

UNITED STATES PARACHUTE ASSOCIATION

SKYDIVER'S INFORMATION MANUAL 2025

跳伞者信息手册



UNITED STATES PARACHUTE ASSOCIATION

美国跳伞协会

SKYDIVER'S INFORMATION MANUAL

跳伞者信息手册

2025

USPA is committed to promoting an atmosphere that allows our sport to be safe, inclusive and fun. We advocate for the dignity and well-being of all individuals and respect diverse traditions, heritages, and experiences. We value inclusivity and reject discrimination based on race, ethnicity, gender, sexual orientation, religious belief, or any other attribute not related to performance or merit. USPA affirms its vision of a safe and healthy skydiving environment free of violence and any form of discrimination, including sexual or racial harassment.

美国跳伞协会（USPA）致力于营造安全、包容、有趣的跳伞氛围。我们拥护所有个体的尊严和福祉，并尊重多元的传统和经历。我们重视包容性，拒绝基于种族、民族、性别、性取向、宗教信仰以及任何其他与表现和品质无关的区别对待。USPA 的愿景是一个安全、健康的跳伞环境，一个远离暴力和任何形式的歧视，包括性骚扰和种族歧视的跳伞环境。

For additional information, refer to the USPA Policy Regarding Discrimination and Harassment in the USPA Governance Manual Section 1-9.

更多信息详见 USPA 管理手册 1-9 节关于歧视和骚扰的 USPA 相关政策。

跳伞者信息手册 2025 Skydiver's Information Manual

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ISBN: 9798308540175

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封面照片 (顺时针从上到下):

by Mark Kirschenbaum/Hypoxic | D-28511

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From left: Charles Knott, Robert Doughty and Ryan Clough fly a 3-way during the Chicks Rock boogie at Skydive Elsinore in California.

从左到右: Charles Knott、Robert Doughty 和 Ryan Clough 在加州 Skydive Elsinore 基地的 Chicks Rock 活动期间进行 3 人编队跳伞。

by Bert Navarrete | D-19159

Bert Navarrete 摄 | D-19159

A 9-way head-down skydive builds during the July 4 Boogie at Skydive Cross Keys in Williamstown, New Jersey.

新泽西州 Williamstown 镇 Skydive Cross Keys 基地 7 月 4 日活动期间的 9 人倒飞编队

by Eddie Phillips | Member #317981

Eddie Phillips 摄 | 会员号 #317981

Dana Bjorn (foreground), Eric Bjorn and Reed Welch prepare to land at Skydive Tennessee in Tullahoma.

在 Tullahoma 市的 Skydive Tennessee 基地, Dana Bjorn (前景)、Eric Bjorn 和 Reed Welch 准备降落。

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The purpose of the translation is to promote skydiving safety and improve current situation. The translation team has tried its best, but cannot guarantee that the original content or the translation is error-free. The translation team makes no warranties as to translation quality, and is not liable for any consequences from the use of this book. Readers must use this book with instructions from a USPA Instructor, and USPA Instructors who choose to use this book for instructions are responsible for the correctness of their instructions. Readers are fully responsible for their own skydives. If you have any questions about the translation, please contact yeung.lo@hotmail.com.

本翻译旨在现状基础上促进跳伞安全的发展。翻译团队尽力呈现了英文原意，但无法保证原文或翻译内容不存在错误，翻译团队对翻译质量不作任何形式的保证，对使用本书导致的任何后果不承担任何责任。读者必须在 USPA 教练的指导下阅读本书，选择使用此中文译本进行指导的教练需要对指导内容的准确性负责。读者对自己的跳伞负全部责任。如对翻译有疑问，请反馈至 yeung.lo@hotmail.com。

致谢 Acknowledgments

This book was translated with the help of many friends. The translation team thanks all participants for their contributions. Thanks to Yan Xia for his guidance and endorsement. Thanks to Tao Yin for his endorsement. Thanks to Yuewei Zhang and Bingdong He for their donation. Thanks to Kozma Janos for his assistance in the translation. And thanks to all those who have contributed to the translation.

本书在翻译过程中得到了许多朋友的帮助，翻译团队感谢所有参与者的付出。感谢夏研为翻译提供指导和背书，感谢殷焘为翻译提供背书，感谢张跃伟、何秉东的赞助支持，感谢 Kozma Janos 在翻译过程中提供的协助，以及感谢所有为翻译做出贡献的参与者。

警告 WARNING

IMPORTANT NOTICE

重要通告

SPORT PARACHUTING OR SKYDIVING IS A POTENTIALLY DANGEROUS ACTIVITY THAT CAN RESULT IN INJURY OR DEATH. EACH INDIVIDUAL PARTICIPANT, REGARDLESS OF EXPERIENCE, HAS FINAL RESPONSIBILITY FOR HIS OR HER OWN SAFETY.

跳伞运动有其潜在的危险性，可能导致受伤或死亡。每个参与者，无论经验水平如何，都对其自身安全负有最终的责任。

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An individual's safety can be enhanced by exercising proper precautions and procedures. This manual contains some of the knowledge and practices that, in the opinion of USPA, will promote the safe enjoyment of skydiving. The UNITED STATES PARACHUTE ASSOCIATION is a nonprofit, voluntary membership organization of the participants and supporters of the sport of parachuting. The sport is also referred to as skydiving. USPA has no involvement in the conduct or operations of any skydiving center, parachute center, or drop zone.

个人安全可以通过采取适当的预防措施和程序来提高。本手册包含了 USPA 认为有利于安全享受跳伞的知识和行为实践。美国跳伞协会是一个非营利性、自愿性质的会员组织，由跳伞参与者和支持者组成。这项运动有时也被称为降落伞运动。USPA 不参与任何跳伞中心、降落伞中心或降落区的指挥或经营。

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Regardless of any statements made in any USPA publications, USPA has neither been given nor has it assumed any duty to anyone. USPA has no obligation to anyone concerning his or her skydiving activities. All references by USPA to self-regulation

refer to each individual person regulating or being responsible for him or herself. USPA issues various licenses, ratings, awards, and appointments and provides various types of information, advice, and training but does not authorize anyone in any capacity to act for USPA as an agent or representative in connection with the regulation or control of skydiving operations. It is the responsibility of each student to ask whatever questions are necessary for him or her to have a thorough understanding of the actions and procedures that he or she must perform in order to make a safe jump. Each skydiver has the responsibility to exercise certain practices and perform certain actions to maintain safety for himself or herself and for other people.

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Looking for Forms or Applications?

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导言：美国跳伞协会

The United States Parachute Association

Although you may have heard talk of USPA, you may still wonder what USPA is exactly and have questions about your role in it. USPA is an internationally recognized skydiving organization that is governed by a volunteer board of directors consisting of members of the skydiving community. The board, supported by paid staff at headquarters, serves USPA's rating holders and members. USPA's mission is three-fold:

尽管你可能已经听说过 USPA，但你或许仍对 USPA 究竟是什么抱有疑惑，并对你在其中的角色有疑问。USPA 是一个国际公认的跳伞组织，由一个由跳伞社区成员志愿组成的董事会管理。董事会在总部带薪员工的支持下运作，为 USPA 的评级持有者和会员提供服务。USPA 的使命有三重：

- to promote safe skydiving through training, licensing, and instructor qualification programs
通过培训、执照发放和教练资格认证计划来促进安全跳伞
- to ensure skydiving's rightful place on airports and in the airspace system
确保跳伞活动在机场和空域系统中的合法地位
- to promote competition and record-setting programs
推进跳伞比赛和破纪录项目的发展。

协会 The Association

The United States Parachute Association is a voluntary, not-for-profit membership organization of individuals who enjoy and support the sport of skydiving. In 1946, USPA—then called National Parachute Jumpers and Riggers—was first incorporated in New York with an estimated 100 members. Now, USPA has tens of thousands of members across the globe, and many countries use USPA's materials, standards, and credentials as the foundation for skydiving in their nations.

美国跳伞协会是一个由热爱并支持跳伞运动的个人自愿组成的非营利性会员组织。1946 年，USPA——当时称作国家跳伞者与装备师协会——首次在纽约注册成立，当时约有 100 名会员。如今，USPA 在全球拥有数十万会员，许多国家将 USPA 的资料、标准和资格认证作为本国跳伞运动的基础。

In its **sporting role**, USPA is the official U.S. skydiving representative recognized by the National Aeronautic Association (NAA) and the official skydiving representative of the Fédération Aéronautique Internationale (FAI) in the U.S.

在**体育角色**方面，USPA 是美国国家航空协会（NAA）认可的美国官方跳伞代表，也是国际航空运动联合会（FAI）在美国的官方跳伞代表。

In its **governing role**, USPA is officially recognized by the Federal Aviation Administration (FAA) as the representative of skydivers in the United States. Although the FAA does not mandate that sport skydivers have USPA membership to jump in the United States, the agency does recognize USPA as the skydiving authority in the U.S. As a result, most drop zones in the U.S. affiliate with USPA, adhere to USPA policies and guidelines, and require USPA membership.

在**管理角色**方面，USPA 被美国联邦航空局（FAA）正式认可为美国跳伞者的代表。尽管 FAA 并未强制要求跳伞运动参与者必须加入 USPA 才能在美国跳伞，但该机构确认 USPA 为美国的跳伞权威机构。因此，美国大多数跳伞基地都与 USPA 合作，遵循 USPA 的政策和指南，并要求 USPA 会员资格。

USPA operates under a constitution and bylaws that define the organization's purpose. They are contained in the USPA Governance Manual, available on the downloads page on USPA's website or from USPA Headquarters.

USPA 基于其章程和细则运行，这些章程和细则定义了 USPA 的宗旨。它们包含在 USPA 管理手册中，该手册可从 USPA 网站或 USPA 总部获得。

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董事会和领导层 Board of Directors and Leadership

USPA is governed by a board of directors, elected by USPA members every three years. The USPA Board of Directors meets twice a year to address concerns from the membership and review guidelines and regulations. These board members are volunteers who are active skydivers, drop zone owners, jump pilots, and other members of the skydiving community from across the country. USPA members can attend these biannual board meetings in person or via live broadcast.

USPA 由董事会管理，该董事会由 USPA 会员每三年选举一次。USPA 董事会每年召开两次会议，处理会员关心的问题并审查指南和规章。董事会成员由志愿者组成，这些志愿者是自全国各地的活跃跳伞者、跳伞基地所有者、跳伞作业飞行员以及跳伞社区的其他成员。USPA 会员可以亲自参加或通过直播参加半年一次的董事会会议。

The USPA Board consists of 22 members in total. This includes eight **National Directors**, elected by the USPA membership at large, and 14 **Regional Directors**, one from each designated geographical region of the U.S. Regional Directors and their jurisdictions can be found at uspa.org/regions.

USPA 董事会共有 22 名成员，其中包括 8 名**国家级董事**，由全体 USPA 会员选举产生，以及 14 名**区域董事**，每个指定的美国地理区域各有一名。区域董事及其管辖范围可在 uspa.org/regions 上找到。

The Board makes procedures and policy via the **committee system** following an agenda set prior to each meeting. To each committee, the president appoints committee chairs, who then appoint committee members and non-voting advisors. These committees research agenda items before meetings, discuss these in person at the meeting, then recommend additions, changes, deletions, and waivers for full board vote. Any USPA member can request that items of interest be put on the agenda of the appropriate committee by contacting their Regional Director or completing the Proposed Agenda Item form found at uspa.org/bod.

根据每次董事会会议前设定的议程，董事会通过**委员会系统**来制定程序和政策。USPA 总裁任命各委员会的主席，委员会主席随后任命委员会成员和无投票权的顾问。这些委员会在会议前研究议程项目，在会议期间进行现场讨论，然后提出增补、修改、删除和豁免的建议，供全体董事会投票表决。任何 USPA 会员都可以通过联系其区域董事或填写 uspa.org/bod 上的“提议议程项目”表，要求将感兴趣的项目列入相关委员会的议程。

The board of directors elects its **Executive Committee**—president, vice president, secretary, treasurer, chairman of the board, and a member at large—from its membership. Other committees are Competition, Finance & Budget, Governance, Group Membership, Membership Services, Regional Directors, and Safety & Training. You can find contact information for members of the board and the committees at uspa.org/bod.

董事会从其成员中选举**执行委员会**——包括总裁、副总裁、秘书、财务主管、董事会主席和一名普通成员。其他委员会包括比赛委员会、财务与预算委员会、管理委员会、团体会员委员会、会员服务委员会、区域董事委员会，以及安全和培训委员会。你可以在 uspa.org/bod 上找到董事会成员和委员会成员的联系信息。

Nearly all drop zones have at least one USPA **Safety & Training Advisor** (S&TA) who is appointed by and serves as the direct link to their USPA Regional Director. The S&TA is a local jumper who is available to the drop zone's members to provide administrative services and information.

几乎所有跳伞基地都至少有一名 USPA **安全和培训顾问** (S&TA)，他们由 USPA 区域董事任命，并作为与区域董事的直接联系纽带。S&TA 是当地的跳伞者，为跳伞基地的会员提供行政服务和信息支持。

总部员工 Headquarters Staff

The USPA staff are paid employees whom the USPA Executive Director hires to implement the vision of the board and to serve members with administrative needs such as membership applications and renewals, ratings, licenses, and awards. The Executive Committee of the USPA Board hires the executive director, who reports to the board president. Staff headquarters is located in **Fredericksburg, Virginia**. You can find contact information for headquarters departments and staff at uspa.org/staff.

USPA 员工是带薪雇员，由 USPA 执行董事聘用，负责落实董事会的愿景，并为会员提供行政服务，例如会员申请与续费、评级、执照和奖项的办理。USPA 董事会的执行委员会负责聘用执行董事，执行董事向董事会总裁汇报工作。员工总部位于弗吉尼亚州 **Fredericksburg**。你可以在 uspa.org/staff 上找到总部各部门及员工的联系信息。

作为 USPA 会员的你 Your Role as a USPA Member

As a member-led association, USPA is comprised of board members, staff, rating holders, appointees and regular jumpers. USPA members determine who sits on the board of directors and therefore, the direction of the organization. So, in a sense, you are USPA. In the U.S., you can skydive without a USPA membership, but USPA makes skydiving in the U.S. possible. You can support skydiving by being a member in good standing and striving to follow the Federal Aviation Administration's Federal Aviation Regulations (FARs) and USPA's Basic Safety Requirements (BSRs).

作为一个由会员主导的协会，USPA 由董事会成员、员工、评级持有者、任命人员以及普通跳伞者组成。USPA 会员决定谁担任董事会成员，从而决定组织的方向。因此，从某种意义上说，你就是 USPA。在美国，你可以不加入 USPA 进行跳伞，但是 USPA 让跳伞运动在美国成为可能。你可以通过成为一名良善守纪的会员，努力遵循联邦航空局的联邦航空条例（FAR）和 USPA 的基本安全要求（BSR），从而支持跳伞运动。

What happens if you don't follow the FARs and BSRs? The **Compliance Group** investigates purported violations of the FARs and BSRs, as well as misconduct as defined in the USPA Governance Manual. The group consists of four members of your elected board as well as the USPA Director of Safety and Training at USPA Headquarters. If you willfully violate the BSRs or FARs as a member or an instructional rating holder, the Compliance Group could bring disciplinary actions, such as suspending or even revoking your ratings or membership, against you. For more information on this process, see the **USPA Governance Manual** Section 1-6.

如果你不遵守联邦航空条例和基本安全要求会怎样？**合规小组**会调查涉嫌违反联邦航空条例和基本安全要求的行为以及 USPA 管理手册中定义的不当行为。该小组由四名选举出的董事会成员以及 USPA 总部的安全和培训董事组成。如果你作为会员或教学评级持有者故意违反联邦航空条例或基本安全要求，合规小组可能会对你采取纪律行动，例如暂停甚至撤销你的评级或会员资格。有关此流程的更多信息，请参阅 **USPA 管理手册**第 1-6 节。

Skydivers can only continue to enjoy self-governance if each is aware of their role, as well as the roles of others, in the community. Continue to follow USPA guidance as best practices. Continue to adhere to FAA regulations. Continue to respect local authority with an air of collaboration. And most importantly, continue to update your knowledge and develop your own good judgment.

只有当每位跳伞者都知悉到自己在社区中的角色以及他人的角色时，跳伞者们才能继续享受自我管理的权利。请继续遵循 USPA 的指导作为最佳实践，继续遵守 FAA 法规，继续以合作的态度尊重地方当局。最重要的是，不断更新你的知识并培养自己的良好判断力。

关于本手册

About this Manual

The Skydiver's Information Manual (SIM) provides basic skydiving standards—the Basic Safety Requirements (BSRs) and recommendations that USPA members have agreed upon as providing for the conduct of safe and enjoyable skydiving. It also describes the programs USPA administers to recognize individuals for their expertise, ability to train others, and proficiency or tenure in the sport.

跳伞者信息手册 (SIM) 提供了跳伞的基本标准——基本安全要求 (BSR)，以及 USPA 会员们就如何安全地享受跳伞所达成的一致建议。它还介绍了 USPA 管理的一些认证项目，这些项目对个人的专业技能、培训他人的能力，以及跳伞的熟练程度或履历进行认证。

Although the SIM provides much basic information for skydivers, each jumper should research further and consult USPA and industry officials, documents, and other media, as well as other reliable individuals for clarification and additional information.

尽管 SIM 为跳伞者提供了许多基本信息，但每一位跳伞者都需要做更多的研究，通过向 USPA、业内官员进行咨询，参考相关文件、其他媒介，以及询问其他可靠人员来获得更明确的解释和更多其他信息。

Although USPA is a voluntary membership association with no regulatory authority, USPA can suspend or revoke any USPA license, rating, award, appointment, or membership it issues, according to terms and conditions stated in the USPA Governance Manual. Compliance with the Basic Safety Requirements contained herein is mandatory for participation in USPA programs. The BSRs represent the commonly accepted standards for a reasonable level of safety.

尽管 USPA 是一个自愿性质的会员协会，没有任何监管权力，但 USPA 可以根据 USPA 管理手册中的条款，暂停或撤销其签发的任何 USPA 执照、评级、奖项、任命或会员资格。参与 USPA 的项目就必须强制遵守本手册中的基本安全要求。基本安全要求代表了合理安全水平的公认标准。

However, the recommendations contained herein, unless otherwise stated (such as in the case of compliance with a Federal Aviation Regulation), are put forth as guidance and are not mandatory. Moreover, a deviation from these recommendations does not necessarily imply negligence and is not to be used in a court of law to demonstrate negligence.

然而，本手册中的建议仅作为指导，并非强制要求，除非另有说明（如遵守联邦航空条例）。此外，偏离这些建议并不一定意味着过失，也不能在法庭上用来证明过失行为。

Voluntary compliance with rules, recommendations, and standards within the SIM demonstrates that jumpers and drop zone operators are exercising self-regulation.

跳伞者和跳伞基地运营商自愿遵守本手册内的规则、建议和标准的行为，是其进行自律管理的表现。

SIM 的修订 SIM Revisions

As a living document reflecting best practices in skydiving, the Skydiver's Information Manual requires continuous updating. It is the responsibility of SIM holders to keep their version current. Users can purchase the most current physical or digital copies or download free copies from the USPA website at uspa.org/sim. Change documents that highlight differences from the previous version are available at uspa.org/downloads. The SIM is also available as a mobile app through Google Play and the App Store.

作为一份反映跳伞最佳实践的动态文件，跳伞者信息手册需要不断更新。SIM 持有者有责任确保其版本为最新版本。用户可以购买最新的实体书或电子书，或在 USPA 网站 uspa.org/sim 上免费下载副本。修订文档可在 uspa.org/downloads 获取，该文档突显了当前版本与前一版本的差异。SIM 还有移动应用程序版，可通过 Google Play 和 App Store 下载。

Third-party translators prepare translations of the SIM to make USPA documents accessible to those who may not read English. The official and binding documents that govern USPA are the English versions.

第三方译者制作 SIM 的译本，以便无法阅读英语的人能获取 USPA 文件。规制 USPA 的具有约束力的官方文件是英文版的。

Readers are encouraged to submit comments or recommended changes in writing to:

我们鼓励读者以书面形式向 USPA 反馈评价或提出修改建议，收件地址：

USPA

5401 Southpoint Centre Blvd.

Fredericksburg, VA 22407;

or by email to uspa@uspa.org.

或发送邮件至 uspa@uspa.org。

This manual provides procedures to address many foreseeable situations, but each situation is different. Deviations from these recommendations do not imply negligence.

本手册提供了针对许多可预见状况的处理程序，但每种情况都有每种情况的不同之处。偏离这些建议并不意味着失误。

第一章 综合学生计划

Integrated Student Program

概览 Overview

USPA developed the Integrated Student Program (ISP) as a comprehensive student training outline that meets the Basic Safety Requirements (BSRs). It includes all methods of instruction (see below) used to train students from their first jumps through their A licenses. Some schools have developed equivalent programs that train students to meet all the qualifications of the USPA A license. If your drop zone follows a program by a different name, you can still use the ISP to find appropriate guidance for training.

USPA 制定了综合学生计划 (ISP) 作为符合基本安全要求 (BSR) 的全面的学生培训大纲。它包括所有用于培训从学生第一跳到获得 A 执照的培训方法 (见下文)。一些学校开发了等效的课程以培养学生达到 USPA A 执照的所有资格要求。如果你的跳伞基地教授名称不同的课程, 你仍然可以使用 ISP 来获得适合的培训指导。

USPA recognizes the following training methods:

USPA 认可以下培训方法:

1. Accelerated Freefall (AFF or harness hold), where the student exits with at least one instructor who holds the student by the harness
加速自由落体 (AFF, 又称 Harness Hold): 学生与至少一名教练一起出舱, 教练会抓住学生的背带。
2. Instructor-Assisted Deployment (IAD), where an instructor in the aircraft deploys the pilot chute as the student falls away
教练辅助开伞 (IAD): 学生离开飞机时, 飞机内的教练拉开学生的引导伞。
3. Static Line (SL), where a line connected to the aircraft deploys the student's parachute
Static Line (SL): 通过一条连接飞机的 Static Line 打开学生的降落伞。
4. Tandem, where the student's harness attaches to the instructor's harness, and they share one parachute system
双人伞 (Tandem): 学生的背带与教练的背带相连, 双方共用同一个降落伞系统。

关于你的培训 About Your Training

The **A-License Progression Card** charts your individual progress as you make your way through this journey. All licenses, quizzes, and training materials are available in online and paper formats. You can download a PDF of this card at uspa.org/downloads in the License Applications folder. If you join USPA as a member, you can take advantage of the **online A-License Progression Card** at uspa.org/mya.

A 执照进度卡记录了你个人在整个过程中的进展。所有执照、测验和培训材料均提供在线版本和纸质版本。你可以在 uspa.org/downloads 的“License Applications”文件夹中下载此卡的 PDF 版。如果你加入 USPA 成为会员, 可以在 uspa.org/mya 上使用**在线版 A 执照进度卡**。

Following each jump during which you meet an A-license requirement, your coach or instructor signs of the appropriate spot on your A-License Progression Card, either online or on paper. At the end of each category, you complete the category quiz online or verbally with a coach or an instructor. Especially in Categories A through D, you will be expected to complete all the objectives of one category before making any jumps in the next. Recommended dive flows for freefall and canopy flight are at the end of each category.

在每次跳伞后, 如果你完成了 A 执照的其中某项要求, 你的助理教练或教练会在你的 A 执照进度卡 (在线版或纸质版) 上签署相应的条目。在每个单元结束时, 你需要在线上完成单元小测, 或者与助理教练或教练口头完成单元小测。你需要在进入下一个单元之前完成当前单元的所有目标, 特别是在 A 到 D 单元中。每个单元末尾提供了建议的自由落体流程和降落伞飞行流程。

According to the Basic Safety Requirements (Chapter 2-1G) all students must jump under the direct supervision of an appropriately rated **USPA Instructor** until demonstrating stability and heading control prior to and within 5 seconds of initiating two intentional disorienting maneuvers involving a back-to-earth orientation (e.g., barrel roll, front loop, back loop), which occurs in Category E. A **USPA Coach**—that is, an instructional rating holder who teaches students under the supervision of an instructor—may conduct freefall training and supervise jumps for students in Categories E through H. A coach may also supervise IAD and static-line students who have successfully deployed their own parachutes. Until USPA issues the student an A license, all training remains the responsibility of an instructor.

根据基本安全要求（见 2-1G），所有学生必须在持有合适评级的 **USPA 教练** 的直接监督下跳伞，直至其展示出有能力保持稳定和方向控制，且在 2 次涉及背朝下姿态的故意失稳的动作（如横滚、前空翻、后空翻）之后的 5 秒内恢复稳定和方向控制。这一要求是在 E 单元中完成。**USPA 助理教练**（即持有教学评级并在教练监督下教授学生的人员）可以指导 E 单元到 H 单元的学生的自由落体培训并监督跳伞。助理教练还可以监督已能自行开伞的 IAD 和 Static Line 学生。在 USPA 给学生颁发 A 执照之前，所有培训由教练负责。

（译者注 1：USPA 教学评级从低到高依次为助理教练评级（Coach）、教练评级（Instructor）、考官评级（Examiner）。任何较高教学评级的持有者均可行使助理教练的职责，因此，本章中说明确可由助理教练执行的内容，也可由更高级别持有者执行，并不仅限助理教练执行。旧版 SIM 译文中将 Coach 译为“初级教练”，为明确强调此类评级人员须在教练监督下进行教学，新版 SIM 译文中统一将其译为“助理教练”。）

（译者注 2：还有一类提供进阶跳伞类型培训（如翼装、自由飞等）的教学人员，英文也称为“Coach”，在译文中为示区分，将此类教学人员称为“科目教练”（详见本书末的名词解释），或视具体情况称为“翼装教练”、“自由飞教练”等。**USPA 没有对翼装、自由飞等进阶跳伞类型设置教学评级。**）

CANOPY: Canopy, parachute, and wing are interchangeable terms.

“伞布”的相关术语：在英语中，“Canopy”、“Parachute”和“Wing”是等价的术语，指伞布，也可译为伞衣或伞翼，或指代降落伞。

Before receiving your license, you will complete a check dive and oral and written exams.

在获得执照之前，你需要完成一次检查跳以及口试和笔试。

与你相关的规定 Regulations Pertaining to You

All participants in skydiving must meet the USPA Basic Safety Requirement (BSR) for **medical fitness** (Chapter 2-1.C): 所有参与跳伞的人员必须满足 USPA 基本安全要求（BSR）中关于**健康状况**的规定（见 2-1.C）：

MEDICAL REQUIREMENTS

医疗要求

1. All persons engaging in skydiving must:

所有参与跳伞运动的人员必须：

- Possess at least a current FAA Third-Class Medical Certificate; or
至少拥有现行有效的联邦航空局三级健康证明；或
- Carry a certificate of physical and mental fitness for skydiving from a registered physician; or
持有注册医师签发的跳伞身体和心理健康证明；或
- Agree with the USPA-recommended medical statement:
同意 USPA 建议的健康声明：

"I represent and warrant that I have no known physical or mental infirmities that would impair my ability to participate in skydiving, or if I do have any such infirmities, that they have been or are being successfully treated so that they do not represent any foreseeable risk while skydiving. I also represent and warrant that I am not taking any medications or substances, prescription or otherwise, that would impair my ability to participate in skydiving."

“我声明并保证，我不患有已知会损害我参加跳伞的能力的身体或精神疾病，或者，如果我任何这样的疾病，它已

经或正在受到有效的治疗，在跳伞时不会导致任何可预见的风险。我还声明并保证，我没有服用任何可能影响我参与跳伞的能力的药物或物质，无论是处方药还是其他药物。”

A person should be in good health and physical condition to skydive and should not be on medication; however, many conditions can be properly managed if the instructor knows about them. In some cases, you may need to provide an FAA flight physical or a doctor's statement of fitness for skydiving. Your instructor will also need to know about any medical history that may affect your ability to skydive safely (e.g., recent blood donations, joint dislocations or recent dental work). People who participate in scuba diving should not skydive for at least 24 hours afterward.

跳伞者应保持良好的健康和身体状态,且不应服用药物;然而许多身体状况是可以妥善管控的,如果教练了解相关情况的话。在某些情况下,你可能需要提供联邦航空局的飞行体检证明或医生开具的适合跳伞的声明。你的教练还需要了解任何可能影响你安全跳伞能力的医疗史(例如,近期的献血、脱臼或近期的牙科治疗)。参与潜水的人员在潜水后需等待至少 24 小时才能跳伞。

All participants in skydiving must meet **the BSR for age** (Chapter 2-1.D).

所有参与跳伞的人员必须满足基本安全要求中关于年龄的规定（见 2-1.D）。

For skydives made within the U.S. and its territories and possessions, no skydive may be made in violation of **FAA regulations** (Chapter 2-1.B).

在美国领土和美国属地范围内进行的跳伞，不得违反**联邦航空局法规**（见 2-1.B）。

[illegible]

EXPERIENCED SKYDIVERS > MY MEMBERSHIP > MY EDUCATION > MY A LICENSE CARD



A B C D E F G H *

A License (view A-license check dive video)

- Completed ground school training
- Pass A-license oral exam at 100%
- Pass A-license written exam at 75%
- Pass A-license practical exam check drive with a USPA instructor
- Be introduced to the SIM and Governance Manual Section 1-6
- Attain a total of 25 skydives

Sample A-License Progression Cards: Print (left) and online (right)

A 执照进度卡样表：纸质版（左）和在线版（右）

A 单元 (弓形)

Category A (Arch)

AFF 和双人伞 1 跳	IAD 和 Static Line 2 跳	开伞程序启动高度 AFF: 5500 英尺 IAD 和 Static Line: 4000 英尺 双人伞: 6000 英尺
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In Category **A**, you take an active role in your skydive and perform the first basic body position, the **Arch**!

在 **A** 单元, 你在跳伞中需要积极主动, 并学习第一个基本身体姿势——**弓形姿势**!

This category contains information about your first-jump course. Check out USPA's free online ground school to help you study ahead at skydiveschool.org.

本单元包含了与你的第一跳课程有关的信息。你可在 USPA 的免费在线地面学校 (skydiveschool.org) 提前学习相关内容。

单元概览 Category at a Glance

First-Jump-Course Advancement Criteria (IAD, Static Line and AFF)

第一跳课程晋级标准 (IAD、Static Line 和 AFF)

Equipment

装备

- ☐ Find and operate main-deployment, cutaway and reserve-activation handles (or single-operating-system handle)
找到并操作主伞开伞把手、切伞把手和备伞把手 (或单把手紧急系统的把手)
- ☐ Explain the use of the altimeter and the importance of altitude awareness
解释如何使用高度表及高度意识的重要性
- ☐ State how many gear checks you will receive
说出你将接受多少次装备检查

Aircraft

飞机

- ☐ Approach the plane from behind (away from propeller) and with an instructor
在教练陪同下从飞机后方 (远离螺旋桨) 接近飞机
- ☐ Demonstrate correct procedure for landing with the plane in an emergency
演示飞机紧急着陆时的正确程序
- ☐ Demonstrate correct procedures for emergency exit (exit using main parachute, exit using reserve parachute)
演示紧急出舱的正确程序 (出舱后开主伞的情况、出舱后开备伞的情况)
- ☐ Respond correctly to questions about how to handle an open parachute in the aircraft with the door open and with the door closed
正确回答关于飞机舱门打开时或关闭时如何处理已打开的降落伞的问题

Freefall

自由落体

- ☐ Demonstrate the basic arch position
演示基本的弓形姿势
- ☐ Demonstrate proper arm and leg position and positive leg extension with symmetry
演示正确的手臂和腿部姿势, 并对称地伸腿
- ☐ Demonstrate the correct deployment and practice-deployment procedures, including cue words (e.g., "arch, reach,

touch!") and symmetrical movement

演示正确的开伞程序和模拟开伞程序，包括提示词（如“弓形、找、摸！”）和平衡动作

- ☐ Understand and respond with the correct body position to freefall hand signals
理解自由落体手势信号并以正确的身体姿势响应
- ☐ Explain your three pull priorities (if taught during ground school)
解释你的三个开伞优先事项（如地面学校有教的话）
- ☐ Demonstrate the correct technique to handle both a hard pull and an inability to find the handle for the main deployment
演示如何正确处理主伞开伞把手难以拉动或无法找到的情况
- ☐ Demonstrate how to clear a pilot-chute hesitation (main or reserve)
演示如何消除引导伞迟滞的问题（主伞或备伞）

Canopy

伞控

- ☐ Respond correctly and within 5 seconds to malfunction scenarios, including line twists, slider up, end-cell closures, and the four types of two-canopies-out configurations
在 5 秒内正确应对故障场景，包括线缠绕、滑块布挂在上、末端气室不完全充气以及四种双伞情形
- ☐ Name and explain "decision altitude" and "cutaway hard deck"
知道“决断高度”和“切伞硬甲板高度”，并解释其含义
(译者注：硬甲板高度的定义详见本单元降落伞故障部分或书末名词解释。)
- ☐ Solve canopy descent problems from opening to 1,000 feet
解决从开伞到 1000 英尺高度的降落伞下降期间的问题

Landing

着陆

- ☐ Explain your landing priorities
解释你的着陆优先事项
- ☐ Identify the wind direction and draw your landing pattern on an aerial map
识别风向并在航拍图上绘制你的着陆航线
- ☐ Describe how to handle a downwind landing and why you should avoid low turns
描述如何应对顺风着陆以及为何应避免低转
- ☐ Demonstrate the flare and a proper parachute landing fall (PLF)
演示拉平和正确的 PLF 姿势
- ☐ Explain the correct procedure for these landing obstacles: power lines, water, trees, buildings, and hazards specific to the drop zone
解释应对以下着陆障碍物的正确程序：高压线、水域、树木、建筑物以及跳伞基地特有的危险障碍物

Category-A Advancement Criteria

A 单元晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Discuss ground winds and winds aloft for the day
讨论当天的地面风和高空风情况
- ☐ Plan your flight to the holding area and in the pattern with assistance
在协助下规划飞往等待区的路线和着陆航线
- ☐ Practice a PLF
练习 PLF

Academics

学术部分

- ☐ Attend ground school
参加地面学校课程

Canopy Debrief

跳后伞降汇报

- ☐ Prepare to perform a parachute landing fall (PLF) on final approach and perform a PLF if needed
在最后进近时做好 PLF 准备，并在需要时执行
- ☐ Fly your pattern with assistance
在有协助的情况下飞你的航线
- ☐ Perform a staged flare with a full finish
分阶段拉平并拉到底
- ☐ Land within 60 degrees of your intended heading with assistance
在有协助的情况下，着陆方向与预期方向偏差不超过 60 度
- ☐ Land within 330 feet (100 meters) of your intended target with assistance
在有协助的情况下，在离预定着陆目标不超过 330 英尺（100 米）的范围内着陆

Freefall Debrief

跳后自由落体汇报

- ☐ Perform a safe exit
执行安全的出舱
- ☐ Show overall freefall awareness (AFF and tandem)
总体表现出自由落体意识（AFF 和双人伞）
- ☐ Be stable for the last 10 seconds of freefall (AFF and tandem)
在自由落体的最后 10 秒内保持稳定（AFF 和双人伞）
- ☐ Be altitude aware throughout the freefall (AFF and tandem)
在整个自由落体过程中保持高度意识（AFF 和双人伞）
- ☐ Initiate the pull within 1,000 feet of your assigned altitude (AFF and tandem)
在指定高度的 1000 英尺内启动开伞动作（AFF 和双人伞）

Category-A Tandem Training Requirements

A 单元双人伞培训要求

A USPA Tandem Instructor must teach this section.

本节内容必须由 USPA 双人伞教练教授。

Before boarding the aircraft, the instructor should brief you on:

登机前，教练应向你简要说明以下内容：

- ☐ Emergency procedures (stay calm and follow instructor's directions)
紧急程序（保持冷静并遵循教练指示）
- ☐ Exit and freefall procedures (safety position)
出舱和自由落体程序（安全姿势）
- ☐ Operating the parachute
操作降落伞
- ☐ Landing procedures
着陆程序

You will learn how to do the following:

你将学习以下内容：

1. perform the safety position used for exit and emergencies
执行出舱和紧急情况下要采取的安全姿势
2. maintain an arch in freefall
在自由落体中保持弓形姿势
3. read the altimeter
读取高度表
4. deploy the main parachute
开主伞
5. fly a landing pattern
飞着陆航线
6. flare for landing
拉平着陆

Category-A skills and training are mostly **the same as for solo students**, described in the Academics section below. Here are the differences:

A 单元的技能与培训与单人跳伞学生基本相同，详见后文学术部分。以下是不同之处：

- **Climb-Out and Exit:** Your instructor will teach you the exit that best suits your tandem jump.
爬出机舱和出舱： 教练将教你最适合双人伞的出舱方式。
- **Freefall:** Exit with both hands in the safety position. Your instructor will signal you to move them into a neutral body position once in freefall, where you will start your dive flow. You will receive further instructions regarding main-canopy deployment.
自由落体： 出舱时双手采取安全姿势。进入自由落体阶段后，教练会示意你将手移至中性位置，这时你将开始执行跳伞流程。你将收到关于开主伞的进一步指示。
- **Canopy:** Your instructor will perform the canopy-control check, then hand you the toggles and introduce you to basic canopy flight, including altitude awareness and landing pattern.
伞控： 教练将进行降落伞可控性检查，然后将刹车交给你，并介绍基本的伞控，包括高度意识和着陆航线。
- **Landing:** Your instructor will teach you landing procedures with techniques specific to tandem jumping
着陆： 教练将教你双人伞特有的着陆程序和技巧。

学术部分 Academics

The topics appear here in chronological order; however, your school's first-jump course may teach them in a different order. Unless otherwise indicated at the beginning of a section, a current USPA Coach under the supervision of any USPA Instructor may teach the first-jump course.

以下主题按时间顺序排列,但你的跳伞学校可能会以不同的顺序教授这些内容。除非在环节的开头另有说明,否则在任何 USPA 教练监督下的评级在有效期内的 USPA 助理教练都可以教授第一跳课程。

Equipment

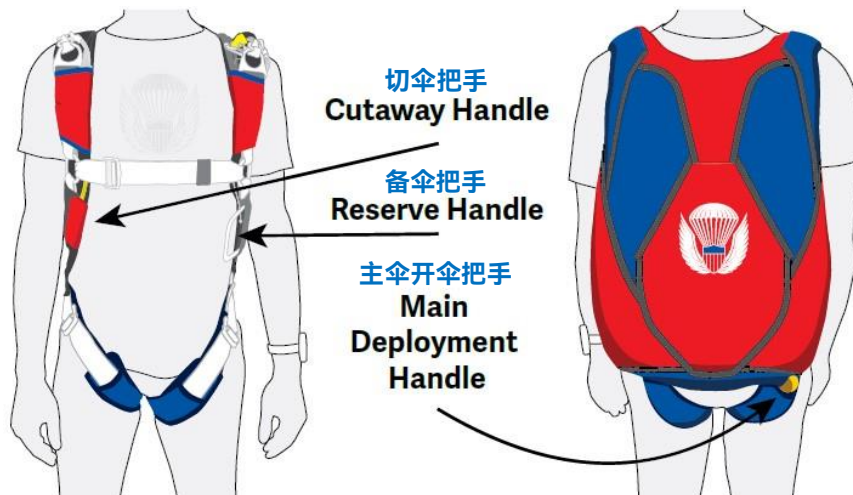
装备

Your equipment will consist of a harness-and-container system, commonly referred to as "a rig," which contains a main parachute and a reserve parachute. The rig will have three handles: a **main deployment handle** to open your main parachute, a **cutaway handle** to release the main parachute in an emergency, and a **reserve handle** to deploy your reserve parachute.

你的降落伞由一个背带和伞包系统组成,英文中常称作“Rig”(装备),其中包含了主伞和备伞。装备上有三个把手:一个用于打开主伞的**主伞开伞把手**,一个用于在紧急情况下断开主伞的**切伞把手**,以及一个用于打开备伞的**备伞把手**。

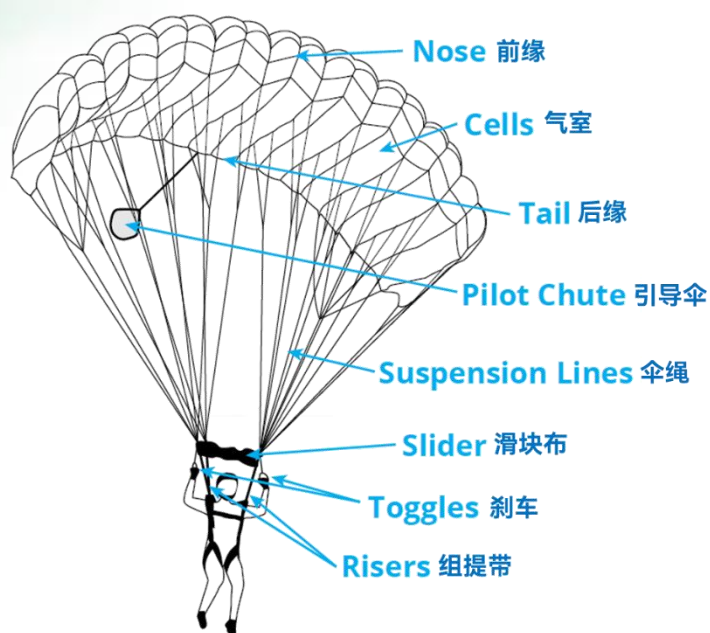
Your **main parachute** is divided into a series of cells that trap air. You will be suspended under the canopy by a set of suspension lines that attach to risers, which are connected to the harness-and-container system. There are also two toggles, which are attached to steering lines, that you'll use to steer the canopy.

你的**主伞**分为多个气室,用于捕获空气。你将通过一组与组提带连接的伞绳悬挂在伞布下方,组提带则与背带和伞包系统相连。还有两个刹车,它们连接着刹车线,用于操控降落伞。



Basics of a Rig: Locations of primary points on a skydiver's rig.

装备基础: 跳伞者装备的关键点位



Parachute: Familiarize yourself with the names and parts as illustrated.

降落伞: 熟悉图中的名称和部件

Visual Altimeters: digital (top) and analog (bottom)

目视读数的高度表: 电子式(上)和机械式(下)

A **parachute** opens in three stages:

降落伞的打开分为三个阶段:

1. Activation—by throwing the pilot chute, by pulling the ripcord, or by static line
激活——通过释放引导伞或拉出开伞拉索实现, 或通过 Static Line 实现
2. Deployment—the parachute comes out of the container
展开——降落伞从伞包中飞出
3. Inflation—the parachute fills with air
充气——降落伞充入空气

(译者注 1: 手动打开主伞的方式分为两类: 1. 释放引导伞; 2. 拉出开伞拉索。引导伞分为两种: 一是抛出式引导伞, 即 Throw-out Pilot Chute, 简称 TOP, 二是拉出式引导伞, 即 Pull-out Pilot Chute, 简称 POP。最常见的主伞开伞方式是抛出式引导伞: 跳伞者抛出引导伞, 引导伞拉出关包针, 从而释放主伞; 其次为拉出式引导伞: 跳伞者先拉出关包针, 然后拉出叠在伞包内部的引导伞, 从而释放主伞。通过开伞拉索打开主伞的方式较少见, 它通过拉动产伞拉索释放弹簧引导伞, 从而打开主伞, 这种开伞方式主要用于备伞的打开, 有时会被用于一些军事训练用的降落伞主伞, 少数的跳伞学生培训计划中也会使用这类主伞开伞方式。)

(译者注 2: 这里将降落伞打开的第二阶段“Deployment”译作展开。大部分情况下, Deploy 或 Deployment 可译作开伞。在描述降落伞打开过程时, 该词特指降落伞从伞包中飞出, 包括伞绳在内的降落伞系统铺展开来的阶段, 注意在此阶段伞布尚未开始充气。)

Your rig also includes two important safety devices. The **reserve static line** is a connection between the main parachute risers and the reserve pin that activates your reserve parachute when you release a malfunctioning main parachute. The **automatic activation device** initiates deployment of your reserve parachute at a pre-set altitude and speed. Both are only back-up devices. It is always your job to pull the handles in case of a malfunction.

你的装备还包括两个重要的安全装置。**RSL** 是主伞组提带与备伞关包针之间的连接装置, 当你在主伞发生故障时释放主伞的时候, RSL 会激活备伞。**AAD** (自动激活装置) 则会在预设的高度和速度下开始打开备伞。这两者都只是作为备用装置。在发生故障时, 手动拉把手始终是你的责任。

You will also be equipped with an **altimeter**, which indicates your approximate altitude in thousands of feet above the ground. Handle it with care. Altitude awareness is your most important task until you open your parachute. You also use your altimeter throughout your canopy flight.

你还将配备一个**高度表**，用于显示你距离地面的近似高度（以千英尺为单位）。请小心使用它。在开伞之前，保持高度意识是你最重要的任务。你还需要在整个降落伞飞行过程中使用高度表。

In freefall, you should **check your altitude**:

在自由落体阶段，你应在以下情况下**检查高度**：

- every three seconds
每三秒一次
- after each maneuver
每完成一次动作后
- whenever you encounter something unexpected
每当遇到意外情况时

In Category A, the USPA Instructor takes responsibility for putting your equipment on you, adjusting it correctly, and **checking it**:

在 A 单元中，USPA 教练负责为你穿戴装备，正确调整装备，并在以下节点**检查装备**：

1. before you put it on
在你穿装备前
2. immediately after you put it on
在你穿装备后立即检查
3. before boarding the plane
登机前
4. in the aircraft shortly before exit
即将出舱前

Aircraft

飞机

Your instructor must accompany you anytime you approach, enter, and move about the aircraft, whether the engine is running or not. Always approach fixed-wing aircraft from the rear to avoid contact with the propeller. Protect your gear by being mindful of the parachute rig on your back when climbing into and moving about the aircraft. According to Federal Aviation Regulations (FARs), the pilot and the jumper are jointly responsible for ensuring that the jumper wears seat belts or restraints during taxi, takeoff, and landing.

你在任何时候接近、进入飞机或在飞机内移动时，都必须有教练陪同，无论飞机发动机是否运转。必须始终从后方接近固定翼飞机，以避免螺旋桨。在登机时和在飞机内移动时，请注意你背着的降落伞装备，要保护好装备。根据联邦航空条例（FAR），飞行员和跳伞者共同负责确保跳伞者在飞机滑行、起飞和着陆期间系好安全带或使用约束装置。

Aircraft Emergencies

飞机紧急情况

A USPA Coach, under the supervision of a USPA Instructor, may teach this section.

本节内容可由在 USPA 教练的监督下的 USPA 助理教练教授。

The probability of an aircraft emergency is low. In an emergency, your first response is to **stay calm and wait** for a command from your instructor. The pilot will tell your instructor to either prepare for landing or to exit the plane. Your instructor will tell you which of these actions you need to perform:

飞机出现紧急情况的概率很低。在紧急情况下，你的第一反应需是**保持冷静并等待教练的指令**。飞行员会告诉你的教练是要准备着陆还是要出舱。你的教练会告诉你需要采取以下的哪种行动：

- land in the aircraft
留在机内，随飞机一起着陆

- exit and use your reserve parachute
出舱并使用备伞
- exit and use your main parachute
出舱并使用主伞
- perform a routine exit with or without instructor assistance
在有教练协助或无教练协助的情况下进行常规出舱。

If you land with the aircraft in an emergency:

在紧急情况下，如果你留在机内，随飞机一起着陆：

- ensure your helmet and seat belt or restraint are on
确保头盔已戴好，安全带或约束装置已系好
- assume a safety position taught by your instructor
采取教练教的安全姿势
- clasp your hands behind your head to reinforce your neck
双手交叉放在头后以保护颈部
- after landing, unfasten your seat belt or restraint and immediately exit in an orderly fashion and walk at least 100 feet away from the plane
着陆后，解开安全带或约束装置，立即有序离开飞机，并远离飞机至少 100 英尺以上

If you exit the aircraft after an emergency:

在紧急情况下，如果你出舱：

- ensure your parachute is open immediately
确保立即打开降落伞
- look for your instructor's parachute
寻找教练的降落伞
- follow them to a clear, open landing area and prepare to perform a parachute landing fall (PLF)
跟随他们前往一个开阔的着陆区域，并准备执行 PLF（着陆缓冲）；

Select any clear area if you can't find your instructor.

如果找不到教练，则选择一片开阔区域着陆。

If any parachute opens in the aircraft, attempt to contain the parachute and inform the instructor. If your parachute goes out the door, follow immediately to prevent damage to the plane and injury to yourself or others. If anyone else's parachute goes out the door, immediately push them to and through the door for the same reason.

如果任何降落伞在舱内打开，则尝试控住降落伞并通知教练。如果你的降落伞飞出了舱门，则立即跟随其出舱，以防止对飞机造成损坏或对自己或他人造成伤害。如果其他人的降落伞飞出舱门，出于同样的原因，应立即将他们推向舱门并推出舱门。

Exit and Freefall

出舱和自由落体

A USPA Instructor rated for the method-specific discipline in which you are training must teach this portion.

本节内容必须由持有你所接受的培训方法对应的教练评级的 USPA 教练教授。

It's important to plan your dive, then dive your plan.

做好跳伞计划，然后按计划执行是非常重要的。

Exit

出舱

A good **exit** from the aircraft makes best use of learning time and provides a safer, more controlled experience. Mentally breaking the exit into three parts can help you be more aware and responsive during the exit and help you perform better, allowing for more working time in freefall. The three parts are:

良好的**出舱**可以腾出更多后续学习时间，并带来更安全可控的体验。可在内心将出舱动作分为三个部分，这可以让你在出舱过程中更加专注，反应更加迅速，从而有更好的表现，并有更多时间做自由落体阶段的事。这三个部分分别是：



THE SETUP
准备就位



THE LAUNCH
跳出



THE FLYAWAY
飞离

Set yourself **up** for success by placing your hips, head, feet, and hands in the easiest position to get to the next picture ...

将臀部、头部、脚和手放在最容易转换至下一个姿势的位置，为成功出舱**准备就位**

As soon as you leave the plane, **launch** your hips into the relative wind, keeping your head and eyes up, relaxing as you get to the next picture ...

一旦离开飞机，**跳出**并顶胯迎向（飞机前方吹来的）相对气流，保持头部抬起向上看，放松身体，以进入下一个姿势

Hold a relaxed arch as you **fly away** and shift from the relative wind to the terminal wind, a transitional state known as "the hill."

飞离时，保持放松的弓形姿势，这时气流会由（飞机前方吹来的）相对气流过渡到（自由落体时来自下方的）终端气流，这一过渡状态在英文中被称为“the hill”，即“山坡”。

Setup procedures prepare you to exit in a stable, belly-first freefall body position. The setup position should place your belly (pelvis) facing forward into the supporting wind, known as the **relative wind**. As you exit, you will feel the relative wind coming from the front of the airplane. During the first several seconds of freefall, you will naturally transition to a belly-to-earth position and will feel the relative wind supporting you from below. Presenting your belly to the relative wind on exit increases your stability during the exit.

准备就位的程序可以帮助你以稳定的腹部迎风的自由落体姿势出舱。准备就位的姿势应是腹部（骨盆）迎向顶风（即**相对气流**）的方向。出舱时，你会感受到来自飞机前方的相对气流。在自由落体的最初几秒内，你会自然过渡到腹部朝地的姿势，并感受到相对气流在下方支撑着你。出舱时让腹部迎向相对气流可以增加出舱时的稳定性。

Your setup will vary based on the aircraft from which you are exiting, but your launch and **flyaway** will be essentially the same, regardless of aircraft. To time the **launch**, you will either perform a count or respond to a "go" command.

你的准备就位的姿势会根据飞机类型而有所不同，但无论飞机类型如何，你的跳出和**飞离**动作基本相同。为了掌握**跳出**时机，你可以执行出舱信号或响应教练的“Go”指令。

Tandem students: Your instructor will rehearse your exit and exit commands with you.

双人伞学生：你的教练会与你一起演练出舱动作和出舱指令。

AFF students: Verify that the instructors are ready. Call, "Check in!" to the inside instructor, who responds, "OK!" Call, "Check out!" to the outside instructor, who responds, "OK!" Take a deep breath to relax and then begin a count with a verbal and physical cadence "Up, down, arch!" or "Out, in, arch!" to help the instructors leave simultaneously with you.

AFF 学生：确认教练已准备好。对舱内教练喊“Check in! ”，教练会回应“OK! ”。然后对舱外教练喊“Check out! ”，教练会回应“OK! ”。深呼吸放松，然后以口头和身体动作有节奏地给出出舱信号：“Up, down, arch! ”或“Out, in, arch! ”，以帮助教练把握你的出舱时机。（译者注：中文跳伞教学中可能会使用不同的口令）

IAD and static-line students: Climb into position and wait for the instructor's command. Look for signals from your instructor. On "Go!" take a breath to relax and look up. Release from the plane, count out loud by thousands to 5,000, then check the parachute.

IAD 和 Static Line 学生：到达出舱位置并等待教练的指令。注意教练的信号。在听到“Go! ”后，深呼吸放松并抬头向上看。离开飞机后，大声以千为单位数到 5000，然后检查降落伞。

You must exit soon after climbing out to ensure that you open the parachute over the correct place on the ground.

你必须在爬出机舱后尽快出舱，以确保在正确点位的上空开伞。

During the first few seconds after your launch, you will experience what is known as the **flyaway**—the transition from your vertical position to your belly-to-earth position. This happens naturally when you maintain a relaxed, arched body position with your hips facing the relative wind.

在跳出后的最初几秒内，你会经历所谓的“**飞离**”——从竖直的姿势过渡到腹部朝下的姿势。当你保持放松的弓形姿势并让臀部迎风时，这一过程会自然发生。

AFF students: In case of instability, check your altitude, arch until the horizon comes flat into view, and follow your instructors' signals. If you lose one instructor, continue as usual. If you lose both instructors, pull immediately.

AFF 学生：如果出现不稳定的情况，检查高度，保持弓形姿势，直到地平线平稳进入视野，并遵循教练给出的信号。如果你失去一位教练，继续照常操作。如果你找不到两位教练，则立即开伞。

Tandem, IAD, and static-line students: In case of instability on exit, arch.

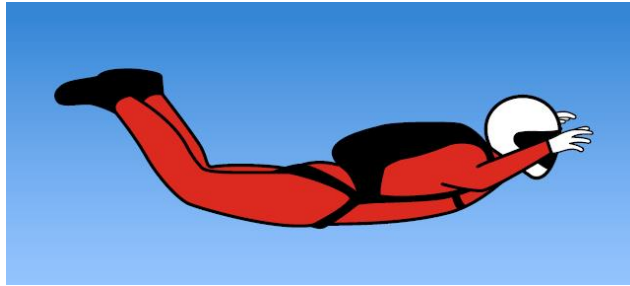
双人伞、IAD 和 Static Line 学生：如果出舱时不稳定，保持弓形姿势。

Body Position

身体姿势

You will learn to fall belly first into the relative wind in a neutral, arched body position. An arched body position creates stability and results in a more reliable deployment of the parachute.

你将学习以中性的弓形姿势腹部迎风。弓形姿势能够带来稳定性，并使降落伞更加可靠地展开。



Neutral Body Position
中性身体姿势

Arching and extending the legs slightly while relaxing the rest of the body results in a smooth, on-heading freefall. The key elements of a **neutral body position** include:

弓形并微伸双腿，同时放松身体的其他部分，可以实现平稳且方向稳定的自由落体。**中性身体姿势**的关键要素包括：

- hips forward with back arched
顶胯，背部弓起
- knees at shoulder-width apart
膝盖与肩同宽
- legs extended slightly, knees bent 45 degrees, toes pointed
双腿微伸，膝盖弯曲 45 度，脚尖绷直
- upper arms positioned 90 degrees or less from the torso and relaxed
上臂与躯干呈 90 度或更小角度，并放松
- elbows bent 90-120 degrees and relaxed
肘部弯曲 90-120 度，并放松
- chin up
下巴抬起

You will practice this body position until it becomes more natural. Consciously breathing will help you relax.

你将反复练习这一身体姿势，直到能自然地做到。有意识的呼吸将帮助你放松。

Your instructor may use **hand signals** to correct your body position and to provide dive-flow reminders. You should respond to all adjustments smoothly and slowly and maintain your new body position.

你的教练可能会使用**手势信号**来纠正你的身体姿势并给出跳伞流程提醒。你应该有条不紊地响应所有调整，并保持住新的身体姿势。

Hand Signals

手势信号



Pelvis Forward (arch)
顶胯 (弓形)



Circle of Awareness
(altitude check)
高度意识 (检查高度)



OK
OK



Deploy the Parachute (pull)
开伞 (拉出引导伞)



Legs In (retract legs slightly)
腿收一点



Extend Legs Six Inches and Hold
伸腿6英寸并保持



Open Hand
(release pilot chute)
张开手 (释放引导伞)



Check Arm Position
检查手臂姿势



Knees Together
Slightly -or- Toe Taps
膝盖并拢一点
或双脚的脚尖互碰一下



Perform the Practice
Deployment Sequence
模拟开伞



Relax (breathe)
放松 (呼吸)

Freefall-Dive-Flow Skills (AFF)

自由落体流程技能 (AFF)

If you are training via the AFF method or another harness-hold method, a USPA Coach may introduce these skills and the sequence, but a USPA AFF Instructor is responsible for directly supervising practice and ensuring proficiency.

如果你通过 AFF 培训方法或其他 Harness-hold 培训方法进行培训，这些技能和流程有可能会由 USPA 助理教练来介绍，但 USPA AFF 教练必须负责直接监督练习并确保熟练度。

After exiting, take a breath and relax, making sure you are in the correct freefall body position. Then, perform a **circle of awareness**:

出舱后，深呼吸并放松，确保你采用正确的自由落体身体姿势。然后，进行**高度意识检查**：

- 1 look at the horizon to check your heading
看向地平线以检查你的方向
- 2 read your altimeter
读取高度表
- 3 look first to the reserve-side instructor and then to the main-side instructor for signals
先看向备伞把手侧的教练，再看向主伞把手侧的教练，注意教练给出的手势信号

(译者注：高度意识检查的内容，即“方向 - 高度 - 备伞把手侧教练 - 主伞把手侧教练”呈逆时针环形顺序，英文称此检查为“Circle of Awareness” (COA)，有时也译为循环检查、环形检查。在非 AFF 的跳伞中，该词也常被使用，但检查的内容有所不同，并不一定按照环形排列，因此这里统一翻译为高度意识检查。)

Then, perform **three practice deployments**:

接着，进行**三次模拟开伞练习**：

- practice slowly and deliberately, moving only your arms
缓慢且有条不紊地练习，仅动手臂
- verbalize each action
喊出每个动作
- pause to feel the deployment handle each time
每次都暂停一下以感受开伞把手
- check that your body position is correct before, during, and after each practice deployment
在每次模拟开伞练习之前、期间和之后检查身体姿势是否正确

Perform a second **circle-of-awareness check**. Then monitor your altitude and body position for the remainder of the freefall using **HAALR**:

进行第二次**高度意识检查**。然后使用 **HAALR 法（方向，高度，弓形，腿形，放松）** 监控你的高度和身体姿势，直至自由落体结束：

- Heading (look at the horizon)
方向（看向地平线）
- Altitude (most important)
高度（最重要）
- Arch (hips forward, chin up)
弓形（顶胯，下巴抬起）

DIVE FLOW: is the planned sequence of events. There is a freefall dive flow and a canopy dive flow for every skydive.

跳伞流程：指计划的事件顺序。每一跳都有自由落体流程和降落伞飞行流程。

COA: Circle of awareness consists of checks to ensure you are aware of heading, altitude, and instructor signals.

高度意识检查 (COA)：包括一系列检查，以确保你知悉方向、高度和教练的信号。

HEADING: is the direction you are facing.

方向：指你面朝的方向。

PRACTICE DEPLOYMENT: is a movement that mimics the pull sequence so you can practice finding the handle with the right timing and body position.

模拟开伞练习：是一种模拟开伞流程的动作，你能练习如何在正确的时机和身体姿势下找到开伞把手。

- Legs (ensure neutral leg position)
腿形（确保腿部处于中性姿势）
- Relax (take a deep breath)
放松（深呼吸）

While receiving video of your jump may be of benefit during training, you must pay attention to your altitude not the camera flyer.

观看你的跳伞视频可能在培训期间有所帮助，但你必须关注高度，而不是把注意力放在摄影师上。

At 6,000 feet, **lock on** to your altimeter and keep looking at it until you see it read 5,500 feet. At 5,500 feet, **wave off** by waving both arms smoothly overhead, which signals to your instructors that you know your altitude and intend to pull. Remember that the wave off is the beginning of a slow, smooth, pull sequence that will take approximately 1,000 feet from start to finish. **Initiate deployment** with the wave off, arch, reach, and pull sequence, and deploy your parachute as practiced. The instructor may assist you.

在 6000 英尺高度时，**锁定**你的高度表并一直看着它，直到高度表显示 5500 英尺。在 5500 英尺时，通过平稳地在头顶挥动双臂来发出**挥手**信号，向你的教练表明你已知晓高度并准备开伞。记住，挥手示意是平缓的开伞程序的开始，整个流程大约需要消耗 1000 英尺的高度。通过挥手、弓形、找、扔的顺序来**启动开伞流程**，按照练习的方式打开降落伞。教练可能会协助你。

Main Deployment

主伞的开伞

A USPA Coach can teach this section under the supervision of a USPA Instructor.

本节内容可由在 USPA 教练的监督下的 USPA 助理教练教授。

Body Position for Deployment

开伞时的身体姿势

Establish a neutral body position, then locate the main deployment handle. Look up while reaching for your handle and maintain your arch while keeping your spine straight.

采取中性身体姿势，然后找到主伞开伞把手。在伸手抓把手时抬头，并保持弓形姿势，同时确保脊柱挺直。

For balance, stretch your left hand overhead (like you are raising your hand to ask a question) as you reach with your right hand for the deployment handle. Pull the handle, then return to your neutral body position. Verbalize each action.

为了保持平衡，当你用右手抓开伞把手时，将左手举过头顶（就像举手提问一样）。拉出把手后，回到中性身体姿势。喊出每个动作。



Deployment: From a neutral arch, reach back while staying symmetrical, and pull the handle, throwing it briskly. Then, return to a neutral arch

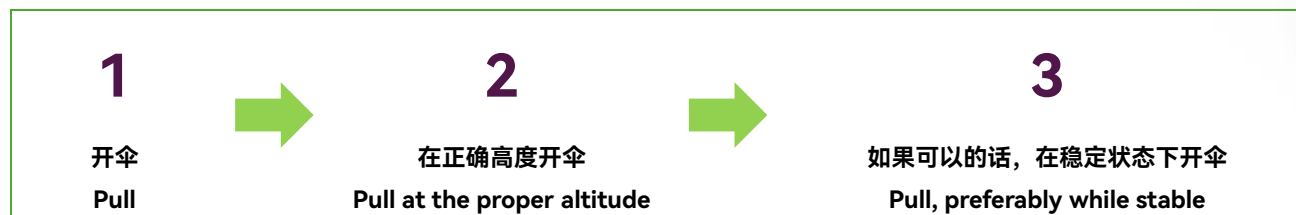
开伞动作：从中性弓形姿势开始，向后伸手，同时保持平衡，拉出把手并迅速抛出。然后，回到中性弓形姿势。

After you pull, remain flat and stable with your shoulders level throughout the deployment, counting by thousands to 3,000. After the count of three, visually check for pilot-chute and main-canopy deployment

拉出开伞把手后，保持平稳且肩膀水平，同时数数以千为单位数到 3000。数到 3000 后，目视检查引导伞和主伞打开情况。

Pull Priorities

开伞优先事项



The number-one priority on any skydive is to pull. You can pull at any time during the skydive when encountering difficulty or experiencing something unexpected. The second priority is to pull at the assigned altitude, and the third priority is to preferably pull in a stable body position. A stable, face-to-earth body position improves opening reliability but is less important than opening at the assigned altitude. Always prioritize altitude over stability.

在任何跳伞中，第一优先事项是开伞。当遇到困难或意外情况时，你可以在跳伞的任何时间开伞。第二优先事项是在指定高度开伞，第三优先事项是尽量在稳定的身体姿势下开伞。稳定的面朝下姿势可以提高开伞的可靠性，但在指定高度开伞的重要性低。高度永远比稳定性重要。

STOP AND CHECK YOURSELF:

停一停，做个自我检查：

What should you do anytime you see your instructor pull? Answer: **Pull**.

当你看到教练开伞时，你应该做什么？答案：**开伞**。

What should you do if you are on your back at pull altitude? Answer: **Pull**. Pulling at the proper altitude is more important than pulling while stable.

如果你在开伞高度时处于背朝下的姿势，你应该做什么？答案：**开伞**。在正确的高度开伞比在稳定状态下开伞更重要。

IAD and static-line students: As you exit the plane, remain arched and stable with your feet extended slightly, toes pointed, and shoulders level through deployment, counting to five by thousands. Look over your shoulder for the pilot chute (if used) and main-canopy deployment.

IAD 和 Static Line 学生： 出舱时，在降落伞展开过程中，保持弓形并稳定，双脚微伸，脚尖绷直，肩膀水平，同时以千为单位数到 5000。回头查看引导伞（如有使用）和主伞打开情况。

Deployment Problems

开伞问题

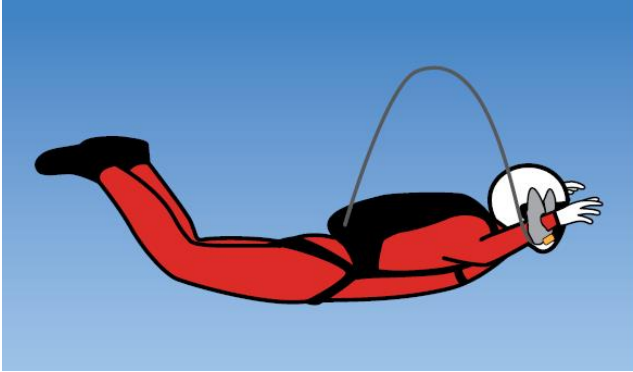
If you **cannot find the main deployment handle**, feel across the bottom of the container to the corner, then down the side to the corner. Attempt to locate it no more than twice or for 5 seconds, whichever comes first. If you cannot find it, initiate emergency procedures.

如果**找不到主伞开伞把手**，请从伞包底部摸到拐角，然后再沿着伞包侧面摸到拐角。尝试找把手的次数不要超过两次，时间不要超 5 秒，以先到者为准。如果仍然找不到，立即启动紧急程序。

If you find the main deployment handle but it is stuck, often referred to as a **hard pull**, attempt to throw the pilot chute no more than twice or for 5 seconds, whichever comes first. If you are unsuccessful, initiate emergency procedures.

如果找到主伞开伞把手但它卡住了（即**把手难以拉动**），尝试抛出引导伞的次数不要超过两次，时间不要超 5 秒，以先到者为准。如果不成功，立即启动紧急程序。

If you throw the pilot chute but it gets stuck in the burble behind your back, clear this **pilot-chute hesitation** by twisting at the waist and looking over your shoulder to change the airflow. Attempt to clear the pilot chute no more than twice or for 5 seconds, whichever comes first. If the pilot chute does not launch off your back, initiate emergency procedures. 如果抛出引导伞后，引导伞滞留在你背后的气流中，则通过扭动腰部并回头看以改变气流，从而消除**引导伞迟滞**。尝试消除引导伞迟滞的次数不要超过两次，时间不要超 5 秒，以先到者为准。如果引导伞仍未从背后飞出，立即启动紧急程序。



Deployment Problems: Pilot-chute entanglement (left) and premature container opening (right)

开伞问题：引导伞缠绕（左）和伞包意外过早打开（右）

If you throw the pilot chute but the bridle wraps around a body part, arch harder for stability and attempt to clear the **pilot chute entanglement** by pointing the limb that's entangled to the sky to shake it off. Attempt this no more than twice or for 5 seconds, whichever comes first. If that fails, initiate emergency procedures.

如果抛出引导伞后，引导伞的系带缠绕在身体某个部位上，请加强弓形姿势以保持稳定，并尝试通过将缠绕的肢体指向天空来解除**引导伞缠绕**。尝试次数不要超过两次，时间不要超 5 秒，以先到者为准。如果这不起作用，立即启动紧急程序。

If your **container opens prematurely** in freefall, attempt to locate and deploy the pilot chute no more than two times or for 5 seconds, whichever comes first. If you can't locate the pilot chute after two tries or within five seconds, cut away and deploy the reserve. Alternatively, if you find and throw the pilot chute and it results in a partial malfunction, cut away and deploy the reserve.

如果在自由落体中**伞包意外提前打开**，尝试找到并抛出引导伞，次数不要超过两次，时间不要超 5 秒，以先到者为准。如果两次尝试或 5 秒内仍未找到引导伞，立即切伞并开备伞。或者，如果你找到并抛出引导伞，但导致发生部分故障，则立即切伞并开备伞。

IAD and static-line students: If the static line fails to disconnect from the parachute system and you are being towed behind the aircraft, a situation known as student-in-tow, arch and signal to your instructor that you are ready for them to cut your static line. After the static line is cut, deploy your reserve.

IAD 和 Static Line 学生：如果 Static Line 未能与降落伞系统断开连接，导致你被拖拽在飞机后方（这种情况被称为“飞机拖拽学生”），请保持弓形姿势并向教练示意你已准备好让他们切断 Static Line。在 Static Line 被切断后，打开备伞。

IAD students: Ensure that you look over your shoulder once you have exited the plane after counting to 5 seconds. If the pilot chute gets caught on your hand or arm, attempt to clear it twice; if it does not clear, execute your emergency procedures.

IAD 学生：出舱后数完 5 秒后，确保要回头查看。如果引导伞缠在手或手臂上，尝试清理两次；如果未能解决，执行紧急程序。

Canopy

伞控

Canopy Basics

伞控基础

A canopy is an inflatable wing that performs like the wing of an airplane. Once it is open and inflated, the canopy will start gliding forward and down through the air. The airflow around the canopy creates lift.

降落伞是一个可充气的翼伞，其功能类似于飞机的机翼。一旦打开并充气，降落伞将开始向下前方滑翔。气流在降落伞周围产生升力。

With both toggles all the way up, the canopy should glide straight ahead at full speed. To turn, look in the direction you want to turn, then pull that toggle down.

当两个刹车完全松开时，降落伞将以全速直线滑翔。要转弯时，看向你想转的方向，然后拉下该侧的刹车。

(译者注：在手保持抓握刹车的情况下把刹车放回上方时，中文的习惯表述是“松刹车”，请特别注意其含义不是手放开刹车。)

Pulling one toggle down a small amount produces a slow turn with a relatively small amount of dive. Small toggle inputs can be used to make minor heading corrections at any point in the canopy flight. Pulling one toggle down farther will produce a faster turn and cause the canopy to dive. Pulling both toggles down, known as a **flare**, decreases the rate of descent and forward speed of the canopy.

将一侧刹车小幅下拉会使降落伞缓慢转弯，并伴随轻微的俯冲。在降落伞飞行的任何阶段，小幅度的刹车操作可用于进行方向微调。将一侧刹车更多地拉下会使降落伞更快地转弯，并导致降落伞俯冲。同时拉下两侧刹车（称为**拉平**）会降低降落伞的下降速率和前进速度。

When flying into the wind, you will fly more slowly across the ground. When flying with the wind, you will move more quickly across the ground. When flying perpendicularly to the wind, known as **crabbing**, you will move in the direction you are facing with some sideways drift, and these effects will increase as wind speed increases.

逆风飞行时，你在相对地面的移动速度会较慢。顺风飞行时，你相对地面的移动速度会较快。垂直于风向飞行时（称为“**蟹行**”），你会往你面朝的方向移动，同时会有一定的侧向漂移，该效应会随着风速的增加而增强。

Canopy Check

降落伞检查

Immediately after deployment, you need to complete a canopy check to see whether you have a good canopy. Common questions used to assess your canopy include: "Is it there? Is it square? Is it steerable?" Or, "Is it square? Is it stable? Is it steerable?" During your first jump course, your instructor will cover what each question means specifically and help you practice applying them to several scenarios. For example:

开伞后，你需要立即完成降落伞检查，以确认降落伞是否正常。常用的评估问题包括：“大小是否正常？形状是否方正？是否可控？”或者“是否方正？是否稳定？是否可控？”在第一跳课程中，你的教练会详细解释每个问题的具体含义，并帮助你在多种场景中练习应用。例如：

FLARE: is a maneuver you perform under canopy in which you pull both toggles down to slow your forward speed and descent rate.

拉平：指一种对降落伞的操作，通过同时拉下两个刹车来减慢前进速度和下降速率。

CANOPY-CONTROL CHECK: refers to the physical part of a canopy check and is often also called the controllability check. It consists of turning and flaring to assess the canopy's flight capabilities.

降落伞可控性检查：指降落伞检查的实际操作部分，也常被称为可操纵性检查。它包含了转弯和拉平，以评估降落伞的飞行能力。

DECISION ALTITUDE: is the lowest altitude by which you must decide whether your canopy is safe to land. For students, this altitude is 2,500 feet.

决断高度：是你必须确认降落伞是否能用于安全着陆的最低高度。对于学生来说，这一高度为 2500 英尺。

FULL FLIGHT: is when the parachute is flying at its natural forward speed and descent rate with the toggles all the way up.

全速飞行：指降落伞在其自然的前进速度和下降速率下飞行，刹车处于完全松开的状态。

There? Check the canopy for proper inflation after the deployment. The canopy should be large and fully inflated.

大小是否正常? 检查降落伞在开伞后是否正常充气。降落伞应看起来够大并充分充气。

Square? It should have four well-defined edges that create a rectangular shape. The suspension lines should cascade down in four neat line groups to each riser, and the slider should be down to the tops of the risers. The canopy should be stable; it is flying level toward the horizon, not turning or spinning, with only fixable problems left to be solved.

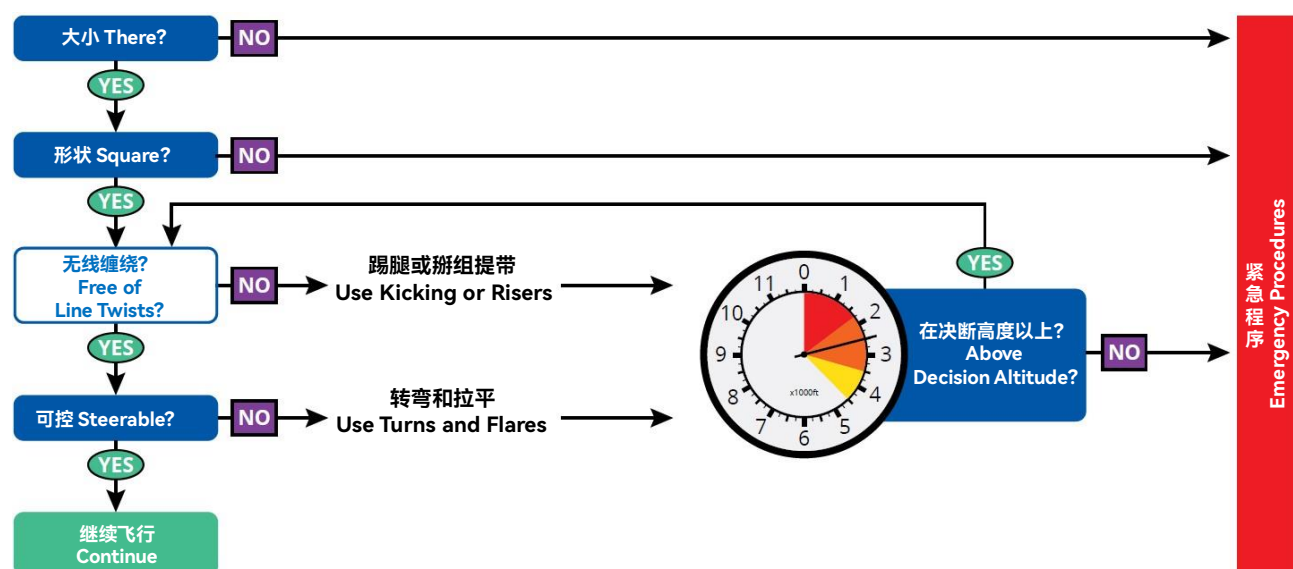
形状是否方正? 降落伞应有四条清晰的边缘，形成一个矩形。伞绳应整齐地汇聚成四组，分别连接到各个组提带上，滑块布应下滑至组提带顶端。降落伞应保持稳定；它应伞翼水平，朝着地平线飞行，没有转向或旋转，至多只有一些可修复的问题需要解决。

Steerable? You must perform a canopy-control check to ensure the canopy flies straight in full flight, is steerable and can be flared. First, unstow your toggles and confirm the canopy is flying straight. To confirm the parachute will brake properly for landing, flare by pulling both toggles all the way down. Smoothly raise the toggles back up to full flight. To confirm the parachute is steerable, look right, turn right at least 90 degrees, then stop the turn by going back to full flight. Finally, look left, turn left, then stop the turn by going back to full flight.

是否可控? 你必须进行降落伞可控性检查，以确保降落伞在全速飞行时能沿直线飞行、可操控并能拉平。首先，释放刹车并确认降落伞能直线飞行。为确认降落伞在着陆时能正常刹车，可完全拉下两个刹车进行拉平操作。然后平稳地将刹车松回到全速飞行状态。为了确认降落伞可操控，先向右看，再向右转至少 90 度，然后停止转向，恢复全速飞行。最后，向左看，再向左转向，然后停止转向，恢复全速飞行。

Decide whether the canopy is controllable and safe to land by 2,500 feet, which is your **decision altitude**. If it is not, you must immediately initiate emergency procedures.

在 2500 英尺的**决断高度**之前，判断降落伞是否可控且能用于安全着陆。如果不能，你必须立即启动紧急程序。



Emergency Procedures Decision Tree

紧急程序决策树

Fixable Problems

可修复的问题

Problems that are usually minor include end cells of the canopy that stay closed, a slider that stays up near the canopy, an unintended turn, line twists, or other issues involving an inflated canopy. Line twists must be fixed first. To untwist the lines, spread the risers and kick, but release the brakes only after clearing the twist. Except for line twists, you can solve most minor problems with a canopy-control check. If the problem continues or gets worse, initiate your emergency procedures by 2,500 feet. If in doubt, initiate your emergency procedures. It is not advisable to try to land a compromised parachute.

通常较轻微的问题包括降落伞末端气室未完全打开、滑块布卡在上方伞布附近、意外转向、线缠绕，或其他在降落伞已充气的情况下发生的问题。其中，线缠绕必须优先解决。要解开缠绕，应掰开组提带并踢腿，刹车只能在解开缠绕后再释放。除了线缠绕外，大多数轻微问题可以通过执行降落伞可控性检查来解决。如果问题持续或恶化，应在 2500 英尺高度以上启动紧急程序。如仍存疑，也应立即启动紧急程序。尝试使用有问题的降落伞着陆是不明智的。

LINE TWISTS: are a common problem in which the canopy has inflated but the lines or risers have developed one or more complete twists. This situation is usually easily remedied.

线缠绕：一种常见的问题，指降落伞已充气，但伞绳或组提带出现一个或多个缠绕。这种情况通常很容易解决。

CUTAWAY HARD DECK: is 1,000 feet, the altitude where it becomes too low for a safe cutaway. Instead of cutting away, you must deploy the reserve and land both canopies.

切伞硬甲板高度：切伞硬甲板高度为 1000 英尺，低于此高度时切伞将不再安全。此时不应切伞，而应打开备伞并带着两个降落伞着陆。

Canopy Malfunctions

降落伞故障

Your instructor will provide you with practice on the proper procedures for the equipment you will be jumping
你的教练将为你提供针对你所使用装备的正确操作程序的练习。

Emergency Procedures

紧急程序

If you have a canopy malfunction, check your altitude to make sure you are above your cutaway hard deck of 1,000 feet, then cut away and pull your reserve. Below 1,000 feet it becomes too low to safely cut away, and you must deploy the reserve and land both parachutes.

如果遇到降落伞故障，首先检查高度，确保高度在 1000 英尺切伞硬甲板高度以上，然后切伞并开备伞。若高度低于 1000 英尺，则已无法安全切伞，此时必须开备伞并用两个降落伞着陆。

Two Parachutes Out

双伞情形

You can prevent a two-parachutes-out malfunction by staying altitude aware and protecting your handles and closing pins. There are two possible actions you can take in a two-out situation: land both canopies or cut away.

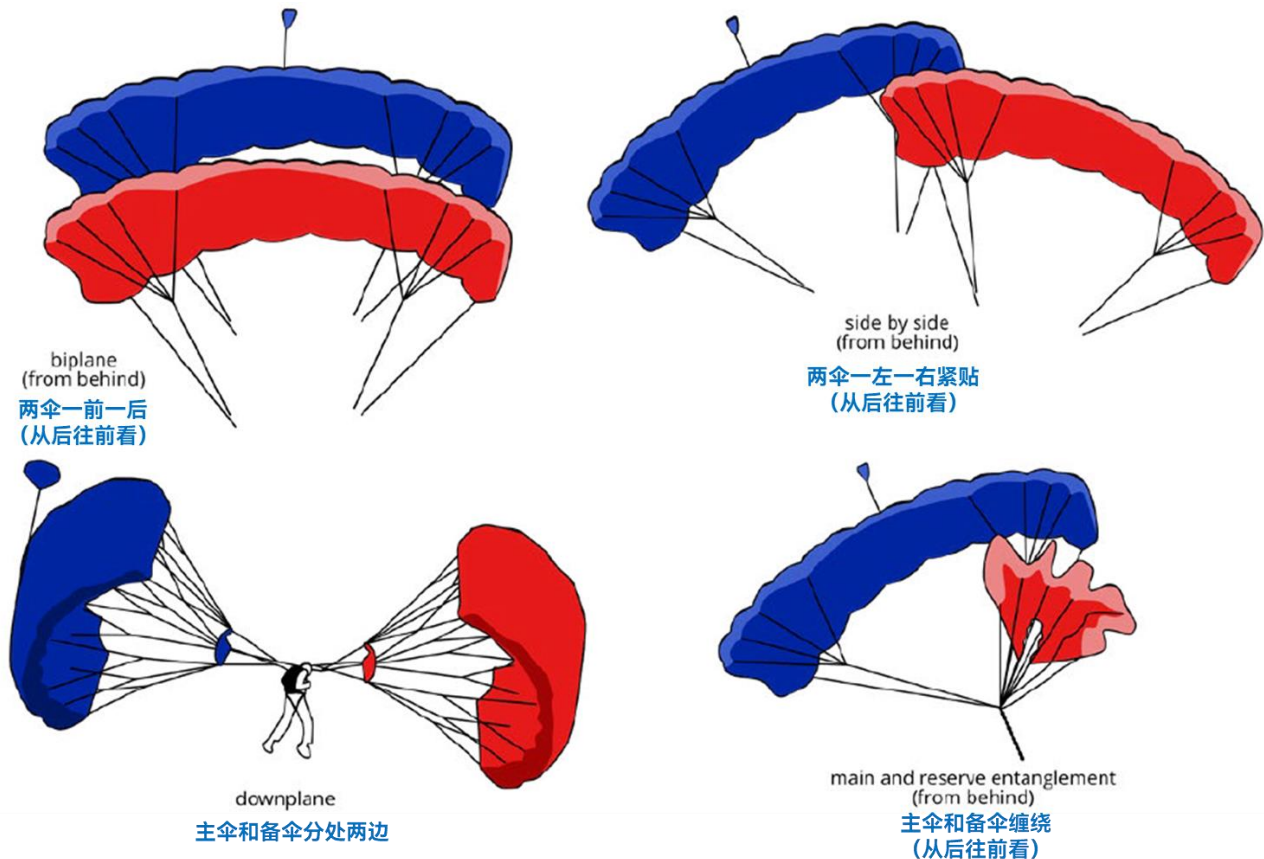
保持高度意识并保护好操作把手和关包针，可以有效避免双伞情形的发生。若出现双伞情形，有两种可能的应对措施：要么带着两个降落伞着陆，要么切伞。

You should land both canopies if you have a stable **biplane**, a **side-by-side**, or a **main-reserve entanglement**. If all toggles are stowed, leave them stowed. If the toggles have been unstowed on one canopy, unstow the toggles on the other. For a biplane, gently steer the front parachute by pulling down gently on the rear riser in the direction you wish to go. For a side-by-side, gently steer the parachute that is more directly overhead, also using the rear risers. Land without flaring and perform a parachute landing fall. In the rare case of a main-reserve entanglement, never give up trying to clear the entanglement or inflate the parachutes. Do your best to make the parachutes fly straight for landing, and perform a PLF.

如果是稳定的两伞一前一后 (biplane) 或一左一右紧贴 (side-by-side) 的情形, 或主伞和备伞缠绕的情形, 则应带着两个降落伞着陆。如果所有刹车都未释放, 则保持未释放的状态; 若其中一个降落伞的刹车已释放, 则释放另一个降落伞的刹车。对于两伞一前一后的情形, 可通过轻轻拉动前伞的后组提带来向想转的方向转向。对于两伞一左一右紧贴的情形, 也可通过轻轻操控较为处于正上方的降落伞的后组提带来转向。着陆时无需拉平, 直接执行 PLF。如遇主伞与备伞缠绕的罕见情况, 切勿放弃尝试解开缠绕或让降落伞充气。尽可能让降落伞直线飞行以着陆, 并执行 PLF。

If you have a **downplane**, you must **cut away** regardless of altitude. A downplane occurs when the two parachutes separate and begin flying toward the ground. *This is the only exception to the 1,000-foot cutaway hard deck.*

如果主伞和备伞分处两边 (downplane), 则无论高度是多少都必须执行切伞。主伞和备伞分处两边指的是两个降落伞相互分开并开始朝着地面飞的情况。这是 1000 英尺切伞硬甲板高度的唯一例外情况。



Two-Parachutes-Out Scenarios

双伞情形

Canopy Flight

降落伞飞行

After making sure you have a good canopy, check your altitude, then observe your position over the ground. Following your canopy inspection, you must locate the airport and the planned **holding area**. Once you have identified the holding area, fly directly to it. Arriving at the holding area at or above 2,000 feet will set you up to be in the right place to enter your landing pattern.

在确认降落伞正常后, 检查高度并观察地面位置。完成降落伞检查后, 你必须找到机场和计划的**等待区**。一旦确认了等待区, 直接飞向该区域。到达等待区时, 高度应在 2000 英尺或以上, 以便为进入着陆航线做好准备。

While you are in canopy flight, regularly check your **altitude** and **position** over the ground while working toward your pattern-entry point and watch for other canopy **traffic (APT)**.

在降落伞飞行过程中，向着陆航线起始点飞行时，需经常检查**高度**和**地面位置**，并注意观察其他降落伞的**交通状况**（APT 检查，即“**高度、位置、交通**”检查）。

All jumpers must also avoid **canopy collisions** (i.e., collisions with other jumpers under open parachutes). If a collision is imminent, in most cases both jumpers should **steer to the right**. If two jumpers collide and entangle, they must communicate their intentions before taking further action. If it is too low for a safe cutaway (below 1,000 feet) and the canopies are uncontrollable, both jumpers should deploy their reserves.

所有跳伞者还必须避免**降落伞碰撞**（即与其他已开伞的跳伞者碰撞）。如果即将碰撞，大多数情况下双方都应**向右转向**。如果两名跳伞者碰撞并发生缠绕，必须在采取进一步行动前先沟通意图。如果高度过低（低于 1000 英尺）无法安全切伞且降落伞无法控制，双方应打开备伞。

Landing

着陆

Landing Pattern

着陆航线

Your landing pattern is a deliberate flight path, usually rectangular, that you use during the final phase of descent under canopy. It usually starts at 900 feet at a predetermined pattern-entry point. There are three legs to the pattern: downwind, base, and final. Before each jump, your instructor will determine your landing pattern and review it with you using an aerial map of your drop zone. It's important to plan your flight, then fly your plan. 着陆航线是降落伞下降最后阶段采用的有计划的飞行路径，通常为矩形。它通常从高度 900 英尺的预定航线起始点开始。着陆航线由三边组成：下风边（第一边）、基线边（第二边）和最后进近（第三边）。每次跳伞前，教练会确定你的着陆航线，并使用跳伞基地的航拍图与你一起复习。重要的是要先做好计划，然后按计划飞行。

The pattern consists of checkpoints at the start of each leg. Each checkpoint consists of an altitude and a landmark. Your **downwind leg** starts at 900 feet above the ground, **base leg** at 600 feet, and **final approach** at 300 feet. For each leg you must turn at your altitude or landmark, whichever comes first.

航线每一边的起点都有一个参考点，每个参考点都有相应的高度和地标。**下风边（第一边）**从离地 900 英尺高度开始，**基线边（第二边）**起点的高度为 600 英尺，**最后进近（第三边）**起点的高度为 300 英尺。对于每一边，在抵达相应高度或地标时必须转向，以先到者为准。

DOWNWIND, BASE, AND FINAL: are the three legs of your landing pattern.

下风边（第一边）、基线边（第二边）和最后进近（第三边）：是着陆航线的三边。

CROSSWIND LEG: and "base leg" are interchangeable terms.

侧风边：与“基线边”可互换使用。

HOLDING AREA: is a predetermined, general location upwind of your landing area and near your pattern-entry point. You aim to stay in the holding area above 1,000 feet to stage your entry into the pattern and ensure you can land in the landing area.

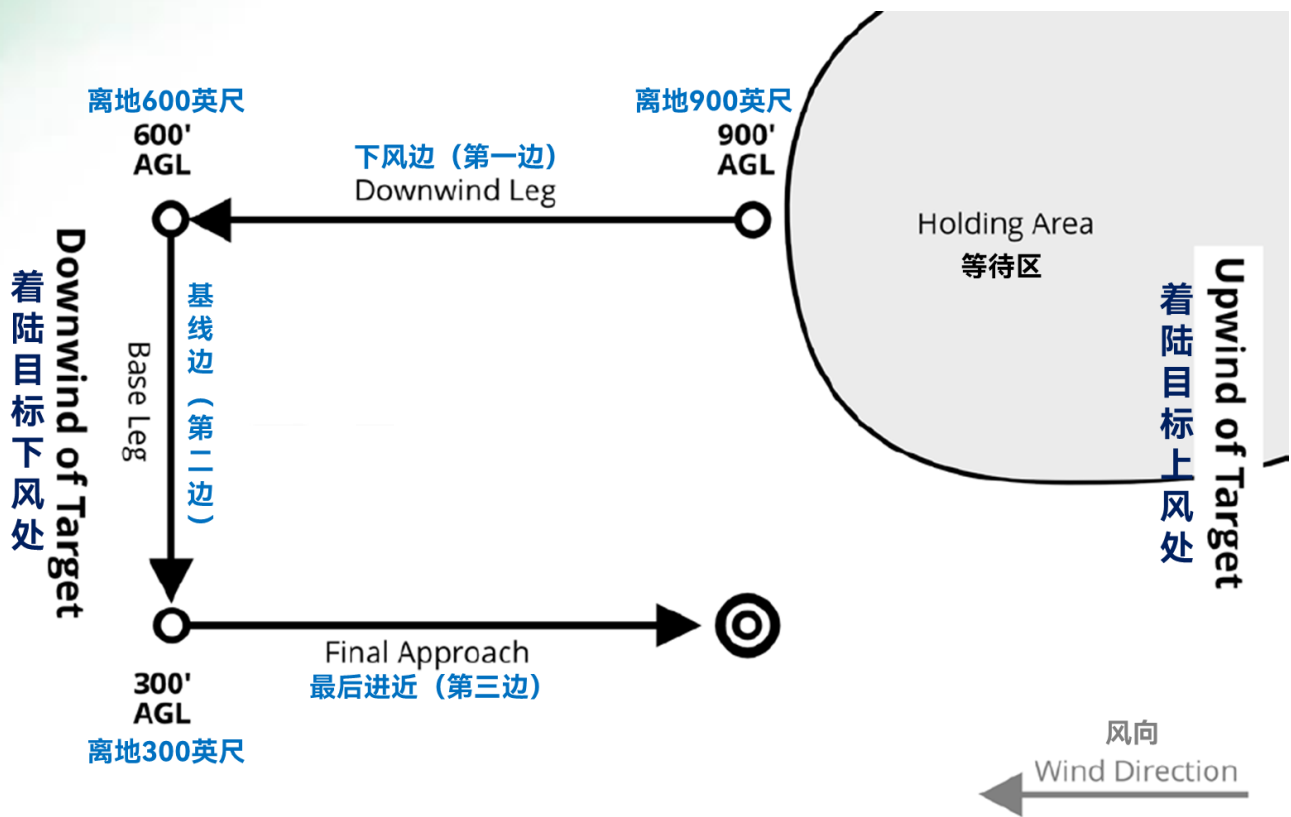
等待区：是位于着陆区上风处的预定区域，靠近着陆航线起始点。你应呆在等待区，直至 1000 英尺，从而为进入航线做好准备，并确保能够降落在着陆区。

PATTERN-ENTRY POINT: is the altitude and landmark where you start your landing pattern, generally at 1,000 feet and upwind of the target.

着陆航线起始点：开始飞着陆航线的起点，有相应的高度和地标，通常高度为 1000 英尺，位置在着陆目标的上风处。（译者特注：此处的 1000 英尺与前文不一致，请以 USPA 修订结果为准。）

Note: Your instructor may adjust the shape of the pattern, the altitudes, or the landmarks to account for various conditions or your drop zone's policies.

注意：教练可能会根据各种条件或跳伞基地的政策来调整航线的形状、高度或参照的地标。



Example Landing Pattern

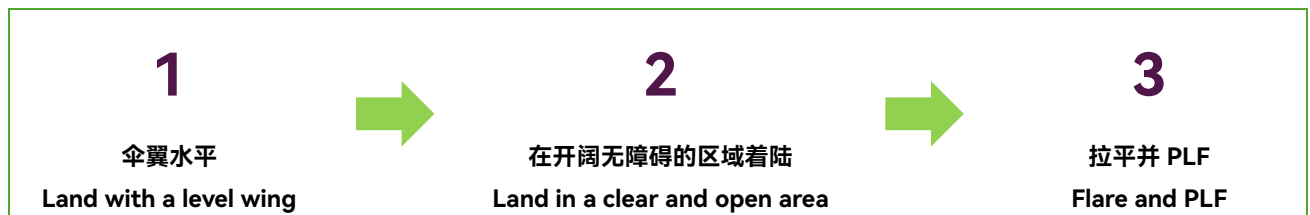
着陆航线示例

Final Approach and Landing

最后进近与着陆

Landing Priorities

着陆优先事项



On final, your main priority is to land with a **level wing**, while flying straight toward a **clear and open area**, **flaring** before touching down and performing a **PLF**. You may use minimal toggle inputs to avoid obstacles on the ground and give yourself a longer, obstacle-free runway for landing, but you must keep your wing level. If the canopy begins to drift right or left, use the appropriate input to stop the drift and keep the canopy flying straight toward a clear area. The best way to avoid obstacles is to look toward a clear area and guide the canopy there rather than focusing on an obstacle. Landing into the wind is desirable but is not one of your landing priorities.

在最后进近时，你的主要优先事项是保持**伞翼水平**，沿直线飞向**开阔无障碍的区域**，着陆前**拉平**并执行 **PLF**。你可以用少量刹车操作避开地面障碍物，给自己留出更长的无障碍物的着陆通道，但必须保持伞翼水平。如果降落伞开始向右或向左漂移，可用适当的操作停止漂移，使降落伞保持沿直线飞向开阔区域。避开障碍物的最佳方法是看向开阔区域并引导降落伞飞向那里，而不是把注意力放在障碍物上。能逆风着陆最好，但这不是着陆的优先事项。

To slow your forward speed and descent rate, you will **flare** when your feet are above the ground at approximately twice your height. Prepare to land during the last part of the final approach by putting your feet and knees together in a

parachute landing fall (PLF) position. Except for small corrections, keep your toggles all the way up in the full-glide position when on final approach. This will help the canopy produce more lift when you flare. Judge the flare height by looking forward and down at a 45-degree angle.

为了减慢前进速度和下降速度，你应在脚离地约两倍身高时**拉平**。在进近的最后阶段，双脚和双膝并拢，准备以 PLF 姿势着陆。除小幅调整外，在最后进近阶段，刹车要保持在全速飞行位置。这将有助于降落伞在拉平时产生更多升力。拉平高度可通过看向下前方 45 度来判断。

Note: Your instructor may vary the exact flare technique based on the type of canopy you will be using or other factors.
注意：教练可能会根据你使用的降落伞类型或其他因素来调整具体的拉平技巧。

Think of flaring as driving down a one-way street. You can stop at any point but cannot go back. If you start the flare too high, stop flaring and hold the toggles where they are. Letting the toggles up abruptly causes a steep dive toward the ground, known as a "flight cycle." (You will learn more about flight cycles in Category B.) Quickly assess your height above the ground. Keep looking ahead and keep the canopy flying straight. When you are closer to the ground, push the toggles forcefully the rest of the way down to finish the flare before touching the ground.

将拉平想象成是在单行道上开车。你可以在任何点停下，但不能倒车。如果你拉平过早，则停止拉平并保持当前刹车位置。突然松开刹车会导致急剧俯冲向地面，这被称为“飞行循环”（你将在 B 单元中了解更多关于飞行循环的内容）。快速评估离地高度，保持目视前方并使降落伞沿直线飞行。当接近地面时，用力将刹车拉到底，在接地前完成拉平。

You should be prepared to **PLF** every time you land. You should only attempt a stand-up landing if you touch down softly and are confident that you can comfortably remain on your feet.

每次着陆都应做好执行 **PLF** 的准备。只有在轻轻触地且确信能稳稳站立时，你才能尝试站立着陆。

Parachute Landing Fall (PLF)

着陆缓冲 (PLF)

Performing a PLF can help you reduce the risk of injury during landing by distributing the impact across five points of your body. To prepare for a PLF, press your feet and knees together with your knees slightly bent. Flare completely with both hands together and close to the front of your body to help prevent wrist and hand injuries. Keep your chin to your chest to help prevent neck injuries. Allow your feet to contact the ground first. Maintain the PLF position throughout the entire landing roll.

执行 PLF 可以将冲击力分散到身体的五个接触点，从而降低着陆受伤风险。准备 PLF 时，双脚和双膝并拢，膝盖微屈。拉平到底，双手互相结合并贴近身体前部，以防止手腕和手部受伤。下巴抵近胸部以防止颈部受伤。先让脚接触地面，并在整个着陆滚动过程中保持 PLF 姿势。

PLF: stands for "parachute landing fall" and is a technique used to prevent injury on landing.

PLF: 即“着陆缓冲”姿势，是一种用于降低着陆受伤风险的技巧。

As the balls of your **feet** touch the ground:

当前**脚掌**（跖球）触地时：

1. Lean into the direction of the landing to roll down one side of the body
身体向着陆方向倾斜，身体一侧向下滚。
2. Lay over to the side of one **calf**
然后**小腿**侧面触地。
3. Continue to roll to the **thigh** on the same side
继续滚至同侧**大腿**触地。
4. Continue rolling through the small of your **back** to the opposite **shoulder**
继续滚动至后腰，再到对侧**肩膀**。

Allow your body to continue rolling and absorb the energy of the fall
让身体继续翻滚，吸收着陆的能量。

The **PLF position** is also the proper way to prepare for a stand-up landing as it keeps your weight balanced in the harness and your hands even when the toggles are all the way down in the flare. If you touch down softly, you can step out of the PLF position and remain on your feet.

PLF 也是准备站立着陆的正确方式，因为它能让背带平衡地承载你的重量，并让双手对称地进行拉平。如果触地轻柔，你可以退出 PLF 姿势并保持站立。（译者注：站立着陆常称作“站降”）



Landing Problems

着陆问题

Alternate Landing Areas: You should be prepared to make correct decisions and land safely without assistance, whether you land in the intended landing area or an alternate one. If you are not in your holding area or close to it when the canopy opens, be prepared to **choose an alternate landing area by 2,000 feet**. Maintain altitude awareness while flying back toward your 900-foot pattern-entry point.

备降场：无论你降落在预定着陆区还是备降场，都要准备好在没有帮助的情况下做出正确决策并安全着陆。如果开伞后不在等待区或离等待区很远，应准备好在 **2000 英尺以上选择备降场**。在飞回 900 英尺着陆航线起始点时保持高度意识。

At or above 2,000 feet, you should determine whether you will be able to reach your 900-foot pattern-entry point. If it is obvious that the 900-foot point is unreachable, look for your 600-foot and 300-foot points. If you are sure that you will be able to reach one of those points, fly toward it and remain over that point until you reach the correct altitude to begin that leg of your pattern. If it is obvious that you will not reach any point in your pattern by the correct altitude, then plan to land in an open area that is free of obstacles. Keep in mind that your best alternate landing area may be behind you. Choose your new holding area and visually transfer the intended landing pattern to the new landing area. 在 2000 英尺或以上时，应判断能否到达 900 英尺着陆航线起始点。如果明显无法到达 900 英尺航线起始点，则寻找 600 英尺参考点和 300 英尺参考点。如果确信能到达其中一点，则飞至该点，待下降至正确高度后开始对应边的飞行。如果明显无法在正确高度到达着陆航线的任何参考点，则应计划降落在无障碍物的开阔区域。请记住，最佳备降场也可能在你身后。选择新的等待区，并将预定的着陆航线平移到新的着陆区域。

Landing Off Field: Any time you must land in an alternate area, on or off the airport property, look carefully for obstacles. You can look closely during the downwind leg of the pattern because you are closer to the ground. Avoid the obstacles by looking and steering the canopy **toward a clear and open area**, avoiding straight lines in the terrain that may indicate power lines, fences, or ditches. PLF and wait for assistance or further instructions. Be polite to property owners. If possible, contact the drop zone to give them your status and location.

场外着陆: 如果不得不在场外着陆，无论是在机场区域内还是外，都应仔细注意障碍物。在下风边时可以更仔细地观察，因为此时离地面更近。通过目视并操控降落伞**飞向开阔区域**来避开障碍物，避开地形中的直线型物体（如高压线、围栏或沟渠）。执行 PLF，等待援助或进一步指示。对土地所有者保持礼貌，如有可能，联系跳伞基地报告状态和位置。

Recovering the Canopy in Higher Winds: When you are on the ground, pull in one toggle and steering line to assist in collapsing the canopy, especially if it is dragging you. Cut away the canopy as a last resort or if you're injured.

大风中收伞: 着陆后，拉下一侧的刹车和刹车线，这样有助于降落伞塌缩，尤其是在被降落伞拖拽时。切伞是最后手段，仅在受伤时执行。

Obstacle Landing

障碍物着陆

Potential obstacles during landing include water, trees, buildings, power lines, fences, and similar hazards. You can usually avoid these obstacles by preparing for the canopy flight by observing the winds and planning an appropriate landing pattern. Also, choosing an alternate landing area by 2,000 feet allows you to assess potential obstacles and plan your new pattern. Follow your **Landing Priorities**. You can find comprehensive best practices for obstacle landings in Chapter 4-1 G. Below are critical points listing actions you can take when landing in or on common obstacles.

着陆时可能遇到的障碍物包括水域、树木、建筑物、高压线、围栏等类似危险物。通常可以通过观察风况并规划合适的着陆航线来为降落伞飞行做好准备，从而避开这些障碍物。此外，在 2000 英尺高度以上就选好备降场可让你评估潜在障碍物并规划新航线。要遵循**着陆优先事项**。你可以在 4-1.G 节中找到关于障碍物着陆的全面的最优操作选项。以下是应对常见障碍物着陆时的关键要点：

LOOK AWAY - STEER AWAY: Skydiving is just as much a mental sport as it is physical. There is a natural tendency to steer or move in the direction in which you are looking. "You go where your eyes go." Capitalize on this.

眼不见，行不至: 跳伞不仅是体育运动，更是心理运动。人会自然地倾向于朝目视的方向转向或移动，即“目之所向，行之所往”。要充分利用这一特性。

- **Water:** Flare and PLF in case the water is shallow. After entering the water, try to stand up. If you cannot touch the bottom, swim out of your gear and leave it behind.

水域: 拉平并 PLF，以防水深较浅。入水后尝试站立。如果无法触底，则脱离装备并游出，让装备留在那别管。

- **Trees:** Keep your arms close to your body and your legs together. Use a half flare as you enter the tree. Be prepared to finish your flare and PLF in case you drop all the way to the ground. If you remain suspended, hold on and stay

in the tree. Wait for help; do not attempt to climb down.

树木: 双臂紧贴身体, 双腿并拢。飞入树木时拉平到一半。如果完全落地, 则完成拉平并 PLF。如果挂在树上, 则抓牢并待在树上; 等待援助, 不要尝试爬下。

- **Buildings:** If landing on a roof, flare and PLF. Once you've landed, disconnect the RSL and cut away. If landing under your reserve, contain it if it's windy. Wait for help; do not attempt to climb down. If hitting a building broadside, turn the canopy slightly to avoid a direct impact before flaring. Prepare to PLF, flare to slow down, and attempt to strike a glancing blow.

建筑物: 如果降落在屋顶, 拉平并 PLF。着陆后立即断开 RSL 并切伞。如果使用备伞着陆, 则在有风时收住备伞。等待援助, 不要尝试爬下去。如将撞击建筑物侧面, 则在拉平前稍微转向以避免直接碰撞。准备 PLF, 拉平减速, 并尝试以擦碰方式接触建筑物。

- **Power Lines:** Drop any handles. Flare and PLF. Touch no more than one wire at a time. Your parachute can conduct electricity, so if you are suspended in the wires, do not cut away and do not let anyone near you. Wait for qualified personnel to confirm the power is off. If your feet are on the ground, disconnect the RSL and cut away, leaving your main canopy behind.

高压线: 扔掉所有把手。拉平并 PLF。一次只能接触一根电线。降落伞可能导电, 因此如果挂在电线上, 不要切伞, 也不要让任何人靠近。等待专业人员确认断电。如果双脚着地, 则断开 RSL 并切伞, 让主伞留在那。

A 单元跳伞流程 Category A Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

AFF AND TANDEM

AFF 和双人伞

- **安全出舱 SAFE EXIT** ✓
- 高度意识检查 COA ✓
- 模拟开伞练习 (三次) PRACTICE DEPLOY (3x) ✓
- 高度意识检查 COA
- **6000 英尺** 锁定 (双人伞 6500 英尺) **6,000'** LOCK ON (6,500' for tandem) ✓
- **5500 英尺** 挥手示意并开伞 (双人伞 6000 英尺) **5,500'** WAVE OFF and PULL (6,000' for tandem) ✓
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT ✓
- 找等待区 LOCATE HOLDING AREA ✓
- **飞着陆航线 FLY PATTERN** ✓
- **拉平并 PLF** (如需) **FLARE and PLF** if needed ✓

IAD AND STATIC LINE (2 jumps from 4,000')

IAD 和 Static Line (从 4000 英尺跳两次)

- **安全出舱 SAFE EXIT** ✓
- 数五下 COUNT 1 - 2 - 3 - 4 - 5 ✓
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT ✓
- 找等待区 LOCATE HOLDING AREA ✓
- **飞着陆航线 FLY PATTERN** ✓
- **拉平并 PLF** (如需) **FLARE and PLF** if needed ✓

TAKE THE QUIZ:

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单元小测 (中英对照)

微信扫一扫



TRANSLATION OF THE QUIZ

《《《 采取行动 ACTION STEP 》》》

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B 单元（基础）

Category B (Basics)

AFF 和双人伞 1 跳	双人伞 1 跳	IAD 和 Static Line 3 跳
开伞程序启动高度 AFF: 5500 英尺 IAD 和 Static Line: 4000 英尺 双人伞: 6000 英尺		

In Category **B**, you must practice the most **B**asic maneuver in freefall: pulling!
在 **B** 单元，你必须练习自由落体最**基础**的动作：开伞！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Discuss ground winds and winds aloft for the day
讨论当天的地面风和高空风情况
- ☐ Plan your flight to the holding area and the pattern with assistance
在协助下规划飞往等待区的路线和着陆航线
- ☐ Discuss runways and aircraft patterns
讨论跑道和飞机航线
- ☐ Practice clearing your airspace before turns and check for traffic in the holding area and in the pattern
练习转弯前确认空域净空，并注意等待区和着陆航线上的交通
- ☐ Discuss the flight cycle and how flaring is like a one-way street
讨论飞行循环以及拉平操作为何像在单行道上开车一样
- ☐ Practice a PLF
练习 PLF

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100%的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Practice correct responses to deployment problems
练习正确应对开伞问题
- ☐ Consider joining USPA if you haven't already
考虑加入美国跳伞协会 USPA（如果未加入）

Canopy Debrief

跳后伞降汇报

- ☐ Fly your pattern with assistance
在有协助的情况下飞你的航线
- ☐ Perform a staged flare with a full finish
分阶段拉平并拉到底
- ☐ Prepare to PLF before landing and perform a PLF if needed
着陆前做好 PLF 准备，并在需要时执行 PLF
- ☐ Land within 60 degrees of your intended heading with assistance
在有协助的情况下，着陆方向与预期方向偏差不超过 60 度
- ☐ Land within 330 feet (100 meters) of your intended target with assistance
在有协助的情况下，在离预定着陆目标不超过 330 英尺（100 米）的范围内着陆

Freefall Debrief

跳后自由落体汇报

- ☐ Be stable throughout
全程稳定
- ☐ Demonstrate leg control
表现出控腿能力
- ☐ Assist with the pull within 500 feet of your assigned altitude (AFF and Tandem)
在指定高度 500 英尺内协助完成开伞（AFF 和双人伞）
- ☐ Successfully perform three practice pulls, three jumps in a row (SL and IAD)
连续三次跳伞中成功完成模拟开伞练习（Static Line 和 IAD）

学术部分 Academics

The Academics section of each category includes information on exit and freefall, canopy flight, emergency procedures, equipment, and standard operating procedures. Some of this information will review what you learned earlier, while some will be new and build on that foundation.

每个单元的学术部分都包含以下内容：出舱与自由落体、降落伞飞行、紧急程序、装备知识以及标准作业程序。其中部分内容是对之前学习内容的复习，另一部分则是新知识，旨在巩固扩展基础。

A. Exit and Freefall

出舱和自由落体

Review the exit procedures from Category A. For AFF students, your exit will be the same. IAD and static-line students perform the climb-out with little or no assistance from the instructor and exit promptly on the "Go!" command. Tandem students climb into position after the instructor's OK, check with the instructor once in position, and initiate the exit count.

复习 A 单元中的出舱程序。对于 AFF 学生，你的出舱方式将保持不变。IAD 和 Static Line 学生需在教练的少量协助或无协助情况下爬出机舱，并在听到“Go!”指令后迅速出舱。双人伞学生在得到教练 OK 信号后就位，到达位置后与教练再次确认，并开始执行出舱信号。

During this category, you will improve your overall awareness and stability, reinforce muscle memory for your pull, and work on leg awareness and heading.

在本单元中，你将提高整体意识和稳定性，强化开伞动作的肌肉记忆，并加强腿部意识和方向控制。

LOCK ON: is where you focus on your altimeter before pulling.

锁定：指在开伞前将注意力集中在高度表上。

WAVE OFF: is where you signal with both hands that you are intending to pull. Your actual deployment usually occurs approximately 500 feet after waving off, given the time it takes to wave off, reach, and pull.

挥手示意：指用双手发出信号，表明你即将开伞。由于挥手、找到和拉出开伞把手需要时间，实际开伞通常会在挥手示意后约 500 英尺发生。

Heading, Altitude, Arch, Legs, Relax (HAALR)

方向、高度、弓形、腿形、放松 (HAALR)

Repeat this drill to establish and maintain awareness, stability, and control. First, recognize your **heading** to confirm you are not turning. Know your **altitude**.

重复此练习以建立并保持意识、稳定性和控制力。首先，识别你的**方向**以确认没有转向。要知道你的**高度**。

IAD and static-line students: Know your exit altitude and count to keep track of time after release from the aircraft.

IAD 和 Static Line 学生：要知道你的出舱高度，并在离开飞机后通过计数来跟踪时间流逝。

Tandem and AFF students: Make sure you check your altimeter. Check your **arch**, making sure your hips are forward a little. Check your **legs**; most beginners need to extend their legs a little and point their toes. **Relax** ... how? Breathe consciously, a full breath in and out, to release tension. Use this **HAALR** technique just before and after releasing from the aircraft.

双人伞和 AFF 学生：确保检查高度表。检查你的**弓形**姿势，确保臀部略微向前。检查**腿姿**；大多数初学者需要稍微伸腿并绷直脚尖。要如何做到**放松**？可有意识地呼吸，深吸一口气再呼出，以释放紧张感。在离开飞机前后使用“**方向、高度、弓形、腿形、放松**”的技巧。

Main Deployment

主伞的开伞

Tandem and AFF students: Perform practice deployments in freefall until you can perform them smoothly and are comfortable with locating the deployment handle. At your assigned pull altitude, wave off to signal deployment, then

pull at the correct altitude without prompting from the instructor.

双人伞和 AFF 学生：在自由落体中练习模拟开伞，直到能够流畅完成并能熟练找到开伞把手。到达指定开伞高度时，挥手示意即将开伞，然后在正确高度在无教练提醒的情况下开伞。

IAD and static-line students: Practice stable deployment within 5 seconds of exit. You must complete three jumps in a row with successful simulated deployments before moving to the solo freefall starting in Category C.

IAD 和 Static Line 学生：在出舱后 5 秒内练习稳定的模拟开伞。在进行 C 单元的单人自由落体之前，必须在连续三次跳伞中成功模拟开伞。

Leg Awareness

腿部意识

You can practice and improve your leg awareness by learning how to move forward in freefall. To move forward, extend your legs with your toes pointed while keeping your arms in a neutral position. Extending your legs from the neutral position adds more drag in the back, lifting your lower body to the relative wind. This off-level attitude causes you to move forward. It is less noticeable on a tandem jump. To practice in freefall, extend your legs smoothly and hold for three seconds, then relax your legs to neutral.

通过学习如何在自由落体中向前移动，你可以练习和提高腿部意识。要向前移动，请在保持手臂中性姿势的同时伸腿并绷直脚尖。从中性姿势开始伸腿会增加背部的阻力，使得下半身在相对气流中被抬升。这种非平面姿态会使你向前移动。在双人伞中，这种效应较不明显。在自由落体中练习时，平稳地伸腿并保持三秒，然后放松双腿回到中性姿势。

IAD and static-line students: Increase your leg awareness during the exit set-up and after release from the plane. You can accomplish this with a little mental preparation on exit.

IAD 和 Static Line 学生：在出舱的准备就位阶段和离开飞机后提高腿部意识。你可以通过出舱前的心理准备来实现这一点。

Maintaining a Heading

保持方向

Staying stationary is key to having control. Relax in a neutral body position and find a point ahead on the horizon as a heading reference.

保持静止是保持控制的关键。在中性身体姿势下放松，并找到前方地平线上的一个点作为方向参考。

Tandem and AFF students: Your instructor may have you perform turns together.

双人伞和 AFF 学生：你的教练可能会让你一起完成转向动作。

IAD and static-line students: You must perform three successful practice deployments before moving on to a clear-and-pull jump, also called a "hop-and-pop," where you clear the aircraft then pull for yourself.

IAD 和 Static Line 学生：在进行“净空开伞”（Hop and Pop，即“即跳即开”）跳伞前，你必须成功完成三次模拟开伞练习。在“净空开伞”跳伞中，你需要在离开飞机一段距离后自行开伞。（译者注：中文习惯将学生的净空开伞称作“跳低空”，应注意，从建筑物、山崖等处进行的定点跳伞也常称作“低空跳伞”，但两者是不同的概念。）

B. Canopy

伞控

For Review

复习

In your first-jump course you learned to prevent canopy collisions by always clearing your airspace both before and during any turn. Simply look in the direction of the turn both horizontally and below before you make the turn.

