Bailing Out Successfully!

This May Just Save Your Life

First Presented at the

Chicagoland Glider Council

Monthly Winter Meeting

chicagolandglidercouncil.com

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PLEASE NOTE

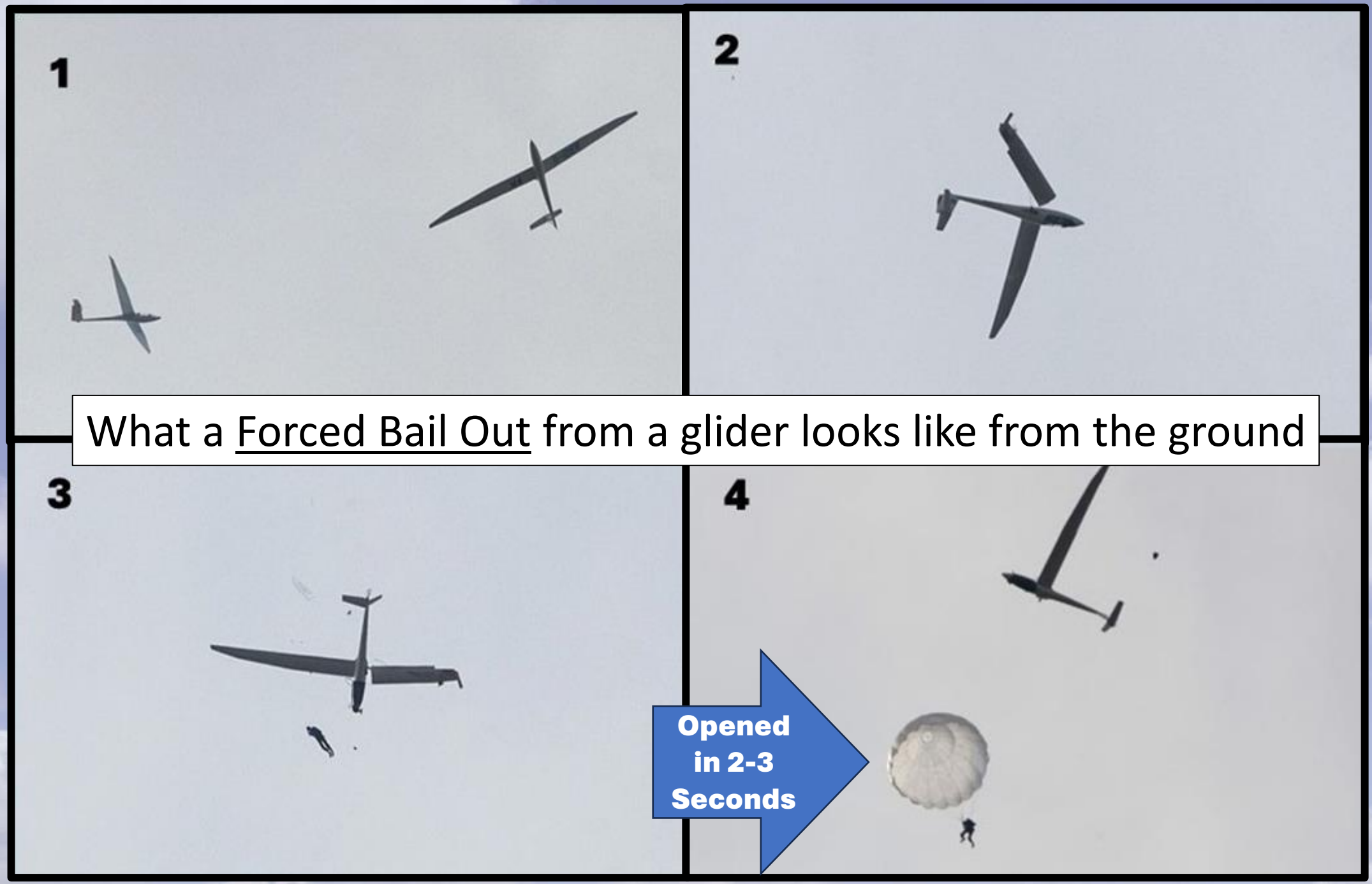
This document may have been updated with new information, changes, and corrections.

Be sure to visit my presentation web site and download the latest version of this document. It could make an important difference for your work!

http://aviation.derosaweb.net/presentations

Thank you, John (OHM)

What a Forced Bail Out from a glider looks like from the ground



FULL DISCLOSURE

Disclosure #1

I have never

bailed out of a glider…

Disclosure #2

Actually, I have never

bailed out of anything…

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What is this Presentation All About?

"It is not about why it became necessary to bail out"

"It is only about what we can learn from those that did bail out"

This May Just Save Your Life

Bailing Out Successfully!

Where does the following content come from?

This presentation is based on interviews with pilots who have successfully bailed out of a glider.

Their valuable lessons learned about bailing out were gleaned from these interviews.

These lessons will be extraordinarily valuable to pilots forced into experiencing a bail out event.

I truly hope that you will never have to use this information

"forewarned is forearmed"!

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FAA FAR 91.307 on Parachutes

(a) No pilot of a civil aircraft may allow a parachute that is available for emergency use to be carried in that aircraft unless it is an approved type and has been packed by a certificated and appropriately rated parachute rigger—

(1) Within the preceding 180 days, if its canopy, shrouds, and harness are composed exclusively of nylon, rayon, or other similar synthetic fiber or materials that are substantially resistant to damage from mold, mildew, or other fungi and other rotting agents propagated in a moist environment; or

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FAA FAR 91.307 on Parachutes

(c) Unless each occupant of the aircraft is wearing an approved parachute, no pilot of a civil aircraft carrying any person (other than a crewmember) may execute any intentional maneuver that exceeds—

(1) A bank of 60 degrees relative to the horizon; or

(2) A nose-up or nose-down attitude of 30 degrees relative to the horizon.

Core Rule Exceptions

Even if you exceed the 60-degree bank or 30-degree pitch limits, a parachute is not legally required in the following scenarios:

- Flight Training: A Certificated Flight Instructor (CFI) is conducting instruction for a pilot certificate or rating. This explicitly includes mandatory spin training.
- Solo Flight: The pilot is flying completely alone with no passengers or extra crew onboard.
- Military & Test Operations: Distinct military rules or special test flight waivers apply.

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Why I became Interested in Parachute Safety

Years ago I listened to a speech hosted by Allen Silver* where he trained me on how to reinforce "muscle memory" for a potential bail out while getting into and out of a glider while still wearing a parachute.

Later, I read an article in Soaring Magazine about static lines. So, I bought one and have used it ever since. Cheap insurance!

I truly hope that you will never have to use this information

But, as they say, "forewarned is forearmed"!

* Allen Silver is a renowned FAA Master Parachute Rigger, Designated Parachute Rigger Examiner, Military parachute trainer and exhibitionist, and expert in emergency bailout procedures

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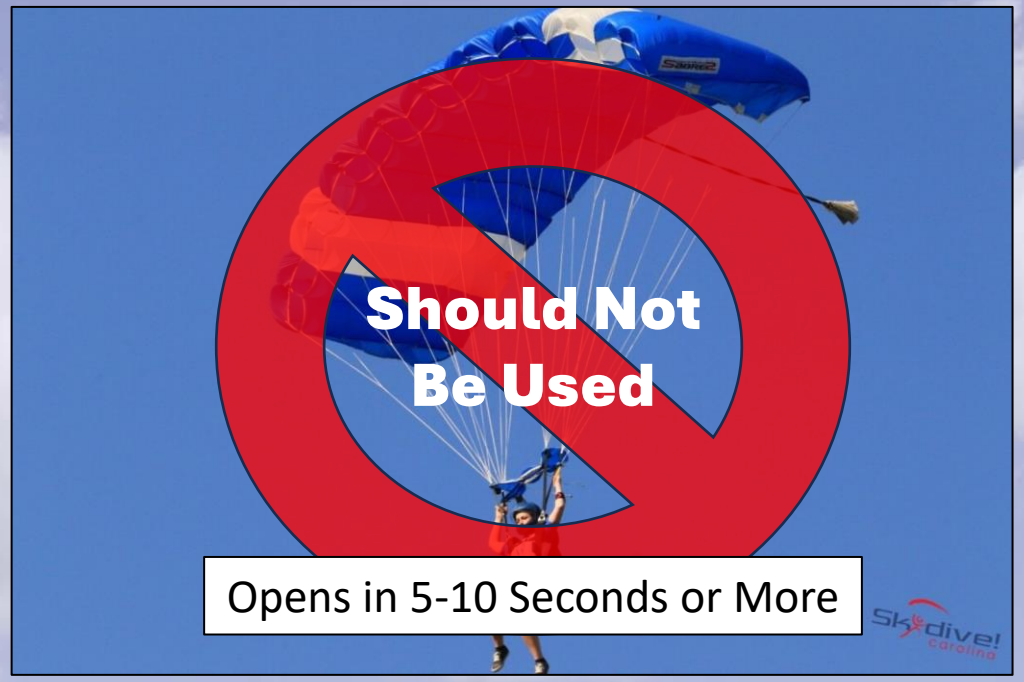
About Parachutes

Opens in 2-3 Seconds Guaranteed

Round “Emergency”



Ram-Air “Sport”

