

How do gliders get into the air?

I HAVE written a lot about what gliders do when they're in the air, but not much about the critical early part of the flight when they actually get into the air. There are two common methods in use, being aero tow and winch, but there are other ways to do it too.

Aero-tow Launching

Aero-tow essentially is precision formation flying behind a power plane, until the glider reaches a height sufficient to allow the pilot to contact lift (or the cost of the tow exceeds the depth of his pocket, whichever comes sooner). Aero-tows are expensive but their

efficiency makes them the most popular method used in this country. Many gliding clubs own their own towplanes and they range from microlights rated for towing, such as Auckland Aviation Sports Club's FK Lightplanes FK9, through Piper Cubs, to the very popular Piper Pawnees.

Learning to fly a glider on aero-tow is not difficult from either end of the rope, but it does have to be precise. The tow-pilot needs to know the glider's max towing speed, emergency procedures, and if he wants to keep his club members happy, he'll know how to read the sky and fly the glider to an area of good lift.

At the other end of the 80m rope, the glider pilot puts a lot of trust in the tow-pilot. Once checks are completed, a wing runner attaches the rope to the glider and checks that it is secure. The wing runner holds the glider's wings level and the signal is given to the tow plane to "take up slack". Once the rope is taut the "all out" is given. The tow-plane starts to accelerate gently, the wing runner keeps the wing level for as long as possible, before letting it fly off his hand. Usually, by the time the runner lets go, the wing is just starting to fly. The glider pilot then keeps his wings level and follows that rope. The glider is lighter than the power plane and will lift off the ground first. Once both aircraft are airborne the glider slides up above the aeroplane's slip stream in 'high tow' position. The wings of the tow-plane should sit just on the horizon, from the glider's point of view. Australians are different, they fly below the slip stream in 'low tow'.

Then it is just a matter of keeping the glider's wings level with the other plane's. If the tow-plane banks, the glider banks. The glider can need quite a lot of rudder to keep from sliding too far out to the side in a turn. Once the glider has reached release height, 1000 ft AGL for a circuit or 2000 ft or higher for soaring, then he pulls the release knob and turns to the right while the tow-plane turns left. For safety's sake, both ends of the combination can release the rope if needed.

Winch Launching

Compared to the sedate climb behind a plane, winch launching has been likened to a bungee jump in reverse. The winch sits at

the end of the airfield, as far from the launch point as possible. Basically it is a machine with a big motor and a large spool of cable. Traditionally in NZ the wire used to be #8 fence wire, but these days is more likely to be stranded cable or a modern composite material like Dyema. The winch cable is attached to the belly hook of the glider. The checks and launch signals are the same but within three to four seconds of the "all out" the glider will be airborne, flying at sixty knots and have rotated to be pointing at the sky as it climbs out. It is just like launching an enormous kite. About 300 ft AGL the climb will steepen to about 45°. The pitch drops off at

the top of the climb, and levels off to a normal flying attitude for release. If the glider over-flies the winch, the belly hook will back release, but the pilot should have pulled the bung before that happens.

In less than a minute you've gone from ground level to somewhere between 800 to 1200 ft. The difference depends on wind strength, skill of the pilot and winch driver, and the length of the cable. As you can imagine, it is hard to instruct during a winch launch and the briefing and debrief will be thorough. Just like aero-tow, it isn't hard. It just takes practise. Winch launching is considerably cheaper than aero-towing and on a good day, 1000 ft is enough to let the glider find lift and get away.

If you are a power pilot, give glider sites with winches a wide berth. A winch launch happens fast and you will never see the cable that slices your wings off (*or wraps around your rotor blades. Ed.*)



Bungee launching a glider at a vintage rally. The process involves volunteers running down a hill until the bungee is at maximum stretch, thence catapulting the glider into the air over their heads. Lots of fun for everyone, but fortunately modern techniques are more efficient.

Alternatives

There are other ways of getting a glider in the air. An auto tow is similar to a winch launch, but involves a powerful car with a long cable that races into wind to launch the glider. Large airfields or beaches are the place of choice for this. Not surprisingly, this launch method is generally considered good fun by all involved.

Bungee launching is one of the original glider launch methods. It is not very efficient and is very labour intensive. The glider launches from the top of a slope. A group of people hold the glider still, while two other groups race off down the hill, hanging onto two rubber bungee cords, which attach by a single cord to the glider tow hook. When the cords are stretched as far as the volunteers can manage, the glider is released by its minders and catapults out and over the heads of everyone. Hopefully the pilot can slope soar and even climb. Usually though, it is just a gentle sledge ride to the bottom of the hill. Then everyone comes down to haul the glider back up again. When bungee launching is resurrected at vintage rallies and the like, it too, seems to be considered great fun.

I'm Jill McCaw and I'm editor and publisher of SoaringNZ, the official journal of Gliding NZ. For subscriptions and details on gliding clubs see the GNZ website.