Well, here I am again, surrounded by airplane parts. I've got four ailerons standing on padding in a spare shower keeping company with a wing tank, tail surfaces split between my office and a spare bedroom, the canopy is in the den behind the sofa, and the garage is chock-full of goodies. I've got the fully welded and powdercoated fuselage sitting on sawhorses, the engine mount up on top of the shop fridge, and all of the wing wood laid out on shelving; lower wing parts below and upper wing parts above. You need to have some sort of organization system and that's mine. Simple and effective.

As you've probably already guessed, I'm building a biplane, a Pitts Model 12 to be precise. It's my second airplane project and a very different one from the first, a Van's RV-8. While there are many obvious differences between the airplanes, it's somewhat less obvious that the projects themselves have a great deal in common. Both were undertaken after a lengthy period of research into airplanes that met the respective mission profiles.

Five years ago, when I was evaluating kits for my first project, my mission profile was for a 180+KTAS, tailwheel, two seat, tandem seating, sliding bubble canopy airplane with good cross-country legs and the capability for gentle, positive g aerobatics. Some investigation revealed that the Van's RV-8 (www.vansaircraft.com) filled the bill perfectly. I also liked that it was a metal airplane. Though I'd never so much as touched a rivet gun, years of familiarity with aluminum airplanes resulted in my feeling most comfortable psychologically with that construction method. I was very satisfied with Van's responses to my many questions, and I was pleased to discover an absolutely thriving online community of RV builders. The friends I made during the two and a half years it took to build my RV-8 continue to provide benefits of camaraderie far beyond the valuable technical resource which I've almost come to take for granted.

This year, after flying my RV-8 for two complete flying seasons, I found myself craving another project. By the way, that's an unforeseen 'hazard' of homebuilding airplanes: once you get used to having a project in the shop, you'll never feel quite right again if you don't have something to putter on out in the garage. Most multiple builders (repeat offenders) of my acquaintance tend to stick with aircraft sharing a single primary method of construction, if not actually building the same type over and over again. That is, most RV guys tend to build metal airplanes as their second (and third, fourth, fifth, etc.) projects, if not actually building another RV. I didn't share this tendency and, in fact, very consciously decided to choose a different construction method for my new project. I felt as though I had gained considerable experience the first time around with riveted aluminum structures, and now had the confidence to successfully tackle something new. I wanted to get experience with as many different aviation building skills as possible, and I especially wanted to build a particular type of airplane and I wasn't about to let the fact that it wasn't primarily made of riveted aluminum stop me.

The mission profile that drove this line of thought was quite different from the one that resulted in the RV project. This time around, cross country speed and range didn't enter into the equation. I've always loved the large Golden Age biplanes, especially the Wacos. A little investigation showed that purchasing a new YMF-5 was beyond my price point and, besides, I really wanted to build one. Also, as my interest in aerobatics has continued to grow over the

years (and I was very impressed with a demo ride last year in a Pitts S2C), I wanted the capability for unlimited aerobatics. So, I knew that I wanted a large biplane, tailwheel, tandem seating, bubble canopy, tube and fabric construction, a radial engine, and unlimited aerobatic capability. I'd been aware of the Pitts Model 12 (www.pittsmodel12.com) for a few years, and some detailed investigation satisfied me that it was a perfect fit for my requirements.

There are so many choices available to the homebuilder today that any project really needs to start with an adequate definition of its own goals. The simple desire to build and fly a homebuilt airplane, while certainly the genesis of all that follows, is no longer enough. Much thought needs to be given to a mission statement to include such items as: airplane performance (*i.e.* # of seats, speed, useful load, short field capability, fuel endurance & economy, etc.), desired operating environment (*i.e.* long paved strips vs. short grass fields and everything in between), total project cost (*always* more than your first optimistic estimates), aerobatic capability (or not), and, last but certainly not least, visual aesthetics (does the sight of the plane get your blood pumping with the anticipation of flight). Once you've used these or similar criteria to narrow your list of possible projects down to two or three likely contenders, it's time to delve into the manufacturer-related issues.

Think of building an airplane as a marriage with the kit company. You're going to be spending a lot of time and money with them over the next few years. It behooves you to do the very necessary due diligence now and to *choose wisely*. You should plan to do enough investigation to satisfy yourself (and possibly your wife and family) that each kit manufacturer under consideration is running a sound business and that their respective products will be safe, fun, and realistically buildable and insurable. Some items to consider:

1. The length of time that the kit manufacturer has been in business. This is only an indicator, of course, since long established businesses can and do fail. That said, you can be reasonably certain that a company which has been around for ten years or more is likely to continue to be around to support you as a builder and, eventually, an owner/pilot of their aircraft.

2. Plan to visit the kit manufacturer's factory. A little time and money spent upfront in visiting a perhaps distant facility might very well prevent you from making a costly commitment to a company with which you won't be comfortable down the road. A satisfactory visit could also wind up being the deciding factor in favor of committing to a particular design. When you visit a kit factory pay attention to details:

    - Is the person leading the tour (you are being given a formal tour, aren't you?) knowledgeable, friendly, and forthcoming with answers to all of your questions?

