



TITAN T51—JIM KOEPNICK

LAST MONTH WE SPENT 20 MINUTES in the cockpit of an airplane in which you were planning to take a demo flight. Adjusting seats, touching switches, assessing the field of view, and generally scrutinizing this little room, you evaluated everything you could think of from two vantage points. The first was general familiarity with the surroundings to help prepare you for your demo. The second was how you might get along with these accommodations on a long-term basis after you build your plane.

Giving the clock hands a mighty spin, this month we leap forward and begin talking about your flight test program. We'll concentrate on preparing for your first flight, raise a philosophical question or two about your flight test, and give several valuable flight test information sources. The details are up to you, but there's plenty here to get you started. So much, in fact, that we'll start this month and finish next month.

On a wall at the U.S. Naval Test Pilot School is a sign that reads, "Plan

Your Flight Test Program

First Flights, Part I

ED KOLANO

the flight. Fly the plan." Without a plan, you're increasing the risks involved with an already potentially hazardous flight. It's a lot easier to create a sensible, well-considered plan in the sanctuary of your home than by extemporaneously bumbling from event to event in the air.

Your test plan is a tool. It is a systematic approach for the safe, effective, efficient conduct of your flight test program. The act of creating it forces you to think about all aspects of your test flight from the people involved and radio frequencies to whether you'll use a kneeboard, and, of course, your flight profile. Merely thinking—even a lot—about your test flight isn't enough. Write it down. Altitude, airspeed, power setting, configuration, proximity to the

runway, engine limitations, checklists, procedures, and whatever else is necessary to completely define every flight condition belong on paper, not just between your ears.

Your test plan is a living document. It changes as you proceed through your test flights. That's okay, but never change your plan in the air. If you discover something unexpected during a planned test, stop testing, land, and figure it out. If a test plan change is warranted, do it with the same scrutiny you gave to the original version. Do this every time you make a change. Flight test discipline applies to all aspects of flight testing, including test planning.

First Flight

You may be suffering from Get-This-Plane-In-The-Air-itis, but may not realize it. Realize it! The goal of your first flight is to get into the air and back on the ground safely. Not maximum level speed checks. Not low passes over the runway. Not touch and goes.

Assuming you have a typical 40-hour-per-week job and a couple of

weeks of vacation each year, you spend about 2,000 hours on the job. Most likely, you've put this much time into building your airplane, and you're ready to fly! Once in the air, the exhilaration can be seductive. You wouldn't risk a year's salary or a year's worth of achievements without the most thorough consideration. Don't give in to the dark side of digressing from your test plan.

Did you know that, depending on the source of the statistics, 25 to 50 percent of new homebuilts suffer some form of significantly reduced power or outright engine stoppage during their first 10 flight hours?

Embedded between the bookmarks of the first flight goal is the purpose of the flight, which is to determine your airplane's flying characteristics and engine performance *within a very small flight envelope*. The idea is to get a feel for your airplane before returning for a landing. There'll be plenty of time for expanding the performance envelope later in your test program. This self-imposed limited-look flight doesn't preclude you from noting problems, anomalies, or other unexpected discoveries. If you notice any of these during your first flight, make a note of them but don't probe them any deeper.

Your First Flight Philosophy

How do you get that feel for your airplane? What tests will you perform, and in what order will you perform them? Stalls? Large control displacements? Speed runs? Airspeed checks? Will you fly high enough to be able to use that new parachute, or will you want to be able to get back down quickly if something goes wrong?

Will you raise the landing gear? What if one, two, or three of them don't come down? How about flaps? What if the manufacturer recommends a half-flap takeoff and a full-flap landing? Canopy open or closed? Check with the manufac-

turer before experimenting—especially on your first flight.

