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CFIDarren Newsletter

# Operating an Airport, Stall Refresher, FL370 wingsuit

**Issue #50**

**July 3, 2012**

Happy Independence Day - God Bless the USA

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## Quote of the Month

*"Courage is the price that life extracts for granting peace. The soul that knows it not knows no release from little things ~ Knows not the livid loneliness of fear, or mountain heights, Where bitter joy can hear the sound of wings."*  
- Amelia Earhart  
(1897-1937)

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Thank you for taking the time to read this safety message. We all face the challenges of flying less (due to cost) and regulatory complexity increasing. This newsletter is meant to stay in touch with those interested in general aviation, airport operations, and flight safety. I hope that it keeps you in touch with your love of aviation.

This newsletter brings the second of a two part feature on stalls & spins, an in-depth discussion of what it takes to run a regional airport, and the video of the month is of the Highest Wingsuit Flight Ever (37,265 feet).

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Thanks for your continued support... Darren

## Operating an Airport

A recent cross country found me and my student at Charleston (SC) International Airport. I'm a stickler for pilots using the visual glideslope -- in this case a PAPI. As we landed and got our taxi instructions, we started wondering how many light bulbs are in use at the airport and we figured it had to be in the thousands. We then got to thinking about the cost to run those thousands of runway and taxiway lights. These thoughts soon faded as we taxied up to the FBO, got the crew car, and headed to Jim & Nick's BBQ near the airport.

The thoughts were tucked away in my mind until I had more time to think about it and ponder its usefulness. Curiosity sparked an effort to determine how many light bulbs were at a typical US airport like KCHS. Numbers and facts were fairly difficult to get for Charleston so I looked

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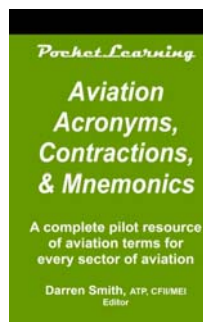
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Quick tips for *SAFE*  
Winter Flying

around for similarly sized airports in the region. Here's what I found for nearby Knoxville (TN) International Airport -- one of the many 2nd tier hubs in the US Airways system.

McGhee Tyson airport adds about \$616 million a year to the local economy, according to a University of Tennessee study. The airport provides about 4,630 jobs and in 2010, brought in 1,691,000 total passengers, of which 366,000 were nonresidents. These visitors spent an estimated \$151 million in the area, according to the study.

McGhee Tyson Airport has 175 acres and about 7.8 million square feet of airfield pavement. It serves six airlines that fly a total of about 140 flights per day, serving 19 nonstop destinations. Besides light bulbs, here are some other curious facts I wanted to know:

- 3,800 employees
- 7.8 million square feet of airfield pavement
- 16-inches is the average pavement thickness
- 240,000 square-foot terminal
- 6 airlines operating at least once a week
- 140 flights per day

The four main sources of revenue for the airport include FAA airport improvement grant funds, a 4.5 percent fee on the sale of aviation fuel, concessions fees on parking and rental cars and airline user fees and landing fees. Oddly enough, the airline user and landing fees are the smallest revenue source. The airport makes much more from parking and rental car concessions according to Bill Marrison, president of the Airport Authority.

Other Good-To-Know Facts about Knoxville:

- McGhee Tyson Air National Guard Base, home to the 134th Air Refueling Wing, which operates KC-135 aerial tankers.
- McGhee Tyson is the home of a major aircraft maintenance facility operated by the 211 staff of ExpressJet -- a regional airline.
- Delta Air Lines the largest tenant at McGhee Tyson

Now that you've learned more than you ever wanted to know about the airport in Knoxville, TN, let's get back to those light bulbs. At KTYS, there are 6,800 light fixtures with a little more than 7,000 light bulbs in service to the pilots who fly there.

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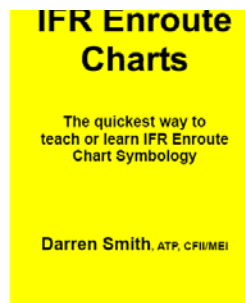
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## Ground School: Stalls

A stall is defined as the minimum speed below which further controlled flight is impossible. A stall occurs whenever the critical angle of attack is exceeded

"When the angle of attack is increased to approximately 17-20 degrees on most airfoils, the airstream can no longer follow the upper curvature of the wing because of the excessive change in direction. This is the critical angle of attack. " (Source: Gleim's Pilot Handbook)

### Progression of a Stall

- As the critical angle of attack is approached, the airstream begins separating from the rear of the upper wing surface. As the angle of attack if further increase, the airstream is forced to flow straight back away from the top surface of the wing.
- This causes the swirling of air as it attempts to follow the upper surface. As the effect increases, turbulent air quickly spreads over the entire upper wing surface.
- The result is a significant increase of pressure along the upper surface and a considerable decrease in lift.
- More of the wing and fuselage is exposed to the airstream causing form drag.

