

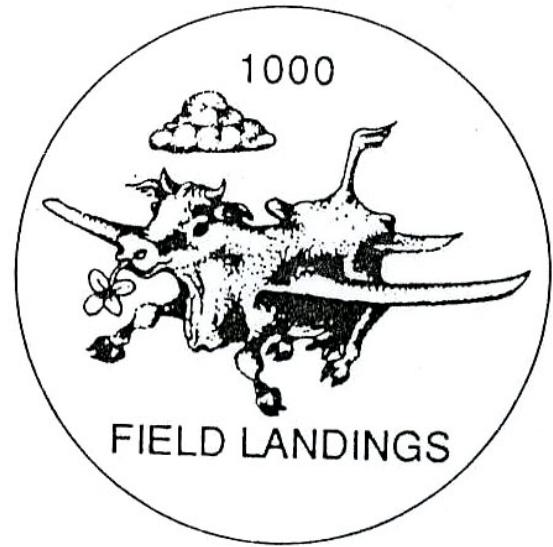
Landing Away From The Gliderport

Moments ago you were the master of the sky, easily skimming over roads, farms, fields and houses. Now it is very quiet.....

Landing away from your gliderport is the most difficult part of cross country flying. A landout is, at best, inconvenient and at worst, dangerous. Landing in a cut hayfield on a lazy summer day can be sort of fun; landing in a mountain valley on a windy day in the spring or fall is a definite challenge.

No one likes to landout, but it is part of the game of cross country flying and racing. With proper planning a landout can be something that is a "normal" part of your flying.

Pilot work load is very high during an off field landing, so planning and preparation before you fly cross country is important and essential.



Decision Heights

After you have done a little cross county flying, it is easy to realize when a flight is starting to go downhill (literally). It is time to transition from a *XC Flying* mentality to a *Landing* mentality. **This change is a very important and very necessary decision**

- Never head over unlandable territory without plenty of altitude to make the next landable fields or *airports*. The general rule is at 2000 feet AGL, you should begin selecting 2-4 good fields for your landing (*or have an airport in view*). **Note - The 2000 foot altitude may vary depending on where you are flying.**
- *However, keep looking for lift, the game is not up yet !*
- Pattern planning should begin between as you select your fields at 2000 feet AGL and continue down to 1000 feet AGL.
- At 1000 feet, narrow down your selection to the best available area and finalize your plan for the pattern to this field. An optional field may be kept in the back of your mind, but **do not - repeat - do not** - be indecisive. **Altitude is slipping away**
- At 800-1000 feet AGL, commit to the landing and do it well.

Choice of Fields

A good checklist for field selection is **Wind, Wires, Surface, Slope (WWSS)**. Each of these major points is outlined below.

Wind

You should always have a good idea of the direction of the wind during the flight. Mark it on your chart if you like.

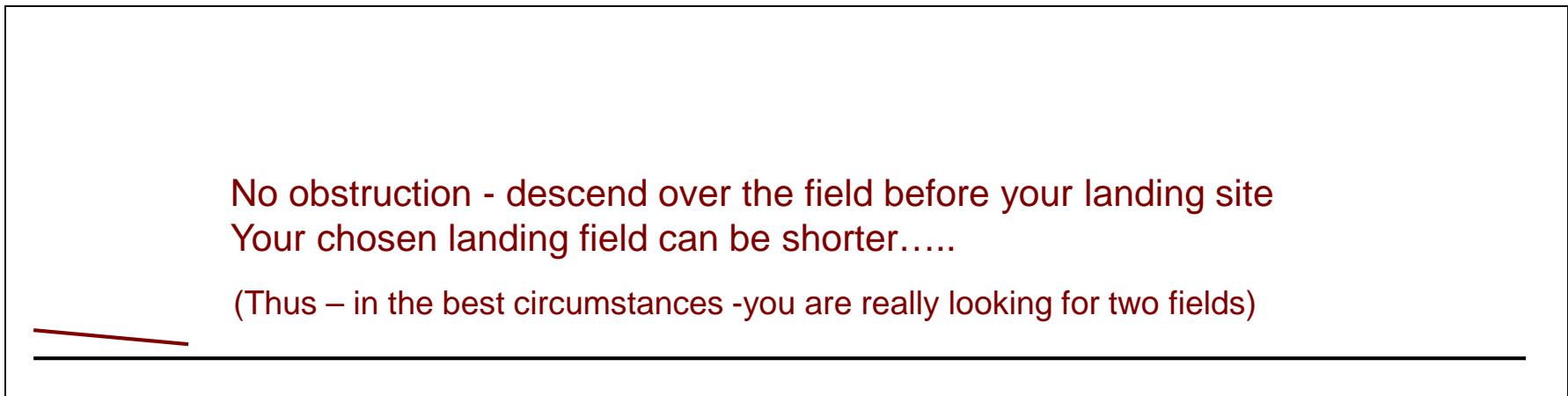
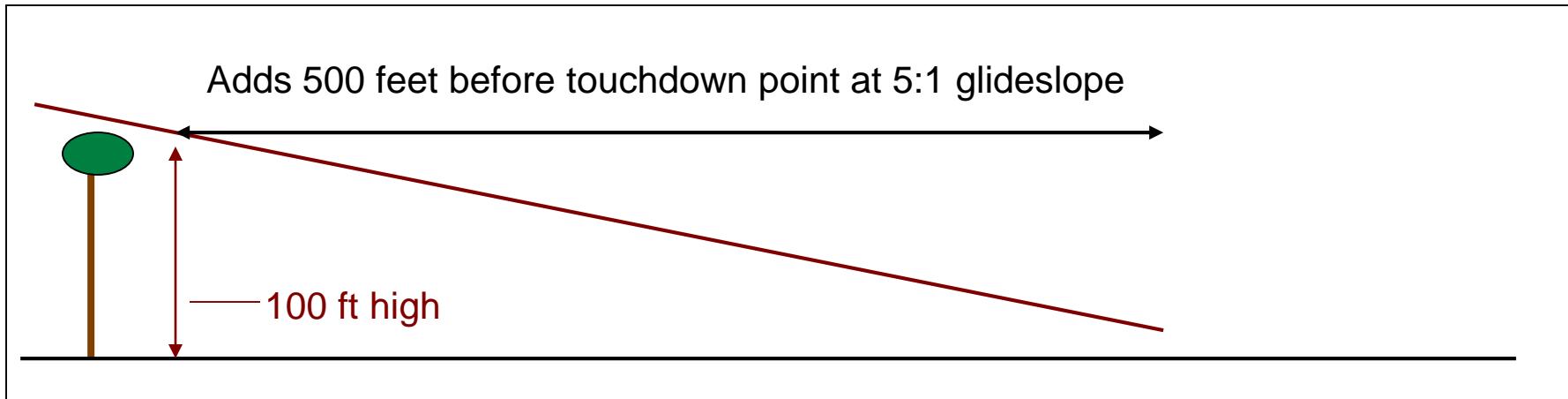
Always land into the wind if possible, although the field may dictate otherwise. You should be experienced in cross-wind landings. You probably should not land downwind (but this may not be true for *sloping fields*, see below).

