



December 28, 2023

Aviation Investigation Report AIR-23-02

# Publish Spin Recovery Techniques for Twin Commander Aircraft

## Introduction

The National Transportation Safety Board (NTSB) is providing the following information to urge Ontic, the owner of Twin Commander Aircraft LLC, to take action on the safety recommendation in this report. We identified this issue during our investigation of an accident involving a Rockwell International 690B airplane that impacted terrain following an inadvertent stall and spin from which the pilot did not recover.<sup>1</sup> The NTSB is issuing one safety recommendation to Ontic.

## Background and Analysis

On September 28, 2021, about 0900 central daylight time, a Rockwell International 690B airplane, N690LS, impacted wooded terrain near Hiles, Wisconsin, after entering an inadvertent stall and spin. The pilot and two passengers sustained fatal injuries. The aerial imagery survey flight was operated by Surdex Corporation under Title 14 *Code of Federal Regulations (CFR)* Part 91.<sup>2</sup>

The company pilot and two employees intended to obtain aerial imagery of forest vegetation for the Wisconsin Department of Natural Resources. Automatic dependent surveillance-broadcast and air traffic control information provided by the Federal Aviation Administration (FAA) indicated the airplane departed Rhinelander-Oneida County Airport, Rhinelander, Wisconsin, about 0850. About 8 minutes later, the airplane began to level off at an altitude of about 16,100 ft and accelerated to a maximum recorded groundspeed of 209 knots. Less than 2 minutes later, the airplane's groundspeed decreased to about 93 knots, and the airplane descended about 500 ft while on a steady northeasterly heading.

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<sup>1</sup> Rockwell International was acquired and sold by several different companies between 1981 and 2003 when it was reincorporated as Twin Commander Aircraft LLC.

<sup>2</sup> Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB investigation (case number CEN21FA459). Use the [CAROL Query](#) to search safety recommendations and investigations.

The airplane subsequently entered a rapid descent and a right turn. "Mayday, mayday, mayday" and "we're in a spin" transmissions were broadcast to air traffic control.<sup>3</sup> A witness, who was located about 1 mile from the accident site, observed the airplane in a nose-down attitude, descending at a high rate of speed, and spinning about its longitudinal axis.

Postaccident examination of the airplane confirmed that it impacted the ground in a nose-low vertical attitude and at a high rate of speed. No preimpact mechanical malfunctions or failures were noted during the examination of the airframe, engines, and propellers. The NTSB determined the probable cause of this accident was "the pilot's failure to maintain adequate airspeed, which caused the airplane to exceed its critical angle of attack and enter an inadvertent stall and spin." In addition to this accident, the NTSB identified five other accidents involving Twin Commander aircraft in which the pilot did not recover the airplane from a spin (see the Appendix for additional information about these accidents).

The pilot operating handbook (POH) for the Twin Commander 690B does not include a procedure for recovering from an inadvertent spin (the 690 and 690A models also don't contain a procedure). Regarding spins, the POH states, "acrobatic maneuvers, including spins, are unauthorized." However, the POHs for later models of the Twin Commander series of aircraft (690C and 690D) do include a procedure.<sup>4</sup>

The Twin Commander 690B was certificated in 1976, under US Civil Air Regulations (CAR) 3.20(a)(1) for normal-category, non-acrobatic, non-scheduled passenger and non-scheduled cargo operations. Under this operational category, spin recovery procedures were not required to be included in the POH. Current regulations that govern airworthiness standards for normal-category airplanes (14 CFR Part 23) also do not require spin recovery procedures be included in the POH. However, 14 CFR 23.2610(a), amendment 23-64, requires all normal category airplanes, regardless of weight, to display "in a conspicuous manner any placard and

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<sup>3</sup> According to the aircraft performance study for this accident, the airplane pitched down in excess of 30° and descended at a rate that reached 20,000 ft per minute. About the time that the airplane pitched down, the estimated normal load factor decreased from about 1.6 Gs to less than 1 G (normal load factor is the ratio of the lift of an aircraft to its weight). A rapid decrease in normal load factor is consistent with a stall when the wing exceeds its critical angle of attack.

