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**OWNER MAGAZINE**

**April 2021**

## Cessna 140

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Wheel To Aileron Cable.....	U0400107-1.....	<b>\$133.32</b>
Aileron Carry-Thru Cable .....	U0400107-2.....	<b>\$111.01</b>
Flap Control Cable .....	U0400107-3.....	<b>\$60.26</b>
Rudder Control Cable.....	U0400107-4.....	<b>\$91.29</b>
Elevator Up Control Cable .....	U0400107-5.....	<b>\$100.38</b>
Elevator Tab Aft Cable.....	U0400107-7.....	<b>\$85.35</b>
Elevator Tab Forward Cable ...	U0400107-8.....	<b>\$79.85</b>
Elevator Down Cable .....	U0400107-9.....	<b>\$97.62</b>
Flap Control Cable .....	U0400107-10.....	<b>\$62.91</b>
Elevator Tab Forward Cable ..	U0400107-11.....	<b>\$72.07</b>
Wheel To Aileron Cable.....	U0400107-17.....	<b>\$146.31</b>
Aileron Carry-Thru Cable .....	U0400107-18.....	<b>\$121.07</b>
Aileron Carry-Thru Cable .....	U0400107-21.....	<b>\$136.92</b>
Flap Extend Forward Cable...	U0400107-22.....	<b>\$73.89</b>
Flap Retract Forward Cable ..	U0400107-23.....	<b>\$73.89</b>
Flap Retract Cable .....	U0400107-26.....	<b>\$77.78</b>
Aileron Cable.....	U0400107-31.....	<b>\$148.34</b>
Flap Retract Cable .....	U0400107-33.....	<b>\$72.94</b>
Flap Extend Cable.....	U0400107-34.....	<b>\$66.96</b>
Aileron Cable.....	U0400107-35.....	<b>\$124.94</b>
Aileron Cable.....	U0400107-36.....	<b>\$177.15</b>
Flap Retract Forward Cable ..	U0400107-37.....	<b>\$66.60</b>
Flap Retract Cable .....	U0400107-38.....	<b>\$62.47</b>
Flap Extend Forward Cable...	U0400107-39.....	<b>\$72.94</b>
Flap Extend Cable.....	U0400107-40.....	<b>\$62.79</b>
Aileron Cable.....	U0400107-41.....	<b>\$128.75</b>
Flap Control Cable .....	U0400107-45.....	<b>\$45.03</b>
Flap Control Cable .....	U0400107-46.....	<b>\$43.77</b>
Rudder Forward Cable.....	U0400107-47.....	<b>\$65.35</b>
Rudder Aft Cable .....	U0400107-48.....	<b>\$100.63</b>
Rudder Cable, Left.....	U0400107-49.....	<b>\$105.21</b>
Rudder Cable, Right .....	U0400107-50.....	<b>\$100.20</b>
Elevator Tab Forward Cable ..	U0400107-52.....	<b>\$88.72</b>
Elevator Tab Forward Cable ..	U0400107-54.....	<b>\$88.72</b>
Elevator Tab Forward Cable ..	U0400107-56.....	<b>\$78.58</b>
Aileron Cable.....	U0400107-60.....	<b>\$64.62</b>

Aileron Direct Cable, Left.....	U0400107-61.....	<b>\$77.37</b>
Elevator Up Aft Cable.....	U0400107-63.....	<b>\$74.52</b>
Elevator Down Aft Cable.....	U0400107-64.....	<b>\$119.87</b>
Aileron Direct Cable, Right ...	U0400107-65.....	<b>\$81.11</b>
Elevator Forward Cable .....	U0400107-66.....	<b>\$74.77</b>

## Landing Gear

Brake Disc Cover Plate .....	0441126.....	<b>\$3.68</b>
Axle Nut .....	0441130.....	<b>\$445.00</b>
Tailwheel Leaf Spring .....	U0442106.....	<b>\$67.94</b>
Tailwheel Leaf Spring .....	U0442106-2.....	<b>\$74.73</b>
Tailwheel Leaf Spring .....	U0442107.....	<b>\$43.74</b>
Tailwheel Leaf Spring .....	U0442108.....	<b>\$75.94</b>
Tailwheel Leaf Spring .....	U0442108-2.....	<b>\$83.54</b>
Tailwheel Leaf Spring .....	U0442109-2.....	<b>\$48.32</b>
Tailwheel Leaf Spring .....	U0442110.....	<b>\$94.58</b>
Tailwheel Leaf Spring .....	U0442110-2.....	<b>\$57.63</b>
Tail Spring Attach Stiffener.....	0442115.....	<b>\$482.04</b>
Tailwheel Steering Chain Guard	U0442125.....	<b>\$46.52</b>
Tail Spring Shackles .....	U0442122.....	<b>\$64.15</b>
Tail Spring Abrasion Strip .....	U0442124.....	<b>\$58.89</b>

## Aluminum Cowling

• Applicability: Cessna 120, 140, 140A



### 1946 Cowling Parts

Lower Cowl Skin, Left .....	U0452126-3 .....	<b>\$1,246.93</b>
Right .....	U0452126-5 .....	<b>\$1,246.93</b>
Nose Cowl Only .....	U0452124 .....	<b>\$904.06</b>

### 1947 and 1948 Cowling Parts

Center Cowl Support .....	U0452187 .....	<b>\$566.05</b>
Lower Cowl Skin, Left .....	U0452189-3 .....	<b>\$1,070.52</b>
Right .....	U0452189-5 .....	<b>\$1,070.52</b>
Nose Cowl Blank.....	U0452185 .....	<b>\$904.06</b>

• Applicability: Cessna 170, 170A, and 170B through serial number 25372



170 Nose Cowl.....	U0552000-13 .....	<b>\$1,083.79</b>
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## Air-Maze Air Filter

- Applicability: C-85 and C-90 engines
- Use with A50256 housing
- Supersedes part number 40599



Air Filter .....	600314.....	<b>\$83.77</b>
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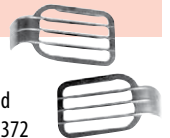
## Tail Surfaces

Fin Assembly.....	U0431000 .....	<b>\$2,628.67</b>
Front Fin Spar.....	U0431115 .....	<b>\$50.65</b>
Fin Hinge Bushing.....	U0431119 .....	<b>\$7.77</b>
Top Fin Hinge .....	U0431120 .....	<b>\$79.85</b>
Lower Fin Skin.....	U0431128 .....	<b>\$372.31</b>
Rear Fin Spar .....	U0431130 .....	<b>\$117.42</b>
Lower Fin Rib .....	U0431135 .....	<b>\$155.03</b>
Fin Rib .....	U0431136 .....	<b>\$97.06</b>
Fin Rib .....	U0431137 .....	<b>\$73.82</b>
Upper Fin Rib .....	U0431138 .....	<b>\$55.91</b>
Upper Fin Cap Assembly.....	U0431139 .....	<b>\$410.29</b>
Fin Spar Reinforcement.....	U0431145* .....	<b>\$10.86</b>
Fin Spar Reinforcement.....	U0431145-1* .....	<b>\$12.01</b>
Stabilizer Assembly.....	U0432000-3 .....	<b>\$7,848.90</b>
Leading Edge Inboard Stabilizer		
Left .....	U0432158 .....	<b>\$110.27</b>
Right.....	U0432158-1 .....	<b>\$110.27</b>
LE Outboard Stabilizer.....	U0432159 .....	<b>\$139.30</b>
Rudder Assembly .....	U0433000-14 .....	<b>\$2,793.55</b>
#1 Rudder Rib .....	U0433106-2 .....	<b>\$34.30</b>
Rudder Tip.....	U0433111 .....	<b>\$200.26</b>
Rudder Bellcrank.....	U0433113 .....	<b>\$360.88</b>
Tail Light Mount Support .....	U0433121 .....	<b>\$52.74</b>
Rudder Spar .....	U0433125 .....	<b>\$183.13</b>
Rudder Tab .....	U0433127 .....	<b>\$16.04</b>

\* To comply with AD 50-31-01

## 120-140 Cowl Grilles

- Applicability: Cessna 120, 140
- Also approved for 170, 170A and 170B through serial number 25372



Left Cowl Grille.....	U0452207 .....	<b>\$225.62</b>
Right Cowl Grille .....	U0452207-1.....	<b>\$225.62</b>

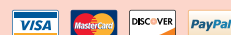


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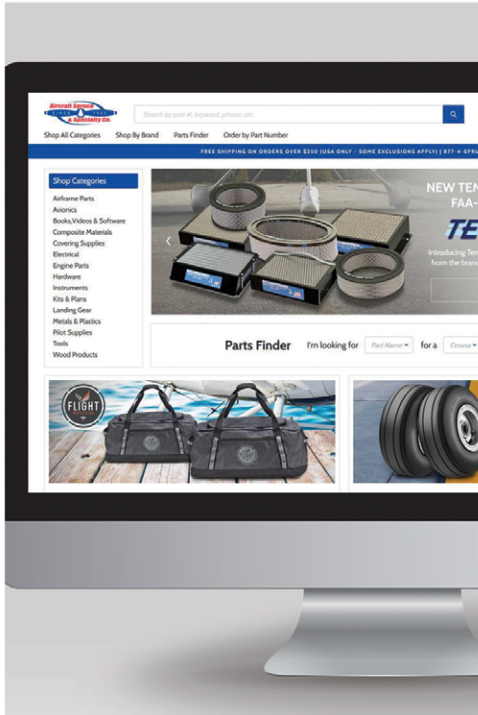
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### **On the cover**

Cover photo of Jeffrey Ethriedge's 1946 140 taken by August Haeuser.

Photo credit: August Haeuser ([www.augustjphoto.com](http://www.augustjphoto.com))

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## Questions? Ask Our Experts

Last month I talked about our Cessna Owner forums and how it is a great place to seek advice from fellow members. Sometimes, though, you may find yourself asking a question that only an expert can answer. While there are members on the forums who fit that mold, to ensure you're getting expert advice you can contact our tech support team.

