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A Hot Mod

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The Aviation Consumer

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Two Good Ideas

Because of aviation's higher-than-normal dingbat factor, I don't see many business ideas in the industry that make my head swoon. Most of them make my head hurt, frankly. We're covering two exceptions in this issue, the Next Dimension Aircraft Cirrus mod project and the basic idea of aircraft partnerships. In a way, the two are related.

Here's why. If Cirrus has figured out anything, it's that magic formula so often proposed but rarely realized: If you build the right airplane, buyers who wouldn't necessarily buy *any* aircraft or maybe just a "traditional" airplane will write the check for your product. In other words, Cirrus set out to bring the moneyed BMW and Lexus crowd into aviation and they've by-God done it, more or less.

But they've also created a problem for themselves. A percentage of the Cirrus demographic is wealthy enough to buy every new model Cirrus has introduced and many have done just that. As a result, there are a lot of used Cirri on the market, especially SR22s. That's worrying enough, but here comes Next Dimension to mod up those used airplanes with turbos and new glass panels that will make them as capable and attractive as a new SR22, or nearly so, for less money. Cirrus needs every sale it can get, so every buyer it loses to Next Dimension—a project I think will take off—is one it can't afford.

APA's marketing brochure.

Coming at the market expansion challenge from the opposite end of the spectrum is David Kruger with his Aircraft Partnership Association idea. I don't know if it can work, but it's just a terrific concept, in my view. His notion is to approach the sale of new airplanes strictly from the affordability of splitting ownership through partnerships. He's trying to get the manufacturers and alphabets signed up to support this and I hope they're listening.

Wait a minute, you say, this is nothing new. AirShares Elite, PlaneSmart and others are already doing this. It's true, they are, but those efforts are managed fractionals, not true partnerships. You buy into them—they aren't cheap—and you essentially get a rental arrangement with concierge service. Cheaper than sole ownership for sure, but because they're buying new, state-of-the-art aircraft, they're still pricey.

Kruger's argument is that a fractional offering $65,000 down and $800 a month may expand the market a little, but $5000 down and $250 a month for an LSA will ignite the interest of many more who thought owning an aircraft was out of the question for them. So would an economical partnership in a late model high-performance single and APA supports that, too.

Obviously, we need both kinds of buyers, but I'll wager Kruger's numbers benefit the industry more. So why aren't the alphabets and manufacturers on board? They are in principle, but commitment lags, probably because of inertia. Aircraft salesmen, who are as strapped for resources as any of us, instinctively go for that small number of prospects capable of writing a check. And why wouldn't they? Kruger wants to direct the discussion to defraying the high cost of purchase by sharing the load in group ownership that's *real* ownership, not a managed fractional. There's a difference and it's not subtle.

The demographics may favor him. He told me there's an age divide between people in their 50s and 60s who want the privacy of sole ownership for its own sake and buyers in their 40s and younger who are appalled at investing multiple hundred thousands in something they might use for 120 hours a year, if that. Frankly, I think he's on to something.—*Paul Bertorelli*

aera ERA

Interesting reading about the latest from Garmin in your December 2009 issue. A question from those of us that fly open cockpit: Will the touchscreen work with gloves on?

My iPhone won't. This could be another case where "improvements" take a whole class of user out of the market.

Gary Mitchell
via e-mail

Yes, the aera will work with gloves on. It's resistive technology, not the capacitance technology used by the iPhone and others of its ilk. Although we didn't try the aera with gloves on, we used its motorcycle cousin, the zumo. Works fine with gloves.

Now that touchscreen entry is finally here, can you tap the course line on the new Garmin aera and drag/edit a segment in real time?

This would be great when ATC gives you a clearance change while IFR. No need to enter new fixes by keyboard... just drag your existing course line and have it snap to the nearest fix as when editing a line segment in a typical vector drawing program.

You didn't say, so I'm guessing the answer is "no." Or "not yet."

Mike Palmer
Glendale, Arizona

We'll go with not yet. At press time, Garmin told us the aera doesn't currently have this precise capability, but that there might be a way to do it. When they let us know, we'll let you know.

ADS-B CHALLENGE

In the November 2009 sidebar on ADS-B, you said, "But the FAA doesn't like the idea of ADS-B parasites not transmitting, so it recently had ITT modify the transmission from ADS-B ground stations so they only broadcast information about traffic near participating aircraft. "

That may make a great conspiracy theory, but it is false. I worked as a private consultant to one of the firms that was bidding against ITT for the ADS-B contract. What you describe as "recently" was always part of the FAA requirement.

What is the point of transmitting in the blind when no participating aircraft are in the area? The ground-based transceivers receive traffic reports from both UAT and 1090ES and if traffic is detected using both frequencies at the same time and area, the GBT will duplicate the messages on the opposite frequency.

The GBT also receives transponder radar targets that are not participating in ADS-B and formats them into TIS-B transmissions. They are only sent, however, if there is an aircraft on the frequency with the capability to receive it. The ADS-B Out includes messages that define the participating aircraft's capabilities.

Unnecessary transmissions just congest the frequency, particularly on 1090ES. The FAA ADS-B design never considered "parasite" receivers (those receivers which do not have ADS-B Out). I spent considerable time discussing this with the FAA at the time. Traffic messages can be monitored with a "receiver only," but they will not see all traffic and cannot control what traffic they will see.

John Collins
Via e-mail

Your points are well taken, but exactly what went on (and is going on) with ADS-B seems to depend on who you ask. Apparently, the final details weren't actually final until they went into ITT's contract in 2008. That's recent.

Some people say it was always the plan, others don't. We had to pester the FAA for two weeks to finally get their side of the story and that was after deadline. At the least, the FAA is not happy about the parasite ADS-B systems and would like to see them all go away. Now.

MT: Hold The Phone

Nice article on composite props in the December 2009 issue. I was wondering when articles like this would begin to hit the streets. Composite props are the current must-have accessory along with glass-panel displays and fluid de-ice systems.

You may want to check your source for price between the MT three-blade composite and the Hartzell three-blade composite. For the Cirrus SR22 (Hartzell item number J3F30500) the price is $29,229 while the MT is MTV-9-D-198-50 at $12,450.

This article also missed the owner feedback you normally ask for in advance and include in your work. I always look forward to that and missed it here. (Our Website includes several pages of owner quotes: http://www.flight-resource.com/Testimonials.aspx)

I checked for STC'd applications of MT and Hartzell composite props. MT Props are STC'd for install on nearly a thousand models equating to more than 100,000 currently flying aircraft worldwide. Hartzell composites have only a few STCs approved covering a much smaller population. I

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Aircraft Partnerships: Find the Right People

The best partnerships are like good marriages: Well-matched individuals who contribute equitably—and a solid prenuptial agreement just in case.

CHECKLIST

- ⊕ Arguably the best option for keeping the cost of flying reasonable.
- ⊕ Allows access to aircraft not normally rented and for longer periods.
- ⊖ If you can't find the right partners, the endeavor is probably doomed to fail.

by Jeff Van West

On the surface, co-owning an aircraft just makes sense. Most airworthy privately-owned light singles fly less than 100 hours a year—in many cases far less. Regular use is better for the aircraft and better for amortizing the fixed costs (hangar, insurance, databases) per hour of flight. More users should mean more bang for everyone's buck.

Unfortunately, several owners also mean more opportunities for conflicts in time, resources, flying style, opinion and even personality. Being connected to anyone by your checkbook can put a strain on the best relationship. There's no magic formula for creating the right partnership. But our survey results hit the same key points with metronome-like regularity: Good partnerships have clear expectations between partners of similar economic standing, and they have written rules or bylaws to settle disputes.

EQUALLY DEEP POCKETS

The prevalence of comments like, "Our partnership has worked well for so long because we have similar financial resources," was a surprise to us at first, but it shouldn't have been. There are three big problems with unbalanced discretionary income among partners. The first is for maintenance and upgrades.

For example, if two partners are hard IFR fliers and want an approach-certified WAAS GPS and the third isn't even instrument rated, there is often a conflict. Partnerships can weather such issues when the VFR pilot sees a payback. That might be as undefined as knowing the aircraft will be used more, or as concrete as a trade for the low-time pilot's impact on the shared cost of insurance.

We saw several examples of upgrades where one or a few of the aircraft partners shouldered the whole cost because they felt passionate about the need. One of these was a $27,000 avionics upgrade—not exactly chump change. Other partnerships ended because of unresolved differences in what an airplane "needed." Similar comments came up about maintenance—all members must have the same philosophy, be it "fix it now" or "shop on eBay."

The second issue is that each partner must be able to comfortably afford the dues and fixed costs. "The most damaging thing would be a partner that is stretching himself to make the payments," one respondent

told us. "A bad partnership is one thing, but having to sell the plane or find another partner quickly is worse."

The third facet to the economic resources issue is that few of the partnerships we heard about built a full reserve cost into the hourly rate for their airplane. While this may seem foolish, in a partnership of a few members, there's a reasonable logic. Money put into a reserve fund typically won't make as much profit for the individuals and certainly isn't available as liquid cash. The partnership may not last or may move to a different aircraft before a major engine or airframe bill comes in.

One part-owner in a late-model Seneca added this point about not collecting for an engine overhaul: "To do so would break a psychological barrier for us of paying more than $200 an hour for flying or more than $1000 per month in fixed expense."

If that sounds like a bit of self-delusion to make flying seem cheaper, well, maybe it is. Few partnerships volunteered hard numbers for their real, per-hour costs and many admitted they didn't know and didn't want to. Of the few we did see, dividing their reported hours flown by their reported costs showed rates that might be higher than you'd expect with a partnership: $230/hour for a Beech Bonanza, $170/hour for a Cirrus SR20, $150-$125/hour for an older Cessna 172. In none of these cases was there a set aside for engine replacement or major upgrades.

Of course, we did hear of some real deals, like the nine pilots in an Aeronca Champ who each chip in $25/month and $25/hour wet. A similar group, at a fly-in community, shares a Piper J3 who split insurance and other costs as they come up. The often do the maintenance themselves. The only hourly cost of the plane is to refill the tank. We're still trying to find out where these guys live.

The takeaway is that a solid partnership mitigates the financial sting of ownership by spreading out costs, but it's not slam-dunk cheaper than renting or being part of a larger flying club—especially if you're not flying that many hours or there's a big, unexpected bill to pay.

AIRPLANE COST PER YEAR					
Partners	**1**	**2**	**3**	**4**	**5**
Fix/Yr	$6,300.00	$3,150.00	$2,100.00	$1,575.00	$1,260.00
Fix/Month	$525.00	$262.50	$175.00	$131.25	$105.00
@50Hr/YR					
Fix/Year	$6,300.00	$3,150.00	$2,100.00	$1,575.00	$1,260.00
50 Hr/Yr	$3,250.00	$3,250.00	$3,250.00	$3,250.00	$3,250.00
Total/Yr	$9,550.00	$6,400.00	$5,350.00	$4,825.00	$4,510.00
$/Hr	**$191.00**	**$128.00**	**$107.00**	**$96.50**	**$90.20**
@ 40 Hr/Yr					
Fix/Year	$6,300.00	$3,150.00	$2,100.00	$1,575.00	$1,260.00
40 Hr/Yr	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00
Total/Yr	$8,900.00	$5,750.00	$4,700.00	$4,175.00	$3,860.00
$/Hr	**$222.50**	**$143.75**	**$117.50**	**$104.38**	**$96.50**
@ 30 Hr/Yr					
Fix/Year	$6,300.00	$3,150.00	$2,100.00	$1,575.00	$1,260.00
30 Hr/Yr	$1,950.00	$1,950.00	$1,950.00	$1,950.00	$1,950.00
Total/Yr	$8,250.00	$5,100.00	$4,050.00	$3,525.00	$3,210.00
$/Hr	**$275.00**	**$170.00**	**$135.00**	**$117.50**	**$107.00**
@ 20 Hr/Yr					
Fix/Year	$6,300.00	$3,150.00	$2,100.00	$1,575.00	$1,260.00
20 Hr/Yr	$1,300.00	$1,300.00	$1,300.00	$1,300.00	$1,300.00
Total/Yr	$7,600.00	$4,450.00	$3,400.00	$2,875.00	$2,560.00
$/Hr	**$380.00**	**$222.50**	**$170.00**	**$143.75**	**$128.00**

FLY MORE, PAY LESS

The chart above can be thought of as the aviation equivalent of cheaper by the dozen. It was sent to us by Gary Klingele of Wenatchee, Washington, who is currently in a long-term partnership (18 years) with two members in a Piper Archer. By his analysis, the magic partner number is five and the chart above shows how the numbers work.

Some assumptions: Fixed costs are $2500 a year for hangar, $1000 for insurance, $2000 for an annual inspection, $500 for miscellaneous and two percent of this total for lost investment opportunity. The $6300 a year fixed costs are spread among the partners. The aircraft variable costs are pegged at $65 an hour. The values in red show the hourly costs for each partner flying 20 to 50 hours a year versus the total number of people sharing those fixed costs from one to five.

The chart puts values on what every one knows: In partnerships, more partners and more flying drive down the unit cost of each hour. It also supports the magic number of between 150 and 200 flight hours per year for the partnership to work well. Rates just north of $100/hour appear for each member with three members flying 50 hours each, four members flying forty hours each or five members flying 30 hours each.

One thing we did hear was that partnership offered more airplane for the same net investment. People who were renting Cessna 182s were now partners in a Piper 6X or a Mooney. Or they were in a plane that wouldn't be available any other way, as Chris Cussen told us: "I would not be able to do the flying I do without a partnership arrangement as there are very few Cessna 180s available for private hire. Those that are available would not be released for mountain/strip flying. I could not afford the costs associated with individual ownership."

PARTNERSHIP STRUCTURES

We had reports of partnerships from two to 10 members, with the most common being two to four. Reports of conflicts were rare. If anything, it seemed that with even four or five pilots the aircraft sat more than some members wished.

The magic number may be more in terms of hours flown than number of members. Happy partnerships reported 100-300 hours of use on the aircraft, with an ideal number being between 150 and 200. So the right number of players is the number that will net about 175 hours of flying time a year. One potential catch is that more than four or five members becomes a club for insurance purposes and significantly raises the rates.

Few partnerships reported conflicts when it came to scheduling. Most used e-mail or free web calendars from Yahoo or Google. If there was a conflict, usually the preference went to someone making the longer trip. Some partnerships use a rotating week where one member has first rights to the aircraft, usually on a Thursday-Wednesday schedule.

Many of the partnerships were corporations (see August 2008 *Aviation Consumer* for more on aircraft corporations). The gain here was the potential for some level of liability protection (we still feel good insurance is the first and best line of defense) and it's an easier transfer of the asset as members come and go. The aircraft is owned by the corporation and doesn't change hands. Shares in the corporation are bought and sold. Some folks reported that having the corporation in place before the corporation even bought an airplane help new members feel OK with the commitment to get on board.

