

Wants & Needs

A Pragmatic Approach to Buying Avionics

STORY AND PHOTOS BY SCOTT M. SPANGLER

For more than a decade, pilots have been forming clots in the aisles of exhibitors at EAA AirVenture in Oshkosh, Wis., learning about and comparing the latest avionics. Those with portable needs go home immediately satisfied. Those with panel-mounted or remote needs should follow a more premeditated path because surrendering to impulse often is expensive.

AirVenture might be aviation's Best Buy or Circuit City, but avionics are not plug-and-play consumer electronics. If something causes a flat-screen TV to abruptly go black at the good part of a DVD, aggravation is the only real problem. Breaking out of the muck and seeing the runway is the good part of an instrument approach. A problem here is more serious, perhaps life-threatening.

Just as the Geek Squad reduces the likelihood of a dark TV, working with a reputable avionics shop is the best way to avoid the aerial equivalent and get the best return on your investment.

New or used, the box itself is but one line on the invoice. Parts and labor follow. How far the total marches from the decimal point depends on the installation's complexity and the time it takes to make the interfaced components a reliable team.



Comparison shopping at aviation gatherings, such as EAA AirVenture Oshkosh, is an efficient way to learn which manufacturers' products satisfy your avionics wants and needs.

Before shopping, take your avionics wish list to the shop that will install them. The shop's staff can point out possible conflicts, if any, and suggest solutions.

Whether it's across town or several states away, work with a shop you trust. When shopping for a shop, start with recommendations from other aircraft owners. Then, check it out with the Better Business Bureau and interview the owner. How long has the shop been in business? Is it an authorized dealer? What is the tenure and training of its technicians? Are they active VFR or IFR pilots? What professional associations do they belong to (such as the Aircraft Electronics Association, which promotes

continuing education and training events)?

Ask any question you feel necessary and evaluate the answers honestly. Your life depends on the shop's work. Continue to ask questions and build trust during the next step of a prudent purchasing process.

Distill Wants Into Needs

"Wants are limited by desire and money — if you want it and can afford it, you should have it," said Todd Adams, general manager of Lancaster Avionics, an AEA member in Lititz, Pa.

"Needs are driven by necessity and are more difficult to address, especially if a limited budget is involved," he said.

Rare is the owner with an unlimited budget, so most must distill the wish list before shopping. This can be more complicated than it sounds. Good decisions are based on the type of flying you do, your current avionics, their age, the airplane's age, how long you plan to keep it, the compatibility and learning curve of new equipment like WAAS GPS, and future capabilities and requirements.

Pilots can sort this out for themselves, but talking with a knowledgeable avionics technician saves time — and it can be a good gut check because the tech isn't emotionally involved.

Seek out a tech who is an active pilot, said Gary Morris, co-owner of Kings Avionics, an AEA member in New Century, Kan., "someone who (flies) in the same world you're in."

When shopping, many pilots focus on an individual unit, their primary desire. The shop should refocus them on the total package and create an efficient and economical upgrade plan, according to Morris. Depending on what's needed and the budget, the plan could have one step or several.

Morris uses a Cessna 340 with 1980s avionics as an example. The coms don't meet new specs and tolerances; the navs don't meet FM immunity requirements; and it probably has a Loran.

"If the guy is going to use an airplane of that category, he's going to need an IFR GPS, and he probably needs to upgrade the primary nav/com to something he can count on," Morris said. "This guy would be a good candidate for a Garmin 430/530 because it's a one-step fix."

Replacing the old units with a new nav/com with glideslope and IFR GPS costs just shy of the single Garmin unit, according to Morris. But it's a lateral move. Installing the Garmin gives the airplane WAAS capability and increases its value.

Trade-ins are another factor, and some, like the Bendix-King KX 155 nav/com, still have "a reasonable trade-in value."

Ultimately, the plan depends on the airplane. If it has good radios and an IFR GPS, but the "autopilot...dogs him \$2,000 or \$3,000 a year and it's something he can't count on in the soup," the plan might start with the autopilot, not

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'Used' Means More Than 'Not New'

Some used avionics are better than others, and the source — and the trust you have in it — is what makes the difference.

• **Factory Remanufactured/Reconditioned:** With like-new condition, these units are a good buy and usually come with a 6- to 12-month warranty.

• **Overhauled:** Solid-state equipment is often replaced, sometimes repaired, but rarely overhauled. This term usually defines instruments and servos. It can be a good buy, especially when backed by a 6- to 12-month warranty.

• **Yellow-Tagged:** Issued by approved repair stations, Form 8130-3, the Airworthiness Approval Tag, indicates the component meets manufacturer specs. Such equipment can be a good buy, but some tags are "pencil whipped," and a warranty can be the deciding factor.

