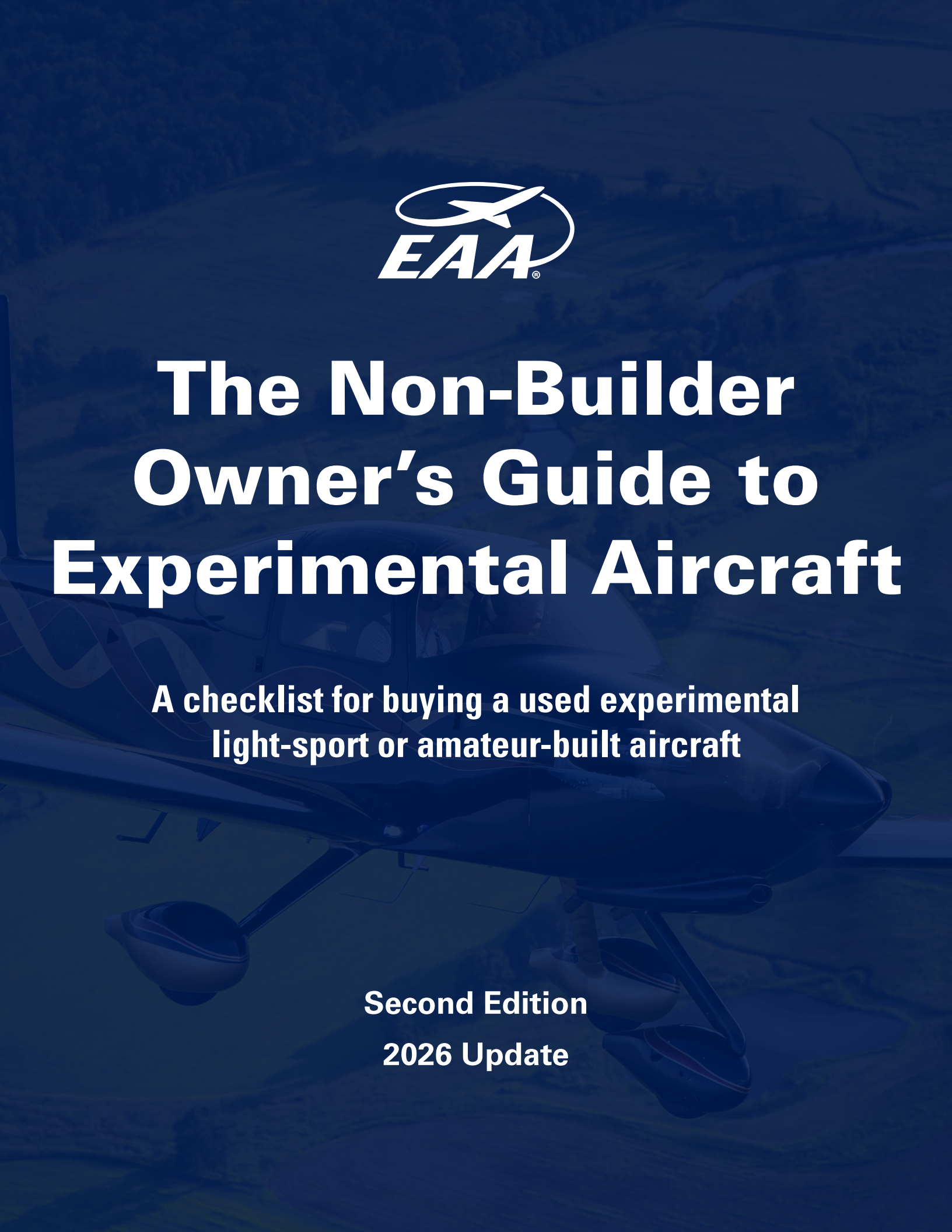

The Non-Builder Owner's Guide to Experimental Aircraft

A checklist for buying a used experimental light-sport or amateur-built aircraft

Second Edition

2026 Update

Introduction

Congratulations on your decision to purchase an experimental amateur-built or light-sport (E-AB or E-LSA) aircraft!

This is quite likely to be the beginning of one of the most exciting and rewarding chapters in your aviation experience! The purchase of an experimental aircraft offers many exciting opportunities not available to owners of certified aircraft, not the least of which is the opportunity to operate or upgrade to exciting new avionics, as well as perform much of the aircraft maintenance yourself. Aircraft ownership has many unique aspects, and this checklist is designed to assist you in reducing your costs, purchase and ownership workload, and avoid missed opportunities that may only be available during the purchase of your aircraft.

This checklist is intended to provide guidance for experimental aircraft owners who were not the original builders of the aircraft ("nonbuilder owners," or NBOs), and to allow you to fully understand the capabilities and limitations of your purchased experimental aircraft.

EAA strongly recommends you obtain a copy of the *EAA Flight Test Manual (FTM)* and reaccomplish much of the flight testing to completely understand the capabilities of your aircraft.

EAA also strongly recommends that you complete a thorough transition training program based on your experience in the type of aircraft you are purchasing. Five or 10 hours of dual instruction can be a wise investment in your safety and operational enjoyment, and there are many resources available for this training.

The overall purpose of this manual is to improve the safety of the operation of your experimental aircraft, as well as enhance your enjoyment of flight operations by increasing your knowledge of your own aircraft's handling and performance characteristics by providing some guidance on the needs and objectives of transition training.

This checklist is divided into the following major sections:

1. Evaluating an Aircraft Before Purchase
This section strongly recommends that you hire an independent, fully qualified inspector to look at candidate aircraft, and provides information on how to locate and evaluate your prebuy inspector

Accident statistics show that nearly 20 percent of E-AB accidents are caused by builder errors or mechanical failures, so a good prebuy inspection can make your operations safer. A good prebuy inspection can also save many thousands of dollars in repair costs for unwitting buyers. The construction quality of homebuilt aircraft can vary widely, and knowing its true condition and using that knowledge to properly assess its value can save you money.

2. Aircraft Documentation
This section is designed to help you understand the pertinent documents that you need to make sure are part of the aircraft purchase and some resources for these documents.

There are a number of checklists provided in this section to help you organize your purchase. You want to obtain all necessary documents from the seller before completing the sale to ensure your aircraft is registered and operated in compliance with all regulations.

This section is primarily designed for experimental aircraft operators in the United States but may be useful to purchasers in other countries.

