# ASRC Seat Harness

## Version 2.0

***Special Presentation to the***
***2019 ASRC Winter Retreat***

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# ASRC Seat Harness - History

- The ASRC Seat Harness was created in 1974 to provide a *simple* & *superior* tied webbing seat harness for SAR, Cave & Technical Rescue Missions & Operations
- The ability to build and use a *validated* tied webbing seat harness serves as a primary training *Essential Skill*, plus a Backup with Emergency Capabilities.
- There were *many* existing tied webbing seat harnesses, but thorough research & assessments discovered that almost all were unreliable, unsafe, ineffective, and sometimes *lethal*!
- Key Functional Requirements:: Safe. Strong. Simple. Tied Webbing (or Rope). Reliable. Flexible. Compact & Light. Fit to User. Adjustable to Everybody. Inexpensive. Suited to almost all Vertical Ropework Needs. Reasonably Comfortable (modest durations). Adaptable to other uses. And many others…
- Safe & Assured User Retention:: Assured Safe during *Inverted Operations.* Endure a *Cut* or *Failure* at any One Spot (Single Point Failure prevented).
- Spanning over *four decades,* the ASRC Seat Harness (v1.0) has become the "*Gold Standard*" across the SAR, Cave, and other technical rescue communities!

# ASRC Seat Harness – v1.0 Design

- There are several specific design features that were carefully selected and incorporated into the original ASRC Seat Harness (v1.0) in 1974.

- Reliability through Redundancy::
  - Multiple *independent* and *webbing* loops.
  - Minimizes impact of (otherwise) *Single Point Failures*, such as from cuts, abrasion...
  - *Primary Connection* (seat carabiner) provided with *multiple loops*

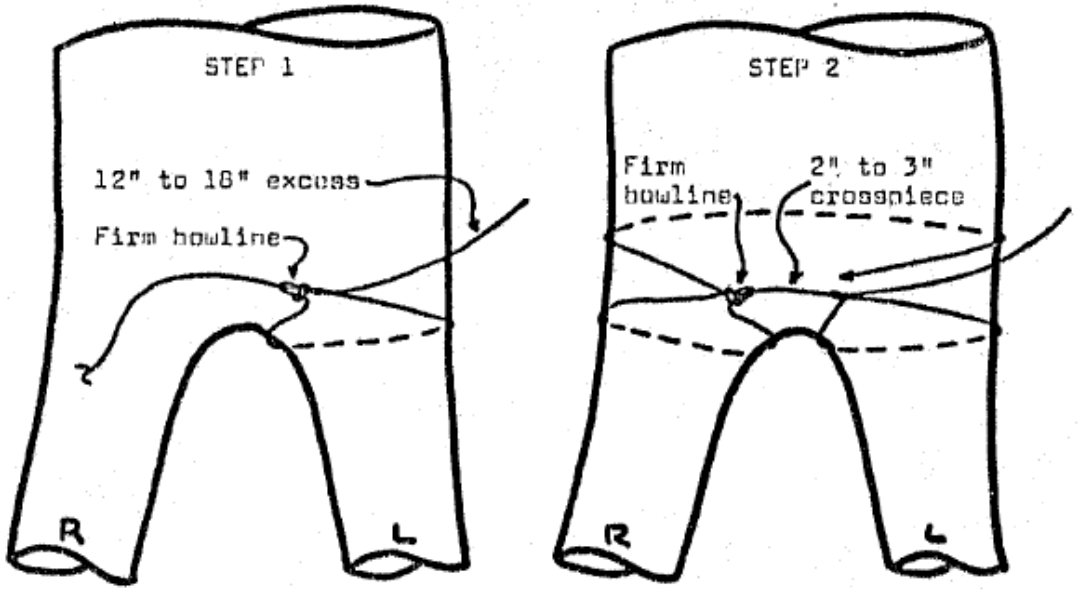
- User Retention::
  - *Reasonable User comfort* during *modest* periods for Rappels, Climbing & Technical Rescue
  - Redundant webbing loops retain User *even if the webbing is cut or fails at any area*.
  - Multiple firm Waist Loops ensure User easily & safely *can operate inverted*

- Simple & Compact::
  - Employs common ropework knots, familiar to all SAR, Cave & Technical Rescue Users.
  - Such as Bowline, Square Knot, Overhand, Halfhitch, Barrel...
  - Each seat harness is *custom fit* to the User, yet *easily adjusted* for anybody else.
  - When constructed in advance, User can easily (& always) carry in field & cave packs.

SEAT HARNESS R-VR/CL(20JUL74GLH)

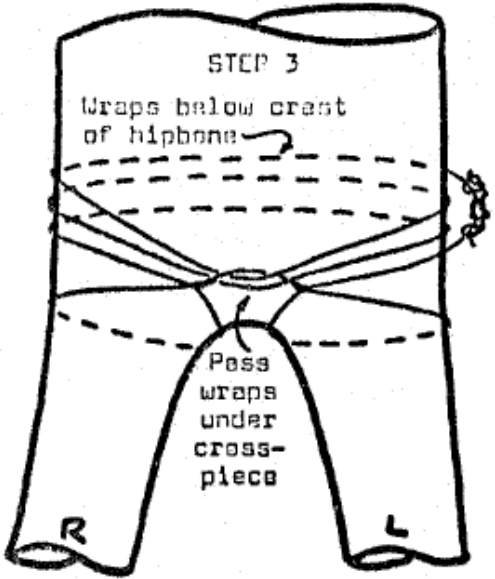
Semi-permanent seat harness using 1" wide tubular webbing:

