

# FINAL SOLUTION

A GUIDE TO STRESS-FREE LANDINGS BY WARWICK DUNCAN

**W**e've all seen them. Those pilots that make landing look really easy. It doesn't matter what the size, shape or obstructions the paddock may have, they always come in calm, cool and collected. No high banked turns, no last minute corrections. So much time to do everything.

They always end up with a nice long final with lots of extra speed for cutting through turbulence or (for the show-offs) thrilling the crowd with a whistling ground effect approach.

Then there's the rest of us. Don't get me wrong, sometimes it all comes together for us too when we're at the right place and time and come zooming in like the guns... sometimes. But we've all been in the bomb-out paddock watching someone completely botch their landing approach, too high and too far up the paddock, doing ever more desperate S-turns and fast running out of options. Everyone on the ground goes quiet, waiting to see where this poor soul will end up and hoping it's not the powerlines.

Wouldn't it be great to have a versatile and foolproof landing system that can be applied to any situation and works every time?

A system that puts you in the right place at the right time every time, ready for that long, fast final? It's called the 'Aircraft Approach'.

"Is that all?" I hear you say, but unless you are one of the 'landing guns' (in which case you already use it, even if you aren't aware of it), then maybe you should have a fresh look at this approach and learn how to develop it into a reliable landing system, a template that can be applied anywhere.

If you say, "I don't need to learn this because I fly on the coast," then I would argue that the last section of an S-turn approach is an aircraft approach with a long base and a very short final. So if you move inland from the coast or visa versa it's just a matter of adjusting the system to fit. Versatility is the key.

Humans are pretty lousy at judging distances. Our binocular vision only works up to a distance of about 50m - beyond that it's just guesswork as things get smaller. Fortunately it turns out that human eyes and brains are excellent at judging angles. So let's look at a system that allows you to land using angles, that can be repeated over and over until it's second nature, that requires no turns beyond 90° and allows you to always turn in towards your landing point so you never lose sight of it. Best of all it's logical and predictable so everyone on the ground and in the air knows exactly where you're headed.

Of course, if you're already flying gliders then you must be landing, right? You already use a system of sorts (even boating about aimlessly is a system, I guess) and it may be necessary to move outside your comfort zone in order to learn something new. I recommend the following should be practised at a large and unobstructed landing site. Once you're familiar with it, you can take it away and apply it anywhere. Believe me, it will be worth the effort.

Here is a step by step lesson on how to develop your very own landing system.

## 1. PRE-PLANNING

Stop off at your landing paddock and have a look around. Of course, if you're towing, you're already there. Look out for obstructions as you normally would, but look at it as an aircraft approach with its downwind, base and final legs in mind and decide whether a right or left hand approach might be more appropriate. There's almost always a preferred direction to approach any given paddock. Choose the direction that brings you over the lowest obstructions and, if the wind is crossed, that will give you a base leg that's slightly headwind rather than slightly tail. This last point ensures that things tend to happen more slowly. A compromise between

these two factors may have to be reached. Next, grab your altimeter and zero it.

This pre-planning can be done from the air as you become more familiar with the technique and checking out your landing paddock from the ground will not always be possible.

## 2. PREPARATION (above 500ft)

By whichever method takes your fancy, take-off and fly over your landing paddock. Preferably for your first attempt I would recommend between 800 - 1,500ft. Find a spot on the ground that you are going to try and nail as your landing spot. Make it something you'll be able to see for your entire approach. This is your 'aiming point'.

Now find a point about 100 - 150m from the aiming point in a direction at right angles to the wind (see diagram). Picture a point 300ft above this. This imaginary point, floating 300ft in the air and offset 100 - 150m from the aiming point is called the 'entry point' which is where you must enter your approach.

Next, as you float serenely over the paddock, still with plenty of altitude, trace out a downwind leg, base leg and final leg on the ground starting at your entry point and ending at your aiming point.

You won't necessarily follow this track exactly, but it will give you an idea of whether you will have to shorten or lengthen any particular legs to avoid obstructions or whether a left hand approach may be more appropriate than a right hand one. If this is the case, place your entry point out the other side and go through the process again.

This may seem like a lot to do, but in practice it will only take you a matter of seconds. Also, the more planning you do up high, the less you have to do down low where things start to happen much faster.

This is why the guns are so relaxed coming in - they've already done most of the work!

## 3. HEADING FOR THE ENTRY POINT (800 - 300ft)

The next bit takes discipline. That's because there are any number of things you can do once you've worked out your approach and you fly through the entry point. If winds are light, sometimes it feels right to do nice lazy 360's over your entry point until you are down to 300ft.

If winds are stronger you may find it easier to 'park' over it into wind as you slowly come down. Whatever feels appropriate. What takes the discipline is that you must end up at your entry point at the correct altitude. Enjoy the view, keep an eye on the wind direction, but don't become too distracted, because if you end up at 300ft in completely the wrong place, everything will fall in a heap.

For this first flight use your zeroed altimeter to judge 300ft above the landing paddock (all heights in this article are with respect to the landing area). I certainly don't recommend people to always start their approaches purely on what their altimeter says, but for this initial flight use it to get an idea of what 300ft 'looks like'. During future flights use the altimeter less and less and your judgement more and more.

## 4. ENTERING THE APPROACH (BELOW 300ft)

Approach your entry point heading downwind and as you fly through it, pull on some speed. You are now on your landing approach and you should consciously 'switch on' and concentrate. Maintain this excess speed through the entire approach until you are in ground effect.

