

Model Building in the Soaring World

By Tom Johnson

I sat in the cockpit of new sailplane looking obviously confused. The local check pilot looked at me and said, "Confused? First time?"

I replied "No, I've been confused before!"

The CFG had asked one question, expecting a predictable answer. I had heard a different question, and gave a predictable response. After clarifying what the CFG was actually asking, and a few patient minutes of explanations and answering questions, I was ready to go on my first flight in the sailplane.

Webster's defines confusion as a lack of understanding; uncertainty; the state of being bewildered or unclear in one's mind about something. The CFG experienced confusion. I experienced confusion. But both of us became confused for very similar reasons.

Confusion happens when the mental model you have constructed for any given situation runs headlong into reality. You expected, based upon your experience and preparation, a certain set conditions and outcomes to take place. Something happened that you did not think of, or changed, or whatever. This something often comes as a surprise and can catch you off guard and unprepared to deal with.

Every time you go flying, you construct a mental model of what is going to happen. How elaborate that model is depends upon your experience, local knowledge, and imagination. This mental model allows you to deal with situations as they occur. And your mental model is constantly changing throughout the flight.

The use of Scenario Based Training allows you to more quickly change and adapt your mental model as the flight progresses.

Confused?

Well, in 1994, NASA published a report about pilot confusion. This confusion led to runway incursions, clearance deviations, and other safety related errors.

The NASA study analyzed 100 pilot reports that specifically used the word "confusion" which was used 234 times. The writers of the report were quite surprised that professional aircrew in rather benign situations experienced confusion. Even more surprising was that the crew could not recall exactly how they got themselves into the situation.

What was going on?

The researchers found out that the aircrew had built a mental model that established a strong expectation bias for the situation. That is, they believed they knew what was going to happen because that is the way it always happened, or that is how they envisioned it would happen. This expectation bias allowed the crews to get deep into the situation before they realized they were in an unsafe situation.

Human factors like fatigue, hunger, dehydration, and stress exacerbated the strength of their expectation and decreased their ability to recognize a deteriorating situation.

Crews also tended to be slow or reluctant to reassess their mental model when the task at hand was a routine situation. Complacency is a common description of this habit.

Now fast forward to a flight where you experienced confusion. Your first reaction is surprise. You think “what was that?” and “what is going on?”.

How do you recover to a mental model you understand and comprehend?

That’s when you have to slow down and analyze where you are. The “where, how high, how fast, and what situation” questions have to be asked. You have to correctly determine where exactly you are to ask the right questions.

Human factors can be against you, especially at the end of a long flight. The more fatigued, hungry, and dehydrated you are, the longer it will take you to accurately assess your situation.

In the NASA study, the crews were able to relatively quickly assess where they were and develop a course of action to return to normalcy. The adrenaline shot they got from suddenly being surprised or endangered in a benign situation, woke them up fast and their depth of experience allowed them to relatively quickly recover.

If you look through glider accident reports, confusion is very evident. Pilots routinely report after an accident that the situation surprised them. Confusion is implicit in their description. Confusion caused by a lack of training or by a lack of experience.

This is where Scenario Based Training (SBT) comes in.

SBT not only allows you to properly react to a situation, but also be able to recognize when a situation could deteriorate because of fatigue, hunger, dehydration, or complacency.

Ask yourself what you would do if you knew you were getting tired, hungry , or thirsty and were still 100km from home. What mitigation strategies would you put in place and what signs would you look for to tell you this is happening?

Complacency can be a tougher nut to crack. Webster defines complacency as “self-satisfaction especially when accompanied by unawareness of actual dangers or deficiencies”. How do you develop a strategy when you are unaware of the actual dangers?

Use SBT to analyze situations to look for the unaware dangers. Be critical of your abilities and actively try to identify your deficiencies. This skill is, quite frankly, sometimes very difficult for our personality type. But ironically, the more you self-analyze your deficiencies, the more you become a better pilot.

So hopefully, the next time you are confused, your preparation and experience allow you to change your mental model and deal with the situation.