



MEMORANDUM FOR RECORD

Brian C. Rayner
Senior Air Safety Investigator
Eastern Region

Date: May 7, 2025

Person Contacted: Phillip Steinbach – XtremeAir Flight Test Engineer
NTSB Accident Number: ERA24FA038 Union City, TN

Narrative:

Mr. Steinbach was a cofounder and a test pilot for the company that manufactured the accident airplane. He provided engineering and handling insights into the XtremeAir GMBH XA42 airplane and some scenarios that occurred to him based on preliminary information he had received about the accident. Mr. Steinbach collected his thoughts, along with his resume, in an email he forwarded to the FAA inspector assigned to the accident investigation. His thoughts were excerpted from a lengthy email chain, and appear below. While the content below contains suppositions and opinions, they are based in his intimate, first-hand knowledge of the airplane and represent the entirety of what was forwarded by Mr. Steinbach.

Brad,

from the description of the incident by you and Mike Rinker:

- **The airplane attempted to fly an avalanche, which is a looping with a snap roll in the top.**
- **A snap roll is a rolling maneuver in partially stalled condition: (1) GB1 GameBird - Positive Snap Rolls - YouTube**
- **The snap transformed into a flat spin which was not recovered from.**
- **Propeller blades were found nearly intact, attached to the hub, indicating an impact with engine out / not providing power and the propeller only windmilling.**
- **Fuel selector was found in the right wing position by the incident investigation team.**
- **Scott McDonald, the instructor pilot, was in the front seat. Scott had a lot of experience with aerobatic airplanes with similar fuel systems, like the Extra 300 or the GB1 GameBird. I am not aware of any experience with the XA-42. I did know Scott personally, we met on several occasions and flew GB1 together. The last time we met was at a GB1 owner meeting we held in Bentonville in September.**
- **I do not personally know the other crew member occupying the rear seat at the time of the incident.**
- **At the time of our discussion this morning, the investigation team has not completed flight control continuity investigation.**
- **The airplane was not operated in Experimental, but in the category specified in the TCDS.**

Handling qualities:

The XA-42 elevator is large and very efficient. Noticeable for the pilot are comparably large inertia, and slipstream effects.

The inertia requires some physical strength from a pilot to execute precise competition-stye snap rolls.

The slip stream is most noticeable in high angle of attack conditions, like a snap roll without ‘unloading’, which is basically a flat spin entry.

This can be perceived by the pilot as an elevator stick force reversal, i.e. during a left turn flat spin with the stick in the aft right corner, the stick may have the tendency to stay there.

Moving the aileron from the right extreme position towards center will alleviate this effect and the airplane recovers, but it can be surprising to a pilot not familiar with this type and class of airplane.

I have conducted all company- and certification flight test for XA42 and XA41, including all modes of spins with 100% asymmetric fuel.

Asymmetric or symmetrical fuel in the wings, no matter how much, does not have an appreciable effect on spins or spin recover.

Power on accelerates spin recovery because of the slipstream over the tail, especially stopping yaw motion. Power off recoveries are standard, but are slower due to the lack of slipstream.

Fuel system:

the XA-42 has three tanks that are selected individually:

- Acrotank in the forward section of the fuselage
- Left and right wingtank

The fuel selector switch is located in the center section of the aft instrument panel. The only way for a person in the front cockpit to know the location of the fuel selector switch is to ask the pilot in the rear (aft cockpit is pilot on command).

It has 4 positions: Acro, RH wing, LH wing, off

Switching between any of the tanks requires to overcome a certain amount of breakout torque, induced by a spring-loaded indexing ball.

To switch into the OFF position, a spring-loaded plunger must be pulled back, which prevents inadvertent selection of the OFF position.

Leaving the switch between any of the indexed positions will cause either reduced fuel flow or complete fuel starvation.

The acro tank is used for aerobatics and is equipped with a flop tube that picks up fuel in any attitude.

The wing tanks have conventional fuel pickups with strainers in the inboard rib of each tank.

The AFM states that aerobatics with fuel in the wings is prohibited, mandating aerobatics to be flown with the fuel selector in the 'acro' position.

Main reason is to prevent damage to the wing structure from sloshing by centrifugal forces during rolls or snaps, but also to prevent fuel starvation during maneuvers.

A partially filled wing tank cannot provide uninterrupted fuel supply. As soon as centrifugal forces inducing yaw cause the fuel to flow outboard, the pickup will starve.

The remaining fuel in the lines between pickup and fuel servo will provide engine power for maybe another 2-4 seconds before the engine quits.

If the maneuver is stopped and fuel returns to the pickup, the engine will restart within less than 5 seconds.

As long as the engine driven fuel pump is functional, the electric boost pump is not required to be switched on for this procedure.

From the description, this could be a possible scenario:

- Flight is conducted with RH wing tank selected – insufficient familiarity with the airplane
- Snap is started at top of loop
- No 'unloading' during the snap, therefore rotation does not stop after 360 degrees as presumably originally intended– insufficient familiarity with the airplane
- Sustained yaw causes fuel starvation
- Insufficient altitude to recover from a power-off spin

An accident in Zimbabwe last year with an XA-41 (single seat version of the XA42) shows similar entry and outcome: (1) **BREAKING** :Plane Crashes At Charles Prince Airport |Zimbabwe - YouTube

From all I know there is no conclusive accident report, but no mechanical failure was found as contributing to the accident.

The video shows a snap roll without unloading, leading into a spin, which the pilot attempted to recover against the mass vector for which he had insufficient altitude.

**Please find attached my resume for reference.
Please let me know if I can be of any further assistance.**

kind regards,

**Philipp Steinbach
END OF STATEMENT**