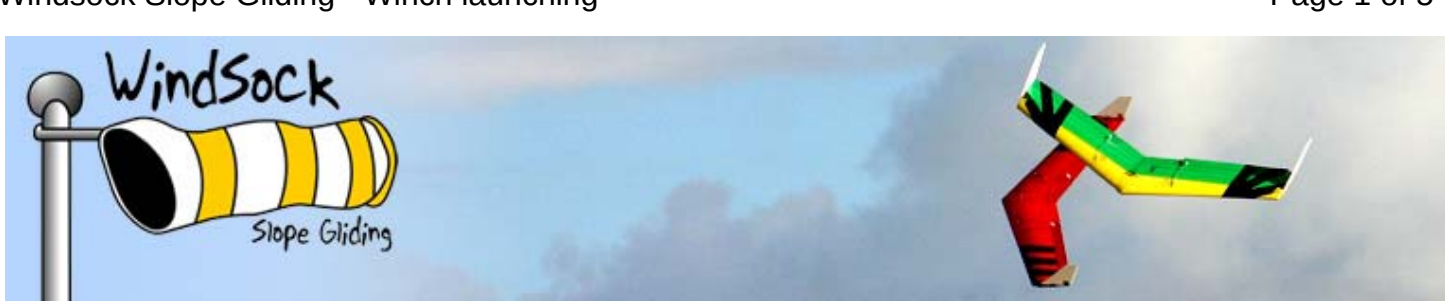

Windsock Slope Gliding
« Winch launching »

Hey, windsock, you have 46 messages, 0 are new.
Feb 7, 2009, 8:54am

Author

bananaman
> 0
member is offline

Joined: Aug 2008
Gender: Male
Posts: 29
Location: Just south of my keyboard

Topic: Winch launching (Read 40 times)

Winch launching
« Thread Started on Feb 4, 2009, 11:15pm »

quote

In another thread Jeff was looking for winching and launching tips. I've been writing this on and off for a few days, so hopefully it will make some sense.

I've watched a lot of launches over the years here, around Oz and overseas and obviously done a few as well. For a period of almost 2 years I worked very hard to improve my launches and used data loggers to quantify improvements. I've now come to a point where I'm comfortable with most of them, no matter what winch/line/thrower/conditions. I compromise a little bit and could do better but consistency makes up for that in the longer term. You won't become a world champion following what I've written, but it might save you some time learning to become one.
The "main" variables, these **will** affect the ultimate height attained:
- winch power
- winch drum diameter
- line
- thrower
- conditions
- model
- setup
- process

Winch power - Not something you can easily change. A standard tested FAI style winch will have a fairly ordinary output compared to some, but in general they are ample for a good launch using good quality mono. Most of you may not have used a tested winch, but if you did may well find the one you use is overpowered. The battery condition/charge, lead resistance and brush condition will affect any winch. Make sure they are in good condition. You may fly off different winches, so you need to be aware that each one is different and will affect your launch in some way. When you walk up to a winch that isn't your normal one, ask, what diameter line it has? Does the line have a knot in it? Is the winch powerful? Look at the drum diameter. You don't want any surprises.

Drum diameter - This has a definite affect. Many winches have different diameter/ length drum and depending on the power above will greatly affect what happens during your launch. The small dia. drum (38-40mm) will wind in a

lot less line but can generate more tension. However the model speed will be slower up the line. The bigger drum will fly the model faster, use more line and possibly generate less tension or even stall the winch. I use a larger diameter (50mm) for most occasions now as I prefer to get the model flying faster and feel it allows me a bit more margin for ordinary throws. You need to be listening to the winch and the line to get an idea of what's happening.

Line - Smaller diameters stretch more, have less drag and will obviously break easier. Bigger doesn't stretch much but will take more punishment. For a given wind speed the thinner the line you can get away with the greater the launch height. A good compromise is 1.25/1.3mm for most occasions. Always check the line condition for nicks/ abrasions when setting up/retrieving. (When you wind down do not let it bang into the ground. Stop winching about 30 to 50ft from the turn around, once the energy is gone out of it, do frequent short taps to retrieve further or pull by hand if across other lines. Don't ever wind in across other lines on the ground. Ideally a helper at the turnarounds will glove the line down (mandatory at some of the bigger comps). A moving line will easily slice/nick a stationary one.) Once you get better at launching you will find tying knots to join cut lines will nearly always result in another failure. If you have to, put the knot in the bottom line. At $30 to $55 a line you need to look after yours and others near you. Soaking in water with a little fabric conditioner for a week or two can make some lines more supple and stretchier. You should also remove all tension off a line before finishing for the day to stop it crushing the line near the drum. Look after the line and it will look after you.

