ANGLE FLYING

GUIDELINES FOR SAFE PROGRESSION

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Should the angle group go first or last on this load? Does the leader have a plan? Can I trust the group won't fly up the line of flight? How do we deal with multiple angle-flying groups on one load? Why did a group open so close to me?

These are just some of the questions jumpers are asking more regularly given the increasing popularity of angle flying. We can broadly define angle flying as skydiving with sustained movement off the vertical axis that traditional freeflyers and formation skydivers typically use. (For this article, it includes traditional flat tracking but excludes wingsuiting.)

As the number of jumpers seeking to learn and progress grows, so does the need for renewed emphasis on awareness and formal discussions around safety, flight paths and exit order. With the dozens of variables jumpers face on every skydive, as well as policies that vary across drop zones, it's impossible to take a one-size-fits-all approach for every angle flight at every DZ. However, these basic guidelines can help jumps progress safely and may facilitate healthy discussions at drop zones that are relatively new to the discipline.

WHO'S IN CHARGE?

While there is no doubt that safety is a team effort and everyone needs to play a part, these guidelines primarily address the leader. Whether it's a solo, a 2-way or an 8-way, the leader has the responsibility to set up the appropriate flight path, establish a safe position in the exit order and execute a plan that ensures the group's safety and, to a large extent, the safety of everyone else on the load. It's a responsibility the leader must fully accept: If you are not ready to play that role, then you should not be the leader.

So what can an angle-flight leader do to implement an appropriate plan that will minimize the risks for all skydivers on the load? It all starts with information and awareness.

INFORM YOURSELF

Before setting up a flight path, the leader needs to take in as much information as possible in the hangar and on the ground. From knowing the winds and jump run to knowing what the rest of the load is up to, a leader must absorb every detail to optimize the skydive and minimize risk. The time to figure it all out is not when you're in the door of the plane and ready to exit.

KNOW THE WINDS. Do you fly left or right on exit? Where do you want your group to be at breakoff time and on opening? How much distance can you travel but still land safely back at the DZ? The answers are largely

driven by wind speed and direction, which ultimately set the outer boundaries of your flight path. Observing canopy openings from the ground in addition to reading about the winds can also be very useful for developing a visual context for a flight plan. You also need to consider the layout of the drop zone and surrounding areas. For example, if flying one direction off the line of flight takes your group over an interstate and an area with minimal options for landing off, you may need to go the other way regardless of winds.

KNOW JUMP RUN. When it comes to the safety of the entire load, the most critical bit of information is the plane's jump run. It may change from load to load, so always be on your toes. Keep your eyes open, ask others and also observe from the ground, in the plane and at the door. You should have a mental picture of the jump run ingrained in your mind as you visualize and fly your pattern. It's helpful to look at a map, overlaying the jump run and winds on it and drawing your flight path, before even leaving the hangar. Be ready to adjust if the pilot modifies the jump run before exit.

KNOW THE LOAD AND COMMUNICATE. With all the different disciplines and angle groups on any given load, it's imperative that jumpers be aware and verbal at the loading area. As the leader, you must communicate with your group and everyone else about your plans and theirs. The presence of other tracking groups or even vertical flyers who are including an angle in their dive flow will have an impact on your flight direction and exit order. It's equally as important to communicate with wingsuiters. And if you are last in the fun-jumper exit order, let the tandem camera flyers know your plans, as the pilot may at times make banking turns that could put your group directly on the line of flight. If another angle group is present, you will want to discuss each other's plans and what modifications you'll need to make.