• **Green-Tagged/Serviceable:** This tag indicates an untested component should be repairable. Such units rarely come with a warranty. Buyer beware. Have an avionics shop bench check the unit before purchase.

• **As-Removed:** What you see is what you get. These units are straight from an airplane in the graveyard. Heed the green-tag advice.

REPAIR STATION NO. NCS0052H
(800) 445-4430

OVERHAUL FUNCTIONAL TEST

1. Issuing Station Name FAA-Approved Station		AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG					
4. Organization Name and Address SPORT-AVIONICS, INC.		2441 Aviation Drive WAUKESHA, WI 53186					
6. Date	7.	Description	8. Part Number	9. Flight Hour	10. Flight Day	11. Serial Number	
		Bendix-King KX-155	G99-1324-43			111999	
12. Remarks Repaired 25 kHz switch and squish test switch. Repaired circuit trace to pin 14-12. Aligned as needed and tested to							

When shopping for used equipment, a Form 8130-3 (often called a "yellow tag") issued by a trusted repair station indicates the repaired unit meets manufacturer tolerances.

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a WAAS GPS or some form of glass. In building-block fashion, those items would come after a new autopilot, especially if the owner flies a lot of IFR.

In the end, “you need to take an overview of the whole package because it’s much cheaper to make the right decision the very first time and develop a plan than it is to come back and piecemeal things back and forth,” Morris said. Without an upgrade plan, owners “end up redoing the same thing over and over again.”

With your mission defined and upgrade plan in place, it’s almost time to shop. There’s just one more question to answer.

Installing New or Used

All things being equal, new or used, the installation cost is the same, according to Lancaster Avionics’ Todd Adams. Used costs more if the installation kit is incomplete or missing, and in either case, the owner “eats the installation costs...as far as resale value.”

The value is based on what you are installing.

Installation cost is what separates shops, Adams said. The difference is not the shop rate, it’s the time each task takes, “which is directly proportional to the answers” to these questions:

- Is the equipment and accessories to be installed new, used or a mixture?
- What accessories, if any, are required and/or optional?
- Will the installation have a new wiring harness? If not, what won’t be new?
- Will the installation have new cable? If not, what won’t be new?
- What happens to the old harness/cable? Will unused wiring be removed?
- What antennas will be replaced?
- What happens to the removed



When shopping for an avionics shop, the owner should willingly answer questions and refer you to trade and business groups to which it belongs.

avionics (traded, sold on consignment, dumpster)?

- What is the lead-time?
- How long will the installation take (downtime)?

By reusing old wires and cables, a shop can cut its installation quote \$500 to \$1,000, according to Adams.

Therefore, owners must answer another question: Does it make sense to hobble new or reliable used equipment by using 20-year-old wires, cables or antennas, improper pins or contacts, poor grounds, inadequate cooling, or mixing and matching incompatible equipment or accessories to save a couple of bucks?

Three things are important to consumers: quality, price and time. Unfortunately, they can only demand two of the three, Adams said. A customer felt his quote for a Garmin 530 installation was too high, so he went elsewhere. He

Avionics & Aircraft Purchases

Buying an airplane is another way to purchase avionics, and what’s installed can play a big part in the price. Your pre-purchase inspection should include an avionics shop.

The in-aircraft inspection takes two or three hours, said Todd Adams, general manager of Lancaster Avionics, an AEA member in Lititz, Pa., and you get a detailed report on each unit.

“You could fly an ILS to make sure it works, but does it work up to spec? Maybe it should have captured the glideslope another quarter mile out,” he said. “That’s what putting the test equipment on it can do for you.”

What avionics are installed plays a major role in the aircraft price. To help prospective buyers decide among several airplanes, Kings Avionics in New Century, Kan., an AEA member, creates a spreadsheet on each airplane’s avionics to help buyers figure out the best deal, said Gary Morris, co-owner.

“We work for a lot of used airplane dealers,” Morris said. “I can’t tell you how many times we’ve ended having to dress up a panel with a (Garmin GNS) 430 or 530 just to get the thing sold.”

got a top-quality installation for less money, Adams said, but it took seven weeks. Adams quoted 10 days, but “time wasn’t an issue for him, so he was able to go that route.”

New or used, the box itself is but one line on the invoice. Parts and labor follow. How far the total marches from the decimal point depends on the installation’s complexity and the time it takes to make the interfaced components a reliable team.

When installing avionics, reliability is the foundation of safety, Adams said. A quality installation is only as good as the units it connects. Some, like Lancaster Avionics, will install (at a premium rate) reliable used equipment it does not sell. Others, like Kings Avionics, only install the used equipment they sell and will not touch anything customers carry in because it too often leads to nightmares.

