



Pilot examiner Jason Blair tells **GREG BROWN** that half his IFR checkride failures result from misprogrammed GPS navigators.
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GOTCHA SWITCH

Every pilot experiences a bit of pucker factor when descending through clouds on an instrument approach. Am I really where I think I am, safely separated from the ground?

I was reminded of the stakes when my friend Mark phoned after landing at Colorado Springs with his wife and another couple.

"After clear weather through the mountains, we encountered an inversion east of the Rockies," he said. "Colorado Springs was reporting 1,000 broken, 1,500 overcast, so I requested the ILS Runway 17L approach. The vectoring and intercept seemed fine, but we broke out of the clouds just above the trees while still several miles from the runway. It was quite a scare, and I want to determine the cause so it never happens again."

For you VFR pilots: An instrument landing system (ILS) consists of two intersecting perpendicular radio signals projected from the ground. By centering the associated vertical and horizontal needles, pilots are guided to the runway.

Mark wondered if the problem was with the glideslope signal or receiver, or if he'd made some serious error in executing the approach. The approach plate showed terrain 1,000 feet above field elevation north of the airport, so I suggested he might feel low breaking out there. That didn't satisfy Mark, however. The glideslope needle had remained centered throughout his descent, so he'd wondered if it was working properly.

Modern instrument flying melds satellite-based GPS with ground-based (such as ILS and VOR) navigation. Pilots navigate primarily by GPS, but must tune radio frequencies for the occasional ILS approach to descend through instrument conditions to a landing. Depending on circumstances, GPS navigators sometimes make this change automatically, but not always. Pilots must remember to check, and manually switch

if necessary. The relevant "GPS-VLOC" selector is so safety-critical that it's sometimes nicknamed the "gotcha switch."

I asked Mark if he remembered switching his navigator to VLOC upon joining the approach. He did. Those of us who flew instruments pre-GPS are conditioned to triple-check ILS reception before descending. But today's GPS pilots often forget to do that, so I peppered my friend with questions: *Did a red "inop" flag appear on the glideslope needle?* Not that he noticed. *Did he audibly identify the ILS to confirm radio reception?* No. *Did he tune and crosscheck the approach on his number two radio?* Tuned, but did not crosscheck. *Did he check glideslope altitudes against the chart during descent?* No. Those actions would have confirmed properly tracking the ILS.

The next day, Mark troubleshot the approach with a flight instructor. Again, after selecting VLOC on the "gotcha switch" the ILS needles did not properly come alive. The CFI explained that the ILS automatically populates the backup frequency, and must be manually switched to "active" to intercept the approach.

"But it's always in the primary when I shoot the approach at Flagstaff," said Mark.

"That's because you only practice ILSs at your home airport, and never change the frequency," answered the CFI. His error explained, Mark emailed flight-track data from the bad approach. "Note that although I remained centered on the final approach course, I descended somewhat erratically to within 100 feet of the ground. Now I'm convinced I didn't properly engage the ILS and must have been tracking GPS instead."

Returning home, Mark scheduled his instrument instructor for further practice. "I told him that after reviewing the basics, I want him to throw every wrench he can to challenge my brain." They flew an uneventful ILS to Grand Canyon Airport, but back at Flagstaff the localizer never came alive.

"It was *déjà vu* all over again," said Mark. "Only this time I verified that my GNS 430 was in VLOC mode, that both nav radios were properly set, and I correctly noted the 'inop' flags." Identifying that Flagstaff's localizer signal was out of service proved a worthy lesson.

Since then, Mark has been practicing approaches both on a home instrument simulator and aloft. Pilots who thoroughly analyze their errors, and train accordingly, rarely repeat them. **FT**