Lima, Peru | photo by Nick Greece.

Spirals, Spins, Collapses Know the Difference?

by Luis Rosenkjer

There may be several reasons for confusion about the causes of the above, such as self-instruction, lack of information, difficulty visualizing the situations, difficulty understanding them, unclear terminology, etc.

The fact is that too many pilots do not seem to fully understand the differences between these three situations and how to deal with them. Immediate recognition and appropriate response is very important in order to not make things worse, if any of them happen to us. Therefore, in this article I try to make a very detailed description of each one.

WHAT THE TERMS MEAN

Sometimes the usual aeronautical terms do not exactly describe the behavior of our very special machines. Have you seen many birds, insects or airplanes that have their main mass 20 feet below a non-rigid wing to which they are connected by strings? Perhaps we need to create our own language.

1) This is how a dictionary describes a spiral: *A single curve generated by a point moving around a fixed point while constantly receding from or approaching it, like the groove on a record.*

A helix, on the other hand, is a three-dimensional coil that runs along the surface of a cylinder, like a cork screw. Perhaps we should call it a helix?

Sometimes in English or in other languages when we try to define what a paraglider does, the word spiral is used along with the word dive, deep, centrifugal or corkscrew to better describe it.

The common-used aeronautical term is ***spiral-dive***.

2) According to a dictionary, a spin is defined as: *the movement of an object in a fast circular motion.*

This is true for paragliders in this configuration, but we are also moving straight down at the same time. When that happens, we sometimes use the words negative spin or asymmetric stall. The word spin is also used in aeronautical terms.

3) Collapse!!!

It sounds terrible. There are many meanings for this word in the dictionary, but the most relevant are: fail completely, exhaustion, abrupt failure, break down, fold or close up, fall apart, etc. Some pilots call it deflation, but probably fold is a better description of what the wing does.

Fold *- To bend over or double up so that one part lies on another part. A piece or section that has been folded.*

In reality, it is the temporary response our paraglider has in order to adapt to a sudden sinking air mass as it enters it. On any other small rigid wing aircraft, if you don't have your seat belt fastened, you would be hitting the roof with your head.

Obviously, there is no common aeronautical word for this specific situation that we encounter in paragliders.

WHY AND/OR WHEN THEY HAPPEN

1) A spiral can be induced by the pilot applying progressive additional brake input on one side while simultaneously weight shifting to the same side. It can also happen as a consequence of a big collapse if the wing does not reopen immediately and there is no pilot input, or in the case of a cravat (wingtip tangled in the lines).

2) A spin is always pilot induced, usually with a large brake input on one side, in a short time, with no weight shift. Normally the pilot is already flying slowly with too much brake, when he/she decides to turn more sharply using extra inside brake input. When thermalling, the inside wing is often in the strongest part of the thermal where the air is rising the fastest. This creates a higher angle of attack on the inside part of the wing, making a spin more likely.

3) A collapse happens when the pilot flies through turbulent air, enters strong sinking air, exits a strong thermal or does not stop a surge early enough. It can also

happen while doing wingovers if the timing at some point is not appropriate.

WHAT HAPPENS?

In order to understand what happens to our fragile soft fabric wing, a quick refresher of basic flight dynamics is required that is specifically related to the angle of attack. Angle of attack is defined as the angle between the chord (imaginary line between leading edge and training edge of the wing) and the relative wind (our path through the air). See figures 1 - 4.

Basically, angle of attack too high = stall and angle of attack too low = collapse.

So, with the understanding of these basic concepts, this is what happens:

1) During a pilot-induced deep spiral dive, the wing's leading edge almost faces straight down and the trailing edge straight up. However, the wing is flying and lift and drag forces are very similar as in normal flight, except that lift is fighting the centrifugal forces more than it fights gravity, and we only have drag left to fight the latter. Sink rate becomes really high; it can go up to 4000 feet per minute on certain paragliders, at around 45 miles per hour. This extra speed, compared to our maximum normal flying speed (35 miles per hour), is achieved thanks to very high centrifugal forces (high G's) going on in addition to gravity force's help. The pilot's speed along the (wider than the wing) "helix" or "corkscrew" shaped trajectory can exceed 50 miles per hour.

The angle of attack varies from one wing tip to the other due to different helix or corkscrew trajectories for each wing tip. There is a higher angle of attack on the inside wingtip and a lower one on the outside wingtip. Sometimes, on high aspect ratio wings, the very outside wingtip will collapse due to a negative angle of attack even though on the inside wingtip the angle of attack will be pretty high.

On a collapse induced spiral the maximum speed will normally be lower due to some extra drag on the collapsed side of the wing, but the configuration is still the same except for a higher angle of attack on the outside wingtip since the inside is not flying.

Internal pressure is extremely high (exponential relation to air speed) and, therefore, non-cravatted collapses will reopen

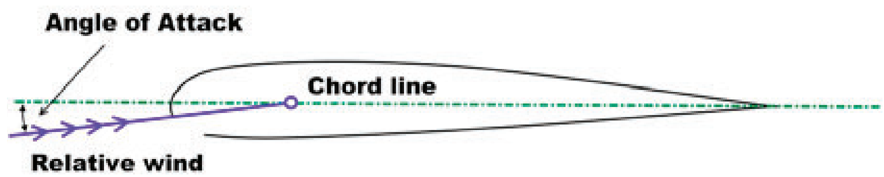

Fig. 1 | If the angle of attack is positive, lift is created. If the angle of attack increases, drag increases, and we slow down on both axes (horizontal and vertical) until a new equilibrium is reached.

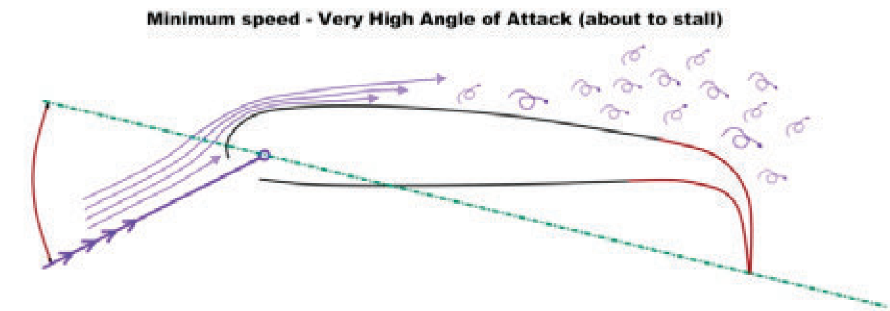

Fig. 2 | If the angle of attack is too high, the wing stalls.

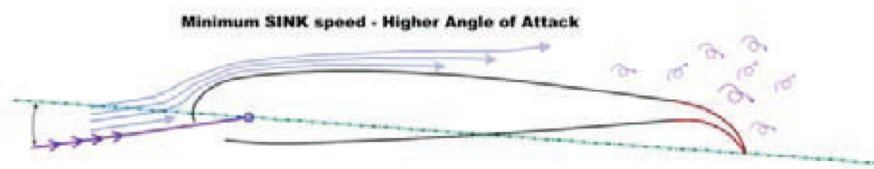

Fig. 3 | On paragliders: if the angle of attack becomes negative on any part of the leading edge of the wing, that part will fold down.