Useful wind indicators include drift, smoke, ponds, swaying crops, flags, wind socks, your GPS. The latest Flight Computers make an estimate of wind easy to know. Listening to the nearest ATIS and or UNICOM be very helpful.

As always, set your pattern speed based on the wind and turbulence.
Do not let the stress of an off field landing cause you to fly too slow or too fast.

Obstructions and Wires

If there are obstructions such as trees, wires or poles at the approach end of the field, you will require a longer field for the landing. With full spoilers, your glide ratio may range between 5:1 and 8:1. Thus, a 100 foot tree will require a 500-800 foot longer field (almost 3 football fields). If it is windy and turbulent, you will be flying faster and will also need a longer field



Wires

Wires are the most dangerous obstacle in a landout. Plan for them and AVOID THEM !! *Tell Caleb Glick story.* Wires are impossible to see from the air -- but they surround most every field. You can see the poles --- *look for the poles.* Sometimes the poles are hidden by trees. Plan to go over the trees, NEVER, NEVER thru the gaps between the trees. There could be wires there...!!!!

There are 4 types of wires that you should anticipate.

High Tension Wires. Not too common. These are easy to see by their large towers. They are high (200-300 feet AGL). *They often have a little wire on top* --- about 10 feet higher than the big wires that you can see. Try to land parallel to the towers.

Electric and Telephone Wires. These surround most every field at tree top height (about 50-100 feet AGL). Helpful Hint -- Telephone Poles are about 150 feet apart -- count the poles to tell the length of field. Watch for wires running diagonally across a field.

Wire Fences (about 6 feet AGL). Not easily visible until on base or final. May be visible by a change in color of the field from one side to the other. Expect them and plan for them.

Electric Wires in Pastures. These are really nasty and very hard to see. One wire on little metal T poles at 3-6 feet AGL. They are common in pastures (used to separate stock) and uncommon in fields with crops. Look for the poles - *but avoid pastures anyway.*

More Points About Wires

Wires always go to houses or buildings. In farm country it is not unusual for an electric line to cross a field to get to an isolated house or barn. Look for the poles. Beware the **diagonal wire that goes from one corner of a field across to the middle.** This geometry is nasty and hard to see.

Telephone Poles may be hidden in the trees around the field.

NEVER try to fly *under* an electric or telephone wire on final to land close to the edge of the field. The tail of your sailplane is designed to catch wires.....

The bottom of the ship is shaped to slide over them

You can judge your distance over the wire, but not your distance under it.



If a wire crosses the middle of an otherwise good field and it is possible to be down on the ground before the wire, this circumstance should not disqualify the field. This finding is fairly common.

Field Surface

General Characteristics

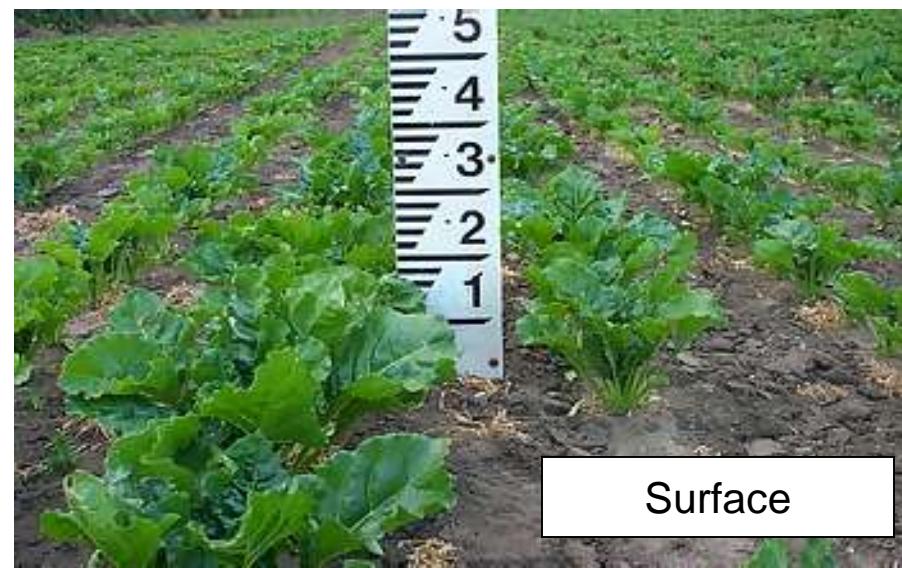
Your search for a good field should begin on your trips to the airport. *Be aware of what a good field looks like from the ground and the air.* Get out of your car and inspect some fields. Remember the color of the various crops at different times of the year.

Begin to think like a farmer. Be in tune with the changes in crops in a field during the soaring season. A field that is excellent in April may be full of corn in August. After a corn field is cut in October, it becomes a good field again. Note when the Hay is cut. See next slide for differences in fields as the crops grow.

Size of Field. You should look for fields that are at least 800-1000 feet long (without obstructions). Practice landing in the first 1/3 to 1/2 of your runway. Measure the distance of your landings...