3. Transition Training
Experience in the experimental aircraft category has shown that flying is much safer and more enjoyable when the new owner is familiar with the unique characteristics of their new aircraft. In fact, nearly 20 percent of all E-AB accidents involve pilots with fewer than 10 hours in type. E-AB accident statistics show that accidents with nonbuilder owners (NBOs) in their first 10 hours are actually higher than during the initial 10 hours on a new E-AB aircraft

Extensive experience flying a C-172, an F-18 in the Navy, or a B-737 for an airline does not necessarily prepare a pilot for the challenges of many experimental aircraft. This is not to say that experimental aircraft are more difficult to fly, but the handling and performance characteristics of any given example can be quite different from other aircraft, and especially different from other certified aircraft.

An excellent reference for creating a training program is FAA advisory circular AC 90-109A, Transition to Unfamiliar Aircraft, which includes this wise quote: "All pilots should consider the first flight in any particular experimental airplane a test flight."

Most airlines provide their highly experienced pilots 25 hours or more of simulator time, and an additional 25 hours of aircraft training during a pilot's transition into a new model of aircraft. Military flight schools also provide experienced pilots with considerable simulator time, and five to 10 hours of dual instruction (if possible, depending on type) before pilots are allowed to solo in a new model of aircraft. It is perfectly reasonable for you to anticipate scheduling a minimum of five or more hours of transition time before flying as pilot in command, even if you are already quite familiar with other similar aircraft. Pilots transitioning to significantly different aircraft (e.g., amphibious, tailwheel, high-performance, etc.) should anticipate even more time to safely master their new acquisition.

You should develop a personal plan for training and qualification in your newly acquired aircraft, one that recognizes your personal experience as a pilot and highlights the unique challenges. Some of these areas to consider include:

- Tailwheel experience (if applicable)
- Electronic flight instrument displays versus traditional "round dials"
- Autopilot experience
- High performance or low performance relative to your new aircraft
- Aerobatic experience (if applicable)
- Constant-speed (or manually controllable pitch) prop versus fixed-pitch experience
- Unique systems: retractable gear, flaps, turbocharger, etc.

Look for a CFI with a letter of deviation authority (LODA). The LODA allows a CFI to provide training in an aircraft that they rent for the purpose of training. You can find these CFIs through:

- The kit builder's website
- Type aircraft social media sites
- EAA's LODA list at EAA.org

Background
Before purchasing an amateur-built or experimental light-sport aircraft, it's important to understand a few key concepts that will shape how you operate, maintain, and insure your aircraft. These considerations are different from what you may be used to with an aircraft with standard airworthiness certificate, and a few have been updated recently under the FAA's Modernization of Special Airworthiness Certification (MOSAIC) final rule (*Federal Register*, August 7, 2025).

Operating Limitations (Ops Limits)
Every experimental aircraft is issued a set of operating limitations (often referred to as "ops limits") along with its airworthiness certificate. These are legally binding, must be carried in the aircraft at all times, and define the conditions under which the airplane may be flown. For example, ops limits will describe whether the aircraft may be used for aerobatics, flown at night or IFR, or carry passengers during the initial test period.

Unlike type-certificated aircraft, which have limitations defined by mandatory placards and operating manuals because of their FAA-approved type design, experimental ops limits are issued to individual aircraft and can vary based on many factors. Two aircraft from the same kit manufacturer and of same design ("make and model") may have slightly different operating limitations depending on equipage, intended use, or often simply the latest FAA guidance at the time of certification.

Buyer takeaway: Make sure you read the ops limits closely. They are effectively the "rule book" for your aircraft, and they carry the same legal weight as regulations. If you intend to fly IFR or at night, or if you want to do aerobatics, look at your aircraft's ops limits to understand what they say about performing those operations.[1] You are able contact a flight standards district office (FSDO) or designated airworthiness representative (DAR) to get an updated set of ops limits, which can change your privileges but will void previous operating limitations.

Maintenance
One of the most appealing aspects of experimental aircraft ownership is the flexibility you have with who can do maintenance. Unlike standard category aircraft, where most maintenance and all inspections must be performed by certificated mechanics, experimental aircraft owners have the freedom to allow anyone to perform any maintenance and repair. This can save significant money over time and also give you a deeper understanding of your airplane.

That said, all experimental aircraft must undergo a condition inspection annually as defined in the aircraft's operating limitations, the experimental aircraft equivalent of an "annual" in type-certificated aircraft. The wording in the logbook must certify that the aircraft has been inspected by a qualified individual (see the following) and found in a condition for safe operation.

Owners who complete an FAA-approved light sport repairman with an inspection rating (LSRI) course may perform condition inspections for any E-AB or E-LSA they own. The LSRI course is 16 hours in length. Note that the LSRI privilege for E-AB was added in the final MOSAIC rule. Previously, only the primary builder of the aircraft was eligible for a repairman certificate. Ops limit issued before 2026 may not allow LSRIs to perform condition inspections without an update. Make sure to confirm who is authorized to perform condition inspections. These are found in the aircraft's ops limits, and this information is critical to help you determine whether you should contact a FSDO or a DAR to update them.

Buyer takeaway: Always confirm who performed past condition inspections, and ask for any related checklists or documentation they used. Going forward, MOSAIC gives you more options — especially if you want to handle your own inspections rather than relying solely on an A&P mechanic or the original builder. If you wish to take advantage of these options, ensure your ops limits allow it.

[1] By way of example, current operating limitations at the time of this writing require that any specific aerobatic maneuver must be flight tested in Phase I and documented in the aircraft's records (adding additional maneuvers requires a return to Phase I); night and IFR flight require proper equipage per applicable regulation

Primary Differences Between Aircraft with Standard Airworthiness Certificate and E-AB/E-LSA
If you are switching from an aircraft with a standard airworthiness aircraft, you will notice some important differences when moving into the experimental world:

- **Certification:** Aircraft with a standard airworthiness certificate must conform exactly to an FAA-approved design or have FAA-approved alterations. Experimental aircraft do not; rather, each one reflects the builder's workmanship, choices, and sometimes modifications. Two experimental airplanes that look the same may not be identical under the skin.
- **Documentation:** For aircraft with a standard airworthiness certificate, the type certificate data sheet (TCDS), maintenance manual, and the FAA-approved pilot's operating handbook and/or aircraft flight manual serve as your basis for how you can operate and maintain your aircraft. With experimental aircraft, the equivalent is the aircraft's operating limitations, builder's logs, wiring diagrams, and manuals provided at the time of construction. These documents may vary in quality and completeness.
- **Inspections:** For aircraft with a standard airworthiness certificate, an annual inspection is required by an airframe and powerplant mechanic (A&P) with inspection authorization (IA). An experimental aircraft requires a yearly condition inspection. Who can perform that inspection depends on the certificate held (builder's repairman certificate, an A&P, or an LSRI-certificated owner). See previous sections.
- **Modifications:** Aircraft with a standard airworthiness certificate require FAA approval for major modifications, either via STCs or field approvals. Experimentals have much more latitude, but major modifications will trigger a return to Phase I flight testing (notify FSDO to return to Phase I).