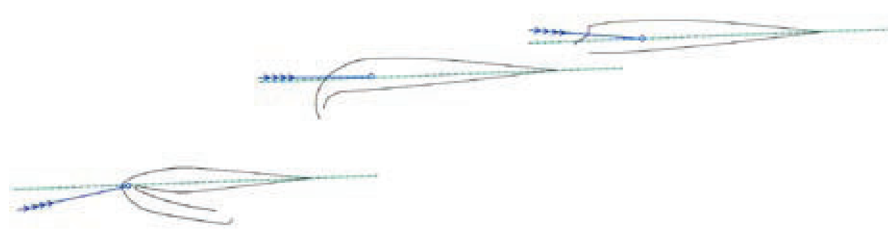

Fig. 4 | The new trajectory will be steeper, the angle of attack higher and that will help the folded part of the wing unfold again along with other factors.

more quickly if the wing is allowed to turn and dive, thanks to the pressurized airflow from the open cells to the folded ones through the internal ribs and cross -ports.

2) During a spin, the wing stays flat compared to the horizon and rotates around an axis located close to the geometrical center of the wing. The pilot still remains underneath the center of the wing. A spin starts when the angle of attack becomes too high on one side of the glider, resulting in a stall. This half of the wing begins to move backwards. The stalled wingtip will fold underneath like an inverted collapse, as a consequence of the air coming from behind. The other half of the wing is flying normally and since lift is still created on the flying side, the sink rate will be relatively low.

The pilot will normally rotate at the same rate as the wing, similar to the way one would rotate on an office chair. If at some point there is no synchronization between wing and the pilot's rotating speeds, a riser twist will happen.

3) Collapses happen due to a sudden transitory negative angle of attack. The air hits the wing at an angle from up above on the leading edge, instead of from un-

derneath like in normal flying. The internal air pressure is not enough to keep the airfoil's shape, and the punched part of the wing folds underneath. There are symmetric or frontal collapses as well as asymmetric ones. The latter are by far the most common ones. It depends on where the turbulence (sudden relative sinking air) hits first. Lift decreases and drag increases on whatever side of the wing the collapse happens. The harness (and pilot) will also fall down lower on the side where lift was lowered or disappeared. Simultaneously, the increased drag on that same side of the wing will induce a turning motion at the wing level. As soon as a certain bank angle is achieved, if the folded part of the wing does not unfold and there is no pilot input, a spiral dive could start. The bigger the collapse, the quicker and more violent the consequences will be. Higher wing loading also increases speed and the violence on a wing's behavior.

Spiral

WHAT CAN GO WRONG?

On every one of these three situations, the key to reduce risk is to quickly recognize what is happening and react accordingly, without overreacting. The slower or less precise and the closer to the ground we are, the higher the risk will be. Of course, misunderstanding the situation and giving the wrong input will also increase the risk.

1) On any spiral dive or deep spiral, pilot-induced or not, the highest risk is not being able to exit it before getting to the ground. Speeds are very high, and we can quickly run out of time and altitude. Only trees or water could save the pilot from a probable fatality. At least 500 feet or more of altitude is needed to successfully exit a spiral dive and regain normal flight, depending on the pilot's skills and type of paraglider used. Exiting a spiral (to straight flight) too abruptly will lead to a large swing forward of the pilot compared to the wing at first, due to high tangential speed and kinetic energy at the pilot's level, and the wing slowing down quickly as it loses the extra wing load created by the centrifugal force. A big wing surge will follow and in case of inefficient control of the surge a collapse could happen.

2) A spin can create different problems, and the risk is highly related to the timing of the pilot's inputs. If the pilot is close to the ground, he/she may touch down before the wing starts flying again and/or regains directional control. If it happens while the wing is straight above the pilot, the speed will not be very high, and injuries will probably be minor. If the pilot touches down while the wing is surging forward, the pilot will hit the ground at a high speed. resulting in serious injuries or even a fatality. If the wing is already flying (after the surge) but now going straight into a hill, the extent of injuries will depend on the hill's shape and angle

Collapse

and the speed of impact.

The highest risk after a spin is hitting the ground at the moment the wing surges forward and regains full flight. Not only will there be a steep trajectory and high speed, but the wing will act as a whip with the pilot at the tip of it. To successfully recover from a spin and regain normal flight, a pilot should be 200 feet or higher, depending on the pilot's skills and type of paraglider. If the spin includes a riser twist at an early stage that blocks the brake lines and/or speed system use, the recovery time will be greater and more altitude will be needed to fully recover from the situation.

3) Again, the main risk of collapses is being too close the ground and not having enough time for the wing to recover, regain directional control, or stop a spiral. Even with enough height, if the pilot over reacts or gives hard inputs, it can become a "close to the ground situation" with bad consequences. Among the three situations we are studying, this is the only one that can happen without the pilot triggering the initial mistake, and, therefore, pilots need to stay high enough to prevent them in strong turbulence.

If a collapse ends up in a cravat, the

pilot probably will have to throw the reserve parachute, unless there is enough altitude to work on the problem.

Never hesitate to pull that red handle!!!

HOW DO WE SOLVE THE PROBLEM?

1) A spiral dive is not really considered a problem; in fact, it is sometimes used as a fast descent technique. There are two recommended ways to exit a spiral.

Start slowing down the outside part of the wing by applying some brake without releasing brake pressure on the inside, and weight shift to the outside and try to slow down the speed while increasing the size of the circle and lowering the bank angle to reduce centrifugal forces. It can take up to over one full circle before the speed is lowered enough to fly straight without risking a big surge. Once we are at that point we need to release pressure on the inside brake; as we start flying straight, we release pressure on the outside brake to allow the wing to catch up with our own speed, and then we have to stop the surge.

Instead of stopping the surge at the end of the sequence, especially if trying to exit the spiral earlier, we will reinitiate the turn in the same direction right before the wing starts catching up with the pilot, and that will transform the kinetic energy into some extra climb while turning. Timing is very important for this second option to work correctly.

2) A spin can easily be avoided, if recognized early. The recipe is very simple. HANDS UP!!

Under a 180 degrees turn with no forward motion, can be considered successful early recognition.

The problem is that when it happens for the first time, the pilot has a hard time recognizing the difference between his previous tight, slow, flat turn with the fact that now half of the wing is being stalled and starting to fly backwards. Some wings can be very stable and their recovery even after over 180 degrees will be fine. Other more advanced wings can get a little wilder.

If the inside wingtip is already folded (forwards and opposite to a normal collapse) some surges and oscillations will probably start. In this case, depending on when the simple recipe, "hands up", is used, some extra surge control will probably be needed. It is very important not to stop the surge too early, since we need to let that part of the wing regain normal flying configuration, and the worst thing we can do is to stall it again.

Being late on stopping the surge can lead to a collapse.

3) The first reaction to any collapse, especially if we are low, needs to be "weight shift to the open (flying) side". Then, we need to apply a little brake on the flying side, only enough to maintain our heading. Next, if needed, we will do some deep and paused pumps with our brake on the collapsed side. It is very important to understand why we use "little brake" on the flying side and deep pumps on the collapsed side.

Basically, due to increased drag and reduction in lift, our trajectory is steeper. Assuming we don't let the wing turn, gravity will keep us underneath the wing. If our trajectory is steeper, the angle of attack on the only "flying piece" of wing is now increased without any brake input. Therefore, even applying less brake than normal, we could stall the flying part of the wing. The bigger the collapse, the smaller the remaining flying portion of the wing will be, and the higher the initial rotating force on the wing, as well as the angle of attack, if we manage to keep our heading.

With a big collapse, we will have a very small margin between applying enough brake in order to prevent the wing from turning, and applying too much brake that might stall the only piece of wing that prevents us from "falling off the sky". Generally, the higher the aspect ratio of our wing, the more sensitive these corrections will be.

Spin

The collapsed side of the wing is not flying and you cannot stall it; therefore, deep paused pumps with that brake are advised in order to unfold it quicker. One deep pump will sometimes be more effective than five small, quick ones.

