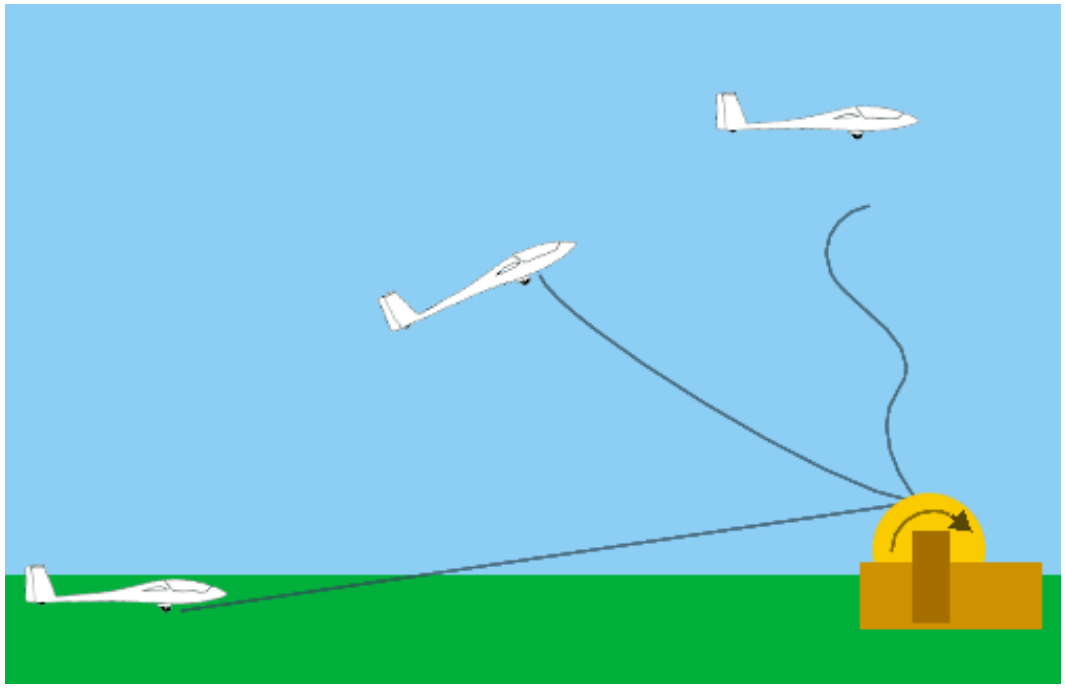
Winch Launching of Gliders

An Introduction To A Rather Un-American Activity



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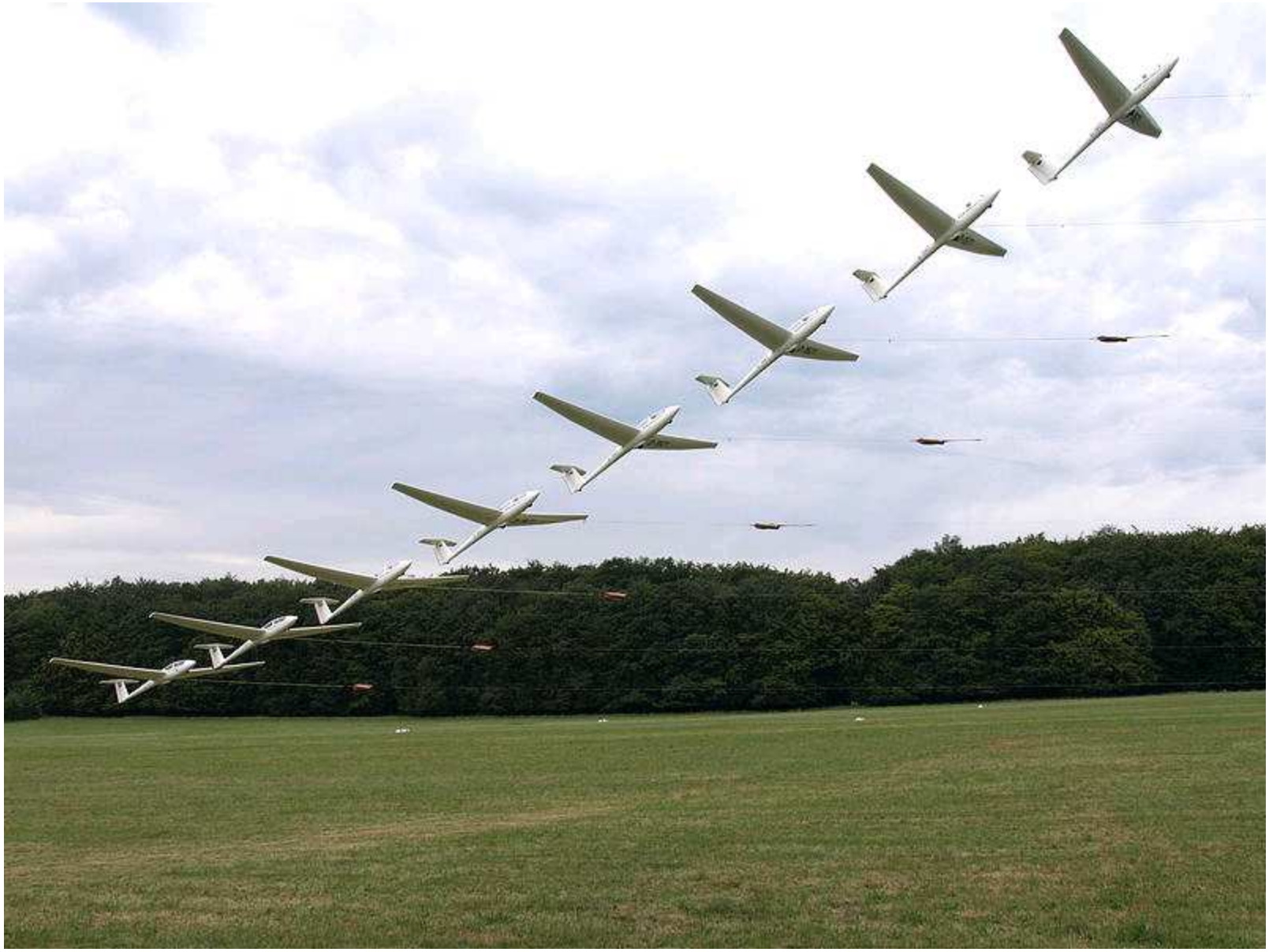

