Pilot's Guide

This document contains important things you must know before you fly with the club. Please read it and keep a copy handy for future reference. Its purpose is to help you make your stay with us a more enjoyable and safer experience. You may have read some of the information elsewhere but it is repeated here for completeness.

Club Member: _____ NO:_____

Date of Issue: _____

General Advice and Requirements

Engines and propellers

You may not be familiar with being close to powered aircraft and ULMs (ultralights and microlights). Please be very careful. Spinning propellers are nearly invisible and can kill or seriously injure in an instant. Keep all pets and children off any part of the airfield that is used by aircraft. Keep your eyes and ears open and stay away from propellers!

Another danger from tug aircraft is the towrope itself. If the tug lands with the rope attached it can have up to 100 metres of flailing line behind it. Always stay well clear of a tug making its approach to land. The line may be trashing about for several metres either side of the aircraft and you may not notice it before it is too late. The towline can do some nasty damage if it catches you. Keep a look out and stay clear of landing aircraft.

Once the tug has landed it might be taxiing and dragging the line behind it. Once more the line will be hard to see. Look carefully before crossing the runway behind a tug aircraft. If you step on the line or it is dragged across your leg you may be hurt.

Alcohol

If you are not legal to drive then don't fly. You will not only be putting your own life at risk but that of the tug pilot as well. We will not tow you up if we consider you are unsafe to fly. You could lose a flyable day to an evening of excess. As a rule don't fly within 12 hours of drinking alcohol.

Drugs

Same as for alcohol. Remember it is not just your life at stake.

Fires

There are large quantities of gasoline on the airfield, both in aircraft and storage containers. Therefore no fires will be allowed on the airfield.

Smoking

Do not smoke in or near building, no matter what you may see other people do. Ensure that all butts are disposed of correctly and not left on the ground. See Fires above!

Pets

Ensure that pets are under control at all times. Please do not let dogs foul the airfield. Be aware that propellers can kill. You are responsible for the safety of your pet.

Noise

Please try to be as quiet as possible in the early mornings and late evenings there are people who live on the airfield and close by. Let them sleep.

Please don't have music systems on loudly, your choice of music may not be to everyone's taste.

Requirements

Aerotow and airfield safety

We operate under the safety guidelines laid down by the British Hang-gliding and Paragliding Association (BHPA). The final pages of this document detail the BHPA procedures that we follow. Be sure you understand these and have been given the introductory safety and procedures talk. If in doubt, always ask! Your association may have additional procedures and safety guidelines. Please tell us what they are and we will gladly incorporate what we can into our own procedures. The safety of everybody involved is one of our main priorities.

Your experience

Before you can aerotow unsupervised you must hold an aerotow rating, if one is available in your country. If your association does not offer such a rating you must have proof that you are a current aerotow pilot. Pilots who can not demonstrate that they are a current aerotow pilot or have an aerotow rating, will be required to undertake an aerotow coaching.

If you have the required rating but can not demonstrate that you can tow safely you may be required to undergo coaching.

Unless you have towed recently it is a good idea to take a few tows in smooth conditions. These need not necessarily be down flights. The conditions in the evening are very buoyant. Things will be different to what you are used to at home. Take these smooth flights and enjoy the view, get to know the locality and how to spot the field from the air.

Insurance

All pilots must possess valid third party insurance..

Club membership

All pilots must be members of the club.

Equipment

The following equipment is required:

1. Helmet.
2. A single steel karabiner or two aluminium karabiners of suitable type
3. A backup loop.
4. A reserve parachute.
5. An aerotow release of suitable type securely attached to your harness. These can be rented from aerotow.com.

The following equipment is recommended:

1. Basebar wheels or skids
2. A bridle knife.

Aerotowing Flight

Getting ready to fly

Unlike hill flying a whole team of people is required to get you airborne when aerotowing. To ensure that things can run as smoothly as possible we have developed some guidelines to make it clear to everybody the way things should happen. These guidelines are not set in stone. If they do not work or somebody comes up with a better way of doing things, we'll change them. Just let us know!

The team, who does what?

