September 2011
Volume XLI
Number 9

*The consumer resource for pilots and aircraft owners*

# The Aviation Consumer®

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The Aviation Consumer

**EDITOR**
Paul Bertorelli

**MANAGING EDITOR**
Jeff Van West

**CONTRIBUTING EDITORS**
Jonathan Doolittle
Rick Durden
Larry Anglisano

**SUBSCRIPTION DEPARTMENT**
P.O. Box 420235
Palm Coast, FL 34142-0235
800-829-9081
www.aviationconsumer.com/cs

**FOR CANADA**
Subscription Services
Box 7820 STN Main
London, ON 5W1
Canada

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**AVIATION CONSUMER** (ISSN #0147-9911) is published monthly by Belvoir Aviation Group LLC, an affiliate of Belvoir Media Group, 800 Connecticut Avenue, Norwalk, CT 06854-1631. Robert Englander, Chairman and CEO; Timothy H. Cole, Executive Vice President, Editorial Director; Philip L. Penny, Chief Operating Officer; Greg King, Executive Vice President, Marketing Director; Ron Goldberg, Chief Financial Officer; Tom Canfield, Vice President, Circulation.

Periodicals postage paid at Norwalk, CT, and at additional mailing offices. Revenue Canada GST Account #128044658. Subscriptions: $84 annually; single copies, $10.00. Bulk rate subscriptions for organizations are available. 

Postmaster: Send address corrections to AVIATION CONSUMER, Box 420234, Palm Coast, Fl 32142. In Canada, P.O. Box 39 Norwich, ON NOJ1PO, Canada. Publishing Agreement Number #40016479



## Thielert: Not That Bad, But No Homerun, Either

Given *Aviation Consumer's* status as the only subscriber-supported, consumer-oriented publication in aviation, we are often asked to "get to the bottom" of certain issues. Some of these are mundane, such as comparing cockpit accessories or even writing about insurance, which we're doing in this issue.

For me, the most difficult subjects are those in which buyers, owners or consumers report radically different results and perspectives when discussing the very same product. And so it is with this month's follow-up report on the Thielert diesel engines.

Refreshing your memory, Thielert burst upon the scene around 2001 and got above ground when Diamond announced it would use the engines in the innovative DA42 twin. Thielert basically reworked a mass-production Mercedes-Benz sedan engine, stuck a gearbox and a prop on it and thus was born a modern—although not the first—aerodiesel.

Things went swimmingly forward, Diamond sold a bunch of twins and some DA40 singles and all was well. Until it wasn't. In late 2007, widespread maintenance and support issues came to light, Diamond and its customers were unhappy and by 2008, Thielert had gone into receivership, the apparent victim of a hopelessly optimistic business plan and horrible customer support.

Scrub the slider forward and where are we in 2011? Thielert claims to be profitable and it ought to be, given what customers are paying for engines and parts. Yet no buyer—evidently, not even the Chinese—has come forward to take the company off the solvency master's hands, so it chugs along more or less in stasis. Diamond went its own way with the Austro engine and that's what new DA42 NG airplanes are equipped with.

Against this backdrop, you'd think there would be a lot of angry Thielert and Diamond customers out there. And there are. A group put together a small class to sue Diamond over the engine issues, but, surprisingly, many seem happy with the airplanes despite the engine shortcomings, which are considerable.

Despite having to rip gear boxes off the engine every 300 hours, change pumps and pay Thielert very high prices for parts—wire the money first, please—the owners I talked to have a grudging admiration for the diesel engines. They have proven exceptionally economical and although maintenance intensive, they are dispatch reliable, something many owners place high value in.

Some owners seem to so love the DA42 that the engines that power it are seen as a tolerable wart on the ownership experience. Although I heard complaints about Thielert's service and customer support—with a few brickbats thrown Diamond's way, too—I heard no complaints about the airplane itself. That's a fairly remarkable outcome, given that some owners had their $600,000 airplanes beached for weeks, awaiting support from Thielert.

My view of diesels for airplanes remains neutral. I am just a little south of believing their market dominance is inevitable, despite the avgas fuel situation. Nonetheless, if the current state of play with Thielert is as bad as it gets in the diesel market, consider me encouraged. No sane person could consider Thielert's business experience a good one, yet the engine has survived this and earned a surprisingly satisfied, if not ecstatic, customer base. If that sounds a little like "doesn't suck that bad," it probably is. Considering how many aviation startups sink without a trace, maybe it's really a resounding endorsement.—*Paul Bertorelli*

## No Vac Revisited

Re your article on going vacuumless in the June 2011 issue, when I bought my new Columbia 300 in 2002, it came from the factory as a traditional six-pack with a vacuum AI (KI-256). In November 2008, I embarked on an upgrade to the Aspen EFD1000 Pro using Lancaster Avionics in Lancaster, Pennsylvania. (They are awesome.) I chose to install the Mid-Continent Life Saver electric attitude gyro with battery backup as my backup AI. As part of the upgrade, I wanted to remove the vacuum system because it would no longer power any instruments. Initially, we were led to believe that we would be able to remove the vacuum system with local FSDO approval. It turns out this was not possible because the vacuum system is on the type certificate. It had to go through the ACO that controlled the type certificate.

Our initial interaction with the Harrisburg FSDO led to a physical inspection of the airplane and our plans by the FSDO on October 23, 2008. He researched and let us know immediately that he could not approve the vacuum removal. He put us in touch with the New York ACO, which researched and decided Seattle ACO needed to approve. Seattle ACO then provided us with their requirements. We chose a DER with experience with the Seattle ACO to do the engineering packet.

The DER took a few weeks to complete the engineering packet. The cost was $3600. The DER took care of everything Seattle, New York and Harrisburg wanted for the vacuum removal. Our avionics shop managed the process as part of the install.

So, the process was submitted to Harrisburg FSDO on November 26, 2008 and Seattle approved it on February 10, 2009. Harrisburg approved it on February 17, 2009. The total time in FAA hands was less than three months. That time included Christmas holidays. During the time, I was provided regular updates by the avionics shop and the Harrisburg FSDO.

The engineer provided the details that proved our proposed upgrade was statistically safer than the vacuum system it replaced.

On the Columbia, there is an airframe standby battery which powers critical systems for at least 30 minutes. In addition, we have the Aspen backup battery and the Mid-Continent backup battery. So, we have backup power for at least an hour, probably more. It would be nice to have a second alternator, but I am convinced that my all-electric Columbia 300 is far safer now than it was using a vacuum system.

Andy Barrett
Via e-mail

## We Are Bemused

I am a little bemused by your editorial as well as the two letters you chose to publish regarding the GTN series. You posed the question early on: What else do you want these to do?

The GTNs do plenty. They're not autopilots, they don't control the airplane, but they give you a lot of capability. But it's myopic to say the GTN is just another 480. For one thing, that's not true, but it also misses a larger issue. It's not just what the box does; it's how it does it. The presentation, interface and user-friendly sophistication puts this product in a class by itself.

I'm not sure what people were expecting. It's certainly not revolutionary, like, say, an Eclipse. Advances in processor speed and display are to be expected. But the integration of nav, terrain, traffic, obstacle, charts and weather is done in such a way that situational awareness is immediate.

Flight planning and loads of information are literally at your fingertips. This unit obviously had the benefit of people trained in consumer product design, unlike so many other radios, like the 480. And yes, the expensive Jepp charts are an option for a hefty price. The intuitive color design and vector-based graphics, unlike the FliteCharts, make them a useful addition. For someone who flies outside the Americas coverage, it's nice to be able to add extras, like the Caribbean kits, without having all the paper.

Yes, the economy sucks, and it is hard to justify putting money into a depreciating asset. But I, for one, am glad that companies like Garmin and Aspen (and ForeFlight) are still working to develop products that make flying more enjoyable, safer, and yes, even easier.

Seems like Garmin deserves some credit for designing these and releasing them when they were announced, more or less working well. That's more than you can say for many products in the aviation industry. The dilemma isn't Garmin's—they have a very focused view of the GA market and a track record that says they know what they're doing—the dilemma should be how to make room for one in your stack.

Rod Paul
Atlanta, Georgia

## Flight Guide Heartburn

Just read your article in the July 2011 edition of *Aviation Consumer* about electronic Flight Guide. The company

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### CONTACT US

**Editorial Office**
941-929-1693
E-mail: avconsumer@comcast.net

**Subscription Department**
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AVIONICS WATCH

# MFD Market Scan: Has Their Era Passed?

*Standalone MFDs as we know them make sense only for a select few thanks to all-in-one navigators like Garmin's GTN 750, GPS portables and the iPad.*

*by Larry Anglisano*

Remember overlaying your ADF needle on an Argus moving map display? This is what started the ball rolling on dedicated MFD displays. Years later, Avidyne revolutionized the big MFD with the original FlightMax series.

**CHECKLIST**

- ⊕ Plenty of models to choose from, both new and used.
- ⊕ For the right needs, such as on-board radar, the MFD makes sense.
- ⊖ For the rest of us, a better total value is had with a portable, a PFD/MFD glass panel upgrade or a Garmin GTN 750.

But the upgrade demand for standalone MFDs has plummeted to near extinction. The first salvo was Garmin's 530, whose screen took the GPS navigator to the near-MFD level. The new GTN 750 now crosses the line with every major MFD feature save ship's radar. On the other end of the scale, most MFD map functions are mimicked by aeras, iPads and the like—and for far less cash.

If your goal includes displaying radar, or demands a panel-mounted display without an accompanying navcomm upgrade, there are numerous products to choose from. Shopping the used market could offer cheaper alternatives.

## GARMIN: MFD AND MFD KILLER

Garmin still offers the GMX200 MFD in its lineup, but with the GTN750 on its heels we have to wonder for how long. We've covered the GTN750 (and smaller 650) extensively over the past few months, so here we'll look at its MFD functions. Just remember this is all on top of it being a full WAAS GPS/nav/com.

*It doesn't take much imagination to replace an MFD with a big-screen Garmin GTN 750. Avidyne and Honeywell are both following Garmin's lead in creating MFD-like GPS navigators.*

In Garmin tradition, the GTN750 is built around a liberal remote sensor interface with a generous availability of data input formats and ports, from RS232 to digital Arinc, and GAMA to Ethernet.

You won't have to place your peepers on the units display for long to realize it's up to the dedicated MFD challenge. It sports a near-VGA-quality display and touchscreen controls. That display is a high-resolution mega-color TFT LCD with a 600 x 708 pixel count. Overall, the unit stands tall in the radio stack at six inches vertical, but compared to separate MFD and navigator, it's a huge space (and dollar) saver.

The GTN750 comes standard with a wealth of functions that were once optional on retrofit MFDs: Garmin FliteCharts, SafeTaxi, terrain and obstacles, airways and graphical flight planning. Traffic alerting, XM weather and sferics display cost extra but are available. Want to lose the audio panel and transponder from the radio stack? The GTN750 can channel these units remotely.

The GMX200 is a worthy MFD that shares little in common with the GTN750. It originally started life as the MX20 from the old UPS-AT days. Still, most agree that it offers an easy feature set and speedy processor that makes for quick map redraws and efficient weather graphic refreshes. It also has a split-screen mode and impressive terrain functions, including a look-ahead or vertical profile view of obstacles.

Speaking of vertical profile, the I/O version of the GMX200 overlays the Bendix/King RDR2000/2001, RS181-series radar plus Garmin's own GWX68 radar. The GMX200 doesn't come with charts. You'll need to buy a Jeppesen subscription and $2395 Chartview unlock for that.

| DISPLAY | HEIGHT | SCREEN SIZE | SCREEN TYPE | RADAR? | CHARTS? | PRICE | COMMENTS |
|---|---|---|---|---|---|---|---|
| EX600 | 4.93 IN | 5.8 IN DIAG | TRANSREFECT LCD | MANY | STD JEPP | $9940 BASE | EASY FEATURE SET, LARGE SCREEN, DIM DISPLAY |
| GMX200 | 5.0 IN | 6.0 IN DIAG | LCD | FEW | OPT JEPP | $8995 BASE | SPLIT SCREEN FUNC, TRAFFIC OPTIONAL |
| EFD1000MFD | 7.0 IN (3.5 IN W) | 2.5 IN H x 2.75 IN W | LCD | NO | OPT NACO | $14,990 W/PFD | SECTIONAL MAP, PFD REVERSION, CONNECTED COCKPIT |
| G500 | FITS SIX-PACK | 6.5 IN DIAG | LCD | FEW | OPT, JEPP OR NACO | $15,995 W/PFD | RICH FEATURE SET, HAS PFD W/AHARS |
| GTN750 | 6.0 IN | 6.9 IN DIAG | HIGH-RES TFT TOUCH | NO | STD, JEPP OR NACO | $16,995 | BEST VALUE FOR NAVIGATOR/ MFD COMBO |
| IFD540 | 4.6 IN | 5.7 IN DIAG | LCD LED BACKLIT | NO | STD JEPP | $16,995 | NOT AVAILABLE YET, GNS530 SLIDE IN |
| KMD150 | 4.0 IN | 5.0 IN DIAG | LOW RES LCD | NO | NO | 13/14 | VFR GPS GOOD FOR LORAN REPLACEMENT, DATED MAP |
| KMD250 | 3.0 IN | 3.8 IN DIAG | ACML | NO | NO | $5,800 | PRICEY, DECENT GRAPHICS, GOOD SIZE FOR TIGHT STACK |
| IPAD 2 | N/A | 9.7 IN | LED BACKLIT | NO | APP-DRIVEN | $599 | ENDLESS APPS, HEAT LIMITS,WIDE VIEW ANGLE |
| AERA560/ GIZMOS | 3.3 IN | 4.3 IN DIAG | TFT TOUCHSCREEN | NO | SAFETAXI ONLY | $1799 +$130 | XM WX/RADIO STANDARD, EASY INSTALL,SNAP AND GO |

VFR and IFR en route charting is standard, however.

The GMX200 is a space-eater, requiring five inches of vertical space for its crisp and bright 6.5-inch diagonal LCD display. As with any standalone MFD, you'll need a GPS to drive it and the GMX200 plays with most. A top of the line GMX200 I/O Radar unit retails for $17,390 with Chartview option or $13,390 with just traffic capability and charts.

## AVIDYNE'S EX-SERIES

Avidyne replaced the popular and worthy EX500 (a good used buy for the right price as we'll explain later) with the EX600. The newer MFD is big but not huge. It stands 4.93 inches high and fits the standard 6.24-inch rack-width. Weighing 4.75 pounds and fairly deep at 11 inches, the box feels substantial and sturdy.

There's a lot of display area at 5.8 inches diagonal, and Avidyne stepped up the panning capability for that big display—something the EX500 lacked. With the EX600, you can finally pan the map to look at weather or other features that lurk miles away.

The newer transflective screen technology has many benefits including good visibility in low and high light environments, but can appear dim when wearing sunglasses. Further, this display appeared dimmer than some other displays that were collocated in the radio stacks of a small twin, even though it's designed for better sunlight readability. Some owners are pleased with the EX600 in their stacks. Others struggle while using certain sunglasses.

The EX600 and EX500 require 28-volts bus input. A 14-volt system requires a voltage converter. These beefy power supplies are hungry and we've seen more than one stress a marginal charging system. A power supply also means there is another remote box to install, with the associated hassle and expense.

Satellite Weather is supplied by the MLB700, a SIRIUS-based satellite receiver with products provided by WSI InFlight (a HeadsUp XMD76 series, XM-based system will work also). For active lightning data, the TXW670 or L-3 WX500 will easily input, as will nearly every common traffic system including the Avidyne TAS600.

