



**TRUCKEE
TAHOE
AIRPORT**



**FLIGHT RESEARCH
AEROSPACE**

***“Environmentally Responsible Aviation in Truckee Tahoe –
The TTAD Fly Quiet Ambassador Aircraft Initiative”***

Concept Overview

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*Col Paul “Speedy” Fast
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dba Flight Research Aerospace*

Intro & Overview



- Local pilot (Carnelian Bay) and business owner (Moffett Field & Reno)
- Member of the Truckee Tahoe AS & FF Board of Directors
- Colonel in USAF Reserve – Vice Commander, 926th Wing (Nellis)
- We have the best GA airport in the country, operated by the best management and staff, and serving the best communities!
- ***How can the local aerospace industry and pilot community help the TTAD Directors and Staff continue to “tell the story” of aviation’s positive impact on our community, and the environmentally responsible aspects of aviation technology being implemented right here in Truckee?***

Truckee Tahoe Airport District Environmentally Responsible Aviation Fly Quiet Ambassador Aircraft Initiative

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- In partnership with TTAD and Flight Research Aerospace...
- **Provide TTAD with aircraft and outreach services to “tell the story” of environmentally responsible aviation, and to expand TTAD’s ability to effectively manage and advocate safe and effective aviation in the TRK operating area using state of the art general aviation technology**
- Brand new Zenith STOL CH 750 powered by Continental’s new CD155 JET-A fueled diesel aircraft engine – extremely safe aircraft for high density-altitude operations
- Propeller and engine combination provides dramatic efficiency and noise advantages
- ***Incorporate the aircraft into TTAD’s continued Fly Quiet, pilot, passenger, and community outreach and service programs...***



Extremely safe aircraft for high density-altitude operations



How does an Ambassador Aircraft support Fly Quiet & Community Outreach?

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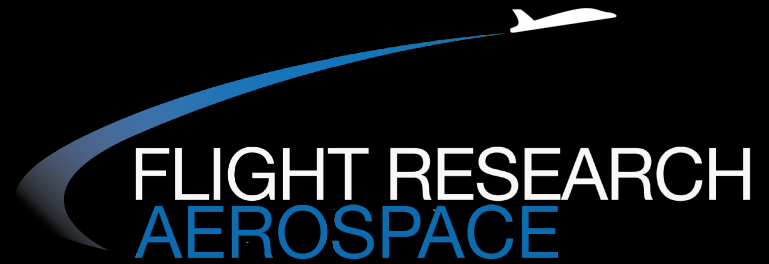
Integrate the Ambassador Aircraft into daily life at TRK...

- Regular static display with supporting awareness and educational displays
- Fly the aircraft regularly, with real-time and recorded position reporting available on an Environmentally Responsible Aviation mobile app
- Incorporate into the Truckee Tahoe Air Show and Family Festival brand, year-round (promote STEAM exhibits, volunteerism, awareness)
- Incorporate into the EAA community outreach activities such as Young Eagles
- Quarterly STEAM-themed events with the aircraft
 - Host local schools for aviation-themed seminars on theory of flight, airplanes 101...
 - Design-a-logo contests for display on the aircraft
 - Honorary pilot-of-the-month contests, name on the aircraft
- TTAD staff flies the aircraft as needed for airport management and advocacy
 - Procedure verification and testing
 - Early detection fire watch
 - Orientation flights
 - Search and Rescue



CH 750 "Guardian" equipped with pan-tilt-zoom camera
- ideal for fire watch and SAR

Tell the story...



- *“TTAD partners with local veteran-owned aerospace company to provide a Fly Quiet Ambassador Aircraft that highlights new technologies in environmentally responsible aviation...”*
- *“The Fly Quiet Ambassador Aircraft is a catalyst for STEAM outreach initiatives in our community. Our local students gain hands-on access to aviation technology that inspires curiosity and passion for the sciences, and our environment...”*
- *“The flight paths and noise footprint of the TTAD Fly Quiet Ambassador Aircraft are available to the public on the TTAD Fly Quiet Ambassador Aircraft app. See where the Green Machine is today...”*

