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Panel Animals

Part 1: Forming a Plan

By Tom Machum

Editor's note: The following is the first in a series of articles chronicling a professional panel upgrade on a single-engine, legacy aircraft; in this case, the author's 1979 PA-28-236 Dakota.

Although the photos may be largely Piper-centric, the goal of this series is to provide a behind-the-scenes look at what the owner of any legacy GA aircraft – be it Piper, Cessna, Beechcraft, Mooney or other – can expect when he or she decides to in-

vest time and resources into a professional avionics upgrade.

Future installments will cover the removal of the old equipment, panel design considerations, installation of the new equipment, operation and reviews of the new equipment, how Tom and his plane partner, Paul, are addressing ADS-B (out and in), along with a bit of an introduction to the people and the facility where the work was done.

Now sit back, relax, and enjoy the ride!

It's hard for me to believe that it's been 4½ years since I became a proud, part owner of a little airplane. In that time, I have logged about 160 hours in the left seat and probably another 200 from the right, watching and sharing with my plane partner, Paul, as we go on adventures in our little time compressor.

Along the way, there have been many memorable (mostly good) flying events and countless learning points, including a number of points that I have filed away for future reference. For me, the major take-aways have involved learning the equipment on our airplane, returning to my aviation roots and sharpening my small airplane handling skills, and actively participating in our airplane's maintenance and upkeep.

Speaking of maintenance, our strategy is to be as proactive as possible, and I think we've had reasonable success in that regard. Keeping ahead of things by addressing them before they become major issues is one way of doing that.

As part of my contribution to our partnership, I've helped Paul to emulate the habits and traits that professional pilots use in their flight operations. As a result, we have both learned how to effectively apply those philosophies in our airplane.

It was in this spirit of open communication and rational thought that we began discussions surrounding our instrument panel. (See the accompanying photo and table to view the current panel layout and the list of gadgets that we have installed).

While we agreed that it is still a pretty capable panel, we have identified several items that we'd like to address. For instance, we specifically looked at the age of some of the equipment and its usefulness and relevance to modern operations. We also considered the current equipment's reliability and the general layout and ergonomics of the panel as it pertained to what we might want or need in the future.



PHOTO KEY

- | | | |
|-----------------------------------|-------------------------------------|---|
| 1. Master for Aspen and Autopilot | 11. ADF display (behind column)] | 21. Cigarette lighter (behind column) |
| 2. Airspeed Indicator | 12. Turn co-ordinator and autopilot | 22. Left bank of engine gauges |
| 3. Aspen PFD/ND | 13. Vacuum horizon | 23. ELT controls |
| 4. Altimeter | 14. King CDI display | 24. Standby vacuum control |
| 5. Annunciator panel | 15. King Nav-Comm | 25. Manifold pressure gauge |
| 6. Garmin CDI display | 16. Garmin GPS 496 (on swivel) | 26. Right bank of engine gauges |
| 7. Garmin audio panel | 17. King ADF controller | 27. Tachometer |
| 8. Garmin GNS 430W | 18. King DME | 28. Master, light and pitot heat switches |
| 9. Avionics Master switch | 19. Garmin GTX330 | 29. EDM700 engine analyzer |
| 10. BFG Stormscope | 20. Vacuum gauge | 30. Circuit breaker panel |

Ultimately, we concluded that it was time to consider a panel makeover, and once we established that a makeover seemed like the thing to do, we developed a decision-making process to help us prioritize what we needed to do.

Here are the criteria we used:

1 Safety - Everything had to be looked at from this perspective. Does the current gadget enhance safety? Is it in a location on the panel that makes it easy to use? Is the current or newly envisioned gadget reliable? If we're contemplating a replacement gadget, will there be a steep learning curve that could actually compromise safety?

2 Functionality or Capability - Does the current item have functions or capabilities that will remain relevant? Would a new unit maintain or enhance these qualities? How complex are these instruments to use?

3 The Gee-whiz Factor - Will the upgrades be aesthetically impressive? Will they have that extra wow factor? Of course, this is the irrational part of the process. Or to put it another way; this is where one's passion comes into play. It's hard to disagree that these are not factors that live just beneath the surface and, hopefully, they don't get too out of hand. Logic and rational thought should rein them in, but if not, the next point will likely do the trick.

4 Budget - What can we afford? Does our current equipment have any trade-in value? What on the list is must-have and what is optional?

With guidance from the shop we had selected, we judiciously went through the above process and our plan became much clearer.

