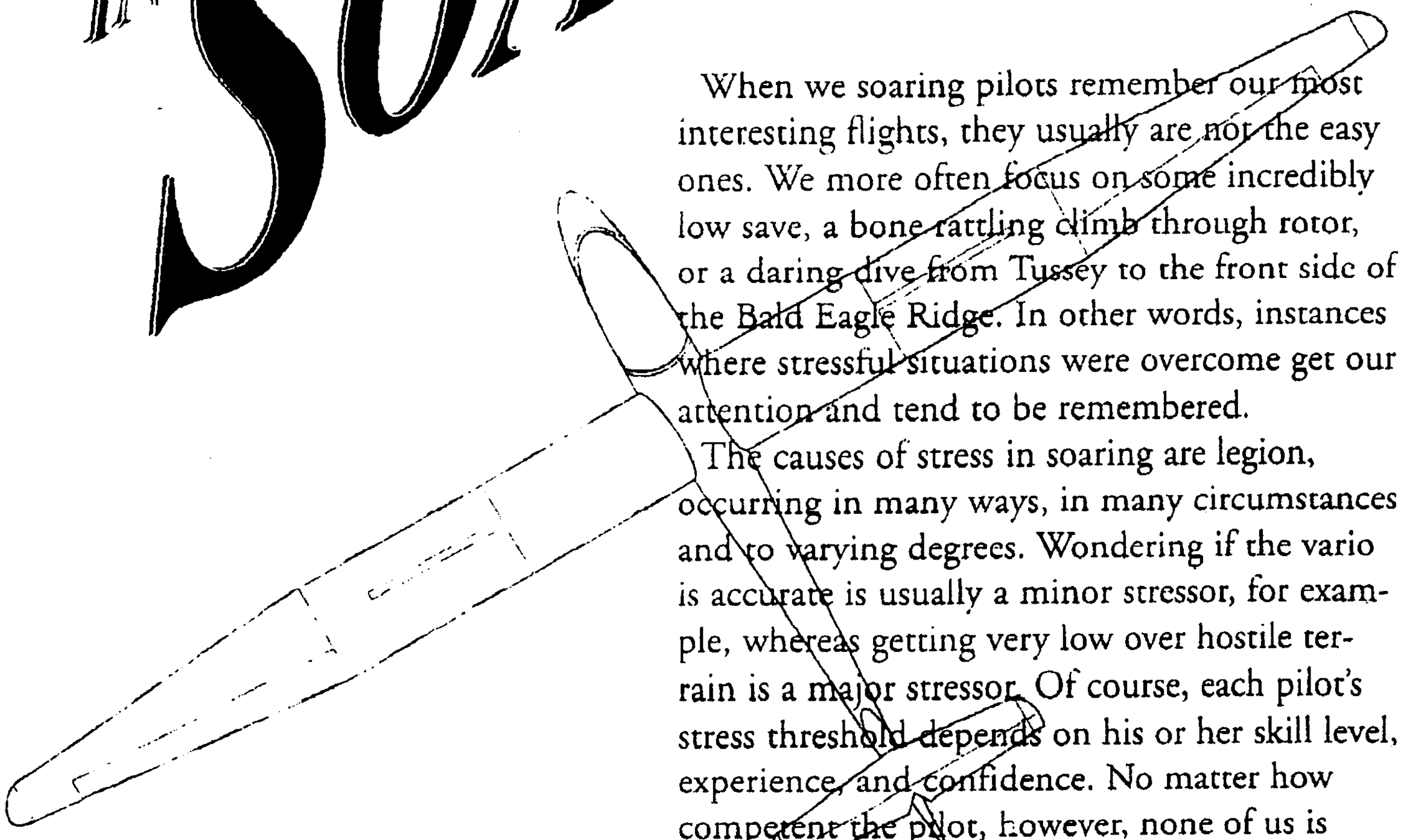
STRESS AND MENTAL OVERLOAD IN SOARING



When we soaring pilots remember our most interesting flights, they usually are not the easy ones. We more often focus on some incredibly low save, a bone rattling climb through rotor, or a daring dive from Tussey to the front side of the Bald Eagle Ridge. In other words, instances where stressful situations were overcome get our attention and tend to be remembered.