The first thing to say is that you are part of the team! The ***pilot*** is always part of the team, but chances are you'll be asked to help out in other areas also. Here are the main jobs involved in getting you airborne. Make sure you are familiar with them. Usually one person can do more than one job.

Tug pilot	-	needs no introduction. Highly skilled people who tow you because they love to fly. Be grateful for them.
Front marshal (FM)	-	a skilled person responsible for passing launch signals to the tug pilot.
Rear marshal (RM)	-	a skilled person who passes launch signals from the pilot to the front marshal and hence to the tug pilot.
Safety chief (SC)	-	A qualified person in charge of flight safety.

Before you fly!

Before you can fly you'll need a team of at least three people: A tug pilot and two launch marshals. It would be nice if these people were always hanging about ready to tow you skywards whenever you decide to fly. This may be the case during the busy parts of the day, but in general you'll have to indicate when you intend to fly in advance, so that people can be ready to assist you.

Getting ready to launch

OK, so it is getting close to the time you want to fly, what happens now?

Get you glider to a staging area and prepare to fly. There are a number of staging areas defined on the airfield. You will be shown where they are. Which one is in use for any day will depend on the wind direction. The staging areas are close to the launch areas. Be sure to keep you glider at least a wingspan from any runway whilst in the staging area.

Do not move out onto the launch area until you have everything you need to fly. Consider it your goal to spend as little time on the ground as you can once you are ready.

If there is a queue get everything ready close by and find some shade until the pilot before you has launched. As soon as they have launched use the next few minutes to get ready. Aim to not keep the tug pilot waiting on their return. Be ready to go when they are lined up. This means having all your pre-flight checks done!

Always perform your pre-flight checks. The marshals will help you with this.

- Glider pre-flight checked
- Helmet on and fastened
- Leg loops
- Hang check
- Parachute secure
- Bar Clearance
- Release operation and weak link check (do you have the correct link if you have a personal one?)
- If using a dolly/trolley/cart/GLV check that nothing can snag on it
- Check that you have the correct amount of VB or flaps set.

Only launch when you are ready to go. Despite what has been written in the previous paragraphs, if conditions are not right for you to launch, then do not do so. ***Safety*** as always, is the overriding concern.

Getting into the air

This section goes over the basics of what you should know already about being aerotowed, but it never hurts to have a reminder of the important stuff. It is not intended to be a substitute for a training manual. It also tells you about some things that are unique to this area. Our system may not be the same as what you are used to at home, so please familiarise yourself with the way we do things.

Launching

OK, so we've not got in the air yet, but the flight has begun once you give the "all out" command.

You have done all your checks, are clipped into the tow-line and are ready to go. The marshal tells you "all clear above and behind". You give the "take up slack" command and the tow-line goes tight. You check the wind and are ready to give the "all out" command in a clear loud voice.

What happens next depends on a number of things. First off, you have the opportunity to stop the whole process by saying "STOP, STOP, STOP" and releasing the line. But let's assume you are going to launch. You will either be foot launching or dolly/cart launching (some people call them "Ground Launch Vehicles (GLV)" and that's what we call them in this document).

Foot launching

You'll have been holding the nose of the glider slightly nose high compared to a hill launch, if the winds are light. As the tug starts to move you start your run. Try not to let the nose drop or rise and give a committed run. When you are airborne pull in and try to stay about 3 metres above the ground until the tug lifts off and then increase speed as the tug does to avoid climbing too high.

GLV launching

Some people love GLVs, others do not. Once you get used to using them they provide the ability to launch in cross or tail winds that would normally keep you grounded. But in these conditions they can also present you with difficulties if you have a line or weak link break before you have enough height to turn into wind for landing.

Before you us a GLV ensure that it is set up with the correct pitch for your glider. The keel support should be such that your glider is resting in a position that would be just beyond the stall attitude if it was flying in level flight. If there is not enough pitch angle you will find it hard to leave the GLV without pushing out. Ideally the keel of your glider will rise off the support and the glider should rotate slightly before you leave the GLV. Slightly too much pitch angle is not too bad for flexwings, but rigid wing pilots should check they ***do not*** have too much pitch angle.