<sup>4</sup> When asked why the POHs for some Twin Commander airplane models contained spin recovery procedures and some didn't, representatives of the manufacturer did not specifically answer the question. Instead, they stated that the airplane should be operated in the normal category and spins are unauthorized.

instrument marking necessary for operation"; according to the FAA's interpretation of this regulation, a placard prohibiting intentional spins is required.<sup>5</sup>

The General Aviation Manufacturers Association (GAMA) developed guidance, Specification 1, "Specification for Pilot's Operating Handbook," with representatives of member companies for use in preparing POHs. Specification 1 states that it is at the manufacturer's discretion if spin recovery procedures for multi-engine airplanes, such as Twin Commander airplane models, are included in the POH. The guidance further states that if the manufacturer opts to include spin recovery procedures in the POH, it also should be noted that multi-engine airplanes have not been tested for spin recovery by the manufacturer (GAMA 2016).<sup>6</sup>

The NTSB recognizes that the Twin Commander 690 airplane series was certificated in the normal category; thus, it did not undergo spin testing and, therefore, pilots shouldn't be intentionally performing spins. However, it is possible pilots could unintentionally enter a spin following a stall, similar to this accident. Accordingly, pilots should have access to all pertinent information to promote safe flight (including spin recovery techniques).

Further, because Twin Commander has already documented this procedure in the POH for the 690C and 690D models, the NTSB believes it is prudent to include the spin recovery procedure, appropriate to each model, in the POHs for the 690, 690A, and 690B models as well.<sup>7</sup> The NTSB concludes that the inclusion of a spin recovery procedure in the Twin Commander Aircraft POHs for the 690, 690A, and 690B models might aid pilots in recovering from a spin in the event they inadvertently enter a stall and spin condition. Therefore, the NTSB recommends that Ontic develop a supplement that documents a spin recovery technique for inclusion in the Twin Commander Aircraft 690, 690A, and 690B models' POHs and distribute this information to all owners and operators of these aircraft.

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<sup>5</sup> The FAA's interpretation, available in the public docket for CEN21FA459, notes that this regulation originated in CAR 3.769(a), amendment 3-1, continued through to 14 *CFR* 23.1567(a), amendment 23-63, and remains in 14 *CFR* 23.2610(a), amendment 23-64 (latest amendment) and associated consensus standards. For the accident airplane, the required placard prohibiting intentional spins was located on the left side of the instrument panel.

<sup>6</sup> Title 14 *CFR* 23.221 requires that single-engine, normal category airplanes must be able to recover from a spin or demonstrate compliance with optional spin-resistant requirements before certification. Conversely, multi-engine airplanes are not required to demonstrate spin recovery for certification.

<sup>7</sup> According to Twin Commander personnel, there were 541 of the 690, 690A, and 690B models built and 178 of the 690C and 690D models.

## Findings

The inclusion of a spin recovery procedure in the Twin Commander Aircraft Pilot Operating Handbooks for the 690, 690A, and 690B models might aid pilots in recovering from a spin in the event they inadvertently enter a stall and spin condition.

## Recommendations

### To Ontic:

Develop a supplement that documents a spin recovery technique for inclusion in the Twin Commander Aircraft 690, 690A, and 690B models' Pilot Operating Handbooks and distribute this information to all owners and operators of these aircraft. (A-24-1)

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**Report Date: December 28, 2023**

## Appendix: Related Accidents

NTSB case (report)	Date	Location	Accident circumstances	Injuries	Aircraft Model
<b>NYC73AN026</b>	8/14/1972	Wellsburg, West Virginia	Loss of control in a stall maneuver for reasons unknown at 12,500 ft.	3 fatal	690
<b>MIA87FA191</b>	6/24/1987	Hilliard, Florida	Airplane climbed normally to 9,200 ft and then entered a near vertical dive and broke up. Pilot previously mentioned rolling the airplane.	2 fatal	690A
<b>FTW92FA169</b>	6/25/1992	Konawa, Oklahoma	Deviating around weather climbing through 20,500 ft mean sea level. Departed controlled flight and entered right spiral with descent rates in excess of 16,600 fpm. In-flight break-up.	1 fatal	690B
<b>ERA13FA295</b>	6/20/2013	McClellanville, South Carolina	Training flight for airwork at altitude block of 13,000 to 15,000 ft. The airplane then abruptly turned right and lost altitude, which is consistent with a loss of airplane control.	2 fatal	690B
<b>CEN16FA146</b>	4/9/2016	Taylor, Texas	Recurrent training flight. After apparently clearing turns and slowing to 90 kt groundspeed at 5,000 ft, the airplane entered a steep bank and impacted the ground in a nose-low attitude.	2 fatal	690B
<b>CEN21FA459</b>	9/28/2021	Hiles, Wisconsin	Airplane climbed to 15,000 ft. The airplane slowed to 93 kt groundspeed shortly before entering an abrupt right bank. A "mayday, mayday, mayday...we're in a spin" was broadcast.	3 fatal	690B

## References

GAMA (General Aviation Manufacturers Association). 1996. Specification No. 1, Specification for Pilot's Operating Handbook. Washington, DC: GAMA.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID DCA22MA193. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting –

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