*A panel-mounted portable or an iPad makes a pretty capable poor-man's MFD. You could even have both for less than one true MFD.*

## CONTACTS

Aspen Avionics
www.aspenavionics.com
888-992-7736

Avidyne Corporation
www.avidyne.com
800-284-3963

Bendix-King by Honeywell
www.bendixking.com
800-601-3099

Garmin International
www.garmin.com
800-800-1020

The cMax approach charts capability (Jeppesen-charts) are standard on all EX600s and the base unit starts at $9990. Common radar interfaces like a RDR160 bump that price to $13,990 and big-airplane radar interfaces can bump that price to nearly $17,000. Replacing an EX500 with the EX600 is a reasonably easy project as long as there's spare space to work with.

### HONEYWELL BENDIX/KING

Two MFDs remain in the Bendix/King line: the KMD150 and KMD250. The lower-end KMD 150 is available either with or without a built-in GPS receiver. The system can function as a standalone VFR GPS navigator, or driven by an existing KLN 89B, KLN 90B or KLN 94 GPS. It also has steering outputs for coupling to an autopilot. The KMD150 map dates back to the SkyForce days, which is obvious when comparing what you get on the five-inch diagonal display to other modern screens.

But it's easy to use with an intuitive joystick control. The KMD150 with internal GPS is $4168 and non-GPS flavor is $3871.

The KMD250 is a holdover from the pricey IHAS line. It accepts a variety of remote inputs including the $7000 Bendix/King KDR-series XM Weather system, WX500 Stormscope, and TAWS/traffic sensors. The KMD250 has a sharp 3.8-inch-diagonal ACML display—small but crisp enough for utilitarian mapping. The bezel stands three inches high, making it ideal for replacing an old Loran. It has an integral non-WAAS GPS. At nearly $6000, though, it's pricey for dated technology.

We're not sure of the longevity of these products, frankly, as it took us a while to confirm if they were readily available or not.

### PFD/MFD GLASS PANELS

We extensively covered the G500 and EFD1000-series displays in the May 2011 issue of *Aviation Consumer*. These represent far bigger install jobs and prices—think $15,000 to $30,000 once all the bills are paid—as they are an upgrade to a full glass panel, but you do gain MFD functionality.

In summary, Garmin's G500/600 has a split-screen bezel with a dedicated MFD on the right. Aspen does a similar duty but with two separate displays, which provides redundant backup and flight data integrity cross-checking with dual-AHRS. There's also split-screen data capability. Take a look at the May issue for more details.

On the MFD side, G500 has FliteCharts (NACO approach charts) and SafeTaxi standard. The pricey Jeppesen ChartView is optional. Aspen offers NACO charts only, but they are georeferenced (your position is shown on the chart) where FliteCharts are not. An annual FliteChart subscription for the Garmin is $395. For the Aspen, it's $299, and is supplied by Seattle Avionics. Garmin's G500 has an option for displaying some ship radars.

We think the Aspen MFD500 would be an excellent standalone MFD for space challenged panels. All bets are off, however, as it relies on an accompanying 1000PFD to feed it heading data. For this reason, it can only function as a secondary or third add-on display to a primary PFD.

### USED MARKET DEALS

When shopping the used MFD market, you'll need to keep a sharp eye on unit flavor, particularly if overlaying radar is a requirement. Avidyne told us they can easily modify a non-radar capable EX500 but for a hefty cost. Understand, too, that EX500's that aren't equipped for cMax charts require a $2000-plus add-on. Unless the unit is still under warranty (Avidyne offers an extended warranty plan), any repairs will be flat-rated.

In scanning the used MFD market, we found some good deals. One reputable reseller had an EX500 advertised for $2900. It didn't have charts, but at that price we think it's a steal. Avoid old MX20s like the plague. One display failure and it's a paperweight. (A GMX200 can replace an MX20 with minimal fuss.) GMX200s demand premium pricing, but a good eye can score one with charts for around $5000. If you have to play traffic on a GMX200, be

*For ship's radar, an MFD makes sense. Finding a used EX500 might be your best bet.*

sure to buy the GMX200 I/O-Traffic flavor. The base GMX200 won't do it.

Before making a used purchase, get a quote for installation. You don't want surprises when you show up with box in hand. MFD installations aren't complicated. In fact, wiring is reasonably straightforward. It's the panel work to make them fit that runs up the bill. The best case is mounting the display in the main avionics stack for optimal viewing. This space dilemma is resolved with all-in-one navigators that serve double-duty as MFDs.

## ROLL YOUR OWN MFD

If the main driver on your MFD decision is budget, there are seemingly countless ways to build your own multi-data displays. First is panel-mounting a portable GPS with the popular AirGizmos docking station. Maybe it's an older GPS496 or newer touchscreen aera; these units mounted in the panel offer a cost-effective way of decluttering a loose portable strung across the cabin while offering the convenient visibility of a panel-mount.

Installing an AirGizmos in a certificated aircraft panel used to be an unethical and taboo practice. Now it's commonplace. The arguing shops wore their FSDOs down and many now view the install as a minor alteration sealed with an appropriate logbook entry. Obtain counsel from your shop, however, before taking the plunge.

The Gizmo dock is a sturdy polycarbonate plastic housing with feed-through channels for routing interface cables to the connector ports on the portable. No stray wires involved. The housing secures to existing radio rails or other appropriate structure. This isn't a slap-and-go affair; your shop still needs to wire power and ground to a circuit breaker and route antenna cables. If the interface includes a data connection to a panel-mount GPS for flight plan overlay, that's more wiring and teardown yet. But it's still far less money than any panel-mount MFD. For example, the Gizmo dock for a Garmin 496 or aera runs about $100. You can also get an angle adapter for canting the unit for better visibility.

The iPad has become a permanent

*continued on page 14*

# AVIDYNE GOES AFTER GARMIN'S 530

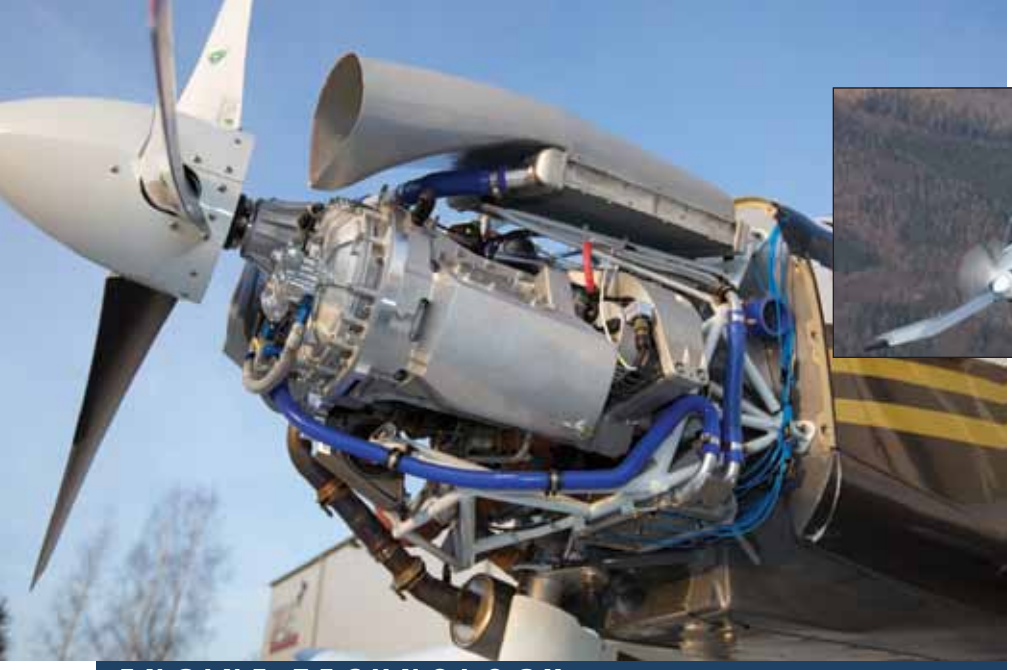
If there was a wart with Garmin's world-conquering GNS 530 series navigator, it was its inability to function like a true multi-function display. It did well with traffic and general topographical and airspace depiction, but high-resolution weather and terrain graphics suffered on its limited color screen. It also lacks charts and airways. Garmin rectified this with the GTN 750, but that unit requires a completely new install even if upgrading from a GNS 530.

Avidyne surprised the industry recently announcing the IFD540, a nav management system/MFD-combo unit that's trickled down from the company's R9-series MFD and FMS900w. It's a powerful NMS with Avidyne's GeoFill waypoint functions plus FMS-vectors that further automates flight plan autopilot coupling.

The real magic with the IFD540, however, is that it's a slide-in, pin-for-pin GNS 530 replacement. At $16,995, it's priced identically to Garmin's GTN 750. Avidyne also introduced a slide-in audio panel, transponder and autopilot that we'll look at in a future article. Interestingly, there is no announced plan for a slide-in replacement for the almost ubiquitous GNS 430. Given that Garmin didn't create one these on its own, we wonder if the technical compromises just make it impractical. Or it could be that scaling down the R9 MFD that much is too much to ask. Avidyne told us they have no plans for offering radar capability to the recently introduced IFD540 display, which seems surprising. Then again, it reinforces the dwindling radar market, at least at the lower end.

The IFD540 follows Garmin's lead with a touchscreen. But unlike the GTN series, which is almost total dependent on touch, Avidyne built the IFD540 with a combination of buttons, knobs and the touchscreen. Our first impression of the IFD540 was that there's a lot crammed into the display. One GTN 750 owner told us the on-screen menu icons are small compared to the ones his fingers have been touching. But this was just the prototype and Avidyne told us it won't be ready for prime time for about a year.

Also in the works is the Aspen/Honeywell-partnered KSN770 NMS/MFD that's been stalled on Honeywell's bench for years. It has a 5.7-inch touchscreen and VGA-like graphics that will overlay ship's radar and play with Aspen's Connected Panel. The design of this unit, too, is in flux with a claim of a final version out sometime next year. We asked Honeywell if they have any plans to target the GNS 430 with a replacement and were told, "That strategy would make sense, wouldn't it?" Take that non-answer to mean what you will.



*In Europe, the Avions Robin, left, is a popular transplant host for the Thielert engines. Dozens are flying. In the U.S. and worldwide, Diamond's popular DA42, lower photo, was originally shipped with only the Thielert 1.7 engines.*

ENGINE TECHNOLOGY

# Thielert Report Card: Mixed Experiences

*Six years on, owners love Diamond's diesel-equipped DA42, but we would describe their attitude toward the engines as satisfied, if not enthusiastic.*

*by Paul Bertorelli*

In business, it's axiomatic that eight of 10 startups fail within three years. In general aviation, if anyone bothered to track them, the odds are probably a little worse. Nonetheless, when Thielert Aircraft Engines GmbH went belly up in the spring of 2008, it was a surprise to many who had been following the company casually.

Diamond's innovative DA42 was selling well, the engines seemed to be performing and with avgas threatened, the trend line appeared to point in only one direction: up.

Yet in the summer of 2011, the company remains under the bankruptcy protection of German law. But it also continues to operate, delivering both new engines and parts, albeit at high prices. And despite market projections that persistently show Jet A piston engines as the wave of the future, Thielert still has more engines flying than anyone else and no competitor has yet challenged its dominance.

## HOW GOES IT?

With three years of reorganization behind it, we wondered if Thielert had gotten back on its feet, improved its engines and established a service network that owners and operators can rely on. The short answer is mixed. The company claims to be profitable, but parts and engine prices are high. Owners of Thielert engines say service has improved, especially in the last year, but some complain that the company is more interested in its bottom line than in satisfied customers. "The people running it now don't have a feel for the aviation business," we were told by one operator of two DA42 twins. "They are just interested in the business of running companies in bankruptcy."

To put that comment in context, you need to understand that German bankruptcy laws are different than those in the U.S. Specifically, when a company files for insolvency, the government appoints a special master—in this case the law firm of Bruno Kubler—whose sole assignment is to right the company's finances, without regard to protecting customers, vendors or its market share. As a result, customers saw huge leaps in prices for such critical components as gearboxes, clutches and pumps and with no other sources, owners had the choice of paying up or grounding their airplanes. Turning aggravation to irritation, bankruptcy rules also require invoices to be paid in full before parts were shipped.

Thielert still exists as a business entity, but to keep from being hobbled by insolvency limitations, it provides parts and engines to Centurion, a separate company organized to act as a Thielert agent. If a buyer ever materializes for Thielert, it would acquire both companies, according to Centurion CEO Jasper Wolfson.

## NO INTERRUPTION

Our interviews with customers reveal a mixed pattern of customer service and satisfaction. Wolfson told us that

despite its financial troubles—including a criminal investigation into false invoicing and reporting—Thielert never shuttered production. It continued to deliver engines and parts, albeit at much higher prices.

As Thielert's largest volume customer, escalating prices and complaints about service prompted Diamond to wash its hands of Thielert and start its own engine company, Austro. Austro makes its own version of the same Mercedes-Benz-based four-cylinder automotive diesel. Diamond offers this engine in the DA42 NG, and it has offered owners the option of converting from Thielert to Austro engines at favorable prices.

It has found some takers. Embry-Riddle Aeronautical University, for instance, recently converted one of its Thielert-powered DA42s to Austro engines and one of our editors flew it from London, Ontario, to Oshkosh. The reason for the conversion? "We had a very difficult time getting parts from Thielert," said ERAU's Joe Maynard in an interview at AirVenture. "We would call Diamond in London, they would call Diamond in Austria… it was a communication breakdown. It was tough to get parts."

In fairness, not everyone reported the same experience. Two operators we spoke to told us they didn't have the same kinds of problems getting parts, but they were less thrilled with the delays and having to pay for them up front. Centurion's Wolfson said the company heard the complaints and has streamlined payments and invoicing so parts can ship the same day they're ordered, or shortly thereafter. In addition, it now stocks most of the principle parts in the company's Texas service center, and owners confirmed that parts response from Texas has generally been good and have improved during the last year.

## OPERATING COSTS

Our interviews with owners revealed decidedly mixed reports on operating costs. Although all of the operators we talked to reported good reliability and dispatch rates, the incidence of scheduled maintenance remains high—or at least expensive—and owners are on the hook for the downtime and cost of required replacement parts.

In addition to ERAU, one of the highest time operators of Thielert diesels is Stan Fetter, whose busy traffic reporting service in the Washington, D.C., area operates a couple of Cessna 172s converted to Thielerts at least five days a week. He has about 5600 hours total time on both the 1.7 and 2.0 engines combined. One of the 1.7 engines—Thielert's original product—went to 2580 hours before being recently replaced. Installed in November of 2006, Fetter's 1.7 engine was the fleet leader in total hours.

During its service life, it had the oft-experienced cracked cylinder head problem, which was addressed as a warranty claim, but it did not have the oil cooling nozzle issue that many other engines did. And then there were the gearboxes, a sore point for all Thielert owners.

From the beginning, Thielert structured its costs to allow for gearbox and clutch inspections/replacements at 300-hour intervals and these were, on paper at least, built into the cost of the engine. Because a diesel delivers power with strong torque impulses that transmit through the crankshaft, gearbox and prop, Thielert took the conservative approach of requiring the gearbox and clutch inspections, with the intent of a life extension program that would increase the inspection/replacement interval.

For Fetter's high-time 1.7 engine, that worked out to eight gearbox changes. "That's never been a problem. That stuff is there, as long as you're willing to write the check. Generally, it comes out of Texas. So it's not a shipping or a time delay event," Fetter said.

But it is an expense. At about $3500 a pop, gearbox maintenance alone on the 1.7 engines amounts to about $12 an hour. The improved 2.0 engines have a water-cooled gearbox with a 600-hour replacement cycle.