Thrower – Not much you can do here, some guys do it really well, others not so good. For the most part with higher performance models, a flat straight ahead "just let go" launch is bad. The best launch is upwards with a lot of energy. This is a learned technique and only few guys have the knack to do it properly and safely. The US/Euro "behind the body style" is very good if executed properly, however most helpers you will encounter around this region will do a "model in front of the body style" launch. If it is a first launch or you are a newbie throwing for someone else, the safest way in general is to release model in front (but with a throwing action) with the nose up a little and with medium line tension. If you haven't launched many models, don't experiment with someone else's. If you are the pilot, make sure the thrower understands what you would like and get ready on the sticks. A "little" dab of down elevator can save a pop off or flick. The launch height may well be lower but it is safer. You only get two chances in an event. There is nothing worse than a pop-off on the second launch. Better to be 10m lower up high than just 10m off the ground at the start of a 10min task. Also remind the thrower to get on the winch pedal ASAP to wind down the line for you and pull the release pin.

Conditions – Firstly, no matter what always try to ping into the wind, in line with the turn around. A constant wind, down the winch lines will give you a great launch, but can mask a lot of inadequacies in your launch setup if those are the prevailing conditions when you set it up. When you launch in other conditions it will most likely not be satisfactory. Best is to set up by launching in dead air. If you can get that right, you can detune for windier days. Just as an example, a warm dead air day will give you only 180, maybe 200m launches, you wind in a lot of line to get tension. On a cooler windier day you could get 300+m. The point is, everyone else is in the same air so try not to give them too much of an advantage by not getting the most out of your launch. If you have everything setup well you will find you can even do the dreaded downwind launches and get far better heights than you would expect. Cross winds needn't be too much of a hassle either. Just get the thrower to launch slightly to the down wind direction. Steer the model downwind initially then direct it into the wind for the ping. OK, there may be other models launching. It is often prudent to wait for the others to launch first, if you are in the air at the same time as someone else on launch just keep clear. Sometimes you will need to stand on the pedal to get tension, sometimes you need to tap the pedal or use a combination of both. Always stand on the pedal before the model reaches the point you push over for the zoom. Listen to the line and winch, and watch the model. They will give you the signals you need, especially when you fly into lift during the launch.

Model – All models need different launch setups, even if they are the same type. E.g. both my Europhias are similar weights and CG and are similar in

construction but both have different tow hook positions and need different settings for all phases of flight. Make sure the flap and aileron linkages are as slop free as you can possibly make them. Make sure the servos and flap/aileron horns are securely seated. When you setup the model, make sure the flap pairs and aileron pairs move in symmetry. If you have a bit of slop, you can set up with the model upside down to mimic an air load otherwise you may find the model veers on launch.

Setup - This very general but the following is a good start point for launch mode setup: Around 8/10mm is a good place to start with launch flap with equal ailerons. Make the aft vertical surface of the tow hook just in front of the C.G. Ensure the hook is secure. Have full aileron to rudder mix and make sure you mix out any down going aileron using differential. Even though you will steer with the rudder you may need to make a course (i.e. more forceful) correction. Don't be afraid to experiment with settings. Make sure you have enough down elevator (more down than up), especially on V-tails, you need it for the push down at the top of the launch and for landing with crow.

