

Next Time Maybe We'll Slow Rope



By Capt. Jason D. Arthaud

Three Ch-46s lower to treetop high and push for the insert LZ. The crew chief signals one minute out. The HRST master signals for the Marines to unbuckle their seat belts and tighten up toward the rear of the aircraft. The HRST master peers over the ramp, waiting for the aircraft to clear the forest and a hover over the LZ.

The helicopter drops to a hover, and the pilot tells the HRST master he's clear to deploy rope. The HRST master shoves the coiled fast rope off the ramp and watches it fall to the ground. Grabbing the first of 12 Marines by his H-harness, the HRST master shouts over the whining engines and roaring rotor wash, "Hands!" The Marine grabs the rope with both hands. "Feet. Go!" The Marine hooks the rope with one foot, as he pivots, jumps clear of the ramp, and disappears, sliding toward the ground. The next Marine steps into position, "Hands! Feet! Go!" One by one, the Marines slide to the ground and sprint for the tree line.

Half of the 12-man stick slides to the ground, and everything seems to be going well. However, the eighth Marine out the door loses his grip. Unable to control the speed of his descent, he zips down the rope. His vain attempts to brake are interrupted when he slams into the head and hands of the Marine on the rope beneath him. The collision knocks both Marines from the rope, and they fall about 12 feet to the ground, one on top of the other. Peering over the ramp, the HRST master sees the crumpled bodies writhing in pain on the ground and waves for them to get out of the way.

Nearly a minute has passed, and four Marines are still in the hovering helicopter, two are injured on the ground receiving buddy-aid and being helped out of the way. Without a shot being fired, the 12-man assault element is reduced to four Marines. Luckily, it's only training, so observers shake their heads, mutter among themselves, and call for the safety vehicle to bring up some backboards. The four Marines still on the helo eventually rope to the ground, the clock is reset, and the mission continues minus two Marines who wait for a ground medevac.

Since 1996, we've had 22 reports of fast-roping mishaps; improper braking and landing techniques caused 19 of them. Nine of these "brake failings" caused fractured backs, legs, knees, ankles, and feet. While few fast-rope injuries prove fatal, they occur at the worst possible time—during insert. Marines injured during insert pose a tremendous liability, as the unit intends to move rapidly away from the landing zone, often directly into an assault. Halting an operation to treat injuries isn't practical, and, depending on the insert site, an air medevac may not be possible until actions on the objective are complete, and the unit can transport injured Marines to a suitable LZ.

Marines are often required to carry too much gear and often overestimate their ability to slow and land properly when wearing it. In a typical out-of-control descent, the Marine's feet come off the rope, and his arms are stretched out straight above his head. When out of position like this, it's hard to look down, see the rope, or establish a foot brake. Also, looking up makes it impossible to tell when other Marines are beneath you or when to bend your legs for landing.

Other fast-roping tricks to avoid:

- **Don't land hard.** Whether going too fast or sliding out of control, the result is the same. The shock

from impact has snapped knees, legs, ankles, and feet. When Marines realize they are falling, they instinctively tense and lock their legs; this makes the landing even harder on their joints.



• **Don't hit each other.** This can happen when too many Marines are on the rope at the same time and when they descend at different speeds. The HRST master should make sure Marines are spaced at 10-foot intervals.¹ Since you should be looking down, not up, base your descent speed on that of the Marine below you; if he slows down, you slow down.

• **Get out of the way!** It's OK to fall down and roll away from the rope. You may lose cool points lying on your back, pawing at the air like a flipped

turtle, but if you use momentum from your fall to roll, you'll at least be out of the way. To end any slide, flex your legs to cushion your landing. When out-of-control or heavily loaded Marines land, they often sink to a low squat, with their butt on their heels or the ground. Instead of using momentum to roll out of the way, they cling to the rope and try to pull themselves upright. Just about the time they succeed, they're stomped flat by the next Marine coming down the rope. To prevent this, stress the importance of getting

