

Why You Should Buy a New Airplane

Though used airplanes deliver great value, and low depreciation, a brand new airplane is unbeatable. FLYING MAGAZINE

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Four of the last five airplanes that I bought were new. The one that wasn't new had but 500 hours on it. That was years ago, the last being in 1979. Still, I know the real thrill that comes from getting a brand-new airplane and being the only person, other than the test pilot, who has flown it. Today, the new high-performance single-engine airplane (over 200 horsepower, according to the FAA) buyer is a lot different. Most new airplanes are now bought by relatively new pilots. Old pilots will just tell you that they buy used because you can get a comparable airplane for a lot less money. True, but there is more to the argument than that and saving money is not always the same as a lower purchase price.

To begin, a huge factor is whether or not you have business use for the airplane and your business activity has enough cash flow to cover the airplane. This is strictly between the individual and his tax person (and the IRS). Sure, some airplanes are sold to folks with no business use, but most new airplanes have an attachment to a business activity checkbook. It's a very different proposition to pay for an airplane with before-tax dollars, than it is to hand over what's left after the government's cut.

Before looking at airplanes, what kind of money are we talking about? Few buyers are just going to go under the mattress and come up with the cash. Most will finance, be it through a finance company or a bank. And many will use a line of credit instead of using the airplane as collateral. There are also lease deals available.

Looking at new high-performance singles, and looking at the best available financing, you might think in terms of 10 to 20 percent down (of an average price in the high \$400,000 range) and from \$3,000 to \$5,000 a month as the required cash flow to own an airplane in roughly the middle of the price range of the high-performance singles that we are considering here. As a rough rule of thumb, and depending on the deal, about 1 percent of the retail

price would come fairly close to the monthly payment. Some lease deals don't require the substantial down payment. There are many different finance plans, some going out for 20 or more years. Fuel, insurance, hangar and maintenance add on to that monthly payment for the total cash flow requirement.

One thing that has to be considered is the possibility of being "upside down" in the airplane if one of the most liberal finance deals is used. This simply means that a quick sale of the airplane wouldn't yield the amount of the note. The difference would have to come out of your pocket. From looking at values of 2005 Skylanes, Cirrus SR-22s and Columbia 400s in Vref and Aircraft Bluebook, it appears that wholesale prices of 2005s are about 80 percent of retail. That would mean that if you paid 10 percent down and had to sell quickly, you'd have to write a check. I'd add that there is more variation in values of these airplanes between the two sources than I have ever seen. An accountant can show you how the liberal depreciation rules in the federal tax code can help on that cash flow when the airplane is used primarily for business. The interest on the loan is also deductible. In most cases, the cash flow for an airplane used in business is actually positive for a while because of the tax benefits. But, again, the use of the airplane has to be related to business activity and the cash flow has to be there for this to work.

When a person buys a used airplane, it is with a requirement to stash some cash for surprises. Every airplane owner is familiar with these and they can run into the thousands of dollars. New airplanes come with a warranty, so the new buyer is shielded from major and expensive surprises for the term of the warranty. That is a big advantage, as are some incentive plans that are offered on new airplanes from time to time. A while back some airplane manufacturers were offering free fuel, but \$4 a gallon probably cured that. The fact is that you can buy a new airplane and accurately project costs for the term of the warranty. You can't do that when buying a used airplane. Something else that tips the scales heavily in favor of new airplanes is the glass cockpit. If you want a fully integrated glass system you have to buy new. Garmin's retrofit G600 system will allow a primary flight and multifunction display with an AHARS and air data computer for the retrofit market, enabling owners of existing airplanes to get rid of the vacuum system and the gyros and modernize the panel. The retail price of this is just under

30 grand and we won't really know the installed price until the equipment is being delivered and installed. The complete new glass cockpit systems are simply too complex to be economically retrofitted to an existing piston airplane, so if you want the best, and the big screens, so far it has to be a new airplane. All the new airplane buyer has to evaluate here is which airplane/avionics combination is the most desirable. Airplane selling is a highly competitive business and any salesman will try to convince you that his airplane is the only one that you should consider. You have to live with the airplane, the salesman doesn't, so you have to carefully weigh what is available against your needs.

Also, when you take a demo flight, consider how the engine is operated during the flight. If the airplane is a turbo and it is climbed at full power, that looks great in rate of climb, but in the long run it might reduce engine life. Likewise, how much fuel is burned at cruise? Some of the new airplanes, especially turbos, are demonstrated at quite high cruise power settings and the new engines, especially the turbocharged Continentals, will generate more than rated power. It is not uncommon to see a cruise fuel flow of 25 gallons per hour in a turbo single, and that equates to more than 300 horsepower at an average specific fuel consumption. That is roughly 100 percent of the horsepower rating of the engines.

High-performance piston singles (over 200 horsepower) currently in production range from the Cessna Skylane at the lowest price point to the pressurized Piper Mirage at the highest. Those are two great airplanes with a lot of interesting ones in between.

