

Finding the Right Combination of Avionics for Your Panel

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One of the toughest questions for any pilot to answer is which avionics they should get for their instrument panel. After all, there is a virtual plethora of avionics available, each with its own associated features to choose from. With the dizzying array of products and features that are available, more than one pilot has been left trying to figure out which avionics they should buy for their panel.

Unless you are one of the lucky pilots who is independently wealthy, won the lottery, or has some other way that you don't have to worry about money, picking the right mix of avionics for your airplane can be a real challenge. However, if you break down the purchase to the basic elements of what you need, what you want, and how much you can afford, the activity becomes less stressful and as a result, easier to accomplish.

Which Panel: VFR, VFR+ or IFR

The first question a potential avionics buyer needs to ask is what mission they need their instrument panel to fulfill. For example, if you are flying around in a small panel with limited fuel

and little or no gyros, or are a VFR pilot and have decided you will always be one, you can pretty much go for a VFR panel. A good VFR panel comes in two types: the minimum panel which will allow you to communicate and navigate, and the maximum VFR panel which will provide redundancies to some critical functions.

Starting with the good VFR panel: the owner should be thinking about this in two ways: First, you will need a transponder and if you want to go anywhere these days, an altitude encoder. Transponders and altitude encoders are available from a variety of manufacturers such as Garmin, Bendix/King, Narco and others, and all models have

the right features to meet your needs.

If you are flying in an area where air traffic is very busy and your plans include a Multi-Function Display or MFD, you may be wise to spend the extra \$4,000 and purchase a Mode S Transponder. The new line of Mode S Transponders provides traffic in many areas of the country via TIS, or the Traffic Information Service. Basically, ATC takes the traffic information they get from transponders, and broadcast it as data that the Mode S Transponder can interpret. With a MFD on board, the traffic can be shown to pilots right on the display, helping you to avoid any mid-air. It is important to note that while Mode S



coverage is expanding, it is not nationwide.

With the transponder decision down, it is down to what you will need to be successful in navigation. Depending on your finances, this can be as simple as a single com, or a reliable nav/com, or a more complex and expensive GPS/com or GPS/nav/com unit. The prices



for new avionics varies with the make and model, but range from around \$1,000 and up for a new com, to \$3,200 and up for a new nav/com, to \$10,000 for the more complex GPS/nav/com units.

In the area of com, nav and GPS combinations, generally you get more going higher. For example, a non-ILS version of the popular KX-155A carries a MSRP of \$3,160, while the glideslope equipped version has a MSRP of \$3,600. If you were to add a GPS equipped MFD on to that combination, you would see your project price jump by around \$4,500.

If you were to total up the separate parts, you end up with a price starting at \$8,100. This means that you end up fairly close to the price of an all-in-one GPS/nav/com unit, and you end up taking up more panel space for the installation. Thus,

if you are limited in the amount of space in your radio stack, it may be wise to pay the extra money and get one of the all-in-one units. Generally speaking, you will be looking at a price of between \$6,500 for a nav/com and transponder/encoder combination, or \$16,000 and up for a MFD and Mode S transponder/encoder combination.

VFR+

Some pilots might question what we mean when we say VFR+ in describing a panel, so some explanation is in order. If you want to be able to have reliability via redundancy,

fly in controlled airspace on a regular basis, or have any notion of taking your pilot skills and enhancing them with the addition of an instrument rating in the future, then the VFR+ panel is where you should head. If there is one thing that we can tell you about avionics, is that despite the best intentions and efforts of the manufacturers, failures do happen from time to time, and when something does fail, having a com radio on board can make a big difference.

The same can be said with a second nav, which is why we would suggest a nav/com as your second line of defense. The second nav/com allows several improvements in your avionics. First, it provides a second fix to cross-check your location against while in flight. With two navs on board, you

can easily find your position by tuning two different VORs, and then plotting the radials that you identify on your chart, not to mention having a backup on board in case one nav goes out. The second com allows you to more easily stay in touch with ATC, and when installed with an audio panel, allows dual transmission for you and your instructor or fellow pilot when needed.

The price varies by model of course, but to add on a second nav/com costs generally in the area of \$3,200 to \$3,600 or so, plus installation. If you choose to add on an audio panel with built-in marker beacon receiver, which is advisable if you are thinking of pursuing an instrument rating, you can add on another \$2,000. Another advantage of adding on one of today's new audio panels is that you get an intercom system with the new audio panel.