Program Concept



- Aircraft owned by Flight Research Aerospace (FRAero / Fast Dev LLC)
 - 3-year lien placed on aircraft by TTAD to ensure availability throughout a 3-year period of performance
- Insured, maintained, and managed by FRAero
- Hangar and fuel funded by TTAD
- Aviation outreach integration services provided by FRAero
 - Aircraft management (movement, maintenance tracking, flight scheduling)
 - Outreach marketing materials and multi-media
 - Aircraft display hosts, tour and seminar docents
 - Public-facing advocacy
- TTAD Environmentally Responsible Aviation Mobile App
 - Tracks aircraft flight paths in and around TRK
 - Displays compliance with Fly Quiet procedures
 - Tracks the Ambassador Aircrafts activity and flight paths
- Aircraft available to TTAD staff pilots for local missions

TTAD Investment (1)



- 3-year period of performance (PoP)
- \$220K total fee for services
 - 1,440 hours of outreach services
 - Static displays
 - STEAM events
 - TTAD ERA Mobile App
 - Design, development, fielding
 - Maintenance
 - 360 hours flight time for TTAD staff pilots
 - All compliance, maintenance & scheduling
 - Aircraft available to TTAD for:
 - New procedure test & evaluation
 - Early detection fire watch
 - Community orientation flights
 - Search and rescue support

3 years and \$220,000 later...

- 360+ hours of quiet and efficient general aviation hours flown by TTAD Ambassador Aircraft with direct outreach to the community
- 5,400 airport visitors exposed to TTAD's Fly Quiet Ambassador Aircraft and displays
- 600 school-age children exposed to focused STEAM outreach using Environmentally Responsible Aviation as a catalyst
- 100,000s of Fly Quiet Ambassador Aircraft app hits
- Dozens of media articles highlighting TTAD's focus on Environmentally Responsible Aviation

TTAD Investment (2)

- Year 1

- \$100K lump sum payment upon delivery of aircraft
 - Development of mobile app (\$40K value)
 - 480 hours outreach support services (\$48K value)
 - 120 hours flight time for TTAD staff pilots (\$18K value)
- Indicate TTAD as lien-holder on the aircraft
 - Lien remains until end of PoP
 - Protects TTAD from early sale of aircraft
 - Ensures aircraft availability for entire PoP

- Years 2 and 3

- 24 x payments of \$5K per month (\$120K)
 - 960 hours outreach support services (\$96K value)
 - 240 hours flight time for TTAD staff pilots (\$36K value)
 - On-call outreach and advocacy support

3 years and \$220,000 later...

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Potential Partners



- Zenith / Zenair
- Continental
- NASA
- Lighthawk Conservation Flying
- Tahoe-Baikal Institute
- Civil Air Patrol
- Placer & Nevada County LE & SAR
- EAA
- Enola Labs
- Cal Fire
- UNR / NAASIC

Discussion



- Does this concept fit into the TTAD community outreach, Fly Quiet, and aviation services mission?
- Is there measurable value to the Truckee Tahoe community (i.e. STEAM, fire detection, visibility on compliance)?
- Is this concept viable in the eyes of ACAT? BoD?
- Is the investment a realistic one for TTAD (ACAT)?
- Why not pursue the Redhawk Diesel Cessna 172?
 - Underpowered for safe and effective TRK operations
- Timing...

- Aircraft acquisition – 4 months
 - Source the airframe + engine
 - Engineering solutions for first-ever CD155/CH750 pairing
 - Certification and reviews by FAA DAR
 - Modifications for patrol operations?
- Development of app
 - Engage Enola Labs
 - Integrate with existing “FlightAware”-like data streams
- Source and develop multi-media displays
- It all starts with TTAD ACAT approval and funding...

