THE SRA GUIDE TO SOARING COMPETITION

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A service of the Sailplane Racing Association and the Soaring Society of America

FOREWORD

The purpose of this SRA Guide to Soaring Competition is to promote safety and to make it easier for new pilots to get started in competition soaring. It is primarily directed toward the pilot who has not yet flown in a contest, but may also be useful to those with contest experience.

This document is produced by the Sailplane Racing Association, an organization of dedicated competition pilots. We welcome all comments and contributions, particularly from new competition pilots.

INTRODUCTION

For many pilots, competition soaring represents the pinnacle of the sport. There's something about concentrating solely on soaring for a week (or more) at a time that tends to bring out the best in your flying. Having other dedicated pilots nearby who are doing the same certainly helps. And the chance to renew acquaintances with a circle of friends means there is much more to a contest's appeal than merely the time spent in the air.

In this document, however, we're not going to try to "sell" the sport. We assume you've already decided you'd like to give it a try, and so we concentrate on the "nuts and bolts": the things you need to know and do to enjoy safe and successful soaring competition.

PREPARATION

It probably won't surprise you to learn that one of the keys to a successful contest is the preparation you do in the few weeks before it. In this section, we look at some areas that deserve your attention.

Your Glider

It's tempting to think that in the time leading up to a contest a great deal of effort should be spent tuning your glider for optimum performance. In reality, the last bit of extra performance hardly matters for your first few contests. It's more important that the ship trim and fly well with no annoying distractions to divert your attention. Thus, unsealed aileron gaps mean little, but an airvent that howls is a real problem. You should be current and comfortable in your ship, able to fly relaxed for long flights.

A few details should receive attention: It should hardly be necessary to note that a good audio vario is essential for contest flying - you'll be part of many gaggles during the course of a contest, and you absolutely cannot afford to fly with your head in the cockpit. Good total-energy compensation, though not critical to safety, should also be considered mandatory.

Your trailer and tow vehicle should function well, since they are likely to get a workout at your first contests. Deficiencies that make your ship tough to rig or de-rig (or that leave you stranded in some distant field) are demoralizing. It's a good idea to check your batteries (a spare could come in handy) and their chargers -- a dead radio or vario would be most unwelcome. If the upcoming contest will involve high-altitude flying, make sure your oxygen system is tested and dependable (remember -- this is life support equipment).

Emergency Equipment

As a responsible competitor, you'll place great emphasis on flying safely. You should also allow for the possibility that a problem might occur. This means that an adequate first aid and survival kit should be on board. It also means that you should give careful consideration to installing an ELT (Emergency Locator Transmitter). Though not required by the rules, an ELT has proven value in case of a crash; they are appearing in more and more competition gliders.

Checklists

Good checklists can be vital, particularly at a contest. Pressure and distractions make it easy to overlook important items; checklists help combat this tendency. Here's a list of suggested checklists:

- Equipment to take to the contest (it's discouraging to discover that you left your battery charger at home)
- A thorough assembly checklist
- A pre-flight checklist
- A pre-landing checklist
- A trailering checklist (showing how to hook up your trailer and start your tow vehicle)

Your pre-flight checklist should include several contest-specific items, such as the need to ensure that a task sheet and landing card are in your cockpit, and that the keys to your tow vehicle are not in your pocket. Your landing checklist is one you may wish to commit to memory, since contest landings can get busy (see below).

Paperwork

You should ensure that all paperwork is in order. Here is a list:

- Aircraft paperwork (airworthiness certificate, registration, logbook, etc.)
- Pilot license
- Pilot logbook (showing current BFR)
- Parachute packing record (packed within 120 days of the end of the contest)
- Insurance policy front page (as proof of coverage)
- SSA Membership card
- Telephone credit card

The last item is essential in case of landouts -- you don't want to stick a friendly farmer with the charges for your call back to the retrieve office. It's great to have a mobile phone with you in the glider, but you shouldn't assume that coverage will always be available. For a comprehensive list of the items (paperwork, etc.) that the rules require you to bring to a contest check out the document on Pilot Requirements under Contest Forms on the SSA website (www.ssa.org).

Charts

To navigate properly, you must have a good chart of the contest area. Most pilots make such a chart by pasting together the appropriate pieces of FAA Sectional Charts, then covering them with clear plastic film.

Before covering, each turnpoint should be clearly marked. You'll be able to get some good ideas on chart preparation by looking over the shoulders of experienced pilots, or asking for their help.

In the GPS age, less emphasis is placed on charts than previously. But it's a mistake for anyone unfamiliar with a task area to be without a good one.

The Rules

Considering the time, money, and effort that pilots expend on a soaring contest, you'd think they would make a point of knowing the rules. Alas, it is not so. Even pilots with considerable contest experience sometimes have a hazy understanding of the rules by which they fly.

Avoid this trap -- get a copy of the current rules (available on the SSA website: www.ssa.org) and study them carefully. Pay particular attention to the rules concerning turnpoint control, starting, finishing, and penalties. Understand the types of tasks you might be flying and at least the basics of the way in which scores are calculated. Be a trifle skeptical of what other pilots tell you about the rules -- their understanding may be good or hazy, and they may or may not have kept up with recent changes.

Flight Documentation

Your contest flights are documented with a GPS Flight Recorder (FR). You need to be sure that it is properly mounted and if it has a navigation display this is positioned so that it can be clearly seen during flight. Obviously, reliability is important. The most common cause of failures is loss of power (batteries go dead, cable becomes disconnected, etc.) so make sure your installation is reliable. The FR should be easy to remove from the glider so it can be submitted to the Scorer after a contest flight (or you should know how to get the flight log file onto a disk or memory card).

Turnpoint control with a Flight Recorder is reasonably simple. The FR keeps a continuous record of your position, so you simply fly to the turnpoint, then press on toward the next one. The Rules require at least one fix within the specified radius of the turnpoint (1 mile for all tasks except the Turn Area Task -- see below). Many pilots have taken this to mean that they could save a few seconds by getting no closer than the defined radius. But few have persisted with this technique -- they've found it's far too easy to wind up with a flight log that shows they never got quite close enough. If you want to avoid occasional penalties, plan to get well inside the cylinder -- by at least 0.1 mile. And while you do so, don't forget the importance of keeping your eyes outside the cockpit: turnpoints attract gliders.

Here's a small point worth attention: Pilots have various notions of how to set up their instrumentation. You may be among those who prefer to use nautical miles or kilometers for distance. If so, be aware that all contest distances are expressed in statute miles. Unless you are careful, it will be easy to make a distance mistake at some turnpoint. For contest flying, either use statute miles or remind yourself to take great care with the distance conversion at every control point.