An additional benefit with the corporate structure is that ownership in the corporation didn't equate flying rights on the aircraft. A member who was behind on dues could be prevented from legally flying the plane, as could someone inheriting the share as part of a family estate. That's not an option with outright ownership.

The downside of corporate structure can come in fees and hassle. Some states have yearly filing fees and requirements. Taxes become more complex, including depreciation of the asset. There are simply too many permutations to explore

SELLING THE IDEA OF PARTNERSHIPS

The way Dave Kruger figures it, mass marketing of aircraft partnerships may prove instrumental in the salvation of light aircraft general aviation. That's why he started the Aircraft Partnership Association, a Web-based match-up service, a year ago.

The marketing of partnerships as a means of roping in the high cost of flying is something that's simply never been done on a large scale, if at all. The question is, how do you do it?

At the moment, Kruger is experimenting with various approaches, including a kiosk at a local mall with a Remos LSA on display. The pitch is focused sharply on cost: "Own this aircraft for $5000 down and $250 a month." Kruger told us that invariably, prospects who may have been interested in aviation, but have ruled it out as too expensive take a second look at those numbers. "Really? I could do that." As part of his sales pitch, Kruger flogs a $40 intro ride right on the spot. Can this guy sell, or what?

He realizes that this guerilla marketing plan is small potatoes compared to what needs to be done and that's to get AOPA, EAA, NBAA and GAMA on board with the manufacturers to sell structured partnerships as a practical way to own an airplane. Thus far, the alphabets have been timid about the idea and the manufacturers too narrowly focused on that small number of buyers capable of writing a half-mill plus check without batting an eye.

In Kruger's view, the emerging LSA market provides a low-cost wedge to both bump student starts and keep people engaged once they've learned the basics. Based on his face-to-face marketing experience, there may be a generational shift afoot.

"I see it a lot. In people who are in their 50s or a little older, the attitude is 'keep your hands off my stuff,' so they don't see the value of partnerships. But younger people seem to more interested in the experience than in the ownership [of one thing.]"

APA's site is currently undergoing an overhaul, but it still offers unique assistance in putting any kind of partnership together. Log on to www.theapa.com for more, or contact Kruger at 972-334-0403.

You won't find a Bonanza like this for rental (or most any Bonanza for that matter). But your personal preferences may not jive with others in the club, such as the GPS so far to the right and the turn-and-bank moved down behind the yoke. If you're buying into a partnership, make sure any customizations or STCs have the right paper trail too.

here, so we'll leave that discussion for you and your accountant. Overall, the more members involved the more a corporate structure to the partnership makes sense.

We heard of a few alternate structures where only one member owned the aircraft and others chipped in the fixed and hourly costs. Some were a straight percentage of fixed and some only paid by the hour. This starts to sound a lot like rental, but it isn't. Whether the aircraft is corporately held or privately owned, pilots can reimburse the owner for "operating expenses" on the aircraft they borrow without it being looked at as a commercial enterprise.

Leasebacks are another option that comes up for individual owners or small partnerships. While these may soften the cost of ownership somewhat, it's rare that they truly pay back and are a good deal for the owner. Primary trainers might be the exception.

GET IT IN WRITING

Dennis Pelletier has been part of an 18-year-old partnership that first owned a Piper Cherokee and now has a Cessna Cardinal, and has seen many members come and go. "Some people want the cost benefits of a partnership, but don't really have the flexibility, personality, or respectfulness required in a group ... Every time we've experienced a difficult partner, there was either a hole in the partnership agreement (which has been amended a number of times over the years), or we didn't take enough time to insure the candidate properly understood the philosophy of our partnership."

Even in partnerships as small as two people, having a written agreement for all aspects of the partnership was ranked high as a key component of success. The partnership agreement must cover how moneys will be collected and spent and policies for aircraft use. Many groups go further with details of aircraft operation—how it will be flown and in what conditions, how it will be left for the next user, and so on. We think the bigger the group, the more this matters.

The boilerplate partnership agreement AOPA offers (www.aopa.org/members/files/guides/agree.html) has 52 items on it. If you're setting up a new corporation, it's worth making sure you have some plan for all these contingencies and that the big ones involving the asset—buying, selling, upgrades, inheritance, insurance—are agreed on paper and signed by all partners.

The paper agreement can be a way to weed out potential problem partners. In the responses we heard some partnership horror stories. There was one potential partner in a Cessna 172 who told the group he'd be great because he only liked to fly at night. He really wanted the plane for hauling light cargo after hours (it wasn't clear what was meant by "cargo" either). There was another group where one member was an instructor and chose to give instruction in the plane at his low usage rate. Of that doomed partnership the person told us, "the wheels fell off."

One critical item that is often overlooked is what happens when a partner can't fly for some period of time due to a financial, medial or other issue. Many partners choose to stay in the plane, still paying their share of the fixed costs, or some pre-agreed reduction. We heard of one case of 10 partners in a Cessna Cardinal where only four fly.

A COMMITTED RELATIONSHIP

Brian Bailey told us about his Cirrus SR22 partnership, "We fly together often and ask each other questions about procedures, avionics use, maintenance etc., trying to stump each other with some obscure aviation related question. It makes both of us better pilots."

Perhaps that's one of the intangibles of a good partnership. It's an opportunity to raise your bar on professionalism just due to peer pressure and keep up your enthusiasm for flying. We've heard of more that one case where a new partner pumped up sagging spirits of the other owners.

There's also the fact that with only a few people to negotiate with, owning an aircraft means real freedom of use. Mac McCarthy is a partner in a 1983 Mooney. "It allows me to fly the way I like. While there are still a lot of rentals available, they all charge you a daily fee when you go on longer trips. And try renting one to go to the Bahamas or Belize. It's also kinda neat, like being a kid again. You have a club that only a select few can join, you have a ball doing it and others think you're rich."

Jeff Van West is Aviation Consumer's managing editor

Aspen MFD: Cost- and Size-Effective

The big attraction is that you can shoehorn everything into the six-pack zone without much angst. It can also double as a PFD or split-screen display for backup.

by Paul Bertorelli and Larry Anglisano

AVIONICS FLIGHT TRIAL

Once upon a time in a galaxy not far away and not that long ago, there was no such thing as an EFIS. The aviation world was guided by spinning iron gyros on jeweled bearings. Then, overnight it seems, you could practically buy one of these things in the electronic department at Walmart.

Okay, so that's an absurd exaggeration, but there are still a bunch of aftermarket EFIS choices out there and Aspen, Garmin, Avidyne and, soon, Bendix/King continue to offer more. Most recent is an expansion of the Aspen line with new approvals for the EFD500 and EFD1000 in the multifunction role.

As we've reported previously, Aspen has essentially invented its own niche market by engineering a compact, easy-to-install PFD that fits electronic gyros into the space normally occupied by the AI and DG/HSI. Even in an anemic market, Aspen has enjoyed brisk sales, evidently because the installation does less violence to the basic panel and because the price is right.

Aspen's plan all along had been to make a full glass suite available by displaying additional information on a second or third display. In September, it announced approvals to do just that.

Unique to the Aspen line is the ability to split the screen to display an AI and other data, left photo. The MFD can also be entirely reversionary for the main PFD. Weather data, right, includes graphical METARS and scrolling and clicking on the icons brings up additional text data.

WHICH IS WHICH?

The basic building blocks for the entire Aspen line is the EFD1000 hardware. There are three versions: The $5995 EFD1000 Pilot is the entry level model with a single ADAHRS that shows attitude, but that won't interface with NAV or GPS sources.

Next up is the $9995 EFD1000 Pro that does what the Pilot does, but interfaces with GPS and NAV sources give it flight director input, dual bearing pointers and GPSS autopilot capability, plus rudimentary map information. The top-of-the-line

CHECKLIST

- ⊕ Display is suitable for a map and other data, despite the vertical format.
- ⊕ Operating logic is easy to grasp because Aspen hasn't tried to do too much with the unit.
- ⊕ Single-button reversion is unique for aftermarket products.
- ⊖ Competition in MFDs is fierce and some have more interface options.

INSTALLATION CONSIDERATIONS

So, quick question: How easy is an Aspen MFD to install? The short answer is that it's as easy as installing an Aspen PFD—times two. Then add the additional wiring effort that tags along with any MFD installation. Mechanically and electrically, the MFD is really the familiar Evolution PFD, but requiring several additional install requirements mainly because the 1000 MFD has a reversionary data mode. (The MFD 500 does not, because it has no internal ADAHRS.) The 1000 MFD/PFD combo requires the emergency backup battery (EBB58 that weighs 2.25 pounds and measures 8.5 x 1.7 by 3.7 inches) option. This battery is connected to the MFD only and its presence allows ditching the steam gauge airspeed and altimeter from the panel.

Aspen is working hard to rid the round gauge AI from the panel, too, but the FAA hasn't bought off on that just yet. Since the MFD might become a primary PFD in reversionary mode, it must be mounted +/- 35 degrees of the pilot's horizontal centerline, per FAR 23.1311(a) criteria. That means putting it somewhere in the normal six-pack zone.

The MFD and PFD each require a dedicated remote sensor module (RSM), the GPS antenna-like device that provides heading, GPS and OAT feed to the display. Until now, this RSM had to be installed externally atop the aft area of the fuselage, but Aspen has provisions for mounting the RSM inside of the airframe. A version of the RSM without GPS receiver is used in this application.

This could cut down on installation effort since there's one less sensor to mount on airframes already littered with antennas. Further, the RSM could be conveniently installed on an avionics shelf, an area once occupied by a traditional heading flux sensor, or any other area clean of magnetic and other interference.

Aspen requires that dual RSMs be well separated from each other in the aircraft in case a common mode failure was present. While internal mounting of the RSM might be an easier effort for the shop, the operator loses OAT, TAS and calculated winds capability on the associated display.

There's also a bottom-mount RSM, but this will be the exception in most applications. A single analog converter unit (ACU) can be shared between displays, since converted analog data is crossfed between units in digital format. The remote emergency battery is connected to the MFD only.

The MFD requires pitot and static source input and in reversionary interfaces, an alternate static source—with static valve easily accessible by the pilot—is required. For aircraft that have dual and independent static systems, it's required that one display is connected to each system.

Similarly, for aircraft with dual electrical systems, each display is connected to an independent bus. The MFD and PFD are interconnected through an RS232 serial dataline and each display has its own configuration module for storing installation-specific setup data.

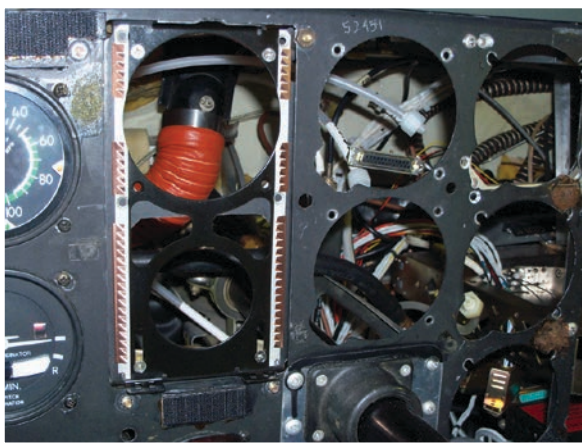
Since the MFD can accept a variety of traffic sensors, EWR50 XM datalink weather and WX500 Stormscope, this additional wiring effort can be extensive, as it is for a traditional stack-mounted display.

Further, since these blind boxes can only output to so many devices, owners might have to pick and compromise on which displays will carry a given interface.

While an ARINC 429 bus can often output to a half-dozen devices, RS232 serial data output is limited in the number of devices it can drive at the same time. In other words, if you currently have traffic and Stormscope playing on your existing stack of Garmin units, your shop might have to disable (read: rewire) the interface to accommodate the Aspen MFD.

While digital 429 has become the common data stream, RS232 still exists in older systems. Be sure to discuss this interface with your shop beforehand.

Whether the Aspen MFD is part of a fresh, dual-screen installation or is added to an existing single-screen PFD, the interface certainly won't be a slap-and-go event and installation prices will be all over the board. *—Larry Anglisano*



AC TV

For a video tour of the Aspen MFD, log onto www.avweb.com, then click the video button in the upper right of the home page and scroll down to the Aspen video. Here's the direct link: http://snipurl.com/tj200

EFD1000 ATP ($12,995) adds traffic, weather and charting functions to the PFD side.

On the MFD side, the entry level 500 is priced at $4995 while the 1000MFD lists for $7995. If you want weather, you'll have to opt for Aspen's $2495 EWR50 XM WX Satellite weather receiver; the system won't play with other brands, something that might limit it's appeal to some buyers.

So what's the difference between the 500 and the 1000? Think of the 500 as nothing but a display capable of accepting remote sensor input, including GPS and map data, traffic and weather. The 1000—for a little less than a third more money—will do all that the 500 will, but it can also serve as a full PFD for buyers who want belt-and-suspenders back-up, with duck tape thrown in.

To do that, it requires its own independent ADAHRS wired to an independent bus, plus a back-up battery. If the main PFD goes dark, a single button push pulls up the identical PFD on the right side (or left, if you put it there) for instant reversion. This capability is unique for the aftermarket and we're sure Aspen will—and should—make it a sales point.

FLYING IT

We flew the new system with Scott Smith in a Cirrus SR22 equipped with three Aspen displays: an MFD 500 on the far right, an EFD1000 Pro in the center and an MFD1000 on the right.

First, the interfaces. The 500/1000 will accept traffic from any of the popular boxes, lightning data from a remote WX-500 Stormscope and weather from the aforementioned Aspen receiver. The SR22 we flew was equipped with dual Garmin GNS430s which display course and flightplan data on the MFD1000.

One limitation of the Aspen architecture is screen size or, more accurately, aspect ratio. Measuring 3.5 by 7 inches, the Aspen displays are strongly biased toward portrait mode. This is ideal for a PFD display, less so for an MFD, especially when you want to see things well to either side of the

WHAT ELSE IS OUT THERE?

MODEL	SIZE	RETAIL	INTERFACES, COMMENTS
AVIDYNE			
EX500	6.2x4.3x 10.7D	$9990	WX-500, TAS, TIS AND TCAS traffic, XM WX weatherlink, FMS/GPS navigator
EX600	6.2x4.9x10.9D	$9990 (w/o radar)	Most popular traffic boxes, TXW670, WX-500 lightning, EGPWS, TAWS Collins and Bendix/King airborne radars, electronic approach charts, MLB700 weatherlink (Sirius/WSI), XM WX weatherlink
EX5000	8.5x10.7x4.6D	$14,999 to $17,995	Interfaces with many popular airborne radars,TAS, Ryan 9000B/BX traffic, Skywatch, Garmin TIS, KTA870 traffic, TXW679, WX-500 lightning
BENDIX/KING			
KMD150	6.2x4.0x6.9D	$5486 (with GPS)	WX-500 lightning, HSI/autopilot coupling, can be purchased without GPS option ($3686)
KMD250	6.3x3.0x7.6D	$5628	TCAS, TIS, Skywatch, Ryan 9900BX traffic, KDR-510 weatherlink, WX-500 and WX-1000E Stormscopes. Price varies with I/O
KMD550	6.2x4x10D	$9789	XM WX weatherlink, TIS traffic (B/K transponder only). TAS, TAWS, WX-500 lightning, limited interface with Garmin mapcomms
KMD850	6.2x4x10D	$16,838 with radar	XM WX weatherlink, TIS traffic (B/K transponder only). TAS, TAWS, WX-500 lightning, RDR radar display, limited interface with Garmin mapcomms
GARMIN			
GMX200	6.2x5.0x8D	$8995 to$14,995	Airborne radar with GWX68, ChartView, FliteCharts, SafeTaxi, XM WX weatherlink, TAWS, GDL90 ADS-B. Prices vary with I/O

displayed course line. The easy solution to this is a panning function—up and down on the right hand knob, left and right on the left knob. It takes a little getting used to, but it's not a show stopper.