About 800 - 2000 feet is a reasonable length field. Remember that telephone poles are about 150-200 feet apart (20 poles is a big field). Football fields, while well groomed, are a bit short !! **Important** -- the length of the field should match the performance of your glider. Standard class ships use more landing distance than flapped ships. Ships with weak spoilers need bigger fields.

Views of Beet Fields at 2 Months and 6 Months of Growth



Good Fields

Another Airport --- No doubt about it, your best choice. There are many airports in most areas making it possible to use them as stepping stones to your goals. Use them wisely.

*Plan to land at airports **but** be mindful that your GPS database could have errors about private airports. Maybe that airport is now a cornfield or your GPS database has the wrong lat/long and you cannot find the grass strip you are headed for.*

*Cultivated Field. Note -- this is **not** a plowed field. A plowed field contains very large clumps of dirt. You will not be hurt, but your glider will suffer. A cultivated field has been worked and smoothed. It is not likely to contain large rocks, ditches or holes. "Land in the dirt and you will not get hurt". Your glider will not be hurt either.*

A cultivated field that was an excellent choice in April will contain crops in May-September. The ground hogs may have moved in as well.

Cut Hayfields. A good choice. Look for the hay bales and do not hit them ! Look for changes in color of the grass that may indicate ditches (darker green means water). Undulations in the field will be marked with color differences as well.

*A field with short crops. Lots of variations here to consider. Early corn, tobacco, wheat, hay, beans, soybeans, alfalfa, strawberries and so on. These types of fields may have furrows. Land *with* the rows. The owner of the field is not likely to be happy.*

Cut Fields After Harvest. Cut Hay field is best -- However, a corn field that was a dangerous place to land in August may be great in October when it has been harvested.

Worse Fields

Pastures. Pastures are variable in quality. They were chosen as pastures because of rocks, ditches, holes and other unmentionables like tree stumps. Unfortunately, they are usually green and look like the landing area at the gliderport which lures you into thinking they are good landing areas. While they can be OK, they can be bad. Don't get fooled. Beware of the wires (see above). Remember that the farmer *does not work pastures* with expensive equipment.

Pastures have stock in them. **Cows** are curious and may come inspect your glider. **Bulls** may see you as competition (and you thought you were nervous on your base leg !!). A single cow in a field may be a bull. **Sheep** jump a lot and run about when frightened. **Horses** may be very expensive (like near the cost of a new glass ship). Note that horse owners have a different view of their animals than farmers do of cows.

When you open the gate to remove your glider, you can let the stock out of the field (this will surely get you in trouble with the owner).



Bad Fields

Fields with High Crops. Wheat fields, uncut hayfields, uncut corn, alfalfa, etc. Two big dangers here, you cannot see the actual ground and the high crop will catch your wing and cause a ground loop. You will be OK, but your glider will be hurt. Stick forward at the end to raise the tail.

Roads. Lots of trouble lurks here. Wires, posts, stop signs, cars and more. You might get a 1-26 down on a road uneventfully, but don't try it in a 15 meter ship. A new, not yet opened, 4 lane highway might be an exception. A road in a field will be rough.

Playing Fields and Golf Courses. While well groomed, they are not big and people may arrive on them just as you turn to final. If the people do not get out of the way, you are out of options. The people are *not likely* to hear you coming

Fields That Are Irrigated. Some fields have irrigation equipment and/or pipes in them. This equipment may be hard to see and will be big trouble. Look for color changes... More common out west. **Tell the JJ Sinclair Black Ace Story..**

Fields with Snow. Landing out on a wave flight is potential trouble. You cannot see the ground --- what type of field is it? If the snow is 1-2 feet deep it may not matter, but recovery of your sailplane will be interesting.

Wet Fields

Do not land across the boundary of two fields. There may be unseen fences, but even if there are not fences, there may be ditches or poles embedded in the boundary. Never land and roll across a color change between fields. Keep your wings in one field as well.

Another Fred Daams story.

Ponds. The water option is not usually considered, but the surface is smooth and it is possible to land in the water. Put your gear down! (the bottom of the glider works like a wing when it touches water, sucking the plane down).

Be sure and close the spoilers just before you touch the water (when the wave comes over the wing, it can bend the spoilers in a glass ship. Because of the design (upper spoilers, lower dive brakes) this problem is even worse in a 1-26). You are not likely to get hurt, but recovery of the sailplane may be interesting. It will not float