As you begin your downwind leg, look at your aiming point. This is important and a better way of describing it would be to 'fixate' on the aiming point. If you look right at the aiming point and keep looking at it as you fly along your approach, you'll find that the world moves with respect to it and you can begin to judge your glide. In this situation your brain is seeing angles that are changing in a very dynamic manner due to your motion and this will give you the cues for when to turn onto base and again onto final. This is why the approach starts offset from the target. If your entry point was directly over it, you'd be looking straight down on the target and there would initially be no angles, so your brain would have nothing to calculate with. Once you'd fly away from the target angles are created again, but this method would be definitely more difficult than starting offset.

In theory you would stare at the spot, like an eagle diving for a rabbit, all the way in and never divert your attention for a second. In practice this is not a good idea since there is a chance you might fly into something while looking at your target! When you created your landing template up high you should have got an idea at which points in your approach you'd have to watch out for obstacles. Glance ahead

## IN A NUTSHELL

### Above 800ft;

1. Pick aiming point
2. Apply template to fit
3. Choose entry point

### At 800 - 300ft;

1. Bleed off height
2. Keep an eye on the wind direction
3. Pass through entry point

### Below 300ft;

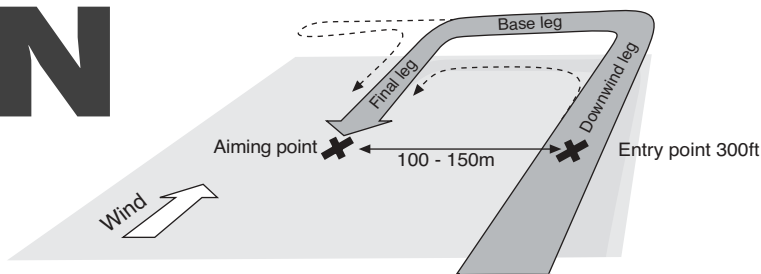
1. Increase speed and start approach
2. Fixate on aiming point
3. Adjust approach legs as required
4. Nail the spot!

ACCURATE LANDINGS DEPEND ON A CORRECT APPROACH

Photo: Murray Rose/WHGS World Hang Gliding Series



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at intervals to make sure the way is clear, but make the effort to fixate back on the target. This is the key to really accurate spot landings. Concentration and discipline.

The visual cues you're getting from looking at the aiming point will tell you when to turn from downwind to base leg. If you appear to be sinking out with respect to your aiming point, then cut the corner. If you're too high, then extend the leg or, if you are comfortable doing so, add a little bit of sideslip to the turn (if you're unfamiliar with sideslipping then practice it higher up).

In a worst case scenario, a thermal may break off giving you lift right along your base leg. In this situation you may have to continue right along past where you would normally make your final turn and then double back. You would then be shifting into more of an S-turn approach with all its inherent drawbacks (greater than 90° turns, a tendency to 'creep' up the paddock), but the key is to have options and this system provides them in abundance. Remember, this is a worst case situation. What we really want is an approach with only two 90° turns.

So you're ready to turn from base to final. As with the previous turn you will see from the changing angles whether you're under or overshooting. Again, either cut in or extend the turn to line up the spot. Sideslipping on this turn should be done with extreme caution as you're now quite close to the ground.

Since you have been carrying extra speed right around the approach and judging the angles with it, you should be all lined up for a nice safe final approach. If you want, you can start the last turn slightly higher and come in with even more speed. Whatever you feel is appropriate, given the conditions and who's watching!

This places you on final, fast, straight and lined up on the aiming point and into wind. It is also where this discussion ends as the mechanics of the landing itself are beyond the scope of this article.

### THE PORTABLE TEMPLATE

The next thing to do is practice, preferably at the same site and on the same day. Try for consistency and let those angles sink into your head until they look familiar. Wean yourself off the altimeter as soon as possible. Try right and left hand approaches. You should become just as comfortable with both, but remember that there's almost always a best way to come in. This consolidation is very important.

Finally, take away your mental template to a new site. Beware the trap of flying only one site and believing you are using a transportable landing system when you're really just landing on visual cues specific to that site. At a new site, repeat your preparation at altitude (Step 2). Trace out various approaches on the ground until you find the one that will work best. Bleed off your height to 300ft, then come in using those familiar angles. In fact, it's amazing how familiar an unfamiliar landing paddock can be when you have a system.

### VARIATIONS AND PROBLEMS

Landing on the coast requires some variation. You may have to fly out of the lift band in order to bleed off height (probably over the water). Once you pass the entry point you will most likely fly a long base leg with a short final into the wind. You may find that a downwind leg is not even required. 300ft may not be an appropriate starting altitude if it is a small site and conditions are smooth. In this situation, consider a lower entry point.

Towing can also fool people new to the game. Quite often you have to set up right near the rear fence. Again, in this situation, it's much easier to have a long base leg over the rear fence, followed by a short final into wind.

Also, in the flatlands you can often land anywhere - so you do! Discipline yourself. Make every landing a spot landing. Find a feature in the paddock and use it as your aiming point and every landing you do will improve your technique. It may even cheer you up, bombing out knowing that at least you nailed that weed you were aiming for!

However much you distort and change your template to suit the coast, towing, the mountains - it will still work. Every time you land you'll build on what has gone before. After a season of consolidation you can even start to tighten your approach a bit with a lower entry point and a smaller approach (note that the angles will remain the same, but things will happen faster and there's less room for error as the ground gets in the way. Also, higher bank angles mean the lower wing may obscure the aiming point in turns). This can be fun to practice in winter or in other very mellow conditions. In rough air, though, 300ft is plenty low enough no matter how experienced you are.

At least 50% of the bad landings I've seen were caused by bad approaches. So if you have poor landing approach skills and you develop a system that works, expect at least a 50% improvement in the landings themselves. Surely this is motivation enough! So there you are: Warwick's guide to the Aircraft Approach. I don't claim to have invented it and no copyright applies to this technique.

You can't be sued for using it. Safe landings for all!

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