The team is headed by Master Pilot and COO Aviation Director Scott Sherer. Scott has been flying for more than 50 years and has owned a variety of single- and twin-engine aircraft. If you're trying to track down a part or find a good shop in your area, Scott can help. He also has extensive experience restoring his own aircraft and thus is a great resource for your DIY projects.

The other half of our tech line team is Erich Rempert. Erich is an A&P/IA based in southern Wisconsin. If you have questions about your annual, engine overhaul, airworthiness, rigging, or pretty much anything else under the sun, Erich is here to help.

You can contact our tech line by emailing [tech@cessnaowner.org](mailto:tech@cessnaowner.org) or call 715-445-5000 ext. 123 to leave a message for our experts. There's no limit to how many questions you can ask, and it's always free of charge with your membership. Personally, I think this is the best member benefit we offer.

Tailwinds,

Katie Holliday-Greenley  
Aviation Editor



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# Cessna 140

A Cessna 140 taildragger airplane is parked on a grassy field at sunset. The plane is dark green with a red stripe along the fuselage. The background shows a hazy sky with orange and blue tones, and a barn is visible in the distance.

## Entry-level trainer

**By Bill Cox**

**D**on Hennesey could easily have afforded something faster, larger, and more ostentatious. He was a successful real estate broker back in the day when real estate could actually be profitable.

Don had purchased his one and only airplane, a Cessna 140, in the late 1980s, and he told me he planned to die with it (no, not in it). He loved the airplane, felt it was “about as fast as his brain,” and didn’t aspire to anything faster, larger, or more modern.

Don accumulated some 700 hours in that little airplane in just over seven years, not bad for a weekend pilot who rarely flew farther than 100 miles at a time. I used to fly with him on some of his short trips around

Southern California, and it was readily apparent he was in love with his little taildragger.

I was flying an old Mooney at the time, but I understood the attraction of a late 1940s-vintage two-seat taildragger. After all, I spent my first 30 hours of flying (all of it unloggable as I was underage) in a modified J-3 Cub in Anchorage, Alaska, then earned my certificate and survived 500 hours in a 1946 Globe Swift back in the 1960s, a puddle-jumper in its own right (though a nice handling one).

I may have had a slight advantage over the majority of the pilot population in that I never set foot (or butt) in a Cessna 150 until well after I was licensed.





For that reason, I had no preconceptions about the advantages of a nosewheel over a tailwheel.

In fact, I thought it was the other way around. In Alaska (and everywhere else), tailwheels have the advantage on unimproved runways, regardless of whether they are legitimate airports.

### Simple efficiency

The Cessna 120/140 was something of a mini bird in the Cessna line, a machine designed for pilot training and the epitome of low-cost flying. With its hyper-economical 85-hp Continental engine (90 hp on the later models), the type was fairly efficient, despite the fact that fuel costs were hardly a factor in those days at about \$.35 per gallon.

The 120 was the first iteration of the model, introduced in 1946 and produced through 1949, a super-simple machine with no flaps, no aft side window and (usually) no electrical system. The lack of electrical power obviously limited the 120 to day/VFR operation since, by definition, lights required an electrical system of some kind. The 140 was the more capable step-up airplane, though it shared the same fuselage and wing, and a pilot could start it unassisted without tempting fate or getting caught in a rainstorm.

**Left:** 1946 Cessna 140 owned by Jeff Ethridge. Photo by August Haeuser ([www.augustjphoto.com](http://www.augustjphoto.com))

**Below:** Cessna 140 owned by Jeramie Eitel. Photo by Jack Fleetwood ([www.JackFleetwood.com](http://www.JackFleetwood.com))





Photos of Jeramie Eitel's Cessna 140 by Jack Fleetwood.



Both models were intended to address the post-war aviation boom that wasn't. Despite a low initial price of \$3,495, most of the thousands of pilots returning from war didn't have that kind of money, and many of those who did had memories of friends who didn't return and, accordingly, they were no longer interested in flying.

The initial, entry-level Cessna featured an all-fabric covering until 1949 when the 140 converted to an aluminum fuselage and control surfaces with fabric wings. The improved 140A was the last of the type, built in 1950, offering a single wing strut on each side to replace the earlier V-struts, plus the option of a controllable pitch prop.

In total, something like 7,700 of the little devils were produced before Cessna shut down production of its post-war two-seater. The company began building the modern model 150 in 1959, a design that carried on with many of the 140's components and concepts.

What didn't translate was the tail wheel. By some estimates, that was unfortunate. Cessna was eager to move into the modern age, and the





competition, primarily Piper and Beech, had transitioned to more modern nosewheel designs, which were notably easier to fly, even if they were heavier and more complex in construction.

Don Hennesey told me he'd flown a 150 before buying his 140, and he didn't feel the newer airplane was as much fun to fly. Certainly, it wasn't as much of a challenge, and therein lay the rub. Don was one of those guys who liked to test himself against the sky, even if the tests weren't tough. If there was a crosswind blowing at Long Beach, Don would be out testing his ability. In 10 years of flying with him, I never found him lacking, and he never bent his airplane.

Fact is, many pilots enjoy the challenge of confronting and defeating new, more demanding conditions, despite (or perhaps because of) the fact they've never been tested so rigorously before.

Don passed away a few years ago, but his airplane lived on for several more years. I didn't follow its chain of ownership, but I learned someone wiped it out in a nasty crosswind at McCarran Airport in Las Vegas. Don would have been sad to see his good friend crumpled in a pile beneath the neon casino signs.



Jeramie Eitel's 140





Photo of Travis Latham's 1950 Cessna 140 by Jack Fleetwood.

## Flying the 140

To be fair, the 140 isn't that tough to fly during transitions to and from the earth. It is a very light machine, only 1,450 pounds gross, and almost by definition that means greater susceptibility to the vagaries of wind.

The NACA 2412 airfoil was nevertheless relatively forgiving of all but the most egregious transgressions. Stall speed was a low 39 knots, so you could approach at 48-50 knots without that verge-of-destruction feeling.

Stall characteristics with Cessna's 33-foot-span, 159-square-foot wing were about as benign as they come. Frustrate a stall with full back yoke, and the airplane would usually buck and complain as the nose bobbed up and down, seeking flying speed and lift. Allow the ball to drift too far out of center, and the airplane could eventually get mad at you and drop a wing into a spin, but recovery demanded little more than forward yoke and opposite rudder. If you were simply awake, you could usually countermand a spin in one turn.



# SPECIFICATIONS & PERFORMANCE

## 1946 Cessna 140

All specs and performance numbers are drawn from official sources, sometimes the specific aircraft flight manual or Jane's All-The-World's-Aircraft.

### Specifications

Engine:	Continental C-85-12
Fuel:	73 octane
Capacity:	22 gallons/ 132 pounds
Prop:	two-bladed, fixed pitch
Gross weight:	1,450 pounds
Useful load:	560 pounds
Empty weight:	890 pounds
Payload – full fuel:	428 pounds
Landing gear:	Fixed, tailwheel
Wingspan:	33 feet
Height:	6', 3"
Wing area:	159 square feet
Wing loading:	8.7 pounds per square feet
Power loading:	17.1 pounds per horsepower
Cabin doors:	2
Cabin width:	40 inches
Cabin height:	42 inches

### Performance

Cruise speed:	94 knots
Fuel burn:	4.8 gph
Range:	360 nm
Rate of climb:	680 fpm
Service ceiling:	15,500 feet
Takeoff distance:	750 feet
Landing distance:	460 feet

### Performance

The diminutive Cessna could easily squat into places it couldn't hope to leap back out of. Landing gear extenders were a popular option that increased the deck angle, improved the wheelbase, and made the airplane less likely to flip onto its nose under heavy braking.

Empty weight on the 140 was about 890 pounds, leaving a useful load of 560 pounds for a lightly equipped airplane. With a full 22 gallons of 73 octane fuel in the tanks (standard aviation fuel in 1946), this left a hefty 428 paying pounds for people and things in the cabin.

Considering that there were only two seats, that's a substantial payload. It's adequate for two big men plus toothbrushes or a typical couple and major luggage, assuming you could find a place to stow it.

When it was time to lift the weight into the sky, power loading was a controlling factor. With only 85 hp to boost 1,450 pounds, each of the Cessna's horsepower had to elevate 17 pounds of airplane, so you couldn't logically expect great enthusiasm during the ascent. Cessna bragged of 680 fpm climb, but most owners suggest that was optimistic. On a fairly standard day,





Photos of Jeramie Eitel's Cessna 140 by Jack Fleetwood

Don's airplane managed more like 500-550 fpm, and the alleged 15,500-foot service ceiling was little more than a dream.

Fortunately, there was usually no great rush to climb, and little reason to fly high. We were both too smart to take on a 6,000-plus foot density altitude at full gross. In one instance, we did launch from California's Big Bear Airport (elevation 6,750 feet MSL), 60 miles east of Los Angeles in the San Bernardino Mountains, and we were grateful for a nice, flat lake that extended several miles out on the initial leg.

The 140 seemed happiest at relatively low altitudes — 2,000 to 6,000 feet AGL — and 75% power usually produced about 90 knots cruise, a speed that seemed quick enough considering that we were rarely in a hurry. The 140 was in every sense a fun machine, more sport plane than medium speed family transport. Pushed to max cruise, it burned about 4.5 gph, so its 22-gallon tank could provide an easy 3.5 hours' endurance plus reserve. Pulled back to 55% power, it could linger aloft for more than four hours. This provided an easy range of 360 nm, depending upon who you believe.

Four hours in a 140 would have been quite enough for anyone, especially two men of modest beam. The cabin was a mere 40 inches across at the hips and not a lot taller, so long trips weren't the 140's strong suit. Don did fly his airplane to the Albuquerque Balloon Fiesta one year (about 600 nm each way) and he survived without any permanent spinal damage.