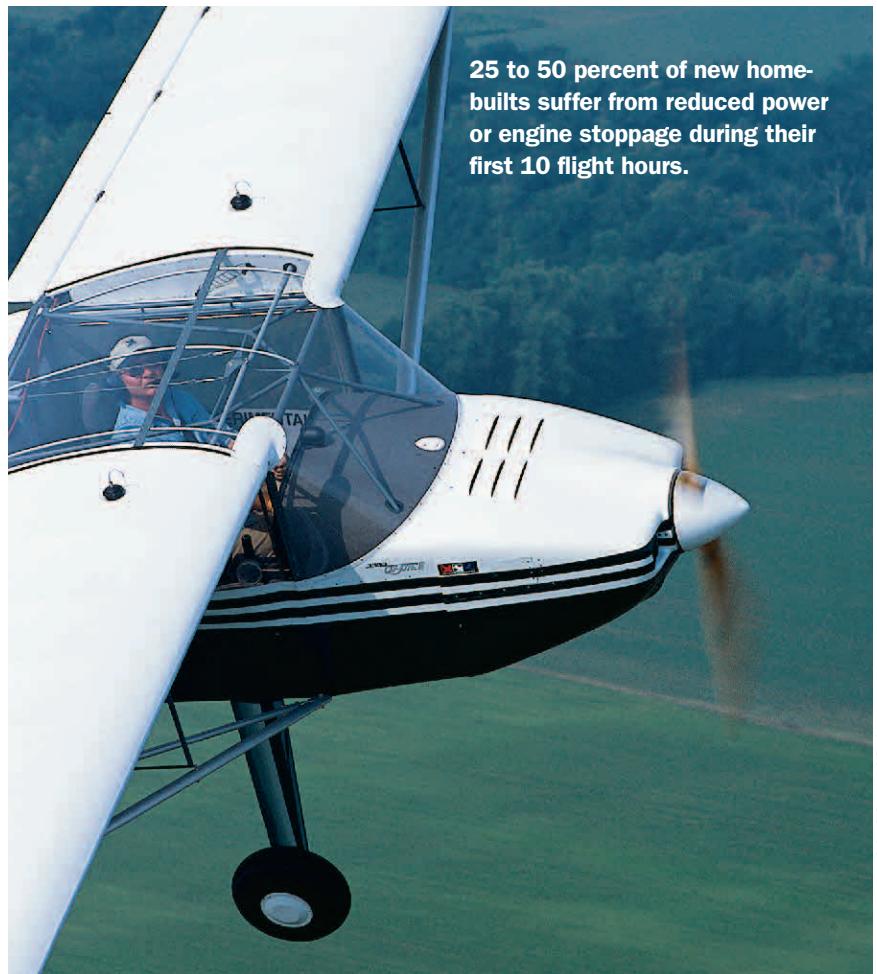
Will you fly from your home airport? What are your runway options? Single runway? Grass, paved, or something else? Can you safely operate your airplane from an unimproved runway? Chuckholes, dips, width, length, trees at the ends, suitable dead-stick landing fields be-

*Without a plan,
you're increasing
the risks involved
with an already
potentially
hazardous flight.*

yond the departure end, other traffic, and hundreds of other considerations should be carefully assessed during your planning.

Controlled fields may offer amenities like cooperative tower personnel, emergency equipment, and rescue crews. Controlled fields generally mean more traffic, more radio chatter, and other intrusions you may not want for this flight. Private strips may provide you the traffic solitude you want, but how long will it take the local fire department to get there? Tough call, and there isn't one correct answer. You must weigh your airplane type, surrounding topography, available necessary support equipment, and other pertinent factors when making your decision.

Your flight test philosophy should be one which best suits your airplane, requirements and comfort level. Pay attention to those little hairs on the back of your neck. If they're standing up, something is



amiss, and they don't lie.

Airplane Preparation

By the time your first flight day rolls around, your airplane will have been scrutinized more than it will likely be ever again. It will have passed multiple Tech Counselor inspections. Yes, multiple. *Tech Counselors provide their services for free. Their interest is ensuring your airplane is put together soundly. Their motivation is promoting homebuilt aviation. Take advantage of this EAA program.* You've asked your Tech Counselor to inspect your project periodically while you were building it. You may have had more than one Tech Counselor review your building progress. Why not?