The causes of stress in soaring are legion, occurring in many ways, in many circumstances and to varying degrees. Wondering if the vario is accurate is usually a minor stressor, for example, whereas getting very low over hostile terrain is a major stressor. Of course, each pilot's stress threshold depends on his or her skill level, experience, and confidence. No matter how competent the pilot, however, none of us is immune to stress. This being the case, we all need to know a few things about how stress affects us.

---

by

Bob Leve

Humans are not genetically programmed for the kind of stress inherent in soaring

Evolution has provided us with coping with reactions geared toward a cave dweller's need to avoid being gobbled by the resident lion or trampled by a passing mastodon. The process involves the cerebral cortex, a higher part of the brain, recognizing danger, and signaling lower parts of the brain to set off glandular secretions of steroids, adrenaline, and noradrenalin. The results of all these hormones racing around the bloodstream causes increases in heart rate, blood pressure, sweating and the secretion of blood sugar — which temporarily allowed our anchient ancestors to become stronger and run faster.

These physical reactions comprise the fight or flee response, aptly named for the available choices when debate arose over whether to wrestle the lion or outdistance the mastodon. Unfortunately, neither choice is very helpful when flying a sailplane. Who or what are you to fight and how, exactly, can you flee — without making things worse? To further complicate matters, an undesirable side effect of the fight or flee response is the fatigue which sets in when blood sugar drops and we become less able to cope with emergencies.

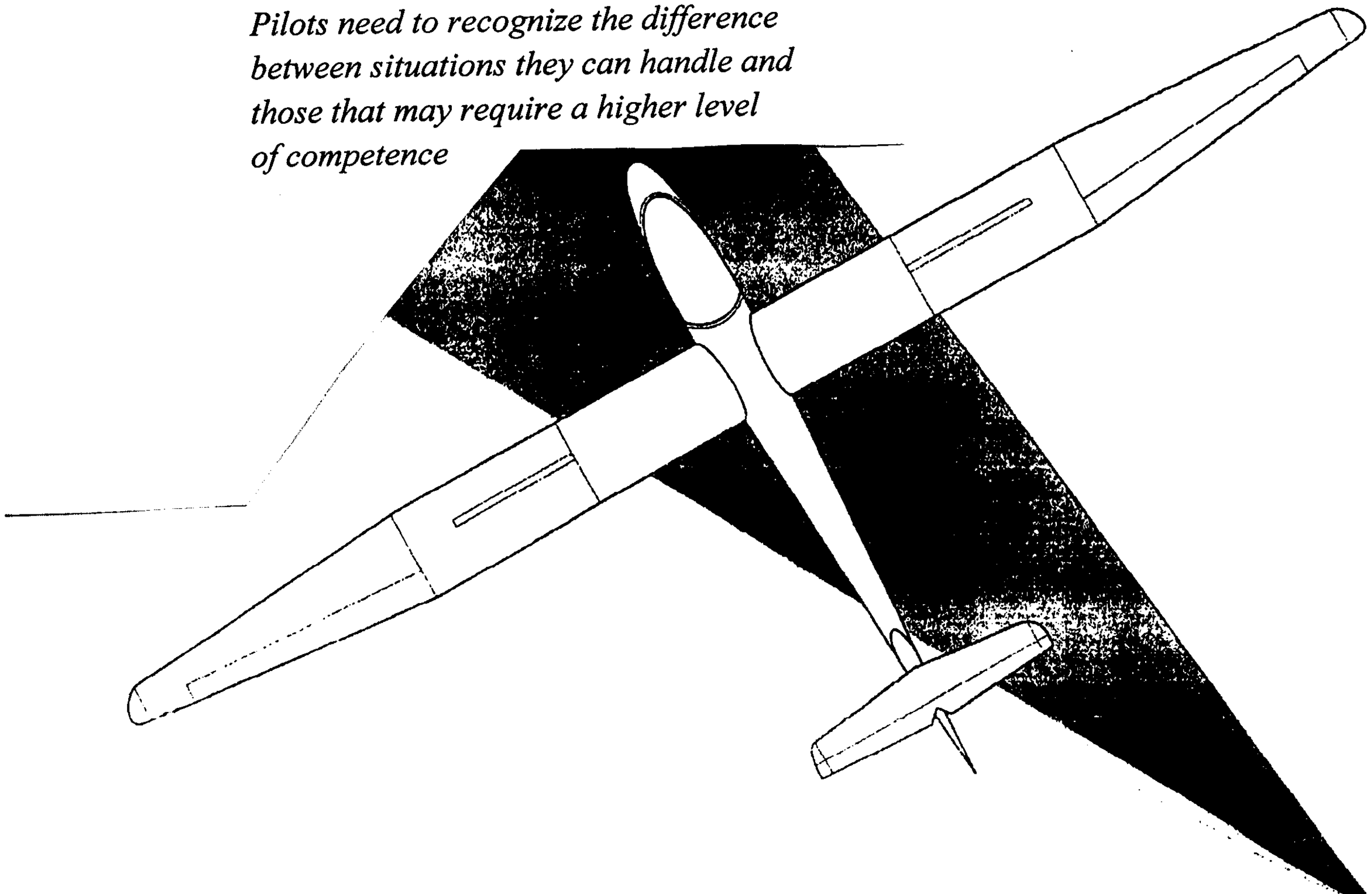
Stress degrades mental reactions, flying skills and decision making.

