

**Chapter 7**

**LETDOWN PROCEDURES**



## LESSON PLAN OUTLINE

### **PROGRAM: SMOKEJUMPER**

### **LESSON: LETDOWN PROCEDURES**

**OBJECTIVES:** Upon completion of these lessons, the trainee will be able to safely and efficiently descend to the ground from the letdown simulator using approved procedures and techniques. These techniques will also be carried forth into the smokejumping environment.

**INTRODUCTION:** Often smokejumpers, either intentionally or unintentionally make timber landings when parachuting to smokejumper missions. Executing a quick, safe letdown is essential if the smokejumper is to reach the ground safely. To avoid the risk of serious injury or a fatality, it is imperative that the trainee follow **ALL** of the correct procedures.

### **I. LETDOWN PROCEDURES**

- A. Trainees should view the slide tape or a video illustrating proper letdown procedures.
- B. Trainers will demonstrate the proper coiling of the letdown tape or rope. It is necessary to have a tape that can be dropped from 150' or more and deploy without tangling. A birdnest coil or rope bag are the approved methods of stowing the rope or tape.
- C. Demonstrations and training should be conducted using the following tested and approved letdown procedures and standards. Two basic letdown systems covered in this lesson are both capewell release letdowns. Both systems employ the use of a carabiner but one system used the carabiner as an integral part in the event of a two tape letdown or the need to tie off during descent.

D. Have an experienced smokejumper demonstrate a correct letdown as the instructor verbally explains each step. Demonstrate the letdown completely.

**E. Capewell Release Letdown with a Tie-Off.**

1. This letdown method employs the use of a locking gate carabiner which is attached to the standard smokejumper suit. The carabiner is attached by running it through the same look that attaches the right friction ring (or 'D' ring) to the jump pants. The mechanics of making this letdown follows:
  - a. Make sure the parachute is securely hung in the tree. If not, the jumper should attempt to pull themselves over to the tree trunk or a large live limb (+3") and tie off there. All movements should be careful, smooth, and fluid.
  - b. Starting at the top and working down, the jumper will check suspension lines around the helmet, under the chin, arms, legs, and harness. Make sure all lines are clear of the body.
  - c. Do not remove helmet or gloves. They will be needed during the descent for protection against limbs and rope burns.
  - d. Release the following in order from top to bottom:
    1. The FS-14 reserve parachute by releasing both safety pins and riser snaps. Release the bottom right fastex snap, but not the left one, which allows the reserve to hang by the left fastex. Let the reserve hang to the left.
    2. Release the right fastex snap on the PG bag and allow it to hang by the left fastex. If a small carabiner is used as a safety device, release the carabiner from the handle of the PG bag now.
  - e. Pull out the friction rings sewn into the jump pants and make sure they are not twisted. The carabiner should also be pulled out at this time. The carabiner should be to the outside of the right friction ring with the gate up and the opening away from the jumper (Figure 1).



Figure 1

- f. Reach into the right leg pocket and pull out the running end of the letdown tape. Make sure to leave the rest of the tape in the leg pocket until the risers are tied off. This will ensure that the tape is not dropped and lost. (Leaving this pocket ties will ensure against dropping the tape). Pull out about six to ten feet of tape.
- g. Pass the letdown tape through the friction rings two or three times depending on body weight. (Two wraps are sufficient for most jumpers however those over 190 lbs. may want to try three wraps).

**ALWAYS** insert the tape into the rings from right to left (Figure 2).



Figure 2

- h. Starting from the inside, thread the tape between the 'V' formed on the tight riser. Starting around the back, continue with a complete circle around the riser. Finish off by tying a minimum of three half hitches and leaving at least a 12" tail. (Figure 3).



Figure 3

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- i. Tuck the tail between the riser so it not be in the way later.
- j. Take up the slack in the tape between the tight riser and the friction rings by:
  - a. Grasping the tight riser with one hand and the tape below the friction ring with the other hand and then,
  - b. Simultaneously perform a one arm pull up on the tight riser, taking up the slack with the other hand.

### **REMEMBER – SMOOTH, FLUID MOVEMENTS!**

- k. While hanging onto the tape, with slack pulled up, untie the the leg pocket. Make the tape makes it to the ground and is clear of obstacles. The descending tape should run between the jumper's legs.
- l. Catch the running end of the tape with the heel of the right foot. Reaching behind, the jumper grabs the tape with the right hand and brings it up on the outside of the right thigh. (Figure 4).



Figure 4

- m. Take the running end of the tape and pass it through the gate of the carabiner while maintaining continuous tension on the tape with the right hand to keep the tape taut. (Figure 5).