The basic buttonology is the same as the PFD, since the hardware is the same. There are two knobs on the bottom of the bezel and three keys. Along the right bezel are five context-sensitive keys, a menu key, a map range key and a red-labeled reversion key.

As with most displays, the MFD display consists of multiple pages and subpages or layouts, which you navigate using the knobs. For example, for the weather function, there are eight pages and a page navigator in the lower left of the screen tells you where you are: 2/8, 3/8 and so forth. Each page has a different weather product.

This design approach provides both unambiguous access to information in a logical way and quite a bit of flexibility. For example, one of the layouts allows a basic map in the lower portion of the screen and two thumbnails at the top. Using the menu keys, you can customize these thumbnails to suit your fancy. For instance, if you're tiptoeing through convective weather, you might want to have the strike page in one thumbnail and NEXRAD in the other, or some other combination. Again, other MFDs do this in some fashion, but not in displays that occupy the six-pack zone.

None of these combinations are difficult to figure out, even without cracking the pilot's guide. We think this is primarily because Aspen hasn't tried to do too much with the MFD, but it still has enough capability to keep up with the competition. We would rate screen size, brightness and viewability as excellent and even though some of the labeling is smaller than we would like, the fact that it's placed directly in front of the pilot is a plus.

CONCLUSION

When we're asked about our honest feelings about the Aspen concept, we always seem to visualize an older airplane—say, a Comanche or an E-model Mooney—that already has a GNS430. The EFD1000 allows the owner to bring this airplane up to state of the art for not much money, assuming you don't go hog wild with the interfaces. The MFD500/1000 offers a similar cost-effective, simple mechanical installation that doesn't requiring ripping out the panel back to the cold side of the firewall. Check on the detail on the prices of other MFDs in the chart on the opposite page. In our view, the Aspen MFD option is near the top in value.

However, the Aspen's vertical aspect may not appeal to everyone. If there's room in the center panel and budget isn't a driving factor, there are other products—not to mention used options—that might prove a better fit. Either way, if you already have the Aspen PFD, upgrading to an MFD of any kind will start around $10,000 and go up from there.

If you want an aftermarket MFD that doubles as a PFD, Aspen is the only choice and that will give it strong market appeal.

Larry Anglisano is Aviation Consumer's avionics editor. He works at Exxel Avionics in Hartford, Connecticut.

AIRCRAFT MODIFICATIONS

Next Dimension Mod: Cirrus Upgrades

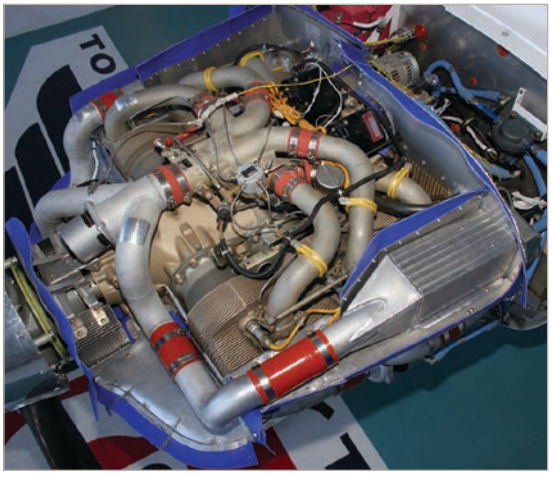
With the market flooded with used SR22s, Next Dimension's offering would upgrade them with turbochargers and Avidyne's Release 9 EFIS.

by Paul Bertorelli

Operating on the premise that good airframes are forever, companies have, from time to time, offered major upgrades and mods that turn the old into the new. Some have been successful, such as RAM Aircraft's twin Cessna engine upgrades or Rocket Engineering's Malibu turbine redo, but many have not. It's not that the upgrades don't perform, but that buyers just don't sense an obvious price/value connection.

This conundrum frames the challenge that a new company called Next Dimension Aircraft will face in introducing what's one of the most ambitious mod projects we've seen to date. We define "ambitious" as a modification whose costs come close to or exceed the value of the airframe.

That's definitely the case for a new Cirrus project from a startup Next Dimension, which proposes to modify normally aspirated SR22s equipped with IO-550Ns with the Tornado Alley turbonormalizer set-up Cirrus has been selling in new SR22s for three years. The turbonormalized SR22 has been wildly successful for Cirrus until the current downturn hammered sales. Even at that, Cirrus is still selling new aircraft, reporting 68 sales during the third quarter of 2009, a respectable total given the



Next Dimension mods can include the Release 9 EFIS system from Avidyne, whose control keyboard replaces the pedestal-mounted mapcomms. Tornado Alley Turbo setup, lower photo, includes dual turbos with generous intercooling.

sorry state of the economy.

In addition to the engine upgrade, the Next Dimension mod offers Avidyne's second-generation EFIS, the Release 9. Although it's comparable to the Garmin G1000 Cirrus offers in the Perspective SR22, the Release 9 hasn't gained huge traction in the OEM market that Garmin simply owns. Depending on how successful Next Dimension is or isn't, Avidyne might see some sales if enough buyers show interest in Next Dimension.

WHAT'S INVOLVED?

A lot. Next Dimension is no weekend bolt-up project, but a fundamental re-do of the airplane. Beginning with the engine, the existing powerplant can serve as the basis for the Tornado Alley turbonormalizer, it can be overhauled or replaced entirely. Either way, the project involves rework or replacement of the cowling and installation of lots of plumbing for the intercooling and turbo systems.

The existing engine's total time and condition will have an impact on the cost of the mod. Tornado Alley has built hundreds of turbo systems for new SR22s, but has done relatively few TN conversions of older SR22s. Nonetheless, says TAT's George Braly, the company is happy installing a turbo system on a 1000-hour engine that's in good condition and Next Dimension's Scott Crenshaw told us the decision will be up to the customer.

On the avionics side, the Release 9 represents major surgery for the panel. Some early SR22s have steam gauge/EHSI combos, but most have a version of the original Avidyne Entegra. While that's certainly a capable system, the R9 (and G1000) surpass it in top end features, if not operability. Avidyne has as fully-digital autopilot (comparable to Garmin's GFC700) that it hopes to certify by mid 2010. At present, R9 uses the S-Tec 55X.

The Entegra systems relied on a pair of Garmin GNS430s for navigation and communication, but the R9 system has its own VHF suite. So as installed in the SR22, the Garmin mapcoms are removed from the center pedestal and replaced with the R9's keyboard/controller. The trade-in value of the removed avionics are factored into the price. Also, the R9 will be available in three levels, the platinum (dual AHRS), the silver (single AHRS) and the gold, a non-WAAS version for the overseas market.

COST

Obviously, this isn't a cheap mod. At the upper end, figure around $200,000 all in. But this will be variable with the aircraft selected because Next Dimension's business approach envisions an à la carte menu of options. Scott Crenshaw told us the company is aiming for "a new aircraft buying experience for a used aircraft buyer." To deliver that, ND has in mind buying 2004 and 2005 G2 SR22s on the open market—of which there is a great abundance—performing the mods and then selling them as new for prices between $350,000 and $450,000, against a new price from Cirrus of about $625,000. (In the current market, we suspect new airplanes are going below those prices.)

Price variability depends on the options package the buyer wants. The full boat includes the engine mod, the avionics, an interior refurb and fresh paint. But the buyer can opt in or out of any of these. Some buyers may elect to keep their SR22s and have Tornado Alley do only the turbo mod, which it has the STC to do.

Another option is for an owner who already has an SR22 to have ND do some or all of the mods, at all-in prices that Crenshaw estimates to be between $175,000 and $200,000, but buyers should contact ND for an exact quote for the airplane they have in mind. Crenshaw said some owners have also asked about installing Garmin's G600 instead of the R9 and ND is considering that option. It's not clear to us, however, that the G600 would be much of a step up over the Entegra to make it worth the trouble of the modification.

THE NUMBERS

There are several things about this project that give it a leg up, in our view. First, timing. The market is absolutely awash with used, late-model SR22s, some sporting breathtakingly low prices. There are two reasons for this: one is the soft economy in general, the other is the unique buyer Cirrus attracts—owners who have tended to purchase every new model Cirrus has developed, dumping their

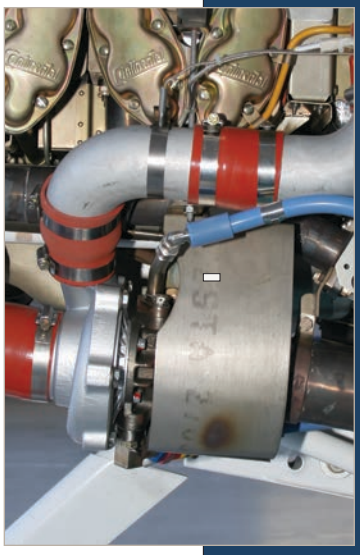
CONTACTS

Next Dimension Aircraft
www.ndaircraft.com
336-756-7722

old airplane into the used market, which hasn't absorbed all the inventory by any means.

Although used aircraft sales seem to be showing signs of life and prices may be stabilizing, it's hardly a seller's market. We've seen G2 SR22s selling in the low $300s and we suspect some are going for a lot less than that. Crenshaw told us ND's mod efforts will focus initially on the G2 aircraft, which appeared during the 2004 model year, but variable with serial number. That's not to say, Crenshaw told us, that earlier SR22s can be upgraded, but the company hasn't examined that option yet.

In our view, the smoking hot best value might be to buy a 2001 SR22 for $160,000, throw on the turbo mod and a Garmin G600 and have an airplane as good as anything flying for half the money, if models that early can be converted by Next Dimension. And that leads us naturally to wonder what effect this will have on the overall market, Cirrus new aircraft sales and used Cirrus values. Complicating such speculation is that Continental plans to sell its own version of the turbocharged TSIO-550 as a replacement engine for the Tornado Alley systems that come up for overhaul. Moreover, we suspect Continental will pressure Cirrus to drop the TAT turbo as an option and offer only the Continental version. (See the September 2009 issue of *Aviation Consumer* for more on that.)



Conclusion: We don't think the market is going to recover to anything like 2007 or 2008 levels, so there are going to be a lot of product choices chasing fewer buyers. That's not good news for Cirrus and it may or may not be good news for sellers trying to unload used SR22s. We don't buy the argument that all these airplanes will suddenly broaden the market into a demographic that wouldn't have otherwise bought an airplane.

ANOTHER STAB AT ELECTRONICS

In chemistry and biology, the suffix phobic is applied to things that repel each other. Oil is hydrophobic. So is wax. Extending the analogy to the sublime, we would argue that aircraft engines are FADECphobic, which is to suggest that conventional opposed engines seem to have some sort of autoimmune response to electronic controls. When they've been tried, they either haven't worked very well or the market has rejected them. Nonetheless, we keep trying. The newest attempts come from Tornado Alley Turbo/General Aviation Modifications, the mod house supplying the engines for the Next Dimension project. GAMI proposed its own FADEC some years ago, but it remains a lab bench curiosity, stifled by lack of clear economics that would make it worth doing. GAMI's latest proposal represents an attempt to break the FADEC idea into its component parts and sneak it onto the engine without benefit of the dreaded "full authority" curse.

There are two projects, actually, each independent of each other. The first is a new digital wastegate controller, the second automatic mixture control, again using a digital controller. First, the wastegate or density controller. Traditionally, turbocharged engines have used engine oil pressure to open and close the turbo wastegate, although some designs are manual and a very few are electric. A common Continental design is an absolute pressure controller (or a variation called a slope controller) that samples upper deck pressure and then regulates oil pressure to position the wastegate to maintain a constant manifold pressure.

This has proven to be an effective if inelegant solution because it requires a lot of oil plumbing which introduces multiple failure points. Further, it has no way of compensating for density altitude effects on a hot day, thus, despite its ability to hold sea-level induction pressure, a turbocharged engine takes a performance hit on a hot day.

TAT's idea to address this is an electronic controller that accounts for density altitude and thus ramps up to the induction pressure so the engine can deliver full rated power at any temperature. Further, the wastegate is controlled by a small electric motor, so it eliminates the failure points of the oil lines, plus three pounds of weight.

The density controller samples ambient temperature and upper deck pressure then adjusts the boost to compensate for density altitude effects—in both directions. Bottom line: on a hot day, it will maintain standard condition full power at any altitude, which, says TAT's George Braly, translates to additional cruise speed of up to 7 knots on days when the power would otherwise be heat sapped. It should also improve takeoff and climb performance in high denalt conditions.

TAT's mixture controller, which it calls "Mixture Magic," also uses electronic sampling and controls to automatically lean the engine within a specified range. Braly declined to offer any details on this system, but says that both it and the density controller will eventually be available for the Next Dimension conversions and also aftermarket turbo applications.

If the Next Dimension idea gets rolling, we think a five-year-old SR22 decked out with a new TN system, the R9, tarted up paint and new seats is going to look like a sweet deal against a new airplane costing at least $100,000 more, but probably with a bigger price Delta than that. Next Dimension might just help Cirrus along in doing what it has been good at: being a victim of its own success.

For-Pay Flight Planners: It Depends on Your Style

Voyager 4 leads if you mind meld with its novel presentation. For more traditional thinkers, FlightPrep's Golden Eagle Plus gets the nod.

by Jeff Van West

With so many free resources on the web, any fee-based solution must offer serious added value. And that's exactly the rub with a critical review of the different options: One pilot's added value is another pilot's useless frill.

All of these products do everything you need, but one might fit your style better than the others. To help you find your match, we looked closely where flight planning can really shine: optimizing a route for winds and fuel stops, accessing the most current airport information and printing a wad of information to toss into your flight bag.