The GLV has a rope that you should hold on to with your forefinger, not your thumb. Ensure you have a good grip on the base bar as well as the rope and that you can let go of the rope without releasing your grip on the base bar! Hold on to the rope until you are sure you have enough speed to lift the glider off. Until the GLV starts to move you should have you arms rigid and try to keep the base-bar at about your chin level. You must resist being pulled through the A-frame. Transmit the energy from the tow-line to the GLV to get it moving. If the GLV veers of to one side you might try to bump it back on line, do not try to use weight-shift. Before you release the rope you should move forward so the base-bar is at trim or a little faster. As you release the rope to leave the GLV pull in more and try to stay about 3 metres above the ground until the tug lifts off. Then increase speed as the tug does. Be sure not to zoom up too high. If at any time things go wrong shout, "STOP, STOP, STOP" and release.

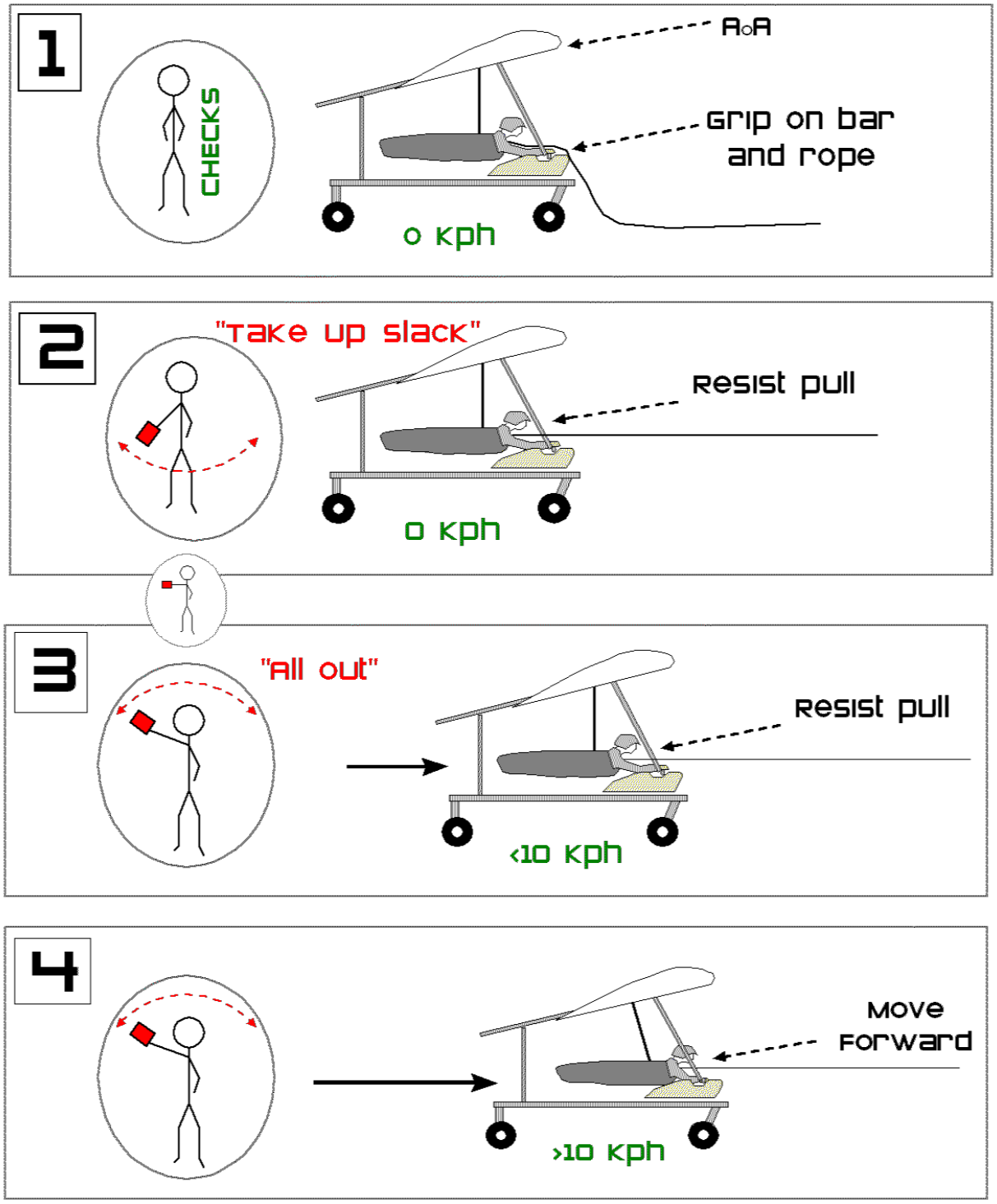
One problem a GLV launch has that a foot launch does not, is what happens if you have an early line or weak link break. This is because:

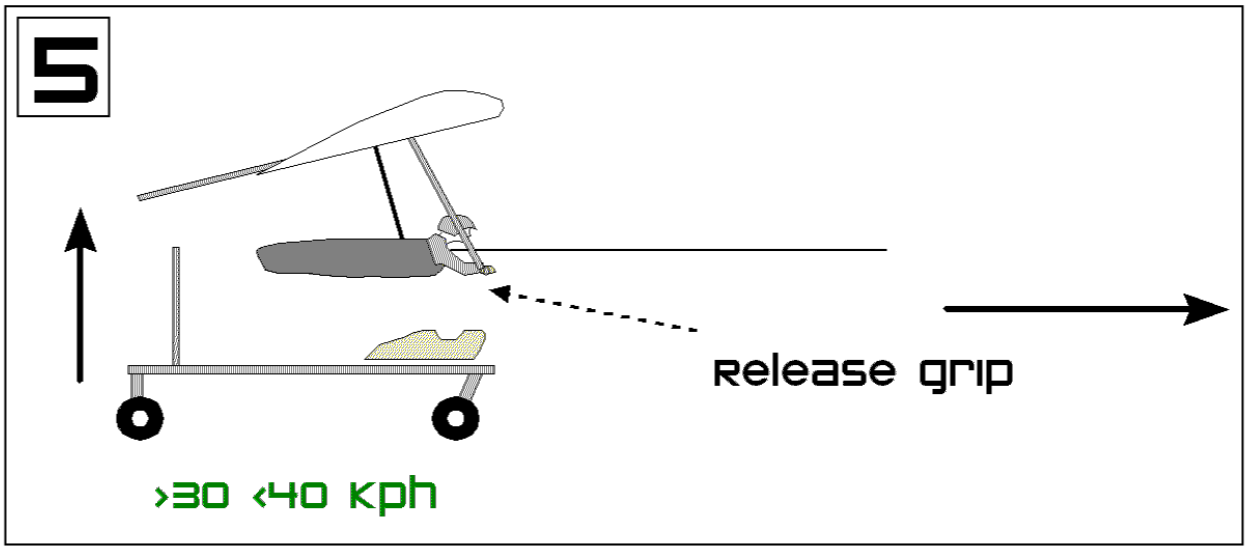
- You are in prone and need to get your legs down to land.
- There is a GLV speeding along underneath you, you want to avoid hitting it, or it hitting you.