If you have tried flight training without an intercom, trying the same training with an intercom is a real eye-opener, since it makes communications so much easier than they would otherwise be. The advantage of the intercom system is simple: by allowing you to communicate better with your instructor, you will be able to learn faster than you would be able to otherwise, and progress faster as a result in your lessons. This means you will get to your rating generally in fewer hours, at a lower cost.

IFR Panels

For the pilot who flies IFR, especially those pilots that take on the challenge of single pilot

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IFR, having avionics that can support you in all phases of flight is critical. For a basic IFR panel, you should have dual nav/coms, with preferably one of the nav/coms being a GPS receiver as well with a moving map display or an MFD for maximum versatility and pilot awareness. You also need a transponder and encoder, with the same comments about your area traffic applying as to whether you accept a Mode C transponder, or elect to get TIS and go with a Mode S system. Finally, you will need an audio panel and three light marker beacon to round out the mix.

The price range of the equipment and options are as varied as the stars in the sky, so we'll give you a couple of estimates that you can combine to get a general idea of the project cost. Two nav/coms, assuming one is ILS capable, will run you \$6,800. Making both nav/coms ILS capable will raise the price of two to \$7,200. An average audio panel with three light marker beacon and intercom will range from \$1,800 to \$2,300, depending on the make and model you choose. Transponders vary in price, with Mode S units bringing a premium at around \$5,300, while Mode C units range from \$1,800 to \$2,300. An average altitude encoder will run you \$300 to \$700.

Moving into the MFDs, there is a wide array of both prices and features. We'll explore the displays only, and allow you to think about the costs of add ons such as traffic, weather and lightning. An average GPS MFD is running between \$4500 and \$6000 these days, with additional interfaces costing extra. If you take the

GPS and combine it with a nav/com, prices are typically in the \$9,250 range, with the price doubling when you add on a second GPS/nav/com unit.

One thing that is frequently forgotten in an installation is the price of antennas. While some older antennas can be reused, others are not the right match for the latest in avionics, and will need to be replaced. The price of antennas is quite frankly all over the spectrum, so rather than take a best guess estimate that will no doubt prove wrong, we'll point out that you need to keep this cost in mind. For the best advice, ask your avionics expert.

Other Factors

Beyond your flying practices, there are other factors such as traffic, airspace and weather considerations that we already mentioned, with a few more that the prospective avionics purchaser needs to keep in mind for their panel decision. For example, if you fly around Class B airspace, MOAs or Special Use airspace, you would be well-served to pay the extra money and get a moving map GPS receiver. Even a simple monochrome model can make a surprising improvement in your situational awareness by keeping you completely informed about airspace boundaries.

In personal discussions with ATC controllers in the Chicago region, they can clearly tell which pilots have the latest GPS and moving map gear on board, as they are the pilots who can fly literally on the edge of the airspace without crossing over into it. Contrast that with the practice of having to give at least five to 10 miles of berth to such airspace to avoid a bust, and you can quickly see how spending a little more

now will be able to save you the same amount and more in the future by allowing you to make more direct trips.

Similarly, if you are an IFR pilot and are thinking of including an MFD in your panel plans, make sure that the MFD can support the display of lightning information. While a separate Stormscope or Strikefinder works well, having the lightning information placed on the screen with your course laid over the information takes all the guesswork out of weather avoidance.

Hands-On Time

If the opportunity arises, we strongly suggest you get some "hands on" time with the new equipment you want to install in your cockpit, before you sign on the dotted line for the installation. The reasoning behind this approach is simple: whether you are installing a simple VFR panel or the most complex IFR panel you can imagine, you should be able to try out the equipment to make sure you like how the controls feel. While most of today's products are very similar in feel, this approach helps to reduce the chance of having any "buyer's remorse."

You may get lucky, and find that a friend's plane has the avionics in whole or in part that you are looking for. In other cases, your avionics shop may have a plane outfitted with the equipment for you to try. At times, shops have demo stands, with the one of the units in them for you to try out. Other than those options, there are always the various major air shows such as EAA's AirVenture, AOPA, and even Sun 'n Fun, in which the avionics vendors are on hand

with units to give you a chance to see how it feels.

With these decisions as to what level of system and options aside, you will be ready to tackle the difficult choice of picking the right equipment for your plane. In these days of modern avionics and electronics, it's hard to go wrong with your choice. Once you have chosen the right combination of avionics for your panel and set your appointment with your avionics shop expert, you will only have to sit back and patiently relax, knowing that the panel of your dreams is only a few weeks and an installation away from making your airplane newer, more exciting, safer and easier to fly. ■