

Thursday, May 18, 2023

Charles Ziade



Margate, Florida
33063

On Wednesday, May 17th, 2023, Mitchel Knaus (pilot) took off around 12:25 from Runway 28R to fly a banner for 1.5 hours over Fort Lauderdale beach area. Everything seemed normal from takeoff to sound of the engine, nothing I could hear or see was abnormal to cause any concern on my part. Mitchel picked the banner at 12:29, after doing first pass for hook deployment and verification, again everything was normal. After he picked the banner, I asked to do a right climbing turn (per airport procedure), and he did so, he followed my instructions. He was on the downwind leg around 600 feet heading eastbound when he was communicating with HWO Tower. I was still watching him when HWO ATC asked the pilot if he was ok because he was not climbing, and may have lost some altitude, Mitchel replied that he was ok, and that he was climbing. ATC switched him over to FLL Tower.

When I saw he wasn't climbing, I tried to contact him a couple of times over radio, but no response. I wanted to talk him through it or bring him back to the banner box as I usually do. He seemed to have had a high "nose up" pitch more than needed which was preventing him from climbing in my professional opinion. I never heard any roughness from the engine or anything abnormal.

I did see him go left and then right a couple of times as he was flying east bound or northeast bound.

At this point, I was monitoring FLL Tower, and heard him advise FLL Tower that he was going to release the banner in a lake. A few seconds later, I saw black smoke!

I contacted HWO Tower to confirm, and they did. They gave me the crash site location and headed straight there.

Charles Ziade



Investigator Name: Brian C. Rayner
Title: Senior Air Safety Investigator
Division: AS-ERA

Date: 06/10/2024

Subject: ERA23FA234 Hollywood, FL

Contact: Adam Dalke - Manager - Pilot Recruitment and Training

Mr. Dalke recruited, hired, and trained pilots for the operator. He provided information and analysis through an exchange of emails that have been excerpted below.

NTSB:

Good morning and thank you for your help so far. I need you to educate me on the aerodynamics/additional stability of and provided by the banner in tow.

More than one source has referenced the increased directional stability provided by the banner and that it "keeps the airplane from spinning" but I can't find that anywhere in the documents provided or in any Google searches. Perhaps a trade secret? Seems logical, and that the lever arm of stability would shorten dramatically at the point of banner release. Your training documents illustrate the following:

Unable to Climb With a Banner

"If you experience difficulty in climbing after picking a banner, or are unable to climb at all, consider the following: first, step on the ball and coordinate the airplane. Even a slightly cross controlled condition will inhibit climb performance. Next, adjust your airspeed. You may be trying to climb at too slow a speed and in the incipient stage of a stall. Lower the nose slightly to gain 5 to 10 MPH which may improve climb performance. Advise Tower that you want to return to the banner box and also advise company. As you proceed back toward the banner box you may encounter lift from

thermals which will produce a slight improvement in climb performance. If you are still unable to climb, plan on dropping the banner in the banner field. If you manage to climb to 1,300 feet over the banner box make your decision whether it is safe to continue to the display area. If not, advise company and follow ground crew instructions to drop in the banner field. Try to avoid dropping the banner off airport, but if you are unable to maintain altitude find a safe area to drop the banner, advise company ground, then comply with the Lost Banner Enroute procedure (Pg 33)."

I'm sure you've watched the video captured from the news helicopter on multiple occasions. Could you please describe where the airplane demonstrates an "incipient stage of a stall" and the behavior of the airplane (pitch, roll, yaw...) after banner release?

Among the responses listed in the multiple-choice questions of your written tests was "steep turn into wind" but I can't find it in your Training Manual. I'm guessing the intent is to put slack in the tow rope and reduce the load? Is this covered during classroom instruction? All the recommended actions appear to be reinforced in the responses to the question on the final exam. "All of the Above" being my point. I'm just trying to nail down where I would learn this, and where it would be reinforced. Also, the aerodynamics. It feels like one of those things that "everybody knows, so someone must have written about it, but nobody did." I can't find an AC or a Safety Bulletin or anything, but I am a caveman when it comes to computer research. Please help me with these items at your earliest convenience. I'm putting the final touches on this report, so I need your knowledge.

