

Chapter 5

PARACHUTE MANIPULATION



LESSON PLAN OUTLINE

PROGRAM: SMOKEJUMPER

LESSON: PARACHUTE MANIPULATION

OBJECTIVES: Upon completion of this unit, trainees will be able to:

1. Explain the performance of smokejumper parachutes.
2. Be able to define and describe the terms and concepts of parachute maneuvering.
3. Satisfactorily maneuver a parachute to the intended landing spot within performance parameters.
4. Be able to identify the various ground hazards.
5. Describe safety procedures relative to canopy collisions and hazardous landings.

INTRODUCTION: The ability to steer and maneuver a parachute consistently to within approximately 50 feet of a pre-selected spot on the ground is one of the most important skills a smokejumper must possess. Snag patches, rocky areas, as well as streams or ponds, often lie in close proximity to landing areas on fire jumps. If you, as a jumper, are to be able to perform your job safely, you must be able to maneuver your parachute to avoid these obstacles and arrive at your intended landing zone.

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I. OUTLINE

A. The following outline includes topics that need to be presented in a classroom setting prior to the simulator and then performing actual parachute jumps.

1. Pre-jump Plan.

2. Size-up jump spot and area.

- a. Size
- b. Shape (Orientation to wind line)
- c. Slope
- d. Alleyways
- e. Alternate Jump Spots
- f. Hazards – in and around.

3. Assess wind conditions.

- a. Streamers
- b. Smoke
- c. Weather
- d. Terrain induced or modified
- e. Listen for spotter's briefing of previous jumpers

4. Develop basic, initial strategy for jump.

- a. Approach
- b. Flight

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5. Plan with Jump Partner.

- a. Determine 1st jumper
 - (1.) Heavier jumper first
 - (2.) Heavier in weight range (3 sizes of parachutes).
- b. Plan for horizontal separation.
 - (1.) Split the wind line
 - (2.) Approach
 - (3.) Intended area within jump spot for landing.
- c. Plan for vertical separation.
 - (1.) Bomb turns
 - (2.) Extended deep brakes
 - (3.) Others?

6. Spotter Briefing.

- a. Modify jump strategy
- b. Modify changes to plan with Jump Partner

7. Exit (as in Exit Unit)

8. Initial procedures

- a. Count
- b. Check Canopy
- c. Grab toggles
- d. Check JP (jump partner)
 - (1.) Fly parachute toward planned flight zone/check wind drift/ check parachute performance.

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9. Flight

- a. Parachute maneuvers and performance
 - (1.) Observe FS-14 parachute manipulation video and written materials that go along with video about maneuvering and performance.
- b. Jump strategies
 - (1.) S-turns
 - (2.) Backing
 - (3.) Remain upwind of the spot for a good portion of the jump
 - (4.) Deliberate and purposeful maneuvers

10. Situation Awareness

- a. **Jump Partner**
- b. **Position awareness in relation to jump spot**
 - (1.) Wind line
 - (2.) Wind cone
 - (3.) Angle to jump spot
 - (4.) Mis-spotted/twisted
- c. **Changing conditions**
 - (1.) Wind changes
 - (2.) Changes in plan
 - (3.) Seeing unfamiliar terrain and obstacles as you get close to the ground

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d. Approach

- (1.) No to low wind
 - (a) With-the-wind/Base/In-to-wind Final
 - (b) With-the-wind/Crabbing Base/In-to-wind Final
- (2.) Low to moderate wind
 - (a). With-the-wind/In-to-wind Final
- (3.) Moderate to high wind
 - (a) Quarter In
- (4.) High wind
 - (a) Back in
- (5.) Other, less desirable approaches
 - (a) No wind approach from any direction
 - (b) Run in (with any wind)
 - (c) Low hook turn
 - (d) Straight down

e. Set-up to land

- (1.) Refer to Landing Techniques for body position
- (2.) 100 feet AGL (approximately)
- (3.) Into the Wind
- (4.) Parachute controlled to appropriate ground speed
- (5.) Minor corrections (maintaining into wind/hazard avoidance)

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f. Power line landings

- (1.) In the event of a power line landing, the jumper's main concern is to avoid touching two of the wires at the same time. Maintain good body position and try to avoid the wires.

g. Timber landings

- (1.) If a tree landing is unavoidable, hands must be kept on toggles. Landing with brakes on should be accomplished by rotating hands and elbows into the body while still holding toggles. Keep hands and elbows in to prevent grabbing for limbs or injuring elbow.
- (2.) Make sure you are going to hand securely by aiming at a point 15 feet from the top of the tree. This will allow the canopy to cover the tree and avoid a poor hang up.
- (3.) If a tree landing is imminent, don't try to avoid the tree by maneuvering around it. This has caused many injuries to smokejumpers as the canopy collapses as it snags on branches rather than capping the top of the tree.
- (4.) Once secure, communicate to your jump partner and to the aircraft, if possible.

h. Mid-Air Collision Avoidance and Mitigation

- (1.) After opening and canopy checks, locate jump partner(s) and avoid them.
- (2.) Develop a plan with you JP in the aircraft and communicate verbally and audibly with your jump partner(s) during parachute flight.
- (3.) Low jumper has the right of way.

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- (4.) In the event of a potential head on collision, both jumpers involved should make right-hand turns until they have mitigated the potential collision. The exception to this would be if the jumpers are flying offset to each others right in which case a left turn is the obvious maneuver to avoid a canopy collision.
- (5.) In the event of a collision, spread arms and legs to avoid passing through lines.
- (6.) Avoid passing over lower jumpers when close, less than 100 ft., lower person will steal your air, causing a potential for you to drop onto their canopy.
- (7.) If you land on another canopy, carefully walk off, avoiding slots of modifications.

II. EXAMPLES OF TASK PROGRESSION AND EVALUATION METHODS

- A. Trainees view FS-14 manipulation video – Consider written test or have open discussion with class.
- B. Classroom lecture to reinforce video and cover peripheral issues – Consider written test.
- C. Begin practicing standard initial checks on training units.
- D. Simulator training
 1. Practice parachute maneuvers
 2. Practice parachute maneuvers in relation to wind
 3. Practice jump strategies
- E. Evaluation Criteria
 1. Evaluation parameters are included in Practical Parachute Jump Experience Unit. Brief and Debrief is Key to accomplishing performance elements.

III. SMOKEJUMPER PARACHUTE MANEUVERING TERMS AND CONCEPTS

A. Developed by Missoula Technology and Development Center