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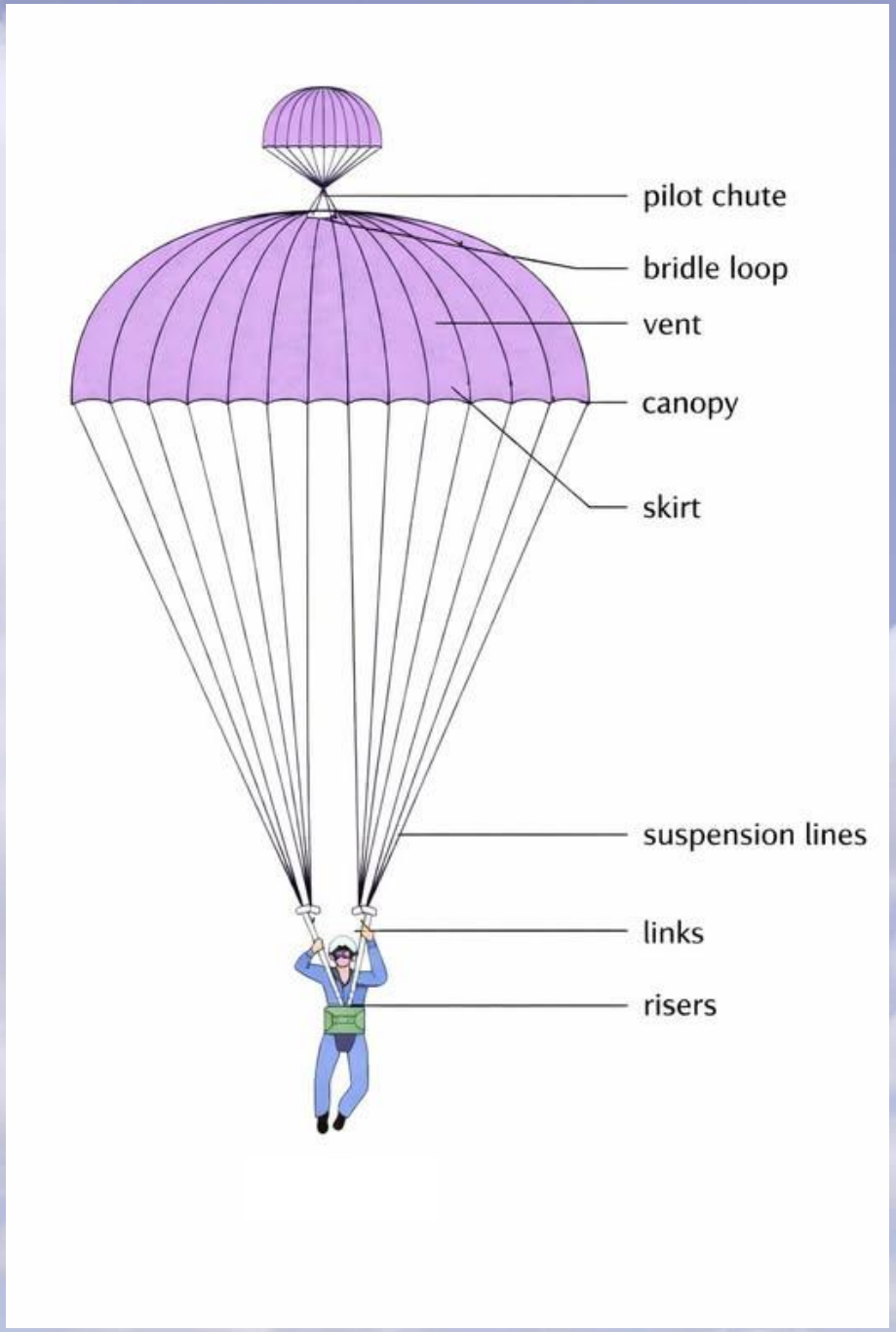
Parts of a Parachute



Bailing Out Questionnaires'

CRITICAL LESSONS LEARNED

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Questioning Those That Have Bailed Out

I began with a list of <u>seventeen (17) names</u> of glider pilots known to have bailed out;

- **<u>Eight (9)</u>** of the pilots were either individually interviewed (3) or have sent their completed questionnaire (6)
- **<u>Two (2)</u>** of the pilots have been contacted and I have received their questionnaire but have not at this time to include their information
- **<u>Four (4)</u>** of the pilots I have not as yet been able to contact
- **<u>Two (2)</u>** of the pilots have passed away in the intervening years

NOTE: All pilot's personal details are kept anonymous

NOTE: Detailed questions asked and responses are shown below

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Part 2

Critical Lessons Learned

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Part 2

Categories of Critical Lessons Learned

A. Before THE EVENT
B. THE EVENT ITSELF
   Those Critical Moments
C. Egress & Bailing Out
D. Under the Canopy
E. The Landing
F. The Aftermath
G. After The Dust Settles

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Critical Lessons Learned

Before THE EVENT

"Parachute Information"

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Before THE EVENT

- **“Dress to egress; know your environment.”**
- Examples of materials to have attached to the Parachute
  - “Must be connected securely, and safely, to the parachute.”
  - **“Allen Silver SMAK PAK** is the best to carry stuff.”
  - “Get an InReach, Spot, or PLB. ELTs do NOT help.”
  - Carry
    - Pencil and paper,
    - Simple pain and medication
    - Signal mirror
    - Space blanket
    - Knife
    - Fire starting kit
    - Compass
    - Money
    - Cell phone
    - Knife
    - Fire starting kit
    - Compass
    - Money
    - Eyeglasses
    - Food
    - Eyeglasses

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Before THE EVENT

- **"Do <u>not</u> use rectangular parachutes as you will be moving much faster across the ground and may land very hard."**
- **"Round emergency chute are best all around"**
  - Docile & stable during descent.
  - Low ground speed and reduced falling speed.
  - Are steerable but performance is modest. Grasp the marked lines/toggles and use them to avoid obvious hazards.
  - Despite the incorrect orientation of my body to the parachute canopy emergency chutes are much more reliable in this regard, as compared to sport chutes.

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Before THE EVENT

- **“Tighten all the parachute’s straps.** The leg straps should be tightened while you are slightly bent over from the waist.”
- “When was the last time your equipment was re-certified by the factory? Cheap insurance!”
- “At the next repack ask the rigger if you can pull the rip cord. Its good practice and interesting.”

*The use of parachute “envelope” instead of “canopy” is to avoid confusion when referring to a glider’s canopy.

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Critical Lessons Learned

Before THE EVENT

“Critical Pre- and Post-Flight Parachute Training”

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Before THE EVENT - Training

- **“Don't expect a bail out to go smoothly without before launch on-the-ground practice.”**
- **“Muscle memory of what you must do very quickly is CRITICAL to a successful bailout.“**
- **“Train before, and after, each flight!”**;
  - Look for and put hand(s) on, the canopy emergency release handle(s) and pretend to open them.
  - Unbuckle the seat belts but **DO NOT** unbuckle the parachute harness
  - Climb out of cockpit with your parachute still on.
  - Look down at the D-ring
    - Use two thumbs through ring and pretend to push away from your chest.

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Before THE EVENT - Training

- "Have a bailout plan and checklist:"
  - C (jettison Canopy)
  - B (release Belts)
  - B (get yer' Butt out of the cockpit)
  - D (locate and pull D-ring with both hands)

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Critical Lessons Learned

- Before THE EVENT -

"What to Carry on the Parachute"

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Before THE EVENT – What's On Your Chute

- **Attach to your parachute or body!**
  - "Do not assume that things in your pants pockets will stay with you. I.E. Wallet, cell phone, money, eyeglasses, etc."
  - "Anything not securely attached to your body or parachute is JUST CAMPING GEAR!" [Master Rigger Allen Silver]
  - "Use small packs attached to your parachute's harness to carry items."
  - Use a "fisherman's vest" with lots of loving pockets.

See much more information on this topic in Part 5 "Miscellaneous" of this presentation

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Critical Lessons Learned

THE EVENT

- The Critical Moments -

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THE EVENT!

- “If possible, try to take a short moment to THINK. As some pilots say, ‘wind your watch’”.
- “Remain as calm as possible.”
- “Don’t delay after initial disbelief! Don’t freeze up. Keep calm.”
- “If possible, try to continue to fly the glider and gently checking each control input.”
- “If the glider loses roll control it will load up. You can unload positive g with the stick to get out.”

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THE EVENT!

- “If there's a lot of negative G you may not easily release the straps. It took me all my strength and both hands.”
- “Any large amount of positive G cannot happen if the glider still has a tailplane (think of a spiral dive cause by no roll control) in which case it should be possible to unload by shoving the stick forward.”
- “Consider pushing stick forward to reduced negative G.”
- “To deal with problem G forces, consider extending spoilers, gear and/or flaps.”
- “Elevator is probably still going to work. Pushing the stick to leave the aircraft is a technique that has often been used by pilots - sometimes inadvertently!”

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Critical Lessons Learned

– Egress & Bailing Out –

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Egress and Bailing Out

- “The canopy may not jettison easily. Especially forward hinged. Push with all your might!”
- “It is an overwhelming event when going over the side.”
- “Do not try to stabilize your body in free fall before pulling the D-Ring.”

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Egress and Bailing Out

- “Emergency parachutes are impressively reliable (2-3 seconds to open). They are designed to be very stabile no matter your body position.”
- In all probability, you will be injured to some extent. But don’t let that delay your bail out!
- “Keep pulling the D-ring until the canopy deploys.”

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Critical Lessons Learned

– In Free Fall –

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In Free Fall!

- “Don't worry about your position in freefall.”
- **“DO NOT TRY TO ‘STABILIZE’ YOUR FALL”**
- “Learn where the toggles are for your parachute. They are brightly colored.”
- “Toggles are located on the risers and are used to steer the parachute.”
- “Pulling on a riser also works to turn.”
- “Use toggles to steer left and right by alternately pulling one at a time.
- “NEVER flare by pulling both toggles … this can collapse the canopy!”

