

Single Rope Technique (SRT)

By Jeff Jepson

The single rope technique (SRT) employs a static climbing line system and is used as a means of canopy access only.

The SRT is hard to beat when the climb is long or when the rope cannot be isolated around a single limb. This is often the case when installing lines in tall conifers or thickly crowned deciduous trees. Many of the same working and descending limitations that exist when footlocking on a doubled line apply to the SRT as well.

The suggested equipment, procedures, and techniques presented on the following pages are but a few of many options available for climbing a single line. For more information on SRT see the book *On Rope*, by Smith/Padgett.

Climbing Line Anchoring Precautions

There are concerns and potential hazards that exist when the climbing line is anchored to the base of the tree that do not occur when anchoring the line to the limb itself. Climbers need to be aware of the loading forces that occur on the branch or crotch that is redirecting the climbing line (see figure 1a) to an anchor point below (2a, 2b). This situation exposes the redirecting limb to twice the load that would occur if the rope was anchored to the branch itself (3).

For example, if the climber weighs 200 pounds, that means 200 pounds will be on the load “leg” of the climbing line (1b) and 200 pounds on the tension leg (1c). This exerts a total of 400 pounds of static load on the limb redirecting the rope (1a). It is critical therefore, that the tie-in point selected is strong enough to support this



Christina “Chrissy” Spence of Gisborne, New Zealand, won the title of Women’s International Tree Climbing Champion at the International Society of Arboriculture’s 29th International Tree Climbing Championship in Nashville in 2005. Spence climbed on Yale Cordage’s XTC line for the competition. The climbers demonstrated their ability to quickly, professionally, and safely maneuver in a tree while performing work-related tasks.

increased load.

Secondly, the climber must take precautions against cutting the tension “leg” of the climbing line (1c) with a hand saw or chain saw. Many SRT climbers avoid this potential entirely by reserving use of the climbing line as a means of access only.

Work is only performed after tying in to a more suitable climbing system. If it is necessary to perform limited work with any type of saw during the ascent, the risk of cutting the line can be greatly reduced by using brightly colored rope (for better visibility) and anchoring the line in such a way that it is in full view. In addition, it is

SRT Procedure

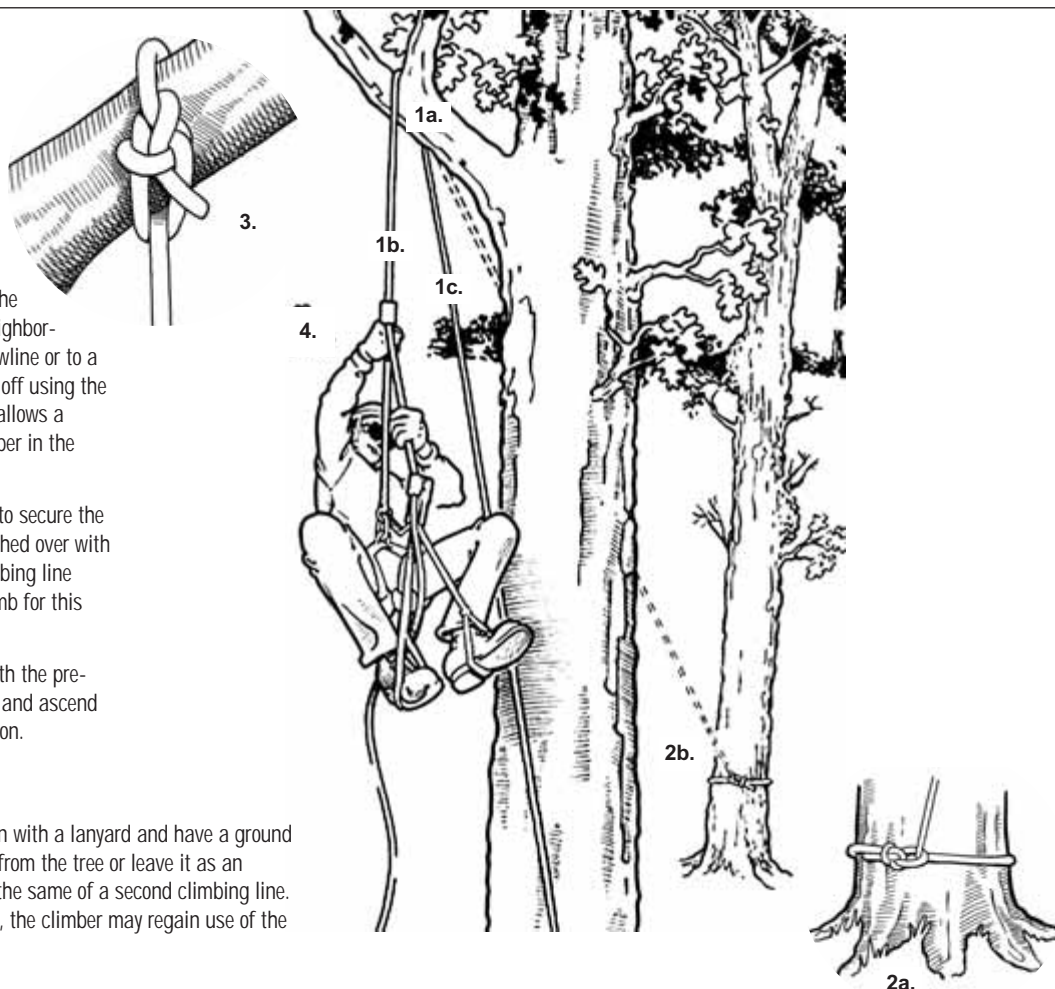
1 Install the climbing line over a suitable crotch (1a). With the SRT, it doesn't matter if the rope runs through several crotches.

