

## Upcoming Events

Chpt. 983 Meeting

May-Rex Havis Spectro Oil analysis

April- TBD

April 26<sup>th</sup> AOPA fly-in at San Marcos FREE LUNCH!

June-Garmin Team X

983 Fly-in We are seeking Leads for Food, AC Parking, Set up/tear down, and Young Eagles.

(Same people every year and though we appreciate them greatly, make this year your year to help!)

I've had several conversations with Foreflight founder Tyson Weihs, the last being at Oshkosh 2013, on how I thought he could improve his application. My suggestion was that I would like to see some type of synthetic vision that would give you airspeed, altitude, compass rose and an artificial horizon. This would allow you to use an iPad attached to a Gizmo in your instrument panel, which would allow the use of the iPad as an MFD. It would have 75-80% of the functionality of a Garmin, or

# Riveting News

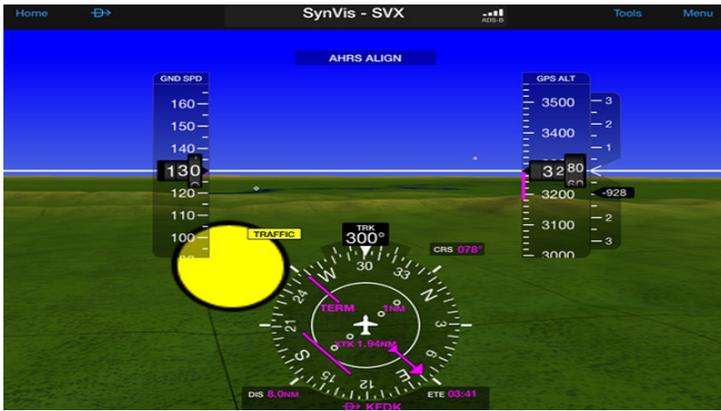


Spring  
2014



## Garmin Synthetic Vision for Tablets

other MFD manufacturers for 1/5 of the price. For some reason Foreflight has been reluctant to do so (see follow-up of this article for some exciting news from Foreflight). Now Garmin has beat Foreflight to the punch by adding syn-vis to their popular Garmin Pilot flight planning app. Garmin wasn't the first to offer a syn-vis on a tablet computer app, but adding it to Garmin Pilot puts the technology in front of thousands of additional pilots and raises the utility and sophistication of electronic flight bags to a new level. Running it requires a GDL-39 receiver and an IFR or VFR Premium subscription to Garmin Pilot (\$75 a year plus \$50 for VFR Premium or \$75 for IFR). Also, customers who get the GDL-39 3D can get synthetic vision with a regular Garmin Pilot subscription (\$75 a year.) The GDL-39 3D (\$899 including battery) has an attitude and heading reference system (AHRS) built into it that senses pitch and roll and communicates via Bluetooth to a tablet computer (currently working only on an iPad).



## FLASH!!

For those who use Foreflight a big announcement was made at SnF.

Foreflight now has their version of synthetic vision available on foreflight utilizing the Stratus (version 2).

Now you can use the Foreflight application as a second emergency panel in your homebuilt while also using it for flight planning, charts, moving map, airport information and weather and traffic downloaded from Stratus.

(See article on following pages)

Thanks for listening Tyson! What took you so long?

The high-resolution display is crisp, clear, and colorful and looks like a high-fidelity version of a G1000 primary flight display.

If your aircraft is equipped with a Automatic Dependent Surveillance-Broadcast (ADS-B) Out the GDL 39 receives both ADS-B traffic and weather. (Without ADS-B Out, it would only get partial traffic and full-time weather.)

Once airborne, a few of the syn-vis limitations became apparent. First, in a 10-degree climb, the unit wrongly thought it was level. In level flight, it erroneously believed it was in a 10-degree descent. The reason for this is that the GDL is programmed to believe it is level on the ground—and that works fine in most nosewheel airplanes, but not with tailwheel airplanes like an RV-4. A quick tap of the “reset” button in level flight quickly recalibrated the unit and it remained accurate the rest of the flight.

The syn-vis display is exceptionally good at showing traffic. Other aircraft appear as tiny white diamonds, then grow into white dots, and finally large yellow spheres as they get closer.

Airports appear as billboards with their four-letter identifiers spelled out. As you fly closer, the runways

show up in their proper orientation, and runway numbers appear on the thresholds as they do in real life.