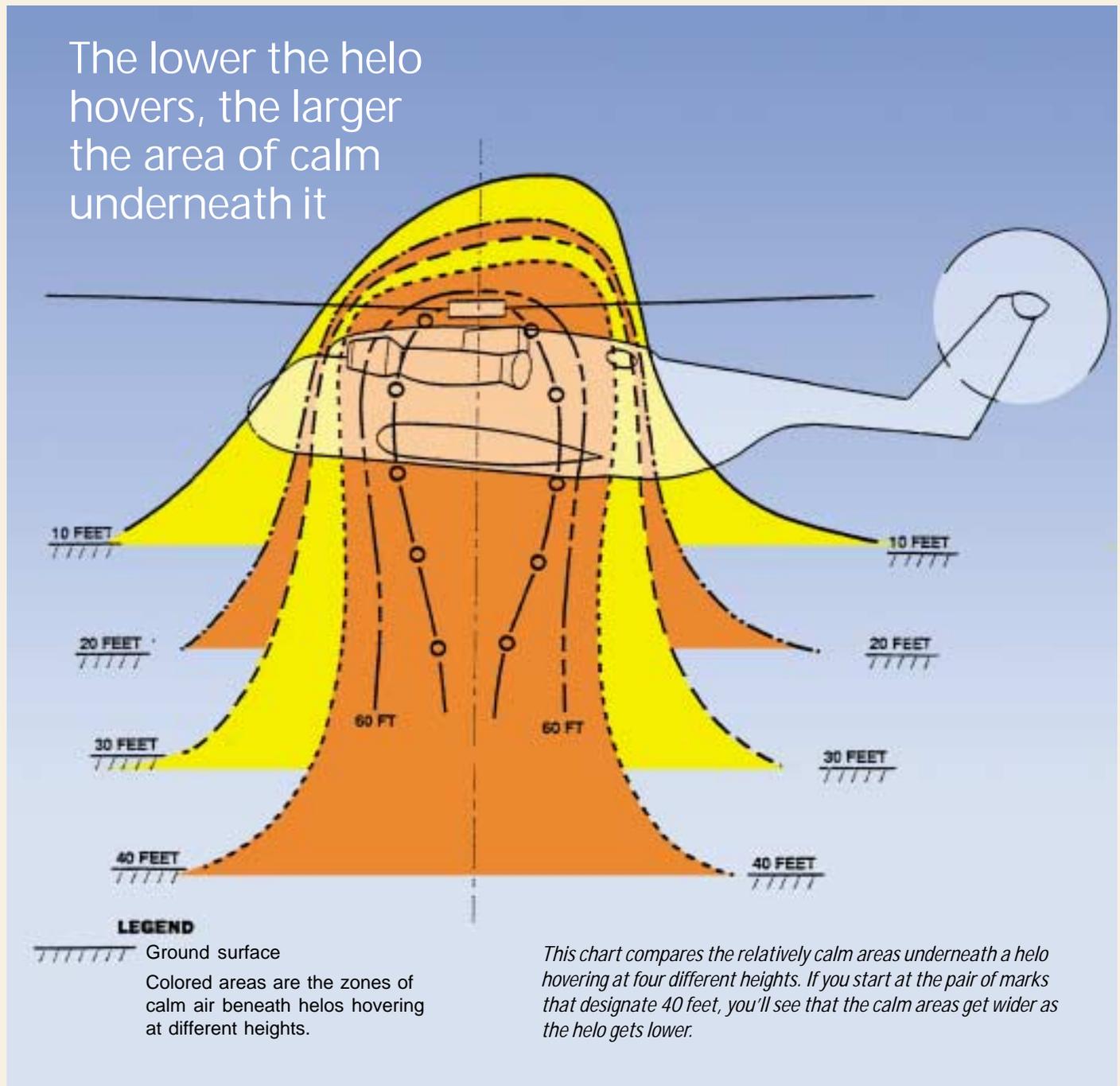


Figure 1.

away from the rope, and enforce it. You can task the first Marine down to remain at the base of the rope to assist each roper, or “bump” and have each Marine assist the roper behind him. This may not be feasible all the time, but it keeps fallen Marines out of the way and dog piles to a minimum.