在第一跳课程中，你学习了在任何转弯前和转弯过程中通过确认空域净空来防止降落伞碰撞。在转弯前，只需观察想转的方向的水平方向和下方。

Review the wind direction and speed with your instructor. You'll develop your **descent strategy**, that is, determine the expected opening point and prepare your canopy flight plan. After opening and performing your canopy check, check your altitude, determine your position relative to the drop zone, and then monitor canopy traffic. Locate the holding area and establish your path to your 900-foot pattern-entry point. Fly directly to your holding area. Fly to the pattern-entry point and fly the planned pattern using downwind, base, and final-approach legs with checkpoints. Flare and PLF. 与教练一起复习风向和风速。你将制定**伞降策略**，也就是说，要确定预期的开伞点并准备降落伞飞行计划。在开伞并完成降落伞检查后，检查高度，确定自身相对于跳伞基地的位置，然后观察交通。找到等待区并规划前往 900 英尺跳伞航线起始点的路径。直接飞向等待区，然后飞往着陆航线起始点，并按照计划的下风边（第一边）、基线边（第二边）和最后进近（第三边）以及相应的参考点飞行。拉平并 PLF。

More about **canopy traffic in the pattern**: It is important to fly predictably so that canopies behind you in the pattern can determine your flight path and remain sufficiently separated from you. You do this by flying your pattern, staying in your lane and flying a straight final approach.

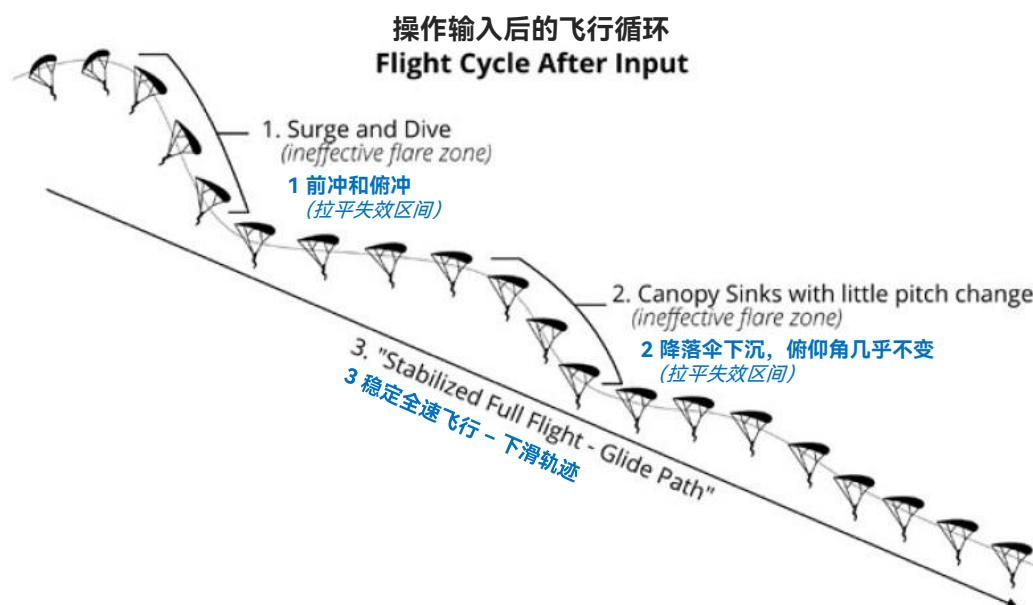
更多关于**降落伞在着陆航线中的交通**知识：保持飞行的可预测性至关重要，以让后方降落伞能够判断你的飞行路径并保持足够的间隔。为此，你应严格按照着陆航线飞行，保持在自己的航道上，并在最后进近阶段保持直线飞行。

New Stuff

新知识

Flight Cycle

飞行循环



A flight cycle is the parachute's response during the period of time between an input and the parachute's return to stabilized full flight. It is important to understand how a flight cycle is created so that you can avoid entering one close to the ground just before landing. Flaring is a **one-way street**, meaning you can stop pulling down the toggles at any point during the flare stroke if you started it too high, but you cannot go back up.

飞行循环是指降落伞从接收到操作输入到恢复稳定全速飞行期间的响应过程。了解飞行循环的形成机制至关重要，这有助于避免在接近地面即将着陆时触发飞行循环。拉平操作是**单向的**，这意味着如果你在拉平时发现启动拉平的高度过高，可以在拉平过程中的任一点停下拉刹车，但不得再松回去。

(译者注：飞行循环也译作俯冲循环)

Any input to a canopy, such as turning or pulling down the toggles and letting them back up, initiates a flight cycle. The flight cycle is a normal and predictable flight characteristic of all parachutes. When a flight cycle occurs, the parachute

dives, its speed increases beyond that of full flight, and the jumper swings back behind the parachute. The parachute then slows down as the jumper swings forward under the parachute and it returns to full flight.

任何对降落伞的操作输入，例如转弯或拉刹车后再松开，都会启动一次飞行循环。飞行循环是所有降落伞的正常且可预测的飞行特性。当飞行循环被触发时，降落伞会俯冲，速度会超过全速飞行状态的速度，跳伞者则会向后荡至降落伞后方。随后，降落伞减速，跳伞者向前荡至降落伞下方，降落伞恢复全速飞行。

Experiencing a flight cycle up high can be fun. However, a flight cycle just before or during a flare is dangerous because the parachute dives forward and picks up speed, and the effectiveness of the flare is greatly reduced. This is why the proper response to a flare initiated too high is to stop and hold whenever you realize it is too high, then finish the flare forcefully when closer to the ground.

在高空体验飞行循环可能是一种有趣的体验。然而，在拉平前或拉平过程中触发飞行循环则非常危险，因为降落伞会向前俯冲并加速，导致拉平效果大减。因此，如果发现启动拉平的高度过高，正确的应对方式是立即暂停并保持当前状态，待更靠近地面时再用力完成拉平动作。

C. Emergency Procedure Review

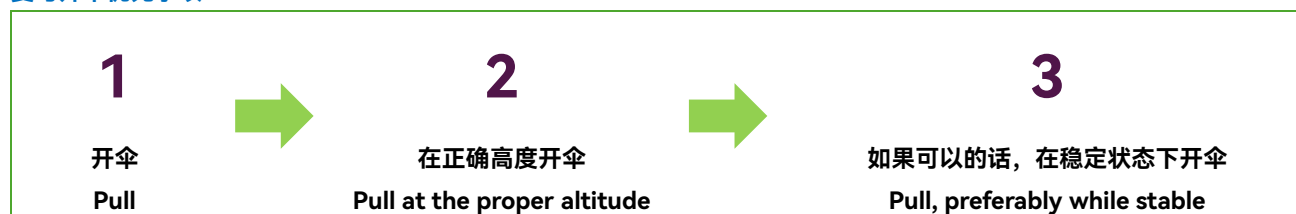
紧急程序复习

Review the correct responses to a **premature deployment in the aircraft**: Attempt to contain the open parachute and inform the instructor. If your parachute goes out the door, follow immediately to prevent damage to the plane and injury to yourself or others. If anyone else's parachute goes out the door, immediately push them to and through the door for the same reason.

应对**降落伞在舱内意外打开**的正确操作：尝试控住降落伞并通知教练。如果你的降落伞飞出了舱门，则立即跟随其出舱，以防止对飞机造成损坏或对自己或他人造成伤害。如果其他人的降落伞飞出舱门，出于同样的原因，应立即将他们推向舱门并推出舱门。

Review Pull Priorities:

复习开伞优先事项



Review deployment problems and correct responses.

复习开伞问题以及正确的应对方法

IAD and static-line students: this may be new to you.

IAD 和 Static Line 学生： 这对于你们来说可能是新知识

Make no more than two attempts or take no longer than 5 seconds, whichever comes first, before initiating emergency procedures.

在启动紧急程序之前，尝试次数不要超两次或时间不要超 5 秒，以先到者为准。

- **Premature container opening in freefall:** Attempt to locate and deploy the pilot chute first. If you can't locate the pilot chute after two tries or 5 seconds, or if deploying the pilot chute results in a partial malfunction, cut away and deploy the reserve.

自由落体过程中伞包意外提前打开： 先尝试找到并抛出引导伞。如果两次尝试或 5 秒内仍未找到引导伞，或者，如果你找到并抛出引导伞，但导致发生部分故障，则切伞并开备伞。

- **Lost deployment handle:** Place your hand on the side of the container and slide it down to the bottom corner. Find the pilot chute and deploy. If you cannot find the pilot chute after two tries or 5 seconds, initiate emergency

procedures.

找不到开伞把手: 手沿着伞包侧面摸到拐角, 找到并抛出引导伞。如果两次尝试或 5 秒内仍未找到引导伞, 立即启动紧急程序。

- **Hard pull:** Place your elbow against the container for leverage. If you cannot throw the pilot chute after two tries or 5 seconds, initiate emergency procedures.

开伞把手难以拉动: 将肘部抵住伞包来借力。如果两次尝试或 5 秒内仍未扔出引导伞, 立即启动紧急程序。

- **Pilot-chute hesitation:** Modify the airflow by twisting slightly while looking over your right shoulder. If that doesn't work, repeat over your left shoulder. If the pilot chute does not launch after two tries or 5 seconds, initiate emergency procedures.

引导伞迟滞: 通过轻微扭转身体并回头向右肩后方看以改变气流。如果无效, 在左肩方向再次尝试。如果两次尝试或 5 秒内引导伞仍未从背后飞出, 启动紧急程序。

Static-line students: Your instructor will review the **student-in-tow** procedures, which are: Arch and signal to your instructor that you are ready for them to cut your static line. After the static line is cut, deploy your reserve.

Static Line 学生: 教练将带你复习**飞机拖拽学生**的应对程序, 具体为: 保持弓形姿势并向教练发出信号, 表示已准备好让他们切断 Static Line。Static Line 被切断后, 打开备伞。

Remember these critical altitudes: You must **decide to cut away by 2,500 feet and then act immediately**. Also, if you find yourself below 1,000 feet without a functioning canopy, deploy the reserve without cutting away.

牢记以下关键高度: 必须在 **2500 英尺以上**决定是否切伞, 然后立即执行决定。如果高度在 1000 英尺以下且主伞无法正常使用, 则在不切伞的情况下直接开备伞。

With your instructor, practice in the training harness to recognize and respond to **problems and malfunctions** using guidance from Category A—Academics in the first-jump-course topics.

穿上训练背带, 与你的教练一起练习识别和应对**问题及故障**, 参考第一跳课程中 A 单元——学术部分的指引。

Expanding on what you learned in Category A, if you have line twists and are also spinning, **don't delay, cut away**. Spinning main parachute malfunctions can cause you to lose altitude very quickly and require a rapid response. You will also be unable to control the canopy due to it having line twists. For this reason, check your altitude to confirm you are **above the 1,000-foot cutaway hard deck** and initiate emergency procedures immediately.

在 A 单元所学内容的基础上, 如果你遇到线缠绕并伴有旋转, **切勿拖延, 立即切伞**。旋转中的主伞故障可能导致你的高度迅速下降, 需要快速反应。此外, 由于线缠绕, 你将无法控制降落伞。因此请检查高度, 确认你在 **1000 英尺切伞硬甲板高度**以上, 并立即启动紧急程序。

D. Equipment

装备

For Review

复习

Review how to retrieve your parachute after landing.

复习着陆后如何收伞。

E. Standard Operating Procedures

标准作业程序

For Review

复习

Minimal and careful movement in the aircraft helps protect your gear from a premature container opening.

在飞机内的动作幅度尽量小和谨慎, 这有助于防止伞包意外提前打开。

S&TA: stands for Safety and Training Advisor, an appointed USPA position usually held by a highly experienced instructor. The S&TA at your drop zone represents your USPA Regional Director and is available to provide advice and administrative assistance to USPA members.

安全和培训顾问: USPA 任命的一个职位, 通常由经验丰富的教练担任。你所在跳伞基地的安全和培训顾问代表了 USPA 区域董事, 可为 USPA 会员提供建议和行政协助。

New Stuff

新知识

Tandem students: your progression in the tandem method ends with Category B, and you will transition to a different method by attending a solo-equipment first-jump course in order to continue on to Category C.

双人伞学生: 你的双人伞培训在 B 单元结束, 之后你需参加单人跳伞装备的第一跳课程, 以过渡到其他培训方法, 从而继续 C 单元的学习。

Student **wind limits** are 14 mph, waivable by your S&TA, according to the BSRs (Chapter 2-1.H).

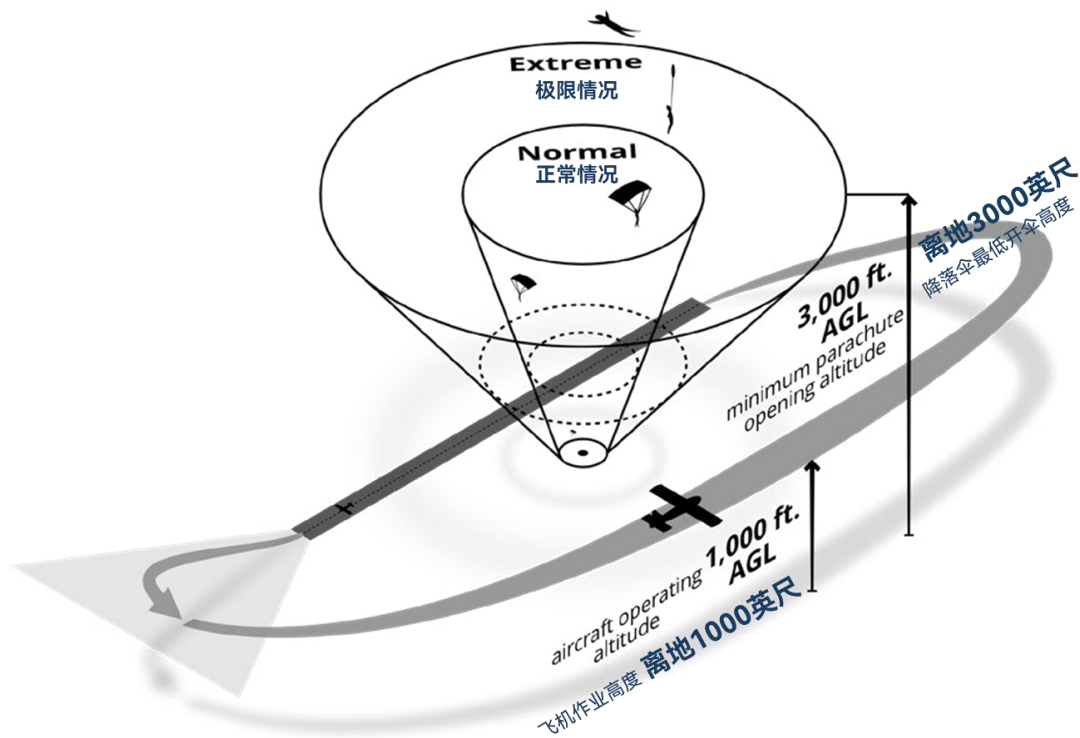
根据基本安全要求 (2-1.H), 学生的**风速限制**为 14 英里/小时, 该限制可由你的安全和培训顾问豁免。

The minimum required **deployment altitude** for students and USPA A-License holders is 3,000 feet (Chapter 2-1.I).

学生和 USPA A 执照持有者的**最低开伞高度**要求为 3000 英尺 (2-1.I)。

At airports, normal flight practices **separate aircraft traffic from parachute traffic**, but you need to respect runways and aircraft landing patterns. Your instructor will explain your drop zone's policies about avoiding runways while flying your canopy and after you've landed.

在机场, 正常的飞行作业会将**飞机的交通与降落伞的交通分开**, 但你需要尊重跑道和飞机的着陆航线。你的教练将解释你所在的跳伞基地关于在降落伞飞行期间和着陆后避开跑道的政策。



Aircraft and Parachute Traffic

飞机和降落伞的交通

B 单元跳伞流程 Category B Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

AFF AND TANDEM

AFF 和双人伞

- 放松的出舱 RELAXED EXIT
- 高度意识检查 COA
- 模拟开伞练习 PRACTICE DEPLOY
- 方向, 高度, 弓形, 腿形, 放松 HAALR
- 伸腿 (3 秒) **EXTEND LEGS** (3 seconds) ✓
- 方向, 高度, 弓形, 腿形, 放松 HAALR
- 一起转向 (如有培训) TEAM TURNS (if trained) ✓
- 6000 英尺锁定 (双人伞 6500 英尺) **6,000'** LOCK ON (6,500' for tandem)
- 5500 英尺挥手示意并**开伞** (双人伞 6000 英尺) **5,500'** WAVE OFF and **PULL** (6,000' for tandem)
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- 飞着陆航线 **FLY PATTERN**
- 拉平并 PLF (如需) **FLARE and PLF** if needed

IAD AND STATIC LINE (3 jumps from 4,000')

IAD 和 Static Line (从 4000 英尺跳三次)

- 出舱时伸腿 EXIT **WITH LEGS EXTENDED** ✓
- 模拟开伞练习 (计数) “弓形,找,扔,弓形,检查” **PRACTICE DEPLOY** (with count) "Arch, Reach, Pull, Neutral, Check" ✓
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- 飞着陆航线 **FLY PATTERN**
- 拉平并 PLF (如需) **FLARE and PLF** if needed

TAKE THE QUIZ:

参加单元小测



uspa.org/quiz/b

单元小测 (中英对照)

微信扫一扫



TRANSLATION OF THE QUIZ

C 单元（控制）

Category C (Control)

AFF 和双人伞 2 跳	IAD 和 Static Line 3 跳	开伞程序启动高度 5500 英尺
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In Category **C**, you finally gain **Control** over your skydive by pulling stable, solo, and unassisted!

在 **C** 单元，你将在无协助的情况下自行稳定开伞，从而**掌控**你的跳伞！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Discuss ground winds and winds aloft for the day
讨论当天的地面风和高空风情况
- ☐ Plan your flight to the holding area and the landing pattern
规划飞往等待区的路线和着陆航线
- ☐ Discuss adjusting landing pattern for wind changes
讨论风况改变时着陆航线的调整
- ☐ Discuss wing loading and downwind landings
讨论翼载和顺风着陆
- ☐ Discuss turbulence and flight cycle
讨论乱流和飞行循环
- ☐ Review off-field landings, including choosing an alternate area by 2,000 feet and obstacle avoidance
复习场外着陆，包括在 2000 英尺以上选择备降场以及避开障碍物

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100% 的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Review what to do for an open parachute in the aircraft
复习如何应对降落伞在飞机内打开的情况
- ☐ Observe equipment pre-flight check and AAD operation
观察装备的飞行前检查和 AAD 的操作

Canopy Debrief

跳后伞降汇报

- ☐ Perform a flight-cycle drill
进行飞行循环练习
- ☐ Fly your pattern with minimal assistance
在尽量少协助的情况下飞着陆航线
- ☐ Perform a staged flare with a full finish with minimal assistance
在尽量少协助的情况下执行分阶段拉平并拉到底

- Prepare for a PLF and PLF if needed
做好 PLF 准备，并在需要时执行 PLF

Freefall Debrief

跳后自由落体汇报

- Establish control within 5 seconds of exit
出舱后 5 秒内进入受控状态
- Perform a relaxed fall
放松的自由落体
- Show heading awareness
表现出方向意识
- Wave off before pulling
开伞前挥手示意
- Pull at the assigned altitude with stability
在指定高度稳定开伞
- Be cleared to freefall with one AFF Instructor (AFF only)
被准许仅与一名 AFF 教练进行自由落体（仅 AFF 学生）

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

For Review

复习

Review the **climb-out and exit** procedures. Improving your setup, launch, and flyaway on each jump will prepare you for a solo exit in Category D.

复习**爬出机舱和出舱**的程序。在每次跳伞中改进你的准备就位、跳出和飞离动作，这将为你在 D 单元进行独立出舱做好准备。

Review the stability recovery and maintenance procedure: **heading, altitude, arch, legs, relax (HAALR)**. First recognize your **heading** to confirm you are not turning. Know your **altitude** by reading the altimeter (AFF and tandem) or counting from exit (IAD and static line). **Arch** at the hips to improve belly-to-wind stability. Check your **leg** position—extended to 45 degrees with toes pointed—and adjust as needed. **Relax** by taking a breath in and out, letting go of unwanted body tension.

复习恢复稳定和保持稳定的程序：**方向、高度、弓形、腿形、放松 (HAALR)**：首先识别**方向**，以确认没有在旋转。通过高度表读数（AFF 和双人伞）或从出舱开始计数（IAD 和 Static Line）来掌握**高度**。胯部**弓形**以提高腹飞稳定性。检查**腿部**姿势，伸至 45 度且脚尖绷直，并根据需要调整。通过深呼吸来**放松**，释放不必要的身体紧张感。

IAD and static-line students: HAALR might be new to you, as this applies only after you've made a successful clear and pull.

IAD 和 Static Line 学生：“方向、高度、弓形、腿形、放松”对于你来说可能是新知识，因为这是在你成功执行净空开伞后才要用到的。

New Stuff

新知识

AFF students: If you now have only one AFF instructor, the instructor will revise the climb-out procedure for your exit. With one instructor, you may prepare for slightly different results after the launch, as it typically flies vertically a little longer than it would with two instructors.

AFF 学生：如果你现在仅有一位 AFF 教练带跳，教练将调整你的爬出机舱程序。单教练带跳时，跳出后的垂直姿态飞行时间

通常略长于双教练带跳出舱，因此要准备好面对稍有不同的跳出后的效果。

AIR: The freefall rule for Category A and B was: if your AFF instructors are not with you, you must pull immediately. This rule changes for Category C and forward. Now that you have demonstrated awareness and stability, your instructors may release you during the freefall. *The new rule is:* if you are **Altitude aware**, **In control**, and **Relaxed (AIR)**, you may continue in freefall and deploy at the assigned altitude. However, if you are not **Altitude aware**, **In control**, and **Relaxed (AIR)**, you have only 5 seconds to fix it. If unsuccessful after **5 seconds**, deploy your main canopy immediately.

AIR 原则: 在 A 单元和 B 单元，自由落体规则是：如果你与 AFF 教练分开了，你必须立即开伞。从 C 单元开始，规则有所调整。鉴于你已展现出高度意识和稳定性，教练可能在自由落体阶段松开你。**新规则要求：**若你同时具备**高度意识 (Altitude aware)**、**保持受控 (In control)** 和**状态放松 (Relaxed)** 三项条件（简称 **AIR**），可继续自由落体并在指定高度开伞。但若未满足这三项条件，你仅有 5 秒进行调整。若 **5 秒**后仍未成功，则立即开主伞。



Roll out of Bed: Check altitude (left). Arch, and start rollover (center). Neutral body position; check altitude (right).

翻滚起床：检查高度（左）。弓形，并开始翻滚（中）。中性身体姿势；检查高度（右）。

If you are above your assigned deployment altitude and oriented back-to-earth, roll to one side to recover to a stable, belly-to-earth body position. To do so, first check your altitude, relax, arch, and hold it. Look toward the ground either to the right or left and bring the arm on that side across your chest. As your body rolls that direction and you face the ground, go back to the neutral body position. Check altitude. This is commonly called the roll-out-of-bed technique. If you are unsuccessful after 5 seconds, deploy your main canopy immediately, even if you are on your back, spinning, or tumbling.

如果你处于预定开伞高度之上且背朝地面，应向一侧翻滚以恢复至稳定的腹飞姿势。具体操作为：首先检查高度，放松身体采取弓形姿势并保持。视线看向左侧（或右侧）地面，同时将同侧手臂完全收回胸前。当身体朝该方向翻滚至朝向地面时，立即恢复中性姿势并再次检查高度。该技巧通常被称为“翻滚起床法”（Roll-out-of-bed）。若 5 秒内未能成功，即使处于背朝地、旋转或不稳状态也必须立即打开主伞。

IAD and static-line students: After your first successful clear-and-pull jump, you will experience more freefall time by performing two stable 10-second delays. The transition of the relative wind from opposite the aircraft heading to below will be a new experience. Use HAALR to control stability. Add a wave-off prior to deployment, which is a signal to other jumpers that you are getting ready to pull.

IAD 和 Static Line 学生:在完成首次净空开伞后，你将通过执行两次稳定的出舱并延迟 10 秒开伞来获得更多自由落体时间。相对气流从飞机前方吹来转换为从下方吹来将是全新体验。使用“方向，高度，弓形，腿形，放松”法则保持稳定，并在开伞前加入挥手示意动作，作为向其他跳伞者示意即将开伞的信号。

B. Canopy

伞控

New Stuff

新知识

Wing Loading and Canopy Size

翼载与降落伞面积

The wing-loading ratio is the jumper's exit weight (geared up) divided by the square footage of the canopy. Canopy manufacturers publish wing-loading recommendations for each model of canopy in their owner's manuals and often on their websites. Take the time now to calculate your wing loading for the canopy you are about to jump next.

翼载等于跳伞者的出舱重量（含装备，单位：磅）除以降落伞面积（单位：平方英尺）。各降落伞制造商会用户在手册及官网上公布每款伞的推荐翼载。现在你要好好计算下一跳即将使用的降落伞的翼载。

Wing loading affects the performance and speed of your canopy. **With higher wing loadings**, expect faster forward speeds and descent rates, quicker turns, steeper and longer dives from turns, and more violent malfunctions. Canopies at higher wing loadings require more skill to flare correctly. **With lighter wing loadings**, expect less drive against a strong wind, slower turns, and more forgiveness of landing errors.

翼载直接影响降落伞的性能与速度。**翼载较高时**，降落伞的前进速度、下降速度、转弯灵敏度会显著提升，转弯产生的俯冲角度更陡且俯冲时间更长，如发生故障，程度也会更严重。伞处于较高翼载时，需要更高的技巧才能正确地拉平。伞处于**较低翼载时**，降落伞的顶风前进的能力较弱，转弯较迟缓，但对着陆失误的容错率更高。

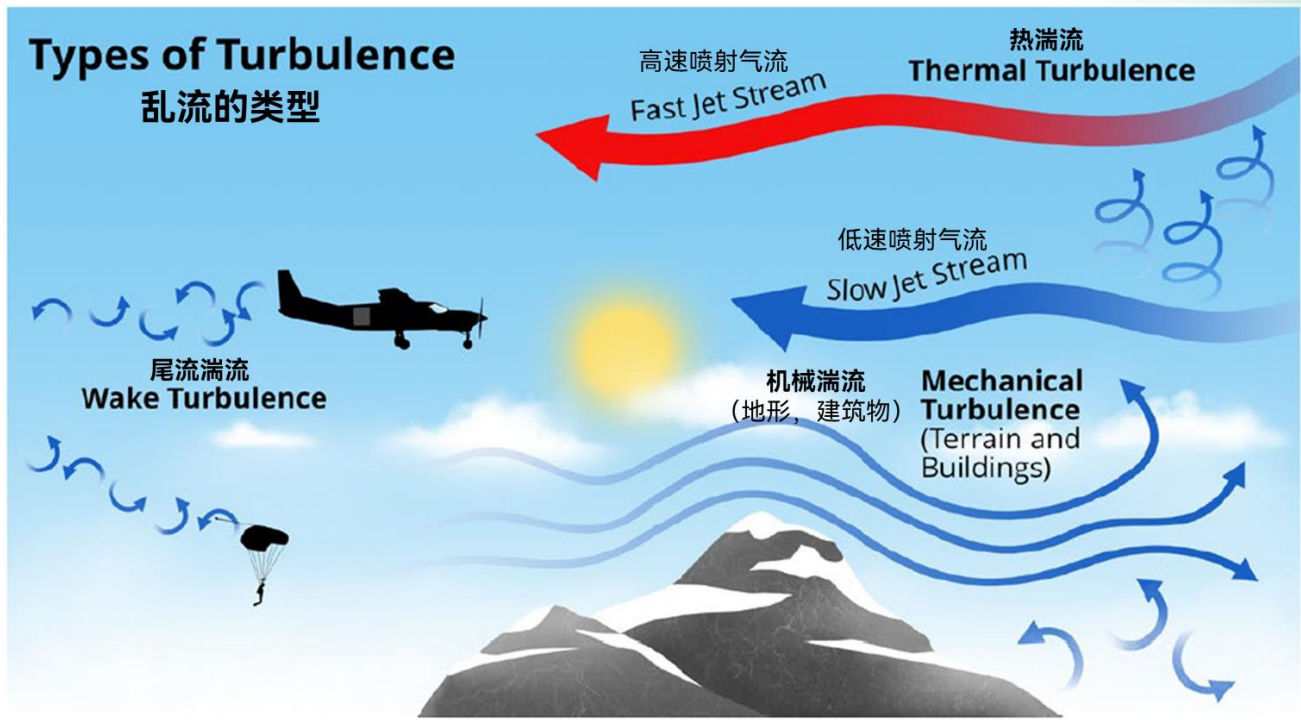
WING LOADING EXAMPLES		
翼载算例		
Jumper's exit weight 跳伞者出舱重量（磅）	215	215
Divided by canopy size (sq ft) 除以降落伞面积（平方英尺）	280	195
Wing loading 翼载	0.77:1	1.1:1

Turbulence on Landing

着陆时的乱流

Turbulence is disturbed air that can affect canopy flight and integrity. Due to obstacles and wind direction, turbulence sometimes occurs in the landing area. Understanding and predicting turbulence will allow you to make safe landing choices. Managing unexpected turbulence on landing is an important skill, but avoiding a landing in turbulence is the best plan for safe landings.

乱流指可能影响降落伞飞行稳定性和完整性的扰流空气。受障碍物和风向影响，乱流有时会出现现在着陆区域。理解并预判乱流有助于你做出安全的着陆决策。虽然应对预料之外的乱流是一项重要技能，但最安全的方案始终是着陆时避开乱流。



Types of Turbulence

乱流的类型

Anticipate turbulence 10-20 times the height of an obstacle on its downwind side. The effects and likelihood of turbulence increase with the surface-wind speed.

障碍物下风处的障碍物高度 10-20 倍的区域内预计会产生乱流。乱流强度及出现概率会随地面风速增加而增大。

Other types of turbulence often occur near runways, alongside roads, behind other canopies, over irregular terrain, and anywhere the color of the ground changes. You can even find it downwind of the propeller wash of an aircraft.

其他常见乱流区域包括：跑道附近、道路两侧、其他降落伞尾流区、不规则地形上空，以及地面颜色突变区域。飞机螺旋桨尾流的下风区也可能有乱流。

When flying in turbulence at any altitude, maintain the desired heading using smooth but effective toggle input. Fly in full flight unless the canopy's owner's manual directs otherwise. If there is turbulence near the ground, prepare to respond quickly with a forceful flare and a PLF.

在任何高度遭遇乱流时，应通过平稳有效的刹车输入来保持希望的方向。应保持全速飞行状态，除非降落伞用户手册另有说明。若近地面出现乱流，需做好快速反应的准备，以强力的拉平配合 PLF 以进行着陆。

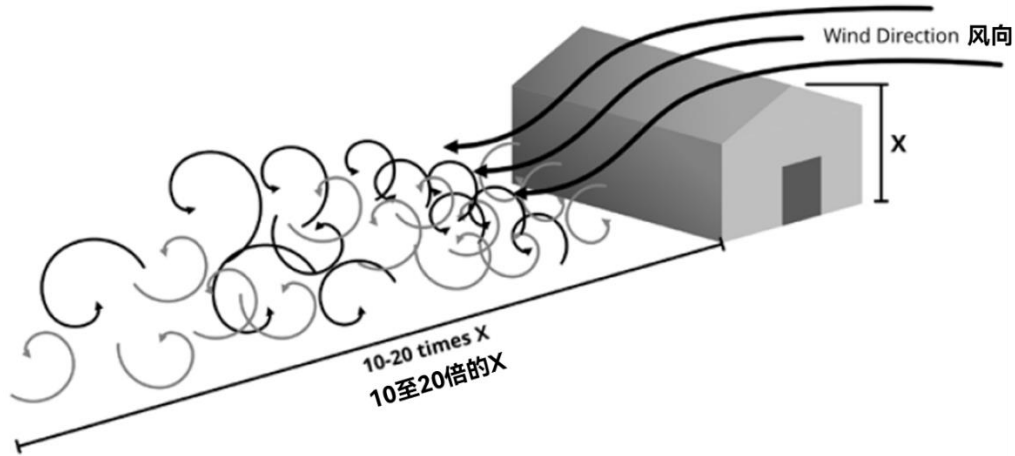
Turbulence can create a flight cycle. Category B introduced the concept of the flight cycle to reinforce that flaring a parachute is a one-way street, meaning you can always stop pulling down the toggles at any point during the flare stroke, but cannot go back up. A flight cycle is the parachute's response during the period of time between any input and the parachute's return to stabilized full flight.

乱流可能触发飞行循环。 B 单元曾引入飞行循环的概念，强调降落伞拉平操作是单向的——这意味着你可以在拉平过程中的任一点暂停下拉刹车，但不得再松回去。飞行循环特指从对降落伞的任何操作输入开始，到降落伞恢复稳定全速飞行期间的降落伞的响应过程。

Turbulent or gusty winds on landing can also initiate a flight cycle, causing your parachute to dive toward the ground. If this happens just before the flare, the effectiveness of the flare diminishes. Because the flight cycle will cause you to swing back from underneath the parachute as it dives and picks up speed, you must flare forcefully to get back under

the parachute and in a position for landing. To help you recognize a flight cycle and respond effectively, you will perform a flight-cycle drill in this category and practice a forceful flare when in a flight cycle.

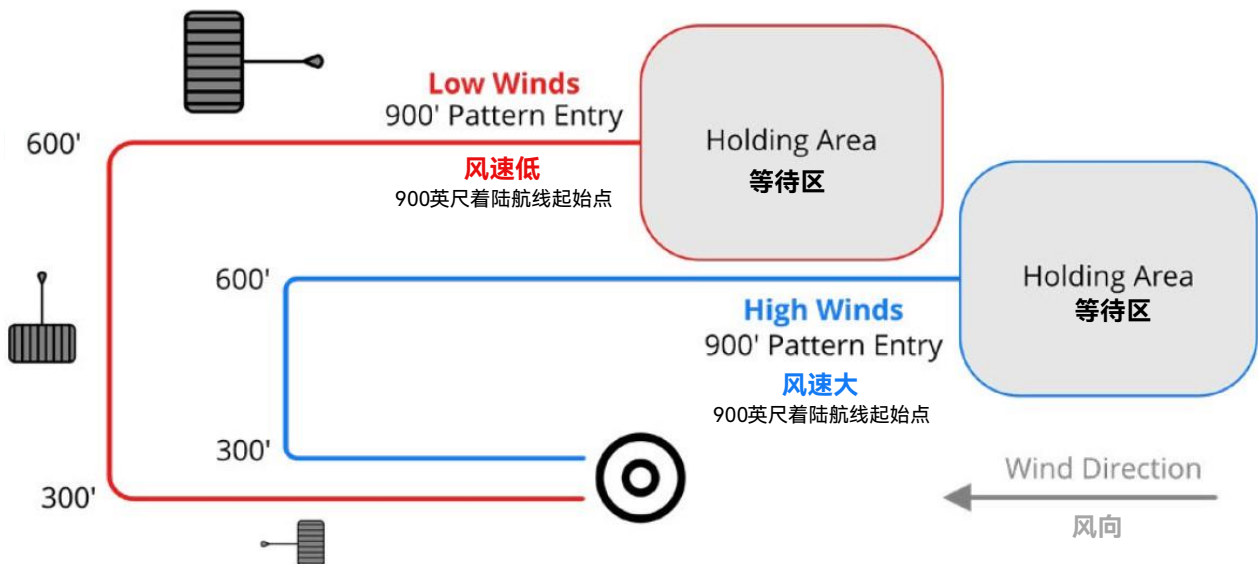
着陆时遇到的乱流或阵风同样会触发飞行循环，导致降落伞向地面俯冲。若此情形恰好发生于拉平前，将显著削弱拉平的效果。由于飞行循环会使你在降落伞俯冲加速时向后荡，你必须用力拉平才能重新回到降落伞的下方，为着陆做好准备。为帮助你识别飞行循环并做出有效应对，本单元将安排飞行循环的练习，重点演练在飞行循环中进行强有力的拉平。



Mechanical Turbulence: Anticipate turbulence 10 to 20 times the height of an obstacle on its downwind side.
机械湍流: 预计在障碍物下风处 10 至 20 倍障碍物高度的范围内会出现乱流。

Comparing High-Wind to Low-Wind Landing Patterns

对比大风速和低风速情况下的着陆航线



The location of each point and the shape of your landing pattern will vary based on the strength of the wind.
 各参考点的位置及着陆航线的形状会因风力强弱而有所变化。

In lighter winds, your pattern will resemble a square, with the downwind leg, base leg, and final-approach leg being of similar length. Make sure you have plenty of clear space past the target in case you overshoot.

在风速较低时，着陆航线航线近似正方形，下风边（第一边）、基线边（第二边）与最后进近（第三边）长度相近。请确保着陆目标的后方留有充足的开阔区域，以备飞越着陆目标的情形。

In stronger winds, the final-approach and base legs become shorter, and the downwind leg becomes longer. Turn over a clear area during your base leg and final approach in case you land short of the target.

当风力较强时，第三边和第二边会相应缩短，而第一边则变长。在第二边和第三边时，应在开阔区域上方转弯，以备未飞达着陆目标提前着陆的情形。

Note: Your USPA Instructor may adjust the shape of the pattern or the checkpoint altitudes or landmarks to account for various conditions.

注：根据实际情况，你的 USPA 教练可能会调整航线形状、参考点高度或参照的地标。

Improving your Landing

改进你的着陆

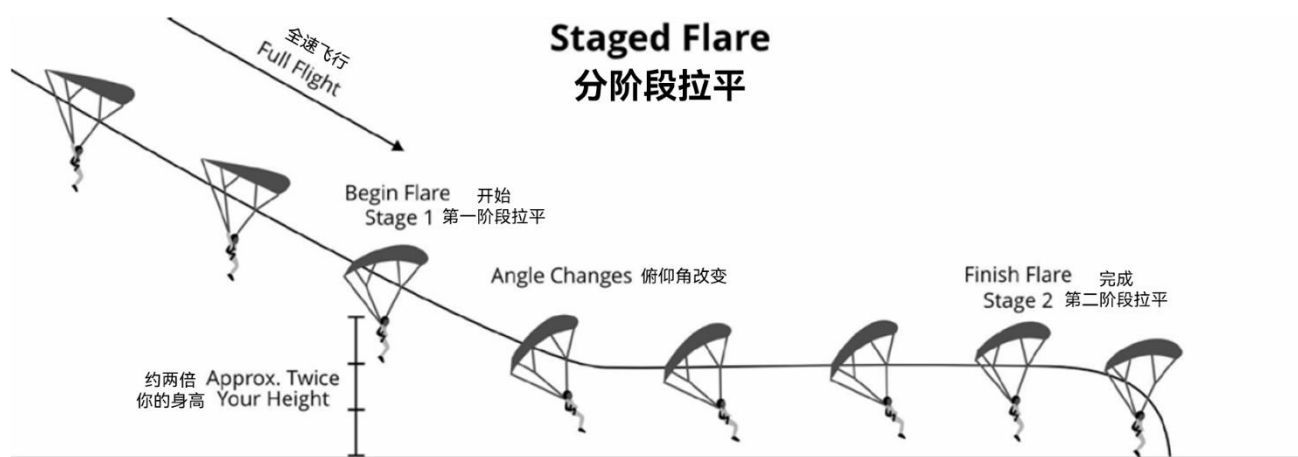
Downwind landings are better than low turns. On calm days, unexpected wind shifts sometimes require you to land with the wind, instead of against it. Sometimes, jumpers become confused about the pattern and don't realize they are set up for a downwind landing until they're on final approach. When faced with deciding between a low turn or a downwind landing, apply your landing priorities and choose to land downwind. When making a downwind landing, flare at the normal altitude, regardless of ground speed, and PLF. **顺风着陆总比过低转好。**在静风天气里，意料之外的风况变化有时会迫使你顺风着陆而非逆风着陆。有时候，部分跳伞者对着陆航线会产生困惑，直到进入最后进近阶段才意识到自己即将顺风着陆。当面临要低转还是要顺风着陆的抉择时，应遵循着陆优先事项的原则，选择顺风着陆。执行顺风着陆时，无论相对地面的速度如何，都应在常规高度开始拉平，并 PLF。

TWO TYPES OF FLARES: A staged flare uses multiple stages; a continuous flare uses a single continuous motion.

两种拉平方式：分阶段拉平分多个阶段进行；连续拉平则以单一连续动作完成。

Flaring for landing can take a few seconds, so dissecting the parts of the flare can increase your awareness and improve your flare for better landings. During the flare, you are converting forward speed to lift. Flare the canopy quickly to the first stage to slow down and swing under your canopy, flattening the glide. Continue the flare to keep the flat glide. Continue flaring smoothly and completely until landing.

着陆拉平动作需要数秒完成，通过分解拉平的各阶段，你能提升动作感知力，从而优化着陆效果。拉平过程中，你将前进速度转化为升力。要快速将降落伞拉平至第一阶段以减速，这时身体与伞的相对位置会有所变化，下滑轨迹会变水平。接着持续拉平以保持水平滑翔状态。最后平稳地拉平到底直至触地。



C. Emergency Procedure Review

紧急程序复习

IAD and static-line students: review procedures for deployment handle problems, premature container opening in freefall (hand deployment), and pilot-chute hesitations before making any jump in Category C.

IAD 和 Static Line 学生：在 C 单元的任何一次跳伞前，请复习以下问题的应对程序：开伞把手问题、自由落体阶段伞包意外提前打开（对于手动式开伞）以及引导伞迟滞。

For Review

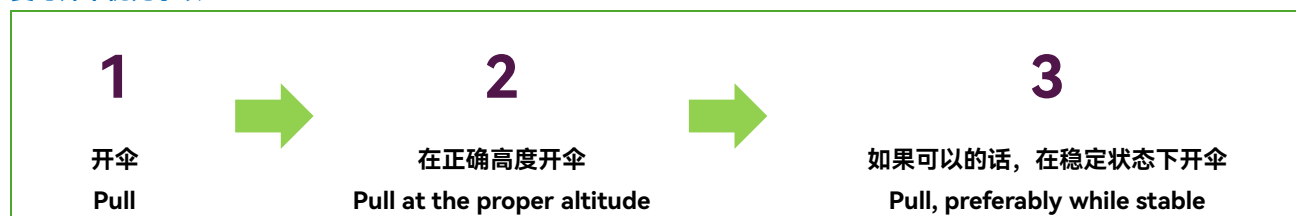
复习

To prevent an **open parachute in the aircraft**, take care when you're leaning back against anything. Move carefully when you're near or outside the door. If a parachute opens in the plane and the door is closed, secure the parachute, notify your instructor and land with the plane. If the door is open, contain the parachute, close the door, and land with the plane. If the parachute goes out the door, follow immediately to prevent endangering yourself and others. A pre-jump gear check shortly before leaving the aircraft is essential to prevent these occurrences.

为防止**降落伞在机舱内意外打开**，倚靠任何物体时务必小心谨慎。靠近舱门时或在舱门外侧时，需谨慎移动。若降落伞在机舱内打开且舱门处于关闭状态，应控住降落伞并通知教练，随飞机一起着陆。若舱门处于打开状态，需控住降落伞并关闭舱门，随后随飞机一起着陆。若降落伞飞出舱门，必须立即跟随跳出，以避免危及自身及他人安全。出舱前进行最后一次装备检查是预防此类情况的关键措施。

Review Pull Priorities:

复习开伞优先事项



If you see your instructor pull, you should pull.

如果你看到教练开伞，你也应立即开伞。

If **landing off the DZ** is unavoidable, look for an open, clear, accessible field as early as possible. Decide on an alternate landing area by 2,000 feet. Be aware that power lines often run along roads and between buildings, as well as randomly in open fields. A row of vegetation often hides a fence. Rocks, hills, and other terrain irregularities often remain invisible until just prior to touchdown. Inspect an unfamiliar landing area more closely at every 500-foot interval during descent and continuously below 500 feet. Fly a predictable landing pattern and attempt to land clear of turbulence and obstacles. Prepare for a PLF.

若不得不**场外着陆**，应尽早寻找开阔、无障碍物且便于（他人）抵达的场地。2000 英尺以上要选好备降场。需注意高压线常沿道路铺设或穿越建筑群，还可能随机分布在开阔地带。成排植物的后方则往往隐藏着栅栏，岩石、山丘等地形起伏通常在即将触地前才能察觉到。下降过程中每降低 500 英尺需重新检查陌生着陆区域，500 英尺以下则需持续进行观察。要按照可预测的着陆航线飞行，避开乱流与障碍物，做好 PLF 准备。

Be polite to property owners. Cross only at gates or reinforced areas and leave all gates as they were found. Do not disturb cattle. Walk parallel to and between any rows of crops until reaching the end of the field. Repair or replace any damaged property. If possible, contact the drop zone to give them your status and location.

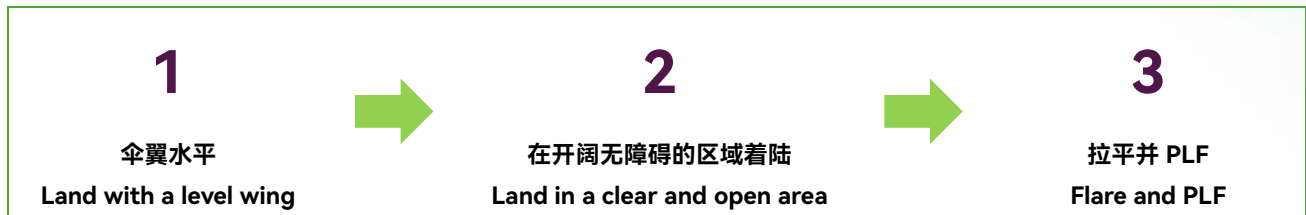
对待土地所有者应保持礼貌：仅通过大门或固化地表通行，所有的大门，原来是什么样，离开后都弄回原样。勿惊扰牲畜。如果庄稼是平行排列，则在两列庄稼之间平行地走，直至到达庄稼地尽头。对造成的财产损失予以修复或赔偿。如条件允许，及时联系跳伞基地通报状态与位置。

Some skydiving schools are subject to state and local rules or restrictions concerning landing off. Your instructor will explain anything that pertains to you and your drop zone.

部分跳伞学校在场外着陆方面受州和地方法规的约束。教练将对与你和你所在跳伞基地相关的事项进行说明。

Review Landing Priorities:

复习着陆优先事项



After **landing in high winds**, pull in one toggle and steering line to assist in collapsing the canopy, especially if the canopy is dragging you. Cut away the canopy as a last resort or if you're injured.

在大风中着陆后，拉下一侧的刹车和刹车线，这样有助于降落伞塌缩，尤其是在被降落伞拖拽时。切伞是最后手段，仅在受伤时执行。

New Stuff

新知识

IAD and static-line students: Previously, in Categories A and B, if you needed to exit the plane in an aircraft emergency, you used your reserve. The new rule for Category C and forward is: if you are **above 3,000 feet**, you can use your **main canopy** if exiting the plane **in an aircraft emergency**.

IAD 和 Static Line 学生：在之前的 A 单元和 B 单元中，若遇飞机紧急情况需出舱，应使用备伞。C 单元以及此后的新规则是，若在 **3000 英尺以上** 遇到飞机紧急情况需出舱，可使用主伞。

D. Equipment

装备

New Stuff

新知识

The automatic activation device—which you wear only as a backup—initiates reserve deployment when certain parameters are met. *Detailed AAD operation is explained in Category D.*

自动激活装置（AAD）仅作为备用设备，当满足特定参数条件时 AAD 会触发备伞的开伞。AAD 的详细操作说明见 D 单元。

Observe the instructor performing the **pre-flight check**, that is, the equipment check that happens before you put your gear on.

注意观察教练进行**飞行前装备检查**，即你穿装备前进行的装备检查。

Back: top to bottom—

从上到下，检查伞包背面—

- ☐ reserve pin in place and straight
备伞关包针到位且形态笔直
- ☐ reserve closing loop must have no visible wear
备伞关包绳不得有任何可见磨损
- ☐ reserve ripcord cable movement in housing
备伞开伞拉索是否可以顺畅移动
- ☐ reserve packing data card and seal
检查备伞卡（备伞叠伞记录卡）和铅封
- ☐ AAD on
AAD 已开启
- ☐ main activation cable or pin in place, free of nicks or kinks

主伞开伞拉索或关包针到位，没有划痕或扭结

- ☐ main closing loop not worn, near perfect
主伞关包绳无磨损，状态几近完好
- ☐ pilot-chute-bridle routing or ripcord-cable movement
引导伞系带的走线，或拉索能否顺畅移动
- ☐ main activation handle in place
主伞开伞把手就位

Front: top to bottom—

从上到下，检查伞包正面—

- ☐ three-ring release system
三环系统
- ☐ RSL connection and routing
RSL 的连接和走线
- ☐ chest strap and hardware intact
胸带以及胸带的金属部件完好
- ☐ cutaway handle in position
切伞把手到位
- ☐ reserve handle in position
备伞把手到位
- ☐ leg straps and hardware operational and correctly threaded
腿带以及腿带的金属部件状态正常且安装正确

E. Standard Operating Procedures

标准作业程序

As a student, you have certain mandatory **gear requirements** (BSR, Chapter 2-1.M.2-5).

作为学生，你需要强制满足特定的**装备要求**（基本安全要求，见 2-1.M 的第 2 至 5 点）。

The Federal Aviation Administration regulates the training and certification of **the FAA rigger** (FAR 65).

联邦航空局对**降落伞装备师**的培训与认证进行监管（联邦航空条例第 65 部分）。

Your reserve parachute must have been packed by a certificated FAA rigger within the last **180 days**. Your main parachute must have been packed within the last 180 days, as well, and can be packed by a rigger, someone under the supervision of a rigger, or the person jumping it (FAR 105.43).

你的备伞必须由联邦航空局认证的装备师在过去 **180 天**内叠伞。主伞同样需要在过去 180 天内完成叠伞，主伞可由装备师、装备师监督下的人员，或使用者本人完成叠伞（联邦航空条例 105.43）。

C 单元跳伞流程 Category C Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

✓ indicates new skills

✓ 表示新技能

AFF (2 jumps, first with two instructors, second with one instructor)

AFF (2 跳, 先双教练带跳, 再单教练带跳)

- 放松的出舱 **RELAXED EXIT**
- 高度意识检查 COA
- 模拟开伞练习 **PRACTICE DEPLOY**
- 高度意识检查 COA
- **教练松开 RELEASE** ✓
- 方向, 高度, 弓形, 腿形, 放松 HAALR
- **6000 英尺锁定 6,000' LOCK ON**
- **5500 英尺挥手示意并开伞 5,500' WAVE OFF and PULL**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **练习飞行循环 FLIGHT-CYCLE DRILL** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF** (如需) **FLARE and PLF** if needed

IAD AND STATIC LINE

IAD 和 Static Line

#1 **CLEAR & PULL** (1 jump from 4,500')

净空开伞 (从 4500 英尺跳一次)

- 出舱时伸腿 **EXIT WITH LEGS EXTENDED**
- **开伞** (计数) “弓形, 找, 扔, 弓形, 检查” **PULL** (with count) "Arch, Reach, Pull, Neutral, Check" ✓
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF** (如需) **FLARE and PLF** if needed

#2 **10-SECOND FREEFALL** (2 jumps from 5,500')

10 秒自由落体 (从 5500 英尺跳两次)

- 出舱时伸腿 **EXIT WITH LEGS EXTENDED**
- **放松**, 采取中性弓形姿势 **RELAX** INTO NEUTRAL
- 数到十 COUNT TO 10
- **4500 英尺挥手示意** (第 7 秒) **4,500' WAVE OFF** (at 7 seconds)
- **4000 英尺开伞 4,000' PULL**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **练习飞行循环 FLIGHT-CYCLE DRILL** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF** (如需) **FLARE and PLF** if needed

CANOPY DRILL: Experience a Flight Cycle

伞控练习：体验飞行循环

- Release brakes and address any routine opening problems.
释放刹车，解决常规开伞问题
- Look left, turn left.
看左，转左
- Look right, turn right.
看右，转右
- Flare.
拉平
- Check altitude, position, and traffic.
检查高度、位置、交通
- Find the holding area, landing area and pattern-entry point.
找等待区、着陆区、着陆航线起始点
- Fly directly to the holding area.
飞到等待区
- Check altitude, position and traffic.
检查高度、位置、交通
- Smoothly and evenly pull toggles to $\frac{3}{4}$ brakes (hip bones) and hold for 5 seconds.
平稳且对称地拉下刹车至 $\frac{3}{4}$ 的位置（股骨处），保持 5 秒
- Quickly but smoothly raise the toggles back to full flight to induce the flight cycle.
快速但平稳地将刹车松回到全速飞行的状态，从而触发飞行循环
- Take note of the canopy surge and dive as it picks up speed.
注意降落伞加速时发生的前冲和俯冲
- Expect 5-7 seconds to pass for the canopy to recover to full flight.
预计降落伞需要 5-7 秒恢复全速飞行状态
- Repeat, if altitude permits, this time with a forceful flare to get back under the parachute for landing (to practice your response to turbulence close to the ground).
如果高度允许的话，再次练习，这次要用力拉平，使身体荡回降落伞下方以备着陆（练习应对地面附近遇到的乱流）
- Check altitude, position, and traffic.
检查高度、位置、交通
- Stay in the holding area until starting the pattern at 900 feet.
呆在等待区，直至 900 英尺开始飞着陆航线
- Fly the planned pattern following the landing priorities on final.
根据规划好的着陆航线飞行，最后进近时遵循着陆优先事项
- Flare to land and PLF.
拉平着陆，PLF

TAKE THE QUIZ:

参加单元小测



uspa.org/quiz/c

单元小测（中英对照）

微信扫一扫



TRANSLATION OF THE QUIZ

D 单元（方向）

Category D (Direction)

AFF 和双人伞 2 跳	IAD 和 Static Line 3 跳	开伞程序启动高度 5000 英尺
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In Category **D**, you must perform turns in both **D**irections, right and left, in varying degrees!

在 **D** 单元，你必须完成左右两个**方向**的不同角度的转向动作！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Provide the ground winds and winds aloft information for the day
提供当天的地面风和高空风情况
- ☐ Discuss spotting, wind drift, and opening point
讨论看点定位，风导致的漂移量，以及开伞点
- ☐ Discuss cloud clearance and visibility requirements
讨论云层间距和能见度要求
- ☐ Plan your flight to the holding area and the pattern
规划飞往等待区的路线和着陆航线
- ☐ Discuss landing accuracy and choosing the landing target
讨论着陆精准度以及着陆目标的选择
- ☐ Discuss observing jump run
讨论跳伞航线的观察
- ☐ Review EPs for landing on a building
复习建筑物着陆的紧急程序
- ☐ Train for rear-riser turns for canopy-flight EPs
培训降落伞飞行紧急程序——后组转弯

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100%的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Review canopy-opening EPs in a training harness
使用训练背带复习降落伞开伞紧急程序
- ☐ Conduct four gear checks with supervision
在监督下执行四次装备检查

Canopy Debrief

跳后伞降汇报

- ☐ Perform a 90-degree rear riser turn with brakes set (1st)
在刹车未释放的情况下执行 90 度后组转弯（第一次）

- ☐ Perform a 90-degree rear riser turn with brakes set (2nd)
在刹车未释放的情况下执行 90 度后组转弯（第二次）
- ☐ Perform a 90-degree rear riser turn with brakes released (1st)
在刹车已释放的情况下执行 90 度后组转弯（第一次）
- ☐ Perform a 90-degree rear riser turn with brakes released (2nd)
在刹车已释放的情况下执行 90 度后组转弯（第二次）
- ☐ Fly a proper pattern and land within 165 feet (50 meters) of your planned target with assistance
在有协助的情况下，正确飞着陆航线，并在预定着陆目标 165 英尺（50 米）范围内着陆

Freefall Debrief

跳后自由落体汇报

- ☐ Perform a solo exit and get stable within 5 seconds
独立出舱并在 5 秒内进入受控状态
- ☐ Perform a 90-degree left turn with a 20-degree heading tolerance (1st)
90 度左转，误差不超过 20 度（第一次）
- ☐ Perform a 90-degree right turn with a 20-degree heading tolerance (1st)
90 度右转，误差不超过 20 度（第一次）
- ☐ Perform a 90-degree left turn with a 20-degree heading tolerance (2nd)
90 度左转，误差不超过 20 度（第二次）
- ☐ Perform a 90-degree right turn with a 20-degree heading tolerance (2nd)
90 度右转，误差不超过 20 度（第二次）
- ☐ Perform a 180-degree left turn with a 45-degree heading tolerance
180 度左转，误差不超过 45 度
- ☐ Perform a 180-degree right turn with a 45-degree heading tolerance
180 度右转，误差不超过 45 度
- ☐ Perform a 360-degree left turn with a 45-degree heading tolerance
360 度左转，误差不超过 45 度
- ☐ Perform a 360-degree right turn with a 45-degree heading tolerance
360 度右转，误差不超过 45 度

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

Solo Exit

独立出舱

In this category, you will perform a solo exit, achieving stability within 5 seconds. Remember tools to maintain control and stability, including HAALR and AIR.

本单元中，你将独立出舱，并在 5 秒内实现稳定姿态。请牢记保持控制与稳定的技巧，包括“方向，高度，弓形，腿形，放松”与 AIR 原则。

Freefall Turns

自由落体转向

To turn in freefall, first establish a comfortable, relaxed, neutral body position. Find a point ahead on the horizon as a primary **heading** reference. Use the **start-coast-stop (SCS)** technique to control your turn. Turns should begin from a neutral body position. Maintain symmetry in your arms and legs, a straight spine, and level shoulders. Breathe, relax, and initiate the turn:

在自由落体中进行转向时，需先建立舒适放松的中性身体姿势。选择地平线上某点作为主要**方向**参考。运用“**启动-滑行-停止**”

(SCS) 的方法控制转向，转向动作应从中性姿势开始。先保持肢体对称、脊柱挺直、双肩水平。调整呼吸，放松，然后再开始转向：

Start by pressing one elbow down from the shoulder joint only. Press your arm down no more than 45 degrees. Maintain a neutral leg position during the turn.

启动阶段：仅从肩关节处下压一侧的手肘，手臂下压角度不超过 45 度。转向过程中腿部保持中性姿势。

Coast in the turn by returning to neutral before your desired heading comes into view. Your momentum will continue to turn you while you are neutral, much like your car continues to go forward after taking your foot off the accelerator. During the coast, assess your speed and the distance to your desired heading to determine when you should begin your stop movement.

滑行阶段：当目标方向即将进入视野时，恢复中性姿势。惯性会使你继续转向，如同松开油门后车辆仍会滑行。滑行期间，评估你的转向速度以及与目标方向的差距，以确定何时开始停止动作。

Stop by countering the turn in the opposite direction, then return to a neutral body position.

停止阶段：以反向动作抵消转向，然后回到中性身体姿势。

SCS: stands for start-coast-stop, and is a technique used in a variety of maneuvers where you start by moving a particular body part, coast by returning to neutral, and stop with the opposite motion.

SCS: 代表“启动-滑行-停止”，是一种用于多种机动动作的技巧，通过特定的身体部位的动作来开始机动，然后以中性姿势滑行，再以反向动作来停止。

CANOPY-FLIGHT EMERGENCY: is an emergency that happens while under a fully inflated canopy, anytime during the canopy descent or landing.

降落伞飞行紧急情况：指在降落伞完全充气后，伞降或着陆过程中发生的紧急情况。

CANOPY-FLIGHT EMERGENCY PROCEDURES (CEPs): is a set of five skills you can use to respond to canopy-flight emergencies.

降落伞飞行紧急程序 (CEP)：是一套包含五项技能的应对降落伞飞行紧急情况的技能集。

STAY ALIVE – PRACTICE FIVE!

练五项，保周全！

If you go past your intended heading or encounter other difficulties, use HAALR and pick a new heading before starting another turn. Stop all maneuvers by 6,000 feet.

若你越过了目标方向或遇到其他问题，则执行“方向，高度，弓形，腿形，放松”，并在选择一个新的方向后再开始新的转向。所有机动动作须在 6000 英尺以上进行。

B. Canopy

伞控

Rear-Riser Steering

后组操控

Learning to use your rear risers gives you more options to control your canopy. The rear risers operate the back half of your canopy, and steering with them with your brakes still stowed is the fastest way to change heading right after opening. Rear-riser steering is the first of several **Canopy-Flight Emergency Procedures (CEPs)** you will learn, because it can be useful for avoiding a canopy collision right after opening.

学习后组操控技巧后，你能有更多的降落伞控制选项。后组所操控的是降落伞伞布的后半部分，在开伞后立即使用后组转向（此时刹车仍处于未释放状态）是改变方向最快的方式。后组操控是你学习的多项**降落伞飞行紧急程序 (CEP)** 中的首个技能，因其能有效避免刚开伞后发生降落伞碰撞。

To steer with your rear risers, reach up and grab them firmly above where the toggles are stowed. Look in the direction you want to turn, check for traffic, and pull that riser down 4 to 6 inches. Once you have unstowed your toggles, keep them in your hands while performing rear-riser maneuvers.

操作后组时，向上伸手稳稳抓握后组（抓握位置需高于刹车的收纳处）。目视想转的方向，检查交通后，将该侧后组下拉 4 至

6 英寸（10 至 15 厘米）。释放刹车后，进行后组机动时仍需保持握持刹车的状态。

In this category, you will perform 90-degree rear-riser turns after visually inspecting your canopy but before you unstow your toggles. You will perform them again with your toggles unstowed. Stop all rear-riser steering practice by 2,000 feet. 在本单元，开伞后，你将目视检查降落伞，然后执行 90 度后组转向，之后再释放刹车，在释放刹车后重复执行后组转向。所有后组操控练习须在 2000 英尺以上进行。

Accuracy

着陆精准度

Before your jump, identify your target and draw a 165-foot (50-meter) radius circle around it on the aerial map. Use an interactive online map to help estimate the distance. Land within that area with minimal radio assistance and record the distance from the target in your logbook.

跳伞前需选定着陆目标点，并在航拍图上以该点为中心绘制 165 英尺（50 米）半径的着陆圈。建议使用在线交互地图辅助测距。在尽量无需无线电对讲机引导的情况下，在该区域着陆，并将实际落点与着陆目标的距离记录于跳伞日志。

C. Emergency Procedure Review

紧急程序复习

You will review **canopy problems and malfunctions** in the training harness to help you develop quicker recognition of malfunctions and improve your decision-making ability, especially as your assigned pull altitude lowers as you gain experience. The canopy must reliably fly straight, turn, and flare. Decide if your canopy is safe to land by the **2,500-foot decision altitude** and execute your emergency procedures if necessary.

你将使用训练背带复习**降落伞的问题与故障**，这有助于提升故障快速判断能力并增强决策能力——尤其是随着经验积累，你的预定开伞高度会逐步降低。降落伞必须能可靠地保持直线飞行、能转向及能进行拉平。务必在 **2500 英尺决断高度**前判定降落伞是否能安全用于着陆，必要时立即执行紧急程序。

You should be able to describe procedures for **landing on a building**: If landing on a roof, flare and PLF. Cut away once you've landed. If landing your reserve, contain it. Wait for help. If hitting a building broadside, turn the canopy slightly to avoid a direct impact before flaring. Prepare to PLF, flare to slow down, and attempt to strike a glancing blow.

你应当能清晰描述**建筑物着陆**的程序：若降落在屋顶，则完成拉平后 PLF。着陆后立即切伞。若使用备伞着陆，需控住降落伞。等待救援。若以侧面撞击建筑物，应在拉平前微调降落伞方向以避免正面撞击。准备 PLF，拉平减速，并尝试以擦碰方式接触建筑物。

D. Equipment

装备

AAD Operation

AAD 的操作

You will learn how to turn on your automatic activation device. Different brands of AADs have different operational modes that affect the firing altitude and speed. The owner's manual contains more information.

你将学习如何启动你的 AAD。不同品牌的 AAD 具有不同的工作模式，这些模式会影响其被触发的高度和速度条件。更多信息请参阅用户手册。

Conducting Gear Checks

装备检查

You should perform four gear checks supervised by your instructor before every jump.

每次跳伞前，你应在教练监督下完成四次装备检查：

1. Check your gear before putting it on (pre-flight)
穿装备前检查（飞行前检查）

2. Check your gear immediately after putting it on
穿装备后立即检查
3. Check your gear before loading the plane
登机前检查
4. Check your gear before exiting the plane
出舱前检查

As you make more jumps, you will start taking more responsibility for your gear checks. The "**check of threes**" is a self-check commonly used for the pre-boarding and pre-exit gear checks. They include:

随着跳伞经验积累，你将逐步承担更多自主检查装备的责任。“三个三检查”是登机前和出舱前常用的自检方法，包括：

1. three-ring assembly and reserve static line (three rings)
三环系统和 RSL（三环）
2. three points of harness attachment for snap assembly and correct routing and adjustment (three straps)
背带三点的卡扣是否到位，背带走线是否正确，以及松紧程度（三带）
3. three operation handles—main activation, cutaway, reserve (three handles)
三个操作把手——主伞开伞把手、切伞把手、备伞把手（三把手）

Additionally, you should have another jumper check your **pins** on the back of the system from top to bottom:

另外，需请其他跳伞者协助自上而下检查伞包背面的**关包针**等部件：

1. AAD on
AAD 处于开启状态
2. reserve pin in place
备伞关包针到位
3. main pin in place
主伞关包针到位
4. ripcord cable movement or correct bridle routing
拉索能否顺畅移动，或引导伞系带的走线是否正确
5. reserve handle in place
备伞把手就位

Your **personal equipment** check includes SHAGG:

个人装备检查，即 SHAGG 检查包含以下事项：

Shoes—tied, no hooks

鞋子——鞋带系紧且无钩状部件

Helmet—fit and adjustment and buckled

头盔——大小合适，调节到位并扣紧

Altimeter—set for zero

高度表——调好零点

Goggles—tight and clean

护目镜——戴得稳且干净清晰

Gloves—lightweight and proper size (below 40 degrees F)

手套——轻量且尺码合适（华氏 40 度或摄氏 4 度以下使用）

E. Standard Operating Procedures

标准作业程序

Requirements

要求

All student jumps, including tandems, must be completed between official **sunrise and sunset** according to the BSRs (Chapter 2-1.G.9).

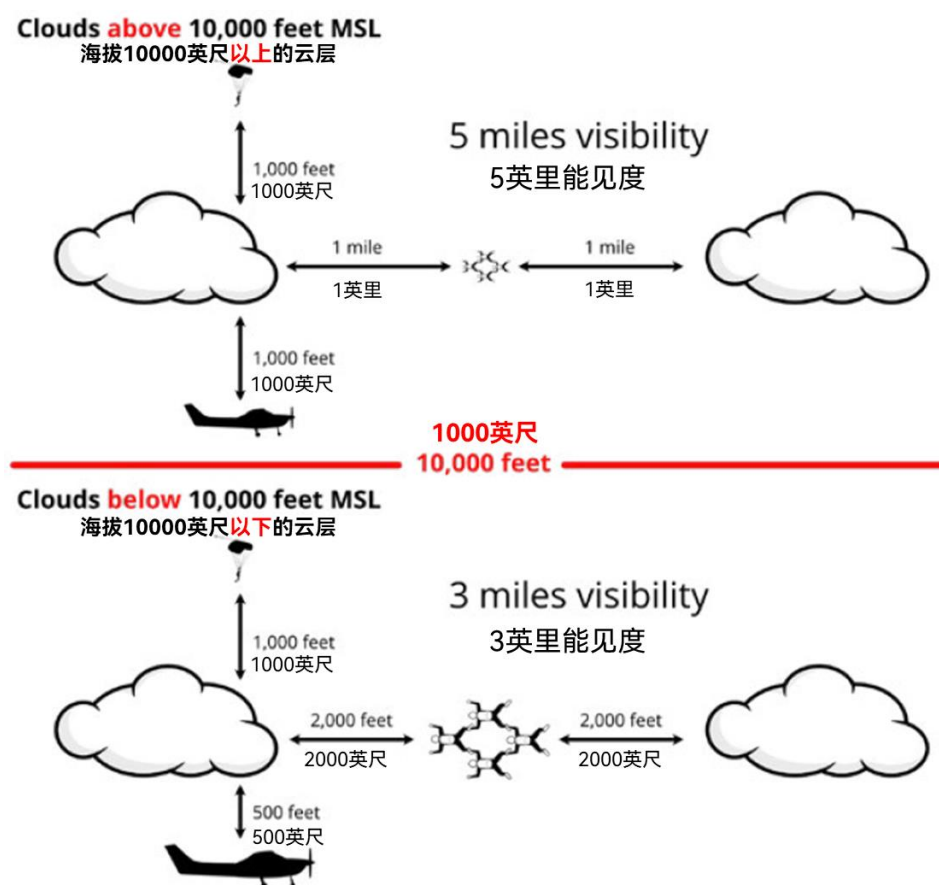
根据基本安全要求（见 2-1.G.9），所有的学生跳伞，包括双人伞跳伞，必须在官方公布的**日出和日落**时间之间完成。

You must maintain vertical and horizontal separation from clouds while jumping. FAR 105.17 lists the FAA's **cloud clearance and visibility minimums** for skydivers. You must be able to apply these requirements to your jumps, as the FAA places joint responsibility for cloud clearance and visibility on the jumper and the pilot.

跳伞时你必须保持与云层的垂直和水平间距。联邦航空条例 105.17 中列出了联邦航空局对跳伞者规定的云层间距和最低能见度要求。你必须能在跳伞中遵守这些要求，因为联邦航空局将遵守云层间距和能见度要求的责任同时归于跳伞者和飞行员。

The altitudes are given in mean sea level, or **MSL**, which is your true altitude using sea level as zero. Pilots use MSL to allow for consistent application of altitude requirements regardless of a location's elevation. The **elevation** is the altitude of a given location, like your drop zone, at ground level. Above ground level, or **AGL**, refers to your height above the ground. Using AGL allows for better understanding of your actual reference to the ground.

高度是以**平均海平面（MSL）**为参考给出的，即以海平面为零点的高度。飞行员之所以使用 MSL 高度，是因为无论地点的海拔如何，都能统一地应用高度要求。一个地方（如你的跳伞基地）的“**海拔（Elevation）**”指的是该地的高度。“**离地高度（AGL）**”则指的是你距地面的实际高度。使用离地高度能让你更好地理解与地面的实际参照关系。



Visual representation of FAR 105.17: Cloud clearances above and below 10,000 ft.

联邦航空条例 105.17 的图示：10000 英尺以上和以下的云层间距要求

Spotting, Wind Drift, and Opening Point

看点定位, 风导致的漂移量, 以及开伞点

You must determine the ground winds and winds aloft **before every skydive** according to the BSRs (Chapter 2-1.K). Having this information can help you plan your canopy flight and landing pattern. You can obtain current wind information from various weather apps. Ask your instructor which apps provide the most accurate information for your drop zone. The apps provide the direction and strength of the wind at ground level and at various altitudes in either miles per hour or knots. The description of winds includes their direction of origin expressed as a compass heading such as, "The ground winds are from two-seventy degrees." In this example, the winds are blowing from the west. Thus, your planned landing pattern will have the final approach going west, facing into the wind for landing.

根据基本安全要求(见 2-1.K), **每次跳伞前**必须确认地面风况和高空风况。掌握这些信息有助于你规划降落伞飞行路径与着陆航线。你可以通过各类天气 App 获取实时风况数据。请咨询教练哪些 App 能为所在跳伞基地提供最精准的信息。这些 App 会以英里/小时或节为单位, 显示地面及各高度层的风向和风速。风向指的是风的来源方向, 以磁航向表示, 例如“270 度地面风”表示风从西边吹来。在此情况下, 规划的着陆航线的最后进近阶段应朝着西边逆风着陆。

To land on the drop zone, you must be able to determine the spot on the ground over which to exit the plane and know how to find that spot while on jump run in the aircraft. **Jump run** is the predetermined path the aircraft flies prior to exit. Your **exit point** is the point at which you exit the plane. The direction of jump run is determined by the strength and direction of the winds aloft. The stronger the winds aloft, the farther the exit point will be from the landing area. The wind pushes you during freefall from the exit point toward the landing area. This horizontal movement is known as **wind drift**. The winds, presence of clouds, the size of your group and your jump type, planned deployment altitude, and many other factors all go into determining your ideal exit point.

为降落在目标区域, 你需具备两项能力: 一是确定出舱点及其对应的地面位置, 二是在跳伞航线上在飞机上找到该点。**跳伞航线**指出舱前飞机的预定飞行路径, 而**出舱点**指跳伞者离开飞机时的位置。跳伞航线的航向由高空的风速和风向决定——高空风越强, 出舱点距着陆区域就越远。自由落体阶段, 风会将你从出舱点吹向着陆区域, 这种水平位移称为风导致的**漂移量**。理想出舱点的确定还需综合考虑云层状况、团体规模、跳伞类型、预定开伞高度等多重因素。

Spotting is the term for selecting an exit point while accounting for the effect of winds aloft in freefall and during canopy flight. The exit point is also known as **the spot**. Spotting starts with determining the best **opening point** for canopies, which is the ground point of reference over which you open your parachute. This point is determined from wind forecasts for different altitudes. The stronger the wind is at the exit altitude and during freefall, the farther upwind of the holding and landing area the exit point, or spot, will be. This is also true for the canopy opening point, as it also should be upwind of your holding and landing area. If you open upwind of your holding area, the wind will help you get there.

看点定位 (Spotting) 指根据高空风对自由落体及降落伞飞行的影响来选择出舱点。出舱点即“看点”中所说的“点”。看点定位首先要确定**最佳开伞点**, 即降落伞打开时对应的地面参考位置, 该点通过各高度层风况预报推算得出。出舱高度和自由落体阶段的风力越强, 出舱点就要设在等待区或着陆区的更上风处, 开伞点也是同理。若在等待区上风处开伞, 风将助你抵达

GROUND WINDS: are also called surface winds.

地面风: 也称为地表风。

WINDS ALOFT: are the winds at various altitudes above the ground.

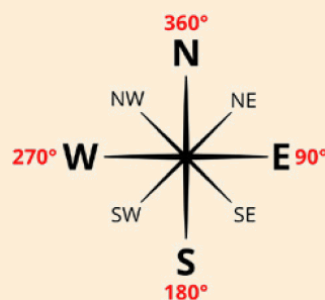
高空风: 指地面以上不同高度的风。

WIND DRIFT: is the horizontal movement caused by the wind, and understanding it is important for accurate navigation and landing.

漂移量: 是由风引起的水平移动, 理解漂移量对于精确导航和着陆至关重要。

CARDINAL DIRECTIONS: are North 360°, East 90°, South 180°, and West 270°.

基本方向: 北 360°, 东 90°, 南 180°, 西 270°。



等待区。

The pilot, instructors, and drop zone staff determine the direction of jump run and the location of the spot based upon the forecasted and observed winds. The direction of jump run and the location of the spot may change throughout the day as the weather and winds change.

飞行员、教练及基地工作人员根据预报风况和实测风况确定跳伞航线的航向与出舱点。随着天气和风况的变化，这两项可能全天动态调整。

The first step in learning to spot is determining what is "straight down" and predicting how the plane is moving across the ground. First, look straight out at the horizon and draw an imaginary line back to you. Then look forward toward where you are headed and draw an imaginary line back to you. The junction of the two perpendicular lines from the horizon marks the point straight below the aircraft. Before exiting, you must also verify that the area below you is clear of clouds and aircraft, and to do so effectively, you must get your head completely outside the aircraft.

学习看点定位的第一步是学会判断飞机“正下方”的位置并预测飞机的地面轨迹。具体方法是，先平视地平线，构建一条假想的直线延长至自身，再在飞机飞行方向构建第二条直线延长至自身，这两条互相垂直的线的交点即为飞机正下方的投影点。出舱前还须确认下方空域无云层及其他飞行器，为此需将头部完全探出舱外观察。

You will observe your instructor's spotting procedures, and then you will demonstrate the technique for looking straight down from the aircraft during jump run. You should be able to determine whether the aircraft is on the intended jump run and when you are at your desired exit point.

你将先观摩教练看点定位，随后在跳伞航线上演示在飞机上判断正下方的技巧。最终你应能自主判断飞机是否在预定跳伞航线上飞行，并及时识别你的目标出舱点。

Estimating Freefall Time

估算自由落体时间

You can note your freefall time in your logbook based on your exit altitude by assuming an average terminal velocity of 120 mph. The first 1,000 feet of your freefall takes approximately 10 seconds as you reach terminal velocity. Each 1,000 feet after that takes approximately 5 seconds. For example: You exit the airplane at 5,000 feet and deploy your canopy at 3,000 feet. The first 1,000 feet takes 10 seconds, and the next 1,000 feet takes 5 seconds. You can log 15 seconds of freefall time.

假设平均终端速度是 120 英里/小时，你可依据出舱高度算出自由落体时间并记录在跳伞日志中。达到终端速度前的 1000 英尺自由落体耗时约 10 秒，此后每下落 1000 英尺耗时约 5 秒。例如：从 5000 英尺出舱并在 3000 英尺开伞时，首段 1000 英尺耗时 10 秒，后续的 1000 英尺耗时 5 秒，总共可在跳伞日志中记录 15 秒自由落体时间。

D 单元跳伞流程 Category D Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

AFF

#1 90° TURNS

90 度转弯

- 观察点位 OBSERVE SPOTTING
- 放松的出舱 RELAXED EXIT
- 高度意识检查 COA

- 模拟开伞练习（可选） PRACTICE DEPLOY (optional)
- 方向，高度，弓形，腿形，放松 HAALR
- 找方向参考，请示转向 Find reference, ask to turn
- **90 度转向（使用“启动，滑行，停止”技巧） 90° TURNS SCS ✓**
- （重复练习直至 6000 英尺） (repeat until 6,000' no more)
- **5000 英尺挥手示意并开伞 5,000' WAVE OFF and PULL**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **后组转弯 REAR-RISER TURNS ✓**
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF（如需） FLARE and PLF if needed**

#2 180° and 360° TURNS

180 度和 360 度转弯

- 观察点位 OBSERVE SPOTTING
- 放松的出舱 RELAXED EXIT
- 高度意识检查 COA
- 模拟开伞练习（可选） PRACTICE DEPLOY (optional)
- 方向，高度，弓形，腿形，放松 HAALR
- 找方向参考，请示转向 Find reference, ask to turn
- **180 度和 360 度转向（使用“启动，滑行，停止”技巧） 180° and 360° TURNS SCS ✓**
- （重复练习直至 6000 英尺） (repeat until 6,000', no more)
- **5000 英尺挥手示意并开伞 5000' WAVE OFF and PULL**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **后组转弯 REAR-RISER TURNS ✓**
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF（如需） FLARE and PLF if needed**

IAD AND STATIC LINE

IAD 和 Static Line

#1 15-SECOND FREEFALL (2 jumps from 7,500')

15 秒自由落体（从 7500 英尺跳两跳）

- 观察点位 OBSERVE SPOTTING
- 放松的出舱 RELAXED EXIT
- 高度意识检查 COA
- 模拟开伞练习（可选） PRACTICE DEPLOY (optional)
- 方向，高度，弓形，腿形，放松 HAALR
- **90 度转向（使用“启动，滑行，停止”技巧） 90° TURNS SCS ✓**
- **5000 英尺挥手示意并开伞 5,000' WAVE OFF and PULL**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **后组转弯 REAR-RISER TURNS ✓**
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF（如需） FLARE and PLF if needed**

#2 30-SECOND FREEFALL (2 jumps from 9,500')**30 秒自由落体 (从 9500 英尺跳两跳)**

- 观察点位 OBSERVE SPOTTING
- 放松的出舱 RELAXED EXIT
- 高度意识检查 COA
- 模拟开伞练习 (可选) PRACTICE DEPLOY (optional)
- 方向, 高度, 弓形, 腿形, 放松 HAALR
- **180 度和 360 度转向 (使用“启动, 滑行, 停止”技巧) 180° and 360° TURNS SCS ✓**
- **5000 英尺挥手示意并开伞 5,000' WAVE OFF and PULL**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **后组转弯 REAR-RISER TURNS ✓**
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF (如需) FLARE and PLF if needed**

CANOPY DRILL: Rear-Riser Turns**伞控练习: 后组转弯**

- Correct minor canopy problems (line twist, slider, end cells) using rear risers with brakes stowed.
在未释放刹车的情况下, 使用后组纠正降落伞的小问题 (线缠绕、滑块布挂在上部、末端气室不完全充气)。
- Check altitude, position, and traffic.
检查高度、位置、交通
- Locate the holding area and turn toward it. Reach to the top of the risers and grab where the lines meet the risers.
找等待区并转向等待区。伸手抓握组提带顶部与伞绳的连接处
- Look right, turn right 90 degrees using rear riser.
向右看, 使用后组完成 90 度右转
- Check altitude, position, and traffic.
检查高度、位置、交通
- Repeat to the left.
向左边重复练习
- Check altitude, position, and traffic.
检查高度、位置、交通
- Repeat turns if altitude permits.
如果高度允许的话, 重复转弯练习
- Unstow the brakes above 2,500 feet, do a controllability check and fly to the holding area.
在 2500 英尺以上释放刹车, 进行可控性检查并飞往等待区。
- With your hands in your toggles, reach to the top of the risers and grab the risers where the lines meet the risers.
在保持刹车握在手的情况下, 双手向上伸至组提带顶部, 抓握伞绳与组提带的连接处
- Look right, turn right 90 degrees using rear riser.
向右看, 使用后组进行 90 度右转
- Check altitude, position, and traffic.
检查高度、位置、交通
- Repeat to the left.
向左边重复练习
- Check altitude, position, and traffic.
检查高度、位置、交通
- Repeat turns right and left if altitude permits.
如果高度允许的话, 重复转弯练习

- Return to steering with the toggles by 2,000 feet.
在 2000 英尺以上恢复使用刹车控制方向
- Fly the planned pattern, flare and PLF if needed.
飞着陆航线，拉平并 PLF（如需）

TAKE THE QUIZ:

参加单元小测



uspa.org/quiz/d

单元小测（中英对照）

微信扫一扫



TRANSLATION OF THE QUIZ

E 单元（探索）

Category E (Explore)

2 跳	开伞程序启动高度 4500 英尺
-----	---------------------

In Category E, you Experiment with intentionally disorienting maneuvers: barrel roll, front loop, and back loop!
在 E 单元，你将尝试进行故意失稳的机动：横滚、前空翻和后空翻！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Provide the ground winds and winds aloft for the day
提供当天的地面风和高空风情况
- ☐ Discuss time between groups and spotting techniques
讨论各团体之间的时间间隔以及看点定位的技巧
- ☐ Plan the spot accounting for exit separation, wind drift, and opening point
规划好点位，将出舱间隔、风导致的漂移量以及开伞点考虑在内
- ☐ Plan your flight to the holding area and the pattern, including traffic avoidance
规划飞往等待区的路线和着陆航线，包括避开交通
- ☐ Discuss landing accuracy and choosing the landing target
讨论着陆精准度以及着陆目标的选择
- ☐ Discuss two common flare techniques: staged (sweet spot) and continuous.
讨论两种常见的拉平技巧：分阶段拉平（应用“甜点”）和连续拉平
- ☐ Train for sweet-spot drill
“甜点”练习的培训
- ☐ Train for stall-point drill
失速点练习的培训

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100% 的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Expand on the causes of having two parachutes out and review high-wind landings
扩展学习导致双伞情形的原因，复习大风着陆
- ☐ Identify the components, their functions, and potential malfunctions of your parachute system
识别你的降落伞系统的部件、其功能以及可能发生的故障
- ☐ Join USPA if you haven't already
加入 USPA（如未加入）

Canopy Debrief

跳后伞降汇报

- ☐ Participate with spotting during jump run using SPACE
在跳伞航线上参与看点定位，执行 SPACE 检查（跳伞者，飞机，机场，云层，出舱信号灯）
- ☐ Practice finding the sweet spot
练习找到“甜点”
- ☐ Practice finding the stall point (above 2,500 feet)
练习找到失速点（2500 英尺以上）
- ☐ Perform a flare technique appropriate for your canopy
使用适合你的降落伞的拉平技巧
- ☐ Land within 165 feet (50 meters) of your planned target without assistance
在无协助的情况下，在预定着陆目标 165 英尺（50 米）范围内着陆

Freefall Debrief

跳后自由落体汇报

- ☐ Perform a barrel roll, recovering within 5 seconds
执行横滚，5 秒内恢复稳定
- ☐ Perform a back loop, recovering within 5 seconds
执行后空翻，5 秒内恢复稳定
- ☐ Perform a front loop, recovering within 5 seconds
执行前空翻，5 秒内恢复稳定
- ☐ Be cleared to jump without freefall supervision by recovering twice from intentional instability (barrel roll, back loop, or front loop) within 5 seconds
通过两次在 5 秒内从故意失稳的机动（横滚、前空翻或后空翻）中恢复稳定，获得许可进行无监督的自由落体

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

For Review

复习

You will perform a stable solo exit. Set up your position for the best launch that will present the front of your hips to the relative wind. Exit in a neutral position with your legs slightly extended for better stability. Maintain your arch as the relative wind changes from ahead to below after exit. As always, you can recover from exit and freefall instability by using HAALR, AIR, and the roll-out-of-bed technique.

你将执行一次稳定的独立出舱。准备就位以最佳姿态跳出，使胯部迎向相对气流。以中性姿势出舱，双腿微伸以增强稳定性。出舱后，在相对气流由从前方吹来转换为从下方吹来期间保持弓形姿势。如往常一样，若出舱或自由落体阶段出现不稳定的情况，可通过“方向，高度，弓形，腿形，放松”（HAALR）、“高度意识，保持受控，状态放松”（AIR）及“翻滚起床”（Roll-out-of-bed）的技巧恢复控制。

New Stuff

新知识

In Category E, you will purposely experiment outside of the neutral stable position by performing barrel rolls, back loops, and front loops. When you recover from any two of these within 5 seconds, you qualify for **self-supervision** in freefall. The BSRs state: "All students must jump under the direct supervision of an appropriately rated USPA Instructor until demonstrating stability and heading

SELF-SUPERVISION: is the point in your training where you are cleared by an instructor to jump without supervision in freefall. An instructor or coach will continue to supervise your activities on the ground.

自我监督：这是你培训中的一个阶段，此时教练允许你在无监督的情况下进行自由落体。教练或助理教练将继续监督你的地面活动。

control prior to and within 5 seconds after initiating two intentional disorienting maneuvers involving a back-to-earth presentation." (Chapter 2-1.G.4)

在 E 单元, 你将故意尝试脱离中性稳定姿势, 练习横滚、后空翻和前空翻动作。当你能在其中任意两个动作后 5 秒内恢复稳定时, 即有资格在自由落体阶段进行**自我监督**。基本安全要求明确规定: 所有学生必须在持有合适教练评级的 USPA 教练的直接监督下跳伞, 直至他(她)展示出“有能力保持稳定和方向控制, 且在两次故意扰乱姿态的动作之后(包括背朝地的情形) 5 秒内仍能回到稳定姿态和保持方向控制”。(见 2-1.G.4)

Being cleared for self-supervision indicates that an instructor authorizes you to jump without direct oversight. However, an instructor or coach will still supervise your pre-jump preparations and must give you a gear check before boarding the aircraft. It is your responsibility to check your gear before you exit but it is highly recommended to do a mutual gear check with an experienced jumper before exiting. (see Chapter 4-4.A)

获准自我监督意味着教练授权你在无直接监督的情况下进行跳伞。但教练或助理教练仍会监督你的跳前准备工作, 并且必须在登机前对你进行装备检查。出舱前自行检查装备是你的责任, 但强烈建议你在出舱前与有经验的跳伞者进行互相检查(见 4-4.A)。

An analog altimeter may read high when it is in your burble during inverted positions such as loops and barrel rolls, so you may be lower than the altimeter indicates.

当处于反转姿势(如后空翻或横滚)时, 机械式高度表可能因其处于尾流区而显示偏高的读数, 此时实际高度可能低于高度表的显示读数。

Barrel roll

横滚

The barrel roll is a fun maneuver, as well as the best technique for returning to a belly-to-earth position. Start the barrel roll in a neutral body position. Become narrow by bringing your knees together and stretching both arms out in front of your head. Keep your eyes on the horizon. Aggressively drive one arm across your chest in a punching motion to create momentum. Create a scissoring action with your arms and legs to twist around the imaginary axis that runs from your head to your feet. Recover by returning to the neutral body position. Relax and check your altimeter.

横滚是极具趣味性的机动动作, 也是恢复腹飞姿势的最佳技巧。要做横滚动作, 先从中性弓形姿势开始, 双膝并拢使身体收窄, 双臂向前伸展至头前方。保持视线在地平线上, 然后以有力的动作让一侧手臂快速横跨胸部, 以产生动量。通过手臂与双腿的剪式交叉动作, 让自身围绕从头部到脚部的假想轴完成旋转。然后恢复中性弓形姿势结束动作, 放松并检查高度表。

Back loops

后空翻

The back loop is a dynamic maneuver that challenges you to use your entire body. Start the back loop by bringing your knees up into a sitting position. Stretch your arms out to the side and widen your leg stance. Next, push your legs out and look back in the direction of the loop. Keep your head back as you roll over until you see the horizon. Recover by returning to the neutral body position. Relax and check your altimeter.

后空翻是对全身协调性要求较高的动态机动动作。起始时, 屈膝前顶呈坐立姿势, 双臂向两侧伸展并扩大腿部间距。随后蹬出双腿, 同时朝翻转方向后仰头部。保持头部后仰直至完成翻转重新看到地平线。然后恢复中性弓形姿势结束动作, 放松并检查高度表。

Front loops

前空翻

The front loop is also a dynamic maneuver that requires more aggressive action at the beginning and end. Start the front loop by forcefully bending at the waist while throwing your head forward toward your knees and tucking your legs in. Hold this position until you feel the wind in your face again. Recover by throwing your knees back out and returning to the neutral body position. Relax and check your altimeter.

前空翻同样是一项动态机动动作，在起始和结束时需要更用力的动作。开始前空翻时，需用力弯腰，头部向前朝膝盖方向顶，同时收拢双腿。保持这个姿势，直到再次感受到迎面气流。恢复时，双膝后甩，回到中性身体姿势。放松并检查高度表。

B. Canopy

伞控

For Review

复习

Before you meet with your instructor for your training, you can check ground winds and winds aloft and construct your flight plan so you're ready to discuss it.

在与教练见面并进行培训前，你可以先查看地面风和高空风的情况，制定飞行计划，以便做好讨论的准备。

Review your **traffic avoidance** procedures: watch for other canopy traffic, especially upon entering the landing pattern. The most dangerous point of the pattern occurs when two jumpers who are flying in opposite directions on their base legs turn to final approach. The lower canopy has the right of way, but one jumper should not maneuver to assert right of way over another. It takes two people to have a collision, but only one to avoid it.

复习**避开交通**的程序：注意其他降落伞，特别是在进入着陆航线时。着陆航线上最危险的情况是在两名在第二边相向飞行的跳伞者转向第三边的时候。高度较低的降落伞拥有优先通行权，但跳伞者不应通过机动动作来确立相对他人的优先通行权。相撞是由两个人的失误造成的，但避免相撞只需一个人正确操作。

New Stuff

新知识

Flare techniques

拉平技巧

Effective flare techniques vary depending on the design and size of a parachute, but the basics of flaring apply to any technique. You can refine your flare technique by expanding on the basics using the following strategies:

有效进行拉平的技巧因降落伞的设计和尺寸而异，但所有技巧都遵循相同的基本原则。你可以通过以下策略完善拉平技巧：

Being in the PLF position for landing allows you to maintain your heading and stay level in your harness during the landing flare. Except for small corrections on final approach, keep your toggles all the way up, in full glide, for 8 to 10 seconds before starting your flare. This will help the canopy produce more lift when you flare. Keep your chin level, looking at the point mid-way to the horizon, to better judge the flare height. Start the flare when your feet reach an altitude of approximately twice your height above the ground. Flare with your hands close to your body, bringing your elbows back as your hands come down. Continue to push your hands evenly down the side of your thighs to full arm extension. **It is important to fully finish your flare.** Finish with your feet approximately 12 inches above the ground. Hold the flare all the way down during a PLF or for a few steps after touch down.

采用 PLF 姿势准备着陆可使你保持身体的朝向稳定，并使你在着陆拉平时，让背带可以平衡地承载你的身体。除在最后进近阶段进行微调外，开始拉平前的 8 至 10 秒内应完全松刹车，让降落伞处于全速飞行的状态。这能增强拉平时降落伞产生的升力。保持下巴水平，视线聚焦于自身与地平线之间的中间位置，这有助于准确判断拉平高度。当双脚距地面约两倍身高时，启动拉平动作。拉平时，双手贴近躯干，双手下拉的同时后收肘部。持续且对称地让双手沿大腿下压，直至手臂完全伸展。**完全拉平到底是非常重要的。**最终在双脚离地面约 12 英寸（30 厘米）高度时完成拉平。PLF 期间或触地后的几步内，应全程保持拉平到底的状态。

SIGHT PICTURE: refers to the visual cues you observe to judge your altitude, speed, and trajectory as you approach your landing.

视觉画面：指你在接近着陆时观察到的视觉线索，用于判断高度、速度和飞行轨迹。

RAM-AIR PARACHUTE: is a canopy characterized by its design which includes a series of cells that inflate to create an airfoil shape. It needs to be moving forward and have air flow in the nose in order to fly.

冲压空气式降落伞：一种有特定伞布设计的降落伞，其特点是由一系列气室通过充气形成翼型。这种伞需要向前移动让气流吹进伞的前缘才能飞行。

Two common flare techniques are the **continuous flare** and the **staged flare**. Most larger canopies, those 220 square feet or more, flare effectively with either technique.

常见的拉平技巧分为**连续拉平**与**分阶段拉平**两种。对于面积在 220 平方英尺以上的大型伞，两种技巧均适用。

The **continuous flare** is one smooth motion that should take about the same time that it takes to count to five. You may count slower or faster depending on wind conditions or your sight picture. Regardless of the speed of your flare, you should time it to be smooth and consistent overall, responding to how your canopy is performing.

连续拉平是一个流畅的动作，花费的时间大约是缓慢数到五的时间。你可以根据风况或视觉画面调整计数的速度。无论拉平的速度如何，你都应确保动作整体流畅一致，并根据降落伞的表现进行调整。

The **staged flare** consists of points where you may pause during the flare stroke. The flare your instructor taught you may have two, three, or even more stages. Many canopies flare most effectively using a two-stage flare. The first stage of this two-stage flare is called the **sweet spot**, the point where your wing is in level flight. You can find the sweet spot several ways, including by noticing at what point in your flare the nose of your canopy is directly above you; or by locating where the locking loops on the steering lines are even with the steering-line rings on the riser. Note the position of your hands in relation to your body so you can find this spot again easily. Once you reach this point in your flare, pause and assess your height above the ground. Start the second stage of this two-stage flare when you are at the proper height to smoothly and fully finish the flare with your feet approximately 12 inches above the ground.

分阶段拉平允许在拉平过程中设置停顿点。教练教你的拉平可能包含两阶段、三阶段甚至多阶段。多数降落伞最适合两阶段拉平，其中第一阶段拉平至“甜点”，即能使降落伞处于水平飞行状态的位置。可通过多种方式找寻“甜点”，包括观察拉平到什么位置时，降落伞的前缘移动到你的正上方；或拉平至刹车线上的猫眼与组提带上的刹车线引导环对齐的位置。你需记住此时双手相对身体的位置，以方便后续重复利用。拉平到“甜点”后，暂停动作，评估离地高度，当达到合适高度时，启动第二阶段的拉平，最终在双脚离地面约 12 英寸（30 厘米）高度时平稳且完全地拉平到底。

(译者注: Toggle Locking Loop, 也称 Cat Eye, 即猫眼, 是刹车线上的绳环, 刹车未被释放前会插在此绳环上)



Finding the sweet spot:

Here, the locking loop on the steering lines are even with the steering-line ring on the riser.

找到“甜点”：这里，刹车线上的猫眼与组提带上的刹车线引导环对齐。

Your instructor will determine the best flare technique for your canopy and practice with you for the landing on your next jump. You will practice finding the sweet spot above 2,500 feet on your next jump, even if you use a continuous flare for landing.

教练将根据你用的伞确定最佳拉平技巧，并为你下一跳的着陆带你进行练习。即使采用连续拉平，下次跳伞时仍需在 2500 英尺以上练习找寻“甜点”。

Stalls

失速

A stall is an aerodynamic event where the wing loses its ability to produce lift. When a ram-air parachute stalls, it also loses pressurization, and the canopy will no longer be able to support the weight of the jumper. To avoid stalling close to the ground in a flare, you should know the **stall point** on any canopy you jump, especially if the canopy is new to you. *For this reason, you need to perform all stall practice above your 2,500-foot decision altitude.*

失速是指降落伞丧失产生升力的能力的空气动力现象。当冲压空气式降落伞失速时，伞内的充气压力随之消失，伞布将无法

继续承载跳伞者的重量。为避免在近地面拉平时发生失速，你必须掌握所用的每个降落伞的**失速点**，尤其是初次使用的伞。因此，所有失速练习都应在 2500 英尺决断高度以上进行。

Too much input or input applied too abruptly using either the **toggles** or the **rear risers** can cause a stall. Applying too much input is associated with a slow-speed stall, where the canopy loses airspeed and eventually stalls. Applying input too abruptly is associated with a high-speed stall, where the stall occurs more suddenly and at a higher airspeed.

无论是使用**刹车**还是**后组**，操作幅度过大或动作过猛都会导致失速。过大的操作量会引发低速失速——降落伞的空速逐渐降低直至失速；而过猛的操作则会引发高速失速——失速会在较高空速的情况下突然发生。

Before intentionally stalling with **toggles**, make sure your canopy is in full flight and flying straight. Slowly pull the toggles down to full arm extension until you feel the onset of the stall, a feeling similar to rocking back in a chair and falling backward. After holding the toggles all the way down for 5 to 6 seconds, the stall will develop further, and the canopy will become bowtie shaped. The air will leave the canopy, and you will begin descending at a high rate. Some student canopies are configured to prevent a toggle stall, so your canopy may not develop a full one. Recover from a fully developed toggle stall by slowly raising the toggles up a few inches until the canopy inflates and returns to slow flight. Avoid raising the toggles too quickly, which can cause the canopy to surge, dive, or spin into line twists.

STALL POINT: is the position of your input at which your canopy stalls. The stall point will differ from canopy to canopy, jumper to jumper, and at different speeds with different maneuvers. Your student canopy may not stall using toggles, even after holding your toggles all the way down for several seconds.

失速点：指导致降落伞失速的操作输入位置。失速点会因降落伞、跳伞者而有所不同，并在不同速度和不同机动动作下有所差异。你的学生降落伞可能不会在使用刹车时失速，即使你将刹车完全拉下并保持数秒。

在刻意进行**刹车**失速练习前，需确保降落伞处于全速直线飞行状态。缓慢下拉刹车至手臂完全伸展，直至感受到失速征兆（类似椅子后仰时的后坠感）。保持刹车完全下拉 5 至 6 秒后，失速状态会进一步发展，伞布将呈现领结状，内部空气排出，此时你将进入高速下坠状态。一些学生伞经过特殊配置可防止刹车失速，因此你的降落伞可能不会进入完全失速状态。要从完全发展的刹车失速中救出，需缓慢向上松刹车数英寸，直至伞布重新充气，恢复慢速飞行。切忌过快地松刹车，否则可能导致降落伞前冲、俯冲或旋转并引发线缠绕。

Stalling using the **rear risers** works similarly, except that you need to pull down only 5 or 6 inches on both risers. For now, you will **practice only toggle stalls**; your B-license canopy training addresses rear-riser stalls.

后组失速的操作原理类似，区别在于只需拉下两侧组提带 5 至 6 英寸（13 至 15 厘米）即可引发失速。当前阶段你**仅需练习刹车失速**，后组失速训练将在 B 执照伞控培训中涉及。

C. Emergency Procedure Review

紧急程序复习

Two Open Canopies

双伞情形

You will review detailed procedures for having two canopies out with your instructor, expanding on your first-jump-course knowledge by looking at the guidance in Chapter 4: Recommendations for Everyone. A two-canopies-out malfunction can be caused by your AAD firing if you fail to deploy at the planned deployment altitude or by deploying your reserve without cutting away if you are below your 1,000-foot cutaway hard deck.

你将与教练一起复习双伞情形的详细应对程序，通过研读第四章“对所有人的建议”中的指引，拓展你在第一跳课程中学到的知识。双伞情形可能由以下两种原因导致：一是你没能预定开伞高度开伞，AAD 后续被触发；二是你在 1000 英尺切伞硬甲板高度以下不执行切伞，直接开备伞。

Procedures for High-Wind Landings

大风情况下的着陆程序

Winds can change from the time you leave the plane to when you are under canopy. If you land in high winds, PLF and then pull one toggle all the way in as quickly as possible until the canopy collapses. You risk injury when being dragged after landing in high winds. When you land and the canopy is dragging you and you cannot collapse it, disconnect your RSL, if possible, and cut away.

在你离开飞机到降落伞打开的期间，风况可能发生变化。若在大风中着陆，请执行 PLF，着陆后尽快完全拉下一侧刹车，直至降落伞完全塌缩。在大风中着陆后若被降落伞拖行，极易造成身体损伤。当你持续被降落伞拖拽且无法使降落伞塌缩时，断开 RSL（如有可能），并执行切伞。

Your canopy may dive or collapse behind any **obstacle** that generates turbulence. Thus, if landing in high winds, plan your final approach and choose a landing spot with the least potential for turbulence and the greatest distance between you and any obstacle.

任何引发乱流的障碍物都可能导致降落伞俯冲或塌陷。因此在大风条件下着陆时，必须精心规划最后进近的路线，选择受乱流影响最小且离障碍物尽量远的着陆点。

D. Equipment

装备

Open-Parachute Orientation

了解展开的降落伞

If you have not already been involved in packing, you should begin packing lessons in this category. A rigger or instructor will expand on your knowledge of the parachute system by slowly opening a packed rig, highlighting how your parachute ideally deploys in a specific order. A malfunction happens when the deployment is delayed, halted, or happens out of sequence. You should identify your rig's components, their functions during deployment, and how malfunctions might happen.

若你尚未参与过叠伞，应在当前阶段开始学习叠伞课程。装备师或教练将通过逐步打开叠好的降落伞，向你详细讲解降落伞系统，并重点展示主伞在理想情况下按特定顺序展开的过程。当展开过程出现延迟、中断或顺序错乱时，即构成故障。你需要掌握装备各部件的名称、其在降落伞展开过程中的功能，以及可能发生的故障类型。

Components

部件

- pilot chute, bridle, and collapsing system
引导伞、引导伞系带，以及可缩引导伞系统
- deployment bag
D 包
- pilot-chute attachment
引导伞连接处
- top skin, bottom skin, ribs, and crossports
伞布上表面、下表面、伞肋，以及气室间的通风切口
- nose and tail (leading and trailing edges)
伞布前缘与后缘
- stabilizers and slider stops
稳定翼与滑块布限位器
(译者注 1: 稳定翼, 即 Stabilizer, 是位于伞布左右两侧边缘的部分)
(译者注 2: 滑块布限位器, 即 Slider Stop, 是位于伞布边缘的, 一般内部缝有圆形硬片进行加固的部分伞布)
- A, B, C, D, and brake lines
A、B、C、D 组伞绳和刹车线

- line cascades, including brake lines
伞绳汇聚点（两条或多条伞绳汇聚成一条的连接点），包括刹车线
- slider and slider grommets
滑块布和滑块布的孔环
- connector links and link protectors
（伞绳和组提带的）连接器和连接器保护套
- risers and toggles
组提带与刹车
- AAD
AAD
- standard RSL or MARD
标准 RSL，或 MARD

Potential Malfunctions

潜在故障

- lost or unrecoverable deployment handle
开伞把手找不到或丢失
- hard pull
开伞把手难以拉动
- pack closure
伞包无法打开
- pilot-chute hesitation
引导伞迟滞
- pilot chute in tow
引导伞拖拽
- premature deployment (hand deploy)
意外提前开伞（对于手动式开伞）
- pilot-chute entanglement
引导伞缠绕
- bag lock
D 包锁死
- streamer
降落伞完全不充气
- line over
线翻越
- fabric or line failure sufficient to interfere with control and flare
足以影响降落伞可控性和拉平的伞布或伞绳故障
- slider hang-up
滑块布卡在上部
- control-line entanglement
刹车线缠绕

RSL and MARD

RSL 和 MARD

A **reserve static line (RSL)** is a back-up safety device meant to automatically deploy the reserve canopy following a cutaway. On an RSL-equipped rig, one end of the RSL lanyard attaches to a main riser, and then the lanyard runs to the reserve ripcord cable, where the other end attaches. When the main risers depart following a cutaway, the RSL lanyard pulls the reserve pin and releases the reserve pilot chute, which deploys the reserve parachute. When the RSL includes a **main-assisted-reserve-deployment (MARD)** device, the RSL lanyard hooks to the reserve-pilot-chute bridle, which allows the departing main parachute to assist in extracting the reserve, speeding up its deployment. RSLs help to both ensure and speed up reserve deployment when fractions of a second matter; MARDs speed up the deployment even further. (See Chapter 4-3: Equipment for more details.)

联动装置 (RSL) 是一种备用安全装置，用于在切伞后自动打开备伞。在配备 RSL 的装备上，RSL 系带一端连接主伞组提带，另一端连接备伞开伞拉索。当主伞组提带因切伞而脱离时，RSL 系带会拉出备伞关包针并释放备伞引导伞，从而让备伞飞出伞包。若 RSL 集成了**主伞辅助备伞开伞装置 (MARD)**，RSL 系带将与备伞引导伞系带相连，从而让脱离的主伞协助拉出备伞，加速备伞的展开过程。在分秒必争的紧急情况下，RSL 既有助于确保备伞展开又可加快开伞速度；而 MARD 则能进一步缩短开伞时间。(详见第四章第三节：装备)

USPA requires all students to use an RSL and recommends that all experienced jumpers use an RSL with a MARD. The RSL must be attached and routed correctly to function properly.

USPA 要求所有学生使用 RSL，并建议有经验的跳伞者选用带 MARD 的 RSL。为确保 RSL 正常运作，其连接和走线须正确。

E. Standard Operating Procedures

标准作业程序

According to the BSRs (Chapter 2-1 H), students are limited to jumping when surface winds are **14 mph or less**. An S&TA may file a waiver for students to jump in higher winds. Licensed jumpers have no established wind limit, so they must exercise good judgment.

根据基本安全要求（见 2-1.H），学生只能在地面风速**不超过 14 英里/小时**的情况下跳伞。安全和培训顾问可申请豁免，允许学生在更高风速的条件下跳伞。持证跳伞者不受风速限制约束，需自行判断安全性。

FAR 91.107 establishes that you must wear a **seat belt** during taxi, takeoff, and landing. Drop zones establish their own policies regarding the altitude at which you may remove your seat belt.

联邦航空条例 91.107 规定，飞机滑行、起飞及着陆阶段必须系好**安全带**。各跳伞基地自行制定政策，确定在什么高度可以解开安全带。

Review aircraft EPs from Category A. In an aircraft emergency, you can choose one of these actions: land in the plane, exit on your reserve, or exit on your main parachute. When choosing which action is appropriate, consider your drop zone's policy on the altitude at which you take off your seat belt. If an aircraft emergency occurs below that altitude, land in the plane. Further, consider your decision altitude when choosing when you use your main rather than your reserve. If an aircraft emergency occurs above seat-belt-off altitude and below your decision altitude, use your reserve.

复习 A 单元飞机紧急程序的内容。若出现飞机紧急情况，可选择以下应对方式：随飞机一起着陆，或出舱开备伞，或出舱开主伞。选择合适应对方式时需考虑到跳伞基地允许解开安全带的高度，若紧急情况发生在该高度以下，则应选择随飞机一起着陆；此外还要考虑你的决断高度，当紧急情况发生在允许解开安全带的高度以上，但低于决断高度时，出舱应使用备伞。

Spotting, Winds Aloft, Opening and Exit Points, Exit Separation, and SPACE

看点定位、高空风、开伞点与出舱点、出舱间隔及 SPACE 检查

Previously, you learned that **spotting** is the process of selecting an exit point while accounting for the effect of winds aloft in freefall and during your canopy flight. The exit point is known as "**the spot**." You will take a more active role in spotting by calculating the spot and participating during jump run. Determining the spot involves multiple steps, which

include obtaining the winds-aloft information, calculating the effect of wind on your canopy flight and calculating your freefall drift.

此前你已学过，**看点定位**指的是综合考虑自由落体阶段与降落伞飞行期间的高空风影响后选定出舱点的过程。这个出舱点即“看点”中所指的“点”。你将通过计算该点位并在跳伞航线上参与看点定位来发挥更主动的作用。确定点位包含多个步骤：获取高空风数据、计算风对降落伞飞行的影响，以及测算自由落体漂移量。

Finding the Winds Aloft

获取高空风数据

Accurately determining the spot will allow you to arrive at your pattern-entry point at 900 feet. Ground winds are often not the same as winds at higher altitudes. **Winds aloft** cause jumpers to drift across the ground both when in freefall and under canopy. You must account for winds aloft to determine your ideal **exit and opening points**.

精准地确定出舱点能确保你在 900 英尺高度能抵达着陆航线起始点。地面风况通常与高空风况不同，自由落体阶段和降落伞飞行期间，**高空风**会使跳伞者相对地面发生漂移。必须将高空风纳入考量才能确定最佳**出舱点和开伞点**。

Use an app recommended by your instructor to find a winds-aloft report, which might look like this:

使用教练推荐的 App 获取高空风报告，报告通常看起来是这样的：

The data provided includes the altitude in feet above the ground (AGL), a heading in degrees indicating where the winds are coming from, and the wind speed in either mph or knots. You can convert knots to mph by multiplying by 1.15. Degrees are expressed as a position on a compass:

提供的数据包括：离地高度（单位：英尺）、风向（以度数为单位，表示风的来源方向）以及风速（单位：英里/小时或节）。以节为单位的风速乘以 1.15 可将单位转换为英里/小时。风向的度数采用磁航向表示：

高度 (英尺) 风向 风速 (节)

Surface: 316° at 14 kts
(地表)

1000 ft: 317° at 19 kts

2000 ft: 317° at 21 kts

3000 ft: 319° at 22 kts

4000 ft: 324° at 23 kts

5000 ft: 332° at 23 kts

6000 ft: 329° at 24 kts

7000 ft: 320° at 26 kts

8000 ft: 314° at 24 kts

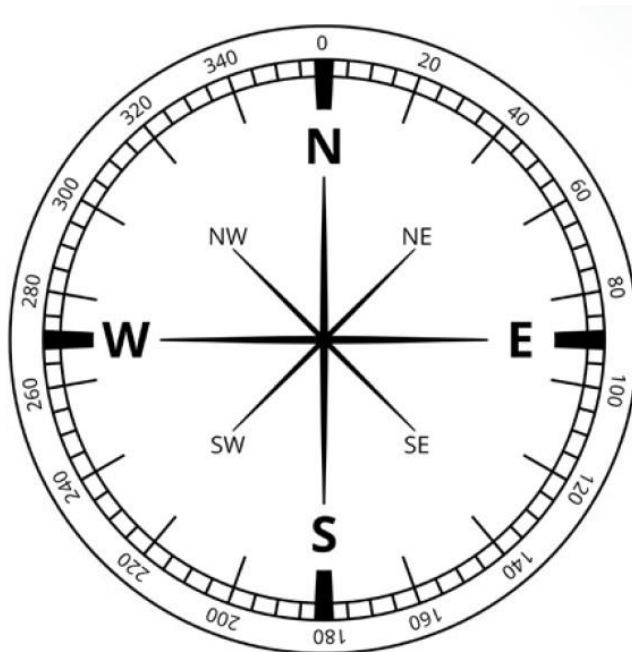
9000 ft: 308° at 22 kts

10000 ft: 303° at 21 kts

11000 ft: 299° at 21 kts

12000 ft: 296° at 23 kts

13000 ft: 294° at 24 kts



Sample Winds-Aloft Report and Compass Headings

高空风报告样例以及磁航向

Keep in mind that the winds-aloft report is only a forecast and can differ from what you actually experience. To assess the accuracy of the forecasted winds, observe other jumpers' opening points and canopy flights from the ground. Ask

them about their flights and how the winds aloft affected their canopy flights.

需注意高空风报告仅为预测值，可能与实际状况存在差异。为评估预报的准确性，可在地面观察其他跳伞者的开伞点及降落伞飞行轨迹，并向其询问高空风对降落伞飞行过程的影响。

Determining Opening Point

确定开伞点

Using the winds-aloft report, first consider the effect of winds during canopy descent. **A student canopy descends at approximately 1,000 feet per minute.** We can convert the strength of the wind in miles per hour to distance drifted per minute by dividing by 60, like this:

使用高空风预报时，首先考虑降落伞下降阶段的风的影响。**学生伞的下降速率约为 1000 英尺/分钟。**将风速（英里/小时）除以 60 即可换算为每分钟的漂移距离，计算公式如下：

AVERAGE WIND IN MILES PER HOUR 平均风速（英里/小时）	DISTANCE PER MINUTE (in miles) 每分钟漂移距离（英里）
60	1
30	1/2
20	1/3
15	1/4
10	1/6
5	1/12

To determine the opening point, start by calculating how many minutes you will spend under canopy from opening point to pattern-entry point.

要确定开伞点，首先计算从开伞点到着陆航线起始点之间的降落伞飞行时长。

For example, at a descent rate of 1,000 feet per minute, if you are **open at 3,000 feet**, your time from opening to pattern entry at 900 feet would be approximately two minutes.

例如，若降落伞的下降速率为每分钟 1000 英尺，你在 **3000 英尺开完伞**，那么从开伞到 900 英尺进入着陆航线大约需要 2 分钟。

Now, average the winds-aloft report for altitudes from 3,000 feet AGL to 1,000 feet AGL.

接下来，计算离地高度 3000 英尺至 1000 英尺之间各高度的风的平均值。

For example, if the reported winds aloft were:

例如，假设高空风预报如下：

- **1,000 ft:** 260° at 10 mph
1000 英尺: 260°, 10 英里/小时
- **2,000 ft:** 270° at 15 mph
2000 英尺: 270°, 15 英里/小时
- **3,000 ft:** 280° at 20 mph
3000 英尺: 280°, 20 英里/小时

The average would be 270° at 15 mph.

则平均风为：风向 270°，风速 15 英里/小时

To determine the distance of your drift from 3,000 feet to the pattern-entry point, find the average wind speed in the first column, multiply the distance per minute column by two minutes under canopy.

要计算从 3000 英尺到着陆航线起始点的飘移距离，先在第一列的风速中找到平均风速值，将该平均风速对应的“每分钟飘移距离”乘以 2 分钟的降落伞飞行时间。

AVERAGE WIND IN MILES PER HOUR 平均风速 (英里/小时)	DISTANCE PER MINUTE (in miles) 每分钟飘移距离 (英里)	Example: drift from 3,000 feet to 900-foot pattern entry. (approximately 2 minutes). 示例: 从 3000 英尺到 900 英尺航线起始点的飘移量 (约 2 分钟)
60	1	2 miles
30	1/2	1 mile
20	1/3	2/3 mile
15	1/4	1/2 mile
10	1/6	1/3 mile
5	1/12	1/6 mile

According to the above chart, from 3,000 feet to the pattern entry point, this 15-mph average translates to a $\frac{1}{2}$ mile of drift. The direction 270° is wind from the west. Thus, the ideal **opening point** would be $\frac{1}{2}$ mile to the west of the entry point of your landing pattern. Use an aerial map to determine a landmark at this calculated opening point. You can use your runway as a ruler to estimate the distance from your opening point to your pattern-entry point by converting your runway's length to miles.

根据上表，在 3000 英尺至着陆航线起始点间，15 英里/小时的平均风速将产生 $\frac{1}{2}$ 英里的飘移量。 270° 的平均风向表示风从西边吹来。因此，理想**开伞点**应位于着陆航线起始点的西侧 $\frac{1}{2}$ 英里处。建议使用航拍图查看计算的位置对应的地标参照物。你可将跑道长度（换算为英里）作为标尺来估算开伞点至着陆航线起始点的距离。

Determining Exit Point

确定出舱点

After calculating the ideal opening point, which is the ideal spot to open your canopy, calculate the **exit point**, which is the ideal spot to leave the plane. This requires adding the drift experienced in freefall to the drift experienced under canopy.

在计算出理想开伞点（即最佳开伞位置）后，需进一步计算理想**出舱点**（即最佳离机位置）。该计算需叠加自由落体阶段的漂移量和与降落伞飞行阶段的漂移量。

Start by computing your time in freefall, where the first 1,000 feet takes approximately 10 seconds and each 1,000 feet after that takes approximately 5 seconds.