Don always talked about someday stepping up to the 90-hp engine, or even the STC'd Lycoming O-235 that pumped power to 108 hp, but it was never more than a dream. The stock engine seemed as bulletproof as they come. Don believed in running the Continental at full throttle most of the time, and he never had any problem with the durable C85-12F. Additional power probably would have offered a welcome improvement in climb, but I doubt there would have been much change to cruise speed.



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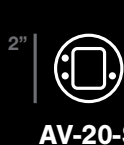


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Cooper Smith's 1957 Cessna 140 Photo by Jack Fleetwood



Photo of Jeramie Eitel's Cessna 140 by Jack Fleetwood



Cooper Smith's 1957 Cessna 140 Photo by Jack Fleetwood

What the 140 did best was take us to places I couldn't even consider in my airplane. The book said landing distance was only about 300 feet if you were doing everything right, but takeoff demanded more like 500 feet, not that unusual for a low-powered two-seater. No big surprise that the owner flew the airplane better than I did, though I had the greater number of hours, and he was consistently able to sandwich into places I never would have attempted. He had the stock tires in place — none of those big, heavy, balloon bush tires for him — and he could consistently ground the airplane in what seemed a ridiculously short distance.

Some 140s in Alaska were actually fitted with floats and many were flown above skis. The ski undercarriage would have been fun, but I imagine floats would have relegated the airplane to low level, with precious little climb performance. Even so, a 65-hp Cub seemed to fly reasonably well on lightweight floats, so perhaps the 140 would have performed better than I expected.

Despite 65-plus years of attrition, there were enough Cessna 140s built that there is still a ready supply on the market. Most owners of Cessna's first, real, entry-level, trainer are justifiably proud of their arrogant, little, fun, tailwheel machines. 🛩️



**Bill Cox** took his first flight in a Piper J-3 Cub in 1953 and has logged some 15,000 hours in 311 different types of aircraft since. He has authored more than 2,200 magazine articles and was the on-camera host of the 1980s TV series "ABC's Wide World of Flying." Bill is currently rated Commercial/Multi/Instrument/Seaplane/Glider/Helicopter. He can be contacted via email at [flybillcox@aol.com](mailto:flybillcox@aol.com).





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By Katie Holliday-Greenley



## How to choose the best options for you

This month, we asked members to share their best advice for upgrading avionics. Many said that research is the most important first step and others named matching mission to equipment as their top tip. From specific product suggestions to tips on what not to do, this article will help you prep for your next panel upgrade.

### Carlton Stidsen

#### Cessna 152

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Find a radio that works. Buy new, if you can afford it.
2. Stay away from fancy whistles and bells unless you really need them.
3. Don't let your ego overcome your checkbook.

**If you could change one thing about your avionics upgrade, what would it be?**

Buy a new transceiver. I'm a VFR 152 driver and tired of 40-year-old, well-used radios crapping out when I need them. For navigation, ForeFlight on an iPad works fine for me for VFR when matched with printed sectionals and looking out the windshield.

**What's your favorite part about your avionics upgrade?**

Giggling over all the goodies available before reality about price and mission sets in. It's kind of like a kid at Christmas drooling over the window displays.



### ▲ Frank Jungman

#### Cessna 172

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. It will cost twice as much and take twice as long as you think it will.
2. Really look at what you need, what your mission is, and what is available to meet that need.
3. Elimination of the vacuum system, if in-reach, is worthwhile as you remove a lot of moving parts and weight.

**If you could change one thing about your avionics upgrade, what would it be?**

I would have dedicated more time to getting it done quickly. I severely underestimated the work.

**What's your favorite part about your avionics upgrade?**

The uAvionix AV-30-C. That is a really easy-to-install, beautiful device with AOA audio output.





## ◀ Norbert Cooley

### Cessna 177RG

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Do your research.
2. Analyze both short-term and long-term plans with upgrades particularly if you're not doing a complete upgrade.
3. Once a decision is made, understand what you will have and what you will not have.

**If you could change one thing about your avionics upgrade, what would it be?**

Although everything is compatible, I would have installed a system from one manufacturer.

**What's your favorite part about your avionics upgrade?**

The weight reduction and decluttering of the panel.



## ▶ John Brain

### Cessna P210

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Get a written estimate.
2. Get a written timeline.
3. When changes happen, get a change order with a cost breakdown.

**If you could change one thing about your avionics upgrade, what would it be?**

I would not change a thing about the panel, but I would have insisted on a timeline.

**What's your favorite part about your avionics upgrade?**

The ease of use: touchscreens are so much easier than twisting knobs.

## Rob Garrett

### Cessna 182

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Research, research, research.
2. Understand your mission — VFR day/night, light IFR, or true IFR.
3. You might pay a little more but will forget the difference shortly after the install and enjoying the benefits.

**What's your favorite part about your avionics upgrade?**

The preciseness of the glass avionics. You're not reliant on a spinning vacuum pump. It has calculated TAS, ground speed, and wind direction. It also has ETA to destination displayed for passengers, ADS-B traffic notifications, and weather display. It has airport runway and frequency information, extended runway centerlines to locate the airport in weather or at night, and glideslope calculations even when no IFR approach exists.



## ► Paul Koehler

### Cessna 182

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Do your homework and research potential shops — you need to trust the shop you choose and that relationship, once started, can last a long time so make your choice carefully and intentionally. Use social media, other pilots, and the shop website. Call the avionics manufacturer and ask about the shop to see if they are certified installers for your products. Visit the shop, see who they are and what type of planes they have in the shop — if you're in a Skylane and their shop is full of Citations maybe you want a different shop. If you want Garmin and they have Dynon on every wall, you need to ask more questions: Is the shop clean? What is the backlog to get in? What is the estimated downtime? How much added money will you need for unforeseen “while the panel is open” issues? It's really a marriage between you and the shop once they open the panel — choose your mate carefully.
2. Once you settle on your avionics wish list and narrow things down to a few shops, sit down for an hour with the shop manager and review what you want and the associated cost keeping your post-upgrade goal (heavy, light IFR, etc.) centered in the conversation. Open your ears and your mind and listen to what they say carefully. A good shop will give you solid advice that balances the practical and cost-effective while also seeing what you already know. Also, don't think because you got a firm quote from a good shop that you will write a check for that amount and go home happy — far from it. And the older your airplane, the worse this gets — new GPS unit but keep old non-pullable breaker? Probably not. Replace five of 12 breakers and leave the rest? Probably not. Prepare yourself for unforeseen costs up to 50%.
3. Do your homework again and ask yourself what the purpose of the avionics upgrade is when it's done. Is it heavy IFR where you need to be somewhere in all but the worst weather? Is it light IFR where you want a bigger options toolbox to get yourself out of a bad situation with weather? Or is it just to satisfy FAA requirements? Let that answer lead you to the best (not perfect, just best) avionics choices — remember also when you mix manufacturers of the different panel units you create an entirely new, and perhaps one-off, set of challenges for yourself and the shop. Be prepared to manage bugs, bugs, and more bugs, which may never end as each manufacturers' later upgrades to their software will bring in a new set of bugs for you to enjoy.

**If you could change one thing about your avionics upgrade, what would it be?**

I failed on a detail — I added a “starter engaged” light after the upgrade and the labels don't match the custom panel. Other than that, I got great advice and a great in-



stall, and I am still thrilled with my avionics suite every time I power it up three years later. And I am still learning about all the capabilities of each unit three years later — the pilot remains the most improvable part of the airplane.

**What's your favorite part about your avionics upgrade?**

The integration and lack of “bugs” — it's all Garmin except the JP Instruments EDM so they played well together from the day I picked the plane up. It hasn't been perfect but it's as close to perfect as I think we can get especially after hearing some horror stories from other guys who used a Dynon unit with a Garmin unit with another unit and they are still swatting bugs five years later as each unit software gets upgraded — yes it was more expensive but it was worth it to me.

## David Ellis

### Cessna 170


**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Figure out your budget and look for what fits both budget and mission.
2. I would go with the latest generation of equipment. Don't buy something on the end of its support cycle just because it's cheaper.
3. If in doubt, refer to number one.

**What's your favorite part about your avionics upgrade?**

I have a Garmin 750 in my other plane and love it. For the 170 I will probably do the Garmin 375 for traffic and GPS approaches.






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## ► Norman Clark

### Cessna 182

**What are your top tips for someone who's preparing to upgrade their avionics?**

Get several bids: cheaper doesn't mean better. Ask each one what they are going to do and compare their responses. You will be surprised by the differences and what's included/excluded in the price.

**If you could change one thing about your avionics upgrade, what would it be?**

I would have upgraded the engine monitor to a JP Instruments 930. At some point you just have to stop spending money. Right?

**What's your favorite part about your avionics upgrade?**

Upgraded to get better situational awareness for single pilot IFR. The GFC 500 is awesome.



## Rocky Capozzi

### Cessna 172

**What are your top tips for someone who's preparing to upgrade their avionics?**

You need to have a clear idea of what you want to use your new avionics for. Will you fly IFR? Do you operate in airspace requiring ADS-B? Do you need a (larger) moving map display? I just put in a Garmin GNX 375 that has integral ADS-B capability because I fly out of the only airspace in Alaska that requires ADS-B. I didn't want to be shut out of the approaches to Anchorage and Merrill Field. It's a small screen because the GNX 375 was designed as a retrofit for old 2-inch by 6-inch units. That's OK because it ports all data directly to ForeFlight or Garmin Pilot. The 375 has a high-definition color display and thoughtful pilot interface and I find it's very useable for IFR and VFR operations. I also added USB ports and 2-inch electronic attitude (for backup).

**If you could change one thing about your avionics upgrade, what would it be?**

No complaints so far. If I had more money, I might have added an OAT probe to feed the GNX 375 so it could compute TAS, but I decided I didn't need that capability.

**What's your favorite part about your avionics upgrade?**

I love the interface between the GNX 375 and portable electronic devices. It ports via bluetooth to ForeFlight or Garmin Pilot including AHRS data. It also provides data to my JP Instruments EDM 830.