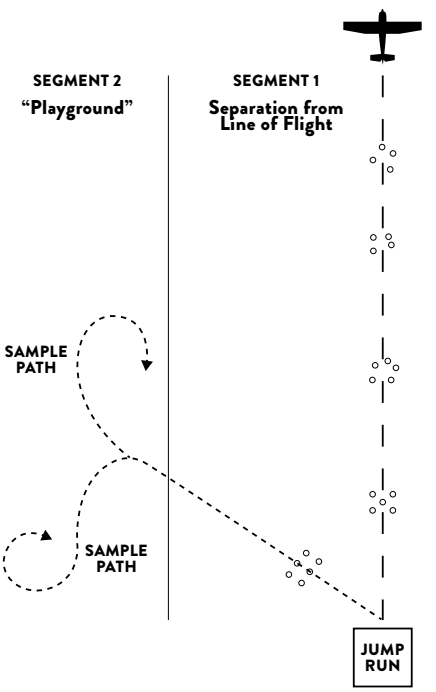
KNOW YOURSELF. We all like to believe that we are safe and proficient, but we also need to frequently check our egos and perception of our own skills versus the reality. Realize that angle flying is complex and challenging and involves not only body technique but navigational skill, as well. The flyers in your group and the rest of the load are relying on your ability to execute on the flight path you've communicated. So, before you organize the next 10-way angle dive where you plan to go steep and fast with several turns, take a step back and honestly assess your own skill level.

FLIGHT PATHS AND EXIT ORDER

Due to the many variables that exist on every load, there is no guaranteed formula for success when it comes to flight path and exit order, so you'll have to take into account the particular situation at hand and use your judgment. When in doubt—and regardless of your expertise in other disciplines—be humble and have a discussion with more experienced angle skydivers about how to proceed.

FLIGHT PATH.

The basic premise when setting up a flight path is to get off the line of flight and stay off of it, thereby keeping away from other groups. To do so, you'll need to factor in the winds, jump run and the composition of the rest of the load.



FLIGHT PATHS

Break it down into two segments:

1) GETTING OFF THE LINE OF FLIGHT

This is the segment of the jump during which you separate yourself from the plane's line of flight. You are essentially creating a new line of flight parallel to but separated by a safe distance from jump run.

To create this separation, you can initiate a sharp 90-degree or a mellow 45-degree turn at exit. A less experienced group might make a gradual turn that allows the group to form around the leader, while an experienced group might go for a sharper, more perpendicular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turn immediately at exit. Whether you fly left or right after exiting will depend on wind direction and the direction of other tracking groups. Depending on the type of aircraft you're exiting, this could mean flying under the plane.

How long you travel off the line of flight will depend on the group's speed and angle: If the group takes a while to get together, it could be half of or even the entire skydive; if the group is tight at exit and moves quickly, it could be a quarter of the skydive. Always check the spot and note the jump run at exit. You may even want to look up at the plane after exiting for an additional reference of your direction and speed.

2) STAYING IN THE SAFE ZONE

If you've traveled the appropriate distance for the correct length of time, you should now be in the safe zone or "playground," comfortably offset from jump run. It is here that you can make the rest of your maneuvers as long as none result in returning to the line of flight. The winds and flight paths of other groups will play a role in the length and direction of your turn(s) in the playground. For example, if a long left turn would result in the group opening too far downwind of the drop zone or too close to another angle group, then you should turn right.

The challenge for beginners is to focus on gauging distance traveled. A less experienced leader may overestimate how far off the line of flight the group has traveled, which may result in turning back too soon for fear of landing off. Or a leader may underestimate the distance of a turn in the playground, causing the entire group to land out. Make a point of noting where you end up after breakoff on each skydive, and eventually your judgment as a leader will improve. While you'll want to avoid landing out, you should be familiar with alternate landing areas around the DZ and consider them as a fallback when planning your flights.

Set the complexity of the jump according to everyone's ability to fly smoothly and consistently along the entire flight path. Keep in mind that you are leading a group, so how tight or dispersed everyone is should factor into the speed, angle and intensity of turns. As with any skydive, there may be flyers who lose a handle on the jump at different times, but this is part of the learning process. Just realize that there is a difference between a challenging skydive on which everyone is pushing the limits and a skydive where the plan completely breaks down due to erratic speeds and angles. Keep the plan simple until you are ready for more.