A big collapse could also cause a spiral. Normally, a certified wing will reopen, making it easy to exit the spiral. On high-aspect ratio wings it can take longer, and precious time and altitude can be wasted if the pilot does not help the wing correct the situation on an early stage.

Over correcting with the open (flying) side brake, could also lead to a stall situation. The wing will now swing behind the pilot, and the normal reaction of raising our hands in order to let the wing fly again, will lead to a big surge and further possible collapse. We call this a cascade, where the inappropriate input on a certain situation leads to another risky configuration.

It is recommended that a novice pilot not upgrade from a DHV 1 wing before this kind of fine correction is mastered. Of course participating in an SIV (simulation de incident en vol – French) clinic is recommended in order to get familiarized with these procedures.

HOW TO PREVENT THEM:

Except for a collapse-induced spiral, spirals are always done on purpose. In case of practicing spirals as a fast descent maneuver, it's best to do them with lots of altitude.

In order to prevent spins, extremely slow flying while turning is to be avoided. Using as much weight shift as we can, especially in strong small cored thermals, is very important. If we are flying slowly and find ourselves being "kicked out of the thermal" because the wing does not want to turn, due to strong lift on the inside part of the wing, we need to make sure our weight shift is done towards the correct (inside) side, and prioritize raising our outside brake instead of forcing our inside brake further down.

In order to suddenly start a turn, or tighten it, while flying paragliders, speeding up the outside part of the wing is far more efficient (and less risky) than slowing down the inside part of it.

Collapses are probably the most difficult of these three situations to prevent. Sooner or later everybody will experience one. If it happens while flying in good conditions, with enough ground clearance, and using the appropriate wing for the pilot's skill, the situation should be non-eventful.

The more we fly, the more accurately, timely and instinctively we will respond to our wing's needs in every given situation and the fewer complications we will experience. This is called active piloting. As pilots push the line and start flying stronger air, they sooner or later experience situations they can't master. We just need to be high enough for collapses still to be non-eventful…

Applying a short, sturdy and timely pull on our brake will do the following: 1) increase the angle of attack at the exact moment the air is starting to kick our wing from up above, 2) push some extra air towards the leading edge by temporarily reducing the internal volume, and briefly increase the internal pressure. Looking at the drawings up above, basically going from Phase 1 on Fig. 4, to the amount of brake described on Fig. 3 for a split of a second at the exact right moment when phase 1 is starting to happen, could prevent phases 2 and 3 from happening.

In case of it being a potential asymmetric situation, letting our harness go down on the side the collapse is about to happen, the couple of inches we lower the whole piece of wing at the exact moment (increase of the angle of attack), added to point 1 and 2 above, may be enough to perhaps prevent certain collapses. As we can see, perfect timing is absolutely important and this technique can only be perfected with hours and hours of airtime.

While flying in thermals, collapses normally happen as we exit a strong thermal core. The best way for it not to happen, is to "just stay in it", but often either the wing will just not turn due to the higher angle of attack on the inside half of the wing, or the extreme high pitch sound of our varios that seem to be telling us to leave that area. If we manage to stay in

Spin | photo by Nick Greece

it (without spinning our wing), even with a high bank angle and an increased sink speed within the air mass, we will probably prevent collapses in this kind of situation. Airspeed is a bit higher thanks to centrifugal forces, and therefore the internal pressure rises exponentially, making our wing more solid. By staying inside the core, we will also climb faster. After some full circles, the thermal will probably become wider and easier to master.

While ridge soaring, the most common reason for collapse is when the wind does not come straight into the ridge, but comes in sideways. Depending on the ridge's shape and angle, that will cause some rotor and the turbulence will eventually hit the wing. Also, the wind direction can change while flying; not detecting that early enough will definitely cause higher risk.

As a rule, while flying close to the ridge, it is wise to keep some weight shift to the side away from the ridge. In order to fly straight, you must add more brake input on the ridge side. The increased angle of attack on that side will make our most risky side—the mountain side—less likely to collapse. Since our wing will start a turn quicker by releasing the pressure on our outside half of wing and applying more pressure on the inside of the wing, in case we find some sudden sink, clearing away from the ridge will be more effective. If our wing collapses on the mountain side, we will already have our weight shifted to the correct side and maintaining our heading will be easier. Basically three different advantages with just some extra weight shift to the side away from the ridge.

If our valley-side collapses, we will have a lot more time to correct the situation and risk only starts if we let our wing turn over 180 degrees…

As we progress and gain experience in our flying, knowing the differences between spins, spirals and collapses is important. Learning and practicing the techniques to control them will help us fly safely.

photo courtesy flyozone.com

Safety: A Constructive Response

by David Dagault
French Champion
Designer & Ozone Test Pilot

The last issue of Parapente Mag made me reflect. Thank you, Kti and Pierre, for asking us: "Safety, what do you think?" If you're giving me the chance to speak, I'm going to take it! It would allow me to help others a little, and there's a little bit of ego that likes to grab the opportunity!

I've been flying 20 years, and in those years I've seen the sport evolve in many ways—equipment, pilots, mental approaches, testing regimes, techniques—but despite this drive to make the sport safer, accidents continue to happen. Most of my paragliding friends are experienced. Some of the time, a few of them fly competition wings even though they don't do competitions any more. Why do they continue to fly race wings, which they can't use to the full potential? The category below, (LTF 2-3 or EN D) would be more than enough.

"But they don't fly as well; the feeling is not as good, they tell me." [What isn't said, but what I think is their argument with the most weight is: "I'm the local top dog, with the biggest willy/knob/penis, and I don't envisage belittling myself by flying a wing in a lower category."]

From developing the entire range of Ozone paragliders (from school to competition glider), I have an understanding of the differences in performance between the categories. Nowadays a 2-3 (or D) flies just about like a comp wing, especially if the pilot only uses the first part of the speed system. Climb rate and min sink? There is a small difference, but in a very strong thermal close to the slopes, we finish our 360 on a wing with an AR of 6 whilst we move away from the slope and crap ourselves on a wing with an AR of 8!

Feel? Yes, there is a difference. But even if we have a little less of the slippery glide feeling with a wing in a lower category, all of a sudden we have better handling, more of a solid feeling; we tire ourselves out less and we fly for a longer period of time.

To put it in an extreme way: we feel better in the air under a 2-3 wing than we would in a hospital bed, no? Easily said, but true. It's when you've spent several weeks in a hospital that you become aware of the little things that you take for granted in more normal times. After years of discussion, hoping for a change, I'm pleased to see that the majority of my friends have followed this path and have never equalled the pleasure they now experience under less demanding wings. And me, contemplating the world and my little friends around me, I feel better.

I've taken the example of the difference between a comp wing and a 2-3, but it's true at all levels. It would be in the best interest of all pilots on LTF 2 gliders to consider dropping down to 1-2s. In general, there are no "holes in the air" or inevitable collapses; there are only pilots, flying with equipment more-or-less suited to their level, with more or less experience, in conditions more or less turbulent than they can handle.

It's difficult for me to go back to basics on the subject of equipment as I get the impression that this goes in one ear and out the other! Ego and pride do not make for a good mix when paragliding! There's no risk in buying a Ferrari to park outside to impress the neighbors, but the risk gets greater when we "over-equip" or buy above our skill level in paragliding.