GOLDEN EAGLE PLUS

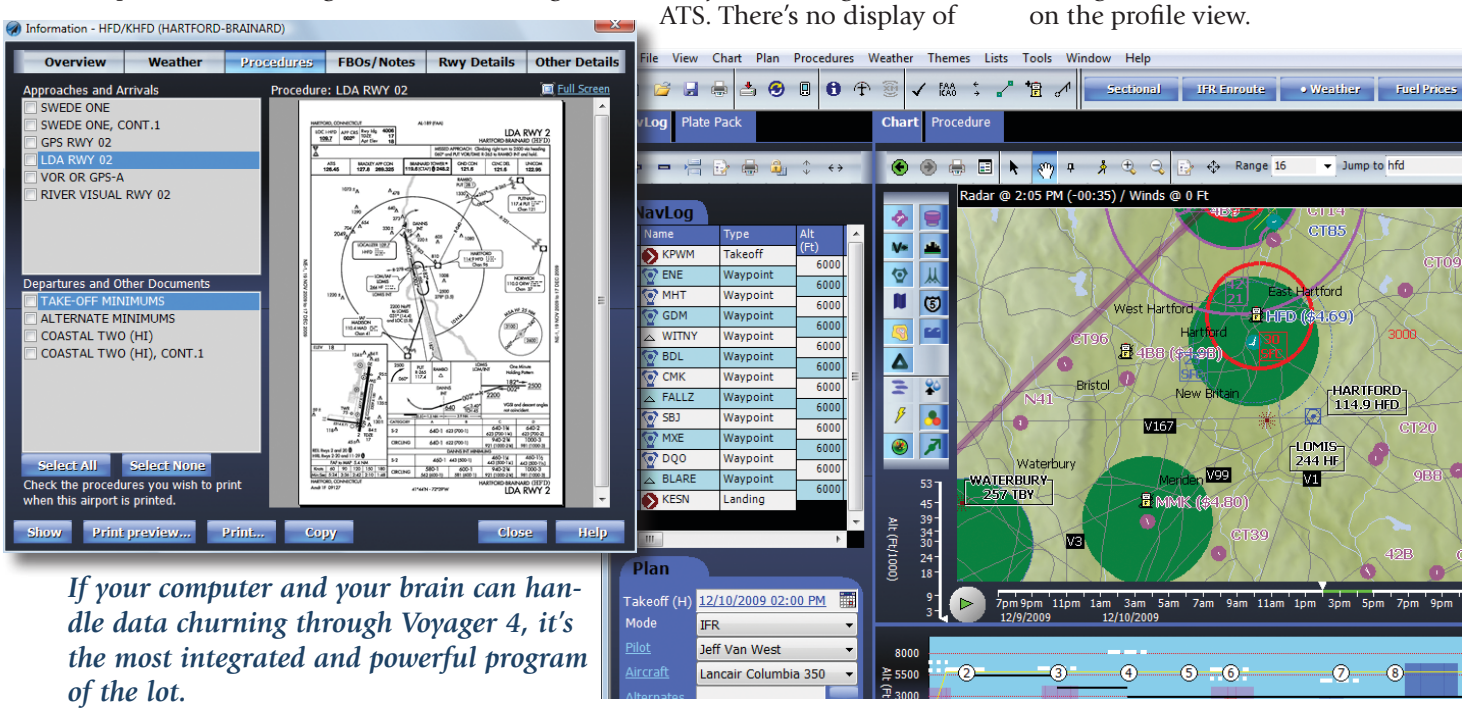
Flight Prep Golden Eagle Plus wins our prize for all hitting all the important items without any frills. It's also relatively intuitive to use. Golden Eagle Plus is an enhanced version of the free Golden Eagle software. The upgrade adds scanned charts, approach plates and airport information from NavInfo.com and Flight Guide, by subscription of course.

The window layout is utilitarian, as is much of the data presentation. For example, METARs are displayed on the map with color coding for a quick view of what's going on but the pop-up details are on a single line of text. While we're on the topic, automation of weather was a weak point for Golden Eagle Plus. TAFs can't be shown on the map. NEXRAD can be displayed, but it's not downloaded automatically. You must get the data by connecting with DUATS. There's no display of weather over time as with Enflight, Flightsoft or Voyager.

But manual control isn't all bad. Select the Compare Altitudes function and you'll see a simple table with altitudes and total times for your route. Pick the one you like best and the nav log, chart and profile view update. There are also hidden powers that take some manual reading, but work well. The "plain language router" is probably misnamed; a command "KHIO NOONS *V-7000 KRBL" isn't exactly vernacular, but it will plan a flight from Hillsboro to Red Bluff via the NOONS intersection then airways but no higher than 7000 feet. The same can be accomplished more intuitively by other software, but not so quickly.

The approach plate viewer for Golden Eagle Plus is simple but effective. Departure procedures appear with approaches, something that's overlooked on many planners. Golden Eagle Plus can export the nav log, plates and charts (scanned or its own maps) to a PDF trip kit. This ets you take as a file or print whatever information you might want. You can't, however, export the FlightGuide data to the trip kit, although you can print it separately.

Golden Eagle Plus wasn't as safety conscious as some other packages. It let us choose an altitude that took us right through a mountain without warning. In fairness, the path through the mountain was available on the profile view.



If your computer and your brain can handle data churning through Voyager 4, it's the most integrated and powerful program of the lot.

SOFTWARE	STRENGTHS	WEAKNESSES	TRIAL?	PRICING AND OPTIONS
Enflight (online)	Color-coded weather, integrated sectionals, decent printed output.	No terrain or wind awareness in flight planning. No integration of fuel costs. Weakly interactive map.	30-day trial	Web only $199/year Web and mobile phone access $249.95/year
FlightPrep Golden Eagle Plus	Simple and intuitive, well-integrated charts and approach plates, access to Flight Guide data and weather.	No display of weather over time or automatic NEXRAD. Editing plans not as intuitive as other programs.	30-day money back	$79.95 for the program. Flight guide data $35-89/year. Charts and approach plates $129-$357/year
FlightPrep Online	Easy to use. Integrated weather, charts, approaches and airport info. No need to download updates.	Not as easy to navigate as desktop version. Access to airport data not as flexible as desktop.	30-day money back	$149.95/year
Jeppsen Flightstar	Offers Jeppesen data and approach plates. Good weather on chart. Many display options for the charts.	Not as user friendly as other options. Data subscriptions pricey.	No	$149 North America VFR, $299 IFR. Data updates $119-$429. Viewing and updates for approach plates *not* included.
RMS Flightsoft	Simple interface. Updates still available via CD if you want.	Weaker options for printing information. Weaker integration of weather data on chart.	No	Personal (VFR) $125. Professional (IFR) $198. Commercial (Turbine) $398. Data subscription $119-$219/year.*
Seattle Avionics Voyager	Most features and best integration of weather and data. Works well for novice and high-time pilots.	Requires a powerful computer and patience to learn.	10-day trial	$199 for VFR package, $350 for IFR Subscriptions are $99 for VFR and $199 VFR/IFR. Other bundles available.
* More subscription options for additional data (such as scanned charts) exist than we can list. See the website for details.				

The online version of Flight Prep's planner is similar to Golden Eagle plus but not identical. Most noticeable is the ability to split screen and show a scanned chart beside the standard map—a surprisingly handy feature.

The tripkit function also lets you add weather charts to the kit, which is not an option in the desktop version. The route wizard lets you view current weather charts before you start your planning. On the down side, the online version only lets you build routes—there's no easy way to just look up one airport within the planner. Ironically, you can easily do it from the FlightPrep home page, which is just a click away.

JEPPESEN FLITESTAR

Jeppesen's NavSuite is a combination of their FliteStar flight planner and the JeppView software for viewing Jeppesen plates. If you want integrated Jepp approach plates and Jepp-style en route charts, then NavSuite is the only game in town.

It's not a bad game, either. FliteStar is arguably the least intuitive to operate of the flight planners, but it's powerful in what it can display. Strengths are the integration of the Jepp approach plates and getting information off the map. FliteStar handles multiple objects of your click better than anyone else, asking you what you want if it's unsure.

Weather is displayed on the map once you've downloaded it via a DUATs session or by connection with an optional Jeppesen weather service (for an additional fee). Alternate planning, optimizing altitudes and building a trip kit with plates and charts is all there.

The main drawback to FliteStar is the price. The subscription for IFR navigation data is $139-$429 depending on frequency, but adding approach plates is a whole 'nuther program and subscription. One thing that makes the combo worthwile to some: Jeppesen can be worldwide with charts *and* plates.

RMS FLIGHTSOFT

Flightsoft has been around for quite a while and doesn't look as flashy as some other packages. It is old school in design—you even get a real, printed manual—but, in our opinion, it lacks some of the power of other packages.

The main map is quick to configure and shows downloaded weather as color-coded icons. Click a station to see the details, or use the time slider at the bottom of the window to see conditions in the future based on the TAFs. If you have a flight planned, you'll see an airplane icon showing your probable position along the route at that time.

Flightsoft is strong in its simplicity. Choose the Winds/Efficiency tool to select an altitude and pick "Best Time" or "Best Fuel." Simple. Right-click an airport on the map or in the navlog and you get all the critical info in a tabbed popup window. The result is less jumping between windows than Golden Eagle or FliteStar. There are a couple special features like road maps or putting the program on a flash key to take with you that might be just the thing for some.

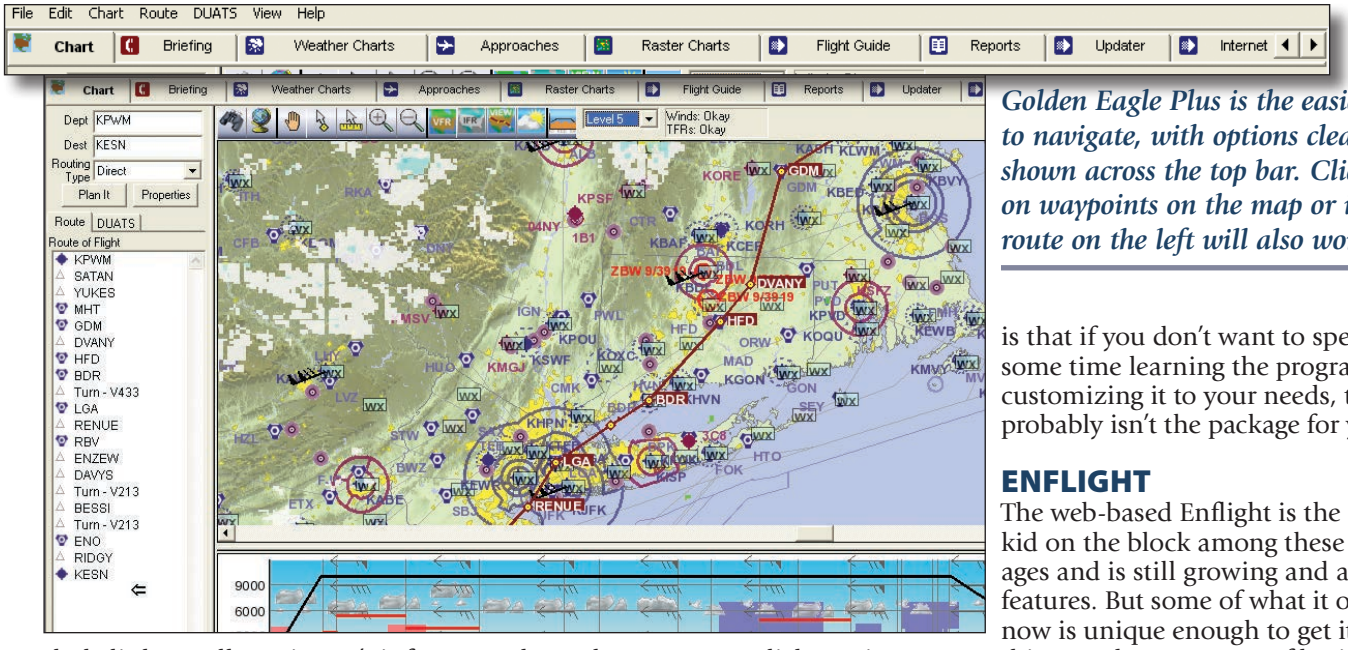
In other areas, we think Flightsoft is less integrated. Scanned charts open in a separate window, which can be cumbersome. You can print charts, approaches and airport data, but not in a single step.

VOYAGER 4

The free version of Seattle Avionics Voyager 4 was one of our top picks in free flight planners because it offered so much capability for no cost. The full version of Voyager arguably offers more capability than any of the competition. It's also the most non-traditional in design—and that's why we could alternately put it at the top or the bottom of our ranking.

First the tops: We think Voyager 4 offers more flight planning capability and a better system for viewing weather than any other program out there. The flight planner lets you put in the route directly, put in key restrictions and let Voyager do the rest or just get guided step-by-step through the process. We're not usually a fan of software "wizards," but Voyager does it surprisingly well, and—more importantly—lets you customize to only show the steps you want.

Great features of the planner in-



Golden Eagle Plus is the easiest to navigate, with options clearly shown across the top bar. Clicking on waypoints on the map or in the route on the left will also work.

clude links to all an airport's information during the flight planning process and an alternates selector that shows a list of alternates with icons for the weather at the time of your proposed arrival. Routing can be by best time or efficiency, take fuel prices into account and will warn of potential hazards. Almost any parameter is customizable. It's the smartest smart router out there.

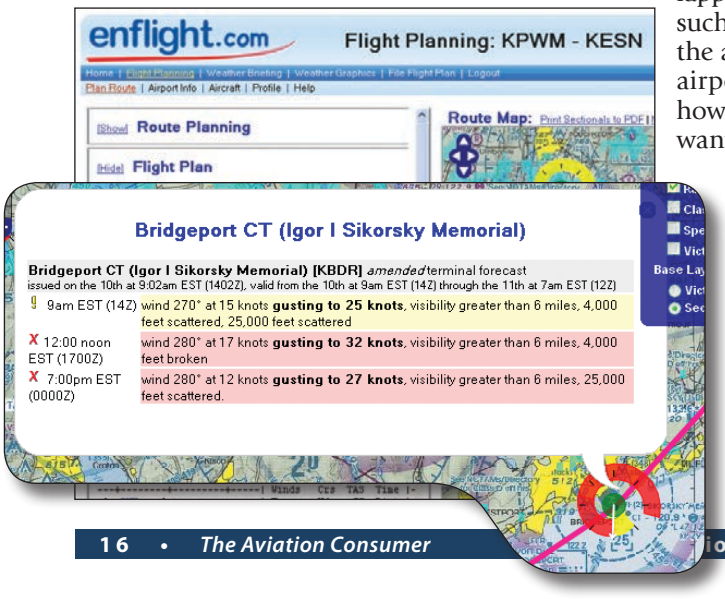
Weather is displayed with color coding on each reporting point. NEXRAD, cloudtops and winds are automatically downloaded and can be shown on the map. Clever bits here include showing the wind speed with an actual number rather than the old-school weather barbs, or showing the altitude limits of TFRs.

The signature feature (partially copied by Flitesoft) is a pair of sliders for time and altitude to see how weather and winds change over time, as well as where your aircraft would be at that moment. Click an airport and all the data for it—weather, approaches, AOPA info, whatever—is accessed from one window.

There are more slick tricks, such as toggling a scanned chart on and off at any time and integrated Airnav and Flightguide info. You can print specific pieces of information or procedures, or get a trip book (on paper or PDF) with all the information you could ever need.