Although it was promised, the gearbox inspection/replacement interval was never increased for the 1.7 engine,


*Don't count us out, says SMA. At AirVenture, the French company was showing its improved and recently certified SR305 aerodiesel. It has improved altitude performance (up to 20,000 feet) and better cold weather operational performance. It says it's concentrating on finding major OEMs to use the engine.*

**CHECKLIST**

- ⊕ Through its Centurion outlet, Thielert continues to ship parts and engines.
- ⊕ Owners say parts supply and service have improved recently.
- ⊖ Expected service life extensions have been slow to materialize.
- ⊖ Thielert currently has no major GA OEM, putting future growth into question.

**AVIATION CONSUMER PODCASTS**
**For a pair of podcasts on Thielert engines, scan the tags at left with a mobile app or log onto www.avweb.com and click the podcast button. Scroll to the Thielert and Embry Riddle AirVenture podcasts.**

but the clutches went to 600 hours. Some parts did get life extensions, such as the feed and high pressure pumps, whose life was extended to 1200 and 600 hours, respectively. These were originally 300-hour parts. Furthermore, in the clutch assembly, only the disc itself requires replacement; the pressure plate is good for the life of the engine. Engine alternators also require replacement at 600 hours for both engine types.

## DIFFERENT NUMBERS

Pinning down exact operating costs is possible, but putting them in the larger context is not easy. For example, Fetter keeps careful records and told us his maintenance costs for his two diesel airplanes were $21.51 and $23.48, less fuel, which runs about $16 an hour in additional costs. That includes the gearbox and pump replacements. For his Lycoming 172s, fuel costs are $41 an hour, at wholesale prices, plus what we would estimate is an additional $8 in engine reserves. But Fetter's numbers for his Thielerts don't include amortization of the $60,000 conversion cost. Nonetheless, Fetter still figures he's ahead.

"I'm not putting cylinders on the Lycoming, I'm not screwing around with mags, I'm not fighting the electrical system. I don't have reliability problems. I have to have the airplane ready for rush hour. To make sure I had two ready to go every day, I had to have three or four Lycoming airplanes sitting out front. Now, at worst, it's three. You don't have stuff go wrong between the hundred hours. All that's gone," Fetter told us.

But not everyone has the same view of Thielert engine economics. Jeffrey Soules, who has a 70-airplane flight school and FBO operation based in Denton, Texas, told us the company's Thielert 2.0 airplane has a higher hourly maintenance cost than its King Air A90. His data puts the Thielert airplane at $87.80 per hour on maintenance, the King Air at $51.40, a number that doesn't include fuel or engine reserves, just wrench hours. Although dispatch reliability has been good, Soules' operation has experienced some extended downtimes and hassles with dealing with Centurion's German headquarters. But like others, he says customer response is getting better.

Another flight school we checked with, Lynn University in Boca Raton, Florida, gave us a similar report. According to Tim Jensen, the school's chief flight instructor, the DA42 bills for $380 per hour, with only about $40 to $50 of that for fuel, according to our calculation. Lynn is a nonprofit, so that number represents a bare-bones cost of doing business. Commercial rates on the DA42 are at least $100 more an hour.

Lynn bought its airplane just as Thielert's financial troubles came to light, but with a $50,000 deposit on a $600,000 airplane, it felt it had no choice but to proceed with deal.

Have they been satisfied with the airplane? Short answer: Yes.

"It's been great. They've been very reliable. The numbers are true to the POH and they're fuel efficient. We love the airplane. Our squawk is the stupid gearbox," Jensen told us. This is a sentiment we heard repeatedly. Despite the warts with the engines—and they are considerable for some operators—everyone loves the DA42 as a reliable, fun-to-fly and economical twin. The Lycoming-powered version also gets rave reviews.

## CONCLUSION

We're not sure we can draw one at this point. Although owners we spoke to gave the DA42 glowing reviews, their opinions of Thielert engines are more reserved, which is not to say necessarily negative. They like the operational simplicity, the economy and the reliability. They're less confident about the company's long-term presence in the market and no one likes the required replacement of gearboxes, pumps and alternators.

Despite Thielert's troubles, we didn't hear anyone describe the engines as outright failures, nor did anyone tell us they wouldn't purchase the airplanes again, although some owners may think that. When asked if he would buy the airplane again, U.S. Aviation's Soules said he wasn't sure. "That's a tough question," he said.

How about Stan Fetter? Would he buy again, converting his 172s to diesel power? "I think so. It would depend on the Euro situation at the time. My installed cost on these was about $60,000 each and now, I'm not sure you could do it for that given the Euro exchange rate," he told us.

While we found a distinct lack of ringing endorsements for Thielert, we also found no vein of opinion that suggests buyers think the engines have no future. More curious to us is that even with avgas apparently on the ropes and with increasing promotion and market activity in the diesel field, only one major OEM—that's Diamond—offers a diesel option and that's the Austro, not the Thielert.

We know that Cessna still has diesel projects active and before he departed Cessna, Jack Pelton told us the company has tested or considered all of the diesel offerings. But it still doesn't have a diesel airplane you can buy, having frozen the Thielert-powered 172 project just before the company went into bankruptcy.

It seems to us that if the diesel market will inevitably expand, displacing gasoline engines, the sharp edge of that wave still isn't visible.

# Load Hauler Bargains: Pipers Have an Edge

*While not fast, pretty or nimble, six-seat Pipers offer the most used aircraft per dollar in this class. If you can fit, a Cessna 210 will get the load there faster.*

*by Jeff Van West*

Hauling half a ton without feeding two engines is just the ticket for air taxi, small cargo outfits and families of five plus a dog. The number of makes is actually surprising if you look worldwide and count antiques, and it's growing with aircraft like the Piper Matrix, Expedition (Found) Aircraft E350 and Gippsland Airvan.

The used market, however, is still dominated by four venerable models that have been around since the '60s: Piper's Cherokee 6/Lance/Saratoga line, Beech's 36-Series Bonanza, the Cessna 206/207 and the Cessna 210. This is likely where you'll find a good deal, although we're told well-priced six-seaters don't last long, even in this economy.

## PIPER SIXES

Piper's six-seat line reminds us of the old Avis car rental commercial—"We're number two."—with number one being the Cessna line. But shopping the less-favored has perks.

The first Cherokee Six appeared in 1965 with only 260 HP (PA-32-260). Realizing that buyers might need max-gross climb rates that didn't inspire prayers to St. Christopher, Piper offered a 300-HP option the next year (PA-32-300). In 1976, a retractable option hit the market in the form of the Lance (PA-32R-300).

The idea of a T-tail looked good in the light of a 1977 disco ball, and Piper offered the Lance and Turbo Lance (PA-32R-300T) with T-tails for two years. The downside of these aircraft is a stabilator that isn't effective until about 80 knots (some technique is required for smooth takeoffs and landings) and needing a ladder to preflight for ice in the winter. Buyers willing to put up with these quirks can get an especially good deal on these model years, however.

Pipers shed the T-tail and gained a semi-tapered wing in 1980. The line was now the fixed-gear Saratoga (PA-32-301—the "1" indicates the tapered wing) and Turbo Saratoga (PA-32-301T), and the retractable Saratoga SP (PA-32R-301) and Turbo SP (PA-32R-301T). The fixed-gear option was dropped, only to reappear briefly as the Piper 6X from 2004-2007. The retractable version saw iterations under the Saratoga name until 2008.

Piper pluses are a huge rear door for passengers, club seating in most later models and a four-foot-wide cabin for the first two rows (3.5 feet for the third). They are also quiet, largely due to a baggage compartment between the engine and the cabin. There's a second baggage area behind the rear seats and both areas have 100-pound capacities. There's usually some configuration that will keep the load within the CG limits. Two pilots and light gear putting the plane out of forward CG is the most common issue.

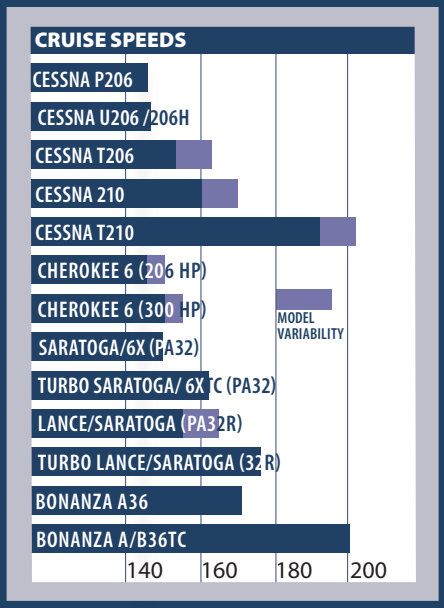
The earliest 260-HP models have the most useful load (up to 1700 pounds) but they have the least power to lift it come hot or high temps, and they are the slowest. In fact, the Piper line is five to 10 knots slower than the corresponding Cessna or Beech, if arguably more

***If you can deal with its quirks, a T-tail Lance offers much for little cash, as do Cherokee Sixes. You also can't go wrong with a 206. A 210 is also a winner—if everyone will fit.***

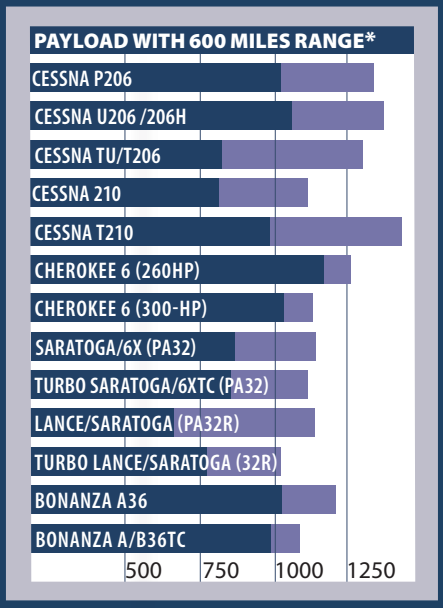
### CHECKLIST

- Six-seaters are selling for a small—or no—premium over four-seaters.
- There's likely some speed, load and comfort combo right for you, even if no model has it all.

# SPEED




# STUFF




# DISTANCE

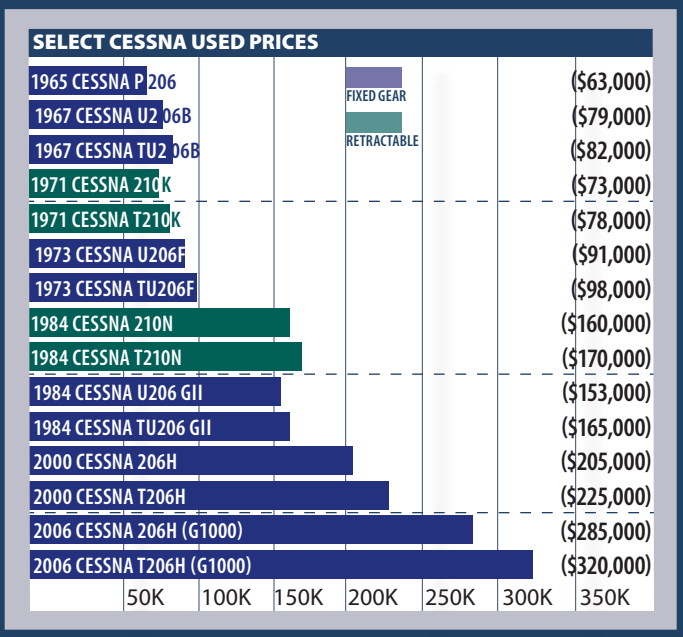

* FUEL FOR 600 MILES AT NORMAL CRUISE) PLUS 45 MIN. RESERVE. RANGE IS LIMITED BY FUEL CAPACITY IN SOME CASES AND GROSS WEIGHT IN OTHERS.
** SIX 170-POUND PEOPLE PLUS A OF COUPLE BACKPACKS

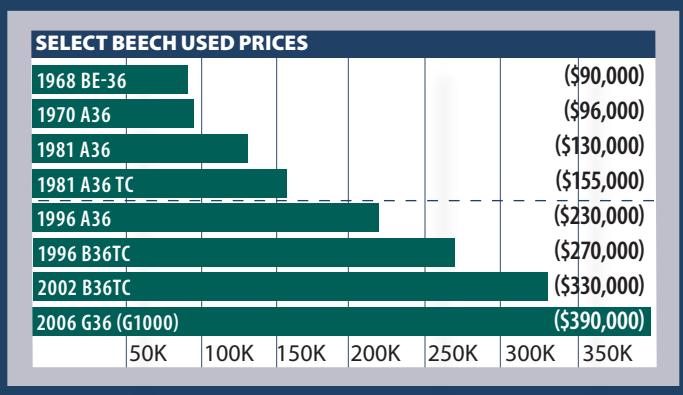
To offer some useful comparison with so much model variation, we took the book speeds for normal cruise (not max range) with real-world fuel consumption (rich of peak) and looked at two real scenarios: How much weight could you haul 600 miles with basic IFR reserves, and how far could you go hauling 1050 pounds?

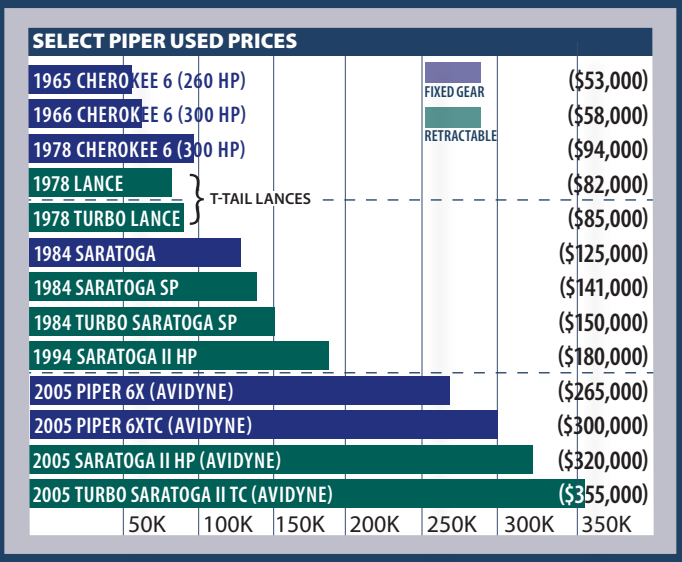
The idea here is to show the range of performance possible for a given model. Much of the variability in payload and range comes from variations in gross and empty weights (the Lance/Saratoga being the poster child) or optional long-range fuel tanks (note the U206/206H and the 210). Some variability comes from differences in speed as the model was tweaked over the years. The takeaway from the chart is best- and worst-case scenarios for a model.

The Cessna 207 is notably missing from our charts, but its speed and range are comparable to the 206, and it carries what the higher capacity 206s do. Price-wise, 207s (turbo or not) are about $5000 to $15,000 more than a like 206 of the same model year.

# PRICES



comfortable. An average early '80s Lance can carry six adults and light bags for 2.5 hours and 155 knots. Later models had fuel capacities of 100 gallons, but these 'Togas can be as fat as Rome before the fall. Empty weights over 2400 pounds in some Saratoga HP/TCs leave 1200 pounds useful load. Fill the seats and you can add gas for 18 minutes of normal cruise before you hit VFR reserves—literally.

Fuel management and sumping is complicated in earlier Pipers. Cooling can be an issue with stock turbos. The parts supply is still OK from Piper and some aftermarket sources. Many mods for speed and comfort are also available. They make terrific IFR mounts, and we found many listed with excellent avionic upgrades. This sweetens the purchase deal substantially with older birds.

None of the Sixes are sporty to fly. But the amount you save on purchase price would pay for a pretty good sports car or motorcycle habit if you were so inclined.

## CESSNA 206/207/210

The Cessna "200s" cover the full range of load-hauling singles. The 210 will take four people plus bags for a month's vacation in style and speed. A late-model 207 could carry the Brady Bunch, including Tiger.