Transparent tapes show GPS-derived altitude, ground speed, and ground track in the traditional glass-cockpit locations along with an HSI and magenta trend indicators. Unlike the G1000, however, the syn-vis for tablets doesn't include a flight path marker (green dot) or highway-in-the-sky boxes to fly through.

This version of syn-vis also must be viewed full screen. There's no split-screen to allow a moving map or traffic on one screen and syn-vis on the other.

In sum, Garmin's syn-vis for tablet computers makes a helpful technology much more widely available at a tiny fraction of the cost of FAA certified, panel-mount systems. And while these portable units aren't nearly as robust as the certified, panel-mount varieties, pilots who become accustomed to flying with syn-vis and the situational awareness and comfort it brings won't want to do without it.

I think the perfect, reasonably priced panel, would include an MFD and the iPad with Garmin Pilot with syn-vis installed with a gizmo on your panel. (ed. Note)

# Do Piston Engine TBOs Make Sense?

March 13th, 2014 by Mike Busch

Last month, I discussed the [pioneering work on Reliability-Centered Maintenance](#) (RCM) done by United Airlines scientists Stan Nowlan and Howard Heap in the 1960s, and I bemoaned the fact that RCM has not trickled down the aviation food chain to piston GA. Even in the 21st century, maintenance of piston aircraft remains largely time-based rather than condition-based.

Most owners of piston GA aircraft dutifully overhaul their engines at TBO, overhaul their propellers every 5 to 7 years, and replace their alternators and vacuum pumps every 500 hours just as Continental, Lycoming, Hartzell, McCauley, HET and Parker Aerospace call for. Many Bonanza and Baron owners have their wing bolts pulled every five years, and most Cirrus owners have their batteries replaced every two years for no good reason (other than that it's in the manufacturer's maintenance manual).

Despite an overwhelming body of scientific research demonstrating that this sort of 1950s-vintage time-based preventive maintenance is counterproductive, worthless, unnecessary, wasteful and incredibly costly, we're still doing it. Why?

Mostly, I think, because of fear of litigation. The manufacturers are afraid to change anything for fear of being sued (because if they change anything, that could be construed to mean that what they were doing before was

wrong). Our shops and mechanics are afraid to deviate from what the manufacturers recommend for fear of being sued (because they deviated from manufacturers' guidance).

Let's face it: Neither the manufacturers nor the maintainers have any real incentive to change. The cost of doing all this counterproductive, worthless, unnecessary and wasteful preventive maintenance (that actually doesn't prevent anything) is not coming out of their pockets. Actually, it's going into their pockets.

If we're going to drag piston GA maintenance kicking and screaming into the 21st century (or at least out of the 1950s and into the 1960s), it's going to have to be aircraft owners who force the change. Owners are the ones with the incentive to change the way things are being done. Owners are the ones who can exert power over the manufacturers and maintainers by voting with their feet and their credit cards.

For this to happen, owners of piston GA aircraft need to understand the right way to do maintenance—the RCM way. Then they need to direct their shops and mechanics to maintain their aircraft that way, or take their maintenance business to someone who will. This means that owners need both knowledge and courage. Providing aircraft owners both of these things is precisely why I'm contributing to this AOPA Opinion Leaders Blog.

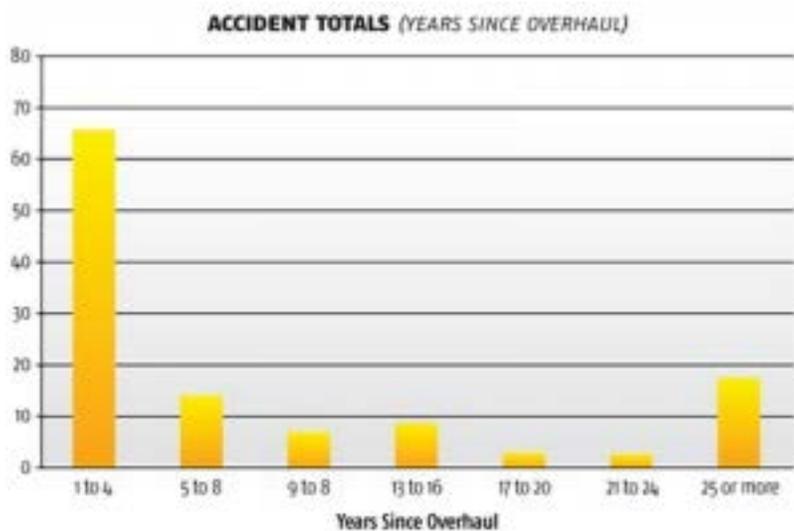
When are piston aircraft engines most likely to hurt you?

