

TRANSITIONING INTO A HOMEBUILT: *This is test-flying!*



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Who's flying what?



- **How many E-AB aircraft are being flown by someone other than their builders?**
 - **Hard to say, but**
- **In 55% of homebuilt accidents, the pilot was a second (or later) owner**
- **Some occur during check-out**
- **Inadequate check-out probably contributes to others.**

The Ideal Seller:



- **Built the aircraft you're buying**
- **Master Aerobatic Instructor with 2,000 hours dual given**
- **1,000+ hours in that individual airframe**
- **Graduate of National Test Pilot School**
- **Personal friend of Bob Hoover, Chuck Yeager, Burt Rutan, and Mike Melville**
- **More patient than any three saints.**

The Next Best Thing:



- **YOU are a Master Aerobatic Instructor, A&P / IA, and**
- **graduate of the National Test Pilot School with**
- **1,000+ hours in the same or closely related design,**
- **friends among aviation's elite,**
- **impeccable judgment and unshakeable patience.**

THE REALITY??



- **Seller is the aircraft's third owner**
- **225-hour private pilot:**
 - Owned the aircraft three years
 - Logged only 26 hours, because...
 - He never learned to fly it well enough to feel confident in its cockpit
- **(Guess why he's selling?!)**
- **NOW what are you going to do?**

OBSTACLES



Obstacles to transition training in an E-AB:

- **May be impossible to find a CFI with make-and-model experience**
- **Aircraft configuration may be unfamiliar (taildragger, pusher, canard, etc.)**
- **Unusual features and equipment may make airworthiness hard to determine**
- **Buyer won't have builder's familiarity with design or construction details**
- **Sparse flight manuals, other documentation.**

OBSTACLES, CONT'D



Compared to manufactured aircraft, wider variation in:

- **Aircraft systems (fuel, avionics, etc.)**
- **Control and panel layout**
- **Powerplants and powerplant management**
- **Weight, balance, fuel capacity, useful load**
- **Actual flight characteristics (especially stalls, landings, go-arounds, and ground handling).**

HOW NOT TO DO IT, PART I



- CEN11FA652
- Socorro, New Mexico
- September 19, 2011



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THE AIRCRAFT



- **Concannon Radial Rocket, N91TX**
- **Two-seat, 2,550-pound composite aircraft**
- **400-hp supercharged 9-cylinder MP-14 radial**
- **28.1 lb / 6.38 hp per square foot**
- **Mixture and boost pump position “critical” during landing (according to seller / builder).**

THE OWNER



New owner:

- **4,000-hour commercial pilot (ASEL, AMEL, glider)**
- **Owned a Yak-52 (same engine but no mixture control)**
- **“Concerned” about autopilot, switch placement, boost pumps, mixture control, and complexity of EFIS.**

THE CHECK-OUT



- **Seller offered to deliver from MS to Phoenix; buyer declined**
- **Seller set aside 10 days for inspections and training flights**
- **Sept. 18: Buyer, seller, and buyer's passenger spent "several hours" examining airplane and reviewing systems**
- **Seller took buyer on 30-minute flight; said he was "very smooth and coordinated on controls" but had trouble reading airspeed and altitude on EFIS display.**

THE CHECK-OUT, CONT'D



- Buyer's passenger got 10-minute flight
- "A couple of hours" post-flight review of systems, procedures
- Buyer declined further instruction, completed transaction, and flew from Auburn, MS to Dallas Executive, TX (340 nm) to spend the night
- NO stalls or takeoff / landing practice.

THE FLIGHT HOME



- **Sept. 19: Departed KRBD at 0939 local for KONM (510 nm)**
- **KONM field elevation is 4,875 msl**
- **Mechanic on field heard “loud pop,” saw airplane turn north with “wings rocking back and forth”**
- **“Appeared to be losing power;”
“struggling to maintain altitude.”**

THE FLIGHT HOME, CONT'D



- **Wobbling increased after turn to west; nose dropped and disappeared, followed by a plume of black smoke**
- **Second witness saw airplane pitch up and stall**
- **Boost pump, mixture settings could not be determined.**

THE RESULT



HOW NOT TO DO IT, PART II



- **CEN11FA597**
- **Heath, Ohio, August 25, 2011**
- **Lancair 235, N777BN**
- **20 years old, sold in September 2010 with 1,131 hours TTAF.**

HOW NOT TO DO IT, PART II



Continued...

- In 11 months since, new owner had not flown airplane
- “Expressed concern with ground-handling characteristics”
- Several high-speed taxi tests during preceding weeks.

THE FIRST (AND LAST) FLIGHT



- **Began takeoff roll on Runway 27, KVTA**
- **Airplane veered off left side of runway before liftoff; nose gear hit runway edge light; took off 100 feet later**
- **“Very unstable” immediately after liftoff, alternately rolling right and left just above runway.**

THE FIRST (AND LAST) FLIGHT



Continued...

- Cleared hangars by ~10 feet
- Climbed to 100-150 agl, banked hard left, and crashed nose-down into trees
- No obvious flight-control or mechanical failure
- Still under investigation.

HOW TO DO IT



- **DON'T BE IN A HURRY!!**
- If seller offers to deliver aircraft for expenses – accept!
- Ready to become a test pilot? If not,
- **FIND THE BEST TEACHER YOU CAN!**
- May not be the builder or seller
- Not required to be a CFI – but not a bad idea
- Experience in the most similar possible aircraft is crucial.

HOW TO DO IT, CONT'D



- **DON'T BE IN A HURRY!!**
- Consider having instructor do his/her own check-out training first ... or test-fly solo if that's not possible
- Don't start training until he/she is ready to teach you in that aircraft
- Do a **THOROUGH** review of systems and procedures **ON THE GROUND**
- Pass the blindfold test!

HOW TO DO IT, CONT'D



- **Expect to go through most of a full flight-test protocol**
- **Low-speed taxi tests to verify steering and brakes**
- **High-speed taxi tests to gauge flight control effectiveness.**

HOW TO DO IT, CONT'D



- On first flight, climb to safe altitude before attempting any turns, then make them gently with ample airspeed
- Explore the flight envelope cautiously, systematically, and thoroughly – and, above all,
- **DON'T BE IN A HURRY!!**

RESOURCES:



- **EAA Flight Advisor Program**
- **Type clubs**
- **FAA Advisory Circulars:**
 - **90-89A: AB and Ultralight Flight Testing Handbook**
 - **90-109: Transition to Experimental or Unfamiliar Airplanes**
- **NTSB Report: The Safety of Experimental Amateur-Built Aircraft (2012)**
- **ASI transition training on-line course (in preparation).**

THANK YOU!



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