首先计算自由落体时长：出舱后第 1000 英尺（约 305 米）下落时间约 10 秒，此后每 1000 英尺下落时间约 5 秒。

The example below uses 1 minute of freefall.

下例假设自由落体时长为 1 分钟以进行计算。

AVERAGE WIND IN MILES PER HOUR 平均风速 (英里/小时)	DISTANCE PER MINUTE (in miles) 每分钟漂移距离 (英里)
60	1
30	1/2
20	1/3
15	1/4
10	1/6
5	1/12

Now, determine the average winds aloft during freefall. If the reported winds aloft were:

现在，确认自由落体阶段的平均风。如果高空风报告是以下这样的：

- **3,000 ft:** 280° at 20 mph
3000 英尺: 280°, 20 英里/小时
- **6,000 ft:** 290° at 27 mph
6000 英尺: 290°, 27 英里/小时
- **9,000 ft:** 270° at 31 mph
9000 英尺: 270°, 31 英里/小时
- **12,000 ft:** 240° at 42 mph
12000 英尺: 240°, 42 英里/小时

EXIT SEPARATION: is the practice of spacing out exits of groups of skydivers, based on the strength of the upper winds, to maintain a safe distance between them in air.

出舱间隔: 指根据高空风的强度安排的跳伞团体间的出舱间隔，以确保他们在空中保持安全距离。

The average would be 270° at 30 mph.

则平均风为：风向 270°，风速 30 英里/小时

According to the above chart, from 12,000 feet to 3,000 feet, this 30-mph average translates to a freefall drift of 1/2 mile in one minute of freefall. The direction 270° is wind from the west. Add this freefall drift distance on top of the opening point of 1/2 mile west, so the ideal **exit point** would be one mile to the west.

根据上表，从 12000 英尺到 3000 英尺，30 英里/小时的平均风速将在 1 分钟的自由落体中产生 1/2 英里的漂移量。270° 的平均风向表示风从西边吹来。在位于着陆航线起始点西侧 1/2 英里的开伞点的基础上，还需叠加上这段自由落体漂移距离。因此理想**出舱点**应位于着陆航线起始点西侧 1 英里处。

Participating in Jump Run

在跳伞航线上参与看点定位

Establish what communication with the pilot you might use for spotting corrections or the go-ahead to open the door and jump.

要与飞行员确认以什么样的沟通方式来进行点位修正或传达打开舱门及跳伞的许可。

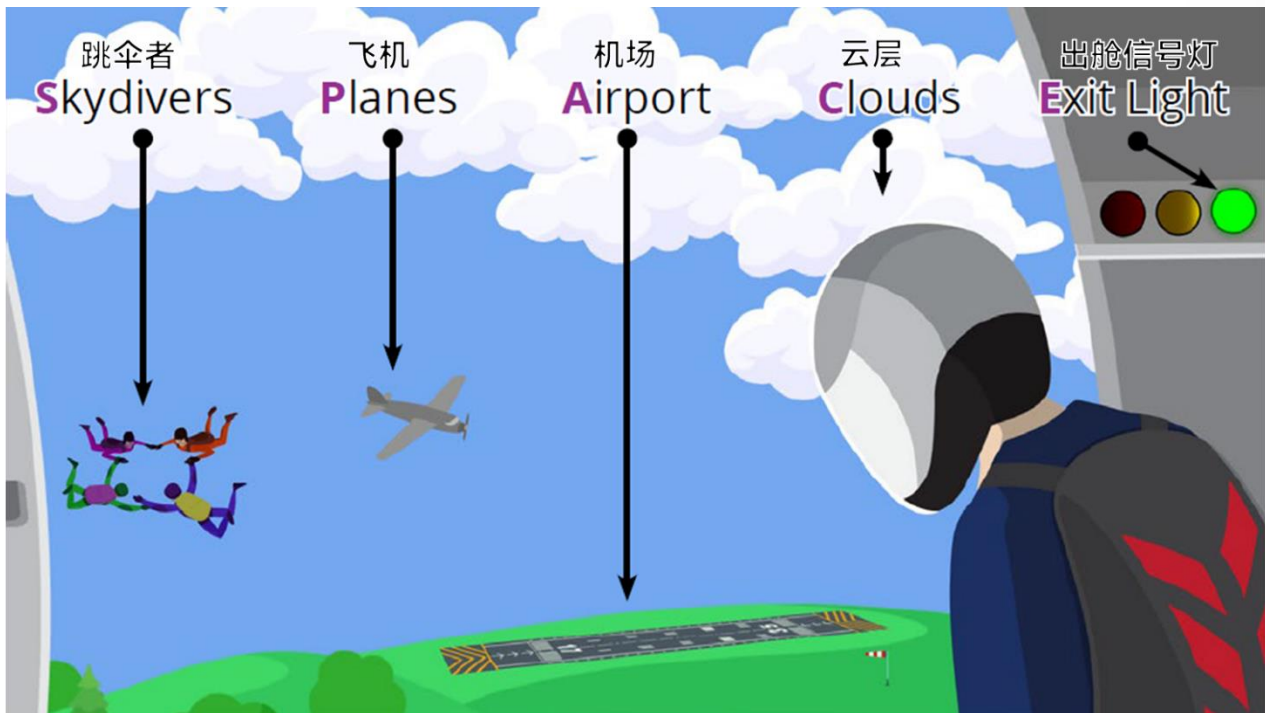
Commonly, jumpers use verbal or physical communication like hand signals, shoulder taps, or yelling "door!" for smaller aircraft, and electronic (e.g., spotting buttons) and lights for larger aircraft. Regardless, the pilot determines when the door may be opened and may prefer to operate the door.

通常情况下，跳伞者在小型飞机上采用口头沟通或肢体动作，如手势信号、拍肩或大喊“门！”，在大型飞机上则使用电子设备（如点位提醒按钮）和信号灯。但无论采用何种方式，舱门打开的时机由飞行员决定，且飞行员可能倾向于操作舱门。

Clearing your SPACE

确认空域净空的“SPACE”检查

Using the acronym **SPACE** can help you quickly remember what to look for while clearing your airspace before exiting. 运用 **SPACE** 缩略词可帮助你快速记忆出舱前确认空域净空时的检查要点：



Skydivers

跳伞者

Exit separation between groups of **skydivers** is a critical part of clearing the space on exit and can change according to winds at altitude, size of the groups, and the skydiving disciplines they are engaging in. Generally, the stronger the winds aloft, the more time between groups is needed for proper exit separation. Chapter 4-7 explains how to determine the time between exiting groups.

各跳伞者团体间的**出舱间隔**是确保空域净空的关键要素，具体间隔需根据高空风速、团体规模及跳伞类型调整。通常高空风越强，各团体间所需的出舱间隔时间越长。第四章第七节详细说明了如何计算各团体间的出舱时间间隔。

Planes

飞机

According to FAR 105.5, the jumper and the pilot are jointly responsible for making sure the space is clear of other **planes** before jumping.

根据联邦航空条例 105.5，跳伞者与飞行员共同负责在跳前确认空域内无其他**飞机**。

Airport

机场

Make sure you see the **airport** in the space below you and orient it to the direction of jump run. Ensure it is in the expected location based on your previously determined exit point.

确认你的下方可见**机场**，并辨清其与跳伞航线航向的方位关系。基于预先确定的出舱点，检查机场是否处在你预期的位置上。

Clouds

云层

The FAA prohibits skydiving through or near clouds. Make sure the distance between clouds is sufficient according to what you learned in Category D.

联邦航空局严禁跳伞穿越云层或在云层附近跳伞。按照你在 D 单元所学的知识，确保与云层保持足够间距。

Exit Light

出舱信号灯

In larger aircraft, wait for the green light to exit. In smaller aircraft, confirm with your pilot. At any time during jump run, the pilot may have to remove their OK for the jump due to traffic, instructions from air traffic control, or other reasons. 在较大型的飞机上，需等待绿灯信号出舱，在较小型的飞机上则需与飞行员确认。在跳伞航线任何阶段，飞行员都可能因空中交通、空管指令或其他原因取消跳伞许可。

E 单元跳伞流程 Category E Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

#1 BARREL ROLL/RECOVERY

横滚/恢复稳定

- 看点（在协助下） SPOT (with assistance)
- **独立无连接出舱 SOLO UNGRIPPED EXIT** ✓
- 方向，高度，弓形，腿形，放松 HAALR
- **横滚 BARREL ROLL** ✓
- （5 秒内恢复稳定）方向，高度，弓形，腿形，放松 (recover w/in 5 sec) HAALR
- （重复练习直至 6000 英尺） (repeat until 6,000' no more)
- **4500 英尺挥手示意并开伞 4,500' WAVE OFF and PULL**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **“甜点”练习 SWEET-SPOT DRILL** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF**（如需） **FLARE and PLF** if needed

#2 FRONT & BACK LOOPS

前空翻和后空翻

- 看点（在协助下） SPOT (with assistance)
- **选择出舱方式 CHOICE OF EXIT**
- 方向，高度，弓形，腿形，放松 HAALR
- **前空翻 FRONT LOOP** ✓
- （5 秒内恢复稳定）方向，高度，弓形，腿形，放松 (recover w/in 5 sec) HAALR
- **后空翻 BACK LOOP** ✓
- （5 秒内恢复稳定）方向，高度，弓形，腿形，放松 (recover w/in 5 sec) HAALR
- （重复练习直至 6000 英尺） (repeat until 6,000' no more)
- **4500 英尺挥手示意并开伞 4,500' WAVE OFF and PULL**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **失速点练习 STALL-POINT DRILL** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF**（如需） **FLARE and PLF** if needed

CANOPY DRILL #1: Sweet-Spot Practice**伞控练习 1: “甜点”练习**

- Altitude-Position-Traffic
检查高度、位置、交通
- Full flight, flare to chest strap (or until steering-line locking loops are even with rings on riser) and hold
从全速飞行状态开始，两侧刹车拉平至胸带位置（或拉平至刹车线上的猫眼与组提带上的刹车线引导环对齐）并保持
- Is the nose of the canopy directly above? (meaning canopy is in level flight)
此时降落伞的前缘是否位于头顶正上方？（这意味着降落伞在平飞）
- If not:
如果不是：
 - full flight for 10 seconds
全速飞行 10 秒
 - flare to slightly lower than chest strap
拉平至稍微低于胸带的位置
 - hold and assess for level flight
保持并评估降落伞是否在平飞
- If so:
如果是：
 - note the position of your hands in relation to your body so you can find this **sweet spot** again
记住此时你的手相对于身体的位置，这样便于你以后再次利用“甜点”
 - Full flight for 10 seconds
全速飞行 10 秒
 - Practice full flare, pausing at sweet spot, then finish
练习完整的拉平：拉平至“甜点”然后暂停，接着再拉平到底
- Repeat if altitude and position permit
如果高度和位置允许的话，重复练习
- Stop all practice by 2,000 feet
2000 英尺以上停止所有练习
- Fly pattern and land within 165 feet (50 meters) of target
飞着陆航线，并在预定着陆目标 165 英尺（50 米）范围内着陆
- Measure your distance from the planned landing point
测量你与预定着陆目标的距离

CANOPY DRILL #2: Toggle-Stall-Point Practice**伞控练习 2: 刹车失速点练习**

- Check altitude, position, and traffic
检查高度、位置、交通
- From full flight, slowly pull the toggles down to full arm extension
从全速飞行状态开始，缓慢下拉刹车至手臂完全伸展
- Hold the toggles down for 5-6 seconds until you feel the onset of the stall, a feeling like rocking back in a chair and falling backward, which signals that you have found the stall point
保持刹车下拉 5 至 6 秒，直至感受到失速征兆——类似摇椅后仰时的后坠感，这表明你已找到失速临界点
- As the stall develops further and the canopy begins to look like a bowtie, the air will leave the canopy, and you will begin descending at a high rate.
随着失速状态的继续发展，伞布会开始呈现领结状，内部空气排出，此时你将进入高速下坠状态
- Recover from a fully developed toggle stall by slowly and symmetrically raising the toggles up a few inches until the

canopy inflates and returns to slow flight

要从完全的刹车失速状态恢复，你需缓慢且对称地抬起刹车约数英寸，直至伞布重新充气，恢复缓速飞行

- Continue to raise the toggles up 6 inches at a time to return to full flight
随后以每次 6 英寸（15 厘米）的幅度继续把刹车向上松，以最终恢复全速飞行状态
- Repeat if altitude and position permit
如果高度和位置允许的话，重复练习
- Stop all maneuvers above your decision altitude of 2,500 feet
在 2500 英尺决断高度以上停止所有机动
- Fly the planned pattern and land within 165 feet (50 meters) of target
飞着陆航线，并在预定着陆目标 165 英尺（50 米）范围内着陆
- Measure your distance from the planned landing point and log it
测量你与预定着陆目标的距离并作记录
- **Note:** Some student canopies are configured to prevent a toggle stall, so even with your toggles down at full arm extension for more than 5-6 seconds, a full toggle stall may not develop.

注意：部分学生伞被设置成可防止刹车失速，因此即使将刹车拉至手臂完全伸展的位置并保持 5-6 秒以上，也可能不会进入完全刹车失速的状态。

TAKE THE QUIZ:

参加单元小测



uspa.org/quiz/e

单元小测（中英对照）

微信扫一扫



TRANSLATION OF THE QUIZ

F 单元 (Tracking)

Category F (Flat Track)

2 次 Tracking 跳伞, 以及
2 次净空开伞 (如未完成)

开伞程序启动高度
4500 英尺

In Category F, you must perform a Flat track, among other skills, in preparation for jumping with others.

在 F 单元, 你必须执行“平 Track”等技能, 为与他人一起跳伞做准备。

(译者注: 平 Track, 即 Flat Track, 是一种前进速度较快, 下降速度较慢, Tracking 轨迹相对于地面的角度较平坦的 Tracking)

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Provide the ground winds and winds aloft for the day
提供当天的地面风和高空风情况
- ☐ Plan the spot accounting for exit separation, wind drift, and opening point
规划好点位, 将出舱间隔、风导致的漂移量以及开伞点考虑在内
- ☐ Plan your flight to the holding area and the landing pattern
规划飞往等待区的路线和着陆航线
- ☐ Train on braked turns for canopy-flight Eps
培训降落伞飞行紧急程序——带刹车转弯
- ☐ Train on half-braked flares for canopy-flight Eps
培训降落伞飞行紧急程序——从半刹车位置开始拉平
- ☐ Train on braked pattern for canopy-flight Eps
培训降落伞飞行紧急程序——带刹车飞着陆航线

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100% 的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Review EPs for landing in power lines
复习高压线着陆的紧急程序
- ☐ Review SHAGG for checking accessories
复习用于检查各种附件的 SHAGG 检查
- ☐ Pack with assistance
在协助下叠伞
- ☐ Check another jumper's gear before boarding
登机前检查另一位跳伞者的装备
- ☐ Discuss aircraft weight and balance
讨论飞机的重量和平衡

Canopy Debrief

跳后伞降汇报

- ☐ Spot providing for appropriate exit separation with minimal assistance
在尽量少协助的情况下看点定位，有合适的出舱间隔
- ☐ Perform a 90-degree braked turn (1st)
90 度带刹车转弯（第一次）
- ☐ Perform a 90-degree braked turn (2nd)
90 度带刹车转弯（第二次）
- ☐ Perform a 90-degree braked turn (3rd)
90 度带刹车转弯（第三次）
- ☐ Perform a 90-degree braked turn (4th)
90 度带刹车转弯（第四次）
- ☐ Above 2,000 feet, perform a half-braked flare (1st)
在 2000 英尺以上执行从半刹车位置开始的拉平（第一次）
- ☐ Above 2,000 feet, perform a half-braked flare (2nd)
在 2000 英尺以上执行从半刹车位置开始的拉平（第二次）
- ☐ Fly your landing pattern in half brakes on downwind and base legs, returning to full flight on final
在带半刹车的情况下飞着陆航线的下风边（第一边）和基线边（第二边），在最后进近（第三边）恢复全速飞行
- ☐ Land within 82 feet (25 meters) of your planned target without assistance
在无协助的情况下，在预定着陆目标 82 英尺（25 米）范围内着陆

Freefall Debrief

跳后自由落体汇报

- ☐ Flat track for 5 seconds with a 30-degree heading tolerance (1st)
执行 5 秒平 Track，方向偏移在 30 度以内（第一次）
- ☐ Flat track for 5 seconds with a 30-degree heading tolerance (2nd)
执行 5 秒平 Track，方向偏移在 30 度以内（第二次）
- ☐ Flat track for 5 seconds with a 30-degree heading tolerance (3rd)
执行 5 秒平 Track，方向偏移在 30 度以内（第三次）
- ☐ Perform a stable clear-and-pull exit from 5,500 feet
在 5500 英尺执行稳定的出舱和净空开伞
- ☐ Perform a stable clear-and-pull exit from 3,500 feet
在 3500 英尺执行稳定的出舱和净空开伞

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

The Flat Track

平 Track

Before beginning to jump with others, you need to learn to generate horizontal speed with minimal altitude loss, a skill called "tracking." This skill allows you to create separation from others before opening your parachute. You will perform a flat track, maintaining heading within 30 degrees. Focus on **heading** first, then **pitch**; **speed** will come with practice. 在学习与他人一起跳伞之前，你需要学习一种在尽量少高度损失的情况下提升水平速度的技能——“Tracking 机动”。这项技能能让你在开伞前与其他跳伞者保持安全间距。你将练习平 Track，且需要保持方向偏移在 30 度以内。Tracking 首先要注重方向控制，再学习调整俯仰角，速度则会随着练习逐步提升。

First, locate a point on the horizon to establish your **heading**. Smoothly and fully extend both legs with your toes pointed

to initiate forward motion, and steer to maintain heading. Roll your shoulders and flatten your arch to control your **pitch**. Fully extend your arms to the side, pressing them down level with your hips. Once you can control your heading and pitch, you can **speed** up your track by extending your legs more quickly and sweeping your arms back slightly.

首先, 选择一个地平线上的参考点以确定飞行方向。平稳地完全伸直双腿, 脚尖绷直, 以开始向前移动, 并通过微调保持方向。双肩前倾并让弓形变得扁平些来控制俯仰角。双臂向两侧完全伸展, 压至与臀部齐平。当你能稳定控制方向与俯仰后, 可通过加快伸腿速度及稍微后置双臂来提升 Tracking 速度。

Stop your track by passing through neutral, extending your arms forward and down slightly. Return to neutral. 要停止 Tracking, 需恢复中性姿势, 在此基础上双臂稍向前下方伸展, 最后回到中性姿势。

Practice entering and refining an on-heading 5-second track, turning 180 degrees after each attempt and repeating as altitude permits. Exit from a position facing up the line of flight, such as a **float exit**. Turn 90 degrees to start tracking perpendicularly to the **line of flight**. This allows you to avoid those who exited before or after you, up and down the line of flight. Always plan tracking dives with other groups in mind.

练习进行方向稳定的 5 秒 Tracking 并进行优化, 在高度允许的情况下, 每次 Tracking 后旋转 180 度, 重复练习。采用面向飞机的飞行路线的姿势出舱 (例如**外挂出舱**), 随后转 90 度开始垂直于飞机的飞行路线进行 Tracking。这样能有效避开飞行路线上先于或晚于你出舱的其他跳伞者。规划 Tracking 时务必始终将其他团体考虑在内。

LINE OF FLIGHT: is the path that the aircraft follows over the ground while on jump run dropping skydivers.

飞行路线: 指飞机在跳伞航线上投放跳伞者时所遵循的移动路径。

FLOATER EXIT: is an exit where you set up outside the aircraft to achieve a stable entry into the relative wind, facing the line of flight. Three common positions in the door are front, center and rear float exit on a side-door aircraft.

外挂出舱: 是一种出舱方式, 跳伞者在飞机外侧准备就位, 以迎风姿势稳定地跳入相对气流, 方向面朝飞机飞行路线。常见的三种外挂出舱位置是舱门前部外挂出舱、舱门中部外挂出舱和舱门后部外挂出舱。

POISED EXIT: is an exit where you set up using the aircraft door frame or strut for stability to achieve a stable entry into the relative wind with your hips presented into the relative wind.

扒机身出舱: 指跳伞者借用飞机舱门门框或支杆来稳定身体, 以准备就位进行出舱, 并以胯部迎向相对气流的姿态跳出。

CLEAR-AND-PULL: is interchangeable with “hop-and-pop.” It refers to exiting and clearing the aircraft, then deploying immediately.

净空开伞: 与“即跳即开”同义。指跳出并远离飞机后立即开伞。

Clear-and-Pull

净空开伞

IAD and static-line students: You have already met the clear-and-pull requirement in Category C.

IAD 和 Static Line 学生: 你已在 C 单元完成净空开伞要求。

AFF students: You will perform a clear-and-pull jump from 5,500 feet and, once successful, another from 3,500 feet. A clear-and-pull is used during emergency exits and pre-planned low-altitude jumps. You may want to practice the clear-and-pull on full-altitude jumps by doing a practice throw right after exit, then continuing your planned freefall.

AFF 学生: 你需执行一次 5500 英尺净空开伞, 成功后再在 3500 英尺执行一次。净空开伞适用于紧急出舱及计划好的低高度跳伞。建议先在全高度的跳伞中练习净空开伞动作, 即出舱后立即模拟抛出引导伞, 随后继续按计划进行自由落体。

On the clear-and-pull, use a familiar, stable exit technique. To deploy within 5 seconds of exit, present your hips to the relative wind and execute normal pull procedures without the wave-off. Expect the parachute to open in relation to the relative wind, not overhead as usual.

执行净空开伞时, 使用熟悉的稳定的出舱技术。为了在出舱后 5 秒内开伞, 需让胯部迎向相对气流, 并执行标准开伞程序 (无需挥手示意)。注意此时降落伞会在相对气流的方向展开, 而非像往常一样在头顶正上方打开。

Although they are included in Category F, you may complete these two clear-and-pull jumps anytime during your A-license progression and can continue to Category G without them at the discretion of your drop zone and instructor.

尽管这两次净空开伞属于 F 单元内容，但你可于 A 执照培训过程中的任意阶段完成。你可于暂未完成该要求的情况下开始 G 单元的培训，前提是经跳伞基地和教练评估后同意。

B. Canopy

伞控

CEP—Braked Turns

降落伞飞行紧急程序——带刹车转弯

Braked turns are one of the most important **canopy-flight emergency procedures** (CEPs) you can practice. Using braked turns, also called "flat turns," you can change direction under canopy while losing as little altitude as possible. A braked turn also slows your forward speed while maintaining a stable, level wing. If you find yourself landing in a tight or unfamiliar landing area and you must turn to avoid an obstacle at a low altitude, you can use a braked turn. In this emergency situation, executing a braked turn instead of a turn from full flight allows you to change heading and still honor the first landing priority: landing with a level wing.

带刹车转弯是你练习的最重要的**降落伞飞行紧急程序（CEP）**之一。这种转弯方式也称为“平转”，能在尽量少高度损失的情况下调整飞行方向。带刹车转弯还能在保持伞翼稳定水平的同时降低前进速度。若你遇到需在狭小或陌生的着陆区域转向避障的情况，可使用该技能。在这样的紧急情况下，执行带刹车转弯而非全速飞行状态转向，既能改变方向，又符合着陆第一优先事项：着陆时保持伞翼水平。

Start by pulling both toggles down evenly to the half-braked position and hold for a few seconds. Push one toggle down slightly to initiate a 90-degree turn. Practice changing heading as quickly as possible while keeping the wing level. You will practice 90-degree braked turns in this category, but you may need only a 45-degree turn or less, followed by a braked flare, to avoid an obstacle on landing.

练习时，先将两侧刹车对称下拉至半刹车位置，保持数秒。随后再轻微下拉一侧刹车以完成 90 度转向。重点练习在维持伞翼水平的前提下快速改变方向。在本单元你将练习 90 度的带刹车转弯，但实际着陆避障时，可能仅需 45 度或更小角度的转向，接着在带刹车状态下开始拉平着陆。

CEP—Half-Braked Flares

降落伞飞行紧急程序——从半刹车位置开始拉平

Practicing braked flares can help you discover the effectiveness of the flare when finishing from a braked position. This CEP is useful in several situations, including when you initially flare too high and need to hold in brakes for a few seconds before finishing; after you use a braked turn to avoid an obstacle on landing; or when you turn too close to the ground. 通过练习从带刹车状态开始拉平，你将体会到这种拉平的效能。该技能适用于多种场景：在过高的高度启动拉平，在继续拉平到底之前需保持刹车位置数秒时；在带刹车转弯避障后；或低转时。

First, for reference, start by performing a flare from full flight using your normal landing technique. Note the pitch change of your parachute and your swing forward under the parachute at the bottom of your flare stroke. Start a half-braked flare by pulling the toggles to a half-braked position and hold for a few seconds. Then, from that position, flare more quickly and forcefully than you would for your normal flare stroke. Compare the flares you just practiced, especially the parachute's pitch change and your swing forward. Practice another braked flare, adjusting the speed and force to most closely match the effect of your flare from full flight. Braked flares generally need to be faster and more forceful than a flare from full flight to get an equivalent response.

首先以常规着陆技巧在全速飞行状态下进行拉平，以作为参照，注意伞布的俯仰变化及在拉平末端你相对伞布的前荡幅度。接着练习从半刹车位置开始拉平：先将刹车拉至半刹车位置并保持几秒，然后从半刹车位置开始，以比平常更迅疾的力度完成拉平。对比两种拉平的效果，重点关注伞布俯仰变化与身体前荡幅度的差异。继续练习从刹车状态开始拉平，通过调整拉

平的力度和速度，使从刹车状态开始的拉平的效果能近似全速飞行状态开始的拉平——而这通常需要更快的拉平动作速度和更大的力度。

Braked Landing Pattern

带刹车飞着陆航线

Knowing how your canopy flies in different modes of flight can be useful for adjusting your descent, which allows you to keep a safe vertical distance from other canopies, as well as flatten your glide to conserve altitude on the downwind leg of your pattern.

掌握不同飞行模式下伞的性能有助于你调整伞的下降轨迹，既保持与其他降落伞在垂直方向上的安全间距，又在下风边（第一边）通过更平缓的下滑轨迹来节省高度。

Fly the downwind and base legs of your landing pattern in at least half brakes to determine the effect on your glide path. Expect a different a glide path than what you normally experience, and plan for a longer final approach to avoid overshooting the target. Once you turn onto your final approach, go into full flight and land as usual.

在着陆航线的下风边（第一边）和基线边（第二边）以至少半刹车的状态飞行，观察这对下滑轨迹的影响。此时的下滑轨迹会异于往常，你需要为最后进近（第三边）规划更长的长度，以避免飞越着陆目标。转入最后进近阶段（第三边）后，切换至全速飞行，像往常一样着陆。

Accuracy

着陆精准度

You must accumulate two unassisted landings within 82 feet (25 meters) of the planned target.

你必须在无协助的情况下，在预定着陆目标 82 英尺（25 米）范围内累计着陆 2 次。

C. Emergency Procedure Review

紧急程序复习

Explain to your coach or instructor the procedure for an emergency power-line landing. Power lines are difficult to see under canopy, but you can expect them along roads, between buildings, and in clearcut passages for utilities in the forest.

向你的助理教练或教练说明高压线的紧急着陆程序。高压线在降落伞飞行期间难以看清，但通常预期分布在道路沿线、建筑物之间以及森林中为公共设施开辟的通道上。

D. Equipment

装备

Packing Your Main

叠主伞

You will pack at least one parachute with assistance. Remember the most important points of packing: the lines are straight and in place in the center of the completed pack job, the slider is quartered and at the slider stops at the top of the lines, and the line stows are tight to prevent premature line deployment.

你将在指导下完成至少一次叠伞。请牢记叠伞的要点：伞绳必须拉直并位于叠好的伞的中间的正确位置；滑块布需四等分折好并置于伞绳顶端的滑块布限位器处；皮筋必须绑紧伞绳，以防止伞绳意外提前释放。

Pre-Jump Equipment Check

跳前装备检查

You will perform a pre-jump equipment check on another jumper who is in full gear, applying the principles you learned in Category D.

你将按照 D 单元所学的规则，对一名完整穿好装备的跳伞者执行跳前装备检查。

"Check of threes" in the front

对伞包正面进行“三个三检查”

1. three-ring assembly and reserve static line (three rings)
三环系统和 RSL (三环)
2. three points of harness attachment for snap assembly and correct routing, adjustment, and stowing of excess (three straps)
背带三点的卡扣是否到位, 背带走线是否正确, 松紧程度是否合适, 以及织带富余长度的收束 (三带)
3. three operation handles—main activation, cutaway, reserve (three handles)
三个操作把手——主伞开伞把手、切伞把手、备伞把手 (三把手)

Pin check back of system, top to bottom:

自上而下检查伞包背面的关包针等部件:

1. AAD on
AAD 处于开启状态
2. reserve pin in place
备伞关包针到位
3. main pin in place
主伞关包针到位
4. ripcord cable movement or correct bridle routing
拉索能否顺畅移动, 或引导伞系带的走线是否正确
5. reserve handle in place
备伞把手就位

Also check personal equipment ("SHAGG")

并进行个人装备检查 (SHAGG 检查)

Shoes—tied, no hooks

鞋子——鞋带系紧且无钩状部件

Helmet—fit and adjustment and buckled

头盔——大小合适, 调节到位并扣紧

Altimeter—set for zero

高度表——调好零点

Goggles—tight and clean

护目镜——戴得稳且干净清晰

Gloves—lightweight and proper size (below 40 degrees F)

手套——轻量且尺码合适 (华氏 40 度或摄氏 4 度以下使用)

E. Standard Operating Procedures

标准作业程序

Having supplementary **oxygen** available on the aircraft is mandatory for skydives made from higher than 15,000 feet MSL (Chapter 2-1.N)

在海拔 15000 英尺以上高空进行跳伞时, 飞机上必须提供补充**氧气**。(2-1.N)

Aircraft Weight and Balance

飞机的重量与平衡

An aircraft needs to maintain proper **weight and balance** for the pilot to be able to control its flight. Each aircraft has a specified maximum weight it can carry, and that weight must be distributed properly for it to be in balance. Jumpers moving around the aircraft improperly can place the load out of balance. For example, in aircraft with a door in the rear,

some jumpers must remain forward as groups congregate near the door. Large groups planning to exit together should inform the pilot. Your instructor or pilot will answer any specific questions you may have about the aircraft your drop zone flies.

飞机必须保持适当的**重量与平衡**，飞行员才能有效操控飞机飞行。每架飞机都有规定的最大载重限制，且重量必须合理分布以维持飞机的平衡。跳伞者在机舱内的不当移动可能导致载荷失衡。例如，在舱门位于飞机后部的飞机上，当跳伞团体聚集在舱门附近时，部分跳伞者需留在机舱前部。计划集体一起出舱的大型团体应提前告知飞行员。关于跳伞基地所用飞机的具体问题，可由教练或飞行员解答。

Winds on Jump Run

跳伞航线上的风的影响

Winds at altitude can affect jump run. **Airspeed** is the speed the aircraft is flying. Flying into or with the wind can change its **ground speed**, that is, the speed it is traveling across the ground. Subtract the speed of the headwind on jump run from the airspeed of the aircraft to determine the ground speed.

高空风会影响跳伞航线。**空速**指飞机相对空气的飞行速度，逆风或顺风飞行会改变飞机的**地速**（即飞机相对地面的移动速度）。计算飞机在跳伞航线上逆风飞行的地速时，需将飞机空速减去风速。

There is also a consideration called **forward throw**. Jumpers first get thrown forward on exit approximately 0.2 miles in calm winds, less with headwind, from residual aircraft speed before they fall straight down.

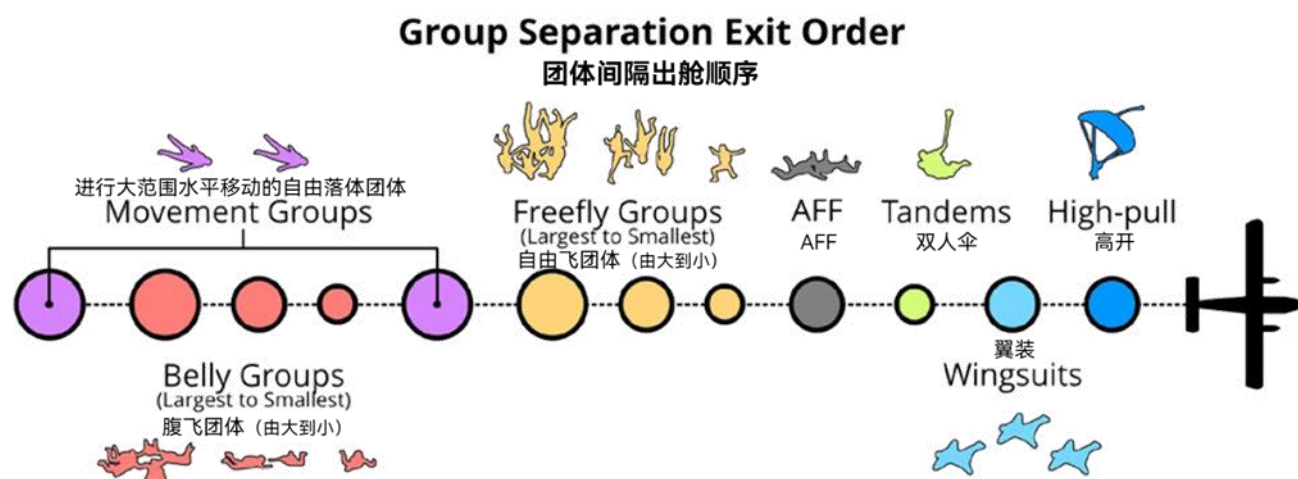
此外还需考虑**前抛量**：在无风条件下，跳伞者出舱时会被飞机向前抛出约 0.2 英里（逆风条件下前抛距离缩短），之后才转换至垂直下落状态。

Exit Separation

出舱间隔

Slower-falling jumpers and groups are exposed to upper headwinds longer and are blown farther downwind than faster-falling jumpers and groups. Slower-falling groups should exit before faster-falling groups if jump run is flying into the wind.

下落速度较慢的跳伞者及团体受高空风影响的时间更长，其随风漂移的距离会大于下落速度快的跳伞者及团体。若飞机是在跳伞航线上逆风飞行，下落速度较慢的团体应早于下落速度较快的团体出舱。



As upper winds get stronger and group sizes get larger, more time between groups is necessary for them to get sufficient horizontal separation over the ground. Provide at least 1,000 feet of ground separation between individuals jumping solo. Provide at least 1,500 feet of ground separation between small groups, adding more as the size of the groups increase.

当高空风增强或团体规模较大时，必须延长各团体间的出舱间隔时间以确保各团体之间在水平方向上的地面间距充足。单人

跳伞者间需要至少 1000 英尺的地面间距，小型团体间需要至少 1500 英尺的地面间距，随着团体规模扩大，间距也要增加。

Many drop zones post in the aircraft a chart of calculated separation times based on the aircraft's ground speed.
多数跳伞基地会在机舱内张贴根据飞机地速计算的出舱间隔时间表。

Aircraft Ground Speed (knots) 飞机地速 (节)	Time in seconds for 1,000' separation between individuals 单人 1000 英尺间距所需出舱间隔时间 (秒)	Time in seconds for 1,500' separation between groups 团体 1500 英尺间距所需出舱间隔时间 (秒)
115	5	8
110	6	8
105	6	8
100	6	9
95	7	9
90	7	10
85	7	11
80	8	11
75	8	12
70	9	13
65	10	14
60	10	15
55	11	16
50	12	18

Once your parachute has opened, fly perpendicularly to the line of flight to promote more separation under canopy from the groups that exited before and after you.
开伞后，请垂直于飞机的飞行路线飞行，这样可有效增加你与在你之前或之后出舱的团体间的降落伞间距。

F 单元跳伞流程 Category F Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

FLAT TRACKING (2 jumps, first focusing on heading and pitch, second focusing on speed if ready)

平 Track (2 跳, 先注重方向和俯仰的控制, 其次是速度, 如果准备好的话)

- 看点 (在尽量少协助的情况下) SPOT (with minimal assistance)
- **选择出舱方式 CHOICE OF EXIT**
- **进行 Tracking** (5 秒) **TRACK** (for 5 seconds) ✓
- 180 度转弯 TURN 180
- 方向, 高度, 弓形, 腿形, 放松 HAALR
- (重复练习直至 6000 英尺) (repeat until 6,000' no more)
- **4500 英尺挥手示意并开伞 4,500' WAVE OFF AND PULL**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **带刹车转弯 BRAKED TURNS** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF** (如需) **FLARE and PLF** if needed

TAKE THE QUIZ:
参加单元小测



uspa.org/quiz/f

CLEAR and PULL (2 jumps, first from 5,500', second from 3,500' if not already done)

净空开伞 (2 跳, 第一跳从 5500 英尺出舱, 第二跳从 3500 英尺出舱, 如果之前没做过的话)

- 看点 (在尽量少协助的情况下) SPOT (with minimal assistance)
- **外挂出舱或扒机身出舱 FLOATER OR POISED EXIT**
- **开伞** (5 秒内) **PULL** (within 5 seconds) ✓
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **练习从半刹车位置开始的拉平 HALF-BRAKED FLARES** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF** (如需) **FLARE and PLF** if needed

单元小测 (中英对照)
微信扫一扫



TRANSLATION OF THE QUIZ

CANOPY DRILL #1: Braked Turns (CEP)

伞控练习 1: 带刹车转弯 (降落伞飞行紧急程序)

- ☐ Check altitude, position, and traffic
检查高度、位置、交通
- ☐ Pull toggles smoothly and evenly to half-braked position
平稳均匀地将两侧刹车拉至半刹位置
- ☐ Perform a 90-degree-braked turn by pushing down one toggle slightly
轻微下拉一侧刹车以进行 90 度带刹车转弯
- ☐ Stop the turn by bringing the toggle back to the half-braked position
将该侧刹车复位至半刹车位置以停止转弯
- ☐ Check altitude, position, and traffic
检查高度、位置、交通
- ☐ Perform a 90-degree-braked turn in the other direction
朝着另一个方向进行 90 度带刹车转弯

- ☐ Return to full flight
恢复全速飞行
- ☐ Check altitude, position, and traffic
检查高度、位置、交通
- ☐ Repeat to no lower than 2,000 feet
重复练习直至 2000 英尺
- ☐ Fly the planned landing pattern and flare
按照规划好的着陆航线飞行，拉平着陆
- ☐ Measure your landing distance from the planned target
测量你与预定着陆目标的距离

CANOPY DRILL #2: Half-Braked Flares (CEP)

伞控练习 2：从半刹车位置开始拉平（降落伞飞行紧急程序）

- ☐ Check altitude, position, and traffic
检查高度、位置、交通
- ☐ For reference, start by doing a flare from full flight, using your normal landing technique.
作为参考，首先用常规着陆技术，从全速飞行状态开始拉平
- ☐ Note the pitch change of your parachute and your swing forward under the parachute when at the bottom of your flare stroke
注意观察拉平到底时降落伞的俯仰变化以及你在伞下的前荡幅度
- ☐ Return to full flight for 10 seconds
恢复全速飞行并保持 10 秒
- ☐ Start a half-braked flare by pulling the toggles to a half-braked position and hold for 3 seconds
将刹车拉至半刹车位置并保持 3 秒，以准备从半刹车位置开始拉平
- ☐ Flare from that position more quickly and forcefully than you would for your normal flare stroke.
从该刹车位置开始，以比常规拉平更快、更用力地完成拉平动作
- ☐ Compare the braked and normal flares you just practiced, especially the parachute's pitch change and your swing forward under it.
对比常规拉平的效果和从半刹车位置开始拉平的效果，重点关注降落伞的俯仰变化差异及你在伞下的前荡幅度差异
- ☐ Return to full flight for 10 seconds and check altitude, position, and traffic
恢复全速飞行 10 秒，检查高度、位置、交通
- ☐ Practice another half-braked flare, adjusting the speed and force to most closely match the effect of a flare from full flight.
再次从半刹车位置开始拉平，通过调整拉平的速度和力度，使拉平效果尽可能接近全速飞行状态下启动的拉平
- ☐ Repeat to no lower than 2,000 feet
重复练习直至 2000 英尺
- ☐ Fly the planned landing pattern and flare
按照规划好的着陆航线飞行，拉平着陆
- ☐ Measure your landing distance from the planned target
测量你与预定着陆目标的距离

G 单元（团体）

Category G (Groups)

3 跳	分离高度 5500 英尺	最低开伞高度 4000 英尺
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In Category **G**, you must perform skills relating to jumping with **Groups**, such as moving forward to dock, changing levels, performing the breakoff sequence, and canopy traffic considerations!

在 **G** 单元，你必须完成与**团体**跳伞相关的技能，例如前进连接、调整水平高度、执行分离程序以及降落伞交通注意事项！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Canopy Pre-Jump

跳前伞降准备

- ☐ Provide the ground winds and winds aloft for the day
提供当天的地面风和高空风情况
- ☐ Plan the spot, accounting for exit separation, wind drift, and opening point
规划好点位，将出舱间隔、风导致的漂移量以及开伞点考虑在内
- ☐ Plan your flight to the holding area and the landing pattern, choosing your target for landing
规划飞往等待区的路线和着陆航线，选择着陆目标
- ☐ Discuss maximum rate of turn under canopy
讨论降落伞的最大转弯速率
- ☐ Train on turn reversal, a canopy-flight EP, for collision avoidance
培训反向转弯——降落伞飞行紧急程序的一种，用于避免碰撞
- ☐ Train for adjusting your glide path
培训下滑轨迹的调整

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100%的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Review tree-landing Eps
复习树降紧急程序
- ☐ Discuss high-wear equipment items and gear maintenance that requires a rigger
讨论易磨损的装备部件以及须由降落伞装备师进行的装备维护
- ☐ Pack without assistance
在无协助的情况下叠伞

Canopy Debrief

跳后伞降汇报

- ☐ Spot with minimal assistance
在尽量少协助的情况下看点定位
- ☐ Adjust the glide path on your canopy

调整你的降落伞的下滑轨迹

- ☐ Perform the turn-reversal drill (1st) above 2,500 feet
在 2500 英尺以上执行反向转弯练习（第一次）
- ☐ Perform the turn-reversal drill (2nd) above 2,500 feet
在 2500 英尺以上执行反向转弯练习（第二次）
- ☐ Perform the turn-reversal drill (3rd) above 2,500 feet
在 2500 英尺以上执行反向转弯练习（第三次）
- ☐ Perform the turn-reversal drill (4th) above 2,500 feet
在 2500 英尺以上执行反向转弯练习（第四次）
- ☐ Land within 65 feet (20 meters) of your planned target without assistance (1st)
在无协助的情况下，在预定着陆目标 65 英尺（20 米）范围内着陆（第一次）
- ☐ Land within 65 feet (20 meters) of your planned target without assistance (2nd)
在无协助的情况下，在预定着陆目标 65 英尺（20 米）范围内着陆（第二次）

Freefall Debrief

跳后自由落体汇报

- ☐ Re-dock from 10 feet using start-coast-stop (1st)
使用“启动，滑行，停止”的技巧，从 10 英尺处开始再次进行连接（第一次）
- ☐ Re-dock from 10 feet using start-coast-stop (2nd)
使用“启动，滑行，停止”的技巧，从 10 英尺处开始再次进行连接（第二次）
- ☐ Match level—"up" from 6 feet using start-coast-stop
使用“启动，滑行，停止”的技巧，向下移动 6 英尺以匹配水平高度
- ☐ Match level—"down" from 6 feet using start-coast-stop
使用“启动，滑行，停止”的技巧，向上移动 6 英尺以匹配水平高度
- ☐ Re-dock with level adjustment using start-coast-stop (1st)
使用“启动，滑行，停止”的技巧，进行带水平高度调整的再次连接（第一次）
- ☐ Re-dock with level adjustment using start-coast-stop (2nd)
使用“启动，滑行，停止”的技巧，进行带水平高度调整的再次连接（第二次）
- ☐ Break off at your assigned altitude without being prompted
在无提示的情况下，在指定高度分离
- ☐ Track at least 50 feet within a 10-degree heading tolerance
Track 至少 50 英尺，方向偏移在 10 度以内

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

Group Exits

团体出舱

You will practice for an efficient group exit using the same key elements you have used for your solo exits: setup, launch, and flyaway.

你将运用与独立出舱相同的关键要素，即准备就位、跳出和飞离，来练习如何进行高效的团体出舱。

In the **setup**, each jumper in a group has an assigned exit position and should know that position before climb-out. This exit position should include specific foot and hand placement to support **presentation of hips into the relative wind** during the launch and flyaway. You can exit in a group with or without grips on other jumpers. If you are making a gripped exit, presentation to the relative wind in a neutral body position is the largest contributor to success.

在**准备就位**阶段，团体中的每位跳伞者都有指定的出舱位置，且应在爬出机舱前明确该位置。此位置应涵盖特定的脚部和手

部摆放方式，以确保在跳出和飞离阶段**臀部能迎向相对气流**。你可以选择与其他跳伞者通过连接或非连接的方式出舱。若采用连接出舱，保持中性身体姿势迎风是确保成功的最关键因素。

To coordinate the **launch**, one person in the group will give the count. The movements of the count should be pronounced and given with a smooth cadence so that all jumpers can follow it and leave at the right time. Launch using a neutral body position, presenting to the relative wind.

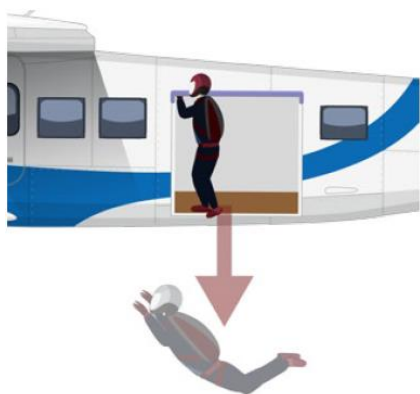
为了协调**跳出**的节奏，团体中需指定一人来做出舱信号。出舱信号的动作应清晰有力且节奏平稳，以确保所有跳伞者能同步跟随并在正确时机离开飞机。跳出时，使用中性身体姿势，迎向相对气流。

FUNNEL: happens when a formation collapses or fails. A group exit is susceptible to funneling.

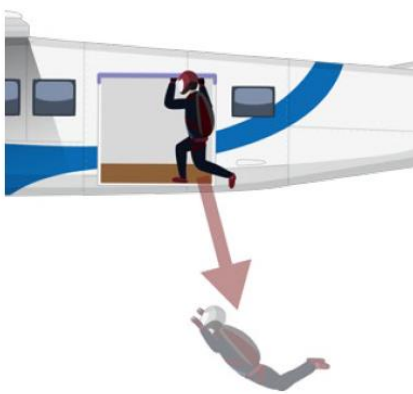
漏斗效应: 指团体编队塌掉或失败。在团体出舱时容易发生。

During the **flyaway**, maintain eye contact across the center of the group. Looking toward the center of the group will keep you close to the others and support a stable flyaway, preventing the exit from funneling.

飞离阶段，需持续看向团体的中心区域。视线看向团体中心有助于与团体保持紧凑，确保飞离过程稳定，避免发生漏斗效应。



Front Float Exit: Setup and Launch
舱门前部外挂出舱：准备就位和跳出



Rear Float Exit: Setup and Launch
舱门后部外挂出舱：准备就位和跳出



Diving Exit: Setup and Launch
俯冲出舱：准备就位和跳出

Forward Movement to Dock

前进连接

Just as you did for turns in Category D, you will use the concept of start-coast-stop when performing forward movement. 正如你在 D 单元练习转弯时那样，执行向前移动时需运用“启动-滑行-停止”原则。

Start forward movement by extending both legs. This will tilt you slightly head-low and initiate forward movement. Use your legs for forward movement, keeping your arms neutral. Maintain your heading by steering with your arms or legs.

启动阶段：伸双腿，这会使身体略微倾斜（头处于低位），由此产生向前的移动。用腿部动作来前进，手臂则保持中性姿势。通过手臂或腿部微调维持方向。

Coast by returning to neutral before your desired stopping point. Your momentum from the start movement will continue to carry you forward while you are in neutral, much like your car continues to move forward after removing your foot from the accelerator. During the coast phase, assess your speed and distance to your target to determine when you should begin your stop movement.

滑行阶段：在抵达想要停下来的地方之前，恢复中性姿势。启动阶段的动作产生的惯性将使你持续前移，如同松油门后汽车仍会滑行。在滑行阶段，需评估你的速度以及你与目标之间的距离，判断何时开始做停止动作。

Stop by briefly extending both arms and pushing down slightly, which produces backward movement. Keep your legs neutral during the stop. Fly on level all the way to the **grips**. If you stop prematurely, extend your legs slightly to take

the grip.

停止阶段：双臂短暂地伸展并轻微下压以产生向后的移动，腿部保持中性姿势。保持与对方在同一水平高度，直至**抓握**。若停早了，可稍微伸腿以抓握对方。

"**Docking**" is the term for taking grips, which you'll do on your coach at the end of your forward movement. Take the **grip** on your coach's wrist. Check that your **elbows** are back to neutral after your stop movement. Extend your **feet** slightly to maintain positive pressure and counter any tension you feel in the grips, and check altitude. Once you feel no tension, you can loosen your grips and open your **palms**.

“**连接**”指抓握他人的动作。在向前移动之后，你将与助理教练连接。你需要**抓握**助理教练的手腕，并检查你在停止动作之后**手肘**是否回到中性姿势。微伸**双脚**维持正向压力以抵消抓握的张力，同时检查高度。当你感觉到张力消失时，可放松抓握，打开手掌。

Levels

高度调整

When jumping with others, you need to get level with the formation prior to docking. Getting level before docking allows for a smooth approach and prevents vertical collisions with other jumpers. You will practice getting level by going up or down relative to your coach.

与他人跳伞时，你需在连接之前与团体编队处在同一高度上，这可以让你平稳地接近他人，避免与他人发生垂直方向上的碰撞。你将练习相对于助理教练上升或下降，以掌握高度调整技能。

Just as with turns and forward movement, use **start-coast-stop** to control your level relative to your coach. Start your movement with the appropriate body position indicated below, coast by going back to neutral, and, if needed, stop by applying movement in the opposite direction.

与转向和前进动作类似，可运用“**启动-滑行-停止**”的方法来控制你与助理教练的相对高度。请按下方所述的身体姿势来执行启动动作，然后恢复中性姿势来滑行，如有必要，可通过反向动作来停止。

To **start downward** movement, temporarily increase your vertical freefall speed by pushing your hips forward, raising your chin, and lifting your shoulders and knees to spill air.

要**启动向下移动**，可暂时加快垂直方向的自由落体下落速率：顶胯、下巴抬高，同时提起双肩和双膝以破风。

To **start upward** movement, temporarily decrease your vertical freefall speed by rounding your spine, widening and dropping your knees, cupping your shoulders and chest, and extending your arms and pushing down slightly. Your legs will remain neutral.

要**启动向上移动**，可暂时减慢垂直方向的自由落体下落速率：脊柱上弯，打开双膝宽度并向下顶膝，肩部和胸部呈凹状姿势，手臂略微伸展并略微下压。腿部保持中性姿势。

When jumping with others, you will likely have to combine the skills of moving up or down with moving forward to dock. First, make sure you are on **level**, move forward into your position, which is called your "**slot**," then take your **dock**.

与他人跳伞时，你通常需要将上下移动与前进移动结合起来完成连接。首先确保你于他人**处于同一水平面**，然后向前移动至预定位置（该位置被称为“**Slot**”，即跳伞者应处的位置），再进行**连接**。

FALL RATE: is the speed at which you are falling, which can be increased or decreased by changing your neutral body position. In this category, you will go up and down to match the level of your coach. Later, you will learn how to fly in an adjusted neutral body position to match other jumpers' fall rates for entire skydives.

下落速率：指你下落的速度，可以通过改变中性身体姿势来加速或减速。在本单元，你将通过上下移动来匹配助理教练的水平位置。之后，你将学习如何以经调整的中性身体姿势飞行，以在整个跳伞过程中匹配其他跳伞者的掉率。

(译者注：下落速率也常称作“掉率”)

LONG SPOT: is the term for being far from the drop zone with the wind mostly at your back.

长距离：指跳伞者离跳伞基地很远且风主要从背后吹来的情况。

Breakoff

分离

Breaking off is the term for tracking away from other jumpers in your group to create horizontal separation before pulling. This assures you have clear airspace when you open your canopy, avoiding a collision with another jumper.

分离是指在开伞前通过 Tracking 远离所在团体内的其他跳伞者以隔开水平间距。这能确保你在开伞时拥有净空的空域，避免与其他跳伞者发生碰撞。

Breakoff occurs at a pre-planned altitude on every skydive. This should be at least **1,500 feet above** the planned deployment altitude. At the breakoff, turn 180 degrees from the center of the group, track away, stop, and deploy. It should take approximately 8 seconds from the time you turn and start your track to the time you stop and pull.

每次跳伞都应在预先计划好的高度分离。该高度应至少高于预定开伞高度 **1500 英尺**。分离时，先转 180 度，背朝团体的中心，然后 Track 走，再停止 Tracking，再然后开伞。从开始转向到执行 Tracking 再到停止 Tracking 并开伞，整个过程应花费约 8 秒。

Wave off and deploy at the planned altitude whether or not you have turned and tracked. Follow your pull priorities. You are always responsible to break off and open at the planned altitude on jumps both with your coach and with others once you get your license.

无论是否完成转向和 Tracking，都必须在预定高度挥手示意并开伞。请务必遵守开伞优先事项的原则。无论是在与助理教练跳伞时还是取得执照后与他人跳伞时，你都始终有责任在预定高度分离和开伞。

B. Canopy

伞控

Extending Glide

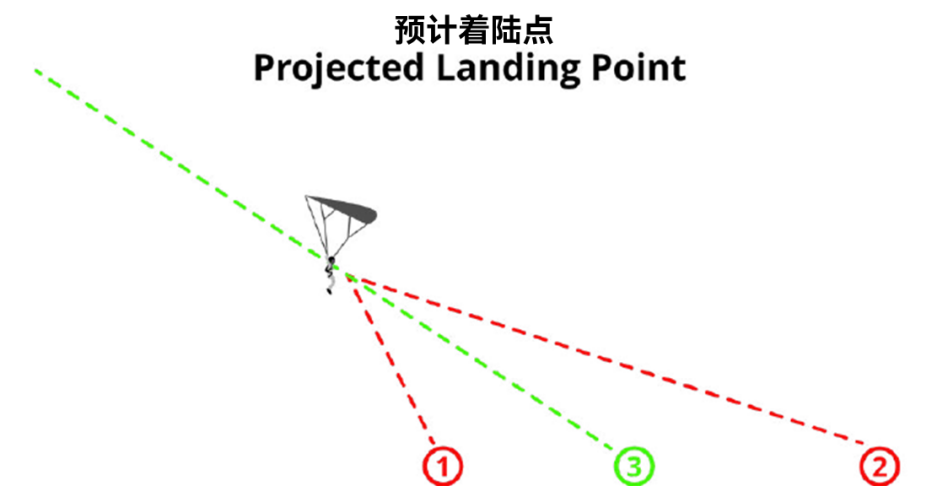
延长滑翔距离

Extending the glide of your canopy allows you to cover a greater distance than full flight. This is important when you are coming back from a long spot.

通过延长降落伞的滑翔距离，你能够比全速飞行状态飞更远的路程。这在长距离返回时尤为重要。

You can use your brakes or rear risers to extend your glide. Many other variables, such as wind strength, wind direction, and canopy design and size, also affect your glide path. In this category, you will practice using your toggles to extend your glide path. You will learn more about using your rear risers in your B-license canopy proficiency training.

你可以使用刹车或后组来延长滑翔距离。其他诸多因素也会影响下滑轨迹，包括风速、风向以及降落伞的伞形与尺寸。本单元中，你将练习使用刹车延长滑翔距离，关于运用后组的更多知识将在 B 执照伞控培训中涉及。



To find your projected landing point:**判断预计着陆点的方法:**

Pick a point in front of you on the ground and fly toward it.

选取飞行的前方的地面参照点进行观察:

1. If that point falls relative to the horizon or appears to move closer to you, you will fly past this point. You will overshoot this point.
若参照点相对于地平线下沉或看起来向你靠近, 说明你将飞越该点。
2. If that point rises relative to the horizon or appears to move farther from you, you will not make it there. You will undershoot this point.
若参照点相对于地平线上升或看起来远离你, 说明你无法抵达该点。
3. If the point stays stationary, this is your project landing point. You will land there.
若参照点保持不动, 则该点为你的预计着陆点, 你将在那里着陆。

To adjust your glide path:**调整下滑轨迹的步骤:**

Find your projected landing point in full flight. Then pull the toggles down slightly and find the new projected landing point for your new glide path. If the new projected landing point rises or appears to move farther relative to the original projected landing point then your glide path has flattened, and the canopy will cover more distance. If not, your glide path is steeper, and the canopy will cover less distance.

首先确定全速飞行时的预计着陆点, 然后轻微下拉两侧刹车, 观察新的下滑轨迹对应的预计着陆点。若新的预计着陆点相对于原预计着陆点上升或看起来更远离你, 则你的下滑轨迹趋于平缓, 降落伞的滑翔距离也会增加; 反之则下滑轨迹变陡, 滑翔距离缩短。

CEP—Turn Reversals with Max Rate of Turn**降落伞飞行紧急程序——最大速率反向转弯**

A turn reversal is when you make a toggle turn in one direction then immediately in the opposite direction, with the goal of maintaining line tension and stability under the canopy throughout the turns. Turn reversal is another canopy-flight emergency procedure (CEP) used for collision avoidance during canopy flight.

反向转弯指的是操纵刹车向一个方向转弯, 然后马上向反方向转弯。你需要在降落伞转向全过程中的保持伞绳的张力与稳定。反向转弯是降落伞飞行紧急程序 (CEP) 中的又一技能, 用于在降落伞飞行过程中避免碰撞。

Unexpected line twists can occur if you switch too aggressively or rapidly between left and right toggle inputs. Practicing **turn reversals** will help you discover how far and how fast you can do so without creating line twists. Knowing your maximum safe rate of turn can help you avoid line twists when reacting to avoid an imminent canopy collision. A canopy collision can happen anytime during a canopy descent or in the landing pattern. The potential for collision with other jumpers increases when in the holding area and pattern because other jumpers may be focused more on the target than on traffic. Line twists at landing-pattern altitude may be unrecoverable in time for a safe landing, particularly with a higher wing loading. For these reasons, you must practice all turn reversals above your decision altitude, just in case you induce a line twist.

若左右刹车的操作切换得过于剧烈或快速, 可能意外导致线缠绕。通过**反向转弯**练习, 你可以知道不会引发线缠绕的最大操作幅度与速度。知悉安全范围内的最大转向速率有助于在紧急避让其他降落伞时规避线缠绕风险。降落伞碰撞可能发生在降落伞下降阶段或着陆航线的任何阶段。尤其在等待区与着陆航线中, 碰撞风险会加大, 因为其他跳伞者可能更关注着陆目标而非交通状况。若在着陆航线的高度发生线缠绕, 可能无法及时恢复以进行安全着陆, 特别是在较高翼载的情况下。因此, 所有反向转弯练习必须高于决断高度进行, 以防诱发线缠绕。

To practice turn reversals, make a smooth but deep turn at least 90 degrees to the left, then reverse toggle positions smoothly but quickly for a 180-degree turn to the right. Enter a turn only as quickly as the canopy can maintain balance

and line tension during the turn. Surging, lurching, or line twists indicate a turn entered too quickly. The canopy dives sharply after a maximum-performance turn.

要练习反向转弯，先平稳地深度左转至少 90 度，随后快速而流畅地调换左右刹车的位置，右转 180 度。转向速率应以降落伞能维持平衡并保持伞绳张力为限。若出现前冲、颠簸或线缠绕，则表明转弯过急。需注意，最大性能转弯后，降落伞会急剧俯冲。

Accuracy

着陆精准度

You will accumulate two unassisted landings within 65 feet (20 meters) of a planned target. Remember, you need five total to complete the requirements for your A license.

在无协助的情况下，在距离预定着陆目标 65 英尺（20 米）的范围内着陆 2 次。记住，你需要累计完成 5 次，以满足 USPA A 执照的要求。

C. Emergency Procedure Review

紧急程序复习

CEP for Canopy-Collision Avoidance - Rear-Riser Steering

用于避免降落伞碰撞的降落伞飞行紧急程序——后组操控

Know where other nearby jumpers are during opening and steer with the back risers to avoid them. If a head-on collision is pending, both jumpers should turn right. For expanded collision-avoidance training, look up the USPA-recommended procedures in Chapter 4-1.

开伞过程中，需时刻掌握周围跳伞者的位置，并通过后组操控进行规避。若即将发生正面碰撞，双方均应向右转。如需更全面的避免碰撞的培训，请查阅第四章第一节中建议的程序。

Tree-Landing Avoidance

树降的规避

As a review, your coach or instructor will ask you to describe the tree-landing emergency procedure that you learned in the Category A first-jump course.

作为复习，你的助理教练或教练将要求你复述在 A 单元第一跳课程中学到的树降紧急程序。

D. Equipment

装备

By the end of this category, you should be able to pack at least one main parachute without assistance.

至本单元末尾，你应能独立叠一次主伞。

Inspecting Gear

装备检查

You should be able to inspect your gear to identify areas susceptible to high wear. If you find items requiring maintenance, you should alert your coach or instructor. Many of these items must be addressed only by an **FAA rigger**.

你需掌握装备检查技能，能够识别易磨损部位。若发现需维护的部件，必须立即告知助理教练或教练。其中多数都必须由联邦航空局认证的降落伞装备师处理。

pilot chute, bridle, and deployment handle

引导伞，引导伞系带和开伞把手

- Look for broken stitching around the apex and the seam where the pilot chute's fabric and mesh meet.
检查引导伞顶部以及引导伞伞布面料和网眼布的交汇处是否有断开的缝线
- Check for security at the bridle's attachment point.
检查引导伞和引导伞系带的连接处的情况

- Look for damage to the fabric and mesh.
检查引导伞伞布面料和网眼布是否有损坏

deployment bag

D 包

- Look for distortion in the grommets, especially at the bridle, and fabric damage around their edges.
检查金属环是否变形，尤其是在引导伞系带处，以及其边缘的布料磨损情况
- Check the loops that hold the line-stow rubber bands.
检查 D 包上用于固定绑伞绳的皮筋的系环

closing pin

关包针

- Check for nicks or corrosion on the pin.
检查关包针有无划痕或腐蚀

pilot-chute attachment

引导伞的连接处

- Look for wear where the bridle attaches to the canopy.
检查引导伞系带与降落伞伞布相连的地方是否有磨损
- Look for broken stitching on the canopy itself where it is reinforced for the bridle-attachment loop or ring.
引导伞系带与降落伞伞布通过绳环或金属环相连处的降落伞伞布会被额外加固，检查这些被加固伞布的缝线是否有断线

parachute fabric

降落伞的面料

- Check for small holes on the top skin where the bridle attaches to the parachute
检查伞布上表面的引导伞系带与伞布的连接处是否有穿孔
- Look for wear on the top skin and end cells caused by contact with sharp objects or corrosive materials.
检查伞布上表面和末端气室是否有尖锐物或腐蚀性物质引起的磨损
- Look for wear in and around the reinforcements in the stabilizers that contain the slider stops.
检查伞布稳定翼加固处里外的磨损情况，此处含有滑块布限位器
(译者注 1: 稳定翼, 即 Stabilizer, 是位于伞布左右两侧边缘的部分)
(译者注 2: 滑块布限位器, 即 Slider Stop, 是位于伞布边缘的, 一般内部缝有圆形硬片进行加固的部分伞布)
- Look for broken or missing stitching along the seams.
检查各接缝处是否有断开或丢失的缝线

slider

滑块布

- Inspect for nicks or sharp edges in the slider grommets and fabric pulling out of the grommets.
检查滑块布孔环是否有划痕，是否有锋利边缘，是否有面料被从孔环中扯出
- Look at the fabric for damage.
检查面料是否有损坏

lines

伞绳

- Look for wear anywhere along the lines, but especially where the slider grommets contact metal connector links.
检查伞绳各处的磨损，尤其是滑块布孔环与金属式连接器接触处附近的伞绳。
(译者注: 金属式连接器, 即 Metal Connector Link。这里的 Link 指伞绳与组提带的连接器, Metal Connector Link 是其中一种连接方式, 使用了金属材料, 此外也有降落伞使用 Soft Link, 即软性连接器)

- Look for signs of line shrinkage that cause unequal lengths.

检查是否有伞绳的长度收缩，这会导致各伞绳长度不均

slider bumpers and links

滑块布缓冲器以及伞绳与组提带的连接器

- Look for damage to slider bumpers.

检查滑块布缓冲器是否有损伤

(译者注: 滑块布缓冲器, 即 Slider Bumper, 是当伞绳与组提带通过金属式连接器连接时, 为了在开伞冲击中减轻滑块布孔环与连接器 (及附近处伞绳) 摩擦碰撞而套在连接器上的保护套)

- Check that the slider bumpers are tight on the link or secured with tack cord to prevent them from sliding up the lines and stopping the slider.

检查滑块布缓冲器是否紧紧地套在伞绳与组提带的连接器上, 或使用线绳固定, 以防其沿伞绳上滑, 阻碍滑块布

- Check accessible links for nicks and sharp edges. Ensure they are closed and tightened.

检查可触及的连接器是否存在划痕和锋利边缘, 确保其闭合且拧紧。

- Check soft links for wear.

对于 Soft Link (软性连接器), 检查其磨损状况

brake system

刹车系统

- Look for wear on the lower steering lines.

检查下部刹车线的磨损

- Examine the toggle locking loops on the brake lines for damage and wear.

检查刹车线上的猫眼有无损坏和磨损

(译者注: Toggle Locking Loop, 也称 Cat Eye, 即猫眼, 是刹车线上的绳环, 刹车未被释放前会插在此绳环上)

- Inspect toggle keepers and brake-line-excess keepers.

检查刹车收纳带和收纳刹车线剩余长度的收纳带

(译者注: 刹车收纳带, 即 Toggle Keeper, 指用于固定刹车棒的头部 (和尾部, 如果尾部的固定方式为 Tuck Tab) 的缝在组提带上的收纳带。Tuck Tab 为刹车尾部用于塞入收纳带的部分)

- Ensure that the toggle keepers hold the toggles securely.

确认刹车收纳带能稳稳固定住刹车

three-ring release system

三环释放系统

- Look for wear in the loops holding the rings and the white retaining loop.

检查三环固定带和白色固定绳 (译者注: 即切伞拉索穿过的白色绳环) 的磨损

- Check the cutaway-cable housings for wear or damage and broken or loose tacking.

检查切伞拉索收纳管是否有磨损、破损或松动 (译者注: 切伞拉索收纳管, 即 Cable Housing, 是收纳切伞拉索的钢管)

- Look for kinks in the cutaway cable where it contacts the white retaining loop.

检查切伞拉索与白色固定绳接触的地方是否有扭结

- Check the front and back of the riser webbing for fraying or warping around the edges of the grommets.

检查组提带的两面, 看金属孔环的边缘是否磨损或翘曲

- Check that riser-housing inserts are secure and excess cutaway cable is stowed in the riser housing.

检查组提带上用于收纳切伞拉索末端的切伞拉索末端收纳管是否稳固, 以及切伞拉索的剩余长度是否被收纳进收纳管内

(译者注: 切伞拉索的末端部分被塞入组提带上的小管内, 有些组提带上的小管是织物制的, 有些则是硬质的收纳管)

riser covers

组提带挡盖

- Confirm tuck tabs fit properly and stay in their pockets.

确认 Tuck Tab 可以合适地塞进收纳处并保持住

- Check that the stiffener in the tuck tab is not cracked or bent.

检查 Tuck Tab 内部的加固片是否有破裂或弯折

(译者注 1: 组提带挡盖, 即 Riser Cover, 是背带肩部用于盖住组提带的挡盖。挡盖的 Tuck Tab, 在叠伞时被塞入收纳处, 使挡盖不易松开)

(译者注 2: Tuck Tab 和 Tuck Flap 一般指降落伞伞包以及某些部件上的附加延伸部分, 用途为将某些东西固定住, 一般通过塞入收纳处来固定所需固定的东西, 典型的例子包括组提带挡盖的 Tuck Tab 或某些 D 包上用于收纳松弛伞绳的 Tuck Flap。Tuck Tab 和 Tuck Flap 的主要区别是形状, 一般薄片状的叫 Flap, 凸条状的叫 Tab, 有时候也会混用, 例如组提带挡盖的 Tuck Tab 有时也称作 Tuck Flap)

main-container closing grommets

主伞伞包的关包金属环

- Inspect for distortion, sharp edges or nicks, and fabric damage around the edges.

检查金属环是否变形, 是否有锋利边缘, 是否有划痕, 附近金属环边缘附近面料是否损坏

- Check for severe distortion or breakage of the plastic stiffener inside the fabric where the grommet is set.

检查关包盖片内部的塑料加固片是否有严重变形或破损, 关包金属环就固定在其上

main- and reserve-pin covers

主伞关包针和备伞关包针的挡盖

- Check the plastic stiffeners for distortion.

检查挡盖内的塑料加固片是否变形

reserve loop and pin

备伞关包绳和关包针

- Check that there is no fraying of the reserve loop.

检查备伞关包绳是否有磨损

- Check that the thread on the seal is not broken.

检查铅封的线是否有断开处

- Look at the condition of the reserve pin and grommet.

检查备伞关包针和金属孔环的状况

Store your parachute in a cool, dry, dark place. In the summer, cars are too hot for safe prolonged storage since heat weakens AAD batteries and rubber bands. The sun's ultraviolet rays degrade nylon. Moisture corrodes hardware, which is very dangerous, since rust degrades nylon. Moisture also promotes mildew, which is harmful to nylon. Many chemicals and acids damage parachute materials.

将降落伞存放在阴凉、干燥、避光的环境中。在夏季, 车辆内部温度过高, 不适宜长期存放装备, 因为高温会缩短 AAD 电池寿命并影响皮筋的性能。阳光中的紫外线会使尼龙材料降解。潮湿环境会腐蚀金属部件, 这很危险, 因为金属锈会使尼龙材料降解。潮湿环境还会滋生霉菌, 对尼龙材料造成损害。此外, 多种化学物质和酸性成分都会损伤降落伞的材料。

E. Standard Operating Procedures

标准作业程序

Only an **FAA Senior or Master Rigger** may maintain and repair a parachute system, but only an **FAA Master Rigger** may make **major repairs and alterations**. (FAR 65.125)

降落伞系统的维护和维修只能由联邦航空局认证的资深降落伞装备师和专家级降落伞装备师来进行, 而大修和改装则只能由专家级降落伞装备师来进行。(联邦航空条例 65.125)

AADs, if installed, must be maintained according to the manufacturer's instructions (FAR 105.43.c).

如果安装了 AAD，则必须按照制造商的指引进行维护。(联邦航空条例 105.43.c)

Weather Conditions

天气条件

Refer to the information on **weather** in Chapter 4-5, Recommendations for Everyone. Some weather conditions can be hazardous for skydivers, but there are many practical methods of observing weather and obtaining forecasts that can help you avoid these hazards. In this category, you will perform all spotting procedures with assistance in routine weather conditions.

请参阅第四章“对所有人的建议”的第五节中关于天气的内容。某些天气条件可能对跳伞者构成危险，但通过观察天气和获取天气预报等多种实用方法，可帮助规避这些危险。本单元中，你将在常规天气条件下，在协助下完成所有看点定位程序。

G 单元跳伞流程 Category G Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

#1 FORWARD MOVEMENT

向前移动

- 看点（在尽量少协助的情况下） SPOT (with minimal assistance)
- 舱门后部外挂出舱（利用飞机内侧支杆） **REAR-FLOAT EXIT** (inside strut) ✓
- 助理教练做出舱信号 Coach does the count
- 面朝飞机前进方向 Face direction of flight
- 助理教练与学生连接，接着助理教练点头并后退（5 至 10 英尺） Coach docks, nods, backs up (5 to 10 feet)
- **前进连接 FORWARD MVT TO DOCK** ✓
- 高度意识检查 COA
- （重复练习直至分离）（repeat until breakoff）
- **5500 英尺执行分离程序 5,500' BREAKOFF SEQUENCE** ✓
- **4000 英尺以上开伞 PULL BY 4,000'**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **调整下滑轨迹 ADJUST GLIDE PATH** ✓
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF**（如需） **FLARE and PLF** if needed

#2 LEVELS (UP & DOWN)

上下移动

- 看点（在尽量少协助的情况下） SPOT (with minimal assistance)
- 舱门前部外挂出舱（利用飞机外侧支杆） **FRONT-FLOAT EXIT** (outside strut) ✓
- 学生做出舱信号 Student does the count
- 面朝飞机前进方向 Face direction of flight
- 助理教练与学生连接，接着助理教练点头并后退（5 至 10 英尺） Coach docks, nods, backs up (5 to 10 feet)
- **助理教练下移，学生下移以匹配高度（5 英尺） DOWN TO MATCH LEVEL (5 ft)** ✓
- 高度意识检查 COA
- **助理教练上移，学生上移以匹配高度（5 英尺） UP TO MATCH LEVEL (5 ft)** ✓
- 高度意识检查 COA

- (重复练习直至分离) (repeat until breakoff)
- **5500 英尺执行分离程序 5,500' BREAKOFF SEQUENCE**
- **4000 英尺以上开伞 PULL BY 4,000'**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- **反向转弯练习 TURN REVERSALS ✓**
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF (如需) FLARE and PLF if needed**

#3 LEVEL THEN DOCK

匹配高度然后连接

- 看点 (在尽量少协助的情况下) SPOT (with minimal assistance)
- **选择出舱方式 CHOICE OF EXIT**
- 学生做出舱信号 Student does the count
- 面朝飞机前进方向 Face direction of flight
- 助理教练与学生连接, 接着点头、后退、下移 (5 至 10 英尺) Coach docks, nods, backs up and down (5 to 10 feet)
- **学生下移并与助理教练连接 DOWN TO LEVEL and DOCK**
- 高度意识检查 COA
- 助理教练与学生连接, 接着点头、后退、上移 (5 至 10 英尺) Coach docks, nods, backs up and up (5 to 10 feet)
- **学生上移并与助理教练连接 UP TO LEVEL and DOCK**
- 高度意识检查 (重复直至分离) COA (repeat until breakoff)
- **5500 英尺执行分离程序 5,500' BREAKOFF SEQUENCE**
- **4000 英尺以上开伞 PULL BY 4,000'**
- 检查降落伞, 检查高度、位置、交通 CANOPY CHECK - APT
- 找等待区 LOCATE HOLDING AREA
- 按需进行伞控练习 CANOPY DRILLS as needed
- **飞着陆航线 FLY PATTERN**
- **拉平并 PLF (如需) FLARE and PLF if needed**

CANOPY DRILL #1: Adjusting Glide Path

伞控练习 1: 调整下滑轨迹

- Check altitude, position and traffic
检查高度、位置、交通
- Find projected landing point (PLP) for full flight
确定全速飞行状态下的预计着陆点
- Go to 1/4 brakes and find PLP for 1/4 brakes
转换至带 1/4 刹车飞行, 确定以 1/4 刹车飞行时的预计着陆点
- Compare full flight PLP with 1/4 brakes PLP
对比全速飞行状态与 1/4 刹车状态下的预计着陆点
- While holding in 1/4 brakes, check altitude, position, and traffic
继续保持 1/4 刹车, 检查高度、位置、交通
- Go to 1/2 brakes and find PLP for 1/2 brakes
转换至带半刹车飞行, 确定以半刹车飞行时的预计着陆点
- Compare 1/4 brakes PLP with 1/2 brakes PLP
对比 1/4 刹车状态与半刹车状态下的预计着陆点
- While holding in 1/2 brakes, check altitude, position, and traffic
继续保持半刹车, 检查高度、位置、交通

- If altitude permits, go to 3/4 brakes and find PLP for 3/4 brakes
如果高度允许的话，转换至带 3/4 刹车飞行，确定以 3/4 刹车飞行时的预计着陆点
- Compare 1/2 brakes PLP with 3/4 brakes PLP
对比半刹车状态与 3/4 刹车状态下的预计着陆点
- Slowly return to full flight
慢慢恢复全速飞行
- Check altitude, position, and traffic
检查高度、位置、交通
- Fly planned pattern and flare
按照规划好的着陆航线飞行，拉平着陆
- Measure your landing distance from the planned target
测量你与预定着陆目标的距离

CANOPY DRILL #2: Turn Reversal with Max Rate of Turn (CEP)

伞控练习 2：最大速率反向转弯（降落伞飞行紧急程序）

- Check altitude, position, and traffic in both directions
在两个方向上检查高度、位置、交通
- Make a quick but balanced 90-degree turn
执行快速但平衡的 90 度转弯
- Reverse the toggle position aggressively and make a balanced 180-degree turn
猛地反转刹车位置，执行平衡的 180 度转弯
- Check altitude, position, and traffic in both directions
在两个方向上检查高度、位置、交通
- Repeat to no lower than 2,500 feet, in case of line twist
在 2500 英尺以上重复练习，以备发生线缠绕
- Fly planned pattern and flare
按照规划好的着陆航线飞行，拉平着陆
- Measure your landing distance from a planned target
测量你与预定着陆目标的距离

TAKE THE QUIZ:

参加单元小测



uspa.org/quiz/g

单元小测（中英对照）

微信扫一扫



TRANSLATION OF THE QUIZ

H 单元（精进）

Category H (Hone)

2 跳	分离高度 5500 英尺	最低开伞高度 4000 英尺
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In Category **H**, you must **Hone** previously learned skills to higher measurable standards, blending skills such as diving and docking, using forward and down together over longer distances!

在 **H** 单元，你必须将之前学到的技能打磨至更高的可衡量的标准，通过结合诸如俯冲与连接等动作，在更长距离上完成前进与下降的复合机动！

单元概览 Category at a Glance

Advancement Criteria

晋级标准

Pre-Jump

跳前准备

- ☐ Provide the ground winds and winds aloft for the day
提供当天的地面风和高空风情况
- ☐ Plan the spot accounting for exit separation, wind drift, and opening point
规划好点位，将出舱间隔、风导致的漂移量以及开伞点考虑在内
- ☐ Plan your flight to the holding area and the landing pattern, choosing your target for landing
规划飞往等待区的路线和着陆航线，选择着陆目标
- ☐ Train for the low-turn recovery drill, a canopy-flight EP
培训降落伞飞行紧急程序——低转改出练习

Academics

学术部分

- ☐ Read the Academics section for this category
阅读本单元的学术部分
- ☐ Pass the category quiz at 100%
以 100% 的正确率通过单元小测
- ☐ Train for exit and freefall
出舱和自由落体培训
- ☐ Review flotation-gear advice and EPs for water landings
复习关于漂浮装置的建议，以及水降建议
- ☐ Discuss equipment maintenance you can perform
讨论你可以做的装备维护事项
- ☐ Replace a main closing loop
更换主伞关包绳
- ☐ Assemble a three-ring-release system
组装三环系统

Canopy Debrief

跳后伞降汇报

- ☐ Spot without assistance
在无协助的情况下看点定位
- ☐ Above 2,000 feet, perform a low-turn recovery drill (1st)
在 2000 英尺以上进行低转改出练习（第一次）

- ☐ Above 2,000 feet, perform a low-turn recovery drill (2nd)
在 2000 英尺以上进行低转改出练习（第二次）
- ☐ Land within 65 feet (20 meters) of your planned target without assistance (1st)
在无协助的情况下，在预定着陆目标 65 英尺（20 米）范围内着陆（第一次）
- ☐ Land within 65 feet (20 meters) of your planned target without assistance (2nd)
在无协助的情况下，在预定着陆目标 65 英尺（20 米）范围内着陆（第二次）
- ☐ Land within 65 feet (20 meters) of your planned target without assistance (3rd)
在无协助的情况下，在预定着陆目标 65 英尺（20 米）范围内着陆（第三次）

Freefall Debrief

跳后自由落体汇报

- ☐ Dive to dock using a stairstep approach, 100 feet to your coach/instructor (1st)
使用阶梯式接近的方法，从 100 英尺远俯冲并连接你的助理教练或教练（第一次）
- ☐ Dive to dock using a stairstep approach, 100 feet to your coach/instructor (2nd)
使用阶梯式接近的方法，从 100 英尺远俯冲并连接你的助理教练或教练（第二次）
- ☐ Break off at your assigned altitude without being prompted
在无提示的情况下，在指定高度分离
- ☐ Track 100 feet within a 10-degree heading tolerance
Track 至少 100 英尺，方向偏移在 10 度以内

学术部分 Academics

A. Exit and Freefall

出舱和自由落体

Diving Exit

俯冲出舱

A diving exit is where you launch out of an aircraft without climbing out and then achieve a stable entry into the relative wind. **Set up** in the door with your hips facing the relative wind as much as possible. **Launch** by placing your hips and chest into the relative wind in a neutral body position, oriented side-to-earth, looking at the wing tip. During the **flyaway**, turn your head left to look for your coach, who exited in the floater position.

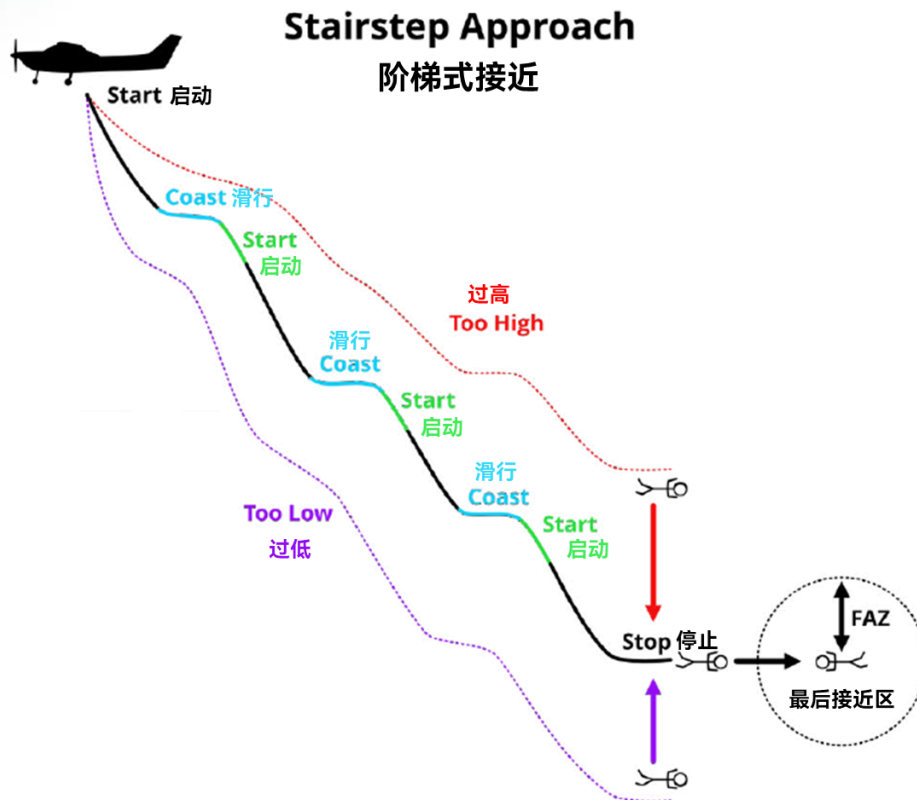
俯冲出舱指不经过爬出机舱环节直接跳出飞机，然后以稳定姿态进入相对气流。舱门内**准备就位**时，胯部尽可能朝向相对气流方向。**跳出**时以中性身体姿势让胯部和胸部迎向相对气流，身体侧朝地面，目视飞机翼尖。在**飞离**阶段，向左转头寻找已外挂出舱的助理教练。

Dive to Dock with Stairstep Approach

使用阶梯式的方法接近的方法俯冲并连接

In larger groups, some jumpers will launch together or from a floating position outside the aircraft, but others will need to dive out of the plane from inside. The divers leave slightly after the floaters and dive down to the other jumpers to dock. Because divers often must cover long distances, they use a technique to safely dive to a formation that helps them manage their speed and descent. This is called the **stairstep approach**.

在较大的团体编队中，部分跳伞者会同步跳出或以外挂位置出舱，而其他跳伞者则需从舱内俯冲出舱。俯冲者稍晚于外挂者出舱，通过俯冲来接近其他跳伞者从而进行连接。由于俯冲者通常需要跨越较长的距离，他们采用一种既能控制速度又能调节下降速率的安全俯冲技巧，称为**阶梯式接近法**。



In this category, you will use the stairstep approach to practice diving to dock with your coach. After you exit but before starting to dive, hold the neutral body position for two to three seconds while slowly turning toward your coach. Use the **start-coast-stop** concept as you have before, but this time using start and coast repeatedly while diving, with a stop at the end.

在此单元中，你通过阶梯式接近法练习俯冲，以与助理教练连接。出舱后，开始俯冲前，保持中性身体姿势 2 至 3 秒，同时缓慢转向助理教练的方向。像之前一样，继续应用“启动-滑行-停止”的概念，但这次俯冲时需反复“启动”与“滑行”，最终以“停止”动作收尾。

To **start**, smoothly extend both legs fully with your toes pointed to initiate forward motion, steering to maintain heading. Arch more and sweep your arms back. Your hands should be above your hips. To **coast**, return to neutral and assess your horizontal and vertical distance from your coach.

“启动”时，充分伸腿并绷直脚尖以产生前进动力，通过调整姿态保持方向。加强弓形姿势并将双臂后扫，双手应高于臀部。“滑行”时，恢复中性姿势，评估与助理教练的水平及垂直距离。

Start again, adjusting your pitch based on the horizontal and vertical distance to your coach. To create a **steeper** pitch angle in your dive, arch more and sweep your arms up farther behind your hips. To create a **shallower** pitch angle in your dive, flatten your arch and move your arms slightly down toward your hips. After a few seconds, return to **coast** and assess your position. Repeat as necessary, maintaining altitude awareness.

再次“启动”时，根据与助理教练的水平及垂直距离调整俯仰。如需让角度更陡，则强化弓形，并将手臂置于臀部更后上方的位置；如需让角度更平，则减少弓形，并将手臂略微朝臀部下压。数秒后恢复“滑行”，重新评估位置。根据需要重复这些步骤，全程保持高度意识。

To **stop**, extend both arms forward, flatten your arch, and drop your knees slightly, approximating the combination of the body positions for back and up movement. Aim to stop your dive on level with and approximately 20 feet away from your coach, just outside the **final-approach zone (FAZ)**. The FAZ is a buffer area that gives you room for error in case your approach is too fast, shallow, or steep. Before entering the FAZ you need to be level with your coach, then move forward to dock.

“停止”时，双臂前伸、减小弓形、膝盖稍微下压，近似采取同时向后及向上移动的复合姿势。你的目标是停在与助理教练同一高度、相距约 20 英尺的地方，即**最后接近区 (FAZ)** 的外缘。最后接近区是一个缓冲带，可为过快、过平或过陡的接近提供修正空间。进入最后接近区前，必须与助理教练保持同一水平高度，再向前移动完成连接。

FINAL-APPROACH ZONE (FAZ): Once you earn your license and jump with larger groups, the FAZ helps you avoid a collision with other jumpers approaching the same formation. Remain clear of the area immediately below and above any group. Watch for traffic and dive in a straight line.

最后接近区 (FAZ): 一旦你获得执照并与更大的团体一起跳伞，最后接近区可以帮你避免与其他跳伞者在接近同一编队时发生碰撞。始终远离任何团体的正下方和正上方。注意空中交通并沿直线俯冲。

If you have built up too much speed in your approach, you will need to initiate your stop higher and more aggressively. If you go past the level of your coach, use the position for up movement while outside the FAZ to match the level of your coach and then move forward to dock.

若接近时速度过快，需在更高处以更大幅度的动作来“停止”。若俯冲到助理教练所在水平面的下方，应使用向上移动的姿势，在最后接近区之外调整至与助理教练同高，再前进连接。

If you stop in a position close to the FAZ, but higher than your coach, use the position for down movement to match the level of your coach. Once level, enter the FAZ and move forward to dock.

若“停止”的位置靠近最后接近区但高于助理教练，应采用向下移动的姿势，调整至与助理教练同高。达到同一高度后，即可进入最后接近区，并前进连接。

Improving Your Breakoff and Track

改进你的分离和 Tracking

After you earn your A license and begin to jump with larger groups, plan your breakoff altitude conservatively. The minimum breakoff altitude for **groups of five or fewer** should be at least 1,500 feet higher than the highest planned deployment altitude in the group. For **groups of six or more**, minimum breakoff altitude should be at least 2,000 feet higher than the highest planned deployment altitude in the group.

获得 A 执照后开始参与多人跳伞时，请保守地设定分离高度。**5 人及以下的团体编队**的最低分离高度应比团体编队内成员的最高计划开伞高度高 1500 英尺以上；**6 人及以上的团体编队**的最低分离高度应比团体编队内成员的最高计划开伞高度高 2000 英尺以上。

During your breakoff sequence, scan for and steer clear of jumpers ahead of and below you. Look sideways and above for other jumpers in the immediate area during wave-off and deployment so you can steer clear under canopy as soon as you open.

执行分离程序时，需持续观察并避让前方及下方的跳伞者。在挥手示意和开伞阶段，应环视侧方及上方临近空域的是否有其他跳伞者，以在开伞后能立即操纵降落伞避让。

B. Canopy

伞控

CEP—Low-Turn Recovery

降落伞飞行紧急程序——低转改出

The low-turn-recovery technique is a canopy-flight emergency procedure. Practicing the skill will build muscle memory, allowing you to quickly **neutralize a turn**. Use low-turn recovery anytime you turn too low to the ground and do not

have enough altitude to achieve a level wing without immediate input. A low-turn recovery requires neutralizing this turn.

低转改出是降落伞飞行紧急程序之一。通过练习该技能可形成肌肉记忆，从而使你能快速**中和转弯**。当你在过低高度转弯且剩余高度不足以供降落伞在无立即操作输入的情况下恢复伞翼水平时，都应使用低转改出技术。低转改出要求你及时中和转弯。

To practice low-turn recovery, first check your canopy, altitude, position and traffic. From full flight, pull one toggle down to at least quarter brakes to initiate a 90-degree turn. To neutralize the turn, pull the toggle that is still in full-flight position to match the lower toggle, resulting in both toggles in a braked position. Hold the toggles even, then continue pushing them down evenly but forcefully for a braked flare. Anticipate that you may need more input than you expect to arrest the canopy descent. Slowly return to full flight for additional practice.

为了**练习低转改出**，需要先检查降落伞状态以及高度、位置、交通。从全速飞行状态开始，将一侧刹车下拉到至少 1/4 位置，启动 90 度转弯。中和转弯时，通过拉下另一侧仍在全速飞行位置的刹车，使两侧刹车量匹配，这时两侧刹车都处于制动位置。保持两侧刹车对称，然后再对称地继续用力下拉，以从带刹车状态开始执行拉平。预计需要更有力的刹车输入以期减慢降落伞的下降。接着缓慢恢复全速飞行，继续练习。

NEUTRALIZING A TURN is different than just stopping a turn. Instead of just raising a toggle to stop a turn, you will pull down the toggle still in full flight so both toggles are in a braked position. This maneuver not only stops the turn, but it also slows the descent and forward speed.

中和转弯与停止转弯不同。它不是通过松回一侧刹车来停止转弯，而是拉下仍在全速飞行位置的刹车，使两侧刹车都处于制动位置。这个动作不仅停止转弯，还减慢下降速度和前进速度。

In a real low-turn emergency, immediately neutralize the turn, hold the toggles evenly in brakes, finish with a braked flare, and PLF.

实际遭遇低转紧急情况时，应立即中和转弯，保持双侧刹车对称，从带刹车状态开始完成拉平，执行 PLF。

Accuracy

着陆精准度

Perform the remaining unassisted landings within 65 feet (20 meters) of the planned target to meet the USPA A-License requirements (five total required).

在无协助的情况下，在距离预定着陆目标 65 英尺（20 米）的范围内着陆（要求累计完成 5 次），以满足 USPA A 执照的要求。

C. Emergency Procedure Review

紧急程序复习

Explain the procedure for an **emergency water landing** to your coach or instructor. Include when it is appropriate to have flotation devices. Look up USPA recommendations on procedures for an unintentional water landing in Chapter 5-4: Discipline-Specific Recommendations.

向助理教练或教练说明**紧急水降**程序，包括什么情况下要使用漂浮装置。查阅第五章“特定跳伞类型的建议”的第四节中 USPA 关于意外水降应对程序的建议。

D. Equipment

装备

Owner Maintenance of the Three-Ring Release System

装备所有者对三环释放系统的维护

You should disassemble the three-ring system every month to clean the cable and exercise the material between the rings to prevent the riser forming a memory of its shape. Clean the cables with silicone spray or according to the manufacturer's instructions to remove the sludge-like coating that develops on most three-ring release cables and

causes them to bind, increasing the required pull force.

你应每月拆卸三环系统，清洁切伞拉索并揉一揉各环之间的材料，以防止组提带形成形状记忆。使用硅喷剂或按制造商指引清洁切伞拉索上的污渍，大多数三环释放拉索（切伞拉索）都会形成一层类似污泥的污渍层，使它们粘在一起，从而增加拉动拉索所需的拉力。

Line Stows

绑伞绳

Make sure your rubber bands are in good shape and hold your line stows securely. Replace stretched, worn, or broken rubber bands.

确保你的皮筋状态良好，并能稳稳地固定住伞绳。更换被拉长的、磨损或断裂的皮筋。

Main Closing Loop

主伞关包绳

If your closing loop is worn and does not appear to be nearly perfect, it warrants replacement. The loop must have enough tension to keep the container closed in freefall. A loose closing loop could result in a premature deployment. Freeflying maneuvers increase the importance of closing-system security.

若你的关包绳出现磨损且状态不佳，则必须更换。关包绳需保持足够张力，确保伞包在自由落体阶段不会打开。松弛的关包绳可能导致意外提前开伞。进行自由飞时，关包系统的稳固性显得更加重要。

Adjust the closing-loop tension by moving the overhand knot or replacing the loop with the knot tied in the correct place. Use only closing-loop material approved by the harness-and-container manufacturer.

可以通过调整关包绳的绳结位置或更换绳结位置合适的关包绳来调整关包绳的张力。只能使用背带和伞包系统制造商批准的材料制作关包绳。

Clothing and Accessories

衣着与附件

Check your jumpsuit or clothes to ensure they allow access to your main, cutaway, and reserve handles. You should tuck in shirt tails, jackets, and sweatshirts and zip your pockets closed. Your clothing should provide protection during landing and provide you with the correct fall rate based on your physical size. Tighter fitting clothing will increase your fall rate, while baggier clothing will slow it.

检查跳伞服或衣服，确认不会影响你使用主伞把手、切伞把手及备伞把手。你需将衬衫下摆、夹克与卫衣收束妥当，并拉紧所有口袋拉链。你的衣着应能在着陆时提供一定保护，并根据体型让你在自由落体时有合适的下落速率。紧身衣着会加快下落速率，宽松衣着则能减慢下落速率。

E. Standard Operating Procedures

标准作业程序

All skydivers wearing a round main or reserve canopy and all solo students must wear **flotation gear** when the intended exit, opening, or landing point is within one mile of an open body of water (an open body of water is defined as one in which a skydiver could drown). (Chapter 2-1.M)

当预定的出舱、开伞或着陆点距离开阔水域（开阔水域的定义是跳伞者可能会被淹死的水域）不到一英里时，所有使用圆形主伞或备伞的跳伞者，以及所有单人跳伞学生都必须穿戴**漂浮装置**。（见 2-1.M）

Look up USPA recommendations on training following **periods of inactivity** in Chapter 4-2. Students have different currency-training recommendations than licensed skydivers.

查阅第四章第二节中 USPA 关于**停跳一段时间**后的复训建议。学生的复训要求与持证跳伞者不同。

Study for your A-license exam.

为你的 A 执照考试进行学习。

Aircraft-Radio-Use Requirements

飞机无线电使用要求

Jump aircraft must have an operating **radio**, and the pilot must be in contact with air traffic control prior to jumping (FAR 105.13).

跳伞作业飞机必须有正常运行的**无线电**通信设备才能跳伞。跳伞前，飞行员必须与空中交通管制部门取得联系（根据联邦航空条例 105.13）。

Notification Before a Jump

跳前通告

A jumper or the pilot must **notify the appropriate air traffic control facility** at least one hour but no more than 24 hours prior to jumping. Some drop zones have a written notification renewed annually for that location only (FAR 105.25 and AC-105-2E).

跳伞者或飞行员在大多数空域进行跳伞作业时，必须提前至少 1 小时（不超过 24 小时）**通知相应的空中交通管制部门**。有些跳伞基地持每年更新一次仅适用于其所在地的书面通告（根据联邦航空条例 105.25 及咨询通告 105-2E）。

Aircraft Approved for Flight with Door Removed

准许移除舱门飞行的飞机

Some aircraft are unsafe for flight with the door open or removed. Aircraft approved for flight with the door removed may require additional modifications and usually require additional **FAA field approval**. Other modifications to a jump aircraft, such as in-flight doors, hand holds, or steps, require additional field approval or a supplementary type certificate. 一些飞机在舱门被打开或移除的情况下飞行是不安全的。可在舱门被移除的情况下飞行的飞机可能需要额外的改装，这通常需要额外的**联邦航空局适航审定**。对跳伞作业飞机的其他改装，如可在飞行过程中打开的舱门、扶手或台阶，需要额外的适航审定或补充的型号证书。

H 单元跳伞流程 Category H Dive Flows

RED indicates Advancement Criteria

红色 表示晋级标准

- ✓ indicates new skills
- ✓ 表示新技能

DIVE TO DOCK (2 jumps)

俯冲以进行连接 (2 跳)

- 看点定位（无协助情况下） SPOT (without assistance)
- **俯冲出舱 DIVING EXIT** ✓
- 转向助理教练 TURN TO COACH
- **俯冲以进行连接 DIVE TO DOCK** ✓
- 使用阶梯式接近*的方法，在最后接近区停下 Use stairstep approach*, stopping in FAZ ✓
 - 第一跳：至 10-20 英尺外 First jump 10-20 ft out
 - 第二跳：至 20-40 英尺外 Second jump 20-40 ft out
- （如果时间足够，在助理教练再次就位后重复练习）（repeat if time after coach gets into position）
- **5500 英尺开始分离程序 5,500' BREAKOFF SEQUENCE**
- **4000 英尺以上开伞 PULL BY 4,000'**
- 检查降落伞，检查高度、位置、交通 CANOPY CHECK - APT

- 找等待区 LOCATE HOLDING AREA
- 练习低转改出 **LOW-TURN-RECOVERY PRACTICE** ✓
- 飞着陆航线 **FLY PATTERN**
- 拉平并 **PLF** (如需) **FLARE and PLF** if needed

CANOPY DRILL: Low-Turn-Recovery Practice (CEP)

伞控练习：练习低转改出（降落伞飞行紧急程序）

- Check altitude, position, and traffic
检查高度、位置、交通
- From full flight, pull one toggle down to at least quarter brakes to initiate a 90-degree turn
从全速飞行状态开始，拉下一侧刹车到至少 1/4 的位置，以启动 90 度转弯
- Neutralize the turn by pulling down the toggle still in full-flight position to match the lower toggle, resulting in both toggles in a braked position
通过拉下另一侧仍在全速飞行位置的刹车，使两侧刹车量匹配，从而中和转弯，这时两侧刹车都处于制动位置
- Hold the toggles even, then continue pushing them down evenly but forcefully for a braked flare
保持两侧刹车对称，然后再对称地继续用力下拉，以从带刹车状态开始执行拉平
- Anticipate needing more input that you expect to arrest the canopy descent
预计需要更有力的刹车输入以期减慢降落伞的下降
- Slowly return to full flight for additional practice if altitude permits
缓慢恢复至全速飞行状态，如果高度允许的话再做更多练习
- Fly your planned pattern and flare
按照规划好的着陆航线飞行，拉平着陆
- Measure your landing distance from a planned target
测量你与预定着陆目标的距离

TAKE THE QUIZ:
参加单元小测



uspa.org/quiz/h

单元小测（中英对照）
微信扫一扫



TRANSLATION OF THE QUIZ

申请 A 执照

Applying for Your A License

Before you apply for your license, you also will:

申请执照前，你需要完成以下要求：

- ☐ Pass the A-license oral exam at 100%
满分通过 A 执照口试
- ☐ Pass the A-license written exam at 75%
以 75% 或以上的分数通过 A 执照笔试
- ☐ Pass the A-license practical exam (check dive) with a USPA Instructor
通过由 USPA 教练进行的实操考核 (A 执照检查跳)
- ☐ Be introduced to USPA SIM and Governance Manual Section 1-6
熟悉 USPA 跳伞者信息手册以及 USPA 管理手册第一章第六节
- ☐ Attain a total of 25 skydives
跳数达到 25 次

The examining USPA Instructor will conduct a **40-question written** USPA A-license exam (available online). The applicant must score **at least 75% on this written exam**.

负责考试的 USPA 教练将监督含 **40 道题的 USPA A 执照笔试** (可在线考试)。申请人笔试成绩必须达到 **75% 及以上**。

The examining USPA Instructor will also conduct an **oral quiz of at least 20 questions** taken from the USPA Integrated Student Program syllabus, with emphasis on the following:

负责考试的 USPA 教练还需对申请人进行**含至少 20 道题的口试**，试题选自 USPA 综合学生计划大纲，重点考查以下内容：

- cloud-clearance and visibility requirements
云层间距和能见度要求
- equipment operation and maintenance
装备操作和维护
 - wing loading and its effects
翼载及其影响
 - closing loop
关包绳
 - Velcro and tuck flaps
魔术贴和 Tuck Flap
(译者注: Tuck Flap 一般指降落伞伞包以及某些部件上的布片状附加延伸部分, 与 Tuck Tab 类似, 其用途为将某些东西固定住, 一般通过塞入收纳处来固定所需固定的东西, 典型的例子包括组提带挡盖的 Tuck Flap 或某些 D 包上用于收纳松弛伞绳的 Tuck Flap。Tuck Tab 和 Tuck Flap 的主要区别是形状, 一般布片状的叫 Flap, 凸条状的叫 Tab, 有时候也会混用, 例如组提带挡盖的 Tuck Flap 有时也称作 Tuck Tab)
 - packing and authorization to pack
叠伞及叠伞的授权
- canopy flight
降落伞飞行
 - traffic patterns and collision avoidance
交通航线和碰撞避免
 - braked turns and obstacle avoidance
带刹车转弯和避障
 - low-turn avoidance and recovery
避免低转, 以及如何从低转中改出

- downwind landing procedures
顺风着陆程序
- obstacle-landing-emergency-and-recovery procedures
障碍物紧急着陆和救援程序
- aircraft procedures
机内程序
 - during jump run and exit to observe balance limits
在跳伞航线上和出舱期间遵守飞机平衡限制
 - distance between groups to maintain separation
保持各团体之间的分开距离
 - aircraft emergency procedures
飞机紧急程序
- group breakoff recommendations
团体编队的分离建议
- parachute emergency procedures
降落伞紧急程序
 - deployment malfunctions
开伞故障
 - cutaway decide-and-act altitude
切伞的决断和实施高度
 - two-canopies-deployed scenarios
双伞情形
- accountability for FAR compliance
遵守联邦航空条例的责任

The applicant must score **100% on this oral exam**. If the student fails to answer all questions in the oral quiz correctly, the examining USPA Instructor will conduct or arrange appropriate review training until passing.

申请人必须在**口试中获得满分**。若学生未能正确回答口试中的所有问题，负责考试的教练将进行或安排适当的复习培训，直至学生通过考试。

The examining instructor will also conduct a **practical exam** by making a skydive (also referred to as the "A-license check dive") with the applicant to verify practical capabilities in the following areas:

负责考试的教练还将与申请人一起跳一次伞（也称为“A 执照检查跳”）以进行**实操考核**，从而验证申请人在以下方面的实际能力：

- choosing the spot and selecting and guiding the pilot to the correct exit and opening point in routine conditions
在常规条件下选择正确的出舱点和开伞点，并引导飞行员飞到正确点位
- pre-jump equipment checks for self and others
对自己和他人进行跳前装备检查
- planning an effective group breakoff
对团体分离进行有效规划
- right 360-degree turn, left 360-degree turn, and a back loop (back loop to be completed within 60 degrees of the original heading)
右 360 度转、左 360 度转和后空翻（后空翻在原朝向 60 度内完成）
- docking from 20 feet (evaluator flies into position)
从 20 英尺处开始对接（评估人飞入准备位置）
- breakoff-altitude recognition and tracking for a minimum of 100 feet within 10 degrees of heading
能识别分离高度，能 Track 至少 100 英尺，方向偏移不超 10 度

- signal before deployment and overall awareness during and after deployment
开伞前给出手势信号，以及开伞中、开伞后的整体意识
- planning and flying a logical landing pattern that promotes a smooth traffic flow and avoids other jumpers
能规划合理的着陆航线，并按照规划好的着陆航线飞行，该着陆航线应有利于保持交通顺畅，避开其他跳伞者
- packing and preparing equipment for the next jump
为下一跳叠伞和准备装备

The applicant must score **satisfactorily on this practical exam**. If the student fails to demonstrate practical capabilities in any area, the examining USPA Instructor will conduct or arrange appropriate review training and re-jump until passing. 申请人必须**在此实操考核中取得合格成绩**。若学生在任一方面未能展示实操能力，负责考试的教练将进行或安排复习培训以及重跳，直至学生通过考核。

A-License Check Dive

A 执照检查跳

- Stable exit
稳定的出舱
- 360° Right Turn SCS
360 度右转（使用“启动，滑行，停止”技巧）
- 360° Left Turn SCS
360 度左转（使用“启动，滑行，停止”技巧）
- Backloop
后空翻
- Forward Movement to Dock
前进连接
- 5,500' Breakoff Sequence
5500 英尺分离
- 3,500' Wave and Pull
3500 英尺挥手示意并开伞
- Canopy Check – APT
降落伞检查，“高度，位置，交通”
- Landing Pattern
着陆航线
- Pack for Self
自行叠伞

This dive must be performed with a USPA Instructor.

检查跳必须是和 USPA 教练进行。

第二章 要求和规定

Requirements and Regulations

USPA Members must follow the fundamentals contained in two interrelated documents—the USPA Basic Safety Requirements (BSRs) and the Federal Aviation Regulations (FARs) pertinent to skydiving.

USPA 会员必须遵循两份相互关联的文件中所包含的基本准则，这两份文件分别为 USPA 基本安全要求（BSR）以及联邦航空条例（FAR）中涉及跳伞的部分。

The **Basic Safety Requirements** have been established as the cornerstone of a self-policing principle and represent the industry standard generally agreed upon as necessary for an adequate level of safety. Research can be conducted to develop and document new methods and procedures within the BSRs and, when necessary, under waivers to the BSRs, establish a justifiable basis to modify these standards.

基本安全要求作为行业自律准则的基石，代表了业界公认的、为确保基础安全水平所需的标准规范。人们可以研究如何在基本安全要求的范围内制定新方法和程序，必要时，经申请基本安全要求的豁免后，可建立修改这些标准的合理依据。。

The Federal Aviation Administration (FAA) of the U.S. Department of Transportation has the responsibility for regulating airspace usage in the United States. Concerning skydiving activities, the FAA fulfills this responsibility by specifically regulating certain aspects of skydiving through the **Federal Aviation Regulations** and by relying upon the guidelines and recommendations published by USPA.

美国交通部下属的联邦航空局（FAA）负责监管美国空域使用。在跳伞方面，联邦航空局主要通过以下两种方式履行监管职责：一是通过**联邦航空条例**对跳伞的特定环节实施专门管制，二是采纳 USPA 发布的指引和建议作为监管依据。

基本安全要求概览 Overview of the BSRs

A. How the BSRs Affect Safety

基本安全要求如何影响跳伞安全

The BSRs promote practices aimed at eliminating incidents in skydiving and, by doing so, make skydiving safer and more enjoyable. USPA establishes the BSRs by evaluating incidents and identifying their root causes.

基本安全要求倡导可以减少跳伞事故的做法，使跳伞更加安全和令人享受。USPA 是通过对事故的评估以及对事故根本原因的分析而建立基本安全要求的。

Safety is accomplished by reducing the risk factors, which requires everyone involved in skydiving to:

安全是通过控制风险因素来实现的，这要求参与跳伞的每个人做到以下几点：

- acquire knowledge and make a continuing effort to increase and improve that knowledge
学习知识，并持续努力提高知识水平
- practice and prepare for both the expected and the unexpected
为预期内和预料外的状况做好练习和准备
- evaluate the risk factors
评估风险因素
- accurately evaluate personal capabilities and limitations
准确评估个人能力和局限
- stay alert and aware of surroundings
保持警惕并注意周围环境
- keep options open
保持对各种选项的开放态度
- exercise good judgment

有良好的判断力

Failure to follow the BSRs may not always result in an incident, but many incidents are the result of not following these risk-reduction procedures.

背离基本安全要求并不一定会导致事故，但许多事故的原因是没能遵守这些风险控制流程。

B. Waivers and Changes to the BSRs

基本安全要求的豁免与修订

Included in this chapter is a section titled "Waivers to the Basic Safety Requirements," which describes procedures for approving and documenting exceptions to the BSRs. Waivers provide for the responsible development of new techniques and methods.

本章节还包括了“基本安全要求的豁免”小节，介绍了申请豁免基本安全要求的批准程序和归档程序。基本安全要求的豁免是为了让人们能以负责任的方式去开发新的跳伞技巧和方法而准备的。

- The BSRs are designed to establish safety standards for common situations; however, local circumstances may allow for greater tolerance in some cases.

基本安全要求是为常见情况制定的安全标准；但在某些情况下可能可以对其有更大的宽容度。

- The purpose for filing a waiver is to document that the particular BSR has been evaluated in the individual case and that the prescribed deviation and conditions do not represent an unacceptable compromise of safety.

基本安全要求的豁免需要提交申请，目的是证明我们对豁免情形所对应的基本安全要求进行了就事论事的分析，且违背指定基本安全要求的行为不会对跳伞的安全性造成不可接受的负面影响。

- Each BSR is categorized for the level of authority necessary for the approval of the waiver. Each BSR requires full board approval of a waiver, except for those designated with an [S] (S&TA or Examiner), or an [E] (Executive Committee).

每条基本安全要求都根据豁免它所需的权限级别进行了分类。除了附注有[S]（安全和培训顾问或考官）或[E]（执行委员会）的情形外，每条基本安全要求的豁免都需要得到董事会的全体同意。

From time to time, the USPA Board of Directors changes the BSRs as equipment and practices develop and evolve.

随着跳伞装备和实践的发展和演变，USPA 董事会不时地对基本安全要求进行修订。

2-1 基本安全要求 Basic Safety Requirements

Note: Every BSR requires full board approval if a waiver is requested, unless the BSR has a marginal notation of [S] or [E], which identifies its waiverability by others as indicated.

注：申请任何一条基本安全要求的豁免都需要董事会全体的批准，除非该条基本安全要求带有[S]或[E]的旁注标记，表明其可由指定的其他主体批准。

A. Applicability

适用性

- These procedures are applicable worldwide, apply to all jumps except those made under military orders, and those training personnel under military orders, and those made because of in-flight emergencies. However, USPA-licensed skydivers when jumping outside of the United States, its territories, and possessions, must comply with the USPA Basic Safety Requirements or the rules and regulations of the country where the jump is being made, but must comply with the USPA BSRs when instructing student skydivers unless the instructor simultaneously holds the appropriate instructional rating issued by the country where the jump is completed, in which case they must follow the USPA BSRs or they must follow the rules applicable to that rating as defined by the issuing body of that rating. 基本安全要求适用于世界各地除军事跳伞和飞机紧急情况外的所有跳伞情形。在美国领土和美国属地范围之外进行跳伞时，持有 USPA 执照的跳伞者必须遵守 USPA 基本安全要求，或者遵守所在国的跳伞规定，而在教授跳伞学生时，则必

须遵守 USPA 基本安全要求，除非教练同时持有所在国签发的合适的教学评级，在这种情况下，他们须遵守 USPA 基本安全要求，或者遵守该评级的签发主体所制定的适用于该评级的规则。

2. A "skydive" is defined as the descent of a person to the surface from an aircraft in flight when he or she uses or intends to use a parachute during all or part of that descent.

“跳伞”是指一个人从飞行中的飞行器上跳下，且在全部或部分下落阶段中使用或打算使用降落伞降落到地面的降落过程。

3. All persons participating in skydiving should be familiar with the Skydiver's Information Manual and all federal, state, and local regulations and rules pertaining to skydiving.

所有参与跳伞的人员都应该熟悉跳伞者信息手册的内容以及任何与跳伞有关的联邦、州、地方法律法规。

B. Compliance with Federal Regulations

遵守联邦法规

1. For skydives made within the U.S. and its territories and possessions, no skydive may be made in violation of Federal Aviation Administration (FAA) regulations.

美国领土和美国属地范围内进行的跳伞活动不得违反联邦航空局（FAA）的规定。

2. FAA regulations include the use of restraint systems in the aircraft by all skydivers during movement on the surface, takeoff, and landing. [FAR 91.107]

联邦航空局的规定包括：所有跳伞者在地面、起飞和降落时在飞机上需使用安全带约束系统。[联邦航空条例 91.107]

C. Medical Requirements

医疗要求

1. All persons engaging in skydiving must:

所有从事跳伞运动的人员必须：

- a. Possess at least a current FAA Third-Class Medical Certificate; or
至少拥有现行有效的联邦航空局三级健康证明；或
- b. Carry a certificate of physical and mental fitness for skydiving from a registered physician; or
持有注册医师签发的跳伞身体和心理健康证明；或
- c. Agree with the USPA-recommended medical statement: "I represent and warrant that I have no known physical or mental infirmities that would impair my ability to participate in skydiving, or if I do have any such infirmities, that they have been or are being successfully treated so that they do not represent any foreseeable risk while skydiving. I also represent and warrant that I am not taking any medications or substances, prescription or otherwise, that would impair my ability to participate in skydiving."

同意 USPA 建议的健康声明：“我声明并保证，我不患有已知会损害我参加跳伞的能力的身体或精神疾病，或者，如果我任何这样的疾病，它已经或正在受到有效的治疗，在跳伞时不会导致任何可预见的风险。我还声明并保证，我没有服用任何可能影响我参与跳伞的能力的药物或物质，无论是处方药还是其他药物。”

2. Any skydiver acting as tandem parachutist in command must possess a current FAA Third-Class Medical or military flight or diver physicals that are required by their position or duty status by their military command authority. Alternatively, if acting as tandem parachutist in command outside the United States, its territories or possessions, a current medical certificate recognized by the civil aviation authority of the country where they will be exercising their tandem rating privileges may be substituted.

任何在双人伞中担任指挥的跳伞者必须持有在有效期内的联邦航空局三级健康证明，或持有军事指挥机构要求的，匹配军队岗位和职责的军事飞行或潜水体检证明。或者，如果在美国领土或美国属地以外进行双人伞跳伞，在双人伞中担任指挥的跳伞者在行使作为双人伞教练评级持有者的权利时，必须持有所在国的民航局认可的在有效期内的健康证明。

- a. A tandem parachutist in command with a medical condition that would not allow the use of their FAA medical certificate to act as a pilot in command of an aircraft may not act as a tandem parachutist in command.

在双人伞中担任指挥的、持有 FAA 健康证明的跳伞者，如有身体问题，导致其无法将该健康证明用作担任飞机机长的资质，那么也不得在双人伞跳伞中担任指挥。

- b. A tandem parachutist in command with a medical condition that would not allow the use of the privileges of

their USPA-accepted-equivalent medical certificate may not act as a tandem parachutist in command.

在双人伞中担任指挥的、持有 USPA 认可的等效健康证明的跳伞者，如有身体问题，导致其失去行使该健康证明所赋予的权利，那么也不得在双人伞跳伞中担任指挥。

3. Any foreign national in the United States, its territories or possessions for the purpose of qualifying as a tandem parachutist in command, or to fulfill rating renewal or currency requirements, must be under the direct supervision of a tandem examiner and must possess a current FAA Third-Class Medical Certificate or a current medical certificate recognized by the civil aviation authority of the country where they will be exercising their tandem rating privileges.