Flying with equipment suited to your ability is the key to everything! It's easier to take off, it's less tiring to fly, and you get more from flying. In flight, you're more at ease, so you concentrate more on what's happening around you—where you are going, how to maximise your climbs, the ongoing changes in conditions, or simply enjoying the view of the countryside. Less stress, less tension, makes for more pleasure! A wise old man said, (*no, it was Jocky Sanderson actually) "It's better to fly a wing with a glide ratio of 8 at 100% than to fly an 8.2 GR wing at 50%." Have you ever calculated the difference in height after a transition of 5 km at 36 km/h between two wings with a half-a- point (which is enormous) glide angle difference? Answer: 19 metres! Buying higher level equipment is a very poorly-thought-out way to go! I'm sure if we put all pilots on gliders one level down, we'd do better on all levels!

EXPERIENCE

Experience cannot be bought. It's acquired over the passage of time. Flying hours are important, but the variety of sites flown and the types of flights made also are important. Fly elsewhere, change your habits, make yourself think about things, analyse them, and then share your thoughts with others. Take various flying courses to hone your skills, your feel for the air, and your understanding of your wing. Flying is a very perception- based activity where high demands are placed on your senses. Being able to see better and work out what's happening more effectively will lead to better reactions. Courses on Cross-Country Flying, SIV, and trips away are all good for feeding your mind full of new things which will allow you, in difficulties, to have already worked through the situation and to cope better with the unexpected.

Spend flying time on the ground! Ground handling is the best way to develop a feel for a wing and an understanding of the machine. The level of ease with the wing you feel on take-off is a great indicator of the level of glider control in the air. There is no doubt about this. When you can do what you want with your wing on the ground, it will be the same in the air, and vice versa. If your take-offs are risky, then you can say that the main risk you face in the air is from the wing above your head!

CONDITIONS

"Better to be on the ground regretting that you haven't taken off, than to be in the air regretting that you have," runs the old saying that's made the whole world smile. Have you already experienced its truth? I hope not. Otherwise it won't make you laugh anymore. Fortunately (or unfortunately), all events leave memories.

INSTANT "T"

Wassup?? Ah! You've never realized when you end up on the ground, it always coincides with a certain moment, a certain instant in time? What's important is knowing how to deal with the frustration when it arises. How do we know that instant? It's the day with lots of good-looking women on take-off (or if you're a woman, it's the day there are lots of admiring glances from the SAT guys), or when your friends want to see your latest cool acro stunt. Maybe it's when you're still a little bit hung over, have already made several aborted attempts at take-off and/or you're hot, sweaty and a bit nervous. Or alternatively, hassles in everyday life. In short, a whole heap of reasons you could be tied up with: place, equipment, other stuff and flying conditions. That's every day! Except on a paraglider you're in the air under a wing you control well or not so well, so it's not a good idea to burden yourself with other useless baggage....

FACTS THAT CAN'T BE IGNORED

Pleasure: Paragliding must only be a pleasure, never frightening or painful.

Another way to reduce stress and risk is to give yourself a bit of a margin. The higher you are, the more slack you cut yourself. The topography of a place has its own significance: with a slightly sloping ridge, you'll need to move out a little bit to give yourself space underneath you. Pilots who are higher up will find it easier to turn and less turbulent.

Anticipate! Learning to counter against a collapse is not the only safety precaution! Prevention is better than cure! Only fly in the conditions where your abilities will not be exceeded, and fly actively. The control of your wing in pitch and roll is the key to active flying. Those aspects are helped by the hours of ground handling you've done. A collapse is a pilot error.

Conditions change. When you've taken off at 11 am, everything is perfect for putting yourself in the air. After an hour of flying, the conditions can change. For example, the wind could become surprisingly strong, creating a convergence, wind shear, Cu-nims for tens of kilometers. Your flying ability and your capacity for analysing and decision making change with levels of fatigue and stress. You need to pay attention to what's happening around you and to your own well-being.

Test pilots know golden rules I'll revisit and share with our professional colleagues: It's not a competition, don't look to do better or best your comrades, give yourself a bit of a margin with the terrain, listen to each other. If today isn't top notch, don't force it; tomorrow will be another day. These rules work with the professionals who spend hours and days putting their wings in unimaginable states with pleasure, and they will work for those people who are leisure flyers.

One more time, paragliding must always be a pleasure—never a fear or a pain.

Jamie Messenger over rice terraces in Nepal | photo by Nick Greece

Photo by Steve Roti

The Three P's Preparation, Practice, Prevention

by Steve Roti

"There are no accidents."

- Master Oogway in the movie *Kung Fu Panda*

Our most important safety tool as pilots is located in our heads. How we think about safety, how we talk about it, and how we integrate it into our flying determines, to a large extent, how successful we'll be at making good decisions and avoiding accidents. It's a truism that all accidents are due to pilot error, but research by NASA's Aviation Safety Program has shown that no one thing "causes" accidents; they're caused by a confluence of multiple events, actions taken or not taken, and environmental factors. So how can we think about safety in a way that helps us avoid accidents? After 17 years of flying paragliders, a couple thousand flights, and one trip to the emergency room for a broken arm, I've categorized my safety-thinking into three P's: Preparation, Practice and Prevention.

It may sound corny, but what the Boy Scouts have been saying for a hundred years is eminently applicable to paragliding and hang gliding. Their motto, "Be Prepared", encourages us to be ready in mind and body. "Be Prepared in Mind by having thought out beforehand any accident or situation that might occur, so that you know the right thing to do at the right moment, and are willing to do it. Be Prepared in Body by making yourself strong and active and able to do the right thing at the right moment, and do it."

What does this mean in our sports? For starters, a well-rounded fitness routine will prepare your body for the physical demands of flying—strength for carrying the glider, agility for launching and landing, and endurance for staying in the air for multi-hour flights. Hang gliding and paragliding may not be as taxing as running a marathon or riding in the Tour de France, but being fit maximizes our performance as pilots and minimizes the chance that we won't be able to handle an emergency situation that requires physical effort (for example, handling a glider in strong wind).

Mental preparation can cover a wide variety of topics such as visualization of in-flight scenarios and appropriate responses to them, review of pre-flight checklists, and study of sectional charts. When we first learn to fly, our instructors provide us with skills and knowledge that prepare us to fly on our own. But Novice-level instruction can't cover everything, so it's up to us to continue the learning process afterwards. Examples of the types of preparation we can do on our own are reading books and watching videos on flying techniques and weather concepts and consulting maps when planning to visit a new flying site. The concept of "life-long learning" is important in aviation—there's always more to learn, and the more we learn, the safer we are.

Equipment preparation plays a part as well. Before flying, we need to check our electronics (GPS, vario, radio, cell phone, camera, etc.) to make sure the batteries are charged and everything is working correctly.

If we're planning to fly cross-country, we need to prepare by having adequate water, food and clothing for the conditions we're flying in and the terrain we're flying over. And if we're flying alone, we need to take one extra step of preparation by letting someone know our flight plan. The tragic example of Scotty Marion, one of the most accomplished paraglider pilots the U.S. ever produced, who disappeared on a cross-country in Austria five years ago, is a lesson to all of us. Without knowledge of his flight plan, searchers spent months looking, but failed to find any trace of him.

Practice Makes Perfect. It's also said that "Nobody's perfect." So if nobody's perfect, how can practice make perfect? The answer is to think of "perfect" as being the best pilot you can be.

Anders Ericsson, one of the world's leading researchers on expertise, writes, "[T]here is surprisingly little hard evidence that anyone could attain any kind of exceptional performance without spending a lot of time perfecting it." Practice makes perfect means the more you practice, the better you will become. When we are learning to fly, our instructors tell us to practice as much as possible. Paragliding and hang gliding are the types of sports where we can continue to learn year after year, so continual practice is necessary to achieve our full potential. It's a good thing we love to fly, because if we didn't, we probably wouldn't work hard enough at it to get really good.

