# Got IFDs?

## *Be Careful When Selecting an Avionics Shop for Troubleshooting, Repair Work*

BY DALE SMITH

Where once they were found only in the top-end air transport aircraft, today they are found in the panels of nearly every new aircraft type. In fact, it would be difficult to find a production airplane that doesn't have them — "them" being integrated flight decks, or IFDs. The more familiar marketing monikers include G1000, Entegra, Pro Line 21 and EPIC.

What exactly are IFDs? There is still a bit of uncertainty among aircraft owners as to what constitutes a "real" integrated flight deck from a "nearly" integrated flight display.

"Integrated flight decks are actually a technology that has been out there for quite a while," said Adam Parish, avionics sales manager for Cutter Aviation. "We have some Beechjets that have been using it since the early '90s. But it's an avionics suite that pretty much ties in every system on the airplane and to each other, for that matter."

Tony Bailey, director of avionics and engineering for Pentastar Aviation, said a greater degree of awareness and safety are realized with IFDs.

"Terrain awareness, traffic avoidance, radar, satellite weather, navigation and many other (situational) awareness components are displayed right in front of the pilot," Bailey said. "That awareness and safety is what the integrated flight deck is all about."

Simply, avionics manufacturers have taken all the information that used to be in separate displays on a radio stack, ADI, HSI, radar, MFD and such that was spread all over the panel, and now present it on two, three or four (depending on the aircraft's configuration) large, flat-panel LCDs.

Although the Garmin G1000 in this Cessna Skyhawk panel has separate "boxes" behind the panel, it functions as a truly integrated flight deck.

Kings Avionics technicians are trained to diagnose problems with IFDs.

"In my opinion, this advancement brings a new level of functionality to the GA market that was only previously available in the larger aircraft types," said Doug Hayden, vice president of Kings Avionics. "They have the capabilities to select various sensors or display configurations at the touch of a button."

Depending on the type of aircraft being flown, there are varying degrees of IFDs. A Honeywell EPIC or Rockwell Collins Pro Line 21 system truly are integrated. All the sensors, radios and other items that used to be in separate boxes now are just LRUs (cards) in a central unit. Although the Garmin G1000 and Avidyne Entegra systems still have separate "boxes" behind the panel,

they also function as true IFDs. And from the pilot's perspective, all of these systems function like true IFDs.

## Troubleshooting in Paradise

While these new IFDs are a blessing to pilots, they can present challenges to avionics shop technicians.

"Troubleshooting is no longer a process of shaking the box, tapping the glass or little 'tweaks,'" Bailey said. "Now, computer knowledge and the ability to interpret printed configuration logic are as important as understanding electronics. It's just a different mindset than in the past."

Parish said it isn't as simple as it used to be when there was just a Nav, a Com and a transponder.

"With an integrated system, you have all those pieces, but now you also have display units and adaptors and sensors all over the place," Parish said. "So, your problem with a transponder may not actually be in the transponder. It could be in another card somewhere else, or in a data transfer wire. You have to be able to know how the system works well enough to follow the path to the right portion of the system that is truly bad."

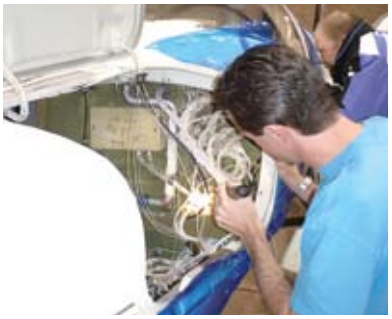
What all that means is, today's avionics technicians have to complement their experience and talent with training — lots of training.

"To get to this level of equipment — the new Garmin, Honeywell and Collins — to hold our dealership and to be able to work on this, we have to have specific training from the factory," said Don Rice, customer service manager for avionics at Flightcraft. "We send our guys to school for a whole week. It's very expensive — it's not a cheap date.

The Honeywell Primus Epic is a truly integrated IFD with all sensors, radios and others items in a central unit.

"I say 'work on' it, but there's not much you can do in the field as far as working on the components," he said. "You pretty much send (the manufacturers) the boxes. Our goal is troubleshooting inside the airplane."

If your equipment is under warranty, a shop has to be "factory authorized" to even pull the boxes and send them in for repair. But the box may not have to be pulled if a trained technician knows what he's looking at in the first place.



Avionics technicians must be able to troubleshoot when working with IFDs.

"(The IFDs) rely heavily on software interface, and you must be trained to diagnose these problems using your previous avionics experience, troubleshooting skills and a knowledge of the system's unique architecture," Hayden said. "Many of these systems can be diagnosed using onboard displays or laptop computers. And some of the problems can be repaired by simply reloading or reconfiguring the software.