Speed is often foremost in every pilot's mind when buying an airplane. But how important is it? That depends on how far you fly. If most of your trips are 200 to 300 miles, then speed isn't the most important issue. The longer the trip, the more speed counts, especially when there is a headwind, which there will statistically be more than half the flying time. Even though an extra 10 or 20 knots of true airspeed will save only a few minutes on an average trip, I'd bet that most pilots put speed pretty high-if not at the top-on the list. We buy airplanes to move about, and the faster the better. Speed is expensive, though, and a 30 percent increase costs more than 30 percent more money.

Range might be second only to speed as a performance factor important to most pilots. It is often said that the average trip in a business jet is about 300 miles. For some reason, in singles pilots tend to want to fly farther, as in getting from where it is cold to where it is warm in the winter. An airplane that will do this without a fuel stop is highly desirable. Actual useful range has to be carefully calculated because the range and speed superlatives cited by a salesman might not go together. An airplane might fly fast and fly far but not do both at the same time.

If you have a specific trip in mind, it is a good idea to get information from a pilot's operating handbook and feed the trip through a flight planning program on a number of different days to see how often it could be done without a stop. The computerized flight planners plug in the forecast winds for the day and give you a very precise estimate, but you can also enter your own estimates of wind based on experience over the route. In either case, wind must be considered because the no-wind range of an airplane is an interesting but almost useless number, particularly at single engine speeds where the wind can add or subtract a large percentage of the actual true airspeed to or from the groundspeed.

Range also has a direct bearing on what you can carry in the cabin. Most new four-seaters excel at carrying full fuel and two people and baggage, which is a fairly standard load. If every heavy option is added then the choice of a passenger might be limited to someone who is not bottom-heavy. Maximum range trips with full seats are just not possible in any of the new high-performance piston singles. There are other performance matters to explore. The climb rate and the airfield performance might be more important to some than to others, for example.

Turbo or not turbo is a big question for the new airplane buyer. I could sit here and write many words about why turbocharging is not really worth the expense on an unpressurized airplane flown in the eastern U.S., but I'd be just as out of step as I always managed to be in close order drill. When airplanes are offered with the choice, buyers often vote in favor of the turbocharged airplane. An exception is the Cessna 182 where the normally aspirated airplane has been outselling the turbo by a lot, but even that is changing. The 206 turbo far outsells the normal. The turbo version of an airplane will fly

higher, go faster up high, burn more gas and cost more to maintain. The warranty deals with the latter for a while. And while it is hard for a pilot to "hurt" a normally aspirated engine, because once it starts climbing there is less available power, it is easy to trash a turbocharged engine that will make gobs of power well up into thinner air. There is no fade on new turbocharged airplanes yet. When it comes, any turbo advantage will be enhanced.

A normally aspirated airplane will almost always beat a turbo when an upwind and downwind round trip are compared. The reason is that the naturally aspirated airplane is typically faster down low, so it spends less time on the upwind leg than the turbo saves by climbing into stronger winds on the downwind leg. So the turbo has to be attractive for other reasons. These might include smoother rides in the middle altitudes, better tailwinds eastbound and a little better shot at getting on top of the clouds, though that is pretty elusive no matter how high you fly. Most turbocharged airplanes have a built-in oxygen supply, though getting the system recharged is not something that you can do at every airport. And a lot of pilots don't think that flying above 18,000 feet even with supplemental oxygen is such a good idea. There are certainly cases on record of higher-flying pilots becoming incapacitated. A strong advantage of the new normally aspirated big-engine singles is their ability to be operated in the mid-teens to snag a big tailwind. No, they won't go as fast as a turbo at 15,000 feet, but when you are enjoying a 60-knot tailwind the difference in groundspeed won't be all that great and the fuel flow will be a lot lower without the turbo.

Where the used airplane buyer has to look at equipment and the possibility of a lot of expense in upgrading, the new airplane buyer has no such problem. All the new singles in this category have complete glass cockpits, most including traffic, weather and terrain information. The avionics option lists, which used to be long, are now short and virtually all the airplanes are built with all the options.

On most new airplanes, there is not a choice of autopilots. And, the autopilot in a new airplane is something that you probably fly with for a long while. Wise buyers look carefully at this.

Autopilots currently in new airplanes range from those barely integrated into the glass cockpit system, as in the Cessnas with Garmin G1000 cockpits and Bendix/King KAP 140 autopilots, to completely integrated, as in Columbia and Beech airplanes with the Garmin G1000 system, including the automatic flight control system. More airplanes will likely be getting the complete Garmin package, and a competitor offering an equally integrated package will almost certainly emerge. (Because the Diamond DA40 has 180 horsepower, less than the FAA definition for high performance, it is not included here, but that airplane now has a completely integrated Garmin system and recent improvements have boosted the airplane's performance.)

