



NTSB National Transportation Safety Board

Office of Aviation Safety

Survival Factors

Was this Accident Survivable?

- Airplane loading in the survivable range
- Survivable space in airplane cabin
 - Parachutists seated aft of intrusion
- Two parachutists survived
- Survival dependent on
 - Restraint use and design
 - Protection from intrusion
 - Protection from objects and other parachutists

Parachutists' Restraints



- Airplane modified to carry up to 22 parachutists
- Single-point restraints attached to sidewall seat track

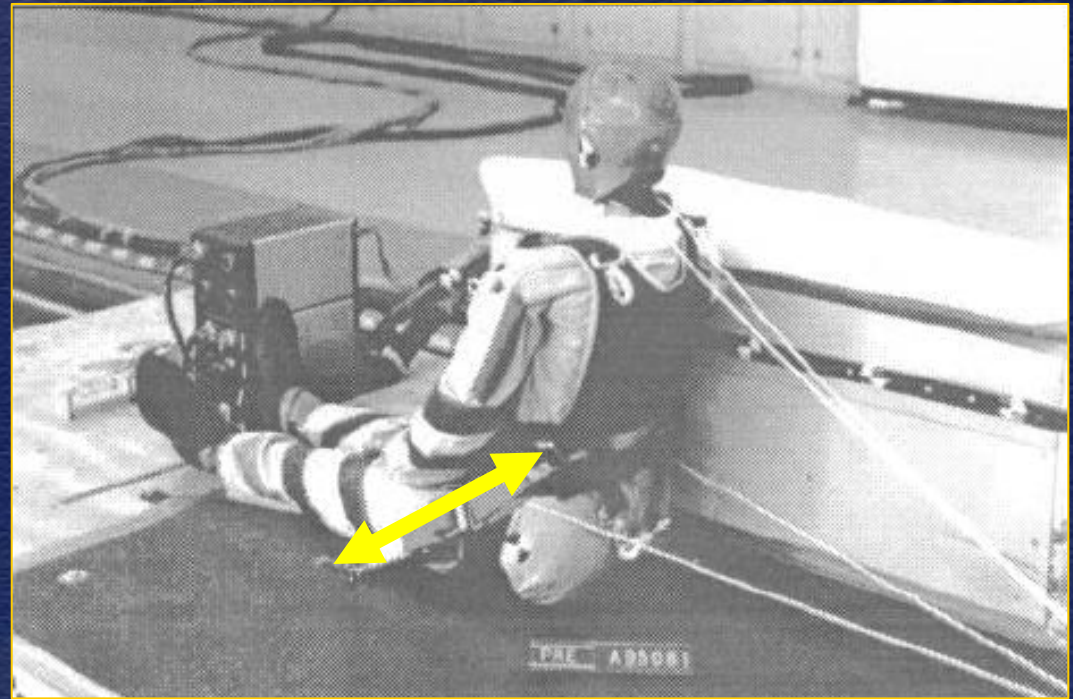
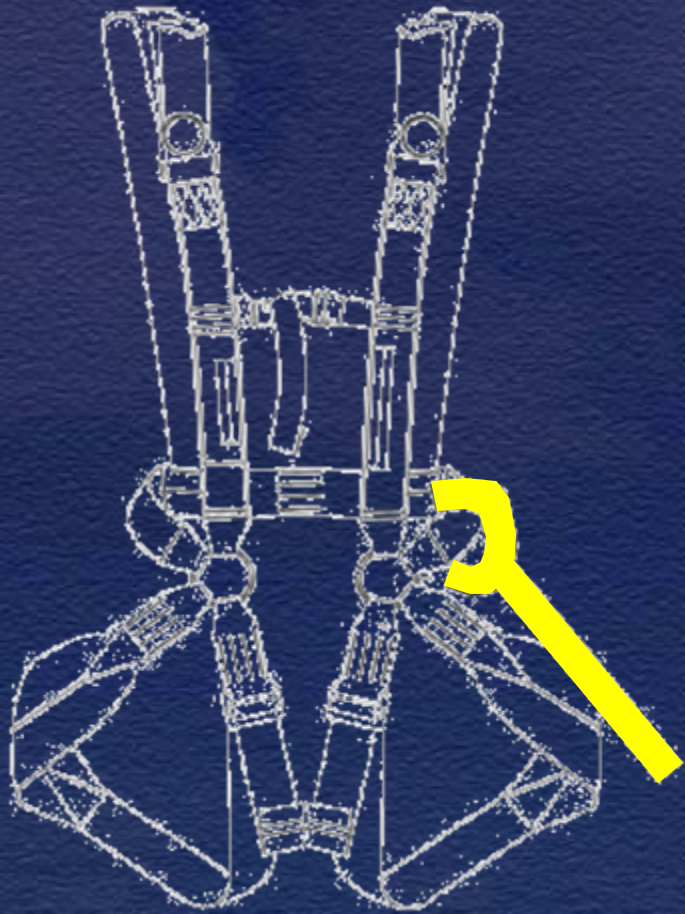