## Paul Burke

### Cessna 182

**What are your three top tips for someone who's preparing to upgrade their avionics?**

1. Determine your mission and let that dictate your budget. It will all be expensive, but you may be going overkill for what you need.
2. It is sometimes less painful to do everything at one time. However, if you are unable to do it at one time, think two steps ahead so that can keep it modular and don't have to replace something that does not play well with the next piece.
3. If you think you know what you want, find someone who has it and see if you can fly with it. You may determine you love it — or not!

**What's your favorite part about your avionics upgrade?**

I got rid of my vacuum pumps. I went with the Aspen Evolution Pro MAX 2000. It was not much less expensive than the Garmin system, but the Aspen system will talk to legacy autopilots and the Garmin will not. This allowed me to keep and continue to use my S-TEC 50. In the future, if I'd like to upgrade the autopilot, I can still upgrade to the digital S-TEC. Since it will continue to use the same service, I will be able to get into a digital autopilot at a much lower cost and if I was to go straight to Garmin 500 or other digital autopilot. This allows me to upgrade in steps to ensure that future pieces will fit and work with the current upgrades in place. 🛩️



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by Scott "Sky" Smith



# Aerial Overlanding

## A fun, adventurous way to travel

Usually, at this time of year I'm talking about traveling in your aircraft to shows and events and enjoying the great world of aviation.

But with the current situation, shows are few and far between. And travel, well, that depends on where you go. If you fly to the wrong state (or city) you may be staying in a local hotel for two weeks before enjoying the sights.

One of my customers landed to deliver parts to an airport in a state that had mandatory quarantining. The airport manager told him to stay in the airplane because if he got out, officially he would have to stay for two weeks. Yeah, I know — who is going to know, right? I doubt anyone would be the wiser, but why take the chance — just stay out of the area to begin with.

Of course, there are lots of places you can go that do not require quarantining. But once you are there and you find the closed hotels, restaurants, and stores, what is a pilot to do?

Well, that got me to thinking about the world of "overlanding."

Haven't heard of overlanding? Well one definition says, "Overlanding is vehicle-based, on-road and off-road, adventure travel with a focus on self-reliance, resilience, and enjoyment of the journey... You can start

small or go big — often it starts with a weekend here or there and then becomes more serious over time as the love for overlanding grows." Another quick definition is, "Overlanding is self-reliant overland travel to remote destinations where the journey is the principal goal."

So, I know you are thinking how does "overlanding" fit in with aviation? Well, when you fly you are already going "over land" and "off-road" — and you can go to destinations for short or long periods of time and be self-reliant. Aerial overlanding!

If you think about it, even with all the quarantining, masking, and lockdowns happening around the country, one thing that has pretty much remained unchanged is personal flying.

As an aircraft owner, you can still take your aircraft and social distance travel to almost anywhere in the country. Yes, there are some limits, but if you plan (and pack) wisely, pilots can still enjoy traveling and getting away.

Look around on the internet and you can find there are still small events happening in communities — many that have an airport. Some of the hotels and motels are closed, but many more have just added restrictions or limitations. If you are comfortable with the situation, you just might have a place to stay.



## Camping at an airport?

If you really want to “aerial overland,” there will often be an opportunity to stay or camp on some of the smaller airports.

How many of you have flown to an aviation event like AirVenture or SUN 'n FUN? If you have, you probably have already had the experience of camping at an airport. I realize these bigger events are organized and have advantages such as shower and bathroom facilities, but that doesn't mean you can't find the same on a smaller scale.

Camping at small airports can be a completely primitive experience, but more than likely it won't be. It is not unusual for an airport to have bathrooms and kitchenettes for pilots who are hanging out in the facilities.

## Getting started

So, how do you figure out what airports are good options for overlanding? First, check out (and maybe join) the Recreational Aviation Foundation (RAF).

According to its website, the RAF was founded by a group of pilots from Montana who realized the closure of recreational airports was a national concern. “[The pilots] also recognized that there was the need for a unified effort by pilots everywhere to protect public recreational opportunities. The RAF is dedicated to preserving existing airstrips and actually creating new public-use recreational airstrips throughout the United States,” the website states.

The reason I mention the RAF is that they are out there promoting and preserving small airports and landing strips that can be used for just this type of aviation.

Once you've checked them out, start thinking about *your* type of trips. Are you a one-day type of pilot or multiple days? What type of trips are appropriate for your aircraft? If you are a Cessna 150 owner, your trips will probably be short in distance and time. How much can you pack in your aircraft? If you need a tent, cooking supplies,

## AERIAL OVERLANDING CHECKLIST

1. What is your aircraft capable of?
2. What are you capable of?
3. Where are you going? Is it a private or a public location? If private, make sure you get permission or permits first.
4. Are there fuel services? Can you use mogas if avgas is not available nearby?
5. Are lodging and bathroom facilities available? If not, can you camp on the airport or sleep in the aircraft?
  - a. You might investigate dry biodegradable waterless toilet supplies.
6. What can you do after you arrive? Fish, hike, shop — you never know what might be close by.
7. What will you do for food? Can you buy it there or do you need to take it with you? It's always good to take backup food and water anyway.
8. Do you have transportation available if needed? If you have room, you could take bicycles.

etc., a smaller plane is at a disadvantage for long duration trips, especially if you are really in the backcountry. That doesn't stop the trip, it just changes the location.

## Don't forget insurance!

Most aviation insurance policies do not prevent you from flying into grass and remote airstrips. Most do not even prevent you from landing in a field. It comes down to “pilot common sense,” if there is such a thing.

Think about the risk you will be undertaking before you take it. For example, if you are in a remote area, aircraft repair and medical facilities are a long way away. Make sure your planning includes taking into consideration what you

are capable of doing on your own.

Insurance usually covers search-and-rescue and wreck removal, but only within the limits mentioned in the policy (check your policy or ask your broker). If the aircraft is too remote and recovery will be over the policy limits, you may have to pay out of pocket to get you and the plane home.

If you have an off-airport landing and all you carry is liability, there won't be any coverage for the wrecked aircraft. Removal of the wreckage can cost a lot of money. I was talking to an Alaska pilot who lands at places that do not have easy, if any, access by ground. The only way to get the damaged aircraft out is by helicopter or another aircraft.

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1961 Cessna 172  
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## BASIC TRAVEL CHECKLIST

1. Credit cards
2. Get out of town cash
3. Copy of logbooks – pilot and plane
4. Digital or paper copy of insurance policy or declaration pages
5. Handheld navigational and communication devices
6. Backup batteries
7. Power cords
8. Parts and service manuals
9. Tool kit that includes:
  - a. Screwdrivers
  - b. Adjustable wrenches, pliers, etc.
  - c. Aircraft remote start “cables”
  - d. Tie downs
  - e. Control locks
  - f. Wheel chocks
10. Sick sacks
11. Food and water
12. Survival equipment as appropriate for the trip
13. Assorted zip ties
14. Duct tape
15. Whatever else you think you might need on the trip

Another issue is your aircraft’s capabilities and your pilot abilities. If you and your aircraft are not designed for short- or soft-field locations, don’t go. If you do and have an accident, it doesn’t mean the insurance company won’t pay the claim, but they will probably cancel your policy afterward.

### What type of aircraft?

Any type of airplane can work for aerial overlanding. Each aircraft has its own limitations and if you fly within those limitations, everything should be good, although in this case I’m thinking about aerial overlanding as “going to non-standard airports and runways.” While there are many small, paved airstrips just waiting to be visited, there are a lot more that are unpaved and waiting to be discovered.

Many people will tell you that you need a tailwheel aircraft for grass strips. That’s not true. But if you do have a fixed tricycle gear aircraft, you might need to remove your wheelpants to prevent damaging them. Also, some aircraft have less substantial gear and probably should stay on paved airports. But, again, there are still a lot of small airports in small communities with paved airports, so don’t let that stop you.

Thinking out loud, I think my choice would be a Cessna 172 or 182, or maybe a Piper PA-28-180 or 235. These models are readily available, easy to maintain, have reasonable insurance rates, and are very durable. If I were shopping for a plane to use for aerial overlanding, I’d look for one that was mechanically sound and cosmetically weak with no wheelpants and maybe even heavy-duty wheels and tires. And if it has a STOL kit, it would go to the head of the list.

Aerial overlanding can be hard on the paint and interior, which is why cosmetically weak is a good choice. Why pay for new paint or a fresh interior just to beat it up?

If you are carrying bicycles, tents, stoves, tools, etc., you might even take out a couple of seats. Removing the back seats of a Cessna 172 can even give you enough space to sleep. ✈️



**Scott “Sky” Smith** is a nationally recognized writer and speaker. He is the author of “How to Buy a Single-Engine Airplane,” “How to Buy a Skymaster,” “Ultimate Boat Maintenance Projects” and “How to Build a Hot Tuner,” (published by Motorbooks International). Smith’s background includes: aircraft and avionics sales, boat dealership and fiberglass manufacturer. He is a single and multi-engine pilot with over 30 years’ experience. Smith is also owner of Sky Smith Insurance Agency, a nationally recognized specialty insurance agency, insuring boats, custom vehicles, and aircraft since 1985.



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STRATEGIC PARTNER

By Jim Gibertoni

# NIGHT MOVES

## CURRENCY VS. PROFICIENCY

About a half-century ago, Bob Seger and the Silver Bullet Band had a song called “Night Moves,” which is one of my favorites. For some reason, that song sticks in my head when I think of night currency and proficiency. Night flying is a program all to itself and therefore deserves its own risk management program. It’s a different ball game.

Currency is a level of current experience required by some FAA regulation and it must be entered in your logbook. Currency is not to be confused with proficiency, which means you’re very comfortable and competent. Pilots that are very proficient in a specific aircraft are said to be the “absolute master” of that aircraft. What I mean by absolute master of that aircraft is that pilot has all the air speeds and flap speeds memorized. The three engine knobs are different colors and surface contours, so by touch the absolute master knows which is which while in darkness. They’ve got any nuances by heart. Every button and whistle is down pat. That’s the proficiency I think a pilot needs before night flight. I would recommend you become the absolute master of your aircraft before you fly cross-country at night in Alaska.