There are so many aspects of flying paragliders and hang gliders it's hard to know where to start practicing, so I'll suggest launching. A confident and competent launch sets the tone for the rest of the flight. Many of us probably remember a particularly shaky launch that rattled us psychologically and diminished our enjoyment of the entire flight. The best way to avoid having that happen again is to practice launches on a training hill (and that includes kiting practice for paraglider pilots). As we gain experience over the years and our flights get longer, we often don't do as many launches as we did earlier, so periodic launch practice is a good way to sharpen old skills, especially after a long winter's layoff.

Next, we need to practice landings. As the saying goes, "In aviation launches are optional but landings are mandatory." In unpowered aviation we don't always get to choose the time and place of our landings. This is particularly true on cross-country flights but can also happen in ridge-soaring sessions when the wind abruptly changes direction or velocity. At flying sites I regularly use, I like to practice by using landmarks to help regulate my approach—for example, turning from downwind to base over a particular tree and turning base to final over a road. If I'm too high or too low nearing a familiar landmark, I can make small adjustments to my approach to get back in the zone. When I visit a new flying site where I haven't had a chance to practice the approach, I look at the landing zone and try to find similarities to familiar LZ's, so I can use the techniques and tricks I've practiced at home.

The topic of practicing flying skills is a large one and beyond the scope of this article, but I think of it as an on-going process of constantly refining my existing skills. We've all heard the advice to only try one new thing at a time: learn it, practice it, incorporate it into your skill set, and then you're ready to try another new thing.

Weather forecasting is something we can practice even on days when we can't fly. Get the forecast as if you were going flying, make your best guess about what the conditions will be like, and if any other pilots do go out flying, quiz them on conditions and see how close your guess was. Also use non-flying days to read as much as you can about weather, because forecasting is one important flying skill that benefits from life-long learning.

Benjamin Franklin's famous saying, "An ounce of prevention is worth a pound of cure," was actually fire-fighting advice, but it applies to our sports too. Most flying accidents are preventable, which means the pilot could have prevented the accident by taking different actions. Some accidents are predictable and some aren't, but there are steps we can take to prevent most of them.

One obvious step is to eliminate safety hazards. Obstacles in or near launch and landing areas are a prime example of safety hazards. If there's a tree or a large rock in front of the launch area or in the middle of the landing zone, someone eventually will hit it. Removing obstacles at flying sites is an important preventative step.

Near-misses are something we tend to ignore, but they should be taken seriously. You might come close to hitting a fence on landing approach and not think anything of it because you weren't actually injured. However, sometimes, it's just a few feet or a split- second that separates the near-miss from a serious injury. The next time you might not be so lucky. Find out what caused the near-miss and take proper action to prevent it from happening again.

There's a popular aviation saying, "It's better to be on the ground wishing you were in the air than in the air wishing you were on the ground." How do we make the decision about appropriate flying conditions? Forecasting is part of it, but assessing the conditions correctly at the flying site is the single most important part of this. The first year I was flying Phil Pohl taught me the "15 Minute Rule": when you get to a flying site, spend 15 minutes watching the wind and the sky before making the fly/no-fly decision. If you see unsafe conditions, for example, peak gusts stronger than your personal limit, reset your timer and spend another 15 minutes watching.

Of course, conditions can change while we're flying. A cloud deck can move in below our flying altitude or a cumulus cloud can grow into a cu-nim. In cases like this, prevention tells us to keep a constant eye on the changing weather conditions and to fly away or land, before we get trapped above a cloud deck without a visible LZ, or below a cloud that's sucking us up faster than we can descend using emergency techniques.

As pilots we understand the importance of pre-flight checklists, but it's easy to forget items when we're interrupted. To prevent interruptions, find a quiet place to go through your checklist, and, if interrupted, take an extra minute to start over from the beginning. It's better to spend a little extra time on pre-flight safety than to launch a hang glider with the hang strap unhooked or a paraglider with the leg straps unclipped.

Proactive thinking can help prevent accidents by anticipating events and giving you more time to make an optimal decision. While flying, work on being proactive rather than reactive. Think ahead, make plans, and ask yourself "What if my plan doesn't work?" We should always have a Plan B as a safe backup.

Finally, humility is a way to prevent over-confidence. Granted, it takes a substantial ego to fly an unpowered ultralight glider, to think that we can toss aside hundreds of thousands of years of human evolution on the ground and step off the top of a hill with only a lightweight glider above our heads. We need to remember that we're still at the mercy of the atmosphere, so it pays to be humble. As the saying goes, "There are old pilots and there are bold pilots, but there are no old, bold pilots."

"The mark of a true hero is humility."
- Master Shifu in the movie
Kung Fu Panda

Photo by Steve Roti

Two Cent Tips

by Mike Steed

MID-DAY LANDINGS IN THE DESERT

Over the years, you have perfected small-field skills, and you can navigate to any pre-selected target on the ground. But the risk that lies in the desert is not that it is studded with obstacles; it is studded with dust devils. Dust devils on hard ground are often invisible, and even a weak dust devil can be lethal near the ground. So change your mindset. Don't select an LZ—select the air you will be landing in. As a landing starts to look likely, turn toward sink, if there is any. Map out a rectangle of air by flying in a zigzag search pattern, ending at a downwind corner of the rectangle. Then turn upwind at the last moment, landing into known good air. Disconnect yourself from the wing immediately before a dust devil sneaks up on you.

SMALL LZ APPROACHES

Any landing can be a small-LZ approach. Consider whether or not you can safely practice your skills by trying to land in an arbitrary small space. Don't risk stalling by trying to descend steeply, but rather design an approach pattern that gets you there on a safe glide.

Aircraft approach patterns you read about are intended for powered planes. No glider should attempt to glide straight in from far downwind. If there is any significant wind or risk of increasing wind at the ground (valley wind), start your descent upwind of the target. Small LZs tend to have obstacles that will cause leeside turbulence, so identify a target landing spot with the least upwind obstruction. Often the best plan is to descend upwind or crosswind of the target in smooth air (over a river for example), then crab in from one side. Come in a bit high, but leave room to add s-turns or figure 8's, as necessary, to adjust altitude. Take a curved path across or downwind on final approach, so that you can shorten the path by turning into the wind from anywhere along the path as your altitude dictates.

LANDING IN HIGH WIND

As your flights get longer or you begin to fly cross-country, the odds increase that you will have to land in high wind—not smooth coastal air, but strong valley wind or a gust front. No doubt you have some training or experience about handling a wing in high wind, which, for a paraglider, means bringing the wing down by pulling C lines, B lines, maybe the opposite A and C, or, heaven forbid, just pulling the brakes. And you know to pick out a big open space where you have plenty of room to get down, going either backwards or forwards. But now consider what happens when strong wind pushes across that big flat expanse. The larger the uninterrupted field, the more likely it will set up a regular rolling turbulence. Envision a cosmic load of 50-to-100 foot diameter barrels tumbling across the field that is the air you will land in. As each barrel reaches you, you encounter strong sink, followed by less headwind, followed by strong lift and strong headwind, and, once again, strong sink. Each transition from one barrel to the next will toss you up and down, unsettling on a hang glider and a possibly causing frontal collapse in a paraglider. This will keep your hands on the controls. A hang glider may find smoother air at the bottom of the turbulence, but a paraglider will land with the wing still up in turbulence. Also, consider that when you finally hit the ground, it is likely to be while you are in strong sink which will drop you abruptly to the ground. This makes it hard to land gracefully on your feet. The net result is that you will have a hard time staying on your feet, and your hands may not be where you intended. Getting blown off your feet is the likely result. A paraglider pilot may want to practice rear-riser control so as to be proficient with that option on such an occasion.