Complex thinking deteriorates under stress and the thought process reverts to simpler levels. We are less able to integrate anc connect the minute by minute and second by second sensory inputs that occur. This often leads pilots to make impulsive decisions or focus on one or two variables among the myriad that actually exist. Staring at the variometer or endless fiddling with the flight computer, for example, can preclude seeing changes in cloud formation, likely thermal generators on the surface and other sailplanes. Put simply, the stressed pilot tends to miss important events — he or she is likely to be less attentive to not only sights and sounds outside the cockpit, but also the subtle feel of the sailplane.

Mental overload is related and more dangerous phenomen

Mental overload occurs when we try to carry out too many tasks or stay aware of too many events in too short a time. An analogy would be Catastrophe Theory in mathematics, where, to a point, adding variables to an equation yields orderly graph-

Pilots need to recognize the difference between situations they can handle and those that may require a higher level of competence



ic solutions. Then, adding one variable too many, the bottom falls out of the graph and the equation becomes unsolvable. Similarly, mental overload happens very quickly and can suddenly plunge the pilot into confusion, indecisiveness, and panic - none of which are emotionally pleasant states. In an emergency, they can be deadly.

Generally, we humans attend to one or two simultaneous sensory inputs at a time in everyday life, but, with experience, we are able to prioritize and deal reasonably well with up to four or five such inputs. Beyond that, our thinking falls into a chaotic state of overload. Imagine, for example, the cross-country pilot who tries to do all the following at low altitude:

- Look for a thermal
- Search the area for landable fields
- Scan for wires, surface conditions, slope etc. at fields the pilot can reach
- Stay aware of altitude
- Remain aware of airspeed
- Maintain coordinated flight
- Stay aware of sailplane's attitude
- Make a radio call announcing position
- Lower the landing gear & prepare for landing
- Still hoping, look for a thermal
- Setup a landing pattern
- Make a safe off-field landing

Trying to manage these separate tasks in the last minute of flight is likely to result in overload, particularly if the pilot is inexperienced or unfamiliar with the sailplane or the terrain. By contrast, a competent and experienced pilot is better able to sequence and evaluate individual pieces of information, addressing each at an appropriate time according to its relative importance and the demands of the situation. Our competent pilot is able to integrate multiple informational variables into a meaningful whole. This pilot's pattern and landing, for example, do not require juggling four separate tasks to keep track of airspeed, altitude, position, and the intended touchdown spot - he or she collapses these into angle relationships and the sailplane's total energy.

Dealing with Stress and Mental Overload

There are a number of things we as glider pilots do and can do better in order to cope with the dangers of stress and mental overload:

Gain experience and keep current. An experienced pilot is familiar with a wide range of situations and is less likely to become stressed and overloaded. Equally as important, the more recent the flight experience, the better the pilot can cope with a difficult situation. Pilots who have not flown recently are not just rusty in terms of mechanical skills. Those who fly once or twice a month or only a couple of times all season are putting themselves at risk by being less able to deal with stress and over-

No matter how competent the pilot, however, none of us is immune to stress

Develop risk self-awareness. Pilots need to recognize the difference between situations they can handle and those that may require a higher level of competence. Just as cross country pilots evaluate the weather to define an altitude band for their flights, I believe each of us should evaluate our flying skills realistically in order to define a personal Competence Band.