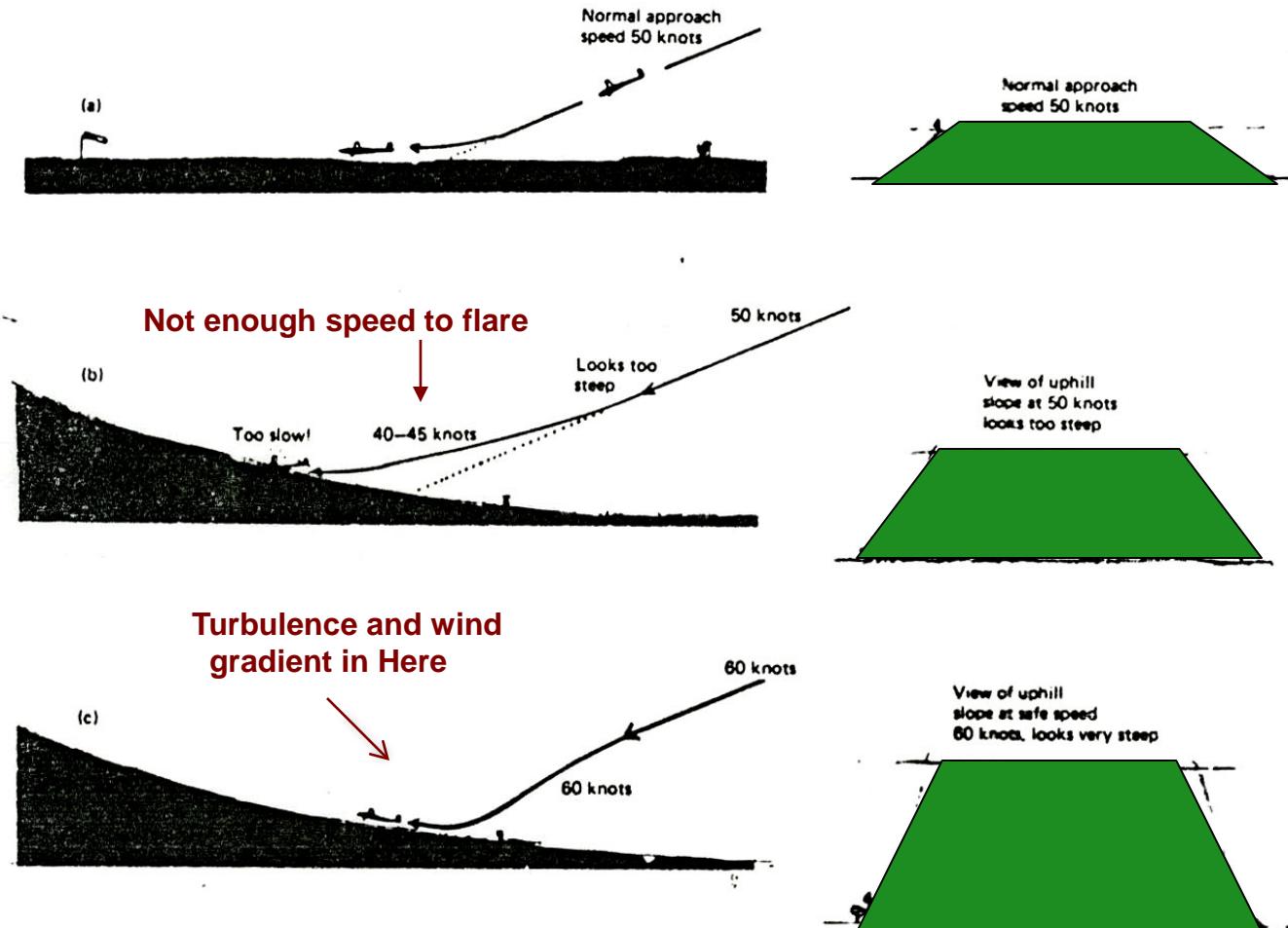
Simple Slope

A slope is hard to judge from the air. If it seems to slope from the air, *you can be sure it is steep.* Look for slope on upwind and downwind legs.

Always land uphill regardless of the wind direction.

If necessary, land uphill and downwind. Even with full spoilers deployed, a downhill field may "slope out from under you" leading you into a very bad situation.

When landing uphill, special considerations apply. The field looks different and you need more speed (see diagram at right).



97. (a) View at a normal approach speed to a flat field. (b) A similar approach on an uphill slope looks far too steep. More speed and careful monitoring of the airspeed are essential. (c) View at a safe speed of 60 knots looks very steep but is safe.