"What it all comes down to is, if a technician is not trained on these systems and they don't have the proper equipment and knowledge to troubleshoot these

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From the pilot's perspective, the Avidyne Entegra, such as the one in this Piper panel, functions as a true IFD.

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new IFD systems, they can't repair or return them to service properly once a component has been replaced," he said.

And it's not just product-specific training that is important today. Each aircraft installation is unique in the way an IFD system is installed. A G1000 in a Cessna 182 is not the same as a G1000 in a Mooney or Bonanza.

"As a matter of fact, there are a number of manufacturers out there now, like the new Eclipse jet, that are manufacturing their own avionics suites for a particular airframe," Parish said. "Every time something new comes out, it is even more integrated than it was before."

This Bombardier Challenger features the Rockwell Collins Pro Line 21, which is a true IFD.

## AEA Member Shops

If you are lucky enough to be flying an IFD-equipped airplane, choosing a factory-authorized shop is critical for a variety of reasons. And there is something you can do to ensure your trip to an avionics shop is a good experience: Find a shop that is a current member of the Aircraft Electronics Association. While the majority of avionics shops wanting to work on IFDs take training seriously, AEA member shops kick training up a notch.

"AEA member shops have access to great training and are connected to current trends in technology," Bailey said. "Just like a doctor who is a member of the American Medical Association is probably more reputable than one who is not — it is the same thing, except for avionics."

Hayden said AEA has access to an extra level of training.

"I've been to many, many national and regional (AEA) meetings and every one of those is training-oriented," Hayden said. "You have all the events hosted by the manufacturers that will give you the latest information on the systems."

The AEA is a training partner with many of the major avionics manufacturers.

"The manufacturers are looking to the Association to host these training events for them," said Mike Adamson, director of training and education for AEA. "You will see it more this year with Garmin and their G1000 classes. They are telling their dealers they have to attend an AEA training event to receive G1000 training. Garmin is looking at our venues and the opportunity they represent to get our members better trained on these integrated avionics systems.

"This equipment changes so fast, you are only as current as the last meeting — especially with integrated systems which are all software-driven," Adamson said. "So, even if you did sit through factory training last year, there have been changes — many changes. It's not like you learn it once and know it for the rest of your life."

Just look at how hard you have to work to keep up with your personal computer.

Adamson and AEA member shops believe having this high level of constant retraining available is especially important to today's aircraft owners, particularly when considering the sophistication and nuances built into an integrated flight deck.

"If the technician working on your airplane isn't familiar with the latest troubleshooting, you may have added downtime with your airplane because the technician can just pull a box and send it back to the factory," Adamson said. "Then, the factory sends it back to the shop with 'no fault found' and says the problem is not with the box. So, the technician has to start again."

## Real-World Information Served Up Fresh

The type of training the Association makes available is fresh and frequent, which gives AEA member shops another advantage. And it's not just classroom information — it's real-world training straight from the field.

"Because that's what the OEMs want," Adamson said. "At this year's (AEA) Convention, we had more than 75 hours of training available to our members. I wouldn't say that's because of any rule; I would say it's because

everybody wants to use the venue for training."

Among the topics and training sessions available to technicians at this year's convention were everything from "A Logical Approach to Troubleshooting and Auto Flight Control Systems" to "G1000 Training and CNI Product Line Refresher Training," including Garmin's new autopilot and radar systems. In addition, there were technical training workshops from Avidyne, Chelton Flight Systems, Garmin, L-3 Avionics, Sandel Avionics, Shadin Avionics, S-TEC, Universal Avionics and others.

It's not only the avionics technicians who are taking advantage of this chance to go one-on-one with factory representatives. According to Adamson, the local FAA also is well represented at these sessions.

"A lot of inspectors are sitting side-by-side with the technicians so they can get up to speed on this new equipment," he said. "There must be a reason why the FAA takes time out of their day and often weekends to attend these sessions."

Because of the frequency of the AEA's regional and national meetings, manufacturers can update their sessions to reflect the latest information, which is another advantage of AEA training opportunities.

"It's not like the training is the same every time," Adamson said. "Systems evolve. Training evolves. And the AEA is helping shops and technicians stay on top of all these changing issues. It's an advantage for member shops."

All this initial and recurrent training available to AEA member shops adds up to a better, more consistent and cost-efficient avionics repair experience for the aircraft owner.

"I just feel that (an AEA member) is a stronger shop," Rice said. "I know I'd rather bring an airplane to a shop with an AEA sign on the wall. It's just because I've been involved with the training, and the AEA is such a professional organization. Any shop that is involved with the AEA is going to move up a level just by being a member."

To find an AEA member shop in your area, look in the back of this guide or visit the AEA website at www.aea.net, then click "Membership Directory." From there, you're in the best of hands. ■