### The rules

*“No certificate holder may use any person, nor may any person serve, as pilot in command of an aircraft carrying passengers unless, within the preceding 90 days, that person has - (2) For operation during the period beginning 1 hour after sunset and ending 1 hour before sunrise (as published in the Air Almanac), made three takeoffs and three landings during that period as the sole manipulator of the flight controls in an aircraft of the same category and class and, if a type rating is required, of the same type in which that person is to serve.”*

You’ve got to know the rules — do your homework.

Night currency regulations always seem absurd to me, especially because I live in the interior of Alaska, which has 22 hours of darkness come December 21, and 22 hours of daylight come June 21. Down south, most of the time, day and night are more evenly split. Not

in Alaska. Again, one shoe doesn’t fit all. Because Fairbanks is so far north, the area experiences 70 straight days of sunlight from approximately May 17 through July 27, and, conversely, during the winter season the area experiences a significant reduction of daylight hours. OK, hold on we’re going down a rabbit hole — long way to daylight (no pun intended).

As I understand it, to regain legal night currency I have to complete three takeoffs and landings to a full stop one hour before sunrise or one hour after sunset if I carry passengers.

First thing, we have to define “night.” Night means the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the Air Almanac converted to local time.

Second thing, we need to define “civil twilight.” The National Weather Service defines civil twilight as: “Begins in the morning, or ends in the evening, when the geometric center of the sun is 6 degrees below the horizon.” Therefore, morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon and ends at sunrise. Opposite for evening. This is really important up here because the sun never gets high in the sky. It’s just over the horizon.

That’s why you need a sextant (like Columbus or Magellan) to be absolutely sure the sun is at least 6 degrees above or below the horizon.

Under these conditions, absent fog or other restrictions, the brightest stars and planets can be seen, the horizon and terrestrial objects can be discerned, and, in many cases, artificial lighting is not needed.

### Beyond the requirements

There is no requirement to make a night cross-country for currency (that I know of) but I think it’s important for proficiency. So, here’s the way to do it. I pick a day in (let’s say) late August when daytime and nighttime are somewhat equal. Let’s say sunset is 7:30 p.m. so the legal witching hour is about 8:30 p.m. (per the above definition). I take off 15 minutes before the witching hour and get



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immediately into the pattern and start doing touch-and-goes or stop-and-goes as the light leaves us. Now, none of these are counted for legal night currency. However, I'm acclimating myself to the diminishing light. Around and around the berry patch for 15 minutes and each time it's getting darker. After the witching hour, then those stop-and-goes can be logged as legal night currency.

A day or two after, I pick a night with very VFR conditions and complete a three-landing cross-country with one leg greater than 100 nm. This is for my own proficiency training, not a regulation. Due diligence!

In late fall or beginning of winter, we have very dark evenings, little or no snow, and ceilings of 4,000 to 5,000 feet about shut off the moon light. Absent is any artificial light (no towns or cities, maybe a few bush villages). It's like being inside a closet with the door closed — thus, night vision like being in a room with no windows. It's the opposite in spring — no ceilings, high full moon, clear, snow covers the earth completely for optimum reflection. Hence, night vision is pretty good.

I carry two lanyards with three pen lights attached to each one. One goes around my neck and hangs down inside my coat to keep them warm. This is paramount to keep the batteries warm. Each light is different: one red, one black, and one green. Redundancy. I use these so I can see in the cockpit. No white lights.

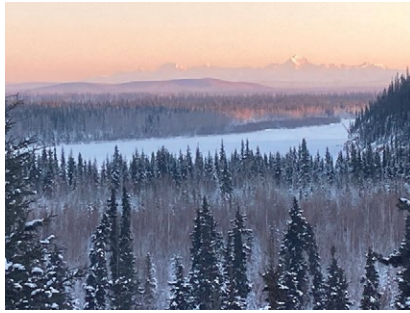
Review of FAR 91.205: Powered civil aircraft with standard category; instrument and equipment requirements for day and night VFR or IFR during your preflight is paramount. If you're going to fly up here at night, I suggest you have an instrument rating and make sure you're current and proficient in IFR.

## Lights at night

My airplane has all LED lights and it also has wing tip pulse lights, which I love except when I am IFR at night descending down through cloud layers. I get a very disconcerting effect when the pulse lights are reflecting off the clouds back into my peripheral vision.

Which brings me to another night issue. I call it "night decorum white light pollution." When taxiing at night from my hangar to the elephant loop, I leave my pulse lights and my landing light off (I use them while flying). I just use my taxi light, beacon, and position lights. This is done so my wing tips and landing light don't inadvertently flash other pilots, which destroys their night vision. Understand the pulsing wing tip white lights are the worst here. Landing lights are also bad because, if properly adjusted, they point straight out. Taxi lights on your aircraft are not so bad because, if adjusted properly, they kind of point down more — that's why they're called taxi lights! Turn on your landing light and wing tips immediately prior to taking the active.

Night vision is something that is acquired only after one takes specific steps. Keep bright white light away from your eyes for about 45 minutes before takeoff.



Airport landing lights are yellow and green, airport taxi lights are blue. You ever wonder why airport lights are not white? That's not an accident — white lights are taboo for night vision.

## Night procedures

Another thing, in Alaska we have about 200 airports but less than a dozen with operating towers. About 85% of the approaches are to non-towered airports that state on the approach plate "Procedure NA Night" (I guess come back in a month or two when we have daylight). So, unless you arrive at high noon you cannot use the airport approach plate. If you arrive at that village on an IFR clearance at night, ATC will not clear you for that approach because they are well aware of the "Procedure NA Night" caveat. (Gotcha!)

Once again, one size doesn't fit all! Here's why: In the lower 48, when "Night NA" is applied, it basically shuts the use of that specific approach chart down for a few hours for IMC conditions. However, the same rule up here in Alaska may shut down a procedure for four months. In a state that's half the size of the lower 48 and only 4% of it is accessible by road, this is a big deal. Aviation is our lifeblood up here! The results have a very restrictive, profound effect on the very commerce and utility of your aircraft. Understand, to an Alaskan resident like me, whose livelihood is plumbing and heating, and whose Cessna 206 has been my plumbing truck for years, this issue is painful and increases my risk management scores. As Hook would say, "Bad form!"

You never want to be left out in the dark with no place to run up here. Numerous animals up here are bigger than you, faster than you, and hungrier than you. As I've mentioned before, Alaskan aviation infrastructure is very poor. It's lacking in nav aids, ADS-B stations, FSS/RCO, weather reporting, and aircraft with ADS-B In and Out equipment installed. Then to heap more fuel on the fire, we do not have SiriusXM radio signal up here either. That whole program stops about 750 miles south of Alaska.

Up here we have a lot of ravens. They do not migrate and it's very common to see them flying around all year even at 50 degrees below zero during daylight. It's extremely rare for them to fly around at nighttime; evidently they got the FAA's memo on night flight. It always made me wonder why am I flying at night when a bird with a brain under 1 ounce doesn't.

Again, make no mistake about it, flying at night in Alaska is very different than the lower 48. You can fly into a cloud you never saw nor heard reported coming. Icing, terrain, poor infrastructure, poor weather reporting, few IFR approaches. Night flying in Alaska is like black holes in space! 🛩️

---

**Jim Gibertoni** has been a pilot in Alaska for more than 40 years. He has flown as a search and rescue pilot for 23 years and currently owns a Cessna U206G, which he uses to give the occasional ride to Alaska newbies.



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# PDQ Emergency Egress System

## The simplest most cost effective solution for 206 owners

Safety should be the foremost thing on every pilot's mind and part of that mindset is ensuring plane, pilot, and passengers are prepared for an emergency landing. In the case of the Cessna 206, the aircraft came with a potentially fatal flaw.

The emergency egress issue in the Cessna 206 boils down to a design flaw that makes it impossible to open the forward cargo door if the flaps are down, which they usually will be in a successful emergency landing.

Located in Fairbanks, Alaska, where the 206 is commonly used for sightseeing flights, Airframe Innovations – America's Northernmost PMA facility – had firsthand knowledge of the problem and knew a new solution was needed.

"This has been a documented concern for decades," said Airframe Innovations President and CEO Karl Braun. "Even for a small horse jockey, exiting from the rear cargo door is a circus act under the best of controlled conditions. In a water upset or post-crash fire, seconds count, and the average North American does not stand a chance."

So, the company set out to create a new option for owners and operators that would be an easy-to-install, easy-to-use fix.

"The solution needed to be simple, cost-effective, and safe so that folks on sightseeing flights, commuter, and family excursions would be able to use the door as normal in normal situations and **'PULL THE BIG RED HANDLE'** in an emergency."

One of the goals Airframe Innovations had when creating the PDQ Emergency Egress System was to ensure it could even be used by children.

"I am the father of small children," Karl said. "The thought that they or others could easily drown in a 206 in a water upset bothered me. Many folks have already called and shared heartfelt stories of such losses."

The system works in two easy steps:

1. Open the Cessna door handle. If the flaps are up, the door will open normally.
2. If the flaps are down, **"PULL THE BIG RED HANDLE"** and the door falls away.

Even if the occupant panics, which is common in the event of an emergency landing, they need only remember step 2: **"PULL THE BIG RED HANDLE,"** the door will fall away.

"The OEM method is not simple enough for a child," Karl said. "When giving my wife the standard 206 egress briefing, she stopped me before I got to step 4 and said, 'Not Mom approved! Me and the kids are not going.' I then described the system I had designed and had my children demonstrate the simplicity of the system. There is no reason folks should drown in a water upset or perish in a fire."



Thus, the "so easy a child can use it" PDQ system was Patented.