Buyer takeaway: Expect more variability between experimental aircraft than you are used to in aircraft with a standard airworthiness certificate. Build quality, equipment, and paperwork can differ significantly, and these differences affect both safety and resale value. Documentation and logbook completeness matter even more in this world.

Stall Speeds
Stall speed is one of the most important performance figures in any aircraft, and it is particularly critical when evaluating an experimental aircraft. Unlike certified airplanes, which publish stall speeds in a standardized format, experimental aircraft may not always have these values documented consistently.

You should carefully review logbooks, flight test records, and airspeed indicator markings to verify the actual stall speeds. Keep in mind that modifications such as increased gross weight, changes in wing design, or different engine/propeller combinations can alter stall behavior.

All pilots will be familiar with the stall characteristics of the aircraft they obtained their license in. If this was done in a typical training aircraft, the stall characteristics were likely quite benign. Experimental aircraft may have very different stall characteristics by design. Some models, especially certain high-performance ones, may have a very abrupt stall break and an altitude loss during recovery that is measured in thousands of feet. Additionally, individual builder variations (especially things like wing twist and contour) tend to show up more dramatically in slow speed characteristics than in middle-of-the-envelope flight.

Buyer takeaway: Don't rely solely on the numbers you see online or in kit marketing material. Confirm stall characteristics for the specific airplane you're purchasing, as they directly impact safety margins, handling, and what pilot certificates or privileges may apply. After purchasing, it can be beneficial to confirm the stated stall speeds, at tested weights and configurations, to ensure you understand your aircraft's characteristics. Utilizing the EAA Flight Test Manual is a great way to test the specifics of your aircraft.

SECTION 1

Evaluating an Experimental Aircraft Before Purchase

01

Homework
Let's assume you have already picked out an aircraft model you are interested in. This is an aircraft that meets your defined mission profile, including:

- Number of seats
- Range
- Cruise speed
- Fuel consumption
- Climb rate
- Baggage space, capacity, and location (center-of-gravity limitations)
- Airframe size (Will it fit in a standard hangar?)
- Payload
- Runway requirements (short/long/smooth/rough/paved/grass)
- Stall and handling characteristics
- Accident history (from NTSB statistics)
- Ease of maintenance and inspection
- Availability of maintenance services and support for the type of construction (metal/fabric/composite)
- Availability of parts (Is the manufacturer of the kit still in business?)
- Cost and availability of insurance for you personally in this aircraft (obtain indicative quotes)

After selecting a model that meets your criteria, there is still much to be done before proceeding with a specific example for a prebuy inspection. This early research is vital and may save you much heartache and considerable money in repairing or replacing expensive systems or components that were not in proper condition at the time of purchase. There is nothing wrong with buying an aircraft that needs work. However, you are much better off knowing the exact condition of the aircraft before deciding on its value and before you sign the purchase check.

- Check online forums and manufacturers' online resources for the aircraft, engine, propeller, and avionics in the aircraft you are considering.
- Find other pilots operating the same or similar aircraft and/or systems, and ask for their opinions on advantages and disadvantages of major components.
- Check the manufacturer's website (or type club in the case of orphaned aircraft that are no longer supported by a manufacturer/kit supplier) for service bulletins.
- Review the aircraft and logbooks to be aware of the status of your potential purchase regarding these items.
- Make sure the aircraft has a certificate of airworthiness (CoA) and operating limitations. If the aircraft has not yet flown and does not yet have a CoA, make certain you have the build history (e.g., builders log, photographs, receipts for component parts) and a fully documented chain of ownership listing all previous owners, preferably via FAA bill of sale forms. Refer to *EAA's Step-by-Step Certification Guide*, contained within the Amateur-Built Certification Kit, for details. It's available at EAA.org/Shop.
- Research service bulletins/notifications issued by the kit manufacturer or plans seller, including accessory parts (wheels/brakes, fuel pump/filter, avionics/electronic flight instrument systems, etc.).
- Research upgrades to your specific aircraft model or plan, and research available options to understand the exact condition of your potential purchase.
- Check the FAA (or appropriate regulator's) website for Airworthiness Directives (AD) regarding any installed certified equipment (i.e., the engine and propeller). In most cases, ADs don't specifically apply to experimental aircraft; in rare cases, they do. This depends on the AD's applicability statement. See FAA Advisory Circular 39-7D for more information. In any case, you should do this research and consider what action should be taken for your aircraft.

- Take a close look at the avionics that are installed. Are they still supported by a manufacturer? Are they compatible with your future plans? Can you connect them to the avionics you plan to install? Avionics evolve quickly, and in some cases, it may be more cost-effective in the long run to upgrade many systems simultaneously, rather than trying to connect obsolete avionics to newer systems.
- Investigate the engine type recommended by the manufacturer/designer and determine if the builder used that or something different. Understand that if the builder used a different type of engine than recommended the aircraft may have unusual flying characteristics and have unique maintenance requirements (ex. automotive engine).
- Know the ballistic parachute and rocket expiration and repack intervals/costs.

  *Note: It is always a good idea to use a title search company to make sure that the title is clean and there are no liens on the aircraft (the aircraft's FAA registration is used in lieu of a title). Additionally, using a good aircraft purchase agreement and escrow company can also save you a lot of money***.**

Hiring an Independent Inspector Before Purchase

The decision to hire an independent inspector for your prebuy inspection is an important and personal consideration that should be carefully thought out. Experienced inspectors or people experienced in prebuy inspections can easily identify serious issues that you may not be familiar with, especially when they are experienced with the type of aircraft you are considering. If you have never built an E-AB aircraft, hiring a qualified, independent inspector may save you considerable cost and frustration in the long term. Most importantly, an experienced inspector may identify safety issues that could be significant enough that they may delay a prebuy test flight or that may significantly affect long-term safe operations.

To locate an inspector:

- Check with the aircraft kit or plans manufacturer and/or type club, and solicit recommendations.
- Use online forums or social media to find recommended individuals. Some types of aircraft have dedicated social media sites that may provide references.
- If a professional prebuy inspector can't be found (especially for types with smaller fleets), find an experienced, reputable builder of the type in your area. You may need to cover their travel costs.