- **How low can you go?** The lower the better—the helo pilot should land if he can. The insert unit determines fast-roping height. However, pilots prefer to hover in ground effect because it increases their available power. Ground effect altitude is roughly equal to the rotor diameter—UH-1=48’, CH-46=51’, CH-53E=79’.² Within the ground-effect range, it may be necessary to vary altitudes up or down to avoid obstacles. Antennas, power lines and trees may interfere with the rotor blades; trees, brush, and other ground debris may snag on the rope. The ground may be obscured in dusty or snowy environments and the helo pilot may have to adjust his altitude. Higher isn’t necessarily better, because in some environments, it may make the dust cloud worse or more difficult for the aircrew to maintain hover-holding reference points.³

- **Don’t blow me down.** Rotor wash will affect fast-ropers and may cause the rope to whip around at certain altitudes. However, the effects of rotor wash directly beneath the helicopter are less at lower hover altitudes than at higher ones. Reference 1 says if your rope starts to whip, you may need to adjust elevation. Pilots won’t be fooled, but this is potentially misleading if used as a planning concern by ground operators. The “higher hover would reduce” statement is generic and includes lighter rappel ropes and other HRST operations. Fast ropes are heavy, and lowering the helicopter widens the rotor-wash dead-air area, and the helicopter will shield ropes and Marines directly beneath it. Regardless of the altitude, if a rope starts to whip, have a Marine hold it. Because of the way aircraft weight, rotor wash and hover altitudes interact; unless the altitude is 70 feet or higher, Marines won’t be blown down the rope by rotor-wash. Since the air is dead directly under the helo, Marines are blown around mainly when they move away from the aircraft and run toward the end of the rotor blades (Fig 1).

- **Spread ‘em.** Watch the ground during descent; spread your legs and place your feet clear of the rope, rocks and other Marines. Landing with your feet

together will cause you to fall over. Plus, if you land on the rope with one foot while your other one is still in the air, all of your weight will be on one foot—forcing it to roll, sprain or break.

- **Don’t miss the boat.** Pilots have been known to move helicopters vertically or slide during a hover. If you don’t look down and control your descent, how will you know the ship or building rooftop is still beneath you? If you fail to notice and stop, you’ll hit the end of the rope and fall 20 to 30 feet into the ocean or onto a paved street. During descent, be prepared to stop and lock-in by wrapping a leg around the rope as if climbing an obstacle-course rope. When the helo slides back over the target or lowers the rope back to the ground, loosen your brake and continue. This can be practiced on the tower; have Marines force them to look down stop on signal from the ground. This will demonstrate their ability to halt and lock-in. If they can’t, they are descending too fast or their technique needs refinement.

- **Grab the rope first.** Do not mount the rope until the HRST master commands, “Go.” Hold onto the aircraft until you have one hand on the rope. If handholds aren’t readily available, the aircrew can rig some from the overhead. Do not step from the aircraft before grabbing the rope with both hands. If necessary, don’t start your descent until both feet are on the rope. If you don’t grab the rope and are strong enough to grab it and stop yourself on the way down, see figure 2, and go join the circus.

- **Don’t hang up.** Machine gunners, SAW gunners, mortar men and assault men are notorious for snagging weapons, accessory bags and boxes on other Marines and the aircraft. Develop a standardized packing method to make sure weapons and all gear is securely strapped down; this is especially critical during night operations. If you have a gear-bomb Marine in front of you, make certain his weapons and equipment don’t hook you or your equipment—if he does, he may jerk you out with him. When you step from the aircraft to exit, turn sharply 45 to 90 degrees; this should keep your pack and weapon from hanging up on the ramp or interfering with the rope. If you do get hung up on the aircraft, do not let go of the rope or attempt to untangle yourself! You need to hang on for dear life as the HRST master will kick and stomp you through the hole, pull you back, or cut offending straps and slings.