2 Secure the climbing line to the base of the tree (2a) or a neighboring tree (2b) with a Running Bowline or to a figure-8 descending device tied off using the "hard lock" method. A figure-8 allows a ground person to lower the climber in the event of an emergency.

3 Another anchoring option is to secure the rope to the branch it is crotched over with a Running Bowline (3). The climbing line must be isolated around that limb for this method to be effective.

4 Tie in to the climbing line with the preferred ascending system (4) and ascend the rope to the desired destination.

After reaching the canopy, tie in with a lanyard and have a ground person clean the anchored rope from the tree or leave it as an access/rescue line. Tie in using the same of a second climbing line. If anchoring option #3 was used, the climber may regain use of the rope by untying the Bowline.



imperative that the climber tie in with a second means of attachment when operating the saw!

Selecting an Ascending System

The single rope climber has a variety of equipment and ascending systems from which to choose, each one offering a different level of efficiency and safety. There is, quite literally, a climbing system suitable for anyone, regardless of age, weight, or strength. For these reasons, the SRT is the preferred method with recreational tree climbers and becoming increasingly popular with professional tree climbers as well. Experience is the best teacher in determining which ascending system best meets the climber's needs. There are however, certain criteria to help the climber make that selection and design an ascending system. The sys-

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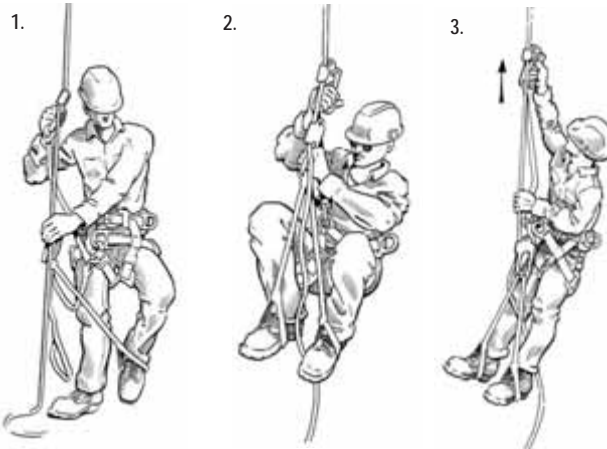
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The "Sit-Stand" Method

1 Place ascenders on the rope and attach the climbing system to the climbing saddle. Take up slack in the system.

2 Hang or sit from the upper ascender while raising both legs and the lower ascender at the same time.

3 Stand up in the foot loops and advance the upper ascender. This sequence of "sit and stand" is repeated until the destination has been reached.



"Rope Grab" Options



Footlock



Foot ascender



Foot loop

Helpful Hint: To make ascending easier, anchor the running end of the rope to a chain saw or have a ground person hold it taut.

tem, along with its components should:

- ▶ grab the rope securely and allow for easy upward movement.
- ▶ allow the climber to use the major muscle groups for most of the effort.
- ▶ enable the climber to stop while enroute to rest or perform limited work operations.
- ▶ provide at least two attachment points for means of ascension, as well as fall protection, to secure the climber's position in the event that one point fails. The "sit-stand" method (see second illustration) satisfies these requirements.