In addition to allowing passengers to operate the handle from the inside, the PDQ system also allows rescuers to open the door from the outside even if it is locked.

"No other APPROVED 206 Egress system has this lifesaving feature when seconds count," Karl said. "Airframe Innovations PDQ system removes the door completely from its hinges allowing passengers the ability to egress the aircraft in a water upset BEFORE the cabin fills with water and pressures equalize, unlike other systems. Many fire-

fighters and rescue personnel have given our system high praises for removing the door quickly and completely allowing the maximum amount of clear unobstructed egress space from both doors"

At \$3,495, the PDQ Emergency Egress System is a fraction of the cost of other solutions. It also takes much less time to install, meaning more time spent in the air.

"Unlike other view-obstructing complex contraptions, this does not modify either of the doors in any way and can be installed by a junior mechanic in the field in about an hour," Karl said. "Other solutions complicate the exceptionally rare Cessna doors with white glove workmanship rarely found in the field. The Airframe Innovations design is simple, robust, and manufactured out of corrosion-resistant stainless steel by America's northern-most PMA. It leaves the door unmolested, installs in an hour, and sells for a fraction of the cost without restricting the view. An additional benefit is that it is compatible and can be used in conjunction with all 206 cargo door egress systems on the market as well as our PMA door handles AI-0517003-2.

Learn more and purchase the PDQ Emergency Egress System, or Cessna Exterior Door Handles, aka "Help You out Handle" at [www.airframeinnovations.com](http://www.airframeinnovations.com).



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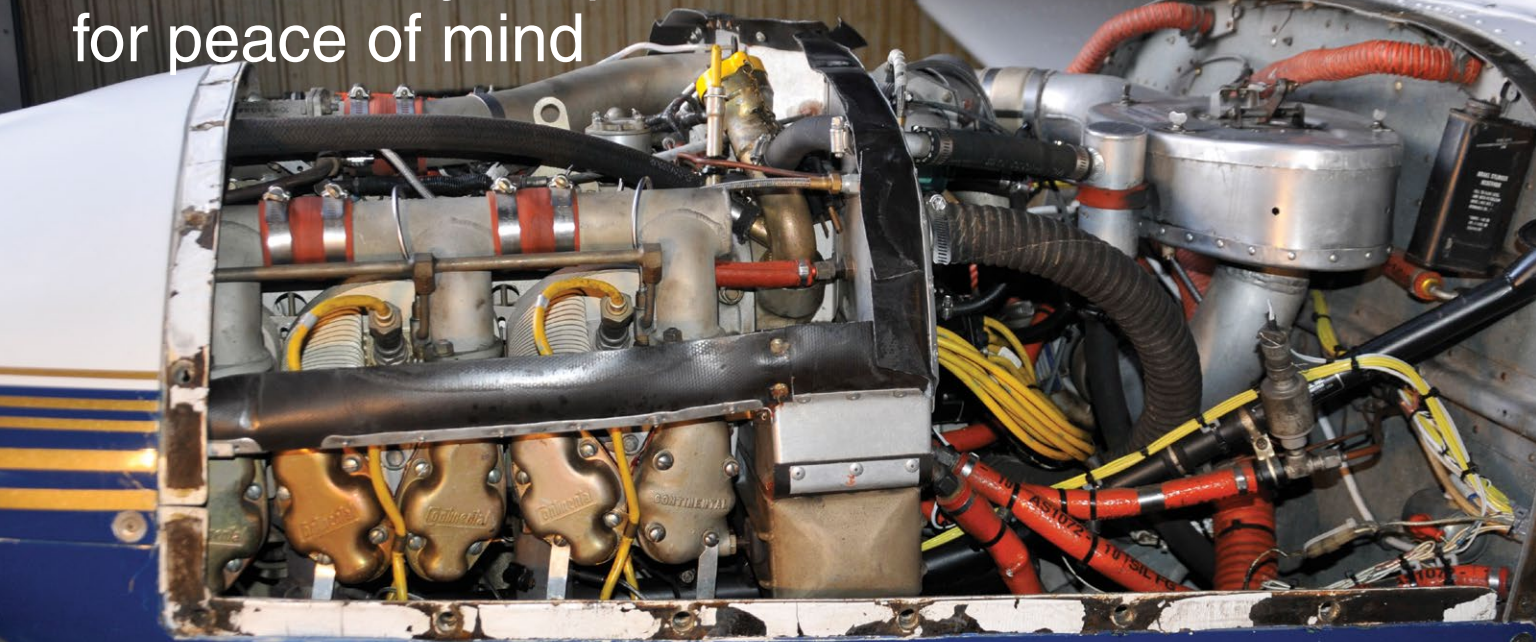
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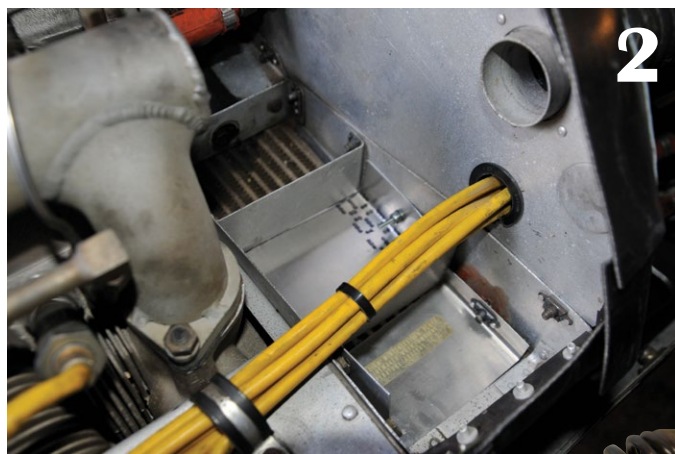
by Scott Sherer - FAA Master Pilot, author and COO Aviation Director

I've been thinking about safety, my plane, and flying quite a bit in the years since selling my Seneca and buying an Arrow. There have been a couple of safety issues that I've been concerned about since I made the change in March 2018 and if you've read our forums over that period of time, you can probably guess what they are.

## Engine Health Part 1: Oil temperature

A couple of years ago, I had my twin in the shop for an annual inspection, my mechanic (Cessna Owner Organization A&P/IA consultant Erich Rempert) made a comment to me. He said that my engine oil temps probably weren't high enough. I asked him how he knew, and he gave me one of those Alice In Wonderland Cheshire cat grins that he's really good at. He walked over to one engine and removed one of the yellow painted steel oil filler caps and handed it to me. He said to turn it over, which I did. I didn't see anything, so I gave him a confused look. He said that there was corrosion on the inside of the oil cap, which was indicative of the engine oil not reaching a high enough temperature to boil all of the water out of the engine. No water, no corrosion on the oil cap.

My single has the same engine as my old twin — a Continental TSIO-360 — and my oil filler has the same painted yellow steel cap. I removed it and, much to my relief, there was no corrosion on the inside of the cap. However, my oil temperature gauge generally reads about 120 degrees. Erich said that I need around 180 degrees to boil off any water in the oil. Obviously, this was not good.

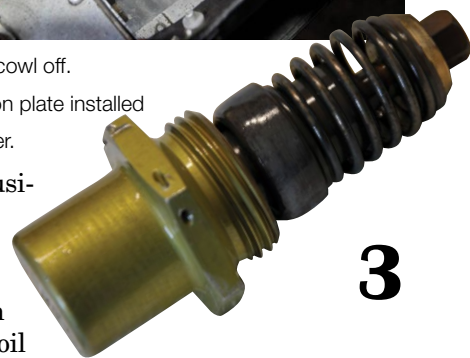


Top: Scott's engine with the cowl off.

Above: Oil cooler winterization plate installed

Below: Temperature controller.

The first order of business was to install an oil cooler winterization plate (Picture 2) to block cold air from going through the oil cooler. I made a second winterization plate, installed it (my oil cooler has three compartments, so I now had two blocked off), and went on another test flight. This time the temperature rose a little to 140 degrees.





The next step was to replace the oil temperature controller, a pricey little thermostat that on your car would cost about \$25 and on your plane costs 10 times that, at least. Erich's team replaced the temperature controller (Picture 3) and I took the plane up for a test flight. No change on the oil temp.

While I'm not a mechanic, I have learned a lot over the years by watching and asking questions. I'm also relatively good at diagnosing problems and finding logical paths to follow when solving them. This particular problem was frustrating because the next item that could cause low oil temps was the oil cooler. Was it original from 1977? Was it overhauled or replaced on the last engine overhaul 1,200 hours ago? The answers to those questions seem to be difficult to come by. I may have had to remove, replace, or overhaul the oil cooler, which might have been clogged to some extent. Overhauling or replacing an oil cooler could cost several thousand dollars so it wasn't something I took lightly.

Before I went down that path, I thought it would be prudent to confirm that the oil temp displayed on my 1977 oil temp gauge was actually correct. Even though I had an engine monitor in my plane, a JP Instruments EDM 830, neither the oil temp nor oil pressure sensors were installed and monitored. I was still reading oil temp and pressure on the old analog gauges. So, I ordered the temperature probe (Picture 4) and oil pressure sensor (Picture 5) from Aircraft Spruce. The analog gauge shows oil temp barely above 75 degrees and the engine monitor shows oil temp at 117 degrees, a 42-degree difference. On the last test flight, the analog gauge showed about 140 degrees and the engine monitor showed 170 degrees. So, I didn't need to overhaul my oil cooler, which saved a wheelbarrow full of money.

But why the large delta in oil temperatures displayed? The most logical assumption is that the 1977 oil temperature sensor, wiring, and display gauge are collectively broken or out of alignment. In reality, I don't think that's the answer. Rather, the old temp sensor is placed very near the oil cooler and hence is, well, cooler! The new temperature sensor is at the front of the engine where the oil is about 50-plus degrees hotter. This problem seems to have been solved.