Fifty years ago, RCM researchers proved conclusively that overhauling turbine engines at a fixed TBO is counterproductive, and that engine overhauls should be done strictly on-condition. But how can we be sure that this also applies to piston aircraft engines?

In a perfect world, Continental and Lycoming would study this issue and publish their findings. But for reasons mentioned earlier, this ain't gonna happen. Continental and Lycoming have consistently refused to release any data on engine failure history of their engines, and likewise have consistently refused to explain how they arrive at the TBOs that they publish. For years, one aggressive plaintiff lawyer after another have tried to compel Continental and Lycoming to answer these questions in court. All have failed miserably.

So if we're going to get answers to these critical questions, we're going to have to rely on engine failure data that we can get our hands on. The most obvious source of such data is the NTSB accident database. That's precisely what brilliant mechanical engineer Nathan T. Ulrich Ph.D. of Lee NH did in 2007. (Dr. Ulrich also was a US Coast Guard Auxiliary pilot who was unhappy that USCGA policy forbade him from flying volunteer search-and-rescue missions if his Bonanza's engine was past TBO.)

Dr. Ulrich analyzed five years' worth of NTSB accident data for the period 2001–2005 inclusive, examining all



accidents involving small piston-powered airplanes (under 12,500 lbs. gross weight) for which the NTSB identified “engine failure” as either the probable cause or a contributing factor. From this population of accidents, Dr. Ulrich eliminated those involving air-race and agricultural-application aircraft. Then he analyzed the relationship between the frequency of engine-failure accidents and the number of hours on the engine since it was last built, rebuilt or overhauled. He did a similar analysis based on the calendar age of the engine since it was last built, rebuilt or overhauled. The above histograms show the results of his study:

Note: Article published with Mike bushes consent.

If these histograms have a vaguely familiar look, it might be because they look an awful lot like [the histograms generated by British scientist C.H. Waddington in 1943.](#)

Now, we have to be careful about how we interpret Dr. Ulrich’s findings. Ulrich would be the first to agree that NTSB accident data can’t tell us much about the risk of engine failures beyond TBO, simply because most piston aircraft engines are voluntarily euthanized at or near TBO. So it shouldn’t be surprising that we don’t see very many engine failure accidents involving engines significantly past TBO, since there are so few of them flying. (The engines on my Cessna 310 are at more than 205% of TBO, but there just aren’t a lot of RCM true believers like me in the piston GA community...yet.)

What Dr. Ulrich’s research demonstrates unequivocally is striking and disturbing frequency of “infant-mortality” engine-failure accidents during the first few years and first few hundred hours after an engine is built, rebuilt or overhauled. Ulrich’s findings makes it indisputably clear that **by far the most likely time for you to fall out of the sky due to a catastrophic engine failure is when the engine is young, not when it’s old.**

(The next most likely time for you to fall out of the sky is shortly after invasive engine maintenance in the field, particularly cylinder replacement, but that’s a subject for a future blog post...stay tuned!)

So...Is there a good reason to overhaul your engine at TBO?

It doesn’t take a rocket scientist (or a Ph.D. in mechanical engineering) to figure out what all this means. **If your engine reaches TBO and still gives every indication of being healthy** (good performance, not making metal,

healthy-looking oil analysis and borescope results, etc.), **overhauling it will clearly degrade safety, not improve it. That's simply because it will convert your low-risk old engine into a high-risk young engine.** I don't know about you, but that certainly strikes me as a remarkably dumb thing to do.

So why is overhauling on-condition such a tough sell to our mechanics and the engine manufacturers? The counter-argument goes something like this: "Since we have so little data about the reliability of past-TBO engines (because most engines are arbitrarily euthanized at TBO), how can we be sure that it's safe to operate them beyond TBO?" RCM researchers refer to this as "the Resnikoff Conundrum" (after mathematician H.L. Resnikoff).

To me, it looks an awful lot like the same circular argument that was used for decades to justify arbitrarily euthanizing airline pilots at age 60, despite the fact that aeromedical experts were unanimous that this policy made no sense whatsoever. Think about it...