Parachute Steering Toggles

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In Free Fall!

- “If you can only use one toggle (injured) then remember that making three (3) right turns makes one (1) left turn!”
- “Judging wind direction can be difficult but try to land into the wind. This slows ground speed.”
- “Aim away from hard objects. Trees, buildings, fences, vehicles, etc.”
- “I fainted at about 100' due shock and looking upwards at the chute. I hit the ground unconscious. I had looked up which shuts down the blood supply to the brain. I have a friend who explained how this works - he's a professor of brain surgery so he knows how it works.”

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Critical Lessons Learned

– The Landing –

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The Landing

- "**NEVER flare** an emergency parachute. The envelope may collapse. A round emergency chute doesn't land like that. If you do that with a round parachute you can deflate the canopy and may hit the ground very hard."
- "Try to face into the wind which will slow your ground speed."
- "Keep your eyes on the horizon. If you look down at the ground, there will be a strong involuntary reaction to stiffen your legs as you approach."
- "For landing: feet together, knees slightly bent, leg muscles tightened."
  - Stiff legs without knees bent encourages broken bones.
  - Roll sideways, not backwards or forwards.
  - Relaxed leg muscles tend to cause your butt to hit the ground hard, leading to spine injuries.

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Critical Lessons Learned

– The Aftermath –

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The Aftermath

- **Search and Rescue**
  - “Lay out the parachute canopy for visibility’
  - “Use a cell phone or satellite devices (InReach, Spot, PLB) to contact help.”
  - “Notice your environment.”
  - “Note details for Search and Rescue (SAR), your memory may be cloudy.”
  - “Be patient. It may take hours for rescue to arrive.”
  - “Rescue helicopters will probably not land in rough terrain after sunset.”
- **Injury**
  - “If at all possible don’t walk out as you may be hurt and don’t know it yet due to adrenaline.”
  - “Wait for someone to come by to get help.”

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Lessons Learned

– After The Dust Settles –

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After the Dust Settles

- **Federal and Local Agencies**
  - Contacted by FAA and NTSB
  - “FYI – The FAA grounded me until I was healed.”
- **Aftermath To Do’s**
  - Keep track of time! Find shelter.
  - Is the sunset approaching? It may get cold.
  - Write down everything about the incident; important facts tend to be forgotten.
  - If possible, recover all flight recorders from the crash site.

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After the Dust Settles

- **Insurance**
  - If possible, protect the wreck for the NTSB investigation.
    - See FAA FAR 830.10 - Preservation of aircraft wreckage.
  - Preserve your flight recorders.
  - Photograph the wreck.
  - Photograph the surrounding area, especially tree and ground scaring.
  - The insurance company must recover the damaged aircraft on any public property (parks, etc). [unsure about private land]
  - Understand that the wreck will likely be removed on a 4’ x 4’ utility trailer after being sawn into rather small bits.

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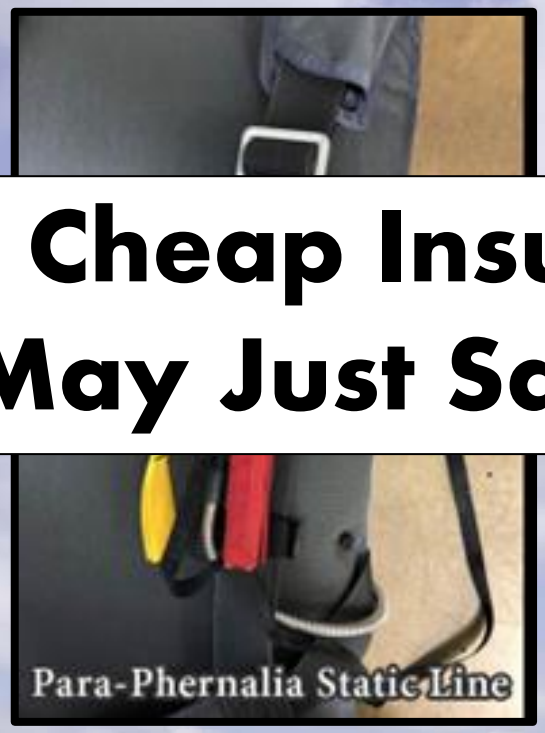
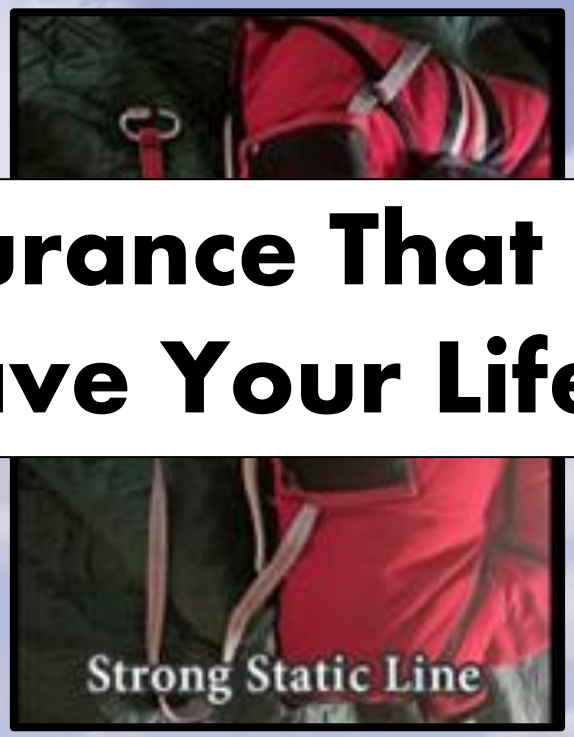
Part 3

About Parachute Static Lines





Cheap Insurance That May Just Save Your Life

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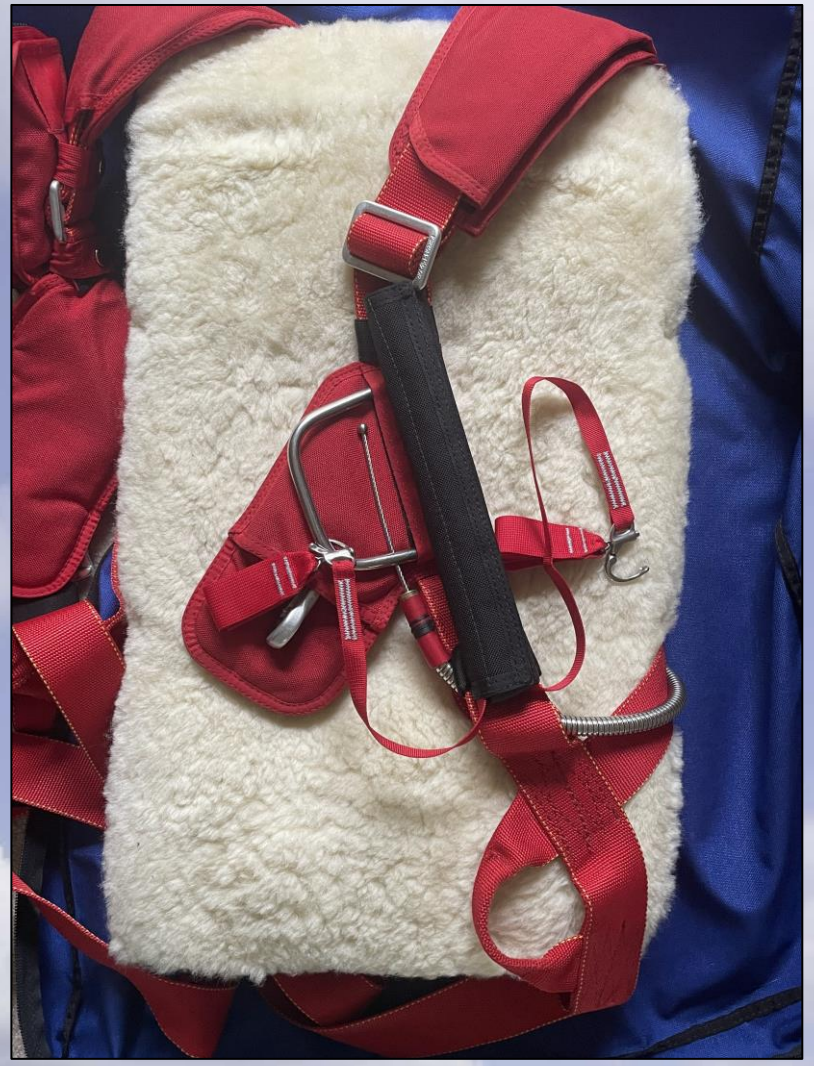
Parachute Static Lines



- **STATIC LINE DEFINITION** – A static line is a strong ~25 ft (7.4m) of webbing that attaches between your glider's connection point directly to the D-Ring of your parachute. A static line will automatically open your parachute for you in the event of a bail out.
- **WHY HAVE ONE?** – There is a high probability that you will be injured during your bail out. Maybe you will be totally incapacitated and unable to pull the d-ring of your parachute by yourself.
- **HOW TO USE** – Once installed in your glider, and attached to your parachute, there is nothing more you have to do than bail out any which-way you can.