Slope – Imagine Landing Here

Might be a tricky landing, but..... you can ski after securing the glider



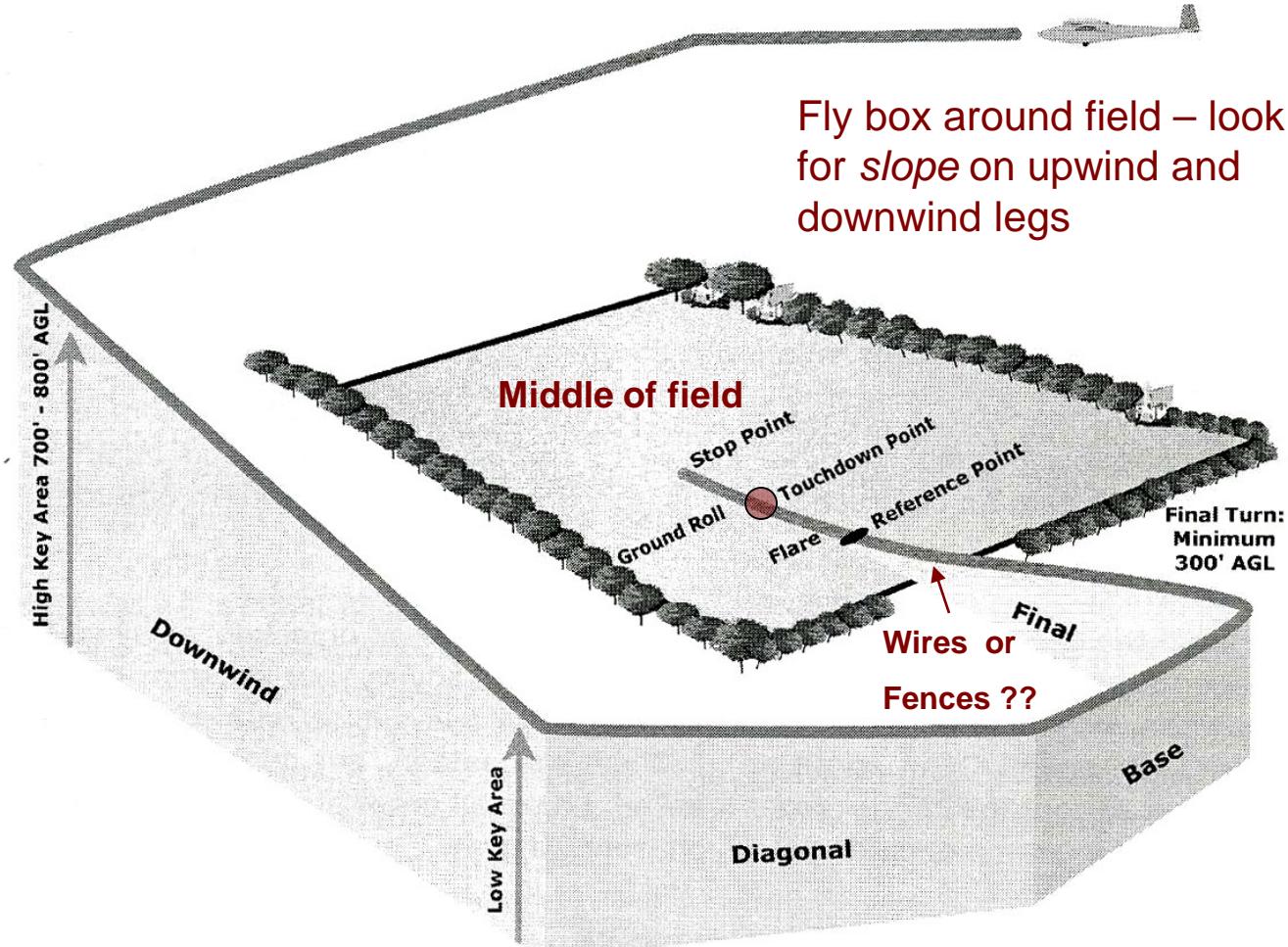
Courchevel, France

Planning Your Landing Pattern

Once your field is chosen, you should fly a pattern that includes an upwind leg, crossing leg, downwind leg, base leg and final approach. This pattern gives you a look at the field from different angles and may uncover hidden problems. It also helps to judge wind. Your altimeter should not be used, although you may note the general altitude from your chart. Correct airspeed is critical.

Plan exactly where you will touch down. This spot will vary with each field, but it is important to call out the touchdown point to yourself on the downwind leg. Make allowances for trees, wires and fences in the plan.

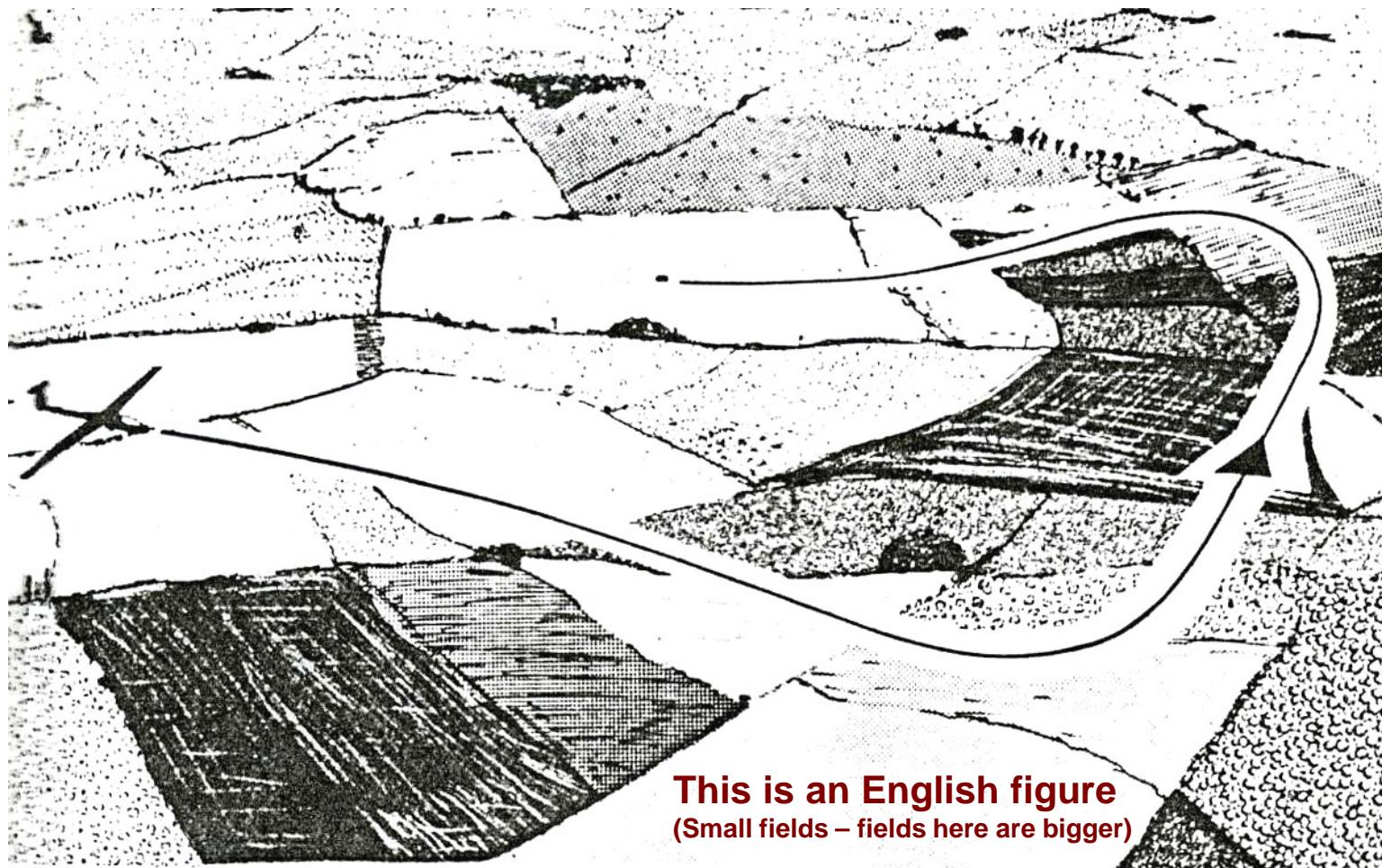
Make spot landings part of your routine.



Flying an approach to off-field landing using angle judgment to establish and maintain a Safe Relationship with the Reference Point.

More Circuit Planning

Use nearby fields to help set your downwind and base legs far enough away from your landing point. Do not crowd the field (see diagram). If you stay too close to the field and are high on final, you have few options. Use the 45° triangle method to estimate height and distance. *Do not rush the pattern.*



Making a field landing. Unless short of height, keep several fields away during the circuit and leave about one field length for the final approach.

Low Saves

You are 10 miles from the finish and You missed connecting with your last couple of thermals. The sky is still full of good looking cu's -- *But Alas* -- there you are circling over your chosen field at 1000 AGL (more or less).