But all this capability comes at a cost aside from dollars. Voyager 4 will take out a lesser computer at the knees. (The company still supports the older version of Voyager but it isn't as full-featured.) We also had some issues with Voyager under Vista. They were worked out, but it was the most persnickety of all the software packages we tried.

We did have a few complaints, such as finding it difficult to get the information we wanted with overlapping map information, such as an airport under the airspace of a larger airport or figuring out how to get the airports we wanted on the SmartPlate view. But these we could usually puzzle out. The takeaway is that if you don't want to spend some time learning the program and customizing it to your needs, this probably isn't the package for you.



Enflight offers a unique color coding of METARs and TAFs that correspond to personal minimums you set.

ENFLIGHT

The web-based Enflight is the new kid on the block among these packages and is still growing and adding features. But some of what it offers now is unique enough to get it in this roundup. In terms of basic flight planning, the critical items are there. You can create aircraft profiles and plan routes via direct, VOR-to-VOR, airways, etc. Enflight lacks advanced features such as taking terrain or winds into account. These are planned for the future.

What Enflight does well today is display data. In its flight planning view, it shows your route over simple airways or sectionals. This can appear split screen with your nav log. TFRs, automatically-updating NEXRAD, airspace and other features can be overlaid on this chart. Some of the map items show details on roll over, but not all.

METARs and TAFs are displayed on the chart in a unique, color-coded spiral. The spiral corresponds to time. Click the spiral at some point and you'll get the weather for that time. The color coding comes from users' settings where you can set minimum ceilings or maximum winds. At a glance you can see where weather is now an issue or will be in the future. Pretty neat.

You get the same color coding on your weather briefing, which makes wading through the text briefing much easier. NOTAMs are also color coded by a different scheme in terms of their likely impact on your flight. Enflight has the ability to print sectionals, charts and airport information, but it's not entirely integrated as with other planning software. We do like that it not only shows the charts, but also departure and alternate information if it applies. This is often overlooked in IFR flight planning.

Enflight also offers a mobile flight planner, but for the price, it's not quite on par with programs like ForeFlight, WingX or PilotMyCast.

MORE ONLINE OPTIONS

We can't talk about online options without hitting on AOPA's Internet Flight Planner and Aeroplanner, free to AOPA and EAA members respectively. Both offer good access to airport information. AOPA's program is easy to use for flight planning—the best of any online system for editing a route on the map—and has some good weather overlays. Aeroplanner has many charts available and many options for printing it.

Neither site has the strong weather integration to make them contenders. But if you're already paying for the membership, they are effectively free and worth checking out.

MORE TO COME

One complicating factor in this review is that all four PC-based flight planners can be used in flight as well. If you're taking the flight planner with you, a whole new set of factors come in and those impact the utility and ranking of each product.

We're out of space and time here to dive into that abyss. Look for a continuation of this review in an upcoming issue. Until then, take advantage of trial versions of any of the programs that intrigued you to see if one of them jibes with your style of flight planning.

CONTACTS

Enflight
feedback@enflight.com
www.enflight.com

FlightPrep (Golden Eagle Plus)
800-966-4360
www.flightprep.com

Jeppesen
800-353-2107
www.jeppesen.com

RMS Flightsoft
www.rmstek.com
800-533-3211

Seattle Avionics (Voyager 4)
425-806-0249
www.seattleavionics.com

A Buyer's Market: But It's About to Swing

The insurance industry saw record profits after 9/11, drawing in more providers and driving down premiums. But the tide is about to turn back.

by Jon Doolittle

The good news about aircraft insurance is that for most owners, insurance has never been more affordable or more available. The bad news is that most people in the business think that the pendulum is about to swing back the other way.

What got us here? Ironically, the 911 attacks had something to do with it as does the current economic malaise. Demand is slack, there are more providers than ever and companies are willing to deal. But, as always, it won't last.

A BAD YEAR, A GOOD YEAR

Following the 9/11 attacks, insurance rates for most aircraft increased dramatically. The amount of the increases depended upon the market segment, with many big iron operators seeing their rates double overnight.

Most light aircraft owners saw less of an impact, but as a result, 2002 and 2003 were some of the most profitable years for the industry in recent history.

This profitability did not go unnoticed by the MBAs talking to the corner office. A number of companies, seeing dollar signs, jumped into the market. "Jump" may be a little misleading. Starting an insurance company is a bit like erecting an office building: It takes two to three years or more in most cases.

Insurance is regulated by the states and insurers need to have their policy forms approved by every state insurance department where they do business. They also have to find sources of capital, hire experienced people and recruit brokers to their cause.

In 2002, depending on how you

count, there were nine aircraft insurers. By the beginning of 2006, that number had risen to 16. You read that right—they nearly doubled.

As the hungry new entrants came on line, the existing carriers were forced to lower their pricing or lose business to the new guys. Long the darling of underwriters, corporate heavy metal operators reaped much of the benefit. Premiums for many of these operators are now 25 percent of what they were in 2002. *One quarter.* Gradually, the competition expanded to include light airplanes and some helicopters, although the reductions here were not all quite as dramatic.

HEY, SKIP A YEAR

In addition to price decreases, underwriting began to relax in a number of ways. Several companies began to allow some turbine owner-pilots to attend school every other year, rather than the traditional annual requirement. Several companies began to offer higher limits of liability on light airplanes that had not been available at any price since the early 1990s.

The insurance business is a cyclical one, rising and falling from so-called "hard markets" to a soft market. Some of the ups and the downs are caused by sweeping trends in reinsurance, which are often driven by large, non-aviation catastrophes like hurricanes. These swings are also related to the business cycle.

Most soft insurance markets occur in times of economic expansion when interest rates are fairly high and insurers can earn interest income by investing premiums before they have to be handed over to pay claims. In this kind of environment, insurers can literally sustain loss ratios of over 100 percent and still make money because of the interest income.

Ironically, the one factor that doesn't usually drive light aircraft insurance rates is light aircraft accident rates. Accident rates move within a narrow range and don't individually have the impact of a hurricane or a wide body airliner with 300 people in back. The current soft market is different in that it has lasted well into the deepest financial recession in decades. In the current environment, investment opportunities are limited. So why are rates still low?

In part, aircraft insurers don't want to lose customers to competitors, even if holding on to them means reducing rates below the break-even point. In addition to the usual market pressures, it seems as if insurers are afraid of driving their clients out of the airplane business entirely, as if by offering lower premiums and more relaxed underwriting requirements, they can encourage owners not to sell their airplanes.

Perhaps a vain hope. A cursory scan through an aircraft dealer's data service recently revealed that almost one quarter of all the Gulfstream IVs ever built are listed for sale. Things are not as dire for light airplanes, but values have taken a pasting; it's definitely a buyer's market.

ACCIDENTS: THE SAME

Meanwhile, aviation accidents and claims have continued at about their usual rate. Repairs and replacements and lawsuits cost about the same amount as they did last year. With premiums down and claims holding about steady, there are signs that things might be changing. One of the canaries in the coal mine of general aviation insurance is the airline insurance industry. And airline rates have begun slowly, in fits and starts, to increase. In many cases, airlines are retiring airplanes faster than insurance rates have been rising, so actual premiums have not been increasing until quite recently.

Even now, most premium increases have been reserved for airlines with significant loss experience. But most people in the airline business agree that rates are going to have to go up in order to pay ongoing claims; it's just a question of how much and how quickly.

There are also signs that not all of the current general aviation carriers will remain standing. Travelers recently announced that its fairly new domestic aviation unit would cease underwriting new policies as of December 31, 2009. Britt-Paulk Aviation has been telling brokers that it's looking for a new insurer, after AXA Corporate Solutions withdrew as the capital provider for its general aviation program. There could be others who decide to take their money elsewhere.

If the amount of risk-taking capital continues to dwindle as companies drop out, and particularly if the economy doesn't come back quickly, rates could go up rapidly. If all of the carriers in the GA market remain, and if the economy improves dramatically, the change will be less abrupt.

Based on conversations with brokers and underwriters, we think that the market will turn within the next year, but we didn't hear a consensus about when or how much. For the most part, the owners who have seen the greatest reductions during the past four years will probably see the greatest increases when the pendulum begins to swing the other way. Those who haven't seen much change as the market declined probably won't see much increase as it heads back up.

Either way, it's a good time to buy insurance, with bargain premiums for coverage limits that might not have been affordable in 2004.

Jon Doolittle is owner of Sutton James Insurance in Hartford, Connecticut. Contact www.suttonjames.com.

SheepSkin Seat Covers: DIY Comfort

Improbably, they're warm in the winter and cool in the summer. All three vendors offer good products, but Aircraft Spruce has the bargain price.

by Joseph E. (Jeb) Burnside

Most airplane seats are poor places to park your keister for a few hours. After a decade or so of the temperature extremes found on the typical airport ramp, their foam deteriorates, eliminating any resilience in the cushions and creating a permanent sag. The vinyl and fabric—or, if you're lucky, leather—has long since started to rip apart at the seams, snagging shirts and trousers as you shift and squirm.

A good interior shop can fix this for a grand per seat, but there are less-expensive options, including ready-made upholstery you install yourself. One often-overlooked option is to do nothing at all with the seat itself but simply hide the ugliness and discomfort with a custom-fit cover. A wide variety of materials are available—especially if you don't mind installing something from the automotive market. One of the more popular options is the made-to-fit sheepskin seat cover. Installing one automagically resolves several issues, among them eliminating the hot/cold seat, sticky vinyl and unsightly, worn and torn upholstery. They trap air between you and the seat itself, so they're cooler in the summer and warmer in the winter, plus they wick away moisture, like the sweat from your next flight review.

To find out if they're a viable option for personal aircraft, we obtained samples from three of the popular vendors—Aerosheep, Aircraft Spruce and Sporty's—and installed them in our Debonair. All were high-quality products, with similar finishing details and many similarities, along with a few differences.

Sheepskin covers simply slip over the stock seat, fastened with snap fittings or Velcro fasteners. This version from Aircraft Spruce is available in various colors.

OVERVIEW

A sheepskin seat cover isn't without its drawbacks. For one, the added thickness can further crowd an already too-tight cockpit.

CHECKLIST

- ⊕ Sheepskin covers can hide unsightly upholstery easily and elegantly.
- ⊕ Comfort is a definite plus, regardless of what shape your stock seats are in.
- ⊕ Covers evaluated were similar in construction and quality.
- ⊖ Watch the overhead: Adding thickness to the seat can cramp headroom.
- ⊖ Installation is harder than it looks. Removing the seats may help.

If you're close to bumping your head against the cockpit ceiling already, the extra thickness they add to the seat may eliminate any remaining room. For another, they also add thickness to the seat at the sides. Put a sheepskin cover on a seat already close to the cabin sidewalls—whether by design or deformed by years of use—and it may fit so snugly that adjusting the seat's fore-and-aft position becomes difficult. The same is true for retractable arm rests between the seats, for example, or consoles.

Installing *anything* in a low-wing airplane cabin with only one door can be a chore and these seat covers were no exception. Each sample we examined came with sturdy fabric straps and either heavy-duty metal clasps or hooks to secure them. The straps are designed to secure the cover to the seat back, under the seat bottom and through the gap between the two. Covers we obtained from Aircraft Spruce and Sporty's were one-piece designs, encompassing the headrest; the Aerosheep cover came in two pieces, including a separate one for the headrest.

To do this right, at least in our airplane, we'd want to remove the seats from the airplane entirely, install the covers and then reinstall the finished product. On some airplanes—double-door Cessnas, for example—that's probably not a big deal. On ours, it is, as it might be on

VENDOR	STRAP TYPE	COLOR CHOICES/ SAMPLESAVAILABLE?	CUSTOM SIZING?	SEPARATE HEADREST COVER?	RETURN POLICY	PRICE (PAIR)
AEROSHEEP	Clamps/Sewn	12/Yes	Yes	Yes; $75 extra/ pair	30 days	$389
AIRCRAFT SPRUCE	Sewn/Hooks	17/Yes	Yes	Yes	No charge for fit-related modifications	$378.95
SPORTY'S	Sewn/Hooks	12/Yes	Yes; $45 fee	Yes; $120 extra/ pair	"If it's defective, we'll make it right."	$449

other single-door airplanes.

But the effort would be worth it. The covers we examined were all well made, with thick fleece and heavy-duty stitching. Each was nicely finished, with piping sewn to the edges and each product left uncovered the seatback, allowing ready access to map pockets for rear-seat passengers. While it will require a few years of use to tell the tale, all the straps appeared up to the task and used a minimum of elastic, which loses strength over time. With one exception, the attachment methods used heavy-duty hardware, with what appear to be chrome-plated hooks and clasps. The exception involved Aerosheep's cover, which used a hook-and-loop fabric fastener in two places. More on that in a moment.

One thing to keep in mind when considering sheepskin seat covers for your airplane: None of the vendors keep ready-made covers on the shelf, ready to ship. Instead, each cover is custom-made when ordered. If your seats aren't stock for your airplane—if they've been reupholstered and, perhaps, modified since new—be sure to mention this when ordering. All three vendors supply a measurement form for this purpose; fill it out and mail or fax back the form to complete your order.

This also means it's highly unlikely you'll be able to order these covers one day, have them shipped overnight and install them the next. Allow several days from ordering to receipt. Another thing: We weren't able to evaluate how well these covers will stand up to the wear and tear of a personal airplane's cabin over the long term. Based on the heavy-duty materials used and their thickness, however, we're fairly confident the covers we examined will last several hundred hours, or at least until you break down and get the seats reupholstered.

DETAILS

Earlier, we mentioned the Aerosheep cover came in two pieces, one for the headrest and the other for the rest of the seat. That's different from the covers supplied by Aircraft Spruce and by Sporty's, both of which were one-piece affairs. The Aerosheep headrest cover fit nicely, using our supplied dimensions. It has a slit on the bottom, with color-coordinated hook-and-loop fabric closures—once installed, no one will notice.

A similar arrangement is also used at the top of the seatback, to clear the headrest support rods. For a permanent installation, we'd want to judiciously cut out a portion of the hook-and-loop fabric where it interferes with the headrest supports on both pieces. This two-piece cover design adds a bit of work to your installation, but also allows you to adjust the headrest as you might like it after the cover goes on.

The Aerosheep cover also uses an attachment arrangement differing from the other vendors. Instead of straps sewn to the cover's underside and terminating in hooks, it uses a cam-style clamp to secure them to the cover. In our view, this allows custom positioning of the covers during installation and, if that portion wears out, the clamp can be relocated. Similarly, the straps can be replaced in the field if they break; a broken strap on the other covers

Covers fasten with clips and/or hook-and-eye fasteners. This makes them secure, but easy enough to remove when necessary for washing.

CONTACTS

Aerosheep
800-635-4113
www.aerosheep.com

Aircraft Spruce
877-477-7823
www.aircraftspruce.com

Sporty's
800-776-7897
www.sportys.com

would require their removal and some heavy-duty stitching to repair correctly.