在美国领土和美国属地范围内，以考取双人伞指挥员资格、更新双人伞教练评级，或保持评级有效期为目的的外籍跳伞者，必须受到双人伞考官的直接监督，且必须持有在有效期内的联邦航空局三级健康证明，或持有其行使作为双人伞教练评级持有者的权利时所处的国家的民航局认可的在有效期内的健康证明。

D. Age Requirements

年龄要求

1. For skydives made within the U.S. and its territories and possessions, skydivers are to be at least 18 years of age. [E, during interim]
对于在美国领土和美国属地范围内进行的跳伞运动，跳伞者的年龄至少应为 18 岁。[E，在董事会休会期间]
2. For skydives made outside the U.S. and its territories and possessions, the minimum age is specified by the country's (or its national airport control's) requirements. Such skydivers who are under 16 years of age will not be issued a USPA license.
对于在美国领土和美国属地以外进行的跳伞运动，最低年龄由所在国家（或其航空运动管理单位）规定。16 岁以下的跳伞者不能获得 USPA 执照。
3. A waiver for tandem jumps may be issued to terminally ill persons under the age of 18 with manufacturer approval. The organizer of such jumps must submit a USPA Waiver Request form to the director of safety and training and the chair of the safety and training committee for approval prior to such jumps.
如果获得装备制造商的同意，对于 18 岁以下的临终病人，可在双人伞跳伞中申请豁免年龄要求。此类跳伞的组织者必须在跳伞前提交 USPA 豁免申请表至安全和培训董事以及安全和培训委员会主席并获得批准。

E. Membership

会员资格

USPA membership is required of any skydiver cleared for self-supervision at a USPA Group Member drop zone, except for non-resident foreign nationals who are members of their own national aeroclubs.

在有 USPA 团体会员身份的跳伞基地被允许进行自我监督的任何跳伞者都需要获得 USPA 会员资格，但拥有所在国相应航空俱乐部的会员身份的非居民外国人除外。

F. Alcohol and Drugs

酒精和药物

1. No person may make a parachute jump, or attempt to make a jump, if that person is or appears to be under the influence of either;
任何看起来受到下列物品影响的人员不得跳伞或尝试跳伞：
 - a. alcohol.
酒精
 - b. any drug that affects that person's faculties in any way contrary to safety.
任何对安全有负面效果的，影响个人能力的药物。
2. No person may make a parachute jump, or attempt to make a jump, within 8 hours after the consumption of any alcoholic beverage.
在饮用酒精类饮料后 8 小时内，任何人员不得跳伞或试图跳伞。

G. Student Skydivers

跳伞学生

Note: All references to USPA instructional rating holders apply to higher rating holders in that training discipline.

注：所有提及 USPA 教学评级持有者的内容均适用于相应培训方法中持有更高等级评级的人员。

1. General [E]

总则[E]

- a. All student training programs must be conducted under the supervision as required by an appropriately rated USPA Instructor until the student is issued a USPA A license.
所有学生培训项目必须在有合适 USPA 教练评级的教练的监督下进行，直至学生获得 USPA A 执照。
- b. A person conducting, training, or supervising student jumps must hold a USPA instructional rating according to the requirements that follow.
进行、训练或监督学生跳伞的人员必须根据以下要求持有 USPA 教学评级。
- c. On any student jump, the supervising instructor or both instructors if a two-instructor jump, must submit a completed incident report to USPA within 48 hours if any automatic activation device (AAD) was activated on the jump. No disciplinary action will result from this self-report.
在任何学生跳伞时，如果任何 AAD 被激活，则教练（无论是只有一位教练监督的跳伞还是有两位教练的跳伞）都必须在 48 小时内向 USPA 提交一份完整的情况报告。这份自我报告不会导致纪律处分。
- d. Instructional rating holders must give each of their students a complete gear check before boarding the aircraft and verify that their student's gear is in proper jumping configuration.
教学评级持有者必须为他（她）的每一位学生在登机前进行完整的装备检查，确认学生装备配置正确。

2. First-jump course [E]

第一跳课程[E]

- a. All first-jump non-method-specific training must be conducted by a USPA Instructor or a USPA Coach under the supervision of a USPA Instructor.
所有非特定培训方法的第一跳培训必须由 USPA 教练，或在 USPA 教练的监督下的 USPA 助理教练进行。
- b. All method-specific training must be conducted by a USPA Instructor rated in the method for which the student is being trained.
所有特定方法的培训必须由 USPA 教练进行，该教练必须持有这个特定方法所对应的教练评级。

3. All students must receive training in the following areas, sufficient to jump safely [E]:

所有学生必须接受以下方面的训练，以安全地跳伞[E]

- a. equipment
装备
- b. aircraft and exit procedures
飞机和跳出飞机的流程
- c. freefall procedures (except IAD and static-line jumps)
自由落体流程（IAD 和 Static-Line 跳伞除外）
- d. deployment procedures and parachute emergencies
开伞流程和降落伞故障紧急情况
- e. canopy flight procedures
降落伞飞行流程
- f. landing procedures and emergencies
着陆流程和紧急情况

4. Advancement criteria

学习通关的条件（晋级标准）

- a. IAD and static line [E]

IAD 和 Static Line 培训方法[E]

- (1) All jumps must be conducted by a USPA Instructor in that student's training method.
所有跳伞都必须由持有该培训方法对应的教练评级的 USPA 教练进行。
- (2) Before being cleared for freefall, all students must perform three successive jumps with practice deployments while demonstrating the ability to maintain stability and control from exit to opening.
在被允许进行自由落体之前，所有学生必须在三次连续跳伞中练习开伞动作，同时必须展示从离机到开伞期间保持稳定性和控制力的能力。
- (3) All students must be under the direct supervision of an appropriately rated instructor until completing one successful clear-and-pull.
所有学生必须受到拥有合适评级的教练的直接监督，直到完成一次成功的 Clear-and-Pull（确认净空并开伞，下称净空开伞）。
(译者注：净空开伞主要用于紧急离机和有计划的低空跳伞)
- (4) Following a successful clear-and-pull, each student must be supervised in the aircraft and in freefall by a USPA Coach or Instructor until demonstrating stability and heading control prior to and within five seconds after initiating two intentional disorienting maneuvers involving a back-to-earth presentation.
学生在一次成功的净空开伞之后，在展示出“有能力保持稳定和方向控制，且在两次故意扰乱姿态的动作之后（包括背朝地的情形）5 秒内仍能回到稳定姿态和保持方向控制”之前，每位学生都必须在机内和在自由落体过程中继续受到 USPA 助理教练或 USPA 教练的监督。
- (5) All ground training must be conducted by an instructor in that student's training method, until demonstrating stability and heading control prior to and within five seconds after initiating two intentional disorienting maneuvers involving a back-to-earth presentation.
在学生展示出“有能力保持稳定和方向控制，且在两次故意扰乱姿态的动作之后（包括背朝地的情形）5 秒内仍能回到稳定姿态和保持方向控制”之前，所有地面培训都必须由持有该学生使用的培训方法所对应的教练评级的教练进行。

b. Harness-hold program

Harness-hold 程序

- (1) All students must jump with two USPA AFF rating holders until demonstrating the ability to reliably deploy in the belly-to-earth orientation at the correct altitude without assistance, except:
在学生能够证明他（她）可以“在没有协助的情况下，在正确的高度以腹部朝下的姿态可靠地开伞”之前，所有学生都必须与两位 USPA AFF 教练评级持有者一起跳伞，除非：
 - i. Students who have been trained in a wind tunnel may jump with one AFF rating holder after demonstrating the following in the wind tunnel:
在风洞中训练过的学生如果能够在风洞中展示以下技能，则可以仅与一位 USPA AFF 教练评级持有者跳伞：
 - basic stability (neutral body position)
基本稳定性（腹部朝下姿态）
 - heading control
方向控制
 - controlled forward and backward motion
前后运动控制
 - controlled turns
转向控制
 - proper response to hand signals
能正确回应教练的手势信号
 - simulated altimeter checks and time awareness
模拟高度表查看和时间意识
 - wave-offs
挥手

- simulated main parachute activation
模拟打开主降落伞
- ii. The wind tunnel training and tunnel flight sessions must be conducted by an AFF rating holder, or a tunnel instructor who is under the direct supervision of an AFF rating holder. All training must be documented.
风洞训练和风洞飞行课程必须由 AFF 教练评级持有者，或在 AFF 教练评级持有者直接监督下的风洞教练开展。所有风洞培训必须记录在案。
- (2) All students must jump with one USPA AFF rating holder, exit safely, maintain stability, and deploy at the planned altitude without assistance prior to attempting disorienting maneuvers.
在尝试故意扰乱方向姿态的动作之前，所有学生跳伞必须与一位 USPA AFF 教练评级持有者一起，并能够在没有他（她）协助的情况下安全离机，保持稳定，并在计划高度开伞。
- (3) All students must jump under the direct supervision of an appropriately rated USPA Instructor until demonstrating stability and heading control prior to and within five seconds after initiating two intentional disorienting maneuvers involving a back-to-earth presentation.
所有学生必须在持有合适教练评级的 USPA 教练的直接监督下跳伞，直至他（她）展示出“有能力保持稳定和方向控制，且在两次故意扰乱姿态的动作之后（包括背朝地的情形）5 秒内仍能回到稳定姿态和保持方向控制”。
- c. Tandem training jumps [E]
双人伞跳伞训练[E]
- (1) Any USPA member conducting a tandem jump must have successfully completed a tandem instructor course conducted by the manufacturer of the tandem parachute system used in the parachute operation, been certified by the appropriate parachute manufacturer or tandem course provider as being properly trained on the use of the specific tandem parachute system to be used, and must hold a current USPA Tandem Instructor rating.
任何执飞双人伞的 USPA 会员必须已经成功完成其使用的双人伞的制造商所提供的双人伞教练课程，必须获得制造商或者双人伞教练课程机构的认证，认证内容为其已经经过适当的训练可以使用该特定的双人伞系统，且必须持有当前有效的 USPA 双人伞教练评级。
- (2) For progressive training requirements following tandem jumps, refer to "Crossover training."
学生在双人伞跳伞后的渐进训练要求，请参考“转换训练”。
- (3) Intentional back-to-earth or vertical orientations that cause tandem freefall speeds exceeding that of droguefall are prohibited.
禁止故意背部朝下的姿态，以及其他会导致双人伞自由落体速度超过使用减速伞的下降速度的垂直姿态。
- (4) Tandem equipment instruction must be conducted by an individual approved by the tandem equipment manufacturer of that system.
双人伞装备的教学讲解必须由该双人伞制造商认可的人员进行。
- (5) All student tandem skydives must be conducted in accordance with the specific manufacturer's age requirements for the tandem system used for that jump.
所有进行双人伞跳伞的学生必须符合其使用的双人伞的制造商对该双人伞系统使用者的年龄要求。
- (6) Use of any extendable or fixed pole camera mounts, attached or handheld by the tandem instructor or student, is prohibited.
禁止双人伞教练或学生使用相机支架，无论是固定的还是手持的，无论是可伸缩的还是固定杆。
- (7) Any person acting as parachutist in command on a tandem skydive is required to conduct system-handles checks as defined by the manufacturer of the specified tandem equipment being used immediately after deploying the drogue.
在双人伞跳伞中担任指挥的人，须在部署减速伞后，立即进行把手检查。把手检查内容由其使用的双人伞的制造商指定。
- (8) Any person making a tandem skydive may not perform a turn of more than 90 degrees below 500 feet AGL.
进行双人伞跳伞的任何人不得在高度 500 英尺以下进行 90 度以上的转弯。

- (9) Tandem instructors must have at least 200 tandem skydives before any camera device may be used, held or attached to the tandem instructor or tandem student.

双人伞教练在使用任何摄像设备（无论是手持的还是固定式的，无论设备在哪个个人身上）之前，必须至少有 200 次双人伞跳伞经验。

- (10) Any person acting as a parachutist in command on a tandem skydive must meet the jump currency and retraining requirements defined by the manufacturer of the specified tandem equipment being used. A Tandem Designated Evaluator or Examiner rated on the equipment used, or an S&TA must supervise the currency training.

在双人伞跳伞中担任指挥的人必须满足所用双人伞的制造商规定的评级有效期要求及再培训要求。复训须由持有相应装备类型对应的评级的双人伞指定评估官、考官或由安全和培训顾问监督完成。

5. Crossover training [E]

转换训练[E]

- a. Students may transfer after the first or subsequent jumps to another training method after demonstrating sufficient knowledge and skill in the areas of equipment, aircraft, exits, freefall maneuvers, deployment, emergency procedures, canopy control, and rules and recommendations to enter into that program at a comparable level of proficiency and training.

学生可以在第一次或随后几次跳伞后，转换至别的培训方法，前提是他（她）能够以同等水平的熟练程度和训练水平，在装备、飞机、跳出飞机、自由落体动作、开伞、应急程序、降落伞控制、相应培训方法的规则和建议等方面展示足够的知识水平和技能。

- b. Students previously trained in a tandem program may continue in a harness-hold program or must demonstrate a solo exit and practice deployment with stability in the IAD or static-line program prior to advancing to freefall. 先前参与双人伞培训的学生可以进入 Harness-hold 程序的训练。又或者，学生在进入自由落体训练之前，在 IAD 或 Static-Line 方法中，必须能够独立出舱，并稳定地进行模拟开伞。

- c. Students who have completed at least two tandem jumps and demonstrated the ability to reliably pull the drogue release at the correct altitude, maintain heading and a stable body position, without requiring any control or altitude prompts from the tandem instructor, may progress to single-instructor AFF jumps after completion of solo ground training.

学生如果已完成至少两次双人伞跳伞，并能够证明其可以在正确的高度可靠地释放减速伞，同时能够保持朝向、保持稳定姿势而无需双人伞教练介入控制或进行高度提示，那么他（她）在完成单人跳伞地面培训后，可以开始以 AFF 方法学习跳伞，且只需有一位 AFF 教练。

- d. Students previously trained in a harness-hold program must have exited stable without assistance or performed a stable IAD or static-line jump with a practice deployment supervised by a USPA IAD or Static-Line Instructor prior to performing freefall jumps with any non-AFF-rated USPA Instructor.

先前以 Harness-hold 程序进行训练的学生，在允许与没有 AFF 教练评级的教练一起进行带自由落体过程的跳伞之前，必须能够在没有帮助的情形下稳定跳出飞机，或已经在 IAD 或 Static-Line 教练的监督下能够进行一次稳定的，带模拟开伞的 IAD 或 Static-Line 跳伞。

- e. Students previously trained in Categories A-C in SL, IAD and tandem programs may jump with one AFF instructor after demonstrating the AFF wind-tunnel requirements.

先前通过 Static-Line、IAD 或双人伞方法进行综合学生计划 A 至 C 单元的培训的学生，在符合 AFF 风洞培训要求后，可以仅与一位 AFF 教练跳伞。

6. Students training for group freefall [E]

学习团体自由落体的学生[E]

- a. Student freefall training for group freefall jumps must be conducted by either a USPA Coach or a D-license holder approved to make coach jumps by their S&TA, under the supervision of a USPA Instructor, and;

团体自由落体跳伞的教学必须由获得安全和培训顾问批准进行教学的 USPA 助理教练或 D 执照持有者，在 USPA 教练的监督下进行，且：

- b. The maximum number of participants in any skydive that includes a student on solo equipment is four. Students

must not form the majority of the group, must be cleared for self-supervision and have successfully demonstrated the skills of ISP Category G. All other participants must be current USPA instructional rating holders.

如果团体中包含使用单人跳伞装备的学生，那么团体的人数上限是 4 人，且学生不能占团体人数的多数。学生必须获得自我监督的许可，并通过综合学生计划 G 单元的技能要求。其他参与者必须持有当前有效的 USPA 教学评级。

7. Instruction of foreign students [E]

外国学生的培训[E]

- a. Foreign non-resident instructional rating holders appropriately and currently rated by their national aero club may train students from that nation in the U.S., provided the instruction is conducted in accordance with the USPA Basic Safety Requirements.

外国的，非美国居民的人员，如果持有其国家的相应的当前有效的教学评级，可在美国对他（她）自己国家的学生进行培训，前提是其遵守 USPA 的基本安全要求。

- b. Appropriately and currently rated USPA instructional rating holders may assist in this training.
持有适当的且当前有效的 USPA 教学评级的人员可协助培训。

8. No skydiver will simultaneously perform the duties of a USPA instructional rating holder and pilot-in-command of an aircraft in flight.

任何跳伞者都不能同时即是 USPA 教学评级持有者，又是飞行中的飞机的驾驶员。

9. All student jumps, including tandems, must be completed between official sunrise and sunset.

所有的学生跳伞，包括双人伞跳伞，必须在官方公布的日出和日落时间之间完成。

H. Winds

风

Maximum ground winds

地面最大风速限制

1. For all solo students [S]

所有（非双人伞培训方法的）单人跳伞学生（Solo Student）[S]

- a. 14 mph for ram-air canopies
冲压空气式（Ram-air）降落伞的上限是 14 英里/小时
- b. 10 mph for round reserves
圆形备伞的上限是 10 英里/小时

2. For licensed skydivers are unlimited

对有执照的跳伞者无限制

(译者注：请注意区分 Solo 的三种含义：1. Solo Student 指（非双人伞培训方法的）单人跳伞学生；2. 学生学习阶段中后期的 Solo 跳，指学生进行的独立跳伞；3. Solo 也可指持证跳伞者进行的单人跳伞)

I. Minimum Opening Altitudes

最低开伞高度

Minimum container opening altitudes above the ground for skydivers are:

跳伞者伞包打开的最低高度为：

1. Tandem jumps: 5,000 feet AGL [E]
双人伞跳伞—离地高度 5000 英尺[E]
2. All students and A-license holders: 3,000 feet AGL [E]
所有学生和 A 执照持有者—离地高度 3000 英尺[E]
3. B-license holders: 2,500 feet AGL [E]
B 执照持有者—离地高度 2500 英尺[E]
4. C- and D-license holders: 2,500 feet AGL [S] (waiverable to no lower than 2,000 feet AGL)
C 执照和 D 执照持有者—离地高度 2500 英尺（最低可申请豁免至不低于 2000 英尺）

J. Drop Zone Requirements

降落区要求

1. Areas used for skydiving should be unobstructed, with the following minimum radial distances to the nearest hazard: 用于跳伞的区域应没有障碍物，与最近的危险障碍物的最小径向距离不得小于如下要求：
 - a. solo students and A-license holders: 330 feet
单人跳伞学生和 A 执照持有者—330 英尺
 - b. B- and C-license holders and all tandem skydives: 165 feet
B 执照和 C 执照持有者以及所有双人伞跳伞—165 英尺
 - c. D-license holders: 40 feet
D 执照持有者—40 英尺
 - d. Or, landing areas that do not meet the minimum radial distance to the nearest hazard requirement, as described above, may be approved by the Regional Director and the Director of Safety and Training. These areas may be non-circular and similar in square footage to those described above.
离最近的危险障碍物的最小径向距离不符合上述要求的降落区对该项要求的豁免申请需得到区域董事以及 USPA 安全和培训董事的批准。这些降落区可以是非圆形的，其区域大小应近似于上述要求。
2. Hazards are defined as telephone and power lines, towers, buildings, bodies of water, highways, vehicles, and clusters of trees covering more than 32,292 square feet. However, clusters of trees must not be greater than 10% of the designated landing area.
危险障碍物的定义是：电话和高压线、塔楼、建筑物、水域、公路、车辆，以及面积超过 32292 平方英尺的树丛。但树丛面积不得超过指定着陆区域的 10%。
3. Manned ground-to-air communications (e.g., radios, panels, smoke, lights) are to be present on the drop zone during skydiving operations.
在跳伞作业期间，地面必须有地对空的通信方式（如无线电、通讯面板、信号烟雾、灯光）。

K. Pre-Jump Requirements

跳伞前要求

The appropriate altitude and surface winds are to be determined prior to conducting any skydive.
在进行任何高空跳伞之前，应确定适当高度的风速和地面风速。

L. Extraordinary Skydives

特殊跳伞

1. Night, water, and demonstration jumps are to be performed only with the advice of the appropriate USPA S&TA, Examiner, or Regional Director.
夜间、水上和演示跳伞只能在合适的 USPA 安全和培训顾问、考官、区域董事的指导下进行。
2. Pre-planned breakaway jumps are to be made only by class C- and D-license holders using FAA TSO'ed equipment. [E]
仅 C 执照和 D 执照持有者才能使用联邦航空局技术标准规定认证的（TSO'ed）装备进行含预先计划的切伞的跳伞。[E]
3. Demonstration jumps into Level 2 areas require a D license with a USPA PRO Rating for all jumpers, including both tandem jump participants. [E]
进入二级区域的演示跳伞要求跳伞者持有 D 执照且有 USPA PRO（专业表演）评级，双人伞的两人也不例外。[E]
4. Contact canopy formation activity is prohibited on tandem jumps. [E]
双人伞跳伞时，禁止进行接触式降落伞编队活动。[E]
5. Tandem jumps into stadiums are prohibited. [E]
禁止双人伞跳入体育场。[E]
6. Any person performing a wingsuit jump must have at least 200 skydives, and hold a current skydiving license. [E]
任何进行翼装跳伞的人必须至少有 200 次跳伞，并持有当前有效的跳伞执照。[E]

7. Freefall within 500 feet vertically or horizontally of any student under parachute, including tandem students, is prohibited. (This requirement excludes scenarios where—during a training jump—a student's instructor(s) and videographer may be within this distance.) Freefall within 500 feet vertically or horizontally of any licensed skydiver under canopy requires prior planning and agreement between the canopy pilot and the skydiver in freefall.

禁止跳伞者在任何学生（包括双人伞学生）的垂直或水平距离 500 英尺内进行自由落体（此要求不包括学生的教练和摄像师可能在这一距离内的情况）。在距离任何已开伞的跳伞执照持有者的垂直或水平距离 500 英尺范围内进行的自由落体，须要开伞飞行的跳伞者和进行自由落体的跳伞者在跳前事先计划并达成一致。

M. Parachute Equipment

降落伞装备

1. FAA regulations [FAR 105.19] require that when performing night jumps, each skydiver must display a light that is visible for at least three statute miles from the time the jumper is under an open parachute until landing.
联邦航空局的规定（联邦航空条例 105.19）要求，在进行夜间跳伞时，从开伞后至落地期间，跳伞者必须带有指示灯，这个指示灯必须至少在 3 法定英里（1 法定英里=5280 英尺）外可见。
2. All students are to be equipped with the following equipment until they have obtained a USPA A license:
在获得 USPA A 执照之前，所有学生应配备以下装备：
 - a. a rigid helmet (except tandem students)
一顶硬质头盔（双人伞学生除外）
 - b. a piggyback harness-and-container system that includes a single-point riser release and a reserve static line
一个背驮式背带系统，该系统须有单点组提带释放装置和 RSL
(译者注：1.“Piggyback”，这里译为“背驮式”，指主伞和备伞的伞包均在背部；2.“单点”意即单个把手可释放两个组提带)
 - c. a visually accessible altimeter (except tandem students)
(目视读数的) 高度表（双人伞学生除外）
 - d. a functional automatic activation device that meets the manufacturer's recommended service schedule
可正常运作的自动激活装置（AAD），该装置的使用须符合制造商建议的使用时间安排
 - e. a ram-air main canopy suitable for student use
一个适合学生使用的冲压空气式（ram-air）降落伞
 - f. a steerable reserve canopy appropriate to the student's weight
一个适合学生体重的可操纵的备用降落伞
 - g. for freefall, a ripcord-activated, spring-loaded, pilot-chute-equipped main parachute or a bottom-of-container (BOC) throw-out pilot chute
自由落体跳伞时，需要使用由开伞拉索激活的、装有弹簧的、带有引导伞的主降落伞（译者注：此类主伞开伞方式较罕见），或者一个安装在伞包底部的（BOC）抛出式引导伞
3. Students must receive additional ground instruction in emergency procedures and deployment-specific information before jumping any unfamiliar system.
在使用任何不熟悉的降落伞系统之前，学生必须接受额外的地面指导，指导内容包括紧急情况处理程序和开伞程序相关内容。
4. All instructional rating holders must have a visibly accessible altimeter when conducting student jumps.
和学生跳伞的所有教学评级持有者必须配备一个可目视读数的高度表。
5. All skydivers wearing a round main or reserve canopy and all solo students must wear flotation gear when the intended exit, opening, or landing point is within one mile of an open body of water (an open body of water is defined as one in which a skydiver could drown). [S]
当预定的出舱、开伞或着陆点距离开阔水域（开阔水域的定义是跳伞者可能会被淹死的水域）不到一英里时，所有使用圆形主伞或备伞的跳伞者，以及所有单人跳伞学生都必须穿戴飘浮装置。[S]

N. Special Altitude Equipment and Supplementary Oxygen

特殊海拔设备和氧气补充

Supplementary oxygen available on the aircraft is mandatory on skydives made from higher than 15,000 feet (MSL). 在海拔 15000 英尺以上高空进行跳伞时，飞机上必须提供补充氧气。

2-2 基本安全要求的豁免 Waivers to the Basic Safety Requirements

A. Why BSRs May Need to be Waived

为什么可能需要豁免基本安全要求

The Basic Safety Requirements represent commonly accepted standards necessary to promote safety in average conditions. Since these standards may be an unnecessary burden in some individual circumstances, USPA provides procedures to document exceptions, known as waivers to the BSRs. These waivers also provide for the responsible research and development of improved techniques and methods.

基本安全要求代表了公认的一般条件下为促进安全而必须执行的标准。由于这些要求在个别情况下可能造成不必要的阻碍，USPA 提供了申请例外的程序，称为基本安全要求的豁免。这些豁免也是为了人们能够以负责任的方式研究、开发改进跳伞技术和方法而准备的。

B. Classification of Waivers

豁免的分类

Waivers to the Basic Safety Requirements are filed at three levels:

三个权限级别可以申请基本安全要求的豁免：

1. the USPA S&TA or USPA Examiner
USPA 安全和培训顾问或 USPA 考官
2. the Executive Committee of USPA
USPA 执行委员会
3. full Board of Directors of USPA
USPA 董事会全体成员

Neither USPA Headquarters nor any other person or group of persons except those here stated has the authorization to file a waiver to any BSR.

除所述人员外，任何人均无权申请豁免，无论是 USPA 总部还是任何其他人或团体。

Each BSR is waiverable only by the full board, except for those BSRs designated as being waiverable by:

除指定可由以下人员批准豁免的情形外，每条基本安全要求的豁免都必须有董事会全体同意批准：

- S&TA or Examiner only [S]
仅安全和培训顾问或考官[S]
- Executive Committee of the USPA Board only [E]
仅 USPA 董事会执行委员会[E]

C. Procedures for Filing Waivers

申请豁免的程序

Waivers are to be filed only when the person(s) filing the waiver is assured that there will be no compromise of safety. 只有申请豁免的人确信豁免不会危及安全时，才能提出申请。

The person(s) filing the waiver should make periodic inspections to ensure that safety is not being compromised and to determine whether the waiver should be rescinded. In the case of waivers by the Executive Committee, the Regional

Director will perform these inspections and make recommendations to the Board.

提交豁免申请的人员应定期检查，以确保安全未受妥协，并确定是否应撤销豁免。执行委员会的豁免将由区域董事负责检查并向董事会提出建议。

Any waiver filed by an S&TA or Examiner except for the deployment altitude exception in 2-1 I.4. will be in writing on the waiver form available for download at uspa.org/downloads. A copy of the waiver will be sent to both the USPA Regional Director and USPA Headquarters. The S&TA may waive the minimum deployment altitude for C- and D-license holders from 2,500 feet down to 2,000 feet for a jump or a series of jumps, if necessary. The deployment-altitude waiver does not require any written notification to USPA Headquarters or the Regional Director, however the S&TA should make a note of the waiver for his own records. Any waivers filed by S&TAs or Examiners must specify a location and provide a copy to USPA Headquarters and the location's USPA Regional Director. The waiver will remain in place permanently unless the drop zone changes ownership or location, or the S&TA or Regional Director rescinds the waiver.

除 2-1 I.4 中的开伞高度例外之外，由安全或培训顾问或考官提交的任何豁免申请应为书面形式并使用从 uspa.org/downloads 下载的表格。豁免申请表的副本将同时发送给 USPA 区域董事和 USPA 总部。如有必要，安全和培训顾问可以批准一次或者多次的 C 执照和 D 执照持有者的最低开伞高度调降，将最低开伞高度从 2500 英尺降至 2000 英尺。开伞高度的豁免不需要书面通知 USPA 总部或区域董事，但安全和培训顾问应将其记录在案。安全和培训顾问或考官提交的任何豁免必须指定地点，并将副本发送给 USPA 总部和该地点的 USPA 区域董事。豁免将永久有效，除非跳伞基地所有权或地点发生变更，或者安全和培训顾问或区域董事撤销该豁免。

S&TAs are not to file waivers for skydiving activities outside their assigned area. If there is a conflict between an S&TA and an Examiner as to whether a waiver should be filed, the decision of the S&TA will be final.

安全和培训顾问不得对其管理区域以外的跳伞活动提出豁免申请。如果安全和培训顾问与考官之间就是否应提交豁免申请存在冲突，则以安全和培训顾问为准。

The Executive Committee or full USPA Board of Directors will not approve a waiver without consulting and notifying the local S&TA or USPA Regional Director.

如果未经咨询，也未通知当地安全和培训顾问或 USPA 区域董事，执行委员会或董事会全体成员不得批准豁免。

D. Filing of Waivers

豁免申请表的提交

Persons will permanently maintain a record of any waiver they file. The S&TA and Regional Director will maintain permanent records of all waivers filed for skydiving activities within their area. The records will be kept in such a manner as to indicate those waivers currently in effect and those that have been rescinded. USPA Headquarters will maintain a permanent record of all waivers.

提交豁免申请表的人应永久保存自己提交的所有豁免申请记录。安全和培训顾问与区域董事应永久保存其所在地区内所有豁免申请记录。记录的保存方式应能够明显区分目前有效的豁免和已撤销的豁免。USPA 总部将永久保留所有豁免记录。

2-3 联邦航空条例 Federal Aviation Regulations

The FAA's main responsibility is to provide for the safety of air traffic, as well as persons and property on the ground. The FAA does this by certifying pilots, mechanics, air traffic controllers and parachute riggers and by requiring approval data for aircraft and parachutes. The agency has the authority to impose fines and suspend or revoke certificates it has issued. In the case of a skydiving violation, the FAA can fine the pilot, rigger, and the jumpers, as well as suspend or revoke the certificates of pilots and riggers. The FAA relies upon self-policing from within the skydiving community for most training and operational requirements.

联邦航空局的首要职责是保障空中交通安全及地面人员与财产安全。联邦航空局通过认证飞行员、机械师、空管人员及降落伞装备师，并审批航飞行器与降落伞的数据来实现该职责。联邦航空局有权处以罚款，并暂停或吊销其颁发的各类证书。若

发生跳伞违规行为，联邦航空局可对飞行员、装备师及跳伞者处以罚款，同时暂停或吊销飞行员与装备师的资格证书。在大部分的培训及作业要求中，联邦航空局依托跳伞行业内部的自律机制进行监管。

Important Reference Numbers

重要参考资料索引

- FAR Part 61 (excerpts), pilot certification
联邦航空条例第 61 部分（节选）：飞行员认证
- FAR Part 65 (excerpts), parachute riggers
联邦航空条例第 65 部分（节选）：降落伞装备师
- FAR 91 (excerpts), general flight rules pertaining to skydiving operations
联邦航空条例第 91 部分（节选）：与跳伞作业相关的飞行通则
- FAR Part 105 (all), skydiving
联邦航空条例第 105 部分（全部）：跳伞
- FAR Part 119 (excerpts), limits of jump flights
联邦航空条例第 119 部分（节选）：跳伞作业飞行的限制
- AC 90-66, multi-users at uncontrolled airports
咨询通告 AC 90-66：多方共用无控制塔台的机场
- AC 105-2E, sport parachuting
咨询通告 AC 105-2E：降落伞运动
- FAA Air Traffic Bulletins, information for air traffic controllers
联邦航空局空中交通公报：向空中交通管制员提供的信息

PART 61—Certification: Pilots, Flight Instructors, and Ground Instructors

第 61 部分——认证：飞行员、飞行教官、地面教官

Found in SUBCHAPTER D—AIRMEN

可在“分章 D—航空人员”中找到

Important sections to note:

需注意的重要条款：

Sec. 61.1: Applicability and definitions

适用性和定义

Sec. 61.3: Requirement for certificates, ratings, and authorizations

证书、等级和授权的要求

Sec. 61.23: Medical certificates: Requirement and duration

健康证明：要求和期限

Sec. 61.51: Pilot logbooks

飞行日志

Sec. 61.56: Flight review

飞行审查

Sec. 61.57: Recent flight experience: Pilot in command

近期飞行经验：机长

Sec. 61.133: Commercial pilot privileges and limitations

商业飞行员的特权和限制



uspa.org/far/61

PART 65—Certification: Airmen Other Than Flight Crewmembers

第 65 部分——认证：机组人员以外的航空人员

Found in SUBCHAPTER D—AIRMEN

可在“分章 D—航空人员”中找到



Important sections to note:

需注意的重要条款：

Sec. 65.1: Applicability

适用性

Sec. 65.11: Application and issue

申请和签发

Sec. 65.12: Offenses involving alcohol or drugs

涉及酒精或毒品的犯罪

Sec. 65.15: Duration of certificates

证书期限

Sec. 65.16: Change of name: Replacement of lost or destroyed certificate

更改姓名：更换遗失或毁坏的证书

Sec. 65.17: Tests: General procedure

考试：一般程序

Sec. 65.18: Written tests: Cheating or other unauthorized conduct

笔试：作弊或其他未经授权的行为

Sec. 65.19: Retesting after failure

不合格者的重考

Sec. 65.20: Applications, certificates, logbooks, reports, and records: Falsification, reproduction, or alteration

申请、证书、日志、报告和记录：伪造、复制或篡改

Sec. 65.21: Change of address

地址变更

Sec. 65.111: Certificate required

证书要求

Sec. 65.113: Eligibility requirements: General

资格要求：通则

Sec. 65.115: Senior parachute rigger certificate: Experience, knowledge, and skill requirements

资深降落伞装备师证书：经验、知识和技能要求

Sec. 65.117: Military riggers or former military riggers: Special certification rule

军队降落伞装备师或原军队降落伞装备师：特殊认证规则

Sec. 65.119: Master parachute rigger certificate: Experience, knowledge, and skill requirements

专家级降落伞装备师证书：经验、知识和技能要求

Sec. 65.121: Type ratings

类型等级

(译者注：这里将 Type Rating 译为类型等级。降落伞有不同类型，如座椅式、背包式，持有背包式降落伞类型等级，即该类型降落伞的 Type Rating 的装备师只能对背包式降落伞进行操作，而不能处理座椅式降落伞，除非他也持有该类型降落伞的类型等级。)

Sec. 65.123: Additional type ratings: Requirements

额外类型等级：要求

Sec. 65.125: Certificates: Privileges (uspa.org/far/65/125)

证书：特权

Sec. 65.127: Facilities and equipment

设施和设备

Sec. 65.129: Performance standards (uspa.org/far/65/129)

表现标准

Sec. 65.131: Records

记录

Sec. 65.133: Seal

铅封

PART 91—General Operating and Flight Rules

第 91 部分——一般操作和飞行规则

Found in SUBCHAPTER F—Air Traffic and General Operating Rules

可在“分章 F—空中交通和一般操作规则”中找到

Important sections to note:

需注意的重要条款:

Sec. 91.1: Applicability

适用性

Sec. 91.3: Responsibility and authority of the pilot in command (uspa.org/far/91/3)

机长的责任和权力

Sec. 91.5: Pilot in command of aircraft requiring more than one required pilot

需要一名以上飞行员的飞行器的机长

Sec. 91.7: Civil aircraft airworthiness

民用飞行器适航性

Sec. 91.11: Prohibition on interference with crewmembers

禁止干扰机组人员

Sec. 91.13: Careless or reckless operation

粗心或鲁莽的操作

Sec. 91.15: Dropping objects (uspa.org/far/91/15)

空投物体

Sec. 91.17: Alcohol or drugs (uspa.org/far/91/17)

酒精或药物

Sec. 91.19: Carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances

麻醉药品、大麻、镇静剂或兴奋剂的运输

Sec. 91.101: Applicability

适用性

Sec. 91.103: Preflight action

飞行前的行为

Sec. 91.107: Use of safety belts, shoulder harnesses, and child restraint systems (uspa.org/far/91/107)

安全带、肩带和儿童约束系统的使用

Sec. 91.111: Operating near other aircraft

在其他飞行器附近操作

Sec. 91.113: Right-of-way rules: Except water operations

通行权规则：水上作业除外

Sec. 91.119: Minimum safe altitudes: General

最低安全高度：通则

Sec. 91.126: Operating on or in the vicinity of an airport in Class G airspace

在 G 类空域的机场或其附近操作飞行器

Sec. 91.127: Operating on or in the vicinity of an airport in Class E airspace



在 E 类空域机场或其附近操作飞行器

Sec. 91.151: Fuel requirements for flight in VFR conditions (uspa.org/far/91/151)

目视飞行条件 (VFR) 下的燃料要求

Sec. 91.155: Basic VFR weather minimums (uspa.org/far/91/155)

基本目视飞行的最低天气标准

Sec. 91.211: Supplemental oxygen (uspa.org/far/91/211)

氧气补充

Sec. 91.215: ATC transponder and altitude reporting equipment and use.

空中交通管制应答机、高度报告设备及其使用

Sec. 91.223: Terrain awareness and warning system

地形感知和警告系统

Sec. 91.225: Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment and use

自动相关监视广播 (ADS-B) 发射 (OUT) 设备和使用

Sec. 91.307: Parachutes and parachuting

降落伞和跳伞

Sec. 91.403: General

通则

Sec. 91.409: Inspections (uspa.org/far/91/409)

检查

PART 105—Parachute Operations

第 105 部分——降落伞作业

Found in SUBCHAPTER F—Air Traffic and General Operating Rules

可在“分章 F—空中交通和一般操作规则”中找到

Important sections to note:

需注意的重要条款:

Sec. 105.1: Applicability

适用性

Sec. 105.3: Definitions (uspa.org/far/105/3)

定义

Sec. 105.5: General

通则

Sec. 105.7: Use of alcohol and drugs (uspa.org/far/105/7)

酒精和药物的使用

Sec. 105.9: Inspections

检查

Sec. 105.13: Radio equipment and use requirements (uspa.org/far/105/13)

无线电设备和使用要求

Sec. 105.15: Information required and notice of cancellation or postponement of a parachute operation (uspa.org/far/105/15)

必要信息, 以及取消或推迟降落伞作业的通知

Sec. 105.17: Flight visibility and clearance from cloud requirements (uspa.org/far/105/17)

飞行能见度和云层净空要求

Sec. 105.19: Parachute operations between sunset and sunrise (uspa.org/far/105/19)

日落至日出之间的降落伞作业

Sec. 105.21: Parachute operations over or into a congested area or an open-air assembly of persons



uspa.org/far/105

(uspa.org/far/105/21)

在拥挤区域或露天人群集会上空进行的，或进入这些区域的降落伞作业

Sec. 105.23: Parachute operations over or onto airports (uspa.org/far/105/23)

机场上空或着陆至机场的降落伞作业

Sec. 105.25: Parachute operations in designated airspace (uspa.org/far/105/25)

指定空域的降落伞作业

Sec. 105.41: Applicability

适用性

Sec. 105.43: Use of single-harness, dual-parachute systems (uspa.org/far/105/43)

单背带双降落伞系统的使用

Sec. 105.45: Use of tandem parachute systems (uspa.org/far/105/45)

双人伞系统的使用

Sec. 105.47: Use of static lines (uspa.org/far/105/47)

Static Lines 的使用

Sec. 105.49: Foreign parachutists and equipment

外籍跳伞者和装备

PART 119—Certification: Air Carriers and Commercial Operators

第 119 部分——认证：航空公司和商业运营商

Found in SUBCHAPTER G—Air Carriers and Operators for Compensation or Hire:

Certification and Operations

可在“分章 G—航空公司和营利性运营商：认证和运营”中找到



uspa.org/far/119

2-4 其他联邦航空局指引 Other FAA Guidance

Advisory Circulars

咨询通告



uspa.org/far/AC90-66B

AC 90-66B

Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Towers

没有运行中的塔台的机场的航空作业的建议标准起落航线和规范



uspa.org/far/AC105-2E

AC 105-2E

Sport Parachuting

降落伞运动

Contains information about TSO for parachutes, deployment-assisted devices for static line, parachute operations onto and over airports, aircraft inspections, jump pilot responsibilities, exhibition jumping, parachute packing, repairs and alterations, door removal, and field approval process.

包含关于降落伞技术标准规定，Static Line 开伞辅助装置，在机场及其上空进行的跳伞作业，飞行器检查，跳伞作业飞行员职责，跳伞表演，降落伞叠伞、维修与改装，舱门拆除以及现场批准流程的信息。

Seats and Restraint Systems

座椅和安全带约束系统



uspa.org/far/seatbelts

Air Traffic Bulletins

空中交通公报



uspa.org/far/ATB

第三章 执照、评级和奖项

Licenses, Ratings, and Awards

Skydivers can qualify for and receive a variety of licenses and ratings according to their experience, skill, and knowledge level.

跳伞者可根据自身经验、技能和知识水平考取多种执照与评级。

USPA **Licenses** are documents of proficiency, divided into four classes from the lowest to highest levels: A, B, C, and D. USPA **执照**是技术能力的证明文件，由低到高分 A、B、C、D 四个等级。

USPA **Ratings** are credentials earned through experience and expertise in one of three areas: student instruction, professional demonstration jumping, and competition judging. For more details on the USPA instructional ratings, see the USPA Instructional Rating Manual (IRM). For the USPA PRO Exhibition rating, see SIM Chapter 6, "Exhibition Jumping and PRO Rating." For information on competition judging, see the USPA Skydiver's Competition Manual (SCM).

USPA **评级**指的是在以下三个专业领域通过经验与专长获得的资质：学生教学、专业跳伞表演和比赛裁判。关于 USPA 教学评级的详细信息请参见 USPA 教学评级手册（IRM）；关于 USPA 专业表演评级（PRO 评级）的相关信息请参见跳伞者信息手册第六章“跳伞表演和 PRO 评级”；比赛裁判的相关信息请参见 USPA 跳伞者伞比赛手册（SCM）。

USPA also presents **Awards** to members in recognition of their accomplishments in skydiving. USPA established these awards programs, representing significant achievement, to provide goals and promote recognition in a variety of fields. USPA 还颁发**奖项**以表彰会员在跳伞领域的成就。USPA 设立这些代表重要成就的奖项是为了在各领域设立榜样并推动认可。

The Federal Aviation Administration (FAA), not USPA, issues certificates for riggers, pilots, and aircraft mechanics. For more information on FAA credentials, refer to the FAA website at faa.gov.

降落伞装备师、飞行员执照及航空机械师的资质由联邦航空局（FAA）签发，而非 USPA。有关 FAA 资质认证的更多信息，请访问 faa.gov 查询。

3-1 执照 Licenses

USPA intends for its license requirements to encourage skydivers to develop knowledge and skills as they gain experience. All Fédération Aéronautique Internationale (FAI; aka the World Air Sports Federation)-member countries recognize USPA licenses, which serve as official documentation that the holder has attained the stated experience and skills. Licenses are valuable instructional tools, serving both as goals and as guidelines for acquiring the skills and knowledge necessary for a reasonable level of safety and enjoyment.

USPA 旨在通过其执照要求鼓励跳伞者随着经验积累不断提升知识与技能。国际航空运动联合会（FAI，又称世界航空运动联合会）的所有成员国均承认 USPA 执照，该执照作为官方凭证，证明持有者已达到规定的经验与技能水平。执照是重要的教学工具，既可作为目标，也可作为获取必要技能与知识的指引，以确保达到合理的安全水平与娱乐水平。

USPA License Authority

USPA 执照签发机构

The National Aeronautic Association and the Fédération Aéronautique Internationale authorize the United States Parachute Association to issue internationally recognized Parachutist Certificates of Proficiency. USPA issues these as A, B, C, and D licenses, ranked according to level of accomplishment, based on demonstrated skill, knowledge, and experience.

美国国家航空协会和国际航空运动联合会授权美国跳伞协会颁发国际认可的跳伞者能力等级证明。USPA 根据跳伞者展示的技能、知识和经验，按成就水平进行划分，将执照分为 A 执照、B 执照、C 执照和 D 执照。

Validity of Licenses and Ratings

执照和评级的有效性

USPA licenses and ratings are valid only while the holder is a current USPA member.

USPA 执照和评级仅在持有者当前为 USPA 会员时有效。

USPA licenses are valid in all FAI-member countries and, while valid, entitle the holder to participate in open skydiving events organized in FAI-member countries. USPA issues licenses only to USPA members who meet the conditions set forth for that license.

USPA 执照在所有国际航空运动联合会成员国有效，且在有效期内，持有者有权参加在国际航空运动联合会成员国的公开跳伞活动。USPA 仅向符合该执照规定条件的 USPA 会员颁发执照。

Applicants may use student-training and military-training jumps toward total jump requirements for licenses and ratings if the appropriate USPA official verifies them.

如经适当的 USPA 官员核实，申请人可以使用学生培训和军事培训的跳伞次数来满足执照和评级的总跳数要求。

USPA defines "total freefall time" to include both freefall and droguefall time. The required number of jumps for licenses and ratings can include static-line and IAD jumps.

USPA 将“自由落体总时间”定义为包含自由落体时间和带减速伞下落的时间。执照和评级所需的跳数可以包括 Static Line 和 IAD 跳伞的跳数。

USPA may suspend, revoke, or refuse to issue a license or rating acting in compliance with existing USPA Board directives.

USPA 可根据现有的董事会的指令暂停、撤销或拒绝颁发执照或评级。

Logging Jumps for Licenses and Ratings

为达到执照和评级的要求而记录跳伞日志

Applicants must make skydives offered as evidence of qualification in accordance with USPA requirements in effect at the time of the jump. This evidence must be legibly recorded in chronological order in an appropriate log that contains the following information:

申请人必须根据跳伞当时的有效的 USPA 要求，完成可作为资质证明的跳伞经历。这些证明必须按时间顺序清晰记录在包含以下信息的合适的跳伞日志中：

- jump number
跳数编号
- date
日期
- location
地点
- exit altitude
出舱高度
- freefall length (time)
自由落体时长
- type of jump (formation skydiving, freeflying, canopy formation, etc.)
跳伞类型（编队跳伞、自由飞、降落伞编队等）
- landing distance from the target
与着陆目标的距离
- equipment used
使用的装备

- verifying signature to include a legible USPA membership number, skydiving license number, or pilot certificate number
见证签名，包含见证人的笔迹清晰的 USPA 会员号、执照号或飞行员执照号

A witness of the jump—who may be another licensed skydiver, pilot, or USPA Instructor, Examiner, S&TA, or board member— must sign off on jumps submitted to meet **the number-of-jumps requirements** for USPA licenses and ratings. 为满足 USPA 执照和评级的**跳数要求**而记录的跳伞必须由跳伞见证人（可以是其他持证跳伞者、飞行员或 USPA 教练、考官、安全和培训顾问及董事会成员）签字确认。

A USPA Coach, Instructor, Examiner, S&TA, or board member must sign off on jumps to meet **skill requirements**. A USPA Examiner must sign off on special requirements and additional qualifying items such as first-jump courses, air evaluations, ground evaluations, and teaching requirements needed for examiner ratings. 为满足**技能要求**而记录的跳伞必须由 USPA 助理教练、教练、考官、安全和培训顾问或董事会成员签字确认。考官评级所需的特殊要求及附加资格认证项（如第一跳课程、空中评估、地面评估和教学要求）必须由 USPA 考官签字确认。

A USPA Instructor, Examiner, S&TA, or board member must sign off on all jumps needed to meet **requirements for licenses or ratings**, except for jumps to meet the number-of-jumps requirements. 除用于满足跳数要求的跳伞外，所有用于满足**执照或评级要求**的跳伞记录必须由 USPA 教练、考官、安全和培训顾问或董事会成员签字。

Applicants who use **digital devices** instead of traditional paper logbooks to record jumps must ensure that the digital device contains the required information, including a signature verification from a licensed skydiver, the pilot, or a USPA National or FAI Judge who witnessed the skydive. Each instructor, S&TA, examiner, or board member who verifies license requirements for a USPA license must review and verify the jumps logged in a digital device. Skydivers pursuing licenses and ratings must clearly log their first 500 jumps so officials can easily verify them. 使用**数字设备**替代传统纸质跳伞日志的申请人，必须确保设备记录包含必要的信息，包括持证跳伞者、飞行员、USPA 全国锦标赛裁判或国际航空运动联合会裁判的签名验证。验证 USPA 执照要求的每位教练、安全和培训顾问、考官或董事会成员，必须审查并核实数字设备记录的跳伞。申请执照和评级的跳伞者，必须清晰记录前 500 次跳伞，以便官方人员核实。

Logging Freefall Time
记录自由落体时间

The following table provides the estimated freefall time from a given altitude. Many factors affect the actual terminal velocity in freefall, including the total weight of the jumper (including equipment), the surface-area-to-weight ratio, jumpsuit, altitude, and skydiving discipline. You should log every jump made, including the amount of freefall time experienced in actual time. 下表提供了不同高度的预估自由落体时间。影响实际自由落体终端速度的因素众多，包括跳伞者总重量（含装备）、表面积和重量的比值、跳伞服、高度及跳伞类型。所有跳伞都应如实记录在跳伞日志中，包括实际自由落体时长。

Freefall-Time Table
自由落体时间表

Length of Freefall (feet) 自由落体高度差（英尺）	Time at 120 mph (seconds) 120 英里/小时自由落体时间（秒）	Time at 160 mph (seconds) 160 英里/小时自由落体时间（秒）	Time at 50 mph (seconds) 50 英里/小时自由落体时间（秒）
500	2.84	2.13	6.82
1,000	5.68	4.26	13.64
1,500	8.52	6.40	20.45
2,000	11.36	8.53	27.27
2,500	14.20	10.67	34.09

3,000	17.05	12.80	40.91
3,500	19.89	14.94	47.73
4,000	22.73	17.07	54.55
4,500	25.57	19.21	61.36
5,000	28.41	21.34	68.18
5,500	31.25	23.48	75.00
6,000	34.09	25.61	81.82
6,500	36.93	27.75	88.64
7,000	39.77	29.88	95.45
7,500	42.61	32.02	102.27
8,000	45.45	34.15	109.09
8,500	48.30	36.29	115.91
9,000	51.14	38.42	122.73
9,500	53.98	40.56	129.55
10,000	56.82	42.69	136.36
10,500	59.66	44.83	143.18
11,000	62.50	46.96	150.00
11,500	65.34	49.10	156.82
12,000	68.18	51.23	163.64
12,500	71.02	53.37	170.45
13,000	73.86	55.50	177.27
13,500	76.70	57.64	184.09
14,000	79.55	59.77	190.91
14,500	82.39	61.91	197.73
15,000	85.23	64.04	204.55
15,500	88.07	66.18	211.36

License Exams

执照考试

The A-License Written, Oral, and Practical Exams

A 执照笔试、口试和实操考核

The examining USPA Instructor will supervise a 40-question **written** USPA A-License Exam (available online). The applicant must score at least 75% on this written exam. See the next section for more details on written exams for all licenses.

负责考试的 USPA 教练将监督含 40 道题的 USPA A 执照**笔试**（可在线考试）。申请人笔试成绩必须达到 75%及以上。关于各等级执照笔试的更多信息，请参阅后文。

The examining USPA Instructor will also conduct an **oral quiz** of at least 20 questions taken from the USPA Integrated Student Program syllabus, with emphasis on the following:

负责考试的 USPA 教练还需对申请人进行含至少 20 道题的**口试**，试题选自 USPA 综合学生计划大纲，重点考查以下内容：

- cloud-clearance and visibility requirements
云层间距和能见度要求
- equipment operation and maintenance
装备操作和维护
 - » wing loading and its effects
翼载及其影响
 - » closing loop

关包绳

- » touch fastener (aka Velcro) and tuck flaps

魔术贴和 Tuck Flap

(译者注: Tuck Flap 一般指降落伞伞包以及某些部件上的布片状附加延伸部分, 与 Tuck Tab 类似, 其用途为将某些东西固定住, 一般通过塞入收纳处来固定所需固定的东西, 典型的例子包括组提带挡盖的 Tuck Flap 或某些 D 包上用于收纳松弛伞绳的 Tuck Flap。Tuck Tab 和 Tuck Flap 的主要区别是形状, 一般布片状的叫 Flap, 凸条状的叫 Tab, 有时候也会混用, 例如组提带挡盖的 Tuck Flap 有时也称作 Tuck Tab)

- » packing and authorization to pack

叠伞及叠伞的授权

- canopy flight

降落伞飞行

- » traffic patterns and collision avoidance
交通航线和碰撞避免
- » braked turns and obstacle avoidance
带刹车转弯和避障
- » low-turn avoidance and recovery
避免低转, 以及如何从低转中改出
- » downwind landing procedures
顺风着陆程序
- » obstacle landing emergency and recovery procedures
障碍物紧急着陆和救援程序

- aircraft procedures

机内程序

- » during jump run and exit to observe balance limits
在跳伞航线上和出舱期间遵守飞机平衡限制
- » distance between groups to maintain separation
保持各团体之间的分开距离
- » aircraft-emergency procedures
飞机紧急程序

- group breakoff recommendations

团体分离建议

- parachute-emergency procedures

降落伞紧急程序

- » deployment malfunctions
开伞故障
- » cutaway decide-and-act altitude
切伞的决断和实施高度
- » two-canopies-deployed scenarios
双伞情形

- accountability for FAR compliance

遵守联邦航空条例的责任

The applicant must score 100% on this oral exam. If the student fails to answer all questions in the oral quiz correctly, the examining instructor will conduct or arrange appropriate review training until passing.

申请人必须在口试中获得满分。若学生未能正确回答口试中的所有问题, 负责考试的教练将安排或进行适当的复习培训, 直至学生通过考试。

The examining instructor will also conduct a **practical exam** by making a skydive (also referred to as the "A-license check dive") with the applicant to verify practical capabilities in the following areas:

负责考试的教练还将与申请人一起跳一次伞（也称为“A 执照检查跳”）以进行**实操考核**，从而验证申请人在以下方面的实际能力：

- choosing the spot and selecting and guiding the pilot to the correct exit and opening point in routine conditions
在常规条件下，选择并引导飞行员到正确的出舱点和开伞点
- pre-jump equipment checks for self and others
对自己和他人进行跳前装备检查
- planning an effective group breakoff
对团体分离进行有效规划
- right 360-degree turn, left 360-degree turn, and a back loop (back loop to be completed within 60 degrees of the original heading)
右 360 度转、左 360 度转和后空翻（后空翻在原朝向 60 度内完成）
- docking from 20 feet (evaluator flies into position)
从 20 英尺处开始对接（评估人飞入准备位置）
- breakoff altitude recognition and tracking for a minimum of 100 feet
能识别分离高度，能 Track 至少 100 英尺
- signal before deployment and overall awareness during and after deployment
开伞前给出手势信号及开伞中、开伞后的整体意识
- planning and flying a logical landing pattern that promotes a smooth traffic flow and avoids other jumpers
能规划和按照合理的着陆航线飞行，该着陆航线应有利于保持交通顺畅，避开其他跳伞者
- packing and preparing equipment for the next jump
为下一跳叠伞和准备装备

The applicant must score satisfactorily on this practical exam. If the student fails to demonstrate practical capabilities in any area, the examining instructor will conduct or arrange appropriate review training and re-jumps until the student passes.

申请人必须在此实操考核中取得合格成绩。若学生在任一方面未能展示实操能力，负责考试的教练将安排复习培训并重跳，直至学生通过考核。

A-, B-, C-, and D-License Written Exams

A、B、C、D 执照笔试

An appropriate examining official must supervise license exams. Applicants may not use references or other assistance during the exam and must pass with a score of 75% or more. The official will record any passing score on the license application and in the applicant's logbook.

执照笔试须由合适的负责考试的官员监督完成。考生考试期间不得查阅资料或获取协助，75%及以上的分数的视为通过。负责考试的官员需将合格成绩记录于执照申请表及申请人的跳伞日志上。

When giving written exams on **paper**, the examining official gives the license applicant a blank answer sheet and the questions to the exam. After the test, the examining official collects the materials and grades the exam. An applicant who does not pass will be eligible to retake this exam after seven days.

纸质考卷的笔试：负责考试的官员向申请人发放空白答题纸与试题。考试结束后负责考试的官员回收材料并评卷。未通过者可于七日后申请补考。

For written exams taken using USPA's **online** license-testing program, applicants who do not pass may immediately retest using the same method for a total of three attempts per day.

USPA **在线**考试系统的笔试：未通过者可立即重考，每日最多允许三次尝试。

To qualify for a higher license, the applicant must possess a USPA license, meet all qualifications for lower licenses, and have passed all lower-class license exams.

为满足更高级别的执照的要求，申请人须持有有效的 USPA 执照，满足所有较低级别的执照资质条件，且全部通过较低级别的执照考试。

License Applications

执照的申请

Students can apply for their **A License** using a completed A-License Progression Card either online or paper. If they use the online progression card, they can purchase and receive their A License instantly. A properly completed paper progression card serves as a valid A License for up to 60 days from the date on which it was signed by the certifying instructor. However, the student should send the paper application and the associated fee to USPA Headquarters within 60 days.

学生可通过在线方式或纸质方式提交填写完整的 A 执照进度卡以申请 **A 执照**。若使用在线进度卡，学生可即时缴费并获取 A 执照。由进行认证的教练签署的填写完整的纸质进度卡自签署日起 60 天内视作有效 A 执照，但学生须在 60 日内将纸质申请表及相关费用寄至 USPA 总部。

Applicants for **all license levels** must submit the appropriate fee and the completed application to USPA through any of the following methods:

所有级别执照的申请人须通过以下任一方式向 USPA 提交填写完整的申请表及相应费用：

- Have requirements verified online and purchase the license **online**.
在线完成要求的核验，并**在线**缴费购买执照
- Scan and **email** a copy of the card to membership@uspa.org and call USPA Headquarters with credit card payment.
将进度卡扫描件通过**电子邮件**发送至 membership@uspa.org，并致电 USPA 总部完成信用卡支付
- Copy both sides of the completed license application and **mail** it with payment.
将填写完整的执照申请表的正反面复印件和付款材料通过**邮件**寄出
- **Fax** both sides of the completed license application to USPA and call USPA Headquarters with credit card payment.
将填写完整的执照申请表的正反面**传真**至 USPA，并致电 USPA 总部完成信用卡支付

Once USPA issues a license, it will update the applicant's membership card to include the new license number, which Parachutist magazine will publish if the member opts into sharing through their privacy settings in their uspa.org profile. USPA will mail a new physical membership card if the member opts into that mailing preference.

USPA 签发执照后，会对申请人的会员卡信息进行更新，以体现新的执照号。若会员在 uspa.org 的个人隐私设置中勾选共享选项，其执照号将刊载于 Parachutist 杂志。若会员勾选邮寄纸质卡的偏好，USPA 将寄出实体的新会员卡。

For **paper license applications for B, C, and D licenses**, the verifying official signing the license application should check that each of these items has been completed:

负责核验 **B、C、D 执照**的**纸质执照申请表**并签字的官员须确认以下项目已完成：

- applicant's personal information
申请人的个人信息
- experience verification (number of jumps and freefall time, if applicable)
经历的核验（跳数与自由落体时长，如适用）
- skill verification
技能的核验

The official verifies either that the jump number, date, or score for each requirement is correct and can be found in the applicant's logbook; or, if applicable, the applicant included their appropriate license number with the application. For

experience verification, the certifying official should verify that the number of jumps and total freefall time are correct and meet the listed requirements for the license sought. For **skill verification**, a current USPA Instructor, S&TA, Examiner, or board member must initial the jump numbers, scores, or date(s) of completion.

负责核验的官员要确认跳数、日期或每项要求的分数是正确的，且在申请人的日志中可查到；或者申请表中应包括申请人的相应执照号（如适用）。**核验跳伞经历时**，负责核验的官员须确认跳数与自由落体总时间符合所申请执照的要求。**核验技能时**，须由持有当前有效资格的 USPA 教练、安全和培训顾问、考官或董事会成员在跳数、分数或完成日期处签注（可用名字首字母签名）。

You may not sign for your own license application or initial any of the verification blocks of your own license application. An appropriate official (as listed in this chapter) must sign paper applications for all licenses before the application is forwarded to USPA Headquarters. Instructors may verify A, B, and C licenses. USPA S&TAs, Examiners, and board members may verify any license application.

申请人不能自行签署执照申请表或任何核验栏位。所有纸质申请表须经本章节列明的适格官员签署后方可提交 USPA 总部。教练可核验 A、B、C 执照的申请，USPA 安全和培训顾问、考官及董事会成员可核验所有级别的执照申请。

Every USPA B-license application must also include a completed copy of the **B-License Canopy Proficiency Card** signed by a current USPA S&TA, Examiner, or board member. The S&TA must ensure that the person who conducts the training is qualified. In some situations, the best candidate to teach this material may not hold any USPA ratings but may have extensive knowledge about canopy control and landings. The signature of the appropriate official on the proficiency card verifies that the candidate has satisfactorily completed the training.

所有 B 执照的申请均须包含由现任的安全和培训顾问、考官或董事会成员签署的 **B 执照伞控熟练程度记录卡**。安全和培训顾问须确保培训的执行者具备相关资质（特定情况下，最佳的培训人员不一定持有 USPA 评级，却精通伞控与着陆技术）。经合适的负责核验的官员签署熟练程度记录卡后，申请人即被确认已通过培训。

USPA will charge a separate license fee for each license number issued.

USPA 将对每个签发的执照号单独收取执照费。

License Privileges and Requirements

执照的特权和要求

A License

A 执照

Persons holding a USPA A License may jump without supervision, pack their own main parachute, engage in formation skydives, perform water jumps, and must have—

持有 USPA A 执照的人员可以在没有监督的情况下跳伞、自行叠主伞、进行团体跳伞、进行水降，且必须：

- completed 25 freefall jumps
完成 25 次自由落体跳伞
- completed all requirements listed on the USPA A-License Progression Card
完成 USPA A 执照进度卡上列出的所有要求
- passed the USPA-developed written, oral, and practical USPA A-License Exams conducted by a current USPA Instructor, S&TA, Examiner, Judge or board member
通过了由持有当前有效资格的 USPA 教练、安全和培训顾问、考官、裁判或董事会成员进行的 A 执照笔试、口试和实操考核。

B License

B 执照

Persons holding a USPA B License may exercise all privileges of an A-license holder and perform night jumps, and are eligible for the USPA Coach Rating after making 100 jumps, and must have—

持有 USPA B 执照的人员可以行使 A 执照持有者的所有特权，可以进行夜间跳伞，完成 100 次跳伞后有资格考取 USPA 助理教练评级，且必须：

- met all current requirements for or hold a USPA A License
满足所有 USPA A 执照的最新要求，或者持有 USPA A 执照
- completed 50 jumps including:
完成 50 次跳伞，包括：
 - » accumulated at least 30 minutes of controlled freefall time
累积至少 30 分钟的受控自由落体时间
 - » landed within 33 feet (10 meters) of target center on 10 jumps
10 次在距离着陆目标中心 33 英尺（10 米）范围内着陆
- successful completion of the planned formation(s) on 10 formation skydives, or 10 formation freefly skydives, at least five of which, in either discipline, must involve at least three participants
成功完成事先计划好的 10 次编队跳伞或 10 次编队自由飞跳伞，其中至少 5 次，无论是哪种编队，都必须包括至少 3 名参与者
- documentation of live water-landing training with full equipment in accordance with the procedures in the Skydiver's Information Manual
根据本手册中的程序，使用全套装备进行水降训练的证明文件
- complete all the requirements listed on the B-License Canopy Proficiency Card available at uspa.org/downloads
完成 B 执照伞控熟练程度记录卡上列出的所有要求（可在 uspa.org/downloads 下载）
- passed the written USPA B-License Exam conducted by a current USPA Instructor, S&TA, Examiner, Judge or board member
通过了由持有当前有效资格的 USPA 教练、安全和培训顾问、考官、裁判或董事会成员进行的 B 执照笔试。

C License

C 执照

Persons holding a USPA C license may exercise all privileges of a B-license holder, are eligible for USPA Instructor ratings except USPA Tandem Instructor, may participate in certain demonstration jumps, may ride as passenger during USPA Tandem Instructor training and rating-renewal jumps, and must have—

持有 USPA C 执照的人员能够行使 B 执照持有者的所有特权，有资格申请 USPA 教练评级（USPA 双人伞教练除外），可参加某些跳伞表演，可以作为 USPA 双人伞教练培训和评级更新跳伞的乘客，且必须：

- met all current requirements for or hold a USPA B License
满足 USPA B 执照的所有要求或持有 B 执照
- completed 200 jumps, including accumulating at least 60 minutes of controlled freefall time
完成 200 次跳伞，包括累积至少 60 分钟的受控自由落体时间
- landed within 7 feet (2 meters) of target center on 25 jumps
25 次在距离着陆目标中心 7 英尺（2 米）的范围内的着陆
- successfully completed 50 formation skydives, or 50 formation freefly skydives, at least 10 of which, in either discipline, must involve at least four participants
成功完成 50 次编队跳伞或 50 次编队自由飞跳伞，其中至少 10 次，无论是哪种编队，必须至少有 4 名参与者参与
- passed the written USPA C-License Exam conducted by a current USPA Instructor, S&TA, Examiner, Judge or board member
通过了由持有当前有效资格的 USPA 教练、安全和培训顾问、考官、裁判或董事会成员进行的 C 执照笔试。

D License

D 执照

Persons holding a USPA D License may exercise all privileges of a C-license holder, are eligible for all USPA ratings, and must have—

持有 USPA D 执照的人员能够行使 C 执照持有者的所有特权，有资格申请所有 USPA 评级，且必须：

- met all current requirements for or hold a USPA C License
满足 USPA C 执照的所有要求或持有 C 执照
- completed 500 jumps, including accumulating at least three hours of controlled freefall time
完成 500 次跳伞，包括累积至少 3 小时的受控自由落体时间
- completed at least two of the following skills requirements (a requirement may be repeated):
至少满足下列技能要求的其中两项（同一项可以重复）：
 - » night jump (following the SIM recommendations)
夜间跳伞（按照 SIM 的建议）
 - » landed within seven feet (2 meters) of the target center on 100 jumps
100 次在距离着陆目标中心 7 英尺（2 米）范围内着陆
 - » participated in a canopy formation of a 3-stack or larger, completing a full rotation
参与一个由三个降落伞的或更多降落伞组成的堆叠式（Stack）降落伞编队，完成一次完整的角色轮换
 - » completed an intentional water jump
完成一次故意的水降
 - » successful completion of 100 formation skydives, at least 25 of which must involve at least eight participants
成功完成 100 次编队跳伞，其中至少 25 次必须有至少 8 名跳伞者参与
- passed the written USPA D-License Exam conducted by a current USPA S&TA, Examiner, Judge Examiner or board member
通过了由持有当前有效资格的 USPA 教练、安全和培训顾问、考官、裁判或董事会成员进行的 D 执照笔试。

The USPA D-License represents the highest level of licensing within the USPA system, requiring advanced skills and a comprehensive understanding of parachuting safety and procedures. The FAA uses the term '**Master Parachute License**' in its regulations to describe a level of parachuting proficiency required for certain privileges. In alignment with FAA terminology, a holder of a valid USPA D-License satisfies the requirements of the term 'Master Parachute License.'

USPA D 执照代表着 USPA 系统中的最高级别执照认证，要求持有者掌握高阶跳伞技术并全面理解跳伞安全与操作流程。联邦航空局在其条规中使用“**专家级跳伞执照**”（Master Parachute License）这一术语来描述特定权限所需的跳伞能力。根据联邦航空局术语标准，持有有效的 USPA D 执照的跳伞者即满足“专家级跳伞执照”的要求。

Restricted USPA Licenses

限制性的 USPA 执照

In limited circumstances, USPA may issue USPA Restricted Licenses to applicants who have disabilities that make them unable to meet all of the specific license requirements. A person may be qualified for a restricted license if the applicant has met all the requirements for the license desired except for those listed in a waiver they submit to the Safety & Training Committee, containing:

在特定情况下，USPA 可向因身体条件限制无法满足执照全部要求的申请人颁发限制性的 USPA 执照。若申请人已满足执照除豁免申请项外的所有要求，并向安全和培训委员会提交包含以下内容的豁免申请，即可能可以获取限制性执照：

- type of license requested
申请的执照类型
- specific license requirement(s) that cannot be met
无法满足的执照的特定要求
- circumstances that prevent compliance with license requirements
妨碍满足执照要求的情况
- license application completed, except for the restricted activities
除限制性活动外，执照申请已完成

The committee will consider each waiver individually on its own merit. If the board of directors approves the waiver,

USPA will issue the license with the word "restricted."

委员会根据每一项申请本身的特点进行单独审议。如果董事会批准豁免，执照上将印上“Restricted”（限制）字样。

3-2 评级 Ratings

Instructional Ratings

教学评级

USPA issues instructional ratings, attesting that the holder has not only achieved skydiving skills but has also demonstrated the techniques needed to teach these skills to others.

USPA 签发教学评级。教学评级证明持有者不仅具备跳伞技能，而且还有向他人传授这些技能所需的技术。

From lowest to highest, these ratings are:

评级有以下级别（从最低到最高）：

1. Coach
助理教练
2. Instructor
教练
3. Examiner
考官

（译者注 1：旧版 SIM 译文中将 Coach 译为“初级教练”，为明确强调此类评级人员须在教练监督下进行教学，新版 SIM 译文中统一将其译为“助理教练”。）

（译者注 2：还有一类提供进阶跳伞类型培训（如翼装、自由飞等）的教学人员，英文也称为“Coach”，在译文中为示区分，将此类教学人员称为“科目教练”（详见本书末的名词解释），或视具体情况称为“翼装教练”、“自由飞教练”等。USPA 没有对翼装、自由飞等进阶跳伞类型设置教学评级。）

USPA Instructors may be qualified to conduct initial skydiving training in one or more instructional methods:

USPA 教练可在以下一个或多个培训方法中获得资格，进行相应培训方法的初始阶段跳伞培训：

- harness hold (accelerated freefall or AFF)
Harness-hold（加速自由落体或 AFF）
- instructor-assisted deployment (IAD)
教练辅助开伞（IAD）
- static line (SL)
Static Line（SL）
- tandem (TAN)
双人伞（TAN）

A USPA Coach may act as a supervised assistant to the USPA Instructor to teach specified portions of the first-jump course. Any instructional rating holder may perform the duties of the coach or of any lower rating holder in their method. Coaches and instructors who have just completed a rating course in any new method should pair with more-seasoned staff as they begin to work with students.

USPA 助理教练可以作为受到 USPA 教练监督的助理，教授第一跳课程的特定部分。任何 USPA 教学评级持有者都可以履行 USPA 助理教练或其培训方法中任何较低评级持有者的职责。助理教练以及刚完成任何培训方法所对应的评级课程的教练在刚开始对学生进行教学时都应与更有经验的人员合作。

Examiners appoint qualified instructional rating holders as course evaluators in accordance with the requirements outlined in the USPA Instructional Rating Manual (IRM). The IRM contains all policies, procedures, new rating and renewal requirements, and rating-course outlines, support materials and examinations.

USPA 考官根据 USPA 教学评级手册 (IRM) 中的要求, 任命合格的教学评级持有者作为课程评估官。所有政策、程序、新评级和评级更新要求、评级课程大纲、支持材料和考试信息请见 USPA 教学评级手册。

PRO Professional Exhibition Rating

专业表演评级 (PRO 评级)

The FAA and USPA cooperate on the means for skydivers to demonstrate competence to perform skydiving shows before the public via the PRO exhibition rating. Chapter 6, Exhibition Jumping and PRO Rating, describes the program. The FAA may ask jumpers who do not hold a PRO rating to demonstrate competence prior to issuing a Certificate of Authorization to conduct a parachute exhibition jump.

联邦航空局和 USPA 合作, 为跳伞者提供了一种选项, 可以通过 USPA PRO 评级来证明其有能力在公众面前进行跳伞表演。该程序在本手册第六章“跳伞表演和 PRO 评级”中有描述。联邦航空局可在签发跳伞表演授权证书之前, 要求未持有 USPA PRO 评级的跳伞者证明其能力。

Judge Rating

裁判评级

The purpose of the judging program is to ensure the highest possible standards for judging competitions and records at the local, national, and international levels. USPA issues discipline-specific Regional and National Judge ratings. The FAI, not USPA, rates International Judges. The USPA Skydiver's Competition Manual (SCM) contains details on the judge rating program and judge training courses.

裁判评级程序的目的是确保地方、国家和国际各级赛事与纪录的评判工作达到尽可能高的标准。USPA 分跳伞类型颁发区域级和国家级裁判评级。国际裁判员评级由国际航空运动联合会 (而非 USPA) 颁发。USPA 跳伞者比赛手册中详细介绍了 USPA 裁判评级程序和裁判培训课程。

3-3 奖项 Awards

USPA presents awards to members in recognition of their accomplishments in skydiving.

USPA 颁发奖项给会员, 以表彰他们在跳伞方面的成就。

Service Awards

服务奖

USPA reserves its service awards for special USPA members whose contributions to the organization and the sport meet the awards' criteria. These awards include the Gold Medal for Meritorious Service, the Lifetime Achievement Award, the Regional Achievement Award and the Chesley H. Judy Safety Award. The committee also selects nominees for several international skydiving awards, including those for awards given by the Fédération Aéronautique Internationale and National Aeronautic Association.

USPA 将服务奖项授予那些为协会及跳伞运动做出符合奖项标准的贡献的杰出会员。这些奖项包括 USPA 服务金奖、终身成就奖、区域成就奖以及 Chesley H. Judy 安全奖。委员会还推选国际跳伞奖项的候选人, 包括国际航空运动联合会和美国国家航空协会颁发的奖项。

Service awards recognize excellence in areas such as safety, innovation, instruction, and community involvement. Member participation is essential in identifying individuals who deserve these honors. By nominating fellow skydivers, you can help ensure that their contributions and dedication are recognized and preserved in USPA history. USPA accepts nominations annually at uspa.org/awards.

服务奖项旨在表彰在安全、创新、教学和社区参与等领域的卓越表现。会员的积极参与对发掘值得获此殊荣的人选至关重要。通过提名其他跳伞者, 你可以帮助确保他们的贡献与奉献精神得到认可, 并载入 USPA 史册。USPA 每年在 uspa.org/awards 接受提名申请。

The **USPA Lifetime Achievement Award** is perhaps the most respected honor offered by the United States Parachute Association. It was originally conceived and created in 1970 as a result of an initial gift of \$3,000 from an anonymous donor. The sum was eventually enlarged to a total of \$30,000 over a period of years and the funds were placed on deposit with the National Aeronautic Association, which agreed to administer them on behalf of the United States Parachute Association for the purpose of underwriting the cost of a variety of perpetual competition trophies, as well as the Lifetime Achievement Award. The fund ceased to exist in 1982 when the final money available was used to construct the floor-to ceiling display cases at USPA's Headquarters in Alexandria, Virginia. The agreement signed on May 13, 1970, between Attorney John Kerr Wilson, acting for the anonymous donor; National Aeronautic Association Executive Director General Brooke E. Allen, acting for the National Aeronautic Association; and Dr. Edward A. Fitch, president of the United States Parachute Association, acting for USPA, stipulates (among other things) that at any time on or after May 13, 1975, the anonymous donor may identify himself and direct that any and all awards created through his gift carry his name. To date the anonymous donor has not seen fit to exercise this privilege.

USPA 终身成就奖也许是 USPA 颁发的最受尊敬的荣誉，该奖项最初在 1970 年被构想和创建，缘由是一位“匿名捐赠者”捐赠的 3000 美元。这一数额在接下来的几年里扩大到 3 万美元，这些资金存入美国国家航空协会，该协会同意代表 USPA 管理这些资金，以便为各种长期比赛的奖励以及 USPA 终身成就奖提供资金。该基金在 1982 年被解散，当时可用的最后一笔资金被用于在弗吉尼亚州亚历山大市的 USPA 总部建造一个从地板延伸到天花板的陈列柜。1970 年 5 月 13 日，代表“匿名捐赠者”的律师 John Kerr Wilson、代表美国国家航空协会的美国国家航空协会执行主任 Brooke E. Allen 将军，以及代表 USPA 的 USPA 总裁 Edward A. Fitch 博士签署协议，规定（本段内容为协议的各项条款中的其中一项）自 1975 年 5 月 13 日起，“匿名捐赠者”可在任意时候选择亮明自己的身份，并指示通过其“礼物”设立的任何和所有奖项上都包含他的名字。迄今为止，“匿名捐赠者”未行使这一特权。

The May 13, 1970, agreement, as accepted by USPA, describes the award itself and the qualifications required of recipients, using this language:

USPA 所接受的 1970 年 5 月 13 日的协议使用以下文字描述了该奖项和获奖者所需的资格。

"To provide a bowl or other suitable trophy to be known initially as 'The United States Parachute Association Achievement Award' [renamed 'USPA Lifetime Achievement Award' in July, 2004], which shall be perpetual and will be awarded annually to an expert active or retired sport parachute jumper in recognition of outstanding sportsmanship, skill, or personal contribution to the sport of parachuting and the United States Parachute Association, its goals and purposes. The recipient of such award will be selected by the board of directors by a majority vote during a closed regular or special meeting. In the event a majority of the board of directors cannot agree upon a recipient of such award on account of a lack of preeminence of the sport parachutist in any one year, the award will be made at least once each two years. Such trophy will be kept permanently in an appropriate location to be determined by the board of directors."

“为‘USPA 成就奖’（2004 年 7 月更名为‘USPA 终身成就奖’）提供奖杯或其他合适的奖励，持续性地每年颁发给一名现役或退役的运动跳伞专家，表彰其体育精神、技能，或为跳伞运动、为 USPA 及其目标和宗旨做出的个人贡献。获奖者将由董事会在非公开的定期或特别会议上根据多数票选出。如果在任何一年内，由于缺少表现特别杰出的跳伞者，董事会不能就获奖者达成多数一致，则该奖项应至少每两年颁发一次。该奖杯将永久保存在董事会决定的合适的地方。”

The trophy itself is a sterling silver bowl, 15 inches in diameter, seated on an octagonal teakwood base which bears carved wooden replicas of the USPA emblem on four faces and sterling silver plates listing the names and qualifications of recipients of the award on the other four faces. Traditionally, each year the recipient receives a smaller, eight-inch diameter replica sterling-silver bowl as his or her personal possession.

奖杯本身是一个直径 15 英寸的纯银碗，银碗在一个八角形的柚木底座上，底座其中四个面上刻有 USPA 会徽，另外四个面上有纯银标牌，标牌上刻有获奖者的姓名和获奖资格。传统上，获奖者每年会收到一个较小的、直径为 8 英寸的纯银碗，作为他或她的个人物品。

Traditionally, the award is made for the year prior to the year in which it is presented. While the deed of gift requires that the award be given only to an individual, in 1974, the presentation was made to the United States Army Parachute Team and in 2024 to Arizona Airspeed, which suggests that the language in the deed is usable more as a guideline than as a strict requirement.

传统上，奖杯是在颁发前一年制作的。虽然奖项要求只授予个人，但 1974 年的奖项是向美国陆军降落伞队授予的，这表明协议中的表述更多是指导性的，而不是作为严格要求。

The Membership Services Committee and the board has usually regarded the statement, "In recognition of personal contribution to the United States Parachute Association, its goals and purposes" as an overriding requirement (i.e., achievements in sport parachuting unrelated to the United States Parachute Association would normally not be considered sufficient to qualify a recipient, lacking specific contributions to USPA).

会员服务委员会和董事会通常将“为 USPA 及其目标和宗旨做出的个人贡献”这个表述视为最重要的要求（即与 USPA 无关的跳伞运动方面成就通常被认为不足以满足获奖资格，因为缺乏对 USPA 的具体贡献）。

While the deed of gift states that the award must be made at least once every two years, neither in 1991 nor in 1992 was a recipient named, thereby again suggesting that this particular language serves more as a guideline than as a requirement.

虽然奖项规定，必须至少每两年颁发一次，但 1991 年和 1992 年都没有指定获奖者，这再次表明，协议中的相关表述更多是指导性的，而不是作为严格要求。

No current member of the USPA Board of Directors may be recommended for the USPA Lifetime Achievement Award during his or her term as a member of the board. In practice, this requirement has been extended to forbid a nomination for at least two full years after the end of board service. It is enlarged to include as ineligible current or former USPA employees, also until at least two years after their employment ends.

USPA 董事会现任成员在其担任董事期间不得被推荐获得 USPA 终身成就奖。在实践中，这一时间要求已经延长到董事会任期结束后至少两年内不能被提名。其范围也被扩大到包含无上述资质的现 USPA 员工或前 USPA 员工，他们也是直到服务期结束后至少两年内不能被提名。

The USPA Gold Medal for Meritorious Service was established on July 13, 1997, by the USPA Board of Directors. The award is given to no more than three recipients per year, in the form of a struck-brass medal that measures three inches in diameter, weighs approximately five ounces and is slotted at the top for attachment of a 30-inch gold fabric ribbon. On permanent display at USPA Headquarters is a large wooden plaque measuring two feet by six feet and adorned with an exact replica of the medal along with brass metal strips bearing the name of each recipient and the year awarded.

USPA 服务金奖由 USPA 董事会于 1997 年 7 月 13 日设立。该奖项每年颁发给不超过三名获奖者，奖品形式为一枚直径为 3 英寸、重约 5 盎司、顶部开槽的黄铜打制奖章，奖章顶部有一个 30 英寸的金色织带。在 USPA 总部永久性展示的是一块两英尺乘四英尺的大木牌，上面装饰着奖章的精确复制品，以及印有每位获奖人姓名和获奖日期的黄铜金属条。

The USPA Gold Medal for Meritorious Service honors outstanding USPA members who, by their efforts over a period of years, have made significant contributions to the skydiving community. Each recipient must be or have been a USPA member and been active in sport parachuting for at least 20 years in the areas of, but not limited to judging, instruction, jumpmastering, photography (still and video), competition, and safety.

USPA 服务金奖是为了表彰那些通过多年努力为跳伞界做出重大贡献的杰出 USPA 会员。获奖者必须是 USPA 会员，并在跳伞运动领域活跃至少 20 年，范围包括但不限于裁判、教学、跳伞指导、摄像（电影和视频）、赛事和安全等方面。

No current member of the USPA Board of Directors may be considered for the award and no past member of the board of directors of USPA may be considered for the award until at least two years after retiring from the board. No current employee of USPA may be considered for the award and no past employee of USPA may be considered for the award

until at least two years after leaving USPA employment.

USPA 董事会的现任成员不在该奖项考虑范围内，USPA 董事会的前成员在从董事会退休后至少两年内也不在奖项考虑范围内。USPA 现员工或离开 USPA 不到两年的前员工也均不在该奖项考虑范围内。

The USPA Regional Achievement Award honors an outstanding member of a USPA region who, by their efforts over a period of time or one outstanding act, has made a significant contribution to that region's skydiving community. The award is presented in the form of a certificate to a total of no more than five recipients per year.

USPA 区域成就奖是为了表彰 USPA 各下属区域的杰出会员，他们通过长时间的努力或某项亮眼成绩，为该区域的跳伞圈做出了重大贡献。该奖项每年以证书的形式颁发给不超过 5 名获奖者。

No current member of the USPA Board of Directors may be considered for the award and no past member of the USPA Board of Directors may be considered for the award until they have been off the board for at least two years. No current employee of USPA may be considered for the award and no past employee of USPA may be considered for the award until at least two years after leaving USPA employment.

USPA 董事会的现任成员不在该奖项考虑范围内，USPA 董事会的前成员在从董事会退休后至少两年内也不在奖项考虑范围内。USPA 现员工或离开 USPA 不到两年的前员工也均不在该奖项考虑范围内。

The USPA Chesley H. Judy Safety Award was created in 2004 to honor members who had promoted skydiving safety. The USPA Board determined that the award was consistent with the original intent of the Ches Judy Safety Fund established in 1997 to honor the memory of Ches Judy, former USPA Director of Safety and Training, who was killed in a skydiving plane crash two years earlier. Distribution of the fund was in abeyance pending the development of a suitable safety-related program.

Chesley H. Judy 安全奖于 2004 年设立，以表彰在跳伞运动中促进安全水平的会员。USPA 董事会认为该奖项与 1997 年设立的 Ches Judy 安全基金的初衷一致，该基金是为了纪念两年前在一次跳伞坠机事故中遇难的前 USPA 安全和培训董事 Ches Judy。当时，在合适的安全相关程序被确定之前，该基金的分配暂时搁置。

USPA Headquarters developed the certificate, which is available at no charge to each drop zone to honor the local USPA member who is most deserving of the award. The award is to be presented on USPA Safety Day in conjunction with the other planned activities for the annual event.

USPA 总部设计了该证书，可免费提供给每个跳伞基地，以表彰当地最值得获得该奖的 USPA 会员。该奖项将与年度活动的其他活动一起在 USPA 安全日颁发。

The selection for the award recipient should be based on the previous year's actions or accomplishments of any current USPA member who, through example, deed, training, or innovation, had promoted safe skydiving in a substantive way. The USPA S&TA in consultation with the drop zone owner selects one individual from the drop zone to which the award is appointed based on the above criteria.

获奖者的评选应以 USPA 任何现任会员前一年的行为或成就为依据，这些会员通过例如善举、教学或创新等方式，实质性地推动了跳伞的安全发展。USPA 安全和培训顾问与跳伞基地所有者协商，根据上述标准从跳伞基地中选择一名个人授予该奖项。

The S&TA should request a certificate from headquarters either online or by email to safety@uspa.org. The request should include the correctly spelled name of the recipient and the name of the drop zone. USPA will provide the completed certificate to the requesting S&TA for presentation during that year's Safety Day activities.

安全和培训顾问以在线形式或通过发送电子邮件至 safety@uspa.org 向总部申请证书。申请内容应包括正确拼写的获奖者姓名和跳伞基地的名称。USPA 将向提出申请的安全和培训顾问提供制作完成的证书，以在当年的安全日活动中进行颁奖。

Achievement Awards

成就奖

USPA members earn achievement awards by accumulating significant levels of experience. For number of freefall jumps, USPA issues Jump Wings in 1,000-jump increments and, for amount of freefall time, Freefall Badges in 12-hour increments.

积累了可观的跳伞经验的 USPA 会员可获得成就奖。在跳数上，专家之翼奖（Expert Wings）奖励自由落体跳伞累计 1000 跳，以及 1000 跳以上整千跳数的跳伞者。在自由落体时间上，每累积一次 12 小时自由落体就可以获得自由落体徽章。

Performance Awards

能力表现奖

USPA issues canopy performance awards for accomplishments in canopy formation skydiving. These include the 4-Stack Award, CCR (Canopy Crest Recipient) or 8-Stack Award, and CCS (Canopy Crest Soloist) Award, and include night versions of each.

USPA 颁发降落伞编队奖以表彰在降落伞编队方面的成绩，奖项包括四伞堆叠式（Stack）编队奖、CCR（编队徽章奖）或八伞堆叠式编队奖、CCS（编队徽章个人奖），以及这些奖项的夜跳版本。

Tenure Certificates

资深会员证书

Upon request, USPA issues tenure certificates to acknowledge membership in USPA for significant periods of time, beginning at 10 years of USPA membership and for each five-year increment thereafter.

USPA 在收到请求后可颁发资深会员证书，以表彰长期的 USPA 会员，从 USPA 会员会籍满 10 年开始可颁发，之后每满 5 年可颁发一次。



Sportsmanship Award

运动精神奖

USPA established the **Ted Strong Award for Extraordinary Sportsmanship** in 2012 to honor extraordinary sportsmanship displayed by teams or individuals at a USPA National Championships. For further information, see USPA National Skydiving Championships General Competition Rules in the Skydiver's Competition Manual.

USPA 于 2012 年设立 **Ted Strong 杰出运动精神奖**，用于表彰在 USPA 全国锦标赛中展现出卓越运动精神的队伍或个人。该奖项的更多信息请参见跳伞者比赛手册中的 USPA 全国锦标赛一般比赛规则。

For more details on these awards, visit uspa.org/awards.

这些奖项的更多信息请见 uspa.org/awards。

FAI and NAA Awards

国际航空运动联合会（FAI）和美国国家航空协会（NAA）的奖项

Nominations for Fédération Aéronautique Internationale and National Aeronautic Association awards go through the Membership Services and Competition Committees of the USPA Board of Directors for endorsement, then to USPA Headquarters for submission to the NAA.

国际航空运动联合会及国家航空协会的奖项提名需经 USPA 董事会会员服务与比赛委员会背书，再提交至 USPA 总部，由其转呈国家航空协会。

Fédération Aéronautique Internationale General Awards

国际航空运动联合会 (FAI) 一般奖项

The Paul Tissandier Diploma is awarded to those who have served the cause of aviation in general and sporting aviation in particular, by their work, initiative, devotion, or in other ways. Each year, the United States may submit the names of up to three candidates.

PAUL TIS-SANDIER 证书授予那些通过工作、主动性、奉献精神或其他方式为通用航空和航空运动事业服务的人。美国每年最多可以提交三名候选人的名字。

The FAI Honorary Group Diploma, as its name implies, may be awarded to groups of people (design offices, scientific bodies, aeronautical publications, etc.) that have contributed significantly to the progress of aeronautics or astronautics during the previous year or years. Each year, an FAI member may submit the names of two candidates, one for aeronautics and one for astronautics.

FAI 团体荣誉奖, 顾名思义, 颁发给在过去一年或几年中对航空或航天事业的进步做出重大贡献的团体 (设计办公室、科学机构、航空出版物等)。FAI 成员每年可以提交两个候选者的名字, 一个是航空领域的, 一个是航天领域的。

The FAI Gold Parachuting Medal may be awarded annually for an outstanding accomplishment in connection with parachuting, in the realm of sport, safety, or an invention. The medal was created by an endowment fund provided by Mr. J.A. Istel, President of Honour of the FAI Parachuting Commission.

FAI 跳伞金奖每年颁发一次, 以表彰在跳伞的运动方面、安全方面或发明方面的杰出成就。奖章是由 FAI 跳伞委员会荣誉主席 J.A. Istel 先生提供的捐赠基金设立的。

The Leonardo da Vinci Diploma is awarded to a parachutist who has any one of the following:

达芬奇证书颁发给有下列任何一项成就之一的跳伞者:

- been at least twice an individual champion or a member of a champion team at a first-category event
至少两次在一类赛事中获得个人冠军或是团体冠军的成员
- established at least three world parachuting records
至少三次创造世界跳伞纪录
- have been at least three times an FAI/IPC official at a first-category event (Chief Judge, FAI Parachuting Judge, FAI Controller, International Jury Member or any combination thereof)
至少三次在一类赛事中担任 FAI 或国际跳伞委员会 (IPC) 官员 (首席裁判、FAI 跳伞裁判、FAI 管理员、国际裁判委员会成员, 或上述职位的任何组合)
- have been at least three times a competition director at a first-category event
至少三次担任一类赛事的赛事总监
- have been for at least six years the chair of an IPC Committee (IPC Internal Regulations 6.7) or an IPC Bureau Member or any combination thereof
至少担任过六年 IPC 主席 (IPC 内部条例 6.7) 或 IPC 办事处成员, 或两者的任何组合

The Faust Vrančić Medal was established in memory of the first person to construct a functioning parachute and is awarded annually for technical innovation or achievement in parachuting. It cannot be awarded to delegates to the FAI Parachuting Commission.

Faust Vrančić 奖章是为纪念首位成功研制出实用降落伞的发明者而设立, 每年颁发一次, 旨在表彰跳伞运动领域的技术创新或杰出成就。该奖项不得授予国际航空运动联合会跳伞委员会的代表成员。

The Sabiha Gökçen Medal is awarded to the woman who performs the most outstanding achievement in any air sport in the previous year. It was created in 2002 upon a proposal from Turk Hava Kurumu, and is supplied by the Turkish NAC. Sabiha Gökçen, winner of the FAI Gold Air Medal, was Turkey's first woman pilot and, in 1937, became the world's first female military pilot. She was an inspiration to women pilots.

SABIHA GÖKÇEN 奖章颁发给上一年在任何航空运动中获得最突出成就的女性。该奖于 2002 年应土耳其航空协会 (THK) 的提议而设立, 由土耳其国家航空运动管理组织 (译者注: 即土耳其航空协会) 提供。Sabiha Gökçen 是 FAI 航空金奖获得者, 她是土耳其第一位女飞行员, 并在 1937 年成为世界上第一位女性军队飞行员。她是女飞行员的榜样。

Refer to www.fai.org/page/civa-awards and naa.aero/awards for the most up-to-date information. FAI parachuting awards are subject to approval by the FAI Parachuting Commission.

请访问 www.fai.org/page/civa-awards 和 naa.aero/awards 获取最新信息。国际航空运动联合会跳伞奖项需经国际航空运动联合会跳伞委员会批准。

National Aeronautic Association Service Awards

美国国家航空协会 (NAA) 服务奖

The Frank G. Brewer Trophy, awarded annually, is given to an individual, group or organization for significant contributions of enduring value to aerospace education in the United States. The nomination period is open from May 1 through August 31 every year.

FRANK G. BREWER 奖每年颁发一次, 授予个人、团体或组织, 以表彰他们对美国航空航天教育做出的具有持久价值的重大贡献。提名期限是每年 5 月 1 日至 8 月 31 日。

The Wesley L. McDonald Distinguished Statesman and Stateswoman of Aviation Awards honor outstanding Americans who, by their efforts over a period of years, have made contributions of significant value to aeronautics and have reflected credit upon America and themselves. The nomination period is open from May 1 through August 31 every year. A nominee must:

WESLEY L. MCDONALD 航空界元老奖授予在过去几年中努力为航空事业做出了重大贡献, 为美国和他们自己带来了荣誉的美国人。提名期限是每年 5 月 1 日至 8 月 31 日。被提名人需满足以下要求:

- be a living citizen of the U.S who has for at least 25 years been actively identified with aeronautics and has made contributions of significant value to aeronautics;
是在世的美国公民, 至少 25 年来一直积极支持航空业, 并为航空业做出高价值贡献;
- have exhibited qualities of patriotism, integrity, and moral courage worthy of emulation;
具有这些值得学习效仿的品质: 爱国、正直、道德勇气。
- be well and favorably known as a person of ability and character.
以其能力和品格而享有盛名。

Refer to naa.aero/awards for the most up-to-date information.

请访问 naa.aero/awards 获取最新信息。

第四章 对所有人的建议

Recommendations for Everyone

This section provides USPA's recommendations for skydiving that apply to all jumpers, regardless of discipline or experience. USPA updates them as equipment and techniques change.

本章提供 USPA 对所有跳伞者的跳伞建议，不限跳伞类型或经验水平。随着装备和技术的更新，USPA 会相应更新这些建议。

4-1 跳伞紧急情况 Skydiving Emergencies

A. Types of Emergencies

紧急情况的分类

Types of skydiving emergencies include those occurring in aircraft, during freefall, on deployment, during canopy flight, and on landing.

跳伞紧急情况包括发生在飞机内、自由落体阶段、开伞时、降落伞飞行阶段以及着陆时的各类紧急情况。

B. Prevention and Preparation

预防与准备

Regular, periodic review, analysis, and practice of emergency procedures prepares you to act correctly in response to problems that arise while skydiving:

定期回顾、分析并练习紧急程序能让你在面对跳伞突发状况时做出正确反应：

Annually, review all aircraft-, deployment-, and landing-emergency procedures using appropriate training aids.
每年都要全面复习飞机紧急程序、开伞紧急程序及着陆紧急程序，复习时可借助培训辅助工具。

Monthly, dedicate a clear-and-pull or high-pull jump to practicing canopy-flight-emergency-procedure skills.
每月安排一次净空开伞或高开，专门用于练习降落伞飞行紧急程序。

Before each jump, review the procedures for both avoiding and responding to emergency situations. Long periods between jumps not only dull skills but heighten apprehensions.
每次跳伞前，都要复习避免紧急情况和应对紧急情况的程序。长时间不跳伞不仅会让技能生疏，还会增加紧张感。

At every reserve repack, practice your reserve emergency procedures on the ground. Simulate some type of main malfunction, then cut away and deploy the reserve. This practice will provide you with first-hand knowledge about the potential pull forces and direction of pull on your gear.
每次重新叠备伞前，在地面练习备伞紧急程序。在地面模拟某种主伞故障，然后切伞并开备伞。这种练习能让跳伞者实际感受在自己的装备上拉动把手所需的力量以及把手的拉动方向。

Proper preparation and responsible judgment greatly reduce the probability of encountering an emergency, but even with the greatest care, they may occasionally occur. Anticipating and being prepared to respond to various emergencies makes skydiving safer. One of the greatest causes of fatal incidents in skydiving is failure to effectively deal with an emergency situation.

充分的准备和负责任的判断能极大降低遭遇紧急情况的概率，但即便万分谨慎，紧急状况仍可能偶发。预判各类紧急情况并做好应对准备，能让跳伞运动更安全。跳伞事故中致死率最高的原因之一，正是未能有效应对紧急情况。

Doing the following reduces risk:

以下措施可以减少风险：

- Acquiring accurate knowledge
学习准确的知识
- Jumping only in suitable conditions
只在合适的条件下跳伞
- Evaluating the risk factors
评估风险因素
- Knowing your personal limitations
了解个人局限
- Keeping your options open
保持对各种选项的开放态度
- Respecting your decision altitude
尊重你的决断高度
- Adhering to the 1,000-foot cutaway hard deck
遵守 1000 英尺切伞硬甲板高度

Survival Skills

生存技能

Altitude Awareness: Check your altimeter every 5 seconds (approximately 1,000 feet of freefall), every time you complete a maneuver, anytime you encounter difficulty, and if you simply do not know your altitude.

高度意识: 每 5 秒检查一次高度表 (约每下落 1000 英尺), 每次完成一个机动动作后, 或者遇到困难时, 或者不确定当前高度时都需立即检查高度。

Pull Priorities: The number-one priority on any skydive is to pull. You can pull at any time during the skydive when encountering difficulty. The second priority is to pull at the assigned altitude, and the third priority is to preferably pull in a stable body position. A stable, face-to-earth body position improves opening reliability but is secondary to opening at the assigned altitude. Always prioritize altitude over stability.

开伞优先事项: 在任何跳伞中, 第一优先事项是开伞。当遇到困难或意外情况时, 你可以在跳伞的任何时间开伞。第二优先事项是在指定高度开伞, 第三优先事项是尽量在稳定的身体姿态下开伞。稳定的面朝下姿态可以提高开伞的可靠性, 但在指定高度开伞的重要性低。高度永远比稳定性重要。

Canopy Right-of-Way Rules: Look before you turn. Turn right to avoid other jumpers. The lower jumper has the right-of-way.

降落伞优先通行权规则: 转向前必须先观察。右转以避免撞上其他跳伞者。高度较低的跳伞者拥有优先通行权。

Landing Priorities: The number-one landing priority is to land with the wing level while flying in a straight line. The second landing priority is to land in a clear and open area, avoiding obstacles. The third landing priority is to flare, always being prepared to PLF. Remember: Landing with a level wing is a higher priority than landing in a clear and open area.

着陆优先事项: 着陆的第一优先事项是以伞翼水平、直线飞行的状态着陆。第二优先事项是选择开阔的区域着陆, 避开障碍物。第三优先事项是执行拉平并随时准备好 PLF。切记: 以伞翼水平的状态着陆的优先级高于在开阔无障碍的区域着陆。

Land with a level wing, even if you need to make a flat turn to avoid an obstacle. Land in a clear and open area, even if it is farther from the drop zone. To avoid injury, always flare the parachute before touchdown with your feet and knees together, prepared for a PLF.

即使需要通过平转来避开障碍物, 也必须在伞翼水平的状态下着陆。备降时, 要选择开阔无障碍的区域, 即使离跳伞基地较远。为防止受伤, 触地前务必拉平, 双脚和双膝并拢, 随时准备好 PLF。

C. Aircraft Emergencies

飞机紧急情况

Each skydiving center should establish and review procedures for all possible aircraft emergencies. Every pilot and non-student jumper should thoroughly understand these procedures. All students should take direction from their instructor(s). All licensed jumpers should take direction from the pilot.

每个跳伞中心都应建立并审查所有可能发生的飞机紧急情况的应对程序。每位飞行员和非学生跳伞者都应彻底了解这些程序。所有的学生都应听从教练指示。所有持证跳伞者都应听从飞行员指示。

D. Freefall Collisions

自由落体阶段的碰撞

Jumpers face danger of collision when exiting in a group or when they lose track of each other when exiting on the same pass. Taking into account horizontal and vertical movement, the difference in speed between jumpers may reach upward of 150 mph. You must take precautions to prevent a collision with freefalling jumpers during and after opening.

团体出舱或同一批次出舱的跳伞者，如果找不到彼此的踪迹，就有碰撞的危险。考虑到水平和垂直方向上的运动，跳伞者之间的速度差可以达到 150 英里/小时以上。你必须采取预防措施，防止在开伞期间和开伞后与自由落体中的跳伞者发生碰撞。

E. Deployment Emergencies

开伞紧急情况

Parachute Malfunctions (General)

降落伞故障（一般）

Most malfunctions trace to three causes:

大多数故障都源于三个原因：

1. poor or unstable body position during parachute deployment
开伞时身体姿态不良或不稳定
2. equipment failure
装备故障
3. improper or careless packing
叠伞不当或粗心的叠伞

Refer to Category A of the Integrated Student Program for specific, basic procedures for dealing with parachute malfunctions. Licensed jumpers may need to adjust procedures to accommodate different techniques, equipment, and personal preferences. Using safety devices, such as a reserve static line (RSL), preferably with a main-assisted-reserve-deployment (MARD) system; and an automatic activation device (AAD) can significantly reduce risk when encountering malfunctions.

请参阅综合学生计划 A 单元中应对降落伞故障的具体基本程序。持证跳伞者可能需要根据不同的技能、装备及偏好来调整相关程序。使用安全装置，如 RSL（最好配有主伞辅助备伞开伞系统——MARD）和 AAD，能显著降低发生故障时的风险。

You can prepare for emergencies by thinking through possible scenarios, having a plan in mind, and practicing reacting correctly. You should decide upon and take the appropriate actions by a predetermined altitude that should be no lower than 2,500 feet for students and A-license holders and no lower than 2,000 feet for B- and C-license holders. D-license holders should establish their **decision altitude** for themselves based on their experience and equipment.

通过预想可能的情景、制定应对方案并反复练习正确的应对措施，可有效为紧急情况做好准备。你应在下落至一个预先设定的高度之前做出决断并实施正确的行动，对于学生与 A 执照持有者，该高度应不低于 2500 英尺，对于 B 执照和 C 执照的持有者则应不低于 2000 英尺。D 执照持有者则需根据自身经验与所用装备确定其**决断高度**。

Reserve Activation

备伞的激活

Reserve pilot chutes contain a metal spring in the center, which adds to their weight. During a stable, belly-to-earth reserve deployment, the reserve pilot chute can remain in the jumper's burble for several seconds, delaying reserve deployment. Immediately after pulling the reserve handle, look over your right shoulder while twisting your upper body upward to the right or sit up in a slightly head-high orientation to change the airflow behind your container to help the reserve pilot chute launch into clean air.

备伞引导伞中间安装了一个金属弹簧，该弹簧增加了备伞引导伞的重量。采取稳定的腹部朝下的身体姿态打开备伞时，备伞引导伞可能会在跳伞者上方的尾流中停留几秒钟，从而延迟备伞的打开。拉出备伞把手后，应立即看向右肩后方，同时将上半身向右上方扭动，或以头部略朝上的姿态坐起来，以改变伞包后方的气流，这样有助于让备伞引导伞飞入顺畅的气流中。

Most harness-and-container manufacturers secure the steering toggles to reserve risers using touch fasteners (e.g., Velcro), which will firmly hold the toggles in place. Be sure to peel the Velcro before attempting to pull the toggles free from the risers to unstow the brakes.

大多数背带和伞包制造商使用接触式固定装置（如魔术贴）将刹车固定在备伞组提带上，这样可以将刹车牢牢固定在位。在尝试将刹车与组提带分开以释放刹车之前，一定要剥离魔术贴。

There are two categories of malfunctions:

降落伞故障分为两大类：

1. total malfunction: the main pin is not out; parachute is not activated or is activated but not deploying; the container is closed
完全故障：主伞关包针未脱出；或降落伞未被激活，或降落伞已被激活但没有飞出伞包；或伞包无法打开
2. partial malfunction: the main pin is out; parachute is deployed but is not landable; the container is open
部分故障：主伞关包针已脱出；或降落伞已飞出伞包，但无法用于安全着陆；或伞包处于打开状态

Total Malfunction

完全故障

A total malfunction includes deployment-handle problems such as being unable to locate the main handle, a hard pull, a container lock, and a pilot chute in tow. You should attempt to solve the problem only when altitude permits and should make no more than two attempts or take no more than five additional seconds to solve the problem.

完全故障包括开伞把手的问题（例如无法找到或拉出主伞开伞把手）、伞包无法打开，以及引导伞拖拽的情况。仅当有足够高度时你才应尝试解决问题，且尝试次数不得超过两次，耗时不超过 5 秒。

Procedures:

应对程序：

- When no main pilot chute deploys (e.g., cannot find handle or hard pull), deploy the reserve.
如果无法释放主伞引导伞（例如，开伞把手摸不到或卡住），则应开备伞。
- For a pilot-chute-in-tow malfunction, there are currently two common and acceptable procedures, both of which have pros and cons. Seek guidance from an instructor to plan your training and ensure you're prepared before you jump.
对于引导伞拖拽故障，目前有两种常见的可接受的处理程序，这两种程序各有利弊。请咨询教练制定培训计划，并确保跳伞前做好充分准备。
 - **Pilot-chute-in-tow procedure 1:** Pull the reserve immediately. A pilot-chute-in-tow malfunction is associated with a high descent rate and requires immediate action. The chance of a main-reserve entanglement is slim, and you could lose valuable time and altitude by initiating a cutaway before deploying your reserve. Be prepared to cut away. The main may deploy after the reserve is open, so be prepared for a two-out scenario.
引导伞拖拽应对程序一：立即开备伞。发生引导伞拖拽故障的时候跳伞者的下降速率很高，需要立即采取措施。主

伞与备伞发生缠绕的概率很小，在开备伞之前切伞可能会浪费宝贵的时间和高度。但也要为切伞做准备。主伞可能会在备伞打开后展开，因此要准备好应对双伞情形。

- **Pilot-chute-in-tow procedure 2:** Cut away, then immediately deploy the reserve. Because there is a chance the main parachute could deploy during or as a result of the reserve activation, a cutaway might be the best response in some situations.

引导伞拖拽应对程序二：先切伞再立即开备伞。因为主伞有可能在开备伞的过程中展开或由于备伞的激活而展开，所以在某些情况下，切伞可能是最好的处理措施。

Partial Malfunction

部分故障

Deployment or partial deployment of the main parachute characterizes a partial malfunction. This includes pilot-chute entanglement, premature deployment, bag-lock, streamer, line-over, tension knots, major or unlandable canopy damage, and other open-canopy malfunctions.

部分故障的特征是降落伞已从伞包中出来或仅部分从伞包中出来。部分故障包括引导伞缠绕、伞包意外过早打开、D 包锁死、降落伞完全不充气、线翻越、伞绳张力结、程度严重或致使不能用于安全着陆的降落伞损坏，以及其他打开的降落伞的故障。

Emergency Procedures

紧急程序

The recommended procedure for responding to partial malfunctions is to **cut away the main parachute before deploying** the reserve. However, if you are below your cutaway hard deck of 1,000 feet, where it's too low for a safe cutaway, you must **deploy the reserve and land both parachutes**. Also, consider the operating range of the AAD when determining your personal malfunction-response altitudes.

部分故障的建议应对程序是**切主伞然后开备伞**。但是，如果你低于 1000 英尺切伞硬甲板高度，这时高度已经太低以致无法安全切伞，你必须**开备伞然后带着两个降落伞着陆**。此外，在确定你个人的故障处理高度时，应注意 AAD 的工作范围。

Premature Main-Container Opening

主伞伞包意外过早打开

A premature main-container opening happens when the main pin is dislodged, allowing the container to open and the bag to come out, but the main pilot chute is still stowed.

主伞伞包意外过早打开是指主伞关包针松脱，导致伞包打开，D 包脱出，但此时主伞的引导伞仍未释放。

You can **prevent** a premature main-container opening by inspecting your closing loop regularly and asking for a pin check before exit. Move carefully in the aircraft and avoid your rig contacting the door frame during the climb-out and exit.

预防主伞伞包意外过早打开的措施包括：定期检查关包绳，出舱前请其他跳伞者帮忙检查关包针等部件，在机舱内移动时保持谨慎，爬出机舱及出舱过程中避免装备触碰舱门的门框。

The recommended **procedure** is to first attempt to throw the main pilot chute; however, finding the pilot chute may be difficult after the bag is out of the container. Attempt to find the pilot chute twice or for 5 seconds. If that fails, cut away and deploy the reserve. If you are able to deploy the pilot chute, be prepared to execute emergency procedures as the main may not come out of the bag.

建议的应对**程序**是先尝试抛出主伞的引导伞，但需注意，D 包脱离伞包后，引导伞可能难以找到。寻找引导伞的尝试不应超过两次，时间不超 5 秒。若未成功，应立即切伞并开备伞。若成功释放引导伞，需做好执行紧急程序的准备，因为主伞不一定能从 D 包中脱出。

Two Canopies Out

双伞情形

Note: The following recommendations are drawn from experience with larger canopies during tests conducted in the mid-1990s. Smaller canopies may react differently and require a different response.

注：以下建议是从 1990 年代中期进行的试验中使用较大的降落伞的经验中得出的。较小的降落伞可能会有不同的反应，要求不同的处理方式。

Various scenarios can result in having both parachutes deploy with one of the following outcomes:

不同的情况可能会导致主伞和备伞都被打开，并产生以下结果之一：

- One canopy inflated, another deploying
一个降落伞已打开充气，另一个脱离了伞包
 - Attempt to contain the deploying canopy by stuffing it between your legs. If the second canopy's deployment is inevitable, disconnect the RSL if possible, wait for inflation, and evaluate the result.
尝试收住脱离伞包的伞，并将其塞入两腿之间夹住。如果无法阻止第二个降落伞展开，则断开 RSL（如有可能），待其充气，然后评估结果。
- Stable biplane
稳定的两伞一前一后的情形
 - Land both parachutes. Disconnect the reserve static line if altitude permits. If all toggles are stowed, leave them stowed. If any toggle is unstowed, unstow all of them. Steer using the rear risers of the front canopy only as necessary to maneuver for a safe landing. Land without flaring and perform a PLF.
应带着两个降落伞着陆。若高度允许，则断开 RSL。若所有刹车均未释放，则保持这样；若有任一刹车被释放了，则所有刹车都要释放。仅在必要范围内使用前伞的后组提带进行操控，以确保安全着陆。着陆时不拉平，执行 PLF。
- Stable side-by-side (choose one procedure):
稳定的两伞一左一右紧贴的情形（选择其中一个应对程序）：
 - **Side-by-side procedure 1:** Land both parachutes. Disconnect the reserve static line if altitude permits. If all toggles are stowed, leave them stowed. If any toggle is unstowed, unstow all of them. Steer using the rear risers of the dominant canopy (more overhead) only as necessary to maneuver for a safe landing. Land without flaring and perform a PLF.
两伞一左一右紧贴情形的应对程序一：带着两个降落伞着陆。若高度允许，则断开 RSL。若所有刹车均未释放，则保持这样；若有任一刹车被释放了，则所有刹车都要释放。仅必要范围内使用占主导地位伞（较为处于头顶正上方的伞）的后组提带进行操控，以确保安全着陆。着陆时不拉平，执行 PLF。
 - **Side-by-side procedure 2:** If both canopies are flying without interference and altitude permits, disconnect the reserve static line. Confirm the parachutes are completely separated from each other then cut away the main and steer the reserve to a normal landing.
两伞一左一右紧贴情形的应对程序二：若两伞互不干扰且高度允许，则断开 RSL。确认两伞完全没有缠绕后，切主伞，然后操控备伞正常着陆。
- Downplane or pinwheel (canopies spinning around each other)
主伞和备伞分处两边的情形，即“风车”旋转情形（两伞相互绕转）
 - Disconnect the reserve static line if altitude permits. Cut away the main canopy and steer the reserve to a normal landing.
若高度允许，断开 RSL。切主伞并操控备伞正常着陆。
- Main-reserve entanglement
主伞和备伞缠绕的情形
 - Although rare, main-reserve entanglements can occur in multiple configurations, making a single solution impractical. Land both parachutes. Never give up trying to clear the entanglement or inflate the parachutes. Recommended techniques include pulling in the less-inflated canopy, hand over hand, to contain it, or pumping the brakes or rear risers of both parachutes to increase their inflation. Try to make the parachutes fly straight

for landing. Prepare for and execute a PLF on landing.

主伞和备伞缠绕的情形虽罕见，但可能呈现多种缠绕形态，故无通用的应对方案。应带着两个降落伞着陆。切勿放弃尝试解开缠绕或让降落伞充气。建议的应对方式包括：双手交替收拉充气较少的伞，将其约束住，或者抽拉两伞的刹车或后组以让降落伞尽量充气。尽可能让降落伞沿直线飞行以着陆。准备并执行 PLF。

F. Canopy-Flight Emergencies

降落伞飞行紧急情况

A **canopy-flight emergency** is any canopy emergency that happens under a fully inflated parachute, anytime during the canopy descent or landing. **Canopy-flight emergency procedures (CEPs)** are a set of five skills used in response to a canopy emergency during a canopy descent or landing. Be prepared for unexpected situations with regular practice of these skills. (Stay alive, practice five.)

降落伞飞行紧急情况指降落伞完全充气后在下降或着陆过程中发生的任何紧急状况。**降落伞飞行紧急程序 (CEP)** 是由五项技能组成的技能集，用于应对降落伞下降或着陆过程中的降落伞飞行紧急情况。要通过定期练习这些技能来为突发状况做好准备。(练五项，保周全)

Canopy Collisions

降落伞碰撞

The best way to avoid a collision is **prevention**. You should know where other canopies are at all times. Most canopy collisions occur soon after deployment when two jumpers open too close to each other, or below 1,000 feet while in the landing pattern. Higher break-off altitudes, better planning and tracking farther can help ensure clear airspace during deployment. Every time you deploy your canopy, keep your eyes forward, looking for any jumpers deploying nearby who may open coming straight toward you. Steer with rear risers as soon as inflation allows. Fly perpendicularly to the aircraft line of flight until you have identified jumpers exiting after you. Remaining vigilant throughout the canopy descent and always looking in the direction of the turn before initiating it can help you identify and avoid other canopies during the descent. Canopy collisions are more likely to occur in the base leg of the landing pattern. Planning for a longer base leg promotes more predictability and visibility for everyone under canopy. **Practicing the CEP drills of rear-riser turns and turn reversals** monthly during a dedicated clear-and-pull or high-pull jump above decision altitude can build the proficiency needed to avoid a canopy collision.

做好预防措施是避免碰撞的最佳方式。你必须时刻掌握其他降落伞的方位。多数碰撞发生在开伞初期，即当两名跳伞者开伞间距过近时，或者发生在低于 1000 英尺的着陆航线高度。更高的分离高度、更优的规划、更长的 Tracking 距离有助于确保开伞空域净空。每次开伞时保持目视前方，警惕是否有在你附近开伞且可能朝你飞来的跳伞者。降落伞充气后立即用后组转向。保持垂直于飞机的飞行路线飞行，直至你确认了后续出舱的跳伞者的位置。在整个伞降阶段保持警觉，转弯前先观察想转的方向，这有助于发现并规避其他降落伞。在着陆航线的基线边（第二边）很容易发生碰撞。规划更长的基线边能提升所有降落伞的可预测性与可见性。每月都建议安排一次净空开伞或高开，专门用于在决断高度以上**练习包括后组转向和反向转弯在内的降落伞飞行紧急程序**，以提升避免碰撞的熟练度。

Canopy collisions and the events leading up to them can be complex, making it impossible to offer just one solution for every situation. The following are accepted **procedures** for the most common scenarios:

降落伞碰撞及其诱因可能很复杂，无法提供通用的应对方案。以下是常见情形的可接受的**应对程序**：

If the canopies are approaching each other head on, both canopy pilots should steer to the right unless it is obvious that steering left is necessary to avoid the collision (both jumpers are more offset toward the left).