Prebuy inspector qualifications include:

- Talk to potential inspectors and ask them what they look for in that particular aircraft, and what may be on their personal "do-not-buy" list.
- Has personally built the same or similar aircraft
- Has significant flying time in the same or similar aircraft
- Has previously accomplished numerous prebuy inspections of that model aircraft (or similar types)
- Is familiar with the installed engine, propeller, avionics, GPS, autopilot, etc.
- Is recommended by a number of recent buyers of the same model
- Is an A&P/IA, EAA Technical Counselor, and/or EAA Flight Advisor
- Selected by you, not the seller

Prebuy Inspection General Considerations

Be ready to back away from an aircraft that has a lot of issues.

There are a number of things to do to help ensure a good prebuy inspection. These *may* include:

- The inspector should use a prebuy checklist and make extensive notes. This may be similar to a conditional (e.g., "annual") inspection checklist, ideally specific to that model of aircraft.
- Make a list of each squawk for later discussion, potential repair, and purchase price negotiations.
- Take lots of photos and/or video.
- Use a bright light. Many problems are only detected by using a bright light.

- Touch everything possible. Your hands are as valuable an inspection tool as your eyes, and in some instances, more valuable.
- Listen to the flight controls, flaps, etc., as they are moved through full deflection. Do this near the flight controls and from the cockpit.
- To ensure engine health, check the condition of the cylinders with a borescope (with the help of an experienced mechanic, if needed). If possible, take photographs of the cylinder walls and valves. Follow the recommended procedure for taking an oil analysis sample and have it analyzed.
- If the aircraft is equipped with an EFIS that records engine data, download the files and analyze them for any operating limit that is out of the specifications based on the engine manufacturer. Several commercial products exist for analyzing electronic engine data.
- If any logbook for the aircraft, engine, or prop is missing, there is a chance that undocumented damage, such as a prop strike, may have occurred. It is worth checking the crankshaft runout with a qualified professional for any indication of damage. Asking for additional clarity on why any of the logbooks are missing is prudent.

Ask your prebuy inspector to comment on anything they identify that must be fixed before a test and/or ferry flight or that you may wish to upgrade in the future.

Overall Condition of the Aircraft
Look at the general condition of the aircraft. For example:

- General appearance, fit, and finish of cowlings and panels
- Lubrication of moving parts
- Quality of rivets, fiberglass workmanship, corrosion
- If you find a single jam nut loose, there are probably more; be thorough
- Labeling of switches and lights on panel and throughout aircraft
- Look at how well organized the wiring is; all wires should be secured and routed in an organized manner

Caution: Significant Modifications by the Builder/Owners
Look for significant modifications to kit aircraft or plansbuilt aircraft. While there are no regulatory limitations (e.g., FAA limitations) on builder design modifications, the buyer should proceed with caution and look for significant modifications by the builder. Some modifications and their consequences include:

- Increasing the engine horsepower may result in inadequate rudder authority during takeoff, at low speeds, or during go-arounds.
- A larger engine can result in center-of-gravity issues or inadequate flight control authority to counteract the increased power and torque of the engine. It may also apply higher stresses to the airframe structure designed to absorb the power, leading to potential premature failure of motor mounts or attached airframe components.
  Note: Installing an engine not supported by the kit manufacturer may cause problems obtaining insurance.
- Operating outside the manufacturer's design center of gravity may result in a loss of control, overstress of the aircraft, or undesirable handling characteristics.
- Increasing the maximum true airspeed (either indicated airspeed, altitude, or both) may result in less margin from flutter.
- Moving the gear forward on a conventional-gear aircraft may increase the propeller ground clearance while decreasing directional stability on the ground.
- Increasing the size of the elevator may increase the sensitivity to control inputs, and decrease VNO (maximum structural speed, or the speed at which full control deflection results in maximum *g*).

[2] ***g*** refers to how much force an aircraft (and everything inside it) experiences compared to normal gravity. One *g* is equal to the everyday force of gravity on Earth. For example, at 2 gs, you and the aircraft experience twice your normal weight.

- Some builders increase the gross weight above what the original designer recommended. This increase should be accompanied by a detailed analysis of what justified that weight increase, as this can increase stress on many areas of the aircraft and significantly affect performance and handling characteristics, including takeoff distance, landing distance, climb rate, stall speed, and stall characteristics. It also means maximum design structural loads are reached at lower g's[2] and at lower airspeeds.
- Pay attention to the aircraft's empty weight compared to other typical examples of the type and the empty weight published by the manufacturer. Many amateur-built aircraft in the field are too heavy due to modifications, accessories, "creature comforts," heavy paint jobs, or engine installations that are alternative to the manufacturer's recommendations.
- Make sure the aircraft's documents list the correct maximum gross weight versus that specified by the manufacturer or designer.

  Note: It is possible that the weight and balance was done before all of the equipment is installed and before the aircraft has been painted. This can significantly affect the center of gravity, flying qualities of the aircraft, and reduce the useful load. Ensure the empty weight and center of gravity calculations were done after these things were completed and ensure this is current.
- Increasing the gross weight reduces the design margins and increases wear on components such as landing gear struts, tail wheels, landing gear steering mechanisms, etc.
- Adding fuel tanks to wingtips, leading edges, baggage compartments, etc., can greatly increase the aircraft's range and performance. It can also have very serious consequences regarding stability, center of gravity, and the aircraft's structural limits (particularly regarding gust loading and negative g). Considerations include fuel transfer issues, fuel tank venting, and flight control issues associated with potential failures of the fuel to transfer.
- Modifications to basic systems may enhance or reduce operational safety. For example, adding electronic engine ignition may be a significant performance and safety enhancement, but only if the backup power supply to the ignition system is installed properly.

This is not an all-inclusive list of issues that may result from design changes, but is designed to enhance your sensitivity regarding these types of changes.

Online Resources

It's a good idea to check the registration of the aircraft you are considering. For U.S. aircraft, enter the N-number at FAA.gov. You can also search this database under the aircraft serial number.

Another good idea is to visit one or more online flight tracking sites. Enter the N-number into that site, and see if the ADS-B is working well. FlightAware flight tracker/flight status (FlightAware.com) will allow you to see the most recent flights from that aircraft and gives a good indication of the ADS-B functionality.

Prepurchase Test Flight
In general, a prepurchase test flight (with a qualified prebuy inspector or the builder/owner) is a valuable opportunity to determine if the aircraft meets your needs and is in satisfactory condition. If you are not familiar with the aircraft type and have hired someone who is familiar with the type, you are probably better off letting them perform the test flight.

