

New Technology for Older Aircraft:

Is This a Trend?

By Thomas H. Chappell

The introduction of the Very Light Jet (VLJ) is not the only exciting change to the world's general aviation fleet. With the entry of many medium and small corporations into the aircraft ownership game, we are experiencing an increase in the life expectancy of older general aviation aircraft. Older aircraft that until recently were thought to be almost worn out or obsolete are proving themselves a safe and viable form of transportation. An after life, if you will.

Airline over-crowding, increased airport security, flight delays, foodless flights, lost baggage, and a hoard of other annoyances have pushed the once economically conservative corporate CEO to loosen the company purse strings and invest in a corporate plane. The trend of small corporations moving from commercial air travel to privately owned general aviation aircraft has taken on a momentum that we have never seen before.

“Once economically conservative, always economically conservative”, that's what I say. The need for a new and more efficient form of transportation does not mean throwing economic caution to the wind and buying a new production line aircraft. Today's used aircraft can be modified to include much of the new technological advances that are now included on new generation aircraft. More powerful engines, TCAS, GPS, satellite weather, new paint, new interior, glass panels, engine modifications and a host of other advances can be added to older aircraft bringing them up to almost new standards in safety, speed, and comfort at a fraction of the price of a new aircraft.

Don't misunderstand, such upgrades are not cheap. They are just less expensive than a new aircraft off the assembly line.

OK. We take an older but serviceable aircraft and upgrade it. We add new paint, new avionics, and a new interior. If necessary, we install fresh engines (either original or modified), polish the glass and “voila”, we have a nice aircraft. Although a great value, this still costs money. So we then add up what we have spent and have our insurance agent contact the underwriting community for a premium quotation.

Now, with some underwriters, the problems start. The “all powerful” *Aircraft Bluebook - Price Digest* (the Blue Book) is called into play. Most underwriters use the Blue Book as a general guide when judging the value of an aircraft. With most aircraft hull insurance policies, the value shown on the coverage summary page (the declarations page) is the value used when adjusting a claim. This is called the “agreed value”. Understandably, an underwriter's goal is to insure any aircraft as close to its true replacement cost value as possible.

Even with the assistance of the *Aircraft Bluebook - Price Digest*, valuing an aircraft is subjective at best. When up-grades and modifications are introduced into the formula, the task of valuation becomes difficult. The *Aircraft Bluebook - Price Digest* lists a few of the

more recognized aircraft modifications, but the kinds of upgrades we are seeing today are varied and expensive. The astute underwriter will ask for an equipment list in an attempt to justify increasing the insurable value. The old rule of thumb in valuing avionics is fifty percent of the retail value. Little value is placed on the installation expense. How much does the new paint and interior contribute to the value of an aircraft? After all, any aircraft should have paint.

The value of the used but upgraded general aviation fleet is increasing. The prices a willing buyer will pay seem well above the quoted "Blue Book" price. After all, the editors of the *Aircraft Bluebook - Price Digest* can only anticipate sales reported on basic manufactured aircraft. The modifications available today such as the Garmin G1000 retrofit for the King Air C90 with an installed price of \$330,000 can greatly affect the value of an aircraft. Due to its complexity as much as one third of the cost of the King Air G-1000 modification can be contributed to installation. How will the underwriters value that? After all, it is replacement cost we are insuring, not just market value.

This industry modernization is spreading quickly. Garmin has applied for more than 400 different Supplemental Type Certificates (STC) for the installation of the G600 in various light aircraft.

This is one argument where the owner of the "modified" aircraft may need a true aviation insurance specialist to represent him to the underwriting company.

Another area of discussion is in the banking sector. Like the insurance industry, the banking industry also depends upon the *Aircraft Bluebook - Price Digest* for aircraft valuation. Like your underwriter, your banker will struggle with the true valuation of a modified aircraft. In this case, the banker is interested in true market value and not replacement cost.