## Engine Health Part 2: Oil pressure

So, one area of queasiness solved — oil temperature. But what about oil pressure? Are the old analog gauge and sensor reading correctly? While installing the temperature sensor I had Erich install the pressure sensor, too. And this is where technology again collides. However, the outcome is better than what I had to go through for oil temperature. Erich installed the pressure sensor and configured the engine monitor for both new sensors: oil temp and pressure. I took it for a test flight and the old analog pressure was lower than what the engine monitor was reading but by no more than 15%. Close enough!

Here's where a healthy amount of paranoia is a good thing. When I was flying my twin over the last 30 years, I really didn't worry about engine health. I had two engines, after all. Now that I have just one engine, I admit to worrying about it constantly. With the engine monitor now displaying correct oil temperature and pressure — in addition to turbine inlet temperature (TIT), individual cylinder head temps and exhaust gas temps (CHT and EGT), and other very meaningful displays — I'm beginning to wonder what I did without this miracle computer over the last 50 years.

## Paper to electronic mapping

While my plane was in the shop, we did two more small projects, both of which I recommend.

When I switched from the twin to the single, I was determined to upgrade my brain along with the airplane. Erich recommended that

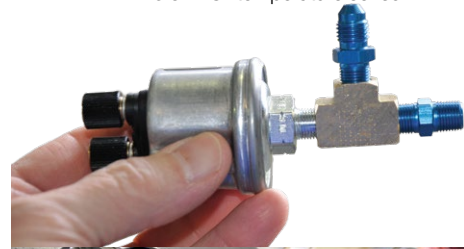


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Above: The new oil temp sensor installed in the front of the engine right behind the prop.

Below: Oil temperature sensor.



6



Oil pressure sensor installed on the engine.



The oil temp and pressure while idling.



The new temp and pressure on the engine monitor.



**Above from top:** A&P/IA Erich Rempert about to configure the engine monitor. • Guardian Avionics dual USB power port. • Guardian Avionics pulse oximeter monitor (left) and USB power port installed in Scott's panel.

I purchase an iPad mini with a yoke mount, get ForeFlight, and dump the paper charts and approach plates.

So, I bought an iPad mini, et al, connected it to my Garmin 345 transponder and Avidyne IFD 540 via Bluetooth and Wi-Fi and I was now flying without a paper map. But I still purchased the maps and kept them for backup. I have now stopped buying paper anything. My annual subscription to ForeFlight is about \$200 and the amount for the paper charts I'm not buying is \$300. Gosh, I'm actually saving money! What a novel concept.

So, where's the power for my new iPad? The power wire comes out of the bottom of the iPad, a truly bad location, unfortunately, and strings across the entire panel to the cigarette lighter on the far right side of the panel and plugs into a cigarette-to-USB power adapter. It works fine but I hate loose wires in the cockpit. I found a wonderful little gadget from Guardian Avionics: a dual USB power port (Picture 10). Erich installed this right below and to the left of the iPad where some would normally install an autopilot (Picture 11). Since there wasn't any room in the circuit breaker panel, he had to install the breaker in the panel shown in the photo.

## Carbon monoxide

My twin had a gas-fired Janitrol furnace and my single has an exhaust muff. Both are capable of pumping copious amounts of carbon monoxide into the cabin. Were that to happen, I don't think I would be having a good day. So, I started researching carbon monoxide detectors and again came back to Guardian Avionics. I was interested in detecting CO before it could ruin my day.

Guardian has a handful of these devices that fit different kinds of airplanes. In my case, I also was looking at purchasing a pulse oximeter to measure my personal blood oxygen level. Since my plane is a turbo and I have a SkyOx 40-cubic-foot oxygen cylinder in the back seat, I frequently go high on long trips. In my twin 18,000 feet was the norm while wearing cannulas. In my single it takes

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a long time to get up to 18,000 feet so I've been sticking around 12,000 feet as my personal ceiling, at least for a while. Still, while not high enough to be overly concerned, I'm still concerned enough to want a pulse oximeter.

Guardian had just what I needed: the Aero 455 combination device. It's constantly monitoring carbon monoxide and there are two displays connected for this function. If there's a harmful amount of CO in the cabin, a yellow warning light on my panel illuminates in addition to a warning tone that will get my attention. Next, the actual carbon monoxide level is displayed on a second device, an Aero 55 display. The Aero 455 will display on most engine monitors, PFDs, and MFDs as well.

A note on this. I tried for a very long time to get the Aero 455 to display on my JPI 830 engine monitor. Erich connected the 455 to the JPI 830 per the instructions and we couldn't get it to work. Ultimately, I just ordered the Aero 55 matching display and had it installed. It worked perfectly on the first try. And the pulse oximeter we were talking about? Stick your finger in the device for 10 seconds or so and your oxygen level and pulse rate will display, too.

## Safer? Yes!

So, do I feel safer having done these things? New technology oil temperature and pressure displays, iPad power, and pulse oximeter and carbon monoxide monitor. Yes, and with ADS-B In giving me weather and traffic, my S-TEC 55X autopilot giving me a smooth ride, and my engine monitor looking after the health of my engine, I definitely feel safer. ✈️



**Scott Sherer** is the Cessna Owner Organization's Aviation Director and an FAA Master Pilot who brings more than 50 years of aviation experience flying everything from the smallest Cessna 150 to mid-size Cessna Citations. As a contributing author his specialty is restoration, avionics and product review. Additionally, Mr. Sherer is our online forum moderator. To contact Mr. Sherer, please access our member website forums at [www.CessnaOwner.org](http://www.CessnaOwner.org).



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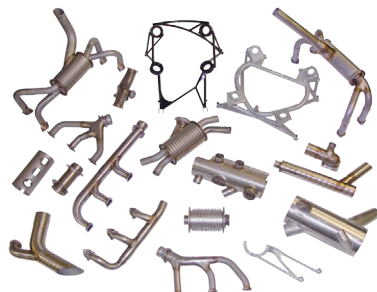
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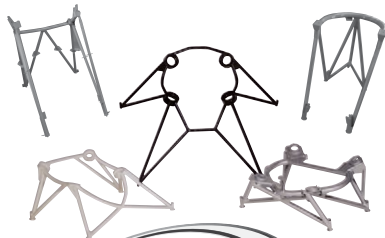
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## Dan Bauknecht 1975 Cessna 150M

Dan Bauknecht's 1975 Cessna 150 is based in Antigo, Wisconsin.

## Dan Vandermeer 1967 Cessna 150

**What are your three top tips for someone who owns or is considering buying this model?**

1. Join a type club like the Cessna Owner Organization.
2. Watch your diet and keep your weight down.
3. Web search the model and read everything you can find — pro and con

**What is special or unique about your airplane?**

Reasonably priced; solidly built; requires all fundamental flying skills; maintenance, parts, and insurance are available almost anywhere.

**What was your most recent upgrade?**

I installed ADS-B Out and In. Otherwise, it's almost all original.

**What is the biggest ongoing challenge with this aircraft?**

Its useful load is limited and it's only comfortable for 2.5-hour legs. It must be hand flown from chocks to chocks.

**What is the best reason to fly this aircraft?**

It's economical, dependable, and as hassle-free as any airplane can be.

**What is your advice to someone who's considering buying this model?**

Do your homework to decide if this small, slow airplane meets your needs. Get an independent prebuy inspection and paperwork review and a test flight.



Dan Vandermeer's 1967 Cessna 150 at its home airport in Florida. Sometimes it's OK to stay on the ground; Florida weather is fickle.



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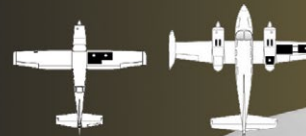
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## Elias Lemoine

### 1971 Cessna 150

#### What are your top tips for someone who owns or is considering buying this model?

I strongly advise looking for corrosion and missing logbooks. The hardest part is finding one of these that hasn't been part of a flight school at some point in its life!

#### What is special or unique about your airplane?

I bought it with just 1,500 hours (for real). It was never used in a flight school.

#### What was your most recent upgrade? How did it go? What would you recommend to others related to that project?

I added a Garmin Aera 500 and upgraded the ELT. It went pretty well and the Aera provides very useful information. I absolutely recommend adding a GPS, not necessarily to be used as a primary instrument, but as a backup in case you need it. You get accurate info so you can reckon the windspeed. That's something I find very useful.

#### What is the biggest ongoing challenge with this aircraft?

I have some weird behavior with my Narco radio display. Sometimes it displays weird numbers as if it had an issue with the power source that feeds the display. I



Elias Lemoine and his girlfriend, Paula, about to jump into his 1971 Cessna 150 in Argentina for their first flight together in *Lucy*.

had it checked and it works well, but from time to time that problem reappears.

#### What is the best reason to fly this aircraft?

I fell in love with it during my training. It's just the right size for me, too. I usually take a friend or my girlfriend for a ride in it and it's just what you need. It's economical, strong, and beautiful.

#### What is your advice to someone who's considering buying this model?

It is hard but try to get one that hasn't been used in a flight school. Mine hasn't, so the time is still really low, and you can tell when you look at it. It does make a difference and you can see that during maintenance.



## Michael Galluzzi

### 1999 Cessna 182

#### What is special or unique about your airplane?

The airplane is named *Sentimental Journey* after the World War II song — hence the registration number 7AM.

Photo by Dawn Gorrell  
Michael Galluzzi's 1999 Skylane  
over Patrick Air Force Base.



## Oil Temp and Other Gauges

**Q** On my Cessna 182B, my oil temperature gauge and right fuel gauge went inoperative at the same time. As you might guess, a replacement for a 1959 model is difficult to find. I am trying to find updated options on a budget. I'm considering, if needed, combining oil pressure and temperature into one unit as well as maybe suction and single-probe EGT. And then that still leaves right fuel. Any ideas?

*Dana Woods*

**A** My recommendation would be to replace both fuel senders with CiES Inc. digital senders and an AeroSpace Logic digital display. You will not regret it and they are far more accurate than the OEM.

As for the oil temp, if you cannot find a replacement analog gauge, your next option might be replacing all primary analog instruments with a digital analyzer. Not cheap, but effective.

