerator, and Control Software and Avionics.

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ARPA-E is using Ampaire's cutting-edge, hybrid-electric testbed to advance energy tech

With the **Ampaire testbed**, ARPA-E can deploy advanced tech in a real flight environment.

**Testing New Tech**

- Power Distribution Systems
- High-Power Electronics
- Batteries & Fuel Cells

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**Meet the Electric EEL**  
Original Aircraft: Cessna 337 Skymaster

- Hybrid Electric
- 300 MI
- 3 PAX
- OR
- 450+ LBS

Fuel Cost Savings: 50 - 70%  
Maintenance Cost Savings: 25 - 50%

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**Meet the Eco Caravan SX**  
Original Aircraft: C208

- Hybrid Electric
- 300+ MI
- 03 PAX
- OR
- 2,300+ LBS

Fuel Cost Savings: 10 - 20%  
Maintenance Cost Savings: 30 - 50%

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**Meet the Eco Otter SX**  
Original Aircraft: DHC6

- Hybrid Electric
- 300+ MI
- 19 PAX
- OR
- 3,700+ LBS

Fuel Cost Savings: 15 - 30%  
Maintenance Cost Savings: 30 - 50%

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**Meet the Tailwind™**  
Fully-Optimized New-Build Aircraft

Fully Electric, No Emissions  
No Compromises

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**Ampaire brings transformative value to the electric aviation industry**

- Speed to Market**  
Our hybrid-electric upgrades to existing planes bring venture-valued returns sooner.
- Regulatory Progress**  
We already have FAA approvals and are working toward certification.
- Sole-Source Contracts**  
We are trusted by NASA, ABRPA-E, and USAF.
- Expert Team**  
We have globally recognized leaders & experts from the aerospace & electric vehicle industries.
- Lean & Agile**  
Our differentiated approach is the lowest-risk and most capital-efficient.
- Customer Traction**  
Customers recognize the real utility of our products, proven through LOIs & orders.

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**The latest: Ampaire has joined forces with Surf Air, and we have an exclusive agreement with Textron to electrify the Grand Caravan EX platform!**

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**Questions?**

<https://www.youtube.com/watch?v=Q2WfGi6IDoQ>

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**The Aerospace & Defense Forum**

**Upcoming Chapter Webinars/Meetings**

Webinars start at 8:00am Pacific Time unless otherwise stated.

- September 16, 2021, In-Person Meeting: 5:30-7:00 pm Phoenix Time "The Impact of the COVID Pandemic as Evidenced by Aircraft Storage and Conversions", Bradley A. Hagen, Manager of Phoenix Goodyear Airport, City of Phoenix Aviation Department and Michael Stafford, Vice President/General Manager, AerSale | [Arizona Chapter](#)
- September 23: "A Business Health Assessment – Whether Exiting or Not"; Larry O'Toole, Founder, Yosemite Associates | [Los Angeles and South Bay Chapters](#)
- September 30: "The future of flight – from electric aviation, to supersonic, suborbital and beyond", Anita Fengueta, CEO/Founder Hydroplane Ltd and Professor of Astronautical Engineering | [Ventura Chapter](#)

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**The Aerospace & Defense Forum**

Recordings of over 250 chapter and webinar presentations are available for download by A&D Forum members (Individual Membership is \$350/year), in addition to free attendance at all A&D Forum meetings and webinars. Membership is free for those not located near one of the nine operating chapters.

You can join the mailing lists of any chapters for free, which will also provide you the monthly A&D Forum Newsletter.

Opportunities to sponsor chapters and to sponsor webinars are available.

For more info:  
<https://aerospacedefenseforum.org/>

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**The Aerospace & Defense Forum**

**Thank You**

For more info:  
<https://aerospacedefenseforum.org/>

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