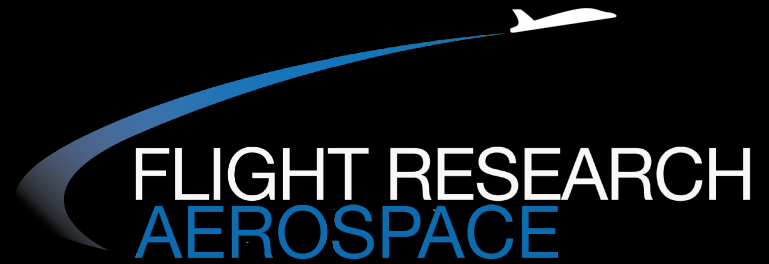


Lightweight EO/IR camera ball

Backup Charts



Engine CO2 Pollution- JET-A vs. 100LL

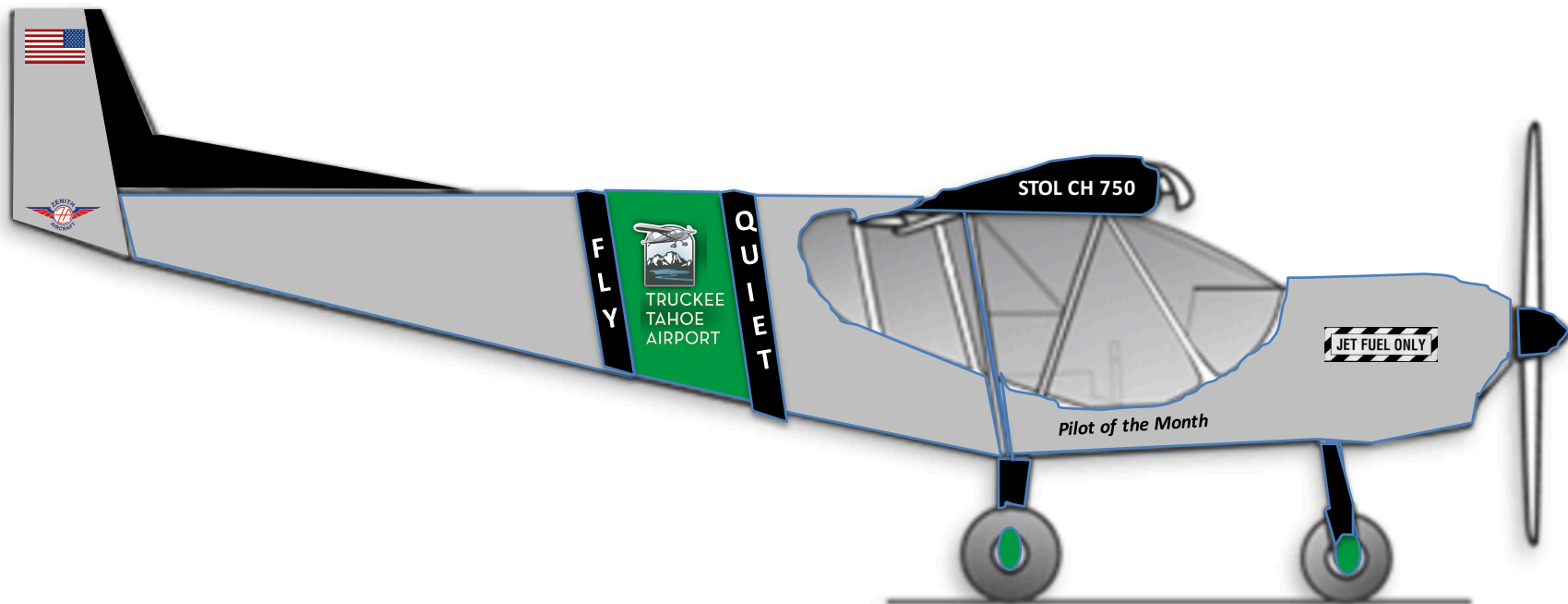


- When comparing the JET-A diesel engine to a 100LL Avgas engine...
 - Important to compare “apples to apples”
 - Must acknowledge fuel efficiency, horsepower, and pounds of CO2 pollution per gallon
- Fuel comparison – CO2 pollution produced
 - JET-A: **21.1 lbs per gallon**
 - 100LL: **18.4 lbs per gallon**
- Engine comparison
 - Continental CD155 JET-AI
 - 155 hp (turbocharged, no loss at TRK op altitudes)
 - **5.2 gallons per hour in cruise**
 - Lycoming O-320 100LL
 - 160 hp (no turbocharger, expect 80% power at TRK op altitudes)
 - **9 gallons per hour in cruise**
- Assuming one hour of flight...
 - **JET-A Diesel: 5.2 gallons → 110 lbs CO2 / hour**
 - **100LL: 9 gallons → 156 lbs CO2 / hour**