如果两个降落伞即将迎面撞上，双方均应右转，除非明显需要左转避让（双方均更靠自己的左边飞行）。

If a **collision is inevitable**, place your left arm across your handles, turn your face away from impact, and spread your legs as wide as possible. If the upper jumper is lower than the bottom skin of the other canopy, that jumper should clear lines and fabric away from their body, harness and three-ring system, cross their legs and be the first to cut away if

altitude permits.

如果碰撞不可避免，应用左臂护住把手，面部转向一边避开冲击，双腿尽可能张开。若位于上方的跳伞者位置低于对方伞布的下表面，该跳伞者需清理干净缠绕在身体、背带及三环系统上的伞绳和伞布，交叉双腿，并在高度允许时先于对方执行切伞。

Entanglements after a Collision

碰撞后发生缠绕

If a **collision with the other jumper's suspension lines** is unavoidable, try to capture as many suspension lines as possible to keep from passing through them during the collision. A high-speed collision with suspension lines can lead to severe cuts and burns. Check your altitude with respect to the minimum cutaway decision and execution altitude recommended for your experience.

如果无法避免与另一跳伞者的伞绳碰撞，应挡住尽可能多的伞绳，以防在碰撞中穿过这些伞绳。高速状态下与伞绳发生碰撞可能导致严重的割伤和擦伤。要立即检查高度，确认当前高度是否高于或低于与你的经验水平相应的建议最低切伞决断和实施高度。

Communicate before taking action. During a cutaway following a collision, the jumper above can strike the jumper below unless one or both are clear or ready to fend off. The lower jumper can worsen the situation for the jumper above by cutting away before they are clear of lines or are ready. Remember, communication may be difficult if one or both jumpers are wearing full-face helmets.

采取行动前须先沟通。碰撞后切伞时，上方跳伞者可能撞到下方跳伞者，除非其中一方或双方都有充足的无阻碍的空间，或都准备好躲避。如果在没清理干净伞绳或没准备好的情况下，下方跳伞者就切伞，这会使上方跳伞者的情况恶化。需记住，当一方或双方有佩戴全盔时，沟通可能受阻。

If **both jumpers are cutting away** and altitude permits, the second jumper should wait at least 5 seconds until the first jumper clears the area below. The first jumper should fly from underneath in a straight line after opening.

如果双方均切伞且高度允许，第二切伞的跳伞者应等到第一切伞的跳伞者远离下方的区域后再切伞。第一切伞的跳伞者开伞后应沿直线飞行脱离第二切伞的跳伞者的下方。

If the upper jumper is **engulfed in the fabric** of the other jumper's canopy, the lower jumper should be the first to cut away if altitude permits. The upper jumper should clear the cutaway canopy from their face and their canopy's controls. Fly slowly to reduce inflation of the cutaway canopy. It is usually safer to keep the fabric on your body rather than risk having it inflate and downplane if all lines do not clear.

如果上方跳伞者**被对方伞布包裹**，在高度允许的情况下，下方跳伞者应先切伞。上方跳伞者需清理被切伞的降落伞，使其不遮挡面部，且不影响到自身降落伞的操控，并通过低速飞行来减少被切伞的降落伞的充气量。若无法清理掉所有伞绳，通常更安全的选择是让伞布附着在身上，以防止其充气并导致两伞分处两边相互绕转的情形。

At some point **below a safe cutaway altitude** (1,000 feet), it may become necessary for one or both jumpers to deploy their reserves (may not be a safe option with a single-operation system, aka SOS system). The lower jumper's reserve will usually deploy faster due to more airspeed and being clear of lines or fabric. If both reserves deploy, it may be necessary for the lower jumper to release the entanglement by cutting away after ensuring that both jumpers have a canopy to land. This is called a canopy transfer and can be successfully executed as low as 200 feet to save both jumpers from striking the ground in a downplane. If both jumpers are suspended under one flying canopy at a low altitude, it may become necessary to land with only that canopy. In this case, the upper jumper should attempt to fly level and slowly.

当高度**低于可以安全切伞的高度**（1000 英尺）时，一方或双方可能必须开备伞（但对于单把手紧急系统（SOS），这可能不是安全的选择）。下方跳伞者的备伞通常更快充气，因为空速更高且无伞布或伞绳的阻碍。若双方均开备伞，下方跳伞者可能需在确认双方均有可用的降落伞后，通过切伞来释放缠绕——此操作称为“降落伞的移交”，最低可在 200 英尺高度成功执行，

以避免发展至两伞分处两边相互绕转的情形并导致两人撞击地面。如果双方在低高度被挂在同一个可飞行的降落伞下，那么可能必须单靠那个降落伞着陆。此时上方跳伞者应保持伞翼水平并缓慢飞行。

Low Turns

低转

Low turns under canopy are one of the biggest causes of serious injury and death in skydiving. A low turn can be premeditated, result from an error in judgment, or result from a lack of experience with a situation.

低转是跳伞中导致重伤和死亡的主要原因之一。低转可能是事先计划的，也可能是由于判断错误或对某一情况经验不足造成的。

You can avoid low turns by flying to a large, uncrowded landing area free of obstacles and flying a planned landing pattern that promotes a cooperative traffic flow. If landing off, choose a landing area by 2,000 feet and plan a landing pattern with an obstacle-free final approach.

为了避免低转，你应飞到一个面积较大的、人少的、没有障碍物的着陆区域，按照规划好的着陆航线飞行，航线的规划应有利于促进空中交通的良好协作。若场外着陆，应在 2000 英尺以上选定着陆区域，并规划一个在第三边无障碍物的着陆航线。

If you choose to turn at a low altitude to avoid an obstacle, use a **braked turn** and be prepared to flare from a braked position. Monthly practice of **half-braked turns** and **half-braked flares** CEPs during a dedicated clear-and-pull or high-pull jump can build the skills needed to avoid injury during landing emergencies.

如果你需在低高度转弯来避开障碍物，请**带刹车转弯**并做好从刹车状态开始拉平的准备。每月都建议安排一次净空开伞或高开，专门用于练习包括**半刹车转弯**和**从半刹车位置开始拉平**在内的降落伞飞行紧急程序，以提升技能，避免因着陆紧急情况受伤。

If you make a turn at an unsafe altitude, where the parachute will not recover to level flight before touchdown without immediate input, a **low-turn recovery**, one of the CEPs, is necessary. As soon as you realize that you've made a turn at an unsafe altitude, use the toggles to get the canopy back overhead, stop the turn and dive, and slow the forward speed. Neutralize the turn by pulling down the toggle opposite the turn, resulting in a braked toggle position. Flare from the braked position and prepare for a hard landing (PLF). Manage the speed induced by the turn. Expect more-responsive flare control with the toggles due to the increased airspeed and expect a longer, flatter flare. In case of premature contact with the ground, no matter how hard the impact, keep flying the canopy to reduce further injury.

如果你在危险高度进行转弯，此时若不立即进行操作，降落伞将无法在触地前恢复平飞状态，你必须执行降落伞飞行紧急程序之一的**低转改出**。一旦你意识到在危险高度转弯，应立即使用刹车让降落伞回到头顶正上方，从而停止转弯和俯冲，并减慢前进速度。要中和转弯，你需要下拉与转弯方向相反的一侧的刹车，让降落伞处于带刹车飞行状态。着陆时从刹车状态开始拉平，并为硬着陆（执行 PLF）做好准备。你需要管控好转弯产生的速度增量。由于空速增加，刹车拉平的响应会更灵敏，且拉平过程会更长，角度会更平。万一提前触地，无论冲击多剧烈，都应持续操控降落伞，以减少进一步的伤害。

Monthly practice of the low-turn recovery CEP on a dedicated clear-and-pull or high-pull jump above decision altitude can build the proficiency needed to avoid injury or fatality due to a low turn near the ground.

每月都建议安排一次净空开伞或高开，专门用于在决断高度以上练习包括低转改出在内的降落伞飞行紧急程序，以提升熟练度，避免因低转导致伤亡。

G. Landing Emergencies

着陆紧急情况

Monthly practice of the CEP drills of **half-braked turns and flares** on a dedicated clear-and-pull or high-pull jump can build the skills needed to avoid injury during landing emergencies.

每月都建议安排一次净空开伞或高开，专门用于练习包括**半刹车转弯**和**从半刹车位置开始拉平**在内的降落伞飞行紧急程序，以提升技能，避免因着陆紧急情况受伤。

Potential obstacles during landing include water, trees, buildings, power lines, fences and similar hazards. You can usually avoid these obstacles by properly preparing for your canopy flight by observing the winds and planning an appropriate landing pattern. Also, choosing an alternate landing area by 2,000 feet allows you to assess potential obstacles and plan your new pattern. Follow your landing priorities. The following are best practices or actions you can take when landing in or on common obstacles.

着陆时可能遇到的障碍物包括水域、树木、建筑物、高压线、围栏等类似危险物。通常可以通过观察风况并规划合适的着陆航线来为降落伞飞行做好准备，从而避开这些障碍物。此外，在 2000 英尺高度以上就选好备降场可让你评估潜在障碍物并规划新航线。要遵循着陆优先事项。以下是应对常见障碍物着陆时的最佳实践和措施。

Water Landings

水降

Procedures for an unintentional water landing focus on actions you can take prior to entering the water (time permitting), while landing in the water, and after entering the water.

意外水降的应对程序重点关注入水前（如果时间足够）、入水时以及入水后可采取的行动。

Prior to entering the water: If possible, continue to steer to avoid the water hazard. Time permitting, loosen the chest strap to facilitate getting out of the harness once you're in the water. If applicable, open your helmet's face shield, activate your flotation device and disconnect your RSL to reduce complications in case you need to cut away after splashing down.

入水前: 如有可能，应继续操控降落伞避开水域。如时间足够，则松开胸带以便入水后脱离背带。请打开头盔面罩（如适用），启用漂浮装置，并断开 RSL，以防溅入水后如需切伞时产生额外风险。

While landing in the water: Flare to half brakes at 10 feet above the surface, understanding that poor depth perception over water may make this difficult to judge. Prepare for a PLF in case the water is shallow. Take a deep breath a few seconds before entry so that you enter the water with your lungs filled with air. Remain in the harness and attached to the canopy until you are actually in the water. Once you are, cut away the main canopy, throw your arms back and swim forward out of the harness.

入水时: 在距离水面 10 英尺时拉平至半刹车位置，注意因为水面上的深度视觉差，高度可能很难判断。准备 PLF，以防备水深很浅的情况。入水前几秒深吸一口气，确保入水时肺部充满空气。直到真正落入水中之前，都应继续穿着背带，且连接着降落伞。已经入水后，立即切主伞，手臂先后置，然后再向前穿出背带，从而游出背带。

After landing in the water: In the absence of flotation gear, separating from your equipment is essential. The container can serve as a flotation device if the reserve canopy is packed in the container. Use caution to avoid the main canopy suspension lines if using the reserve container for flotation. Tests have shown that a container with a packed reserve will remain buoyant for up to 45 minutes or longer. If time permits, use your jumpsuit or clothing to make a temporary flotation device by tying knots at the end of the openings and scooping air into it.

入水后: 若未配备漂浮装置，则必须与跳伞装备分离。若备伞仍装在伞包内，可将伞包作为临时漂浮装置。如果以备伞伞包作为漂浮装置，则必须小心避开主伞伞绳。实验表明，装有备伞的伞包可保持浮力长达 45 分钟或更长时间。如时间允许，可将跳伞服或衣物开口端打结并兜入空气，制成简易漂浮装置。

If the collapsed canopy covers you, dive deep and swim out from under it. Follow one seam to the edge of the canopy until clear. If under the main canopy in swift or shallow water, pull one toggle in or cut away. Refill your lungs at every opportunity. Swim upwind or upstream and use care to avoid entangling in the suspension lines. Remove any full-coverage helmets in the event of breathing difficulties. Do not attempt to recover your gear.

如果塌缩的伞布覆盖了你，则下潜到深处并从伞布下方游出。可沿伞布缝线游至伞布边缘，直到从伞布下面出来。在急流或浅水区被主伞覆盖时，可拉下单侧刹车或切伞。抓住一切机会呼吸。向上风处或上游方向游动，小心避免被伞绳缠绕。如呼

吸困难，需摘下全盔。切勿尝试回收装备。

Air Force-type (LPU) underarm flotation equipment have bladders that inflate outside the harness although they are worn underneath. Consequently, you must first deflate the bladders before removing the harness and then reinflate them orally one at a time.

空军型（LPU）臂下漂浮装置的气囊虽然穿在臂下，但会在背带外侧充气。因此要先给气囊放气才能脱下背带，然后重新用嘴给气囊逐个充气。

Wearing weights to increase your fall rate or using additional equipment such as wingsuits, cameras or skysurfing gear increases your risk during a water landing, and you need to plan your procedures accordingly.

如有佩戴配重以增加下降速率，或使用翼装、摄像机、空中滑板等额外装备，水降时所面临的风险会显著增加，需规划好相应的应对程序。

Water temperature below 70 degrees Fahrenheit severely limits the amount of time a person can survive while trying to tread water or remain afloat. Treading water or swimming causes the body to lose heat rapidly, because blood moves to the extremities where it cools quickly. Depending on the situation, it may be better to float than swim or tread water while waiting for help to arrive.

低于 70 华氏度（21 摄氏度）的水温可能会严重限制跳伞者试图踩水或保持漂浮时的生存时间。踩水或游泳会使身体更快地失去热量，因为血液流向四肢，身体会冷却得更快。在某些情况下，等待救援时可能最好尝试漂浮在水上，而不是游泳或踩水。

You can find more details on water landings in SIM Chapter 2-1, USPA Basic Safety Requirements on water jumping equipment, and SIM Chapter 5-4, Water Landing Recommendations (unintentional and intentional).

关于水降的更多信息，请参阅跳伞者信息手册 2-1 中关于水降装备的基本安全要求，以及 5-4 中关于水降的建议（意外水降和刻意水降）。

Power Lines

高压线

Power lines present a serious hazard to all aviators; know where they are near your DZ. To **prevent** landing in power lines, identify where they are in the landing area as early as possible and steer to avoid them. If you need to make a low turn to avoid a power line, make the minimum, flat, braked turn necessary to miss it, execute a braked landing, flare, and PLF.

高压线对所有航空人员都是严重的危险；一定要知道跳伞基地附近的高压线的位置。为**预防**降落在高压线上，应尽早辨清着陆区域的高压线并转弯避开它们。若需通过低转避开高压线，应在必要范围内进行最小幅度的、伞翼水平的、带刹车的转弯，随后从刹车状态开始拉平着陆，并执行 PLF。

If you cannot avoid a power-line landing, drop handles or other objects, bring the canopy to slow flight, prepare for a PLF with your feet and knees tightly together, and turn your head to the side to protect your chin. Land parallel to the power lines so that you do not touch more than one wire at a time.

如果无法避免降落在高压线上，需扔掉把手及其他物品，让降落伞慢速飞行，准备执行 PLF，脚和膝盖并拢，头转向一边以保护下巴。着陆方向应与高压线平行，以确保一次仅接触一根电线。

If suspended in the wires, do not let anyone touch you. Wait for help from the drop zone and power company personnel. Nylon conducts electricity at higher voltages. Verify only with the power company that electrical power is off and will stay off. If the computer controlling the power distribution senses a fault in the line, computer-controlled resets may attempt to turn the power back on without warning.

如果悬挂在高压线上，不要让任何人触碰你。等待跳伞基地和电力公司工作人员的救援。尼龙在较高电压下是导电的。必须

由电力公司确认线路已断电且保持断电状态，因为配电控制系统若检测到线路故障，可能在没有警告的情况下自动恢复供电。

If your feet are on the ground, disconnect the RSL and cut away, leaving your main behind.

如果双脚已着地，则断开 RSL 并切伞，让主伞留在那。

Trees

树降

Prevent landing in trees by spotting carefully and making a good approach-pattern plan for the conditions. The dangers of landing in a tree extend until you are rescued and safely on the ground. A low-altitude diving turn from full flight is just as dangerous as a tree landing. Make any low-altitude avoidance turns from braked flight.

要仔细地看点定位和根据情况制定合适的进近航线，从而**预防**降落在树上。只有当跳伞者获救并安全回到地面上时，树降的潜在危险才结束。从全速飞行状态开始进行的低转俯冲与降落在树上同样危险。任何低高度的躲避障碍物的转弯都应在带刹车状态下进行。

If you can't avoid landing in a tree under a ram-air canopy, hold the toggles at half brakes until tree contact. Prepare for a PLF; often the jumper passes through the tree and lands on the ground. Protect your body by keeping your feet and knees tightly together, but do not cross your feet or legs. Cover your face with your hands while holding your elbows tightly against your chest. Different trees require different procedures, so, consult with your local S&TA for a briefing appropriate for your drop zone. If the trees are very tall, steer to the middle of the tree, then hold on to the trunk or main branch to avoid falling through to the ground.

如果无法避免降落到树上，在使用冲压空气式降落伞的情况下，应将刹车拉到半刹车位置并保持，直到接触树木。做好 PLF 准备；跳伞者通常会穿过树木落在地面上。双脚和双膝并拢以保护身体，但不要交叉双脚或双腿。用双手保护脸，两个手肘紧紧抵住胸部。不同树木需要采取不同应对措施，因此请咨询当地的安全和培训顾问，以获取适用于你所在跳伞基地的简报。如果树木非常高，则对准树的中间，然后抱住树干或主要枝干，以免摔下去。

If suspended above the ground, wait for help from drop zone personnel to get down. Don't attempt to climb down from a tree without competent assistance such as rescue personnel or properly trained drop zone staff.

如果悬挂在地面上方，则呆在树上等待跳伞基地工作人员来救援，以从树上下去。切勿在没有救援人员或经过专业培训的跳伞基地工作人员协助的情况下尝试自行爬下树木。

Buildings and Other Objects

建筑物和其他障碍物

To **prevent** landing on or into buildings or other objects, plan your landing approach to be well clear of them. Focus on clear, open landing areas and steer there. Use braked turns to maintain a level wing when turning at a low altitude to avoid obstacles.

为**预防**降落在建筑物或其他障碍物上，应规划好着陆航线，确保与障碍物保持足够距离。将注意力集中在开阔的无障碍物的着陆区域，并操控降落伞飞向该区域。如需在低高度规避障碍物，应采用带刹车转弯技术保持伞翼水平。

If you can't avoid landing on a building or object, prepare for a PLF and flare 10 feet above the first point of contact to slow your forward speed. After landing on top of an object in windy conditions, disconnect the RSL if possible, and cut away. If landing under your reserve, retrieve and contain the canopy until removing the harness and wait for competent help.

如果无法避免降落到建筑物或障碍物上，则做好 PLF 准备，在第一接触点上方约 10 英尺处拉平以减慢前进速度。如果在大风天降落到障碍物的顶部，应断开 RSL（如有可能）并切伞。若使用备伞着陆，需收拢并控住伞布，直至脱下背带，然后等待专业人员救援。

When approaching the side of a building, perform a flat turn to avoid hitting it head-on. If a collision is unavoidable,

prepare to PLF, flare to slow down, and attempt to strike a glancing blow. Change the canopy's direction to avoid a direct impact.

如果接近建筑物侧面，则应进行平转以避免正面撞击。若碰撞不可避免，需做好 PLF 准备，通过拉平减速，尝试以擦碰方式接触建筑物。要及时改变降落伞方向以避免正面撞击。

Landing Out

场外着陆

Jumpers prefer to land in the planned area, which is usually familiar and free of obstacles. However, circumstances such as a spotting error, unexpected wind conditions, inadvertent high opening in strong upper winds, and low opening (especially under a reserve canopy) may make that difficult or impossible.

跳伞者通常倾向于在计划的着陆区域降落，这些区域通常是跳伞者所熟悉的，没有障碍物的区域。但诸如看点定位失误、预期外的风况、在高空风很强的情况下发生的意外高开，以及低空开伞（尤其是备伞）等情况，可能导致难以或无法在计划区域内着陆。

Students and experienced jumpers have been injured or killed due to problems resulting from less-than-ideal opening positions over the ground, including:

曾有学生和有经验的跳伞者曾因开伞位置不佳导致的问题引发伤亡，具体情形包括：

- intentional low turn into an unfamiliar landing area
故意低转到陌生着陆区域
- unplanned low turn to avoid obstacles
计划外的低转，以试图避开障碍物
- landing into or on an obstacle or uneven terrain
着陆到障碍物里面或上面，或着陆在不平坦的地形上
- errors made after trying to return to the planned landing area or returning lower than planned, when a better choice was available
虽然有其他更好的选择，但还是试图飞回计划着陆区域，或在高度不足的情况下飞回计划着陆区域，并在此过程中犯错

Avoid landing out by knowing the correct exit point for the current conditions. Once at the door of the aircraft, check the spot before exiting and request a go-around if necessary. In freefall, check the spot soon after exiting and adjust opening altitude if necessary and safe to do so, considering other groups or individuals in freefall nearby or jumpers from other planes in multiple-plane operations.

为**避免场外着陆**，需要于根据当前条件选择正确的出舱点。在舱门处时，务必先检查出舱点然后再出舱，如有必要，可要求飞机再兜一圈。在自由落体阶段，出舱后立即确认所在位置，如有必要，可调整开伞高度，但要注意确认这么做是否安全，不要影响到在附近自由落体的跳伞者或团体，或多飞机跳伞作业时从其他飞机跳下的跳伞者。

If you **cannot avoid landing out**, decide on a viable alternate landing area by 2,000 feet, based on your current location, the wind speed, and wind direction. Plan a descent strategy and landing pattern for the alternate landing area. Check the alternate landing area carefully for hazards while still high enough to adjust the landing pattern to avoid them. For example, when checking for power lines, it is easier to see the poles and towers than the wires themselves. Determine the wind direction to predict turbulence created by trees or other obstacles and plan a landing spot accordingly. It may be difficult to see hills from higher altitudes. It can also be difficult to see fences, but man-made obstacles often run in straight lines along the ground.

如果无法避免场外着陆，应在 2000 英尺以上根据当前位置、风速及风向选择可行的备降场，并为该备降场规划好降落伞下降策略和着陆航线。当高度还足够用以调整着陆航线时，仔细检查备降场是否有危险障碍物，以避开它们。例如寻找高压线时，找电线杆和电线塔比发现电线本身更容易。要确定风向以预测树木或其他障碍物造成的乱流，并相应地规划着陆点。需注意从较高的高度可能难以看到小丘。围栏也比较难看到，但这些人造障碍物在地面往往呈直线状。

Flying a braked approach or making a braked turn allows a slower forward speed and descent rate but may lengthen the approach glide. You may need to use an altitude-conserving braked turn to avoid an obstacle. A low-altitude braked turn may not allow recovery to full flight in time for a landing flare, so you may need to flare from a braked position to avoid a flight cycle. You should frequently practice the CEP drills of **braked turns and approaches** to prepare.

在带刹车状态下进近或带刹车转弯可使降落伞以较慢的前进速度和下降速度飞行，但可能延长进近滑翔距离。为了避免障碍物，你可能需要进行带刹车转弯以减少高度损失。低高度的带刹车转弯可能没有足够的时间恢复到全速飞行状态然后再拉平着陆，因此可能需要在刹车状态下开始拉平，以避免触发飞行循环。你应该定期练习**带刹车转弯和进近**等降落伞飞行紧急程序的技能以做好准备。

Choose a landing area that gives the longest runway for landing and follow the landing priorities. Landing into the wind is desirable, but not at the risk of a low turn. A PLF is especially important during off-field landings, as the terrain may be uneven.

要选择一个有尽可能长的着陆通道的着陆区域，并遵循着陆优先事项。逆风着陆虽好，但切忌为此冒险低转。场外着陆时，PLF 尤为重要，因为地形可能不平整。

Respect property when landing off the drop zone. Do not disturb livestock. Leave gates as you found them. Avoid walking on crops or other cultivated vegetation. Report any property damage to the property owner and make arrangements for repairs. Remember, USPA membership includes insurance for such situations.

地外着陆时请尊重他人财产。勿惊扰牲畜。保持大门原状。避免践踏农作物或其他人工植被。若造成财产损失，请主动联系财产所有者并协商修复事宜。记住，USPA 会员资格已包含此类情况的保险。

4-2 复训 Currency Training

Currency training and jumps should include confirmation of knowledge and ability for a stable exit and body position, altitude awareness, stable deployment, tracking proficiency, canopy-flight planning and CEPs, execution of the pattern, flare technique, and emergency procedures. **Great care is necessary when choosing canopy size.** Depending on the length of the layoff, returning jumpers may require a larger, more conservative canopy than they were previously jumping until the jumper demonstrates proficiency in their canopy skills.

复训和复训跳伞应确认跳伞者在这些方面的知识和能力：稳定出舱与身体姿势、高度意识、稳定开伞、Tracking 熟练度、降落伞飞行规划与降落伞飞行紧急程序、飞着陆航线、拉平技能以及紧急程序。**选择降落伞面积时需格外谨慎。**根据停跳时长，复跳者可能需要使用比原先更大、更保守的降落伞，直至展示出足够的降落伞控制熟练度。

A. Students

学生

Students who have not jumped within the preceding 30 days should make at least one jump under the direct supervision of an appropriately rated USPA Instructor.

在过去 30 天内没有跳伞的学生应在持有其培训方法所对应的教练评级的 USPA 教练的直接监督下进行至少一次跳伞。

B. Licensed Skydivers

持证跳伞者

Skydivers returning after a long period of inactivity encounter greater risk that requires special consideration. Take care to regain or develop the knowledge, skills, and awareness needed to satisfactorily perform the tasks planned for the jump. Jumps aimed at sharpening survival skills should precede jumps with other goals.

长时间不跳伞后恢复跳伞的跳伞者面临较大的风险，需要特别考量。应注意复习或提升顺利完成计划跳伞所需的知识、技能和意识。为锻炼生存技能而进行的跳伞应先于有其他目标的跳伞进行。

C. Changes in Procedures

程序的改变

Any time you change deployment or emergency procedures, you should train and practice under supervision in a harness simulator until proficient. Follow up ground training with a solo jump that includes several practice sequences and deploy at a higher-than-normal altitude. Repeat ground practice at short intervals, such as before each weekend's jump activities, and continue to deploy at a higher-than-normal altitude until thoroughly familiar with the new procedures.

如果在任何时候，你要改变开伞程序或紧急程序，都应接受培训，并在监督下使用背带模拟器练习，直到熟练为止。地面培训后，应进行一次单人跳伞，跳伞内容包含若干次程序模拟练习，并高于正常开伞高度开伞。要频繁地重复地面练习，例如在每周末跳伞前，并继续高于正常开伞高度开伞，直到彻底熟悉新的程序。

D. Long Layoffs

长期停跳的跳伞者

Jumpers should receive refresher training appropriate for their skydiving history and time since their last skydive. Jumpers who were very experienced and current but became inactive for a year or more should undergo thorough training upon returning to the sport. Skydivers who historically jump infrequently should review training after layoffs of even less than a year.

跳伞者应接受与其跳伞经历和停跳时长相适应的复习培训。曾经经验丰富的活跃跳伞者，如果一年或一年以上没有跳伞，则应在重新开始跳伞时接受彻底的培训。以前不经常跳伞的跳伞者，就算离上次跳伞不到一年，还是需要复习培训。

Skydiving equipment, techniques, and procedures change frequently. During currency training following long periods of inactivity, jumpers may encounter new and unfamiliar equipment and techniques. Procedures change to accommodate developments in equipment, aircraft, flying styles, FAA rules, and local drop zone requirements.

跳伞装备、技巧和程序经常变化。在长期停跳后的复训中，跳伞者可能会接触到新的不熟悉的装备和技巧。跳伞程序也会发生变更，以适应装备、飞机、飞行风格、联邦航空局规定和本地跳伞基地要求的发展。

Returning skydivers require thorough practical training in the following areas:

恢复跳伞的跳伞者需要在以下方面接受全面的实操培训：

- aircraft procedures
机内程序
- equipment
装备
- exit and freefall procedures
出舱和自由落体程序
- canopy control and landings
降落伞控制和着陆
- emergency procedures for aircraft, freefall, deployment, canopy-flight, and landing, as described in Chapter 4-1
飞机、自由落体、开伞、降落伞飞行及着陆的紧急程序，详见第四章第一节

A License

A 执照

USPA A-license holders who have not made a freefall skydive within the preceding 60 days should make at least one jump under the supervision of a currently rated USPA instructional rating holder until demonstrating altitude awareness, freefall control on all axes, tracking, and canopy skills sufficient for safely jumping in groups.

在 60 天内没有进行过自由落体跳伞的 USPA A 执照持有者，应在评级在有效期内的 USPA 教学评级持有者的监督下进行至少一次跳伞，直至展示出高度意识、各方向上的自由落体控制、Tracking 技能，以及足以用于安全地和大家一起跳伞的降落伞控制技能。

B License

B 执照

USPA B-license holders who have not made a freefall skydive within the preceding 90 days should make at least one jump under the supervision of a USPA instructional rating holder until demonstrating the ability to safely exercise the privileges of that license.

在 90 天内没有进行过自由落体跳伞的 USPA B 执照持有者，应在评级在有效期内的 USPA 教学评级持有者的监督下进行至少一次跳伞，直到展示出有能力安全地行使该执照的特权。

C and D License

C 执照和 D 执照

USPA C- and D-license holders who have not made a freefall skydive within the preceding 180 days should make at least one jump under the supervision of a USPA instructional rating holder until demonstrating the ability to safely exercise the privileges of the license.

在 180 天内没有进行过自由落体跳伞的 USPA C 执照和 D 执照持有者，应在评级在有效期内的 USPA 教学评级持有者的监督下进行至少一次跳伞，直到展示出有能力安全地行使该执照的特权。

4-3 装备 Equipment

A. Federal Regulations on Equipment

关于降落伞装备的联邦法规

The Federal Aviation Administration of the U.S. Department of Transportation, which publishes the Federal Aviation Regulations (FARs), regulates the design, maintenance, and alteration of parachute equipment.

美国交通部下属的联邦航空局负责发布联邦航空条例（FAR），对降落伞装备的设计、维护和改装进行监管。

All skydivers should be familiar with the following FARs and their applicability to skydiving (see Chapter 2-3 and 2-4 of this manual):

所有跳伞者应熟悉下列联邦航空条例及其在跳伞运动中的适用性（参见本手册 2-3 和 2-4）：

- Part 65—Certification of Parachute Riggers
第 65 部分——降落伞装备师的认证
- Part 91—General Flight Rules
第 91 部分——一般飞行规则
- Part 105—Parachute Operations
第 105 部分——降落伞作业

Advisory Circular 105-2—explains in detail various areas of parachute equipment, maintenance, and modifications.

咨询通告 105-2 详细解释了降落伞装备、维护和改装的各个方面。

The FAA grants **approval of parachutes** to manufacturers in the form of Technical Standard Orders (TSOs). TSO C-23 is issued to parachutes that comply with the current performance standards.

降落伞的批准认证是联邦航空局以技术标准规定（TSO）的形式授予制造商的。TSO C-23 签发给符合现行性能标准的降落伞。

- NAS 804 for TSO C-23b
TSO C-23b 基于 NAS 804 标准
- AS-8015A for TSO C-23c
TSO C-23c 基于 AS-8015A 标准
- AS-8015B for TSO C-23d
TSO C-23d 基于 AS-8015B 标准

These standards specify the tests that a parachute system and its component parts must pass to receive approval for civilian use. FAR Part 21 contains the procedures for obtaining TSO approval.

这些标准规定了降落伞系统及其部件必须通过的测试，以获得民用批准。TSO 批准认证的程序可以在联邦航空条例第 21 部分中找到。

Only those with FAA approval may perform **alterations to approved parachutes**. Approval may be obtained by submitting a request and description of the alteration to the manufacturer or to an FAA Flight Standards District Office. An FAA Master Rigger and a manufacturer with an approved quality-assurance program are eligible to receive alteration approval. Alterations may not be performed without full documentation of FAA approval for the specific alteration.

对经批准认证的降落伞进行的改装只能由已获得联邦航空局批准的人员进行。可通过向制造商或联邦航空局当地飞行标准办公室提交申请和改装说明来获得批准。联邦航空局认证的专家级降落伞装备师以及有获批准认证的质量保证程序的制造商有资格获得改装批准。如果没有联邦航空局对具体改装的完整批准文件，则不能进行改装。

B. Main Parachute

主伞

Jumpers should choose canopies that will provide an acceptable landing in a wide range of circumstances by considering several factors including canopy size, wing loading, planform (shape), skill level, and experience. Owners should verify with a rigger that their gear complies with all applicable updates and bulletins.

跳伞者应根据多种因素，包括降落伞面积、翼载、翼面形状、技能水平和经验，来选择在各种情况下都能进行可接受的着陆的降落伞。装备所有者应找降落伞装备师确认所有适用于其装备的更新和公告已完成。

Jumpers should observe the canopy manufacturer's recommendations for the correct canopy size, which usually includes maximum recommended weight with respect to the jumper's experience, drop zone elevation, and conditions such as density altitude.

跳伞者应遵守降落伞制造商关于正确选择降落伞面积的建议，这些建议通常包括最大建议重量以及与之相关的因素，包括跳伞者的经验水平、降落区海拔以及其他条件，如密度高度等。

Wing loading, measured as exit weight in pounds per square foot of canopy size, provides only one gauge of a canopy's performance characteristics. A smaller canopy loaded equally to a larger one of the same design will exhibit a faster and more radical control response, with more altitude loss in any maneuver. Design, materials, and construction techniques can cause two equally loaded canopies to perform very differently. Different planforms (square vs. elliptical) exhibit very different handling characteristics.

翼载根据单位面积降落伞所承受的跳伞者出舱重量算出，单位为磅/平方英尺，它只是衡量降落伞的性能特征的其中一个因素。在同等翼载的情况下，与设计相同的面积较大的降落伞相比，面积较小的降落伞会对跳伞者的操作有更快和更激进的响应，并且在任何机动中都会损失更多高度。设计、材料和制造技术都可能会使两个同等翼载的降落伞表现出非常不同的性能。不同的翼面形状（矩形与椭圆伞型）会表现出非常不同的操作特性。

The Minimum Canopy-Size Recommendations chart provides the minimum recommended canopy size by taking exit weight and the number of solo-equipment jumps made with square parachutes into account. A student's canopy size is at the discretion of the instructor. Due to the varied sizes of canopies from different manufacturers, any canopy less than 3% smaller than the listed recommendation is acceptable. Canopy choices for jumpers who have made more than 1,000 jumps is at their own discretion. These minimum-canopy-size recommendations may be too aggressive for some jumpers and, in other cases, too conservative. Instructors, canopy coaches and drop zone leadership should assist skydivers in selecting a canopy appropriate for their ability and progression. The USPA Downsizing Best Practices Card, available at uspa.org/downsize, is a valuable self-assessment tool.

建议的降落伞面积下限如表格所示。该表根据出舱重量和总跳数（使用矩形伞型的单人伞进行跳伞的跳数）给出建议的最小降落伞面积。学生伞的大小由教练酌情决定。因为不同降落伞制造商生产很多不同面积尺寸的降落伞，降落伞面积比表中建

议的面积下限小不超过 3%是可以接受的。跳数超过 1000 跳的跳伞者可自行选择降落伞。对于某些跳伞者来说，表格中建议的降落伞面积下限有可能过于激进，也可能过于保守。教练、伞控教练、跳伞基地管理人员应协助跳伞者根据他们的能力和水平选择合适的降落伞。uspa.org/downsize 提供的“USPA 降落伞最佳做法清单”是很有用的自我评估工具。

(译者注：降落伞指使用面积更小、性能更高的降落伞。)

Minimum-Canopy-Size Recommendations																	
建议的降落伞面积下限																	
出舱重量 (跳伞者加所有装备)																	
EXIT WEIGHT (Jumper plus all equipment)																	
单位: 磅, 平方英尺																	
跳数	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	
NUMBER OF JUMPS																	
0-25	190	190	190	190	190	190	200	200	200	220	220	220	220	240	260	280	
26-50	170	170	170	170	170	190	190	190	190	190	190	200	200	220	240	260	
51-100	170	170	170	170	170	170	170	170	170	190	190	190	200	200	220	240	
101-200	150	150	150	170	170	170	170	170	170	170	170	170	190	200	200	220	
201-300	150	150	150	150	150	150	150	150	170	170	170	170	190	190	190	200	
301-400	135	135	135	150	150	150	150	150	150	150	170	170	170	190	190	190	
401-500	135	135	135	135	135	135	135	135	150	150	150	170	170	170	190	190	
501-750	120	120	120	135	135	135	135	135	135	135	150	150	170	170	170	190	
750-1000	107	120	120	120	135	135	135	135	135	135	135	150	150	170	170	190	

C. Reserve Parachute

备伞

All skydivers should use a steerable reserve canopy. The FAA requires that the reserve parachute assembly—including harness, container, canopy, risers, pilot chute, deployment device, and ripcord—are approved.

所有跳伞者都应该使用可操纵的备伞。联邦航空局要求备伞组成部件，包括背带、伞包、备伞伞布、组提带、引导伞、开伞装置和拉索，均须获得批准认证。

Jumpers must observe FARs regarding the manufacturer's maximum certificated weights and speeds for parachutes. Parachutes approved under FAA Technical Standard Order C-23b, C-23c, and C-23d are subject to different testing standards and operation limits. The entire parachute system is limited to the maximum certificated load limit of the harness-and-container system or reserve canopy, whichever is less. Load limits are found in the owner's manual, the manufacturer's website, or placarded on the parachute component itself.

跳伞者必须遵守联邦航空条例中关于制造商获批准认证的最大重量和速度的规定。根据 TSO C-23b、C-23c 和 C-23d 获得批准的降落伞有不同的测试标准和工作限制。整个降落伞系统都受到背带和伞包系统或备伞的认证最大载荷限制，两者中取较小者为准。载荷限制可在用户手册、制造商的网站上或降落伞组件本身上找到。

For a ram-air reserve, jumpers should not exceed the maximum suspended weight specified by the manufacturer (not necessarily the maximum certificated load limit). A jumper may exceed the rated speeds of a certificated parachute system (harness and/ or parachute) by jumping at higher MSL altitudes or falling in vertical freefall orientations.

对于冲压空气式备伞，跳伞者重量不应超过制造商规定的最大悬挂载荷（不一定等同于认证最大载荷限制）。跳伞者可能会因为高海拔跳伞或垂直的自由落体姿态而超过获批准认证的降落伞系统（背带和/或降落伞）的额定速度。

A round reserve canopy should be equipped with a deployment device to reduce the opening force and control deployment, should have a rate of descent that does not exceed 18 feet per second (fps), and must not exceed a rate of descent of 25 fps at sea level conditions (NAS 804). The following scale indicates the minimum size round reserve canopy recommended for use according to the exit weight of the skydiver:

圆形备伞应配备开伞装置用以减少开伞冲击并控制开伞，其下降速率不应超过 18 英尺/秒，且在海平面条件下，下降速率不得超过 25 英尺/秒（NAS 804 标准）。以下为根据跳伞者出舱重量建议的最小尺寸圆形备伞：

Total Suspended Weight* 总悬挂载荷	Recommended Equivalent Descent Rate (high porosity flat circular) 建议的等效下降速率（高孔隙率材质的圆伞）
Up to 149 pounds 149 磅以内	24-foot 24 英尺
150 to 199 pounds 150 至 199 磅	26-foot 26 英尺
200 pounds and over 200 磅及以上	28-foot 28 英尺

**The use of lower porosity materials can reduce the rate of descent.*

**使用较低孔隙率的材料可以降低下降速率*

D. Harness-and-Container System

背带和伞包系统

The FAA requires the harness of a dual parachute assembly to be approved. All harness ends should be folded over and sewn down or wrapped and sewn down to prevent the harness from unthreading through the hardware during parachute deployment.

联邦航空局要求双降落伞系统的背带必须经过批准认证。背带的所有织带的末端都应被折叠并缝合或被包起来缝合，以防开伞过程中背带从金属部件中脱出。

Canopy-release systems should be maintained according to the schedule and procedures in the owner's manual. The location of operational handles should align with the manufacturing industry's standardized locations. The harness should be equipped with single-point riser releases (one handle releases both risers) for easy and rapid disengagement from the main canopy.

降落伞释放系统应根据用户手册中的维护日程和维护程序进行维护。操作把手的位置应符合降落伞制造行业的标准化位置。背带应配备单点组提带释放装置（一个把手释放两个组提带），以便轻易快速地与主伞分开。

Loop-type reserve handles should be made of metal. Plastic and composite reserve handles are not recommended. Jumpers should practice peeling and pulling pillow-type reserve handles until certain they can operate them easily in an emergency.

环柄状的备伞把手应采用金属制成。不建议使用塑料和复合材料的备伞把手。跳伞者应练习撕开和拉下枕状的备伞把手，直到确定在紧急情况下也能轻易操作。

All ripcord-housing ends should be secured. Ripcord pins, when seated, should either be started inside the housing or clear the closing loop before entering the housing. A ripcord-cable stop should not be used; fatal accidents caused by reserve entanglements with ripcords secured in this manner have been documented.

所有拉索收纳管末端都应保护好。备伞关包针插好后，关包针要么一部分还留在收纳管内，要么离收纳管有一段距离，使得关包针抽出关包绳之后不会立刻碰到收纳管。禁止使用拉索限位器；有记录显示，以这种方式固定好的拉索曾与备伞缠绕并导致致命事故。

(译者注 1: 对于早期的降落伞设计，关包针离收纳管非常近，拉动备伞把手时，关包针可能卡在收纳管的管口，阻碍其释放关包绳，因此备伞关包针插好后要确保关包针的一部分还在收纳管内，防止被卡，但对于现在的降落伞，收纳管的管口离关包针足够远，基本不再出现此类问题)

(译者注 2: 拉索限位器是使用把手后防止把手丢失的装置，因曾在上世纪导致多起事故而被禁用)

The reserve system is usually designed to use a specific type of pilot chute. The reserve pilot chute should be properly

seated in the container and repacked if it has shifted.

备伞系统通常被设计为使用特定类型的引导伞。备伞引导伞应正确放置在伞包里，如果有位移，则应重新叠备伞。

Deployment brake systems should provide secure stowage of the steering toggles and slack brake line to prevent brake-line entanglements and premature brake release.

开伞刹车系统应能安全地收纳刹车，并收起刹车线的松弛部分，以防止刹车线缠绕和过早意外释放刹车。

E. Main Pilot Chute

主伞引导伞

The main pilot chute is part of the main parachute system. Pilot chute size can affect the opening characteristics of the main canopy.

主伞引导伞被设计为主伞系统的一部分。引导伞尺寸可能会影响主伞的开伞特性。

Spring-loaded and hand-deployed pilot chutes of both types (throw-out and pull-out) each have strengths and weaknesses that affect the user's emergency procedures and other decisions.

弹簧引导伞以及手动释放的（抛出式和拉出式）引导伞各有优缺点，这些优缺点都会影响使用者的紧急程序和其他决断。

On throw-out hand-deployed systems, the pilot chute and pouch size must be compatible. Collapsible pilot chutes add complexity and have more required maintenance since forgetting to set or cock the pilot chute can cause a high-speed pilot-chute-in-tow malfunction, and the moving parts create additional wear to the system.

在抛出式引导伞的开伞系统中，引导伞和引导伞收纳袋的尺寸必须兼容。可缩的引导伞增加了系统的复杂性，并带来了额外的维护要求，因为如果可缩引导伞的中线没有预位好（译者注：即 kill line 没拉好），则可导致高速引导伞拖拽故障，且更多的移动部件会导致额外的磨损。

F. Reserve Static Line (RSL) and Main-Assisted-Reserve-Deployment (MARD) Device

联动装置（RSL）和主伞辅助备伞开伞装置（MARD）

With very few exceptions, USPA recommends that jumpers use a reserve static line (RSL), a backup device that automatically initiates reserve deployment when a jumper cuts away. Preferably, the RSL is equipped with a main-assisted-reserve-deployment device (MARD). RSL use is mandatory for students. Though RSLs (with or without MARDs) are proven lifesavers, jumpers should never rely on them to initiate reserve deployment and must manually pull the reserve ripcord immediately after a cutaway.

除极少数例外情况以外，USPA 建议跳伞者都使用 RSL，这种备用装置能在跳伞者切伞时自动启动备伞的开伞流程。RSL 最好再配备上主伞辅助备伞开伞装置（MARD）。学生跳伞时必须使用 RSL。尽管 RSL（无论是否配备 MARD）已被证明是救命装置，但跳伞者绝不能依赖其启动备伞，跳伞者必须在切伞后立即手动拉动备伞拉索。

On an RSL-equipped rig, one end of the RSL lanyard attaches to a main riser, and then the lanyard runs to the reserve ripcord cable, where the other end attaches. When the main risers depart following a cutaway, the RSL lanyard pulls the reserve pin and releases the reserve pilot chute, which deploys the reserve parachute. When the RSL includes a MARD device, the RSL lanyard hooks to the reserve-pilot-chute bridle, which allows the departing main parachute to assist in extracting the reserve, speeding up its deployment. RSLs help to both ensure and speed up reserve deployment when fractions of a second matter; MARDs speed up the deployment even further.

在配备 RSL 的装备上，RSL 系带一端连接主伞组提带，另一端连接备伞开伞拉索。当主伞组提带因切伞而脱离时，RSL 系带会拉出备伞伞包并释放备伞引导伞，从而让备伞飞出伞包。若 RSL 集成了主伞辅助备伞开伞装置（MARD），RSL 系带将与备伞引导伞系带相连，从而让脱离的主伞协助拉出备伞，加速备伞的展开过程。在分秒必争的紧急情况下，RSL 既有助于确保备伞展开又可加快开伞速度；而 MARD 则能进一步缩短开伞时间。



RSL vs. MARD-Equipped-RSL Reserve Activation: Reserve activated via a traditional RSL (left) and a MARD-equipped RSL (right).

RSL 和配备 MARD 的 RSL 的备伞的激活对比: 通过传统 RSL 激活备伞 (左) 和配备 MARD 的 RSL 激活备伞 (右)

Photo by Niklas Daniel of AXIS Flight School.

AXIS 飞行学校 Niklas Daniel 摄

An RSL, with or without a MARD, may also incorporate a **Collins lanyard**. This lanyard attaches to the reserve static line and is designed to release the non-RSL-side riser in the event the RSL-side riser breaks or disconnects prematurely. Consult a rigger for more information.

RSL 也可配置柯林斯系绳, 无论是否配备了 MARD。柯林斯系绳与 RSL 连接, 可在 RSL 侧组提带断裂或过早脱离时释放非 RSL 侧组提带。详情可咨询降落伞装备师。

USPA recommends an RSL, preferably with a MARD, for all experienced jumpers with the possible exception of those attempting linked canopy formations. If temporarily disconnecting an RSL, take care to ensure it doesn't interfere with the operation of the parachute system; consult a rigger.

USPA 建议所有有经验的跳伞者使用 RSL (最好配备 MARD), 但试图建立互相连接的降落伞编队的跳伞者可能例外。如果临时断开 RSL, 必须小心, 以免其影响降落伞系统的运作; 请咨询降落伞装备师。

When misrouted or attached incorrectly, these safety devices may not function and can even complicate or prevent a cutaway. Unless the manufacturer's instructions state otherwise, do not use a connector device between the left and right main risers.

当走线错误或连接不当时, 这些安全装置可能无法正常工作, 甚至可能会使切伞情况复杂化或阻碍切伞。除非制造商另有说明, 否则不应使用左、右主伞组提带之间的连接装置。

G. Automatic Activation Device (AAD)

自动激活装置 (AAD)

USPA encourages **all licensed skydivers** to use an AAD—a device that initiates reserve deployment when the jumper reaches a preset altitude and descent rate—and requires its use for student skydivers. An AAD is only a backup device, and **no jumper should rely on it to deploy a parachute**. Those who use one and are educated on its function are significantly more likely to survive loss of altitude awareness or consciousness during a skydive.

USPA 鼓励**所有持证跳伞者**使用 AAD——该装置会在预设的高度和下降速率条件下启动备伞的展开程序, USPA 还要求跳伞

学生必须使用该装置。AAD 仅是备用装置，**任何跳伞者都不应依赖它来开伞**。那些使用 AAD 并了解其功能的人，在跳伞中如遭遇高度意识丧失或昏迷的情况，生存几率将显著提高。

The FAA requires those who use an AAD to maintain it in accordance with the manufacturer's instructions (FAR 105.43.c). Each jumper should read and understand the owner's manual for the AAD.

联邦航空局要求 AAD 使用者必须按照制造商说明对 AAD 进行维护（联邦航空条例 105.43.c）。每位跳伞者都应阅读并理解 AAD 的用户手册。

An AAD may complicate certain situations, particularly if the jumper deploys the main parachute low enough for the AAD to activate. Understanding and reviewing the emergency procedures for two canopies out (SIM Chapter 4-1) is essential.

AAD 可能会使某些情况复杂化，特别是当跳伞者在低至 AAD 激活高度的高度处打开主伞时。理解和复习双伞情形的紧急程序（见第四章第一节）至关重要。

Note: AADs may also be used with main parachutes, but this occurs only in specialized circumstances.

注：AAD 也可用于主伞，但仅限特殊场景。

H. Static Line (Main)

Static Line (主伞)

The FAA requires static-line deployment to be either by direct bag or pilot-chute assist. The **direct-bag** method reduces the chance of the student interfering with main-canopy deployment. The **pilot-chute-assist** method must use an assist device according to FAR 105.47. The assist device must attach at one end to the static line so that the container opens before the device is loaded, and at the other end to the pilot chute. The FAA requires the pilot-chute-assist device to have a load strength of at least 28 but not more than 160 pounds.

联邦航空局要求 Static Line 开伞方式必须是 Direct Bag 或引导伞辅助释放装置两者中的其中一种。**Direct Bag** 可减少学生干扰主伞开伞的可能性。**引导伞辅助释放**方式需结合一个辅助装置使用（联邦航空条例 105.47），辅助装置的一端必须连接在 Static Line 上，在装置承受负载之前打开伞包，装置的另一端则连接到引导伞上。联邦航空局要求引导伞辅助释放装置的载荷强度至少为 28 磅，但不超过 160 磅。

(译者注：Direct Bag 类似一个 D 包，但仅用于收纳叠好的降落伞伞布，而不与伞布连接，Direct Bag 与 Static Line 连接)

The static line should attach to an approved structural point of the airframe. A seatbelt attachment point is considered part of the airframe, but the static line should pull on it in a longitudinal direction. Aircraft seats are not considered part of the airframe.

Static Line 应连接到机身上一个经批准的结构点上。安全带连接点被认为是机身的一部分，但 Static Line 应沿纵向拉动它。飞机座椅不被视为机身的一部分。

Static-line construction should include:

Static Line 的构造应包括：

- a length of at least 8 feet but not more than 15 feet and should never come into contact with the aircraft's tail surfaces
长度至少为 8 英尺但不超过 15 英尺，并且绝对不能接触到机尾表面
- a locking slide fastener, ID number 43A9502 or MS70120
带金属扣，规格编号为 43A9502 或 MS70120
- webbing of not less than 3,600 pounds tensile strength
织带的抗拉强度不低于 3600 磅

I. Borrowing or Changing Equipment

装备的租借或改换

No one should rent or loan a parachute to persons unqualified to carry out an intended skydive or of unknown ability. The use of unfamiliar (borrowed or new) equipment without sufficient preparation has been a factor in many fatalities. Whenever possible, **avoid or minimize changes in equipment type during student training or when borrowing equipment**. Any jumper who makes equipment changes should receive adequate transition training.

降落伞不应出租或借给没有资质进行其拟做的跳伞内容的人或能力不明的人。在没有充分准备的情况下使用不熟悉的（借来的、新的）装备是造成许多死亡事故的一个因素。**学生培训时或借用装备时应尽可能避免或减少装备类型的变动**。跳伞者换用其他装备时，必须受到足够的过渡培训。

When jumping a new or different main parachute, a jumper should follow the recommendations in Chapter 5-9C: Downsizing Progression.

当使用新的或不同的主伞跳伞时，跳伞者应遵循 5-9 C 中关于降伞的建议。

J. Use of Altimeters

高度表的使用

Skydivers must always know their altitude and may choose to use a combination of altimeter types to maintain altitude awareness during all phases of a skydive. Common altimeter types include digital and analog altimeters that can be worn on the wrist or chest strap, as well as audible altimeters worn in or on a helmet.

跳伞者必须时刻掌握高度，并可通过组合使用多种高度表来在跳伞全程中保持高度意识。常见高度表类型包括可佩戴于手腕或胸带的数字/机械高度表，以及可安装在头盔内或头盔外的声音高度表。

Altimeter Errors

高度表出错

All altimeters use electronic and/or mechanical components that are subject to damage and may fail in use. You can expect minor differences in indicated altitude, so turn on or zero the altimeter at the landing area and do not re-adjust the altimeter after leaving the ground. Altimeters may lag during both ascent and descent; expect inaccuracies of up to 500 feet, plus or minus. The needle of an analog altimeter can also stick during both ascent and descent.

高度表使用的电子和/或机械部件在使用中可能会损坏，并且可能失效。指示高度的微小差异是可预期的，因此应在着陆区域开启高度表或调好零点，离开地面后不要重新调整高度表。在上升和下降过程中，高度表读数都可能会滞后；预计会有正负 0-500 英尺的滞后。机械高度表的指针有时可能会在上升和下降过程中停滞。

When an altimeter is in a burble (as when the jumper is falling back-to-earth), it may read inaccurately. To prevent damage that can cause accuracy errors, handle altimeters with care and maintain and store them according to the manufacturer's instructions.

当高度表处于跳伞者的尾流中时（比如在以背部朝下的姿态下落时），读数可能不准。为防止高度表损坏导致读数不准，应小心地使用高度表，并按照制造商的说明来维护和存放高度表。

K. Accessories

附件

Weather, drop zone conditions, the proficiency of the skydiver, and the skydiver's experience with the type of jump they will be performing should determine the use of personal equipment. Jumpers should wear adequate protective clothing, including jumpsuit, helmet, gloves, goggles, and footwear for all jumps, with the possible exception of intentional water landings. Gloves are essential when the jump-altitude temperature is lower than 40° F.

个人装备的使用应根据跳伞者的跳伞经验类型和熟练程度、天气和降落区条件来确定。除刻意进行的水上降落以外，跳伞者应穿上足够的保护着装，包括连体服（跳伞服）、头盔、手套、护目镜和鞋类。当跳伞高度的温度低于 40 华氏度（4.4 摄氏度）时，手套是必不可少的。

A jumper should carry a protected but accessible knife. All skydivers using solo equipment should wear a lightweight, rigid helmet that does not restrict vision or hearing. All jumpers should wear flotation gear when the intended exit, opening, or landing point of a skydive is within one mile of an open body of water (defined as one in which a skydiver could drown).

跳伞者应携带一把带保护的便于取用的伞刀。所有使用单人跳伞装备的跳伞者都应佩戴轻便的硬质头盔，且不得妨碍视野或听力。当预定的出舱、开伞或着陆点距离开阔水域（开阔水域的定义是跳伞员者能会被淹死的水域）不到一英里时，所有跳伞者都应穿戴飘浮装置。

L. Main Parachute Packing

叠主伞

The main parachute of a dual assembly may be packed by—

以下人员有资格叠双降落伞系统的主伞—

1. an FAA rigger
联邦航空局认证的降落伞装备师
 - a. An FAA rigger may supervise other persons in packing any type of parachute for which that person is rated (FAR 65.125.a and b).
联邦航空局认证的降落伞装备师可以监督其他人叠特定类型的降落伞，这里的特定类型指的是该装备师已获得的降落伞类型等级所对应的降落伞类型（联邦航空条例 65.125.a 和 b）。
 - b. A non-certificated person may pack a main parachute under the direct supervision of an FAA rigger (FAR 105.43.a).
非装备师的人员可在联邦航空局认证的降落伞装备师的直接监督下叠主伞（联邦航空条例 105.43.a）。
2. the person who intends to use it on the next jump (FAR 105.43.a)
打算在下一跳中使用该主伞的人（联邦航空条例 105.43.a）

Each individual skydiver should have the written approval of an S&TA, USPA Instructor or Examiner, or an FAA rigger to pack their own parachute. All parachute packers should know and understand the manufacturer's instructions for packing, maintenance, and use.

每位跳伞者都应获得安全和培训顾问、USPA 教练、考官或联邦航空局认证的降落伞装备师的书面批准，才能叠自己的降落伞。所有叠伞员都应知道并理解制造商的叠伞、维护和使用说明。

Tandem main parachutes may be packed by (FAR 105.45.b.1)—

以下人员有资格叠双人伞的主伞（联邦航空条例 105.45.b.1）—

1. an FAA rigger
联邦航空局认证的降落伞装备师
2. the parachutist in command making the next jump with that parachute
在下一跳中打算使用该降落伞的双人伞指挥员
3. a packer under the direct supervision of a rigger
受降落伞装备师直接监督的叠伞员

Exercise extreme caution when using temporary packing pins.

使用临时的叠伞关包辅助针时要非常小心。

M. Parachute Maintenance

降落伞的维护

The equipment owner should frequently inspect equipment for any damage and wear. A qualified person should promptly correct any questionable condition. The Equipment Section of Category G of the USPA Integrated Student

Program details owner inspection of the parachute.

装备所有者应经常检查装备有没有损坏和磨损。任何有疑问的情况都应立即由有资格的人员处理。降落伞所有者的降落伞检查事项在 USPA 综合学生计划 G 单元的装备部分有详细讲解。

Maintenance and Repair of the Reserve

备伞的维护和维修

The FAA requires the entire reserve assembly to be maintained as an approved parachute. Only an FAA-certificated parachute rigger may do repairs to the reserve assembly.

联邦航空局要求，维护备伞系统时，应将其作为经批准认证的降落伞来维护。备伞系统的维修必须由联邦航空局认证的降落伞装备师进行。

Maintenance and Repair of the Main

主伞的维护和维修

An FAA-certificated rigger or the owner (if he or she has adequate knowledge and skill) may perform repairs to the main. The main parachute and its deployment bag and pilot chute need not be maintained as "approved."

主伞的维修可由联邦航空局认证的降落伞装备师进行，也可由降落伞所有者进行，如果他（她）有足够的知识和技能。主伞及主伞的 D 包和引导伞无需作为批准认证的部件来维护。

Major repairs and alterations may be performed only by or under the supervision of an FAA Master Rigger, the parachute manufacturer, or any other manufacturer the FAA considers competent.

只有在下列人员的监督下，才可进行大修和大改：联邦航空局认证的专家级降落伞装备师、降落伞制造商、联邦航空局认为有能力的任何其他制造商。

4-4 跳前安全检查和简报 Pre-Jump Safety Checks and Briefings

A. Equipment Preparation

装备的准备工作

Preparing all skydiving equipment and procedures prior to each jump is critical to preventing accidents. This information is intended to provide instructional staff and other licensed jumpers with guidance in developing an appropriate personal checklist.

每次跳伞前要准备好所有的跳伞装备和跳伞程序，这对预防事故至关重要。本节信息旨在为教学人员和其他持证跳伞者提供指引，用以制定合适的个人检查表。

In some cases, others—the pilot, instructor, coach, rigger, ground crew chief, etc.—will have principal responsibility for these checks; however, no one should assume that others have carried out these responsibilities. Initially, the USPA Instructor performs these pre-jump safety checks and briefings for their students. As students progress, they should begin to learn to do them for themselves. Through leadership and attitude, instructional staff can foster a respect for safety that will serve the beginning skydiver well when they assume sole responsibility for their skydiving activities.

在某些情况下，这些检查是其他人的主要责任——飞行员、教练、助理教练、降落伞装备师、地勤主管等，但任何人都不应理所当然地假定这些责任已由其他人完成履行。一开始，USPA 教练为学生进行跳前安全检查和简报。随着学生一点点进步，应开始学会自己进行这些检查。教学人员有机会通过展现领导力和良好态度，培养对安全的尊重，这对于要为自己跳伞责任的初学者是很有益的。

USPA highly recommends that every jumper, regardless of experience level, engage in a **mutual gear check** with another licensed jumper. This peer-review process serves as an essential safety verification step to identify and rectify any oversights or errors in equipment preparation. The practice of mutual gear checks cultivates a culture of collective responsibility and vigilance, enhancing safety standards in skydiving activities.

USPA 强烈建议每位跳伞者，无论经验水平如何，都与其他持证跳伞者**相互进行装备检查**。这种互查是识别和纠正装备准备过程中疏漏或错误的关键安全验证步骤。相互检查装备有助于培养集体责任意识和警惕性，从而提升跳伞活动的安全标准。

Progressing students and all experienced jumpers should review the items on these lists to familiarize themselves with the wide range of details. This section includes checklists for:

正在培训的学生和所有有经验的跳伞者都应复习这些清单上的所有项目，以熟悉清单上的众多细节。本节包括下列检查表：

- aircraft preflight
飞行前的飞机检查
- ground-crew briefing
地勤人员简报
- pilot briefing
飞行员简报
- skydiver briefing
跳伞者简报
- equipment check
装备检查
- before-takeoff check
起飞前检查
- takeoff
起飞
- spotting
看点定位
- jump run
跳伞航线
- descent and landing in aircraft
随飞机一起降落
- post-jump debriefing
跳伞后的汇报

B. Briefings

简报

Aircraft preflight (primarily the responsibility of the pilot, but the supervising instructional rating holder should check):

飞行前的飞机检查（主要由飞行员负责，但负责监督的教学评级持有者也应检查）：

- placards: in place (as required)
标识：放置到位（根据规定的需要）
- seats removed (as required)
座椅已被拆除（根据规定的需要）
- door stop (under Cessna wing) removed
门挡（塞斯纳飞机的机翼下）已被拆除
- sharp objects taped
尖锐物体被用胶带封住
- loose objects secured
没有约束的物体固定好
- steps and handholds secure, clean of oil
台阶和扶手稳固、无油污
- aircraft altimeter set
飞机高度表设置好

- filing and activation of notice to airmen (NOTAM)
向航空人员提交和激活通知（航空人员通知）
- aircraft radio serviceable
飞机无线电通信可用
- static-line attachment secure
Static Line 连接处安全稳固
- knife in place and accessible
伞刀放到位，容易够到
- remote spotting correction and communication signals operational (larger aircraft)
舱内长距离沟通以及纠正看点定位所用的信号可正常运作（对于较大的飞机）
- winds aloft report or wind-drift indicators available
有高空风报告或风飘指示器
- seat belts available and serviceable
配备了安全带且能够正常使用
- passenger hand straps near door removed
靠近舱门的乘客手带已被拆除

A load organizer (a senior jumper or instructional rating holder) should coordinate to ensure that everyone is in agreement by conducting a **ground crew briefing**. This briefing should include communications procedures to meet BSR requirements for ground-to-air communication (smoke, panels, radio, etc.), jump order, distance/time between groups on exit, landing pattern priorities, and control of spectators and vehicles. For student operations, the briefer should be a USPA Instructor and discussion should include:

架次安排者（资深跳伞者或教学评级持有者）通过**地勤人员简报**进行协调，以确保所有人都达成一致。该简报应包括满足基本安全要求对地空通信方式（如信号烟雾、通讯面板、无线电等）的要求的通信程序、跳伞顺序、各团体之间的出舱时间间隔和距离间隔、着陆航线的优先次序、观众和车辆的管控。对于学生的跳伞作业，应由 USPA 教练作为简报者，并讨论以下内容：

- wind limitations
风的限制
- setting up and maintaining a clear target area
准备好并维护好一个空旷的着陆目标区域
- critiques of student landings
对学生着陆表现进行评价
- maintenance of master log
主日志的维护
- accident and first-aid procedures
事故和急救程序

The load organizer also **coordinates with the pilot** on jump-run altitudes and direction, communications (ground to air, jumpmaster to pilot, air traffic control), aircraft attitudes during corrections on jump run, and jump-run speed and cut. If applicable, the briefing should include locking the wheel brake (the parking brake is not to be used). In addition, the briefing should address the gross weight and center of gravity requirements and limitations, procedures for aircraft emergencies, and procedures for equipment emergencies in the aircraft.

架次安排者也需要就跳伞航线的高度和航向、沟通（地对空、跳伞指导对飞行员、空中交通管制）、在跳伞航线上进行修正时的飞机姿态、跳伞航线上的飞行速度和油门控制等事项与**飞行员协调**。简报还应包括轮胎锁定制动器（但不应使用驻车制动），如果该项适用的话。此外，简报还需涉及总重量和重心的要求和限制、飞机紧急情况的处理程序、机内装备紧急情况的处理程序。

The load organizer also **briefs the skydivers**, discussing items such as seat-belt-off altitude (1,500 feet AGL or designated by DZ policy); movement in the aircraft, especially during jump run; aircraft emergency procedures, including communication procedures; and parachute-equipment-emergency procedures.

架次安排者还需**为跳伞者进行简报**，就解开安全带的高度（离地 1500 英尺或由跳伞基地政策指定）、在机舱内如何进行移动（尤其是处于跳伞航线上时）、飞机紧急程序（包括沟通程序）、降落伞装备紧急情况的处理程序等进行讨论。

A USPA instructor **briefs students** after reviewing the student log or record. The jump plan includes exit and freefall, including jump commands, emergency procedure training or review, canopy control and landing pattern, and drop zone appearance and hazards using an aerial photo or map. The discussion should also include conduct in the aircraft such as protection of operation handles and pins, movement, and mental preparation before the jump.

USPA 教练在详阅学生的日志或记录后，**为学生进行简报**。跳伞计划包括出舱和自由落体（包括跳伞指令）、紧急程序的培训或复习、降落伞的控制和着陆航线、降落区的情况和危险障碍物（使用航拍图或地图）。讨论内容还需包括机舱内的行为，例如操作把手和关包针的保护、在舱内的移动、跳前心理准备。

C. Equipment Checklist

装备检查表

Each individual skydiver should ensure that their own equipment is inspected four times prior to each jump:

每位跳伞者应在每次跳伞前都应该确保自己的装备经过四次检查：

1. before putting it on
穿装备前
2. immediately after putting it on
穿装备后立即检查
3. prior to boarding
登机前
4. prior to exit
出舱前

Utilizing a gear-check routine that you perform in the same order each time is both efficient and helps prevent inadvertently missing an item. The following list of items, used in any logical order, is an example of a pre-flight checklist: 每次按照固定顺序执行装备检查，这样既能提高效率又可避免遗漏检查项。以下是一份飞行前检查的清单示例（可按任何合理的顺序进行检查）：

- helmet: proper fit and the chin strap threaded correctly
头盔：大小合适、下巴的带子穿戴正确
- goggles or glasses: secure and clean
护目镜或眼镜：戴得稳、且干净清晰
- three-ring release system: properly assembled and periodic maintenance performed
三环释放系统：组装正确、并已进行定期维护
- reserve static line (RSL): hooked up and routed correctly (refer to manufacturer's instructions)
RSL 已连上、走线正确（参考制造商的说明）
- altimeters: checked and set; visual altimeters do not block operation handles
高度表检查过并设置好，并且确保（目视读数的）高度表不会阻碍操作把手
- main parachute:
主伞
 - main canopy properly sized
主伞尺寸合适
 - container properly closed, pull-up cord removed, and closing loop in good condition
伞包已正确关包、关包辅助绳已移除、关包绳状况良好

- pilot chute: secure in the pouch, bridle routed correctly and secure, pin secure on the bridle and seated in the closing loop, slack above the pin (if applicable), and color in the kill-line window (if applicable); if using a pull-out pilot chute (not approved for student use): handle secure, pin seated, free movement of the handle through pin extraction (see manufacturer's instructions)

引导伞：稳稳地塞入收纳袋里、引导伞系带的走线要正确且塞好、关包针与引导伞系带的连接稳固并穿过关包绳、关包针上方的引导伞系带留一些松弛部分（可能适用于某些装备）、Kill Line 指示窗显示正确的颜色（如适用）；如果使用的是拉出式引导伞（不允许学生使用），则应确认：把手稳固、关包针插好、拉出关包针的行程中开伞把手的移动畅通无阻（参考制造商说明）

- practice-main-deployment-handle secure (student)
主伞模拟开伞把手固定稳（学生）

● harness:

背带

- straps routed correctly and not twisted
下列各织带无扭曲、走线正确
 - chest strap
胸带
 - leg straps
腿带
 - belly band, if applicable
腹带（如适用）
- snaps secured and closed and/or friction adapters properly threaded
卡扣稳固且已扣好，和/或（借助摩擦力系牢的）调节扣安装正确
- adjusted for proper fit
松紧度调整好
- running ends turned back and sewn
线头或织带的末端已被反折并缝好
- loose ends tucked into keepers
松弛的末端固定稳

● belly band (if used):

腹带（如使用）

- correctly routed
走线要正确
- adjusted
调整好松紧
- friction adapter properly threaded
（借助摩擦力系牢的）调节扣安装正确

● reserve:

备伞

- proper size for jumper
备伞尺寸适合跳伞者
- pin condition: seated, not bent, and closing loop(s) in good condition
备伞关包针的状态：插好、未弯曲、关包绳状态良好
- pilot chute seated
引导伞装好
- packing data card in date and seal in place
备伞卡（备伞叠伞记录卡）上的上次备伞叠伞未过期、铅封没有被破坏
- reserve-handle pocket condition

备伞把手固定夹层 (译者注: 即固定备伞把手的那个地方) 状态良好

- pin-cover flap closed
关包针挡盖塞好
- overall appearance
整体外观状态良好
- risers: not twisted and toggles secure
组提带未扭曲, 刹车收好
- suspension and control lines: not exposed
伞绳和刹车线未外露
- personal accessories:
个人穿戴
 - footwear: proper type and fit, no open hooks or buckles
鞋类: 合适的类型和大小、没有开放的钩状部件或扣子
 - protective clothing
保护着装
 - jumpsuit pockets closed
连体服 (跳伞服) 口袋拉链拉上
 - other outerwear compatible with jumping
其他适合跳伞的外套
 - gloves as needed
按需戴手套
 - empty pockets
口袋清空
 - earplugs (if desired)
耳塞 (如需)
- automatic activation device (AAD):
自动激活装置 (AAD)
 - serviced according to manufacturer's schedule
符合制造商的维护日程要求
 - in the correct mode for the jump (changeable-mode AADs)
设置了适用于本次跳伞的模式 (对于可切换模式的 AAD)
 - proper routing of cable(s)
线缆的走线正确
 - control unit secured in proper location
控制单元安放在正确的位置
 - turned on and calibrated (offset for altitude if needed)
已开启并已校准 (如需设置高度补偿)
- condition of all touch fastener (aka Velcro) and tuck tabs
所有接触式固定装置 (魔术贴) 和 Tuck Tab 的状况良好

(译者注: Tuck Tab 和 Tuck Flap 一般指降落伞伞包以及某些部件上的附加延伸部分, 用途为将某些东西固定住, 一般通过塞入收纳处来固定所需固定的东西, 典型的例子包括组提带挡盖的 Tuck Tab 或某些 D 包上用于收纳松弛伞绳的 Tuck Flap。Tuck Tab 和 Tuck Flap 的主要区别是形状, 一般布片状的叫 Flap, 凸条状的叫 Tab, 有时候也会混用, 例如组提带挡盖的 Tuck Tab 有时也称作 Tuck Flap)
- overall fit and appearance
整体合身, 外观状态良好

4-5 天气 Weather

A. Determining Winds

确定风况

According to the BSRs, jumpers must determine the appropriate altitude and surface winds prior to conducting any skydive. You should measure surface winds at the actual landing area. Winds-aloft reports from the FAA flight service are only forecasts. You can make observations while in flight using navigation systems such as global positioning satellite systems (GPS). Winds can change at any time, so the jumper should check all available information before and during the jump.

根据基本安全要求，跳伞者必须在任何跳伞前确定适当高度和地面的风况。应在实际着陆区域测量地面风速。联邦航空局飞行服务所提供的高空风报告仅为预测数据。你在飞行期间可使用诸如全球定位系统（GPS）的导航系统进行观察。风况随时可能变化，因此跳伞者应在跳伞前和跳伞过程中核查所有可用信息。

B. Hazardous Weather

危险天气

Fronts approach with much warning but can catch the unaware off guard. A gust front (a line of sudden and severe weather) precedes some fronts. Rapid and significant changes in the strength and direction of the winds aloft and on the surface may accompany frontal approach and passage.

气团锋面逼近时会有很多警示信号，但仍可能会让不知情的人措手不及。一些（冷暖气团接触的）锋面到来之前会有阵风锋面（一种突然出现的线状界限分明的恶劣天气情况）。锋面的逼近和经过可能导致高空风和地面风的强度和方向发生急剧变化。

Gusty winds, thermals, abrupt changes in temperature, and even terrain can create turbulence in canopy flight at all altitudes, including near the ground. **Turbulent or gusty winds on landing can also initiate a flight cycle**, causing your parachute to dive toward the ground. Canopies with lighter wing loadings are less predictable in turbulence. When flying in turbulence regardless of your altitude, maintain the desired heading using smooth but effective toggle input. Fly in full flight unless directed otherwise in the canopy owner's manual. If turbulence exists near the ground, prepare for a quick and forceful flare and a PLF.

阵风、热流、气温骤变，甚至地形因素，都可能在任何高度（包括在地面附近）引发乱流，影响降落伞飞行。**着陆时的乱流或阵风也可能触发飞行循环**，导致降落伞俯冲下坠。翼载较轻的降落伞在乱流中的表现更难预测。无论在哪个高度，遭遇乱流时，都应通过平稳而有效的刹车操作保持预定方向。除非降落伞的用户手册另有指示，否则跳伞者应保持全速飞行状态。地面附近存在乱流时，需准备好执行快速且有利的拉平并 PLF。

On calm, hot, humid days, thunderstorms can spontaneously generate and move in unpredictable patterns.

在静风、炎热、潮湿的日子里，雷暴可能自发形成并以不可预测的模式移动。

Dust devils are strong, well-formed, and relatively short-lived whirlwinds (mini-tornadoes). They usually form on days with significant thermal activity, (i.e., hot days with clear skies and strong sunshine). Dust devils may or may not be visible when they form. You should avoid flying in or near dust devils as they may cause sudden and unpredictable changes in your altitude and direction of flight and may even cause your canopy to collapse. If you do encounter a dust devil while in flight, continue to actively pilot your canopy toward a safe landing area and be prepared to PLF.

尘卷风是一种强烈的、成型完全的但持续时间较短的旋风（迷你龙卷风）。它们通常形成于热流活动显著的日子（即晴朗炎热且阳光强烈的天气）。尘卷风形成时可能可见也可能不可见。应避免在尘卷风内部或附近飞行，因其可能导致你的高度和方向出现突然且不可预测的变化，甚至造成降落伞塌缩。若飞行中遭遇尘卷风，应持续主动操控降落伞飞向安全的着陆区域，并做好 PLF 准备。

Cold weather can also be hazardous. Having cold hands or wearing gloves can change how the pilot chute and emergency handles feel, and Velcro becomes much stiffer during cold temperatures. This may make operating the

handles more difficult.

寒冷天气同样存在风险。手部受冻或佩戴手套会改变引导伞和备伞把手的手感，且低温下魔术贴会变得更硬。这可能导致操作把手更难使用。

Weather websites, weather apps, TV forecasts, continuous observation by you and your pilot (who is legally responsible to know the weather conditions before flight) can provide practical information.

天气网站、天气 App、电视天气预报、以及你和飞行员（飞行员在法律上有责任在飞行前了解天气状况）的持续观察都能提供实用信息。

C. Density Altitude

密度高度

Parachute performance is measured at sea level in moderate temperatures and humidity. Altitude, heat, and humidity influence the density of air. Density altitude is a measure of air density that is calculated according to the temperature and altitude.

降落伞性能的测量基于海平面标准，是在温度和湿度适中的条件下进行的。海拔、温度与湿度都会影响空气密度。密度高度是根据温度与海拔计算得出的空气密度指标。

As density altitude increases, airspeed increases by almost 5% per 3,000 feet up to 12,000 feet MSL, and more than 5% per 3,000 feet above 12,000 feet MSL. As density altitude increases, a ram-air canopy pilot can expect the following:

在海拔 12000 英尺以下，密度高度每增加 3000 英尺，空速会提高近 5%，海拔 12000 英尺以上，密度高度每增加 3000 英尺，空速会增加超过 5%。随着密度高度的增加，冲压空气式降落伞的性能预期会有以下变化：

- a higher stall speed
更高的失速速度
- a faster forward speed
更快的前进速度
- a faster descent rate
更快的下降速率
- higher opening forces
更强的开伞冲击

Additionally, higher density altitude affects aircraft in the following ways:

此外，较高的密度高度会以如下方式影响飞机：

- longer distances required for takeoff and landing
起飞和着陆需要更长的距离
- reduced propeller effectiveness
螺旋桨效率更低
- poorer turbine and piston-engine performance
涡轮发动机和活塞式发动机性能更差
- slower and flatter rate of climb
更慢和更平坦的爬升率
- less useful load given the aircraft's maximum allowable gross weight
在飞机的最大允许总重量下，可搭载的有效载荷减少

The pilot is responsible for knowing the density altitude prior to takeoff, and skydivers should consider the effects of density altitude on canopy performance.

飞行员有责任在起飞前知道密度高度。建议跳伞者也将密度高度对降落伞性能的影响考虑在内。

4-6 飞机 Aircraft

Skydivers play a more integral role in aircraft operations than ordinary passengers, because their procedures can dramatically affect the controllability of the aircraft, particularly during exit.

比起普通乘客，跳伞者与飞机的运作有更深的关联，因为跳伞者的各跳伞程序可能会对飞机操纵性造成极大影响，特别是在出舱时。

Parasitic drag reduces airspeed necessary for flight and reduces the effectiveness of control surfaces. Excess weight in the rear of the aircraft can cause the pilot to lose control of the aircraft and cause it to stall. A jump pilot should brief all jumpers on the topics outlined in Aircraft Briefing from Category E of the USPA Integrated Student Program. The smallest aircraft used for student jumping should be able to carry the pilot and at least three jumpers.

寄生阻力会降低飞机飞行所必需的空速，并降低控制面的有效性。飞机后部超重会导致飞行员失去对飞机的控制，并使飞机失速。跳伞作业飞行员应就 USPA 综合学生计划 E 单元中的飞机简报中所列的主题为跳伞者进行简报。可用于学生跳伞的最小的飞机应能承载飞行员和至少三名跳伞者。

Those planning to open their parachute above the normal opening altitude (generally 5,000 feet AGL and lower) should inform the pilot and all jumpers on board, as well as any other jump in flight at the time.

计划在高于正常开伞高度的高度（正常开伞高度通常为离地 5000 英尺及以下）开伞的跳伞者应提前通知飞行员和飞机上的所有跳伞者。如有其他飞机也在进行跳伞作业，则也需进行通知。

Aircraft fueling operations should occur away from skydiver landing and loading areas, and no person, except the pilot and necessary fueling crew, should be aboard the aircraft during fueling. USPA accepts the practice of rapid refueling (fueling an aircraft while an engine is running) for certain turbine-powered aircraft when performed in accordance with the guidelines of Parachute Industry Association Technical Standard TS-122. Piston-powered aircraft should never be rapid-refueled.

飞机的加油操作应远离跳伞着陆区和登机区，加油时除飞行员和必要的加油人员外，任何人都不应在飞机上。USPA 接受某些涡轮动力飞机快速加油（发动机仍运转时进行加油）的做法，前提是符合降落伞工业协会（PIA）TS-122 技术标准的指引。以活塞式发动机作为动力来源的飞机禁止进行快速加油。

Students should never **approach an aircraft**, whether the engine is running or not, unless they are under the direct supervision of a USPA instructional rating holder. Everyone should always approach a fixed-wing aircraft from behind the wing and always approach a helicopter from the front or the side, only after making eye contact with the pilot. Everyone should always protect their handles while entering the aircraft and follow procedures to avoid the accidental activation of any equipment.

除非受到 USPA 教学评级持有者的直接监督，学生不得**接近飞机**，无论发动机是否运转。所有人都应始终从机翼后面接近固定翼飞机。对于直升机，只有与飞行员进行眼神接触之后才可从正面或侧面接近。登机时，每个人都应始终保护好自己降落伞的把手，并遵循程序，以避免意外启动任何装备。

On the **ride to altitude**, everyone on board the aircraft is subject to the seating requirements found in FAR 91.107 and the parachute requirements found in FAR 91.307. Everyone should have a thorough understanding and be prepared to take the appropriate actions in the event of an accidental activation of parachute equipment in the aircraft. Seatbelts should remain fastened and all hard helmets and other potential projectiles secured until the pilot notifies the jumpers that they may unfasten them. Students should sit still and move only when their instructor(s) or coach specifically directs them to do so. Jumpers should determine seating arrangements—which will vary according to the particular aircraft and the size and type of the load—in advance.

在飞机**爬升的过程中**，飞机上的每个人都要遵守联邦航空条例 91.107 中的座位要求和联邦航空条例 91.307 中的降落伞要求。每个人都应对飞机上降落伞装备被意外激活的情况有全面了解，并对此作好准备，以采取适当应对措施。在飞行员通知跳伞

者可以解开安全带并解除对硬质头盔和其他可能乱动的物体的固定之前，跳伞者应继续系好安全带并护好硬质头盔和其他潜在的可能乱动的物体。学生应该坐着不动，除非教练或助理教练明确指示学生移动。座位安排应提前确定，并根据特定的飞机类型、载荷的大小和类型而变化。

Failure to maintain proper **weight and balance** throughout the flight may result in loss of control of the aircraft. This means the load must be properly distributed in the aircraft to maintain balance in relation to the center of gravity, which is necessary for the aircraft to fly safely. The jumpers must cooperate fully with the pilot to keep the aircraft within its safe performance envelope throughout the entire flight. The aircraft must not carry more weight than the maximum allowed in the manufacturer's operating manual.

如果不在整个飞行过程中保持适当的**重量和平衡**，飞机可能会失控。这意味着载荷在飞机上的分布必须适当，以保持重心平衡，这对保证飞机的安全飞行是必要的。跳伞者必须与飞行员充分合作，保持飞机在整个飞行过程中能在安全性能范围内飞行。飞机的载荷重量不得超过制造商操作手册中所允许的最大重量。

Seatbelts/restraints should be stowed out of the way but never fastened together unless being worn. All pilots and other occupants of a jump aircraft must wear parachutes when required by the FAA.

安全带或约束装置应妥善收纳，避免妨碍操作，除非正在使用，否则不得相互扣合。当受到联邦航空局要求时，跳伞作业飞机上的所有飞行员及其他乘员都必须配备降落伞。

4-7 看点定位 Spotting

A. Why Spotting is Important

为什么看点定位很重要

Choosing the correct exit point and guiding the pilot to it (spotting) helps fulfill each skydiver's responsibility to land in an appropriate clear area. Jumpers must demonstrate basic spotting abilities prior to obtaining the USPA A license. Spotting in more difficult circumstances requires continued practice and study. In addition to considerations for getting one jumper or group out of the aircraft at the correct point, spotters must consider the correct exit points for multiple individuals or groups on the same pass from a larger aircraft.

选择正确的出舱点并引导飞行员飞到正确点位（看点定位）有助于跳伞者履行在适当的空旷区域着陆的责任。跳伞者必须展现出基本的看点定位能力才能获得 USPA A 执照。在更复杂情况下的看点定位需要不断的练习和学习。除了要考虑在正确的点位让一名跳伞者或一组跳伞者出舱外，进行看点定位的跳伞者还必须考虑一架较大的飞机上同一批次出舱的多个个人或团体的正确出舱点。

B. Priorities

优先事项

Be familiar with the DZ and surrounding area, including exit and opening points. Jumpers should observe and talk to those on previous jumps to help determine the correct jump-run direction and exit and opening point. The Standard Operating Procedure sections of Categories D, E, and F of the Integrated Student Program explain the methods for estimating the exit and opening point based on winds-aloft forecasts.

建议跳伞者熟悉降落区及周边地区，包括出舱点和开伞点。跳伞者应观察不久前刚跳伞的跳伞者的伞降情况，并与他们交谈，以帮助确定正确的跳伞航线航向、出舱点、开伞点。综合学生计划 D 单元、E 单元、F 单元的“标准作业程序”部分解释了基于高空风预报预估出舱点和开伞点的方法。

Calculation of the spot using the winds-aloft report has replaced the use of **wind-drift indicators** (WDI) for most routine drop zone operations. However, use of WDIs can also be effective for determining drift under canopy. Jumpers aboard the aircraft observe the drift of a piece of weighted crepe paper released at canopy opening altitude over an observed position (or at half of the opening altitude with ground travel doubled for the jump) to determine the distance and direction of the best opening point upwind of the target. Jumpers are responsible for wind drift indicators after they

land.

在大多数常规的跳伞基地作业中，高空风报告已经取代了**风飘指示器**（WDI），作为观察和计算点位的主要方法。但风飘指示器仍是确定开伞后跳伞者会被风吹多远的有效方法。飞机上的跳伞者在观测基准点上方的开伞高度处释放一张带配重的绉纸（即风飘指示器），并观察其漂移量，以确定着陆目标上风处的最佳开伞点的距离和方向，或者在开伞高度的一半处释放它，这样降落伞相对地面的漂移量就是测量值的 2 倍。跳伞者着陆后应负责回收风飘指示器。

To spot, look out the open door of the aircraft for traffic and clouds below, and identify the DZ, the climb-out point, and the exit point. Category D of the ISP discusses techniques for determining the point straight below the aircraft.

看点定位时，需观察舱门外下方空域的飞机与云层，并识别跳伞基地、爬出机舱点及出舱点的位置。综合学生计划 D 单元专门讲解了判断飞机正下方位置的技巧。

Jumpers can use the mnemonic **SPACE** to quickly remember the items they need to check while spotting:

跳伞者可通过缩写“**SPACE**”快速记住看点定位的检查要点：

- Skydivers
跳伞者
- Planes
飞机
- Airport
机场
- Clouds
云层
- Exit light
出舱信号灯

Make sure you have enough separation between the skydivers in front of you and your group. According to FAR 105.5, the jumper and the pilot are jointly responsible for making sure plane traffic is clear before jumping. You should be at a distance and direction from the airport that allows you to make it back to the drop zone given the winds for that day. According to FAR 105.17, the jumper and pilot are jointly responsible for staying the appropriate distance clear of clouds. The pilot communicates the final OK for exit either with a light system or verbally.

你必须确保自己和自己所在团体与较早出舱的跳伞者保持足够的间隔距离。根据联邦航空条例 105.5，跳伞者与飞行员共同负责在跳前确认空域内无其他飞机。你应基于当天的风况，确定自己相对于机场的距离和方位是足以供自己安全返回跳伞基地的。依据联邦航空条例 105.17，跳伞者与飞行员需共同负责确保与云层保持适当的间隔距离。飞行员通过信号灯系统或口头喊话传达最终的出舱许可。

C. Exit Separation on Jump Run

跳伞航线上的出舱间隔

Slower-falling jumpers and groups have a longer exposure to upper headwinds, which blow them farther downwind than faster-falling jumpers and groups. Slower-falling groups should exit before faster-falling groups when jump run is into the wind.

下落速度较慢的跳伞者及团体受高空风影响的时间更长，其随风漂移的距离会大于下落速度快的跳伞者及团体。若飞机是在跳伞航线上逆风飞行，下落速度较慢的团体应早于下落速度较快的团体出舱。

On days with strong upper headwinds, allow more time between groups on the same pass to get sufficient horizontal separation over the ground. Provide at least 1,000 feet of ground separation between individuals jumping solo. Provide at least 1,500 feet of ground separation between small groups, adding more as the size of the groups increase.

当高空风较强时，要延长同一批次出舱的各团体间的出舱间隔以确保各团体在水平方向上的地面间距充足。单人跳伞者间需要至少 1000 英尺的地面间距，小型团体间需要至少 1500 英尺的地面间距，随着团体规模扩大，间距也要相应增加。

Once your parachute opens, delay flying up or down the line of flight until any jumpers in a slower-falling group that exited **before** you have opened their parachutes and turned toward the landing area, and members of the group exiting **after** have completed their freefall and opened.

开伞后，应推迟沿着飞机的飞行路线向前或向后飞行，直到任何**较早**出舱的、下落速度较慢的团体已开伞并转向着陆区域，且**较晚**出舱的团体已完成自由落体并开伞。

Flying jump run across the upper winds (crosswind) helps achieve separation between groups. Whether flying one or more aircraft, each pass should allow enough time for jumpers on a previous pass to descend to a safe altitude before dropping jumpers from the next pass.

飞机在跳伞航线上横向于高空风飞行（侧风飞行）有助于各团体之间分开距离。无论是一架飞机还是多架飞机在进行跳伞作业，每批次投放跳伞者都应留出足够的间隔时间，让上批次投放的跳伞者在下批次跳伞者被投放前下降到安全高度。

D. Exit and Flight-Plan Considerations for Different Disciplines

不同跳伞类型的出舱和飞行计划的注意事项

Larger jump aircraft may include several different groups of skydivers performing different disciplines, some of which use more airspace than others. The following exit order is a general guide, but drop zones may adjust the order based on local considerations such as prevailing upper winds, the terrain, other disciplines on the load, weather conditions, and skill level of jumpers or group leaders.

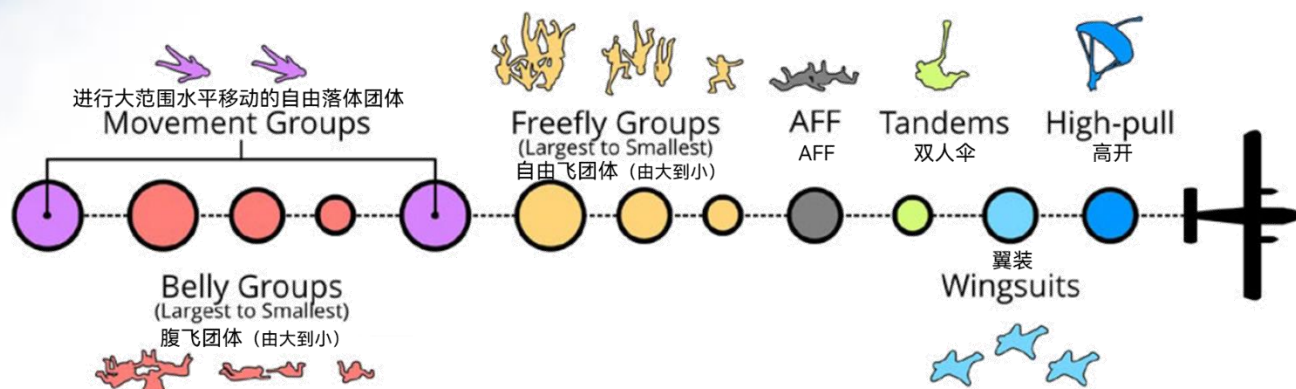
大型跳伞作业飞机里可能会有几个不同跳伞类型的跳伞团体，其跳伞内容各不相同，其中一些跳伞者比其他跳伞者需要使用更多的空域。以下为常规的出舱顺序指引，但各跳伞基地可视当地的因素调整顺序，例如高空盛行风、地形、同架次跳伞者的其他跳伞类型、天气条件以及跳伞者或团体领队的技能水平等因素。

1. Movement group 1 (angle, tracking, etc.)
涉及大范围水平移动的自由落体团体 1（Angle、Tracking 等）
2. Formation skydivers falling in a belly-to-earth orientation (largest to smallest)
以腹部朝下姿态下落的跳伞团体编队（由大到小）
3. Freefly groups falling in head-down, standing or sitting positions (largest to smallest)
以倒飞、站飞或坐飞的姿态下落的自由飞编队（由大到小）
4. Movement group 2 (angle, tracking, etc.)
涉及大范围水平移动的自由落体团体 2（Angle、Tracking 等）
5. Freefall students with instructors
进行自由落体的学生和教练
6. Tandem students and instructors
双人伞学生和教练
7. High-pulls
高开的跳伞者
8. Wingsuit flyers
翼装飞行者

(译者特注：此处所列出舱顺序及本节倒数第三段的描述与下文附图存在一定出入，请以 USPA 修订结果为准)

Group Separation Exit Order

团体间隔出舱顺序



Some of these groups—**formation skydivers, freeflyers, solo students and tandem students**—tend to fall straight down after exit, drifting horizontally with the effects of wind but otherwise not moving much in the airspace. They gain adequate separation from one another by exiting in groups largest to smallest per discipline and waiting the appropriate length of time between groups before exiting the airplane.

其中一些团体，包括**团体编队跳伞者、自由飞跳伞者、单人跳伞学生和双人伞学生**，会在出舱后倾向于直线下落，在风的影响下发生水平漂移，但除此之外，在空域中不会有太多的移动。

Other Groups—**movement groups (angle, tracking, etc.), canopy formation jumpers, and wingsuit flyers**—cover large horizontal distances that you must take into account when planning a descent strategy. These groups must fly a specific flight path that they plan before boarding the aircraft. The jumper leading this type of group must keep the group flying the planned path the entire freefall. This plan may include turning downwind after sufficient lateral distance and flying parallel to groups that exited earlier. The breakoff point must be far enough laterally to allow for the jumpers to gain horizontal separation from each other, as well as any of the groups that exited the airplane earlier.

其他团体，包括**涉及大范围水平移动的自由落体团体 (Angle、Tracking 等)，降落伞编队跳伞者和翼装飞行者**，会移动很大的水平距离，你在规划降落伞下降策略时必须将他们考虑在内。这些团体必须在登机前就制定好飞行路线计划，并按计划飞行。这类团体跳伞者的领队必须在整个自由落体过程中让团体按计划路线飞行。计划路线可能包括让团体在飞出足够的横向间距后，转向顺风方向，平行于先前出舱的其他团体飞行。这类团体的开伞前的分离点与其他跳伞团体间的横向间距必须足够大，不仅要让团体内的跳伞者分开足够距离，还要与先前出舱的任何团体分开足够距离。

Wingsuit flyers should exit last, as they typically follow the plane along jump run after exit, while **high pullers** tend to fly back through the jump-run path. There are possible exceptions to this generalization, such as a canopy formation team exiting with a major offset, e.g. greater than one mile past the last wingsuit flyer exiting. Airplane loads that include more than one wingsuit group add complexity to determining the airspace necessary to allow each group to open in a clear area.

翼装飞行者应当最后出舱，因为他们通常在出舱后会沿着跳伞航线跟随飞机飞行，而**高开的跳伞者**则倾向于沿着跳伞航线的路径飞回。这可能存在例外情况，例如当降落伞编队团队以大幅的位置偏移出舱时（比如在最后一名翼装飞行者出舱后 1 英里以上的位置出舱）。如果一个架次搭载一个以上的翼装飞行团体，则需要更复杂的空域规划以确保每个团体都能在净空的空域开伞。

Loads that include more than two **movement groups** require greater planning to determine exit order. Generally, no movement group should exit immediately after another. Immediately after exit, a movement group must fly perpendicular to jump run to provide lateral separation from the other groups that have exited or will exit the aircraft. After gaining sufficient lateral distance, the group may then turn downwind, flying parallel to groups that exited earlier. A second movement group on the same load should fly the opposite direction of the first, while still flying perpendicular

to jump run, to allow for greater separation.

当一个架次搭载超过 2 个**涉及大范围水平移动的自由落体团体**时，需要更周密的计划来确定出舱顺序。一般来说，此类团体不应接连出舱。出舱后，必须立即垂直于跳伞航线飞行，以与已出舱或即将出舱的团体隔开横向间距。在飞出足够的横向间距后，再转向顺风方向，平行于先前出舱的其他团体飞行。同一架次上的第二个此类团体应沿与第一个此类团体相反的方向飞行，路线仍需垂直于跳伞航线，以制造更大的间隔。

Depending on the situation, it may be safer to restrict each airplane load to no more than two movement groups and one wingsuit group.

视情况而言，可能更安全的做法是，每架飞机只搭载不超 2 个涉及大范围水平移动的自由落体团体和 1 个翼装飞行团体编队。

4-8 事件报告 Incident Reports

A. Incidents

事件

Reporting incidents helps USPA track current trends in the field and gives direction to USPA staff and board members addressing equipment issues, training methods, and safety procedures. It is particularly important to report any event that requires a jumper to receive medical attention or raises a safety concern, but jumpers should also report noteworthy malfunctions, unsafe procedures, unusual or ethically unacceptable skydives, or other extraordinary occurrences concerning skydiving operations. USPA rating holders and S&TAs, the leaders in the field, are the key to encouraging skydivers to file incident reports.

事件报告有助于 USPA 追踪行业动态，并为 USPA 员工及董事会成员处理装备问题、培训方法及安全程序提供方向指引。报告任何导致跳伞者接受医疗救治或引发安全隐患的事件是非常重要的，同时跳伞者也应上报值得注意的装备故障、不安全的操作程序、反常或有违职业道德的跳伞行为，以及其他涉及跳伞作业的特殊事件。USPA 评级持有者及安全和培训顾问作为行业引领者，是鼓励跳伞者提交事件报告的关键力量。

Incident reports are warranted for (but not limited to):

以下情况下需要提交事件报告（包括但不限于以下情况）：

- Fatalities
致命事故
- Injuries requiring medical attention (anything more than local first aid)
需要医疗照顾的受伤（任何超过需要原地紧急处理的程度的受伤）
- Any injury to a student (including tandem students)
学生的任何受伤（包括双人伞学生）
- Reserve deployments (intentional or unintentional)
备伞被打开（无论是刻意的还是意外的）
- AAD activations
AAD 被激活
- Off-field landing or obstacle landings (buildings and other objects, water, power lines, trees)
场外降落或障碍物着陆（建筑物和其他障碍物、水域、高压线、树木）
- Emergency exits from an aircraft
飞机紧急出舱
- Freefall or canopy collisions
自由落体时或开伞后跳伞者之间发生碰撞
- Premature deployments in aircraft or freefall
在飞机机舱内或自由落体时降落伞意外过早打开
- Harness or canopy damaged during jump
跳伞时，背带或降落伞伞布受损

- The unplanned dropping of equipment during jump
跳伞时，有装备意外掉落
- Anything filed on an insurance claim
导致提出保险索赔的任何事情

B. Investigation and Reporting of Incidents

事件的调查和报告

Fatalities and other significant incidents are an unfortunate part of skydiving. To help skydivers learn essential lessons from the mistakes of others and reduce the number and severity of incidents, USPA members should fill out an incident report when it meets any of the conditions in the list above. When appropriate, an S&TA can act as an impartial investigator. Jumpers should coordinate efforts through the local S&TA when an event requires several reports, witness accounts or personal observations of the investigator. Incidents can be reported online at uspa.org/ir.

伤亡及其他重大事件是跳伞运动中令人遗憾的一部分。为帮助跳伞者从他人失误中汲取关键教训，降低事故发生率与严重程度，当出现符合上述任一条件的事件时，USPA 会员应填写事件报告。在适当的情况下，安全和培训顾问可担任公正调查员的角色。当一个事件需要提交多份报告、目击者证词或调查员个人观察记录时，跳伞者应通过当地的安全和培训顾问协调工作。事件报告可通过 uspa.org/ir 在线提交。

USPA keeps reports confidential by following the procedures included in this section. The integrity and effectiveness of the reporting system rely on each USPA official following USPA's procedures precisely as outlined.

USPA 通过遵循本节所述程序来对报告进行保密。报告系统的完整性和有效性取决于每一位 USPA 官员能否准确地遵循所述的 USPA 程序。

C. Submission and Disposal of Incident Reports

事件报告的提交和处理

USPA follows strict operating procedures to maintain the confidentiality of reports and protect the integrity of the incident-reporting system. If possible, the reporting party should use the online submission form at uspa.org/ir, but may also print or type the report and send it to USPA Headquarters.

USPA 遵循严格的操作流程来确保报告保密性并维护事件报告系统的完整性。如有可能，报告方应通过 uspa.org/ir 提交在线报告，也可选择打印或填写纸质报告寄送至 USPA 总部。

USPA maintains only the information that identifies trends for USPA and the skydiving industry. USPA removes dates, locations and names of involved parties and enters the remaining information into a database, then destroys the submitted reports.

USPA 仅保留用于 USPA 和跳伞行业的趋势分析的数据信息。所有涉及日期、地点及当事人姓名的信息均会被移除，剩余信息将录入数据库，原始提交的报告随即销毁。

USPA may publish a brief synopsis of the report in Parachutist, excluding the date, specific location and names of anyone involved.

USPA 可能在 Parachutist 杂志上发布报告的概要，但不包含日期、具体地点和涉事人员的姓名。。

D. The Incident Reporting Form

事件报告表

You can ensure that USPA receives the most accurate and useful data by providing detailed information in your incident report and by specifying the type of injury (if one) that occurred. Completing the narrative area, including all factors that led to the incident, helps USPA produce an accurate summary. If filing a report of a non-fatal incident that caused injury, include the prognosis for the jumper's recovery.

为确保 USPA 获取最准确有效的数据，请在事件报告中提供详细信息并明确注明伤情类型（如发生受伤）。完整填写事件的陈

述栏并涵盖所有导致事故的因素将有助于 USPA 对事故做出准确的总结。如果报告的是造成受伤的非致命事件，请包含跳伞者的康复预后情况。

E. USPA Policy Regarding Privileged Information

USPA 关于正当性和特许保密信息的政策

The success of USPA's safety-reporting program depends upon the free exchange of information between field reporters and USPA Headquarters. If reporting officials believe that the information will be used only for statistical and educational purposes and that the reports themselves will not be released to third parties, the reporting system will continue to serve the best interests of the membership. If, on the other hand, this privileged information is released to third parties for whatever reason, USPA will lose the trust of the field reporters and, with it, valuable safety-generating data.

USPA 安全报告计划的成效取决于现场报告人员和 USPA 总部之间的信息自由交流。如果报告者相信这些信息将只被用于统计和教育目的，并且报告本身不会被透露给第三方，则报告系统将能够继续服务会员的最佳利益。反之，如果这些特许保密信息因任何原因被透露给第三方，USPA 将失去现场报告人员的信任，进而失去宝贵的、可促进安全的数据。

USPA's policy includes:

USPA 的政策包含如下内容：

- Documents for use only by the reporting party and USPA officials as necessary to enhance safety through education and training.
文件仅供报告方和 USPA 官员在必要时使用，以通过教育和培训来促进安全。
- All requests by third parties to access such information or documents will be referred to the USPA Executive Director, who, in consultation with the USPA President, will determine the need to refer to counsel.
第三方要求查阅此类信息或文件的所有请求将被提交给 USPA 执行董事，执行董事在与 USPA 总裁协商后，将决定是否需要咨询法律顾问。
- Failure to adhere to these procedures will subject the violating USPA member to disciplinary action per Section 1-6 of the USPA Governance Manual.
如果不遵守这些程序，违规的 USPA 会员将受到 USPA 管理手册 1-6 节规定的纪律处分。

第五章 特定跳伞类型的建议

Discipline-Specific Recommendations

This chapter provides guidance for various disciplines in skydiving: formation skydiving; freeflying, freestyle and skysurfing; night jumping; water landings; canopy formations; high-altitude jumping; camera flying; wingsuit flying; canopy piloting; movement jumps; and speed skydiving. These guidelines will also assist you in meeting your skill and knowledge requirements for the USPA B, C, and D Licenses and USPA ratings.

本章提供各种跳伞类型的指引：团体自由落体；自由飞、自由式和空中滑板；夜间跳伞；水上降落；降落伞编队；高海拔跳伞；跳伞摄影；翼装；伞控；涉及大范围水平移动的自由落体；以及高速自由落体。这些指引也将帮助你满足 USPA B 执照、C 执照和 D 执照以及 USPA 教学评级所需的技能与知识要求。

5-1 团体自由落体 Formation Skydiving

A. Introduction and Definition

简介和定义

Formation skydiving, traditionally called "relative work" or "group freefall," is the intentional maneuvering of two or more skydivers in proximity to one another in freefall.

团体跳伞，传统上被称为“造型跳伞”，指两位或多位跳伞者刻意在自由落体过程中进行近距离的机动。

B. Training and Procedures

培训和程序

Before training for formation skydiving, each student should complete all the training and advancement criteria through Category F of the USPA Integrated Student Program.

在进行团体自由落体培训前，学生应先通过 USPA 综合学生计划 F 单元的所有培训和晋级标准。

Students should begin training for group freefall skills as soon as they complete Category F of the ISP. This encourages them to maintain their interest in skydiving, fosters relaxation in the air, develops coordination, establishes participation in group activities, and develops safe attitudes and procedures. Initial training should begin with no more than two jumpers—the trainee and a current USPA Coach or Instructor. Categories G and H of the ISP contain a recommended training outline for beginning group freefall skills.

学生应在完成综合学生计划 F 单元后立即开始团体自由落体技能培训。这有助于保持学生对跳伞的兴趣，培养空中放松的能力，提升协调性，建立团体活动参与意识，并培养安全意识和程序。初始培训开始时，跳伞者不应该超过两人，即学生和 USPA 助理教练或教练。综合学生计划的 G 单元和 H 单元包含了初级团体自由落体技能的建议培训大纲。

C. Hazards Associated with Formation Skydiving

与团体自由落体相关的危险

Mid-air collisions and funneled formations are not only undesirable but can be dangerous. Two bodies colliding in flight can cause severe injuries or death. The greatest danger exists when jumpers lose sight of each other and open their canopies independently, which may set the stage for a jumper in freefall to collide with an open canopy. Even after opening, if the jumpers do not follow proper safety procedures, they risk a canopy collision.

空中相撞和漏斗效应不仅不可取，还可能极其危险。飞行中的两人相撞可能导致重伤甚至死亡。当跳伞者从彼此视野中消失并各自开伞时，风险是最严重的——这可能导致自由落体中的跳伞者与已开伞的降落伞相撞。即便开伞后，若未遵守安全程序规范，仍存在降落伞相撞的风险。

D. Breakoff Procedures

分离程序

The minimum breakoff altitude for groups of five or fewer should be at least 1,500 feet higher than the highest planned deployment altitude in the group (not counting one camera flyer). For groups of six or more, minimum breakoff altitude should be at least 2,000 feet higher than the highest planned deployment altitude in the group.

对于 5 人或 5 人以下的团体，最低分离高度应至少比团体成员中计划的最高开伞高度高 1500 英尺（不包括一名摄影者）。对于 6 人或 6 人以上的团体，最低分离高度应至少比团体成员中计划的最高开伞高度高 2000 英尺。

Minimum breakoff altitude should be even higher than these recommendations for the following:

对于以下情况，最低分离高度应比上述建议更高：

- groups with one or more jumpers of low experience
团体中有一位或多位经验较少的跳伞者
- jumpers with slower-opening or faster-flying canopies
有跳伞者使用开伞慢的降落伞，或者飞行速度快的降落伞
- jumpers engaging in freefall activities that involve a fall rate faster than belly-to-earth terminal velocity
自由落体活动中包含比腹飞的终端速度更快的飞行姿态
- jumps involving props, toys, or other special equipment, such as signs, banners, smoke, flags, hoops, tubes, items released in freefall, etc.
跳伞中使用了道具、玩具或特殊设备，例如自由落体中释放了标志、横幅、彩烟、旗帜、呼啦圈、管子等物品
- jumps taking place over an unfamiliar landing area or in case of an off-field landing
在不熟悉的着陆区域或场外着陆时
- any other special consideration
其他特别考虑因素

At the breakoff signal or upon reaching the breakoff altitude, whichever comes first, each participant should turn 180 degrees from the center of the formation and flat track away to the planned deployment altitude. Jumpers can achieve a flat track by initiating with their legs, which will result in more horizontal separation than diving.

在给出分离信号或下落至分离高度时（以先到者为准），各参与者应转 180 度，背朝团体中心，并进行平 Track，直至预定开伞高度。跳伞者可以通过腿部动作启动平 Track，比起俯冲，平 Track 能更有效地进行分离。

Before pulling, jumpers should perform a distinct wave-off to signal jumpers who may be above them. During the wave-off, look up, down, and to the sides to ensure that the area is clear. The low person has the right-of-way, both in freefall and under canopy.

开伞前，跳伞者应做出明显的挥手动作，向可能位于上方的跳伞者发出信号。挥手示意期间，需向上下左右观察，确保空域净空。无论在自由落体阶段还是降落伞飞行阶段，位于下方的跳伞者均有优先通行权。

5-2 自由飞、自由式和空中滑板 Freeflying, Freestyle, and Skysurfing

A. Introduction and Definition

简介和定义

Freeflying refers to all activities that incorporate back, standing, head-down, or sitting freefall positions, including freestyle and skysurfing. These recommendations provide guidance for vertical freefall body positions, which are generally associated with high fall rates and rapid changes in relative speed. The diverse freefall speeds among jumpers engaged in different freefall activities affect separation between groups exiting on the same pass over the drop zone.

自由飞指包含背飞、站飞、倒飞或坐飞等自由落体姿势的所有自由落体活动，自由式和空中滑板也属于自由飞。本章的建议为垂直的自由落体姿势提供指引，此类姿势通常伴随着很高的下降速率和相对速度的快速变化。进行不同类型自由落体活动的跳伞者之间的不同的自由落体速度会影响同一批次出舱的个人和团体之间的间隔距离。

B. Qualifications

资格

Before engaging in freeflying, you should hold a USPA license and have received freeflying instruction from a USPA instructional rating holder with extensive freeflying experience. Before freeflying, you should have demonstrated sufficient air skills, including:

在参与自由飞之前，跳伞者应持有 USPA 执照，并接受具有丰富自由飞经验的 USPA 教学评级持有者的自由飞培训。在进行自由飞之前，你应展示出足够的空中技能，包括：

- orienting to the line of flight of jump run
辨识跳伞航线的飞行路线
- maintaining consistent altitude awareness
持续保持高度意识
- performing basic formation skydiving skills
基本跳伞团体编队技能
- Proficiently performing basic backfly skills such as rotation and moving up, down, forward and backward prior to attempting head-up or head-down maneuvers
在尝试头朝上的姿态动作和倒飞动作前，应熟练掌握背飞姿势下的转向和向上、向下、向前、向后移动。
- tracking to achieve sufficient horizontal separation
能通过 Tracking 分开足够的水平间距

C. Equipment

装备

Freeflying poses specific potential equipment problems. A **premature opening** at the speeds involved in freeflying could injure you severely or stress your equipment beyond the manufacturer's limits.

自由飞存在特定的潜在装备问题。在自由飞所涉及的高速下发生的**意外提前开伞**可能会对身体造成严重伤害，或使装备承受超过制造商规定的极限应力。

To prevent premature deployment of either canopy, **properly secure your gear**. Deployment systems and operation **handles** need to remain secure when you are flying at high speeds and in various orientations. Therefore, equipment for freeflying should include a bottom-of-container mounted, throw-out pilot-chute pouch or pull-out pilot chute with tuck tabs. USPA recommends against using a leg-strap-mounted pilot chute, which is an extreme hazard, as is any exposed pilot-chute bridle. Maintain and properly size your **closing loops** and ensure your **pin protection flap** and **riser covers** are in good shape and stay secure during freefall. Connect **leg straps** with a bungee to keep them from sliding to your knees while in a head-up freefall position or making transitions. Tightly **stow excess** leg and chest strap material.

为防止主伞或备伞意外提前开伞，**装备需稳固**。开伞系统及**操作把手**在高速飞行及各种姿态下必须保持稳固。因此，自由飞所用装备应配置有安装在伞包底部的抛出式引导伞收纳袋或拉出式引导伞（带 Tuck Tab）。USPA 警告，安装在腿带上的引导伞是极端危险的，任何外露的引导伞系带都会造成危险。需定期维护并选用尺寸合适的**关包绳**，并确保**关包针挡盖**与**组提带挡盖**状态完好且在自由落体过程中能保持稳固。建议用弹性绳连接两个腿带，防止在头朝上的自由落体姿势或姿势转换时腿带向膝盖滑动。还需将腿带和胸带的**富余长度**稳稳地收束住。

(译者注：Tuck Tab 和 Tuck Flap 一般指降落伞某些部件上的附加延伸部分，用途为将某些东西固定住，一般通过塞入收纳处来固定所需固定的东西，这里的 Tuck Tab 指引导伞把手上的额外片状部分，可减少引导伞松动并意外飞出的可能性。)

USPA recommends freeflyers use **an AAD and an RSL with a MARD** due to the increased potential for collisions and loss of altitude awareness.

鉴于自由飞中碰撞风险增加且高度意识易受影响，USPA 建议进行自由飞的跳伞者使用 **AAD 以及配置了 MARD 的 RSL**。

When using **skysurfing** boards, use a board-release system that you can activate with either hand without bending at

the waist. Personal accessories for freeflying should include:

使用空中滑板跳伞时，建议配备可用任意一只手启动而无需弯腰的滑板释放系统。自由飞的个人附件应包括以下：

- audible altimeter (two are recommended)
声音高度表（推荐使用两个）
- visual altimeter
目视读数的高度表
- hard helmet
硬质头盔
- clothing or jumpsuit that will remain in place during different orientations of freefall and will not obscure or obstruct deployment or emergency handles or altimeters
在多种自由落体姿态下仍能保持原位的衣服或跳伞服，并且不会遮挡或妨碍开伞把手、切伞和备伞把手，或者高度表

D. Training

培训

Freeflying has many things in common with face-to-earth formation skydiving. A beginner will develop awareness and progress much faster and more proficiently with a coach. Novices should not jump with each other until receiving basic training in freeflying and demonstrating the ability to maintain a vertical axis and control movement up, down, forward and backward in a head-up position.

自由飞和面朝地面姿势的团体编队跳伞有许多共同点。新手如有自由飞教练的指导，相关意识的培养和学习进步会高效得多。新手们不应该一起跳伞，直到接受了基本的自由飞培训，并展示出有能力在头朝上的身体姿势下保持垂直轴的稳定，且能控制向上、向下、向前、向后的移动。

Prior to jumping with larger groups, progress should follow the same model as for the freefall and canopy formation disciplines: 2-way formations of novice and coach to develop exit, body position, docking, transition, and breakoff skills. 在与较大规模的团体一起跳伞之前，学习自由飞的进度应遵循与自由落体和降落伞编队培训方法相同的模式：新手和自由飞教练组成两人编队，以训练出舱、身体姿势、连接、姿态转换和分离的技能。

E. Hazards Associated with Group Freeflying

与团体自由飞相关的危险

Inadvertently transitioning from a fast-falling body position to a slower, face-to-earth position is known as "**corking**" and results in **rapid deceleration**, typically from 175 mph to 120 mph. This could potentially lead to a high-speed freefall collision. To freefly safely in a group, you should be able to consistently remain in a vertical position at all times and remain clear of other freeflyers' airspace. During breakoff, clear airspace above, below, and behind.

从快速下落的姿势意外转换到慢速下落的面朝地的姿势（俗称“软木塞”）会导致速度**迅速减慢**，通常能从 175 英里/小时降至 120 英里/小时。这有可能导致高速自由落体碰撞。为安全地与他人一起自由飞，你需要具备始终保持垂直飞行姿势的能力并始终与其他自由飞跳伞者保持间隔距离。在分离期间，注意确保上方、下方和后方的空域净空。

When learning freeflying from a belly-to-earth background, it can be easy to **lose altitude awareness**. From 13,000 feet, a belly-to-earth jump is approximately 60 seconds while the freefall time of a freefly jump may be as short as 40 seconds. Also, the vertical freefall body positions can make visual altimeters difficult to see. Depending on the helmet used, audible altimeters may also be hard to hear with the increased wind speed of the vertical position. As with any other skydiving discipline, participants must be diligent in maintaining altitude awareness.

仅有腹飞背景的跳伞者学习自由飞时，容易**丧失高度意识**。对于腹飞姿势的自由落体，从 13000 英尺出舱大约会进行 60 秒自由落体，而自由飞的自由落体时间可能缩短至 40 秒。垂直的自由落体姿势还会导致难以看向目视读数的高度表。视头盔类型的不同，在垂直姿势的较高风速下，声音高度表也可能难以听清。与其它所有跳伞类型一样，跳伞者必须始终警觉地保持高度意识。

Novice freeflyers often **drift in various directions** in freefall. Prior to each jump, freeflyers should note jump run as well as landmarks perpendicular to jump run in order to set up facing off the line of flight (90 degrees to jump run). This is especially important for solo freeflyers. An experienced coach can identify whether a participant is drifting and provide guidance. Experienced freeflyers must be aware of drifting when coaching or performing dives involving horizontal movement (see Chapter 5-10, Movement Jumps).