Ron Goodman over Blanchard, Mt. Bellingham, WA | photo by Kaylin Bettinger

Back to the Training Hill

by Bacil Dickert and Joe Gregor

Launching and landing are two of the most critical phases of any hang glider flight. Going fast while close to the ground is the time of day when bad stuff is most likely to happen. Solid launch skills, coupled with accurate and consistent approaches and landings, form the hallmark of every skilled pilot.

Many consider a strong, solid launch technique to be the most important flight skill to possess in terms of safety. Landings are mandatory, as they say, but launches are always optional. No pilot worth his or her salt would actually choose to operate with a weak or inconsistent launch. Unfortunately, it is a common human foible to mistakenly equate luck with skill. In the realm of hang gliding, a long run of past success will inevitably lead all but the most disciplined of us to complacency. Such positive reinforcement (reward) will increase the frequency of any behavior, however dysfunctional it may turn out to be. The ability to get away with a poor launch technique can lead us to believe that what we are doing must be right. After some (accident-free) time, these habits will become naturally accepted practices –until some particularly nasty form of negative reinforcement comes along to teach us a conflicting lesson.

The hang gliding pilot community is a small and tight-knit one. Our peers will undoubtedly notice ANY problems in our launch technique. Many will choose the easy path, waiting until something bad happens before delivering their opinions, cost free. The very best of them will care enough to risk giving some valuable and possibly life-saving feedback BEFORE something bad happens. They may press us to return to the training hill or suggest that we take some additional instruction.

No one wants to believe that they have a serious flaw or shortfall in their skills or techniques. It is only natural to reason: "Hey, I have been flying like this for years. Nothing's ever happened. I've never blown a launch badly enough to get seriously hurt. And I know other people who are good pilots who have gotten hurt. So my launch technique must be better than theirs." We might realize privately, in that place that neither requires nor permits any public admission of imperfection, that there might be some issue with our launches. "I really should get back to the training hill," we might think. We get in the car and point the nose at the training hill, but the car instead goes to the mountains. After all, the forecast is for a good soarable day. All of our flying buddies are going to be there. Life is too short. Time too valuable. Too valuable, in fact, to ever make that trip to the training hill. If we are also lucky, the inevitable wake-up call comes when a blown launch leaves us standing, yet shaken enough to realize that we have a serious problem.

Hang gliders are aircraft. This is aviation. We are pilots. People have been doing this for a century now. The answers are generally known. The best way to address any discrepancy in skill or technique is through practice and training. For those of us who like to run off mountains, the place where much of this practice is best conducted is on the training hill. This is the place that will most often provide the best environment for practicing launches in varying wind directions and strengths, with fewer of the risks that exist at a mountain launch. This is the place where one can pound away, making multiple attempts in quick succession—a key element for success in any form of aviation training. This is the place where friends, observers, and instructors will be in the best position to offer productive advice and instruction. There is no better place for pilots to rapidly and efficiently regain currency and proficiency, improve techniques, and gain the confidence required to consistently launch safely from the mountains.

As Wilbur Wright wisely stated long ago, "Practice is the key to the secret of flying".

Sprog Settings and Hang Glider Pitch Stability

by Dennis Pagan

We have long considered it a good thing for our gliders to remain upright in flight, unless we are intentionally looping or attempting some other craziness. Unintentional tumbling is as welcome as a tornado at a trailer factory. What keeps our gliders upright is their inherent pitch stability combined with the pilots' control actions. We'll concentrate on the glider in this piece and let the pilot fend for himself.

A LITTLE BACKGROUND

Stability is the tendency for a glider to return to straight and level flight when it has been disturbed by either the motion of the air, the pilot's input or an attack condor. Pitch stability is the nose up or down stability of an aircraft. For example, if a stable glider were placed in a dive by a control or gust, it would tend to pull up. If it were too nose high it would tend to bring the nose down to equilibrium or trim flight.

We need pitch stability to fly safely and comfortably. Paragliders get pitch stability from the great pendulum effect of the pilot hanging well below the wing. Hang gliders get pitch stability from a combination of design factors including airfoil shape and twist in the wing. Wing twist means the tips of the wing are at a lower angle of attack than the center portion so they act like a tail to pull the glider out of a dive. There are internal rods braced by a cable to the leading edge tube of a modern topless hang glider that hold up the wing at the tips and sets the minimum amount of twist. These tubes are nicknamed sprogs.

All sprogs on modern hang gliders are adjustable for the combination of optimum handling, performance and safety by the manufacturer. This adjustment can be easily done in the field in a matter of minutes, which brings up a problem. Some competition pilots lower their sprogs to achieve a better high-speed performance. To a certain extent such an alteration also improves control response in some gliders. But the lower the sprogs, the less resistance to tumbling. No one knows for sure the precise relationship of sprog settings to tumble resistance, but we do know that sprog setting directly relates to pitch-up force during a dive. Perhaps the main thing sprogs bring to the picture is dampening, meaning they make the tip quite rigid

at negative angles of attack and thereby help slow down the rotation in a tumble event (Note: in a future article we will discuss all the factors of glider stability in more detail).

The pressure of competition has induced some pilots to lower their sprogs to a degree that safety is compromised. We don't know absolutely where the safety margins lie, but in all likelihood some pilots are flying unsafe gliders. A number of tumble incidents and accidents have occurred to very experienced pilots over the last several years, bringing up a call for some regulation to sprog settings. But what about recreational pilots? Typically these pilots don't change their sprogs unless someone does it for them. However, we have found many used gliders that have been altered, and over time materials stretch, especially after a few hard landings, so it is always good to check sprogs.

There is a mandate from regulatory bodies such as the DHV and the FAI to measure sprogs in competition, so we began measuring sprogs in earnest at the European Championships in Griefenburg, Austria, the test comp in Laragne, France and the Women's Worlds at Monte Cucco, Italy. We took the data and published graphs of the sprog angle settings for each type (brand and design) of glider. A pilot could then compare his or her settings to that of the rest of the pilots with the same design and see where they lie in the "safety spectrum." It was interesting to see at least 30 pilots out of 100 at Griefenburg adjust their sprogs upward and ask for a re-measurement.

We present some of this data here for the benefit of all pilots. Figures 1 and 2 show the overall graph with all types of gliders thrown in together. We rounded off all measurements to the nearest degree. Many sprogs vary with the VG (variable geometry) setting, so all measurements are with the VG rope pulled full on. All topless gliders have two sprogs per side—the inside ones are typically set about 3 degrees lower than the outer. Figure 1 is the inner sprogs and Figure 2 the outer sprogs. Different designs and sizes require slightly different sprog settings, but from this we can still see the overall trend. The inner sprogs peak at 4 degrees