If you belong to an EAA Chapter (another valuable resource), you may have hosted a meeting at your house or hangar. After normal business, you turned the crowd loose on your machine with the task of finding problems, making recommendations, and just getting a few fresh sets of eyes on what you've been doing. This required setting your ego aside for an evening. You knew their comments were intended to help, not criticize. And they probably pointed out a few details you overlooked.

You've weighed your airplane, and have an accurate weight and balance accounting. Now, how are you going to load your plane for that first flight? Having the center of gravity (CG) near the middle of the allowable range is probably a good idea. Don't underestimate the importance of CG location on any flight, but especially on your first flight. If this means using a ballast, do it right. Tossing a few shot bags on the other seat is asking for trouble because they can become missiles if the airplane should rock and roll. If in doubt, contact the manufacturer for advice.

You probably weighed your plane empty, then with partial fuel, then with full fuel. How much fuel do

you want on board for your first flight? Opinions vary from planned duration plus 15 minutes to full fuel. Brainstorm the pros and cons of various fuel loadings—this is a terrific Chapter meeting activity. If you decide on less than full fuel, do you have a means to partially defuel your plane after weighing it with full fuel? Don't forget to dispose of the drained fuel in an environmentally friendly way.

Engines and brakes generally come with break-in recommendations. Do them. Dilemma: What if the engine manufacturer says run it at full throttle for 45 minutes, and you only plan to be airborne for 25 minutes? Certainly full-throttle, straight-and-level flight will take you faster than middle-of-the-envelope airspeed on this flight. How you resolve such challenges is up to you, but the important thing is to make an informed, well-

EAA's Member Specials

BLACK TOTE

E41198

Nylon tote with blue Member logo. Keep organized while showing your EAA pride.

Member Price: \$10.99

Non-Member Price: \$14.99

STEEL BLUE SWEATSHIRT

E41194

Lee® premium cotton/polyester blend sweatshirt featuring the EAA Member Logo.

Member Price: \$34.99*

Non-Member Price: \$39.99*

Sizes M - 2XL available
Add \$4 for 2XL



Order Online www.eaa.org

Telephone Orders **800-843-3612**
From US and Canada (All Others Call 920-426-5912)

EAA Mail Orders
P.O. Box 3086

Oshkosh, WI 54903-3086

Please present EAA number and product code when ordering. Prices effective January 1 - January 31, 2003. Major credit cards accepted. WI residents add 5% sales tax. Shipping and handling NOT included.


The Leader In Recreational Aviation

HANGARS · HANGARS

PRICED FOR IMMEDIATE SALE!
Take Immediate Delivery — or defer it up to 12 months.



Aviators' 1st Choice For 3 Decades!

Revolutionary combination of premium materials ensures that your hangar will provide maximum protection in any weather.

- Fast & easy do-it-yourself assembly—hangar goes up in days without requiring skilled labor or heavy equipment.
- Available in 19 contemporary colors.
- Sizes are customizable to meet your needs.