**Mike Busch** is arguably the best-known A&P/IA in general aviation, honored by the FAA in 2008 as National Aviation Maintenance Technician of the Year. Mike is a 7,500-plus hour pilot and CFI, an aircraft owner for 45 years, a prolific aviation author, co-founder of AVweb, and presently heads a team of world-class GA maintenance experts at [Savvy Aviator](#)

## Meeting Briefs

March 8<sup>th</sup> meeting      New members introduced were Lawrence

\*Ryan who brings to Chapter 983 the first gyrocopter (which will hopefully stay) and Ron and Denise Hanselman. A first flight of a fabulous Falco was made by Tom Langston who hangars it at GDJ.

\* John McCommas has purchased a Turbine Legend, which is undergoing modifications in Arizona. Soon the smell of jet fuel will emanate in the air above OTX1!

\* Sam Butler, Gary Bricker and Pat Wallace were presented with awards for their service to 983.

\* A letter of thanks from Dave Boldenow was read in reference to his fathers passing.

\*Time to renew dues. Check, cash or Paypal or hit the road.

---

Aprils 12<sup>th</sup> meeting

\*New Members- Peter Heffley, Paul Pickering Guest Craig Brown

\*Thanks to Hicks Airfield Pilots Ass. For donating a trailer to carry all our chairs.

\*Kelly Hick, manager at Iron Compass Aviation at KGDJ is looking for new students FMI: <http://www.iron-compass.com> . Kelly is also an airplane detailer and specializes in dirty bellies (the airplane, not yours, geez) Call her at

\*Foreflight's Stanley Hinson was present to talk about Foreflight's new version 6.0 with many new features FMI: <http://www.foreflight.com/ipad/whatsnew/>

\* The chapter is in the process of filing as a 501C3.

\*Bricks continue to be for sale. See Konnie Sasser

\* Red Bull air races at TMS on Sept 6&7<sup>th</sup> FMI: [http://www.redbullairrace.com/en\\_US/event/fort-worth#tickets](http://www.redbullairrace.com/en_US/event/fort-worth#tickets)

\* Water main being buried on grass runway. Should be about 1-1 ½ weeks. Check Notams and let Doug know if you have any complaints.

\*GPS approach soon to arrive. 1<sup>st</sup> week of May the FAA will test fly and then back through the FAA for final approval.



## Garmin Joins the Pack!

I don't mean to boar you with constant information on iPad flight planning products but in my opinion this improvement by Foreflight make the ipad with Foreflight a viable second PFD for experimental airplane and it's cheap.

At the Sun 'n Fun Fly-in this week, (and later confirmed at the EAA 983 April Meeting) the team behind **Stratus** (Appareo, ForeFlight and Sporty's) announced three new features for the popular ADS-B receiver. These upgrades are free, and will be available as a part of ForeFlight version 6.0. Let's take a look at what's new.

Stratus attitude information can now be viewed in a split-screen layout in ForeFlight.

Stratus's built-in Attitude Heading Reference System (AHRS) has proven to be a popular feature with pilots, delivering backup attitude information to the iPad—complete with pitch, bank, groundspeed, track and altitude. For IFR pilots, this can be helpful for situational awareness and a legitimate worst case backup.

Now this data can displayed right in ForeFlight, with a glass cockpit-style split-screen view. The attitude indicator updates multiple times per second so it moves smoothly, and it can be used in either portrait or landscape mode. While Stratus's automatic AHRS calibration works in most cases, ForeFlight offers options for manual adjustment right in the app.

With this feature, pilots can now view ADS-B weather, traffic, moving map and attitude all on the same page.

## Stratus Replay

Recently we reviewed different ways to [extend iPad battery life](#), and determined that turning off the screen or turning down screen brightness had by far the biggest impact. This makes the new Stratus Replay feature a welcome addition. It nearly doubles the effective battery life of an iPad by allowing pilots to turn off the screen between uses.

When the screen is turned on again, Stratus automatically sends ForeFlight Mobile any ADS-B weather that was missed, including radar, METARs, TAFs and PIREPs. This is helpful on a long cross country flight, offering 6+ hour battery life for your iPad and Stratus. Stratus Replay also allows pilots to switch to another app (E6B, checklist, document viewer) without missing important weather data. Best of all, there's nothing for the pilot to do—it's completely automatic.