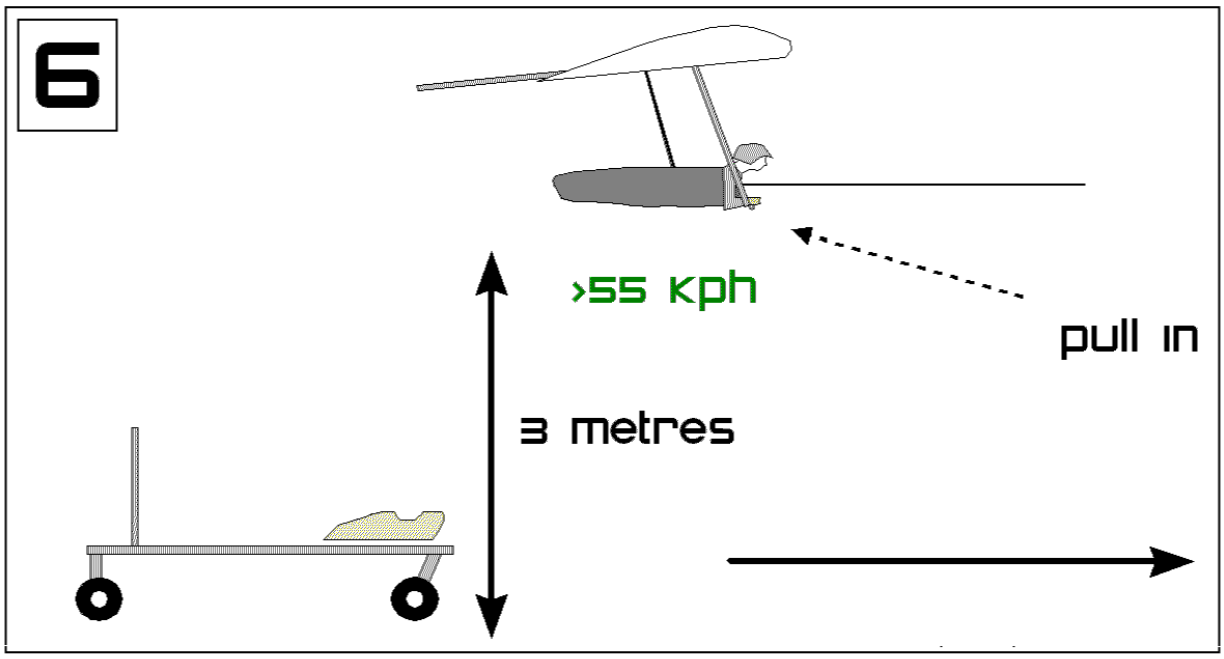
Extra speed can help you here as it gives you time to fly away from the path of the GLV and to get your legs down in time to land safely.

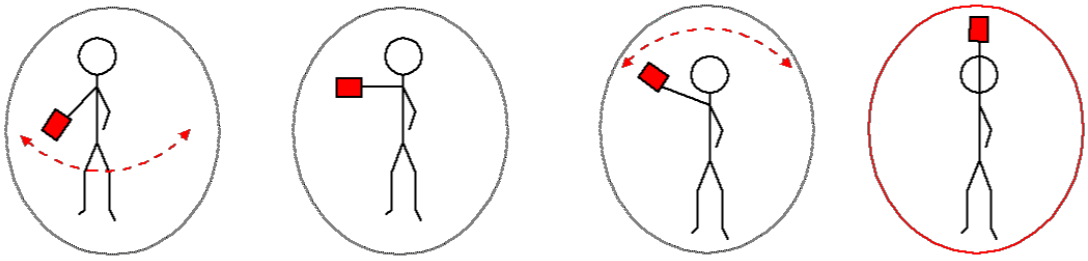
Rigid wing pilots usually employ a wingman if they use a GLV. Their job is to keep the wings level during the initial movement of the GLV. They only need a very light touch to ensure that one wing does not rise up.

It is sometimes a good idea to have your helper give the GLV a slight push to get it moving when you give the ALL OUT command. This helps to reduce the chance of a premature weak-link failure.