A *very important* part of the flight is ahead of you..... But you are happy with your field and committed to land. As you start your pattern the vario squeeks and you feel a bump..... Maybe you could continue the flight, *should you give it a try ??*)

Before you even consider this option, read John Cochrane's "*You Will Be Tempted*" article

What do You do ??

- Ignore the vario and the seat of your pants ?? -- Not necessarily
- Slow way down and begin a slightly banked circle looking for that lift ?? -- **Never do this.**
- Immediately begin a tightly banked turn ?? - Maybe -- If you are low, thermalling must be performed using well-banked turns and additional airspeed.

What are the Risks ??

- Real lift is not there and you lose altitude - maybe 200 feet in a wasted circle – Can you still fly an accurate pattern ??
- You get distracted and Stall or Spin (what is your currency, experience level, are you familiar with your sailplane, have you practiced spins and low thermalling recently ?)

More on Low Saves

Mitigating the Risks (Continued) ??

- *A rule of thumb, -- If you can afford to lose 200 ft, you might give it a try if you are: skilled, current and early in the process – maybe about 1000 feet AGL .*
- *If you cannot afford to lose altitude or do not feel you can circle safely, ignore the lift -- FLY SAFELY AND MAKE A GOOD, SAFE LANDING. Tomorrow is another flying day.*

What are the Benefits ??

- Continuing the flight
- Not landing out and not having to make a retrieve
- *Points are on the line if you are in a contest*

But patience and experience are needed. Always make the safe choice.

Even More On Low Saves

Regardless of your skill, at some point you should stop trying to save the flight and do a proper landing with enough of a pattern to do an accurate approach.

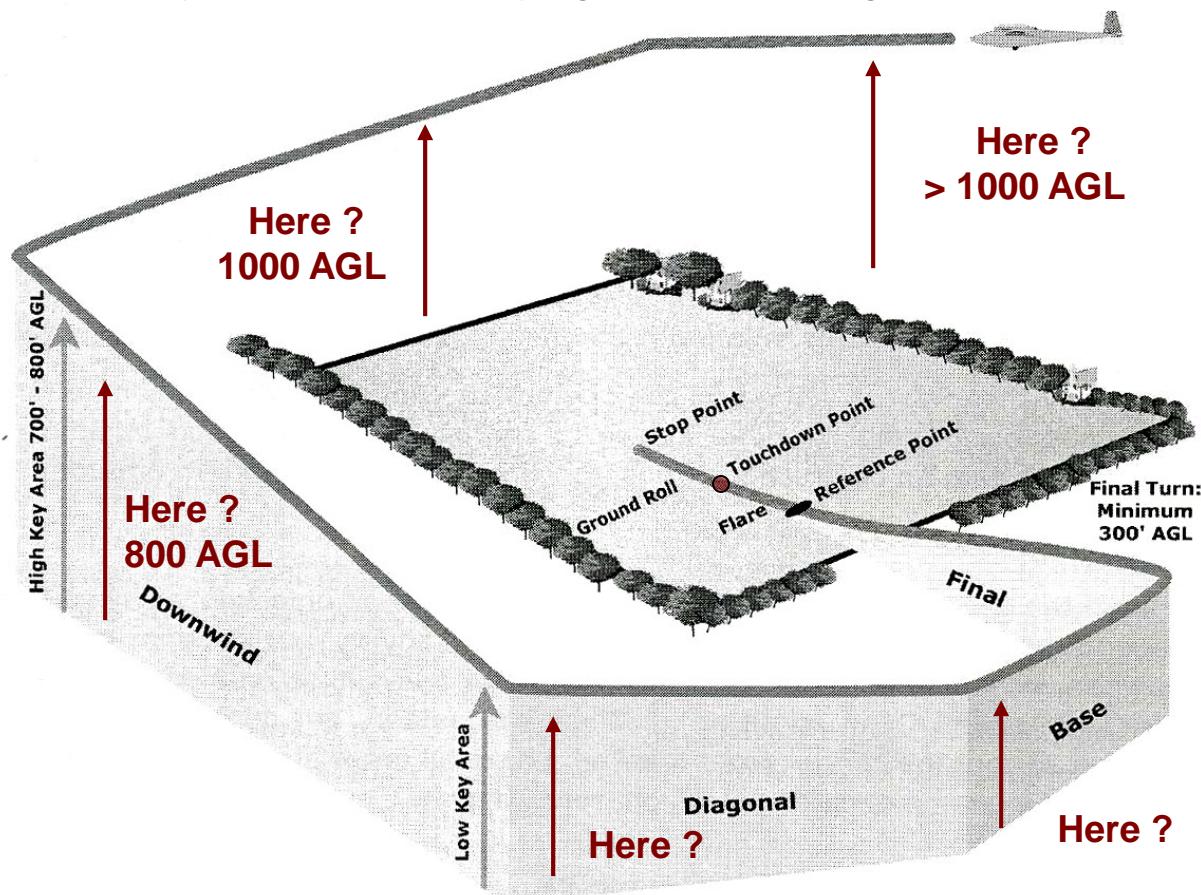
Where is that point ???

On the upwind (above 1000 ft AGL ??)

On downwind
(about 800 ft AGL ??)

Opposite the
touchdown point
(about 600 ft AGL ??)

Before you turn to
your base leg (about
500 ft AGL ??)