Waterballast

Use of waterballast is prohibited in Sport Class and World Class, but in other classes it can be important. Clearly, you should be familiar with all aspects of your ballast system well before using it in a contest flight.

You'll need a reliable filling system. One simple approach uses a large (truck-size) inner tube with attached valve, hose and fittings that is placed on top of your tow vehicle, filled from a hose, then drained into the wings. Bear in mind that overpressure while filling can lead to serious wing damage; if the drop from the top of your vehicle to the wings is more than about four feet, arrange some sort of reliable pressure relief.

Go through the filling process until you are confident everything works as it should. Bags and valves that have gone unused for quite a while often develop leaks -- make sure yours are reliable.

With full ballast, your glider may exceed the allowable maximum weight and so you'll have to dump some water by opening the valves for a certain amount of time. To determine this time, you'll need a set of scales (one will be available at the contest for this purpose). If you ignore this important calibration, penalties are easy to get.

Pilot Relief

On any contest task proper provision for "pilot relief" (urination) can be vital. A pilot who comes to a competition without having planned (and practiced) for this is truly unprepared and has created a *huge* obstacle to success. (Ask yourself if it makes sense for a beginner to try to compete with a handicap that no experienced pilot would for one moment consider.)

Many beginners feel that this is an inconvenient subject and that they can probably get by "on one tank". What they don't realize is that the pilot's situation (semi-reclined, moderate vibration, moderate level of stress, changes in altitude accompanied by changes in temperature) is highly conducive to frequent urination. Many experienced pilots use gallon-size ziplock baggies, though other arrangements can work well (a recent trend is toward the use of an overboard relief tube and a "male external catheter"). You may wish to check out the various systems used by experienced contest pilots. Without question, this must be a part of your pre-contest practice -- neglect this subject at your peril!

Drinking Water

A related subject is the need for drinking water. Physiological studies have shown that a glider pilot who fails to drink will soon become dehydrated, and that this dehydration *will* impair performance, perhaps dangerously. Obviously, dehydration is aggravated if the pilot avoids drinking to reduce the need for "pilot relief".

An ample supply of drinking water must be carried (and consumed) on every flight. A quart is minimal -- a half-gallon is far better (in really hot weather, you'll need as much as a full gallon). A popular arrangement is a bag or a plastic bottle and a hose through which water can be sipped. You should keep the hose handy at all times, and get in the habit of drinking small amounts frequently. (If you wait until you're thirsty, you're already a quart low.)

In any hot climate, make a point of drinking a really large quantity of water in the hour before takeoff. This will ensure that you don't start out partially dehydrated.

Final Glides

Final glide computers are common these days; make sure you have considerable practice with the device you'll use in the contest. When determining your margins, take your experience and the nature of the terrain into account: it seems clear that inexperienced pilots should plan conservative final glides.

A surprising number of pilots seem willing to put blind faith in the numbers that their glide computer displays. This is a bad plan: when you're being told you need just 800 feet to do the last 18 miles, it's time to be skeptical. Get in the habit of doing occasional cross-checks. The old rule of 5 miles per thousand feet (200’ per mile) is a good way to tell if glide calculations make sense.

Finishes

High-speed, low-altitude finishes have been a fruitful source of problems over the years. Contest rules now dictate a cylinder perimeter finish for Sports class (i.e., no high-speed pass is allowed) and a minimum altitude of 50 feet for any finish.

A proper high-speed finish is not the violent aerobatic display that some pilots seem to think impressive. Unless you've misjudged your final glide, you should be arriving home with something like 110 knots (i.e. well below redline speed). A pass through the finish gate at an altitude not less than 50 feet is followed by a smooth pullup, a partial or full pattern, and a normal landing. You should have enough practice that you're able to do this sort of finish while still looking out for other aircraft and running through your landing checks.

Be aware of the accident history here: experience shows that this is a dangerous maneuver, especially for inexperienced pilots after the stress of a typical contest flight. Plan accordingly.

If there is any chance of rain, even light rain, be very careful about planning a high-speed finish: at high speed, rain on the wings is almost like pulling the spoilers out -- it's a nasty feeling to finish low and gain only 200 feet in the pullup! Other kinds of unusual weather (such as rotor and wave suppression) can also cause problems. As you get near home, try to get in the habit of asking yourself, “In view of the conditions right now, is the finish I’m planning a safe one?”

Crew

Though some pilots occasionally fly "crewless," you should try to arrange for a reliable crewperson. The crew's basic duty is to reduce the strain on you, the pilot. Specific duties include helping you to prepare and grid the glider every day, running your wing on takeoff, greeting you with tail dolly (and a cold drink) on landing, and, of course, retrieving you when you land out. A good crew approaches all these tasks eagerly, and takes special pride in cleaning and polishing the glider every day.

A good crew should be able to listen at great length to your stories of how the day's flight went, offering praise, sympathy, encouragement, and no criticism. Both you and your crew must be realistic about the large effort that a contest can involve, and how easily strain can creep in unless both work to avoid it.

Contest flying tests your character in many ways. You must be careful not to blame your crew for shortcomings that are really your own responsibility. You may have asked your crew to find your chart and put it in the cockpit, but if you fail to check and take off without it, the fault is still yours. And items critical to flight safety (such as checking control hookups) must not be delegated.

One final point: In getting ready for competition, no form of practice or preparation is half as valuable as the chance to act as crew for an experienced pilot. This is so useful that it should almost be considered mandatory for anyone who is contemplating competition flying.

THE PRACTICE PERIOD

At the contest site, the days before the start of actual competition are reserved for practice. This allows both competitors and contest organizers a chance to learn the things they must know when the contest starts. As a new competitor, there are many things that require your attention during this period.

Contest Paperwork

When you register and pay your entry fee, you'll receive a package of paperwork. This may include tourist guides and other items of only mild interest, but certain vital items will also be there. One is the list of turnpoints and closed airspace. You'll need to get these on your chart and into your GPS navigation receiver.

To do this, you’ll need to obtain an up-to-date electronic version compatible with your navigation system, and make sure it’s loaded and working properly. Other pilots will be doing the same, so you should be able to get help with this. Beware of the trap of using a version of the control points that isn’t quite up to date. The rules require that contest organizers include a date or version number with each control point list; you should check each time to ensure that the set you using has this, and it’s the latest one.

Also among the paperwork will be a supply of landing cards, which should go in your cockpit. Each day you take a launch, even if you never leave the local area, you must fill out one of these and turn it in to the scoring office after the flight is done (they must keep track of every pilot every day).