Mr. Dalke in response:

Some pretty good questions there, and ones I hope I'm able to answer without adding more questions. Just keep in mind that I claim no super knowledge and this is just in my personal experience with a few thousand towing hours. I would not readily agree that the banner inherently makes the airplane more directionally stable. In fact, I'd argue it makes it less stable through the additional turbulence and oscillations of the banner and through the asymmetric forces it creates (especially on release #1 which is the leftmost release: even moving the banner over just a handful of inches to release #3 makes a difference in how much rudder is needed to counteract the yaw). It does seem reasonable and intuitive that a "big rudder" pulling back on your tail would help straighten you out, but I'm not going to endorse that quite yet. Now with that said, I'm arguing my opinion for banners in flight only. If I lost all rudder control, I might choose to keep the banner on for landing. But an airplane dragging a banner behind you on a runway is a whole other animal than an airplane with a banner in flight.

NTSB: I'm sure you've watched the video captured from the news helicopter on multiple occasions. Could you please describe where the airplane demonstrates an "incipient stage of a stall" and the behavior of the airplane (pitch, roll, yaw...) after banner release?

I have watched the video and I will never not-wonder if I could have given him any additional insight or training that would have changed the outcome that day. I think he was right at that critical angle of attack for (likely) most to nearly-all-of the flight and, obviously, in the region of reverse command. The power required to climb exceeded the power he had available. I think the incipient stage was most of the video I watched, and the full stall occurred when the right wing dropped. When the banner releases (and this is referenced in the training manual pg 22: Another occasion when a banner tow pilot could demand too much of his or her aircraft is after the banner is released. It is often described that once the drag and weight of the banner is no longer holding the aircraft back that it feels "free") he exceeded the critical angle of attack (I presume he did feel that "free" feeling) and stalled it, forgetting temporarily that the stall isn't a function of drag or airspeed. In my experience, the right wing drop would be consistent with releasing the banner and going from having the appropriate amount of right rudder to counteract the yaw from the banner, to having far too much right rudder. The wings level temporarily, (and I would imagine any pilot would come off that large, nearly full right-rudder input) before it stalls again, and this time, clearly, the banner would have no effect with any of the airplane's aerodynamics. The banner whether or not while towing, picking, or releasing it has a negligible effect on roll. I'd say none at all. It also has very little effect on pitch. Again, in my experience, it seems pitch aerodynamics of the plane right after releasing a banner is largely affected by the trim setting. If the pilot has it trimmed all the way back (which I would not think is uncommon) to help relieve all of that back pressure it will pitch up after releasing. If it's trimmed to a setting where the pilot is manually holding some slight back pressure (also, probably not uncommon) there won't be a big pitch change. I'd also just say, and for a reason I don't know, that I don't recall any of the high-wing cessnas I've towed with exhibiting much pitch change after the drop, even when trimmed out for my slow-flight attitude.

You are probably correct with the "steep turn into the wind" not being in the manual. It is something that is covered during the "climbing with a banner" discussion though and for the exact reasons you state. Into-the-wind increasing performance is a no-brainer. And you're correct about temporarily removing the drag and the plane becoming "just a pawnee without a banner" for a short period of time.

I hope this was insightful and you may very well get better / different answers from another banner tower. I did some searching of my own for any of this common-

sense knowledge, and from what I can tell you're 100% correct: I can't find anything either!

From: [REDACTED]
To: [REDACTED]
Subject: N430AB
Date: Thursday, August 8, 2024 11:54:54 AM

[CAUTION] This email originated from outside of the organization. Do not click any links or open attachments unless you recognize the sender and know the content is safe.

Good morning, with regards to flight of N430AB, And it's subsequent crash here is my statement.

And observing the flight data, ATC communications, and the video of his crash I believe the following.

N430AB after picking the banner should have never been allowed to leave the airport environment, the Banner operation area [the box] when the ground supervisor notice, he was having problems climbing, should have ordered him to return back to the airport and drop the banner. Moving onto the flightpath, it appears the pilot deviated off course to the north looking for a place to drop the banner. He went over Fred Hunter's cemetery, but continued back to the south east never climbing above 600 to 700 feet. After several attempts by ATC to help the pilot, the pilot stated he had it under control. On the Pilots last radio transmission he admitted defeat, stating that he needed to drop the banner, the banner just happened to be over a small water treatment pond. In my observation of the video, it is clear to me that the pilot was in an accelerated stall, And was losing altitude at a slow rate of speed because of the stability that towing a banner adds to the aircraft in a stall configuration, The aircraft had a very high angle of attack, which would require the pilot to use excessive right Rutter to counter P-factor, when the pilot released the banner, the aircraft regained Lift and yawed to the right because of the Rutter pressure, it appears the pilot countered with extreme left Rutter and left aileron causing him to spin to the left rotating approximately 270° before impact.

Ryan Hiott