

Communication Summary

January 11, 2021

Communication From: Rick Beach, COPA



Mr. Beach conferred multiple times with COPA instructors and supplied an operational description of the installed avionics in N733CD. He, in part, reported:

From the description of the aircraft for sale, the airplane was equipped with avionics that included "Dual Garmin 430s/TAWS, Sandel 3308 EHSI, ARNAV ICDS 2000, WX-500 Stromscope, S-Tec 55X Autopilot w/ GPSS (GPS Steering) and Glideslope Tracking, Digital Altitude Preselect, Garmin GMA-340 Audio Panel, GTX-327 Transponder, 4 Bose Jacks."

Navigation operation involves pilot selection of modes on three interconnected devices: Sandel 3308 EHSI, the Garmin 430 navigators, and the S-TEC 55X autopilot. The S-TEC autopilot has two selector switches: HDG and NAV that result in 3 lateral navigation modes: HDG, NAV and GPSS, which is invoked by pressing the NAV button twice. The Sandel 3308 EHSI has a NAV source selector switch that in a Cirrus typically cycles through NAV1, NAV2, and GPS1, referring to the dual Garmin radios and top Garmin GPS navigator respectively. The Garmin 430 has two navigation modes, VLOC for radio navigation and GPS for GPS navigation.

When the S-TEC 55X autopilot operates in HDG mode, the autopilot tracks information from the Sandel 3308 EHSI via the Heading Bug. The pilot rotates the Heading Select knob on the Sandel to establish the desired heading. In NAV mode, the autopilot tracks information from the Sandel 3308 EHSI via the Course Deviation Indicator (CDI). The pilot rotates the Course Select knob on the Sandel to establish the desired track. The autopilot strives to center the CDI by maneuvering to intercept and track the navigation course. On the Sandel, the pilot selects the primary navigation source to drive the CDI from the Garmin 430 as either radio navigation (VOR, ILS) or GPS navigation. In GPSS mode (GPS Steering), the autopilot tracks digital GPS course information received directly from the primary Garmin 430 navigator eliminating the use of CDI information from the Sandel 3308 EHSI.

Common autopilot operational procedures utilize these settings:

1. HDG mode to accomplish a turn to a heading and/or track a specific magnetic heading,
2. NAV mode to intercept and/or track a radio navigation course (VOR or ILS) via the Sandel CDI.
3. GPSS mode to intercept and/or track a digital GPS navigation course via the Garmin 430 flight plan.

Confusion is known to arise when the pilot intends to fly a GPS course while the S-TEC 55X, Sandel EHSI and Garmin 430s are utilizing an autopilot NAV navigation mode that relies upon the Course Deviation Indicator on the Sandel. This would happen when the autopilot is in NAV mode, not GPSS mode. In that confusing state, the autopilot uses the Course Deviation Indicator on the Sandel to navigate while the pilot is expecting to fly the GPS track. The pilot can correct this confusion by re-engaging GPSS mode on the autopilot by pressing the autopilot NAV button twice.

With a six-pack Cirrus, a recommended practice to establish the equivalent of the blue LVL button on other autopilots involves a three-step process: 1) press SYNC on the Sandel (to establish the current heading), 2) press HDG on the S-TEC 55X autopilot (to fly that heading), 3) press ALT on the autopilot (to maintain level flight). Then the pilot can rotate the Heading Selector knob on the Sandel to fly a desired course.

I can attest that the above summary is correct to the best of my knowledge:

Edward F. Malinowski
National Transportation Safety Board
Air Safety Investigator