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- **Static Lines**
  - “A static line would have helped me as I was knocked out for a while.”
  - “Many cases of pilot knocked out and unable to get to the D-ring, possible in unresolved fatalities.”
  - “A static line might especially have helped if I was not trained in parachuting.”
  - “Use only parachute manufacturer’s approved static lines”. Static line information in Soaring magazine (May 2024, pages 42-43)

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Para-phernailia Softie Parachute Static Line

Interior of the Static Line container

Style #1 - Static Line container mounted onto the parachute

Style #2 - Static Line container mounted inside the glider

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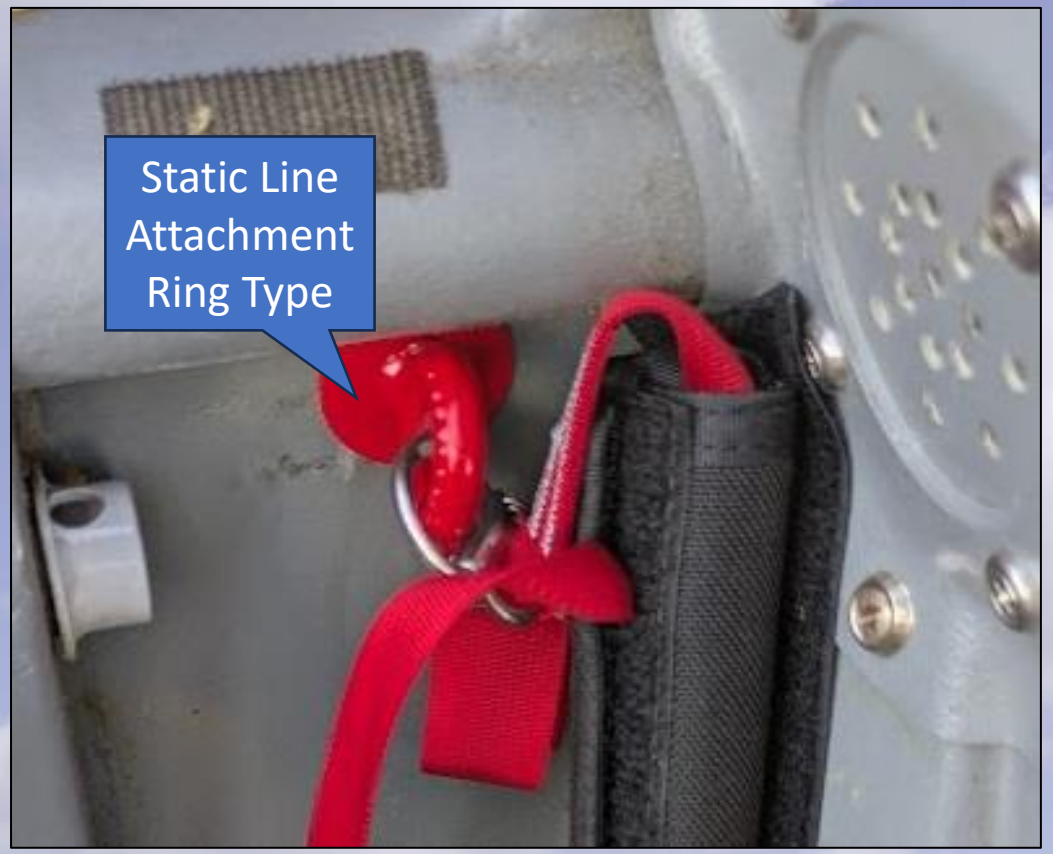
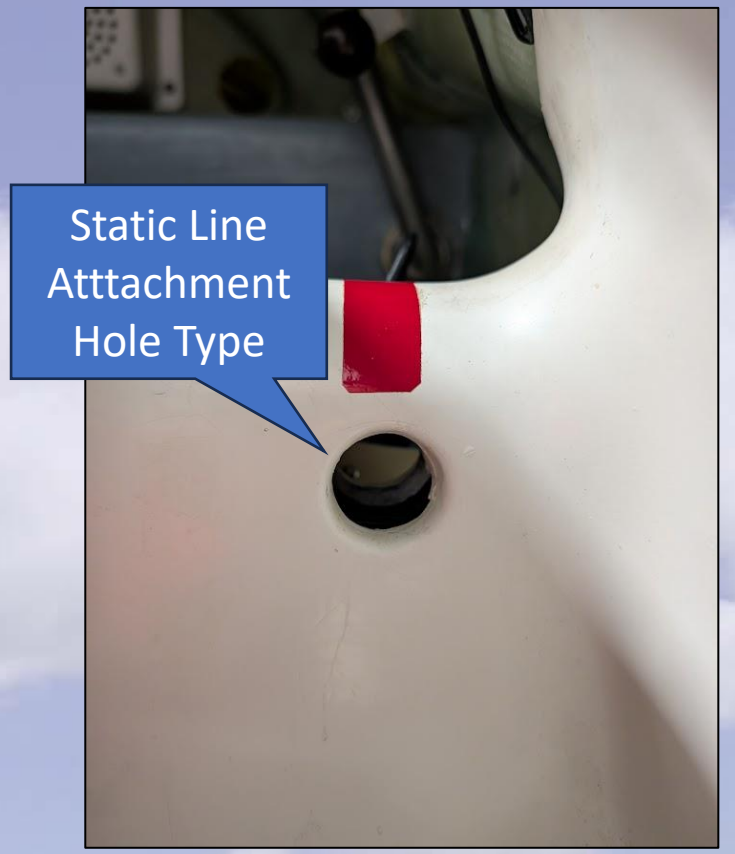
Typical Glider Static Line Attachment Points





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Para-phernailia Softie Parachute Static Line

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Paradigm Parachute and Defense (Formerly Strong Enterprises)

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Parachute Static Lines

The Myth – "You will climb out of your glider and you will deploy your parachute!"

DEBUNKED!

1. There is 25 feet of static line so you would have to walk beyond the wingtip to even start to pull the parachutes D-ring!
2. Walking away the static line is pulling the D-ring in the **opposite direction of operation.** The D-ring is hard to pull out of its sleeve so you will definitely feel a rather strong resistance!
3. You aren't stupid.

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Parachute Static Lines

Manufacturer Sources

- **Paradigm Parachute and Defense**

  (Formerly Strong Enterprises)

  - https://strongparachutes.com/
  - +1 407-859-9317
  - sales-orlando@paradigmparachute.com

- **Prime Rigging LLC**

  - https://www.prime-rigging.com/
  - +1 267-429-5365
  - sales@prime-rigging.com

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Part 4

The Full Questionnaire

with Pilot's Answers

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Questionnaire with Pilots Who Have Bailed Out

Please Note

- No personal information about the pilots is shown
- Some pilot's answers were condensed or slightly reworded for clarity
- Some questions may show *[no answer]* due to questions being added during this research
- Aircraft brand & model may be mentioned

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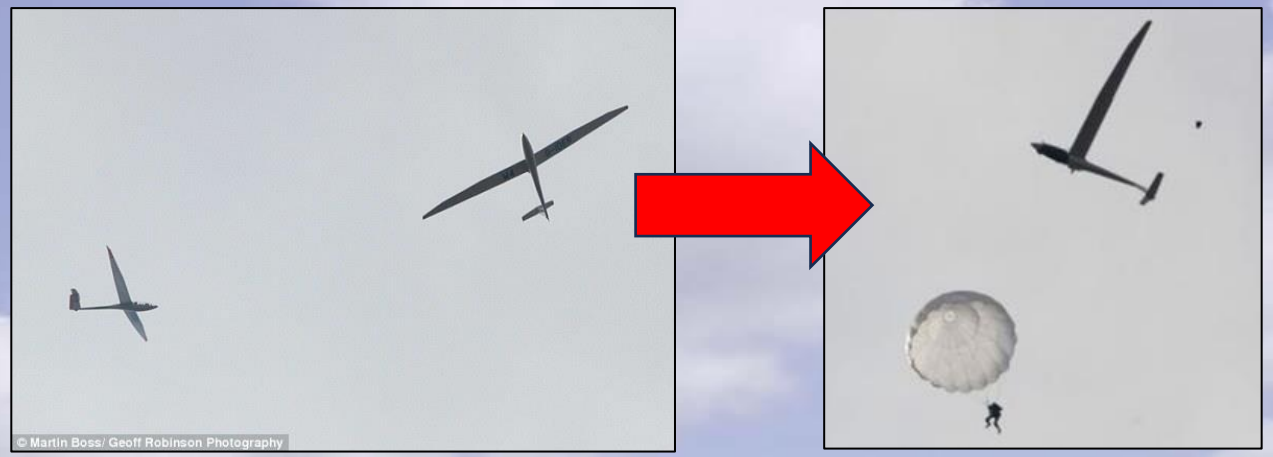
Questions About The Real Time Events

Between when the event occurred until feet are on the ground



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Part 3 - Real Time Question #1

What was the immediate reaction at the moment you knew that something was wrong? Bailed out immediately? Evaluated for some time?

#1	"Jumped into action. Was in a rapidly increasing spin. "
#2	"Eased back on the stick to stop the flutter and determine if the ship was structural ok and controls are still good. If so - then land. If not - then bail."
#3	"Knew immediately and started to react. Was an inadvertent inverted stall spin, tried to recover. Rapid spin. Felt flutter."
#4	"I froze momentarily, fighting the mental trap of thinking "it will be ok, because I've always gotten out of it before" I opened and closed the canopy once before actually convincing myself to jump."
#5	"I instantly knew I was involved in a midair and needed to bail out."
#6	"Immediately. Yelled at the passenger because I thought he had kicked the rudder pedal. Pressed as hard as I could to center rudder pedal – no movement."
#7	"I almost immediately know that I had to abandon the aircraft. Opened the brakes, tried to recover from the dive - that worked for a moment, then the glider pitched vertically.
#8	"I immediately pushed the stick left, against the tendency of my glider to roll right (as it was missing ~4' of the right wing)."
#9	"I knew immediately what had happened and immediately started to exit the aircraft."