It’s a good idea to copy the phone number(s) of the Retrieve Office onto the landing cards (or at least onto a scrap of paper for your wallet) – even during the practice period, you might need this.

Another important item is a diagram of the airport, which usually includes a list of local operating procedures. You must study this, and become familiar with the start and finish procedures, landing patterns, ground procedures, relight procedures, etc. It can be a good idea to review all this with a contest official or experienced local pilot, to be sure you understand everything. Don’t make a launch before you understand all procedures; don’t assume that every flight will work out just as you wish.

Airport Etiquette

Beyond the published airport rules, there are some unwritten rules of contest etiquette that all pilots (and crews) should observe:

- Around the airport, drive at moderate speed (don't terrify pedestrians or stir up dust)
- Don't leave cars or gliders where they block others
- If your car might block anything, leave the keys in it
- Drive around, not across, runways, unless you are *certain* the latter is allowed and safe
- Display your contest ID on your car and your trailer (makes them easier to find)
- Whether on foot or in a car, always defer to aircraft
- Treat contest workers politely (remember, they are volunteers)
- Be considerate of non-contest airport traffic (so the contest gets invited back next year)

Contest Personnel

The **Competition Director** is the head honcho -- the one who calls tasks, and is responsible for ensuring that the contest is a safe, fair soaring competition. The CD must have considerable experience and command the respect of all pilots. CDs are supposed to take competition seriously -- they tend to want to call a task on any day where safe and fair flying is possible.

The **Contest Manager** is responsible for administration of the contest. It is the CM who organizes all the volunteers, ensures that there are enough towpilots, towplanes, towropes, water faucets, porta-potties, etc. This job tends to be more difficult and less glamorous than that of the CD.

The **Contest Competition Committee** is a group of up to 3 experienced pilots. They help with task selection and rules interpretation.

The **Weatherman** is responsible for monitoring weather observations and forecasts, and presenting this information to pilots each day. As we all know, meteorology is an inexact science, and it often pays to be a bit skeptical of the day's forecast. In discussions with local pilots you may get some idea of how much trust the weatherman deserves.

The **Scorer** is responsible for keeping track of the distances and times flown by all pilots every day, entering these into a computer, and producing scoresheets.

The **Retrieve Office** is the collective name for the group of volunteers who take phone calls from pilots that have landed out.

Radio Usage

Proper use of the radio is a small but important part of contest flying. Details of radio procedures used during the start and the finish are discussed below. Here, we'll take a short look at the general subject of radio usage.

Today, a high-quality 720-channel radio can be found in the cockpit of most competition gliders. Yet in most cases all that's required is a radio that can receive and transmit on two frequencies (123.3 MHz and 123.5 MHz). Clear reception and transmission are important: a radio that is hard to hear will annoy you, and one that transmits with screeches and squawks will annoy everyone else.

All contest business (starts, finishes, etc.) is normally done on 123.3; 123.5 is for pilot-to-crew communication. You are required to be on 123.3 during the entire pre-start period and when you finish, and expected to monitor this frequency during the entire flight, to allow safety-related pilot-to-pilot communication (such as "Alpha Bravo Charlie, this is Xray Yankee Zulu -- I'm passing you close-by on your right"). Other than for this purpose, pilot-to-pilot communication is forbidden.

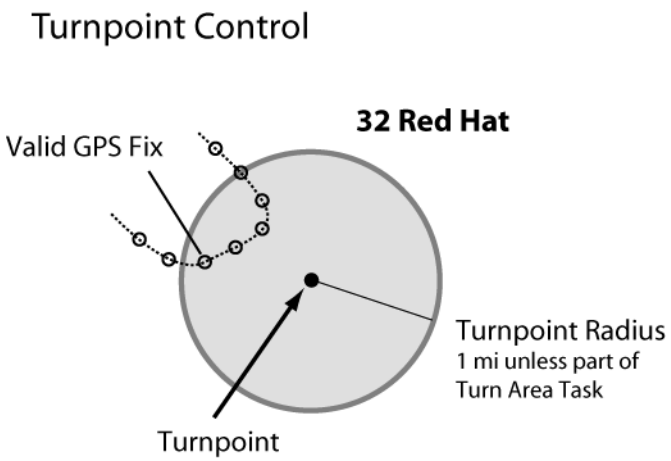
Pilot-crew communications are allowed on 123.5, but must be initiated by the pilot, and a crew may not give a pilot weather or tactical information. You should reach an understanding with your crew as to how often you'll call back with a status report. Some pilots do this frequently; others simply say, "See you at dinnertime".

In general, the goal is to minimize radio chatter. You'll find that talking tends to distract you from your flying. One particular time to bear this in mind in when conditions are tough and you are close to an outlanding; it's nice to keep your crew informed, but it's more important to get the glider safely on the ground. Don't involve yourself in distractions when they might hurt your performance.

Navigation

GPS navigation receivers are now almost universal in gliders used for cross-country soaring. Yet there are still some navigation details that must be attended to the old-fashioned way.

You should learn the local landmarks, and the areas of good and bad outlanding fields. Try to visit as many different turnpoints as possible – flying through a familiar area is always easier. Pay particular attention to areas that the local pilots feel are tricky. Your objective is to be able to find a turnpoint from any direction, and to form some idea of the nearby landing possibilities.



One specific navigation detail should receive careful attention during the contest practice period: you should be able to pinpoint the exact location of the home field from low altitude in any direction from which you might be doing a final glide. Often, the angle of a final glide is shallow enough that the airport itself cannot be clearly seen, and nearby features (e.g. a hill, a lake) provide the necessary clues.

You should also check the landing possibilities within 5 miles of it along the final glide routes. You have no business making a close final glide until you know what your options are if it doesn't work out.

If there is any question, you'll do well to visit some of the nearby fields – if you have to land there because a final glide goes wrong, you probably won't have much altitude and will be glad of having "done your homework."

Outlanding Preparations

Your pre-contest cross-country flying should have included a number of landouts -- it would be a bad idea to come to a contest without a good idea of how to evaluate fields and make safe off-field landings. Because some contest days are likely to have weak weather, the chance of outlanding is good.
It is important to develop a reasonable idea of the landout possibilities in the task area, both from discussions with local pilots and from your own observations. You should learn any special tricks about judging slope and surface quality, and the nature of local land usage (What crops are high or low? Are any particularly valuable? What do they look like from the air? Are there landable pastures? What do they look like from the air?). An hour's drive to inspect typical fields may pay real dividends later.

Flying with Waterballast

Though the use of water can give a boost to your speed on days with large, predictable areas of strong lift, it entails some real disadvantages. Among these are sluggish handling, decreased rates of climb (on tow and in thermals) and additional energy to dissipate on landing. When you do carry water, watch your achieved climb rates to decide how much you really should be carrying.