Process - This is a set up for my Europhias, but it will show you what I look at for a good launch setup. For launch I have 2 stages of flap. First, flaps are 15 mm down at the root and ailerons, 1-2mm higher than flaps at aileron root. Second is 8mm at flap root, and even ailerons across the ship. There is a slight amount of down elevator in the first stage and a bit of up in the second stage.
If you are going with the one stage of flap, I'd start at 12mm down with ailerons matching or slightly higher. Elevator probably will be just a tad of down to start with and adjust up to suit. You will need to play with the elevator settings to get them right each time you change the flap settings. It needs to pull hard hands off. If the model is squirrelly on launches, the quickest fix is to add in a bit more down elevator preset, also check the tow hook hasn't moved or is loose.
Mike Rae's "theory of elevator to flap position" for launch works well for a decent safe launch (it's actually a Martin Weberschock technique). After a launch, fly the model at minimum sink, put it into launch mode, if it is set OK, after the initial pitch up, you should be able to fly around without it pitching up or down. That is a good place to start, then you can tweak the elevator up setting.
The Europhia is pretty good on launch and will still recover from some pretty ordinary positions. Remember to set up aileron differential so you get NO down aileron when in launch mode and setup a good dose of aileron to rudder mix. I.E. full aileron throw gives nearly full rudder (make sure it is the right way!!)
Tow hook is JUST behind the CG on mine. ie the back of the hook where the ring/loop pulls. I can't remember the actual measurement. Each time you change the tow hook position you will need to adjust the elevator setting. And each time you change the C.G. you need to redo/check the elevator setting.
If you have it set up OK (not necessarily perfectly), a good launch into a light breeze will immediately zoom near vertical. If it is a flat launch like many of the people will do in our comps around here, you will have to push a little down elevator as it rears up so you don't ping off. If the wind is stronger you won't need the little down push and expect the model to go behind you. If you get a good upright launch, you won't need the down tweak at all. Just something to be aware of, I can deal with anyone at all launching my Europhias as I know they will cope, there will be a height difference but beggars can't be choosers sometimes.
The model will settle on the line. As it gets to about 20/30m, flick into stage 2 (if setup). The model will pull hard and speed up on the line. Note: In dead air or downwind I might not go to second stage at all.
JUST as you are ready to release, flick into speed mode, dip and pull out. If you go into speed too early you will dump tension. (Remember to have snap flap setup in your normal and speed modes. For the last part of the launch process it will help to maintain energy in the direction change during the dip and pull. Make sure it only gives down flap not up!)
I have around a 0.8/1.0 second transition time set on all my modes. Otherwise the sudden changes alter line tension.
Once you have selected speed mode, DO NOT DIVE DEEP and DO NOT STEP OFF THE PEDAL until the model is well clear.
Don't fly to the top of the line or past the turnaround, there is no need too. Around 70/80 deg is fine for most circumstances, earlier for stronger wind. 70deg is a good climb out angle too, don't need to go vertical unless showing off.

I flick back into normal mode as I push over after the climb out.
Always try to launch into the wind, don't be afraid to fly left or right to do it. Your ping should always be into the wind. Obviously launch line ettiquette when other models are around takes precedence.
Wind speed will change everything. I mostly don't use stage one in windy conditions. Start the zoom earlier as well although the temptation of a lot of pilots is to fly as far upwind on the line as they can. You have a much better performing model now so you'll be exploring a lot more air rather than just parking upwind.
A rescue technique you can use on a windy day if the model is really starting to crank hard, you've stopped winching and you fear the line is about to snap, just flick it straight into speed mode.
That is how I do it. Others do it a bit differently. I think I launch OK most of the time, so I can't be too far off the mark. Just need to practise my landings!!!
Obviously the line type/diameter, the winch, the thrower and the air make a big difference. Don't be afraid to try different settings. However, don't forget that chasing 1% improvements while ignoring the possible 10% improvements is a great way to get frustrated quickly. (I know!!)
This may all seem very complicated and a lot of work, but once you the hang of it, half the battle with the thermal gods is over.

Launch is king, get off earlier, go up higher and go back! (If the wind indicates it)

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member is offline

Joined: Aug 2007
Gender: Male
Posts: 155
Location: Shed...Burpengary

Re: Winch launching
« Reply #1 on Feb 5, 2009, 12:12am »

quote

Brian you have put some work into your writeup. Thankyou
cheers Jeff

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Working to the closest cm!

thevon
Administrator
member is offline

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Gender: Male
Posts: 1,292
Location: Woody Point Qld Aust

Re: Winch launching
« Reply #2 on Feb 5, 2009, 8:03am »

quote

That's great. We should put this article on the main website too.

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km2579
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Re: Winch launching
« Reply #3 on Feb 5, 2009, 9:37am »

quote

Wow... Lots of great info there !!! I will see you next Monday ?

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