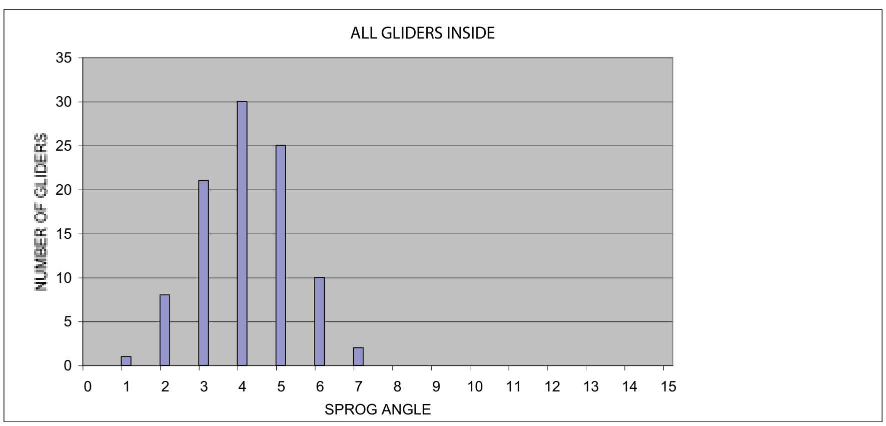

Figure 1

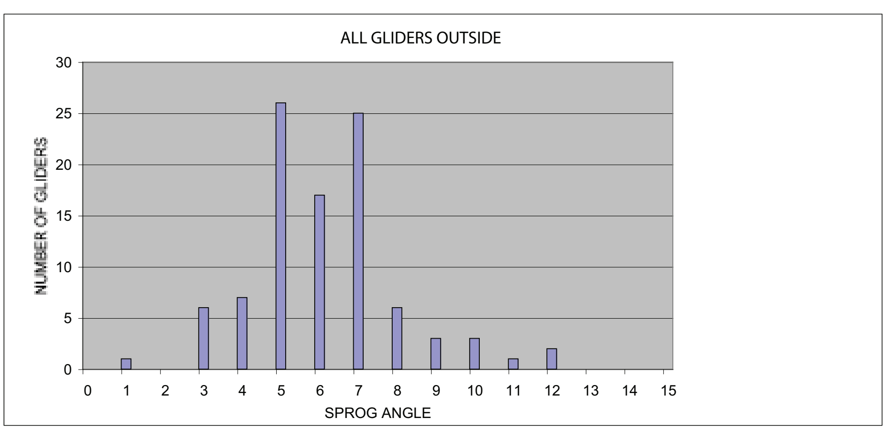

Figure 2

and the outers between 5 and 7 degrees.

Figure 3 is for the Moyes Litespeed S (all sizes), and figure 4 is for the Moyes RS. Figure 5 is for the Aeros Combat II (all sizes). Figure 6 is for the Wills Wing T2 (all sizes) and figure 7 is for the Laminar Z gliders (all sizes). We can see similar numbers on these graphs. *Note: when we have correlated all the data we will present the complete set of graphs for all gliders and sizes on the CIVL web site. We currently have measured over 190 different gliders and have nine different graphs.*

What can pilots learn from this information? First, we should note that all the peaks in these graphs are below the manufacturer's certified settings. But also we can see that the majority of competition pilots are not getting too extreme in their settings. Some are. The lowest settings can be considered too low for safety. Pilots flying these settings are taunting fate. From our experience, recreation pilots generally have sprogs set higher then the graph settings. In fact, the highest graph settings probably represent unaltered gliders and we can see that these are about 2 degrees higher than the peaks of the altered gliders.

With this information, a pilot can measure his or her sprogs and see where they lie in the charts. Here's how to perform the measurements: First open the sprog zippers, pull the VG full on, level the base tube, then level the keel by placing it on a stand (we use a modified telescoping walking stick) as can be seen in the main photo for this article. We use two types of angle measuring devices. The first is a simple protractor gauge with

a string and a weight to give us a vertical reference (plumb) that reads to the nearest 1/2 degree (see photo). The second is a gravity sensing digital readout device that measures to the nearest 1/10th degree (this is a carpenter's Digital Torpedo Level by Craftsman #48295, available at Sears). Both work fine.

Once the glider is set level, pull down a bit on the back of the sprog to set it (don't disturb the level keel), and then measure each sprog in turn. Try to measure near where the support cable attaches to the sprog tube. Avoid any sleeves on the tube and try not to pull down or push up on the sprog. On some gliders, the sail makes this difficult to do, but practice makes perfect. A special problem occurs with carbon sprogs since they are often tapered and may have bumps from the construction process. In this case we measure right under the cable for comparison purposes. A pilot measuring his or her personal glider has the luxury of time to try it several times.

Sprogs not balanced left and right can cause a turn, but they only come into play when we fly at very low angles of attack (usually with half or more VG pulled and the bar at least to our waist). So the first thing to do is test the glider at speed for straight flight. If it flies straight, and the sprogs are not set the same left and right, you will probably have to preserve the difference as you make adjustments. It is surprising to see how many sprogs are set asymmetrically. Here's a tip: if you need to adjust your sprogs, for most gliders one full rotation of the adjustment device equals about one degree of change.

The jury is still out on how much sprogs really add to the pitch stability equation. The DHV thinks they are the main factor. I am aware that four of the world's top pilots who have tumbled in recent years all had very low sprog settings. It is this author's opinion that sprogs are very important to dynamic stability and with our measuring efforts and keeping of records we will find out just how much. At the very least we have begun to shed some light on what is an important safety matter for all of us. For the individual pilot, he or she can decide where the personal limits lie relating to keeping the curved side up.