If you decide to dump ballast, you must not do so in a thermal, unless you are *certain* you are below all other gliders: wetting down other pilots' wings is considered very bad form. Be sure you know how long it takes to dump ballast, and start to do so in plenty of time before landing. This is especially important for off-field landings: ballast puts extra strain on landing gear and brakes, and encourages groundloops.

Be aware of the hazards when empty and full gliders are using the same thermal: the empty ones may have a real advantage in rate of climb, so vertical spacing can change quickly. And be especially alert for problems in the first part of your takeoff roll – if a wing goes down and you can't raise it *immediately*, it's probably best to release and try again.

Asking For Help

You're certain to have questions and it can be really helpful to consult a competition guru who knows the local area. Some contest organizers recognize this and assign a local expert to help each new pilot. If this doesn't happen, don't be shy about asking for help. Go to the CD and say "I'm new at this game and I feel I could use some guidance. Could you introduce me to an experienced pilot who'd be willing to help me?" Beyond the specific help you receive, this will give you a reputation as a pilot with a good attitude toward the sport. Remember the old adage: "We tend to admire the wisdom of people who seek our advice."

A CONTEST DAY

Preparation

Your first duty on any contest day is to get your ship assembled and ready to fly. You should expect this to take longer than normal, because of the special needs of contest flights (contest paperwork, waterballast, etc.). Pay particular attention to having all necessary items (task sheet, landing cards, chart, etc.) in the cockpit, and all unnecessary items (e.g. yesterday's task sheet) out.

You'll want to have a good Critical Assembly Checklist, and to do it properly each day. As you know, this is an independent check of the items on a particular glider that the manufacturer, common sense, and the service history say are critical to safe flight.

The list should be kept small -- this is not a substitute for your comprehensive assembly checklist, but a separate check of the truly vital items. You crew can help you do this. Each day, make a mark on the left wing root tape signifying that it is complete.

With luck, you and your crew will "hit your stride" during the contest, with assembly and preparation becoming a smooth operation. A good goal (not always achieved) is to have the plane entirely ready to go before the pilots' meeting. No matter what it takes, you must make a point of being fully ready to fly by grid time (the time when gliders are pushed out on the runway in preparation for launch).
You should take this seriously (it tends to be a weak area for novices) because many problems can develop when you are almost but not quite ready to launch on time.

The Pilots' Meeting

The first "event" of the contest day is the pilots' meeting (typically held in a hangar or meeting room at around 9:30). Here, the previous day's winners get a chance to describe their flights, and perhaps receive a small prize. The weatherman explains why the forecast for the previous day was less than perfect, and offers a guess about today's conditions. Various administrative notes and comments are presented.

Each pilot receives a bunch of paperwork, typically consisting of a scoresheet, a takeoff grid list (be sure to note where your glider should be positioned), a weather summary sheet, and a task sheet. This last item is the most important. Typically, it lists two or three tasks that might be used, depending on how the weather actually develops; it must be placed in your cockpit.

Gridding

The next big event is gridding -- placing all gliders on the runway in a pre-arranged sequence in preparation for the launch. The CD will have announced the grid time at the pilots' meeting, and on the first contest day should have handed out a grid sheet covering the entire contest period.

It's important to remember that this should be a cooperative project. A few airports have so much room that gliders can be placed on the grid independently; far more commonly, the grid is relatively dense and pilots must cooperate. The normal scheme is that at grid time gliders are expected to be at the side of the runway near their assigned spot; when the CD announces that it's time to grid, gliders are pushed onto the runway, their wheel on the assigned number. This scheme keeps the runway clear for moving gliders prior to grid time.

Some pilots seem devoted to being on the grid as early as possible. This is fine until someone parks a glider on the runway ahead of time, blocking the movement of others and causing delays. Other pilots seem to be fond of showing up at the very last minute -- an especially bad plan for a beginner.

A recent trend is to hold a pilots' meeting at the front of the launch grid just after grid time. The weatherman may give an updated forecast, and the CD may announce or change the task. Obviously, you need to be there. If a new task sheet is handed out, be sure that a copy is in your cockpit (and any old one is removed).

Launching

Typically, a "sniffer" is launched as soon after grid time as conditions warrant. The sniffer is usually a pilot who knows local conditions and is not part of the contest (though contestants are sometimes selected). The sniffer's job is to sample the lift and help the CD determine when it is safe to start the launch: conditions that will allow a few ships to stay up may not be safe for the entire fleet.

Once the launch commences, things move quickly. The goal is to get all gliders safely into the air in the shortest possible time. When your turn arrives, you are expected to be ready in all respects: the rope is hooked up, slack is taken up, and the towplane starts to roll, all without a signal from you. Thus, you must be ready well in advance, with your preflight checklist complete -- plan to be completely ready to go while there are still four gliders in front of you. If for any reason you are not ready, pull the release before the takeoff roll begins and tell the launch crew that you are pulling back (they will move your glider off the grid). Try to be ready, but don't let the fast pace make you accept a launch for which you are not prepared.

Towplanes will follow a prearranged route, and don't want directions from you. The standard release height is 2000' AGL, but the CD may announce a different height (you should confirm this before launching). You may wish to get off tow slightly early if you fly through good lift or see a promising gaggle nearby; in any case, you're expected to get off promptly when release height is reached. It's considered good form to put a *small* amount of tension in the towrope before release (i.e. don't release with a slack rope) so the towpilot knows you are off.

Towplanes may be radio-equipped; if so, they will monitor 123.3 (or another frequency, as announced by the organizers). Communication with a towplane should not normally be necessary, but can occasionally prove useful ("Red Pawnee, please add five knots"). Be sure to refer to your particular towplane, either by registration number or by description. When as many as 5 towplanes may be in the air at once, an ambiguous transmission ("Hey, how about slowing down a little?") can be confusing and even dangerous. Avoid all unnecessary chatter, such as thanking the pilot for a good tow (leave this until after your flight).

Relighting

Relighting means landing and then taking another launch. There are a number of reasons why you might need to do this: perhaps you left an important item on the ground (wasn't your checklist supposed to avoid that problem?). The most likely reason is that you couldn't find lift and climb. If you get low, it may be better to land and launch again than to spend a great deal of time and energy trying to save yourself in weak lift.

Mixing landings with a fast-paced launch can be challenging; the contest organizers will have published a relight procedure that you must know before launching. You should announce your intentions on 123.3 ("Alpha Bravo Charlie, landing, runway 23"), then land and roll well clear (if you couldn't climb, others may be having trouble, too). Find the CD and state your intention to relaunch: you'll have to wait at least until your class' normal launches are completed. The launch team should then assist you in repositioning your ship for re-launch. Clearly, your crew should be there to help with all this.