Make sure you are familiar with all the door controls, normal and emergency canopy controls, ballistic parachute controls, autopilot disconnect modes, trim systems, and fuel system controls (including tank switching and fuel shutoff) during the preflight briefing. Are all of the controls labeled properly? This might be your only chance to ask what a particular switch or circuit breaker is designed to do.

- If the aircraft has not flown in some time, a ground run with the engine's cowling(s) removed may provide considerable information on the condition of the engine.
- Test all fuel tank positions on the fuel selector during the ground run by allowing the engine to run for a few minutes on each selection, and test the fuel shutoff position. Make sure you are aware of which position is the OFF position on the fuel selector and that all positions are clearly labeled. Dip all fuel tanks and compare them with indications in the cockpit.
- If the aircraft is equipped with dual controls, make sure to check all of them, including:
    - » Brakes
    - » Control-stick push buttons (ex. trim, push to talk, etc.) for both seats/sticks
    - » Throttle/mixture/prop controls
- Exercise all the normal systems on the aircraft during the test flight, including flaps, landing gear, cowl flaps, etc.
- Be sensitive to all electronic flight instrument system (EFIS) warnings that occur, and be certain to cycle through all of the EFIS pages available. You may want to turn off audible warnings or turn them down to a very low volume for your test flight, as they can become distracting or may be improperly set. If that is the case, it is best to verify each one and methodically reintroduce them into the system.
- If the aircraft is equipped with an engine monitoring system, take a close look at cylinder head temperature (CHT), exhaust gas temperature (EGT), fuel flow, fuel quantity, and oil system readings. In lieu of an engine monitoring system, use a camera to capture in-flight instrument readings.
- Check for emergency equipment, such as a fire extinguisher and/or canopy breaker tool.
- If the engine is equipped with electronic ignition, understand and test (when possible) backup electrical power.
- Understand the electrical system, the use of alternate batteries, alternate electrical buses, etc.

Delivery Flight Considerations
Don't feel pressured to fly your newly purchased aircraft home on a long cross-country! Consider a qualified ferry pilot with experience in the type, using a trailer (if equipped with removable/folding wings) or ask the seller to deliver as a condition of the sale. A sellers willingness or lack thereof could be an indication of issues with the aircraft. A long cross-country immediately after purchase is not a safe way to familiarize yourself with an unfamiliar experimental aircraft. Be sure to consider each of the following factors as they can add complications which can add to workload, distractions, and affect the outcome of the flight.

- The overall condition of the aircraft, especially if it hasn't flown in many months or has not flown since its last maintenance or inspection.
- A few hours in the local area, followed by detailed postflight inspections, might identify leaks in the fuel, oil, or brake lines that need attention before departure, or an aircraft battery that has reached its service life. These flights ideally could be combined with dual instruction to familiarize yourself with your new aircraft.
- Geographical or airspace conditions that you may not be accustomed to in your regular flying, such as mountain flying or hot weather. Consider and plan for high-density altitude conditions if picking up an aircraft in the Western states, for example, when your previous experience only consists of flying from density altitudes near sea level.
- Departing a short grass strip when your only experience is with long, hard-surface runways.

Recommendations:

- Higher-workload airspace that you haven't experienced in years (or ever) because you've been mostly flying from non-towered airports.
- It is advisable to verify the proper operation of avionics and autopilots in VFR conditions before flying in IMC or at night.

Test Flight Checklist

If the aircraft has a checklist, combine it with the following to create an appropriately comprehensive checklist for the test flight. If any items are in conflict, be sure to understand the differences and select the most appropriate action.

1. Complete exterior preflight

2. Accomplish these additional checks

- ☐ Exercise all flight controls for free, full, and proper movement; listen/feel for binding.
- ☐ Check for internal stick interference.
- ☐ Cross-check actual neutral elevator/aileron/rudder trim position with cockpit indicator.

3. Engine start

- ☐ Safety belts: set
- ☐ Canopy/doors: closed and latched
- ☐ Clear prop
- ☐ Engine readings
    - ☐ Oil pressure:
    - ☐ Oil temperature:
    - ☐ Fuel pressure:
    - ☐ Fuel flow:
    - ☐ Idle rpm: (check with throttle fully closed)
    - ☐ Manifold Pressure (if equipped)
    - ☐ CHTs:
    - ☐ Alternator — ON
    - ☐ Amps:
    - ☐ Volts:

4. Taxi

- ☐ Check brakes (both sets if installed).
- ☐ Make gentle turns to check nose wheel/tail wheel steering.

5. Before takeoff

- ☐ Canopy/doors: closed/latched
- ☐ Flight controls: free and correct
- ☐ Flight instruments: set
- ☐ Fuel selector: desired tank
- ☐ Mixture-rich below 3,000 MSL
- ☐ Elevator and aileron trim: neutral
- ☐ Throttle: run-up
- ☐ Magnetos: check
- ☐ Electronic magneto(s) alternate power: check
- ☐ Prop: check
- ☐ Carb heat: check
- ☐ Radios: set
- ☐ Transponder: set

- ☐ Flaps: set
- ☐ Fuel boost pump: pressure rise
- ☐ Engine readings:
  - ☐ Oil pressure:
  - ☐ Oil temperature:
  - ☐ Fuel pressure:
  - ☐ Fuel flow:
  - ☐ Idle rpm: (check with throttle fully closed)
  - ☐ Manifold Pressure (if equipped)
  - ☐ CHTs:
- ☐ Alternator — ON Amps:
- ☐ Volts:

6. Takeoff

- ☐ Rpm/manifold pressure:
- ☐ Liftoff speed

7. Flight Evaluation

- ☐ Note any issues with flying qualities.
- ☐ Check all trim systems (pitch, aileron, rudder).
- ☐ Power off stall in landing configuration: IAS
- ☐ Exercise all electronics:
  - ☐ Radios
  - ☐ Navigation aids/GPS autopilot
  - ☐ EFIS/engine monitor displays
- ☐ Stabilized cruise flight evaluation:
  - ☐ Cruise speed (verify by GPS):
  - ☐ Oil pressure:
  - ☐ Oil temperature:
  - ☐ Fuel pressure:
  - ☐ Fuel flow:
  - ☐ CHTs:
- ☐ Check the status of ADS-B In if installed. (Request an FAA Public ADS-B Performance Report post flight)
- ☐ Miscellaneous notes

SECTION 2

Aircraft Documentation

02

The aircraft must have the following documentation:

- Airworthiness certificate (original certificate; note that photocopies of this certificate are prohibited)
  - » Operating limitations. This is important! For experimental aircraft, these are considered to be part of the airworthiness certificate and must be carried in the aircraft. Read the operating limitations to determine if there are any restrictions on the aircraft for the kind of flying you to intend to do (e.g., aerobatic, IFR). Ensure all placards required by the operating limitations are installed.
- Registration (FAA form AC 8050-3 is the registration; AC 8050-1 is the application form)
- *Current* Weight and balance
- Aircraft data plate (permanently attached to the aircraft exterior, ensure this aligns with Airworthiness Certificate and FAA data available on file)

Logbooks

It is worthwhile to have a competent maintenance person review all logbooks for the aircraft for any manufacturer's Service Bulletins or FAA Advisory Circulars applying to the aircraft that may not have been complied with. While this is not required, it may save you issues down the road.