    - Does the shop floor seem to be set up and running in an organized and professional manner?

    - Likewise with the company's office space?

- Ask tough questions of your tour guide and be alert for any attempted avoidance, however politely couched, of potentially awkward issues. Some topics to broach at the factory:

    - What sort of testing has been done on the particular design you're considering? Ground vibration testing? Finite element analysis? Flutter testing? Spin testing? Have limit & ultimate g-loads actually been tested or merely calculated? Note that these sorts of tests are not required for kit aircraft, though some companies have them done regardless. It's certainly a personal risk/benefit calculation, but wouldn't you feel better flying an airplane which has been thoroughly tested and whose performance envelope is fully understood in practice (not just on paper or computer)?

    - Are parts and/or sub-kits readily available (actually in inventory), or will there be much lead time between a customer's placing an order and receiving the goods? Be alert for companies financing their daily operations directly from order income. In other words, is the company using their incoming orders to keep the lights on? A company doing this may well be using your cash to pay for the last guy's parts. Think about that: at best this situation could lead to your experiencing delays in having your orders filled (especially large, sub-kit orders) while the company waits for the next guy to send them money to build/acquire your parts. At worst, this is an unsustainable situation and the company won't last. More than one kit company has gone out of business and left customers orphaned without the parts they'd ordered or the cash they'd put up. Item #1 above should provide some reassurance on this point, though no guarantees.

    - Will the company put your funds into escrow until they deliver the goods? If not, why not?

    - Will the company provide multiple references of builders and owners for you to contact? If not, why not?

3. What sort of organized support does the factory offer its customers? Do they provide set telephone hours for answering building questions? How about a dedicated tech support staff? It might only be one person, but it's good to know that he'll be there for you when you need him.

    - Does the company maintain any presence online? This is increasingly important nowadays, as more and more of us rely on email to ever greater degrees.

    - Are there any online builder's groups, forums, or mailing lists? Don't underestimate the usefulness of being able to get questions answered at all hours

(weekends, holidays, etc). Does the company monitor and respond to questions and/or issues raised in these media?

4. How is the company's responsiveness to messages, both email and telephone? Test each a couple of times. If they won't respond to you in a timely manner now, before the sale, how do you suppose they'll do later on, after you've put your cash on the barrelhead?

5. Does the company update their plans and parts over time? If so, are these updates available to current builders? Free or for some nominal charge?

6. Can you take a demo flight with a company pilot in the airplane type you're considering building? Will the manufacturer provide this ride for free? If so, don't expect a checkout, but merely a brief demonstration of the airplane's performance and handling. Expect to get some stick time on this flight.

7. Do an NTSB search on each of your potential project aircraft. You should be looking not for an absence of entries (that might lead me to think that a particular type isn't being flown much, for whatever reason(s)), but for what *sort* of entries you might encounter. For example, when I was doing research on both the RV and Pitts, I didn't pay much attention to airplanes that had been run out of gas, or were the victims of other such obvious pilot errors. Any airplane can be the hapless victim of poor piloting. I was looking for issues like structural failures or other possible design defects.

    - If you find such an issue, you should raise the question with the factory. Believe me, they'll be very familiar with the details of any such incidents and should be very forthcoming with those details (assuming that the investigation has concluded), including their subsequent testing and, if necessary, modification of the design. An excellent sense of a company's priorities can be assessed from an examination of how they deal with adversity. When the chips are down, how will they stand behind their product?

8. Is organized training available in type? Does the factory provide the training themselves, or are they perhaps associated with a particular CFI? In either case, this leads directly to #9.

9. Is adequate insurance available at a reasonable premium for the aircraft type(s) in question? Some homebuilts cannot be insured at any price, just as some airplane/pilot combinations cannot be insured. Ask the kit manufacturer about insurance issues, talk to current builders & pilots of the particular aircraft type, and then take the time to speak with an aviation insurance agent. You need to know that you'll be insurable in the kit airplane of your choice at a price you can afford.

Don't forget to visit a major flyin or two. Oshkosh and Sun-n-Fun are excellent venues for visiting with manufacturers (though they won't have as much quality time for you as they will at

home), as well as viewing the many showplanes on the flightline. A flightline full of the type(s) you're considering is a positive indicator that the airplanes are actually being completed and flown. Take the opportunity to walk the rows of airplanes and speak with as many builders as possible. Trust me, they'll love to talk to you. After spending a few years in the shop, we all love to sit by our planes and talk to new builders on the flightline at one of the big flyins.

These are just a few of the questions and details that should be considered before writing the big check to a kit manufacturer. Remember: everything starts with the mission profile. You need to clearly understand the type of flying that you want to do before you can begin to identify airplanes that meet your requirements. Once you have a few in mind, start investigating!

Good luck and happy building!