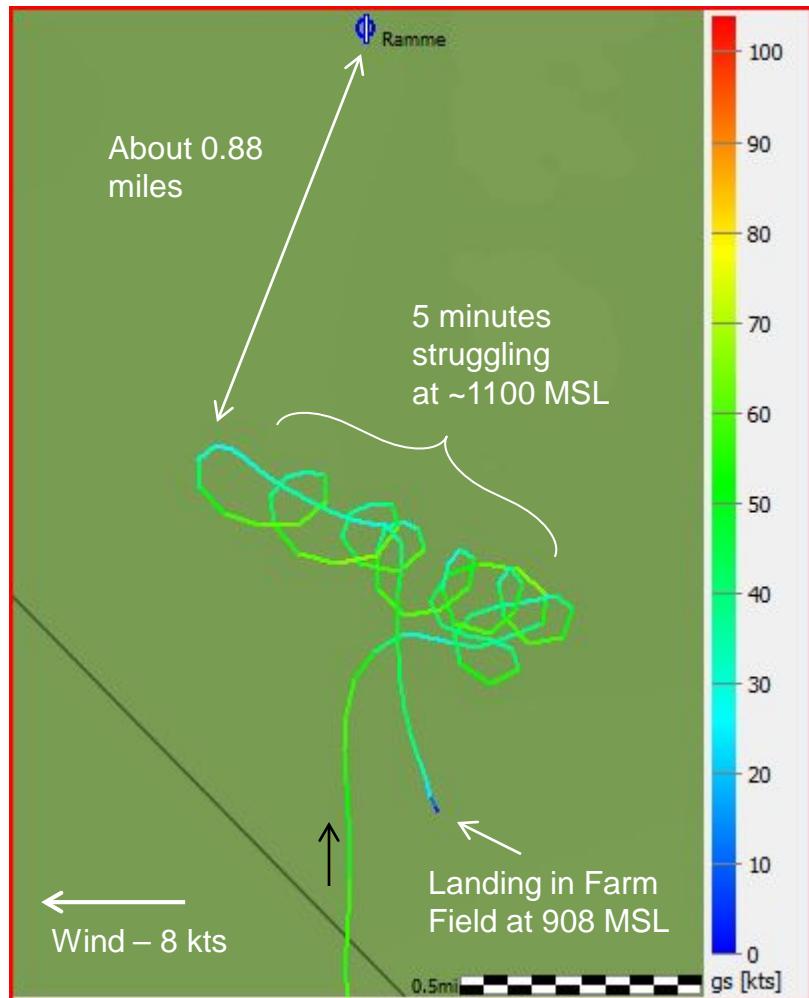


Flying an approach to off-field landing using angle judgment to establish and maintain a Safe Relationship with the Reference Point.

***YOU HAVE to think about it beforehand (at home) and make yourself a FIRM RULE
For Example -- "I will not try thermalling below 1000 ft AGL"***

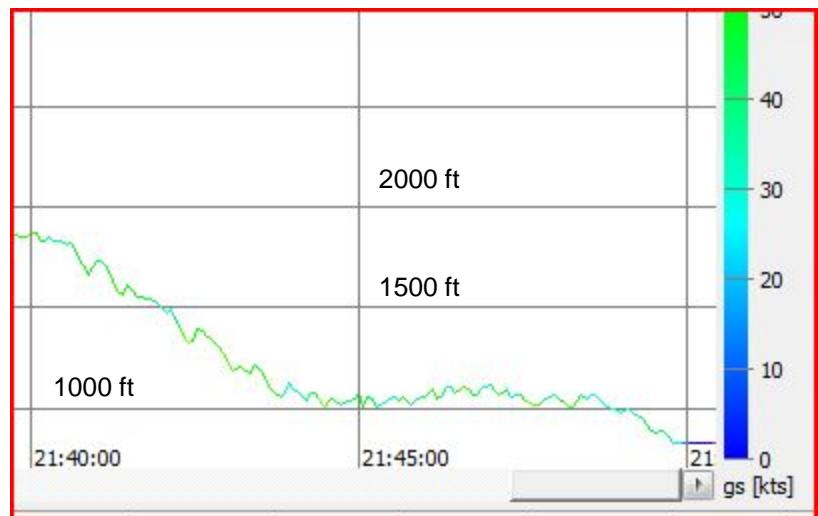
A Low Save That Wasn't

Example from the last 10 minutes
of a 4 hour flight



Notes

- An airport close by (there are also others near the flight path when it was below 1500 MSL)
- 5 min scratching in weak lift at 200 - 300 ft AGL
- Low airspeed throughout
- Straight in approach to field
- This pilot probably never switched from a *XC flying* mentality to a *landing* mentality
- All came out OK – but Not recommended



The Landing - Judging Your Height

On final, use trees and houses to judge height. Leave a useful margin, but not too much (see diagram). Trees are 75-100 feet tall.

Note that when flying over obstructions

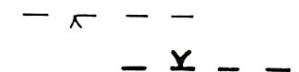
Trees will appear to rise or fall depending on your glide slope and whether you will clear them. Open your airbrakes fully only after clearing the trees or wires

Land and stop in the middle of the field.

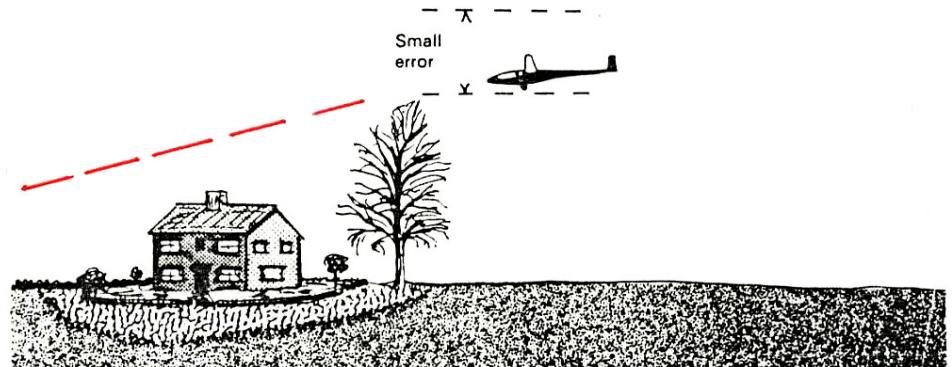
Stop as fast as possible.

Do not plan to land near the gate for convenience - get the plane in the field safely, then worry about the retrieve.

Likely errors



Likely errors



99. Height judgement errors. Whenever possible compare your height with trees or other tall obstructions.

Other Skills and Advice

Do not refer to the altimeter -- Practice flying your patterns without reference to the altimeter. This will help you learn landings by reference only to the landing point.... In an landout, the altimeter may be of limited use (however, with luck, your chart may help you determine the rough altitude of your landing spot from a nearby airport)

No reference to ground features -- Learn to fly your pattern without reference to the barns, houses and churches around your airport.... Use only the landing area for reference.