Starting at the speedy end, the Cessna 210 is probably the best compromise of load and speed, with many models offering useful loads in the 1500-pound range. Normally aspirated birds hit 170 knots at altitude. Turbos will best 200 knots.

Technically, the model hit the market in 1960 and got baby-buckets in the baggage area in 1964. It wasn't until the 210K in 1970 that third-row seats a skinny adult could squeeze into appeared, along with an uptick in gross weight. It's from this point on the model is a true load hauler. Later models got more power, higher gross weights (1700 pounds useful load) and longer-range tanks. There's a pressurized 210 if you're so inclined.

If properly trimmed, the aircraft makes an excellent IFR platform (quite a few are known-icing certified). But no one would call a 210 sporty in handling. Fuel management can be an issue on early models or those with aux tanks. The insect-like gear retraction requires careful maintenance on all models. The cabin width is 44 inches, the same as a 182, and tapers aft. Getting to the third seats requires clambering over the second row. Adults won't be content to stay there long.

In 1963 Cessna brought out the 205. It was basically a fixed-gear 210. In 1964 the U206—"U" for "utility"—hit the market and a dynasty was born. In 1965, the 205 became the P206 ("P" for "passenger") with two doors up front and a small one in back. The U206 has a pilot door on the front left and a double door on the right rear, just like today's 206s. Turbocharging was an option by 1966. In 1969, a seven-seat version with more power, gross weight and a nose baggage compartment was offered as the 207. It got an eighth seat in 1980.

The 206s are the slowest of the lot of the load haulers here (and probably the noisiest). Cruise speeds range from 130 to 160 knots depending on model, motor and mods. Book performance on the 207 says it's about eight knots faster than a like-year 206.

While the 206's double door in the back opens over 44 inches wide, access to all the rear seats requires a bit of sliding and climbing. Because all six (or seven or eight with the 207) face forward, the passengers may be eating their knees rather than the Indian leg wrestling available with club seating. The baggage area of a 206 can take 120 pounds, an optional belly pod can take 300 pounds. The 206 is the most forgiving on loading—it takes effort to put it out of CG—but it can get nose heavy if lightly loaded.

Like most aircraft, the breed puts on weight with the plush of newer interiors. A decked-out, new T206H might have only 1200 pounds useful load compared to the 1800-pound useful load of a 285-HP non-turbo U206. But it will be faster and climb better.

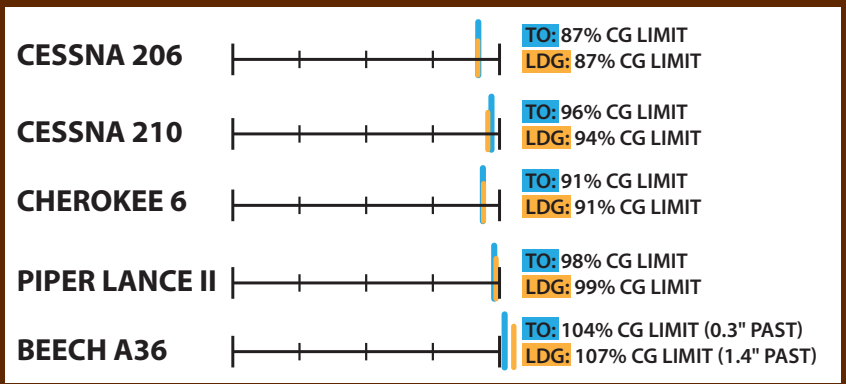
## YOU GOT IT IN, BUT WILL IT FLY?

**The missing factor in the scenarios on the left is whether you can put that weight in the airplane and stay within legal limits. The scales below show a 1050 pounds (a 170-pounder in each seat and 30 pounds of bags) in typical aircraft for each make. CG at takeoff and after two hours of flight is shown.**

**The Cessnas have no trouble at all, with the 206 being the hands-down winner for load tolerance. The Piper Cherokee 6 (a 300 HP model) is OK with the weight, even if the 30 pounds is in the back, but the Lance must have the 30 pounds in the nose compartment to stay within limits. (An '84 Saratoga loaded like the Six, but couldn't carry enough fuel to fly for two hours.)**

**The Beech loading shown below has the 30 pounds wedged between the middle seats, rather than in the back and it's still out of rear CG for takeoff and worse on landing. Even if an A36 has the gross weight for it, you might not be able to make it balance.**

**Note as well that while the Cessna CGs move forward with fuel burn, the Piper and Beech CGs move aft. Pipers are also particularly prone to over-forward CG with only two front seaters. For all load haulers, at least a rough weight and balance is a must to see if there might be a problem.**



Parts, support and mods abound, and the airplane has proven its mettle worldwide. But its demand means it's probably the most expensive of the load haulers in terms of capability for the dollar. We see more 206s with older avionics and tired interiors in the classified ads as well. Perhaps this belies their utility role rather than as a family cruiser. Be sure to factor such upgrades into your total budget.

### BEECH BONANZA 36

Many pilots would argue the Beech Bonanza A36 is about as perfect a compromise as a six-seat single can get. But there's an underlying fear of the cost and limits on what it can really carry. The first is unjustified in our opinion. The second is not.

The 285-HP A36 appeared in 1968 as a 10-inch stretch of the BE33 Debonair, with a useful load of about 1500 pounds and a cruise speed of 170 knots. In 1970, Beech offered club seating, and in 1984 upgraded to 300 HP IO-550 (which can be retrofit on older A36s) and the throwover yoke disappeared. Fuel capacities went up and down to settle on 80 gallons standard in 1980. Aftermarket tip tanks are not uncommon, and they increase the gross weight by 150 pounds.

The machines are a joy to fly—easily the best of the bunch reviewed here—but somewhat challenged in loading. Pre-1979 models have no real baggage area. Owners often remove a seat, trading people for packing space. There is a $5000 mod from Approach Aviation (www.approachaviation.com) to give 1968-1978 Bonanzas the 70-pound baggage area of later models. This is more useful for comfort (not sitting with your bags) than actually loading six people and gear, due to both gross weight and CG limitations. Keeping a loaded A36 within rear CG can be a challenge, especially because the CG moves aft as fuel burns off.

For those who need more speed and power, a turbo A36TC and B36TC will top 200 knots. (Turbonormalizing will do this for an A36, with a gross weight bump as a bonus.) Useful loads in the A36TC drop to the 1200-pound range. The B36TC has a longer wing that earns it about 1450 in useful load.

Access to the rear of an A36 is through generous double doors. There is also a window that opens for emergency egress and everyday cooling on the ramp—a huge plus for Bonanza back seaters. The aircraft is stout. For example, the gear are the same as the much heavier Baron and military T-34. It's also stable and makes an excellent IFR platform. TKS for icing protection is one of almost endless mods. Many A36s have updated panels that can make for a good buy.

While genuine Beech parts may require raising your debt ceiling, the airframes have come down in price. Mid-80s A36s can be less than equivalent 210s, and not much more than like Saratogas. Newer Beeches have a much higher delta; the model is still in production.

### BUYING DECISIONS

Practical points are often justifications for buying the airplane we simply want.

That said, which load hauler would work best for you will depend on which things you prioritize. Need speed and comfort, but not much load? A nice A36 would be our top pick. Need speed and load, but not necessarily six people? Try the 210. For serious load, including six people and comfort, both the Piper sixes and the 206 fit the bill. But we would lean toward the older Pipers for total interior space, configuration and price.

## MFD Market Scan

*(continued from page 7)*

fixture in many cockpits, encouraged further by Aspen's recent announcement of their under-$2500 Connected Cockpit interface. The connection allows wireless loading of flight plan and other data between the iPad and Aspen MFD and then to a remote GPS. A behind-the-panel interface module that has Bluetooth, USB and Wi-Fi is the com hub for the interface. At Oshkosh, Aspen demonstrated loading frequencies and flight plans from an iPad running ForeFlight into a developmental Honeywell KSN 770. While this might smell more like gimmick than real-world usefulness, other manufacturers including JP Instruments, PS Engineering and Sporty's are jumping on the interface. We think it represents a bold and fresh way of thinking that promises to simplify the approach to panel integration.

But mounting the sizeable iPad in the panel poses some challenges, although we're told AirGizmos is working on an iPad dock. You'll need to get creative by using a cradle and RAM surface or yoke mount. Heat and vibration can be an issue. But the capability is impressive. We think the most MFD-like app would be WingX running on an iPad2. This offers full moving map with split screen, geo-referenced charts. Add subscription-free ADS-B weather with an $1100 SkyRadar box. XM weather is available, too. WingX also does synthetic vision via a separate ADHS. Foreflight is a bit less feature-rich an app, but we think easier to use if your main desire is airport data, moving map and charts.

Securing a modern portable to or in the panel isn't trivial, but when you can walk away with MFD capability starting at about $1000 installed, it's worth real consideration.

### CONCLUSION

Take to heart this real-world tale of woe. We know a buyer who thinks his newly installed EX600 is a decent unit, but buyer's remorse is deep because he seldom uses it. His RAM-mounted iPad is where his fingers and eyes are the most. The EX600 is up for sale and thoughts have turned toward a GTN 750 to replace both it and his GNS 530.

If both an MFD and GPS navigator upgrade are calling your wallet, we think an all-in-one Garmin GTN750 fits the bill. It won't play radar, but it'll do most everything else. For a similar cost, you could also look at an Aspen's PFD/MFD1000 combination and get your MFD as part of a glass panel upgrade with high-level redundancy. If you just want a big-and-bright moving map, we don't see how you can beat a panel-mount portable or an iPad.

For the narrow-need niche that's left, we'd probably go used and try to get the niche filled as cost-effectively as possible.

# Paint Shop Survey: Many to Choose From

*Our poll turned up quality shops in most regions of the country. Expect to pay at least $10,000 for a simple job on a single if you want top-notch results.*

*by Jeff Van West*

When aircraft maintenance budgets get tight, paint and interiors are the first things to get put off. This may be part of the reason our latest survey of paint shops turned up fewer top-rated shops than the one we did five years ago. Natural selection is weeding out shops that don't deliver in quality and service.

The good news for anyone with paint so tired it blends in with a canopy cover is that prices have barely moved—perhaps even dropped slightly if corrected for inflation—and there are still several high-skill shops in business around the country (with the seeming exception of the Pacific Northwest). You should be able to find a place to get great paint without crossing multiple time zones.

## OUR METHODOLOGY

We polled the readership of our sister publication AVweb for owner experiences with paint shops, and then sifted through over 250 responses looking at both tangibles, such as price and meeting delivery deadlines, as well as subjective perceptions such as customer service and value for the cost. This is an admittedly skewed sample as it over-represents people who got great service and want to rave, as well as disgruntled customers with a bone to pick. Comparing with our previous surveys and using follow-up calls, we still see consistent trends that warrant recommendations.

Prices vary fairly widely for piston singles, with even some recent jobs going for as little as $6000, including stripping, and others reaching over $20,000. The delta seems mostly due to how much prep work and damage repair the shop had to do. By far, the fat part of the curve was at $10,000 to $12,000 for a light single to be fully stripped and repainted by most shops. Paint prices for twins start in the mid-teens and move up into the high-twenties or more, depending on the extent of the job.

Patience is more that a virtue with paint; it's a survival skill. This comment about Ed's Aircraft Refinishing in New York was common. "Delays in completing the project are my only gripe. Quality and communication were excellent. You can find lower cost shops, but the attention to detail was amazing." Ed's was dinged for tardiness more often than other top shops, even though quality and value was rated nine or 10 out of 10 across the board.

When projects came though exactly as planned, people made a note of it, as with this $25,000 Cessna 340 job: "Reese Aircraft delivered on time and on budget. Their workmanship and attention to detail is excellent." There were these comments about Prestige Aircraft in Vermont, "They hit it out of the park on price, attention to detail, quality, customer relations, and timeliness" and "Prestige did what they said, when they said and for the price they said."

We also looked at recency of the paint jobs and saw the same thing this owner mentioned: "The quality of paint shops is not constant." He had an excellent experience with Artcraft in California less than a year ago, as were several other recent Artcraft jobs. Looking deeper at a mixed review of an Artcraft job, we saw is was several years ago: "We used [Artcraft] because it was the cheapest and could do both paint and windows. The top shops in California also had wait times of up to six months at the time. The plane

***The final outcome relies heavily on human skill in prep and application. Recent customer satisfaction with a shop is key, as labor turns over with time.***

# TOP PAINT SHOPS

THREE OR MORE STANDOUT REVIEWS AND NO NEGATIVE REVIEWS (EXCEPT AS NOTED*)

| SHOP | LOCATION | CONTACT |
|---|---|---|
| ARIZONA AEROPAINTING | ELOY, ARIZONA | 520-466-4336 AZAEROPAINTING@AZCI.NET |
| ARTCRAFT* | SANTA MARIA , CALIFORNIA | 805-925-5934 WWW.ARTCRAFTPAINT.COM |
| DIAL EASTERN STATES AIRCRAFT PAINTING* | CADIZ, OHIO | 740-942-2316 WWW.DESAPI.COM |
| ED'S AIRCRAFT REFINISHING | BROOKHAVEN, NEW YORK | 631-281-8236 EDSAIRCRAFTREFINISHING.COM |
| HAGERSTOWN AIRCRAFT SERVICES | HAGERSTOWN, MARYLAND | 866-359-2447 WWW.HGRAIR.COM |
| KRACON AIRCRAFT REFINISHING | LINCOLN, CALIFORNIA | 916-645-1614 WWW.KRACON.COM |
| KD AVIATION / REESE * | ROBBINSVILLE, N.J. & NEWBURGH, N.Y. | 845-567-1617 WWW.KDAVIATION.COM |
| LANCASTER AERO REFINISHERS | SMOKETOWN, PENNSYLVANIA | 877-574-5422 WWW.LANCASTERAERO.COM |
| MASTER AIRCRAFT SERVICES | WICKENBURG, ARIZONA | 928-684-4926 GOODOLDEGUS@MSN.COM |
| MURMER AIRCRAFT SERVICES | ARCOLA, TEXAS | 800-832-0177 WWW.MURMERAIR.COM |
| PRESTIGE AIRCRAFT | SWANTON, VERMONT | 802-868-3443 WWW.PAINTAIRCRAFT.COM |
| STRABUE'S AIRCRAFT SERVICES | ARIZONA, UTAH, AND HAWAII | 808-220-0024 WWW.AIRSTRAUBE.COM |
| STURGIS AVIATION | STURGIS, MICHIGAN | 269-659-3773 |
| T AND P AERO FINISHERS * | SALINAS, CALIFORNIA | 831-422-6158 WWW.TPAEROREFINISHERS.COM |
| TEJASAERO | SAN MARCOS, TEXAS | 866-391-8554 WWW.TEJASAERO.COM |
| THREE IN THE GREEN | POTTSVILLE, PENNSYLVANIA | 570-617-7754 THREEINTHEGREEN@GMAIL.COM |
| WIREGRASS AIRCRAFT | FLORALA, ALABAMA | 334-858-6173 |

* HAD A SINGLE NEGATIVE REVIEW, BUT INCLUDED DUE TO MANY CONTRADICTING, HIGHLY POSITIVE ONES

still looks great as long as you don't look too close."

Apparent deterioration of service is why some shops that made our tops list in the past aren't there today. There are also new faces, but these turned out to be small shops that do a couple of airplanes a month, such as Wiregrass: "Workmanship and realistic advice on costs of elaborate designs, excellent workmanship and attention to detail. Though hard to schedule and not email savvy, he was on time and on budget." Incidentally, Wiregrass had the lowest prices we saw coupled with excellent comments.

## PICKING A SHOP

Many comments mentioned using a shop you could visit during the painting process to check on progress, as well as work out any design questions. While we agree you shouldn't need to cross half a continent to get good paint, we think good communication in general is more important than having the shop next door.