Figure 5

- n. Pinch the tape off at the carabiner with the left hand. With the right hand, form a loop and push running end of that same loop **UNDER**, then **OVER** the tape that is running up from under the thigh. Continue by passing the same end through the original loop, thus forming a slipknot. Pull the slipknot snug to the carabiner and finish off by maintaining at least a 12” tail. (Figures 6 through 10).

Figure 6





Figure 7



Figure 8



Figure 9



Figure 10

- o. **FINAL CHECK.** This jumper should stop and do a deliberated final four point check. This check consists of:
1. Checking to make sure the correct tie is made at the risers.
  2. The tape is routed properly through the friction rings in the proper manner and the proper number of wraps have been made.
  3. Check to make sure that the tape runs under the leg and through the carabiner and is properly tied off.
  4. Do a final check for any suspension lines to make sure there is no possibility of becoming entangled once the capewell release has been initiated.
- p. Begin the capewell release by reaching up to the loose riser with the hand on the loose riser and do a one arm pull up while simultaneously releasing the capewell fitting with the other hand. (Figure 11).



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- q. Release the tight riser by reaching up to the tight riser with the “tight riser side hand”, place hand in ‘V’ of riser, do a one arm pull-up while simultaneously releasing the capewell fitting with the other hand. **SMOOTHLY** transfer the body weight from the riser to the letdown tape. (Figure 12).



Figure 12

- r. The jumper is now hanging by the letdown tape but is being held securely by the slipknot at the carabiner. (Figure 13). To release the slipknot the jumper grasps the tape at the outside of the thigh firmly with the right hand and the running end below the slipknot with the left hand. (Figure 14).



Figure 13



Figure 14

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- s. With a smooth strong outward thrust with the left hand, the slipknot will be released. (Figure 15).



Figure 15

- t. The right hand can now release the tape at the thigh and is moved up to where the left hand is holding the running end of the tape. Keep both hands on the tape for maximum control. (Figure 16).



Figure 16

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1. Rate of descent can be controlled by exerting pressure on the tape. **BE SMOOTH!**
2. Remember to avoid sudden stops as this could dislodge the canopy from the tree. **KEEP** hands out away from the carabiner to prevent gloves from getting tangled.

DO NOT descent too rapidly as this will have the potential to burn the tape. Remember to keep your helmet and gloves on during letdowns!

### 2. Tie-off procedures.

- a. When using the carabiner letdown system, it is possible to tie off during the descent thereby freeing both hands should the need arise. (The need for a tie off may arise in the case of shroud line entanglement, injury or need for a two tape letdown). The procedure is as follows:
  1. Stop descent by grasping the running end of the tape with your left hand 4 to 6 inches in front of the carabiner and hold firmly.
  2. With the right hand, make the same slipknot used during the original procedure before the capewell release step.
  3. Keeping a hold of the slipknot tail, pull up on the loop and let the weight draw the knot smoothly up to the carabiner.
  4. To release the tie, grasp the tape that goes around the thigh with the right hand below the carabiner and then release the slipknot with the left. (Note: The knot and knot release are the same as those used in the initial release).

### 3. Two -tape letdown.

- a. If the jumper's tape is not of sufficient length to reach the ground, it will then be necessary to use a second letdown tape. The procedure for a two tape letdown system is detailed below:
  1. Once a jumper has determined that their letdown tape is not of sufficient length to complete the letdown, they should tie-off as detailed above in Tie-Off procedures,

leaving at least 10' of unused tape.

2. The jumper should then acquire an additional letdown tape from a jumper already on the ground.
3. The jumper should then attach the additional letdown tape to the running end of their letdown tape below the carabiner with an overhand follow-through knot (also known as a ring bend or water knot). (Figure 17).



Figure 17

4. Once the knot has been secured, the jumper should release the tie-off knot at the carabiner and continue the letdown. The RING BEND splicing of the two letdown tapes will clear both the carabiner and the friction rings and allow the jumper to continue the letdown.

#### **4. Capewell Release Letdown without a tie-off.**

- a. This letdown method is quite similar to the tie off system, however the use of a carabiner as a tie off point is not employed. The mechanics of making this letdown are as follows:
  1. Make sure the parachute is securely hung in the tree. If not, the jumper should attempt to pull themselves over to the tree trunk or a large live limb (+3") and tie off there. All movements should be careful, smooth, and fluid.