Before we get into that, however, let's take a look at what we considered when choosing a shop:

Reputation and Relationship - How long have they been in business? How much experience do they have with the work envisioned? Do we have friends who have had work done there and what were their experiences?

Location and Support - Is the shop nearby? Do they have multiple locations? How well do they support their work?

Using the above benchmarks, we chose Sarasota Avionics (www.SarasotaAvionics.com). Aside from the fact that they aren't located nearby, they met all of our other criteria. Fortunately, it so happens that Paul winters in Venice, Florida, and Sarasota's main shop is located there. That became an important factor for us, as Paul could easily monitor the repairs.

Now back to the plan...

To rewind a bit, the seeds of our decision to upgrade were actually planted about two years ago. At that time, we were happy with our plane's engine analyzer for the most part, but we also knew that it had some shortcomings so we began to research our options.

In previous years, we had routinely dropped by the Sarasota booth at EAA AirVenture to get our Garmin GPS496's database upgraded. We always enjoyed chatting with their staff and we generally got a good vibe from them. Plus, we had friends who had work done at their Venice shop and all of their feedback was excellent.

Dakota co-owner Paul LeBlanc (left) and author Tom Machum (right) as they prepare for the trek from their New Brunswick, Canada, base to the Sarasota Avionics shop in Venice, Florida



At AirVenture 2016, one of our main missions was to review all available options for upgrading our engine analyzer. We spoke with all of the suppliers who were there and, after making our decision, we returned to the Sarasota booth where we had another great chat with their staff and proceeded to put down a deposit on a new analyzer. Our plan would be to fly the airplane to Venice in the winter of 2017 and have the work done then.

Meanwhile, we also knew that we needed to do something with respect to ADS-B and the ever-approaching January 1, 2020 deadline. Our transponder is a GTX330, but not the ES version. So how do we address that?

On top of that, we noticed that our vacuum horizon was getting noisy and it was taking a little longer to come to life. Moreover, a check of the technical logs indicated that it had been quite some time since the vacuum pump was replaced. While suction was still good and we did have a standby system in place (one that uses intake manifold vacuum), we began to wonder how long it would be before we need to do work on that system as well.

On the flights to Florida, just one week prior to writing this column, there was a lot of time to sit back and look at the panel as we made our way from Moncton, New Brunswick, Canada, (CYQM) to Venice Municipal Airport (KVNC) – about 13 hours (over two days) to be exact!

Along the way, I commented to Paul that I didn't think that I'd ever used the ADF or DME in the 4½ years I'd flown the airplane! We also noted how the EGT on our #3 cylinder was bouncing up and down so erratically that it had to indicate a failed probe. Naturally, we were pleased that we would be replacing it with an all-new unit, complete with new probes and sensors. That night, Paul

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That night, Paul and I had a good chat over dinner as we continued to formulate our plan, and the following day we met with the professionals at Sarasota's Venice shop where we got even more information to digest over yet another dinner meeting.

That evening, Sarasota's Dan Gualandri sent us an email with a detailed quote that covered a multitude of options. Bet-

ter yet, the quote was presented in a sort of "a la carte" manner that we could easily analyze to pick and choose the work we wanted done.

The next day, Paul and I flew from Venice to Albert Whitted Field in St. Petersburg. By now we were both completely immersed in all things general aviation, and as we talked more about it over lunch, we decided on a plan.

Upon returning to Venice, we again met with Dan and told him what we had decided to do. He listened intently and agreed with our logic. Handshakes, a detailed work order, and a down payment sealed the deal the next morning. The stage was now set.

Next time, the dismantling of the "old" panel begins. —✈



The author's plane partner, Paul LeBlanc, with our soon-to-be upgraded Dakota at Albert Whitted Field in St. Pete's. The Hangar Restaurant and Lounge in the background was where Paul and Tom finalized their plan for the job. It would prove to be an expensive lunch!

Ironing out the details for the work order is an important step. Here we see (from left to right) Dan Gualandri, Director of Maintenance at Sarasota Avionics in Venice, the author, and his plane partner, Paul LeBlanc, asking each other questions and taking notes as they define the scope of the project.



Tom Machum is a 737NG Captain with about 18,500 hours and an MBA education. He started flying gliders in 1982 and moved into powered flight the next summer. His professional career takes him all over North and Central America, the Caribbean and across the Atlantic to the British Isles. Returning to flying small airplanes has inspired him to share his knowledge and experiences in the hope that it both entertains and educates his readers.

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