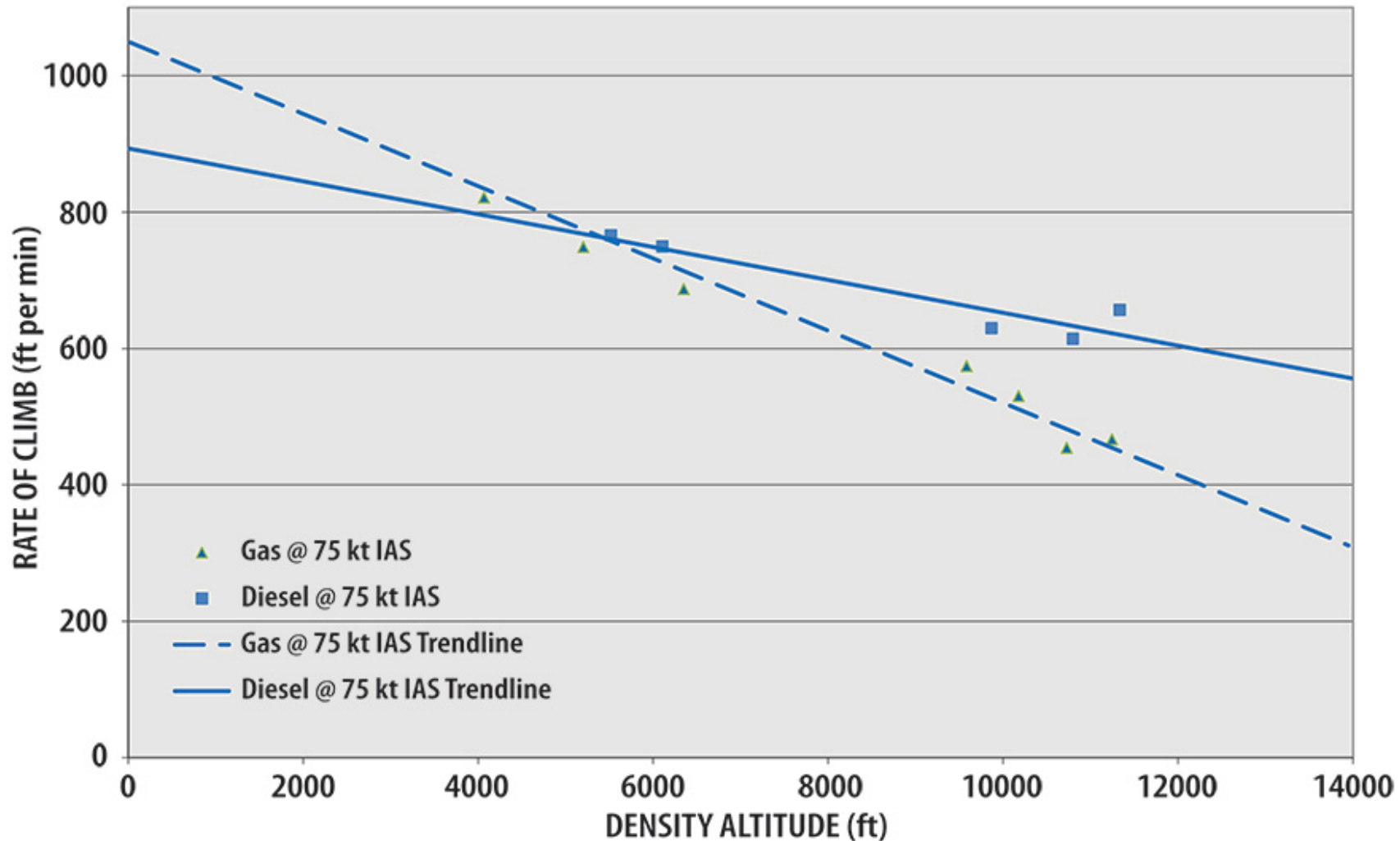
JET-A diesel engine produces 30% less CO2 pollution than comparable 100LL engine.