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Part 3 - Real Time Question

How did the glider react to the event?
Stayed stable? Became unstable?

#1	"Unstable. Flutter. Lost the elevator."
#2	"Become Stable. Upright. Level."
#3	"Unstable at first. Flutter. But became stable once the wing broke off."
#4	"Completely stable. Glider kept flying ~100m away from me while I was under the parachute canopy."
#5	"Relatively stable in an inverted flat spin. One rotation every 2-3 seconds."
#6	"Unstable at first. Spiral dive until wings started breaking off, outer panels first."
#7	"Unstable. Vertical dive to about 150kt until it broke in half then decelerated into an outside loop at about 80kt / -2g."
#8	"After I was out, it entered a flat spin (without pilot weight, CG is way aft)."
#9	"Unstable. Aileron flutter glider wings separated from aircraft."

*The use of parachute "envelope" instead of "canopy" is to avoid confusion when referring to a glider's canopy.

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Part 3 - Real Time Question

How much time elapsed between the very moment that you knew that something was wrong and you bailing out?

#1	"30 Seconds."
#2	"5-10 seconds. Predetermined to jump after "A" results."
#3	"Time had little meaning in my predicament. 10-15 seconds maybe."
#4	"3-4 minutes." [Ed - Why then did he bail out? See comments in part 2, question 2]
#5	"About 30 seconds."
#6	"Around 16 seconds."
#7	"15 seconds."
#8	"About 45 seconds."
#9	"It took a while to get out but do not know the time."

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Part 3 - Real Time Question

What was the approximate elevation at the time of bail out? (AGL only)

#1	"10,000-12,000 ft AGL"
#2	"3,000 ft AGL"
#3	"2,000 ft AGL"
#4	"4,000ft AGL over valley floor. Level with mountain peaks."
#5	"4,000 ft AGL"
#6	"9,000 ft AGL"
#7	"2,300 ft AGL"
#8	"2,400 ft AGL"
#9	"Between 3,000ft and 1,500ft AGL

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Part 3 - Real Time Question

Did you encounter anything preventing a quick exit?
I.E. canopy, seat belt, tangled with cockpit items, canula, wires/cords, etc.

#1	"No."
#2	"Had to take two hands to release canopy and it stayed put until I touched it."
#3	"Did manage to get to straight and level flight then wing broke off. Then all was smooth after that."
#4	"Getting legs out from around center console and ensuring I had everything I needed before jumping (Flight logger, emergency bag, etc)."
#5	"No. Was inverted in a flat spin so fell out once my belts were released. Might have caught a shoulder strap as my neck was bruised."
#6	"High G loads made it difficult to unbuckle."
#7	"Canopy jammed and had to push. Then belts were hard to release as under more than -1g during outside loop portion."
#8	"Just some minor reluctance to abandon my beloved LS-4 to its fate."
#9	"Canopy did not pop off after canopy latches pulled. He had to push it away."

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Part 3 - Real Time Question

After exiting the ship did you have a difficult time finding and/or pulling the D-ring?

#1	"No."
#2	"No issues. Kept the D-ring all the way down!"
#3	"None. Everything went into slow motion."
#4	"No, I located it before jumping."
#5	"No issue. Looked directly at the D-ring and pulled."
#6	"Not once I regained consciousness. Was seeing the sky and my feet and arms above me."
#7	"Don't remember pulling the D-ring but obviously did."
#8	"No."
#9	"Yes, the D-ring was not where it was supposed to be it had fallen out of the holding pocket, and it took time to find it."

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Part 3 - Real Time Question

Did G-forces cause any issues?
What, if anything, might have helped counter that issue?

#1	"None."
#2	"No."
#3	"Buffeted. Maybe some G-forces. Experience tunnel vision. Then smooth after straight and level."
#4	"No. I was flying in 1G level flight, near stall speed."
#5	"None noted."
#6	"High G loads made it difficult to unbuckle."
#7	"No."
#8	"No."
#9	"No."

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Part 3 - Real Time Question

Did the Parachute Canopy open properly?
If not, what did you do to correct the issues?

#1	"Yes."
#2	"Yes. It was 1-2-3 BOOM open."
#3	"Yes. Felt the shroud running out of the pack. Felt the chute pop open."
#4	"Yes. I had a clean opening."
#5	"Yes."
#6	"Yes, despite the incorrect orientation of my body to the parachute canopy. Emergency chutes are much more reliable in this regard, as compared to sport chutes."
#7	"Yes."
#8	"Yes."
#9	"Yes."

*The use of parachute "envelope" instead of "canopy" is to avoid confusion when referring to a glider's canopy.

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Part 3 - Real Time Question

How high above the ground were you when the chute opened? (AGL only)

#1	"Unknown."
#2	"Don't know."
#3	"200 ft AGL."
#4	"3,500 ft over the valley floor, 2,500 ft over landing spot."
#5	[no answer]
#6	"I estimate 150-200 ft AGL. Was unconscious most of the fall."
#7	"We think about 600 ft AGL."
#8	"About 1,800 ft AGL."
#9	"1,300 ft AGL."

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Part 3 - Real Time Question #10

What, if anything, did you do to control or guide your descent? Please describe.

#1	“Pulled on risers.”
#2	“Nothing. Was totally ignorant on what to do.”
#3	“Attempted pulling left shrouds to move away from a building. Only learned later that there were handles to pull and provide some control.”
#4	“I could use my right hand to pull on the rear right risers. The result was making large oval-shaped circles to steer towards the nearest road.”
#5	“Used handles to guide to get oriented into the wind to slow ground speed. Did not flare.”
#6	“Steered into wind and between obstacles.”
#7	“Didn't know about the steering toggles. Used rear risers to turn and look at terrain downwind - didn't like that so turned back into the wind.”
#8	“Used the steering lines to avoid trees and land in the yard of a small house.”
#9	“I did nothing.”

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Part 3 - Real Time Question #11

How much time was there between bailout and landing?

#1	“Unknown.”
#2	“If felt like several minutes.”
#3	“20 seconds.”
#4	“1-2 minutes.”
#5	“Felt like ~5 minutes.”
#6	“Not sure. I was only conscious at most a few seconds to deploy and steer.”
#7	“15 seconds.”
#8	“A couple of minutes? Hard to tell.”
#9	“Less than 5 minutes.”

Bailing Out Successfully!

Part 3 - Real Time Question #12

What did you land on? (terrain type, trees, bushes, power cables, buildings, vehicles, etc.)

#1	"Landed on a mountainside."
#2	"County dump right next to the airport. Landed on the bed of a pickup truck and rolled sideways off of it."
#3	"Absolutely flat terrain. The only thing nearby was a building."
#4	"In a tree 35 feet up, with the canopy stuck in the branches. Swung myself to get close enough to reach a tree to get out of my harness."
#5	"Terrain in the area was flat. Cultivated fields with surrounding tall mesquite. I landed in a field."
#6	"Extremely rough rocky slope between boulders and Joshua Trees."
#7	"Flat grass. Just missed the forest, motorway and railway line."
#8	"A lawn, about 25' from the front door of the house."
#9	"Landed on side area of runway which is dirt and sage brush in Minden."

Bailing Out Successfully!

Part 3 - Real Time Question #13

What were your actions directly after landing? Anything you should have done or forgot to do until later?

#1	"Took off parachute rig and climbed uphill."
#2	"Collapsed the parachute canopy."
#3	"Hit the ground and skidded. Knew that I was injured."
#4	"Undid my harness, climbed down the tree, called 911."
#5	"Took stock of my physical health. Covered head with shirt."
#6	"Briefly looked at hiking out, though better because of injuries and terrain. Crawled under parachute for protection and so I could flap it up and down to attract search aircraft. Regretted that I had not better secured my InReach tracker – it was gone."
#7	"I was unconscious."
#8	"Greeted the young couple who were standing nearby. Asked them for the use of their phone, so I could call the contest and arrange to be picked up."
#9	"I was surrounded pretty quickly with people on the ground at the contest."

Bailing Out Successfully!
Part 3 - Real Time Question #14

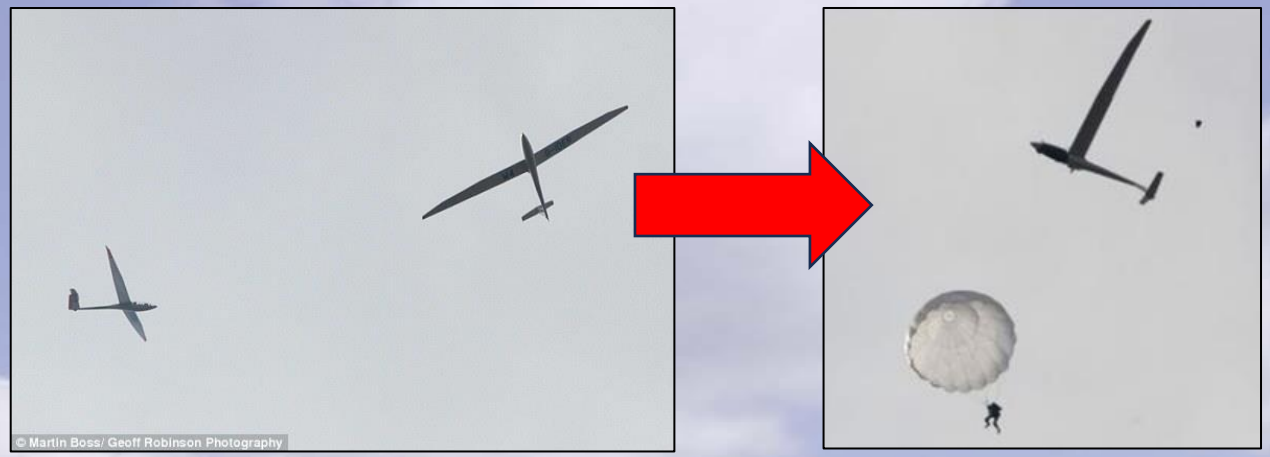
How did you obtain emergency help?
How long did it take to for emergency services to arrive?