AVIATOR SPECIALS

42' x 36' (a \$26,322 value)
with 40' electric bi-fold door
NOW ONLY \$14,228

60' x 48' (a \$54,355 value)
with 54' electric bi-fold door
NOW ONLY \$29,381

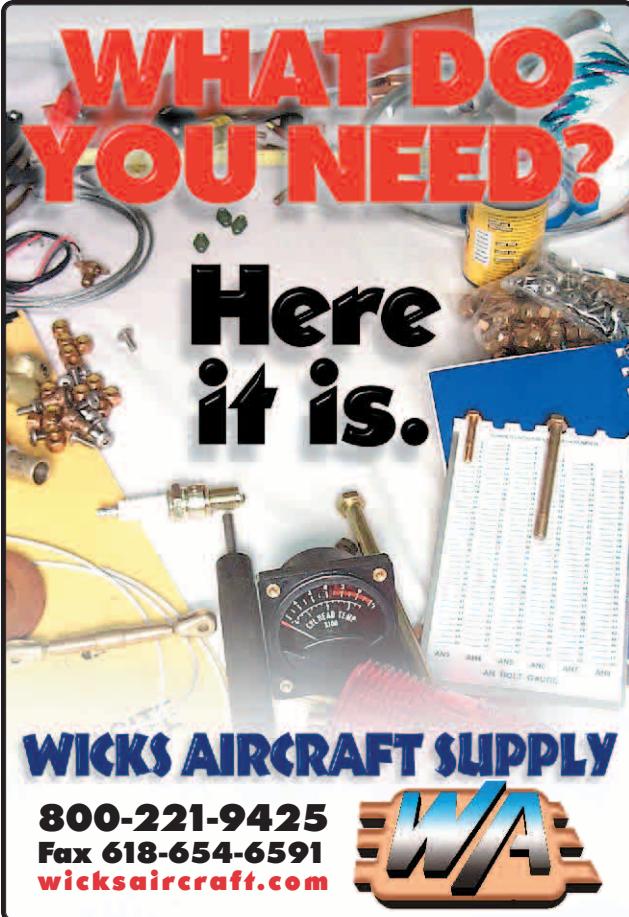
Includes steel frames & endwalls, galv. sheeting, hardware, trim and complete assembly instructions.

Other sizes at great prices too!

 **MIRACLETRUSS®**

1-800-651-6821

www.miracletruss.com



WHAT DO YOU NEED?

Here it is.

WICKS AIRCRAFT SUPPLY

800-221-9425
Fax 618-654-6591
wicksaircraft.com



For more information, visit SPORT AVIATION on the Web at www.eaa.org

Test Pilot

considered decision.

If your project has a tailwheel, consider drawing a small grease pencil line on the windscreen where the horizon is. You can use this reference to know what your pitch attitude is relative to the three-point attitude. This might come in handy during your slow-flight checks or for landing in the event of a problem with the airspeed indicator. Remember, your pitot-static system will not be calibrated for your first flight, and its indications can be different from the published figures.

It might also be a good idea to see what the world looks like from the cockpit in the level flight attitude. Place the tailwheel on an appropriate support so the airplane is in its approximate level flight attitude. Climb aboard and spend a little time getting used to the picture. Go ahead and draw another grease pencil mark if you like.

How many preflight inspections should you perform prior to your first flight? As many as it takes for you to feel comfortable. Host another Chapter meeting and invite everyone to preflight your airplane.

Take the time to create checklists. Preflight (exterior and interior), engine start with appropriate emergency action procedures, taxi, run-up, takeoff, climb, cruise, descent, landing, and shut-down checklists help reduce your anxiety and ensure you won't forget anything. Don't forget about abnormal procedures like an unsafe gear-down light and emergency procedures like smoke in the cockpit. Memorize the immediate action procedures for each.

How's your parachute? If you're borrowing one, does it fit correctly, or do you weigh 75 pounds more than the lender? Ensure its last inspection and re-pack are within the allowable (120-day) time frame. Merely strapping it on can have a calming effect during your first flight, but should you need to use the chute, your procedures should be virtually automatic. This means you'll need some training and practice.

Your airplane preparation checklist should be much longer than this sampling, but no matter how long it is, the ultimate check box is the FAA sign-off. This is your airworthiness ticket, and you can't legally fly your plane without it.

There's a lot to think about—a lot more than mentioned here. Treat these considerations as seeds. Make them the kernels of your first flight planning and preparation. Take your time. In fact, take a month because next month we'll discuss your preparation as the test pilot. We'll also offer a few thoughts about administrative preparation and provide a few sources of flight test information.

Editor's Note: While test pilot Ed Kolano is on sabbatical, we'll be reprinting some of his most popular columns from the past three years.