In the case that FAA Airworthiness Directives apply to your aircraft (see "Homework" in Section 1 of this guide), compliance should be noted in the aircraft's logbooks.

You should review the following logbooks, and they should be included with the purchase of the aircraft:

- Airframe logbook or Maintenance records
  - » Ensure there is a signed entry that Phase 1 flight testing has been completed per the aircraft's operating limitations
  - » Check for the date of the last condition (e.g., "annual") inspection.
  - » Request condition inspection documentation describing how those inspections were carried out. Compare this documentation with the requirements found in the aircraft's operating limitations.
- Engine logbook
  - » When was the last overhaul and who conducted it (factory, reputable shop, etc.)?
  - » When was the last oil change? Record of frequent oil changes? Any additives used?
  - » What were the last compression check readings and have they changed significantly over time?
  - » Does the engine have any nonstandard components installed?
  - » Electronic ignition systems installed? If so, investigate power supply requirements (backup batteries, auxiliary alternators, etc.).
  - » Turbocharger installed?
  - » What types of spark plugs are installed? How old?
  - » What type of fuel is authorized for the installed engine? Any additives used?
- Propeller logbook
  - » Last overhaul and by who?
  - » Any damage or replacement history?
- Avionics logbook (may be included in aircraft log)
  - » When was the last transponder and altimeter/encoder test and certification? These are required to be conducted in the previous 24 calendar months by 14 CFR 91.411 (IFR), 91.217, and 91.413 (IFR and VFR).
  - » When was the last emergency locator transmitter (ELT) inspection and/or battery replacement? (Main and remote batteries may be required.)
  - » Are the avionics manufacturers still in business? If not, is there an ability to update these components?
  - » What software/firmware load is installed in each avionic system?

    - » When was the last GPS database uploaded?
- Avionics Software/Firmware: is it possible to update these with the components installed, or must it be shipped to the manufacturer for updating?

Highly desirable documentation:

- Aircraft Operating Handbook (AOH) specific to aircraft
- Builders logs (may be online)
- Original building plans and diagrams for all installed equipment
- Installation and operation manuals
- Electrical wiring diagram (if available)

  Note: It is not uncommon to find modifications to wiring diagrams that are not documented, so use any diagrams with caution.
- Any kit manufacturers' or component manufacturers' service bulletin information

You should also obtain, whenever possible, the following:

- Serial and model numbers for all installed major components (engine, prop, airframe)
- Serial and model numbers for avionics, wheels/brakes, autopilot, etc.
- Total airframe hours
- Engine hours versus manufacturer's recommended time between overhauls (TBO) interval
    - » Give consideration to the recommended overhaul for engine ignition systems (e.g., magneto overhaul intervals).
- Propeller hours versus manufacturer's recommended TBO interval
- Propulsion battery overhaul for electric/hybrid aircraft (manufacturer's recommended battery cycle replacement)
- Aircraft fabric age versus recommended replacement interval
- Ballistic recovery system (BRS) parachute and rocket motor age versus recommended replacement/repacking interval. Check with the BRS manufacturer for interval information and costs (which may be in the thousands of dollars).
- ADS-B installation status
- Statement of occasional sale or similar documentation. This varies by state, but in some cases, if the seller is an individual, sales/use tax can be avoided by the use of the proper state forms, which must be completed by the seller.

Software and Data Card Status

- Determine the status of any GPS database cards (obtain any spare cards, if possible, and database card loader hardware/cables)
    - » Are the data cards installed in the GPS?
    - » Are the databases (navigation, obstacles) current?
    - » Is the storage technology still available?
- What software is loaded in each electronic system?

Miscellaneous Items to Consider
(may be worth thousands of dollars total)

- Canopy and wing covers, pitot tube covers, landing gear safety pins
- Power connection adapters
- Avionics upload adaptors, chords or dongles
- Chocks (some aircraft require special chocks)
- Tiedowns
- Extra parts (tire tubes, brake pads, etc.)

Documentation Checklist (some items may not be applicable or legally required)

Documentation	Received from seller?
Airworthiness certificate	☐
Operating limitations	☐
Aircraft registration	☐
Aircraft operating handbook (AOH; highly desirable but not required)	☐
Weight and balance	☐
Aircraft data plate (attached to aircraft exterior)	☐
Nonflying aircraft kits: Obtain a complete ownership record via FAA 8050-2 Kit Bill of Sale forms with no gaps in ownership from manufacturer's delivery to the original buyer to you.	☐

Logbooks and miscellaneous documentation	Received from seller?
Aircraft logbook (confirm Phase 1 signed off)	☐
Engine logbook	☐
Propeller logbook	☐
Avionics logbook	☐
Manufacturer's plans and documentation	☐
Builders logs (highly desirable but not required)	☐
Any additional plans or component installation instructions	☐
Operating manuals for engine, propeller, avionics, etc.	☐
Serial/model numbers for all installed major systems	☐
Electrical system wiring diagram (desirable but not required)	☐
Documentation of condition "annual" inspection checklists, notes, or documentation from the seller	

Hours/dates to note (some items may not be applicable)	Hours (Hobbs meter/tach)
Total airframe hours	_____
Engine hours since overhaul	_____
Hours since last condition ("annual") inspection	_____
Hours/months since last oil change	_____
Propeller hours since overhaul	_____

	Hours (Hobbs meter/tach)
Electric aircraft charging cycles	_____
Propulsion batteries, electric aircraft	_____
Total lifetime allowable cycles on engine(s)	
	Date of last inspection
Inspection	_____
Condition ("annual") inspection	_____
Pitot-static inspection (IFR aircraft)	_____
Transponder/encoder inspection	_____
ELT inspection/battery replacement	_____
Ballistic Recovery System (BRS)	_____
• Parachute due date	_____
• BRS rocket due date	