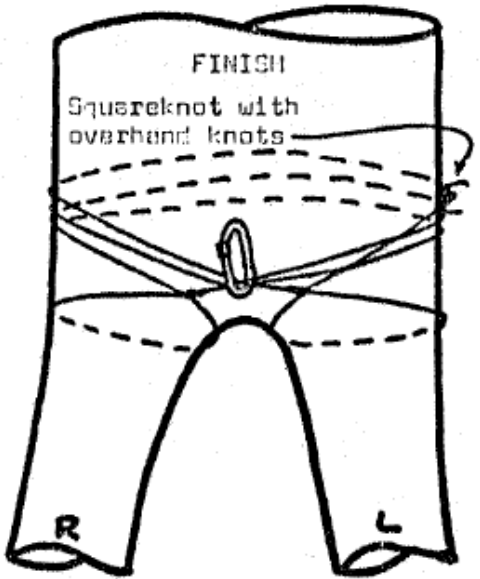
1. Tie a firm bowline high on the left thigh with an excess of 12" to 18" on the short end.
2. Tie a second bowline high on the right thigh with a 2" to 3" crosspiece separating the leg loops. Hand over and rotate the loops to move the crosspiece high in front.
3. Wrap the remaining webbing around the hipbone, just below the crests, passing the end under the crosspiece each time. Tie the ends on the left hip with a squareknot backed up with overhand knots. Secure excess.










# ASRC Seat Harness v1.0 (1974)

- **1 inch tubular webbing,**
- **About 24 feet long.**

- **Simple Knots:**
- **Bowline, Square, Overhand...**

- **Closely spaced Bowline Leg Loops.**
- **Bowlines provide *reasonable***
- ***loading* across four directions.**
- 
- **Crosspiece is Main Load Point for**
- **Primary Connection (carabiner).**

- **Triple-wrap Waist Loops.**
- **Squat and Tighten Firmly**
- ***before* tie-off and loading.**

- **Square Knot Tie-Off**
- **on side *away* from Rappel Rope.**
- **“Binder” knot holds tension in**
- **Waist Loops…**

- **Overhand Backup Knots on each**
- **side of Tie-Off Knot prevents**
- **loosening of Tie-Off.**

# ASRC Seat Harness – v2.0 Update

- *The ASRC Seat Harness has been a proven success for over four decades! And with ZERO reported failures!*
- However, there have been a few issues noted and several improvements proposed. These features are employed in this proposed ASRC Seat Harness (v2.0) in 2019.
- As before, these design features have been carefully selected & incorporated.
- *ALL* of the original v1.0 strengths and capabilities have been retained!
  - Reliability through Redundancy:: Same!
  - Retension:: Same!
  - Simple & Compact:: Same!

# ASRC Seat Harness – v2.0 Update

- PLUS, several features have been added, and capabilities have been improved!
- So whats *New* and *Why*??
  - *Replaced* the Bowline, Square Knot & Overhand …
  - New Design uses Excellent *Figure8* Family!
  - Plus *Barrel*, plus Halfhitch or Sheetbend...
  - *Safety* Issues:: *Figure8* is *much more reliable* than a Bowline in a *multiple force loading* scenario, while always easy to untie afterwards. The Bowline has a *potential* to *upset* with a *cut loop*.
  - *Tie-Off*:: Much *easier* to tie-off *under & retaining tension*, using a *Figure8 Side Loop*!
  - Bonus! The Excellent (*Releasable*!) *Barrel Backup* secures theTie-Off!

# ASRC Seat Harness – v2.0 Design

- The following slides will illustrate the key features of the v2.0 design
- This includes the traditional *one-piece* design, plus an *optional two-piece* compact variant
- And showing the *improved security Figure8* knots
- And easier *tie-off, under & while retaining tension,* using the *Side Loop*
- Plus an improved *Barrel Backup* (in webbing!!) that can also be *released after loading!*

# ASRC Harness V2.0 - ONE-Piece

# 1” Tubular Webbing, > 24 Feet

# *3* Figure8s, 2 Leg Loops, *1* Side

# ASRC Harness V2.0 - TWO-Piece

# 1” Tubular Webbing, > 12+14 Feet

# *4* Figure8s, 2 Leg Loops, *2* Sides

# Sheetbend & Slipped Barrel Backup

# Building the ASRC Harness V2.0

# Centered 6ft From End, Leg Loop ~20” Web

# Leg Loop Figure8, ~11” Loop

# Very Close to Leg Loop Figure8, Side Loop ~12” Web

# Side Loop Figure8, ~3” Loop

# Side Loop Figure8, ~3” Loop

# Sheetbend Tie-Off & Barrel Backup

# Barrel Backup 1 – Formed & Loose

# Barrel Backup 2 – Tail Slipped

# Barrel Backup 3 – Slipped & Tight

# Barrel Backup 4 – Tail Tucked Thru

# Barrel Backup 5 – Slipped & Secured

# ASRC Seat Harness – v2.0 Update

- **SUMMARY**
- *The ASRC Seat Harness v1.0 has been a proven success for over four decades! And with ZERO reported failures!*
- "It ain't broke…!"
- Right! AND it can still benefit from a few *modest updates!*
- The performance of the proposed v2.0 *equals* or *exceeds* that of v1.0, while retaining *ALL* the *simplicity*, *strengths* & *advantages.*
- The proposed ASRC Seat Harness v2.0 provides:
  - Stronger & more Reliable *Integrity under Multiple-Force Loading*
  - *Simpler & Easier* Tie-Off, under improved Waist Loop tension
  - *Stronger Secure* Tie-Off, with *Barrel Backup* (that *releases*!)
  - Option for very compact Two-Piece configuration
- Hmmmm! Does this mean we need a New v2.0 Diagram??

# QUESTIONS??

## DEMONSTRATON?

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