Photo by Cpl. Thomas Michael Corcoran

Marines often don't strip excess gear and pack it prior to roping operations. Since weapons may be needed upon reaching the ground, keeping them secure yet readily available is a question best answered during rehearsal, not after the one-minute warning inside a cramped helicopter. One of the more disturbing mishaps occurred when a Marine fast roped to the ground and gored himself on his M16-A2 service rifle. His buckle or J-hook on his rifle sling popped loose when he left the helicopter. His weapon then fell ahead of him and stuck in the ground, muzzle up. The Marine descended on top of it, and it pierced his rectum, punctured his intestines, and damaged other internal organs.

Most fast-rope mishaps and injuries are caused or aggravated by excessive speed. "Ropers will execute descents at speeds commensurate with their experience and proficiency in fast-rope operations".¹ This may tempt Marines who don't have "experience and profi-

ciency" to go faster than they are really capable of controlling.

Minor injuries will result from fast-rope operations. While a few bruises, scratches, sprains, and rope-burns may be acceptable, falls, severe burns, and broken bones are not. Identify Marines with questionable technique and correct them on the tower. A Marine should be able to stop on the rope while carrying a 40-pound load. He should then be able to lock-in and hold himself on the rope for 20 seconds.² If Marines can't, and you send them down the rope with a weapon and a full combat load, have some stretchers ready.

¹ MCRP 3-11.4A Helicopter Insertion/Extraction

² TC 21-24 Fast-Rope Insertion and Extraction

³ Capt. Doug Glasgow, MAWTS-1 CH-53 Tactics Instructor

⁴ Capt. Chris Connelly, MAWTS-1 CH-46 Tactics Instructor

⁵ TAR304-1 (12-96) Fast Rope

Individual Technique:

- 1. Grasp the rope firmly with both hands when descending. Do not attempt to climb down hand over hand, instead, let the rope slide slowly through your hands.*
- 2. Upon exiting a UH-1, turn 45 to 90 degrees so your equipment does not get caught on the helicopter ramp or skid.*
- 3. There are three points of contact available on the rope to control your rate of descent: hands (primary), knees and insteps of feet.*
- 4. Do not allow your arms to straighten. Keep your hands at face or neck level.*
- 5. Keep your knees bent; although you should be able to land standing up, a bent-knee position will absorb the shock of a descent that is too fast and allow you to roll out of the way of team members if necessary.*
- 6. Watch the ground throughout your descent. If the helicopter begins to climb while you are descending, you will have to stop your descent by "locking in." This is accomplished by wrapping one leg once or twice around the rope and standing on the fast rope with the other foot.⁵ 🌀*

Figure 2

Grab the rope with your hands before leaving the aircraft! If you just reach for it, thinking you'll jump and grab it on your way down, think about this: Can you catch a bullet?

| Elapsed Time (Sec) | Fall Distance in feet | Speed, feet per second | Kinetic energy of 200lbs (170lb Marine with 30lb load) | Equivalent muzzle energy |
|--------------------|-----------------------|------------------------|---|--------------------------|
| 0.2 | 0.6 | 6.4 | 129 ft-lbs. | .22 LR |
| 0.3 | 1.4 | 9.7 | 290 | .38 + P |
| 0.4 | 2.6 | 12.9 | 515 | .357 mag |
| 0.5 | 4.0 | 16.1 | 804 | |
| 0.6 | 5.8 | 19.3 | 1,158 | 5.56mm |
| 0.7 | 7.9 | 22.5 | 1,577 | |
| 0.8 | 10.3 | 25.7 | 2,059 | |
| 0.9 | 13.0 | 29.0 | 2,606 | 7.62mm |
| 1.0 | 16.1 | 32.2 | 3,217 | 30-06 |
| 2.0 | 64.3 | 64.3 | 12,870 | 50 cal. |

This chart shows the amount of kinetic energy possessed by a Marine (relative to the rope) traveling at various speeds and compares it to the muzzle energy of selected cartridges.

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