#1	"Use Cell phone to call 911. Took an hour or so."
#2	"Nothing, the contest director saw what happened. Services came in minutes."
#3	"Workers were right next to my landing place. Immediately people were there. Ambulance arrived quickly."
#4	"I called 911, but they said they were busy, and they were more concerned that my emergency phone with an un-registered SIM [concerned with swatting?]. I walked out of the woods and hitchhiked back to the airport, because 911 wouldn't even send a cop to pick me up when I got to the road."
#5	"Called the retrieve desk which had already heard of my accident who called 911 with my approximate location."
#6	"My co-pilot walked out and found help. I was injured and stayed put. Help came six hours later."
#7	"Another pilot called it in on 121.5. Police, fire engine, two helicopters. Very quick and excellent response."
#8	"No emergency help was needed. Folks from the contest arrived about 40 minutes after my phone call."
#9	"I was surrounded pretty quickly with people on the ground at the contest."

Bailing Out Successfully!

Questions About Aftermath Debrief

After the pilot's feet are on the ground



Bailing Out Successfully!

Part 4 - Aftermath Debrief Question #1

What year did this bail out occur?

#1	2017
#2	1975
#3	2022
#4	2015
#5	2008
#6	2016
#7	2012
#8	1988
#9	1972

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

What glider make/model were you flying?

#1	Schleicher [no model given]
#2	Berkshire Concept 70 (C-70)
#3	Aviastroitel AC-5M
#4	Schreder HP-14
#5	Genesis II
#6	Schempp-Hirth Arcus M
#7	Glaser Dirks DG100
#8	Rolladen-Schneider LS4
#9	Berkshire Concept 70 (C-70)

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

What triggered the need for the bail out?
Choose using this list only:
Mechanical, Collision, Weather, Other

#1	"Other."
#2	"Mechanical. Wing flutter near V_{ne}."
#3	"Mechanical. Over speed spin and wing breakup. First flight in this glider."
#4	"Other. Inadvertent flight into IMC, with not enough visual altitude to make an attempt to return to the airfield. I was closed off from any land-able terrain, between two mountain ranges in a collapsing wave."
#5	"Mechanical - Midair collision."
#6	"Mechanical – Possible aft-fuselage structural failure
#7	"Mechanical - Midair collision."
#8	"Mechanical - Midair collision."
#9	"Mechanical – Aileron flutter near V_{ne}."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

	Single place or two place glider?	One or two people aboard?
#1	“Single place”	“One”
#2	“Single place”	“One”
#3	“Single place”	“One”
#4	“Single place”	“One”
#5	“Single place”	“One”
#6	**“Two place”**	**“Two”**
#7	“Single place”	“One”
#8	“Single place”	“One”
#9	“Single Place”	“One”

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Did you attempt to “walk out” to find emergency help?
If so, was it successful or a bad decision?

#1	“Yes. But probably should not have.”
#2	“No.”
#3	“No.”
#4	“Yes. Help was not coming, and after calming myself down, I could hear the road. Knowing the local geography and road system was key in the decision to self-rescue.”
#5	“Yes. Began walking out and found a rancher in a truck. Found an ambulance soon afterwards who were already looking for me.”
#6	“No. I was significantly injured and stayed put.”
#7	“No need. Was uninjured and close to help.”
#8	“I walked a short distance to the house, which was the right thing to do.”
#9	“No, occurred right at the airport.”

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

What type of parachute did you fly with?
Round (emergency type)
Square (sky diving type)

What was the primary color of your parachute canopy?

#1	“Round emergency”	“White”
#2	“Round emergency”	“White”
#3	“Round emergency”	[no answer]
#4	“Square sport”	“Orange/White”
#5	“Round emergency”	[no answer]
#6	“Round emergency”	“Red/White”
#7	“Round emergency”	“Orange/White”
#8	“Round emergency”	“White”
#9	“Round emergency”	“White”

*The use of parachute “envelope” instead of “canopy” is to avoid confusion when referring to a glider’s canopy.

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Did the parachute have a static line? If so, do you feel it helped? If not, have you thought about installing a static line?

#1	"No."
#2	"No."
#3	"None."
#4	"No. It might have helped, especially if I was not trained in parachuting."
#5	[no answer]
#6	"No. But could have saved my life and may have enabled steering to a safer landing spot."
#7	"No. But it's got to be a useful thing."
#8	"No static line. Yes, it is a valuable idea. Use a static line only with a rig that has been designed for one."
#9	"No."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Was wind an issue as you were descending?
If so, in what way?

#1	"No."
#2	"Drifted and wondering where I was going to land."
#3	"Very light winds."
#4	"Yes, there was about a 35mph wind (flying in wave), so I was constantly being blown downwind."
#5	"No, light winds."
#6	"Yes. I needed to be oriented into the wind. My co-pilot was blown into another canyon."
#7	"No."
#8	"Not really. Wind was ~8 kts - not a problem as I faced into it when landing."
#9	"No."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Optional Question: Where you injured?

#1	"Yes, but minor."
#2	"Wing Flutter was very violent caused scrapes and bruising on temple and face. Legs scrapped from getting them out from underneath the instrument panel. Upper back and neck had some pain from, I believe, the shock of parachute canopy opening."
#3	"Yes, broke femur. Maybe a buckle hit me in the face."
#4	"Not seriously. Minor bruising from the parachute and scrapes from the trees."
#5	"Substantially injured to back. Three (3) days in hospital."
#6	"Yes. Fractured ribs and vertebrae. Face black and blue. Was knocked out."
#7	"Impact vertigo and whiplash, damaged leg from kicking the canopy off. Hit hard on head by headrest as canopy went. Lost consciousness for maybe 7-8 seconds. I fainted at about 100' due shock / looking upwards at the chute - which shuts down the blood supply to the brain. I have a friend professor of brain surgery who explained how this works. I hit the ground unconscious."
#8	"No."
#9	"No."

*The use of parachute "envelope" instead of "canopy" is to avoid confusion when referring to a glider's canopy.

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

What might have helped prevent your injuries?

#1	"Nothing."
#2	"Honestly, no. Happened too fast."
#3	"Landed facing sideways or backwards. If I had time I would have steered the chute to face forward."
#4	"No."
#5	"Not that I know of. I kept my knees bent and together. I concentrated on watching the horizon, instead of the ground, to prevent ground rush causing the reflex of tightening my muscles."
#6	"Nothing, about as good an outcome as possible given circumstances. Static line would have enabled steering to safer landing spot."
#7	"Canopy jettison easier would have helped!"
#8	"N/A No injuries."
#9	"N/A No injuries."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Do you feel that a forward opening, or a side opening, glider canopy is better from a bailout standpoint?

#1	"Forward."
#2	"No preference. Mine was side opening."
#3	"No opinion."
#4	"Probably side, but I'm not passionate about it. Side worked well for me, but I wasn't in a spinning situation."
#5	"Forward preferred."
#6	"Side or front with Roget ("Roeger") hook are both OK. Front without Roget-hook is deadly (has probably prevented many bail-outs with fatal results)."
#7	"No idea. Gut feeling is that the front hinge maybe best, but probably only with a Roget ("Roeger") hook."
#8	"Makes little or no difference if the pilot properly ejects the canopy."
#9	"No opinion."

Canopy Preference

Neither - 4

Forward - 2

Side - 1

Roeger ("Roget") Canopy Hooks

From DG Aviation's Web Site

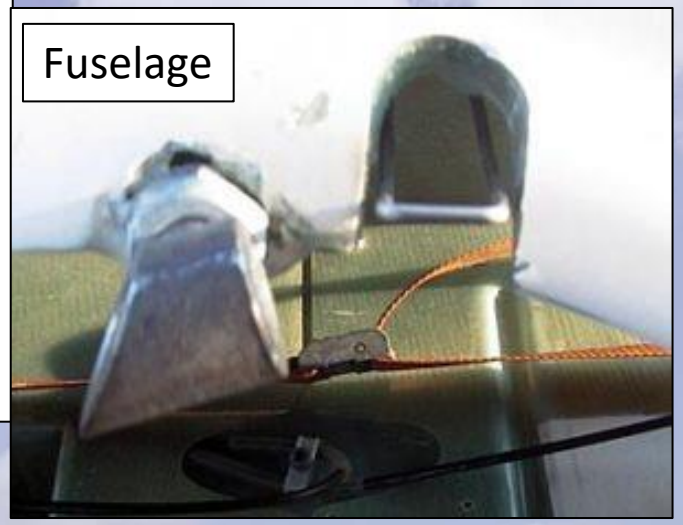
Retrofitting of Roeger hook and canopy lift spring for older versions of LS gliders

An explanation by Wilhelm Dirks

It is well established, that Prof. Roeger at the University of Aachen, did quite a lot of tests with a LS fuselage in order to examine the canopy drop during flight. The deflating results of those tests can be read in a project report.

The test program showed that the canopies did not fall apart the fuselage due to aerodynamic reasons or even hit the pilot during the drop causing heavy injuries. As a result of these tests, the well-known "Roeger-Hook" was developed. But furthermore the canopy had to be lifted upwards in the front by the pilot. This issue then was solved by combining the Roeger hook with a lift up spring enabling a safe drop of the canopy.