Flying cross-country with Karl Striedieck in a Duo Discus last summer, I learned firsthand about the significant differences between his Competence Band and mine. Karl, is a U.S. Champion and the holder of several U.S. National soaring records, has skills I simply do not have. He passed up the mediocre thermals I would have cheerfully used and he pressed on to lower "saves" in stronger lift. Time and again, he put himself in situations — and got out of them — where I would be a fool to try the same. The point is not only that Karl is the more competent pilot. It is also that Karl had neither the same degree of stress nor the same risk of overload I would have experienced if I had attempted the same or a similar flight solo.

Of course, defining a personal Competence Band depends on and changes with many factors. For example, the altitude at which a pilot decides to give up the struggle and land out may be different, comparing a flight over Indiana's long expanses of

Mental overload occurs when we try to carry out too many tasks or stay aware of too many events in too short a time.

cut hay fields to a flight made over the short, hilly, and more widely-spaced farm fields in Upstate New York. The important things are these: think about what your personal Competence Band should be in a given situation — then stick to it.

Use Mental Imagery. Borrowed from a valuable technique in Sports Psychology, mental imagery can help pilots decrease stress and avoid overload in problematic or emergency situations. It provides cognitive experience through visual imagination, allowing the pilot to develop familiarity with a problematic situation without actually experiencing it. Mental imagery works because a pilot can visualize the situation and change his or her reactions from stress to self-confident familiarity. Although a complete description of how to carry out mental imagery requires more words than can be included in this article, some basic guidelines are:

Start by finding a quiet place where you will not be disturbed. Relax and close your eyes if necessary to avoid being distracted by your surroundings.

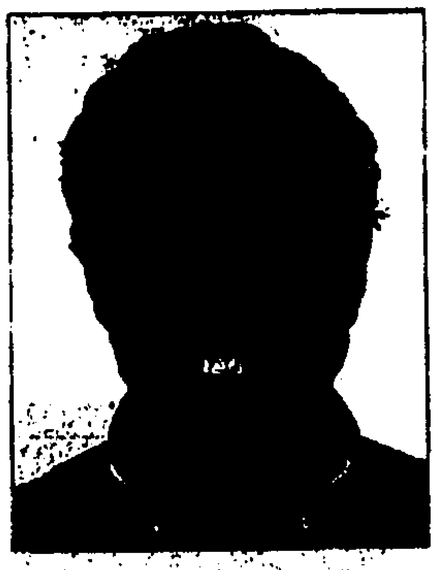
Imagine the stressful situation in the most realistic way you can. Try to create an actual visual image in your mind, complete with colors and details. I find it easiest if I use an actual stressful situation from a past flight.

Progress through the situation, visualizing yourself coping with whatever problems come up. Use slow motion or stop-action imagery to give yourself a chance to think out the best course of action. Imagine that you are not stressed, but if you feel some anxiety, stop-action the sequence and tell yourself to relax.

If your image involves a past situation when you became overloaded, slow everything down and imagine yourself taking things one step at a time, in proper order. If you made a mistake mistake. In my last off-field landing, for example, I was rushed and forgot to set the flaps for landing. The landing was withou incident, but the idea is to learn from the error, not repeat it. When I progress through my mental image of this event, I slow things down and remember to set the flaps correctly.

The last part of the process is to provide a safe and competer ending. Picture yourself ending the situation with little or no stress, feeling self-confident with what you did. All of your mental imagery exercises should end with a positive outcome.

I hope this overview of what happens when we become stressed and overloaded will help pilots cope with problematic situations. I also believe we are likely to have fewer accidents in soaring and can better enjoy our sport if we pilots make the conscious effort to gain experience and stay current, fly within appropriate personal Competence Bands and continue to learn from our own experiences and those of other pilots.



About the author: Bob Leve is a former Army Helicopter pilot and presently flies a Ventus 2a out of Wurtsboro, New York. To support his habit of flying expensive sailplanes he is a Professor of Sport and Clinical Psychology in Hartford, Connecticut. He was Team Psychologist for the USA World Team in St. Auban, France in 1997 and Bayreuth, Germany in 1999. This article is adapted from a safety presentation Bob made at the 2003 Sport Class Nationals.