	Completed?
Change of ownership items to track (some may not be applicable)	☐
FAA bill of sale (FAA form AC 8050-2), bit.ly/FAA_BillofSale	☐
FAA registration (FAA form AC 8050-3), bit.ly/FAA_RegForm	☐
State registration (if required)	☐
Registration of sale with aircraft kit manufacturer	☐
Registration of sale with component manufacturers (EFIS, autopilot, GPS, etc.)	☐
NOAA ELT registration (406 MHz ELT only), BeaconRegistration.NOAA.gov/RGDB/registerUsername	☐
Insurance policy in your name	

SECTION 3

Transition Training For Your New Aircraft

03

Why It's Important
The most important thing a new owner can do to protect their investment, increase the safety of their operations, and minimize their insurance premiums is to obtain at least five hours of dual instruction from a qualified transition CFI. A new owner has just expended significant time and money finding and acquiring a new-to-them aircraft. In this context, a few more hours and dollars of training time is a small additional percentage of investment that has the potential to pay major dividends.

Nearly 20 percent of all E-AB accidents occur to pilots with less than 10 hours in type, and the accident rate for nonbuilder owners (NBOs) in their first 10 hours is actually higher than during the initial 10 hours on a newly constructed E-AB aircraft. Most E-AB aircraft are not inherently difficult to fly, but their equipment, flight, and handling characteristics can be significantly different from other aircraft that the new owner may have flown. Learning the control feel and sight picture with an experienced transition CFI on board is much better than trying to learn these things after they are needed.

Where to Find Training
The category of experimental amateur-built aircraft covers a wide spectrum, everything from one-offs to plansbuilt designs to quick-build kits that number in the thousands. If the chosen aircraft is relatively common, it may be easy to find a transition instructor who has significant experience in that specific make and model. In other cases, it may be necessary to conduct the transition training in a different model of aircraft that is anticipated to have similar flight characteristics. For these aircraft, it may not be possible to find an instructor who can provide transition training in that specific model, but in this case, part of the purchase agreement might include spending a few hours in the airplane with the former owner. In this case, the training may not meet the letter of insurance requirements and it may not be possible to log the flight as dual instruction, but the knowledge gained can be invaluable nonetheless.

Possible sources to find a transition instructor include:

- Manufacturer's approved transition instructors
- Type clubs
- Builders/owners of the same or similar models
- EAA website
- EAA Flight Advisor
- Local EAA chapter

What to Consider

- Determine the unique characteristics of your new aircraft.
  - » How many examples are flying?
  - » Are they similar to other aircraft that might be more common?
  - » Does the aircraft have unique controls, systems, or avionics?
- Determine your experience and currency in this type of aircraft (if any).
  - » Do you have make and model experience?
  - » Do you have experience in a similar make and model?
  - » Do you have experience in other experimental aircraft with similar control feel and performance?
  - » Do you have experience in certified aircraft with similar control feel and performance, and are you confident that the control feel is in fact similar to the new airplane?

Transition Training Program Elements
A good place to start is to contact the kit manufacturer or type club and see if they have a recommended transition training program. Also look at the FAA's advisory circular AC 90-109A for many different training considerations including the pilots experience, proficiency, and currency.

A good transition instructor should come with their own outline of an appropriate program, starting with generic requirements that are then tailored to the specific experience and requirement of the new owner. However, most programs should include elements similar to the following:

- Ground Training
  - ◊ Systems
    - » Seat belts and door operation
    - » Fuel system
      - Operation of the fuel selector while seat belts are fastened
      - Setting of fuel totalizer if installed; validate the calibration after purchase
      - Determination of fuel level (dipping tanks, sight glass, etc.)
      - Presence or absence of low-fuel warnings and fuel timers
      - Selection of fuel tank to be displayed on the fuel gauge (if selectable)
      - Operation of optional/nonstandard tanks
      - How to sump the fuel system
    - » Electrical
      - What happens if the master is switched off in flight?
      - Activation of main or E-bus if installed
      - Selection of primary versus backup batteries if installed
      - Selection of primary versus backup alternators if installed
      - Location of key fuses/circuit breakers. Are the key breakers (autopilot, electric trim) identified with some kind of tag or marker? Can they be quickly found in an emergency, with the seat belt fastened?
    - » Hydraulic
      - Minimum and maximum levels
      - Auxiliary pump, if equipped
      - Provision for emergency hydraulic pressure
      - How to service hydraulic fluids
    - » Flight controls
      - Are there any nonstandard controls or switches necessary to operate the systems during a typical flight?
      - Are all controls clearly labeled, and can they be operated through the full range of travel while the seat belt is fastened?
      - Neutral and takeoff trim cockpit indications
      - How to interrupt trim functions
      - What dual controls are installed (including brakes)?
    - » Landing gear
      - Operation of indicator lights (up/down/transition)
      - Operation of emergency gear deployment system
      - Maximum airspeed for gear extension/retraction

- Maximum speed while gear is extended
- How to control and modulate brakes
- Tail wheel: Does the tail wheel lock or free caster?

» Ventilation/heating/pressurization
- Are there any nonstandard controls? Seat heaters? Airflow versus temperature controls?
- If a standard exhaust heat muff is used for cabin heat, is the aircraft equipped with a carbon monoxide detector?

» Avionics
- Review of all installed avionics and the degree of interoperability between them (e.g., GPS, EFIS, autopilot, nav source selection, component bypass switches, etc.)
- How to update and check databases and firmware

» Powerplant(s)
- Cold and hot starting procedures
- Temperature, pressure, and rpm limits
- Mixture control and leaning indications
- Prop control (and adjustments)
- Cowl flap controls
- Engine information system (EIS) limits (how to check, set, or clear)

» Autopilot systems
- All methods for autopilot deactivation
- Can the autopilot servos be manually overridden?
- Sources of nav data and how to select them
- Roll and heading controls

» Flight instruments
- Ground functional tests if any
- Locations for setting barometric pressure (e.g., do individual EFIS units or altimeters communicate, or must they be set independently?)
- How to verify backup battery status

» Warning systems
- How to ground test
- On-screen versus dedicated warning lights, and the triggers that could cause them to illuminate

» Oxygen systems
- Activation/deactivation of oxygen flow
- Control of flow rate
- Method to monitor tank pressure
- Method to verify flow is actually occurring

» Emergency equipment
- Location of fire extinguisher or fire suppression system

- Method to escape in the event of obstructed exit (canopy axe?)
- ELT remote control location and manual activation
- Is the ELT portable; can it be removed from the aircraft and still operate?
- Ballistic parachute envelope and activation

◊ Procedures and checklists
» Normal
» Abnormal
» Emergency

◊ Performance
» Takeoff and landing
» Climb
» Cruise
» Descent
» One-engine inoperative (OEI)
» Glide

◊ Limitations:
» Weight
» Center of gravity
- Typical loading and use cases (pilots/passengers/baggage locations)
- CG shifts with fuel burn

» V-speeds
» Types of operation
- Aerobatic/nonaerobatic
- If aerobatic, what maneuvers are approved and have been demonstrated during Phase 1?