This California owner had worked with Arizona Aeropainting for several weeks on a unique design. "Don sent update pictures as the work progressed and changed some of the taping to yield what would we thought would be more aesthetic; one conversation and he had what we were looking for. The best thing was the attention to detail."

Personal involvement at delivery matters. "One really cool thing happened when I delivered the plane to Sturgis. A friend flew there with me in another plane that had a paint scheme I wanted to duplicate. They placed a very large sheet of paper over that fuselage and traced the scheme, and then helped me decide on a slight variation of color that I preferred. Then they talked with my wife and got her help to quickly came up with a custom scheme for the wing tips and wheel pants—forever putting my wife's touch on this important family plane."

We've seen both in our own experience and in these surveys that a glitzy shop does not equate a top paint job or vice-versa. "The T&P shop is located in a somewhat dated facility but don't let that lead your decision. They go the extra distance with details and are well known locally for doing an excellent job."

Many owners don't realize how much impact a good paint job has on the mechanical side of things. "[Master Aircraft Services] removed all the flight controls and fairings plus replaced the horizontal stab boot. I didn't expect this but glad they did all they did. Gus just wouldn't let the A/C return to service without everything being done right. They have an A&P on staff who does all the airworthy items (flight controls, etc.). I am very pleased!"

The takeaway advice on this is that you should make sure the shop is communicative and responsive before you commit. It should be crystal clear what will be done and what won't be done. Our opinion is that a quality paint job should include full stripping, removal of corrosion, acid etching and alodining and a base undercoat for corrosion prevention. You should know what parts will be removed for painting, especially flight controls.

We heard some delivery inspection horror stories. "The fuel tank caps were not sealed. The stripping liquid entered the tanks, I drained over five gallons of grit and stripper out of the sump the early morning of departure." Usually the squawks are more minor: "I think they had

Stevie Wonder carry out the post-job inspection. I came up with 17 discrepancies, including side of cowl flaps not painted, orange peel along the side of the cowl, cowl camlocks had been taped off for paint and had deep ridges around them … They didn't argue about any of these points and did fix them."

What are common post-paint squawks? Stripper left in spots and sometimes even painted over; inspection panels sealed with paint; wheel bearings either exposed to stripper or degreased from pressure washing; paint overspray (really check the windows, engine spaces and control surface bearings); and poor masking of stripes and trim. Check the paperwork. It should detail what was done including the paint manufacturers' specs for touch-up or repairs down the road.

Some shops specialize in particular aircraft, which may make them the best bet if they aren't too far from your home base. Biggs Aircraft in Oklahoma specializes in Barons and Bonanzas, including the V-tails, whose ruddervators need precise balancing. "I transported my damaged Bonanza from Arizona to Oklahoma after a recommendation from the American Bonanza Society. The aircraft was painted in 2003 and still looks better than any factory paint job." Fletchair of Texas is a supply house for Grumman light aircraft, but also does painting. Midwest Aircraft Refinishing in Minnesota specializes in Cirrus work.

## DO IT YOURSELF?

We saw a few instances of people painting their own airplanes, or brought someone to their hangar to do it. Some results were good: "A good automotive painter working with an A&P can do a good as or better paint job as an aircraft paint shop right at your home field. It is certainly not difficult. I have painted three planes and I am not a painter."

Others were mixed: "I had a self-proclaimed painter friend paint my 172 for me a few years ago. The prep job was best as it has kept the corrosion at bay. However, the paint job is a lot like most of my girlfriends; they look good from far, but up close far from good." For at least one owner, "This job was criminal." Unless you have excellent faith in the skill of the painter, specifically with aircraft, we wouldn't recommend the homebrew paint job.

# MORE PAINT SHOP BEST BETS

**TWO STANDOUT REVIEWS (USUALLY THE ONLY TWO SUBMITTED) AND NO NASTY ONES**

| SHOP | LOCATION | CONTACT |
|---|---|---|
| ADA AIRCRAFT PAINTING | ADA, OK | WWW.ADAAIRCRAFTPAINTING.COM |
| AEROPAINT | EL CAJON, CA | AIRCRAFT-PAINTING.NET |
| BIGGS AIRCRAFT | WELLSTON, OK | WWW.BIGGSAIRCRAFT.COM |
| CARDAN AIRCRAFT | RED BLUFF, CA | CARDANAIRCRAFT.COM |
| CENTRAL AVIATION | WATERTOWN, WI | CENTRALAVIATIONWISCONSIN.COM |
| DUNCAN AVIATION | LINCOLN, NE | WWW.DUNCANAVIATION.AERO |
| FLETCHAIR | FREDRICKSBURG, TX | WWW.FLETCHAIR.COM |
| FLYING COLORS AVIATION | BENTON HARBOR, MI | WWW.FLYINGCOLORSAVIATION.COM |
| FOSTER'S AIRCRAFT | LAKELAND, FL | 863-709-1779 |
| GENE KEAR AC REFINISHING | MEADOWLAKE, CO | WWW.2MLA.COM/PAINTSHOP.HTML |
| HAWK AIRCRAFT PAINTING | TAMPA, FL | WWW.HAWKAIRCRAFTPAINTING.COM |
| LEXIAIR | DELAND, FL | WWW.LEXIAIREINC.COM |
| MENA AIRCRAFT PAINTING | MENA, AR | WWW.MENAAIRCRAFTPAINTING.COM |
| RUSSEL AC REFINISHING | GREENWOOD, DE | HOME.EARTHLINK.NET/~N67TP/RUSSELL.HTML |

## LONG-TERM SATISFACTION

We like to see comments like, "Juan Solano, the owner [of T & P Aero Refinishers], is a true craftsman, perfectionist and an honest man."

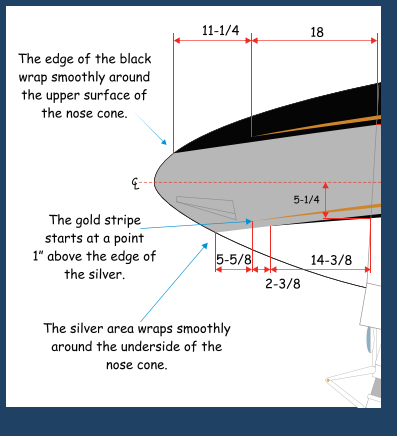
But paint is an investment for the long haul, which is why comments like this are also heartening: "After nine years, my paint job still looks new. I recently took my aircraft back to Kracon for removal of surface corrosion ... the shop not only removed and repainted the corrosion I knew about, but found and dealt with corrosion I hadn't yet discovered, all for only $375 total. I can't think of where I've experienced better customer service."

# KUDOS FOR SCHEME DESIGNERS

Four percent of our respondents specifically called Scheme Designers as a critical part of the painting process. We hadn't planned on mentioning their services in this survey, but it's worth considering. (Full disclosure: Scheme Designers provides our three-view for Used Aircraft Guide each month.)

Scheme Designers provides flat-rate assistance in developing a paint scheme, and then provides detailed drawings to the 1/8-inch for the paint shop. "This gives the shop what they need, but also gives the client what to expect when they pick up their aircraft," says Craig Barnett, President of Scheme Designers. "The flat rate means a client can explore designs as many times as they want, as long as they want." Fee for a custom design range from $1200 for piston singles to $1800 for jets. Adaptation designs—"take this TBM design and put it on my Waco"—are $850 and tweaking of a design on the same base airframe is $750.

Scheme Designers also maintains a list of top paint shops and tips for consumers on their website: www.schemedesigners.com.



# Remos NXT: Slick, Sophisticated

*At a premium price, the new Remos GX-NXT has updated ergonomics and build quality near the top of the class.*

*by Paul Bertorelli*


**AIRCRAFT FLIGHT TRIAL**

In the not-that-rarified world of LSA marketing, Remos enjoys a spot in the top 10, thanks to modest penetration in the training market and the fact that the company has been around the block a few times.

At a distance, a Remos may look like just another white composite LSA, but up close, it struts some different stuff. These are exceptionally carefully crafted airplanes and despite their relatively high prices, they've sold rather well in the U.S., occupying a spot behind Tecnam and Legend, according to LSA guru Dan Johnson's research.

With the announcement of the GX-NXT, the company is into its third generation design and although they haven't exactly rewritten the design brief, the newest airplane has some significant improvements on what was already a refined product. Remos aircraft are manufactured entirely in Germany, where high labor rates mean it's not going to compete on price with airplanes coming from Eastern Europe or China. The company claims that if price competition isn't an option, build quality is and Remos clearly walks the walk in that regard. (Base is about $143,000; fully equipped, figure $160,000.)

If you examine the airframe carefully, the fits are noticeably a cut above other LSAs. The glass work is smooth and ripple free, there are no variable gaps, no paint slobbers and no unfinished surfaces. The NXT we flew reminded us of Diamond's build quality and that's a high compliment.

Less obvious is what must be an obsessive concern with weight, because the Remos airplanes come out of the European ultralight regulatory framework, which limits gross weight to 1020 pounds versus 1320 pounds under the U.S. LSA rules. So you'd expect the Remos to have a light empty weight and it does: 717 pounds with a payload of

**CHECKLIST**

- ⊕ Glass, mechanical and interior work is all but flawless.
- ⊕ Lowered glareshield improves cockpit vis, makes room for avionics.
- ⊖ Price is near top tier for LSAs, but Remos justifies it with high quality.
- ⊖ Like motorcycle saddle bags? You'll love the baggage compartment.

603 pounds. That means with full fuel—22 gallons, 21 usable—the NXT can haul 471 pounds, which is easily two people and a lot of stuff. With empty weights above 800 pounds, not all LSAs will do this well. On the other hand, there's not a lot of room for stuff, either.

The Remos airplanes have a quirky baggage arrangement that consists of a hatshelf-type area with molded pockets for things like headsets, charts and gadgets. Behind the left seat is a hatch with access to a larger 1.5-by-3-foot nook for larger baggage. Getting at it requires removing the seat, but that's not especially difficult to do. Speaking of seats, they're adjustable, but not via tracks.

They sit in a series of notches that afford three positions. It's not a bad design, but some pilots may find that they just can't find that perfect seat position to suit. Nonetheless, this is better than no adjustment at all.

## NEW AND IMPROVED

Remos' Christian Majunke gave us a tour of changes in the NXT over the previous model and although they are largely incremental, they're a bit more than just cosmetic. First, the glareshield has been shrunk in height so it provides better visibility over the top, which anyone who has flown the GX will immediately notice. Less noticeable is that there's a little more knee room on the lower lip of the panel, too.

Part of what makes this possible is that steam gauges are no longer an option in the Remos line. Since few buyers were specing them anyway, Remos now offers only glass. In the version we flew, there was a Dynon Skyview on each side, with a Garmin GPSMap 696 in the center stack and only two analog gauges: an ASI and an altimeter. Those will stay, says Majunke, but otherwise the NXT will be an all-glass airplane. And a sophisticated one at that, with a Dynon autopilot with roll steering, altitude capture and—wait for it—the envelope protection that's all the rage in the certified world. The autopilot—commanded entirely through the Skyview—can be set up to maintain a rate climb. But if the airplane underspeeds toward a stall or overspeeds toward the high side, the autopilot is smart enough to reduce the rate. But this works only when the AP is engaged, not as an always-on flight nanny. Otherwise, you're free to manually dive the airplane into a smoking hole or stall it at will.

The Skyview system has become Dynon's system of choice and it's easy to see why. It borrows heavily from the Garmin G1000 logic and if you can operate that system, you can make the Skyview play, too. In fact, we found it to be stripped down just enough to

*Spiffed up panel, top, includes a couple of Dynon Skyviews, plus a Dynon autopilot. Mode-S transponder is remotely mounted. The Remos airplanes have a steerable nosewheel, but hand brakes, center photo. Baggage compartment is behind the pilot's removable seat. Don't plan on stuffing your Samsonite roll-aboard in there.*

**AC TV**

**For a video review of the NXT scan the tag at right with a mobile app or log onto our sister publication, www.avweb.com, click the video button and scroll down to the Remos review video.**

## WHO ARE THESE GUYS?

While it's relatively new to U.S. pilots, Remos has been around since 1994, when it was started in the former East Germany by Lorenz Kreitmayr. In 2006, investor Eberhard Farber entered the picture and began focusing sales on the U.S. The company is currently owned entirely by Pall Mall Partners, a London-based investment house. In June of 2011, Pall Mall installed its own CEO at the helm, Theo Paeffgen, an attorney with finance expertise who comes from a family with significant business holdings throughout Germany.

When we asked Paeffgen how Remos is capitalized, he demurred on the details, other than to say he's equipped with the funding he needs to grow Remos. The company currently has 58 employees and occupies a new factory in Pasewalk, near the Baltic Sea. The plant was originally intended as a vendor for Diamond's DA50 SuperStar, but that project remains on hold.

Paeffgen sees the LSA market for what we think it is: not a bottomless pit of demand, but a niche opportunity for companies that can control costs and sell to the right strata. The factory has a capacity of 400 aircraft a year, but Remos is now aiming for about a tenth of that number, growing in an orderly fashion as the world economy gains strength.

As Paeffgen sees it, aircraft companies get themselves into trouble because they build their cost structures on unrealistic volume, which is something he told us he refused to accept when taking over the company in June. This trend, says Paeffgen, is aggravated "by the large egos of management and the emotions of the customer." Paeffgen believes the LSA industry will have its shakeout, but that will represent an opportunity for Remos to fill gaps, not buy other companies at firesale prices.

"We are not going to spend money buying these companies. They'll have to go out of business of their own accord," he says. If the LSA business is soon to be populated by a half dozen survivors, Paeffgen believes Remos has the financial horsepower to be one of them.

be a bit easier to manipulate than the G1000. And without the straightjacket of certification, the displays are much more flexible and customizable. You can, for instance, split the PFD into a map or an engine display and select a preference for which side you'd like the various elements to appear. But there aren't so many choices that you risk falling into a blackhole menu loop.

### CONTACTS

Remos Aircraft Inc. (US)
479- 877-9934

Remos Aircraft, GmbH
www.remos.com
(+49) 3973 2255 190

Our only real complaint about the Skyview is that the typography is on the stingy small side. (If you want to see symbology done right, take a look at Eclipse's Avio 2.0—it's the avionics equivalent of IMAX.)

Remos offers various choices of avionics, including the Skyview—single or dual—a GPMmap 696 or the Garmin aera series for the center stack and an SL30 navcomm that includes VOR and LOC capability. The Skyview system can include Dynon's remote SV-262 Mode-S transponder, also controlled through the Skyview's soft key setup.

### NICE ERGOS

All of this adds up to a better-than-average LSA cockpit. Everything is easily at hand on the panel or center console, including the brakes, which are operated by pushing a lever forward on the center console. Wait a minute, you might ask, how do you steer this thing? Certainly it can't have a steerable nosewheel. Certainly it does, something that's a relative rarity in LSAs since these mechanisms add weight. Remos does it with a rod design connected to the rudder pedals. It works well, but it's a little odd not have the ability to hurry ground turns with a stab of one of the brakes.

Ground handling is precise, but that brake lever takes some getting used to. The urge to use it as a throttle is irresistible, but if you do that, you stop. Also, with two throttles to pick from, the leftseater needs to use the left side throttle during taxi, the middle throttle for takeoff and flight.

The fuel system is a model of simplicity, at least for the pilot. There's an on-off, but no tank switch. The tank itself lives behind the right seat on the other side of the keel from the baggage compartment. A single line runs gas to the engine, pushed by a pump under the tank itself and pulled by a mechanical pump in the Rotax. This, says Majunke, gives the NXT the ability to burn E10 autogas because the pressurized line gives a vapor pressure edge. Not so fast. What about phase separation in fuel dosed with ethanol?