EXIT ORDER (ONE ANGLE GROUP)

Jumpers at drop zones new to the discipline most often ask, "Where do we place the angle groups in the exit order?" In theory, and assuming no other groups are incorporating sustained movement into their skydives, a group that adheres to its flight path should be able to exit at any point on a load. This is because a well-executed plan that compensates for winds takes the group completely off jump run and keeps it there. So whether an angle group exits before the formation skydiving team, right before the freeflyers or immediately after the freeflyers, if it flies tightly around a leader who can navigate properly, exit order should be a non-issue.

However, if the majority of skydivers in the group are still at the early or intermediate stages of learning the discipline, the best approach is to exit last in the order of fun jumpers but before wingsuiters. This is not completely foolproof, but the additional vertical and horizontal separation created by exiting after other groups provides an additional margin for error should the leader not execute a safe flight path or should the group become too dispersed.

Assess your group's skill level and the complexity of the jump before deciding where to place yourself in the exit order rather than assuming you should always be first or last. Ultimately, it's up to the individual DZ to decide on implementing either a firm exit-order policy or a more flexible one depending on the group's experience level in the discipline.

EXIT ORDER (MULTIPLE GROUPS)

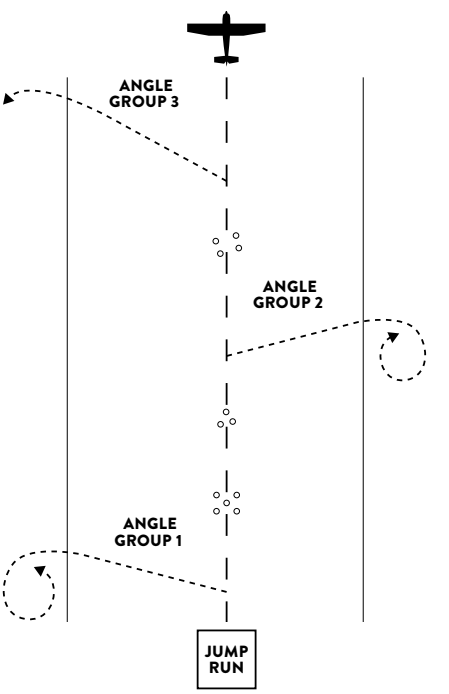
Many times there may be no other option than to have an angle group exit first because there are other angle groups on the load. A short time ago, this situation may have been rare, but loads with multiple moving groups are now the norm. The optimal answer is not black and white and may vary due to the many permutations of skill level and group size.

Let's start with a simple scenario: two highly experienced groups. These groups may choose to exit first, one immediately after the other, as long as they fly in opposite directions off jump run. They may also agree to make opposite turns in their respective playgrounds to ensure separation. If the leaders navigate properly and the groups fly tightly, this should be a non-issue. If the leaders want more cushion for safety or the winds are such that flying in an opposite direction off jump run may not be ideal, then one group may go out first and the other last.

The next scenario is a highly experienced group and a beginner or intermediate group. In this case, the experienced group could go out first and the less experienced group last. Depending on the size of the load and what the other groups are doing, this in theory should place enough separation between the two groups. Depending on winds and the number of groups in between them, these two groups may decide to fly in opposite directions off jump run.

Two groups of beginners or intermediate flyers? Again, some subjectivity may be required in deciding the appropriate exit order. If one group has more navigational experience, it should be able to exit first and have the others exit last. If they are two low-level groups and there is concern about safety, the groups should discuss one of them making a non-angle skydive instead.

What about two beginner groups and one solo beginner track? The optimal approach is to avoid this situation altogether by placing beginner groups on alternate loads. Having angle flyers identify themselves at manifest creates an opportunity for everyone to communicate, cooperate and place themselves on different loads. It may not be ideal to wait, but it could avoid confusion at the loading area and unsafe situations in the sky.