SSF Opinions on Landings

The decision to land is yours and yours alone - If there is another glider in the field -- do not let the direction in which that glider is pointed influence your pattern and landing (the pilot may have ground looped; thus the position of the glider lures you into a downwind landing).

If you land at a private private airport - you are trespassing. Be friendly and helpful. Do not assume you can leave your ship sitting in the middle of the runway. The owner may fly back shortly. Move your glider to the side.

When Preparing to Land -- Turn the radio off -- until you are down and stopped. The radio may be a distraction at just the wrong time. While it may be customary to announce your off-field landings at home, it is **best** done after the landing.

Finally – Be Very Flexible

At home you are used to a very standard pattern with straight downwind, base and final legs. It is possible to land otherwise

- Short field ? -- Increase its length by landing on the diagonal
- Rolling surface ? - If possible, land on the top of a crest and brake
- High trees blocking the approach to your chosen field, but no trees on the adjacent field, which is not suitable ? -- Fly around the trees and then line up for your chosen field on a diagonal.

Summary of a Successful Field Landing

RADIO OFF.

EARLY DECISION TO LAND.

VIEW FIELDS AT ABOUT A 30 - 45 DEGREE ANGLE.

PICK THE BIGGEST AND FLATTEST FIELD.

DISREGARD CONVENIENCE OF THE RETRIEVE.

BE SURE SLOPE IS TOLERABLE AND LAND UP HILL.

SUITABLE SURFACE, LOW OR NO CROP.

ALLOW FOR WIRES AND FENCES.

BE MINDFUL OF THE AIRSPEED.

AVOID LAST MINUTE INDECISION.

WELL DEFINED PATTERN, RIGHT OR LEFT HAND.

BE DISCIPLINED, YET FLEXIBLE (SSF again).

SELECT A SPECIFIC TOUCH-DOWN AND ROLL-OUT AREA.

LAND WELL INTO THE FIELD.

FULL FLARE.

SHORT ROLL-OUT.

From Kai Gersten

Pilot not hurt, plane not hurt, field not damaged, everybody happy

Choices / Choices / Choices



Compare These Fields to an Ideal Field

Here is an interesting set of fields which present many of the obstacles discussed.
Think about your patterns to each field. Picture from about 1000 feet AGL

OK, You Landed Out - Next Issue: Pilot - Farmer Relations

With practice and skill, you can select the property of forward looking people who will let you use the pool, provide libations and have the help take care of your glider while you await your crew on the front porch on in the pool.....



Pilot - Farmer Relations

On the other hand ---



You are an uninvited guest. You are actually trespassing. **Do Not act like a jerk.** Use all of your people skills. Be friendly and humble. You may be viewed as very strange by the locals. On the other hand, you may be treated very well.

From former US Team member, John Seaborn -- "Growing up on a ranch I have been on both sides of the trespass issue. No matter what the law says you are an uninvited guest on the property. Most ranchers / farmers have a long history of yo-yos shooting off the road, starting fires, cutting fences, driving recklessly, tossing beer bottles and your arrival can be labeled just another chapter in this litany.

Remember that some of these folks are rather solitary, get few visitors, are rather wary of strangers and like it that way, hence the choice of vocation.... (*Note - This may be more true of ranchers in the West than of folks in the East, but.....*).

You should make every effort to understand and overcome these obstacles with common sense and the provision of respect for the person and the land."

More Pilot Farmer Relations

- Do everything that you can to avoid damage to the owners property. Do not leave gates open. Do not excite the animals.
- Be polite and courteous. Be sure to show appreciation for all his help including the use of his phone (if your cell phone does not work in this location). Pay for the call.
- Keep onlookers out of the field. Do not bring your tow vehicle and trailer out on the field. Move the glider to the edge of the field. Do everything you can to avoid crop damage. **Do not** cut fences or locks on gates -- this could lead to serious legal trouble.
- If there is crop damage, be sure that you leave names of insurance agents and telephone numbers. These numbers should be in your logbook or in the pocket of the sailplane.
- Show an interest in his farm. Ask questions and talk less about yourself. Take pictures of him, his family and kids next to, or in the glider. Sell soaring - send the owner a calendar..
- The manner in which you conduct yourself will be a reflection on all glider pilots. A discourteous pilot will make a lasting impression on the locals, and any future visiting glider pilots will be treated accordingly.
- You may have had a bad day but do not take it out on the farmer. **Stay away from his daughter**

More Pilot Farmer Relations

If Things Really Go South ---

The farmer may view you as a rich playboy who has landed his expensive plastic toy on his land --- maybe with complete disregard for his property.

The owner, can, in theory, order you off his property. If he forces you to leave your sailplane behind, he becomes liable for its safe keeping.

The law is your friend. If things get out of hand, recommend that he call the authorities, or call them yourself. A State Trooper may help you greatly. Your landing was an emergency !



Maybe you don't want to call these guys

Now You Need to Make Some Telephone Calls

Phone Calls You Need to Make

1) *The Field*

- Do not call before writing down your GPS coordinates (latitude and longitude). The airport needs to know where you are
- Assess whether an areo tow retrieve is possible. Request it soon.

2) *Your Crew* – Be sure your crew tells the airport what he/she is doing. Not doing so causes unneeded stress on other personnel

3) *Calling 911*

- In the eyes of many, you just crashed. The response of the police, fire and EMT personnel may make a simple situation a circus. TV news people will probably make it even worse.
- Calling 911 may calm this response and keep the situation more sane

4) *Your Wife* –

- Don't forget – If you are flying with a “Spot” – Everyone knows what happened ! Go ahead and press the “friends” button on your spot.

Dinner

- Don't Forget – once you have retrieved the plane and are safely on your way home --
- Let the Airport know all is well (actually do this when you and your crew are together – before taking the plane apart)
- You owe all involved dinner



END