"That's a problem, always," concedes Majunke. Remos councils to avoid E10 if possible, but to sample and examine the fuel carefully if it can't be avoided. (The Rotax is happy with avgas, E5 or up to E10. But avgas fouls it with lead, adding a slight maintenance load.) One flight school in California we know using E10 in LSAs told us the trick is to cycle a lot of fuel through the airplane so it doesn't have time to absorb much water.

One touch we especially like in this cockpit is dual push-pull throttles, so the left seater can fly with a left hand on the throttle and a right on the stick, the way it was always meant to be. Remos has figured out a way to mount

*continued on page 32*

# Matchbox FC-1: Smart and Simple

*The Flight Companion gives plug-and-play altitude and fuel-tank alerting, as well as a jack for your tunes or phone. Usability is good, but not perfect.*

*by Jeff Van West*

In a marketplace of electronic gadgets that do everything short of sump the gas on preflight, it's refreshing to find something as simple and task-focused as Matchbox's Flight Companion. With five buttons and six lights, you don't need a training video just to turn it on. In fact, the owner's manual is one page. And the other side is blank.

Plug your headset into the FC-1, plug the FC-1 into the ship's audio system and push the on button to start. That's enough to get a fuel tank reminder every 30 minutes, both through your headset and with a flashing light on the FC-1 itself.

Actually, there are two flashing lights: a red one above a button that says "left" and a green one above a button that says "right." To silence the alarm, push either button. In 30 minutes, the light above the button you pushed will flash again with the audible alert. Whether you want the alert to mean "switch to the right" or "switch from the right" is up to you.

Two more buttons and lights are for altitude alerting. When you reach cruising altitude, push the set button. If you stray 100 too high, you'll get a high-pitched alert and a blue flashing "high" light. Stray too low and you get a low pitch with a red "low" light. To suspend alerting while you change altitudes, there's a standby button.

All that's left on the face of the unit is a VOX light that illuminates when there's intercom or radio traffic and a low-battery warning light. The company claims 25 hours on the unit's 9v battery.

Speech mutes any music or phone you're listening to through the MP3/cell interface on the FC-1. We tried both and found they worked flawlessly. Sound quality was only limited by the quality of the headsets we used. We only tried an iPhone for a call, which is one of two devices (the other is a Blackberry) the FC-1 was designed for. Your mileage may vary. Note, as well, the music or phone is only for one headset connected to the unit.

The only usability issue with the FC-1 is it's cumbersome to have all those wires (headset and music in, plus intercom out) on a box you have to access every 30 minutes or every altitude change, including adjustments due to altimeter setting changes. Matchbox says the cost and reliability of Bluetooth to connect devices or control the unit didn't work out, at least for now.

The alert levels are a bit quiet for our taste. We forgot to suspend alerting for a descent and spent a while wondering, "what's that noise?" before we realized it was the FC-1. These levels can be factory adjusted up or down as a customer wishes, however.

The FC-1 costs $299, which is $50 more than a Bluetooth-capable Blulink, so it's not our pick for just adding music and phone. But if you want both the tunes and the alerts without having to dig into your panel, this little box delivers.

## CONTACT

MatchBox Aeronautical Systems
386-437-3874
www.matchbox-systems.com

## CHECKLIST

- ⊕ Simple design that delivers what it promises and no more
- ⊕ Excellent audio quality and solid construction
- ~ Multiple wires a pain with devices that must be regularly accessible

***Alerts annunciate both visually on the box and auditorily though the connected headset. The spare options for control make sense with a quick study of the directions.***

# Insurance Valuation: Too Much, or Too Little?

*If you over-insure, an accident could leave you with an airplane with a mile-high stack of Form 337s and that no one will ever buy.*

*by Jon Doolittle*

Flying is one of the fastest ways to burn money in this life. Airplanes are expensive and helicopters even more so. For most light airplane owners who fly less than 100 hours each year, owning the airplane actually costs more than operating it.

And in recent years, many airplanes are depreciating much faster than they are being physically worn out. Buying the right amount of insurance to match the aircraft's value is trickier than it used to be, but is still the only way to protect an expensive investment.

When deciding how much physical damage coverage to buy, there are two considerations, depending upon what happens to the airplane. The first is obvious: If the airplane is crushed beneath the snow-covered roof of your T-hangar, how much money will you need to replace it with a similar airplane?

***If you over-insure, you could end up having to fix a damaged airplane that everyone would rather scrap.***

The corollary to this question is less obvious, but just as important. If your airplane is damaged, what insured hull value will make certain that your insurance policy responds correctly? In other words, you want to come out as whole as possible without overspending for insurance.


In the end, the two questions have a single answer. You're most likely to get the best result from your policy if you cover the airplane for its current market value, whatever that is.

## WHAT'S IT WORTH?

Wondering just how to figure out what that "correct" market value is for your airplane? The first thing to understand is that there's no magic number as much as there is a range. The exercise of value determination is bound to be somewhat imprecise, since we're trying to predict what a willing but unknown buyer would pay for the airplane if it were for sale at some not-exactly-known time in the future. This is a horseshoes-and-hand-grenades kind of thing: You just have to be close.

Airplanes are like houses in that even the ones that start out alike change over time. Some airplanes get more use than others. Some have the stock radios 20 years later, while others are extensively retrofitted with the latest avionics. Given the high percentage of a light airplane's value that can be made up of engine, avionics and paint, two airplanes that left the factory on the same day 15 years ago can have values that differ by 50 percent.

Fortunately, there are a number of industry indexes to help determine what that value range is. *The Aircraft Bluebook Price Digest* and *V-Ref* are probably the two most widely used. In addition to providing retail and wholesale prices for a given model, they'll also provide adjustments for engine time, avionics and other optional equipment. These guides also provide information on the costs of overhauling engines and values for aircraft conversions.

If you don't have access to a value guide, your insurance provider will. Guides are an excellent place to start,

***When* Aviation Consumer's *Mooney nose-planted into a swamp, the damage was repairable. But who wants a salt-water-soaked airplane? Thanks to the right policy value, the insuror scrapped it.***

but if you're still wondering if the number you come up with is in the right zone, talk to a dealer or broker who's familiar with the type of aircraft you own. This will give you a sanity check on the book numbers and may identify an airplane that has a market value higher or lower than what the book shows. (For an article on appraised values, see the August 2011 *Aviation Consumer*.)

Used aircraft values fluctuate depending on factors ranging from the price of new airplanes or the price of fuel to accident history to change of seasons. As fuel prices have increased, for example, certain types of fuel-efficient singles have become more valuable relative to light twins, which are a bargain to buy, if not to operate.

Publications such as *Trade-A-Plane* are also a source, but remember that you're looking at prices asked by sellers and you'll have no way to know what airplanes actually sold for, or if they sold at all.

## CONTRACT LANGUAGE

The reason that we spend so much time coming up with the correct number has to do with the way that aircraft insurance contracts are written. Car policies are usually based on the actual cash value of the car at the time of the accident.

If your car is destroyed in an accident, the insurance company looks up the book value of your car, adjusts for mileage, backs out your deductible and writes you a check for less than you think you deserved. And this system works for cars, which are homogeneous when compared to airplanes.

Aircraft policies, on the other hand, are based on an "agreed value." At the time the contract is written, you and your insurer agree on what the airplane is to be insured for, and that amount is written in the policy. The agreed value basis allows for the wide variation in values between similar aircraft to account for equipment, condition and time.

If the airplane is destroyed during the policy, the insurer will pay you that agreed amount, whether the airplane is really worth that amount or not. And therein lies the rub. If the value of your airplane is not in the zone, bad things can happen.

If you have underinsured the airplane by a great deal, the insurance company may be forced to write you a check for a total loss when it could be reasonably repaired. And can you guess who gets to keep what's left of the airplane? Yup, they do. And they'll sell it to salvage buyers to recoup as much of their loss as possible. Can you guess who decides whether it gets fixed or not? Mostly, the insurance companies do. It's all in your policy, right there in the fine print.

If you have over-insured the airplane by a great deal, things can go just as badly. This can force the insurer to fix the airplane when everybody would prefer to scrap it. Instead of getting a claim check for the market value of the airplane, which would be relatively quick and would allow you to replace it and move on, you have to wait through a lengthy repair.

When you finally get the airplane back, it comes with a stack of Form 337s the size of the Manhattan yellow pages and it's worth much less than it was. And aircraft hull insurance policies don't usually pay for a replacement airplane during the repair, nor do they pay for loss of value because of damage history.

## ABOVE AND BEYOND

Regardless of the policy language, one of the things that separates the good aircraft insurers from the really excellent ones is the willingness of claims officers to go beyond the strict confines of the policy language and take care of the customer's problem. But even the most willing and able adjusters need something to work with if they're going to help you. If you've grossly over-insured or under-insured your airplane, don't blame the system. These guys are playing with shareholders' money and there are limits to what they can do.

To avoid selling your airplane to your insurance company at a bargain price or being stuck with an airplane that has been rebuilt from a data plate, pay close attention to the insured value in your policy. Each year at renewal, review with your insurance provider the current Bluebook value and adjustments.

It helps if you know your airplane.

*Major panel upgrades like a full Aspen system, above, should be reflected in the airplane's insured value—but not for the full cost of the upgrade.*

Know how much time is on the engine, as well as how old it is. When describing the condition of the interior or paint, be realistic. It's good to know when the airplane was last painted. If you add equipment during the year, don't wait until renewal to adjust the value. Call your insurer right away. As a rule of thumb, take half of what you paid for new avionics the first year and a third afterward and add it to insured value.

The value guides assume a mid-time engine and typically give an hourly amount to credit or debit either side of that. If you overhaul an engine, add half the cost of the overhaul to the value of the airplane. In some cases, you shouldn't wait until all the work is done. If you own a stack of radios that aren't yet installed, call your provider to find out how to cover those items in case something happens to them before they're installed in the airplane.

## MAINTENANCE VS. UPGRADES

Some of the large invoices that we pay as aircraft owners are for capital improvements and some are for maintenance. When thinking about what your airplane is worth, separate the two. Don't try to cover the cost of maintenance with insurance. If you have to change all the hoses at overhaul, or a cylinder or two in between, that's ordinary wear and tear and won't increase the value of the airplane. Insurance is meant to cover the cost of owning the airplane, not

*continued on page 31*


Photo courtesy
Eliot Ross

# Beech Baron

*Comfort and handling that's second to none, with respectable performance.*

Anyone who has flown a Beechcraft will have come away impressed with the line's quality and, especially, the handling qualities. All the way down to the lowly Musketeer, Beech just took pains to get the airplane's handling qualities a cut above everything else, and that applies in spades to the Baron series.

Even so, every aircraft company has to make compromises. In the 55 Baron, for instance, what many find to be pleasant handling characteristics can prove to be a handful in poor weather, or when the air turns green with turbulence.

And nothing comes for free. No one mistake the Barons for being cheap to own or operate, although thanks to a perennially soft market for twins, they're no longer ruinously expensive to buy. In fact, there are some real bargains out there on 55s.

In the current market—the summer of 2011—55 Barons represent good buys, as well as good investments for pilots who already own them. While the prices of other light twins have tanked due to a sour economy and high gas prices, Barons have declined a little less. But there's enough softness in the market for the canny buyer to negotiate a deal.

## MODEL HISTORY

Although Beech isn't quite the master of the parts-bin model evolution that Piper is, the Baron has nonetheless been through some changes. Like the Bonanza, it comes in two sizes, long- (58) and short-cabin (55). There are several sub-types: The 58 could be had for a time with turbocharged engines and, if desired, pressurization. There aren't many P-Barons flying around and today, only the long-body 58 remains in production. (If you want one, plan on an invoice well north of $1.3 million, complete with Garmin G1000 glass.)

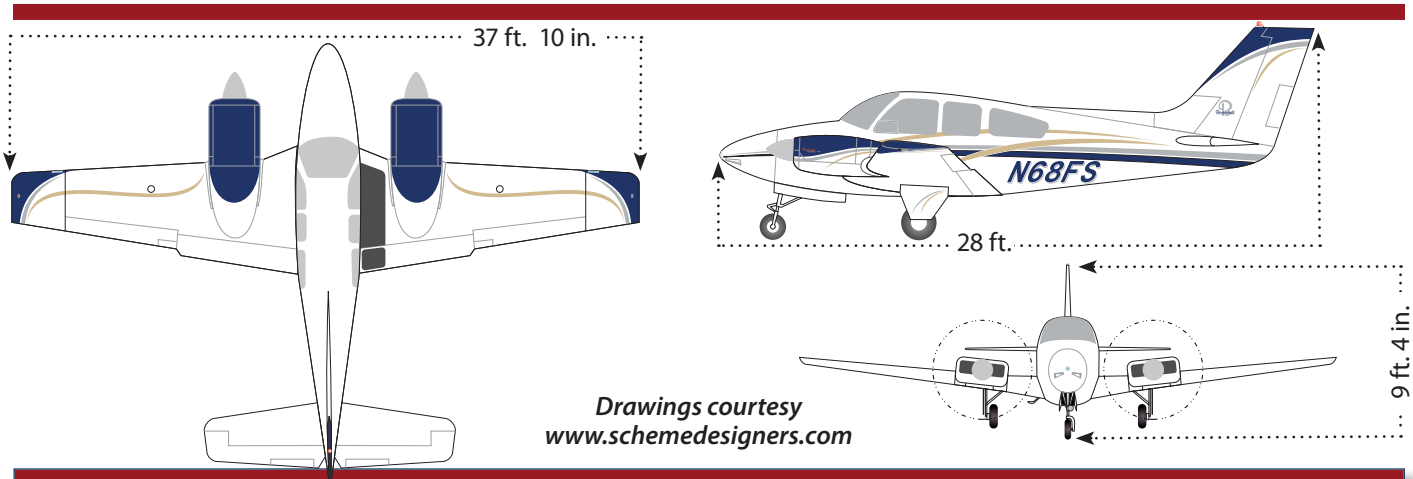
The Model 55 was Beech's first Baron. It was introduced in 1961 as a replacement for the Model 95 Travel Air, which was a bit long in the tooth to meet competition from Cessna's 310 and Piper's Aztec. Like the Travel Air, the 55 comprised a Bonanza fuselage fitted with a conventional tail, not the V-tail. In place of the Travel Air's somewhat anemic 180-HP Lycomings, the original Baron had 260-HP Continental IO-470L engines.

After building 190 Barons that first year, Beech came out with the A55, which has a 10-inch longer fuselage and could be ordered with a second fold-down rear seat, bringing potential seating capacity to six (more on that later).

A total of 309 A55s were built in 1962 and 1963. The airplane's nose was then extended seven inches for more baggage and avionics equipment, and gross weight was bumped from 4880 to 5000 pounds.