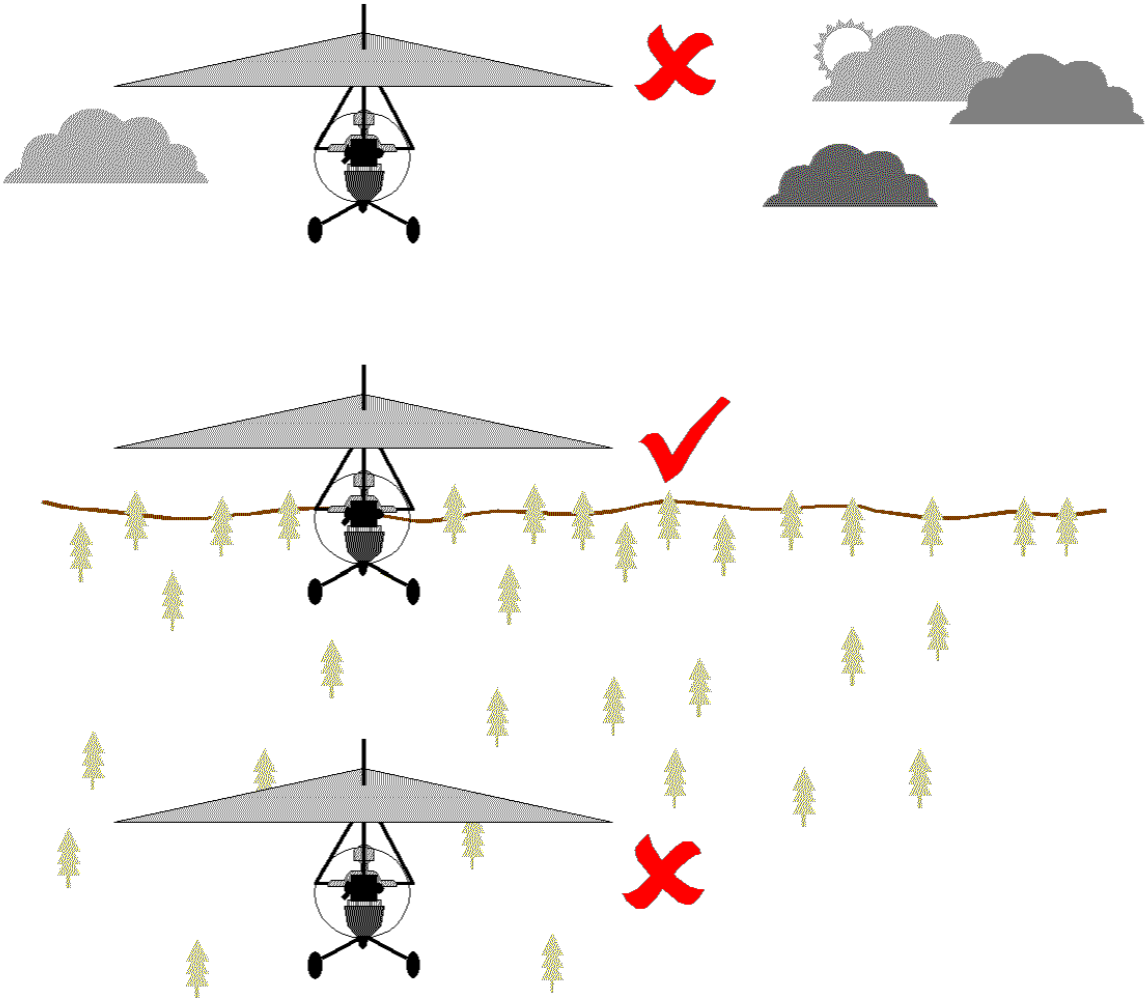




Following the tug

Once you are airborne the best piece of advice we can give a pilot is to follow the tug. You go where it goes, the trick is to make the ride as enjoyable as possible, a good tug pilot can help. The key from the HG pilots

point of view is to anticipate what is going to happen. This is not as hard as it sounds because the tug gives you big clues. Whatever air the tug hits there is a *very* high chance that you'll hit it a few moments later. You should try and think ahead and anticipate what is likely to happen next.



pitch control

If you are being towed by a trike aim to keep between the top of the king-post and the centre of the propeller of the trike on the horizon. If you are behind a Dragonfly keep the wings of the tug level with the horizon.

Being too high is undesirable as you can prevent the tug from climbing, or in extreme circumstances pose a danger to the tug.

Being too low is also undesirable, as you will be flying in rough and trashy prop-wash. You may also find that you are too low to follow the tug if it climbs in a thermal. Better to be slightly high than low, but best to be perfectly positioned.

Watch the tug, if it climbs be prepared to push out slightly and follow it. It if falls, pull in and follow it.

Under both conditions expect to over shoot the mark, so come out of the adjustment a little early.

You can signal to the tug pilot that you are being towed too fast by flying slightly high and too slow by slightly flying low. If the tug pilot is able to they will adjust their speed as required.

roll control

Most pilots will find that roll control is much harder than pitch when on tow. Denis Pagen and Bill Bryden say in their book, Towing Aloft – "*Most pilots new to aerotowing under control in pitch and over control in roll*". The reason for this is that fine roll control needs to be done using yaw rather than roll when under tow. If you move your body as you would in free flight you will tend to over control. For small directional discrepancies, the tug will tend to pull you back on line if you wait.

