MAX TRESCOTT
BETTER PILOT / TRENDS ALOFT

The Pocket CO 300 carbon monoxide detector, about the size of an average car key, continuously displays CO levels, and a flashing LED indicates the device is operating.

Lifesavers in the Cockpit

Pocket carbon monoxide detector

AS A FLIGHT INSTRUCTOR, I'd hate to have someone die because of something I didn't teach him or her. It's rare that anyone tells you, "You saved my life," but I heard those words recently from a friend.

She was the copilot in a King Air on a charter flight returning to the San Francisco Bay area at 1:30 a.m. The captain wasn't familiar with our area. As they were being vectored among the pitch-black hills for the localizer approach into the Hayward airport, she remembered a comment I made at a night flying seminar—that more than 50 percent of fatal accidents in our area occur at night, probably because of the dark hills and frequent low clouds and fog. The advice I gave—which my friend said saved her life—was that if pilots were ever in doubt about their position in our area, they should climb to 4,500 feet, to clear the highest terrain.

My friend told the captain he needed to call the controller now about their turn onto the localizer or to start an immediate climb. The captain called the controller, who initially responded with confusion—but then he ordered an immediate climb. Later, he apologized to the crew. Another Part 135 crew didn't fare so well; in 1995 a controller vectored them at night into the side of the same hills.

THE SILENT KILLER

Not all lifesaving events are as dramatic. Some dangers lurk so far below the radar that pilots

PHOTOGRAPHY BY **MAX TRESCOTT**

aren't even aware of the potential risk. One silent killer is carbon monoxide (CO) poisoning. CO, a byproduct of combustion, is found in aircraft exhaust and can poison pilots in almost any GA aircraft. Pilots are at risk of succumbing to this insidious killer not only when flying, but also while traveling in a vehicle, sleeping in a motel room, and even sleeping at home.

It's rare that I find a product that's applicable to 100 percent of pilots, costs little more than an hour of dual in a Cessna 172, and is built in the United States. But the Pocket CO Model 300 carbon monoxide detector is just such a device, and it could save your life. According to the Centers for Disease Control and Prevention, about 500 non-fire, unintentional deaths occur each year from CO poisoning, making it the third leading cause of unintentional poisoning death in the United States. In addition, at least 50,000 people a year survive encounters with carbon monoxide poisoning, and 43 percent of poisoned patients still have cognitive problems a year after their encounter.

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In aircraft, approximately one fatal accident per year is attributed to carbon monoxide poisoning, though quite likely it's a factor in other accidents. Although you can't see, smell, or taste it, carbon monoxide can make you sick or kill you. The problem is severe enough that the FAA tasked Wichita State University to investigate the problem and solutions. The resulting report, DOT/FAA/AR-09/49 Detection and Prevention of Carbon Monoxide Exposure in General Aviation Aircraft, includes an evaluation of 43 CO detectors.

The panel is the most effective location to mount the detector.

It also comes with a clip that can attach to a shirt (as Max shows here), flight bag, or other mounting location.

According to the report, "The FAA standard for CO in an aircraft cabin is no more than 50 ppm [parts per million]; however, there is currently no requirement to monitor for CO in the cabin." The report said characteristics that are important for GA application include high accuracy, quick response time, inherent immunity to false alarms, and low power consumption, and it concluded CO detectors using electrochemical sensors may be the most suitable for GA.

The Pocket CO 300 I've been testing meets these characteristics. It detects as little as 1 ppm of carbon monoxide, but doesn't sound alarms until levels of 50, 125, or 400 ppm are detected. Those alarm levels are appropriate, since Wichita State found that "CO was detected on more than 90 percent of the flights monitored (either on the ground, in the air, or both), [but] the majority of CO events detected were less than 10 ppm...with a very small percentage [of flights] detected with levels above 50 ppm."

Many pilots use a cardboard chemical patch detector that sticks to the instrument panel. These are inexpensive, less than $10, but they have drawbacks. First, they don't detect low levels of carbon monoxide. Tests show that they take a couple of minutes of exposure to high levels of carbon monoxide—in excess of 100 ppm—before turning color. They also need to be replaced every few months, so unless a pilot is

PHOTOGRAPHY BY MAX TRESCOTT

diligent about changing them, he or she may get a false sense of security.

By contrast, the Pocket CO 300 uses an electrochemical sensor containing hydrochloric acid. A voltage is applied to the acid, and the current flow is proportional to the amount of carbon monoxide present. One drawback is that the sensor slowly dries over time. After about a year, it could read as much as 10 percent lower, so KWJ Engineering offers a calibration kit to recalibrate its detectors. The kit includes an aerosol can and a plastic pouch that the Pocket CO 300 is placed in. Air from the can—which includes 100 ppm of carbon monoxide—is sprayed into the pouch to expose the detector to a known concentration of CO.

I like the Pocket CO 300 because it weighs less than an ounce and is the size of a key fob. It is so small that after I clip it to my shirt in flight, I promptly forget it's there. It can easily attach to a key chain, a good place for most pilots to carry it. However, as a flight instructor, my keys are usually in my pocket, so I store the Pocket CO 300 with my headset so that I see it and am reminded to clip it on.

COMMON SYMPTOMS OF CARBON MONOXIDE POISONING: Headache, dizziness, fatigue, nausea or vomiting, confusion, diarrhea, weakness, shortness of breath

IF YOU EXPERIENCE ANY OF THESE SYMPTOMS: Turn off cabin heat, open windows, and land as soon as practical.

Wichita State analyzed where to mount a CO detector and concluded that the instrument panel was the most effective location. Pilots could attach the Pocket CO 300 to the panel via Velcro, but I'm guessing most pilots will want to leave it on a keychain or use the clip to attach it somewhere near the instrument panel.

The only downside I've heard is that the Pocket CO 300's 82-decibel buzzer isn't as loud as alarms in other detectors. But since it also vibrates and flashes, you won't miss an alarm if it's attached to your shirt.

This detector sells for $139 and can be ordered at *www.KWJEngineering.com* and through many pilot supply distributors. There are other good detectors available, too. What's important is that you have a strategy for dealing with CO. Remember, the life you save may be your own! EAA

Max Trescott, EAA 531980, is an aviation author and publisher, and was the 2008 National CFI of the Year. For more of his articles, go to *www.MaxTrescott.com*.

For a PDF of the DOT/FAA/AR-09/49 Detection and Prevention of Carbon Monoxide Exposure in General Aviation Aircraft, go to *www.SportAviation.org*.