» Crosswind
- Consider both aircraft capability and pilot capability, relative to the new owner's current proficiency with the aircraft. A conservative personal crosswind limit is highly advised until experience is gradually acquired.

» Landing surface

Flight Training (example of a three-flight training program, approximately 90 minutes per flight)

Flight Lesson 1: Basic introduction and flight demonstration

- ☐ Aircraft preflight
- ☐ Normal procedures and techniques
- ☐ Standard entry and exit procedures
- ☐ Canopy latch and emergency egress
- ☐ Cockpit familiarization
- ☐ Checklist usage
- ☐ Review fuel and oil capacity and consumption
- ☐ Passenger safety and pretakeoff briefs
- ☐ Engine start, taxi, and run-up
    - ☐ Cold start
    - ☐ Hot start
- ☐ Mixture control usage
- ☐ Control and trim positioning for takeoff
- ☐ Normal takeoff and climb (demonstrated)
- ☐ Normal operations
- ☐ Aborted takeoff procedures (discussion)
- ☐ Basic aircraft control
- ☐ Pitch attitude familiarization
- ☐ Effect of trim
- ☐ Engine operation
- ☐ Normal descent and landing, including gear and flap operation (demonstrated)
- ☐ Normal operations
- ☐ Effect of flaps
- ☐ Crosswind and gust considerations, taxi/takeoff/landing
- ☐ Energy management
- ☐ Shutdown and securing aircraft
- ☐ Checklist usage
- ☐ Postflight inspection

Flight Lesson 2: Basic Maneuvers

- ☐ Normal takeoff and climb
- ☐ Normal operations
- ☐ Maintaining directional control
- ☐ Basic flight maneuvers
    - ☐ Straight and level flight
    - ☐ Normal climbs and descents
    - ☐ Normal turns (30-degree bank, 360 left and right)
- ☐ Performance maneuvers
    - ☐ Steep turns (45 degrees left and right)
    - ☐ Slow flight (clean, partial, and full flaps)
- ☐ Stall maneuvers
    - ☐ Stall awareness

- ☐ Power-off stalls
- ☐ Effect of flap settings
- ☐ Power-on stalls
- ☐ Spin awareness and prevention

☐ Normal descent and landing

☐ Landing pitch attitude familiarization

☐ Maintaining directional control after landing

Flight Lesson 3: Takeoff and Landing

☐ Takeoff maneuvers

- ☐ Normal and crosswind procedures
- ☐ Short field and soft field procedures
- ☐ Crosswind takeoff
- ☐ Aborted takeoff

☐ Aircraft characteristics

- ☐ Energy loss following engine failure during initial climb
- ☐ Recovery from high sink rates at speeds below approach speed
- ☐ Glide performance engine-out
- ☐ Engine response time from idle
- ☐ Trim changes and acceleration during a full flap configuration go-around

☐ Landing maneuvers

- ☐ Normal and crosswind procedures
- ☐ Stabilized approach using power and trim
- ☐ Short field and soft field procedures
- ☐ Slips
- ☐ No-flap landing
- ☐ Mitigating high sink rates when slow
- ☐ Crosswind and gusty landing procedures

☐ Emergency procedures

- ☐ Complete engine power-loss landing
- ☐ Partial power-loss landing
- ☐ Return to landing (i.e., the "impossible turn"): practice at altitude
- ☐ Electrical system/instrument failure

Conclusion

Congratulations again on taking this step toward becoming an experimental aircraft owner. Whether you are buying your very first amateur-built aircraft, experimental light-sport aircraft, or adding another aircraft to your journey, each new

ownership experience brings fresh opportunities and challenges. With this guide, you now have tools to help evaluate an aircraft, verify documentation, and prepare for years of safe and enjoyable operation. While checklists and references are invaluable, the true strength of ownership lies in your commitment to safety and the connections you build within the aviation community.

It is your diligence and dedication that ensure every flight is conducted with the highest level of safety. New opportunities, such as those introduced through the FAA's Modernization of Special Airworthiness Certification (MOSAIC) final rule, highlight how the experimental community continues to succeed and evolve. Taking advantage of these changes, along with ongoing training and education, will help you remain not only compliant and more proficient, but also more prepared to enjoy your aircraft to its fullest potential.

We encourage you to connect with the many resources available through EAA membership, from Flight Advisors and Technical Counselors to local EAA chapters. Each of these resources exists to support you, answer your questions, and share experiences with others who have walked this path before. The more you engage, the more you will find that the ownership experience is enriched by the friendships, mentorship, and camaraderie of fellow aviators.

Fly safe, enjoy the journey, and to both new and longtime members, welcome to the community that embodies The Spirit of Aviation.

Why Join EAA?
There's an element of excitement associated with the word "airplane" that creates the spirit of adventure. It knows no boundaries and encourages enthusiasm that's as infectious as it is appealing. It is what has captured the imagination of more than 300,000 individuals who proudly call themselves EAA members.

Membership makes you part of EAA's grassroots community of aviators and innovators who've been sharing their passion and experience with one another for more than 70 years.

As an EAA Member, you get:

- Access to exclusive knowledge, information and content online, through our award winning magazine *Sport Aviation* and through our in house aviation experts
- Access to nearly 900 chapters nationwide — your local connection to aviation
    - » Joining your local EAA chapter measurably improves build quality, first-flight safety, pilot proficiency, project completion rates, and long-term survivability — all backed by FAA, NTSB, and EAA program data.
- Discounted admission to the World's Greatest Aviation Celebration, EAA AirVenture Oshkosh
- Free access to nearly 400 museums nationwide
- The support of our government advocacy team that protects your right to fly
- Member benefits focused on supporting your aviation lifestyle

Your EAA membership makes aviation enjoyment and participation easier and more rewarding. At the heart of it all is what we refer to as "The Spirit of Aviation" and that spirit is present in everything we do.

For more than 70 years, the airplanes have brought us together. But it's the people who keep us coming back.

Visit eaa.org/eaa/eaa-membership and become a member today!