For small corrections keep your body central on the control bar and try and yaw the glider back on line. Steer it like you would a shopping trolley. If you need a larger roll input, then "bump" the turn and get centred again as soon as you can.

This advice does not apply to rigid wing pilots. They will control roll by applying spoiler or aileron movement.

turns

Try to stay on the turn radius of the tug. Follow its imaginary trail through the sky. If you fly inside the turn you will fly slower and on the outside you will fly faster, possibly faster than you can manage. For this reason it is best to aim to be just inside the radius of the tugs turn rather than on the outside of it.

time to release

The British convention is to turn left when you release, but the system we use is that the tug will dive and fly straight on after you have released. This allows you to turn left or right and make the best use of any thermal you are in when you release.

If the tug pilot waves their arm up and down it is time to release. Do so as quickly as possible, at whatever height you are at. The tug may have an emergency. Do not overstay your welcome.

Finally, remember not to pull in "harder" before release as you don't want to chase the tow-line and have it snag on an instrument or side wire. A firm grip is all that is needed and be ready to pull in once you have released to counteract any tendency for your glider to pitch up too far.

problems

What can go wrong during a tow?

weak link or line break

If the tug end weak link breaks or the towline is broken you may have a considerable length of towline still attached to you. If the weak link breaks at the pilot end of the line, which is a common occurrence, you should have no line of any significanct length attached to you. Always check visually to see if you have the line attached when you have a break. Do not assume it is the pilot-end weak link.

If you are still on the GLV, then hold on to the GLV rope and stay on the GLV. Pulling in slightly might stop you being bounced off. Wait until the GLV stops. Use your foot as a drag to slow the GLV down if necessary.

If you are flying you have two priorities: Getting ready to land if you are low and getting rid of any line that is still attached (if you have any time at all to do so).

If you have plenty of height and there is no danger of the line dragging on the ground try and drop the line over a clear part of the airfield so it can be retrieved. Do not panic and drop the line far from the airfield or over parked gliders, electricity cables or the hangars.

If the line is dragging on the ground hit the release. If the line snags it will pull you into the ground. If you are very low and have no time to check for any line, get ready to land on your wheels or your feet. Keep releasing the line as a priority if you have the opportunity.

If for some reason you have the line attached and you cannot release it you have three alternatives, in order of priority:

- Use your bridle knife to cut the line free and drop it in a safe spot.
- If you have plenty of height you can haul it in and tuck it in your harness. At the very least you should pull in the line so that it is not over the base bar.
- If you have no time to do anything but land try and pick an approach that keeps the line over clear ground. It might be better to land cross wind with a clear line than into wind with a high chance of snagging the line. It is often possible to 360 around the line and leave your into wind turn as late as you can to minimise the distance you drag the line across the ground.

If you have got rid of the line and you have control over where you land try not to land behind where the tug has just launched. The air there will be rough and turbulent.

Glider roll and oscillations

It is important to correct any glider roll as quickly as possible. An uncorrected roll could lead to a lockout. If you feel you can not correct, then release from the towline. If the tug pilot feels you are not correcting and are in danger they may release the towline. If this happens use the same procedure as described above for a break.

If you are yawed but not rolled you will be pulled straight by the forces acting through the towline. Do not confuse yaw with roll.

Do not over correct in roll or you might start oscillating. Some gliders are worse than others. Most oscillations are the result of a pilot over correcting or correcting too late. Anticipation is the key again. React early and use small movements.

Failure to release

If when the time comes and you can not release, use your knife to cut the towline. If this fails wait for the tug pilot to release at their end. You can signal to the tug pilot that you are unable to release by letting one leg hang down vertically from your harness. The tug pilot will look for this signal and release you. If the tug pilot can not release you must be prepared to land with the tug (this is a one in a million event!)

Free flight

You are up and enjoying it, that is why you came. Relax and take in the view.

Launch check list

Pilot

The pilot must ensure that they are ready to launch. Do not allow yourself to be pressured into launching before you are ready. Your safety and that of the tug pilot are the most important issues. If you want to wait for a more suitable moment to launch, then wait.