SRT Ascending Options

All SRT ascending systems incorporate at least two attachment points on the rope by which the climber alternates

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weight transfer. These attachment points are commonly referred to as “rope grab” devices, such as mechanical ascenders and friction hitches, or techniques, such as footlocking.

When the climber’s weight is applied to one rope grab, it becomes possible to advance the other one, thereby advancing the climber’s position as well. However, not all rope grab or attachment point options provide fall protection (e.g., footlocking, foot loop). In those cases it is strongly recommended that the climber add an additional point of attachment that does.

The second illustration shows the popular “sit-stand” method (which provides two means of fall protection) and several rope grab options which create a combination of at least two points of attachment.

Tools of the Trade: Ascenders

Ascenders are a rope grab device that have found favor among tree climbers because of their efficiency and versatility. There are two main groups of ascenders: cammed and toothed.

Cammed Ascenders

The most commonly used cammed ascenders (Gibbs, Macrograb, Microcender) consist of a shell that houses a grooved cam which, when activated, grips the enclosed rope. Cammed ascenders are commonly employed as lanyard adjusters. Some types of ascenders are well suited for fashioning a foot ascender providing an outstanding means for hands free ascending on a single line. Another type of camming device, referred to as the “Footlocker,” consists of a pair of cams combined in a single shell, providing a self belay when foot-



Paired ascenders secure the climber to the rope while footlocking.

 An advertisement for Buckingham Manufacturing Company. The background is a photograph of an arborist climbing a tree. Overlaid on the image are several pieces of climbing equipment:

- Lanyards:** Two lanyards are shown at the top, one with a red carabiner and one with a blue carabiner.
- Arborlite Saddle:** A white and grey climbing saddle.
- Glide II Saddle:** A blue and white climbing saddle.
- Throw Line Bag Model 4468P1 [9"H x 12"D]:** A blue and black bag.
- Tear Away Chainsaw Lanyard:** A red chainsaw with a yellow lanyard.
- Titanium Cleated Climber Model TB95089S:** A pair of climbing shoes.
- Other gear:** A pair of gloves and a pair of safety glasses are also shown.

 The text "Tools of the Trade for the Professional Arborist" is written in a large, green, stylized font across the top. At the bottom, the company name "BUCKINGHAM MANUFACTURING COMPANY INCORPORATED" is written in a large, green, serif font, with "SINCE 1896" in a smaller font to the left. Contact information is provided at the bottom right.

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locking a doubled climbing line.

Toothed Ascenders

Toothed ascenders rely on small spike-like teeth on a moving cam to provide the grip on the rope. Some designs have handles to grip and operate the device. Handled ascenders have become standard equipment for the SRT and when climbing a doubled line while footlocking. The pre-drilled holes in the shell allow for joining two ascenders together (for climbing a doubled line) and attaching footloops, slings, and straps.

Ascender Precautions

Accidental opening: Keep leaves, twigs, and debris out of and away from the spring and camming mechanism to prevent accidental opening. The climber's hands should be below the camming device during the ascent.

Removing ascenders from the rope:

When removing toothed ascenders from the rope, take care to prevent the teeth from "picking" and pulling out the rope fibers. By design, the cams on the ascender can only be opened after the load has been relieved.

Ascender backup: Some ascenders require a backup means of fall protection. Doubled ascenders, for instance, do not provide twice the protection when used in the manner illustrated above. If one ascender fails, the entire system fails. One method of backing up ascenders entails tying a Prusik loop above the ascender with a friction hitch. The loop is secured to the climber's saddle with a carabiner. This arrangement enables the ascender to advance the friction hitch as it is raised. If the cams on the ascenders open or fail to grip the rope, the Prusik loop will provide fall protection.

Excerpted from The Tree Climber's Companion by Jeff Jepson. ⬆



The Tree Climber's Companion
By: Jeff Jepson

This compact, field-sized reference and safety manual for climbers features illustrations by Bryan Kotwica. Revised and expanded edition includes: "Tools of the Trade," Revised Climbing System (PREP), "Tying In" procedure, climbing with climbing spurs, ascending and descending techniques, more knots (including the French Prusik), safety standards and more.

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