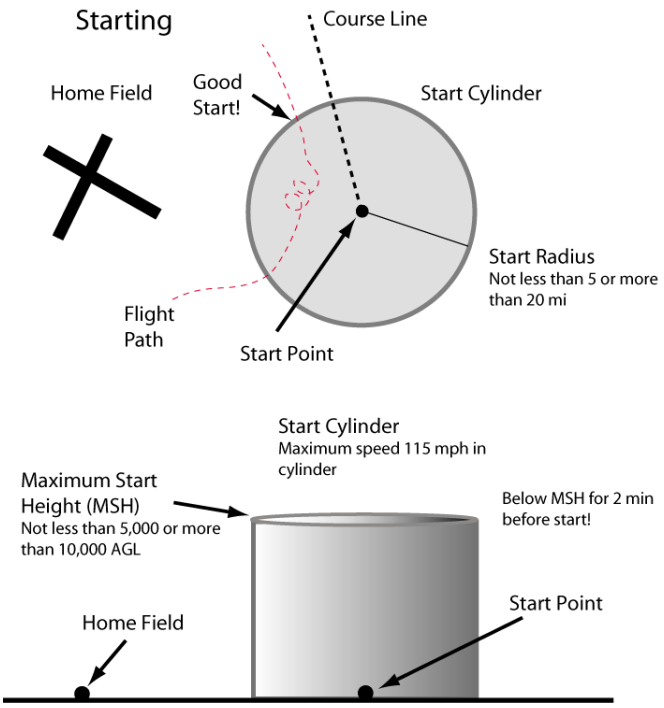
Starting

Once you have connected with lift, your job is to climb in preparation for the start. Since the sky can get crowded, extra caution is needed. Avoid aggressive flying, and be alert for other gliders. If thermals are scarce and you find one, expect company.

The task for your class will not open until about 15 minutes after the last ship in your class launches -- you must have a start after the CD announces that your task is open. You'll usually have time to get a feel for the day's conditions before the race starts. It can be a good idea to head a few miles out on course, to get a better idea about the conditions and weather you'll be facing. Wise pilots look carefully to the limit of vision and stay quite alert to weather trends.

The start cylinder is centered on a designated point and usually has a fairly large radius (often 5 miles). To make a start, you must be inside the start cylinder; your start time is the time you leave it.

The CD will have set a maximum start height (MSH). Often, it will be higher than the lift, and so it is not a factor. But if you are able to climb above the MSH, you must take care to get below it for at least two minutes prior to your start (plan on a bit more, to be sure). A common misconception says that you must be in the start cylinder during these two minutes, but this is wrong: you must be below the MSH, but it doesn't matter whether you're inside or outside the cylinder. (You must, of course, be inside the start cylinder, at least briefly, some time after the two minutes are up, in order to make your start.)



Be aware that other pilots will probably be interested in starting at around the same time. Stay alert anywhere near the edge of the cylinder, and expect circling gliders to attract a crowd.

Pilots do not make radio calls when starting. The CD may specify that start times be reported by radio; if so, you need to report your start time within 10 minutes after you start, and the reported time must be accurate within 2 minutes. You are always free to return and start again. But you must not make a false start time report.

Task Setting

It used to be that tasks were always called well in advance of the launch. This allowed pilots to do all their flight planning before takeoff, but occasionally led to a poorly called task: it's no fun setting off in the one direction where thunderstorms are building. Recently, the trend has been to wait as long as necessary before calling the task. One step in this direction is a task sheet that lists several possibilities, then a meeting just before the launch where the CD names the task that will be flown.

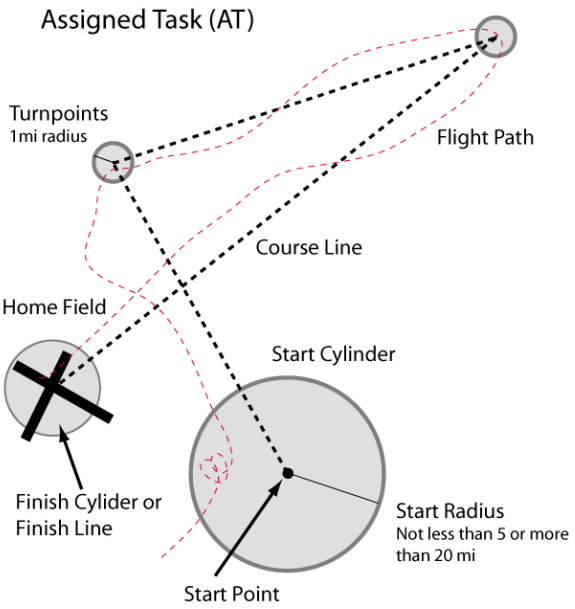
With truly difficult weather, the task may not be called until all gliders have been launched and the airborne "task advisors" (usually, two experienced pilots with knowledge of the task area) have been consulted. This can make the difference between a good task and a day where everyone lands out, but it does add to the problems of flight planning. If a task is called (or changed) "in the air", the procedure is for the CD to fully describe the task on 123.3, then make a roll call in which all pilots acknowledge that they understand the new task. Obviously, you must leave your radio on 123.3, and have your chart and pencil handy. Be aware that all pilots now have an additional distraction; you must still fly your glider and keep most of your attention outside the cockpit.

Task Types and Planning

There are three types of tasks: Assigned tasks (AT), Modified Assigned tasks (MAT) and Turn Area tasks (TAT).

For the Assigned Task (AT), the CD selects a fixed course (of one or more turnpoints) for all pilots in a class. Beginners often prefer an AT, as it reduces the number of decisions to be made. Yet there is still the question of when to start. For experts, the answer to this question is often "as late as you dare". For them, the idea is to get as many "markers" as possible out on course. In theory, early-starting pilots mark the thermals and make rapid progress possible.