There are only so many underwriters to go around for all the risks submitted each year for quotation. The staff it would take to properly evaluate each single aircraft risk would be enormous. Such things as damage history that should enter into the evaluation of an aircraft practically go unnoticed by underwriters. This certainly has a major deflating effect when valuing a relatively new aircraft but the impact of damage history on older aircraft is less.

Acceptable annual training wit modified aircraft:

Underwriters require annual training on most high performance aircraft, especially cabin class pistons, turbines, and jets. This requirement is imposed upon pilots of aircraft of all ages.

Again, one aspect of underwriting that is practically invisible to the underwriter is the availability of training for aircraft that have been heavily modified. This is an area of safety (not just underwriting) that the owner of the modified aircraft must address for his own benefit. Some times a knowledgeable aviation insurance agent can be of assistance in this effort.

Assuming the Garmin G1000 is installed in your King Air C90, what annual school would you select for training? The traditional simulator based training at Flight Safety or SimCom would not answer our need. At this time, most simulators are developed for the traditional fleet of steam gauge avionics.

Beech shook up the industry when they introduced the Garrett powered King Air B100. As you will recall, this was basically a King Air 200 with Garrett dash six engines. The training solution is to use the King Air 200 simulator and ground school and then add a “differences” training. Certainly this is less than ideal, but it is all we have for this manufactured, modified aircraft. The problem is that too few B-100s were built to justify the cost of a simulator.

Of course the popular modification now to the B100 is to further modify the aircraft by upgrading the engines to the 1000 HP (derated to 665SHP or 727 ESHP) Garrett dash tens. Again, there is no real simulator based school for this performer.

Most of the older modifications, whether manufactured or after market, dealt with engines, power, and speed. Many of the modifications we are seeing today deal with navigation, weather, traffic and a host of information that was never offered before. We are learning a new way to fly.

The new modifications for many of the older aircraft to include glass panels would make a conventional aircraft training school and a conventional simulator obsolete because they feature old steam gauges and do not include G-1000 panels.

In addition, the typical open pilot clause often included in an aviation hull and liability policy would be ill defined when requiring a specific number of make and model hours to reflect experience. A high time pilot with high make and model time and no glass cockpit experience would be a poor measure of skill if flying an aircraft equipped with a G-1000 modification.

A situation of this nature would require a customized annual training syllabus, a unique open pilot clause, and a very open minded underwriter in evaluating the aircraft value.

In time, whether original equipment or modified, the general aviation fleet will evolve toward state of the art equipment. It is happening now. General aviation and the underwriting community that serves it will learn to accommodate the various upgrades that are emerging. Training facilities will incorporate programs to accommodate the variations in panel design and the underwriters (and bankers) will come to accept reasonable aircraft valuations.

We have briefly discussed several potential problems with the modernized general aviation fleet of the future. There is more. The availability of back-up pilots to fly modified aircraft will affect many of the turbine and jet powered aircraft. Yes, I have 2000 hours in King Air C90s and have recently completed annual training, but I have never flown a G-1000 equipped aircraft.

Let's look at this scenario from the pilot's point of view five to ten years in the future. A pilot trying to get a job having no experience with modern avionics may have an increasingly difficult time as the fleet moves more and more toward modernized equipment.

Yes, you can take initial training on newly manufactured equipment. Cessna, for example, supports initial training if you are buying a new \$450,000 Cessna 206 which includes a G-1000. But, they could hardly be expected to offer training on an older Cessna that has an after market installation.

Will the avionics manufacturers be pushed into offering initial training programs? If so, how do they deal with all the different makes and models of aircraft being upgraded? The recognized simulator based schools cannot afford to build simulators costing millions of dollars for the various after market configurations.

As with our example of the King Air B100, we may have to make the most of a less than ideal situation and settle for differences training. We may need to return to the days before the simulator and do in-aircraft training.

Watching an entire industry move from old technology to modern technology is exciting and it is happening at lightning speed. →