These requirements, of cause, were then included in the building code for sailplanes and motor gliders (JAR22, CS22).



Source: https://www.dg-aviation.de/en/library/the-roeger-hook

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

What did you carry on your person specifically for a bailout? How do you carry these items? Did you lose any important items during the bail out? Would you carry more or fewer items? Which items?

#1	"I only had a phone. I would carry something like a Spot."
#2	"None. I'm a minimalist."
#3	"Nothing. Cell phone was left in the car."
#4	"I (had the time to) hand-carried my flight logger as well as wore my camelback emergency bag that I take with me on every flight."
#5	"Cell phone only in my pant's pocket. Now use a SMAK pack and carry a SPOT."
#6	"Garmin InReach tracker, but not well enough secured and was lost."
#7	"In remote terrain I'd put the tracker/sat comms/beacon on my chute instead of in the aircraft."
#8	"Nothing in this case. I should have had some basic items."
#9	"Nothing."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Have you ever done any sport parachute sky diving?
Do you feel that this type of training might have helped your bailout in some way?

#1	"No. Maybe would have helped."
#2	"No. I don't feel that taking lessons would be beneficial."
#3	"No. Thought about it since."
#4	"Yes, I had 5 freefall jumps with the USAF. I think it was absolutely critical to having the confidence to bail and taught me the fundamentals of how to steer the canopy and prepare for impact."
#5	"Never. It might have helped to learn how to land properly."
#6	"No."
#7	"No, and not useful. It's a real difficult situation to train for."
#8	"Yes - I have ~400 jumps (last one in the late 1970s) and training might help others but not much from just a few jumps. Need at least 10 before much experience is gained."
#9	"Had previous static line jumps - less than 20."

Bailing Out Successfully!

Part 4 - Aftermath Debrief Question

Did you have a prior training routine to simulated a bail out?
Such as exiting your glider after a flight with parachute still on
and pretend to pull the D-ring? Did your training help in this event? Has your training changed?

#1	"My parachute stays on until I get out of glider after landing. I use a mental rundown of steps. Yes, it helped. I now use better routine training."
#2	"At the time it was mental preparation only. A huge importance to do both a mental and physical preparation."
#3	"I performed my muscle memory training for the first time before this flight. All the time since."
#4	"No. I do not do routine daily training."
#5	"Yes. I use the training taught by Allen Silver to practice exiting the glider at every landing. Used mantra of 'Canopy-Belt-Butt-D-Ring' (CBBD)."
#6	"Yes. Always get out of glider with chute on! I did brief 2nd pilot on bail-out procedure before take-off. Ground training was helpful for deployment and landing."
#7	"No. But now I go through the motions of "look, reach, pull, arch" most times that I get in the glider, and I always revise how to lose the canopy and the straps."
#8	"Not regularly, but I had done this training before the bail out. I do it more frequently now."
#9	"Did not have a bailout training routine."

Bailing Out Successfully!

Part 5

Miscellaneous Information

Emergency Parachute Manufacturers

- **Paradigm Parachute and Defense**
  (Formerly Strong Enterprises)
  - https://strongparachutes.com/
  - +1 407-859-9317
  - sales-orlando@paradigmparachute.com
- **Para-Phernalia Inc** (Softie Parachutes)
  - http://www.softieparachutes.com/
  - +1-360-435-7220, 800-877-9584
  - E-mail: office@softieparachutes.com
- **Mars**
  - https://www.marsjev.com/
  - +420 461 353 858
  - vala@marsjev.cz

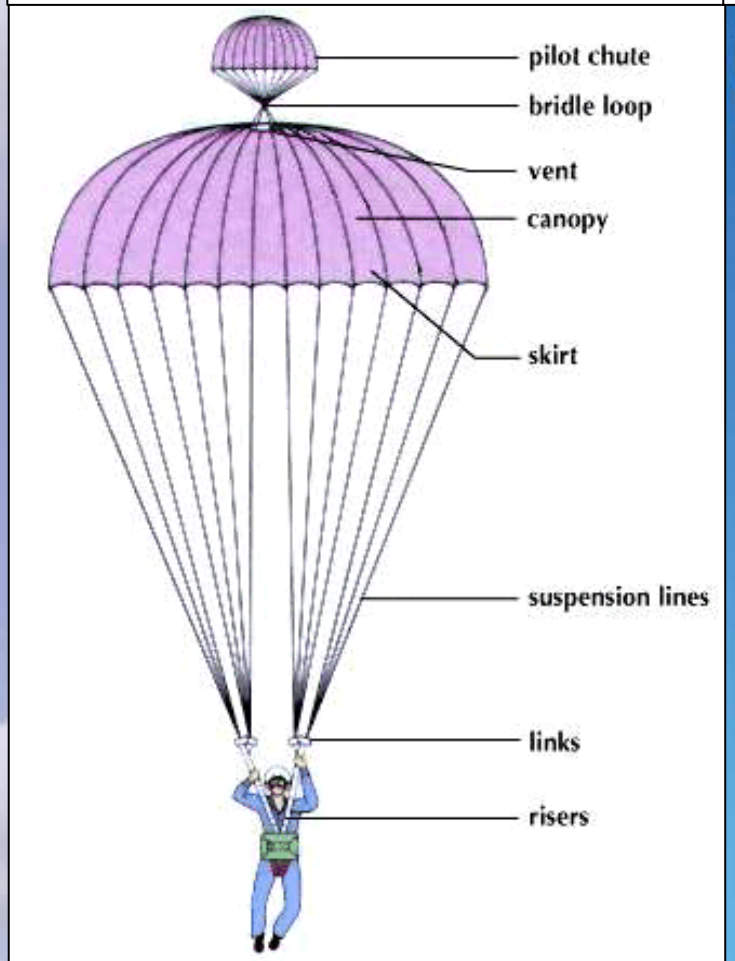
Bailing Out Successfully!

Types of Parachutes

Never "flare" this type of canopy! It can collapse the canopy!

A round "emergency" parachute canopy has a slower ground speed, to help reduce injury upon landing. It is less maneuverable but requires only simple training to use.

Emergency Parachute



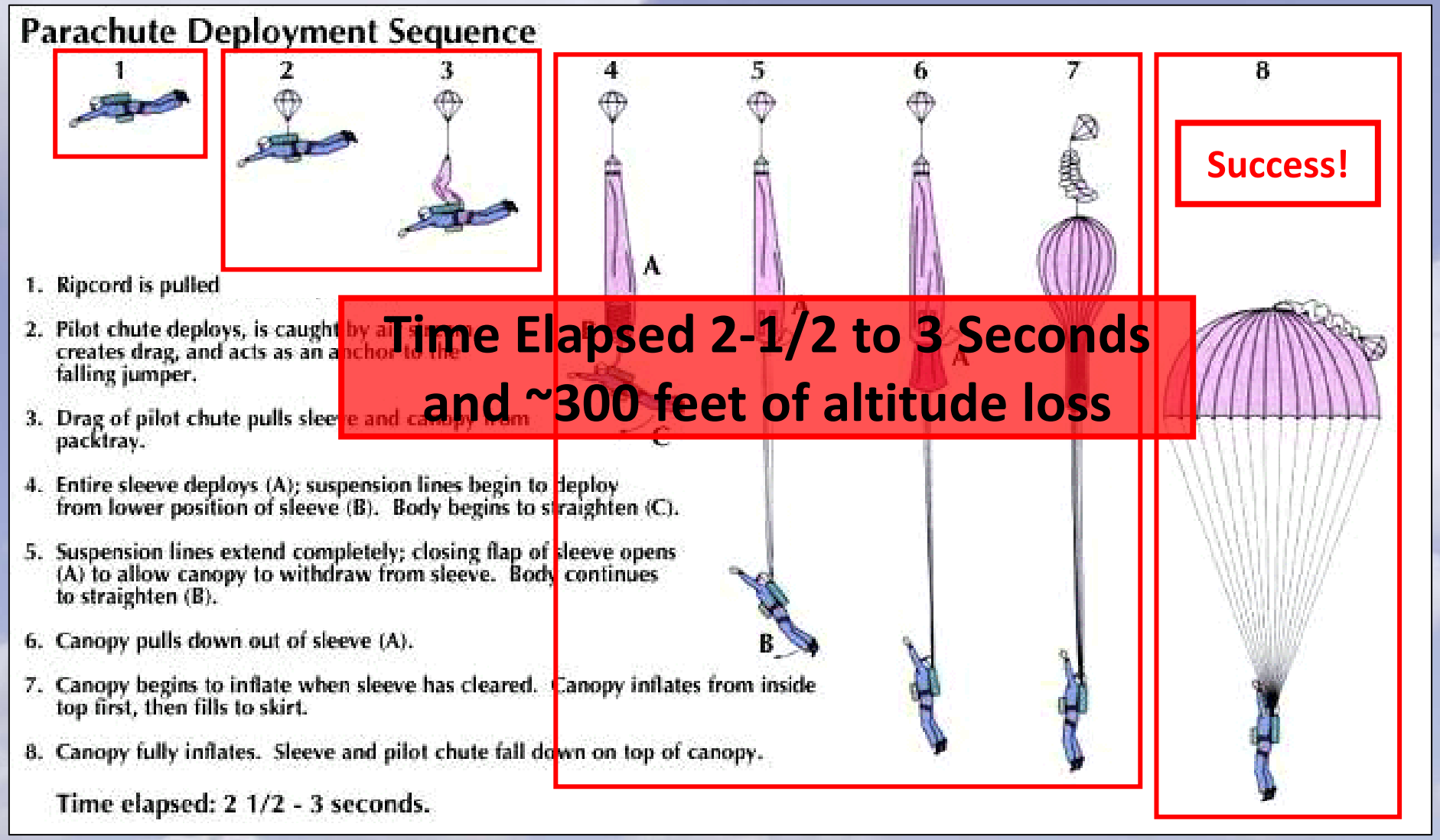
Sport "Ram-Air" Parachute

Not recommended for glider pilots

A "Sport" parachute canopy flies like a wing. This makes them more maneuverable BUT has a significant higher landing speed which is why they are **"flared"** just before touchdown. These parachutes require <u>professional</u> training before use.