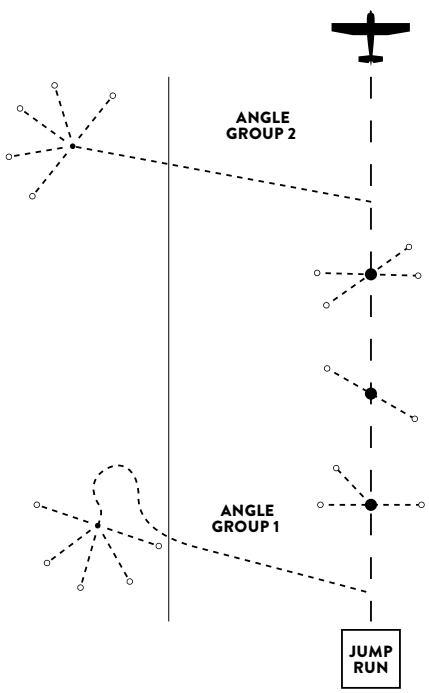


MULTIPLE GROUPS

BUT WAIT, THERE'S MORE

BREAKOFFS

The skydive is not over until everyone is on the ground safely. This starts with the leader discussing a breakoff altitude and plan with the group on the ground before loading. Generally, the breakoffs should take the form of a hand fan, in which the flyers farthest from the leader track perpendicularly from the center while the next set of flyers tracks away at 45 degrees and the closest flyers track at some angle in between. At all costs, avoid 180-degree turns that could result in flying into a trailing flyer or back toward the line of flight. Look in all directions before initiating a breakoff track, and gradually come out of any steep angle to avoid dangerous collisions. You're never too experienced to practice this on the ground.



BREAKOFFS

Whether it's a tight, high-level jump or a loose, casual skydive, having consistently orderly and calm breakoffs with heightened awareness from everyone is the goal. Avoid complacency and the "it's only me and the leader" attitude as much as possible. Complacency from experienced skydivers has led to as many close calls on breakoff as beginners making that final push toward the leader for the video shot.

AND FINALLY: ANALYZE, LEARN AND REPEAT

Repetition and practice are invaluable: The lessons absorbed from each skydive make the next flight even better. This goes for improving your navigational ability and safety as much as it does toward improving body technique.

After each flight, ask yourself the following questions:

WHERE DID YOUR GROUP OPEN IN RELATION TO THE LINE OF FLIGHT? The proximity will provide a clear indication of how well you executed the flight plan. Maybe you were at a safe distance but could have gone a little farther?

DID THE GROUP STRUGGLE TO LAND AT THE DROP ZONE? Maybe you misjudged wind speed and direction or simply needed to revise the turn direction or length.

WERE THERE ANY CLOSE CALLS AT OPENING? You may need to review breakoff procedures more clearly. One close call is one too many.

WHAT IF YOU JUST LED A 6-WAY BUT LOST THREE FLYERS AT EXIT AND ANOTHER TWO SOMEWHERE IN THE MIDDLE OF THE SKYDIVE? Consider keeping the group smaller, slowing down, flying an easier angle or making fewer turns.

DID YOU FLY ERRATICALLY AND MAKE IT DIFFICULT OR UNSAFE FOR PEOPLE TO FOLLOW? Maybe simplify the plan or practice on your own before you lead a group. Again, make an honest assessment of your own skill level at all times.

Angle flying's broad popularity and accessibility reinforces the need for awareness and communication among all participants. At the forefront is the leader whose role is critical in developing and following a safe flight plan from start to finish. But while it may be easy to place the burden on just one person, all jumpers must do their parts through open dialogue, cooperation and humility to minimize risks for all those on the skydive and on the load. It's only through a community effort at each drop zone that the discipline can continue to safely progress to new levels.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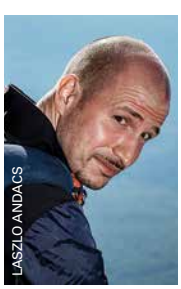
ABOUT THE AUTHOR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Francesco Cipollone, D-31600, has made more than 3,300 jumps focused on angle flying and regularly organizes and coaches in Connecticut, New Jersey and New York. He can be found on most sunny weekends at the Blue Sky Ranch in Gardiner, New York. Jumpers can contact him at fcipollone@gmail.com.