The covers supplied by Aircraft Spruce and by Sporty's were very similar in design, construction and finish. For one, they were both one-piece products, eliminating the need to separately install the headrest cover. That's good and bad: We never reposition our headrest, leaving it against the top of the seat, so a one-piece design would work well in our installation. It may not work well for yours. That said, both Spruce and Sporty's offer two-piece products, and Aerosheep tells us they're happy to make a one-piece cover.

Other details involving the covers from Aircraft Spruce and Sporty's include what seemed slightly thicker fleece, at least when compared to the Aerosheep product. Both the fleece and the pelt (underside) seemed slightly heavier than the Aerosheep cover, but that could be an accident of their being natural, not man-made products. Also and as mentioned earlier, both covers used straps sewn to the underside and terminating in heavy-duty hooks. This differs from the Aerosheep product, which uses the cam-style clamps. We're not sure which would be easier to install, but we're positive removing the seats first will lower your overall frustration level .

CONCLUSION

We liked each of these covers. As mentioned, they all are well made from high-quality materials and should provide hundreds of hours of service. They're each close enough in overall quality that picking one over another comes down to price, color selection and the strap-mounting systems employed. The sewn-on construction of the covers from Aircraft Spruce and Sporty's strikes us as the better solution for the long haul, but the clamp-style straps from Aerosheep are repositionable and should be much easier to replace if the need arises or if you want to remove them for any reason.

All three vendors offer a range of colors; the covers we evaluated were either natural or ivory in color. Aerosheep and Aircraft Spruce present color swatches on their respective Web sites. For $10, Sporty's will sell you a sheepskin sample incorporating the offered colors; the amount is credited against your seat cover order when purchased. Aircraft Spruce will also sell you color samples, priced at either $10 or $50, depending. Aerosheep, through its affiliated Web site at www.comfysheep.com, offers to send up to five color swatches free.

Of the three, Aerosheep is the only vendor selling individual covers—the others offer them in pairs—at $194.50 per cover (plus $37.50 for the separate headrest cover). Aircraft Spruce's pricing is for the one-piece pair and is $378.95, the least expensive of the three. Sporty's price is $449 for a pair of one-piece covers; separate headrest covers will run you $120 for the pair. All three offer a downloadable form to use in taking your seats' measurements.

If we wanted a pair of sheepskin covers, we'd be happy with the products from each of these vendors. Since they're so much alike, both in design, construction and the colors offered, it comes down to price alone. In that case, Aircraft Spruce would get the nod. But if your budget is limited and you're doing only the pilot seat, Aerosheep is hard to beat.

OREGON AERO'S SOFTSEAT

Unhappy with your sagging seat, but not interested in the full-bore sheepskin seat cover? You have a number of options, including something from the automotive market, a throw pillow or even a boat seat cushion. But Oregon Aero, which invented the market for high-tech airplane seats and headset upgrades, may have just the thing for you. The company's $199 Softseat Portable Seat Cushion is a well-made product providing a firm base on which to sit, along with removable lumbar support.

The Softseat cushion uses Oregon Aero's trademark high-density foam in both portions, linked by a heavy-duty zipper and covered with thick ballistic-style fabric. Both are quite firm; the foam in this cushion won't turn to powder any time soon, like what happened to your airplane's seat. Installation? Simple: Place the cushion where you want it and sit down. Straps for securing the cushion to your seat are a no-cost option; the example we evaluated lacked them, but did have a carry strap. Even so, the cushion should be ideal if you rent or fly more than one airplane.

We liked the lumbar support the cushion provides. If your seat lacks that kind of support and your lower back tires after a short while in the airplane, this could be just the thing. The seat-bottom portion of the cushion is both thick and firm (we evaluated the one-inch version). So much so, in fact, our head was uncomfortably close to the overhead in the airplane with the seat back at its most upright position. The thinner, half-inch version might be better for us; your mileage may vary. That's the only downside we could see.

At $199, Oregon Aero's Softseat Portable Seat Cushion comes in a variety of colors and can immediately help resolve any lower back or other discomfort issues your airplane seat may create. Just watch where it puts your head, especially in turbulence.

Add-on Bluetooth: BluLink Works Flawlessly

Wish you could add Bluetooth connectivity to your current headset rather than springing for a new one? BluLink isn't cheap, but it performs as advertised.

by Jeff Van West

It's refreshing to review a product that makes a modest claim on what it can do and then delivers completely. That's exactly what happened with our flight tests of the Pilot Communications USA BluLink Bluetooth headset adapter.

PLUG AND PLAY

BluLink adds Bluetooth connectivity to any headset. You simply plug your headset into the BluLink unit and then plug that unit into the intercom. It can be ordered with cables for traditional two-plug intercoms, helicopter plugs or Lemo-powered plugs used in many Bose X headsets. If you fly more than one setup, the same BluLink controller can use any of the cables interchangeably.

The cabling for BluLink is the most cumbersome part of the whole setup as it makes your headset cords even longer. This annoyance is about our only beef with the system.

Once you find a way to stash the extra cable yet still have access to the BluLink controller, it's pretty straightforward (the complete manual is all of eight pages long). After turning on the unit, push the pairing button and enter any necessary codes on the cell phone. Your headset is now a Bluetooth headset just like the cyborg ear thingies people keep forgetting they're wearing. The fine print says your cell phone must support A2DP Bluetooth, but most do.

There's an answer/end call button on the BluLink that works with most every Bluetooth cell phone. There's also a voice-dial/redial button in case your phone and service supports those options. We asked people we called about the audio quality of our test calls and found the better the headset we used the better it sounded on both ends.

The BluLink controller is simple and a comfortable size. Small buttons near the top control the paired phone and larger ones the iPod. Any music source can be connected through an alternate dongle (upper left), but there won't be any remote control.

TUNES FOR TRAVELING

Connecting to the iPod was much more fun. If your iPod (or iPhone or other AVRCP device) has built-in Bluetooth, Bluelink can pair directly. We didn't have any of those, so we used the iLuv Bluetooth adaptor, which is also available from Pilot Communications USA. This plugs directly into the iPod and lets you control the iPod volume, pause songs or skip forward and back. That means you can start a playlist on the iPod and then toss it in a compartment and forget about it. All the control is off the BluLink. As an aside, the forward and back buttons for music won't work with an iPhone. Volume and play/pause do work.

The disadvantage of this setup is the iLuv adapter gets its power directly from the iPod and drains the iPod battery faster than normal play would. We were down to half charge on our iPod after just over two hours of use. There is an iLuv dongle adapter that plugs into the 3.5mm headphone jack of any MP3 player that has its own battery for

CHECKLIST

- ⊕ Adds reliable Bluetooth to any headset and works with a wide variety of phones.
- ⊕ Offers remote control for iPods or similarly enabled music players.
- ⊕ Unit is well constructed, comfortable size and simple to use.
- ⊖ It's still a hefty price for convenience.

the transmitter. But then you lose the remote control for the iPod, which is a nice feature when you want to pause song to talk to ATC or set up for an approach. The battery life for the BluLink itself is claimed to be 15-20 hours on two AA batteries.

BluLink has settings for both stereo and mono intercom systems. You can also set it up for auto mute for incoming radio calls. We're not big fans of automute, preferring to leave the background volume low and have the comm radio drown it out during a call from controllers, but the automute works as advertised, fading the song back in after the call.

LIMITED BY ACCESSORIES

The weak link in any pairing we tried was the paired device rather than the BluLink. It paired fine with an old Treo phone but then lost the phone connection on pairing with the iPod. We tried the same double pairing—iPod and phone simultaneously—with a different phone and it worked just fine.

One issue that came up with both the iLuv connectors (for iPod and generic mp3 player) is that the iLuv will loose the connection with BluLink if the iPod is paused for a while. BluLink offers a Sony connector that doesn't have this issue and is working on a connector of its own.

In practice, none of these items were more than a small nuisance as the unit can reestablish a dropped pairing quickly. A side benefit of the BluLink is it has some internal noise filtering, so it will take some of the static out of a noisy intercom system.

THE COST EQUATION

The BluLink adaptor with standard GA headset plugs is $260. A Blulink with helicopter plugs is $280 and with the Bose (Lemo) plug it's $310. Pilot Communications USA will also sell you an iLuv adaptor for $69.95 or the 3.5mm audio plug dongle for $59.95. However, we found both these devices from other sources for nearly half that amount. Buy those separately if you need them.

CONTACTS

Pilot Communications USA
www.pilotblulink.com
800-731-0790

Compared to dropping $800 on a Lightspeed Zulu headset, the $260 BluLink isn't a bad cost proposition if you otherwise like your current headset and are just jonseing for Bluetooth. A Zulu doesn't give you remote control of your iPod, either.

Looking at this the other way, cell phone or MP3 adapter cables can be had for under $50, and plugging your MP3 player into the intercom means everyone in the cockpit can enjoy the tunes, rather than having it be a private party for your ears only.

So it comes down to what Bluetooth is worth to you. If going wireless and getting remote control is worth the $200+ difference versus plugging in cables, the BluLink will accomplish the task with ease.

Piper Seminole

This light-light twin is nothing if not a survivor. It's neither fast nor a great load hauler, but it remains a mainstay as a cheap-to-operate multi-engine trainer.

Of all the changes general aviation has gone through in the past 20 years, the piston twin arguably has borne the brunt. Fuel prices, plus improved engine and systems reliability, have made piston twins less desirable than in their heyday of the 1960s and 70s. And for the same money as a new piston twin, pilots these days often can find a used single or twin turboprop with plenty of time left on its engines. Operating expenses are higher, but so are performance, reliability and comfort.

But the piston twin does live on, at least at Piper and Hawker Beechcraft. The latter still offers the six-seat Model 58 Baron while Piper will be happy to sell you a roughly comparable Seneca V. Cessna, despite once selling a wide range of piston twins, left that market long ago and shows no signs of returning. Meanwhile, other piston twins are available new from Tecnam, Diamond and Vulcanair, to name three. But, if you're looking for a smaller, simpler twin, Piper also still makes the Seminole, sort of a double-breasted Arrow IV.

Incredibly popular with flight training organizations, it would be hard to find a regional airline first officer today lacking hours in one. While the Seminole pretty much owns the current multi-engine trainer market, that wasn't always the case: It's also used for light-duty charter, plus personal and business transportation. And it's a stone-simple airplane, making it a good choice for the training market, but also as a potential owner-flown platform.

If, that is, one must have a twin, since even moderately powered singles can keep up with it in cruise, and the average high-performance piston single can outrun it, out-haul it and do it all for many fewer of your hard-earned operating dollars.

If nothing else, Piper's PA-44-180 Seminole is a survivor. First type-certificated in 1978 as an entry-level piston twin—a niche the Seminole ably fills—it quickly established a deserved reputation for good manners, simplicity, economy and good looks. Essentially a T-tailed Arrow with a beefed-up wing and two engines, it didn't take Piper long to design and bring it to market. Contemporary competition was the look-alike Beech BE-76 Duchess and the Grumman/Gulfstream American GA-7 Cougar. Both competitors have long since gone out of production, but you can still buy a new Seminole.

You'd be hard pressed to find a regional airline pilot who hasn't logged time in the Seminole.

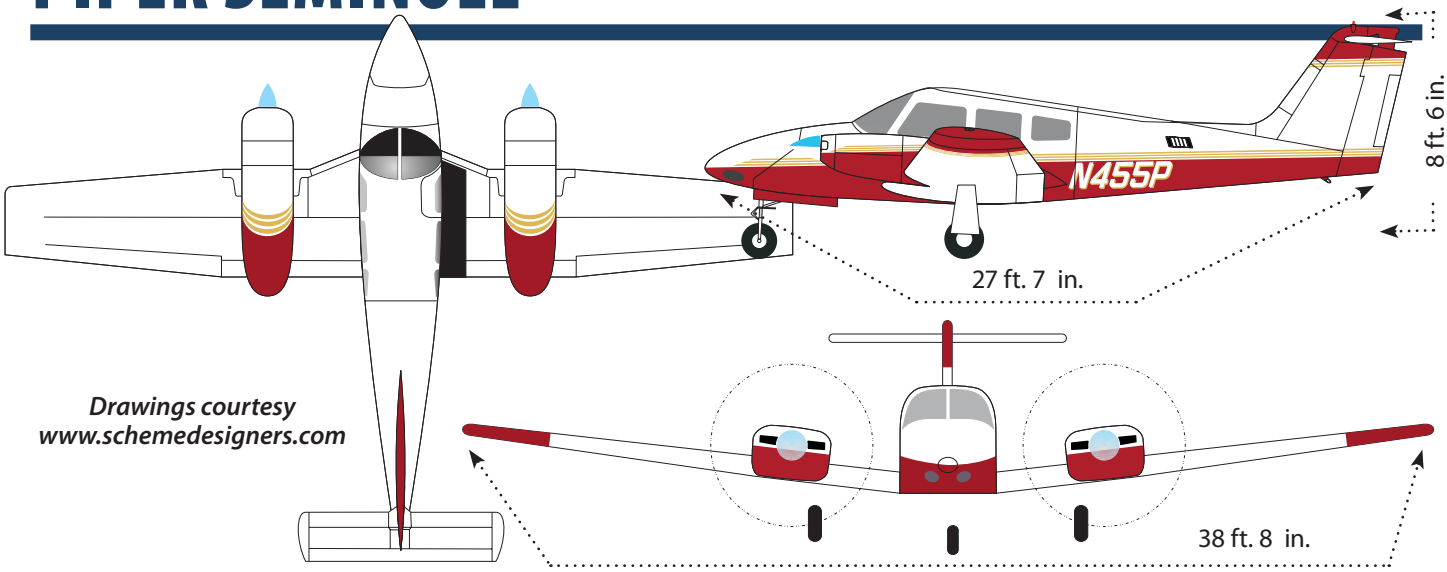
High performance is not what the Seminole is all about, however. The airplane won't haul a really hefty load and its range isn't impressive. It has only four seats. Its 180-HP Lycoming engines are carbureted. Known icing protection is not available and, since its fuselage is adapted from Piper's PA-28 line, there's not a lot of cabin room and panel space is limited.

What it does offer is two engines, with counter-rotating props so there's no critical engine, in an easy-to-handle airplane. It appeals to flight schools because its simple design, based on the T-tailed Piper Arrow IV, is sturdy, easier and cheaper to maintain and more forgiving to fly than most twins. It appeals to single-engine owners looking for the redundancy of a twin in a machine that won't bite them, either in the backside or the wallet—at least not as fiercely as many other twins might.

A new copy today starts at $580,000, with dual Garmin 430Ws in the panel. Most buyers go for the Avidyne glass-panel option, however, which pushes the price to $599,500. But there are hundreds

Viewed from the front, above, a Seminole on final looks very much like an Arrow with two engines which, as it turns out, it really is.