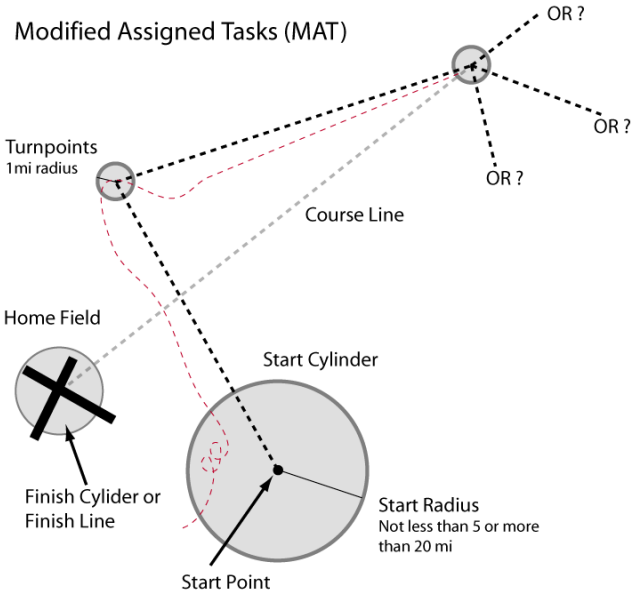
Of course, this approach can lead to "start-gate roulette", where pilots take turns delaying their starts, perhaps leading to a situation where the lift ends a little sooner than planned and they must struggle to get home.



For the beginner, this is not often the best approach. You're better off simply to plan how long the flight is likely to take you (based on a conservative estimate of the speed you're likely to achieve), then start in time to get home before soaring conditions deteriorate. This means that you're likely to be caught and passed by the late starters, but that's only a problem if you're expecting to win the day.

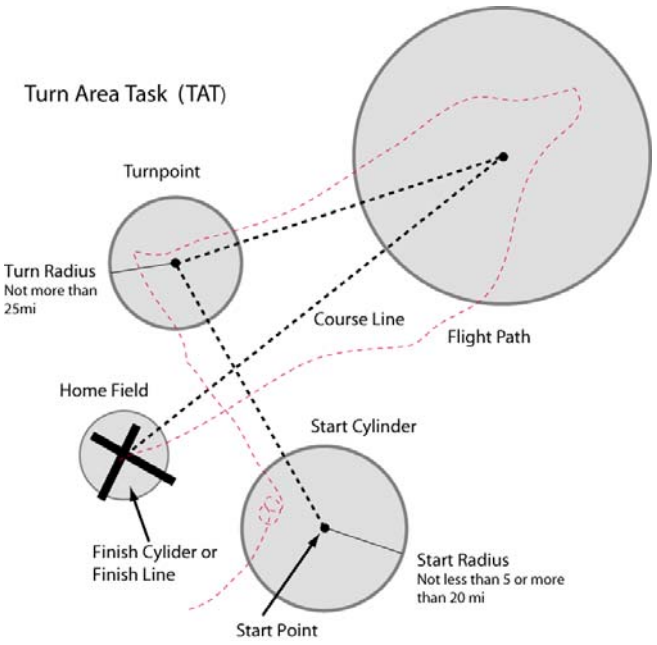
All tasks except for the AT include a minimum time. If you fly longer than this, your scored speed is the distance you flew divided by your time on course, as you'd expect. If you fly less than the minimum, your speed is the distance you flew divided by the minimum time. Thus, finishing in under the minimum time will hurt your scored speed; you generally wouldn't plan to do this unless you felt conditions wouldn't allow you to stay in the air for as long as the minimum time.

The Modified Assigned Task (MAT) usually has a list of assigned turnpoints that you must visit in sequence. The difference (as compared to an AT) is that you may elect to return home and finish after any one of them. The best strategy will generally be to fly as far as you can while conditions are good, and to head home before they deteriorate. If there are no assigned turnpoints or if you are able to complete all the assigned turnpoints and conditions are still good, you can fly to turnpoints that you choose. This usually feels a trifle confusing; it's tempting to think that there is some obscure and inscrutable process, unavailable to you, by which the experts decide what turnpoints to try for. The truth is that there's little magic involved -- the best course is the one that takes you to where the soaring conditions are best. The necessary clues (the terrain, the weather forecast, the wind, and especially the clouds and their development) are available to everyone.



Some restrictions apply to the selection of turnpoints: You may not repeat a turnpoint without at least two intervening turnpoints. This means that you may not shuttle back and forth between two points, but you may make numerous "laps" of a triangle. (But note that the start and finish are not turnpoints, so an out-and-return leg at the beginning or end of the flight is okay). Some turnpoints may be outlawed entirely, and other restrictions are possible -- you'll need to read the Rules and understand the task sheet.

The Turn Area Task (TAT) is like an AT, but instead of the turnpoints being small (1-mile radius) cylinders as with all other tasks, each is a giant cylinder whose radius is up to 25 miles, as set by the CD and listed on the task sheet. You must visit each cylinder in the specified sequence, but you can go as far into the cylinder as you choose, and you get credit to the most favorable point you reach in each cylinder (the point that, with others, gives you the greatest total distance). The minimum time will generally be set long enough that if you just touch each turn area, you'll be home too early. Thus, for a good score you'll need to go further than the minimum distance at one or more of the turn areas.



While waiting to launch, don't be shy about asking the more experienced pilots for their thoughts; a few may be reticent, but most will be quite willing to help you. During the flight you should remain flexible, aware of your options, and willing to change your planned course as conditions dictate.

Remember to read and understand the rules before you fly any task. Have the current task sheet and refer to it.

Gaggles

At your home field, a gaggle can be a leisurely event: two or three gliders circling in the "house" thermal at moderate bank angles. Contest gaggles are different. There may be a dozen gliders whose pilots are *racing*; they want to find the core quickly and outclimb the others if they can.

To fly safely in such gaggles, you must stay alert and keep your eyes "out of the cockpit" at all times. You'll often see experienced pilots wave at you in a rather low-key way. They are not so much saying "Hello" as "Are you paying attention?" A wave in return says "I've got you in sight". Avoid fixating on one glider, especially the one just in front of you. The glider you must worry about is the one you can't see easily: the one that may come from above or below.

Entering a busy gaggle requires the right technique. The idea is to make your first circle somewhat larger than the gaggle, then tighten it to match the circles of the others. The thing to avoid is a pullup through the center of the gaggle (this would typically be followed by an exciting "starburst" maneuver and sharp comments on 123.3, none of which you'd enjoy hearing).

Experienced contest pilots will be tolerant and supportive of beginners, unless they show that they cannot fly safely. Make sure your approach to a gaggle doesn't have people saying "Look out, here comes Alpha Bravo Charlie".

Landing Out

Though it would be nice to complete every task, it's unrealistic to think this will happen. Tasks will be called on all days the CD thinks are safe; in the course of a typical contest, this means you'll see both strong and weak soaring conditions. You must always fly with the possibility of an outlanding in mind, and with a general idea of the terrain below. Avoid the common fallacy that contest success requires a press-on-regardless, "death or glory" approach. Your decisions about flight safety should be no different from those made during a non-contest cross-country flight.