自由飞新手经常在自由落体阶段出现**不同方向的漂移**。每次跳伞前，自由飞跳伞者应注意跳伞航线及垂直于航线的地面参照物，确保自己的朝向与飞机的飞行路线垂直（与跳伞航线呈 90 度角）。这对单人自由飞跳伞者尤为重要。经验丰富的自由飞教练能识别参与者是否发生漂移并提供指导。在进行涉及水平移动的跳伞教学或俯冲时，经验丰富的自由飞跳伞者必须特别注意漂移情况（见第五章第十节：涉及大范围水平移动的自由落体）。

Freeflyers must consider **wind drift**, as well as their drift from body position, to provide adequate **separation between groups**. As a general rule, faster-falling groups should exit the aircraft after slower-falling groups. Vertical freefall groups should stay upwind to allow clear canopy airspace for groups exiting prior.

自由飞跳伞者需综合考虑**风导致的漂移**和身体姿态导致的漂移，确保**各团体之间保持足够间隔**。一般的规则是，下落速度较慢的团体应先于下落速度较快的团体出舱。进行垂直自由落体的团体应暂时呆在上风处，为先前出舱的团体留出降落伞飞行空域。

Important planning considerations to address these hazards include:

跳伞规划中针对这些风险的重要注意事项包括：

- Get a briefing from an instructor experienced in freeflying.
从有自由飞经验的教练那获得简报。
- Consider getting a coach and mentor early in your progression.
在学习早期考虑聘请自由飞教练和导师。
- Ensure your equipment is "freefly friendly."
确保装备适合用于自由飞。
- Utilize both visual and audible altimeters.
同时使用目视读数的高度表和声音高度表。
- Keep the size of the groups small until proficient.
在技能熟练之前，团体规模要小。
- Plan higher breakoffs than usual.
规划比常规情况更高的分离高度。
- Gradually transition from a fast fall-rate to tracking position for separation in case a skydiver is above the formation in a vertical position
若跳伞者在团体编队的上方以垂直姿势飞行，则需逐步从快速下落的姿势过渡至 Tracking 姿势以实现分离。
- Avoid maneuvers near breakoff that increase separation and level changes from the group.
在临近分离的时候，避免进行会增加与团体编队的间距和高度差的机动动作。
- Not only gain separation from other jumpers, but also slow down after breakoff to ensure normal freefall speeds for deployment.
不仅需要与其他跳伞者分离足够的距离，还应在分离后减速以确保以正常的自由落体速度开伞。

5-3 夜间跳伞 Night Jumps

A. Introduction and Definition

简介和定义

Night jumps can be challenging, educational, and fun, but they require greater care on the part of the jumper, pilot, spotter, and ground crew. As with all types of skydiving, night jumping can be safer with special training, suitable equipment, pre-planning, and good judgment.

夜间跳伞具有挑战性、教育性和趣味性，但需要跳伞者、飞行员、负责看点定位的跳伞者和地勤人员更加谨慎。和其他跳伞类型一样，夜跳的安全性可通过特殊的培训、合适的装备、预先的计划，和良好的判断力来提高。

Every skydiver, regardless of experience, should participate in night-jump training to learn or review:

每名跳伞者，不管经验水平如何，都应参加夜跳培训，以学习或复习以下知识技能：

- techniques for avoiding disorientation
避免失去方向感的技巧
- use of identification light, lighted instruments, and flashlight
信号标识灯、照明仪器和手电筒的使用
- target lighting
着陆目标的照明
- ground-to-air communications
地空通信
- emergency procedures
紧急程序

Any jumps made between official sunset and official sunrise are considered night jumps. Jumpers must maintain safety and comply with FAA regulations using this definition. However, night jumps to meet license requirements and to establish world records must take place between one hour after official sunset and one hour before official sunrise.

在官方日落时间至日出时间之间进行的跳伞均视为夜跳。跳伞者必须保障安全，遵守适用于此定义的联邦航空局相关法规。但用于满足执照申请要求以及为创造世界纪录而进行的夜跳必须在官方日落时间一小时后至日出时间一小时前的时间段内完成。

B. Qualifications

资格

Skydivers participating in night jumping should meet all the requirements for a USPA B or higher license. Participants should complete a comprehensive briefing and drill immediately before the intended night jump. A USPA S&TA, Examiner, or Instructor who has completed at least two night jumps should conduct this training. This official should sign and document the training, including the date and location, in the jumper's logbook.

参加夜跳的跳伞者应满足 USPA B 执照或更高级别执照的所有要求。参与者应在预定的夜跳前即将开始之前接受全面的简报和练习。只有完成过两次夜跳的安全和培训顾问、考官，或教练才可进行培训。进行培训的安全和培训顾问、考官或教练需将培训（包括日期和地点）记录在跳伞者的日志中，并签字。

C. Hazards Associated with Night Jumps

与夜跳相关的危险

Night jumps can present new and unusual situations, and jumpers must approach this challenge with caution because darkness greatly impairs vision and depth perception, causing the **opportunity for disorientation**, a different appearance of the earth's surface, and a lack of familiar reference points. You should be thoroughly familiar with the effects of **hypoxia** (oxygen deprivation) on night vision found in the FAA Aeronautical Information Manual (AIM) online at faa.gov. One of the first effects of hypoxia, evident as low as 5,000 feet, is loss of night vision. It takes approximately 30 minutes to recover from the effects of hypoxia. Smokers suffer the effects of hypoxia sooner than non-smokers. Carbon monoxide from exhaust fumes, deficiency of vitamin A in the diet, and prolonged exposure to bright sunlight all degrade night vision.

夜跳可能带来全新且特殊的情况，跳伞者必须谨慎应对挑战，因为黑暗会严重削弱视觉和深度感知能力，可能导致**方向迷失**、地表外观陌生，以及缺乏熟悉的参照点。跳伞者应深入了解**缺氧**对夜间视觉的影响，详见联邦航空局的航空信息手册（AIM），可在 faa.gov 下载。缺氧的首个显著影响即夜视能力下降，这种现象在低至 5000 英尺的高度就可能出现。从缺氧的影响中恢复过来大约需要 30 分钟。吸烟者比非吸烟者会更早出现缺氧症状。发动机尾气中的一氧化碳、缺乏维生素 A 的饮食、强阳

光下的长时间逗留，都会使夜视能力下降。

Night vision requires 30 minutes to fully adjust. A jumper's own **shadow cast by the moon** can resemble another jumper below and cause confusion. Skydivers infrequently make night jumps and are less familiar with and less proficient in handling themselves under the conditions of this new environment. Since the skydiver cannot perceive what is taking place as rapidly and easily as in daylight, it takes more time to react to each situation.

眼睛需要 30 分钟才能完全适应夜间视野。**月光下跳伞者的影子**可能看起来像是下方有另一名跳伞者一样，可能会造成困惑。跳伞者一般不经常进行夜跳，在新环境中不太熟悉，也不太熟练。由于跳伞者无法像在白天那样快速和容易地感知正在发生的事情，所以需要更多时间对各种情况作出反应。

D. Special Equipment

特殊装备

For protection from aircraft, the FAA requires night jumpers to have a **light visible for at least three statute miles displayed from opening until the jumper is on the ground**. USPA recommends using constant-beam lights rather than strobes, which can interfere with night vision and depth perception. Constant lights are preferable, but jumpers can use flashing lights once they open and are in full control of their canopies. Road flares and other pyrotechnics exude hot melted chemicals while burning and are hazardous when skydivers in freefall use them. In addition, the glare greatly increases the possibility of disorientation.

为避开飞行器，联邦航空局要求夜跳者必须配备在 **3 法定英里外可见的指示灯**，该指示灯需在开伞至着陆期间打开。USPA 建议使用常亮光源而非频闪灯，因为频闪灯会干扰夜间视觉和深度感知。虽然更推荐使用常亮光源，但跳伞者在开伞并完全控制住降落伞后可使用闪光信号灯。照明燃料棒和其他烟火在燃烧时会渗出熔融的化学物质，自由落体阶段使用此类物品存在重大安全隐患。此外，明亮的眩光会大大增加失去方向感的可能性。

Additional equipment recommendations include a lighted altimeter, clear goggles, and a flashlight or light on a helmet pointing up to facilitate checking the canopy. A bright LED pointed at the canopy during the entire canopy descent illuminates the parachute for other jumpers, greatly decreasing the chance of a canopy collision. Night jumpers often carry a whistle to warn other jumpers under canopy, signal other jumpers after landing, and to aid rescuers in locating a lost or injured jumper.

额外装备的建议包括：带夜光的高度表、干净清晰的护目镜、以及安装在头盔上方的照明装置，以便检查降落伞状况。降落伞下降全程若使用明亮的 LED 照亮降落伞，既能向其他跳伞者标示自身位置，又可大幅降低降落伞碰撞概率。夜跳者通常携带哨子，用于在降落伞飞行阶段警示他人，在着陆后向其它跳伞者发出信号，以及在迷路或受伤时协助搜救人员定位。

Turn your AAD off and back on before beginning night jumps to ensure it is within the time-frame operational limits for the night jump. Drop zone staff should have and check the manifest after night jumps to ensure all jumpers landed safely.

为了防止夜跳作业期间 AAD 关闭，应在夜跳前**先关闭然后再开启 AAD**。跳伞基地工作人员应在夜跳结束后核查人员清单，确认所有跳伞者均已安全着陆。

(译者注：AAD 会在开启一段时间后自动关闭。)

The landing area should contain **sufficient lighting**—provided by flashlights, electric lights, or similar devices—to illuminate the target. Open flames can be extremely hazardous, so do not use road flares or other pyrotechnics. Car headlights may be used for lighting; however, vehicles clutter the landing area.

着陆区域应配备由手电筒、电灯等类似设备组成的**充足的照明系统**以照亮着陆目标。明火非常危险，因此不应使用照明燃料棒或其他烟火。汽车的车头灯可用于照明，但车辆会挤占着陆区域的空间。

E. Procedures

程序

Skydivers should conduct night jumps in light winds and only in clear atmospheric conditions with minimal clouds. Moonlight greatly increases visibility and night-jump safety. USPA recommends jumping during a full moon when conducting group freefall skydives at night. Skydivers should wear white or light-colored jumpsuits.

跳伞者应在风速低、晴朗、尽量少云的条件下进行夜跳。月光能显著提升能见度与夜跳的安全性。对于团体夜间自由落体跳伞，USPA 建议选择满月时段进行。跳伞者应穿着白色或浅色跳伞服。

The **BSRs require that you consult the local S&TA or a USPA Examiner** for advice for conducting night jumps. Additionally, you may need to notify FAA, state, and local officials as required. Use a topographical map or photo with FAA Flight Service weather information for appropriate altitude and surface winds to compute jump-run compass heading and exit and opening point. One senior member should be designated as jumpmaster for each pass and be responsible for accounting for all members of that pass once everyone has landed. Each jumper performing a night jump who is not familiar with the drop zone should **make at least one jump during daylight hours on the same day** to become familiar with the drop zone and surrounding areas.

基本安全要求规定，你必须咨询当地的安全和培训顾问或 USPA 考官的关于夜跳意见。此外，根据规定，你可能需要通知联邦航空局、州和地方官员。建议使用地形图或航拍图，结合联邦航空局航班服务部提供的地面和相应高度的风况信息，计算跳伞航线的磁航向、出舱点和开伞点。每批次出舱的跳伞者都应指定一名资深跳伞者作为跳伞指导，负责在每个人着陆后对该批次的所有成员进行统计。不熟悉跳伞基地降落区的跳伞者**应至少在夜跳当天的白天跳一次伞**，以在日间熟悉降落区及其周边地区。

To configure your **target for accuracy**, arrange lights in a circle around the target area at a radius of 82 feet (25 meters) from the center. Remove three or four of the lights closest to the wind line on the downwind side of the target and arrange them in a line leading into the target area. This will indicate both wind line and wind direction. By following a flight path over this line of lights, the jumper will be on the wind line and land upwind. Place a red light protected by a plexiglass cover at dead center, flush with the surface. In case of emergency, adverse weather or other hazardous jump conditions, extinguish all lights to indicate "no jump." Ground-to-air radio communications should be available.

为精准着陆而布置**着陆目标**时，应在以着陆目标为中心，半径 82 英尺（25 米）的圆圈上布置灯光。应将着陆目标下风处距离风线最近的三或四盏灯移开，并将它们排成一行引导向着陆目标的直线，这种布置可以指示风线和风向。通过沿此灯光带飞行，跳伞者可对齐风线飞行并逆风着陆。应在着陆目标的正中心处放置一盏红灯，并在地面上盖一面有机玻璃用作保护。如遇紧急情况、恶劣天气或其他危险的跳伞条件，应熄灭所有灯光，以表示“禁止跳伞”。必须确保地空无线电通信畅通。

Current wind information for both surface and aloft conditions is critical at night to ensure a **proper spot**. Spotters should familiarize themselves with the drop zone and surrounding area in flight during daylight, noting ground points that will display lights at night and their relationship to the drop zone and any hazardous areas. The spotter should plan to use both visual spotting and aircraft instruments to assure accurate positioning of the aircraft. During the climb to altitude, familiarize each jumper with the night landmarks surrounding the drop zone.

获取当前的地面及高空风况对在夜跳中确定**合适的点位**至关重要。看点定位的跳伞者应在白天的飞行中熟悉降落区和周围区域，注意那些夜间有灯光的地点及其与降落区和任何危险区域的相对位置。看点定位的跳伞者应计划好同时通过目视定位和飞机仪器确保飞机定位准确。在乘飞机爬升的过程中，应让每名跳伞者熟悉降落区周围的夜间地标。

F. Group Jumps: Freefall and Canopy

团体跳伞：自由落体和伞控

A person's first night jump should be solo. On subsequent night jumps, they can make group skydives, starting with a 2-way and then gradually progressing to larger formations. Jumpers should consider staggering their deployment altitudes to reduce the risk of a canopy collision both during deployment and during the canopy descent and landing pattern. When staggering deployments, the jumpers with the lowest wing loadings should deploy at the highest altitude and

jumpers should continue in order by wing loading until the jumpers with the highest wing loadings deploy at the lowest altitude.

第一次进行夜跳的跳伞者应单人跳伞。后续夜跳可进行团体跳伞，从两人编队开始，逐步过渡到更大规模的编队。建议跳伞者采用错开开伞高度的方式，以降低开伞阶段、降落伞下降阶段及着陆航线中的降落伞碰撞风险。应按照翼载错开开伞高度。翼载最小的跳伞者开伞高度最高，其他跳伞者按翼载从小到大的顺序开伞，翼载最大的跳伞者开伞高度最低。

Once under canopy with others in the air, jumpers should fly predictably and avoid spiraling turns. All jumpers on each pass should agree to the same downwind, base, and final approach and the altitudes for turns to each leg of the landing pattern. Jumpers planning canopy formations should practice together during daylight and rehearse before boarding for each night jump. USPA recommends that skydivers participate in night canopy formations during a full moon. All jumpers should wear brightly colored clothing.

开伞后，多人在空中飞行时，跳伞者应以可预测的航线飞行，并避免螺旋削高。同一批次出舱的所有跳伞者应就着陆航线第一边、第二边、第三边，以及各边的转向高度达成一致。计划进行降落伞编队飞行的跳伞者应在白天一起练习，并在每次夜跳前，在登机前事先进行排练。USPA 建议夜间降落伞编队活动在满月期间进行。所有的跳伞者都应穿着颜色鲜艳的衣服。

5-4 水上降落 Water Landings

A. Introduction and Purpose

简介和目的

Accidental water landings have caused a number of fatalities, usually because the jumper did not use flotation gear, used incorrect procedures, or landed in extremely cold water. USPA recommends water-landing training to improve chances for survival from both intentional and unintentional water landings.

意外水上降落已导致过许多死亡事故，通常是因为跳伞者没有飘浮装置、跳伞程序不正确，或降落在寒冷水域。USPA 建议进行水上降落培训，以提高刻意水降和意外水降的生存机会。

The purpose of wet training (required for the USPA B license) is to expose the individual to a worst-case scenario in a controlled situation. Proper training should decrease the likelihood of panic, which should decrease the likelihood of drowning since drowning is usually brought on by panic.

水上培训（USPA B 执照的要求）的目的是让跳伞者在可控的环境中尝试面对最坏的情况。适当的培训可降低恐慌的可能性，从而降低溺水的可能性，因为溺水通常是由恐慌导致的。

Unintentional water entry may occur due to spotting error, radical wind changes, malfunctions, and landing under a reserve rather than a main. Intentional water jumps are preplanned jumps into a body of water.

意外水降可能由于各种原因发生，如看点定位失误、剧烈的风况变化、降落伞故障、使用备伞而不是主伞着陆等。刻意水降指预先计划好在水域降落的跳伞。

B. Training for Unintentional Water Landings

意外水降的培训

The ISP includes training recommendations for unintentional water landings in the obstacle-landing training of Category A (the first-jump course). Chapter 4-1G contains a more complete and detailed briefing outline.

综合学生计划中包含了意外水降的培训建议，请见 A 单元中关于着陆障碍的培训（第一跳课程）。更完整详细的内容见 4-1G。

Dry (Theoretical Training)

地面培训（理论培训）

A USPA S&TA, Examiner, or Instructor should sign documentation of this training, including the date and location, in the jumper's logbook and A-license application or on a separate statement.

该培训（包括日期和地点）应由 USPA 安全和培训顾问、考官或教练记录在学生的日志和 A 执照申请中并签字，或在单独的

声明中记录并签字。

Theoretical training should include classroom lessons covering:

理论培训应包括以下课堂内容：

- techniques for avoiding water hazards
避开水域的技巧
- how to compensate for poor depth perception over water
如何应对水面上的较差的深度判断能力
- preparation for water entry
入水的准备
- additional risks of water landings in cold water temperatures
在水温低的情况下水降的额外风险
- recovery after landing
水降后的救援

Practice should combine both ground and training-harness drills and should continue until the jumper is able to perform the procedures in a realistic timeframe.

练习应结合地面训练和使用训练背带，并持续训练，直到跳伞者能够在合理的时间内执行处理程序。

Wet (Practical Training)

水上培训（实操培训）

After taking a class on theory, jumpers should undergo practical training in a suitable environment such as a swimming pool, lake, or other body of water at least six feet deep. This training meets the USPA B-License training requirements for intentional water landings and a USPA S&TA, Examiner, or Instructor should sign the documentation of it, including the date and location, in the jumper's logbook.

在理论课程之后，跳伞者应接受实操培训，培训应在合适的环境中进行，如游泳池、湖泊或其他水深至少 6 英尺的水域。该培训符合 USPA B 执照的刻意水上降落的培训要求，培训信息（包括日期和地点）应由 USPA 安全和培训顾问、考官或教练记录在跳伞者的日志中并签字。

Those conducting this training need to consider the safety of the participants. Safety personnel should include properly trained and certified **lifeguards**. If suitably qualified skydivers are not available, assistance may normally be solicited from the local American Red Cross or other recognized training organization. Flotation gear and other lifesaving apparatus is recommended for non-swimmers.

开展此项培训时需确保参与者的安全。负责安全的人员应包括经过适当培训和认证的**救生员**。如果无法调配具备适当资格的跳伞者，通常可向当地的美国红十字会或其他受认可的培训机构寻求协助。建议为不会游泳的人配置飘浮装置和其他救生装备。

Participants may wear swimsuits for initial training but should wear normal jump clothing during final training to simulate water landings. For the **non-swimmers**, training should include basic skills covering breath control, bobbing, and front and back floating. For the **swimmers**, training should include all of the above, plus the breaststroke, sidestroke, backstroke, and treading water.

初始阶段的培训时可穿泳衣，但最后阶段的培训必须穿正常的跳伞着装来模拟水上降落。对于**不会游泳的人**，培训内容应包括呼吸控制、水中上下浮动、俯卧式漂浮和仰卧式漂浮等基本技能。对于**会游泳的人**，培训内容应包括上述所有技能，加上蛙泳、侧泳、仰泳和踏水。

While wearing a parachute harness-and-container system and all associated equipment, the participant jumps into the water. The USPA Instructor should then cast an open canopy of any type over the jumper before any wave action

subsides. The jumper should then perform the steps necessary to escape from the equipment and the water. Repeat this drill until proficient.

参与者需穿着一套降落伞背带和伞包系统及相关装备跳入水中。USPA 教练应在波浪平息前将任意类型的打开的降落伞覆盖于跳伞者上方。随后跳伞者需执行脱离装备及脱困的系列步骤。重复练习直至熟练为止。

C. Procedures for Intentional Water Landings

刻意水降的程序

Any person making an intentional water landing should hold a USPA A license, have undergone wet training for water landings, and be a swimmer. They should also undergo preparatory training within 60 days of the water jump. A USPA S&TA, Examiner, or Instructor should conduct this training and sign and document the date and location in the jumper's logbook.

任何打算进行刻意水降的人应持有 USPA A 执照，已完成实操培训并具备游泳能力。此外，须在水降前 60 天内完成预备培训，该培训应由 USPA 安全和培训顾问、考官或教练实施，并在跳伞者的日志中记录（包含日期与地点）和签字。

Theoretical training should include classroom lessons covering:

理论培训应包括以下课堂内容：

- preparations necessary for safe operations
安全操作的必要准备事项
- equipment to be used
将使用的装备
- procedures for the actual jump
实际的跳伞程序
- recovery of jumpers and equipment
跳伞者的接回与装备的回收
- care of equipment
装备的维护

In preparation, the BSRs require jumpers to obtain advice for the water jump from the local USPA S&TA or Examiner. Jumpers should also check the landing site for underwater hazards and use an altimeter for freefalls of 30 seconds or more.

根据基本安全要求，跳伞者在水降准备阶段必须咨询当地的 USPA 安全和培训顾问或考官。跳伞者还需检查着陆水域是否存在水下危险障碍，自由落体时间超过 30 秒时应使用高度表。

Preparations should include no less than **one recovery boat per jumper**, or, if the aircraft drops one jumper per pass, one boat for every three jumpers. Boat personnel should include at least one qualified skydiver and stand-by swimmer with a face mask, swim fins, and experience in lifesaving techniques, including resuscitation.

准备工作需确保为每名跳伞者配备不少于一艘救援船，若飞机每批次仅投放一名跳伞者，则每三名跳伞者配备一艘救援船。船上人员应至少包括一名有资质的跳伞者，且会游泳，带有面罩、脚蹼，并具备救生技能（包括心肺复苏）方面经验，他（她）要在船上随时待命。

Each jumper should receive a thorough briefing concerning the possible emergencies that may occur after water entry and the proper corrective procedures. Jumpers should open no lower than 3,000 feet AGL to provide ample time to prepare for water entry, especially when the landing area is a small body of water and the jumper must concentrate on both accuracy and water entry. A second jump run should not occur until all jumpers from the first pass are safely aboard the pickup boat(s).

每名跳伞者应全面了解落水后可能发生的紧急情况和正确的应对程序。开伞高度应不低于离地 3000 英尺，确保有充足时间做好入水准备，特别是当降落区域是面积小的水域时，这种情况下跳伞者必须把注意力集中在精准度和入水上。必须先等到

第一批次出舱的所有跳伞者安全上船，才可进行第二次投放。

In calm conditions with readily accessible pick-up boats, the best procedure is simply to inflate the flotation gear after canopy inflation and concentrate on landing in the proper area. In strong winds, choppy water conditions, in competitive water-jump events, or if the flotation gear cannot be inflated, separation from equipment after water entry is essential. 在风平浪静且救援船可快速接应的情况下，最佳操作程序是在降落伞打开充气后立即让漂浮装置充气，然后集中精力降落至合适的区域。若遇强风、浪急的情况，或在水降竞赛时，或在漂浮装置无法充气时，入水后必须立即脱离装备。

Water may damage some altimeters and automatic activation devices. When skydivers opt to jump without these standard instruments and AADs, they should use extra care.

入水可能会损坏某些高度表和 AAD。当跳伞者选择不配备这些标准的装备和 AAD 时，须格外谨慎。

D. Hazards Associated with High-Performance Water Landings

与高性能水降相关的危险

Although making **high-performance landings** over water may reduce injuries in cases of slight misjudgment, larger errors that cause the jumper to hit the water too hard will still cause serious injury or death. Jumpers should obtain coaching from an experienced high-performance canopy pilot familiar with high-performance landings across water prior to attempting them. Raised banks at the approach entry and exit from the body of water present a serious hazard. An injury upon landing in a water hazard can increase the jumper's risk of drowning, so jumpers should approach high-performance landings involving water using the standard water-landing precautions, including the use of a flotation device. The area around the body of water should be clear of hazards and spectators in case high-speed contact with the water causes the jumper to lose control.

尽管在水面上进行**高性能着陆**时，如果发生轻微的误判，水可以减少受伤程度，但若发生较大的失误，导致跳伞者入水冲击过猛，仍会造成重伤或死亡。尝试高性能水降之前，跳伞者应接受经验丰富的、熟悉高性能水降的高性能伞控跳伞者的指导。水体边缘的凸起堤岸在进近起始点和结束点构成重大风险。水降时受伤可能会增加跳伞者溺水的风险，因此，高性能水降应采取标准的水降预防措施，包括使用漂浮装置。水域周围应没有危险障碍物和观众，因为与水面的高速接触可能会导致跳伞者失去控制。

E. Water-Jump Safety Checks and Briefings

水降的安全检查和简报

Jumpers should perform a complete gear check, paying particular attention to any additional equipment to be used or carried for the water jump (see more in Chapter 4-4).

跳伞者应对所有装备进行全面检查，并特别注意水上跳伞时使用或携带的任何额外装备（详见第四章第四节）。

Boat and ground crew briefings should include:

船只和地勤人员简报应包含以下内容：

- communications procedures (smoke, radio, buoys, boats)
通信程序（信号烟雾、无线电、浮标、船只）
- wind limitations
风速限制
- jump order
跳伞顺序
- control of spectators and other boats
观众和其他船只的管控
- setting up the target
着陆目标的布置
- maintenance of master log

主日志的维护

- how to approach a jumper and canopy in the water (direction, proximity)
如何接近在水中的跳伞者和降落伞（方向、距离）

5-5 降落伞编队 Canopy Formations

A. Introduction and Definition

简介和定义

Canopy Formation (CF) is the name of the competition discipline for the skydiving activity commonly called canopy relative work (CRW or "crew") Jumpers build canopy formations by intentionally maneuvering two or more open parachute canopies near or in contact with one another during flight. The goal is smooth flow and grace between two or more jumpers and their canopies in flight. The most basic canopy formation is when two canopies are joined vertically during flight. This can be a stack, where the jumper's feet are docked at the top of the lines, or a plane, where the jumper moves down the lines to secure the feet below the slider of the bottom jumper on the cross connectors (see Equipment below).

降落伞编队（CF）是跳伞比赛科目的名称，简称 CRW 或 CREW。跳伞者们通过有意操控两个或多个已打开的降落伞在飞行中相互接近或接触来构建降落伞编队。其目标是在两名或多名跳伞者及其降落伞之间实现流畅优雅的飞行配合。最基础的降落伞编队形态是两个降落伞在飞行过程中在垂直方向上连接，形成堆叠式编队（Stack）或平面式编队（Plane）。堆叠式编队指跳伞者双脚停靠于另一个降落伞的伞绳顶端；平面式编队指跳伞者沿着另一个降落伞的伞绳下移，将双脚稳定地停靠在下方跳伞者的滑块布下方的组提带连接带处（见下文装备部分）。

Canopy formation specialists consider the recommendations in this section to be the safest, most predictable, and most productive procedures. Experienced canopy formation specialists should lead canopy formation jumps, whether they occur during the day or at night.

本节提供关于降落伞编队的建议，这些建议是降落伞编队专家认为最安全、最可预测，并最有效的程序。无论是白天还是晚上跳伞，降落伞编队都应由经验丰富的降落伞编队专家带领完成。

B. Qualifications

资格

Before engaging in canopy formations, a jumper should have thorough knowledge of canopy-flight characteristics, to include riser maneuvers and the relative compatibility of various canopies. They should also have demonstrated accuracy capability of consistently landing within 16 feet of a target.

在进行降落伞编队飞行之前，跳伞者应全面了解降落伞的飞行特性，包括操纵组提带进行机动，以及对各种降落伞的飞行特性的相似度的理解，并且展示出有精准着陆的能力，能连续在距离着陆目标 16 英尺（5 米）的范围内着陆。

C. Equipment

装备

The following items are essential for safely building canopy formations:

以下工具对于安全地建立降落伞编队是非常必要的：

- hook knife—necessary for resolving entanglements
伞刀——解决缠绕问题的必要工具
- ankle protection—adequate socks to prevent abrasion from canopy lines and no boots with hooks
脚踝的保护——穿合适的袜子，以防伞绳带来的擦伤。不能穿任何带有钩状部件的靴子
- gloves for hand protection
手套——保护手
- self-retracting or removable pilot-chute-bridle systems
可自缩或可拆下的引导伞系带系统

- cross connectors— A secure foothold at the top of the risers is essential for building planes, which can develop greater tension as they grow larger. Cross connectors are a length of webbing attached between the front and rear risers only, not from side to side. Side-to-side cross connectors can snag on the reserve container during deployment and cause a dangerous entanglement.

组提带连接带——可在组提带顶部提供一个稳固的立足点，这对于构建平面式编队是必要的，随着编队变大，连接带的拉力可能会更大。组提带连接带只能连接前组提带和后组提带，不能连接左右两侧的组提带。如果连接左右两侧组提带，在开伞的过程中，连接带可能会钩缠住备伞伞包，造成危险的缠绕。

(译者注：如果平面式编队不使用组提带连接带供上方跳伞者保持位置，处于上方的跳伞者可能会沿着下方跳伞者的降落伞的伞绳向上滑动，并把下方降落伞的滑块布拉上去，让下方伞塌缩)

The following items are **strongly recommended** for safely building canopy formations:

以下工具对于安全地建立降落伞编队是**非常建议使用的**：

- visual altimeter to provide altitude information for dock, abort, and entanglement decisions
目视读数的高度表——可提供高度信息，在对接、放弃建立编队和发生缠绕时提供决策参考
- protective headgear that allows adequate hearing of voice commands in addition to collision protection
保护效果好的头盔——除了缓冲碰撞外，还不应阻碍听觉，以让跳伞者能听到口令
- long pants and sleeves for protection from line abrasions
长裤和长袖——防止伞绳带来的擦伤
- extended or enlarged toggles to make grasping them easier
加长或加大的、容易抓握的刹车
- cascades removed from the two center A lines, which should be marked in red
伞绳汇聚点——建议取消 A 组伞绳中位于中间的两条伞绳的伞绳汇聚点，这两条伞绳应用红色标记。

D. Training

培训

Initial training should occur with two jumpers—the beginner and a canopy formation specialist—and include lessons in basic docking, breakoff procedures, and emergency procedures. The first few jumps should include only stacks and planes, as offset formations are less stable.

最初的培训应由两名跳伞者进行，其中一名是初学者，另一名是降落伞编队专家。培训应包括基本的对接、分离程序和紧急程序的课程。最初的几次降落伞编队跳伞应练习堆叠式编队或平面式编队，因为偏置编队稳定性更差。

(译者注：这里将 Offset Formation 翻译为偏置编队，即各个降落伞的左右对称面不在同一垂直平面的编队)

E. Procedures

程序

Avoid jumping in turbulent air or gusty wind conditions. In areas subject to thermal turbulence and other unstable air conditions, jump in the early morning and early evening. Avoid passing near clouds, which are associated with unpredictable air conditions. Use caution in flying formations over plowed fields, paved surfaces, or other areas where thermal conditions often exist. When unexpectedly encountering bumpy or turbulent air, fly the formation directly into the wind.

应避免在乱流或阵风条件下跳伞。如果跳伞的地区容易受到热流和其他不稳定气流条件影响，建议在清晨和傍晚进行跳伞。要避免在云附近经过，云附近的气流条件通常不可预测。在犁田、硬化路面或其他经常存在热流条件的区域上空进行降落伞编队飞行时要小心。当意外遭遇颠簸的空气或乱流时，建议尽力使编队正面迎风飞行。

Factors you must consider in every pre-jump briefing include:

每次跳前简报必须考虑到以下方面：

- exit order
出舱顺序

- time between exits
出舱间隔
- length of freefall
自由落体时长
- designation of base
指定作为基准的跳伞者 (Base)
(译者注: 作为基准的跳伞者称作 *Base*, 可译作“基准”, 首个与基准进行对接的跳伞者称作 *Pin*, 可译作“二号跳伞者”或“二号”。)
- canopy wing loading and trim
降落伞的翼载和伞绳长度的调整
- order of entry
加入编队的顺序
- direction of flight and techniques of rendezvous
飞行方向和会合技巧
- approach and breakoff traffic patterns
接近和分离的交通航线
- docking procedures
对接程序
- formation-flight procedures
编队飞行程序
- one-word verbal commands
单字口令
- breakoff and landing procedures
分离和着陆程序
- emergency procedures
紧急程序

Spotting should account for upper-wind velocity and direction. Advise the pilot that a canopy formation group is exiting and opening high. Leave a minimum of two seconds of separation between **exits**. With greater experience and the use of staged openings, one-second separation may be possible but drastically increases the chance of collision when an off-heading canopy opening occurs. Any opening delay should be adequate to assure clearance from the aircraft, jumper separation, and stable body position at opening. Each jumper must be prepared to avoid a collision at any time upon leaving the aircraft.

看点定位应考虑到高空风速和风向的影响。要通知飞行员有降落伞编队团体正在出舱并且要高开。出舱间隔至少 2 秒。随着经验提升并采用分阶段的开伞方式, 出舱间隔可能可以缩短至 1 秒, 但当有降落伞出现开伞方向偏转时, 碰撞风险将急剧增加。开伞的延迟应足够且合适, 以确保与飞机分开足够距离、跳伞者之间分开足够距离, 且开伞时身体姿态稳定。跳伞者须随时做好准备, 避免在出舱后发生碰撞。

(译者注: 分阶段开伞指降落伞编队成员采用不同的出舱后开伞延迟, 较早出舱者开伞延迟较长, 较晚出舱者开伞延迟较短。)

When establishing **docking** procedures, identify the jumper who is the base. This position requires the most expertise; however, docking skills are used in all slots. All jumpers should discuss docking methods before boarding the aircraft. 在制定**对接程序**时, 需明确作为基准的跳伞者。该位置对技术要求最高, 但所有参与者都应掌握对接技巧。登机前全体跳伞者应就对接方法进行协商。

During **formation flight**, it is important that the formation pilot maintain a constant direction of flight along a predetermined course and establish an orderly flight pattern for canopies attempting to dock, which will enable interference-free approaches and lessen the possibility of canopy collisions. No canopies should ever pass in front of a formation; the wake turbulence created will disturb the formation's stability and could lead to a very dangerous situation.

编队飞行期间，编队领航员（译者注：这里将 *Formation Pilot* 译为编队领航员，在存在角色轮换（*Rotations*）或队形变换（*Sequential*）的编队活动中，承担该角色的跳伞者是可以更换的）必须沿预定航线飞行，保持方向稳定，并为试图对接的降落伞建立有序的飞行路线，这样可确保跳伞者接近编队时不会产生干扰，并减少发生降落伞碰撞的可能性。任何降落伞都不得从编队前方飞过，否则其产生的尾流将破坏编队的稳定性，可能引发极端危险状况。

For smoothness and safety when **approaching** the formation, approach on level with the dock and slightly behind by only a couple of feet. This also avoids imparting vertical energy into the formation, which can cause the wings on the other side to come around into the center of the formation. This type of approach is recommended for vertical formations, as well. Approaching from below is not recommended.

为保障**接近**编队时的平稳性与安全性，建议接近编队时，对接双方的对接点保持高度平齐，水平间距略差几英尺。这种接近方式能避免向编队传递垂直方向的能量，防止导致对侧的伞转向编队中心。该接近方式同样适用于垂直方向上的编队。不建议从下方接近编队。

When **docking**, grasp only the center section of a docking canopy when the canopy closes third or later in a stack formation. To complete the stack dock, the top jumper should place both feet between both A lines of the center cell of the lower jumper and hook one by each instep. A center-cell dock is preferable for beginners.

对于堆叠式编队，第三个以及后续的降落伞进行**对接**时只应连接降落伞的中心部分。要完成堆叠式编队的对接，上方跳伞者应将双脚放在下方降落伞中心气室的 A 组的两条伞绳的之间，并用足背各钩住一条。对于初学者来说，最好通过中心气室对接。

Improper docks are the most common cause of **collapsed** canopies. You should release a collapsed canopy to allow reinflation only if it will not make the situation worse. To prevent dropping an entangled jumper into a potential collision, make sure the area behind and below is clear. Experienced participants may be able to reinflate a collapsed canopy by continuing to plane down the lines. The jumper with the collapsed canopy can try using brakes or rear risers to back the canopy off and reinflate it. A jumper wishing to be released from the formation should use the term "drop me." This command is to be obeyed immediately, unless it will drop the jumper into a worse situation. The jumper issuing the command should be sure to check behind for other canopies on approach before asking to be dropped.

不正确的对接是造成降落伞**塌缩**的最常见原因。如果你要释放已塌缩的降落伞以使其重新充气，必须先确认这么做不会使情况恶化。为防止释放被伞缠绕的跳伞者后引发碰撞，应确保后方和下方的区域是空旷的。经验丰富的跳伞者可能能够通过继续沿着伞绳下移，压紧编队来重新让自己的塌缩的降落伞充气。发生降落伞塌缩的跳伞者可以尝试使用刹车或后组提带来让伞相对后移以使其重新充气。想从编队中被释放的跳伞者应喊口令“放下我”（drop me）。该口令必须立即执行，除非这会让被释放的跳伞者的情况恶化。发出口令的跳伞者在发出口令要求被释放前，应检查确保后方是否有正在接近的其他降落伞。

When in **formation flight**, verbal commands should be concise and direct, omitting non-essential conversation. The pilot should fly the formation with limited control movements to minimize oscillations and facilitate docking. The formation pilot should never use deep brakes in the formation. If a lower canopy is collapsing in a vertical formation, the jumper should slide his feet back up to the canopy for re-inflation or follow the agreed emergency procedures for the planned formation. Continuing to plane down the lines may end with the canopy completely collapsing and potentially causing entanglement.

在进行**降落伞编队飞行**时，口令应当简洁直接，杜绝不必要的沟通。应通过有限的机动动作来进行编队飞行，以尽量减少晃动，便于对接。编队领航员严禁在编队中使用深刹车。若在垂直方向的编队中，下方降落伞发生塌缩，跳伞者应让双脚上滑回到伞布处帮助其重新充气，或执行预先约定的编队紧急程序。继续沿着伞绳下移可能导致降落伞完全塌缩并引发缠绕风险。

Oscillations are a primary concern in canopy formations, because they can result in collapsed canopies and entanglements. To reduce their effect and frequency, jumpers in the formation can—

晃动是降落伞编队的一个主要隐患，可能会导致降落伞塌缩和缠绕。为降低晃动的影响及频率，编队跳伞者可采取以下措施：

- maintain an arch for speed and stability especially for offset and diamond formations

保持弓形姿势以获得速度与稳定性，尤其适用于偏置编队和钻石形编队

- when on the bottom of the formation, sit still in the harness and cross their legs
如果处于编队底部，应在背带中坐着不动，并交叉双腿
(译者注：在降落伞编队中，交叉双腿可用于表示“不要过来对接我”)
- when on the bottom, apply the appropriate control to reduce or increase tension
如果处于编队底部，可采取适当的操纵来减少或增加张力
- manipulate a lower jumper's lines to dampen the oscillation
操纵下方降落伞的伞绳以抑制晃动
- drop the bottom jumper before the oscillation develops into something worse
在晃动恶化前释放底部跳伞者

Diamonds and offsets require different flying techniques than vertical formations. It is imperative to receive proper training before attempting them.

钻石形编队和偏置编队需要不同于垂直方向的编队的飞行技巧。在尝试之前，跳伞者必须经过适当的培训。

For **breakoff and landing** procedures, approaches and docking should stop no lower than 2,500 feet AGL. Formation pilots should avoid all obstacles, including suspected areas of thermal activity, such as paved surfaces, plowed fields, buildings, etc. Only those with a high level of CF proficiency should attempt to land canopy formations. Breakoff for landing should take place no lower than 2,500 feet AGL because of the danger of entanglement at breakoff time. Jumpers should not attempt to land formations in high or gusty winds, high density altitudes, or high field elevations. CF groups landing off the airport should try to land together.

降落伞分离和着陆程序：编队的接近和对接应在离地 2500 英尺以上停止。编队领航员应避开所有障碍物，包括疑似有热流活动的区域，如硬化路面、犁田、建筑物等。只有拥有高水平降落伞编队熟练度的跳伞者才能尝试以降落伞编队的形式着陆。为进行着陆，降落伞的分离高度应不低于离地 2500 英尺，因为分离时有缠绕的危险。不应试图让降落伞编队在有大风或阵风的地方、密度高度高的地方，或高海拔场地着陆。在机场外着陆的降落伞编队成员应尽量靠近着陆。

For guidance on **night canopy formations**, see Chapter 5-3 Night Jumps.

关于**夜间降落伞编队**的指引，请参阅第五章第三节“夜间跳伞”。

F. Hazards and Emergency Procedures

相关危险和紧急程序

Jumper-to-jumper collisions or hard docks that result in deflated canopies or entanglements can result in serious injury or death. **Entanglements** are the greatest hazards when building canopy formations. Jumpers should know their altitude at all times, because altitude will often dictate the course of action.

跳伞者之间发生的碰撞，或者致使降落伞塌缩或缠绕的冲击猛烈的对接，都可能造成重伤或死亡。**降落伞缠绕**是组建降落伞编队时最危险的情况。跳伞者应随时知道自己的高度是多少，因为高度经常决定了要采取什么样的行动。

If a collision is imminent, you should not take canopy formation grips with any small diameter lines unless you are extremely knowledgeable and proficient on those particular canopies. Beside the danger of slicing into muscles and cutting through harness components, those lines and attachment points are not usually strong enough to withstand the loads that can occur in a docked formation. They are more susceptible to failure, possibly long after the dock has been dropped, potentially much lower than 2,500 feet. Avoid body-to-body contact at all cost, and hit lines or fabric instead. Attempt to clear the entanglement by following the risers out, peeling away fabric and lines while protecting your handles.

如果即将发生碰撞，除非你对特定的降落伞非常了解、掌握透彻，否则切勿像正常组建降落伞编队时一样触碰细直径的伞绳。这些伞绳及其连接点不仅可能割伤肌肉、切断背带部件，其强度通常也难以承受编队产生的载荷。这些伞绳及其连接点很容易失效——甚至在解除对接很久后仍可能发生，且故障高度很可能远低于 2500 英尺。务必不惜一切代价避免双方身体直接

接触，应选择撞击伞绳或伞布。尝试沿组提带向外清理缠绕，在保护好把手的同时，逐步剥离缠绕的伞布与伞绳。

(译者注: “Grip”在这里译为触碰, 在降落伞编队中, Grip 的定义是用手抓住 A 组的伞绳或前组, 或者用脚的特定部位接触 A 组的伞绳, 详见跳伞者比赛手册 (SCM) 第 10 章)

If the upper jumper is engulfed **in the fabric** of the lower jumper's canopy and is unable to disengage, the lower jumper should be instructed to cut away first. The upper jumper should then clear their face and their controls from the canopy that was cut away and take control of their own canopy. It is safer to fly slowly and keep the cutaway canopy's fabric on you than it is to try to clear it and risk having a line or lines snag on you, causing the other canopy to inflate and downplane or spin into your canopy.

若上方跳伞者被下方降落伞的伞布包裹且无法脱身，应指示下方跳伞者先切伞。随后上方跳伞者需清理遮挡自己脸部和阻碍自己操纵降落伞的伞布，以掌控自己的降落伞。此时保持低速飞行，并让被切伞的降落伞伞布继续附着在身上是更安全的选项，因为清离被切伞的降落伞伞布有可能导致一条或多条伞绳钩挂在你的身上，使其再次充气，导致两伞分处两边相互绕转的情形，或导致其旋转冲向你的降落伞。

If the upper jumper **is entangled in the suspension lines** of the lower jumper's canopy, under the bottom skin of that canopy, the upper jumper in the lines should cut away first. That jumper should clear lines and fabric from their body and three-rings to create a path down and out. The upper jumper should also disconnect the RSL (if worn and if time and altitude permits) in case the jumper does not clear the other lines immediately upon initiating cutaway procedures. Crossing your legs prior to cutting away can also prevent straddling cascaded lines or risers. Once clear of the entanglement, the jumper should pull the reserve immediately and not wait to gain stability, as it can take up to 1,000 feet to stop tumbling after a cutaway. If you cannot untangle, make only two attempts to clear the entangled canopy before deploying the reserve. The sooner the reserve is deployed, the more time and altitude you have available to prevent the cutaway canopy from interfering with control of the reserve.

若上方跳伞者被下方降落伞的伞绳缠绕，位置低于下方降落伞的下表面，上方跳伞者应先于对方切伞。上方跳伞者应先清理身上和三环装置上的伞绳和伞布，开辟向下脱离的通道。上方跳伞者还应断开 RSL（若使用了 RSL 且高度和时间允许），以防启动切伞程序后未能立即摆脱其他伞绳。切伞前交叉双腿可避免跨在伞绳汇聚点上或组提带上。脱离缠绕后，应立即开备伞，切勿等待姿态稳定下来——切伞后可能需下落 1000 英尺才能停止不稳定姿态。若无法解开缠绕，在开备伞之前，最多尝试两次清理缠绕的降落伞。备伞越早展开，就有越多高度和时间防止被切伞的降落伞干扰备伞的操纵。

Why upper jumper first? The entangled jumper needs the lower jumper to stay attached to that canopy to provide tension on the lines to allow the upper jumper to slide out of them. If the lower jumper performs cutaway procedures first, the upper jumper becomes hopelessly entangled in the lower jumper's suspension lines while that canopy is temporarily released and re-inflates into a downplane.

为何上方跳伞者先于对方切伞？ 因为被缠绕的跳伞者需要下方跳伞者保持与降落伞的连接，以为伞绳提供张力，从而让上方跳伞者可以滑出伞绳。若下方跳伞者先行切伞，上方跳伞者将彻底困在下方降落伞的伞绳中，下方降落伞因切伞被暂时释放，然后又重新充气，形成两伞分处两边相互绕转的情形。

If the cutaway canopy does not clear the lower jumper's canopy, the lower jumper needs to wait at least 5 seconds before performing cutaway procedures. Once reserves are deployed, steer clear of the other jumper and the cutaway canopies.

若被切伞的降落伞未能脱离下方跳伞者的降落伞，下方跳伞者需等待至少 5 秒再切伞。双方备伞展开后，应互相避让，并远离被切伞的降落伞。

Jumpers should try to land together following a canopy formation emergency.

遭遇降落伞编队紧急情况，编队成员应尽量靠近着陆。

5-6 高海拔跳伞 High-Altitude Jumps

A. Introduction and Definition

简介和定义

A high-altitude skydive is a jump made at or above 15,000 feet mean sea level (MSL), but lower than 18,000 feet MSL. MSL is not to be confused with AGL (above ground level) or the drop zone's elevation.

高海拔跳伞指在海拔 15000 英尺或以上、但低于海拔 18000 英尺进行的跳伞。需注意三个高度概念的区别：海拔高度 (MSL)、离地高度 (AGL)、跳伞基地的海拔。

(译者注：本书的翻译中将以平均海平面为参考的高度 (MSL) 译为海拔高度)

USPA does not provide recommendations for skydiving at and above 18,000 feet MSL since it is outside of sport-parachuting altitudes. Those who do opt to skydive at or above these altitudes should seek outside expertise and use specialized oxygen equipment. The jumpers must develop procedures for the specific jump or event, as well as procure specialized equipment and support.

由于海拔 18000 英尺及以上的高度已超出跳伞运动的常规范围，USPA 不对此类高度跳伞提供建议。在此类高度跳伞的人员应寻求外部专家的支持并使用专用氧气装备。跳伞者必须针对具体的跳伞活动制定专门的程序，同时配备专用装备和保障措施。

Skydives from altitudes higher than 15,000 feet MSL present participants with a range of important considerations, since reduced atmospheric pressure, decreased partial pressure of oxygen, environmental factors including temperature, and higher winds greatly increase the level of risk.

超过海拔 15000 英尺高度的跳伞有许多因素需要参与人员重点考量，因为低气压、低氧分压、包括温度在内的环境因素，以及更强的风力都将显著提升风险等级。

B. Hazards and Hypoxia

危险因素和缺氧

According to FAR 91.211, each occupant of the aircraft must be provided with supplemental oxygen at cabin pressure altitudes at or above 15,000 feet MSL. Hypoxia is a medical condition that develops when there is not enough oxygen in the body's tissues and is the most immediate concern between 15,000 feet MSL and 18,000 feet MSL. Hypoxia can result in impaired judgment and motor function and eventually cause unconsciousness or even death. All participants involved in the jump will benefit from familiarization training that covers the oxygen equipment being used, aircraft drills, and information about the physiological conditions encountered when exposed to reduced atmospheric pressures. Undergoing hypoxia-recognition training that allows the simulation of objective and subjective signs and symptoms of hypoxia is also extremely beneficial.

根据联邦航空条例 91.211，当飞机的舱压高度达到或超过海拔 15000 英尺时，必须为机上每位乘员提供补充氧气。缺氧是指人体组织供氧不足引发的病理状态，在海拔 15000 至 18000 英尺区间缺氧构成最直接的隐患。缺氧可能导致判断力下降和运动功能受损，最终可能引发意识丧失甚至死亡。所有参与人员都应接受培训以熟悉氧气装备、飞机程序的练习以及低压环境对人体生理的影响等相关内容。培训如何识别缺氧症状同样非常有用，该培训能模拟缺氧状态下的客观和主观征兆和症状表现。

C. Equipment

装备

In the event of a malfunction in the primary oxygen system, a backup oxygen system should be available on board the aircraft. Each aircrew member and skydiver will have access to their own oxygen mask or nasal cannula, although a common central oxygen bottle and regulator system may be used as a supply.

在主供氧系统发生故障时，飞机上应配备备用供氧系统。尽管可采用共用的中央氧气瓶和调节器系统作为供气源，但每名机组人员与跳伞者均需配备专用氧气面罩或鼻导管。

D. Oxygen-Use Procedures

使用氧气的程序

Warning: Oxygen explosively accelerates burning! To prevent damage to aircraft and equipment and injury to persons from oxygen-fed flash fires, the aircraft should be electrically grounded during all ground practice. No smoking should be permitted in the vicinity of the aircraft, either on the ground or aloft, while oxygen equipment is on board.

警告：氧气会剧烈加速燃烧！为防止氧气助燃的闪火对飞机和装备造成损坏以及对人员造成伤害，飞机在所有地面练习期间，应确保电气接地。当机上有氧气装备时，飞机内外和周边严禁吸烟，无论是在地面还是空中。

Oxygen-use procedures will vary with the equipment used, but the following are basic:

氧气的使用程序因所用的装备而异，但以下为基本准则：

- All participants should don masks or nasal cannulas with a positive flow of oxygen prior to exceeding 15,000 feet MSL. Oxygen flow should be continuous throughout the remainder of the climb and jump run and should be monitored continuously via gauges or visual flow indicators. The aircraft operator should ensure sufficient oxygen supply for all exposures above 15,000 feet MSL, including supply for extended delays at altitude.

在海拔高度超过 15000 英尺前，所有参与人员应佩戴面罩或鼻导管并确保其供氧正常。在飞机的后续爬升与在跳伞航线上飞行的全过程中，应持续供氧，并通过流量计或可视的流量指示器持续监测。飞机运营方应确保为所有暴露于海拔 15000 英尺以上的情况配备充足的氧气，包括为在高空延长逗留时间的情况准备好额外的供给。

- Prior to exit, jumpers should stay on oxygen for as long as possible, removing their masks or cannulas at the "climb out" or "exit" signal. Participants should rehearse these procedures on the ground in order to ensure a safe climb to altitude and aircraft exit.

出舱前，跳伞者应尽可能延长吸氧时间，在收到“爬出机舱”或“出舱”信号时方可摘除面罩或鼻导管。参与人员须在地面反复演练这些程序，以确保安全爬升至跳伞高度并安全完成出舱。

- In the event of an aborted jump run, all participants will ensure the re-donning of their own oxygen equipment, assist others and await further instructions from the aircrew.

如果中止某次跳伞航线的飞行，所有参与人员须重新佩戴各自的氧气装备并协助他人，然后等待机组的进一步指示。

5-7 跳伞摄影 Camera Flying

A. Introduction

简介

Skydiving provides a wealth of visual inspiration that can be readily captured through still and video photography. Smaller and lighter cameras have made it easier and less expensive to take cameras on a jump, but jumpers still need to exercise caution with their camera equipment and its interaction with the parachute system throughout all activities on the jump, paying close attention to breakoff procedures and special emergency procedures for camera flyers. Only after a camera flyer has become completely familiar with the equipment and procedures of the discipline should they experiment and be creative.

跳伞运动提供了丰富的视觉灵感，可通过静态摄影和动态摄像轻松捕捉。更小巧轻便的相机设备降低了跳伞拍摄的成本与难度，但跳伞者仍需全程警惕相机设备与降落伞系统的相互影响，尤其要注意分离程序及针对带相机跳伞者的特殊紧急程序。只有当带相机跳伞者完全掌握相关装备的操作与跳伞程序后，方可进行创意性尝试。

(译者注：为表述便利，下文简称携带相机设备的跳伞者为“摄影者”。)

USPA recommends that jumpers be licensed and have completed 200 jumps before jumping with a camera.

USPA 建议跳伞者在持有执照且跳数达到 200 次以后再携带相机进行跳伞。

B. Background

背景

Early pioneer camera flyers had to solve the obvious problems presented by big, cumbersome camera equipment and parachutes. Only the most experienced jumpers and photographers would brave the activity of filming others. More recently, miniature digital still and video cameras present less of a challenge, encouraging more jumpers to use cameras on their jumps. Skydivers have become less concerned about the skill of a camera flyer jumping with their group.

以前的摄影者不得不解决大而笨重的相机设备和降落伞带来的明显问题。当时只有最有经验的跳伞者和摄影师才有勇气进行跳伞摄影。现在，微型相机和摄像机使得跳伞摄影的挑战性减弱，并鼓励更多的跳伞者在跳伞时使用这些设备。跳伞者已经不那么在意与他们进行团体跳伞的摄影者的技术水平了。

C. Purpose

目的

Jumpers should realize that flying a camera—even a small one—requires additional effort and attention on each jump and should not take the decision to begin flying camera lightly. To support education for new camera flyers, the USPA Library offers an online course, Camera Flying Recommendations, at uspa.org/library.

跳伞者应意识到，即使携带的是小型摄像机，每次跳伞都需要额外的精力和注意力。不应轻率决定开始携带摄像机。为支持对新摄影者的教育，USPA 图书馆在 uspa.org/library 上提供了在线课程“跳伞摄影建议”(Camera Flying Recommendations)。

D. Equipment

装备

A camera flyer should consult another experienced camera flyer and a rigger before using any new or modified piece of equipment on a camera jump, including:

对于携带相机的跳伞，在使用任何新的装备或改装的装备前，摄影者应就以下内容咨询其他有经验的摄影者和降落伞装备师：

- helmet
头盔
- parachute
降落伞
- deployment-device modification
开伞装置的改装
- camera
相机
- camera mount
相机底座
- flash
闪光灯
- switch and mounting
相机的开关和安装
- camera suit
摄像服
- emergency release
紧急释放装置
- other items such as sky surfboard or skis, tubes or other freefall toys, wingsuit
其他东西，比如空中滑板、软管或其他自由落体玩具、翼装

Prior to filming other skydivers, a camera flyer should jump with each new or additional piece of equipment until they are completely familiar with it and have adjusted any procedures accordingly.

在拍摄其他跳伞者之前，摄影者如果使用任何新的装备的或额外的设备，都应该先用其进行跳伞练习，直到完全熟悉这些设

备，并相应地调整了相关的跳伞程序。

Camera Equipment

摄影器材

Small cameras are not necessarily safer to jump than larger ones. Regardless of the location of the camera mount, users should place and rig them with respect to deploying parachutes. Camera flyers should cover, tape, or protect by other means all edges and potential snag areas. Snag points that cannot be mitigated on helmet-mounted cameras should at least face away from the deploying parachute. A pyramid shape of the entire camera-mounting system may deflect lines better than an egg shape. Deflectors can help protect areas that cannot otherwise be modified to reduce problems. All gaps between the helmet and equipment, including mounting plates, should be taped or filled. Protrusions, such as camera sights, should be engineered to present the least potential for snags. Test for these potential problems on the ground by dragging a suspension line over the camera assembly to reveal snag points.

小型相机并不一定比大型相机更安全。无论相机底座在哪，安装和改装任何相机底座时都应该考虑到其对降落伞开伞的影响。所有边角和可能钩挂住其他东西的部位都应被盖住、用胶带粘住或以其他方式进行保护。安装在头盔上的相机如有可能钩挂东西的部位的无法通过前述方法处置，则应该至少远离正在展开的降落伞。金字塔外形的相机固定系统可能能够比蛋状外形的固定系统更好地使伞绳偏开。导向板可用来保护那些难以改装的区域，以减少问题发生的机率。头盔与相机设备之间的所有缝隙，包括底座板，都要用胶带封好或填充好。镜头瞄准器等突出物的设计应尽量减少钩挂东西的可能性。可通过进行地面测试——在安装好的相机系统上拖拽伞绳，以检查是否有易发生伞绳钩挂的地方。

Sharp edges and protrusions can injure other jumpers during a collision or emergency aircraft landing. During deployment, jumpers should make sure that any cameras mounted on their extremities are kept clear of the deploying canopy, lines, etc. Camera-operation devices such as switches and cables need to be simple and secure. Analyze each piece of added equipment for its potential interaction with the overall camera system and parachutes.

发生碰撞或飞机紧急着陆时，尖锐的边缘和突起处可能会伤害其他跳伞者。在开伞过程中，装在跳伞者四肢上的相机必须始终远离正在展开的降落伞或伞绳等。相机操作装置（如相机开关、传输线）要简单、安全。每增加一件设备，都需要分析其与整个相机系统和降落伞之间的潜在相互作用。

Helmets and Camera Mounts

头盔和相机底座

A rigger or an experienced camera flyer should evaluate all camera platforms, whether custom or off the shelf, for safety and suitability to your purpose. The helmet should provide full visibility for the camera flyer in freefall and under canopy, but especially during emergency procedures. Cover and tape empty camera mounts to prevent snags.

所有相机平台，无论是定制的还是货架产品，都应接受降落伞装备师或有经验的摄影者的评估，以确认其安全性，以及是否适合你的摄影用途。头盔应能在自由落体过程中、开伞后、执行紧急程序时给摄影者提供宽阔的视野，特别是执行紧急程序时。未安装相机的底座应被盖好并用胶带粘好，以防钩缠上降落伞。

Any camera helmet should have an emergency release that is easy to operate with either hand in case of entanglement. Use a reliable helmet closure or clasp that also functions as an emergency release.

摄像头盔应配置有紧急释放装置，在发生缠绕时，该装置应易于用任意一只手操作。可使用一个可靠的、可被用作紧急释放装置的头盔开关扣或搭扣。

Parachute

降落伞

Camera flyers should use a reliable parachute that opens slowly and on heading. Those who use a camera suit need to ensure it is compatible with their deployment system. Camera-suit wings and lower connections must not interfere with the camera flyer's parachute-operation handles or main-bridle routing in any freefall orientation. If using a camera suit, the pilot chute and bridle length must be sufficient to overcome the additional burble the suit creates. If the camera flyer

generally opens higher than the other jumpers on the load, they may wish to use a slower descending canopy to help reduce traffic conflicts. As always, proper attention to packing and maintenance, especially line stows, helps prevent hard openings and malfunctions.

摄影者应该使用开伞缓慢且开伞过程中方向稳定的可靠的降落伞。如果穿了摄像服，则开伞系统需要与摄像服兼容。摄像服的翼和底部连接处不得干扰摄影者对降落伞各把手的操作，以及避免在任何自由落体姿态中干扰主伞引导伞系带的走线。引导伞和引导伞系带的长度必须足够长，以克服摄像服（如有使用）产生的额外的尾流。如果摄影者的开伞高度通常比其他跳伞者高，那么摄影者可能要使用下降速度较慢的降落伞，这有助于减少交通冲突。和其他任何时候一样，跳伞者应适当注意叠伞和维护，特别是伞绳的绑紧装填，有助于预防伞爆开和发生故障。

(译者注：爆开即开伞过快过猛。)

Recommended **accessory equipment** includes an audible altimeter, a visual altimeter that can be seen while filming, and a hook knife. USPA recommends camera flyers use an **AAD and an RSL with a MARD**.

推荐的**附件装备**包括声音高度表、在拍摄过程中可以看到读数的目视高度表、伞刀。USPA 建议摄影者使用 **AAD 以及配置了 MARD 的 RSL**。

E. Procedures

程序

Prior to jumping with a camera, a skydiver should have enough general jump experience to be able to handle any skydiving emergency or minor problem easily. A camera flyer should possess well-above-average skills that are applicable to the discipline or activity planned for the jump.

在携带相机进行跳伞之前，跳伞者应具备足够的普通跳伞经验，能够轻松应对任何跳伞紧急情况或小问题。摄影者应具备远高于平均水平的技能，并且这些技能应适用于计划进行的跳伞类型或活动。

USPA recommends that jumpers be licensed and have **completed 200 jumps before jumping with a camera**. The jumper should have made **at least 50 recent** jumps on the same parachute equipment to be used for camera flying and should know the experience and skills of all the jumpers in the group.

USPA 建议持证跳伞者在**携带相机进行跳伞之前至少进行过 200 次跳伞**。摄影者在进行摄影跳伞前，应该使用将在摄影跳伞中使用的降落伞**在近期进行过至少 50 次跳伞**，并且应该知悉团体中所有跳伞者的经验和技能水平。

The **deployment altitude** should allow time to deal with the additional equipment and its associated problems. The camera flyer must remain aware of other jumpers during deployment.

开伞高度应预留足够时间处理额外的装备及其相关问题。在开伞过程中，摄影者必须继续注意其他跳伞者。

Each camera flyer should conduct a complete camera- and parachute-equipment check before rigging up, after rigging up, before boarding the plane, and again prior to exit. They should approach camera jumps procedurally, following the same routine on every jump. The priorities on the jump should be the parachute equipment and procedures first, then the camera equipment and procedures. Introduce only one new variable—either procedure or equipment—at a time. A camera jump requires additional planning, and jumpers should never consider it to be just another skydive.

摄影者应在每次穿装备前、穿装备后、登机前和出舱前都进行一次完整的相机和降落伞装备检查。摄影跳伞应该按程序进行，每次跳伞都遵循同样的程序。摄影跳伞的优先事项是降落伞装备和跳伞程序，其次是相机设备和拍摄程序。在程序或装备方面，如果要引入新变量，一次最多只能引入一个新变量。摄影跳伞需要额外的规划，永远不要认为摄影跳伞和普通跳伞一样。

Aircraft

飞机

Camera flyers should wear or secure any camera during takeoff and landing to prevent it from becoming a projectile in the event of sudden movement. Be aware of the additional space a camera takes up, and practice climb-out procedures in each aircraft to prevent injury resulting from catching the camera on the door or other part of the aircraft. To prevent

injury and damage to the aircraft, the camera flyer should coordinate with the pilot before attempting any new climb-out position.

在飞机起飞和降落的过程中，应佩戴或固定好相机，以防止在突然移动时，相机被抛射出去。摄影者应意识到相机占用了额外的空间，在每架飞机上都要练习爬出机舱的程序，以防因相机被舱门或飞机其他部分绊住而受伤。为防止受伤和损坏飞机，在尝试任何新的爬出机舱的姿势之前，摄影者应先与飞行员协调。

Exit

出舱

Unless the plan calls for the camera flyer to be part of the exit, they should remain clear of the group, being mindful of the airspace opposite the exiting jumpers' relative wind. Be aware that:

除非跳伞计划要求摄影者参与出舱流程，否则摄影者应在出舱时与团体保持距离，并注意出舱的跳伞者的相对气流的反方向的空域。要注意以下事项：

- Wearing a camera helmet can make collisions with other jumpers more serious.
戴着摄像头盔时发生的碰撞会导致更严重的后果。
- Student jumpers can become disoriented when unexpectedly encountering a camera flyer.
跳伞学生如果意外遇到摄影者，可能会失去方向判断力。
- A tandem parachutist in command requires clear airspace to deploy a drogue.
双人伞指挥员需要开阔的空域来释放减速伞。
- Skydivers occasionally experience inadvertent openings on exit.
跳伞者偶尔会在出舱时遭遇意外过早开伞。

Freefall

自由落体

Jumpers should prepare a freefall plan with the camera flyer to include the camera flyer's position in relation to the group and any planned camera-flyer interaction with the group. The jumpers and the camera flyer should follow the plan.

跳伞者应与摄影者一起制定自由落体计划，内容包括摄影者相对于团体的位置，以及任何计划进行的摄影者与团体的互动。跳伞者和摄影者都应该遵照计划执行。

All jumpers on the load should understand the camera flyer's breakoff and deployment plan. Two or more camera flyers must coordinate the breakoff and deployment more carefully than when only one camera flyer is involved. Filming other jumpers through deployment should be planned in consideration of the opening altitudes of all the jumpers involved and with their cooperation. The camera flyer should maintain awareness of his or her position over the ground and deploy high enough to reach a safe landing area.

飞机上的所有跳伞者都应知悉摄影者的分离计划和开伞计划。如有两个或多个摄影者，则必须比仅有一个摄影者时更小心地协调分离和开伞。如果计划拍摄其他跳伞者的开伞过程，则应与所有参与的跳伞者共同计划，并考虑进所有跳伞者的开伞高度。摄影者应时刻注意其相对地面的位置，并在足够高的高度开伞，以能飞回安全的着陆区域。

Deployment

开伞

The camera flyer must exercise increased caution during deployment to prevent malfunctions, assure an on-heading deployment, reduce the likelihood of line twists, and avoid neck injury. New camera flyers should consult with experienced camera flyers for specific techniques to prevent accidents during deployment and inflation. Malfunction, serious injury, or death can occur if the lines of a deploying parachute become snagged on camera equipment.

在开伞过程中，摄影者必须格外小心防止发生故障，确保开伞时伞能保持方向稳定，减少线缠绕的可能性，并避免颈部受伤。新手摄影者应咨询有经验的摄影者，以了解具体的技巧，防止在降落伞展开和充气过程中发生事故。如果开伞过程中，降落伞的伞绳被相机设备缠住，可能会导致故障、重伤或死亡。

Parachute Emergencies

降落伞紧急情况

The additional equipment worn for filming can complicate emergency procedures. Each camera flyer should regularly practice all parachute emergency procedures under canopy or in a training harness while fully rigged for a camera jump and should practice routine emergency procedures before every jump. Emergency-procedure practice should include removing the helmet with either hand in response to certain malfunctions. A camera flyer should release their helmet during equipment entanglements, obstacle landings (water, trees, building, power lines), and whenever a dangerous situation presents itself.

为摄像而佩戴的额外设备可能会使紧急程序复杂化。每个摄影者都应定期在开伞后练习所有降落伞紧急程序，或在穿上所有摄像装备后，使用训练背带练习紧急程序，并且应在每次跳伞前练习常规的紧急程序。紧急程序的练习内容应包括在发生某些故障时用任意一只手脱下头盔。摄影者在遇到装备缠绕的问题时，在遭遇障碍物着陆时（水域、树木、建筑物、高压线），或每当出现相关的危险情况时，都要释放头盔。

F. Considerations for Videoing Students

拍摄学生跳伞的考虑事项

Refer to the Instructional Rating Manual for additional guidelines for flying camera for student training jumps. A skydiver should have extensive camera-flying experience with experienced jumpers prior to photographing or videoing student jumps, including at least **300 group freefall skydives and at least 50 jumps flying camera** with experienced jumpers. 请参考 USPA 教学评级手册，了解关于拍摄学生训练跳伞的附加指引。在拍摄学生跳伞之前，跳伞者应有大量与有经验跳伞者一起跳伞和摄像的经验，包括至少进行过 300 次团体自由落体跳伞，且至少与有经验的跳伞者进行过 50 次跳伞并摄像。

The USPA Instructor supervising the jump should conduct a thorough briefing with the camera flyer prior to boarding. The USPA Coach or Instructor, the camera flyer, and the student making the jump should all be aware of the procedures and the camera plan. The instructors' full attention is supposed to be on the student, and the student is incapable of considering the movements and needs of the camera flyer.

在登机前，监督学生跳伞的 USPA 教练应对摄影者进行一次全面的简报。所有流程和拍摄计划应在 USPA 助理教练或 USPA 教练，摄影者，以及学生之间共享。教练应该把全部注意力放在学生身上，而学生则没有能力考虑摄影者的动作和需求。

The camera flyer should avoid the area directly above or below a student or instructor(s), because students may deploy without warning and because disturbing the student's or instructors' air could compromise their performance and the safety of the jumpers.

摄影者应避开学生或教练的正上方或正下方的区域。因为学生可能在无预警的情况下开伞，而扰乱经过学生或教练的气流可能会影响他们的表现和安全。

The camera flyer should plan an exit position that avoids contact with the student or the instructor(s). **During the exit**, students often give erratic exit counts, making exit timing difficult for the camera flyer. The camera flyer may leave slightly before the student exits when the count is reliable. The camera flyer should follow slightly after the student's exit whenever the student's exit timing is uncertain. When filming tandem jumpers, the camera flyer must remain clear of the deploying drogue.

摄影者应规划好出舱位置，避免与学生或教练接触。**在出舱过程中**，学生发出的出舱信号通常是不稳定的，这使得摄影者把握出舱时机的难度加大。如果学生做的出舱信号可靠，摄影者可以在学生出舱前稍早离开。如果学生的出舱时机不确定，摄影者应在学生出舱后稍后跟随。当拍摄双人伞跳伞时，摄影者必须远离被释放的减速伞。

The camera flyer needs to maintain independent altitude awareness and never rely on the student or instructor(s). The camera flyer is responsible for opening separation from the student and the instructor(s). Although the footage may be dramatic, aggressive filming of openings compromises the safety of the student, the instructor(s), and the camera flyer.

When using larger aircraft, student groups typically exit farther upwind, which may require a higher opening for the camera flyer to safely return to the landing area.

摄影者需要保持独立的高度意识，永远不要依赖学生或教练。摄影者负责在开伞前与学生和教练分开足够的距离。拍摄开伞过程虽然很激动人心，但会危及学生、教练和摄影者自身的安全。当使用更大的飞机跳伞时，学生们通常会在更上风处的地方出舱，这可能使摄影者需要在更高的高度开伞，以能安全返回着陆区。

When using a hand-mounted camera to video students, the tandem instructor should review the information contained in the Instructional Rating Manual Tandem Section regarding hand-cam training.

使用手持式相机拍摄学生时，双人伞教练应参考教学评级手册的双人伞部分中有关手持式相机的培训信息。

5-8 翼装 Wingsuit Flying

A. Introduction and Definitions

简介和定义

A **wingsuit** is a specialized suit designed with arm wings and a leg wing intended to increase the total surface area of the skydiver, which decreases vertical (downward) speed and increases horizontal (forward) speed. A wingsuit will decrease the skydiver's full range of motion, whereas baggy jumpsuits and tracking suits still allow for a full range of motion. A **wingsuit pilot** is a skydiver who wears a wingsuit.

翼装是一种特殊的服装，带有臂翼和腿翼，旨在增加跳伞者的总表面积，从而降低垂直（向下）速度并提高水平（向前）速度。翼装会限制跳伞者的肢体活动范围，相较之下，宽松的跳伞服和 Tracking 服则允许肢体完全自由活动。翼装跳伞者指穿翼装的跳伞者。

These recommendations provide guidance for a skydive that entails wearing a wingsuit, along with parameters for wingsuit progression and more advanced wingsuit-flying jumps.

本节的建议旨在为涉及翼装的跳伞活动提供指引，并涵盖翼装培训和更进阶的翼装飞行的相关参数。

B. Qualifications

资格

The **BSRs** require any person performing a wingsuit jump to have at least 200 skydives and hold a current skydiving license. USPA also recommends the participating skydiver become a well-rounded, multi-discipline skydiver and canopy pilot. A wingsuit pilot should possess situational awareness regarding loading the plane, aircraft climb pattern and location, jump-run direction, exit order, exit separation, parachute opening, canopy flight, and landing pattern.

基本安全要求规定，进行翼装飞行的人员跳数必须至少达到 200 跳，并持有有效的跳伞执照。USPA 同时建议参与者全能发展，熟悉多种跳伞类型及伞控技能。翼装跳伞者需在以下方面具备态势感知能力：登机、飞机爬升的航线与方位、跳伞航线的航向、出舱顺序、出舱间隔、开伞、降落伞飞行以及着陆航线。

Before engaging in wingsuit jumps, a participating skydiver should take a **first-flight course (FFC)** with an experienced wingsuit coach. While USPA does not have a specific rating for wingsuit coaches, wingsuit manufacturers often offer instructional ratings for their products and provide contact details for endorsed wingsuit coaches. Regardless of manufacturer endorsement, a wingsuit coach should have a current USPA Coach rating and be a highly experienced wingsuit pilot. The drop zone where the FFC is held determines who can conduct it.

参与翼装跳伞前，跳伞者须接受由资深翼装教练指导的**首次飞行课程 (FFC)**。虽然 USPA 未设立专门的翼装教练评级，但翼装制造商通常会为其产品提供教学评级认证，并可提供经认证的翼装教练的联系方式。无论是否获得制造商的认证，翼装教练都必须持有有效的 USPA 助理教练评级，且拥有丰富的翼装飞行经验。首次飞行课程的具体执教资格由课程所在跳伞基地决定。

C. Equipment

装备

Wingsuit pilots should use non-elliptical **canopies** with reliable, on-heading openings. A beginner wingsuit pilot should limit their wing loading to no more than 1.3:1. An experienced wingsuit pilot should limit their wing loading to no more than 1.5:1.

翼装跳伞者应使用非椭圆伞型的、开伞性能可靠的、在开伞过程中能保持方向稳定的**降落伞**。翼装新手的翼载不应超过 1.3，资深翼装跳伞者的翼载上限为 1.5。

Wingsuits create a large burble above and behind a skydiver and may not provide the **pilot chute** enough air for clean inflation and extraction of the deployment bag from the pack tray. USPA recommends a pilot chute with a diameter of at least 26 inches. Wingsuit pilots should use a pilot chute handle that is as light as possible, and USPA strongly recommends a bridle length of at least 7 feet from pin to pilot chute. The bottom-of-container throw-out pilot chute is the only **deployment system** that wingsuit pilots should use.

翼装会在跳伞者上方及后方形成巨大的尾流区，可能导致**引导伞**无法获得充足气流以正常充气并把 D 包从伞包中拉出。USPA 建议使用直径不小于 26 英寸的引导伞，引导伞把手的重量应尽量轻。USPA 强烈建议引导伞系带的从关包针到引导伞之间的长度至少达到 7 英尺。翼装跳伞者只能使用安装在伞包底部的抛出式引导伞作为**开伞系统**。

USPA recommends wingsuit pilots use an **AAD and an RSL with a MARD**. Jumpers should consult their drop zone about its rules regarding AAD use for wingsuit pilots. Wingsuit pilots should wear **helmets**, especially when flying in groups, and use an audible **altimeter** and a visual altimeter mounted on the chest strap or mud flap. Wingsuit pilots should wait to wear any **camera** until their exits, flights and deployments are consistent, stable, and routine.

USPA 建议翼装跳伞者使用 **AAD 以及带 MARD 的 RSL**。跳伞者需向所在跳伞基地咨询翼装飞行使用 AAD 的具体规定。翼装跳伞者必须佩戴**头盔**，尤其是在团体飞行时。并且应使用声音**高度表**以及安装在胸带或 Mud Flap 上的目视读数的高度表。在出舱、飞行及开伞方面达到持续稳定的、熟练的表现之前，翼装跳伞者不应佩戴**摄影设备**。

(译者注: Mud Flap 是降落伞背带上位于三环下方的一个部位。)

D. Training

培训

Regardless of experience in other disciplines, jumpers should seek thorough training with an experienced wingsuit coach before engaging in wingsuit flying. Before flying wingsuits in larger groups, **novice wingsuit pilots** should fly formations with a coach to develop exit, body position, docking, transition, breakoff, and deployment skills, following the same model as for the freefall and canopy-formation disciplines.

无论在其他跳伞类型的经验如何，跳伞者进行翼装飞行前都应接受资深翼装教练的全面培训。**翼装新手**在参与较大规模团体的编队飞行前，应参照自由落体团体编队和降落伞编队的相同训练模式，先和翼装教练一起进行编队飞行，以掌握出舱、身体姿势、连接、姿态转换、分离及开伞等技能。

Regardless of wingsuit experience, jumpers should **learn new wingsuit skills** in groups no larger than a 3-way. This includes acrobatic maneuvers such as barrel rolls and docked transitions, XRW (mixed canopy and wingsuit jumps), performance flying, and dynamic flying. Before flying in a group larger than three wingsuit pilots, each participant should be able to make a stable and controlled exit. They each should be able to approach other wingsuit pilots in a gradual and controlled manner, checking their airspace and remaining aware of all other wingsuit pilots in their group. They should also each be able to break off and create a safe distance from other wingsuit pilots for deployment.

无论有多少翼装飞行经验，跳伞者在**学习新的翼装技能**时（包括横滚、连接状态下的姿态转换、XRW（翼装与降落伞的组合飞行）、高性能翼装飞行和动态翼装飞行等），团体编队人数不得超过三人。进行超过三人的翼装编队飞行前，每位参与者都应能进行稳定可控的出舱。参与者还都应能以逐步且可控的方式接近其他翼装，并在这个过程中观察空域，同时掌握编队内其它成员的位置。分离时，每位参与者还都要能与其他翼装分开安全的开伞间距。

Wingsuit size progression should follow the manufacturer guidelines regarding minimum jump numbers. Larger wingsuit sizes require more skill. A wingsuit pilot wishing to advance into the next suit size should seek guidance from an experienced wingsuit coach. Just as it is important to have solid skill sets on a current canopy before downsizing, it is also important to have solid skill sets on a current wingsuit before upsizing.

翼装尺寸的升级应遵循制造商关于最低跳数的指引。更大尺寸的翼装需要更高的飞行技能。打算升级翼装尺寸的飞跳伞者应咨询资深翼装教练。正如在降伞前需要精通当前所用降落伞的操纵一样，在升级翼装尺寸前也必须能完全掌握使用当前翼装的坚实技能。

E. Procedures

程序

Group wingsuit flights should have planned **breakoff and deployment altitudes**. Wingsuit groups should have a planned breakoff signal to communicate that the group flight is over. The beginner wingsuit pilot—as well as wingsuit pilots who do not have consistent, stable deployments—should deploy at a minimum of 5,000 feet AGL.

翼装编队飞行应规划好**分离高度和开伞高度**。翼装编队需定好分离信号，用于示意编队飞行的结束。翼装新手以及未能持续稳定开伞的翼装跳伞者应在离地至少 5000 英尺的高度开伞。

Wingsuit deployments require active management of forward speed and body symmetry. Arm wings of the suit may fully obstruct the jumper's ability to quickly deploy their main parachute without a specialized deployment technique. Wingsuit pilots should become proficient at the deployment technique before advancing in their progression of suit size. 翼装飞行的开伞需要跳伞者主动控制好前进速度和身体的对称性。除非使用专门的开伞技巧，否则翼装的臂翼可能完全阻碍跳伞者快速打开主伞的能力。翼装跳伞者在升级更大尺寸的翼装前，必须熟练掌握开伞技巧。

Wingsuit pilots have additional steps to their **post-deployment procedures** following normal canopy inflation:

在降落伞正常打开充气后，翼装跳伞者的**开伞后流程**有一些额外的步骤：

1. clear airspace
确认空域净空
2. unzip arm wings first
解开臂翼的拉链
3. perform canopy housekeeping
处理降落伞杂项事务
4. stow the tail wing (This depends on the personal preference of each wingsuit pilot and should not take priority over flying the canopy predictably and safely.)
收腿翼（此步骤取决于翼装跳伞者的个人偏好，应优先以可预测的安全的方式操纵降落伞，再收腿翼）

Wingsuit pilots often **share canopy airspace** with tandems and jumpers still on student status, as well as other jumpers who may have deployed higher than 6,000 feet AGL. Wingsuit pilots should exercise awareness around these other canopies to avoid canopy collisions.

翼装跳伞者经常和双人伞、跳伞学生，以及其他在 6000 英尺以上开伞的其他跳伞者**共用降落伞飞行的空域**。翼装跳伞者应对周边其他降落伞保持警觉，避免发生降落伞碰撞。

Emergency Procedures: Arm wings may restrict movement and inhibit the wingsuit pilot from grabbing their risers until the arm wings are unzipped. Any wingsuit, regardless of the model, should allow enough range of motion for the wingsuit pilot to pull the main cutaway and reserve handles without unzipping the arm wings.

紧急程序：臂翼可能会限制肢体活动，在未解开臂翼的拉链前，臂翼可能会阻碍跳伞者抓组提带。任何型号的翼装都应确保跳伞者能在无需解开臂翼拉链的情况下切伞并开备伞。

During a **high-speed canopy malfunction**, the jumper should immediately execute emergency procedures without

wasting time unzipping the arm wings first. In the event of a **low-speed canopy malfunction**, it may be necessary to unzip the arm wings in order to reach the risers. Wingsuit pilots should demonstrate the ability to unzip the arm wings all the way in a smooth and controlled fashion while practicing low-speed-canopy-malfunction drills. Unzipping the tail wing is not crucial for canopy flight, and an unzipped tail wing can potentially entangle with the main or reserve.

发生**降落伞高速故障**时，跳伞者应立即执行紧急程序，切勿浪费时间先解开臂翼拉链。若发生**降落伞低速故障**，则可能需要解开臂翼拉链以够到组提带。翼装跳伞者在练习降落伞低速故障的处置时，应展示出以流畅的受控的方式完全解开臂翼拉链的能力。腿翼拉链的解开与否对降落伞飞行影响不大，且解开的腿翼可能与主伞或备伞发生缠绕。

There are many facets to **advanced wingsuit flying**. Due to the increased risks involved, only experienced wingsuit flyers with the assistance of a coach following the prescribed outline under Section D—Training of this chapter should attempt any of the following disciplines:

翼装飞行有许多**进阶类型**。由于风险较高，只有经验丰富的翼装跳伞者才可以在翼装教练的协助下按照本节 D 部分“培训”中规定的纲要尝试以下进阶类型：

- **XRW** – a discipline in which a wingsuit pilot flies in close proximity to and/or completes docks with a canopy pilot flying a high-performance parachute at a high wing loading.
XRW (翼装与降落伞的组合飞行)——翼装跳伞者与使用高翼载的高性能伞的跳伞者进行近距离编队飞行和（或）进行连接的翼装飞行类型。
- **Performance** – a competitive discipline that involves a wingsuit pilot flying for maximum performance in three separate tasks: speed, distance, and time.
高性能翼装飞行——在飞行速度、飞行距离或者飞行时间方面追求极限飞行性能的翼装比赛科目。
- **Acrobatic** – a competitive discipline that consists of docking with other wingsuit pilots and performing acrobatic maneuvers.
翼装特技飞行——与其他翼装跳伞者连接并执行特技动作的翼装比赛科目。
- **Mixed** – any wingsuit flight that occurs with other skydivers in freefall, such as rodeo, angles, and carving around freefall groups.
混合飞行——与进行自由落体的其他跳伞者共同完成的翼装飞行，例如骑乘、Angle 以及绕飞自由落体编队等。
- **Large Formations** – as a record category, wingsuits can fly in large formations to achieve state, national and world records.
大型编队——作为跳伞纪录认证的一个类别，翼装跳伞者可组成大型编队，冲击州纪录、国家纪录和世界纪录。
- **Dynamic Flocking** – a type of wingsuit flying that consists of group members flying together in a steep angle, such as layouts, flares, and carving.
动态编队——指翼装编队成员以大倾角协同飞行，包括 Layout、Flare 和 Carving 等动作。
(译者注: Layout、Flare、Carving 为动作的名称，详询翼装教练。)
- **Accessories** – jumping with accessories to wingsuit gear such as brackets, streamers and/or harnesses with ropes or handles. Wingsuit pilots should exercise great care, be cautious about entanglement issues, and plan cutaway procedures for everyone on the jump, whether they are in wingsuits or not.
带附件的翼装飞行——指带有翼装附件的翼装飞行，如支架、彩带和（或）背带上连有绳索或把手。翼装跳伞者须高度警惕发生缠绕的风险，并为每位跳伞者（无论是否穿着翼装）制定切伞程序。

F. Hazards Associated with Wingsuit Jumps

与翼装跳伞相关的危险

Restricted Movement: Arm movements are more restricted during a wingsuit skydive, although the amount of restriction is model-specific. Arm wings of the suit may fully obstruct the jumper's ability to quickly deploy their main parachute without a specialized deployment technique.

肢体活动受限: 在翼装跳伞过程中，手臂的运动通常受限，尽管受限程度视不同型号的翼装而有所不同。除非使用专门的开伞技巧，否则翼装的臂翼可能完全阻碍跳伞者快速打开主伞的能力。

Limited Visibility: The wingsuit pilot should follow the wingsuit manufacturer's guidelines when attaching a wingsuit to the harness-and-container system and use special care to ensure that the wingsuit does not obstruct the cutaway and reserve handles. Since harness leg straps are not visible when the wingsuit is fully zipped up, jumpers should take great care to ensure the leg straps are fully tightened while gearing up and during the pre-jump gear check.

装备视野受限: 翼装跳伞者在将翼装连接至背带和伞包系统时, 应遵循制造商的指引, 要特别注意确保翼装不会遮挡切伞把手与备伞把手。由于翼装完全拉合后无法查看腿带状态, 跳伞者应在穿装备时及跳前装备检查时特别注意确认腿带已完全收紧。

Tail Strikes: During exit, wingsuit pilots must be especially careful to avoid colliding with the tail of the aircraft. A wingsuit flyer must direct their head into the relative wind, avoid jumping up while exiting, and refrain from fully opening leg and arm wings until they have passed below the tail of the aircraft. Wingsuiters should ask the pilot whether an engine cut is possible for their exit, since a solid engine cut helps wingsuiters avoid colliding with the tail during the exit, particularly in low-tail aircraft.

撞上飞机尾翼的风险: 出舱时, 翼装跳伞者须格外注意避免与飞机尾翼碰撞。翼装跳伞者必须让头部迎向相对气流方向, 出舱时避免向上跳跃, 在从飞机尾翼的下方通过前, 不得完全展开腿翼与臂翼。出舱前, 翼装跳伞者应询问飞行员是否有可能让发动机动力降至零, 因为这有助于翼装跳伞者在出舱时避免撞上尾翼, 尤其是低尾翼机型。

(译者注: 飞机空速、发动机气流、飞机俯仰角等因素会影响翼装跳伞者的出舱安全。“Cut”指让发动机(或双发/多发飞机的位于舱门一侧的发动机)的动力降低至慢车或无动力状态, 具体视机型而定, 详询飞行员。)

Out-of-Control Flight: Due to the responsiveness of pressurized wingsuits, stable and controlled flight requires subtle and relaxed movements. If a wingsuit pilot cannot control the heading of their flight, they may tumble and become disoriented in what is known as out-of-control flight (OCF). Wingsuit pilots should seek out coaching early in their progression to learn the skills necessary to control their wingsuit flight and avoid OCF. USPA strongly advises wingsuit pilots to adhere to the manufacturer's recommendations for the minimum number of jumps required to fly a certain size or style of wingsuit. If OCF occurs above deployment altitude and controlled flight cannot be regained within 5 seconds or within 5,000 feet of altitude loss, deploy the main parachute. If unable to locate the bottom-of-container deployment handle, pull the reserve immediately. If OCF occurs below a wingsuit pilot's planned deployment altitude, they should deploy regardless of their body position, which follows the pull priorities for any skydive. The inability to fly and deploy in a stable and controlled orientation will increase the likelihood of needing to execute emergency procedures. Wingsuit pilots should frequently practice their emergency procedures while visualizing the various scenarios where OCF occurred.

失控飞行: 由于受充气加压的翼装对动作的响应很灵敏, 要保持稳定可控的飞行, 动作要细微且放松。若翼装跳伞者无法控制飞行方向, 可能会失稳且迷失方向, 这种情况被称为失控飞行(OCF)。建议翼装跳伞者在飞翼装的早期接受专业指导, 学习控制飞行的必要技能, 以避免失控飞行。USPA 强烈建议翼装跳伞者严格遵守制造商对不同尺寸或款式的翼装的最低跳数要求。若失控飞行发生于开伞高度以上且 5 秒内或下落 5000 英尺以内仍未恢复控制, 则应开主伞; 若无法触到伞包底部的开伞把手, 则应立即开备伞。若失控飞行发生在预定开伞高度以下, 无论姿态如何都必须开伞(这与常规跳伞的开伞优先事项一致)。未能在稳定可控的方向姿态下飞行并开伞将增加需执行紧急程序的概率。翼装跳伞者应通过想象模拟各类发生失控飞行的情景, 并反复练习紧急程序。(译者特注: 本段所提的 5000 英尺为英文原文编辑错误, 请以 USPA 修订结果为准)

Coordination with Other Groups: Wingsuiters should be aware of other groups' deployment altitudes and types of skydiving activities on their loads. Wingsuiters should be especially aware of any other movement groups and any skydivers on the load intending to deploy above 6,000 feet. If multiple groups of wingsuiters plan to exit on the same load, the groups should coordinate their flight patterns to allow separate airspace per the drop zone's policies.

与其他团体的协调: 翼装跳伞者需了解同架次其他团体的开伞高度及跳伞类型。特别要注意同架次上是否有进行涉及大范围水平移动的自由落体的跳伞者, 或打算在 6000 英尺以上开伞的跳伞者。若有多个翼装编队在同一架次上, 各编队应根据跳伞基地政策协调飞行路线, 以确保所使用的空域是分开的。

Navigation and Weather: Wingsuiters can travel for miles between exiting the aircraft and the deployment point. Thus,

navigation—plotting a route, maneuvering to follow that route, and adapting when conditions change—is a critically important skill. Wingsuit pilots should determine winds aloft prior to jumping by consulting the pilot or winds-aloft forecasts. Wingsuit pilots must meet the cloud-clearance and visibility requirements of FAR 105.17, and the margin needed for their horizontal flight may exceed what other freefall groups need. If the wingsuit flight occurs near a coastline or other large body of water, the wingsuit flight pattern should remain close enough to the shoreline to ensure that each wingsuit pilot can make it to the designated landing area or another suitable landing area. Wingsuit pilots should consider wearing flotation gear on these types of jumps.

导航与天气：翼装跳伞者从出舱到开伞可能会飞行数英里的距离，因此导航是一项至关重要的技能，导航技能包括了规划路线、沿着预定路线飞行，以及视情况调整的能力。在跳伞前，翼装跳伞者应通过咨询飞行员或查看高空风预报来确定高空风况。翼装跳伞者必须满足联邦航空条例 105.17 中的云层间距和能见度要求，其水平飞行所需的安全余量通常大于其他自由落体团体。在海岸线或大型水域附近飞行时，翼装的飞行路线应足够靠近岸边，以确保每位翼装跳伞者均可抵达预定着陆区域或其他适合降落的区域。在此类跳伞中，翼装跳伞者应考虑配备漂浮装置。

Wingsuit pilots generally fly a planned **flight pattern**, which may vary due to drop-zone and air-traffic concerns. The wingsuit flight pattern should avoid crossing jump run and should consider canopy traffic, particularly tandem and AFF students. The BSRs require at least 500 feet of vertical and horizontal separation from tandem pairs and students, and a safe distance from any other canopy.

翼装跳伞者通常采用预定的**飞行路线**，飞行路线可能因空中管制或跳伞基地要求而有所不同。翼装的飞行路线应避免与跳伞航线交叉，并考虑到降落伞交通的影响，尤其是双人伞和 AFF 学生。根据基本安全要求，跳伞者需与双人伞及跳伞学生保持至少 500 英尺的垂直/水平间距，并与其它降落伞保持安全距离。

Landing Out: If improper navigation occurs, a wingsuit pilot may land off. Wingsuit pilots should be familiar with the off-landing procedures of the drop zone. If landing in water is unavoidable, the jumper must fully unzip the arm and leg wings before landing in the water to allow as much freedom of movement as possible after entering the water.

场外着陆：导航失误可能导致翼装跳伞者场外着陆。翼装跳伞者须熟悉跳伞基地的场外着陆应对程序。若无法避免在水上降落，入水前必须完全解开臂翼和腿翼，以确保入水后肢体能尽可能自由活动。

G. Pre-Flight Checklist

飞行前检查单

This pre-flight checklist can help you determine the specifics of your jump. Draw your flight plan on the map of your drop zone and confirm it with the drop zone staff, load organizer, pilot, and S&TA.

这个飞行前检查单可以帮助你确定跳伞的细节。你应该将自己的飞行计划画在跳伞基地的航图上，并与基地工作人员、架次安排者、飞行员以及安全和培训顾问进行确认。

- ☐ What is jump run for your load?
你所在的架次的跳伞航线是怎样的？
- ☐ What are the forecasted winds at these points during your jump?
本次跳伞中，以下阶段的风况预报是怎样的？
 - ☐ Exit altitude
出舱高度
 - ☐ Flight
翼装飞行
 - ☐ Deployment
开伞
 - ☐ Landing Pattern
着陆航线
 - ☐ Current Ground Conditions
当前地面风况

- ☐ How many groups and other jumpers are on your load?
你所在的架次有多少组团体、多少其他跳伞者？
- ☐ What is your exit order?
你的出舱顺序是怎样的？
- ☐ Are there any other wingsuit or movement jumps on your load?
是否有其他进行翼装飞行或大范围水平移动的自由落体的跳伞者在同一架次上？
 - ☐ Have you discussed and coordinated deployment areas with these groups?
你和他们是否有讨论和协调开伞区域？
- ☐ What are the terrain factors to consider in navigation?
在导航时，跳伞基地降落区是否有需要考虑的地形因素？
- ☐ What is the intended landing pattern and holding area for the jump?
该次跳伞拟采用的着陆航线和等待区是怎样的？
- ☐ Have you ensured that your flight path does not interfere with jump run?
你是否能确认你的飞行路线不会干扰到跳伞航线？
- ☐ Is your flight plan appropriate for the skill level and wingsuit size for other jumpers in your group?
你的飞行计划是否适合团体编队中的所有成员的技能水平和翼装尺寸？

5-9 伞控 Canopy Piloting

A. Introduction and Purpose

简介和目的

USPA pursues a canopy education strategy in coordination with drop zone instructional staff, expert canopy pilots, advanced canopy training schools, and canopy manufacturers. Basic but comprehensive canopy-flight training starts in the USPA Integrated Student Program leading to the A license. Yet, the canopy designs and flying techniques that jumpers often choose to use as they progress in the sport require training beyond what skydiving students receive. This section serves as a bridge between your basic license training and your future goals, whatever they may be.

USPA 与跳伞基地教学人员、伞控专家、高阶伞控培训学校以及降落伞制造商协调合作推行伞控教育策略。基本而全面的伞控培训始于 USPA 综合学生计划，至跳伞者获得 A 执照为止。然而，随着跳伞者在该运动中不断进阶，他们在伞型设计和伞控技术上的选择常要求他们接受超出学生所学范围的培训。本节内容在基本的执照培训和未来目标之间架起桥梁，无论这些目标是什么。

Analysis of incident reports indicates that jumpers are at risk without continued canopy training at each license level and throughout their skydiving careers. Even canopies considered lightly loaded can be dangerous if jumpers are not properly trained to fly them. Jumpers who have progressed without continued training are largely unprepared for how to handle their canopy in difficult canopy flight and landing situations. Preparation for unusual canopy flight and landing emergencies is key to reducing canopy-piloting mistakes, injuries, and fatalities.

对事件报告的分析表明，如果跳伞者在每个执照级别及整个跳伞生涯中缺乏持续的伞控培训，将会面临风险。即使是翼载轻的降落伞，如果未接受适当的培训，也可能存在危险。那些在缺乏持续培训的情况下进阶至更高阶段的跳伞者，大多并未准备好应对降落伞飞行和着陆出现困难的情形。为异常的降落伞飞行和着陆紧急情况做好准备是减少伞控失误和伤亡的关键。

USPA encourages all jumpers to take canopy-piloting training courses to refine canopy skills, especially as they downsize to smaller canopies with increased wing loadings and performance characteristics.

USPA 鼓励所有跳伞者参加伞控培训课程以提升伞控技能，尤其是降落伞至面积更小、翼载更大、性能更高的降落伞时。

B. Hazards Associated with Canopy Piloting

与高阶伞控相关的危险

Some of the maneuvers described to develop understanding of canopy flight involve a greater risk of injury, even serious

injury or death, than a routine parachute landing using a straight-in approach flown at the canopy's natural speed until flaring. Any pilot who manipulates the canopy controls to induce additional speed prior to landing presents a greater hazard to themselves and others. Before jumping begins, the canopy coach, instructor or course director should require each participant to complete an assumption-of-risk agreement in conjunction with a comprehensive liability-risk-management program applied in accordance with applicable local and state laws.

比起沿直线进近、在拉平前保持降落伞自然速度的常规着陆方式，为提升对伞控的理解而进行的某些机动动作有更高的受伤风险，甚至可能导致重伤或死亡。任何在着陆前操纵降落伞加速飞行的行为都会给自己和他人带来更大的危险。在跳伞开始前，教练、伞控教练或课程主管应要求每位参与者签署一份风险协议，并根据当地和州所适用的法律采用一个综合责任风险管理计划。

C. Definitions and Procedures

定义和程序

A jumper chooses the correct canopy for their experience level based on canopy performance, which is significantly influenced by wing loading and design. A canopy designed for more performance may exhibit relatively docile characteristics when it's loaded lightly and flown conservatively. A canopy designed for docile performance that is flown aggressively at a higher wing loading can exhibit high-performance characteristics.

跳伞者根据自身经验水平选择性能合适的降落伞，降落伞性能主要受翼载和设计影响。为高性能飞行而设计的降落伞在较轻的翼载和保守的飞行操控下，可能表现出相对温和的特性。而为温和性能而设计的降落伞在较高翼载和激进的飞行操控下，也可能表现出高性能特性。

Novice canopy flyers can make errors on larger, docile canopies without getting hurt that on smaller, more heavily loaded canopies could have serious consequences. All canopies can be deemed high performance depending on the wing loading. High performance generally refers to canopies loaded as follows:

新手在使用性能温和的降落伞飞行时所犯下的未导致受伤的操作失误，如果发生在使用更高级的装备时，可能会造成严重后果。在高翼载下，所有降落伞都可被认为是“高性能”的范畴内。“高性能”一般指翼载如下的降落伞：

- above 230 square feet, 1.1 pounds or more per square foot
面积超过 230 平方英尺的降落伞：翼载大于或等于 1.1（单位：磅/平方英尺，下同）
- from 190 to 229 square feet, 1.0 pound or more per square foot
面积在 190 到 229 平方英尺之间的降落伞：翼载大于或等于 1.0
- from 150 to 189 square feet, .9 pound or more per square foot
面积在 150 到 189 平方英尺之间的降落伞：翼载大于或等于 0.9
- canopies smaller than 150 square feet at any wing loading
任何翼载下的、面积小于 150 平方英尺的降落伞

Canopy Design

降落伞的设计

Typical characteristics of elliptical canopies compared to rectangular canopies of the same size and material:

与相同面积和材质的矩形伞型相比，椭圆伞型的典型特征如下：

- flatter glide for same airspeed
在相同的空速下，有更平坦的下滑轨迹
- faster turns
转弯更快
- greater loss of altitude in a turn
转弯会损失更多高度
- may continue to dive after stopping control input following a turn
在转弯后，停止操作输入后降落伞可能继续俯冲
- slower, less predictable opening (some models)

更慢的，更难以预测的开伞表现（某些型号）

- shorter toggle stroke for flare (some models)
拉平时，所需的刹车行程更短（某些型号）
- quicker, more abrupt stall (some models)
更快、更突然的失速（某些型号）

The **stall speed** of any wing increases as the wing loading increases due to more suspended weight. Sudden maneuvers, such as flaring hard after a dive, can increase the stall speed, as well.

任何降落伞的**失速速度**都会随着翼载的增加而升高。突然的机动动作，例如俯冲后猛地拉平，也会让失速速度升高。

Jumpers should approach changing their **canopy's design** with as much caution as downsizing. They should learn whether the canopy's design elements match their overall expectations, goals and experience level. Many design elements drastically change the flight characteristics, stability, and overall level of performance of a parachute.

跳伞者在更换不同**设计**的降落伞时，应像降伞时一样谨慎。他们需要了解降落伞的设计元素是否符合自身的整体预期、目标和经验水平。许多设计元素会显著改变降落伞的飞行特性、稳定性及整体性能表现。

Jumpers should explore only one new **design element** at a time and separate it from downsizing; that is, change only one design characteristic while staying at the same square footage. These elements include tapered or elliptical planform (degree of taper or ellipse varies according to design), cross-bracing or other airfoil-flattening or stiffening design modifications, and anything requiring additional in-flight procedures (for example, a removable pilot chute, deployment bag, or slider).

跳伞者每次应仅尝试一种新的降落伞**设计元素**，且不能同时减小降落伞的面积，也就是说，在降落伞面积不变的前提下，每次只能尝试一项新的设计特性。降落伞的设计元素包括：两端渐缩的（锥形）形状或椭圆平面形状（锥形或椭圆形的程度根据设计而变化）、交叉支撑或其他展平或加强伞翼强度的设计，以及任何使得降落伞飞行程序步骤增加的改装，例如可拆下的引导伞、D包或滑块布。

Downsizing Progression

降伞进度

Each progressive step in downsizing, technique, and canopy design should be a conscious decision based on common sense, experience level, and demonstrated ability, rather than considered a routine part of a skydiver's progression. Downsizing decisions must be based on each individual jumper's readiness; however, the following are downsizing increments that are generally acceptable on the same canopy design.

跳伞者应基于常识、经验水平、技能水平，经深思熟虑后再决定是否在降落伞的面积和设计以及伞控动作方面更进一步，这些进阶内容并不是跳伞者进步过程中所必需做的。降伞的决定必须基于跳伞者的准备程度；不过，下文提供了在保持降落伞设计不变的前提下一般认为可接受的降落伞面积减量。

1. above 230 square feet, 20 to 30 square feet
230 平方英尺以上：一次降 20 至 30 平方英尺
2. from 229 to 150 square feet, 20 square feet or less
从 229 到 150 平方英尺：一次降 20 平方英尺以内
3. from 149 to 120 square feet, 15 square feet or less
从 149 到 120 平方英尺：一次降 15 平方英尺以内
4. below 120 square feet, in smaller increments
120 平方英尺以下：减量要更小

Considerations Before Changing or Downsizing Canopies**使用不同设计的降落伞或更小面积的降落伞之前的考虑事项**

How do you know whether you are ready to downsize? Consider the following:

你要怎么知道自己是否准备好进行降伞？请考虑以下事项：

- Change planform (type of canopy) or size, not both
只改变降落伞形状（类型）或面积的其中一项，而不是同时改变
- Downsize one size at a time
降落伞面积要循序渐进逐步减小
- Take a canopy class to master your current parachute
参加伞控课程，掌握当前所用的降落伞的操纵
- Consider competency and currency rather than only jump numbers
把自身能力和近期跳伞的活跃度纳入考量，而不仅仅考虑跳数

Proficiency Exercises**熟练度练习**

On your current canopy, can you reliably perform the following exercises to the satisfaction of the S&TA or DZO?

在你当前使用的降落伞上，你能否可靠地完成以下练习，并达到安全和培训顾问或跳伞基地的要求？

In-Air Exercises – Perform Above 2,000 Feet**空中练习——在 2000 英尺以上高度执行**

Guidance for these canopy drills can be found in Chapter 1, Category E, and in the USPA Library online modules. 这些伞控练习的指引可在第一章 E 单元以及 USPA 图书馆的在线学习模块中找到。

- Rear-riser turns and slow flight
后组转弯与低速飞行
- 90-degree braked turns with braked flares
90 度带刹车转弯和从刹车状态开始拉平
- Toggle and rear-riser stalls and recovery
刹车失速、后组失速及失速的改出
- Flight cycle and how to prevent one
飞行循环及其预防方法
- Harness turns and flare turns
背带转弯以及在拉平的过程中改变方向
- Low-turn recovery with braked flares
低转改出和从刹车状态开始拉平

Landing Exercises – (Practice in a Canopy Course)**着陆练习——（在伞控课程中练习）**

- Reliable stand-up landings in no wind and crosswind.
在无风与侧风条件下连续稳定地站降。
- Reliable stand-up landings within 30 feet of a target in different wind conditions.
在不同风况下，在着陆目标 30 英尺范围内连续稳定站降。
- Full-glide landing approach.
在全速飞行状态下着陆进近。
- Flare turns on final (no more than 45 degrees).
在最后进近阶段，在拉平的过程中改变方向（角度不超过 45 度）。

Other Considerations Before Downsizing

降落伞之前的其它考虑事项

Have you been jumping your current canopy recently or have you had a layoff? Do you feel you have mastered your parachute? Do you feel confident landing off? If you have any doubt, make 50 to 100 more jumps on your current canopy before downsizing. There is no penalty for waiting!

你最近是否经常使用当前所用的降落伞，还是已经停跳了一段时间？你是否认为自己已经完全掌握了当前所用降落伞的操纵？对于场外着陆，你是否有信心？如果有任何疑虑，建议你在降落伞前，用当前的降落伞再跳 50 至 100 跳。等待没有任何坏处！

Considerations *When Changing or Downsizing Canopies*

使用不同设计的降落伞或更小面积的降落伞的过程中的考虑事项

You have your new-to-you canopy and are ready to make your first jump. Items to consider when learning about your new canopy include:

在你拿到以前没用过的降落伞，准备进行首次跳伞时，需要考虑以下事项：

- Inspect used canopy for wear
检查二手降落伞的磨损情况
- Are steering lines the correct length?
刹车线长度是否正确？
- Does the canopy require a staged or a continuous flare?
该降落伞需要分阶段拉平还是连续拉平？
- Read the owner's manual.
阅读用户手册
- Flight characteristics and landing techniques will be different. Plan on dedicating several hop-and-pops to learning about your canopy and practicing canopy-flight emergency procedures (CEPs).
降落伞的飞行特性和着陆技巧会有所不同。建议安排几次净空开伞（即开即跳，Hop and Pop）来专门熟悉你的降落伞，并练习降落伞飞行紧急程序（CEP）。

In-Air Exercises – Perform Above 2,000 Feet

空中练习——在 2000 英尺以上高度执行

First Jump:

第一跳：

- Find stall point with toggles.
操纵刹车寻找失速点
- If stall point is above a full flare, focus on practice flares to find stall point to avoid a stall on landing
如果失速点在完全拉平之前，则集中精力练习拉平，找到失速点，以避免在着陆时发生失速

Subsequent Jumps:

后续的跳伞：

- Find the sweet spot for the best flare
找到“甜点”以达到最佳拉平效果
- Maximum glide/minimum descent
探索最优滑翔性能/最慢下降速率
- Canopy-flight emergency procedures
降落伞飞行紧急程序
 - Rear-Riser Turns
后组转弯
 - 90-Degree Braked Turns
90 度带刹车转弯

- Half-Braked Flares
从半刹车位置开始拉平
- Turn Reversals—Max Rate of Turn
最大速率反向转弯
- Low-Turn Recovery
低转改出

Landing Exercises

着陆练习

- Full-glide landing pattern and approach
全速飞行状态下的着陆航线和进近
- Braked pattern and full-glide final approach
带刹车飞着陆航线，并在最后进近（第三边）恢复全速飞行
- Accuracy practice
练习精准着陆

Considerations After Changing or Downsizing for Long-Term Proficiency

使用不同设计的降落伞或更小面积的降落伞之后的考虑事项以及长期熟练度的培养

Staying proficient on your canopy is your best defense against injury when forced to deal with a canopy-flight emergency. You should practice the following five canopy-flight emergency procedures at least once a month on hop-and-pop or high-pull jumps so you can use them quickly and correctly when needed. **Stay alive, practice five!**

熟练掌握当前所用降落伞是应对降落伞飞行紧急情况 and 避免受伤的最佳预防手段。你应当每月至少通过一次净空开伞（即开即跳，Hop and Pop）或高开来练习下列五项降落伞飞行紧急程序，以确保在有需要时能快速准确地执行这些程序。**练五项，保周全！**

1. Rear-Riser Turns
后组转弯
2. 90-Degree Braked Turns
90 度带刹车转弯
3. Half-Braked Flares
从半刹车位置开始拉平
4. Turn Reversals—Max Rate of Turn
最大速率反向转弯
5. Low-Turn Recovery
低转改出



Practicing canopy-flight emergency procedures (CEPs) is just as important as practicing malfunction emergency procedures, and you should practice them regularly. Maintain traffic, altitude, and position awareness under canopy while practicing so a simulated emergency does not turn into a real emergency.

练习降落伞飞行紧急程序（CEP）与练习降落伞故障紧急程序同样重要，应定期进行练习。在降落伞飞行过程中练习这些程序时中需保持对交通、高度和位置的感知意识，避免模拟的紧急情况发展成真实的紧急情况。

The **USPA Downsizing Best Practices** printable checklist is available at uspa.org/downsize or with this QR code. It includes all the information discussed in this section and provides a valuable guide for S&TAs, canopy coaches and jumpers themselves to prepare for and assess readiness to downsize or change canopy designs.

USPA 降落伞最佳做法清单可在 uspa.org/downsize 找到或通过扫描二维码获取。它涵盖了本节讨论的所有要点，为安全和培训顾问、伞控教练及跳伞者自身提供了重要指引，用以评估是否已准备好使用不同设计的降落伞或更小面积的降落伞。

High-Performance Maneuvers

高性能机动

High-performance maneuvers occur when jumpers use control manipulation during descent and on the final landing approach to induce speeds greater than stabilized full flight, i.e., their natural speed and glide angle. This activity is commonly known as **swooping**. These types of landings are demanding and unforgiving and require careful supervision, practice, and planning.

高性能机动是指跳伞者在降落伞下降阶段和最终着陆进近阶段通过操纵来诱导降落伞的速度超过其稳定的全速飞行的速度，即超越降落伞在自然状态下的飞行速度与下滑角度。此类机动通常被称为**拉飘**。这类着陆方式对技术要求极高且容错率极低，必须有周密的监督、充分的练习和详细的规划。

A jumper's experience, canopy size and canopy design determine which **techniques** might be considered conservative or high performance. Canopy-flight characteristics and control become more challenging as field elevation, temperature, and humidity increase. For safety, jumpers should receive specialized information and training to fly canopies at wing loadings approaching 1.5 pounds per square foot and beyond or canopies approaching 120 square feet or smaller. The decision to progress to high-performance canopy maneuvers and parachutes should include **focused canopy coaching** and continued consultation with a canopy coach to help the jumper assess readiness and skill level. Neglecting to undertake such training greatly increases the canopy pilot's risk of serious injury or death. Most successful high-performance canopy pilots have practiced extensively and taken multiple canopy courses with larger canopies before experimenting with higher wing loadings and high-performance maneuvers.

跳伞者的经验水平、降落伞的面积及设计共同决定了哪些伞控**技术**是保守的还是在高性能范畴内。随着场地海拔、气温及湿度的上升，降落伞的飞行特性与控制难度都会变得更加棘手。为安全起见，当翼载接近 1.5（磅/平方英尺）及以上或降落伞面积接近 120 平方英尺及以下时，跳伞者必须接受专门的信息和培训。决定进阶至高性能伞控动作和高性能伞前，应接受**专门的伞控培训**，并持续咨询伞控教练以评估自身的准备程度和技能水平。忽视此类培训将极大增加跳伞者的重伤或死亡风险。绝大多数成功掌握高性能伞控技能的跳伞者都经过了大量练习，并在尝试更高的翼载与高性能的机动前，使用较大面积的降落伞完成过多次伞控课程。

High-Performance Landing Areas

高性能着陆区域

Jumpers must perform high-performance landings using strategies to avoid collisions with other jumpers who are on a standard approach and be prepared to abort a high-performance landing maneuver if traffic exists. According to the **USPA Group Member Pledge**, drop zones must establish landing procedures that will include separation of high-performance and normal landing areas; such separation may be by location or time. Jumpers can achieve separation from others in the following ways:

进行高性能着陆时，跳伞者必须采取策略避免与进行标准进近的其他跳伞者发生碰撞，并准备好在存在交通风险的情况下中止高性能着陆。根据 **USPA 团体会员（跳伞基地）的承诺**，跳伞基地必须制定着陆程序，将高性能着陆与常规着陆区域划分开来，这可以通过空间或时间的间隔来实现。跳伞者可通过以下方式来与他人保持安全间距：

1. **Make a high-pull jump:** Canopy pilots must consider other high-opening jumpers (students, tandems, and others) and look for traffic during the descent.

高开：跳伞者需注意其他开伞高度较高的跳伞者（学生、双人伞等），并在下降过程中持续观察交通。

2. **Perform a hop-and-pop:** Canopy pilots exiting on a lower pass must fly to the holding area to clear the airspace for jumpers going to full altitude.

净空开伞（即跳即开，Hop and Pop）：在低高度出舱批次出舱的跳伞者必须飞往等待区，为爬升至全高度出舱的跳伞者预留净空的空域。

3. **Use a separate landing area:** High-performance and standard landing procedures should be prominently displayed and communicated to all jumpers.

使用独立的着陆区域：应向全体跳伞者清晰展示并传达高性能着陆程序与标准着陆程序。

You must never attempt a high-performance landing with a **turn of more than 90 degrees** when other jumpers are landing using a standard landing pattern in the same area.

当有其他跳伞者在相同区域按标准着陆航线飞行时，严禁进行**转弯角度超过 90 度**的高性能着陆。

Canopy pilots should be completely familiar with all techniques and characteristics of advanced landings in a variety of weather conditions and using a variety of approaches before landing in the vicinity of any hazard, including water, as well as before attempting flight into a competition-style course.

跳伞者应全面掌握各类天气条件下进行高阶着陆的技术，并且要在充分熟悉各种进近方式之后，才能在危险障碍物（如水域）附近的区域尝试着陆，或尝试按比赛风格的航线来飞行。

D. B-License Canopy Proficiency Card

B 执照伞控熟练程度记录卡

To get the most from the topics presented in this outline, a jumper should have completed all the exercises listed under "Canopy" in SIM Chapter 1, Categories A-H of the ISP, and hold a USPA A license. Jumpers who complete a course of instruction covering the topics listed here, including evaluation jumps and continued practice, should be better prepared to make choices regarding parachute size, design and maneuvers.

为高效掌握本大纲所列的主题内容，跳伞者应已完成跳伞者信息手册第一章综合学生计划 A 单元至 H 单元中“伞控”部分的所有练习，并已持有 USPA A 执照。完成本课程所列内容（包括评估跳和持续的练习）的跳伞者应有更充分的准备，以在降落伞面积、涉及及机动技术方面做出选择。

Instructor or Course Director Qualifications

教练或课程主管的资质要求

USPA does not issue instructional ratings specifically for canopy coaching. Ideally, those who intend to teach a canopy-piloting course should hold a USPA Instructor rating; however, in some situations the person most qualified to teach this material may not hold any USPA instructional ratings but may have extensive knowledge about canopy control and landings. Regardless, for **USPA B-License requirements**, an S&TA must approve the instructor or course director and sign the **B-License Canopy Proficiency Card** once the jumper completes the course.

USPA 未专门针对伞控教学设置教学评级。理想情况下，教授伞控课程的人员应持有 USPA 教练评级；但在某些情况下，对本节内容进行教学的最佳人选可能虽不持有任何 USPA 教学评级，却可能掌握大量关于伞控和着陆知识。无论何种情况，为满足 **USPA B 执照的要求**，安全和培训顾问必须核准教练或课程主管的资质，并在跳伞者完成课程后签署 **B 执照伞控熟练程度记录卡**。

Instructors who intend to teach this material must realistically assess their level of knowledge regarding canopy flight and instruction. Before teaching this course, instructors must work through the outlined canopy skills using a variety of canopy designs and wing loadings. Attending any one of several commercially available canopy-flight schools as a student is highly recommended before teaching this course.