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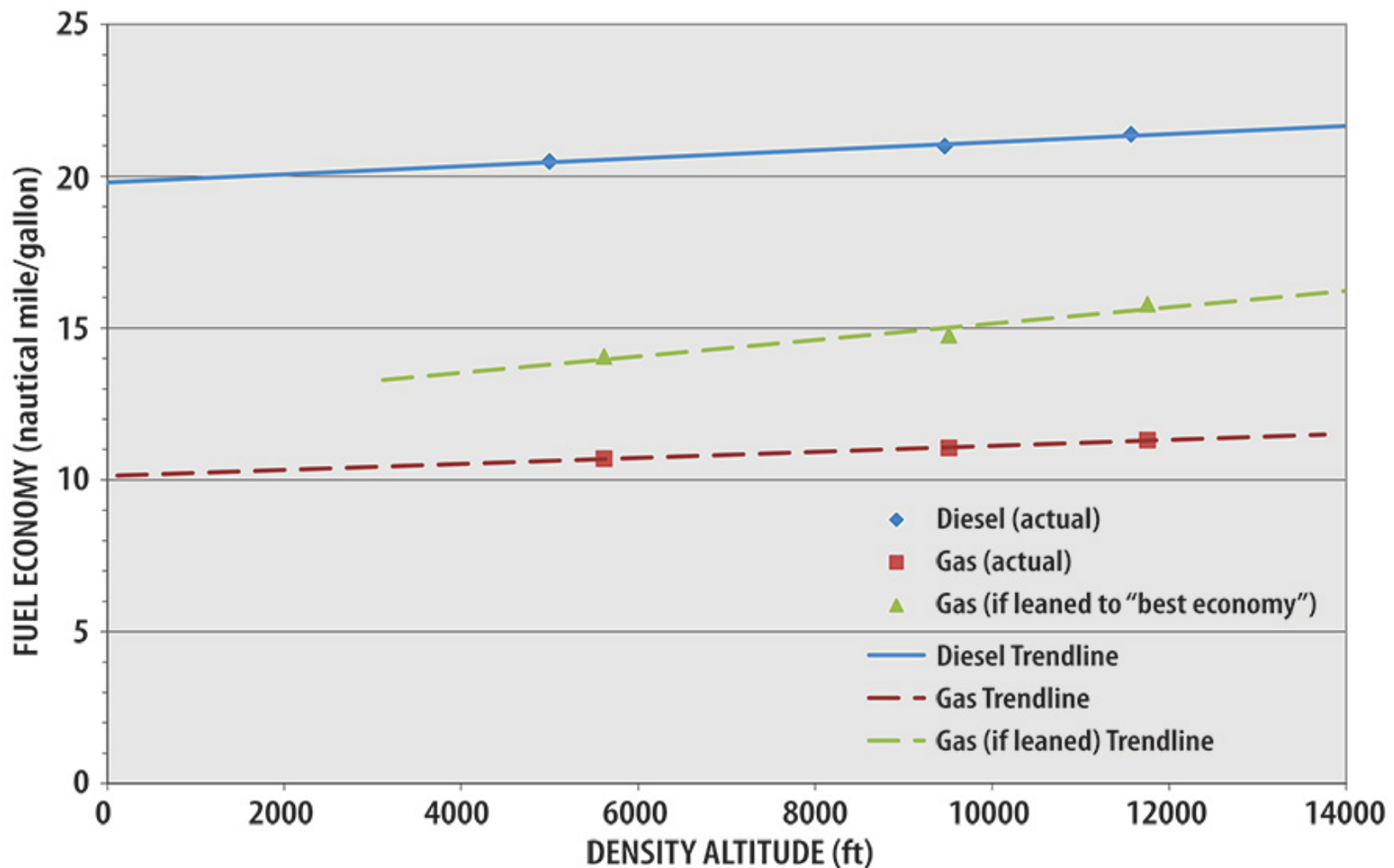
Diesel vs. Gas Climb Performance

Note the altitude that diesel has better climb performance than gas...



Diesel vs. Gas Fuel Economy

20+ mpg in all altitude regimes...!



Zenith STOL CH 750 Variants

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The Zenair STOL CH 750 (Guardian, SM, etc.)

Law Enforcement & Patrol STOL Aircraft



STOL CH 750 - Police Aircraft:



Equipped with external camera...



...and high-intensity search light.

The **Zenair STOL CH 750** is an ideal, lightweight airborne observation platform. Outstanding STOL performances make it possible to manoeuvre in tight spots like a helicopter, but at a fraction of the cost. The rugged landing gear system - combined with its unique STOL performances - mean the aircraft can be safely operated off-airport on just a few hundred feet of clear terrain or roadway.

Ideal for: **Aerial Patrols** (maritime, coastal, highway, pipeline), **Search and Rescue** missions, **Law Enforcement** support, **Wildlife Management** and **monitoring**, **Reconnaissance** and **Surveillance** missions, etc.

<http://zenair.weebly.com/ch-stol-variants-index.html>