Bailing Out Successfully!

Emergency Parachute Deployment



Time Elapsed 2-1/2 to 3 Seconds and ~300 feet of altitude loss

Parachute Related Videos to Watch

- **EXCELLENT ==> Profession Rigger Explaining What To Do**
  https://www.youtube.com/watch?v=s1Uis0N-hKY
- **Kit Planes Emergency Parachutes**
  https://www.kitplanes.com/emergency-parachutes
- **Dave Nadler – Bail-Out Aftermath (SSA)**
  https://www.youtube.com/watch?v=v8I3A3dqsu0
- **G Dale's Bailout Instruction Video (BGA)**
  https://youtu.be/cDXIxHAmSX0?si=lCi3zdCn8onDdm2H
- **National Parachute Operating Procedures**
  https://www.youtube.com/watch?v=nqpN-zMNJ48
- **Master Rigger Allen Silver Videos**
  https://www.youtube.com/c/aerotvnetwork
  … and search for "Allen Silver"

Bailing Out Successfully!

Parachute Industry Association (PIA)
TECHNICAL STANDARD 135
PERFORMANCE STANDARDS FOR PERSONNEL PARACHUTE ASSEMBLIES AND COMPONENTS
Section 4.3.8

FUNCTIONAL TESTS (Normal Pack - All Types)

Opening Time or Altitude Loss: Using the MOW in pounds and the MPOS in KTAS for all 4.3.8 tests the maximum allowable opening time and the maximum allowable altitude loss on any drop shall be determined from the following formulas.

(a) The greater of **3.00 seconds** or the value determined as follows:
Opening Time Allowed (sec.) = (MOW – 250) * 0.01 + (MPOS/150 * 3.0)
-OR-
(b) The greater of **300 feet** or the value determined as follows:
Altitude Loss Allowed (ft) = (MOW-250) + (MPOS/150 * 300)

MOW = Maximum Operating Weight - MPOS = Maximum Pack Opening Speed

Bailing Out Successfully!

SMAK PAK® Emergency Parachute Harness Items

My Parachute Rig

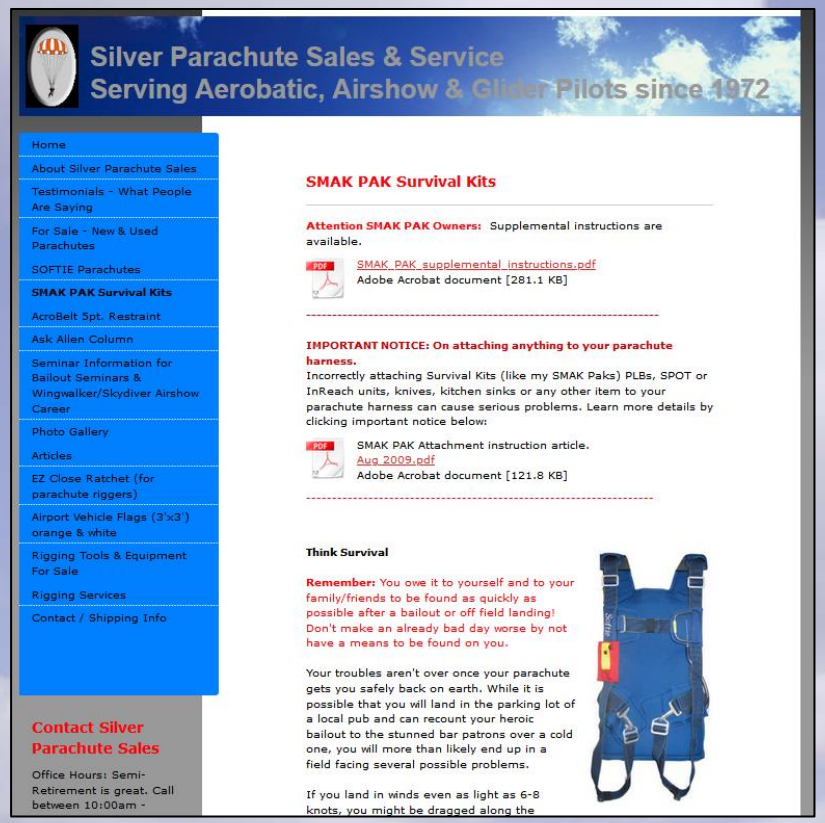
More detailed information about Bail Out Survival Kits

https://aviation.derosaweb.net/presentations/#bailoutkit

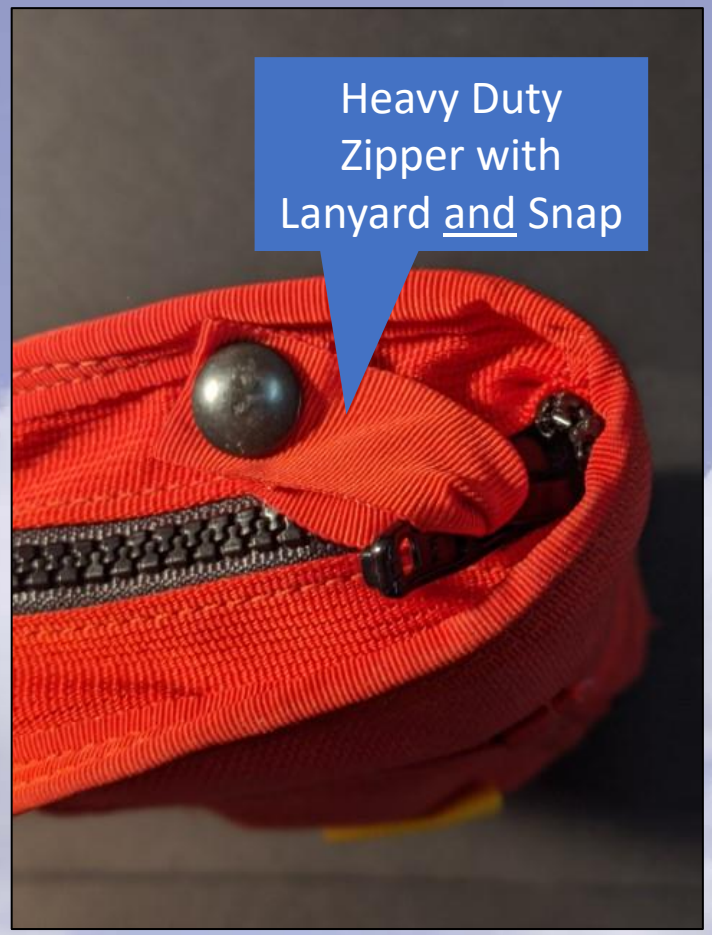
SMAK-Pak® Available From…

http://silverparachutes.com/smak-pak-survival-kits

https://wingsandwheels.com/smak-pak.html



Survival Kits - SMAK-PAK®



Available from:
http://silverparachutes.com/smak-pak-survival-kits
https://wingsandwheels.com/smak-pak.html

Survival Kits – Super Deluxe SMAK-PAK®

My Super Deluxe SMAK-PAK®

Standard Contents

- **Strobe on lanyard**
- **Hook Knife on lanyard**
- **Space Blanket**
- **Survival Kit***

*** Survival Kit Contents:** Signal mirror, whistle, fire starters, compass, fishing kit, scalpel blade, duct tape, aluminum foil, wire, safety pins, pencil, and notepad

My Additional Contents

- Small Reading Glasses!
- Money
- Folding Knife (Swiss)

Survival Kits – Midsized SMAK-PAK®

Survival Kits - SMAK-PAK®

My Secondary Medium Sized SMAK-PAK

My Personal Contents

- Emergency GPD Location Device (with instructions)
- Permanent Marker
- Firestarter and kindling
- Folding utility knife
- Paracord
- Handwarmers
- Miniature First aid kit

Other Bailout Kit Suggestions

- Fishing Vest or Zippered pants, (instead of Smak-Pak)
- Small USB Battery Pack
- Jacket
- Miniature held aviation transceiver (Yaesu FTA-250L)
- Multi-tool knife (Leatherman or SOG)
- Food
  - Energy Bars
  - Tootsie Rolls
- Water
  - Sealed emergency pouches
  - Water purifying straw
- Flashlight (LED)
- Medicine (OTC and/or prescribed)
- Static line on parachute
- Parachute components (canopy, shrouds)

See My Other Presentations

- Glider Electrical Wiring
- Battery Power Systems
- Transceiver Troubleshooting
- Oxygen Systems
- Working with Glider Air Lines
- Trailer Wiring & LED Lighting
- Soaring Pilot Relief Systems
- Battery Testing
- Emergency Location Devices
- Survival Kits (Landout & Bailout)
- Removing Painted Lettering
- Working with Pneumatic Lines
- Open Glider Network
- Spar Alignment Tool
- L'Hotellier Fittings
- Carbon Fiber Instrument Panels
- IGC Filename Decoding
- Blanik L-23 Strut Work

http://aviation.derosaweb.net/presentations

Let me know of any comments!