*Larry Hinton*

## Vortex Generators

**Q** I've considered VGs on my 182Q. I have to admit, I'm ignorant on how they are installed and about what it would cost to do so. Would appreciate some input.

*Dan Linebarger*

**A** You can get the VGs either non-painted or painted with Matterhorn White. I chose the latter. The cost is about \$175 more. The install is done by gluing the VGs to the surfaces with VHB (very high bond) glue. My install took under three hours, but these guys had the process down pat. Everything comes in the kit including spares.

*Larry Hinton*

**A** I did a flight test last year on a plane with VGs. The stall was almost non-existent. Slow speed flight is very gentle and high speed isn't affected at all.

*Scott Sherer, COO Aviation Director*

**A** I love my VGs! I now land on centerline almost every time as result of much better rudder authority and I now come over the threshold at 65 knots and land between 60-62 knots. Crosswind landings are much easier as well due to rudder authority and aileron effectiveness. My 1970 177B FG basically won't stall. I mush along losing altitude slowly, but the nose won't break and actually stall!

*Victor Connor*

**Q** I am wondering about the effect of VGs in icing conditions, not that I plan to ever enter them, but still. We know that ice first begins to form on small protruding objects like rivet heads. Could VGs then be like little icing generators not visible to the pilot on a high wing airplane?

*Richard Shumway*

[Ed. Note: See the article on Micro Aero VGs in the August 2020 issue.]



## Tie Down Retract Spring Replacement on an Early 182

**Q** Has anyone here done this, or seen how the spring is replaced?

*Steve Furtak*

**A** I answered my own question and found out what it takes to replace that spring. It's not easy. The strut must be exposed/removed to work on it.

That screw/nut has to be removed for the tie-down ring's pivot pin to pull out for the ring's removal. From 1957 to today is a long time, but the screw drilled out fairly easy.

It's in pretty rough shape here, but we now know how it works.

*Steve Furtak*

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## UAvionix Announces TSO Authorization for tailBeaconX

UAvionix announced it has received FAA technical standard order authorization (TSOA) for its tailBeaconX 1090MHz ADS-B Out transponder.

The highly integrated device, which replaces a rear navigation light, includes and combines the transponder, ADS-B Out, SBAS GPS, and rear LED position light. The TSOA includes the following:

- TSO-C112e Level 2els, Class 1 (Mode S Transponder)
- TSO-C166b Class B1S (ADS-B Out Extended Squitter)
- TSO-C145e Class Beta-1 (SBAS GPS Position Source)
- TSO-C30c Type III (Rear LED Position Light)

TailBeaconX is Aireon-compatible and designed as a globally compliant, easily installed ADS-B Out solution for general aviation and urban air mobility (UAM), meeting current and future 1090MHz ADS-

B mandates. Specifically built to offer maximum compatibility with both ground and space-based ADS-B receivers used by over 18 Air Navigation Services Providers (ANSP) worldwide, tailBeaconX was extensively tested with Aireon and Nav Canada. Significantly increased performance levels were observed over traditional bottom-mount antenna installations, including at lower altitudes and during surface movements.

“Combining a LED rear position light replacement, a 1090MHz Mode S ES ADS-B Out transponder, SBAS GPS position source, and a dipole antenna into a single package was a major feat for our team – resulting in major cost reduction to our customers,” said Ryan Braun, COO of uAvionix. “Weighing only 140 grams, taking no critical panel space, while incorporating its own antennas, the path to ADS-B compliance is significantly simplified for a large group of aircraft.”

## FreeFlight Obtains AML-STC for Datalink ADS-B

FreeFlight Systems, a NextGen aviation leader specializing in avionics design, development, and manufacturing, announced that its Datalink ADS-B solution has received Approved Model List Supplemental Type Certificate (AML-STC) approval covering over 400 FAA Part 23 aircraft airframes for OEMs including Beechcraft, Cessna, Cirrus, Piper, and more.

The Datalink ADS-B system, available in both receiver and transceiver options, has received five certifications for ADS-B: Transmission on the 978 UAT frequency, receiving flight information broadcast services (FIS-B), receiving and processing aircraft surveillance application systems, receiving traffic information systems broadcasting (TIS-B) and global positioning systems.

The unit interfaces with Traffic Alert System (TAS) and Traffic Collision Avoidance System (TCAS), and supports Ethernet, RS-232, and ARINC 429 data interfaces.

The robust and reliable solution is designed to interface with a broad range of aircraft avionics and tablet applications, and also provides a flexible option for upgrading technologies and displays. FreeFlight Systems' latest ADS-B device is a powerful addition to its extensive list of avionic systems and technologies.

“This is exciting news for our customers,” said Ashley Ring, VP Sales and Marketing of FreeFlight Systems. “Many of our customers already flying with our RANGR series can upgrade to the new Datalink ADS-B transceiver to improve their situational awareness.”

For customers utilizing the RANGR series, FreeFlight Systems is currently offering a \$2,500 trade-in to upgrade to the new Datalink Transceiver.

## New Season of “Pro Pilot Podcast” Available Now

Aviation Tutorials Company, LLC announced the launch of season two of Pro Pilot Podcast ([www.propilotpodcast.com](http://www.propilotpodcast.com)). Featuring two new highly experienced professional pilot hosts, Pro Pilot Podcast delivers practical application straight talk on critical airmanship topics that will help listeners take their flying expertise to the next level.

Pro Pilot Podcast expert content is free and is available for immediate download. “Pro Pilot Podcast is designed to focus on important aviation topics with a focus on practical application,” said Steve McNeilly, President of Aviation Tutorials Company, LLC. “Every episode examines common problems faced by pilots and explains how to integrate regulations and safety knowledge.”

Typical Pro Pilot Podcast topics include critical take-off and landing considerations, building confidence at larger airports, managing high altitude physiology, avoiding inflight icing hazards, low-altitude engine failure, wake turbulence upsets, and more.

“Our goal every episode is to use our personal experiences in aviation to shed light on how we manage specific situations,” explained co-host Frank Kerous, a seasoned pilot with over 20 years of experience. “This podcast was created for pilots looking to expand their knowledge, skills and expertise beyond primary training topics.”

Pro Pilot Podcast has custom-tailored content for pilots who want to expand their capabilities, sharpen their knowledge and fly like a pro. Listeners can expect to get right to the point without wasting time on peripheral topics. Expert hosts deliver high-level guidance to those who want to approach aviation like the pros.



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# Tire Out of Round

By Gary Van Dyke

I've been fighting a shimmy on my Cardinal RG for a while. I had a fairly significant event on a trip that pushed solving that problem to the top of the list.

We were taking off from Texas Gulf Coast Regional Airport (KLBX) in the Houston area to Lakefront Airport (KNEW) in New Orleans. Just as we got to rotation speed, we experienced a violent shimmy that was so bad it was actually scrubbing speed. I had plenty of runway, so it came down to a decision on whether to abort or to go ahead and take off.

I thought the nose wheel had gone flat. Since we were at rotation speed, I decided to take off.

The takeoff went fine. Since KNEW has a good maintenance facility, I decided to make the trip and have the problem fixed once we were on the ground there.

I told my wife that I thought we had a flat tire and that things were likely to get bumpy as the plane slowed but that I was confident everything would be OK.

When we got to New Orleans, I let the tower know that I may have a flat tire and may need to be towed once we got the plane stopped. I did a soft field landing at minimum speed and held the nose wheel off as long as possible.

I had the yoke all the way back when the nose wheel finally touched down and was surprised that there was absolutely no shimmy.

We taxied to the FBO and I did a very thorough look at things once we shut down. With the tail pushed down to get the nose wheel off the ground, everything looked like it should.

We decided to check everything in the nose wheel and steering systems. We pulled the tail down and secured it to a ring I have installed in the floor of my hangar for that purpose. We then pulled the nose wheel and went through all the connectors and settings for the nose wheel and steering system. Everything we checked was in spec.

We had the tire static balanced when I first put it on during last year's annual, but I thought something might have changed. I found a local motorcycle shop that had the equipment needed to dynamically balance the nose wheel, so I took the tire to them.

The mechanic they assigned to balance the tire owns and flies a Maule, so he had a good understanding of my issues. He took a quick look at the tire and said something didn't look right but mounted it to the balancer and



If you start experiencing a shimmy, check your tires to make sure they're not out of round. Photo by Jack Fleetwood ([www.jackfleetwood.com](http://www.jackfleetwood.com))

started to spin it up. He stopped it quickly and got me to come over to look. Once it was spinning it looked like there was a lump on one part of the tire.

To verify that, he got it spinning then took a grease pencil and lightly placed the tip on the center of the tread. When we stopped the tire, you could clearly see gaps in the mark the pencil left showing low spots.

He went through the balance procedure. It took a full ounce of weight on a spot opposite the high spot to get the tire in balance.

That was causing the tire to bounce at high speed when lightly loaded (my shimmy).


My new friend pointed out that the tire was so lightly worn that it still looked original in most places. I told him I would replace it anyway, then he showed me a process they use on motorcycle tires to get them back in round and suggested I try that first.

With the tire off the ground, use a belt sander to get it spinning, then carefully touch the tip of a grease pencil onto the tread. Ideally you mark three or four areas across the width of the tread.

Once the tire stops, spin it slowly by hand. If the tire is round, the marks will go around the entire tire. If it's out of round, you'll see gaps in the marks on the low spots.

If there are low spots, get the tire spinning with the sander again and then turn the sander 45 degrees to the tire. Sand a little, check progress, and repeat until you get the tire round, or you decide you need to just replace the tire.

I found 120 grit sandpaper worked best. The coarser grits don't let the tire slip enough to sand the rubber. I had a small scattering of rubber on the floor when I was done but still had very little wear on the tire.

I took the tire back to the motorcycle shop and this time it was in balance with no balance weights applied. I put it back on the plane and haven't felt any shimmy since. Next time I will start by checking that the tire is round and in balance before doing anything else. 



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