Once you are ready and the marshal has talked you through your checks ask the marshal if the airspace is clear so you can launch. Ask, “all clear above and behind?” The marshal will confirm, “all clear above and behind” if it is clear to launch.

Next you give the command, “Take up slack”, to take up any slack in the tow-line. Once the slack has been removed you issue the, “stand by” command.

When you are ready to begin the launch run or roll give the command “all out” and begin your launch.

Summary of Pilot commands

All clear above and behind?
Take up slack
Stand by
All out
Stop if at any stage you wish to halt the launch.

Front Marshal

It is the front marshal’s responsibility to signal to the tug pilot commands given via the rear marshal. This is done using bats. BHPA standard bat signals are used. Note they differ to those used in the USA.

You need to mimic the bat signals given by the rear marshal. You should position yourself in a position of safety where the tug pilot can see you during their take off run. You are the only communication between the pilot and the tug pilot. Your job may be lonely, but it is very important!

Rear Marshal

It is the launch marshal’s responsibility to ensure that the following checks are completed before every attachment of the line:

- Glider check – ask pilot, “is the glider checked?”
- Helmet – on and fastened?
- Leg loops – both legs secure?
- Hang check – clipped in? Karabiners are the correct type and locked?
- Parachute pins in and secure?
- Bar Clearance check – when the towline is tight, is bar clearance still maintained?
- Release check – test release is working and do you have the correct weak line for you glider?
- If using a GLV check that nothing can snag on it.
- Check that the correct amount of VB or flaps has been set.

When the pilot asks, “all clear above and behind”, scan the sky around the airfield for other aircraft or anything that might mean that now is not a suitable time to launch. Another aircraft in the circuit or a dust devil nearby might be good reason why now is not a suitable time to launch. If it you consider it suitable reply “all clear above and behind”.

It is now your responsibility to signal to the tug pilot and front marshal the pilot’s commands. This is done using bats, often supplemented with a radio. Never be without bats as radio batteries can fail at the most inconvenient times! BHPA standard bat signals are used. Note: they differ to those used in the USA. The UK ***all out*** may be confused with the USA ***stop*** signal! Be sure you use the correct signal.

Take up slack – under arm bat swings 4-8 o’clock
Stand by – stationary bat at 3 o’clock
All out – over arm bat swings 10-2 o’clock
Stop – stationary bat held up vertical

Tug Pilot

No launch will take place until you are ready. When you are ready indicate to the marshal's and be ready for controlling signals passed to you via the bat of the front marshal.

As a qualified tug pilot you know the procedure so it will not be described further here. You can refresh the details by reading the BHPA aerotow section of the Technical Manual.

Tug and pilot signals

Tug

The glider pilots are responsible for their own position relative to the tug. But the tug pilot can provide signals to the glider pilot if they are constantly flying out of position.

An outstretched arm bent downward at the elbow is a signal that the glider should move down relative to the tug. Bent upwards the glider should move up relative to the tug.

When it is time to release, wave your left arm up and down as a signal to the glider pilot to release. If the glider pilot does not respond to the release signal, a shallow dive is an additional signal that can be given to ensure that the glider pilot is paying attention. If they still fail to release, release them from the tug end of the towline.

If the glider pilot hangs one leg down vertically it is a signal that they are having trouble releasing the line at their end. If this happens release them at the tug end.

Pilot

You are responsible for your own position relative to the tug. The tug pilot will provide signals to you if you are constantly flying out of position.

When it is time to release the tug pilot will wave their left arm up and down as a signal to you that it is time to release. Do so immediately you see the signal, as it could be a signal that the tug has a problem.

During the flight the tug pilot may signal to you if you are constantly too high or too low. An outstretched arm bent downward at the elbow is a signal that you should move down relative to the tug. An arm bent upwards means you should move up relative to the tug.

If the tug seems to dive for no apparent reason the tug pilot is probably indicating to you it is time to release and you have not noticed them giving the arm signals. If you still fail to release the tug pilot will release the tow line at the tug end.

You can signal to the tug pilot that you are unable to release by letting one leg hang down vertically from your harness. The tug pilot will look for this signal and release you.