## Animated radar

Animated radar adds an important safety feature for pilots flying in convective weather, allowing them to monitor the trend in NEXRAD radar images. By simply tapping the play button on ForeFlight's map page, pilots can loop the previous 30 minutes of both regional and national radar and determine if a cell building or dissipating. Combined with Stratus Replay, animated radar offers a powerful decision-making tool. This feature has actually been available for a few months now, and works on Stratus 1 and 2. The split-screen attitude and Stratus Replay are only available on Stratus 2.

To access these new features, first download ForeFlight version 6.0 (available next week). Then, connect your iPad to Stratus, open ForeFlight and go to the Stratus Status page. From there, you can "Tap to update" the Stratus firmware. The update is free.

So for about \$75 for the standard version and \$150 for the pro version, which gives you geo-reference plates that can be overlaid on the moving map, you get Wx radar, a useable MFD, taxi diagrams, approach plate, flight planning and filing. Time to throw away those paper charts or use them for sunshades.

# Want Ads

(you got things to sell? We sell 'em)

[Complete Lycoming O-235-C engine](#) and Sensenich Prop for sale. The engine comes with log book, starter and carburetor (no alternator). The engine has 3940.2 hrs total time and 151 hrs since major overhaul. The prop is a 74", 46 pitch, Model M76A Sensenich Prop that has been reconditioned for this engine, selling both for \$7,500.00.

Email me at [Lawrence@lakegranbury.com](mailto:Lawrence@lakegranbury.com) or call 817-894-1095.

[Stratus I \(first generation\) for sale](#). The stratus is used in conjunction with Foreflight to display ADS-B weather, traffic and more. It will update Metars and TAFs on the fly, giving you up to date weather information at your destination. It will also display other ADS-B traffic with location, direction of travel and relative altitude. Even if you have XM weather, which can be up to 12 minutes old ADS-B weather is more accurate and timely. These units are currently selling for \$600 at Sportys (<http://www.sportys.com/PilotShop/product/17165>). Mine includes charging cord, carrying case and Ram mounting (with suction cup for remote mounting), a \$35 value. Selling for \$500/offer. Once you have one you'll wonder have you lived without it!

Contact [Buhwana@charter.net](mailto:Buhwana@charter.net) 817-579-1850h 817-279-3080C

[Electric Power Tow for sale](#). About 2 years old, in excellent condition. Sell or Trade for Gas model. Wanted to buy: used gas-powered tug. Power Tow or similar.

Mark Finkelstein: [mark.finkelstein@gmail.com](mailto:mark.finkelstein@gmail.com) 607-699-1750.

[Aircraft Detailing](#). [Shark Aviation](#) specializes in detailing of aircraft of any size you can afford. From J-3 cubs to Small jets. Prices vary depending on size. Located at Granbury Airport but she is completely mobile and "Plane wash can travel"

Kelly Hicks: [winnerranch@hotmail.com](mailto:winnerranch@hotmail.com) or 254-592-9492

[For Sale: 1975 Hatz CB-1 Biplane](#). S/N 2. A piece of history built by Dudley Kelley. C-0200. 65 hours since rebuild in 2006. 65 hours SMOH. Very nice. Replica of Waco-10. Accepting offers or trades. I made a mistake in buying it. It needs a younger pilot. Let's talk.

Dave Guinn [quinti@aol.com](mailto:quinti@aol.com) 817-279-7186

## The Butler Did it (again!)



Congratulations to Sam Butler and Tom Langston for First flights. This is not the first build for Sam, having built an RV6 prior. Sam took the first flight in his RV12 in December of 2013 but was too late to receive his first flight award at the Christmas banquet. Sam build this airplane in what has to be record time, in less than six months and built it according to Van's plan.

He thanks several Chapter members for their assistance. Sam went into sequester when his kit arrived and wasn't seen until it was signed off by the local DAR.

Tom, on the other hand, is a new chapter member and built his first airplane and it's a beauty. The Falco is a mostly wood airplane that requires in excess of 5000 hours of labor to complete. Tom ordered his plans in 1982 and started building in 2001. Tom has a construction background but no plane building experience. He said he thoroughly enjoyed the first 6 years of building. Tom did the building, panel design, electrical and paint for the airplane himself. Though the airplane is wood the wings are covered with a thin fiberglass overlay to achieve smoothness. Tom said the hardest part was getting the washout on the ailerons and the flaps as it changes from inboard to wing tip.

The first flight was 2/23/14 by an experienced Falco pilot who rung it out. Tom is taking the Phase one slowly as he hasn't flown a lot in many years and realizes how hot the Falco is compared to the Spam Can he was flying previously.