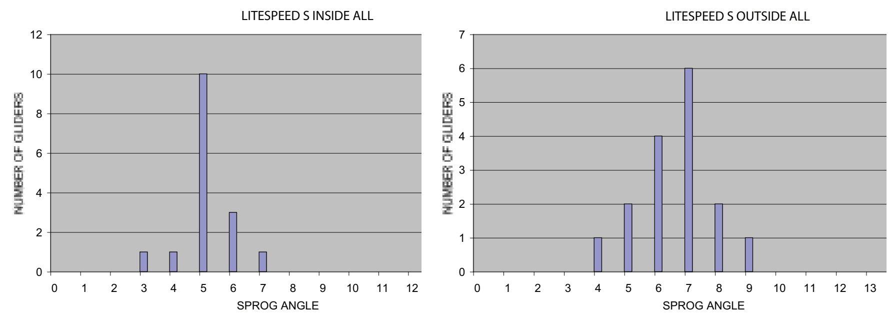

Figure 3

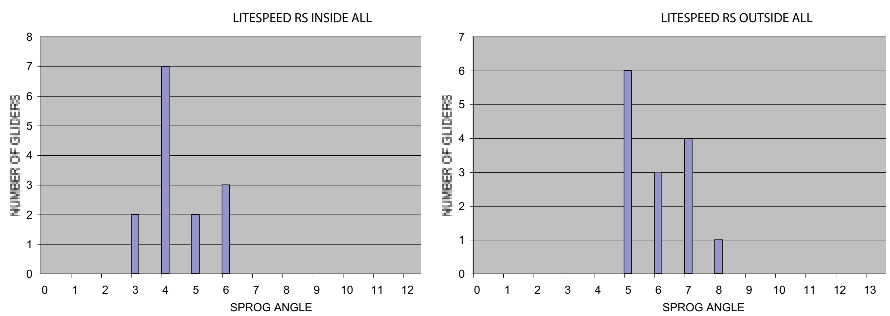

Figure 4

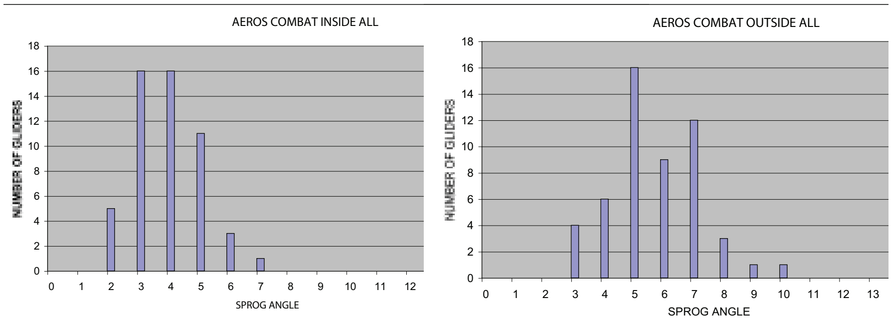

Figure 5

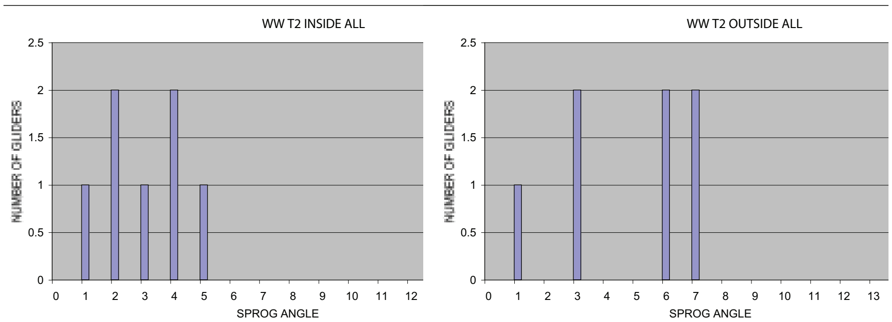

Figure 6

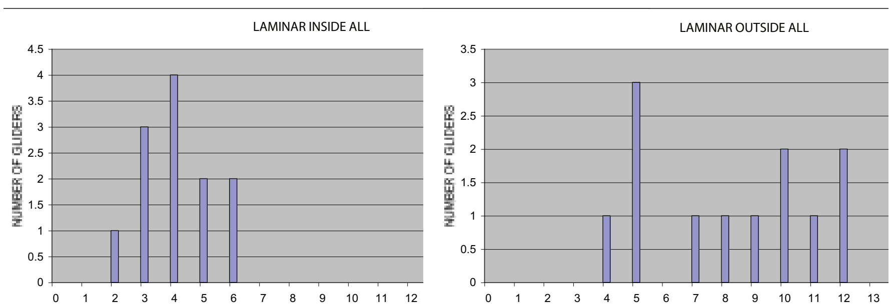

Figure 7

Human beings were, simply put, never meant to fly. We're not born with wings, and we lack the ability to think like a bird. Every time we launch, we could make a million mistakes, and most will hurt or kill us. Aviation is especially unforgiving of mistakes, and humans, by nature, are incapable of perfection.

So are we all doomed? The accident statistics say otherwise. The vast majority of aviation accidents are attributed to "pilot error," which tells me that it's not hang gliding or paragliding that puts me in danger, I put myself in danger! I'm writing this article to share some practices I've picked up over the years that make having a PERFECT safety record an attainable goal. (Some say that's impossible, but I assure you, it's not.) These principles are a collection of lessons I have learned, not by making the mistakes myself, but from other pilots who have. Find a local pilot who's been flying for 20 or 30 years and I'll bet they've learned some lessons the hard way. There's no reason newer generations of pilots need to repeat the same, "there I was, thought I was gonna die…"experiences.

First and probably the most important: Launching is optional, but landing is mandatory. Most hang gliding/paragliding accidents occur in the launching or landing phases of the flight when there's something hard to hit—the ground. I often see people launching in strong and rowdy conditions in which they would never choose to land. When you ask them their intention, the answer is always the same: "I'll fly all day and land when it mellows." But staying aloft in a powerless glider is difficult, even on the best days. The other unwise comment I hear is: "I'm an XC pilot, so I have to launch at 1:00 p.m. in order to catch the best thermals!"

Yes, long XC flights require flying mid-day, but that doesn't mean you have to LAUNCH mid-day. At most sites, conditions progressively ramp-up to the peak of the day, and then start to mellow-out. If you really want to fly in the mid-day stuff, why not launch EARLY, in safer conditions, so you're five grand over launch when conditions are booming (or better yet, 10 or 20 miles downwind already). When a thermal unexpectedly lifts your wing, would you rather be high above terra firma, or have your wingtip on the hill scratching to get up? I'll say it again because it's so important; launching is optional, but landing is mandatory. "Pilot error" can include choosing to fly in the first place, if conditions are not appropriate.

Here's a real life example: Pilots from all over the country (and world) visit the Point of the Mountain, and want to fly the South Side. All you ever hear about the South Side is how great it is, with glassy super-smooth-ridge lift to play in. So people roll in around 11:00 a.m. and see it blowing in. They set up and fly. They're surprised when conditions are really up-and-down, with strong thermals and gusts coming through. They haven't thought about the fact that the Salt Lake valley is a desert, and, by the time they arrive there, the sun has been beating down on the bone-dry ground for four hours. When you pull in to launch and see it blowing in, it's hard to curb your emotions and take the time to look for reasons NOT to fly.

Pilot Error

by Ryan VOIGHT

Which brings us to the next lesson: It's crucial to balance risk and reward. Often this is easy—it's blowing in, with safe and soarable conditions, so it's time to get your wing and go fly! But the line can get blurred fairly easily, too. The classic example is when you've got your harness on, wing set-up and ready, and it starts to lightly blow down. It's light enough that you could still launch, but strong enough that you won't soar. Is the risk of a blown launch worth the reward of a sled ride? I cite this example because I'm as guilty as anyone… so far I've been lucky.

Which leads to a third lesson: Negative reinforcement is a killer. For those unfamiliar with the term, negative reinforcement basically means that you're "lucky" or you "get away with it," but you don't realize it's because of luck. You think it's SAFE because you've done it so many times and nothing bad has happened. Even though I've launched downwind many times without a negative outcome, I can't trust that I can continue to do so without something bad happening. Negative reinforcement surrounds us, and we need to be aware of it. You need answers to questions, such as: How far can you get from a safe LZ and still make it back; how close can you get to the ridge while scratching to get up; and how low can you make your turn onto final and still level out and flair? We base nearly all of our flying decisions on past experiences, but there's no guarantee we'll get the same results as last time, and we need to acknowledge that. But if all of our past experiences are unreliable sources of information, how do we make decisions? The answer is simple, and takes me to my next point.

Lesson number four: Safety is no accident. It's a silly phrase, but it's true. If you want to be safe, you have to exert a conscious effort. Let's use an example everyone can relate to: how far can you get from the LZ and still make it back? Rather than risk not making it to a safe LZ, try to test yourself but still leave some margin for error—see how far you can go and still get to the LZ with 1,000 ft to spare. If you come in under 1,000 ft, you know that would have been a tree landing. If you come in at 1,001 ft, you know you wouldn't have been high enough to set up an approach. Repeat this exercise until you can do it in your sleep, in all conditions. And even when you get dialed in, always budget extra altitude in case you're wrong. Face it: making mistakes is human, so keep yourself in a position where making a mistake doesn't result in having an accident. My favorite saying is that really good pilots are skilled enough to fly themselves out of trouble, but really GREAT pilots avoid having to fly themselves out of trouble in the first place.

The last lesson: Watch out for the "intermediate syndrome." Here's how it works: When you start hang gliding or paragliding you know nothing, but you KNOW that you know nothing, so you're super-cautious and therefore you keep yourself safe. As you learn more and progress through the rating system, it's inevitable that you'll start to feel more confident in your decision-making, and you'll let your margin for error start to slide (whether you know it or not), WATCH OUT! "Intermediate syndrome" affects nearly everyone at one point or another, and, despite the name, it can affect H4/P4's as well. Even pilots who have been flying 30 years or more can have a rude awakening if they don't leave enough margin for error. Obviously a H1/P1 will need more margin for error than a H5/P5, but anyone is susceptible to thinking they're better or more experienced than they are and may not leave enough room for the unexpected.

These precautions are so simple and easy; there is NO excuse for not incorporating them into your decision making process. Launching is optional, landing is mandatory. Weigh the risk/reward of your decision. And remember that safety is no accident.