One more thing to point out, the angle of attack is between the chord line and relative wind (not the horizon). That means the airplane can be stalled in any attitude or power setting if the critical angle of attack is exceeded.

### Why do we learn stalls?

It's important for the pilot to understand the characteristics and handling of his airplane when it stalls but also at an airspeed above a stall. We do stalls to see what happens



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when a particular aircraft stalls - even to the point of when a stall goes bad and becomes a spin.

### Other Aerodynamic Factors

Planform refers to the shape of the airplane's wing when viewed from above. Most airplanes are designed so the wings will stall progressively outward leaving the ailerons effective to enhance aircraft control during a stall.

Configuration refers to the position of flaps and landing gear. Flap extension will generally increase the lifting ability of the wings, reducing stall speed. You can recognize the lower limit white arc which represents VSO (stalling speed in landing configuration) is less than the lower limit of the green arc which represents VS1 (stalling speed in the specified configuration or gear/flaps up).

Load factor affects stall speed, as the bank angle increases, load factor and stalling speed increases. That means the airplane can stall at higher airspeeds in a turn.

Increased weight requires a higher angle of attack at any given airspeed to produce the additional lift needed to support the weight.

Turbulence can cause an airplane to stall at a significantly higher airspeed because a vertical gust or wind sheer can cause an abrupt change in the relative wind leading to a sudden increase in angle of attack. As a result, you should maintain a higher than normal approach speed during severe turbulence and strong crosswinds. In cruise flight, fly at an airspeed well above stalling speed and below maneuvering speed.

### Distractions

These are common distractions that lead to a stall:

- Fumbling with a checklist
- Restarting engine after failure
- Reading a chart or other heads-down duties
- Attempting to avoid an obstruction or extend a glide
- Attempting to get things from the floor, flight bag, etc.

### Stall Recognition

Generally speaking a stall can be recognized by decreasing airspace, decreased control effectiveness, buffeting of the airframe, and the nose pitching over. There are several other signs of an impending stall and your reaction should be instinctive.

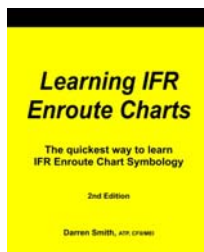
Your visual sense is useful for detecting a stall in that you can note decreased airspeed and nose high attitude during intentional stalls.

You can listen for decreased wind noise along the fuselage as the airspeed decreases.

Your kinetic sense can give you cues that the direction and

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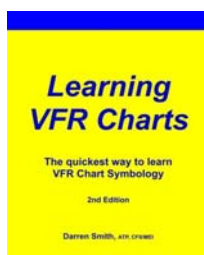
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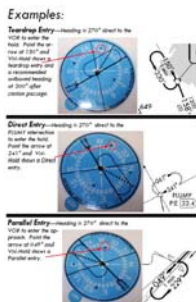
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speed is changing and a settling, mushing, or dropping of the aircraft is experienced.

Your sense of touch to detect control pressures is important as control ineffectiveness or mushiness can be felt. During a complete stall, flight controls can be moved with almost no resistance and no immediate effect. If you always fly the airplane in trim, then you'll always be able to detect when the aircraft is unstable and requiring unusual inputs.

### Stall Recovery

It's all about: Pitch Power Drag Climb

First, reduce the angle of attack, pitch forward. Second, smoothly apply full power to increase airspeed and reduce altitude loss. Third, reduce drag by leveling wings and bringing gear up and bringing flaps up in stages. Finally, climb to a safe altitude.

## Video of the Month

This is the moment thrillseeker Jhonathan Florez smashed four Guinness World Records at once after jumping out of a plane at 37,265 ft.



Highest ever wingsuit jump - from 37,265ft!

Sporting a wingsuit, fearless Mr Florez soared over La Guajira, Colombia, setting records for highest-ever jump, greatest horizontal distance flown in a wingsuit at 16.315 miles and greatest absolute distances flown at 17.520 miles.

The 29-year-old stuntman also flew for a record-breaking nine minutes and six seconds. As he flew like a 'human bird' at 100mph, the adrenaline junkie also had to endure temperatures as low as -45C. The leap was taken from such a high altitude that he needed to carry oxygen cylinders during the death-defying stunt.

His suit was also fitted a GPS tracking system and thermals

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to protect him from the freezing temperatures. The professional filmmaker and photographer captured the dive from start to finish with cameras attached to his helmet and back.

After accomplishing the impressive feat, Mr Florez told a local newspaper: "It was just an amazing feeling when I completed the jump. It was the best moment of my life. "When you are up there it really feels like you are flying. It was great to break so many records in just one attempt. I had to complete a lot of training to prepare my body for the jump as you get put under great pressure travelling through air - the winds can hit speeds of 120mph. You have to be strong enough to be able to maneuver your body and I was up there for a long time."

### Bargain Hunter

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