When evaluating fields from the air, there's a strong tendency to assume that a glider on the ground indicates a good landing field. Be careful about this! That ship may have landed in a direction different from the way it is facing; perhaps it is in a small field that has no room for another. It might have landed in the adjacent field and then have been moved to make room, or even have hit a hidden ditch and damaged its landing gear. If the pilot is nearby, you may be able to get advice by radio, but don't count on this. It's best to assume nothing and to evaluate the field just as carefully as if the ship weren't there.

If you have landed in a field and there's any chance that others might also want to, you have an obligation to move you glider and make room for them. If the ground is soft, this may not be easy. For a single person, the maximum force is usually obtained by standing at the leading edge wing root, facing forward and pushing the glider backward. If other gliders are nearby and getting low, they might appreciate a report about your field on 123.3 -- but keep it brief and to the point.

After you land and secure your ship, find the landowner and do your best to make friends. Apologize for the intrusion and say "thank you" for the use of the field. Be as careful as you can about crop damage after landing; those 3-inch corn plants may seem insignificant to you, but represent real money to a farmer. You are an ambassador both for the sport in general and for other pilots who may wish to continue flying in this area -- take this job seriously. Most areas that are popular with glider pilots have one or two landowners that are not hospitable. Far too often, this is not mere bad temper -- it arises because the landowner was treated inconsiderately by one glider pilot, and resented it.

Your next duty is to fill out your landing card and call the contest Retrieve Office. You should get driving directions from the landowner (a roadmap stowed in your cockpit can be quite useful here). Be sure to have your landing card completely filled out before you call. This is required by the rules, and tends to make the whole retrieve process go much more smoothly. If the driving directions are at all complicated, have the Retrieve Office read them back to you to make sure they are correct. It is a good idea to include some sort of estimate as to how long the drive should take (the landowner should be able to help here).

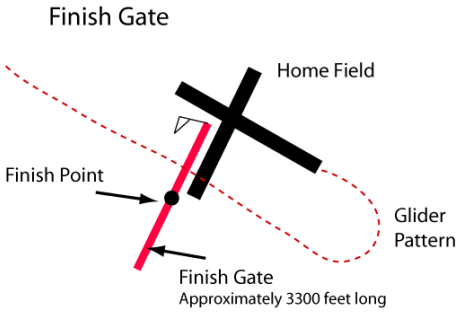
Your crew should be completely familiar with the process of securing and hitching your trailer, as well as with any idiosyncrasies of your tow vehicle. Your crew should make a point of stopping at the Retrieve Office to copy down the driving directions word-for-word and to note (on your retrieve card) the exact time of departure.

It is permissible to make all the arrangements for the retrieve directly with your crew, and have them inform the Retrieve Office about your landout. But it is essential that the Retrieve Office be informed before your crew sets out on the retrieve. If this is not done, you may become the object of a difficult, expensive, and possibly dangerous search. Expect a penalty and some sharp words from the CD if you don't ensure that this happens and you're off enjoying dinner while contest personnel are organizing a search.

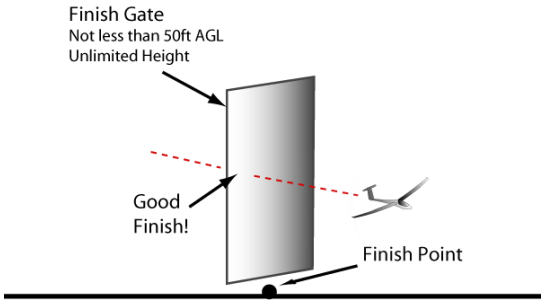
Once your crew is on the road, the retrieve office will assume that their job is done. If you and your crew are not together by the time the retrieve office is due to close for the evening (typically, 8:00 pm), you must call and ask the office to remain open. If you have done this, you must call again when your crew finally does arrive.

Finishing and Landing

If things go well, at the end of the task comes the final glide and the finish. As you get near home, you should pay attention to 123.3 to see how busy the finish is. When you are four miles away, say "Alpha Bravo Charlie, four miles". If there is any question, include the direction: "From the northwest." Contest personnel may respond with the winds and preferred landing pattern. Prepare yourself for some of the busiest minutes of the contest.



Be conservative in planning your finish. You must watch your altitude, airspeed, and distance-to-go closely. If your energy is getting a little low, you need to decide at least a few miles out whether to do a "high-speed" finish (a pullup, followed by a partial pattern) or a "rolling" finish (a straight-in landing with no pattern); if you decide on the latter, be sure to let others know ("Alpha Bravo Charlie, four miles, rolling finish").



Make up your mind ahead of time that if there's doubt, you'll do the rolling finish. This may require that you speed up and perhaps use divebrakes to burn off extra energy, so you arrive at the runway with reasonable height and airspeed for a landing (don't forget your landing checklist!).

If you choose to do a high-speed finish, give some thought to where you wish to cross the finish gate. Out of habit, many pilots tend to want to finish right down the runway. But the finish gate is 3300 feet wide, and the end away from the runway may be favorable. The minimum altitude for a high-speed finish is 50 feet -- "worm-burner" finishes (low high-speed finishes that have the folks on the ground ducking) will earn you an Unsafe Flying penalty.

After your high-speed finish, do a smooth pullup as you reduce your airspeed to pattern speed (avoid aggressive, high-G maneuvers). You must keep a sharp eye out for other aircraft while you run your landing checks (a gear-up landing in front of dozens of spectators will take all the fun out of a good contest flight).

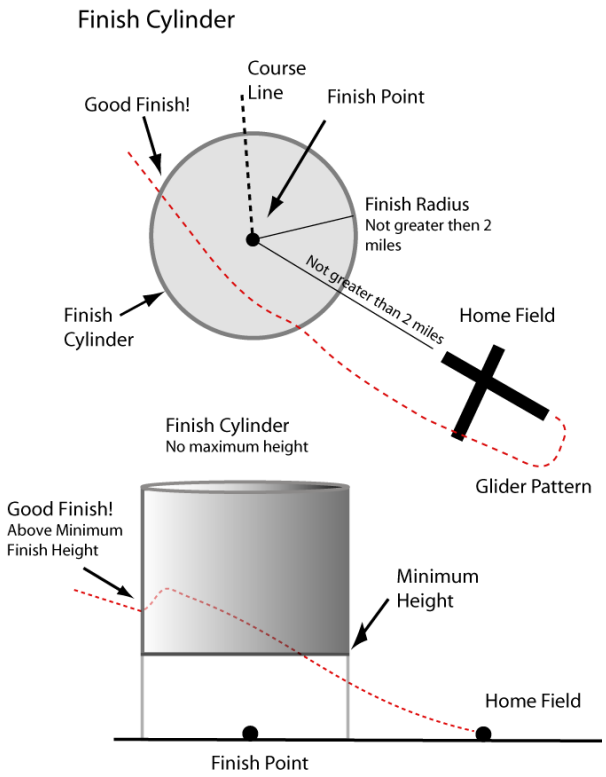
An alternative to the gate finish is a cylinder finish; it's less dramatic and probably a bit safer. The finish cylinder will be centered on a point near the home field, and have a typical radius of two miles. There will be a minimum finish height high enough to ensure that if you enter the cylinder at the necessary altitude, it will be easy to glide back to the home field for a normal landing. You must take care in your glide calculation to reserve the necessary height so that you get a valid finish -- if you can't, it will cost you some time. After your finish, head to the airfield and merge your pattern with any other gliders that are present. Pilots making a cylinder finish are expected to announce their finish on 123.3: "Alpha Bravo Charlie, finished." Additional radio calls that enhance safety are encouraged, but keep it brief -- unnecessary chatter tends to cause problems.If you are landing without completing the task you should still be aware of finishers and plan to conform to the landing patterns of other competitors.

