

## CHAPTER 6

## MAIN PARACHUTE MALFUNCTIONS AND EMPLOYMENT OF THE RESERVE PARACHUTE

*A malfunction is any failure in the deployment or inflation of a parachute; or it is canopy damage, which can create a faulty, irregular, or abnormal condition that increases the jumper's rate of descent. The two classes of main parachute malfunction (total and partial) demand the jumper's immediate attention. Jumpers must be trained to identify the malfunction and take the appropriate action. Thorough training in what actions to take in the case of a malfunction is essential for parachutists. Practical exercises involving the activation of the reserve parachute are incorporated into all phases of training. Each type of malfunction is demonstrated so that jumpers can see exactly how each type of malfunction looks.*

### 6-1. PULL-DROP METHOD

When a total malfunction occurs, or the parachute provides no lift, the jumper must activate his reserve using the pull-drop method. Also, at the end of the 4000-count, if the jumper feels no opening shock, he should immediately activate his reserve using the pull-drop method. The jumper—

- Keeps a tight body position.
- Keeps his feet and knees together.
- Grasps the left carrying handle of the reserve parachute with his left hand.
- Turns his head left or right.
- Pulls the rip cord grip with his right hand and drops it to the ground.

When descending with only the reserve parachute inflated, the parachutist controls directional movement by slipping. The proper landing attitude is obtained by reaching up and grasping as many suspension lines in the opposite direction of drift as possible and slipping (as in the prepare-to-land attitude with the T-10 series parachute). Upon landing, the parachutist makes a quick recovery and collapses the canopy. In strong winds, if a quick recovery is impossible, the parachutist

releases the reserve parachute by pulling the quick release on the waistband, removing the safety wire from the right connector snap, and detaching the connector snaps from the D-rings of the main lift web.

## **6-2. DOWN-AND-AWAY METHOD**

To activate the reserve parachute using the down-and-away method, the jumper—

- Returns to a tight modified body position with his feet and knees together.
- Places his hand on the middle of the reserve (over the rip cord protector flap). He exerts pressure on the reserve and grasps the rip cord grip with his right hand.

NOTE: Strong pressure must be maintained with the left hand to prevent the pilot chute and reserve canopy from springing out.

- Pulls the rip cord grip and drops it.
- With the right hand forming a knife edge, palm facing out, reaches between the pack tray and canopy, and grabs as much canopy and reserve parachute suspension lines as possible.
- Throws the reserve parachute down and to the right (or left) side at about a 45-degree angle. (If the jumper is spinning, the canopy is thrown in the direction of the spin.) (If the reserve does not inflate, the jumper must retrieve the canopy and continue to throw it down and away until it inflates.)
- Uses the thumbs to clear all remaining suspension lines from the pack tray.

When the reserve parachute has activated, the jumper may have two inflated canopies. When descending with two inflated canopies, he has no direction control over the parachutes; all other jumpers remain clear.

## **6-3. TOTAL MALFUNCTION**

A total malfunction is the failure of the parachute to open or to deploy.

a. **Causes of a Total Malfunction.** The failure of the parachute to deploy can be caused by a severed static line, a broken snap hook, or a broken anchor line cable. The jumper's failure to hook up also results in the failure of the parachute to deploy. Malfunctions of these types are rare.

b. **Streamer.** Although not defined as total malfunction, a deployed parachute with a "cigarette roll" or "streamer" provides little or no lift for the jumper. This malfunction must be treated as a total malfunction. This malfunction occurs when a portion of the skirt blows between two suspension lines and begins to roll with the opposite fabric. The heat generated by the friction of the fabric being rolled causes the nylon to fuze and blocks the air channel in the canopy. The jumper immediately activates his reserve using the pull-drop method.

c. **Towed Jumper.** Although not classed as a parachute malfunction, a parachutist can be towed behind the aircraft by a misrouted static line or by a piece of equipment that has snagged the aircraft during the jumper's exit. During the 4000-count, the jumper feels an excessive opening shock and then feels himself being towed by the aircraft. The jumper remains in a tight body position, protecting his rip cord grip until he is either retrieved inside the aircraft or is cut free by the loadmaster on the pilot's order. If the jumper is being towed by the static line and is cut free, the main parachute will not deploy, and the jumper will have to activate his reserve using the pull-drop method. The jumper's actions are as follows:

**WARNING**

THE TOWED JUMPER MUST REMAIN IN TIGHT BODY POSITION AND PROTECT THE RIP CORD GRIP WITH HIS RIGHT HAND. ACCIDENTAL ACTIVATION OF THE RESERVE WHILE BEING TOWED MAY BE FATAL.

(1) **Retrieving the jumper inside the aircraft.** The jumper remains in a tight body position until he is completely inside the aircraft. A towed jumper must not use his hands to assist the retrieving personnel. The most important action of a towed jumper is to protect his rip cord grip.

(2) **Cutting the jumper away.** Once the jumper is cut free of the aircraft, the main parachute may, or may not, deploy. If the jumper was towed by something other than the static line, the main parachute will deploy and inflate. There is no need to activate the reserve parachute. If the jumper was towed by the static line and is cut free, the jumper must immediately deploy his reserve using the pull-drop method.

#### 6-4. PARTIAL MALFUNCTION

The four types of partial malfunctions are *complete inversion*, *semi-inversion*, *blown section or gore*, and *broken suspension lines*. The jumper deploys his reserve using the down-and-away method.

a. **Complete Inversion.** This malfunction may occur when a portion of the skirt blows inward between a pair of suspension lines on the opposite side of the parachute. This portion of the skirt forms a secondary lobe that fills with air and enlarges at the expense of the rest of the canopy. The portion of the canopy forming the secondary lobe is inverted. The canopy turns inside out with no decrease in its lifting surface.

(1) It is difficult to detect if a complete inversion occurs during the initial deployment of the canopy. With a T-10C, the rear risers control the front of the canopy and the front risers control the rear of the canopy. With an MC 1-1 B/C,

the orifice and control toggles are to the parachutist's front and maneuvering techniques are reversed.

(2) There may be no need for the parachutist to activate the reserve parachute unless the canopy was damaged during inversion. The parachute failed to function properly, but will support the parachutist. The inversion may increase the jumper's rate of descent. If the jumper's rate of descent is significantly greater than other jumpers, he deploys his reserve using the pull-drop method. If the jumper's rate of descent is slightly greater than other jumpers, he activates his reserve using the down-and-away method.

b. **Semi-Inversion.** This malfunction may occur if development of the secondary lobe stops before completely inverting. This malfunction may remain stable, become completely inverted, or revert to normal during descent. The total lifting capability of the canopy is decreased by the formation of a secondary lobe. The fabric can be burned by friction and weakened during descent. The parachutist must deploy his reserve using the down-and-away method with this malfunction. The T-10C and MC1-1 B/C parachutes have anti-inversion nets that eliminate this malfunction.

c. **Blown Section or Gore.** This malfunction occurs when the strain placed on the canopy during inflation is great and a panel, section, or gore is ripped or torn out, resulting in a hole(s) in the canopy. The jumper compares his rate of descent with that of other jumpers. If the jumper is falling faster than other jumpers around him, he must deploy the reserve parachute using the down-and-away method. Large holes in the canopy should be treated like a blown section or gore.

d. **Broken Suspension Lines.** This malfunction occurs when six or more suspension lines break; the parachutist must activate his reserve using the down-and-away method. If control lines on an MC-1B/C canopy break, the parachutist controls the canopy by pulling only one of the rear risers in the direction that he wishes to turn. *He must use a rear riser.*