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Why Winch – Launch?

- Other than running down a mountain carrying your glider – this is your lowest – cost option to get airborne
- Fast turn-around, start sequence (assuming 2-drum winch)
- Only the glider pilot needs an FAA license
- Noise abatement relatively simple vs. aero-tow
- If you care about this point: it's "Green"
- Sharpens your skills of finding thermals from down low
- Allows for intense low-cost training of pattern flying
- It's fun!

Pay Attention, This Launch is Happening Fast!

- Takes only 30-40 seconds to get to 1,200 – 1,600 feet
- Winch accelerates glider to flying speed in less than 5 seconds (heavy two seater)
- Wing-runner doesn't run at all
- Flight controls immediately active
- Trim neutral, stick slightly forward to avoid pitching up on acceleration
- Fly the glider off the ground, apply back pressure gently
- At 150-200' assume steeper angle to horizon, gradually going to about 45 deg.

Flying the Winch Launch

- Release some back pressure on stick as altitude is gained
- Glider eventually levels off, is still climbing
- Estimate your position relative to winch, best release point is vertically above
- Release by going to no back-pressure on stick (auto-release) or by pulling the yellow handle
- Tost hook at CG position is different from nose hook, releases as ring moves to point down vertically
- After release, pull yellow handle a couple of times to assure the cable is free, turn right to indicate to winch driver you are off

Cross Wind

- Ideal conditions are 10-15 knots of wind right down the winch cable
- Sometimes that doesn't work out, what then?
- After reaching 150-250', lower upwind wing and fly the glider toward the wind direction
- Move glider upwind depending on wind speed and angle
- Release point will be "besides" the winch but again above it and on the upwind side
- This technique assures that the winch driver avoids having the cable drifting way downwind onto adjacent fields or properties
- This takes a bit of practice…

Communications

- In Europe, buried telephone cables and flex cables to the winch are still very much in use
- If a radio connection is used, the start officer talks on a non-aviation frequency to the winch driver.
- Glider pilot can talk to winch driver to request more or less speed (Receiver-only on winch)
- If all goes well, nobody says a word during the launch
- It is considered bad etiquette to complain to the winch driver (unless safety is compromised)

Winch – Driver's Viewpoint

- Glider is initially 3,000' – 4,000' away, can't really see much detail
- Relying on start ops to know when cable is taught, when to commence launch
- Full throttle on acceleration and until glider is in full climb position
- Adjust throttle as glider moves through field of view
- Gradually reduce throttle as glider moves to nearly vertical above winch
- Reduce throttle to idle when glider is in azimuth
- After release (cable falls, chute opens, glider turns away), up on throttle to pull in cable, ideally chute falls right in front of winch

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Unusual Conditions, Safety

- Weak link on glider side of cable is protecting structural integrity of glider
- Used to have 3 weak links: wooden glider, glass single sear, two-seater
- Breaking of weak link is very rare
- Sometimes cable breaks before weak link, especially on older cables
- Glider pilot is trained to handle cable break at all stages of launch
- Up to about 500': Land ahead, stop before hitting winch
- Above 500': Abbreviated pattern
- In any case: Level the glider from steep climb position, maintain airspeed
- Winch-Launch accidents are most dangerous from this situation

Winching Safety

- Statistics in my old club in Germany are showing this is a rather safe activity
- Used to do 3,000 plus winch launches each year
- Over the 7 years that I was there, we had no accident
- Cable breaks were rather frequent, especially at the end of the steel cable life expectancy
- Cables were spliced together in tedious hand procedure
- "Last Resort" for the winch driver is guillotine to cut the cable if glider is not able to release or in unusual position
- Guillotine was checked each morning on short length of cable

Winches and Drive Components

- Truck chassis with serviceable motor and drive components are mostly used as a basis
- Gas or Diesel engine of at least 200 HP connected to hydraulic torque converter
- Newest winches use electric brushless AC motor with inverter (powered from grid or batteries)
- Motor drives truck axle that had it's differential modified to allow for connection to either OR the other wheel
- Cable drums are mounted on wheel hubs, today large dia. Drums without spooling device are preferred
- Azimuth and horizontal guiding rollers at cable entry to winch
- Guillotine to cut cable gravity or pneumatically operated
- Hydraulic disc brake to slow down drum speed
- "Spectra" and "Dyneema" plasma ropes replacing steel cables (longer life)

No Money for Winch Launching?