拟教授本课程的伞控教练需客观评估自身在降落伞飞行及教学方面的专业水平。授课前，伞控教练应使用多种设计的降落伞在不同翼载条件下完成大纲所列的伞控技能。强烈建议在开始执教该课程前以学生的角色参加任一商业伞控学校的课程。

B-License Requirements

B 执照要求

Every USPA B-License Application, paper or online, must also include a completed, verified B-License Canopy Proficiency Card. The B-license canopy training requires a **minimum of five training jumps** that may be completed in a structured course with all jumps completed in succession or individually, working one-on-one with an approved canopy coach. Some skills may require more than one jump to gain proficiency. The instructor or course director responsible for supervision, training and evaluation of the jump must sign each of the training jumps listed on the B-License Canopy Proficiency Card. A current S&TA, Examiner, or board member must verify the completed card to confirm that the

candidate has satisfactorily completed the training.

每份 USPA B 执照申请，无论是纸质版还是在线版，都必须包含一份填写完整且经核验的 B 执照伞控熟练程度记录卡。B 执照伞控培训要求至少完成 5 次训练跳伞，这些训练跳伞可以在一个结构化的课程中一次性连续跳完，也可以分开跳，但必须与一名经批准的伞控教练一对一进行。某些技能可能需要多次跳伞才能提升熟练度。负责对跳伞进行监督、培训和评估的教练或课程主管必须在 B 执照伞控熟练程度记录卡上签字确认每次训练跳伞的完成情况。最后，必须由现任的安全和培训顾问、考官或董事会成员核验填写完整的记录卡，以确认申请人已通过培训。

Evaluation

评估

The course director or instructor will evaluate each candidate's participation, understanding, and demonstrated ability during the ground school and training jumps. The instructor or course director will debrief each skill, approach and landing. Attendees should be better able to self-assess their canopy aptitude and proficiency during future practice based on their experience with the supervised training maneuvers. The course director should sign and date the entries on the B-License Canopy Proficiency Card as jumpers successfully complete the required skills.

课程主管或伞控教练将评估每位参与者在地面课程和训练跳伞中的参与度、理解力和能力表现。伞控教练或课程主管将对每项技能、进近和着陆的表现进行跳后汇报总结。在这些受到监督的伞控训练经验的基础上，课程参与者应能在未来的练习中更好地自我评估伞控能力和熟练程度。在跳伞者成功完成规定技能后，课程主管应在 B 执照伞控熟练程度记录卡上签名并注明日期。

B-License Canopy Ground School Outline

B 执照地面课程大纲

Part 1: Equipment

第一部分：装备

A. Equipment choice considerations

装备的选择和注意事项

Studies of USPA's serious-injury and fatality summaries reveal that jumpers under canopies popularly considered "average sized" or "conservatively loaded" frequently mishandle them in non-routine landing situations.

对 USPA 关于重伤和死亡案例的总结的研究揭示，在使用普遍认为的“平均面积”或“保守翼载”的降落伞的情况下，在非常规着陆情形中，跳伞者经常会出现失误。

Jumpers should:

跳伞者应：

1. select equipment based on their goals and abilities, understanding that smaller canopies offer some advantages but also pose greater risks.
根据自身目标与能力选择装备，且需知悉，较小面积的降落伞虽有某些优点，但风险更高。
2. should follow the guidance of the **Downsizing Best Practices** form to assess skill and readiness to change canopies.
应按照**降落伞最佳做法清单**的指引评估技能水平以及评估是否已做好更换降落伞的准备。
3. seek out reliable information and advice before changing to smaller canopies.
在改用较小面积的降落伞前，先寻求可靠的信息与专业建议。

The sport of skydiving includes a series of specialized activities that require exclusive equipment, for example:

跳伞运动包含一系列需要专用装备的特定活动，例如：

- classic accuracy
经典的着陆精准度跳伞
- canopy formation
降落伞编队
- wingsuit flying

翼装

- camera flying

跳伞摄影

- high-performance landings
高性能着陆
- competition canopy piloting
伞控比赛

All jumpers should set goals in the sport, choose the best equipment to meet their needs, learn how to use that equipment, and skydive within the limits of their equipment and capabilities.

所有跳伞者都应该设定其跳伞运动的目标，选择最适合需求的装备，学习如何使用那些装备，并在装备的限制范围和自身能力范围内跳伞。

B. Basic aerodynamics

基本空气动力学

- Lift

升力

- Air passing over an airfoil creates a force called lift.
指空气流过翼面产生的一种被称为升力的力。
- Lift is always perpendicular to the velocity.
升力总是垂直于速度方向。
- A ram-air parachute is trimmed nose-down by cutting the A lines shorter and each group behind them a little longer.
冲压空气式降落伞是调成伞翼前缘朝下的，前面的 A 组伞绳被做短，后面的每组伞绳（B、C、D 组）的长度则稍长。

- Drag

空气阻力

- The resistance created by air as an object moves is called drag.
物体运动时空气产生的阻力称为空气阻力。
- Drag is always parallel to the velocity.
空气阻力方向始终与速度方向平行。
- The lines, pilot chute, slider, jumper's body, and even the surface of the canopy itself produce drag (parasitic drag).
伞绳，引导伞，滑块布，跳伞者的身体，甚至降落伞本身的表面都会产生阻力（寄生阻力）。

- Gravity

重力

- Gravity is a constant in the equation of forces acting on the jumper and canopy.
在跳伞者和降落伞的受力方程中，重力是一个常量。
- Using the force created by gravity, the airfoil deflects the air to make the canopy glide.
利用重力产生的力，伞翼使空气偏转，以使降落伞滑翔。

- Momentum (force)

动量（力）

- Mass: Doubling the mass of a moving object gives it twice as much energy.
质量：运动物体的质量和动能呈正比例关系。
- Speed
速度
 - The term "speed" refers to the magnitude of velocity.
“速度”在本手册中指速度的大小（译者注：即速度的绝对值）。

- Energy increases as the square of the speed. (Doubling the speed produces four times the energy. Tripling the speed produces nine times the energy.)
动能与速度的平方呈正比例关系。(运动物体的速度如果变为原来的 2 倍, 则它的动能是原来的 4 倍; 运动物体的速度如果变为原来的 3 倍, 则它的动能是原来的 9 倍)
- Inertia: The term "inertia" means that an object in motion will stay in motion until resisted.
“惯性”指的是, 运动中的物体在受到其他力之前, 将一直保持运动状态。

C. Wing loading

翼载

Wing loading is the jumper's exit weight divided by the area of the parachute canopy, expressed in the U.S. in pounds per square foot. The higher the wing loading, the faster and higher performance the canopy will be. However, even if the wing loading is the same between two otherwise identical parachutes, the size of the canopies affects the performance characteristics. A 150-square-foot parachute at a one-pound-per-square-foot wing loading will have a steeper glide ratio, faster turns, and be more high performance than a 190-square-foot parachute at the same wing loading. This means that, **regardless of the wing loading, all small canopies (150 square feet or less) are high performance.**

翼载等于跳伞者的出舱重量除以降落伞伞布的面积, 在美国以磅/平方英尺为单位。翼载越高, 降落伞就飞得越快、性能越高。然而, 两个翼载和其他特征相同但面积不同的降落伞也会有不同的性能特征。一个面积为 150 平方英尺、翼载为 1 (磅/平方英尺) 的降落伞, 比起面积为 190 平方英尺、翼载相同的降落伞, 下滑角度会更陡, 转弯更快, 性能更高。**这意味着, 无论翼载如何, 所有小伞 (面积小于或等于 150 平方英尺) 都属于高性能伞。**

- Smaller canopies with shorter lines will respond differently than larger canopies of the same design and equal wing loading.
在相同翼载下, 小尺寸降落伞的较短的伞绳将导致其操作响应特性与相同设计的大尺寸降落伞不同
- Compared to a canopy with longer lines, a shorter-lined canopy will have quicker turns, quicker flare response, and quicker pendulum action (quicker to dive after an early flare).
与伞绳较长的降落伞相比, 伞绳较短的降落伞会转向更快, 拉平的响应更快, 伞会更快地把人甩起来 (在过早拉平后更快开始俯冲)
- Lighter jumpers will remain on larger parachutes at lower wing loadings for a longer period of time.
体重较轻的跳伞者将在较大尺寸的降落伞和较低翼载的阶段呆较长时间。
- Most jumpers can get a lot more performance from their canopies without needing to increase their wing loading with a downsize.
大多数跳伞者可在无需降伞的情况下从现用的降落伞上获得更多的性能表现。

D. Performance-enhancing designs

提升性能的降落伞设计

- Tapered shape (planform)
两端渐缩的形状 (翼面形状)
 - more dimensional stability (less distortion)
结构更稳定 (伞翼变形更小)
 - faster forward speed due to decreased drag
因空气阻力较低, 伞的前进速度更快
 - faster turns and less flight stability
更快的转向和较低的飞行稳定性
- High aspect ratio
高展弦比
 - flat glide
平坦的下滑轨迹

- easier flare
更容易拉平
 - lighter toggle pressure
拉平所用的刹车力量更轻
 - shorter toggle stroke (some models)
拉平所需的刹车行程更短 (某些型号)
 - quicker flare response
更快的拉平响应
- Higher rib frequency to reduce billowing between ribs
增加伞肋的数量以减少伞肋之间的气涌
 - seven-cell vs. nine-cell
七孔伞和九孔伞的对比
 - cross bracing
交叉支撑
- Thickness (after inflation)
伞的厚度 (充气后)
 - thicker: slow speed, more predictable and gentler stall
厚伞: 速度较慢, 失速更容易预测且更温和
 - thinner: faster speed, more abrupt stalls at a higher speed
薄伞: 速度较快, 高速飞行时的失速很突然

E. Drag reduction

减小空气阻力

- Zero-porosity fabric
ZP 伞布布料
(译者注: ZP—即 Zero-P 或 Zero Porosity 的缩写, Porosity 指织物的孔隙率。)
- Small-diameter lines
直径较细的伞绳
- Collapsible pilot chute
可缩引导伞
- Collapsible slider:
可缩滑块布
 - cloth or metal links with covers
带盖的布制或金属制连接器 (译者注: 此设计仅出现于早期降落伞, 现在的可缩滑块布已无此类连接器)
 - larger vs. smaller slider grommets
较大的和较小的滑块布孔环的对比
- Risers
组提带
- Outerwear
外部着装
- Removable deployment systems
可拆下的开伞系统 (RDS)
- Body position
身体姿势

F. Controls: toggles and beyond**降落伞的控制：刹车以及更多方式**

- Brakes
刹车
 - toggle types for ease of handling
便于手握的刹车类型
 - steering-line length to allow front-riser maneuvers (toggles in hand)
刹车线长度合适，以便进行前组机动（刹车保持在手中）
- Front risers and control-enhancement discussion (loops, blocks, etc.)
关于前组提带和操纵辅助（俯冲环或俯冲把手等）的讨论
- Back risers and how they work
后组提带及其工作原理
- Front risers and how they work
前组提带及其工作原理
- Harness turns
背带转向

G. Accessories**附件**

- Jumpsuit (reinforced butt and knees)
连体服（跳伞服）（臀部和膝盖部分加强）
- Hard helmet
硬质头盔
- Gloves, pros and cons
手套（使用手套有好处也有坏处）
- Altimeter
高度表
 - altimeter use under canopy
开伞后高度表的使用
 - digital vs. analog
电子高度表（电子信号）和机械高度表（模拟信号）的对比
- Weights
配重

H. Speed**速度**

- The pilot perceives the forward speed more than the downward speed, so a faster canopy can seem a lot scarier to fly.
跳伞者对前进速度的感知大于对下降速度的感知，所以一个更快的降落伞飞起来会显得更可怕。
- The faster the canopy goes, the more effect adding drag (by using a control) will have on the flight path.
降落伞飞得越快，阻力的增加（通过对降落伞的操控）对飞行路径的影响越大。

I. Glide**滑翔**

- Skydiving canopies: approximately 2.5:1 in natural flight
跳伞用的降落伞：自然飞行状态下的滑翔比约为 2.5: 1
- Changing the glide

改变下滑轨迹

- using brakes or rear risers
使用刹车或后组
- using induced speed to temporarily add lift
诱导降落伞加速以临时增加升力

Part 2: Maintenance

第二部分：维护

A. Environment

环境

- Dirt degrades fabric, lines, and slider.
污垢会使布料、伞绳和滑块布降解
- Ultraviolet degrades nylon.
紫外线会使尼龙材料降解。
 - sunlight
阳光
 - fluorescent lighting (50% of the strength of sunlight)
荧光灯（日光强度的 50%）
- Water distorts reinforcement tapes.
水会使加固带变形

B. Collapsible pilot chute and slider

可缩引导伞和可缩滑块布

- Wear results from friction as the line moves through its channel.
线绳在其通道内移动时的摩擦会造成磨损。
- Pilot chute centerlines shrink with use.
引导伞中线（Kill Line）会随着使用而收缩。

C. Suspension lines

伞绳

- Spectra can't stretch, and it shrinks with a lot of use.
Spectra 材质的伞绳难以拉伸，且随着使用易发生明显收缩。
- Vectran is stable in both directions but abrades.
Vectran 材质的伞绳不易伸展或收缩，但是易磨损。
- HMA is stable but can break when it still looks new.
HMA 材质的伞绳是稳定的，但在成色看起来还很新的时候也会断掉。
- Dacron stretches on opening, is stable and durable, but larger.
Dacron 材质的伞绳在开伞时会拉伸，稳定耐用，但直径粗。

D. Brake lines

刹车线

- Wear

磨损

- Shrinkage

收缩

- Dangers of a broken line
刹车线断裂的危险

- upon flaring
在拉平时
- of landing a smaller canopy using risers
使用组提带操作小尺寸降落伞进行着陆时

E. Packing

叠伞

- On-heading opening
开伞过程中伞的朝向保持稳定
- Even risers
整齐对称的组提带
- Symmetrical bag
对称的 D 包
- Line-stow placement and tension
伞绳妥善绑紧和放置
- 24 inches of unstowed line to allow the bag to lift out of the burble over the jumpers back
留出 24 英寸（61 厘米）的伞绳余量不绑，以便 D 包飞出跳伞者背部的尾流区

F. Equipment inspection

装备检查

- Pre-jump
跳前
- During packing (various times throughout the course)
叠伞期间（叠伞过程的不同阶段多次检查）

Part 3: Breakoff, Opening, Separation, and Canopy Traffic

第三部分：分离、开伞、分开间隔、降落伞交通

A. Breakoff

分离

- Breakoff altitude should allow enough time to open clear of others and handle both routine and abnormal circumstances.
分离高度应合适，留足时间与其他跳伞者分开距离开伞，并处理常规和异常情况。
- Tracking review
复习 Tracking
 - conserving altitude during turning and tracking
转向和 Tracking 时节省高度
 - body position and flat-track technique
身体姿势和平 Track 的技巧
 - opening when clear at the optimum altitude
与其他跳伞者分开足够距离后在最佳高度开伞
- Flying through and managing the opening
开伞过程中的控制
 - shoulders level (use this time to look at the horizon)
双肩水平（利用这段时间看向地平线）
 - allow legs to move forward during opening, like sitting in a chair, keeping hips level to avoid harness inputs during opening.
开伞时，允许双腿前移，类似坐姿，保持臀部水平以避免开伞过程中背带受力不均，从而影响降落伞表现

- knees-up position helps to stop the swing going to the hips and absorbs the shock in the event of a hard opening.
提膝姿势有助于抑制摆动传导至臀部，并在降落伞发生爆开时可起到缓冲作用
- If turning occurs during opening, use the harness to stop the turn.
若开伞过程中出现转向，通过调整身体在背带中的姿势来抑制转向
- Keep your head looking forward at the horizon to avoid accidental harness input during the opening.
保持头部向前看向地平线，防止开伞过程中意外导致背带受力不均，从而影响降落伞表现
- Have your hands on your rear risers as soon as they are available immediately after deployment to steer for collision avoidance, even if you believe you have jumped alone.
开伞后立即用双手操纵后组，随时准备转向避让他人，即便你很确信周围无其他人
- Look forward for any jumpers opening nearby who may be coming toward you. Be prepared to turn right, unless you obviously need to turn left, with rear risers to avoid a collision.

目视前方，观察是否有跳伞者在附近开伞并飞向你，做好右转准备（除非明显需要左转），通过后组操作避免碰撞

- Once confirming that you're clear of other jumpers, continue using the rear risers with the brakes set (if responding correctly) to orient toward the drop zone or holding area prior to releasing brakes and completing the canopy-controllability check. Dealing with a standard problem is more difficult as canopy performance increases.

确认周围空域没有其他跳伞者后，继续用后组操纵（保持刹车在未释放状态，如果降落伞响应正常），让降落伞朝向跳伞基地或等待区，然后释放刹车，完成降落伞可控性检查。降落伞性能越高，处理标准故障的难度会越大。

- Discuss the following from the perspective of higher-performance canopies:
从高性能伞的角度讨论以下内容：

- line twists
线缠绕
- premature brake release
刹车意外过早释放
- locked brake(s)
刹车锁死
- slider/brake system fouling
滑块布和刹车系统缠绕
- Spinning under a smaller canopy results in rapid altitude loss.
Check altitude and if above the 1,000-foot cutaway hard deck, **don't delay, cut away!**
小尺寸伞螺旋下降会导致高度的快速损失。要检查高度，如果在 1000 英尺切伞硬甲板高度以上，**切勿拖延，立即切伞！**



B. Traffic

交通

- As canopies fly faster, jumpers must pay better attention to other canopy traffic on descent.
降落伞飞得越快，跳伞者在下降时要越注意其他降落伞
- Altitude management
高度管理
 - use of brakes to stay aloft
使用刹车以减少高度损失
 - relative wing loading
自己相对于其他人的翼载
 - self-assessment
自我评估

- knowing the wing loading of others
了解其他人的翼载
- placement in the aircraft
飞机上的位置安排
- a dive plan, such as stacked approaches, to promote vertical separation under canopy
降落伞飞行计划，如分层进近，以便拉开降落伞间的垂直间隔
- Awareness of others
注意其他跳伞者
 - Know or judge others' canopies, wing loading, and habits.
了解或判断他人所用的降落伞、翼载和飞行习惯
 - Fly the landing pattern or land elsewhere.
要么按照着陆航线飞行，要么在其他地方着陆
 - Fly a straight final approach avoiding S-turns.
最后进近（第三边）要直线飞行，避免 S 形转弯。
 - Dealing with others' errors:
如何应对他人的失误：
 - In the event of a traffic issue, discuss the problem with the canopy pilots who were involved.
如果交通出现问题，应与涉事方进行讨论
 - canopy wake turbulence, which is behind and above the canopy in flight (yours and others')
降落伞的后上方的尾流湍流（自己的和其他人的）
 - only need to miss by a little—no low turns necessary
避让他人只需要稍微避开，而不必要低转
- Off-wind landings (technique)
非逆风着陆（技巧）
 - crosswind
侧风
 - downwind
顺风
- Landing away from the crowd
远离拥挤区域着陆
 - less pressure; room to practice
压力小；有练习的空间
 - familiarity and consistency with using the same landing area every time
每次使用相同的着陆区域，更容易提高熟悉度和连贯性
- Situations that pop up:
遇到突发情况：
 - Crowded landing area: Follow someone you trust closely and let them know you're there.
拥挤的着陆区域：紧跟你信任的人，让他们知道你在那里
 - Cutaways disrupt the plan for a normal main-canopy descent and landing
切伞会扰乱正常情况下用主伞进行的下降和着陆计划
 - Landing accidents on the ground can lead to confusion and chaos.
地面上的着陆事故会导致混乱和困惑

Having your hands on your rear risers immediately after opening has two important purposes:

开伞后立即将手放在后组上有两个重要目的：

- It keeps your body in line with the canopy so you can turn with the canopy if it is turning.
使你的身体与降落伞对齐，如果降落伞转向，你能随之转向。
- It prepares you for immediate action if you are close to another canopy.
如果离其他降落伞很近，你能准备好立即行动。

USING BRAKES TO STAY ALOFT: Think of brakes as a vertical-braking tool, not only a forward-movement braking tool. Brakes affect vertical speed by a greater margin than horizontal speed. Anytime you do not like the traffic or anything else happening during the flight, add brakes to buy time and vertical distance from other jumpers who may create a conflict.

使用刹车减慢下降：将刹车视为垂直方向上的制动工具，而不仅是前进方向的制动工具。刹车对垂直速度的影响大于对水平速度的影响。飞行中任何时候如果你觉得交通状况或其他情况不佳，可以增加刹车量以争取时间，并与其他可能产生冲突的跳伞者拉开垂直距离。

○ Off-field landing

场外着陆

- Plan and follow a sensible pattern.
规划并遵循合理的航线。
- Keep your eyes open.
睁大眼睛注意观察
- Follow the landing priorities and perform a PLF.
遵循着陆优先事项，执行 PLF

B-License Canopy Proficiency Card Exercises**B 执照伞控熟练程度记录卡的练习内容****A. Flight Plan**

飞行计划

The course director should assist the class with an aircraft, canopy flight, and landing plan prior to each jump included in the course. The plan should include an individualized progression plan for each student according to experience and goals. The plan should consider wind conditions, DZ layout and target areas, traffic management to keep clear of other jumpers not participating, and landing separation between canopy students. The course director should videotape landings for debriefing. The first jump in the course should follow the presentation and discussion of the ground-school topics.

课程主管应在本课程所含的每次跳伞前协助制定飞机、降落伞飞行及着陆计划。该计划需根据每位课程学生的经验和目标制定个性化的学习进度方案，并综合考虑风况条件、跳伞基地布局与着陆目标区域、避开非课程参与者的交通管理，以及课程学生间的着陆间距。课程主管应录制着陆视频用于跳后汇报总结。课程的首跳须在地面课程的讲解与讨论完成后实施。

B. Canopy Skill Practice Jumps

伞控技能训练跳伞

JUMP 1—BRAKED TURNS, ACCURACY, AND FLARE EVALUATION**第一跳——带刹车转弯，精准着陆，以及拉平的评估****Classroom Briefing**

课堂简报

- Discuss collapsing slider and loosening chest strap
讨论收缩滑块布和松胸带
- Inspecting the canopy's steering lines while in full flight with the brakes released.
在全速飞行且刹车已释放状态下检查降落伞的刹车线
 - steering lines on most canopies should bow slightly behind the back of the canopy
大多数降落伞的刹车线会略微弯曲，处在伞布后方
 - check with the manufacturer for recommendations for adjustments
咨询制造商以获取调整刹车线的建议
 - steering lines should have enough slack so that the jumper can pull the front risers with the toggles in hand and still not deflect the tail of the canopy.
刹车线应保留足够松弛度，以让跳伞者在手握刹车线同时能拉动前组提带，且不会导致伞尾偏折
 - A parachute rigger should adjust the length of the steering lines, if necessary, before the next jump.
如有必要，降落伞装备师应在下次跳伞前调整刹车线长度
- Reasons for flying in brakes
带刹车飞行的原因
 - vertical separation from canopy traffic
与其他降落伞保持垂直间距
 - slow forward speed and descent rate to conserve altitude

降低前进速度和下降速度以减慢高度损失

- returning from a long spot
长距离返回
- flat turn as a **Canopy-Flight Emergency Procedure** at low altitudes
在低高度执行平转（降落伞飞行紧急程序的其中一项）

● Avoid stalling the canopy.

避免降落伞失速

- effect of brakes on glide
刹车对滑翔性能的影响
- slower forward speed
前进速度减慢
- lower descent rate
下降速度降低

● Change in glide angle:

下滑角度的改变:

- Experiment to determine the change in glide path at different degrees of braked flight.
尝试不同刹车量对下滑轨迹的影响。
- Most modern nine-cell canopies fly flatter when a slight amount of brakes are applied.
大多数现代的九孔降落伞在轻微带刹车飞行时飞行轨迹更平缓。

● Methods for initiating braked turns

启动带刹车转弯的方法:

- Pull both toggles to the quarter-braked position (ears).
将两侧刹车拉到四分之一位置（耳部高度）。
- Pull one toggle down to turn.
下拉单侧刹车来转向。
- Pull both toggles to half-braked position (mid chest).
将两侧刹车拉到半刹车位（胸部中间高度）。
- Pull one toggle down slightly to initiate a turn in the same direction.
轻微下拉单侧刹车以向同方向转弯。

● Flaring Techniques

拉平技巧

- On final approach in natural flight, your body is below the center of the canopy.
最后进近阶段，降落伞以自然状态飞行，你的身体位于降落伞中心下方。
- During initial flare using toggles or rear risers, the canopy rocks slightly behind the jumper, raising the nose in relation to the tail and temporarily increasing lift.
使用刹车或后组拉平的初始阶段，降落伞会略微相对后退跳伞者后方，使伞前缘相对于伞后缘抬起，暂时增加升力。
- Gradually pulling the toggles farther down adds drag on the tail, keeping the canopy at the correct angle and providing the most lift for the remainder of the flare.
逐渐继续下拉刹车会使伞后缘产生更大空气阻力，使降落伞保持正确角度，并在剩余的拉平阶段提供最大升力。
- The most effective flare technique varies by canopy type.
最有效的拉平技巧因降落伞类型而异。
- Practice an effective flaring technique, focusing on a smooth finish.
练习有效的拉平技术，专注于平稳顺畅地拉平到底。
 - Make a straight-in approach facing into the wind, with minimal input for the last 10 seconds before the landing flare.
逆风沿直线进近，在着陆拉平前的最后 10 秒对降落伞的操作要尽量少。

- Focus on flying your canopy as long as possible before allowing your feet to touch the ground and finish the flare completely even after your feet first touch the ground.

在触地前专注于尽可能延长降落伞的滑翔时间，即使在双脚触地后，也要继续完成拉平。

- Finish the flare and hold hands down for a few steps after touch down.
- 完成拉平，触地后保持双手下拉并走几步。

Under Canopy

开伞后

- Collapse slider and loosen chest strap.
收缩滑块布和松胸带
- Inspect the canopy's steering lines while in full flight, with the brakes released.
在全速飞行状态下检查降落伞的刹车线，刹车处于已释放状态。
- Practice flare technique based on the canopy type.
练习适合所用降落伞类型的拉平技巧。
- Braked turns
带刹车转弯
 - Practice braked turns using all the methods discussed.
使用所有讨论过的方法练习带刹车转弯。
- Pattern and landing
着陆航线和着陆
 - Choose a target for landing. A safe, soft landing from a straight-in approach is the priority regardless of accuracy.
选择一个着陆目标。无论精准度如何，都要优先确保直线进近并安全温和地着陆。
 - Perform a straight-in approach in full flight, with minimal input for the last 10 seconds before starting your normal flare technique.
在全速飞行状态下沿直线进近，在着陆拉平前的最后 10 秒对降落伞的操作要尽量少。

TWO COMMON FLARE TECHNIQUES FOR DIFFERENT CANOPIES

适用于不同降落伞的两种常见拉平技术

The Continuous Flare is one smooth motion that should take about the same time that it takes to count slowly to five. You may count slower or faster depending on wind conditions or your sight picture. Regardless of the speed of your flare, you should time it to be smooth and consistent overall, responding to how your canopy is performing.

连续拉平：是一个流畅的动作，花费的时间大约是缓慢数到五的时间。你可以根据风况或视觉画面调整计数的速度。无论拉平的速度如何，你都应确保动作整体流畅一致，并根据降落伞的表现进行调整。

Two-Stage Flare: The first stage is flaring to the sweet spot, where you pause during the flare stroke. Flare with the stroke rate and depth that causes the canopy to remain flying flat for as long as possible. In the second stage, time the stroke rate to finish the flare just before touching down.

两阶段拉平：第一阶段拉平至“甜点”然后暂停，这一阶段拉平的速度和深度应能使降落伞尽可能长时间保持水平飞行。在第二阶段，调整拉平速度，在触地前刚好完成拉平动作。

JUMP 2— FLIGHT CYCLE AND CROSSWIND LANDINGS

第二跳——飞行循环和侧风着陆

Classroom Briefing

课堂简报

- Flight Cycle
飞行循环
 - A flight cycle occurs after any input as the canopy responds and then returns to stabilized full flight.
飞行循环指降落伞对任何操作输入作出响应然后恢复稳定全速飞行的过程。
 - More drastic input equals a bigger flight cycle or surge, where the canopy picks up speed and is moving faster than when in full flight.
操作输入越猛，飞行循环的剧烈程度或前冲幅度就越大，此时降落伞会加速，运动速度会超过全速飞行状态。
 - While turning or flaring your parachute, your body's location in relation to the canopy changes, creating a flight cycle.
当进行转弯或拉平操作时，身体相对于降落伞的位置会发生变化，引发飞行循环。

- In a turn, momentum swings your body out from under the canopy.
转弯时，动量会把身体甩离降落伞下方。
- During the flight cycle, your body begins to swing back under the canopy.
在飞行循环中，身体会开始荡回到降落伞下方。
- Recovery from a flight cycle should take 4 to 8 seconds, depending on the canopy.
从飞行循环中恢复的时间通常为 4 至 8 秒，具体视降落伞型号而有所不同。
- Prevent a flight cycle by raising the toggles slowly, preventing the nose from pitching forward, surging and picking up speed.
通过缓慢上松刹车可避免飞行循环，防止降落伞前缘前倾并前冲加速。
- Flaring from a braked position
从带刹车状态开始拉平
- Expect a different glide on a braked final approach.
要有心理预期，带刹车进行最后进近时，降落伞的下滑轨迹会有所不同。
- Expect a shorter and quicker stroke needed for an effective flare.
预计需要更短促有力的动作才能有效地执行拉平。
- Prepare for a PLF due to potentially harder landing.
由于着陆冲击可能更大，需做好 PLF 准备。

● Crosswind landings

侧风着陆

- Fly a landing pattern that allows for a crosswind final approach and landing.
采用允许在侧风状态下进行最后进近和着陆的着陆航线。
- For training and familiarization, perform the crosswind landing only in winds up to 5 miles per hour.
在培训和熟悉阶段，仅限在风速不超 5 英里/小时的情况下进行侧风着陆。
- All jumpers on the same pass must use the same landing pattern to promote a smooth flow of traffic.
同一批次出舱的所有跳伞者必须采用相同的着陆航线，以确保交通顺畅。
- On final approach, focus on crosswind correction necessary to prevent crabbing.
在最后进近阶段，注意对侧风的影响进行必要的修正，以防“蟹行”。
- A crosswind landing may require pulling the upwind toggle deeper than the downwind toggle to keep going in the same direction and reduce the ground speed upon landing. Performing an uneven flare in this manner increases the stall speed of the canopy. A PLF is recommended for any unusual landing.
侧风着陆时，上风侧刹车的下拉幅度可能要大于下风侧刹车，以保持方向稳定并降低触地时的地速。此类非对称的拉平操作会增大降落伞的失速速度，任何非常规着陆都建议执行 PLF。

Under Canopy

开伞后

- Flight Cycle—Do all flight-cycle exercises above your decision altitude.
飞行循环——所有飞行循环练习须在决断高度以上进行。
 - Flare the canopy to three-quarter brakes and hold for 5 seconds. Let the toggles up quickly to induce the flight cycle.
拉平至四分之三刹车位置并保持 5 秒。然后快速上松刹车以触发飞行循环。
 - Repeat the exercise and count the number of seconds to recover to full flight.
重复练习，注意恢复至全速飞行所需的秒数。
 - Repeat the exercise but slowly raise the toggles over 3 to 4 seconds to prevent the flight cycle.
再次练习，但这次用 3 至 4 秒的时间缓慢上松刹车，以避免触发飞行循环。
- Braked Flares
从刹车状态开始拉平
 - Practice flaring several times from the quarter and half-braked positions, focusing on an effective flare from

each position.

练习从四分之一刹车位置开始拉平以及从半刹车位置开始拉平，分别练习多次，重点掌握从不同刹车位置开始有效拉平的技巧。

● Crosswind landing

侧风着陆

- Choose a target for landing and execute a crosswind-oriented downwind, base, and final approach.

选择一个着陆目标，使用可在侧风状态下着陆的三边航线。

JUMP 3—STALLS

第三跳——失速

Classroom Briefing

课堂简报

● Stalls

- A stall is an aerodynamic event where a wing loses its ability to produce lift. When a ram-air parachute stalls, it will lose lift and pressurization and will no longer support the weight of the jumper. For this reason, perform stalls carefully and always above decision altitude.

失速是指降落伞丧失产生升力的能力的空气动力现象。当冲压空气式降落伞失速时，伞内的充气压力随之消失，伞布将无法继续承载跳伞者的重量。因此，所有失速练习都应在决断高度以上进行。

- A stall can occur as the result of either too much or too abrupt input with the toggles or the rear risers. Applying too much input is associated with a slow-speed stall, where the canopy loses airspeed and will eventually stall. Applying input too abruptly is associated with a higher-speed stall, where the stall will occur more suddenly and at a higher airspeed.

无论是使用刹车还是后组，操作幅度过大或动作过猛都会导致失速。过大的操作量会引发低速失速——降落伞的空速逐渐降低直至失速；而过猛的操作则会引发高速失速——失速会在较高空速的情况下突然发生。

● Toggle stalls

- Intentionally stalling with toggles begins with straight-and-level flight. Slowly pull the toggles down to full arm extension until you feel the stall onset, a feeling like rocking back in a chair and falling backward.

在刻意进行刹车失速练习前，需确保降落伞处于直线飞行状态，伞翼水平。缓慢下拉刹车至手臂完全伸展，直至感受到失速征兆（类似椅子后仰时的后坠感）。

- The ideal stall point using toggles is down at full arm extension, with the stall occurring after holding the toggles there for 5 to 6 seconds. The exact toggle position will differ from canopy to canopy and from jumper to jumper based on the length of the steering lines.

理想情况下，刹车失速的失速点是手臂完全下拉至最低点的位置，保持该位置 5 至 6 秒后，失速就会发生。但实际具体的刹车失速点会因降落伞型号以及跳伞者个体差异（主要是刹车线的长度）而有所不同。

- You must find the stall point on any canopy that you are jumping for the first time. If the steering lines were adjusted for a person with shorter arms, you may be able to stall the canopy at something less than full arm extension, which risks a stall close to the ground during a normal landing flare.

第一次用任何降落伞时，都必须确认其失速点。如果刹车线的长度此前是为手臂较短的人调整的，可能你在手臂未完全下拉时就会触发失速，这将使得常规的着陆拉平阶段存在失速的风险。

- Once you feel the onset of the stall, you can hold the toggles and allow the stall to fully develop. The air will leave the canopy, it will fold into the shape of a bow tie, and you will begin descending at a high rate of speed. When you feel the stall onset, you can keep the brake position, the stall state will further develop, the air inside the canopy is exhausted, the canopy will present a bow tie shape, and you will enter a high-speed descent state.

- Use the same procedure whether recovering from the onset of a stall or a fully developed stall: slowly raise the toggles back up to a position where the canopy inflates and returns to normal flight.

无论是刚进入失速状态还是已经完全失速，改出失速的程序都是一样的：缓慢向上松刹车，直至伞布重新充气并恢复正常飞行。

- Avoid raising the toggles too quickly to recover, which can cause the canopy to surge, dive, or spin into line twists. A forward surge can be severe enough that the jumper gets tangled in the suspension lines, and some line twists can be severe and unrecoverable. Practice stalls carefully and always above your decision altitude. 切忌过快地松刹车，否则可能导致降落伞前冲、俯冲或旋转并引发线缠绕。剧烈的前冲可能使跳伞者被伞绳缠绕，此外某些线缠绕的情况可能会很严重以至无法恢复。务必在决断高度以上小心地练习失速。

● Rear-riser stalls

后组失速

- The same concepts and guidelines as stalling with toggles apply to rear-riser stalls, but rear-riser stalls change the shape of the parachute by affecting the C and D lines (the back half of your canopy). 后组失速的概念和操作指引与刹车失速类似，但后组失速是通过影响 C 组和 D 组伞绳来改变伞布形状（伞布的后半部分）。
- When stalling using rear risers, the stroke is only 5–6 inches as compared to the long control stroke when stalling with toggles. The shorter stroke makes it more difficult to gently approach the stall point and easier to over-control the rear risers, potentially stalling your parachute accidentally. 后组仅需下拉 5 至 6 英寸（13 至 15 厘米）即可导致失速，相比之下，刹车失速的操作行程较长。导致失速所需的后组下拉幅度较短，这使得降落伞难以温和地进入失速。意外的失速很容易因为过度操纵后组而发生。
- Rear-riser stalls commence more suddenly than toggle stalls but recovering from them is easier and smoother. 后组失速的发生比刹车失速更突然，但改出后组失速较为容易和平稳。
- Once you feel the stall's onset, hold the risers and let it fully develop. The back of the parachute will distort, taking the shape of a hot dog bun. 一旦感觉到失速征兆，继续保持后组位置，让失速完全发展。伞布后部会发生变形，呈现“热狗面包”的形状。
- Slowly let your rear risers up to recover from the stall. 缓慢松开后组以从失速中改出。

● High-speed stalls

高速失速

- Stalls can occur at higher airspeeds, such as when the canopy is in a turn or a dive. 失速可能在较高空速的情况下发生，例如在降落伞处于转弯或俯冲状态时。
- At higher airspeeds, adding too much input with risers or toggles or adding input too abruptly can cause the canopy to stall. These high-speed stalls will happen quickly and less predictably than the low-speed stalls, making them much more dangerous. You should avoid doing them intentionally. 在较高的空速下，过猛地或过量地操作组提带或刹车可能导致降落伞失速。这类高速失速的发生比低速失速更为迅速且难以预测，因此危险性更高。应避免故意进行此类操作。
- The best way to avoid high-speed stalls is to understand the limits of your canopy when flying at higher airspeeds. Practice the input limits of your canopy above your decision altitude. 避免高速失速的最佳方法是了解降落伞在较高空速下的操作极限。探索降落伞操作极限的练习必须在决断高度以上进行。

Under Canopy

开伞后

● Stall-practice procedure—perform above decision altitude

失速练习的程序——所有练习须在决断高度以上进行

- Stall using toggles

刹车失速

- Gently apply brakes to a point where forward flight diminishes and the canopy begins to sink. 轻柔下拉刹车至降落伞前进停滞、开始下沉的位置。
- Hold the brakes down until the canopy is shaped like a bow tie. 保持刹车下拉，直至伞布呈领结状。

- Slowly raise the toggles 4 to 6 inches at a time until resuming forward flight.
缓慢逐步上松刹车，以 4 至 6 英寸（10 至 15 厘米）为步进量，直至恢复向前飞行。
- Stall using rear risers
后组失速
 - Grab high on the riser with full arm extension, keeping toggles in your hands.
手臂完全上伸，握住组提带的高位，同时保持手握刹车。
 - Slowly pull down the rear risers several inches until forward flight stops.
缓慢下拉后组数英寸，直至降落伞停止前进。
 - After adding more riser input, the canopy will eventually sink and begin to descend in a backward direction, taking the shape of a hot dog bun.
继续增加下拉幅度后，降落伞最终会下沉，呈“热狗面包”状，向后倒退下降。
 - Let the risers up slowly to recover to forward flight.
缓慢上松组提带，以恢复向前飞行。
- Three-quarter-braked turns
四分之三刹车转弯
 - Pull both toggles to the three-quarter-braked position (hip bones).
将双侧刹车拉至四分之三位置（股骨处）。
 - Let one toggle up slightly to initiate a turn in the opposite direction.
略微松一侧刹车，以向对侧转弯。
- Choose a target for landing and execute a downwind, base, and final approach into the wind.
选择一个着陆目标，按三边航线飞行，逆风着陆。

JUMP 4— REAR-RISER TURNS AND FLARES

第四跳——后组转弯和拉平

Classroom Briefing

课堂简报

- Rear-riser turns and flares
后组转弯与拉平
 - On opening, using rear risers is the quickest way to turn the parachute.
开伞后，操纵后组是让降落伞最快转向的方式。
 - You can use rear-riser turns to turn toward your holding area right after opening or quickly turn away from another jumper to avoid a collision.
开伞后可通过后组转弯让降落伞快速朝向等待区，或迅速避开其他跳伞者以防碰撞。
 - Steer with rear risers for flatter turns to conserve altitude.
后组操控可实现更平缓的转向以减小高度损失。
 - Pull down one to two inches, smoothly and symmetrically, with both rear risers to flatten the glide when flying in a crosswind or headwind.
侧风或逆风飞行时，对称且平稳地将两侧后组下拉 1 至 2 英寸（2.5 至 5 厘米）可使下滑轨迹角度更平。
 - Practice with your rear risers to avoid over-controlling (using too great of an input).
需通过练习掌握后组的操作量，避免过度的操作输入。
 - Landing using rear risers instead of toggles requires practice to avoid stalling close to the ground.
使用后组（而非刹车）来着陆必须经过专门的练习，以防在近地面高度失速。

Under Canopy

开伞后

- Rear-riser turns with brakes stowed:
后组转弯（刹车在未释放状态）：

- Grab high on the riser with full arm extension.
手臂完全上伸，握住组提带的高位。
- Initiate alternating 90-degree turns using rear risers.
使用后组进行不同方向的 90 度转弯。
- Rear-riser turns with brakes unstowed, keeping toggles in your hands:
后组转弯（刹车已释放，保持手握刹车）：
 - Grab high on the riser with full arm extension.
手臂完全上伸，握住组提带的高位。
 - Initiate alternating 90-degree turns using rear risers.
使用后组进行不同方向的 90 度转弯。
- Rear-riser flares with brakes unstowed, keeping toggles in your hands:
后组拉平（刹车已释放，保持手握刹车）：
 - Practice rear-riser flares without stalling the canopy.
练习后组拉平，要避免降落伞失速。
 - Fly the canopy descent using rear risers.
降落伞下降过程中，使用后组操纵。
 - Choose a target for landing and execute the turns onto the downwind, base, and final legs with the rear risers.
选择一个着陆目标，转向下风边（第一边）、基线边（第二边）及最后进近（第三边）的转弯用后组来完成。
 - Take your hands off the rear risers by 150 feet AGL and land into the wind using your toggles.
在离地 150 英尺时松开后组，使用刹车逆风着陆。

JUMP 5—LONG SPOT

第五跳——长距离

Classroom Briefing

课堂简报

- Return from a long spot by projecting the landing point.
从长距离返回，运用预计着陆点的技巧
 - Discover how to locate the point on the ground that a parachute in full flight will reach.
探索如何确定降落伞在全速飞行时预计到达地面的位置
- Alter the glide using brakes and rear risers.
通过操纵刹车和后组以改变下滑轨迹
 - Use brakes with a tailwind.
在顺风情况下，利用刹车
 - Use rear risers with a crosswind or headwind.
在侧风或逆风情况下，利用后组
 - Minimize drag.
尽量减小空气阻力
 - Collapse the slider.
收缩好滑块布
 - Pull legs up, arms in, and arch to reduce air resistance.
向后上方提腿、向内收臂、身体呈弓形以减少空气阻力（译者注：伞控教练可能教授不同的降落伞飞行的减阻身体姿势。）
 - Loosen the chest strap to improve glide.
松开胸带以改善降落伞的滑翔性能
 - If holding brakes, reduce fatigue by hooking your thumbs in the harness. (Be careful not to hook onto your cutaway or reserve handles.)
如果要一直拉着刹车，可以用拇指钩住背带来减少疲劳。（注意不要钩住切伞把手或备伞把手）

- Decide on a new landing area by 2,000 feet.
在 2000 英尺以上确定是否降落到新的着陆区域。
- Choose an alternate landing area if necessary and follow off-field landing recommendations.
如有必要，选择备降场，并遵循关于场外着陆的建议。
- Allow enough altitude to fly a pattern.
为着陆航线留出足够的高度。
- Expect the winds to weaken as you get lower.
做好预期，高度降低时，风也会减弱。

Under Canopy

开伞后

- Exit the aircraft at 5,000 feet AGL at least 1.5 miles upwind of the main landing area.
出舱高度应为离地 5000 英尺，出舱点至少在主着陆区域的上风区 1.5 英里处。
- Determine the glide path of the canopy and the landing point using the projected landing point. Determine the point on the ground that is neither rising nor sinking in your field of vision.
利用预计着陆点确定降落伞的下滑轨迹和着陆点，即确定视野中，地面上的既不上移也不下移的点。
- Alter the glide and compare effectiveness:
改变降落伞的滑翔性能，并对比不同方法的改变效率
 - using brakes
使用刹车
 - using rear risers
使用后组提带
- If you cannot reach the intended landing area in time to start a pattern at the planned altitude, choose an alternate by 2,000 feet AGL.
如果无法及时飞到预定着陆区域以在预定高度开始飞着陆航线，则应在 2000 英尺以上选择备降场。
- Choose a target for landing, and execute a downwind, base, and final-approach leg for landing, following the landing priorities.
选择一个着陆目标，执行三边航线，着陆时遵循着陆优先事项。

5-10 涉及大范围水平移动的自由落体 Movement Jumps

A. Introduction and Definition

简介和定义

Movement jumps include but are not limited to tracking and angle-flying jumps. These recommendations provide guidance for a non-wingsuit jump on which a skydiver or group intends to move horizontally off the line of flight during freefall.

“涉及大范围水平移动的自由落体”包括但不限于 Tracking 和 Angle。本节的建议旨在为那些计划在自由落体阶段在水平方向上飞离飞机的飞行路线的非翼装的跳伞者或跳伞团体提供指引。

(译者注：为表述便利，本节下文简称“此类跳伞”)

B. Qualifications

资格

Before engaging in movement jumps outside of the Integrated Student Program, a **participating skydiver** (not a leader) should hold a USPA A license and demonstrate proficiency at tracking while maintaining situational awareness.

在综合学生计划的范畴外，进行此类跳伞之前，**参与者**（非领队）应持有 USPA A 执照，并能够展示熟练的 Tracking 技能，且在 Tracking 过程中能保持态势感知意识。

Before engaging in movement jumps as the **leader**, the skydiver should have:

在进行此类跳伞之前，团体的**领队**应满足以下资格条件：

- At a minimum, qualified for the USPA C License.
至少持有 USPA C 执照
- The ability to maintain consistent awareness of altitude and location
能够在跳伞过程中始终保持高度和位置意识
- Proficiency and experience in the discipline
在此类跳伞中有熟练的技能和丰富的经验
- Received formal instruction on:
已在以下方面得到过正式的指导：
 - DZ terrain (changing ground levels, bodies of water or any other ground obstacles) and alternate landing areas (outs)
跳伞基地降落区地形（高度起伏、水域或其他地面障碍物），以及备降场地（场外着陆）
 - exit order
出舱顺序
 - navigation (ability to move in the correct direction and deploy where planned)
导航（能朝正确的方向飞行，能在计划位置开伞）
 - communication with drop zone authorities, other jumpers and the pilot (to determine jump run and spot)
如何与跳伞基地管理者、其他跳伞者，以及飞行员进行沟通（以确定跳伞航线和出舱点位）
 - understanding weather (including reading a winds-aloft forecast, and maintaining awareness of clouds prior to jumping)
对天气的了解（包括如何阅读高空风况预报，并在跳伞前保持对云层的关注）
 - Making a flight plan (including exit order, breakoff and designated deployment area) and adjusting that flight plan as necessary to accommodate changing conditions to avoid other groups
制定飞行计划（包括出舱顺序、分离、指定开伞区域），以及根据需要调整飞行计划以适应情况的变化，从而避开其他组别的跳伞团体。

Jumpers can use the graph below to determine their skill levels:

跳伞者可通过下表来确定自己的技能水平处于哪个级别：

	BEGINNER 初级水平	INTERMEDIATE 中级水平	ADVANCED 高级水平
Group Size 编队人数规模	1-3	4-7	8+
Angle of Jump 角度	Flat 俯仰角较平	Shallow 有一定程度的俯仰角	Steep 俯仰角很大
Transitions 动作状态转换次数	0	1-3	4+
Relativity 与团体中其他成员的 相对位置	Can fly in a quadrant, oriented head down (on both back and belly) 能在编队里自己所属的象限中 飞行，姿态可做到头向下（腹 朝地和背朝地的姿态下）	Can fly in quadrant or on level, oriented head down (on belly and back), manage speed and pitch 能在编队里自己所属的象限中 飞行或平齐飞行，头向下（腹 朝地和背朝地姿态下），且能够 控制好速度和俯仰角	Ability to maintain slot and stability in any orientation and matching speed and pitch 能够在各种飞行姿态下准确保 持自己应处的相对位置和稳定 性，并且能让自己的速度和俯 仰角和其他人匹配
Breakoff 分离	Fan out, choose a clear path and airspace 能分散开，选择畅通的路线和 空域	Can accelerate, choose a clear path and airspace to flatten out 能加速，选择畅通的路线和空 域以改平飞行角度	Can accelerate, choose a clear path and airspace to flatten out, while mitigating congestion 能加速，选择畅通的路线和空 域以改平飞行角度，与此同时 减缓拥挤程度
Wind Conditions at Altitude 高空风况	Calm 静风	Calm-Mild 静风至中等风速	Calm-Extreme 静风至极端风况
Wind Speeds and Weather 风速和天气	No-to-light ground winds 地面无风或有微风	Medium ground winds 中等地面风速	High ground winds, wind shear between uppers and canopy winds, clouds, emerging weather 地面风速大，高空风和降落伞 飞行阶段的风况存在切变，有 云，有气象变化迹象

(译者注：1. 表中所提的“象限”，即 Quadrant，是团体编队飞行时使用的术语，编队飞行时，一般把团体沿气流方向分成四个部分（例如，对于腹飞编队，在垂直方向上把水平面切成四块，对于 Tracking 编队，在垂直于飞行方向的平面上切成四块），团体中的每个成员应处于自己该处于的其中一个区域。)

(译者注：2. 表中所提的“平齐”，即 On Level，指编队各成员的前端对齐，处于一个平面内，该平面相对于地面有一定的倾斜角度，但不垂直于地面。)

C. Equipment

装备

Properly secure your gear to prevent premature deployment of either canopy. A premature opening at the speeds involved in this type of skydiving could result in severe injury to the body or stress to the equipment beyond limits set by the manufacturers. Deployment systems and operation handles should remain secure during inverted and stand-up flight. Therefore, equipment for movement jumps should include either a throw-out pilot chute with a bottom-of-

container-mounted pouch, or a pull-out pilot chute. Exposed leg-strap-mounted pilot chutes present an extreme hazard. Also, any exposed pilot-chute bridle presents a hazard. Use a tuck-tab to provide additional security for the pilot chute. Maintain and properly size your closing loops and ensure your pin-protection flaps and riser covers are in good shape. 为防止主伞或备伞意外提前开伞, 装备需稳固。在此类跳伞中, 高速飞行时意外过早开伞可能会导致重伤, 或使装备承受超出制造商指定的极限应力。开伞系统及操作把手在各种姿态下必须保持稳固。因此, 进行此类跳伞时, 装备应配置有安装在伞包底部的抛出式引导伞收纳袋或拉出式引导伞。外露的安装在腿带上的引导伞是危险的, 任何外露的引导伞系带都会造成危险。应使用 Tuck Tab 为引导伞提供额外保护。需定期维护并选用尺寸合适的关包绳, 并确保关包针挡盖与组提带挡盖状态完好。

(译者注: Tuck Tab 和 Tuck Flap 一般指降落伞某些部件上的附加延伸部分, 用途为将某些东西固定住, 一般通过塞入收纳处来固定所需固定的东西, 这里的 Tuck Tab 指引导伞把手上的额外片状部分, 可减小引导伞松动并意外飞出的可能性。)

Connect leg straps with a bungee to keep the leg straps from moving toward your knees. Tightly stow excess leg and chest strap material. USPA recommends participants use an **AAD and an RSL with a MARD** due to the high potential for collisions and loss of altitude awareness associated with movement jumps.

建议用弹性绳连接两个腿带, 防止腿带向膝盖滑动。还需将腿带和胸带的富余长度稳稳地收束住。USPA 建议参与者使用 **AAD 以及配备 MARD 的 RSL**, 因为进行此类跳伞时, 跳伞者发生碰撞并丢失高度意识的可能性很大。

Personal accessories for movement jumps should include:

参与此类跳伞的跳伞者应配备以下个人附件:

- audible altimeter (two are recommended)
声音高度表 (建议配备两个)
- visual altimeter
目视读数的高度表
- hard helmet
硬质头盔
- clothing or jumpsuit that will remain in place during movement flights and will not obscure or obstruct deployment, emergency handles or altimeters
衣服或连体服 (跳伞服) 应能在跳伞过程中保持原位, 不会影响或阻碍开伞、切伞和备伞把手, 以及高度表的使用
- GPS
GPS 导航设备

D. Training

培训

Movement flying has many things in common with belly-to-earth formation skydiving. A beginner will progress more quickly and safely with a coach. Novices should not jump with each other until they have received specific training in movement jumps and have demonstrated the ability to control navigation, pitch, and speed.

此类跳伞和腹飞团体编队有很多类似的地方。在科目教练的指引下, 新手可以更快、更安全地进步。新手们不应一起进行此类跳伞, 直至接受了此类跳伞的培训并能展示出导航、俯仰、速度方面的掌控能力。

Prior to jumping with larger groups, progress should follow the same model as for the freefall and canopy formation disciplines: Novices should begin with coached 2-way formations to develop breakoff skills and exit, body-position, pitch and speed control, and then gradually progress to larger and more complex movement jumps.

在参与较大团体规模的此类跳伞之前, 技能的提升进度应遵循和自由落体培训、降落伞编队培训一样的模式。新手应从由科目教练带领的两人编队开始, 提升出舱、身体姿态、俯仰、速度的控制力, 然后逐步过渡到更大的更复杂的团体编队。

E. Hazards Associated with Movement Jumps

此类跳伞的相关风险

Navigation is a critically important skill that entails plotting a route, maneuvering to follow that route, and adapting when conditions change. Jumpers must plan accordingly to:

导航是一项至关重要的技能，它包含路线的规划、如何沿规划路线飞行，以及在情况发生变化时进行适应性调整。跳伞者必须视情况做好相应规划：

- Move off the aircraft's line of flight
飞离飞机的飞行路线
- Consider other movement groups on the load
考虑同一架次的其他进行此类跳伞的团体编队
- Avoid other groups in freefall and under canopy
避开其他自由落体团体，以及避开其他开伞后的团体
- Open where they've pre-determined
在预定位置开伞
- Account for the DZ terrain
将跳伞基地降落区的地形因素考虑在内
- Have a backup plan for landing out
为场外着陆制定备用计划

Weather is important in the planning phase to determine navigation and exit order and to coordinate with other movement groups. Cloud conditions can change during freefall and canopy flight.

天气是计划制定阶段中很重要的考虑因素，它会影响导航、出舱顺序、与其他进行此类跳伞的团体的协调。在自由落体时和降落伞飞行时，云层情况可能发生变化。

Prior to boarding, it is of the utmost importance to **communicate** your intentions with the drop zone authorities (such as manifest, an S&TA or a load master) and the entire load in order to understand local drop zone restrictions and requirements for movement jumps, share your flight plan, and determine exit order. It is also important that everyone in the group understands the DZ terrain, hazards, and alternate landing areas.

登机前，务必与跳伞基地管理者（如跳伞名单登记处、安全和培训顾问或架次安排者）以及同一架次的其他跳伞者充分**沟通**，告知跳伞意图，以了解当地跳伞基地对此类跳伞的限制和要求、共享飞行计划并确定出舱顺序。此外，要让团体内的每个人都熟悉跳伞基地降落区地形、危险障碍物、备降场地，这一点也很重要。

Several factors—such as local DZ rules and terrain, weather and leader experience—influence how many movement groups may safely be on any one aircraft load. However, the general recommendation is to limit movement groups to two per load.

多个因素（例如跳伞基地规则、地形、天气、领队的经验水平）都会影响每个架次可以安全容纳的进行此类跳伞的团体的数量。一般情况下，建议是每架次有不超过 2 组进行此类跳伞的团体。

Exit order will depend on weather, freefall drift, DZ terrain, deployment altitudes, other groups, and DZ rules and considerations. The group leader must communicate with the S&TA, drop zone, pilot, and others on the load.

出舱顺序受到天气、自由落体漂移量、跳伞基地降落区的地形、开伞高度、其他团体、跳伞基地的规定和考虑事项的影响。领队必须与安全培训和培训顾问、跳伞基地人员、飞行员，以及同一架次上的其他跳伞者沟通出舱顺序。

Every jump plan should accommodate the **skill level** of the jumper with the least experience in order to execute the flight plan and open in the determined spot. Opening in the correct, predetermined spot is crucial for safety, so jumpers must be able to demonstrate proficiency on beginner-level movement jumps before progressing to intermediate or advanced jumps. Jumpers who are unable to follow intermediate or advanced movement jumps may cause their groups

to conflict with others on the load. Adding speed and pitch changes and transitions greatly increases the difficulty of the jump, requiring an expert leader to consider all the variables of the jump so as to avoid collisions, maintain the flight plan and open in the predetermined spot.

为了能正常执行飞行计划，并在预定点位开伞，每次规划此类跳伞时，都应照顾到团体内经验最少的跳伞者的技能水平。在正确的、预定的点位开伞对于安全至关重要，所以跳伞者在进行中级或高级水平的此类跳伞前，应先能熟练进行初级水平的此类跳伞。不能跟上中级或高级水平的此类跳伞机动的跳伞者可能会使其团体对同一架次上的其他跳伞者造成干扰。在此类跳伞的过程中，增加速度和俯仰改变的动作，以及动作的状态转换，会极大地增加难度。必须有一个专家级别的领队来考虑所有因素，以避免碰撞，遵守飞行计划，并在预定点位开伞。

Maintain visual contact with the leader so you can adapt if you are far behind, above, to the side of, or low relative to the group. Even if you are far away from the group, continue moving in the same direction to avoid collisions. Maintain the same heading as the rest of the group. Off-heading collisions are more dangerous than collisions between jumpers heading in the same direction. Never turn 180 degrees from the group's heading, even if you think there is no one behind you. If you have passed the group, slow down and let it catch up. If you are flying to the side of the group and the group starts turning toward you, turn toward the same heading, even if you are far away.

要让领队保持在自己的视野范围内，以在自己远远落后于团体，或者团体处于自己下方、侧方、上方时进行调整。为了避免碰撞，即使自己离团体很远，也应该与团体保持相同的移动方向。方向偏移后发生的碰撞的危险程度要远高于同向飞行时发生的碰撞。绝对不要 180 度背离团体的方向，即使你认为没有人在你后面。如果你超过了团体，要减速，让其他人跟上。如果你在团体的侧方飞行，而团体开始转向朝你飞行，你应该跟着一起转向，即使离团体的距离很远。

It is crucial to understand the elements of **breakoff** to avoid congestion and collisions. Choose a clear path and fan out from the other jumpers while flattening the pitch to a track. Maintain awareness by looking in all directions. If you are on your back at breakoff, avoid flipping to a belly-to-earth orientation until you are on a clear trajectory with no one above you. Once on your belly, continue to track off until it is time to clear airspace and pull.

务必深刻理解分离所涉及的要点，以避免拥挤和碰撞。分离时，选择一个畅通的路线，和团体内的其他跳伞者分散开来，同时改平飞行角度进行 Tracking。观察各个方向，保持交通意识。如果分离时处于背飞状态，在确保自己处于畅通的路线上且没有人在自己上方之前，应避免翻身至腹飞姿态。一旦转换至腹飞姿态，应继续进行 Tracking，直至确认净空并开伞的时候。

F. Pre-Flight Checklist

飞行前检查单

This pre-flight checklist can help you determine the specifics of your jump. Draw the flight plan on the map of your drop zone and share it with the drop zone staff, other jumpers on the load, and the pilot to confirm you can perform the skydive safely:

这个飞行前检查单可以帮助你确定跳伞的细节。你应该将自己的飞行计划画在跳伞基地的航图上，并与基地工作人员、同一架次的跳伞者，以及飞行员共享信息，以确认你可以安全地进行此次跳伞。

- ☐ What is jump run for your load?
你所在的架次的跳伞航线是怎样的？
- ☐ What are the forecasted winds aloft at these points during your jump?
在以下阶段，高空风况的预报是怎样的？
 - ☐ exit altitude
出舱高度
 - ☐ freefall
自由落体
 - ☐ under canopy
开伞后
 - ☐ in the landing pattern
在着陆航线上

- ☐ How many groups and other jumpers are on your load?
你所在的架次有多少组团体、多少其他跳伞者？
- ☐ What is your exit order?
你的出舱顺序是怎样的？
 - ☐ Are there any other movement jumps on your load?
是否有其他进行大范围水平移动的自由落体的跳伞者在同一架次上？
- ☐ What are the DZ terrain factors to consider in navigation?
在导航时，跳伞基地降落区是否有需要考虑的地形因素？
- ☐ What is the intended landing pattern and holding area for the jump?
该次跳伞拟采用的着陆航线和等待区是怎样的？
- ☐ Have you ensured that your flight path does not interfere with jump run?
你是否能确认你的飞行路线不会干扰到跳伞航线？
- ☐ Does your flight plan take into consideration freefall, DZ terrain, canopy flight path and weather?
你的飞行计划是否有将自由落体、跳伞基地降落区地形、降落伞飞行路线，以及天气因素考虑在内？
- ☐ Is your flight plan appropriate for the skill level of all the jumpers?
你的飞行计划是否匹配团体编队中的所有成员的技能水平？

5-11 高速自由落体 Speed Skydiving

A. Introduction

简介

These recommendations guide skydivers who are intentionally attempting to reach their highest terminal velocity in freefall. Although speed skydives incorporate both freeflying and angle-flying elements, the high vertical speeds present several unique considerations. The speeds achieved will vary dramatically based on skill and experience. Only a tiny minority of top competitors surpass 300 mph. Most beginners, especially those without extensive angle-flying and tunnel experience, will likely fly in the low-200-mph range. Jumpers can find competition rules in Chapter 15 of the USPA Skydiver's Competition Manual (SCM).

本节的建议适用于在自由落体过程中刻意尝试达到最高终端速度的跳伞者。尽管高速自由落体包含了自由飞和 Angle 机动的一些元素，但跳伞者所达到的很高的垂直下落速度会带来一些特别的考量因素。实际进行高速自由落体时所能达到的下落速度会因技能和经验水平的不同而有很大差别。仅有极少数的高手的下落速度能超过 300 英里/小时。大多数初学者，特别是没有大量 Angle 经验和风洞经验的初学者，一般其最高速度只能稍微超过 200 英里/小时。USPA 跳伞者比赛手册（SCM）的第 15 章可找到高速自由落体相关的比赛规则。

B. Qualifications

资格

Before engaging in speed skydives, a skydiver should hold a C license or higher, have made a **minimum of 200 jumps**, and exhibit consistent awareness of altitude and location over the ground.

在尝试进行高速自由落体前，参与者需要至少持有 C 执照或更高级别的执照，跳数在 200 跳以上，且展示出能够持续保持高度意识并清楚自己相对于地面的位置的能力。

- To avoid other groups, speed skydivers must make a **flight plan** that includes exit order, freefall, breakoff, and canopy flight path. Speed skydivers should have a qualified person inspect their gear and should consult a local S&TA or drop zone staff on:

为避免与其他团体相撞，高速自由落体跳伞者必须制定**计划**，包含出舱顺序、自由落体、分离及降落伞飞行路线等内容。

高速自由落体跳伞者应请有资质的人员检查装备，并向当地安全和培训顾问或跳伞基地工作人员咨询以下事项：

- the terrain and alternate landing areas around the drop zone
跳伞基地周边地形及备降场信息

- communication with drop zone authorities, other jumpers, and the pilot to determine jump run and spot
与跳伞基地管理者、其他跳伞者及飞行员协调，确认跳伞航线以及点位的选择
- Weather, including reading a winds-aloft forecast and maintaining awareness of clouds before jumping
天气情况，包括阅读高空风预报及跳前持续关注云层状况
- exit order
出舱顺序
- navigation plan determining the correct direction to move and deployment altitude and location
导航计划，以确定正确的移动方向、开伞高度和位置

C. Equipment

装备

Jumpers must adequately secure their gear to prevent premature deployment of the main or reserve parachutes. Because speeds can surpass the maximum deployment speeds of the FAA's Technical Standard Order (TSO) for gear, a premature opening could result in severe injury or death. Deployment systems and operation handles should remain secure during inverted flights. Therefore, equipment for speed skydives should include either a well-maintained bottom-of-container-mounted throw-out-pilot-chute pouch, or a pull-out pilot chute. Exposed leg-strap-mounted pilot chutes are hazardous. Any exposed pilot-chute bridle also presents a danger. Jumpers should use a tuck tab to provide additional security for the pilot chute. Closing loops, pin-protection flaps, and riser covers should be well-maintained and adequately sized. Jumpers must tightly stow excess leg and chest strap material. USPA recommends that **speed skydivers use an AAD** because of the high potential of losing altitude awareness.

跳伞者应采取足够措施确保其装备稳固，不发生意外过早开伞，无论是主伞还是备伞。因为在高速自由落体时，速度可能超过所用装备的技术标准规定认证的开伞速度，如果意外过早开伞，可能会导致重伤或死亡。倒飞时，开伞系统和操作把手必须保持稳固。因此，高速自由落体所用装备应配置有保养良好的安装在伞包底部的抛出式引导伞收纳袋或拉出式引导伞。外露的安装在腿带上的引导伞是危险的，任何外露的引导伞系带都会造成危险。跳伞者应使用 Tuck Tab 为引导伞提供额外保护。关包绳、关包针挡盖和组提带挡盖应维护良好、尺寸合适。跳伞者必须将腿带和胸带的富余长度部分收束好。USPA 建议 **高速自由落体跳伞者使用 AAD**，因为进行高速自由落体时，跳伞者丢失高度意识的可能性很大。

(译者注: Tuck Tab 和 Tuck Flap 一般指降落伞某些部件上的附加延伸部分，用途为将某些东西固定住，一般通过塞入收纳处来固定所需固定的东西，这里的 Tuck Tab 指引导伞把手上的额外片状部分，可减小引导伞松动并意外飞出的可能性。)

Personal accessories for speed skydiving should include:

进行高速自由落体时，应带有以下**个人附件**：

- Two audible altimeters, preferably including flashing visuals inside the helmet, since the wind noise on a speed skydive may drown out the audible beeps. Jumpers must increase the volume of all audible altimeters to maximum.
两个声音高度表，并推荐在头盔内配置彩色闪光视觉提醒装置，因为高速自由落体的强烈风噪可能会盖过声音高度计的声音。声音高度计的音量也必须调到最大。
- Visual altimeter
目视读数的高度表
- Hard helmet. If a jumper uses a full-face helmet, they must ensure that the visor stays shut during the jump, either through its design or by using additional constraints (e.g., tape). The jumper must have a plan in case vision becomes limited by lens fogging. If a jumper uses an open-face helmet, they must ensure that eye protection is secure.
硬质头盔。如果使用全盔，必须确保面镜在跳伞过程中盖好（通过面镜的自身设计，或者使用额外的约束手段，比如用胶布粘好）。同时需制定应对镜片起雾导致视野受限的预案。若使用半盔，则必须确保眼部防护可靠。
- Appropriate clothing. Most speed skydivers choose to fly with extremely tight clothing or a jumpsuit that helps cut down on drag. Consequently, jumpers need better body-flight skills to maintain control. A jumper's chosen attire should not obscure or obstruct deployment or emergency handles or altimeters.
合适的着装。大多数进行高速自由落体的跳伞者会选择使用非常贴身的衣物或者跳伞服，以减小风阻。因此，跳伞者需要有更优秀的身体技能水平才能保持受控。跳伞者的着装不得干扰或影响开伞把手、切伞和备伞把手，以及高度表的使用。

用。

- Speed measuring device (SMD). This device, mounted on the skydiver's body or equipment, records the real-time, three-dimensional position of the jumper.

测速装置（SMD）。该装置安装在跳伞者身上或者装备上，可以记录跳伞者的实时三维位置。

While jumpers may experiment and **modify equipment** as the discipline progresses, there are safety considerations. Jumpers can use aero-shaping—the process of aerodynamic shape optimization, i.e., changing the shape of equipment from its original factory design to a discipline-specific intent—during training or experimentation. Competition speed skydivers may use only standard skydiving equipment.

随着高速自由落体跳伞的发展，跳伞者可能会尝试**对装备进行改装**，但必须考虑安全因素。在训练或实验时，跳伞者可运用气动外形优化技术——即通过改变装备的出厂原始设计形态，使其适配特定跳伞类型的需求。但高速自由落体比赛选手仅允许使用标准跳伞装备。

Maximizing freefall performance for speed skydiving involves reducing drag force. Experimental processes to identify variables include but are not limited to fabricating equipment and bolt-on items using special materials and fabrics. Jumpers should use caution when making modifications to helmets, as a shape or weight change may result in severe torques to the neck and spine that could result in severe injury. Competitors may not wear a propulsion system or added weight. If a jumper wishes to train or experiment with such items, an experienced speed skydiver or S&TA should review them before use. Using a tandem rig for speed skydiving is not permitted in competition nor recommended in training. 提升高速自由落体性能的核心在于降低空气阻力。识别相关变量的实验过程包括但不限于采用特殊材料和面料制作装备及附件。改装头盔时需格外谨慎，其形状或重量的改变可能导致颈部与脊柱承受剧烈扭矩，造成严重伤害。跳伞比赛中禁止使用推进系统或额外配重。如果是出于训练或者实验目的，在使用这类装备之前，应有资深的高速自由落体专家或者安全和培训顾问对装备进行评估。高速自由落体比赛中严禁使用双人伞装备，培训中也不建议采用。

New speed skydivers, who may not yet have the skills necessary to fly at 200-plus mph in a skin-tight suit, should consider using a suit with some **drag**. Jumpers should use a conservative approach when decreasing drag in the speed discipline, relatable to upsizing a wingsuit or downsizing a canopy.

对于尚未有足够技能使用紧身着装以 200 英里/小时以上的速度进行高速自由落体的新手，建议使用具有一定**阻力**的着装。在高速自由落体领域采取减阻措施时，应采取审慎态度，其风险管控的逻辑类似于升级翼装尺寸或降伞时的决策原则。

D. Training

培训

Speed skydiving is a solo discipline, and participants primarily evaluate their performance by analyzing data from an SMD. Speed skydivers can also employ a coach to help analyze data and film their routines, since the analysis of body-flight performance is just as vital as the recorded data from an SMD. During a jump with a speed skydiver and coach, the jumpers must actively mitigate the risk of collisions at high speeds by closely matching speed and direction.

高速自由落体是一个单人跳伞类型，参与者主要靠分析测速装置的数据来评估表现。进行高速自由落体的跳伞者也可以雇佣高速自由落体教练来帮助分析数据和拍摄其跳伞过程，因为对自由落体时身体控制表现的分析和测速装置的数据一样重要。跳伞者和高速自由落体教练一起跳伞时，双方都必须通过精准匹配速度和运动方向来主动降低碰撞风险。

Speed skydiving requires similar skills and shares elements with freeflying and movement jumps. A beginner will progress faster and safer with a coach. **Novices** should not attempt speed skydiving until they have received training in some combination of tracking, angle flying, tunnel flying, and freeflying, and, if possible, demonstrate the ability to control navigation, body pitch, and speed. Angle flying includes many essential skills for novice speed flyers, such as body positions, freefall awareness and flight planning for freefall and under canopy. Once proficient with those skills, jumpers can begin with solo runs, prioritizing control rather than speed to develop exit, body position, heading control, pitch and speed control, and breakoff skills, then progress gradually to faster terminal velocities. Using a coach can maximize the

progression and understanding for jumpers new to speed skydiving.

高速自由落体跳伞所需的技能和涉及的元素与自由飞、涉及大范围水平移动的自由落体这两个跳伞类型有诸多共通之处。新手在高速自由落体教练的指导下可以更快更安全地进步。新手在尝试高速自由落体之前，须接受过 Tracking、Angle、风洞、自由飞其中几种的组合训练，如有可能，还应展示出在导航、身体俯仰及速度的方面的掌控能力。Angle 机动包含了高速自由落体新手所需的许多必备技能，例如身体姿态、自由落体意识、自由落体飞行规划和降落伞飞行规划。熟练掌握这些技能后，跳伞者可以在单人跳伞中开启高速自由落体之旅。跳伞者应该优先提升其自由落体控制能力，而不是优先提升速度。也就是说，要优先提升出舱、身体姿态控制、方向控制、俯仰控制、速度控制、分离等技能，然后再逐步提高终端速度。雇佣高速自由落体教练进行指导可以让新手高效提升技能并加深对高速自由落体的理解。

A speed skydiver's breakoff altitude should be no lower than 5,600 feet (1,707 meters) AGL. Competition rules do not include any measurements below the breakoff altitude. Higher breakoffs also ensure the performer has adequate time to slow down before deploying a parachute. The performance window is the scoring part of the speed jump, which starts at the exit. The end of the performance window is either 7,400 feet. (2,256 meters) below the exit or at breakoff altitude, whichever comes first.

高速自由落体跳伞者的分离高度应不低于离地 5600 英尺（1707 米）。在跳伞比赛中，任何在分离高度以下获得的数据是不计入成绩的。较高的分离高度可确保跳伞者在开伞前有足够时间减速。高速自由落体的评分窗口（即用于评分的自由落体阶段）的起点为出舱，终点为出舱高度以下 7400 英尺（2256 米）或者分离高度，以两者中较高者为窗口终点。

No one should attempt a speed run on a low-altitude pass, for example, a hop-and-pop.

任何人都不得在低高度出舱的批次中尝试高速自由落体，例如在进行“即跳即开”（Hop and Pop）时。

E. Hazards Associated with Speed Skydives

与高速自由落体相关的危险

Before boarding, speed skydivers must communicate their intentions with the drop zone manifest, an S&TA, or a load organizer, as well as the entire load.

在登机前，进行高速自由落体的跳伞者必须和跳伞名单登记处、安全和培训顾问、架次安排者，以及同架次的所有人沟通跳伞意图。

Exit order primarily depends on the speed the jumper consistently attains. Once a speed skydiver can demonstrate that they are consistently exceeding normal maximum freefly speeds (more than approximately 250 mph), they should exit first and turn away from jump run. Speed skydivers who exit after other jumpers create an extreme safety risk. A collision between a speed skydiver traveling at 300 mph and a solo belly jumper in a baggy suit will have a 200-mph closure rate. If more than one speed skydiver is on a load, exit order should be fastest out first, with consideration given to deployment altitudes and parachute type and size. Each jumper should take an opposite direction of flight (e.g., first person turns 90-degrees right off jump run, seconds turns 90-degrees left, and so on). When integrating with other disciplines, speed skydivers should be classified as a movement jump and should not be followed by another movement group.

出舱顺序主要取决于跳伞者能够稳定保持的速度。进行高速自由落体训练的跳伞者一旦展示出有能力持续以高于常规自由飞的速度飞行（即高于大约 250 英里/小时），就应该被允许第一个出舱，并飞离跳伞航线。高速自由落体跳伞者如果在其他跳伞者后面出舱，会导致极大的安全风险。如果一位以 300 英里/小时的速度进行高速自由落体的跳伞者撞上另一位穿着宽松衣物的进行单人腹飞的跳伞者，其相对碰撞速度可达 200 英里/小时。如果同架次有多位进行高速自由落体的跳伞者，则速度快的应该先出舱，还要将开伞高度、降落伞类型和尺寸等因素考虑在内。每位跳伞者应选择相反飞行方向（例如第一人向右 90 度飞离跳伞航线，第二人向左 90 度飞离跳伞航线，以此类推）。与其他跳伞类型综合考虑时，进行高速自由落体的跳伞者应被视为与“涉及大范围水平移动的自由落体”同属一类，不得安排其他涉及大范围水平移动的自由落体的跳伞者在其后面出舱。

After exit, the speed skydiver should move off the aircraft's line of flight yet remain on course. Maintaining **stability and orientation in freefall** is important.

出舱后高速自由落体跳伞者应飞离飞机的飞行路线，保持在预定路线上飞行。**在自由落体阶段保持姿态与方向的稳定很重要。**

Sinus problems and even sinonasal injury can result from uncompensated change in ambient pressures. During a speed dive, sinuses have less time to equalize than during a typical skydive. During a skydive, a jumper can equalize the pressure by swallowing, yawning, or tensing the muscles of the throat. In addition, jumpers can perform the Valsalva maneuver after landing by closing the mouth, pinching the nostrils closed and gently blowing air through the nose. Issues with sinuses can severely hinder spatial awareness and the ability to hear audible altimeters. To prevent issues in case of disorientation, speed skydivers should ensure their flight path does not converge with other groups. If disoriented, a speed skydiver should terminate their run.

如果未能得到及时调节适应环境压力的变化，可能导致鼻窦问题甚至受伤。比起常规跳伞，高速自由落体过程中，鼻窦压力的平衡时间较少。跳伞者可通过吞咽、打哈欠或绷紧喉部肌肉来调节压力，着陆后亦可做 Valsalva 动作（闭口，捏鼻，轻柔呼气）。鼻窦问题会严重削弱空间感知能力及听辨声音高度表的能力。为防止失去方向感时发生问题，高速自由落体跳伞者须确保飞行路径不与其他团体交汇。若出现方向迷失的情况，应立即终止高速自由落体。

Breaking off or pulling out of the dive at or above 5,600 feet. (1,707 meters) AGL is recommended. At 310 mph, a jumper travels at 450 feet per second. Slowing down to a safe deployment speed is critical and can be accomplished by transitioning out of the vertical flying orientation to a horizontal one. A jumper may experience a short-lived yet powerful deceleration up to 3.5 times the force of gravity. Speed skydivers should consider the resulting horizontal speed, as well as vertical speed, whether they are at the end of the performance or experiencing spatial disorientation.

建议在离地 5600 英尺（1707 米）或更高的高度进行**分离**或结束俯冲。在 310 英里/小时的速度下，跳伞者每秒可运动 450 英尺。减速至可以安全开伞的速度是非常关键的，可以通过从垂直姿态转换至水平姿态来减速。此过程可能承受短暂但高达 3.5 倍重力的过载。无论是结束高速自由落体时还是出现方向感迷失时，跳伞者都要考虑到姿态转换导致的水平速度的变化，垂直速度亦同。

A speed skydiver must slow their terminal velocity to deployment speeds. A parachute **deployment**, intentional or unintentional, while performing a speed skydive can result in severe injury or death. Speed skydivers should consider the time it will take to slow down and choose a deployment altitude a safe margin above the minimum deployment altitudes required by the BSRs.

高速自由落体跳伞者必须将终端速度降至可以安全开伞的范围。高速自由落体过程中如果**开伞**，无论是有意还是意外的，均可能导致重伤或死亡。须预留用于减速的时间，预定的开伞高度应有一定的安全裕度，高于基本安全要求规定的最低开伞高度。

Once **under canopy**, a speed skydiver must take great care to avoid other groups that might still be in freefall. Groups to avoid can include those that exit before or after the speed skydiver. After opening, a speed skydiver should continue flying their canopy along a course perpendicular to jump run to avoid flying underneath a group that might still be in freefall.

开伞后，高速自由落体跳伞者必须特别注意避开其他可能仍在自由落体过程中的跳伞团体，包括那些在高速自由落体跳伞者之前或者之后出舱的跳伞者。开伞后应保持垂直于跳伞航线的方向飞行，避免飞到可能仍在自由落体的跳伞者下方的空域。

第六章 跳伞表演和 PRO 评级

Exhibition Jumping and PRO Rating

One purpose of USPA is to promote successful demonstration jumps as part of an overall public relations program for the sport. These recommendations cover experience, ability and attitude, the Professional Exhibition (PRO) Rating, landing-area size, technical considerations, insurance, and how to complete the FAA authorization request form.

USPA 的组织目的之一是推动成功的跳伞表演，并以其作为该运动的公关计划的一部分。本章建议包括以下内容：经验、能力和态度、专业表演（PRO）评级、着陆区大小、技术考虑、保险，以及如何填写联邦航空局授权申请表。

Note: For all intentional off-airport jumps, USPA recommends submitting FAA Form 7711-2 with the local FSDO to obtain a certificate of authorization (FAR 105.21).

注意：对于所有计划在机场外进行的跳伞，USPA 建议向当地飞行标准办公室提交联邦航空局 7711-2 表格，以获取授权证书（联邦航空条例 105.21 规定）。

6-1 跳伞表演 Exhibition Jumping

Note: Requirements for obtaining demonstration jump insurance may differ from the recommendations listed in this section.

注：演示跳伞的保险要求可能与本节中列出的建议不同。

A. Definition

定义

An exhibition jump, also called a demonstration or display jump, is a jump at a location other than an existing drop zone done for the purpose of reward, remuneration, or promotion and principally for the benefit of spectators.

演示跳伞，也称为跳伞表演或示范跳伞，是指为了奖金、报酬或推广而进行的，主要面向观众的在现有降落区以外的地点进行的跳伞。

RELATED READINGS

相关阅读资料

FAA Part 105, Parachute Operations

联邦航空条例第 105 部分 降落伞作业

FAA AC 105-2, Sport Parachute Jumping

联邦航空局咨询通告 105-2 降落伞运动

FAA AC 91-45, Waivers: Aviation Events

联邦航空局咨询通告 91-45 豁免：航空活动

B. Advice and Approval

建议和批准

Jumpers may need to secure approval from federal, state, or local officials prior to a demonstration jump.

跳伞者进行演示跳伞前可能需要获得联邦、州或地方官员的批准。

Jumpers may need to contact **local authorities** before a demonstration jump.

跳伞者在演示跳伞前可能需要联系**当地政府**。

FAR 105.23 requires airport-management approval before jumps onto the airport. USPA recommends that jumpers call the local police, as they might assist with crowd control, and advance notice may make it more likely that they will respond to calls appropriately.

联邦航空条例 105.23 规定，跳伞者需获得机场管理方批准后方可在机场区域实施着陆。USPA 建议跳伞者提前联系当地警方，因为警方可能可以协助实施人群管控，提前的告知也能让警方对报警有更恰当的响应。

Jumpers may need to contact the **state's** Department of Aviation. Additionally, FAR 105.25 requires that jumpers either notify the FAA or receive air traffic control authorization for almost every jump. At least one hour before any jump, the jumper must notify the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude.

Also, FAR 105.21.a. states that no jump be made over or into a congested area or an open-air assembly of persons until a certificate of authorization has been issued (FAA Form 7711-1).

跳伞者可能还需联系州航空管理部门。根据联邦航空条例 105.25 规定, 几乎所有跳伞活动都需向联邦航空局报备或获得空管授权。跳伞者必须向对计划的第一次出舱高度所属空域具有管辖权的空中交通管制处进行报备, 且报备时间不迟于跳伞前一小时。此外, 联邦航空条例 105.21.a 规定: 未经签发授权证书(联邦航空局 7711-1 表格), 严禁在人员密集区域或露天人群集会上空实施跳伞。

The FAA will determine whether an application for authorization must be filed with the local **Flight Standards District Office (FSDO)**. This chapter contains the FAA's instructions on how to fill out the application for authorization, FAA Form 7711-2. The local FSDO may require an aerial photo and aviation sectional chart marking the location of the jump.

联邦航空局将判定是否需要向当地**飞行标准办公室 (FSDO)** 提交授权申请。本章节包含联邦航空局关于如何填写授权申请(联邦航空局 7711-2 表格) 的说明。当地飞行标准办公室可能要求提供标示好跳伞的位置的航拍照片和区域航图。

The BSRs **require the organizers** to contact and receive demonstration jump advice from the **local S&TA or a USPA Examiner**, who should be able to assist in meeting all state and federal requirements. The S&TA or Examiner providing this advice should use FAR 105.15.a as a guideline. **Examiners approached for advice should contact the S&TA for the area or the drop zone at which the flight will originate.** The S&TA should assist the jumpers in meeting all applicable state and federal requirements and check that they are met.

基本安全要求规定**组织者必须联系当地安全和培训顾问或 USPA 考官**以获取演示跳伞的建议, 这些专业人员应能协助满足州和联邦的所有要求。提供建议的安全和培训顾问或考官应以联邦航空条例 105.15.a 作为指导准则。**被咨询的考官应联系跳伞作业飞机始发地区或始发跳伞基地的安全和培训顾问。**安全和培训顾问应协助跳伞者满足所有适用的州及联邦要求, 并核查落实情况。

The organizer should carry all authorizations and permits on the jump. The S&TA should investigate both the proposed area and the participants. The S&TA or Examiner may recommend the use of specific jumpers or advise the organizer to use only individuals meeting certain experience requirements. The organizer may need flexibility in making last-minute substitutions of aircraft and participants. When consulted for a demonstration jump, the S&TA may also recommend certain additional limitations such as wind speed and direction, altitude, etc.

组织者应携带所有授权文件与许可执行跳伞。安全和培训顾问需对拟进行跳伞作业的区域及参与者进行核查。安全和培训顾问或考官可推荐特定跳伞者参与, 或建议组织者仅选用符合特定经验要求的个人。组织者可能在飞机和人员配置的临时调整上需要一定的灵活性。当被咨询演示跳伞事宜时, 安全和培训顾问还可建议增设风速和风向、高度等额外限制条件。

The S&TA should consider the information in this section when making recommendations and should ask the question, "All things considered, are the chances of performing a safe and professional demonstration jump reasonably good?"

安全和培训顾问在提出建议时应综合考虑本节信息, 并考量: “综合所有因素, 是否有足够把握进行安全且专业的演示跳伞?”

C. Landing Areas

着陆区域

All FAA-authorized demonstration jumps are classified as Open Field, Level 1, Level 2, or Stadium. With the FAA's concurrence, USPA defines these areas as described in Table 6.A, Size and Definition of Landing Areas.

所有联邦航空局授权的演示跳伞场地都被归类为开阔区域、一级区域、二级区域或体育场。USPA 定义了这些场地类型, 并已获得联邦航空局的认可。场地类型的定义和大小, 见表 6.A—“着陆区域的大小和定义”。

Minimum landing areas for PRO Rating holders:

PRO 评级持有者的最小着陆区域:

- For PRO Rating holders, there should be no less than 5,000 square feet of landing area per four jumpers.
对于 PRO 评级持有者, 有四名或以内的跳伞者时, 着陆区域面积不得小于 5000 平方英尺。

- An additional 800 square feet per jumper is required for any jumper landing within 30 seconds of the last of any four jumpers.

超过四名跳伞者时，每增加一名跳伞者（在前四位跳伞者均着陆后 30 秒内着陆）时，还必须增加至少 800 平方英尺的额外空间。

When evaluating a demonstration jump, the jumper must consider alternate landing areas, such as run-offs or escape areas. Open bodies of water may be included when measuring landing-area requirements for open-field, level 1 and level 2 landing areas—however, the vertical and horizontal distance limits from any spectator outlined in Table 6.A still applies.

在评估演示跳伞时，必须考虑备降场，例如加赛区域或逃生区域。测量一个场地是否符合开阔场地、一级区域、二级区域的要求时，可考虑计入开放水域的面积。但是，表 6.A 中列出的与任何观众的垂直和水平距离限制仍然适用。

TABLE 6.A—Size and Definition of Landing Areas
表 6.A 着陆区域的大小和定义

OPEN FIELD

开阔场地

1. A minimum-sized area that will accommodate a landing area no less than 500,000 square feet.
面积不小于五十万平方英尺。
2. Allows a jumper to drift over the spectators with sufficient altitude (250 feet) so as not to create a hazard to persons or property on the ground
允许一名跳伞者在观众上空足够的高度（250 英尺以上）飞行，以免对地面上的人员或财产造成危害。
3. Will accommodate landing no closer than 100 feet from the spectators
允许跳伞者在距离观众至少 100 英尺的地方着陆。

LEVEL 1

一级区域

1. An area that will accommodate a landing area no smaller than at least 250,000 square feet up to 500,000 square feet
着陆区域面积在二十五万平方英尺至五十万平方英尺之间。
2. Or an area with the sum total that equals 250,000 square feet, up to 500,000 square feet with a one-sided linear crowd line
或者是一个面积总和在二十五万平方英尺至五十万平方英尺的区域，并在一侧有直线型的人群控制线。
3. Allows jumpers to drift over the spectators with sufficient altitude (250 feet) so as not to create a hazard to persons or property on the ground
允许跳伞者在观众上空足够的高度（250 英尺以上）飞行，以免对地面上的人员或财产造成危害。
4. Will accommodate landing no closer than 50 feet from the spectators
允许跳伞者在距离观众至少 50 英尺的地方着陆。
5. Many Open-Field athletic areas constitute a Level 1 area.
许多开阔运动场地可作为一级区域。

LEVEL 2

二级区域

1. An area that will not accommodate a 250,000 square-foot landing area but will allow an area no smaller than 5,000 square feet per four jumpers
着陆区域面积小于二十五万平方英尺，但至少有一万平方英尺可供不超过四名跳伞者使用。
2. Allows jumpers to fly under canopy no lower than 50 feet above the crowd and land no closer than 15 feet from the crowd line
允许跳伞者在不低于人群上方 50 英尺的高度飞行，并在离人群控制线不小于 15 英尺的地方降落。
3. Parachutists who certify that they will use both ram-air main and ram-air reserve parachutes will be permitted to

exit over or into a congested area but not exit over an open-air assembly of people.

确认将使用冲压空气式主伞和冲压空气式备伞的跳伞者可被允许在人员拥挤区域上空出舱或飞入这些地区，但不能直接在露天人员集会的上空出舱。

4. This area would require an FAA Form 7711-2 to conduct an approved demo.

批准此类区域的演示跳伞需要提交联邦航空局 7711-2 表格。

STADIUM

体育场

1. A Level 2 landing area smaller than 450 feet in length by 240 feet in width and bounded on two or more sides by bleachers, walls, or buildings in excess of 50 feet high

体育场是长度小于 450 英尺，宽度小于 240 英尺的二级区域，且场地两侧（或两侧以上）被看台、墙壁或高度超过 50 英尺的建筑物包围。

2. This area would also require an FAA Form 7711-2 to conduct an approved demonstration jump.

批准此类区域的演示跳伞需要提交联邦航空局 7711-2 表格。

D. Experience and Ability

经验与能力要求

Jumpers must have all the following experience and ability when jumping into an Open Field and Level 1 area, as defined by USPA and accepted by the FAA:

在 USPA 定义的、联邦航空局认可的开阔场地和一级区域进行跳伞的跳伞者须满足以下所有条件：

- C license or higher
持有 USPA C 执照或更高级别的执照
- 50 jumps within the past 12 months
在过去 12 个月内跳过至少 50 次
- five jumps within the previous 60 days using the same model and size canopy to be used on the demonstration jump
在过去 60 天内使用与演示跳伞相同型号和大小的降落伞跳过至少 5 次
- For tandem jumps, the above requirements do not apply to the tandem student
对于双人伞跳伞，上述要求不适用于双人伞乘员

Jumpers must have all the following experience and ability when jumping into a Level 2 and Stadium area, as defined by USPA and accepted by the FAA:

在 USPA 定义的、联邦航空局认可的二级区域和体育场进行跳伞的跳伞者须满足以下所有条件：

- hold the PRO rating (required by the BSRs)
持有 USPA PRO 评级（基本安全要求规定必须持有该评级）
- 50 jumps within the past 12 months
在过去 12 个月内跳过至少 50 次
- five jumps within the previous 60 days using the same model and size canopy to be used on the demonstration jump
在过去 60 天内使用与演示跳伞相同型号和大小的降落伞跳过至少 5 次

E. How to Approach a Demo Jump

如何执行演示跳伞

On a demonstration jump, as with all jumps, jumpers must consider safety first. The next most important aspect is landing in the target area. Good aerial work is not impressive if the jumpers land out. A stand-up landing in the target area is usually a demonstration jump's most visible and impressive portion.

和所有跳伞活动一样，演示跳伞必须将安全置于首位。其次重要的是确保降落在目标区域——即便空中动作再精彩，如果跳伞者在场外着陆，那也无法给人留下深刻印象。在目标区域实现站降，往往是演示跳伞最具视觉冲击力的环节。

Jumpers must consider many variables when planning demo jumps, including wind speed and direction, approach types, equipment type, jumper experience, target areas, and alternate landing areas. The organizer must evaluate each proposed demo individually.

策划演示跳伞时需综合考量多重变量：风速和风向、进近方式、装备类型、跳伞经验、着陆目标区域及备降场等。组织者须对每个演示方案进行单独评估。

While a good demonstration jump provides excellent public relations for the sport, a poorly performed one may severely damage skydiving's image. Therefore, jumpers must recognize and understand that sometimes it may be in the best interest of the individual jumper and skydiving in general not to make the jump at all. Demo jumpers should always exhibit a mature, professional attitude.

一次表现良好的演示跳伞有助于提升跳伞运动的公共关系，但一次糟糕的演示跳伞可能会严重损害跳伞运动的形象。因此，有时完全不跳可能对跳伞的个人和跳伞运动整体最有利。认识和理解这一点是很重要的。跳伞表演者应始终保持成熟专业的态度。

Jumpers should promise no more than they can produce and perform with expertise and efficiency, taking no unnecessary chances. Jumpers should prepare in advance, recognize and deal with the air of excitement that surrounds a demo jump, and make mature and professional judgments when dealing with unforeseen circumstances. This may require jumpers to delay or cancel the demo when conditions are not suitable for a safe jump. Jumpers and support staff should have a sharp, clean appearance to make a better impression and present a professional image.

跳伞者应量力而行，仅承诺有能力专业高效完成的内容，避免任何不必要的冒险。需提前做好充分准备，妥善处理演示跳伞特有的紧张刺激氛围，面对突发情况时做出专业判断。当条件不符合安全标准时，应延迟或取消演示。跳伞者和后勤人员应有干净整练的外表，以给人留下更好的印象和展示专业形象。

Equipment

装备

USPA recommends ram-air main canopies for Open Field, Level 1, Level 2 and Stadium jumps. **The FAA requires** ram-air main canopies for Level 2 and Stadium jumps.

对于开阔场地、一级区域、二级区域或体育场，USPA 建议使用冲压空气式降落伞。对于二级区域或体育场，**联邦航空局要求**使用冲压空气式降落伞。

The reserve canopy should be steerable for open-field jumps. **The FAA requires** ram-air reserve canopies for Level 1, Level 2, and Stadium jumps.

对开阔场地，应使用可操纵的备伞。对于一级区域、二级区域或体育场，**联邦航空局要求**使用冲压空气式备伞。

Jumpers should hand-carry smoke or attach it to an easily ejectable boot bracket. *Warning: military type (M-18) smoke grenades are extremely hot and should not be handheld.*

彩烟应手持携带，或装在可快拆的鞋子的支架上。**警告：军用型（M-18）烟雾弹非常热，不应手持。**

With very few exceptions, USPA recommends demo jumpers use an AAD and an RSL, preferably with a MARD system. AADs can be set to accommodate differences between the jumper's takeoff and landing altitudes.

USPA 建议跳伞表演者使用 AAD 和 RSL 系统，最好配备 MARD 系统，少数情况例外。AAD 可根据跳伞者起飞与着陆的高度差进行相应设置。

Maximum Winds

最大风速

When considering wind limits, jumpers should factor in wind turbulence and the capabilities of the reserve canopy. USPA

recommends conducting all demonstration jumps with a ground-wind **maximum of 15 mph**. For stadium jumps, jumpers should measure the wind at the top of the stadium, always anticipating turbulence.

当考虑风速的限制时，也应该考虑到乱流和备伞的性能。USPA 建议所有演示跳伞的地面风速限制为**最高 15 英里/小时**。对于体育场跳伞，应在体育场顶部测量风速，并应始终为乱流做好准备。

Turbulence and Target Placement

乱流和着陆目标的位置

Especially in windy conditions, jumpers must consider recommended minimum distances from major obstacles, including large buildings and trees, which affect air currents and can cause turbulence. A single tree, pole, fence, etc., is not considered a major obstacle. Stadiums often produce turbulence. Jumpers should be thoroughly familiar with their canopies' flight characteristics in turbulent air.

跳伞者必须考虑与主要障碍物（包括大型建筑物和树木）之间建议保持的最小距离，特别是在有风的条件下。这些障碍物会影响气流并可能导致乱流。一棵树、一根杆、一道围栏等不被视为主要障碍物。体育场通常会产生乱流。跳伞者应充分熟悉其降落伞在乱流中的飞行特性。

Aerial Maneuvers

空中机动

Demo jumpers should rehearse aerial maneuvers, just as any professional would give a show a dry run. Participants should know their exit point, freefall drift, and opening point. Landing on target takes priority over air work. Jumpers should be prepared to break off, track, or pull high if necessary.

空中机动应该事先进行排练，就像任何专业演员都会排练节目一样。参与者应该知道自己的出舱点，自由落体漂移量，以及开伞点。应优先确保能降落在着陆目标上，然后再确保完成空中机动。应该准备好分离、Tracking，或如有必要的话，进行高开。

Jumpers should not perform radical canopy maneuvers below 500 feet. Demonstration jumpers often use smoke or flags to enhance a show. Before jumping with smoke or an unfamiliar flag system, jumpers should seek out training and advice from a PRO-rated jumper who is familiar with the rigging and associated components.

跳伞者不应在 500 英尺以下进行剧烈的降落伞机动动作。跳伞表演者常使用彩烟或旗帜来增强表演效果。在使用彩烟或不熟悉的旗帜系统进行跳伞前，跳伞者应寻求熟悉相关装备及组件的 PRO 评级持有者的指导。

Smoke is usually attached to a foot-mounted bracket or to a line that is dropped below the jumper. The smoke canister is ignited after opening. There are two types of smoke: hot and cold. If using hot smoke, jumpers should ensure that the smoke container won't burn through the line and should use care when crossing over obstacles or spectators during the final approach. Be cautious after landing as the smoke canister may be very hot for a while.

彩烟装置通常安装在脚部支架或通过系绳垂挂于跳伞者下方。彩烟罐于开伞后点燃。烟雾分为热烟和冷烟两种类型。使用热烟时，必须确保烟雾容器不会烧断系绳，并需在最后进近阶段穿越障碍物或观众群时格外谨慎。着陆后需注意高温彩烟罐可能持续发烫一段时间。

A **flag** may be attached to the rear lines or dropped below the jumper on a weighted line connected to the leading edge. Larger flags typically have the weight attached to or sewn into the leading edge and should be folded into a bag or pouch designed to contain it. Jumpers should deploy flags over uncongested areas to protect people and property in case a weight detaches. Those jumping with the U.S. flag should review Title 4 U.S. Code, Chapter 1 (U.S. Flag Code) so they properly handle it. Ground crew attempting to catch a weighted flag before it touches the ground should be aware of the dangers of being hit by the weight.

旗帜可通过其尾部线相连，或把旗帜前缘连接在带配重的绳上，悬挂在跳伞者下方。较大旗帜通常将配重缝制在旗帜前缘，且旗帜需装入专用收纳袋。旗帜应该在人员稀少的区域上空展开，以防配重脱落危及人员和财产。使用美国国旗的跳伞者须遵守美国法典第四编第一章（美国国旗法）的相关规定。地勤人员在带配重的旗帜触地前尝试将其接住时，需警惕被配重击

中的风险。

Only experienced CF jumpers should perform **canopy formation maneuvers** during demonstration skydives. Efforts to build canopy formations should stop no lower than 2,500 feet AGL. It is much more difficult and dangerous to land a canopy stack on target than it is to land canopies separately.

只有拥有丰富的降落伞编队经验的跳伞者能在跳伞表演中实施**降落伞编队机动**。只能在离地高度 2500 英尺以上尝试建立降落伞编队。与单独的降落伞的着陆相比，大量降落伞着陆在着陆目标上要困难得多，也危险得多。

Crowd Control

人群控制

A collision with a spectator is dangerous for both the spectator and the jumper, as well as the well-being of the sport. Ground support should take reasonable precautions to keep spectators out of the landing area. When possible, spectators should be seated, since mobile spectators are more likely to move toward the jump target or into the path of a landing jumper.

与观众相撞会对观众、跳伞者和跳伞运动的发展构成极大的威胁。地面支持人员应采取合理的预防措施，使观众远离着陆区。如有可能，应让观众就坐，因为站着的观众可能会朝着着陆目标移动，或挡住跳伞者的着陆路线。

Jumpers should pick up their equipment immediately after landing, since it could get damaged, and some spectators may decide that skydiving equipment makes good souvenirs. Jumpers who plan on packing in the crowd should protect their equipment against damage from spectators' drinks and cigarettes.

跳伞者应在着陆后立即收拾装备，否则装备可能受损。一些观众可能认为跳伞装备是不错的纪念品。打算在人群中叠伞的跳伞者应防止观众的饮料和香烟损坏装备。

Ground Signals

地面信号

Participants must maintain ground-to-air communication as outlined in the BSRs, using a radio, smoke, or a panel. Ground support should establish a backup to the primary signal in case the primary signal fails. If a Certificate of Authorization (FAA Form 7711-1) is issued, it may require ground-to-air radio communication.

根据基本安全要求，参与者必须保持地空通信。地空通信可以通过无线电、信号烟雾或通讯面板进行。地面支持人员应准备主要通信方式的备份，以防发生故障。如果联邦航空局签发了授权证书（联邦航空局 7711-1 表格），则地对空无线电通信可能是必须的。

Announcer

播音员

An experienced skydiver on the public address system contributes to a quality demonstration jump. The announcer can point out the aircraft, explain each phase of the jump, give general information, and explain any unusual occurrences, such as a reserve activation or a jumper missing the target. The announcer can also contribute to crowd control by asking spectators not to enter the target area.

一名有经验的跳伞者在公共广播系统上讲解有助于呈现一场高质量的演示跳伞。播音员可以指出飞机位置，解释跳伞的每个阶段，介绍一般信息，解释任何特殊情况，如备伞的启动或跳伞者未落在着陆目标上。播音员可以要求观众不要进入目标区域，这有助于人群的控制。

Other Activities

其他活动

Activities after the jump add to the entertainment of the spectators. For example, after landing, team members may pack their parachutes in view of the spectators. While visiting with spectators after a jump, team members should respond to questions politely and factually, directing persons interested in jumping to uspa.org. Often, team members

also distribute brochures advertising a local drop zone.

跳伞后的活动可为观众增添观赏乐趣。例如着陆后，跳伞队员可在观众视野内叠伞。与观众互动时，队员应礼貌如实回答问题，并向有兴趣跳伞的人引导至 uspa.org 网站。队员通常还会分发宣传当地跳伞基地的小册子。

Insurance

保险

USPA individual membership liability skydiving insurance (property damage and bodily injury), which is included as a benefit of USPA membership, is not valid for demonstration jumps. Contact USPA Headquarters or visit uspa.org/demo#Demo-Jump-Insurance for information on demonstration jump insurance.

USPA 个人会员会籍所包含的跳伞责任保险（财产损失和人身伤害），作为 USPA 会员的一项福利，不适用于演示跳伞。请联系 USPA 总部或访问 uspa.org/demo#Demo-Jump-Insurance 以了解演示跳伞的保险信息。

6-2 专业表演评级 Professional Exhibition Rating

A. Definition

定义

Working in conjunction with the FAA, USPA issues Professional Exhibition (PRO) Ratings to any USPA member who meets the current requirements. This rating identifies the jumper as highly proficient and accurate in canopy control.

USPA 与联邦航空局合作，向任何符合当前评级要求的 USPA 会员颁发专业表演 (PRO) 评级。此评级表示跳伞者在降落伞控制方面非常熟练和精准。

The USPA PRO Rating enables skydivers to perform exhibition jumps in challenging landing areas. To earn this rating, skydivers with a USPA D license must demonstrate landing skills using the parachute they intend to use for exhibition jumps. They also receive training in handling flags and pyrotechnic devices, coordinating with the FAA, and obtaining insurance coverage. The PRO rating allows holders to fly and land closer to crowds than jumpers who have not met these qualifications. Thus, PRO-rating holders must be proficient with various canopy sizes and must be capable of landing in small areas. As such, PRO-rating applicants provide a professional demonstration of skills on a wing loading of 1.5:1 and below. A High-Performance (HP) Endorsement allows PRO-rated members to make exhibition jumps with wing loadings above 1.5:1.

USPA 专业表演评级 (PRO 评级) 允许跳伞者在具有挑战性的着陆区域进行跳伞表演。为获得该评级，跳伞者需持有 USPA D 执照，并使用拟用于跳伞表演的降落伞来展示其着陆技能。他们还需接受培训，内容包括旗帜与烟火装置的操作、与联邦航空局的协调程序及保险覆盖范围等事项。相比未获此资质的跳伞者，PRO 评级允许其持有者在更接近人群的空域进行飞行和着陆。因此，PRO 评级申请人须精通多种尺寸的降落伞的操作，并具备在小面积区域进行着陆的能力。PRO 评级申请人需在翼载在 1.5 及以下的条件下完成专业技能演示。高性能伞控认证 (HP 认证) 则允许 PRO 评级持有者在 1.5 以上的翼载条件下执行跳伞表演。

A USPA PRO Rating is not required for all demonstration jumps but may be a valuable advantage in working with the FAA. The FAA recognizes the USPA PRO Rating as a certificate of proficiency.

虽然不是所有的演示跳伞都要求 USPA PRO 评级，但是在与联邦航空局合作时，这可能是一项有价值的优势。PRO 评级受到联邦航空局认可，并可作为一种能力认证。

B. Qualifications and Procedures

资格和程序

PRO Rating Qualifications

PRO 评级资格

To qualify for the PRO rating, an applicant must:

为获得 PRO 评级资格，申请人必须：

- be a current member of USPA
USPA 会员会籍在有效期内
- possess a USPA D license
持有 USPA D 执照
- have at least 500 jumps on a ram-air canopy
使用冲压空气式降落伞跳过 500 次以上
- made two-night jumps in accordance with the BSRs (recommended that the first one be a solo and one in a group) with a freefall of at least 20 seconds. An Instructor with a D license who has completed at least two-night jumps must verify these jumps.

在基本安全要求框架内至少进行过 2 次夜间跳伞（建议第一次为单独夜间跳伞，第二次为团体夜间跳伞），自由落体时间在 20 秒以上。该项要求需由持有 D 执照且完成过 2 次夜跳的 USPA 教练进行核实。

- make a series of 10 solo jumps with a stand-up landing into an area 40-feet long by 20-feet wide using the same

model and size canopy at a wing loading 1.5:1 or below.

使用相同型号和尺寸的降落伞，且翼载小于或等于 1.5，在一系列共 10 次的单独跳伞中在长 40 英尺、宽 20 英尺的指定区域内站降。

- The applicant must pre-declare each jump to count toward the requirements for the PRO rating.
申请人进行每一跳前应先进行申报，以将该跳计入 PRO 评级的要求。
 - All declared jumps must be recorded on video that clearly shows the PRO-rating applicant's final approach and landing into a defined area 40-feet long by 20-feet wide. (Both outside and point-of-view footage are acceptable.)
申报用于申请 PRO 评级的跳伞必须通过视频记录，视频内容应清晰地包含申请人最后进近并着陆在长 40 英尺、宽 20 英尺的指定区域内的片段。（外部视角或第一人称视角的视频皆可）
 - The applicant must submit the video footage of each approach and landing to the appropriate USPA Regional Director or to the Director of Safety and Training at USPA Headquarters, along with the PRO-rating application.
申请人必须提交进近着陆的视频至相应的 USPA 区域董事或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。
 - The applicant may submit the video footage by sharing it online or by sending it on a portable hard drive.
视频可通过在线方式提交，也可以通过移动硬盘提交。
- Once the applicant has started the series, they may make non-declared jumps; however, non-declared jumps may not count toward the accuracy requirements for the rating.
申请人开始进行这一系列用于申请 PRO 评级的跳伞期间，也可以进行非申报用于申请 PRO 评级的跳伞；然而，未申报的跳伞的成绩不计入 PRO 评级的降落精准度要求。
- All 10 pre-declared jumps in the series must be successful for any in the series to count toward the rating. In the event of an unsuccessful jump, the applicant must start a new series. At least two of the landings into an area 40-feet long by 20-feet wide must be crosswind approaches, with the final approach 90 degrees to the direction of the wind. Wind speed must be at least five miles per hour and no more than 15 miles per hour.
一系列共 10 次预先申报的跳伞中，任何一次预先申报的跳伞都必须成功，才可计入 PRO 评级申请；如果跳伞不成功，申请人必须重新开始一个新系列的 10 次跳伞。其中至少 2 次跳伞须为侧风进近并着陆在长 40 英尺、宽 20 英尺的指定区域内。最后进近（第三边）应与风向呈 90 度角，风速应在 5 英里/小时至 15 英里/小时之间。
- On each declared jump, the applicant must make the first contact and stop within the designated landing area.
每一次申报的跳伞，申请人必须在指定着陆区域进行首次接触和停止。
- A USPA S&TA, Examiner, Judge or Board Member must witness and sign off on all declared jumps.
所有申报的跳伞都必须由 USPA 安全和培训顾问、考官、裁判或董事会成员见证并签名。

HP Endorsement Qualifications

HP 认证资格

To qualify for an HP (High-Performance) Endorsement for the PRO rating (fly a parachute at a wing loading greater than 1.5:1), an applicant must:

为了有资格获得 PRO 评级中的 HP 认证（高性能伞控认证）（允许持有者使用翼载在 1.5 以上的降落伞），申请人必须符合以下要求：

- make a series of five solo jumps using the same model and size canopy into an area 40-feet long by 20-feet wide.
在一系列共 5 次单独跳伞中降落在长 40 英尺、宽 20 英尺的指定区域内，且每次使用同一型号和尺寸的伞
 - The applicant must pre-declare each jump to count toward the requirements for the HP Endorsement for the PRO rating.
申请人进行每一跳前应先进行申报，以将该跳计入 PRO 评级中的高性能伞控认证的要求。
 - All declared jumps must be recorded on video that clearly shows the PRO rating applicant's final approach and landing into a defined area 40-feet long by 20-feet wide. (Both outside and point-of-view footage are acceptable.)
申报用于申请高性能伞控认证的跳伞必须通过视频记录，视频内容应清晰地包含申请人最后进近并着陆在长 40

英尺、宽 20 英尺的指定区域内的片段。(外部视角或第一人称视角的视频皆可)

- The applicant must submit video footage of each approach and landing to the appropriate USPA Regional Director or the Director of Safety and Training at USPA Headquarters along with the PRO-rating application.

申请人必须提交进近着陆的视频至相应的 USPA 区域董事或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。

- The applicant may submit the video footage by sharing it online or by sending it on a portable hard drive.

视频可通过在线方式提交，也可以通过移动硬盘提交。

- At least one landing into an area 40-feet long by 20-feet wide must demonstrate a crosswind approach and landing, with the final approach 90 degrees to the direction of the wind. Wind speed must be at least five miles per hour and no more than 15 miles per hour.

其中至少 1 跳在长 40 英尺、宽 20 英尺的区域内

的着陆应为侧风进近着陆，最后进近（第三边）应与风向呈 90 度角，风速在 5 英里/小时至 15 英里/小时之间。

- At least two approaches and landings must demonstrate a heading change of at least 45 degrees during the final 150 feet of canopy flight. The jumper must start and complete the heading change no higher than 25 feet AGL. This flared, carving turn demonstrates the ability to change heading during the swoop portion of the landing while still maintaining control of the parachute.

其中至少 2 次进近和着陆中，最后 150 英尺的降落伞飞行阶段应包含至少 45 度的航向改变。航向改变的开始和结束应在离地 25 英尺高度以下进行。这个带拉平的 Carving 转弯是为了验证申请人是否有能力在着陆拉飘过程中改变航向，并仍然能很好地控制降落伞。

(译者注: Carving 在跳伞中有多种含义, 对于自由落体阶段, Carving 是一种自由飞动作, 对于降落伞飞行阶段, Carving 可指代多种转弯类型, 根据“The Parachute and its Pilot” (Brian S. Germain 著), 着陆阶段进行的 Carving 是诱导降落伞高速进近时高度损失微小或几乎不损失高度的转弯)

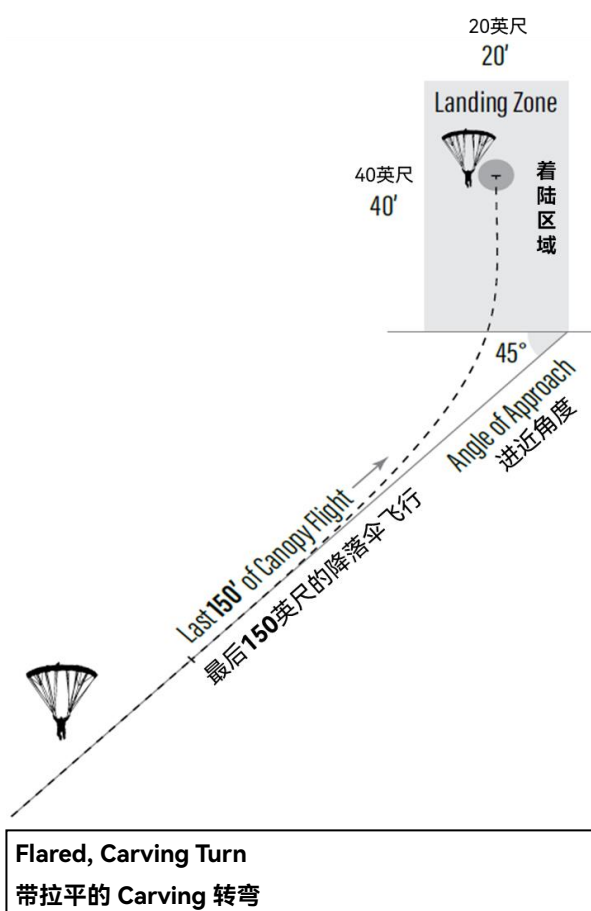
- All five pre-declared jumps in this series must be successful for any in the series to count toward the rating. In the event of an unsuccessful jump, the applicant must start a new series.

该系列跳伞中, 所有 5 次预申报的跳伞必须全部成功, 以计入评级申请, 如果有未成功的一跳, 则应重新开始新的一系列用于申请评级的跳伞。

- On each declared jump, the applicant must make the first contact and stop within the designated landing area. 每一次申报的跳伞, 申请人必须在指定着陆区域进行首次接触和停止。

- a USPA S&TA, Examiner, Judge or Board Member must witness and sign off on all declared jumps.

所有申报的跳伞都必须由 USPA 安全和培训顾问、考官、裁判或董事会成员见证并签名。



Application Procedures

申请程序

A USPA S&TA, Examiner, Judge or Board Member can administer the **PRO Rating Exam** online or on paper. Applicants may not use references or other assistance during the exam and must pass with a score of 75% or more. The official will

record any passing score on the PRO Rating Application and in the applicant's logbook.

PRO 评级笔试由 USPA 安全和培训顾问、考官、裁判或者董事会成员组织进行，笔试可在线进行或使用纸质考卷。考试期间申请人不得参考任何资料或寻求帮助，及格分数为 75%。通过后，考试分数会记录在评级申请记录中，以及申请人的跳伞日志中。

When giving written exams on **paper**, the examining USPA official gives the PRO-rating applicant a blank answer sheet and the questions to the exam. After the test, the examining official collects the materials and grades the exam. An applicant who does not pass will be eligible to retake this exam after seven days.

当进行**纸质考卷**笔试时，负责考核的 USPA 官员会向 PRO 评级申请人发放空白答题纸和试题。考试结束后，考试官员将收回所有材料并进行阅卷。未通过考试的申请人可在七天后重新参加该考试。

For written exams taken using USPA's **online** license-testing program, applicants who do not pass may immediately retest using the same method for a total of three attempts per day.

对于通过 USPA **在线**执照测试系统进行的笔试，未通过的申请人可立即使用相同方式重新测试，每日最多允许三次尝试。

The PRO-rating applicant must send the completed application to the appropriate USPA Regional Director for their signature and include the exam, videos, rating fee, and PRO Rating Proficiency Card signed by a USPA S&TA, Examiner or PRO Rating holder.

PRO 评级申请人须将完成好的申请材料提交至所属区域的 USPA 区域董事签署，材料应包括：考试、视频资料、评级费用，以及经 USPA 安全和培训顾问、考官或 PRO 评级持有者签署的 PRO 评级熟练程度记录卡。

Except for the minimum 500-ram-air-jump requirement, the applicant must have completed all training listed on the application within the previous 12 months. The USPA Regional Director will forward the application to USPA Headquarters.