PIPER SEMINOLE

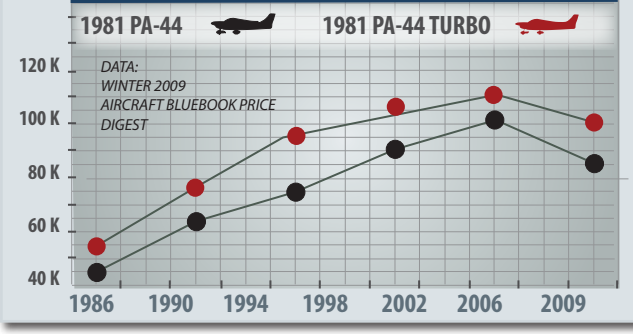


Drawings courtesy www.schemedesigners.com

SEMINOLE MODEL HISTORY

MODEL YEAR	ENGINE	TBO	OVERHAUL	FUEL	USEFUL LOAD	CRUISE	TYPICAL RETAIL
1979-1981 PA-44-180	180-HP LYC O-360-E1A6D	2000	$19,000	108	1380	157 KTS	±$75,000
1981-1982 PA-44-180T	180-HP LYC TO-360-E1A6D	1800	$27,000	108	1490	183 KTS	±$92,000
1989-1990 PA-44-180	180-HP LYC 0-360-A1H6	2000	$19,000	108	1380	157 KTS	±$125,000
1995-1998 PA-44-180	180-HP LYC 0-360-A1H6	2000	$19,000	108	1394	157 KTS	±$185,000
1999-2002 PA-44-180	180-HP LYC 0-360-A1H6	2000	$19,000	108	1394	157 KTS	±$225,000
2003-2006 PA-44-180	180-HP LYC 0-360-A1H6	2000	$19,000	108	1394	157 KTS	±$300,000
2007-2008 PA-44-180	180-HP LYC 0-360-A1H6	2000	$19,000	108	1394	157 KTS	±$450,000

SEMINOLE RESALE HISTORY

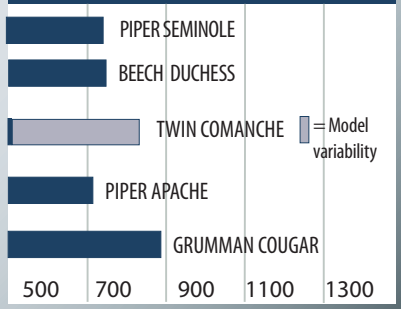


SELECT HISTORICAL ADs

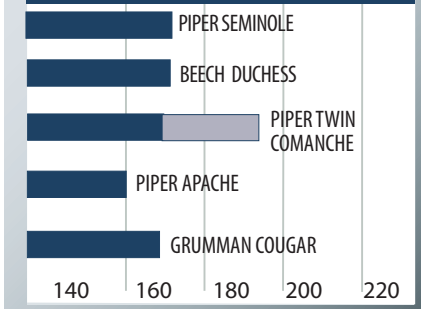
AD 06-06-16	LYCOMING CRANKSHAFT REPLACEMENT
AD 05-15-10	COMBUSTION HEATER FUEL PUMP INSPECTION
AD 04-14-12	CONTROL WHEEL ATTACH POINT INSPECTION
AD 96-10-03	FLAP HANDLE ATTACH BOLT INSPECTION
AD 94-13-11	MAIN GEAR TRUNNION REPLACEMENT

SELECT LATE-MODEL COMPARISONS

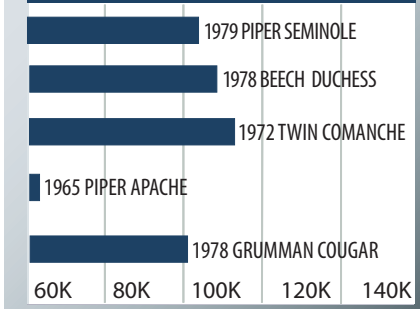
PAYLOAD/FULL FUEL



CRUISE SPEEDS



PRICE COMPARISONS



Given the model's remarkable longevity, Seminole panels have undergone avionics transformations dating from the 1980s. The panel at left, upper, showest one of the latest iterations, the Avidyne Entegra. Lower photo is an example of a steam gauge airplane updated with Garmin mapcomms.

of used ones out there and an older one should be more than adequate. Except for an engine variation and a turbo version, which was offered only for two years, 1981 and 1982, the Seminole has not changed much over the years. The turbocharged version came about by adding a pair of Lycoming L/TO-360-E1A6D engines to the basic model, resulting in the PA-44-180T Turbo Seminole.

The 1979 model was the first, introduced a year after Grumman and Beech had begun selling their respective Cougar and Duchess. Piper made 329 copies that first year but subsequent annual numbers have never come close to that peak. Production trickled to a halt after the 1982 model year but restarted for 1989 and 1990. Then, another hiatus ensued. Production has been steady since 1995, however. Fewer than 100 of the turbocharged version were delivered in 1981 and '82, according to the Aircraft Bluebook Price Digest.

The Cougar and the Duchess fared even worse. New owner Allen Paulsen abandoned the Cougar when his Gulfstream Aerospace bought the Grumman line and renamed it Gulfstream American—115 were built in two years of production before Gulfstream pulled the plug. Beech gave in on the Duchess in 1982 after making 437.

Camshaft failures and tappet-spalling were problems with the Seminole's original Lycoming O-360-E1A6D engines. When Piper started making the normally-aspirated model again in 1989, it used an updated engine, the -A1H6. The current production run began in 1995, when New Piper took over.

Except for turbocharging and the improved engines, the original Seminole has seen few fundamental changes over the years. The landing light was relocated in 1981 to allow for radar in the nose. Hot props and wing boots were added as options years ago but the airplane is not certified for flight in icing conditions even when so equipped. Average prices on today's used market for a typical Seminole range from around $80,000 for the premier 1979 model to $130,000 for a 1989 model and $350,000 for a 2005 model, according to the Aircraft Bluebook Price Digest.

As for the competition, prices for early Seminoles are roughly the same as those for the Beech Duchess, which range from $80,000 for a 1978 model to $99,000 for the final 1982 edition (versus $105,000 for the 1982 Seminole). The Bluebook finds a Grumman Cougar, which offers performance similar to the Seminole's with stingier 160-HP Lycomings, will run around $83,000 for a 1978 model and only $1000 more for the final 1979 model, $4000 more than a 1979 Seminole.

Interestingly, the Twin Comanche doesn't fall into the same price range, even though the Seminole was originally conceived to replace it in Piper's lineup. The 1972 PA-39 C/R Twin Comanche—C/R stands for counter-rotating props, like all Seminoles are configured—fetches about $120,000, much more than a Seminole that's almost 10 years newer. In addition to price, the 160-HP Twinkie enjoys an edge in both speed and efficiency.

PERFORMANCE/HANDLING

First the good news: The Seminole is forgiving so it is, in most ways, very good for advanced training and for single-engine pilots transitioning to a twin. It has a wide margin of 26 knots between its low VMC (56 knots) and its VSSE (single-engine demonstration/training speed) of 82.

With no critical engine because of its counter-rotating props, a Seminole's single-engine operation is less-demanding than with conventional twins. For all its years of production, the Seminole pops up in only 108 accidents on the NTSB Web site; "only" 24 of them involved

fatalities. We identified only three fatal accidents involving airspeed-related loss of control.

Of course, you can't please all the people all of the time: For all its appeal as a trainer, some instructors do consider the Seminole's lack of nasty habits a problem. They say it doesn't teach new twin drivers enough about the challenges of flying with one fan turning and one burning. The idea these days, however, is not to force any twin to demonstrate how nasty it can be, right?

The airplane has been described as handling like a heavy Cherokee, with a sluggish roll response. But even a heavy Cherokee handles fairly well. As a rule, a Seminole's controls are fairly light and well balanced. There's little adverse yaw in the turns and the T-tail keeps the horizontal stabilizer out of the way so, when flaps are applied and gear is cycled, there's very little pitch change. Owners have reported there's a knack to takeoffs with the T-tail. A firm rotation is required to lift off the nose but back pressure must be released quickly to keep from overdoing it as the airplane breaks ground. The same technique works well on other piston-powered, T-tailed Pipers.

Single-engine performance is not great, however, with 212 FPM listed as the single-engine climb speed for the non-turbo; it's only 180 FPM for the Turbo Seminole. (A Duchess gets 235 and the Cougar is 200.) A high density altitude and a full load may mean there's no place to go but down when an engine quits in a normally aspirated Seminole—not exactly news in any light piston twin. Of course, the Turbo Seminole probably does a bit better on one engine than the normally aspirated version when both are at altitude.

A Bonanza or a Mooney, among other singles, can outrun a Seminole. Cruise at 75 percent power is around 165 knots (183 for the Turbo), and 157 knots at 65 percent. Fuel burn for the normally-aspirated model will be about 22.4 GPH at 7000 feet and 75 percent. For the Turbo, it will be 24 GPH at 20,000 feet. At lower altitudes, the speeds between the two are five to 10 knots apart.

Seminoles shine in short-field work. The normally aspirated version needs only 1520 feet to clear a 50-foot obstacle and a measly 1238 feet to land over one. For the Turbo, the numbers are 1500 and 1400 feet, respectively. The airplane has a high maximum gear-extension speed of 140 knots. Full flaps can go down at 111 knots.

CABIN FEATURES

Piper gets good grades for the Seminole's ergonomics and fairly quiet ride. Unsurprisingly, the airplane is as roomy and comfortable as any four-seat Cherokee. And, like a Cherokee, visibility is good, except to the left and right where the engine nacelles can interfere. Its cabin is, however, a little smaller than the Duchess's and—especially in the training-optimized versions Piper is selling these days—is not likely to be as well-appointed.

Another Piper plus, in our view, is the manual flap control, a Johnson-bar handle between the front seats. It's simple, the pilot can control the speed of retraction or extension and it's not likely to fail. But note: There is a 1996 AD requiring inspections because the flap-handle attach bolt has been known to do just that.

It's annoying Piper initially put the manifold pressure gauge and the tachometers at the bottom of the panel, on either side of the quadrant. That placement calls for a bit of looking around to establish power settings—not good during times of high workload in IMC. But, anyone familiar with older models of the Seminole's single-engine cousin, the Arrow, will feel right at home.

Piper fixed the issue in the newer models of the Seminole, which relocated all the power gauges to the right of the altimeter and VSI.

We don't like the fuel-selector setup. It's between the front seats and the pilot has to crane his neck to see it or work it by feel. The selector handle tabs must be moved through the "Off" position to get from "Main" to "Crossfeed," which is primarily for engine-out situations. The design seems an invitation for a stressed pilot to make a mistake.

There's only one baggage compartment, located behind the rear seats. It can hold up to 200 pounds.

Owners should know one quirk involving the cabin heater on some

ACCIDENT SCAN: TRAINING TRAUMA

In our previous sweep of NTSB accidents for the Seminole four years ago, we found 93. Since then, the total has risen to 105 in the U.S. Yes, that's a low number, in part because of the airplane's relatively low population. We found about 460 on the U.S. registry. Furthermore, the airplane is forgiving with no real bad habits.

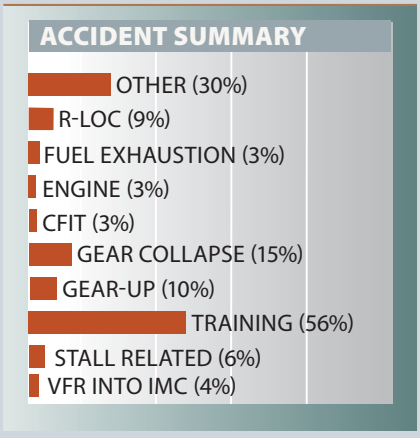
We found 21 fatal accidents, which is a small percentage of the total when compared to other models. A closer look at the fatals reveals no take-it-to-the-bank common threads. Three were mid-airs, two were suicides, two followed what may have been the pilots' spatial disorientation in IMC and one came in the attempt to land after power loss due to carb ice.

In two cases, confusion over ATC instructions resulted in controlled flight into terrain. Certainly none necessarily reflect on the machine.

Given the Seminole's popularity as a trainer, it's no surprise that more than half of all accidents took place on training flights. Of the rest, there's a lot of what you'd expect. Hard landings, loss of control on the runway, gear oversights and collapses were the common threads.

Viewed against other models, these numbers aren't out of the norm. Virtually every model of retractable we have examined—single or twin—has at least some history of gear collapse. Cessnas are a little worse, Beech and Mooney products a little better.

There have been a couple of ADs over the years to address nose gear failures and there's one that deals with main gear failures due to cracks in the trunnions. Not all of the gear crumps were due to hard landings, however. Poor maintenance also takes a toll.



models. If they turn off the heater but forget to run the fan for a few minutes afterward, they may very well pop the overheat microswitch, which is in the nose and not accessible from the cockpit.

If they did not reset a popped switch before flight on a cold winter day, they'll be in for some arctic conditions with no way to get the heater going. Make it part of the preflight or, if there's no heat after starting, shut down, get out and reset the switch.

RANGE, PAYLOAD

The Seminole's useful load of 1394 pounds (it's a bit lower in newer models) is roughly what the average A36 Bonanza, Cessna 210 or Cherokee Six can haul. The Turbo can carry about 65 more pounds. A big plus, though, is the Seminole's wide CG range. For a similar article several years ago, we tried to find a way to load the airplane too far aft but couldn't do it. One experiment had 200 pounds in the baggage compartment. We added full fuel (108 gallons—Piper has offered no longer-range options, and we're not aware of auxiliary fuel tanks for the Seminole on the aftermarket), put a 170-pound pilot up front and added 272 additional pounds of humanity in the two back seats. The result was legal.

As for range, one mostly enthusiastic Seminole owner wrote us some years back that his only complaint about the fuel system—which he described as simple and well-designed—was the lack of range. He wished for another 20 gallons. The Bluebook gives the maximum range with VFR reserve as 681 NM for the normally aspirated model and 850 NM for the Turbo.

MAINTENANCE

The Seminole is not afflicted with a particularly long list of ADs. Only Seminoles built after March 1, 1999 (a small percentage of the fleet), as well as those whose engines were overhauled after that date, are affected by the infamous Lycoming crankshaft replacement AD issued in 2005.

As with any prospective used-airplane purchase, look over the logs carefully for evidence of repairs after gear-up landings, hard landings and gear failures, which the FAA's accident database shows to have been common for the Seminole. Still, it has proven to be a sturdy ship that, structurally, can take years of training abuse without developing any insidious problems.

With that in mind, know that all years of the Seminole have a life limit of 14,663 hours for the "wing and associated structure," per the FAA type certificate data sheet and as required by FAR Part 23, under which the airplane is certificated. Given its popularity as a trainer, we wouldn't be surprised to learn some Seminoles have more than 10,000 hours on them. There's no word on whether that limit might be raised in the future; we wouldn't bet the farm on it.

Over the years, other ADs have dealt with a potential for fire in the Janitrol cabin heater fuel pump, which must be inspected and replaced if leakage is discovered (AD 2003-11-14 was issued in 2003; AD 2005-15-10 superseded and amended it in 2005); cracks in the main gear trunnions, which could cause a gear collapse and require, according to a 1994 AD (94-13-11), repeat inspections until they are replaced.