There are two basic types of autopilots. One is rate-based, meaning the autopilot senses any rate of change in turn or air pressure and does something about it. The KAP 140 and S-Tec autopilots are of this type. These autopilots don't always fly neatly in turbulence, though S-Tec has done a lot to improve the performance of their autopilots and they tend to fly these airplanes rather well. The Garmin autopilot is attitude based, getting inputs from the solid state attitude heading reference system (AHRS) and the digital air data computer. The entire automatic flight control system uses digital electronics, like the ones in turbine airplanes, and it flies with precision. Then there is the ability of the Garmin system to sport a keyboard to use in entering things into the G1000 system. That is currently available only in the Columbia airplanes, but you can expect keyboards to show up in others in the future.

With glass cockpits comes a requirement for electrical and instrument backups. These are mostly all-electric airplanes. On electrical backup, all the FAA requires is battery power to operate all essential items for 30 minutes after a charging system failure. Most pilots would rather have more than that and backups range from nothing other than the primary battery, to standby batteries, to auxiliary standby alternators, to complete dual electrical systems. The buyer of a new airplane should look carefully at this and choose an airplane with a system that provides whatever comfort level the pilot wants. As of this writing, Piper singles have the most basic standby, except for the Mirage, which has a dual system. The Columbia also has a dual system. Everyone else has extra batteries or standby alternators that can support essential equipment after the failure of the primary alternator. Every all-glass airplane has a mechanical attitude, airspeed and altimeter to back up the

electronic displays, and the placement of these standby instruments is also something the pilot has to make peace with. I think the best placement of the standbys is presently in the Cirrus where they are front and center, but every pilot has an opinion on the subject.

With the Garmin systems there is a reversionary mode where all required items can be shown on one screen were one to go bad. There is only one AHRS and one air data computer in the G1000 system in singles so reversionary mode won't cure failure of those items, but it does offer backup of a display failure. This is not true of the Avidyne systems. As this was prepared the Avidyne glass cockpit system was offered on Piper and Cirrus airplanes. Garmin or Avidyne was available on the Columbia, though virtually all orders were for airplanes with the complete Garmin system. Beech, Cessna and Mooney have Garmin glass cockpits and the autopilot question is evolving by the day, with Beech and Columbia already flying with the full Garmin system.

If it sounds like choosing a new airplane might revolve around the systems and the cockpit and the instrument panel, it does seem like it has come to that. Which avionics system attracts you most is as important as the performance of the airplane.

With glass cockpits, terrain awareness and traffic information have become all but standard. On traffic, the best system is the active one that sees all transponder-equipped aircraft. The other system gets information from selected air traffic control facilities and coverage is limited. Any new airplane deserves the active system. Air conditioning is available on most new airplanes and the folks who buy new airplanes gladly pay the money and accept the weight penalty that this rather heavy option demands. Only old cynics would not order A/C and they don't buy new airplanes, anyway. There is always the question of ice protection, too. This comes in two forms, either approved or not, for flight in icing conditions. For new Bonanzas, an approved and a not approved system are available in the aftermarket. On Cessnas, only the not approved system is currently available in the aftermarket. The Cirrus and Columbia airplanes can be ordered from the factory with ice protection that is not approved. The Mooneys and the New Piper Mirage have systems available that are approved.

The main difference in the approved ice protection systems is in the testing that is done. For a system that is not approved, it must only be shown that the system causes no hazard. On an approved system, the airplane has to be flown in selected icing conditions and with various ice shapes attached to the airframe. There might have been ice testing done on unapproved systems and it's up to the buyer to find out how much testing has been done. With either system, the pilot has to be aware that there are certain icing conditions that no airplane can tolerate and that any system is best used while fleeing any ice that is encountered.

There is one other major design feature to consider on high-performance singles-the landing gear. Retractable landing gear used to be considered essential on any airplane used for serious travel. No more. The two big-engine, fixed-gear composite airplanes, the Cirrus and the Columbia, are as fast as, or faster than, the retractable singles that we have known and loved over the years. The first person to talk with about this subject is an insurance broker. If the pilot were torn between a Mooney and a Cirrus or Columbia for example, the insurance premium might or might not be substantially higher in the retractable. That would depend on the pilot's experience level in retractable gear airplanes and the ever-fickle nature of the insurance underwriter.

This is a great time to be shopping for a new single-engine, high-performance airplane. There are a bunch of them out there, there are good finance programs and there might be the opportunity to defray some of the cost (but keep all the tax advantages) by leasing the airplane back to an FBO for his rental or charter fleet. Only the FBO can explain that, so any buyer interested should ask about it and understand what is available.

One other thing. There are not many people around who remember Packard automobiles. I actually owned one years ago. Their ad slogan was, "Ask the man who owns one." That's not a bad idea on new airplanes. Pilots do tend to convince themselves that what they bought is the best, but most would share a word on any warts.