除 500 次使用冲压空气式降落伞进行跳伞的最低要求外，申请人必须在过去 12 个月内完成申请材料列明的所有培训内容。USPA 区域董事会将把申请材料转交至 USPA 总部。

The canopy the jumper uses during qualification will be the smallest size canopy to be allowed for minimum-landing-area (Level 2) jumps, and USPA will note this canopy size on the jumper's USPA Membership Card. USPA will issue an annual PRO Rating with an expiration date that coincides with the applicant's membership expiration date. The PRO-rating holder must renew their PRO rating annually to remain current. If a PRO-rating holder's competence is questioned by an FAA or USPA official such as an S&TA, the PRO-rating holder may be required to reaffirm their proficiency.

跳伞者在资格认证时使用的降落伞将作为其进行最小着陆区域（二级区域）跳伞时允许使用的最小尺寸降落伞，USPA 会在该跳伞者的会员卡上标注此降落伞尺寸。USPA 将颁发有效期与申请人会员资格截止日期一致的年度 PRO 评级证书。PRO 评级持有者必须每年更新评级以保持有效性。若联邦航空局或 USPA 官员（如安全和培训顾问）对 PRO 评级持有者的能力提出质疑，可能要求评级持有者重新证明其熟练度。

C. To Requalify on Smaller Canopies

在更小尺寸的降落伞上重新进行评估

Wing Loading of 1.5:1 or Less

翼载小于或等于 1.5

To requalify on a smaller canopy with a **wing loading of 1.5:1 or less**, the rating holder must make three successive, pre-declared jumps, making the first contact and stopping within an area 40-feet long by 20-feet wide.

使用尺寸更小的，**翼载小于或等于 1.5** 的降落伞进行重新评估时，评级持有者必须进行 3 次连续的经预先申报的跳伞，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的区域内。

All declared jumps must be recorded on video that clearly shows the PRO-rating applicant's final approach and landing

into a defined area 40-feet long by 20-feet wide. The applicant must submit video footage of each approach and landing to the appropriate Regional Director or to the Director of Safety & Training at USPA Headquarters along with the PRO Rating Application and videos (by sharing them online or by delivering a portable hard drive).

申报的跳伞必须通过视频记录, 视频内容应清晰地包含申请人最后进近并着陆在长 40 英尺、宽 20 英尺的指定区域内的片段。申请人必须提交进近着陆的视频至相应的 USPA 区域董事或 USPA 总部的安全和培训董事, 一同提交的还有 PRO 评级申请表 (视频可通过在线方式提交, 也可以通过移动硬盘提交)。

The jumper must stand up all landings, which a USPA S&TA, Examiner, Judge, or Board Member must verify. The applicant must log the three landings on the PRO Rating Application and have the verifying witness sign it. The applicant may then submit the completed application and videos to USPA Headquarters for processing.

所有着陆都应站降, 必须由 USPA 安全和培训顾问、考官、裁判或董事会成员进行核实。这 3 次着陆必须记录到 PRO 评级申请表中, 并由负责核实的见证者签名。然后申请人可提交申请和相关视频至 USPA 总部处理。

Wing Loading Greater than 1.5:1

翼载超过 1.5

To re-qualify on a smaller canopy with a **wing loading greater than 1.5:1**, the rating holder must first meet the qualifications for the HP Endorsement listed above (i.e., must perform the five HP qualification jumps first).

使用更小尺寸的, **翼载超过 1.5** 的降落伞进行重新评估时, 评级持有人必须先满足高性能伞控认证的资质, 如上文所列 (也就是说必须先进行 5 次高性能伞控认证跳伞)。

The rating holder must make three successive, pre-declared jumps, making the first contact and stopping within an area 40-feet long by 20-feet wide. All declared jumps must be recorded on video that clearly shows the PRO-rating applicant's final approach and landing into a defined area 40-feet long by 20-feet wide. The applicant must submit video footage of each approach and landing to the appropriate Regional Director or to the Director of Safety & Training at USPA Headquarters along with the PRO Rating Application and videos (by sharing them online or by delivering a portable hard drive).

评级持有者必须进行 3 次连续的经预先申报的跳伞, 首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的区域内。申报的跳伞必须通过视频记录, 视频内容应清晰地包含申请人最后进近并着陆在长 40 英尺、宽 20 英尺的指定区域内的片段。申请人必须提交进近着陆的视频至相应的 USPA 区域董事或 USPA 总部的安全和培训董事, 一同提交的还有 PRO 评级申请表 (视频可通过在线方式提交, 也可以通过移动硬盘提交)。

Landing Criteria:

着陆标准

- ☐ One landing must be into the wind in any wind speeds up to 15 miles per hour.
其中 1 跳应为逆风着陆, 风速不超过 15 英里/小时。
- ☐ One landing must be crosswind with a final approach 90 degrees to the direction of the wind. Wind speed must be at least five miles per hour and no more than 15 miles per hour.
其中 1 跳应为侧风进近着陆, 最后进近 (第三边) 应与风向呈 90 度角, 风速在 5 英里/小时至 15 英里/小时之间。
- ☐ One approach and landing must demonstrate a heading change of at least 45 degrees during the final 150 feet of canopy flight. The jumper must start and complete the heading change no higher than 25 feet AGL. This flared, carving turn demonstrates the ability to change heading during the swoop portion of the landing while still maintaining control of the parachute.
其中 1 跳的进近和着陆中, 最后 150 英尺的降落伞飞行阶段应包含至少 45 度的航向改变。航向改变的开始和结束应在离地 25 英尺高度以下进行。这个带拉平的 Carving 转弯是为了验证申请人是否有能力在着陆拉飘过程中改变航向, 并仍然能很好地控制降落伞。

A USPA S&TA, Examiner, Judge, or Board Member must verify all landings. The applicant must log the three landings on

the PRO Rating Application, which the verifying witness signs. The applicant may submit the completed application and videos to USPA Headquarters for processing.

所有着陆都必须由 USPA 安全和培训顾问、考官、裁判或董事会成员进行核实。这 3 次着陆必须记录到 PRO 评级申请表中，并由负责核实的见证者签名。然后申请人可提交申请和相关视频至 USPA 总部处理。

D. Annual Renewal Requirements

年度续期要求

Within the previous 12 months, the PRO-rating holder must perform all the following, verified by the signature of a current USPA S&TA, Examiner, Judge or Board member (the jumper may not sign for themselves) and submit a completed PRO Rating Renewal Application to USPA Headquarters with the current renewal fee:

在过去 12 个月内，PRO 评级持有者必须完成下列事项，并经由处在任期内的 USPA 安全和培训顾问、考官、裁判或董事会成员（申请人不得为自己签名续期）签字确认，并将填妥的 PRO 评级续期申请表提交给 USPA 总部，同时提交续期费用：

- Make at least 50 jumps.
至少进行过 50 次跳伞。
- PRO rating for wing loadings of 1.5:1 and less, completed **two** of the following requirements in the presence of a USPA S&TA, Examiner, Judge or Board Member (a requirement can be repeated):
对翼载小于或等于 1.5 的 PRO 评级，应在 USPA 安全和培训顾问、考官、裁判或董事会成员在场的情况下完成下列要求的其中 **2** 项（同一项可以重复）：
 - perform a stand-up landing, making the first contact and stopping within an area 40-feet long by 20-feet wide with a wing loading 1.5:1 or less
进行 1 次站降，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的区域内（翼载小于或等于 1.5）。
 - perform a Level 2 demo jump (as defined by USPA and accepted by the FAA) with a wing loading 1.5:1 or less in (USPA 定义的、联邦航空局认可的) 二级区域进行 1 次演示跳伞（翼载小于或等于 1.5）。
- To renew a HP endorsement for wing loadings of more than 1.5:1, the jumper must meet the requirements for PRO-rating renewal for wing loadings of 1.5:1 or less and complete two of the following requirements in the presence of a USPA S&TA, Examiner, Judge or Board member (a requirement can be repeated) while using a canopy loaded higher than 1.5:1:
对翼载超过 1.5 的 HP 认证（高性能伞控认证），必须在满足翼载小于或等于 1.5 的 PRO 评级续期要求的基础上，在 USPA 安全和培训顾问、考官、裁判或董事会成员在场的情况下，用翼载超过 1.5 的伞完成下列要求的其中 **2** 项（同一项可以重复）：
 - perform a carving accuracy landing with a 45-degree heading change as outlined in the HP section, making the first contact and stopping within an area 40-feet long by 20-feet wide
进行 1 次带 Carving 转弯的精准着陆，包含 HP 认证部分所列的 45 度航向改变要求，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的区域内。
 - perform a crosswind accuracy landing 90 degrees to the direction of the wind as outlined in the HP section, making the first contact and stopping within an area 40-feet long by 20-feet wide
进行 1 次侧风精准着陆，包含 HP 认证部分所列的 90 度垂直于风向的要求，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的区域内。
 - perform a Level 2 demo jump (as defined by USPA and accepted by the FAA)
在（USPA 定义的、联邦航空局认可的）二级区域进行 1 次演示跳伞。
- If the PRO-rating holder renews using a canopy size larger than the one originally qualified on, it becomes the smallest-size canopy the jumper may use for demonstrations.
如果用于续期评估的降落伞的尺寸大于最初获得 PRO 评级时所用的降落伞，则该尺寸降落伞成为演示跳伞中所允许使用的最小降落伞尺寸。

E. Lapsed-PRO-Rating Renewal Requirements

过期 PRO 评级的续期要求

To reinstate a PRO rating that has **expired less than two years ago**, the rating holder must do the following in the presence of a current USPA S&TA, Examiner, Judge, or Board member:

对于 PRO 评级过期不超过 2 年的人员，应在 USPA 考官、安全和培训顾问、裁判或董事会成员在场的情况下：

- for wing loadings of **1.5:1 and less**, perform two stand-up landings, making the first contact and stopping within an area 40-feet long by 20-feet wide.
对于翼载小于或等于 1.5 的，需进行 2 次站降，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的指定区域内。
- for wing loadings **more than 1.5:1**, meet requirements for wing loadings of 1.5:1 or less and perform two landings, one each crosswind and 45-degree heading change outlined in the HP section, making the first contact and stopping within an area 40-feet long by 20-feet wide.
对于翼载超过 1.5 的，需完成与翼载小于或等于 1.5 的跳伞相同的要求，进行 2 次着陆，且满足 HP 认证部分列出的侧风和 45 度航向改变要求，且首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的指定区域内。

If a PRO-rating holder allows their rating to lapse for **two years or longer**, they must meet the initial landing qualification requirements.

如果评级过期 2 年以上，则应满足最初的着陆表现要求。

If the canopy size the jumper uses for reinstatement is larger than the one originally qualified on, it becomes the smallest-size canopy the jumper may use for demonstrations.

如果用于续期评估的降落伞的尺寸大于最初获得 PRO 评级时所用的降落伞，则该尺寸降落伞成为演示跳伞中所允许使用的最小降落伞尺寸。

6-3 联邦航空局 7711-2 表格填写说明 FAA Form 7711-2

Parachute demonstration or exhibition jumps conducted into aviation events, congested areas on the surface, or open-air assemblies, require an FAA Certificate of Authorization to be issued by the FAA Flight Standards District Office with jurisdiction where the jump(s) will occur. [FAA Form 7711-2](#) — the application for that authorization — is located on both the FAA and USPA websites. Submit the application to the FSDO after completing the form using the following FAA instructions:

在航空活动、人员拥挤区域或露天人群集会地点进行演示跳伞或跳伞表演前，需要获得联邦航空局对跳伞地点有管辖权的当地飞行标准办公室颁发的授权证书。用于申请授权证书的表格为[联邦航空局 7711-2 表格](#)——该申请表可在联邦航空局和 USPA 的网站上找到。请根据联邦航空局的以下指引填写表格，然后向跳伞地点当地的飞行标准办公室提交申请表：

Organizers should present applications for parachute-jump authorizations made over or into a congested area or open-air assembly of people at least 10 working days before an event, if possible, to allow for processing time. The FSDO provides approval or denial of the application within five working days of receipt.

组织者应尽可能在活动前至少 10 个工作日提交在拥挤区域或露天人群集会进行跳伞的申请，以留出处理时间。当地飞行标准办公室在收到申请后 5 个工作日内批准或拒绝申请。

Description of items requested on FAA 7711-2 form:

联邦航空局 7711-2 表格中的填写项目的描述：

1. Name of organization

组织名称

Enter the organization sponsoring the event who retains sole responsibility for safeguarding persons and property on the surface. This person will be indicated as the holder of the Certificate of Waiver or Authorization. 填写主办活动的组织名称，该组织对地面人员和财产的安全负有唯一责任。此人将被列为豁免或授权证书的持有人。

2. Name of responsible person 负责人姓名 This individual must have been determined to be competent and knowledgeable concerning the terms and provisions of this Certificate of Authorization. The application may be submitted by the organizer for a sanctioned military team but must be submitted by a team member if not a sanctioned military team. The FAA considers this person responsible for ensuring the operational safety of the event on all authorization matters. 此人必须对本授权证书的条款和规定有足够的知识背景和能力。如果是由经批准的军方团队组织的活动，申请可由组织者提交；若非经批准的军方团队，则必须由团队成员提交。联邦航空局认定此人负责确保活动在授权事项上的作业安全。
3. Permanent mailing address 固定邮寄地址 This information refers to the holder of the Certificate of Authorization listed in either Item 1 or 2. If no organization is listed in Item 1 then the information pertains to the name in Item 2. 本信息与第 1 项或第 2 项中所列的授权证书持有者有关。如第 1 项中未列出组织，则此信息适用于第 2 项中的姓名。
4. State whether the applicant ... waiver pending ... 说明申请人是否.....豁免待定..... Nothing should be entered unless the application is for banner towing. 除非申请涉及横幅拖曳，否则无需填写。
5. State whether the applicant ... waiver denied... 说明申请人是否.....豁免被拒绝..... Nothing should be entered unless the application is for banner towing. 除非申请涉及横幅拖曳，否则无需填写。
6. FAR section and number to be waived 需豁免的联邦航空条例章节和编号 Enter "NONE." 填写“NONE”。
7. Detailed description of proposed operation 拟进行的作业的详细描述 Example: "A four-person skydiving exhibition with flags, banners, smoke and pyrotechnics." 示例：“一个四人的跳伞表演，带有旗帜、横幅、彩烟、烟火。”
8. Area of operation 作业区域 Example: "1.0 Nm in radius from a point 7.3 Nm on the CVG 270-degree radial from surface to 8,000 feet MSL" or Example: "1.0 Nm in radius from the center of W66 airport from surface to 6,000 feet MSL." 示例：“以 CVG 航点 270 度径向线 7.3 海里处为圆心，半径 1.0 海里的从地面到海拔 8000 英尺高度的区域”，或 示例：“以 W66 机场中心为圆心，半径 1.0 海里的区域”
9a. Beginning 开始时间 Enter the beginning date and time when the jump aircraft will arrive over the jump site; indicate if using local or UTC (GMT aka Zulu time). 填写跳伞作业飞机抵达跳伞地点上空的开始日期和时间；注明使用的是当地时间还是 UTC 时间（格林尼治标准时间，俗称 Zulu 时间）。 9b. Ending 结束时间 Enter the date and time the last jumper will be on the ground; indicate if using local or UTC. 填写最后一名跳伞者降落至地面的日期和时间；注明使用的是当地时间还是 UTC 时间。
10. (a) (b) (c) (d)

Enter the aircraft make and model (include N-number if known) to be used, back-up aircraft, pilot(s) name(s) certificate number(s), and home address.

填写飞行器的品牌和型号（包括飞行器的机尾编号，如已知）、备用飞行器、飞行员姓名、证书编号和家庭地址。

Items 11 through 16 are not required for parachuting authorizations; enter the jumpers' names, license and membership numbers and issuing organization either in the remarks block or on a separate sheet of paper attached.

第 11 至 16 项不是跳伞授权所必须的；跳伞者姓名、执照和会员编号及颁发组织可在备注栏或随附的单独纸张上填写。

名词解释

Glossary

A

A&P: 缩写, 在不同语境下有“组装和叠(备)伞”或“飞行器机身和动力装置机械师”两种含义

1. 组装和叠(备)伞, 即“Assemble and Pack”的缩写, 该表述被用于备伞卡(备伞叠伞记录卡)。

Assemble and Pack, used on reserve parachute packing record cards.

2. 飞行器机身和动力装置机械师, 即“Airframe and Powerplant Mechanic”的缩写。

Airframe and Powerplant Mechanic.

A LICENSE: A 执照

第一级的 USPA 执照, 表示跳伞者已通过学生阶段。持有 USPA A 执照的人员可以自行跳伞, 进行基本的团体自由落体跳伞和水上跳伞, 参加某些 USPA 大学比赛项目, 也自己叠主降落伞。

The first-level license that signifies that a skydiver has advanced beyond the student phase. Persons holding a USPA A License are able to jumpmaster themselves, perform basic group freefall jumps and water jumps, participate in certain USPA collegiate competition events, and pack their own main parachute.

AAD: “自动激活装置”(缩写)

见“AUTOMATIC ACTIVATION DEVICE”(自动激活装置)

ACCELERATED FREEFALL (AFF), USPA: 加速自由落体培训方法, 缩写 AFF

是在 Ken Coleman 的指导下制定并被 USPA 采用的 Harness-hold 自由落体跳伞学生培训方法。在最初的跳伞训练中, 持有 AFF 教练评级的 USPA 教练会陪同学生进行自由落体。

Harness-hold freefall skydiving student training discipline developed under Ken Coleman and adopted by USPA. AFF-rated USPA Instructors accompany the student in freefall during the initial training jumps.

AGL: 离地高度

指相对于地面的高度, 如 5000 feet AGL 表示离地高度 5000 英尺。

(译者注: AGL 与 MSL 对应, MSL 指海拔高度, 即离平均海平面的高度)

Above ground level. Refers to altitude, e.g., 5,000 feet AGL.

AIR: AIR 原则

“Altitude aware, In control, and Relaxed”的缩写, 即“高度意识, 保持受控, 状态放松”。

Acronym for "altitude aware, in control, and relaxed."

AIRCRAFT: 飞行器

指任何能在大气内飞行的机器或装置, 包括飞机、直升机、滑翔机、热气球等。就管制而言, 降落伞不被视为飞行器。

Any machine or device, including airplanes, helicopters, gliders, balloons, etc., capable of atmospheric flight. For the purposes of regulation, parachutes are not considered aircraft.

AIR SPEED: 空速

飞行中的飞机或降落伞相对于空气的速度。

The speed of an airborne aircraft or parachute, relative to the air.

ALTERATIONS: 改装

指降落伞任何组成部件在制造商出厂规格基础上的任何修改。另见“MAJOR ALTERATION”（大改）和“MINOR ALTERATION”（小改）。

Any change or modification to any part of the parachute assembly from its original manufacturer's specifications. (see also MAJOR ALTERATION and MINOR ALTERATION)

ALTIMETER: 高度表

一种测量距离某个水平面的高度的装置；对于跳伞者来说，通常用来测量其与预定跳伞着陆区域的高度差。另见“AUDIBLE ALTIMETER”（声音高度表）。

A device that measures height above the surface (altitude); for skydivers, typically above the intended skydiving landing area. (see also AUDIBLE ALTIMETER)

ANGLE FLYING: Angle 机动

一种涉及大范围水平移动的自由落体机动动作，跳伞者在空中横向移动，而非垂直下落。这种飞行可以以不同的俯仰角进行，飞行轨迹是倾斜的，身体姿态可以是腹部朝下或背部朝下。

A type of movement jump where skydivers travel across the sky instead of falling straight down. The flying can occur at various degrees of pitch with a diagonal trajectory either in a belly-to-earth or back-to-earth orientation.

ANGLE OF ATTACK: 攻角

是一个相对的俯仰角度（机翼或伞翼前缘相对朝上或朝下时），指飞机机翼或降落伞伞翼的翼弦相对于风速（而不是水平面）的夹角。

The relative pitch (leading edge up or down) angle of a wing measured between the chord line and the relative wind.

APPROACH ANGLE: 进近角

另见“GLIDE PATH”（下滑轨迹）

APPROPRIATELY RATED: 持有合适评级的

表示 USPA 教练或考官持有必要的针对特定培训方法的教学评级，以在符合基本安全要求的前提下执行某项特定任务。

Refers to a USPA Instructor or Examiner rated in the method-specific instructional discipline necessary to perform a particular task in accordance with the BSRs.

APT: 高度，位置，交通

APT 即“高度，位置，交通”的缩写，这项检查在降落伞下降过程中经常进行。

Acronym for "altitude-position-traffic," the check performed regularly while descending under canopy.

ARCH: 弓形身体姿态

跳伞者为了使身体正面朝向来流风而采取的姿态。具体描述为：臀部顶向前，背部弯曲；双腿 45 度伸展，脚尖绷直，膝盖与肩同宽，肩部和肘部夹角 90 至 120 度并放松，头部抬起。

Position skydivers use to orient the front of their torso to the relative wind. Described, it is hips forward with back arched; legs extended to 45 degrees, toes pointed; knees at shoulder width; arms bent 90-120 degrees at the shoulders and elbows and relaxed; head up.

ARTISTIC EVENTS: 艺术跳伞比赛项目

跳伞比赛项目，包括自由飞和自由式。

Skydiving competition events that include freeflying and freestyle skydiving.

AS 8015 (AEROSPACE STANDARD 8015): AS 8015 标准 (航太标准 8015)

试验标准和最低安全和性能要求的标准, 必须满足后才能获得技术标准规定 (TSO) 认证。作为 TSO C-23c 的标准的 AS 8015A 于 1984 年被采用, 取代了作为 TSO C-23b 的标准的 NAS 804。1994 年 6 月, AS 8015B 成为 TSO C-23d 的标准。

Standard of tests and minimum safety and performance requirements which must be met to receive approval under technical standard order (TSO) certification. AS 8015A, the standard for TSO C-23c was adopted in 1984 to supersede NAS 804, the standard for TSO C-23b. In June 1994, AS 8015B became the standard for TSO C-23d.

ASPECT RATIO: 展弦比 (长宽比)

是冲压空气式 (Ram-air) 降落伞的长度 (翼展) 与宽度 (翼弦) 的比值。

The aspect ratio of a ram-air parachute canopy is the ratio of its length(span) to its breadth(chord).

ASSISTED DEPLOYMENT: 协助开伞

指学生在教练的提示下执行的开伞程序, 开伞由学生完成, 但教练可以协助。

Refers to a pull sequence prompted or cued by the instructor where the student begins the sequence and is completed by the student but may be assisted by the instructor.

AUDIBLE ALTIMETER: 声音高度表

一种发出声音警报的高度表, 可以预先设定一个或多个提醒高度, 在跳伞者下落至这些高度时进行提醒。

(译者注: 国内跳伞者习惯称其为“哔哔哔”)

An alarm used by skydivers to alert them about reaching one or more pre-set altitudes.

AUTOMATIC ACTIVATION DEVICE (AAD): 自动激活装置 (AAD)

也常译作“自动开伞器”, 是一种独立的机械或机电装置, 安装在备用降落伞伞包内, 可自动在预先设定的高度、时间、终端速度百分比或这些参数的条件组合下, 启动备用降落伞。(联邦航空条例第 105 部分定义)

A self-contained mechanical or electro-mechanical device that is attached to the interior of the reserve parachute container, which automatically initiates parachute deployment of the reserve parachute at a pre-set altitude, time, percentage of terminal velocity, or combination thereof. (FAR 105 definition)

AUXILIARY PARACHUTE: 副伞

见“RESERVE PARACHUTE” (备用降落伞)

B**B LICENSE: B 执照**

第二级的 USPA 执照。持有 USPA B 执照的人员可以进行夜间跳伞, 可以在符合相关资格后申请 USPA 助理教练评级。

The second-level USPA license. Persons holding a USPA B License are authorized to perform night jumps, and when qualified, apply for a USPA Coach rating.

B-12s: 夹扣

有些降落伞背带上用于连接腿带的金属夹扣。通常指规格编号为 MS 22044 的金属部件, 最初被用在美国陆军 B-12 降落伞上。见“THREAD-THROUGH” (Thread-thru 式调节扣)。

Clip hardware sometimes used for leg-strap attachment on a parachute harness. Refers generally to the MS 22044 hardware originally used on the U.S. Army B-12 parachute assembly. (see THREAD-THROUGH)

BAG: D 包 (简称)

见“DEPLOYMENT BAG” (D 包)

BAG LOCK: D 包锁死

降落伞飞出伞包后，伞布仍留在 D 包中的降落伞故障。

A malfunction of a deployed parachute where the canopy remains in the deployment bag.

BARREL ROLL: 横滚

指在自由落体过程中跳伞者以自身（身高方向）为旋转轴进行滚转的动作。

A maneuver in which a skydiver rolls about their longitudinal axis.

BASE: 在不同语境下有“基准”或“基线边”两种含义**1. 基准**

进行自由落体编队飞行或降落伞编队飞行时，作为基准的某个人或某群人，其他跳伞者会朝此基准飞行聚集。

When building a freefall or canopy formation, the initial target individual or group of people to which the others fly.

2. 基线边

降落伞三边着陆航线中的第二边，跳伞者在着陆区域的下风区垂直于风向飞行的一边，飞完此边后跳伞者会转向逆风，朝着陆目标飞行。（译者注：请注意区分降落伞着陆的三边航线和飞机机场起降的五边航线，对于降落伞着陆，基线边为着陆航线的第二边，对于飞机的机场起降航线，基线边为航线的第四边）

Base (leg): The portion of the three-legged landing pattern where the jumper flies across the direction of the wind downwind of the landing area before turning for final approach into the wind toward the target.

BASE JUMPING: 低空跳伞

又译作定点跳伞，指用降落伞从固定位置上跳下的一种活动。B.A.S.E 四个字母代指四种常见的低空跳伞地点：B-Buildings（建筑物）、A-Antennae（天线）、S-Spans（桥梁）和 E-Earth（地表，指悬崖）。由于低空跳伞不符合联邦航空局对“物体从飞行中的飞行器落至地面”的定义，因此它不受联邦航空局的监管，也不受 USPA 的管辖。

（译者注：在飞机上低于常规跳伞高度出舱，也常称作“跳低空”，注意与这里说的低空跳伞是不同概念）

An activity involving the use of a parachute for descent from fixed objects. The acronym derives from the first initials of four possible launch categories: buildings, antennae, spans(bridges), and earth(cliffs). Because BASE jumping does not meet the FAA's definition of "the descent of an object to the surface from an aircraft in flight," it is not regulated by the FAA or addressed by USPA.

BASIC SAFETY REQUIREMENTS (BSRS), USPA: USPA 基本安全要求

缩写 BSR，是由 USPA 监督和发布的最低安全标准，通常被认为是可接受的安全跳伞标准。基本安全要求是跳伞者自主管理的基础。USPA 负责监督基本安全要求。

Minimum standards overseen and published by USPA and generally agreed upon as the acceptable standard for safe skydiving activities. The BSRs form the foundation of self-governing by skydivers. USPA oversees the BSRs.

BELLY FLYING: 腹飞

跳伞者腹部朝下（腹部朝地）的自由落体姿态，在编队跳伞中这种姿态被称作腹飞

Slang for FORMATION SKYDIVING or RELATIVE WORK where jumpers are falling with their bellies facing the earth.

BOARD OF DIRECTORS (BOD), USPA: USPA 董事会

USPA 章程中规定的每三年由 USPA 普通会员选出的代表；USPA 章程授权其对组织的事务、资金和财产进行一般管理和控制，并实现组织及章程的目标；USPA 董事会可从现任董事会成员中选举官员。USPA 董事会由以下人员组成：1. 国家级董事—由全体会员选举产生的董事；2. 区域董事—由各地区内的跳伞者选出并负责代表他们利益的董事。

Those representatives elected by the general members of USPA every three years as set forth in the USPA Bylaws; authorized by the bylaws to have general charge and control of the affairs, funds, and property of the organization and to carry out the objectives of the organization and its bylaws; elects officers from among current USPA Board members. The USPA Board of Directors consists of: 1. National Directors—those directors elected at large by the general

membership; 2. Regional Directors—those directors of a specified geographical area, elected by and responsible for representing the interests of the skydivers in a USPA Region.

BRAKE FIRE: 刹车意外释放

降落伞开伞过程中，刹车意外提前释放。

A premature brake release during the canopy deployment.

BRAKED FLARE: 从带刹车状态开始拉平

降落伞飞行紧急程序（CEP）之一，指在降落伞已经带有一定刹车量的情况下启动的拉平，在数种情况中会被使用，例如在过高的高度拉平后、带刹车转弯以避开着陆障碍物后，以及低转改出的紧急程序之后。此操作通常需要更快且更有力的拉平动作，以使降落伞对拉平的响应能够像全速飞行状态下启动的拉平一样。

One of the canopy-flight emergency procedures (CEPs) used in several situations such as after flaring too high, after a braked turn to avoid an obstacle on landing, and after a low-turn-recovery CEP. This maneuver generally requires a faster and more forceful flare to get the same response from the canopy as a flare from full flight.

BRAKED TURN: 带刹车转弯

降落伞飞行紧急程序（CEP）之一，用于在着陆时避开障碍物，这种情况下可能需要在较低高度进行转弯。此机动可减慢前进速度，减少高度损失，并在保持伞翼水平（着陆的第一优先事项）的同时，允许改变方向。

One of the canopy-flight emergency procedures (CEPs) used for object avoidance on landing, which may require a turn at a lower altitude. This maneuver slows forward speed, reduces altitude loss, and allows for a heading change while honoring the number-one landing priority of landing with a level wing.

BRAKES: 刹车

1. 指冲压空气式降落伞的方向操纵装置（另见“TOGGLES”）。

The steering controls of a ram-air parachute. (see also TOGGLES)

2. 指刹车的动作，其程度以增量表示（四分之一刹车、半刹车、深度刹车等），用以在稳定的飞行状态下控制速度和下降率。

The position of the parachute steering controls, measured in relative increments (quarter brakes, deep brakes, etc.), to control speed and descent in a stable state of flight.

BREAK OFF: 分离（动词）

团体自由落体或降落伞编队中，跳伞者互相分离的行为。

Act of a group of jumpers separating from a freefall or canopy group.

BREAKOFF: 分离（名词）

跳伞者停止团体编队活动并互相分开的程序。在自由落体状态下，跳伞者在预定高度开始进行 Tracking，以便在开阔区域安全开伞；在降落伞编队中，跳伞者在预定高度分离，以获得安全的间隔为着陆进近做准备。

Procedure in group skydiving where jumpers cease group activity and separate. In freefall, jumpers begin to track at a predetermined altitude for a clear area to open safely; jumpers building canopy formations break off at a predetermined altitude to gain safe separation and allow jumpers to prepare for a landing approach.

BREAKOFF ALTITUDE: 分离高度

在团体跳伞中计划分离的高度。

Planned altitude for initiating separation of jumpers during a group jump.

BRIDLE: 引导伞系带

一种通常由织带或条带制成的装置，将引导伞连接到 D 包或降落伞的伞布上。

The device, usually made of webbing or tape, connecting the pilot chute to the deployment bag or the canopy.

BSRs: 基本安全要求 (缩写)

见“BASIC SAFETY REQUIREMENTS, USPA” (USPA 基本安全要求)

C**C LICENSE: C 执照**

第三级的 USPA 执照。持有 USPA C 执照的人在符合资质的情况下可以申请 USPA AFF、IAD 和 Static-Line 教练评级，可以作为乘客参加 USPA 双人伞教练训练和评级更新跳伞，并可以参加中等海拔 (intermediate-altitude) 跳伞、开阔场地和一级区域的跳伞表演。

The third-level license issued by USPA. USPA C-license holders may apply when qualified for the USPA AFF, IAD, and Static-Line Instructor ratings, ride as passenger on USPA Tandem Instructor training and rating renewal jumps, and participate in intermediate-altitude jumps and Open Field and Level 1 exhibition jumps.

CANOPY: 降落伞伞布

降落伞的主要部分 (也可译为伞衣)，由薄膜布料组成，通过伞绳与降落伞背带相连，使跳伞者能够安全进行伞降。

(译者注: CANOPY 即降落伞的“伞”部分，很多语境下可以直接翻译为降落伞)。

The major component of the parachute system comprised of fabric membranes that connect to the parachute harness by suspension lines and provide the means for the jumper to descend safely.

CANOPY-FLIGHT EMERGENCY: 降落伞飞行紧急情况

Any canopy emergency that happens under a fully inflated parachute, anytime during the canopy descent or landing. 指在降落伞完全充气后，在伞降或着陆过程中的任何时间发生的任何降落伞飞行紧急情况。

CANOPY-FLIGHT EMERGENCY PROCEDURES (CEPS): 降落伞飞行紧急程序 (CEP)

A set of five skills used in response to a canopy emergency that happens under a fully inflated parachute anytime during the canopy descent or landing. The CEPs are bundled in a safety campaign called "Stay Alive, Practice Five."

由五项技能组成的技能集，用于应对在降落伞完全充气后的伞降或着陆过程中的任何时间发生的降落伞飞行紧急情况。这些降落伞飞行紧急程序被整合在名为“Stay Alive, Practice Five” (练五项，保周全) 的安全倡议中。

CANOPY FORMATION(CF); CANOPY RELATIVE WORK(CRW): 降落伞编队

1. 两个或多个打开的降落伞在下降过程中刻意相互接近或接触的机动。

The intentional maneuvering of two or more open parachute canopies in proximity to or in contact with one another during descent.

2. 国际航空运动联合会 (FAI) 的涉及降落伞编队建立的比赛项目。

The FAI competition discipline involving the building of canopy formations.

CANOPY WRAP: 降落伞缠绕包裹

一位跳伞者的降落伞伞布缠绕包裹在另一位跳伞者的身上。

When the canopy of one jumper is wrapped around another jumper.

CASCADE: 伞绳汇聚点

指两条或多条伞绳汇聚连接成一条伞绳的连接点。

The point where two or more lines of a canopy join into one.

CELL: 气室

降落伞伞布的各承重伞肋之间的弦向部分。有时伞布上任何被垂直伞肋分开的部分也叫做气室。

Chordwise section of a parachute canopy between the load-bearing ribs. Sometimes, any portion of a canopy separated by vertical ribs.

CERTIFICATED: 被认证的

指联邦航空局对降落伞组件、技师（降落伞装备师）、飞行员的认证状态。

Refers to FAA-approval status of parachute components, technicians (riggers), and aircraft pilots.

CHECK OF THREES: 三个三检查

登机后进行的跳伞前的装备自检：1. 检查三环释放系统和 RSL 是否正确组装；2. 检查背带三点的卡扣是否到位或背带走线是否正确，以及松紧程度；3. 检查三个操作把手是否到位—主伞开伞把手、切伞把手、备伞开伞把手。

Pre-jump equipment self-check performed in the aircraft: check three-ring release system and RSL for correct assembly; check three points of harness attachment for snap assembly or correct routing and adjustment; check three operation handles—main activation, cutaway, reserve—in place.

CHORD: 翼弦

伞翼或机翼任意点的前缘到后缘间的最长尺寸。

The longest dimension from the front to the back of a wing at any given point along the span.

CLEARED: 获准的

指学生收到了 USPA 教练的签名，获准进入下一阶段的学习。

Refers to a student who has received a signature from a USPA Instructor to advance.

CLIMB OUT: 爬出机舱

跳伞者把自己置于舱门内或门附近，或挂在飞机外部的突起物或结构上准备跳出，团体跳伞常用。

The act of a jumper positioning themselves in or near the door or on protuberances or structures outside the aircraft to prepare for launch, usually with a group.

CLOSING LOOP: 关包绳

一个绳带，当其穿过降落伞伞包的关包盖片上的孔眼并用关包针锁定时，可以使降落伞在开伞前保持被关在伞包中。

A lace that when threaded through eyelets in the parachute container flaps and locked with a closing pin, keeps the parachute contained until activation.

COACH: 科目教练

提供进阶跳伞训练的非评级人员。另见“COACH, USPA”（USPA 助理教练）

A non-rated operative who provides advanced skydiving training. (see also COACH, USPA)

（译者注：这里将提供进阶跳伞类型培训（如翼装、自由飞等）的教学人员称为“科目教练”，或视具体情况称为“翼装教练”、“自由飞教练”等。USPA 没有像教学评级体系一样，对翼装、自由飞等进阶跳伞类型设置专门的评级体系，因此科目教练是非评级人员，其英文表述“Coach”与 USPA 教学评级体系中的“Coach, USPA”（即 USPA 助理教练，常省略 USPA）基本一致，应注意在具体语境下进行区分。）

COACH, USPA: USPA 助理教练

USPA 的入门级教学评级，持有者可以教授一般通用内容（第一跳课程中的非特定培训方法部分），可以进行团体自由落体技能培训和伞控培训，也可以与学生跳伞，以上均需要在 USPA 教练的监督下进行。

The entry-level USPA instructional rating whose holder may teach the general (non-method-specific) sections of the first-jump course and conduct group-freefall and canopy-skills training and jumps with students, all under the supervision of a USPA Instructor.

COACH JUMP: Coach 跳

指 USPA 助理教练和任何其他人一起跳的，且向该人提供指导或评价的跳伞。

A coach jump is any jump where a USPA Coach jumps with any person and provides instruction and/or critique to that person.

COLLAPSIBLE PILOT CHUTE: 可缩引导伞

一种手动释放式引导伞，开伞后引导伞会自动缩起来。

A hand-deployed pilot chute that automatically collapses after deployment.

COLLAPSIBLE SLIDER: 可缩滑块布

一种滑块布，可以压紧或卷起来，以减少空气阻力。另见“SLIDER”（滑块布）

A slider rigged so the jumper can compress or wrap it to reduce drag (see also SLIDER).

COLLINS LANYARD: 柯林斯系绳

指一条连接 RSL 的系绳，其功能是：连接 RSL 的一侧组提带发生断裂时，可同时释放不连接 RSL 的那一侧组提带。

A lanyard attached to the reserve static line that is designed to release the non-RSL side riser in the event the RSL-side riser breaks.

CONTAINER: 伞包

降落伞系统的一部分，在降落伞打开之前包裹储存着折叠好的降落伞伞布、D 包和引导伞。

The portion of the parachute system that closes around and stores the folded parachute canopy, deployment bag and pilot chute until deployment.

CORK: 软木塞

在高速的团体自由落体机动中，失去控制并迅速减速。

During high-speed group freefall maneuvers, to lose control and decelerate rapidly.

CRW: 降落伞团体

见“CANOPY FORMATION”（降落伞编队）

CROSS BRACED: 交叉支撑

一种降落伞伞布的设计，在伞的垂直伞肋间加入纵向（即伞布前后方向）的桁架结构伞肋以使伞翼在飞行中变得又平又稳固。

Refers to a canopy designed with longitudinal trussing between the vertical ribs to flatten and stiffen the wing in flight.

CROSS-CONNECTORS: 组提带连接带

指连接在组提带之间的带子。用于降落伞编队时，带子的连接方向只能是前后组提带连接，作用是防止进行连接的跳伞者顺伞绳方向向上滑动，这对平面式编队尤其重要。

Straps attached between the risers. Used for canopy formation, they should be from front to rear only to prevent the docked jumper from sliding back up the lines. Especially important for plane formations.

CROSSPORT: 气室间的通风切口

在降落伞结构肋上的通风切口，用来平衡相邻两个气室之间的气压。

A vent cut into the structural rib of a parachute canopy to equalize air pressure between two cells.

CROSSWIND: 侧风

也译为横风，指垂直于风向。

Perpendicular to the direction of the wind.

CUT AWAY: 切伞 (动词) CUTAWAY: 切伞 (名词、形容词)

跳伞者在启动备伞前断开主伞的程序。在以下情景中使用：1. 主伞发生故障，须要防止与展开的备伞纠缠的情况下；2. 在降落伞与另一个跳伞者缠上的情况下；3. 在强风导致跳伞者在着陆后被伞拖曳的情况下。

Procedure where the jumper releases from the main parachute prior to activating the reserve parachute. Used in the event of a main-parachute malfunction to prevent an entanglement with the deploying reserve; in the event of a canopy entanglement with another jumper; and also in case the wind causes the canopy to drag a jumper after landing.

CUTAWAY HANDLE: 切伞把手

双把手紧急系统中的其中一个枕状或环柄状的把手，通常位于跳伞者主支撑带的右侧，用于启动切伞。

Pillow or loop handle of a two-handled system, normally located on the right side of the jumper's main lift web, used to initiate a cutaway.

D**D-BAG: D 包 (缩写)**

见“DEPLOYMENT BAG” (D 包)

D LICENSE: D 执照

第四级也是最高级的 USPA 执照。USPA D 执照持有者可以参加国家级别的所有比赛，当符合相应条件时可申请 USPA 教练和熟练度评级，并可以参加高海拔跳伞。

The fourth and highest level of license issued by USPA. USPA D-License holders may participate in all competitions at the national level, apply when qualified for all USPA instructional and proficiency ratings, and participate in high-altitude jumps.

DECISION ALTITUDE: 决断高度

发生紧急情况时，跳伞者必须在这个高度以上决定采取什么动作并执行动作。

A predetermined altitude at which you must decide and act during an emergency.

DELTA: 三角姿势

一种自由落体姿势，双腿伸展，手臂向后，开始向前下潜俯冲。

Freefall position with legs extended and arms back to initiate a forward dive.

DEMONSTRATION JUMP (DEMO): 演示跳伞 (DEMO)

见“EXHIBITION JUMP” (跳伞表演)

DENSITY ALTITUDE: 密度高度

相对于海平面标准大气压的空气密度的表达式。飞行员计算气压高度和温度，并与标准温度下的等效海拔高度进行比较。

An expression of air density relative to standard atmospheric pressure at sea level. The pilot calculates pressure altitude and temperature and compares the result with an equivalent altitude MSL at standard temperature.

DEPLOYMENT: 开伞

指伞包被打开后，降落伞从伞包中抽出来，降落伞系统在充气前完全伸展。

(译者注：大部分情况下，Deploy 或 Deployment 可译作开伞。在描述降落伞打开过程时，该词特指降落伞从伞包中飞出，包括伞绳在内的降落伞系统铺展开来的阶段，注意在此阶段伞布尚未开始充气。)

After activation, extraction of the parachute from the container and full extension of the system prior to inflation.

DEPLOYMENT BAG: D 包

一个中介包裹袋，配置在主伞上时称作 D 包，在开伞过程中，伞绳还未完全伸展开之前，它包裹着叠好的降落伞。

(译者注：主伞一般使用 D 包，备伞一般使用飞包，与 D 包不同的是，飞包不与降落伞连接)

Intermediate container, also known as a D-bag, for a main parachute or a freebag for a reserve parachute, that contains the folded parachute through complete line deployment.

DEPLOYMENT DEVICE: 开伞装置

启动降落伞展开过程的装置（即 Static Line 或引导伞）。

A device that initiates the deployment of a parachute (i.e. static line or pilot chute).

DESCENT RATE: 下降率

飞机或降落伞的速度的垂直分量，通常以“英尺/分钟”为单位。

The downward horizontal speed of an aircraft or parachute, usually measured in feet per minute.

DIRECT SUPERVISION: 直接监督

1. 指监督者直接在场的情况下对某事项进行的专注监督，监督者对其正确进行负有个人责任（USPA 定义）。

The attentive oversight of an activity taking place in the immediate presence of the supervisor, who is personally responsible for the proper conduct of the activity (USPA definition).

2. 持证降落伞装备师亲自监督未持证人员叠主伞，以确保其正确操作，并对该次叠伞负责（联邦航空条例第 105 部分定义）。

另见“SUPERVISION”（监督）

A certificated rigger personally observes a non-certificated person packing a main parachute to the extent necessary to ensure that it is being done properly, and takes responsibility for that packing.(FAR 105 definition)(see also SUPERVISION)

DIVE BLOCKS: 俯冲把手

前组提带上的把手（不是绳环），用于促使降落伞俯冲。

Hand grips (not loops) on the front risers to facilitate diving the canopy.

DIVE LOOPS: 俯冲环

前组提带上的环状把手，用于促使降落伞俯冲。

Handles on the front risers to facilitate diving the canopy.

DIVING EXIT: 俯冲出舱

又译作下潜式出舱，指不爬出机舱，直接从飞机中跳出，以稳定地跳入相对气流。

Launching out of an aircraft without a climb out to achieve a stable entry into the relative wind.

DIVING (FREEFALL): (自由落体的) 俯冲

向目标迅速俯冲，然后以受控的方式接近目标。

To rapidly descend toward and then make a controlled approach relative to a target.

DOCK: 连接

在自由落体时与另一个跳伞者进行受控的接触；或者在建立降落伞编队时，与另一个跳伞者的降落伞伞布进行受控的接触。

To make physical controlled contact with another skydiver while in freefall; or, when building canopy formations, with another jumper's canopy.

DOWNWIND: 下风向

1. (形容词) 气流流向的方向。

The direction toward which the air is moving.

2. (形容词或副词) 在下风处。

positioned farther along the wind's path.

3. (名词) 顺风着陆。

a downwind-facing landing.

DOWNWIND LEG: 下风边

降落伞三边着陆航线的第一边, 在该边飞行时, 风从跳伞者背后吹来 (顺风)。

(译者注: 请注意区分降落伞着陆的三边航线和飞机机场起降的五边航线, 对于降落伞着陆, 下风边为着陆航线的第一边, 对于飞机的机场起降航线, 下风边为航线的第三边)

The portion of the landing approach flown with the wind blowing from behind the jumper.

DROGUE: 减速伞

一种用来让物体在气流中减速的拖曳装置, 在跳伞中, 用以调节双人伞的下落速率。

A trailing drag device used to retard the movement of an object through the air, used in skydiving to regulate the fall rate of tandem skydivers.

DROGUEFALL: 带减速伞下落阶段

在双人伞跳伞中, 在自由落体阶段和主降落伞展开阶段之间的一个带减速伞下降的阶段。

In tandem skydiving, the portion of the descent where a drogue has been deployed between freefall and main-parachute deployment.

DROP ZONE: 降落区

1. 指跳伞机构或预定的降落伞降落区 (USPA 定义)。

Skydiving establishment or intended parachute landing area (USPA definition)

2. 指任何跳伞者或其他物体通过降落伞降落至其范围内的预定区域, 该区域的中心点以其与最近的甚高频全向无线电信标 (VOR) 的距离 (单位为海里) 表示 (当该距离小于或等于 30 海里时), 如果与最近的 VOR 的距离超过 30 海里, 则以其与最近的机场或城镇 (仅限海岸与陆地测量局世界航图或区域航图收录的机场或城镇) 的距离表示。(联邦航空条例第 105 部分定义)。另见“SANCTIONED DROP ZONE” (获批的降落区)。

Any pre-determined area upon which parachutists or objects land after making an intentional parachute jump or drop. The center-point target of a drop zone is expressed in nautical miles from the nearest VOR facility when 30 nautical miles or less; or from the nearest airport, town, or city depicted on the appropriate Coast and Geodetic Survey World Aeronautical Chart or Sectional Aeronautical Chart, when the nearest VOR facility is more than 30 nautical miles from the drop zone. (FAR 105 definition) (see also SANCTIONED DROP ZONE)

(译者注: 本单词在大多数语境下可直接代指跳伞基地, 除部分必须翻译为“降落区”以避免混淆的语境, 本书的翻译中一般不对降落区和跳伞基地两个概念做特别区分。)

DUAL ASSEMBLY: 双降落伞系统

指双降落伞系统, 包括主伞和备伞、背带和伞包系统, 以及所有其他组件。

Refers to a two-canopy parachute system. Includes the main and reserve canopies, harness-and-container system, and all other components.

E

ELLIPTICAL: 椭圆伞型

指一类锥形或近似椭圆形的平面形状的降落伞。

Refers to a class of canopies with a tapered or approximately elliptical planform.

EMERGENCY PARACHUTE: 应急降落伞

一种经认证的用于紧急情况的降落伞，通常指飞行员所带的降落伞。

A certificated parachute which is intended for emergency use; typically, the parachute a pilot wears.

END CELL: 末端气室

降落伞伞布两侧末端的弦向部分。

The last chordwise section of a parachute canopy on either end.

END-CELL CLOSURE: 末端气室不完全充气

末端气室的充气不完全，是开伞中常遇到问题，一般可以解决。

Deflated end cell. Routine opening problem, usually correctable.

ENDORSEMENT: 认证

1. 为某人或某物做背书认可或支持的行为。

An act of giving approval or support to someone or something.

2. 指在现有评级基础上增加的认证，例如在 PRO 评级上增加的高性能伞控认证，或在双人伞教练评级基础上增加的制造商认证。

A certification that is an addition to an existing rating, for example a High-Performance Endorsement added to a PRO rating or a manufacturer's endorsement added to a tandem rating.

EXAMINER, USPA: USPA 考官

教学评级的最高级别。考官是经验丰富的 USPA 教练，满足了额外的熟练度要求，并通过了一系列与跳伞相关的科目的笔试。考官拥有 USPA 安全和培训顾问的所有特权。

The highest level of the instructional rating program. An Examiner is an experienced USPA Instructor who has met additional proficiency requirements and passed a series of written examinations on a wide variety of skydiving-related subjects. An Examiner has all the privileges of a USPA Safety and Training Advisor.

EXHIBITION JUMP: 跳伞表演

有时也称为展示跳伞，指在已有的降落区以外的地方进行的跳伞，其目的是为了奖励、报酬或推广，主要是面向观众进行的。

An exhibition jump, also called a display or demonstration jump, is a jump at a location other than an existing drop zone done for the purpose of reward, remuneration, or promotion and principally for the benefit of spectators.

EXIT POINT: 出舱点

跳伞者离开飞机的位置所对应的地面点。

The point on the ground over which skydivers leave the aircraft.

EXIT WEIGHT: 出舱重量

跳伞者及其身上所有装备的总重量。

The combined weight of the jumper and all their equipment for that jump.

EXTRAORDINARY SKYDIVE: 特殊跳伞

夜间跳伞、水上跳伞、海拔 15000 英尺以上的跳伞、跳伞表演、含计划内切伞的跳伞，以及其他需要特殊设备和特殊程序的大多数跳伞者所不熟悉的跳伞类型。

Night jump, water jump, jump from above 15,000 feet MSL, exhibition jump, pre-planned cutaway jump, and other jumps requiring special equipment and procedures that might be unfamiliar to most jumpers.

F

FAA: 联邦航空局 (缩写)

见“FEDERAL AVIATION ADMINISTRATION” (联邦航空局)

FAI: 国际航空运动联合会 (缩写)

见“FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE” (国际航空运动联合会)

FARMER MCNAST: 臭脸农民头

黑话，用来代指对跳伞不友好的降落区附近的邻居，他们与跳伞者的关系很紧张或已经中断沟通。

Slang term for a disenchanted drop zone neighbor with whom communications with jumpers are strained or have broken down.

FEDERAL AVIATION ADMINISTRATION (FAA): 联邦航空局

美国交通部的一个机构，其主要职能和责任是管理国家的空中交通，包括所有民用飞行器和组件的认证，所有民航飞行员、机械师和装备师 (Rigger) 的执照发放，以及联邦机场协助计划的管理。

An agency of the U.S. Department of Transportation whose primary function and responsibility is to control the nation's air traffic, including the certification of all civil aircraft and accessories, licensing of all civil pilots, mechanics, and riggers, and administration of the Federal Aid to Airports Program.

FEDERAL AVIATION REGULATIONS (FARS): 联邦航空条例

缩写 FAR，指联邦法规中关于航空的部分。

The parts of the U.S. Code of Federal Regulations that apply to aviation.

FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE (FAI): 国际航空运动联合会

一个管理所有航空运动、认证所有官方航空和航天的纪录，以及管理官方国际比赛的国际组织。在各国通过一个非盈利的国家航空机构来运行。

An international organization that governs all aviation sports, certifies all official aviation and space records, and governs official international competitions. Operates through a non-profit National Aero Club in each country.

FINAL APPROACH: 最后进近

指跳伞者或飞机着陆前所飞行的最后一段。

(译者注: 请注意区分降落伞着陆的三边航线和飞机机场起降的五边航线, 对于降落伞着陆, 最后进近边为着陆航线的第三边, 对于飞机的机场起降航线, 最后进近边为航线的第五边)

The final portion of flight before a jumper or aircraft lands.

FLARE: 在不同语境下有如下含义

1. 拉平

(动词) 操作降落伞时, 把降落伞的下降速度在短时间内转换成升力的动作。

Under canopy: To convert the downward speed of a parachute momentarily into lift.

2. 减速接近

(动词) 自由落体时, 在接近团体编队之前减速。

In freefall: To decelerate prior to approaching a formation.

3. 拉平的动作

(名词) 该单词除了上面的动词用法, 还可以直接作为名词使用。

The act of flaring.

4. (名词) 载荷分配薄膜

在某些降落伞上使用的一种薄膜，用来分配降落伞的负载到伞绳连接点上。

A membrane used to distribute the load of a parachute at the line attachment points of some canopies.

FLAT TURN: 平转

降落伞在带刹车飞行状态下进行的一种转弯，用以在转弯时减少高度损失。

A canopy turn performed at braked flight that conserves altitude.

FLOATER: 外挂出舱者

指处在飞机外部，并稍早于作为自由落体团体基准（Base）的人跳离飞机的跳伞者，另见“BASE”（基准）。该跳伞者在基准的下方相对于地平线移动。

A jumper positioned outside the aircraft to leave slightly prior to the person or group designated as the target for the initial freefall formation (see also BASE). A floater maneuvers from a position below the base relative to the horizon.

FLOATER EXIT: 外挂出舱

指在爬出机舱后，从飞机外侧跳出，以迎风姿势稳定地跳入相对气流。常见的三种外挂出舱位置是舱门前部外挂出舱、舱门中部外挂出舱和舱门后部外挂出舱。

After a climb out, launching from outside the aircraft to achieve a presented, stable entry into the relative wind. Three common positions in the door are front, center and rear floater.

FOREIGN PARACHUTIST: 外籍跳伞者

既不是美国公民也不是居住在美国的外国人，在美国境内使用非美国制造的降落伞装备参与跳伞的跳伞者（联邦航空条例第 105 部分定义）。

A parachutist who is neither a U.S. citizen nor a resident alien and is participating in parachute operations within the United States using parachute equipment not manufactured in the United States.(FAR 105 definition)

FORMATION SKYDIVING (RELATIVE WORK): 团体跳伞

1. 两个或两个以上自由落体的跳伞者相互进行的空中机动，通常组成一定几何形状的队形。2. 腹飞比赛项目。

1. Aerial maneuvers by two or more freefalling skydivers with each other, usually to form geometric formations. 2. Competition discipline of belly flying.

FREEBAG: 飞包

一个中介包裹袋，在开伞过程中，伞绳还未完全伸展开之前，它包裹着叠好的降落伞，但不附连在降落伞上，一般用于备伞。

Intermediate container that contains or constricts the folded parachute through complete line deployment that is not attached to the deploying parachute; generally used with reserve parachutes.

FREEFALL: 自由落体

指从出舱到降落伞开伞之间的阶段，对于跳伞者，降落伞由跳伞者手动打开或由其自动打开，对于空投物，则降落伞自动打开。（联邦航空条例第 105 部分定义）

The portion of a parachute jump or drop between aircraft exit and parachute deployment in which the parachute is activated manually by the parachutist at the parachutist's discretion or automatically, or, in the case of an object, is activated automatically.(FAR 105 definition)

FREEFLY: 自由飞

1. 指在与其他跳伞者无连接的情况下出舱。

To exit unlinked with other jumpers.

2. 指一种不受限制的自由落体类型，特征是以多种姿势受风。另见“SIT FLYING”（坐飞）和“HEAD DOWN”（倒飞）

An unrestricted freefall discipline characterized by varied presentations to the relative wind. (see also SIT FLYING and

HEAD DOWN.)

3. 指自由飞跳伞比赛项目

The competition artistic event of freely.

FREESTYLE: 自由式

1. 指一种单人的自由落体类型，过程中包含编排好的、多姿态的、静态和动态动作。

A solo freefall discipline that involves choreographed multi-orientation static and dynamic maneuvers.

2. 指自由式跳伞比赛项目，跳伞者与一位摄影者组队参加比赛。

The competition event of freestyle performed as part of a team with a camera flyer (freestyle skydiving).

FULL FLIGHT: 全速飞行

打开的正常的降落伞在无操作输入情况下的稳定飞行状态。

The stabilized state of input-free canopy flight under an open and fully functioning parachute.

FUNNEL: 漏斗效应

指失去稳定性的自由落体团体编队，通常原因是其中一个或多个跳伞者飞出了自己的位置，导致编队成员将队形压塌，然后翻盖到队友身上。

A freefall skydiving formation that has become unstable, usually due to one or more jumpers flying out of position, causing the participants to collapse the formation and land on top of each other.

G

GLIDE: 滑翔

降落伞的下降运动，由垂直和水平运动相结合。

The combined horizontal and vertical movement of a descending canopy.

GLIDE ANGLE: 下滑角度

见“GLIDE PATH”（下滑轨迹）

GLIDE PATH: 下滑轨迹

降落伞向地面落点飞行时的轨迹。

(译者注：类似飞机的下滑道)

The trajectory of a parachute as it descends in flight toward a landing point on the ground.

GO-AROUND: 盘旋

指飞机在跳伞高度兜圈。

(译者注：注意与飞机的“复飞”区别)。

An in-flight operation where the aircraft circles at jump altitude.

GOVERNANCE MANUAL, USPA: USPA 管理手册

USPA 章程和细则的官方汇编。

The official bound collection of the USPA Constitution and Bylaws.

GROUND SPEED: 地速

飞机或降落伞相对于地面的速度。

The speed of an airborne aircraft or parachute relative to the ground it traverses in a given period of time.

GROUP MEMBER: 团体会员

指承诺遵守 USPA 基本安全要求的跳伞基地，其能提供 USPA 设计的首跳课程，雇佣持有 USPA 教练评级的教练，以及提供符合 USPA 要求的跳伞装备。在 USPA 团体会员跳伞基地，所有被允许自我监督的跳伞者必须持有有效期内的 USPA 会员资格。

Skydiving centers that have pledged to follow USPA Basic Safety Requirements, including providing USPA-developed first-jump courses, using current USPA-rated instructors and providing USPA-required skydiving equipment. At USPA Group Member skydiving centers, all skydivers cleared for self-supervision must be current USPA members.

H**HAALR: “方向，高度，弓形，腿形，放松”**

A freefall sequence acronym used by students to maintain control and stability check "heading, altitude, arch, legs, relax." 是学生在自由落体阶段用于保持控制和稳定性的检查流程的缩写，代表“方向（Heading）、高度（Altitude）、弓形（Arch）、腿形（Legs）、放松（Relax）”。

HAND-DEPLOYED PILOT CHUTE: 手动释放式引导伞

一种在自由落体过程中用手扔出的小伞，用来把主伞从伞包中抽出。另见“PULL OUT”（拉出式开伞）和“THROW OUT”（抛出式开伞）。

A small parachute thrown by hand in freefall to extract the main parachute from its container.(see also PULL OUT and THROW OUT)

(译者注：手动打开主伞的方式分为两类：1.释放引导伞；2.拉出开伞拉索。引导伞分为两种：一是抛出式引导伞，即 Throw-out Pilot Chute, 简称 TOP, 二是拉出式引导伞，即 Pull-out Pilot Chute, 简称 POP。最常见的主伞开伞方式是抛出式引导伞：跳伞者抛出引导伞，引导伞拉出关包针，从而释放主伞；其次为拉出式引导伞：跳伞者先拉出关包针，然后拉出叠在伞包内部的引导伞，从而释放主伞。通过开伞拉索打开主伞的方式较少见，它通过拉动开伞拉索释放弹簧引导伞，从而打开主伞，这种开伞方式主要用于备伞的打开，有时会被用于一些军事训练用的降落伞主伞，少数的跳伞学生培训计划中也会使用这类主伞开伞方式。)

HARD DECK: 硬甲板高度

是一个预先设定的高度，在此高度上，跳伞者必须完成某项动作，或者在此高度下，跳伞者不得再做某动作。例如，切伞的硬甲板高度为 1000 英尺，低于此高度时跳伞者不应切伞，除非遇到主伞和备伞分处两边（downplane）的双伞情形。

A predetermined altitude above which an action must occur or below which an action must not occur. For example, the cutaway hard deck is 1,000, below which a jumper should not cut away, unless they are experiencing a downplane.

HARNESS: 背带

指降落伞的背带，是降落伞系统中用于绑定跳伞者的织带部分。

The webbing of a parachute system that surrounds and retains a jumper.

HARNESS-AND-CONTAINER SYSTEM: 背带和伞包系统

降落伞系统的主要部分，通常是合一起的，跳伞者用来穿着跳伞。它装载降落伞伞布和一些附属部件。

The major component of a parachute system, usually unitized, which the jumper dons for the jump. It contains the canopies and certain accessory devices.

HARNESS HOLD: Harness Hold 培训方法

一种跳伞训练方法，在该方法中，学生以独立的单人自由落体跳伞为目标进行训练，但至少有一名 USPA AFF 教练陪同，直到满足基本安全要求中允许对自由落体进行自我监督的要求。在前几次跳伞时，AFF 教练会在和学生一起出舱时抓稳学生降落伞的背带，以辅助学生。

A skydiving training discipline where a student is trained for independent, solo freefall but is accompanied by at least one USPA AFF Instructor until meeting the requirements in the BSRs for self-supervision in freefall. On the initial jumps,

the AFF Instructor(s) assist the student on exit via a harness grip.

HEAD DOWN: 倒飞

指头朝下，身体垂直或近乎垂直于地面的自由飞姿态。

Inverted vertical or nearly vertical freeflying orientation.

HIGH-PERFORMANCE LANDING AREA: 高性能着陆区

指跳伞基地指定的，与常规着陆区分开的，供跳伞者进行高性能着陆的区域。

An area at a drop zone that DZ management has designated as separate from the landing area where standard landings take place, allowing canopy pilots to perform high-performance landings.

HIGH-SPEED STALL: 高速失速

指降落伞在以较高速度俯冲或转弯的过程中，因过快或过猛地操作组提带或刹车而引起的降落伞失速的现象。高速失速发生迅速且难以预测，比低速失速更加危险。另见“STALL”（失速）、“TOGGLE STALL”（刹车失速）和“REAR-RISER STALL”（后组失速）。

A parachute stall in a dive or turn at higher airspeed, induced by applying too much input or input too abruptly with risers or toggles. They happen quickly and less predictably than the low-speed stalls, making them much more dangerous. (see STALL, TOGGLE STALL, and REAR-RISER STALL)

HOOK KNIFE: 伞刀

有内刃的钩形刀。在某些紧急情况下用来切断有问题的线绳或降落伞部件。

A hook-shaped knife with an inside cutting edge. Used in certain emergencies to sever problem lines or components of a parachute system.

HOOK TURN: 急转

根据联邦航空局的定义，急转是指在任何一组机动中，导致降落伞在超 60 度的转弯中，滚转角度与垂直方向夹角超 45 度，和/或俯仰角度与水平面夹角超 45 度的机动动作。

Per the FAA: "A hook turn is a maneuver in any maneuver sequence that causes the canopy to roll at an angle in excess of 45 degrees from vertical and /or to pitch up or down at an angle in excess of 45 degrees from horizontal while executing a turn in excess of 60 degrees."

HOOKE HARNESS: 胡克安全带

一种单点式飞行器乘客安全带系统，可以配合降落伞背带使用，由杰克·胡克（Jack Hooker）设计。

A single-point aircraft passenger restraint system that integrates with a parachute harness. Designed by Jack Hooker.

HORSESHOE: 马蹄铁故障

降落伞的部分故障的其中一种，已离开伞包的降落伞的一部分与跳伞者或其装备缠在一起。

A partial parachute malfunction where part of the deployed parachute is entangled with the jumper or his or her equipment.

I&R: 检查并重新叠备伞（缩写）

见“INSPECT AND REPACK”（检查并重新叠备伞）

IAD: 教练辅助开伞培训方法（缩写）

见“INSTRUCTOR-ASSISTED DEPLOYMENT”（教练辅助开伞培训方法）

INITIATED DEPLOYMENT: 协助执行开伞

指学生在教练的提示下执行开伞程序，但可以由教练替学生完成。

Refers to a pull sequence prompted or cued by the instructor where the student begins the sequence but may be completed by the instructor.

INSPECT AND REPACK: 检查并重新叠备伞

降落伞装备师使用的术语，缩写“I&R”，指检查并重新叠备伞。

Rigging term used on reserve parachute packing data cards.

INSTRUCTIONAL RATING MANUAL(IRM), USPA: USPA 教学评级手册

教学评级持有者的教师指南，也是教学评级考生的培训手册。

The teacher's guide for instructional rating holders and training manual for instructional rating candidates.

INSTRUCTOR RATING COURSE, USPA: USPA 教练评级课程

在 USPA 总部登记的课程，用于培训申请人，使其具备获得教练评级的资格，并对申请人进行考核。

A course registered with USPA Headquarters to train, qualify, and test applicants for the USPA Instructor rating.

INSTRUCTOR, USPA: USPA 教练

获得四种培训方法（AFF、IAD、Static Line、双人伞）中的一种或多种评级的 USPA 教练评级的持有者，是 USPA 教学评级体系的中层。USPA 教练可以培训和认证学生获得 USPA A 执照，监督 USPA 助理教练，并有资格被任命为 USPA 安全和培训顾问。

The holder of a USPA Instructor rating qualified in one or more of four methods of instruction: accelerated freefall (AFF), instructor-assisted deployment, static line, or tandem. The mid-level of the USPA instructional rating hierarchy. A USPA Instructor may train and certify a student for the USPA A License, supervise USPA Coaches, and is eligible for appointment as USPA Safety and Training Advisor.

INSTRUCTOR-ASSISTED DEPLOYMENT(IAD): 教练辅助开伞培训方法 (IAD)

一种被动开伞的跳伞培训方法，用于为学生提供初始的跳伞训练。IAD 教练控制手动释放式的引导伞，学生就位并跳伞，同时教练释放引导伞。

A method of passive deployment used for training skydiving students making their initial jumps. A USPA IAD Instructor controls a hand-deployed pilot chute while a student moves into position and jumps, at which point the instructor releases the pilot chute.

J**JUDGE: 裁判**

评估竞赛选手表现的官员。USPA 在地区和国家两级授予裁判评级。FAI 则可授予国际认可的裁判评级。

The official who evaluates a competitor's performance. USPA issues judge ratings at both the regional and national levels. The FAI issues a rating for internationally recognized judges.

JUMP ALTITUDE: 跳伞高度

跳伞者出舱时飞机离地的实际高度。

Actual altitude of an aircraft above the ground at the time a skydiver exits.

JUMP: 跳

见“SKYDIVE”（跳伞）

JUMP RUN: 跳伞航线

跳伞者即将出舱前，飞机的飞行路径，通常遵循预定的航线。

The flight of the aircraft prior to exit, generally following a predetermined path.

JUMPER: 跳伞员

见“SKYDIVER”（跳伞者）

JUMPMASTER: 跳伞指导

1. （名词）一类跳伞者，通常是资深跳伞员或者教学评级持有者，负责协调跳伞者的登机 and 出舱顺序，跳伞作业飞行程序，看点定位，以及与飞行员协调紧急程序。

A skydiver, typically a senior jumper or instructional rating holder, who coordinates boarding and exit order, jump flight procedures, spotting, and emergency operations with the pilot.

2. （动词）派遣（跳伞者）。

To dispatch jumpers.

3. （名词）2002 年前存在的 USPA 教学评级，负责监督学生跳伞。

Prior to 2002, a USPA instructional rating for supervising student jumps.

JUMPSUIT: 连体服（跳伞服）

指用于增加保护或改变气动性能的跳伞服装。

A garment used for protection or to alter performance.

L

LANDING PATTERN: 着陆航线

跳伞者在降落伞下降的最后阶段所使用的经过预先计划的飞行路线，通常是矩形的。

The deliberate flight path, usually rectangular, that a jumper uses in the final phase of descent under canopy.

LICENSE: 执照

证明跳伞者已达到规定的经验、技能和知识水平的证书。USPA 执照分为四类：A 执照、B 执照、C 执照和 D 执照。USPA 执照经由 FAI 受到国际认可。

Certificate of proficiency recognizing that a skydiver has met a specified level of experience, skill, and knowledge. There are four classes of USPA licenses: A, B, C and D. USPA licenses are recognized internationally through the FAI.

LINE DOCK: 线对接

两个降落伞对接的一种形式，在这种对接形式中，前来对接的跳伞者的降落伞在被对接的跳伞者头顶上方。

The docking of two canopies with the docker's canopy above the head of the person receiving the dock.

LINE TWIST: 线缠绕

指降落伞开伞后，虽然完全打开或近乎完全打开并充气，但伞绳或组提带完全缠绕在一起。当这种情况和降落伞螺旋下坠结合在一起时情况会变得危险。

A condition of parachute opening where the canopy has attained full or nearly full inflation but one or more complete twists have developed in the lines and/or risers. Can be dangerous when associated with a spin.

LINEOVER: 线翻越

一种降落伞的部分故障，一些伞绳翻越过了降落伞伞布的顶部。有时也用来指圆形降落伞的部分倒转，见“PARTIAL INVERSION”（部分倒转）。

A partial malfunction of a deployed parachute resulting in lines going over the top of the canopy. Also refers loosely to the partial inversion of a round canopy. (see also PARTIAL INVERSION)

LOW-TURN RECOVERY: 低转改出

降落伞飞行紧急程序 (CEP) 之一，用于快速中和距离地面过近以至来不及自然恢复平直飞行的转弯。该操作通过拉下仍处于全速飞行位置的刹车，使其与另一侧的刹车位置匹配（即两侧刹车均处于制动位置），从而中和转弯并减慢前进速度，以进行后续的拉平。

One of the canopy-flight emergency procedures (CEPs) used for quickly neutralizing a turn initiated too close to the ground for the canopy to recover naturally. This maneuver entails neutralizing the turn by pulling the toggle that is still in full flight to match the lower toggle—resulting in both toggles in a braked position—stopping the turn and slowing forward speed before flaring.

M

MAE WEST: 部分倒转 (旧称)

“部分倒转”的旧称，二战时期用来指圆形降落伞的部分倒转。见“PARTIAL INVERSION”（部分倒转）

WWII term for partial inversion of a round parachute. (see also PARTIAL INVERSION)

MAIN-ASSISTED RESERVE DEPLOYMENT (MARD): 主伞辅助备伞开伞装置 (MARD)

一种设计用来在切伞后加速备伞开伞的装置。在切掉主伞后，该系统利用脱离的主伞来辅助拉出备伞，从而减少高度损失并确保备伞快速开伞。

A device designed to expedite a reserve-parachute deployment after a cutaway. Upon cutting away the main canopy, the system utilizes the departing main parachute to assist in extracting the reserve parachute, thereby minimizing altitude loss and ensuring a rapid reserve deployment.

MAIN PARACHUTE: 主降落伞

简称主伞，是作为主要降落伞使用的降落伞，或打算与备用降落伞一起使用的降落伞（联邦航空条例第 105 部分定义）。

A parachute worn as the primary parachute used or intended to be used in conjunction with a reserve parachute.(FAR 105 definition)

MAINTENANCE: 维护

零件的检查、检修、维修、保存和更换。

Inspection, overhaul, repair, preservation, and replacement of parts.

MAJOR ALTERATION: 大改

指制造商规范中未提及的，可能显著影响重量、结构强度、性能、飞行特性的改装，以及其他影响适航性的特征改变，或指初级操作无法完成的改装。另见“ALTERATION”（改装）。

An alteration not listed in the manufacturer's specifications that might appreciably affect weight, structural strength, performance, flight characteristics, or other qualities affecting airworthiness or that cannot be done by elementary operations.(see also ALTERATION)

MAJOR REPAIR: 大修

指那些如果操作不当，可能会影响重量、结构强度、性能、飞行特性或其他决定适航性的特征的重大维修操作。

A repair that if improperly accomplished may affect weight, structural strength, performance, flight characteristics, or other qualities which determine airworthiness.

MALFUNCTION: 故障

指降落伞在开伞、下降或飞行特性等方面的完全故障或部分故障。

The complete or partial failure of a parachute canopy to accomplish proper opening, descent, or flight characteristics.

MARD: 主伞辅助备伞开伞装置 (缩写)

见“MAIN-ASSISTED RESERVE DEPLOYMENT” (主伞辅助备伞开伞装置)

MASTER RIGGER: 专家级降落伞装备师

联邦航空局对降落伞装备师的两个等级认证中的最高级别，能够执行更复杂的维修任务和经许可的改装。另见“SENIOR RIGGER” (资深降落伞装备师)。

The higher of two certification levels for FAA riggers. May perform more complex repair tasks and approved alterations. (see also SENIOR RIGGER)

MENTOR (SKYDIVING): (跳伞) 导师

经验丰富的跳伞者，通常持有 D 执照，可以就跳伞相关事宜向经验不足的跳伞者提供建议和指导。

An experienced skydiver, usually D licensed, who can offer advice and guidance on skydiving-related matters to jumpers with less experience.

MINI THREE RING: 迷你三环释放系统

是指缩小版的原三环释放系统，另见“THREE-RING RELEASE” (三环释放系统)

Refers to a scaled-down version of the original three-ring release system.(see also THREE-RING RELEASE)

MINOR ALTERATION: 小改

除大改以外的改装。另见“ALTERATION” (改装) 和“MAJOR ALTERATION” (大改)。

An alteration other than a major alteration.(see also ALTERATION and MAJOR ALTERATION)

MINOR REPAIR: 小修

大修以外的维修。另见“MAJOR REPAIR” (大修)

A repair other than a major repair.(see also MAJOR REPAIR)

MOVEMENT JUMP: 涉及大范围水平移动的自由落体

一种非翼装类的跳伞，在该类跳伞中，跳伞者或跳伞者组成的编队计划在自由落体阶段水平移动，飞离飞机的飞行路线。

A non-wingsuit jump on which a skydiver or group intends to move horizontally off the line of flight during freefall.

MSL: 海拔高度

以海平面为基准测量的高度。

Acronym for Mean Sea Level. Altitude measured from sea level.

N
NAA: 美国国家航空协会 (缩写)

见“NATIONAL AERONAUTIC ASSOCIATION” (美国国家航空协会)

NASSER TOGGLES: 纳赛尔拉环

指连接到一条或多条 A 组伞绳或 A-B 组伞绳的位于前组提带上的拉环，用来使降落伞朝降落伞编队俯冲。由纳赛尔·巴希尔设计。

Control loops on the front risers attached to one or more A or A-B lines to facilitate diving the canopy toward a canopy

formation. Designed by Nasser Basir.

NATIONAL AERONAUTIC ASSOCIATION (NAA): 美国国家航空协会

在美国代表 FAI 的国家航空俱乐部。USPA 是 NAA 的一个部门。

The National Aero Club of the USA which represents the FAI. USPA is a division of the NAA.

NATIONAL DIRECTOR: 国家级董事

见“BOARD OF DIRECTORS”（董事会）。

NIGHT JUMP: 夜间跳伞

正式日落后一小时到正式日出前一小时之间进行的跳伞。联邦航空局认为日落后和日出前进行的任何跳伞都是夜跳，需要使用联邦航空条例第 105 部分中规定的设备进行跳伞。

A skydive made from one hour after official sunset to one hour before official sunrise. The FAA considers any jump made after sunset and before sunrise a night jump requiring equipment specified in FAR 105.

NORMAL LANDING AREA: 常规着陆区

指跳伞基地指定的，与高性能着陆区分开的着陆区域。

A landing area at a drop zone that DZ management has designated as separate from the high-performance landing area.

NOTAM (NOTICE TO AIR MISSIONS): 航空人员通知

空域的使用者向联邦航空局飞行服务站提交的空中交通公告或通知。

An air-traffic advisory or notice filed with an FAA Flight Service Station by an airspace user.

O

OBJECT: 空投物

指从飞行器上投下的，在下落到地面的全程或部分过程中使用降落伞运输的任何物品，人员除外（联邦航空条例第 105 部分定义）。

Any item other than a person that descends to the surface from an aircraft in flight when a parachute is used or is intended to be used during all or part of the descent. (FAR 105 definition)

OPEN BODY OF WATER: 开放水域

跳伞者可能被淹死的水域。

A body of water in which a skydiver could drown.

OPENING POINT: 开伞点

指跳伞者打开降落伞的地面位置参考点。

The ground point of reference over which the skydiver opens the parachute.

OPENING SHOCK: 开伞冲击

指降落伞展开和充气时施加在降落伞载荷上的减速冲击力，由降落伞以及其相关物的空气阻力引起。

The decelerating force exerted on the load as the parachute deploys and inflates. Caused by the resistance of the canopy and items associated with it.

OSCILLATION: 晃动

1. 降落伞下悬挂载荷的抖动或来回摆动。

The swinging or pendulum motion of the suspended load under a canopy.

2. 在降落伞编队中，由于编队对接不佳、乱流，或编队人员过多机动等原因引起的编队摇摆或晃动。

In canopy formation, the swaying or swinging of a formation caused by poor docking, turbulent air, or too much movement of the people in the formation.

OUTBOARD: 朝外的

指朝向外侧，例如朝向跳伞者身体侧方而不朝向胸部的备伞把手。

Facing to the outside, such as a reserve handle facing to the side of the jumper rather than toward the breastbone.

P

PACK: 叠伞

叠好降落伞并关包，为跳伞做准备。

To fold and close a parachute system in preparation for jumping.

PACKING DATA CARD: 叠伞记录卡

降落伞系统上带着的一张卡，上面记录了该降落伞系统的维护历史。

A card kept with a parachute system that records the maintenance on that system.

PARACHUTE: 降落伞

一种能降低物体下落速度的，由布料制成的装置；源于法语中的“para”（保护）和“chute”（坠落）。因此，降落伞的字面意思是“从坠落中保护”

A fabric device that slows the descent of a falling object; derived from the French words "para," to shield, and "chute," to fall. Thus, parachute literally means "to shield from a fall."

PARACHUTE DROP: (物资) 空投

指在整个或部分下落过程中使用降落伞，或计划使用降落伞的，空投物从飞行器落到地面的降落过程（联邦航空条例第 105 部分定义）。

The descent of an object to the surface from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent. (FAR 105 definition)

PARACHUTE JUMP: (人员) 跳伞

指在整个或部分下落过程中使用降落伞，或计划使用降落伞的，人员从飞行器落到地面的降落伞作业（联邦航空条例第 105 部分定义）。

A parachute operation that involves the descent of one or more persons to the surface from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent (FAR 105 definition).

PARACHUTE LANDING FALL (PLF): 着陆缓冲 (PLF)

美国军方开发的一种方法，用以将降落伞硬着陆造成伤害的可能性降到最低。跳伞者借助身体最健壮的部位有序散落地的冲击力。

A method developed by the U.S. military to minimize the chance of injury from a hard landing under parachute. The jumper distributes the force of the landing in an orderly manner over the most robust areas of the body.

PARACHUTE OPERATION: 降落伞作业

指为支持或进行人员跳伞或物资空投而开展的所有活动。降落伞作业可包括但不限于下列人员：跳伞员，双人伞指挥员，双人伞乘员，降落区运营人员或所有者，跳伞指导，持证降落伞装备师，或飞行员（联邦航空条例第 105 部分定义）。

The performance of all activity for the purpose of, or in support of, a parachute jump or a parachute drop. This parachute operation can involve, but is not limited to, the following persons: parachutist, parachutist in command and passenger

in tandem parachute operations, drop zone or owner or operator, jumpmaster, certificated parachute rigger, or pilot (FAR 105 definition).

PARACHUTIST: 跳伞员

指意图使用单背带双降落伞系统从飞行器出舱并降落到地面的人（联邦航空条例第 105 部分定义）。见“SKYDIVER”（跳伞者）。

A person who intends to exit an aircraft while in flight using a single-harness, dual parachute system to descend to the surface (FAR 105 definition). (see also SKYDIVER)

PARACHUTIST IN COMMAND: 双人伞指挥员

指对双人伞作业的操作和安全负责的人（联邦航空条例第 105 部分定义）。不一定是 USPA 教学评级持有者。

The person responsible for the operation and safety of a tandem parachute operation.(FAR 105 definition) Not necessarily a USPA instructional rating holder.

PARTIAL INVERSION: 部分倒转

圆形伞的充气故障，伞的一侧穿过伞另一侧的两条伞绳并充气，导致出现两个的充气部分。另见“LINEOVER”（线翻越）。

Inflation malfunction of a round canopy where one side passes through and inflates between two lines of the other side, resulting in two inflated lobes.(see also LINEOVER)

PASSENGER PARACHUTIST: 双人伞乘员

指登上飞行器的，在双人伞作业中不作为双人伞指挥员的，使用双背带双人伞系统的前背带降落到地面的人员（联邦航空条例第 105 部分定义）。USPA 进一步定义双人伞乘员为持证跳伞者或双人伞学生。

A person who boards an aircraft, acting as other than the parachutist in command of a tandem parachute operation, with the intent of exiting the aircraft while in flight using the forward harness of a dual harness tandem parachute system to descend to the surface (FAR 105 definition). USPA further defines a passenger parachutist as either a licensed skydiver or a tandem student.

PERMEABILITY: 透气性

可穿透过布料的空气量或体积。

The amount or volume of air which can pass through a fabric assembly.

PILOT CHUTE: 引导伞

指用于启动，以及/或者加速主伞或备伞打开的一个小降落伞。（联邦航空条例第 105 部分定义）。

A small parachute used to initiate and/or accelerate deployment of a main or reserve parachute. (FAR 105 definition)

PILOT-CHUTE ASSIST: 引导伞辅助释放

将 Static Line 与降落伞连接一种方法。其工作原理是，Static Line 打开伞包，并在与降落伞分离前将引导伞完全抽出。通常使用魔术贴或强度已知的可断绳线来实现。

A method of rigging a static line to a parachute where the static line opens the container and positively extracts the pilot chute before separating from the system. Typically, a strip of touch fastener (Velcro) or break cord of known strength is used.

PIN: 根据不同语境有以下含义

1. 抓住

指自由落体时飞向另一个跳伞者并抓住他，或指进行降落伞编队时飞向另一个跳伞者并与他的降落伞进行连接。

To fly to another jumper and take grips on the jumper (freefall) or canopy (canopy formation).

2. 二号跳伞者

指首先与作为基准（Base）或目标的跳伞者进行接触的跳伞者，以开始形成跳伞编队。

The first jumper to make contact with the base, or target jumper, to begin a formation.

3. 关包针

一种维持装置，当它穿过关包绳时，可将降落伞系统锁住，直到打开降落伞。

Retaining device that, when passed through a closing loop, locks the parachute system closed until activation.

PIN CHECK: 关包针检查

指对伞包上的备伞关包针和主伞关包针进行的检查，以确保它们位置正确且稳固。

Inspection of the reserve and main closing pins on a parachute container to ensure they are correctly positioned and secure.

PLF: 着陆缓冲（缩写）

见“PARACHUTE LANDING FALL”（着陆缓冲）

PLANE: 平面式编队

一种紧凑的（译者注：比堆叠式（Stack）编队压得更紧的）垂直方向上的降落伞编队形式，其中跳伞者的双脚停靠在下方降落伞的滑块布下方的组提带连接带上。

A compressed vertical canopy formation, where the jumper's feet are docked on the cross connectors below the slider of the lower canopy.

PLANFORM: 翼面形状

翼面形状或覆盖面积。

The shape or footprint of a wing surface.

PLANING: 压紧编队

指把降落伞 Stack（堆叠式）编队压得更紧凑的动作。

The act of compressing a parachute stack.

POISED EXIT: 扒机身出舱

跳伞者借用飞机舱门门框或支杆来稳定身体，以准备就位进行出舱，并以胯部迎向相对气流的姿态跳出。

A departure from an aircraft where the jumper sets up for exit using the aircraft door frame or strut for stability and launches with hips presented into the relative wind.

POROSITY: 孔隙率

布料的可透过面积与封闭面积之比。分为高、低或完全不透三个级别。紧密编织和经过处理的材料比松散编织的材料具有更低的孔隙率。

The ratio of open area to closed area in a fabric. Graded as high, low, or zero. Tightly woven and treated material has a lower porosity than loosely woven material.

PRACTICE DEPLOYMENT: 模拟开伞练习

一种空中练习，用来学习如何在开伞前找到开伞把手并对其进行操作。在 IAD 或 Static Line 培训方法中，该练习可能包括拉动或抛出一个练习把手或假把手，该练习也可以是在自由落体或双人伞跳伞的带减速伞下落过程中实际触摸开伞把手。

An in-air exercise used to learn how to locate and operate a parachute deployment handle prior to opening. It may consist of pulling or throwing a practice or dummy handle (instructor-assisted deployment or static-line jumps) or touching the actual deployment handle in freefall or tandem droguefall.

PREMATURE OPENING: 意外提前开伞

非有意的降落伞打开。

Unintentional opening of a parachute.

PROJECTED LANDING POINT: 预估着陆点

根据降落伞的下滑轨迹预估的地面着陆点。

The expected landing spot on the ground, based on the glide path of the parachute.

PROP BLAST: 螺旋桨气流

1. 指螺旋桨制造的产生推力的气流。

The airflow created by a propeller that is developing thrust.

2. 指出舱时跳伞者面对的相对气流

relative wind on exit

PUD: 软握把

一种低空阻的、柔软的把手，符合人体工程学设计，适合用拳头紧握。用于各种降落伞操作把手。

An aerodynamically low-profile, soft handle that is ergonomically designed to fit into a clenched fist. Used for various parachute operation handles.

PULL OUT: 拉出式开伞

一种手动释放式的降落伞激活系统。跳伞者通过拉动一个连接伞包关包针和叠在伞包内部的引导伞的把手来开伞。另见“HAND-DEPLOYED PILOT CHUTE”（手动释放式引导伞）。

A type of hand-deployed parachute activation system. The jumper pulls a handle connected to the container closing pin and the internally packed pilot chute. (see also HAND DEPLOYED PILOT CHUTE)

PULL-UP CORD: 关包辅助绳

一种叠伞辅助工具，用于辅助关包绳穿过伞包的孔眼，在关包针插好后，该辅助绳会被拆走。

A packing aid used to thread the closing loop through eyelets in the container and removed once the closing pin is inserted.

R

RAM-AIR PARACHUTE: 冲压空气式降落伞

指一种降落伞，其降落伞伞布包含上下两个表面，由空气冲入伞前部特设的开口进行充气，充气后形成滑翔翼翼面（联邦航空条例第 105 部分定义）。

A parachute with a canopy consisting of an upper and lower surface that is inflated by ram air entering through specially designed openings in the front of the canopy to form a gliding airfoil (FAR 105 definition).

RATING-RENEWAL SEMINAR, USPA: USPA 评级更新会议

USPA 教学评级持有者的继续教育项目，旨在提高并确保跳伞教学的质量。该会议可以通过会面形式进行，参与者交流信息、介绍和讨论新想法，并回顾 USPA 的近期相关提议；也可以通过 USPA 图书馆在线进行，包含简短的互动课程，复习教学策略以及 USPA 的最新相关提议。

A continuing educational program for USPA instructional rating holders to improve and ensure the quality of skydiving instruction. This seminar can be conducted in a meeting where participants exchange information, introduce and discuss new ideas, and review recent relevant USPA initiatives; or online in the USPA Library consisting of short, interactive lessons reviewing instructional strategies as well as recent relevant USPA initiatives.

REAR-RISER STALL: 后组失速

指通过拉动后组提带（仅下拉 5-6 英寸，即 13-15 厘米）来影响降落伞的 C 组伞绳和 D 组伞绳从而改变降落伞后半部分的形状进而突然引发的失速。过度操作可能导致低速失速。另见“STALL”（失速）、“TOGGLE STALL”（刹车失速）和“HIGH-SPEED STALL”（高速失速）。

A parachute stall induced by changing the shape of the parachute by affecting the C and D lines (the back half of your canopy), commencing suddenly by pulling down only 5-6 inches on both rear risers. Applying too much input is associated with a slow speed stall. (see STALL, TOGGLE STALL, and HIGH-SPEED STALL)

REAR-RISER TURNS: 后组转弯

降落伞飞行紧急程序 (CEP) 之一，用于在刚开伞后、降落伞下降过程中或着陆航线中避免碰撞。此操作是开伞后最快改变方向的方法，即使刹车仍处于未释放状态。

One of the canopy-flight emergency procedures (CEPs) used for canopy-collision avoidance immediately after opening, during the canopy descent, or in the landing pattern. This maneuver is the fastest way to change heading right after opening, even when the brakes are still stowed.

RECOMMENDATIONS, USPA: USPA 建议

适用于跳伞或相关主题的原则、政策和概念，这些建议来自经验或理论，由 USPA 编制并提供指导。

Principles, policies, and concepts applicable to skydiving or a related subject that are derived from experience or theory, compiled by USPA, and offered for guidance.

REGIONAL DIRECTOR, USPA: USPA 区域董事

USPA 董事会成员，从指定地理区域中选举出来，负责代表该地区内跳伞者的利益。

Member of the USPA Board elected from a specified geographical area and responsible for representing the interests of the skydivers in that USPA Region.

RELATIVE WIND: 相对气流

相对于物体运动轨迹的气流来流，与地面无关。

The relative airflow opposite a body's trajectory, irrespective of the horizon.

RELATIVE WORK (RW): 跳伞编队

见“FORMATION SKYDIVING”（团体跳伞）

REMOVABLE DEPLOYMENT SYSTEM (RDS): 可拆下的开伞系统 (RDS)

指一种在开伞后能把滑块布拆下来的开伞系统（有些开伞系统甚至可拆下 D 包和引导伞），主要被做高性能伞控动作的跳伞者使用，目的是开伞后减小降落伞飞行阻力。

Primarily used by high-performance canopy pilots it is a system that allows the slider, and in some cases the deployment bag and pilot chute, to be removed after opening to help decrease drag.

RESERVE PARACHUTE: 备用降落伞

简称备伞，指经审批批准的，紧急情况下使用的降落伞。其仅在主伞失效时启动，或在任何无法使用主伞、使用主伞会增加风险的紧急情况下使用（联邦航空条例第 105 部分定义）。

An approved parachute worn for emergency use to be activated only upon failure of the main parachute or in any other emergency where use of the main parachute is impractical or use of the main parachute would increase risk (FAR 105 definition).

RESERVE STATIC LINE (RSL): 联动装置 (RSL)

主伞组提带和备伞系统之间的连接装置，用于在已飞出伞包的主伞被切伞之后打开备伞。

A connection between the main risers and the reserve activation system intended to initiate reserve activation following the release of a deployed main parachute.

RIB: 伞肋

一种垂直的纵向的薄膜布料，构成了冲压空气式降落伞的翼型和主要结构。

A vertical and longitudinal fabric membrane that forms the airfoil shape and primary structure of a ram-air canopy.

RIG: 在不同语境下有以下含义

1. (名词) 装备，指跳伞用的完整的降落伞系统。

The complete parachute system used for skydiving.

2. (动词) 对降落伞系统进行维护、维修或改装的行为。

The act of maintaining, repairing, or modifying a parachute system.

3. (动词) 穿上降落伞装备 (用法示例: Rigging Up)。

To don a parachute (e.g. rigging up).

RIGGER: 降落伞装备师

联邦航空局认证的降落伞技术人员。另见“MASTER RIGGER”（专家级降落伞装备师）和“SENIOR RIGGER”（资深降落伞装备师）。

An FAA-certificated parachute technician (see also MASTER RIGGER and SENIOR RIGGER).

RIPCORD: 拉索

一种通常由一根金属缆绳和一个把手组成的装置，当它被拉动时，能激活降落伞的开伞过程。

An assembly, usually constructed with a metal cable and handle that, when pulled, activates the opening of a parachute.

RISER DOCK: 组提带对接

指在降落伞编队中，对接方将组提带置于被对接方手中的一种高速对接，是非常高阶的技巧。

In canopy formation, a momentum dock that puts the risers into the hands of the receiver. A very advanced technique.

RISER LOOPS; RISER BLOCKS: 组提带抓环

组提带上的供抓握的环带或装置，使跳伞者更容易抓住组提带。

Gripping loops or devices on a riser that make it easier to grasp.

RISER(S): 组提带

将降落伞背带的主支撑带 (MLW) 连接到降落伞伞绳的带子。

Webbing straps that connect the main lift webs of the parachute harness to the lines of the canopy.

RSL: 联动装置 (缩写)

见“RESERVE STATIC LINE” (联动装置)

S

SAFETY AND TRAINING ADVISOR (S&TA), USPA: USPA 安全和培训顾问

缩写 S&TA，指由 USPA 区域董事任命来代表他（她）的当地人员，可作为 USPA 在降落区（跳伞基地）或指定区域的代表来提供建议和行政协助。

A local person appointed by the USPA Regional Director as his or her representative and who is available to provide advice and administrative assistance as the USPA representative at an individual drop zone or specified area.

SANCTIONED DROP ZONE: 获批的降落区

经 USPA 安全和培训顾问或 USPA 区域董事验证符合 USPA 跳伞者信息手册基本安全要求规定的最低降落区要求的降落区。见“DROP ZONE”（降落区）。

A drop zone that has been verified by a USPA Safety and Training Advisor or a USPA Regional Director as complying with the minimum drop zone requirements as stated in the USPA Basic Safety Requirements section of the USPA Skydiver's Information Manual.(see also DROP ZONE)

SELF-SUPERVISION: 自我监督

指学生得到教练授权在未完成 A 执照所有要求的情况下，无需教练在飞机上、自由落体阶段或降落伞飞行阶段的监督即可进行单人跳伞。在登机前，学生必须由持有教学评级的人员进行装备检查。在 USPA 团体会员跳伞基地，所有获得自我监督许可的跳伞者必须持有当前有效的 USPA 会员资格。详情请见 E 单元的学术部分。

A term used to indicate an instructor has authorized a student to conduct solo jumps without instructor supervision in the aircraft, freefall, and under the canopy, but before they have completed all the requirements for the A license. Before boarding the aircraft, the student must receive a gear check from an instructional rating holder. At USPA Group Member skydiving centers, all skydivers cleared for self-supervision must be current USPA members. See Category E Academics.

SENIOR RIGGER: 资深降落伞装备师

联邦航空局认证的初始级别降落伞装备师，该认证的持有者可以叠伞和维护降落伞系统，并进行简单维修。另见“MASTER RIGGER”（专家级降落伞装备师）。

The initial certification level for FAA riggers that allows its holder to pack and maintain a parachute system and perform simple repairs.(see MASTER RIGGER)

SHAGG: SHAGG 检查

是以下检查项目的缩写：**Shoes**（鞋子）：系好鞋带，无钩状部件；**Helmet**（头盔）：合适并调整好，扣紧；**Altimeter**（高度表）：调好零点；**Goggles**（护目镜）：紧贴且干净清晰；**Gloves**（手套）：轻便且尺寸合适（低于 40 华氏度，即 4 摄氏度时使用）。

Acronym for "shoes—tied, no hooks; helmet—fit and adjustment and buckled; altimeter—set for zero; goggles—tight and clean; gloves—lightweight and proper size (below 40 degrees F)."

SIM: 跳伞者信息手册（缩写）

跳伞者信息手册（本书）的缩写。见“SKYDIVER'S INFORMATION MANUAL”（跳伞者信息手册）。

Abbreviation for Skydiver's Information Manual (this book).(see SKYDIVER'S INFORMATION MANUAL)

SINGLE OPERATION SYSTEM (SOS): 单把手紧急系统 (SOS)

一种降落伞背带与伞包系统，带有一个可单点释放组提带的备伞把手。拉动单个把手将同时释放组提带并打开备伞。另见“TWO-HANDLED SYSTEM”（双把手紧急系统）。

Refers to a parachute harness and container operation system with a combined single-point riser release and reserve handle. Pulling one handle will both release the risers and pull the reserve. (see also TWO HANDLED SYSTEM)

SINGLE-HARNESS, DUAL-PARACHUTE SYSTEM: 单背带双降落伞系统

指由主伞、经批准的备伞、经批准的单人背带和双降落伞伞包的组合。该降落伞系统可选择安装 AAD（联邦航空条例第 105 部分定义）。

The combination of a main parachute, approved reserve parachute, and approved single-person harness and dual-parachute container. This parachute system may have an operational automatic activation device installed (FAR 105 definition).

SIT FLYING: 坐飞

基于坐姿的头朝上的垂直自由飞姿态。

Head up vertical freely orientation based on a seated position.

SKYBOARD: 天空滑板

见“SURFBOARD”（冲浪板）

SKYDIVE: 跳伞

（名词）一个人使用降落伞或计划使用降落伞从飞行器上落到地面的降落过程。

The descent of a person to the surface from an aircraft in flight when he or she uses or intends to use a parachute during all or part of that descent.

（动词）从飞行器上带降落伞跳下来。

To jump from an aircraft with a parachute.

SKYDIVER: 跳伞者

进行跳伞的人。

A person who engages in skydiving.

SKYDIVER'S INFORMATION MANUAL (SIM), USPA (THIS BOOK): 跳伞者信息手册（本书）

一本官方内容集合，包含 USPA 基本安全要求、建议、联邦航空局相关参考资料，以及其他影响大多数跳伞者的 USPA 政策和程序。

The official bound collection of the USPA Basic Safety Requirements, USPA recommendations, relevant FAA references, and other USPA policies and programs that affect the majority of skydivers.

SKYSURFER: 滑板跳伞者

用冲浪板（空中滑板）跳伞的跳伞者。

A skydiver who jumps with a surfboard (skyboard).

SKYSURFING: 空中滑板

使用特殊改装的冲浪板（空中滑板）进行的自由落体跳伞科目。

A freefall skydiving discipline using a specially rigged surfboard (skyboard).

SLIDER: 滑块布

也译作方块布，指一种在降落伞打开充气过程中，通过沿着伞绳逐渐向下滑动来控制降落伞充气的装置。在大多数冲压空气式降落伞上都能找到。

A device which controls a canopy's inflation by progressively sliding down the suspension lines during inflation. Found on most ram-air canopies.

SLINKS: 软连接（缩写）

见“SOFT LINKS”（软连接）

SOFT LINKS: 软连接

一种 Spectra 材质的连接器，用于将降落伞伞绳连接到组提带上，最早由 Performance Designs 公司开发作为金属式连接器的替代品，商标名为 Slinks。

Spectra fabric links for attaching the parachute lines to the risers, first developed as an alternative to metal ("hard") links by Performance Designs under the brand name Slinks.

SOLO DEPLOYMENT: 独立开伞

指学生在无需教练提示的情况下，开始并完成开伞流程，期间教练不接触学生。

Refers to a pull sequence not prompted or cued by the instructor, where the student starts and finishes their pull sequence without instructor contact.

SOLO JUMP: 单人跳 (Solo 跳)

一种跳伞者不进行团体编队跳伞的跳伞。

A jump where a skydiver is not engaged in formation skydiving.

SOLO JUMPER: 单人跳伞员

不进行团体编队跳伞的跳伞者。

A skydiver who is not engaged in formation skydiving.

SOLO SKYDIVER: 单人跳伞者

见“SOLO JUMPER”（单人跳伞员）

SOLO STUDENT: 单人跳伞学生

使用单背带双降落伞系统的跳伞学生。

A skydiving student who uses a single-harness, dual-parachute system.

SOS: 单把手紧急系统 (缩写)

见“SINGLE OPERATION SYSTEM”（单把手紧急系统）

SPACE: SPACE 检查

出舱前确认空域净空和出舱间隔的注意事项的缩写: **S**kydivers (跳伞者)、**P**lane (飞机)、**A**irport (机场)、**C**louds (云层)、**E**xit light (出舱信号灯)。

Acronym used to remember what to look for while clearing the airspace and exit separation before exiting "skydivers, plane, airport, clouds, exit light."

SPAN: 翼展

从一侧翼尖到另一侧翼尖的长度。

The dimension of a wing measured from tip to tip.

SPEED SKYDIVING: 高速跳伞

一种跳伞类型，其目标是达到尽可能高的速度，并在一段预定时间内保持速度。

Skydiving discipline in which the goal is to achieve and maintain the highest possible speed for a predetermined amount of time.

SPOTTING: 看点定位

选择出舱的正确地面对应基准点，选择飞机飞行的航线，并引导飞行员沿跳伞航线飞行至该点。

Selecting the correct ground reference point over which to leave the aircraft, selecting the course for the aircraft to fly, and directing the pilot on jump run to that point.

STABILITY: 稳定性

物体的一种特性，该特性能使得物体在平衡受到干扰时，产生力或运动使得该物体趋向于恢复原来的状态。在跳伞运动中是通过自由落体时身体姿态的控制实现。

That property of a body that causes it, when its equilibrium is disturbed, to develop forces or movements tending to

restore the original condition. In skydiving, control of body position during freefall.

STABLE FREEFALL POSITION: 稳定自由落体姿势

自由落体时跳伞者采取的姿势，跳伞者通过这些姿势进行受控的、有计划运动。

A position attained by a freefalling skydiver in which only controlled, planned movements are made.

STACK: 堆叠式编队

一种垂直方向上的降落伞编队，跳伞者连接另一降落伞的伞布或伞布下面靠近伞布的伞绳。

(译者注: Stack 编队相对于 Plane 编队较松散; 连接 (Grip) 的定义详见跳伞者比赛手册 (SCM) 第 10 章)

A vertical canopy formation with the jumpers gripping the canopy or lines just below the canopy.

STALL: 失速

指一种空气动力学现象，发生失速时，降落伞失去产生升力的能力，并失去充气压力，导致伞布无法再承载跳伞者的重量。另见“REAR-RISER STALL”（后组失速）、“TOGGLE STALL”（刹车失速）和“HIGH-SPEED STALL”（高速失速）。

An aerodynamic event where the parachute loses its ability to produce lift, loses pressurization, and the canopy will no longer support the weight of the jumper. (see REAR-RISER STALL, TOGGLE STALL, and HIGH-SPEED STALL)

STATIC LINE: Static Line (绳拉)

指一条一端固定在降落伞上，另一端固定在飞机某处的绳子或带子，当载荷从飞机上落下时，它被用来启动和打开降落伞或部分打开降落伞。

A line of cable or webbing, one end of which is fastened to the parachute and the other to some part of the aircraft, used to activate and deploy or partially deploy the parachute as the load falls away from the aircraft.

STATIC-LINE JUMP: Static Line 跳伞

跳伞的一种，其用 Static Line 来打开或部分打开降落伞。用于训练学生跳伞。

A parachute jump during which a static line is used to deploy or partially deploy the parachute. Used for training student skydivers.

STEP-THROUGH: 穿线

指由于叠伞错误或跳伞者着陆后踩上并穿过伞绳，导致伞包穿过伞绳，从而引发的伞绳故障。

Slang for a line continuity issue caused when the container passes through the lines either by a packing error or when the jumper steps through the lines after landing.

STUDENT: (跳伞) 学生

未获得 USPA A 执照的跳伞学员。

A skydiver trainee who has not been issued a USPA A license.

SUPERVISION: 监督

对某项活动进行的一般监督。监督人随时提供咨询和指导，并对活动的顺利完成负责。见“DIRECT SUPERVISION”（直接监督）。

The general oversight of an activity taking place where the supervisor is readily available for counsel and direction and who is responsible that the activity is satisfactorily completed.(see DIRECT SUPERVISION)

SURFBOARD (SKYBOARD): 冲浪板 (空中滑板)

一块坚硬的类似于滑雪板的滑板，可附在跳伞者的脚上。

A rigid panel, similar to a snowboard, attached to a jumper's feet.

SUSPENSION LINES: 伞绳

从降落伞伞布的底部连接到组提带上的绳，用于将跳伞者的重量分散并悬挂在充气的降落伞伞布下。

Cords, attached from the bottom of the parachute canopy to the risers, that distribute and suspend the weight of a skydiver under the inflated canopy.

SWOOP: 拉飘

以受控的方式飞行，从一个物体的上方飞向或接近另一个物体、静止物或者地面。

The controlled flight from above of one body to meet or fly close to another body, a stationary object, or the ground.

SWOOP POND: 拉飘池

用于作为高性能着陆区的水体。

A water obstacle used as a high-performance landing area.

T**TANDEM JUMP OR TANDEM SKYDIVE: 双人伞跳伞**

任何使用双人伞系统进行的，带有双人伞学生或者持证跳伞者的跳伞。

Any skydive made using a tandem parachute system with a tandem student or licensed skydiver attached.

TANDEM JUMPING: 双人伞伞降

跳伞的一种方式，通常用于训练跳伞学生。其中一名跳伞者与另一名跳伞者共用一个双人伞系统。

A method of skydiving, typically used for training student skydivers where one skydiver shares a tandem parachute system with another.

TANDEM PARACHUTE OPERATION: 双人伞作业

指超过一人同时使用同一个双人伞系统，同时从飞行中的飞行器降落到地面的降落伞作业（联邦航空条例第 105 部分定义）。

A parachute operation in which more than one person simultaneously uses the same tandem parachute system while descending to the surface from an aircraft in flight (FAR 105 definition).

TANDEM PARACHUTE SYSTEM: 双人伞系统

指由主伞、经批准的备伞、经批准的背带和双降落伞伞包、一个单独供双人伞乘员使用的经批准的前背带组成的系统组合。该降落伞系统必须带有 AAD（联邦航空条例第 105 部分定义）。

The combination of a main parachute, approved reserve parachute, and approved harness and dual-parachute container, and a separate, approved forward harness for a passenger parachutist. This parachute system must have an operational automatic activation device installed (FAR 105 definition).

TANDEM STUDENT: 双人伞学生

未获得 USPA 执照的双人伞乘员。

Any person making a tandem skydive who has not been issued a USPA license.

TARGET: 着陆目标

跳伞基地着陆区内的一个特定区域，跳伞者以此为着陆目标。

An area in the landing area on a drop zone where a jumper aims to land.

TECHNICAL STANDARD ORDER (TSO): 技术标准规定 (TSO)

由联邦航空局发布的，规定产品最低性能标准和材料规格的需强制遵守的规范。降落伞规格相关内容见 TSO-C23。

Issued by the FAA, requires compliance with minimum performance standards and specifications for material and

products. Parachute specifications are referenced in TSO-C23.

TERMINAL VELOCITY: 终端速度

自由落体的物体抵抗空气阻力所能达到的平衡速度。是物体在空气中下落的最大速度。

The equilibrium velocity that a freefalling body can attain against the resistance of the air. The greatest speed at which a body falls through the atmosphere.

THREAD-THROUGH: Thread-thru 式调节扣

降落伞背带上的一种腿带配置，使用单个可调节金属部件。腿带必须从调节扣中解出才能分开。跳伞者只需简单地跨入连接好的腿带就能穿上装备。见“B-12S”（夹扣）。

A leg strap configuration on a parachute harness that uses a single piece of adjustable hardware. The leg strap must be un-threaded to be disconnected, or the jumper simply steps into the connected leg straps when donning the rig (see B-12s).

THREE-RING RELEASE: 三环释放系统

一种单点释放装置，由比尔·布斯（Bill Booth）发明。该系统的基础是每个组提带上的三个互锁的金属环，由一个带小圈的绳子固定到位，而该绳子则由一个缆线（切伞拉索）束缚住。拉动一个把手可同时或几乎同时释放两个主伞组提带。

（译者注：1. “单点”意即单个把手可释放两个组提带；2. 根据降落伞工业协会 PIA 关于术语的标准规定 TS 134，组提带释放装置主要分为三类：三环释放装置-“3-Ring Canopy Release”、反三环释放装置-“Reverse 3-Ring”、锁扣式释放装置-“Parachute Canopy Release”）

A type of single-point release invented by Bill Booth. The system is based on three interlocking rings on each riser held in place by a small loop that is retained by a cable. Pulling one handle releases both main risers simultaneously or nearly simultaneously.

THROW OUT: 抛出式开伞

1.（名词）一种手动释放式的降落伞激活系统。引导伞被折叠放入一个伞包外部的袋子里，可被取出并抛出。当引导伞和引导伞系带飞离跳伞者时，引导伞系带上的弯曲关包针（或等效关包装置）被抽出，从而允许伞包被打开。另见“HAND DEPLOYED PILOT CHUTE”（手动释放式引导伞）。

A type of hand-deployed parachute activation system. The pilot chute is folded into an external pouch, extracted and thrown. A curved closing pin or equivalent locking device on the bridle is extracted as jumper falls away from the pilot chute and bridle, allowing the container to open (see HAND DEPLOYED PILOT CHUTE).

2.（动词）启动开伞程序。

To initiate deployment.

TOGGLES: 操纵棒（即刹车）

指连接降落伞操纵线（刹车线）末端的手柄。见“BRAKES”（刹车）。

Handles attached to the ends of the steering lines of a parachute canopy (see also BRAKES).

TOGGLE STALL: 刹车失速

通过缓慢拉下刹车，直至手臂完全拉下而引发的降落伞失速。此时降落伞空速很慢并最终失速，感觉就像向后靠在椅子上并向后倾倒。过量的操作输入可能导致低速失速。另见“STALL”（失速）、“REAR-RISER STALL”（后组失速）和“HIGH-SPEED STALL”（高速失速）。

A parachute stall induced by slowly pulling the toggles down to full arm extension. The canopy loses airspeed and eventually stalls, which feels like rocking back in a chair and falling backward. Applying too much input is associated with a slow speed stall. (see STALL, REAR-RISER STALL, and HIGH-SPEED STALL).

TRACK: Tracking 机动

1.（名词）一种自由落体姿势，双腿完全伸展，膝盖锁定，手臂向后，肘部锁定，躯干完全伸展并略微向前弯曲，以达到最快

的水平速度。

A freefall position with the legs fully extended, knees locked, arms swept back, elbows locked, and torso fully extended and slightly bowed forward to achieve the maximum horizontal speed.

2. (动词) 在自由落体时, 以最快的水平速度移动。

To move at maximum horizontal speed in freefall.

TRACKING JUMP: Tracking 跳伞

一种涉及大范围水平移动的跳伞, 跳伞者在空中横向移动而非垂直下落。飞行时通过采用 Tracking 身体姿势以达到最快的水平速度。

A type of movement jump where skydivers travel across the sky instead of falling straight down. Flying is done in the TRACK body position to achieve the maximum horizontal speed.

TRACKING SUIT: Tracking 服

一种由两部分组成的跳伞服, 穿上后可将人体变成翼面。

A 2-piece inflating suit that transforms the body into a human airfoil.

TSO-C23: 技术标准规定-C23

见“TECHNICAL STANDARD ORDER” (技术标准规定)

TURBULENCE: 乱流

也译作湍流, 是受到干扰的气流, 它可影响降落伞的飞行和完整性。

Disturbed air that can affect canopy flight and integrity.

TURN REVERSALS: 反向转弯

降落伞飞行紧急程序 (CEP) 之一, 用于避免降落伞碰撞。该操作包括先进行 90 度转向, 然后快速而平稳地反转刹车位置, 完成 180 度反向转向。此操作可作为降落伞训练的一部分, 用于了解降落伞在反转转弯方向时, 在最大速度和刹车操作量上的极限, 以避免线缠绕。

Also known as "reverse turns." One of the canopy-flight emergency procedures (CEPs) used for canopy-collision avoidance. The maneuver entails a 90-degree turn followed by reversing toggle positions smoothly but quickly for a 180-degree turn in the opposite direction. This maneuver can be practiced as a canopy drill to learn the limits of a canopy related to the maximum speed and depth of a toggle input when reversing a turn to avoid line twists.

TWO-HANDLED SYSTEM: 双把手紧急系统

一种降落伞背带和伞包系统, 它有一个把手用来释放主伞, 另一个把手用来打开备伞。另见“SINGLE OPERATION SYSTEM” (单把手紧急系统)。

Refers to a parachute harness and container operation system that uses separate handles for the canopy release and for reserve activation. (see SINGLE OPERATION SYSTEM)

U

UNITED STATES PARACHUTE ASSOCIATION(USPA): 美国跳伞协会

由跳伞者自愿组成的非营利会员协会, 其目的是促进跳伞运动以及代表跳伞运动。作为美国国家航空协会 (NAA) 的一个分部, 它是国际航空运动联合会 (FAI) 在美国的跳伞运动官方代表。

A not-for-profit, voluntary membership association of skydivers whose purpose is promoting and representing skydiving. As a division of the NAA, it is the official representative of the FAI for skydiving in the U.S.

UPWIND: 上风向

风的来源方向。

The direction from which the wind is blowing.

W

WAIVER: 豁免

1. SIM 第 2-2 节所述的, 由 USPA 官员提交申请的基本安全要求的豁免。

Exception to the BSRs filed by a USPA official indicated in SIM Section 2-2.

2. 责任免除。

A liability release.

WATER JUMP: 刻意水降

刻意降落在开阔水域的跳伞

A skydive which includes intentionally landing in an open body of water.

WHUFFO: 非跳伞者

圈内对没有跳过伞, 且对跳伞满不在乎的人的称呼 (原意为“好好的干嘛从飞机上跳下来?”)。

Term for a non-skydiver ("Whuffo you jump out of airplanes?") Considered insensitive.

WIND-DRIFT INDICATOR(WDI): 风飘指示器

一种用来确定开伞后跳伞者会被风吹多远的装置, 它的下落速度与使用平均规格降落伞的平均体重跳伞者的下降速度相当。该装置通常是一条 10 英寸宽 20 英尺长的带配重的绉纸。

A device—usually a weighted strip of crepe paper 10 inches wide and 20 feet long—used to determine the wind drift that a descending parachute will experience, so constructed as to descend at a rate comparable to a skydiver of average weight descending under a fully deployed main canopy of average specifications.

WING LOADING: 翼载

跳伞者的离机重量除以降落伞的面积, 美国国内以磅/平方英尺为单位。

The jumper's exit weight divided by the area of the parachute canopy, expressed in the United States in pounds per square foot.

WINGSUIT: 翼装

一种连体式滑翔跳伞服, 在双腿之间, 以及在手臂和躯干之间有膜状编织布料。

A gliding jumpsuit designed with fabric membranes between the legs of the jumper and from each arm to the torso.

Z

ZOO DIVE: 动物园跳伞

指混乱无组织的跳伞, 许多跳伞者偏离了其本应处于的垂直和水平方位。

A skydive that becomes chaotically disorganized with many jumpers out of position both vertically and horizontally.

附录：执照学习指南索引

License Study Guide Index

Use this guide to find areas of the SIM to study for USPA license exams. Refer to Chapter 3 for more information on licenses and exams.

使用本指南查找 SIM 的各部分内容，以准备 USPA 执照笔试。更多关于执照和考试的信息请参考第三章。

A 执照 A LICENSE

Chapter 1, all categories

第一章 所有单元

Chapter 2-1 BSRs, FAR 105

第二章第 1 节 基本安全要求，联邦航空条例 105

Chapter 4 sections 1 & 2

第四章第 1 节和第 2 节

Chapter 5 sections 2 & 7

第五章第 2 节和第 7 节

B 执照 B LICENSE

Chapter 1, Categories D, F, G, H

第一章 D 单元、F 单元、G 单元、H 单元

Chapter 2-1 BSRs, FARs 91.17, 91.211, & 119.1

第二章第 1 节 基本安全要求，联邦航空条例 91.17、91.211、119.1

Chapter 4 sections 1, 2, & 3

第四章第 1 节、第 2 节和第 3 节

Chapter 5 sections 2, 3, & 5

第五章第 2 节、第 3 节和第 5 节

C 执照 C LICENSE

Chapter 1, Category C

第一章 C 单元

Chapter 2-1 BSRs, FARs 91.15, 91.151, 91.409, & 105.17

第二章第 1 节 基本安全要求，联邦航空条例 91.15、91.151、91.409、105.17

Chapter 4 sections 1, 2, 6

第四章第 1 节、第 2 节和第 6 节

Chapter 5 sections 2, 6, 7, 8, 9

第五章第 2 节、第 6 节、第 7 节、第 8 节和第 9 节

Chapter 6 section 1

第六章第 1 节

D 执照 D LICENSE

Chapter 1, Categories F, G, & H

第一章 F 单元、G 单元、H 单元

Chapter 2-1 BSRs, FARs 91.151, 91.211, 105.17, & 105.43

第二章第 1 节 基本安全要求，联邦航空条例 91.151、91.211、105.17、105.43

Chapter 4 sections 1, 2, 3, 4, 5, & 6

第四章第 1 节、第 2 节、第 3 节、第 4 节、第 5 节和第 6 节

Chapter 5 sections 1, 2, 3, 5, 6, 7, 8, & 9

第五章第 1 节、第 2 节、第 3 节、第 5 节、第 6 节、第 7 节、第 8 节和第 9 节

Chapter 6

第六章



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