The nose gear, which the FAA decided in 1994 needed a mod to prevent collapses resulting from a failed bolt (AD 94-14-14); and the control wheel attach point, which a 2004 AD (2004-14-12) targets for inspection because a screw was too short in some installations and resulted in failures.

Other ADs have dealt with the flap-handle attach bolt (AD 96-10-03), binding aileron push rods (AD 80-21-11), damaged skin at the

aileron outboard leading edge (AD 81-16-10), a damaged fuel line near the boost pump (AD 79-12-11) and binding in the throttle cable (AD 79-05-11).

That may sound like a lot of ADs for one aircraft type, but many of them went into effect in the first couple of years after the Seminole entered service. Additionally, a few of them apply to other Piper models using the same flap mechanisms, control yokes or landing gear components (e.g., PA-28 models).

Searching the FAA's Web site revealed 418 total service difficulty reports listed for the normally aspirated Seminole, not an unreasonable number for a fleet used heavily in training. Other than reports involving engines, carburetors and propellers, four problem areas cropped up via repetitive entries: landing gear-related problems, including switches and hardware; cracks or other failures of the carburetor airbox assembly; cracking engine mounts and—as the fleet ages in both years and hours in service—increasing wear and tear in airframe components like ailerons, wing ribs and the like.

With the airplane still in production and so few changes to the model over the years, parts are no problem, owners have told us. The Piper Owner Society reports that, over the past few years, members have inquired most about the combustion heater issue and the main trunnion gear inspections. Upgrade them and the requirement for repetitive inspections is eliminated.

MODS/TYPE CLUBS

Owners looking for an airplane that offers a lot of extras in terms of performance aren't going to start with a Seminole. For that reason, and the fact that there aren't a whole lot of them out there, mod shops don't focus on it.

One of the most practical modifications is replacing the original aluminum electrical cables with Bogert Aviation copper electrical cables. They are said to boost cranking power and Piper owners are happy with Bogert's support and service (www.bogert-av.com or 800-627-8088).

Meanwhile, a little extra speed has to appeal to owners of the Seminole. LoPresti (www.speedmods.com or 877-565-1731) has underwing fairings, spats, splitters, flap seals and other hardware. Each can add a knot or two by eliminating drag. Knots 2U, Ltd. (www.knots2u.com or 262-763-5100) has a gear-lobe fairing the company says adds four knots. It also markets a vortex generator kit that reduces VMC and stall speeds for the good-natured Seminole. So does Micro Aero Dynamics (www.microaero.com or 800-677-2370).

If you want to get rid of the center strip that joins the original two-piece windshield, LP Aero Plastics, Inc. (www.lpaero.com or 800-957-2376) offers a one-piece unit with tinting, if desired, and thicker plastic for a quieter cabin. Some airplanes did not come from the factory with the "super soundproofing" option, which had the thicker plastic anyway. The STC is owned by Kosola and Associates, Inc. (www.kosola.com or 229-435-4119), which manufactures and sells the installation kit.

That's about it for airframe-specific mods. As a rule, however, things like inflatable door seals available for the PA-28 line should also be available for installation on the PA-44. The same is true for one-size-fits-all avionics, engine and fuel monitors, plus items like electronic ignition components for the Seminole's Lycoming engines, and more.

Two type clubs serve Piper owners. The aforementioned Piper Owner Society (www.piperowner.org) is the oldest and probably largest. Another choice is the Piper Flyer Association (www.piperflyer.org).

The Seminole's T-tail, right, sparks some debate. Some say it makes the airplane twitchy on rotation for takeoff, others say that's nonsense. One thing is certain: It takes a ladder to properly inspect it. Landing gear, lower photo, is Piper's standard electro-hydraulic design which works well if maintained, less well if it isn't.

OWNER COMMENTS

I purchased a 1981 Piper Turbo Seminole on eBay. Aircraft total time was 1950 hours, with only 195 on factory overhauls. The aircraft had not flown in six months and

required some TLC and avionics upgrades. I operated this plane out of a high-altitude airport in Big Bear Lake, California, for a little over 10 years and found it to be an excellent choice for me.

I had specifically wanted the "T" tail configuration to allow for more storage in my hangar. While I found the turbo Seminole to be a fine performer and easy to fly, I was faced with some serious maintenance expenses early in my ownership. During the second annual inspection, corrosion was discovered in the bottom end of the left engine during a routine cylinder removal. We blamed it on the six months the aircraft had sat in Tennessee and dug deep to cover the ensuing $14,000 annual.

Next came compliance with AD 94-14-11, which required replacement of the right and left landing gear trunnions and another $3500. Other than that, the airplane served me well with minimum down time and routine annuals in the $5000 range.

I flight plan for 150 knots at 9500 feet, burning 21 GPH in cruise with good leaning. Single engine performance was superb with the counter rotating props and 56 knot VMC (about the same as stall speed!).

I put the airplane's excellent single-engine handling to good use several times thanks to the 180 HP E1A6 Lycoming engines (a variant of the famous H2ADs used in the 150 HP Cessna 172s from 1977 through 1980). The first incident was a return to Laughlin, Nevada, after a stuck exhaust valve in the right engine required reducing power to about 25 percent. About a year later, I had to shut down the right engine completely and feather the prop when a rocker arm broke in the same cylinder. This landing was made at my home base with no problems.

I finally sold the airplane due to its declining *Bluebook* value and insurance costs ($2500 a year for me as a high-time commercial pilot). I will be flying a Cessna 172RG for the time being, but would love another Turbo Seminole in the future.

Wally Weber
Big Bear Lake, California

I purchased a 1979 Seminole for the unbelievably low advertised price of $34,900. [These comments are from our archives and that purchase was made about 15 years ago. The *Bluebook* average retail for a 1979 Seminole today is $108,000. – *Ed.*] Both of the Hartzell two-bladed props were at the end of a five-year AD inspection limit, which I believe has since been rescinded for Part 91 personal use. One blade flunked inspection and was replaced for an additional $2000.

Since the aircraft was purchased for leaseback revenue at military flying clubs in the Northwest, it was in fine condition. During that time, both engines made it to the 2000-hour TBO, plus or minus three percent, without any problem. The O-360 engines originally installed in the Seminole had a cam problem service history, which resulted in an AD requiring Lycoming snake oil additive and time limit oil changes and examination for filter particulates. Speaking of oil changes, there's not enough clearance between the bottom of the engine oil pan and the access plate to allow installation of a quick oil drain kit. The good news is that the upper engine access cowlings are easy to pull off and re-install.

The fuel system is simple and easily checked for contaminants. My only complaint about fuel is the lack of adequate usable fuel quantity for use as a personal long distance cruiser. Another 20 gallons would have enabled non-stop flights from Monterey to Seattle. I flight plan for 18 to 19 gallons an hour at 138 to 142 knots at 55 percent power. At 22 inches and 2300 RPM, the ride is reasonably quiet.

The landing gear is a simple electric motor driving a hydraulic pump to operate the wheel retraction cycle following a cross country fuel stop. The emergency extension system is a simple matter of pulling on the gear handle to release the hydraulic pressure and allow the springs to push the gear down.

Electrically, the only negative memorable event occurred over the Pacific Ocean near Catalina Island as smoke and smell started to exceed the denial stage. After securing all electrical power, we started reenergizing systems on line slowly to isolate the problem. It was a shorted strobe-light capacitor box which is mounted on the aft floor bulkhead. I replaced the box and still had problems, which I was never able to resolve. The single landing light bulb in the nose frequently burned out. It's definitely a preflight item for night ops.

Another problem related to the alternators. Occasionally, one alternator would not stay paralleled and the other would pick up the entire load. The fix was a small screw adjustment in the paralleling circuit box under the nose cowling that required tweaking.

Airframe wise, the only gotcha is the Cherokee-type single entry door. After briefing another pilot on proper door closing technique, I didn't check his work and it popped open after takeoff; we managed to close it after a struggle.

As for the instrument panel and related switches, these are laid out acceptably. The engine RPM gauges

are low on the panel and the MP gauge is on the right side. You get used to it because you have to. The side panel-mounted engine starter controls and light switches are fine when there is ample light to read which is which. The Janitrol heater controls are on the right side and work fine.

The Seminole is easy to fly well and will not bite unless severely provoked. It flies like a heavier Arrow, with a bit more roll heaviness. The T-tail is great for walk-arounds and the horizontal stabilizer is not susceptible to rock/gravel damage blowback from a swinging propeller.

Takeoffs are more like a launch when the aircraft gets to flying speed. The aircraft does have to be pulled into the air at 75 KIAS and shortly thereafter requires a bit of forward yoke to readjust the pitch attitude. On landing, it takes true skill to hold off the nosegear for a smooth letdown after main gear contact since the horizontal stab dies almost immediately.

Control pressures are light and gentle on the Seminole, as opposed to the solid sports car/high performance feel of the Twin Comanche. The Seminole is not a fast airplane. It's about 25 knots faster than a Cherokee 180 at only twice the fuel burn. The Seminole is easier to slow down and configure for approach and landing than is the Twin Comanche.

Steve Bulwicz
Bloomington, Minnesota

I have owned a 1981 Turbo Seminole for about three years. I am the third owner of the plane. It has a total of 1200 hours on the airframe and about 600 hours on the engines. The airplane is as close to flawless as a 1981 airplane can be. The plane is equipped with dual Collins Microline nav/coms, a Century 41 autopilot, an IFR-certified KLN 90 GPS and radar altimeter. An NSD HSI (unslaved), fuel totalizer and Strikefinder round out the package. It's also got three-bladed hot props.

I maintain the plane meticulously. Annuals have averaged $4000 a year and insurance is about the same. I replaced the aggravating heater that has an AD on it with a ceramic-lined heater that does not need annual inspections. On runup, I have always had to lean the engines for a moment prior to checking the mags and the airplane is a smooth and stable and forgiving machine with counter-rotating props (why doesn't every twin do this?) and no critical engine.

It's a wonderful airplane for two people. I have flown with four people, but that is cramped and I do not carry full fuel then. I can carry full fuel (108 gallons) and burn 20 gallons per hour at 65 percent power and cruise at 160 knots. I have dual vacuum pumps, dual alternators and two engines! With two people, the airplane will fly and gently climb with one engine at zero thrust (11 inches of manifold and 2200 RPM).

I am surprised more Seminoles are not sought out for their safety and redundancy. If not overloaded, I cannot imagine a safer airborne machine. I received my instrument rating in the airplane and am a very conservative IFR pilot in terms of weather.

Robert B. Tober, M.D.
Via e-mail

Letters

(continued from page 3)

think readers should know this fact.

Last, the editorial comment that indicated a personal choice of Hartzell, all other things equal, may have been made with limited knowledge of what goes into the design of the MT blade.

If you can't make a trip to the MT design and manufacturing facility in Germany, you should take 16 minutes to watch the company video that shows the steps involved in the MT build. We have involved the engineering wizards of MT on several occasions to assist in design of a prop for a specific engine and are always impressed with the knowledge of the physical characteristics of every material used in the blades.

They know how to change, or design in, specific vibration frequency range absorbing characteristics, stiffness, inertial moment and peak efficiency at the RPMs we asked for. It is clear why the MT was the *only* prop that passed all the tests involved in selecting a prop for the diesel power plants. As the senior partner in the

Letters

(continued from page 31)

world's largest volume MT distributor, yes, I am biased.

John Nielsen
www.Flight-Resource.com

TELEX BEEF

I decided to get an ANR headset when I bought an airplane 10 years ago and settled on a Telex ANR-1D after trying and rejecting many others. I paid about $700 for the ANR-1D. The Telex was big and clunky with tinny audio but it was sturdy and with an Oregon Aero headband, provided outstanding comfort and noise cancellation.

I flew with it for years and even sent a letter to the editor of *Aviation Consumer* about how I felt it had been treated poorly in the reviews of the magazine. Meanwhile, I had bought a LightSPEED 25XL and was going to return it, but my son said he preferred it when flying so I kept it. It mostly stayed in the back seat except for a couple of minor repairs. The Telex's electronics went belly up four years ago and I had to return it for a whopping $400 flat repair. It worked for a while before recently giving up the ghost again.

This time, after I sent it to Telex, it was returned to me with a short "INOP OBSOLETE" and words to the effect that "we no longer repair these headsets." Now pardon me, but I've sent Peltor and LightSPEED headsets back for repair and have always gotten an excellent repair for a reasonable price. To have Telex first stiff me for an enormous repair cost and then refuse it altogether it is unbelievable.

Pilots are used to huge repair bills for avionics, but not for half the value of the item. This headset was not from the 1950s, it was 10 years old. We are willing to spend a premium on something if we think we are getting quality that the manufacturer will support and when you put a huge price tag on something just because it says "aviation" on the box, you should be prepared to support that product for longer than 10 years.

Or do what LightSPEED does. I recently noticed a program for a new Zulu with credit on the trade-in of my old 25XL. I figured, why not? They support their headsets and now they want to support their customers with a great deal on a trade-in.

I doubted I could get $300 for this headset on eBay, so off the 25XL went to Oregon and now I have a fantastic ANR Zulu headset for $550. The reviewers are all correct. It is comfortable, the ANR works beautifully and it has cellphone and music interface.

Best of all, I have confidence in the customer service of LightSPEED. I'm not sure who at Telex made the decision to stop supporting the ANR-1D. Maybe they were just breaking too often, but they could at least have given me something for trade-in on a new headset.

I'm sure the new Telex headset works great, but I would caution buyers to consider the company that makes them. Telex doesn't value the GA market and believes we should chuck a $700 headset just because it has a few bad circuits, and buy a new one. Sorry, guys, you blew it.

Peter VerLee
Via e-mail

John Weeks, sales manager for Telex, provided us with this response: Telex is committed to providing the very highest level of service and support for its General Aviation customers and we deeply regret Mr. VerLee's recent experience with his Telex headset.

Although there comes a point at which it is no longer economically viable to manufacture and maintain an inventory of spare parts for older headsets, this should never be at the expense of customer satisfaction. To that effect, we are currently evaluating our repair and exchange policies with the goal of making them more flexible and affordable for all our customers, especially those with older products.

Our headsets are designed to provide years of service and we agree that fair pricing for repairs or exchanges is central to the value of choosing a Telex product.

FEEDBACK WANTED

PIPER ARCHER

For the April 2010 issue of *Aviation Consumer*, our Used Aircraft Guide will be on the Piper Archer. We want to know what it's like to own these popular cruisers, how much they cost to operate, maintain and insure and what they're like to fly. If you'd like your airplane to appear in the magazine, send us any photographs you'd care to share. We accept digital photos e-mailed to the address below. We welcome information on mods, support organizations or any other pertinent comments. Please send correspondence on the Archer by January 30, 2010, to:

Aviation Consumer
7820 Holiday Drive South
Suite 315
Sarasota, FL 34231
(preferred) e-mail at:
avconsumer@comcast.net