The airplane was redesignated B55. This version remained in

# BEECH 55/58 BARON

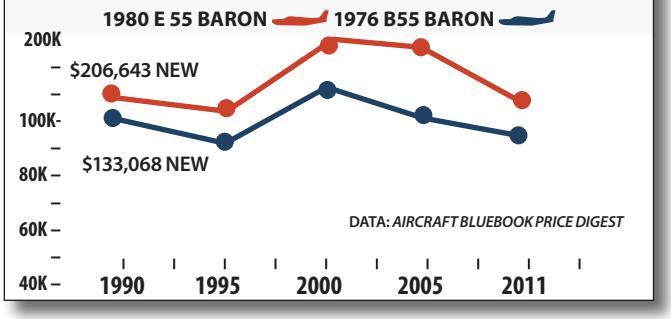



*Drawings courtesy www.schemedesigners.com*

## SELECT MODEL HISTORY

| MODEL YEAR | ENGINE | TBO | OVERHAUL | FUEL | USEFUL LOAD | CRUISE | TYPICAL RETAIL |
|---|---|---|---|---|---|---|---|
| 1961 BARON 55 | CONT. 260-HP IO-470-L | 1500 | $30,000 | 112/142 | 1920 LBS | 191 KTS | ±$50,000 |
| 1962-63 A 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 112/142 | 1920 LBS | 191 KTS | ±$53,000 |
| 1964-66 B 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 100/146 | 1864 LBS | 196 KTS | ±$60,000 |
| 1966-67 C 55 BARON | CONT. 285 HP IO-520/C/CB | 1700 | $30,000 | 112/142 | 2225 LBS | 200 KTS | ±$66,000 |
| 1967-71 B 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 100/146 | 1864 LBS | 196 KTS | ±$75,000 |
| 1968-69 D 55 BARON | CONT. 285 HP IO-520/C/CB | 1700 | $30,000 | 112/142 | 2225 LBS | 200 KTS | ±$70,000 |
| 1970-73 E 55 BARON | CONT. 285 HP IO-520/C/CB | 1700 | $30,000 | 100/166 | 2009 LBS | 195 KTS | ±$75,000 |
| 1972-75 B 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 100/146 | 1864 LBS | 196 KTS | ±$70,000 |
| 1975-78 E 55 BARON | CONT. 285 HP IO-520/C/CB | 1700 | $30,000 | 100/166 | 2009 LBS | 196 KTS | ±$120,000 |
| 1976-79 B 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 100/146 | 1864 LBS | 196 KTS | ±$105,000 |
| 1979-81 E 55 BARON | CONT. 285 HP IO-520/C/CB | 1500 | $30,000 | 100/166 | 2009 LBS | 195 KTS | ±$150,000 |
| 1980-82 B 55 BARON | CONT. 260-HP IO-470-L | 1500 | $30,000 | 100/146 | 1864 LBS | 196 KTS | ±$130,000 |

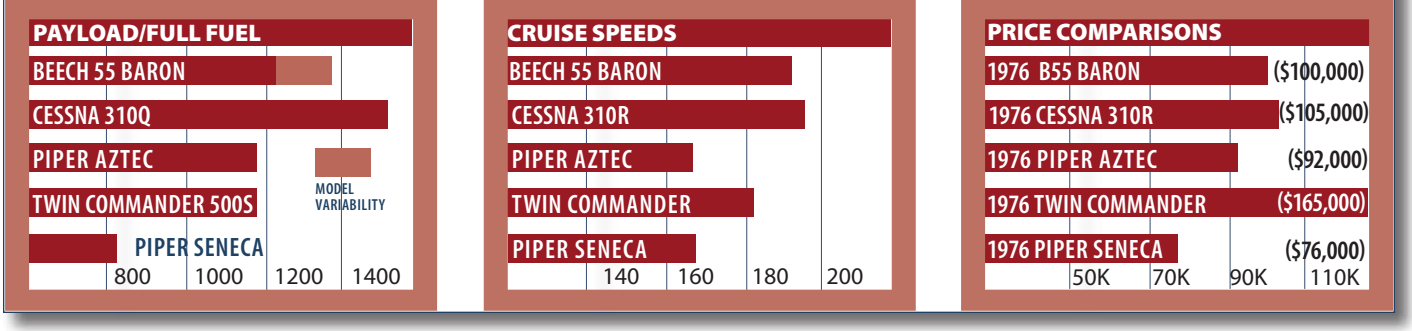
## RESALE VALUES




## SELECT RECENT ADs

| | |
|---|---|
| AD 09-25-01 | SHOULDER HARNESS FASTENERS |
| AD 08-13-17 | CIRCUIT BREAKER REPLACEMENT |
| AD 07-08-08 | UPLOCK ROLLER MOD/REPLACEMENT |
| AD 08-18-02 | ELEVATOR SKIN REPLACEMENT |
| AD 90-08-14 | WING SPAR INSPECTION/REPAIR |

## SELECT MODEL COMPARISONS



production the longest, until 1983, when all 55s were dropped from the line, along with the 58TC and V-tail Bonanza. Browsing the for-sale ads, expect to see more B55s than any other model because there are simply more of them.

Beech built 1954 of the "long-nose" B55s from 1964 through 1982, not including about 70 T-42A versions for the U.S. Army. Among a number of minor refinements during this time was an increase in gross weight to 5100 pounds, starting with S/N TC-955 in mid-1965. Earlier B55s were eligible for the higher gross through a Beech STC kit.

The big-engine version arrived two years after the B55. The C55 Baron appeared in 1966 with a 12-inch longer fuselage and 285-HP Continental IO-520C engines.

The "little Baron with the big engines" also was certified with a gross weight of 5300 pounds. The airplane was redesignated the D55 in 1968 and the E55 in 1970. It, too, was dropped from production in 1983, after 1201 were built, 451 Cs, 316 Ds and 434 Es.

Big-engine 55 Barons are easily identified by the air scoops atop the cowlings. The difference in length is less obvious, but it shows up when it comes time to load the airplane: The nose baggage compartment is larger, as is the cabin.

Other differences included the level of standard equipment, and the availability of a 166-gallon fuel system on the big-engine version.

## BACKWARDS SWITCHES

Designing an airplane is one decision after another followed by one compromise after another. You have to put switches and controls somewhere and Beech decided to put the flap switch on the left, and the gear on the right. There's nothing at all wrong with that arrangement. But as it happened, everybody else in the industry decided to do just the opposite.

The result was (and is) predictable: A new Baron pilot reaches for the flap switch on rollout and retracts the gear instead. The record shows a long string of gear goofs over the years and although some insist that the switch location has nothing to do with this, other models don't seem to suffer the same kind of incidents.

The picture is further confused by the fact that in response to customer pressure and its long history of gear-retraction accidents, Beech changed the controls around in later years so they matched the rest of the industry. (This only showed up in later versions of the 58 Baron. The 55 was out of production by the time the change was made.)

The "backwards" switches aren't really a bad design, it's just that a pilot has to remain aware of them. Many Baron pilots make a particular point of touching nothing until they're clear of the runway and stopped, so that they can devote their full attention to the controls.

And it's not just the gear and flap switches. Beech's throttle quadrant is different, too. Instead of the more usual throttle-prop-mixture, Beech put the throttles in the middle. But the power levers are taller, so they don't demand the kind of care you need with the gear switch.

While there have been some fuel mismanagement accidents, the Baron's system is simpler than some others. Early models can draw fuel into the engines from the main tanks—37 usable gallons, each side—or the auxiliaries, each with 31 gallons. The fuel system was simplified in 1974 with interconnected tanks and three-position (on, off, crossfeed) selectors. Also that year, extra aux tanks became available for

*The Baron's panel is worthy of serious avionics, but they are easier to fit in the more conventional newer models (top, courtesy Martin Howard) than the older ones (bottom, courtesy Caleb Pond). Note the unconventional power quadrant arrangement as well.*

the E55 model, boosting max fuel capacity to 166 gallons.

## CABIN, COCKPIT, PAYLOAD

Beech cabins are notably plush and comfortable, and the 55s—even the early ones—are par for the luxe course. The tapered fuselage, however, can cramp normal-sized adults banished to the rear seats, although it does provide a couple of big windows to ease their exile. Since the rear seats can be gained only by clambering over the middle seats or through the baggage hatch, they're of little use. Many pilots get rid of them, using the space for baggage.

The front seat of a 55 Baron has to qualify as one of the world's greatest places to be, with comfort enhanced by a retractable center armrest, adjustable rudder pedals, lots of headroom and good visibility over the nose and out the side windows. Beech was less successful at the finer points of panel design. The massive tube-like structure carrying the yokes obscures instruments on the lower portion of the panel and hides breakers and switches. Also, the seats have limited forward and aft travel.

As twins go, the 55 Baron has decent if not exceptional payload. A typically equipped 260-HP Baron can carry about 1800 pounds of people, bags and fuel; a 285-HP model, about 1950 pounds. There is no zero-fuel-weight restriction, but care is needed to avoid busting the aft CG when the rear seats or aft baggage compartment is used, a typical Beech weak spot.

Balancing the load is facilitated by a nose compartment that can hold up to 300 pounds (270 pounds in early models with gross weights below 5100 pounds). With the fifth and sixth seats removed, 400 pounds can be loaded into this space. Many Barons also have an extended aft baggage compartment approved for up to 120 pounds.

True airspeed of a small-engined Baron cruising at 75 percent power is about 190 knots on 27 gallons of fuel per hour. That's faster than the naturally aspirated Aztec and Cessna 310, but a good bit off the Aerostar's pace. The big-engined Baron is about five knots faster and five GPH thirstier than its stablemate.

Takeoff and landing performance is average. A B55, for instance, can take off or land over a 50-foot obstacle within 2160 feet. The E55 needs only about 2050 feet to clear the obstacle on takeoff but a bit more than 2200 feet to get back over it on landing.

Short-field technique can cut these figures roughly in half, but it's hairy, involving lift-off below Vmc, for example. Two-engine climb rates of 1630 to 1700 FPM for the small-engined Barons, and 1670 to 1680 FPM for the more powerful models, outpace the Aztec by a wide margin but lag behind the Aerostar and 310.

The B55's single-engine climb rate is a paltry 318 FPM—again, better only than the Aztec. At 388 FPM, the E55's single-engine performance is about par with the 310 and Aerostar. None of these are exceptional single-engine performers, so the wise pilot will keep them as light as possible.

Range, of course, depends on fuel and that varies a bit in the 55 Barons. Depending on year and model, standard tankage was 100 to 112 gallons but optional tanks of 142 or 166 gallons were also available. The 56TC Baron could be fitted with as much as a whopping 204 gallons of gas.

With 112 gallons aboard, the 55 has acceptable but not exceptional endurance and range.

Figure on 26 gallons an hour at 185 knots in the mid altitudes and three- and four-hour legs are easily doable. Without larger tanks, four-plus hours chews into the reserves.

*Interior access is a plus with a B58 Baron, but only the later models had the higher gross weight. (Photo by Jennifer K. Ashmore.)*

The Baron is not a 1000-mile airplane, but it'll knock off 600 miles without breaking a sweat.

The 55 Baron is proof that a light twin doesn't have to handle like a truck. Responsive and well-harmonized, the airplane's controls are one of its biggest selling points. As one owner put it, "Once you've flown an E55, everything else feels like a tin can." As mentioned earlier, however, hand-flying may be delightful in nice weather, but when it gets bumpy, an autopilot comes in handy.

There are trim controls for elevator, rudder and ailerons. Early models have relatively low gear- and flap-extension speeds (143 and 113 knots, respectively). Gear speed was raised to 152 knots, beginning with airplanes built in 1969. The B55 came with approval to lower flaps 15 degrees at 153 knots, and full-flap speed was raised to 122 knots, beginning with TC-955 in 1965.

## MAINTENANCE, MODS

Owners of all Beech models consistently complain about one thing: The high cost of Beech parts, especially control surfaces in need of replacement due to hangar rash or corrosion. Fortunately, the 55s aren't

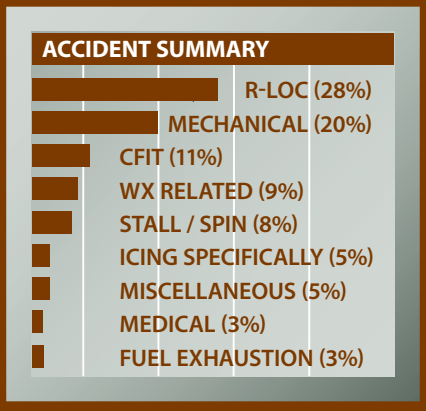
## ACCIDENT SCAN: NAIL THE SPEED EVERY TIME

Like most high-performance twins, flying a Baron requires a healthy respect for speed control on landing. Pilots who don't obey the airspeed indicator risk punishing recognition by a wreck report. In our random sampling of 20 years worth of Baron crashes, runway loss of control (RLOC) ranked top on the list of gotchas for both the model 55 and 58-series. Mechanical failures ranked a close second—with an alarmingly high incident of landing gear problems that weren't always the fault of the equipment.

Classic is the Baron pilot who mistakes the landing gear switch for the flap control and accidentally retracts the gear when cleaning up the airplane. Experienced Beech pilots will advise clearly identifying the correct lever every time. But mechanical gear failures can be equally as troublesome, proving that skimping on your Baron's maintenance will put it into a repair shop. We ran across one model 58 that suffered a not-surprising nose-gear-plunger assembly failure after 10,872 hours in service. Another belly-drop event was the result of corroded linkage the result of obvious neglect.

Like any aircraft, stupid pilot tricks can have devastating results. One sad Baron wreck that took the lives of seven occupants was the result of its pilot departing at gross weight with a known malfunctioning landing gear. If not being able to retract the gear on climb-out wasn't bad enough, engine failure due to a fatigued cylinder barrel and the pilot feathering the wrong prop finished the job. Another Baron 58 pilot was a bit too encouraged after an airshow and rolled his Baron to the point of airframe stress overload and failure.


Photo by Joe Osciak




The Baron isn't always the best airplane for initial twin-engine training. We found a handful of training wrecks where instructors let things get a bit too dicey, including one expensive trip off the side of the runway after a V1 Cut. We also ran across a few older Barons (with reversed throttle quadrant configuration) without unfeathering accumulators. Pilots yanked back on both prop controls instead of the throttles, causing unrecoverable, dual engine failure.

Of note is that 38 percent of these wrecks included fatalities. Since Barons are go-places machines, weather-related mishaps, such as playing too long in icing and descending below the MDA without a runway in sight, run higher than average but with the same predictably deadly results. Still, there's nothing that leads us to believe the Beech Baron is an unsafe aircraft. It just requires training, proficiency and a pilot who stays in the bubble—particularly when it comes time for landing and single-engine ops.

considered maintenance hogs and owners say replacement parts aren't needed often.

Much maintenance relates to the engines. The O-470s are among the most robust and reliable engines in the Continental line and although the O-520s are nearly as good, they seem to suffer premature cylinder wear. Some owners complained of low compression on Continental cylinders after 500 or fewer hours.

Owners say annuals range from $2000 to as much as $6000, but we think the wise owner will budget at least $10,000 a year to cover both the annual and ongoing maintenance. As an hourly maintenance cost, one owner told us a good guideline is to double the fuel cost. With avgas running about $4.50 a gallon, that works out to about $230 per flight hour. Fly 150 hours a year and you'll spend about $35,000 to include engine reserves.

The IO-470L is considered a bulletproof engine, although a few owners, as well as several Service Difficulty Reports, mentioned occasional cylinder problems. The IO-520's reputation is not so good; operators have been beset by cracking crankcases. Continental's switch to so-called "heavy" cases in the late 1970s helped somewhat, but case cracks and broken camshafts have appeared frequently in the SDRs.

Among the notable Airworthiness Directives are: 87-18-06 Rev. 1, requiring replacement of recline-actuator handles on copilot and center passenger seats to prevent inadvertent unlocking; 84-26-02, replacement of paper air filters; and 84-09-01, requiring various inspections and modifications to ensure that the emergency window will open. Prospective buyers should also ensure that 91-15-20 (repair or reinforce cracked engine mounts) has been complied with.

There are three ADs on the props: 97-18-2 (repetitive inspection, A55 and B55 Hartzell props); 95-24-5, (repetitive inspection, E55 McCauley props); and 91-15-4, on the A55. AD 89-5-2 deals with cracking elevator components, with possible replacement of the elevator.

Owners of Beech 55, 56TC, 58 and 95 Barons should look for cracks in the wing forward spar carry-through. The cracking, according

to Airworthiness Directive 90-8-14, could lead to "loss of the airplane."

