Is The Compass Dead? Is Technology Now King?

GPS units are excellent primary navaids, but that doesn't mean we should abandon our old-fashioned whiskey compass

Plane & Pilot Magazines

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Without meaning to, the majority of the population of the industrialized world (and much of the rest) has become wildly dependent on personal technology. Don't believe that? Ask yourself how disconnected from the world you feel when you find you've left home without your phone. Not quite terrifying, but close enough.

Now, imagine yourself about an hour into a cross-country. Like most folks, you're watching the little airplane on the screen obediently work its way toward your destination, and the digits are counting down the distance and time to go. Then suddenly, everything goes blank. Everything! You pull out your handheld GPS, same thing. Nothing! Maybe an asteroid cut through our orbit and clipped a couple of satellites. Or maybe extraterrestrial beings came to visit and snatched a few. Whatever the cause, we instantly know the feeling of being let down by technology. Worse than that, we get that slight damp feeling in the palms of our hands that says we don't know exactly where we are, because we've been glued to the screen and haven't been paying attention to our surroundings. This, of course, isn't the case, if we're old school and have been keeping a thumb on the sectional, tracing our progress along a penciled line, and have been mentally cataloging the compass heading that's keeping us on course.

Here's a basic fact of life: Pencils and pens seldom fail, and a pocket will hold a lot of spares. A sectional, assuming you don't let it blow out the window, will always tell you where you are. Better yet, sectionals and pencils don't need batteries or an electrical supply. Ditto the compass: Electrical failures of any kind don't bother them. The combination of a sectional and a compass are unbeatable in terms of reliability and accuracy. The pencil/pen makes it easier but, in a pinch, even those aren't actually needed.

First, let's get one thing clear. I'm not saying we should all toss our GPSs out and go back to dead reckoning or pure pilotage. What I am saying, however, is that we shouldn't put all our

eggs in one technological basket. Cross-countries have become about a trillion percent easier and, within certain limitations, safer, with GPS and the other wondrous electronic gadgets we now have, including ForeFlight on iPads and such. It's hard to get lost when you're seeing a digital representation of yourself crawling across an electronic sectional. But we should always be aware that gadgets have failure modes built into them simply because they're man-made. So, just as we train and prepare for engine failures, we ought to do the same with navaids: We should have back-up plans in place just in case they decide to die. Because of that, there are some basic rules that we should follow when GPSing our way across the landscape.

Don't Depend On Just One Gadget

Inasmuch as these days GPS is built into just about everything but our socks, there's never a reason to be on a cross-country with only one GPS. A panel-mounted unit is nice, but most little airplanes make do with some sort of stand-alone handheld. And since they're so cheap these days, we should have two. Or a GPS and a tablet. And have ForeFlight loaded into our cell phone, as well. If you're going to have technology leading you around, back it up. Then, back it up some more.

Even if you have a row of GPS units and iPads blanketing the panel, don't forget that they're totally dependent on having a number of satellites to talk to, and those satellites are amongst the most complicated gadgets on, or off, the planet. They've been known to get sick and out-and-out fail. Even solar flares/sun storms can render them nearly useless. When that happens, a good part of civilization immediately loses its way. We don't want to be one of those entities that are lost.

Plan It Like The Electronics Have Already Died

With the advent of GPS, tablets and all the other unreal electronic navaids, a pilot is often tempted to top his tanks, jump in his airplane, hit "go to" and go. While this works most of the time, not having at least a sectional with a clearly marked line on it is taking a terrific chance. It assumes the electrons will always keep flowing and eliminates any form of Plan B should things get dicey. Always plan for the worst. Besides, pencils and sectionals are cheap.

Electronic Dead Reckoning And Pilotage

The way in which we avoid being a navigationally challenged aeronaut is by using the sectional, our thumb, the compass and our commonsense as never-fail backup systems. The GPS/tablet/screen is our primary guidance package, but we're backing it up by investing just a little extra effort in constantly keeping track of our place in the world via dead reckoning and pilotage.

In concept, "dead reckoning" and "pilotage" overlap just a little, but even when each technique is standing alone, they work well to back up the GPS.

Dead reckoning is picking a compass heading that accounts for compass magnetic variation, compass deviations and wind drift, then using our watch to determine how far we are along the selected course line.

Pilotage involves looking out the window, identifying landmarks and following the string of landmarks that are identified by a preselected course line on the sectional.

Backing up our electronic systems involves elements of both dead reckoning and pilotage. To hold the course line indicated by our GPS, we need to identify a compass heading that will hold that line. Through experimentation, we find a heading that keeps us on course that automatically includes all compass devia-tions, magnetic variation and wind corrections. Elements of pilotage are layered over the GPS/dead reckoning in that we're continually looking out the window and following our progress on the sectional by identifying landmarks that we're seeing out the window. If the navaid we're using should decided to take a siesta, nothing changes: We just hold the compass heading we've already fine-tuned and keep our eyes peeled for identifiable landmarks.

The Compass Is Still King

Any discussion of small-plane navigation starts with the compass: There's a reason that an old-fashioned whiskey compass separate from the rest of the airplane's systems is on the "required equipment" list for virtually every light airplane: It provides the most important navigational information a pilot requires. It's the final authority on the direction the airplane is going across the ground and is completely controllable by the pilot. Better yet, it's totally reliable and accurate as long as some environmental effects are understood.

Being magnetic in nature, the actual compass heading required might not be the same as the true course line drawn on the map. The compass heading has to be determined by correcting the true course line for:

—wind (for true heading)
—magnetic variation (the exact definition of "magnetic north" changes with the location on the Earth). Adding variation gives Magnetic heading.
—Deviation is caused by aircraft installation and instrument errors, and is indicated by the deviation card in the airplane. Steer the corrected heading shown.

Even though the compass deserves all of the accolades we're giving it, the compass isn't a maintenance-free instrument. It has to be adjusted from time to time and its deviation card renewed. In fact, every compass in every airplane is supposed to have its deviation card available to the pilot.

In theory, most airports have compass roses painted on the ramp somewhere that can be used in fine-tuning a compass. However, many don't, and it's unknown how accurate those roses are, anyway. Runway headings are also approximate, so when using them to align a

compass, it has to be kept in mind that they may be several degrees off. And when adjusting, remember to use a nonmagnetic screwdriver. Better yet, get your A&P or local instrument repair shop to do it.