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2. Starting at the top and working down the jumper will check suspension lines around the helmet, under the chin, arms, legs, and harness. Make sure all lines are clear of the body.
3. Do not remove helmet or gloves. They will be needed during the descent for protection against limbs and rope burns.
4. Release the following items in order from top to bottom:
  - a. The FS-14 reserve parachute by releasing both safety pins and riser snaps. Release the bottom right fastex snap but not the left and allow the the reserve to hang by the left fastex.
  - b. Release the flap container and drop it to the ground. This will avoid the possibility of the suspension lines hanging up on the container. (It may be desirable to throw the flap container to the ground with vigor to avoid having it hang up in the tree).
  - c. Release the right fastex snap on the PG bag and allow it to hang by the left fastex. If a small carabiner is used as a safety device, release the carabiner from the handle of the PG bag now.
5. Pull out the friction rings sewn into the jump pants and make sure they are not twisted. The carabiner should also be pulled out at this time. The carabiner should be to the outside of the right friction ring with the gate up and the opening away from the jumper. (Figure 1).
6. Reach into the right leg pocket and pull out the running end of the letdown tape. Make sure to leave the rest of the tape in the leg pocket until the risers are tied off. This will ensure that the tape is not dropped and lost. Pull out about six to ten feet of tape.
7. Pass the letdown tape through the friction rings two or three times depending on body weight. (Two wraps are sufficient for most jumpers however those over 190 lbs. may want to try three wraps). **ALWAYS** insert the tape into the rings from right to left. (Figure 2).

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8. Starting from the inside, thread the tape between the ‘V’ formed on the tight riser. Starting around the back, continue with a complete circle around the riser. Finish off by tying a minimum of three half hitches and leaving a 12” tail. (Figure 3). tuck the tail between the riser so it will not be in the way later.
9. Take up the slack in the tape between the tight riser and the friction rings by:
  - a. Grasping the tight riser with one hand and the tape below the friction ring with the other hand, simultaneously perform a one arm pull up on the tight riser and take up the slack with the other hand. **REMEMBER – SMOOTH, FLUID MOVEMENTS!**
10. Untie the leg pocket. Pull out the coiled tape or rope bag and drop it to the ground. Make sure the tape makes it to the ground and it is clear of obstacles. The descending tape should run between the jumper’s legs.
11. Catch the running end of the tape with the heel of the right foot. Reaching behind, the jumper grabs the tape with the right hand and brings it up on the outside of the right thigh. (Figure 4).
12. Take the running end of the tape and pass it through the gate of the carabiner while maintaining continuous tension on the tape with the right hand to keep the tape taut. (Figure 5).
13. Once the jumper has passed the tape through the carabiner, they should grasp the running end firmly with the right hand. The carabiner provides one additional point of friction for the descent.
14. The jumper should again take up as much slack as possible before doing a final four point check.
15. **FINAL CHECK.** The jumper should stop and do a deliberate final four point check. This check consists of:
  - a. Check to make sure the correct tie is made at the risers.

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- b. The tape is routed properly through the friction rings in the proper manner and the proper number of wraps have been made.
  - c. Check to make sure that the tape runs under the leg, through the carabiner, and is held firmly in the right hand.
  - d. Do a final check for suspension lines to make sure there is no possibility of becoming entangled once the letdown has been initiated.
16. Begin the capewell release by reaching up to the loose riser with the left hand. Lift the weight off the capewell by doing a one arm pull up with the left arm and simultaneously release the capewell fitting with the right hand. Keep the running end of the tape firmly in the right hand.
17. Continue the letdown by reaching up to the tight riser with the left hand always keeping the running end of the tape in the right hand. Release the tight capewell by doing a one arm pull up with the left arm and simultaneously release the capewell fitting with the right hand. Once the tight capewell has been released, **SMOOTHLY** transfer body weight from the riser to the letdown tape.
18. It is important to have just enough slack in the tape when releasing the capewell so that the line will not be pulled out of the hand. Another way to avoid losing the tape is to wrap it around the right hand once.
19. Keep the letdown tape in the right hand while reaching over with the left hand to grip the tape just beyond where it is gripped with the right hand. Once the tape is firmly in both hands, begin descent by releasing the grip slowly and allowing the tape to slip through the hands. Control the descent by tightening or loosening the grip on the tape.

**REMINDER:** Remember to avoid sudden stops as this could dislodge the canopy from the tree.

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If a tie off is needed during descent, follow the procedures outlined in this lesson plan.

Remember to keep your helmet and gloves on during letdowns!

### **Evaluation parameters for Letdowns.**

At the completion of this unit, the trainee will demonstrate the correct procedures for performing an approved smokejumper letdown, including:

1. At the letdown simulator, perform a minimum of three approved letdowns within 2 1/2 minutes from a height of at least 25 feet.
2. Correctly describe all of the steps in performing an approved smokejumper letdown.
3. These are minimum standards for both rookie smokejumpers and experienced smokejumpers who are performing letdowns during refresher training sessions.