Beech first apprised owners through a mandatory service bulletin. The bulletin—No. 2269—was originally issued in August of 1989. In March 1990, Beech revised the bulletin, saying "Recent engineering investigation has shown that increased allowable crack lengths as described in this service bulletin will not compromise the integrity of the forward spar carry-through structure."

The AD specifies that the carry-through must be inspected at 1500 hours total airframe time and repeated every 500 hours if no cracks are found. To get at the carry-through, the mechanic must remove the front seats and the carry-through cover on the floor. From there, it's a standard crack inspection. The carry-through and webs are cleaned, then checked using visible dye-penetrant. If no cracks are visible, he can button it up and come back in 500 hours. But if cracks are visible, it's time to get out the rulers. The cracks must be measured and, depending on where they are and how long they are, repaired. Beech sells a kit to do any required repair work.

The other area of concern is the spar web face, in the area of the huck fasteners. Here, cracks are limited to one inch length. Only one crack is allowed per side, and Beech specifies that it can't be stop drilled. Instead, the mechanic must look at it again in 200 hours to see if the crack has grown.

If it has grown, or if it was more than an inch long to begin with, another Beech kit is needed for the proper repair. The repair must be made within the next 25 hours, or immediately if it is between two fasteners and extends more than a half inch beyond the fasteners.

Beech figures one man should be able to complete the inspection in four hours, provided the airplane is already apart for an annual or similar inspection. Like EPA mileage estimates, your labor charge may vary.

If cracks are found, there's the added cost of stop drilling, plus the price of the kits if the cracks need repair. The kits cost several hundred dollars each. Installation time depends on the shop's sheet metal proficiency. The average shop should be able to install one kit in about 55 to 60 hours.

Many mods are available for the Baron, including the usual engine upgrades from Beryl d'Shannon and Colemill. General Aviation Modifications makes GAMIjectors for the Baron line. One mod in particular deserves mention, since it gives such a dramatic improvement in performance: vortex generators.

VGs are available from a couple of different manufacturers. We tested V/G Systems' product for an early issue of *The Aviation Consumer*. Bottom line: They work as advertised. Kits are available from Beryl D'Shannon and Micro AeroDynamics, Inc. of Anacortes, Washington.

Baron owners don't have an association of their own, but the Wichita-based American Bonanza Society supports the Baron along with the Bonanza. The ABS publishes an informative newsletter and conducts service and proficiency clinics at about a dozen locations each year. American Bonanza Society, Mid-Continent Airport, P.O. Box 12888, Wichita, Kansas 67277, phone 316-945-1700 or www.bonanza.org.

## OWNER COMMENTS

I am a 3500-hour private pilot and have owned my Baron for the past 11 years. I decided to purchase a twin upon review of my flight missions, which included routine night flights, long distances over water, and carrying two to four passengers. I frequently fly from the Washington, D.C., area down to south Florida and find the Baron is well suited in both speed and comfort for long trips.

The Baron can handle most weather, with its onboard radar and deicing equipment. Even though it is somewhat shorter than its big brother (58 series), it is a rock solid IFR platform. But it does have a slight tendency to Dutch roll in heavy turbulence. It's light on the controls, but gives you the feel of a heavier aircraft.

I do not run my engines lean of peak. I flight plan for 29 GPH, which gives me a true airspeed of 180 knots at 23 square, which is about 70 percent power. The Baron will climb from sea level at a steady 1000 FPM to about 7000 feet. Single-engine climb is an honest 230 FPM depend-


*The Baron is capable of impressive short-field performance if you're willing to rotate below Vmc. (Photo by Hans Spritt.)*

ing on weight and conditions. I have seen in excess of 300 FPM.

My absolute minimum for runway length is 2800 feet. But on a hot day, or with high density altitude, you would be foolish to try to take off in that distance. I have VGs on my Baron and highly recommend them. VGs places Vmc below stall in a clean configuration, and makes short-field operations more manageable.

I have the 142-gallon tanks, which yields 4.5 hours of flying time 'till dry. This is over 700 nautical miles. The Baron's max gross weight is 5100 pounds, which gives you a payload of 1400 pounds. Subtract full fuel and you are left with 548 pounds for the cabin.

I keep close records of all my annual costs. My maintenance costs have been remarkably predictable. Expect to budget $55 per hour. My annuals usually are $2500 to $3500. Insurance, in a good year is $3600; in a bad year $4900.(Not from accidents, but market cycles.) I strongly recommend to keep your airplane in a hangar, which costs me $2700/year in Western Maryland. I do not reserve for engine overhauls, but having put new engines on it once, I can say you will spend about $60,000 on factory overhauls. The Continental IO-470s are bulletproof. While I would like the performance of turbos, I don't miss the maintenance. I fly my Baron about 130 hours a year. It ain't cheap, but the convenience, safety, and utility are unparalleled.

If you are looking for the safety of a twin to haul your family and friends around the country, look no further than the high-quality Beechcraft Baron. It is at the top of the line in its class and is a fraction of the cost of larger turbocharged twins, or dare I say any turbine aircraft.

Tom Malone
via email

Thirty-five years ago, I was flying my turbo Twin Comanche at night from Dallas to Washington, D.C., when I got into serious weather at 20,000 feet. Upon landing, I decided to upgrade to a twin with radar and deicing capability. After a lengthy study of different models, I bought a Baron 55 and never looked back.

For the next 15 years, I flew regularly from Gaithersburg, Maryland, to my Pittsburgh office and never cancelled a trip because of mechanical difficulties or weather. On balance, my Baron proved to be reliable and easy to fly. I would also argue that once cleaned up and climbing to my assigned altitude, I found it was easier to fly IFR than any single-engine aircraft. With onboard radar and deicing, I regularly flew over the western U.S. when based in Denver.

Several issues are of importance: First, parts from the factory can be prohibitively expensive. When I had to replace a flap motor, Beechcraft wanted $1200. I found a vendor in Wichita who rebuilt these motors for Beechcraft and I was able to get a yellow-tagged motor for $280.

Beechcraft builds a quality product and while parts are expensive, I found that the airframe and systems were more reliable than any other aircraft I owned. My turbo Twin Comanche, in contrast, was a maintenance hog. It seemed to automatically turn towards the closest maintenance shop on its own after landing at a strange airport.

Also, my Baron carried a substan-tial load if you didn't fill up the long-range tanks. I recalled an incident concerning a friend whose son attended a prep school in Maine. The son was engaged in basketball tournaments held in Augusta, Maine, and in Hartford, Connecticut, both on the same day. I shuttled the five first-team players between the tournaments without too much difficulty. (Coincidentally, the team won both championships.)

The Baron performs reasonably well on one engine. I had my right engine overhauled at a shop in Hagerstown, Maryland, and was told they had thoroughly checked out the engine and had test flown the airplane for nearly two hours. As it happened, the airplane had never left the ground and I unwittingly became a test pilot. The engine blew up on takeoff at 500 feet and I feathered the engine and returned safely to the airport. As in any twin, one must assume that with every takeoff, an engine will fail. If you fly the numbers and comply within the operation limitations, you will not get into any trouble.

The Baron is a straightforward aircraft having no measurable faults. With fuel prices on the East Coast approaching $6 a gallon and higher, all twins are expensive to operate. Of note, Beechcraft marketing once demonstrated the fuel efficiency of the B-55 against a turbo Cessna 210. In a three-leg closed traverse, both aircraft flew at the same altitude and identical legs each within six minutes of each other. After the 350-mile trip, the Baron made the trip six minutes faster using three fewer gallons of fuel. The Baron's efficiency is at power settings between 55 and 65 percent. The Aztec and Cessna 310 have comparable speeds at 75 percent power settings; at lower power, they slow down much more rapidly than the Baron. I regularly flew at 170 knots at 22 GPH, which is close to the performance of single-engine aircraft.

With nearly 2000 flying hours in the Baron, I found the aircraft to be very reliable. I would choose another Baron should I ever consider purchasing another twin. After selling my engineering practice, I reluctantly sold my Baron and I am now flying a Mooney, yet another fuel-efficient transportation vehicle.

James J. Davis
Leonardtown, Maryland

I own a 1975 95B-55 with the Colemill upgrade and an updated panel plus an S-Tec 55X autopilot connected to a WAAS receiver. I chose this model as it is probably the safest piston aircraft available. The centerline thrust on the B55 models is substantially closer to the fuselage than almost any other production twin and the loss of an engine at takeoff is little more than a few seconds of opposing rudder while the yaw is manually trimmed out to neutral. After that, especially with the IO-550s and three-blade props, it is just like flying a single, excepting the caution required in turns.

Most of my flights in excess of one hour are flown in the teens and lean of peak at 195-plus TAS. I have flown to FL210 and reached it still showing 400 FPM at 120 knots indicated at 400 pounds shy of gross. The POH rates max usable gross with full fuel (136 gallons) at 650 pounds on the original engines. With the IO-550s, the performance difference between max gross and single-pilot load only shows up as a slightly longer takeoff roll and a marginally reduced speed at 1200 FPM climb to 5000 feet. Once at cruise, the difference is approximately four knots.

This is a true four-passenger aircraft. The engines run very cool and it is rare to see CHTs above 340 degrees on even the hottest day. I have alcohol props and windshield and have used both occasionally when flying through thin tops where diversion is difficult. But with that much power, climbing is truly one possible out among others.

Landings require attention to flying by the numbers as the aircraft will rapidly accelerate once the nose is pointed down. Pulling back to 18 inches MAP/2100 RPM prior to descent is a must if you want to stay out of the yellow arc at the IAF.

Takeoff at max gross in my plane at sea level is just under 2000 feet and landing in the net configuration (less 32 gallons) can be as little as 1000 feet for the experienced short-field pilot.

The airframe is built like a truck and the gear is quite rugged. The airframe is very solid in turbulence. Maintenance has been minimal and my biggest expense has been the continual upgrade in avionics, all of which are enhancements to safety.

I have also added VGs, which seem to have had no effect on cruise speed, but are impressive in the added stability at low speed (short field) landings. Xenon nav lights and beacon, a thick front windscreen, gap seals and Eagle drains have been added as well.

One of the very few downsides is the lack of oil filters, utilizing screens instead. This necessitates changing oil at 30 hours versus 40 hours and cost $400-plus. Fortunately, modern oils show little propensity for breakdown at that point, with corrosion being a bigger threat to engine life.

Upon landing, I immediately open the oil filler caps and allow the vapor to escape for at least 10 minutes, which keeps corrosion to a minimum. Annuals run $4000 including the usual extras like trim adjustment, vacuum pumps and wear-related items. The 2000-hour replacement list will run close to $9000. My average fuel burn is 32 GPH and 36 GPH at lower altitude flights.

I insure at market value, which right now is around $150,000 for my setup and pay $4000 annually. Belonging to the American Bonanza Society is a must, as the tech support and recurrent training is the best of any type organization that I am aware of, and the regional groups—Pacific Bonanza Society, Rocky Mountain Bonanza Society—have frequent fly-ins which are very well attended and are a great opportunity for valued hangar-flying exchanges.

I have flown this bird over 800 hours in the past five years in all kinds of conditions and have the greatest respect for the capabilities of this wonderfully designed and constructed aircraft.

Ronald Hays
Santa Barbara, California

## Insure it Right

*(continued from page 23)*

the cost of operating it. Don't fall in love with the price that you paid for your airplane. It may be worth more or less, but probably less. Airplanes are subject to the gravitational pull of depreciation. The myth that airplanes maintain their value forever is just that. The one guarantee is that an airplane's value will change over time and you need to adjust your policy to match.

When thinking about what you will do if the airplane is destroyed or cannot be economically repaired, consider the costs that you will incur. You may have a substantial deductible. There may be avionics that you feel you need that the next airplane probably will not come with. If you were going to replace your airplane, would you want an airplane with collision avoidance and deicing equipment if you have those now?

For many of us, there's sales tax to pay and the inevitable cost of getting an airplane that's new to you on its feet. We don't suggest that you try to insure these things. But if you're tempted to save a little premium by under-insuring , remember that there's usually a substantial transactional cost to replace it. While valuation is an inexact science, the important thing is that you insure your airplane for an amount that's in the price range that a sane buyer would pay for it. Being off by five or 10 percent won't be the end of the world. But missing by 30 percent could lead to major heartburn during the claims process, if there is one. Don't forget that the amount that you insure the airplane for not only determines the size of the check if it's totaled, but often will decide the entire course of the claim.

If you want the best odds on getting the airplane fixed when it should be fixed and scrapped when it should be scrapped, insure it for what you would expect to sell it for. Insurance is a bet and your best bet is to know how your policy reads and what your airplane is worth.

*Jon Doolittle is an* Aviation Consumer *contributing editor and owner of Sutton James Aviation Insurance.*

The Aviation Consumer

## Remos NXT

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that throttle right in the door opening without it becoming an ingress/egress snag. The doors themselves, by the way, are fully removable and the airplane can be operated without doors up to 100 knots. No tools are required to do this. You simply pop the gas spring loose from the door frame, then extract the pin from the top hinge by pulling a placarded knob. It takes 15 seconds.

Tools are required to see another of the NXT's tricks: The wings fold for storage and/or towing. The horizontal stab comes off, too, by extracting a couple of pins. The main wing pivots rearward and stows tucked in above the horizontal fin. The struts remain attached. Majunke says most owners leave the fin in place unless they need to tow the airplane, in which case its span is too wide for road navigation. The wing stow takes about 10 minutes and requires a provided pin-removal-tool.

Another nice ergonomic touch is sun visors—good sun visors mounted on a flexible stock that make them universally adjustable. They stow with snaps mounted in pockets in the overhead. You don't see this kind of detail in many LSAs and it makes the airplane more civilized and usable.

Another change worth mentioning is an improved nosegear strut that's less susceptible to corrosion and wear, something that has been a weak point for not just Remos, but other LSAs as well.

### FLYING IT

In short, the Remos flies like it looks. Crisp, smooth and with no surprises. Well, maybe one. Because it's lighter than the average LSA, it seems to climb a little better. We easily coaxed 700 FPM in initial climb and even at altitude, it did an honest 600 FPM.

Controls forces are predictably light so like just about every other LSA we've flown, fingertip control is required. Trim is electric only, with a stick-mounted coolie hat. It's not trim hungry, but there is a nose-up pitch moment when the flaps come in.

Cruise wise, figure on about 110 MPH on 4.8 gallons. With only 21 gallons usable, the NXT is slightly short-legged. Call it 3.5 hours with a decent reserve for a still-air range of 375 miles or so. The seats are comfortable enough and the cabin is spacious enough to support that.

Remos' new CEO, Theo Paffagen, told us that the company is working on a model that will have non-folding wings, so the gas will go into conventional wing tanks, perhaps allowing for more of it. Better yet, the cabin tank will come out and the airplane will get a conventional baggage space, which we see as a plus for owners who carry bulky stuff.

## Letters

*(continued from page 3)*

does not deserve your praises for a new product until they resolve their issues with long-time print subscribers, in my view.

I paid annual renewals in September 2009 (for 2010 editions) and November 2010 (for 2011 editions) and the last update I received was the spring edition of 2010. They keep promising the print editions (new format) are on the way. I trust you'll follow up with the truth about this company.

David Lee Ingram
Mount Crawford, Virginia

*We followed this up with Flight Guide and here's the latest. They should have contacted you by now. While their service to print customers may have been poor, we think they are making a good-faith effort to fix a problem.*

*That said, if this continues to be an issue, if they continue to fail to deliver on time, contact us again. We will follow up. For that matter, let us know if the service returns to normal and you are satisfied with the product again.*

**FEEDBACK WANTED**

### CESSNA 421

For the December 2011 issue of *Aviation Consumer*, our Used Aircraft Guide will be on the Cessna 421 Golden Eagle, Cessna's luxe class cabin twin. We want to know what it's like to own these twins, 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 Cessna 421 by October 1, 2011, to:

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