On 123.3, say "Alpha Bravo Charlie, four miles, no finish". Do not do a high-speed, low-altitude pass. Instead, just join the pattern at a point that seems reasonable.

After you finish, there is a strong tendency to relax mentally after the strain of several hours flying: you must resist this -- you are not entitled to relax until your ship is safely on the ground and has rolled to a full stop clear of the runway. But don't overdo this – there have been some recent problems with pilots attempting to roll right up to their trailers, despite gliders, people and pets nearby. Use good judgment.

After you land, you must turn in flight documentation to the Scorer. (The instructions on the Landing Card are simple, but many pilots are distracted and do not fill it out correctly.) You should do this promptly: if you take longer than the FDI (Flight Documentation Interval – usually an hour) you are subject to a penalty (unless you have landed out).

You must turn in a landing card on any day that you make a launch (even if you never leave the area of the home field). Otherwise, the Retrieve Office may not know you have landed, and may start to organize a search.



THE INNER GAME

Beyond the mechanics of flying a contest lies the complex subject of contest psychology. In this section, we'll look at a few of these issues.

Pressure

Contests can be stressful -- few pilots, experienced or beginner, can sit in the cockpit ready to launch without the heart beating a bit faster. Dealing with this pressure is one of the skills you must develop. Remind yourself that this stress is normal, and that all pilots feel it. Admit that mistakes can be easy to make -- so proper use of good checklists can be vital.

Pacing

Most new pilots are surprised at the mental and physical stamina contest flying requires. If you get too wound up in the early part of the contest, you may find that you "burn out" with several days to go. Your goal is to be just as enthusiastic about the last day's flight as you were on the first day.

A Realistic Approach

Perhaps you are the one pilot in a thousand who can immediately compete at the highest level. More likely, you'll spend a good while near the bottom of the score sheet before your full ability shows itself. Thus, it's best to plan a realistic approach, not getting depressed at the inevitable poor flights, nor too elated at early successes (in which luck may play a big part). An approach that allows you to enjoy each day's flying while learning as much as possible is probably the best one.

Sportsmanship

Experienced pilots tend to be kind to newcomers, willing to give advice and help when asked. They will expect you to be able to fly safely, especially in a crowded thermal. They will not be overly tolerant of a pilot who cannot be a good sport. Everyone has had tough contests with frequent landouts and disappointing scores; a pilot who cannot handle misfortune in a graceful way is not much fun to have around.

Weather Psychology

A mental trap you should plan to avoid is the "one-weather pilot" syndrome. Many competitors are eager to race in good conditions, but "psych themselves out" when the inevitable weak conditions arrive. You'll do well to take the opposite approach: to look forward to the tough days, knowing that some of your competitors have convinced themselves they can't fly well in such conditions.

Following

Another notable mental trap comes when you decide to latch on to another pilot and follow closely. This can occasionally produce good results -- the other pilot makes the decisions and you tag along. The trouble comes when conditions get tough. Perhaps you have fallen somewhat below him and can't connect with a weak thermal. As he climbs away, you find yourself wondering "Now who's going to show me the way home?"

Perhaps your "leader" is having trouble too. Maybe you're both getting low in tough terrain. You tell yourself: "Well, if he's happy with the outlanding possibilities around here, I guess I should be too". But he may be different from you: Perhaps he's scouted the one safe field that lies several miles ahead. Perhaps he has far more experience ridge-soaring small bumps in weak conditions. In reality, no two pilots have the same skill or experience, so their safe limits are probably different.

The only reliable strategy is to know your own limits and to stay within them at all times. To do this, you must use your own judgement -- not someone else's.

But having said all this, it should be noted that a beginner can learn a good deal from flying with more experienced pilots. As long as you are not following blindly or refusing ever to lead out, don't be ashamed to grab hold of a promising gaggle and to hang on as long as seems sensible. When you do, you'll soon see that only a few pilots are really worth following. They are the ones who consistently find the best conditions and who are decisive and quick to lead out. You may not be in this category yet, but to get there should be your objective.

Thinking about Safety

Most pilots understand that safety is about 98% judgement and 2% technique. In many situations it will pay to have thought ahead about judgements you may face. Suppose you're marginal on a final glide and then hit some sink. You'll be tempted to press on, hoping things will work out (as they have often done for you in the past). But they may not. There's a time to shift to a straight-in rolling finish instead of pressing on to arrive above the runway at 50 feet and 60 knots with no options. Think about where and when this decision would be right, so when you find yourself there you can make it without delay or strain.

Perhaps your final glide is lower than that -- you're not sure whether you can make it to the field at all. If there are landable fields ahead that you have scouted and are confident about, you can give yourself permission to press on. If there aren't, safety demands that you stop to look for a thermal or a landable field while you still have the altitude to do so safely. Thinking through this beforehand will give you a much better chance of getting it right when under pressure.

The Unwritten Rules

For any sport, the rules that aren't written can be as important as those that are. Here is a brief list of the things you should be trying to achieve in soaring competition, in decreasing order of importance. The first four should be considered mandatory on every flight.

- Don't endanger people on the ground
- Don't endanger other pilots
- Don't endanger yourself
- Don't endanger your glider
- Learn from the flight
- Enjoy the flight
- Score well

FURTHER READING

Winning on the Wind -- George Moffat
Some of this book is dated, but George's comments on competition flying are still the best writing on the subject.

Cross-Country Soaring -- Helmut Reichmann
Every cross-country pilot should own this book.

Turnpoints (and other books) -- Gren Seibels
A good view of flying (including contest flying) from the non-champion's perspective.