The pilot’s nightmare starts with the installation costs. Using a Garmin 430 bought on eBay as an example, Kings Avionics’ Gary Morris said the owner usually doesn’t have the installation kit or any necessary indicators or remote annunciation.

“He didn’t get an antenna; how bad could that be? It’s \$400,” Morris said. Add the cost of missing items, and “all of the sudden he’s paid more than what he would have by walking into anybody’s avionics shop and buying one.”

The shop’s nightmare starts when the box fails and the customer says, “Well, the guy told me it was working fine, you must have screwed it up,” Morris said. “How did I screw it up? The box failed [not the installation]. It’s just not worth the hassle; life is too short.”

With this in mind, it’s time to shop.

Buying New or Used

Generally, authorized dealers are the only source of new avionics, and the dealer must install them. There are no over-the-counter sales, especially with

new IFR boxes, except to amateur builders of experimental aircraft. Shops that violate this OTC rule can lose their dealership.

This makes buying new equipment pretty straightforward. If you’ve distilled your wants into needs and worked out the install plan with a shop, you’ll have answers to most of your new equipment questions. Others are lead-time, required subscriptions and training, if any.

Don’t forget warranty coverage, length and service. Who does what repairs? Is there a new or overhaul exchange, or loaner equipment? What’s the turnaround time and warranty on workmanship?

“Used” is a broad term, and not all previously owned equipment is equal. Before 1998, “the used market was loaded with junk,” Adams said. Now, with good equipment making room for the Garmin 430/530, he can build a package of King Silver Crown radios and install a reliable system saving thousands of dollars. And, if you have a sick radio, repairs often can cost more than replacing it with a used box of the same make and model.

Before shopping, know the price when new and a unit’s going rate when used. Patronize the shop with which you’ve been working. In many cases, they’ve known the equipment since it

was new. If the shop doesn’t have what you need, it might offer leads, but make sure it will install what you find.

To avoid interface problems, don’t deviate from the makes and models on your upgrade list. Verify overhaul dates, especially on gyroscopic instruments, which can go bad with a six-month shelf-nap. A warranty says vendors stand behind their used equipment. If one isn’t offered, insist on a 30-day money-back guarantee — in writing. If you don’t get it, think seriously about looking elsewhere.

Make sure the unit has its data plate — without it, a repair station cannot issue a maintenance release tag, even if it meets specs. Finally, check the serial numbers.

“We had a guy who bought a 430 on eBay, and he brought it in for service. We called Garmin to get the RMA (return material authorization) number, and they said, ‘Oh, that radio was reported stolen.’”

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A green tag suggests — but does not guarantee — the equipment is repairable. Have a trusted shop bench test it before purchase.

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To that pilot, that Garmin was worth as much as a Bic lighter, Adams said.

Shopping Online

Mention online shopping, and eBay probably comes to mind. While it might offer bargains, avionics is rarely one of them. There's no way to verify the unit's ownership or operating condition (all a picture tells you is what the box looks like), and most people end up paying more than the unit is worth, Adams said.

Garmin 430s seem to be eBay's most highly trafficked units. They are rarely pulled from airplanes, according to Adams. A wreck is one reason, and upgrading a really old unit is another.

About two years ago, Adams quoted the installation of an eBay "deal," a 28-volt Garmin 430 that

preceded the 1999 introduction of the 14-28 volt combo model. The pilot paid \$500 less than the price of a new 430, but it "was going to cost more to install the old one than it would have if he would have bought a new one from me to begin with," Adams said.

Buying online is a viable option when the website is an extension of an avionics shop, like Gulf Coast Avionics, an AEA member. Located in Lakeland, Fla., Gulf Coast Avionics is an authorized dealer and an FAA-approved repair station. It has a sister facility, Pacific Coast Avionics, also an AEA member, in Aurora, Ore.

Different from many shops, said Rick Garcia, president of Gulf Coast, "about 70 percent of our business is online, catalog and people calling on the phone."

The Coasts help distill wants and needs and plan installations over the phone.

"Customers send pictures of

their panels that make it more clear what we're trying to quote, what we're going to do, and to make sure stuff is going to fit," Garcia said.

It is a bit tricky because the technician doesn't know what's behind the panel until the airplane arrives for the installation. Customers can "vacation at Disneyworld while we put it in," Garcia said, adding that a Garmin 430 installation takes a week — and they save sales tax if they live out of state. Gulf Coast also installs its used equipment, which comes with a 90-day warranty.

When buying avionics, there are many ways to achieve the same end: a safe, reliable system meeting the needs of a specific aviation mission. How efficiently and economically you achieve this depends on the work you do before you actually buy the boxes. ■