- Designed to pass through parachute harness and anchor to seat track

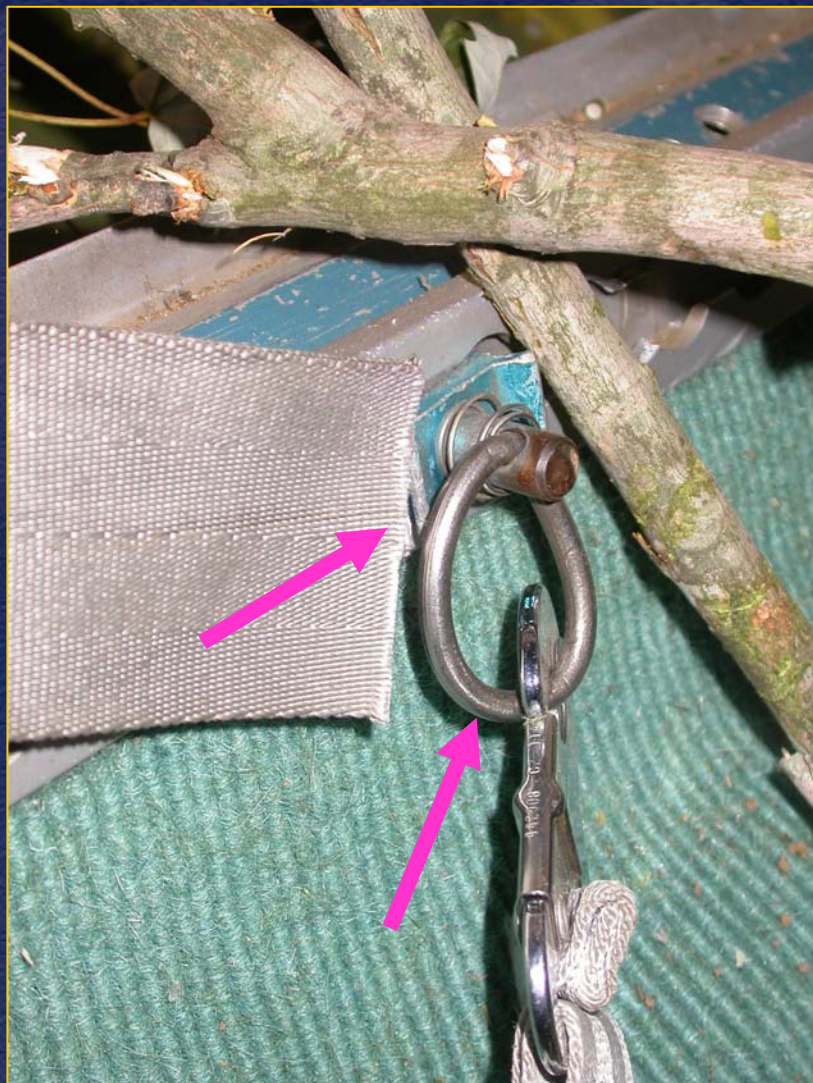
Parachutists' Restraints



Sample Parachutist Restraint



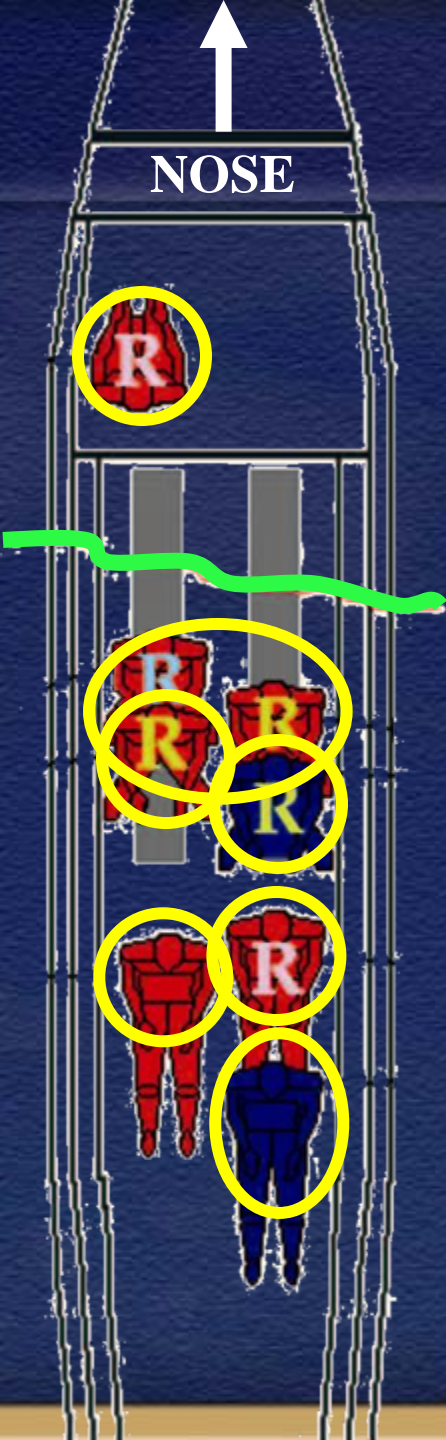
Evidence of Restraint Use



Onboard Helmet Camera Videos

- Aft-facing seating position
- Four parachutists seated on foam block benches
 - Two pairs of tandem jumpers
- Three parachutists seated on floor

Seating Chart



Safety Issues: Restraints

- Previous recommendations (closed)
 - FAA research on parachutists' restraints
- FAA research
 - Single-point restraints ineffective
 - Symmetrical, dual-point restraints function better than single-point restraints
 - Floor mounted
 - Accident airplane could not be configured with a similar symmetrical dual-point restraint
 - Future testing could identify best dual-point restraint method



Summary

- Single-point restraint does not provide adequate restraint
- Fewer fatalities and injuries may result with more effective restraints
- Testing could identify best dual-point restraint



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